S-Drive Standard Conveyor

Portable Grain Belt Conveyor
Assembly Manual

This manual applies to the following brands and models:
Batco BCX: 1565, 1575, 1585, 1590, 15100
Westfield WCX: 1565, 1575, 1585, 1590, 15100
Hutchinson HCX: 1565

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: P1512118 R9

Revised: June 2019

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 3.11 – Install the Hopper Roller and Hex Roller on page 45 and Section 3.12 – Install the Spout Roller on page 46
HCX 1565 Conveyor Tube Layout Added	Section 3.8 – Assemble the Conveyor Tube on page 35
New Primer Bulb (Replacing Fuel Pump) Installation Section	Section 3.34.12 – Gas Drive — Primer Bulb on page 129
Revised Specification Section	Section 4. – Specifications on page 141

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.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.

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.

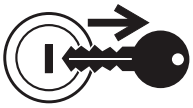
1.4. Rotating Parts Safety

⚠ WARNING

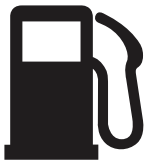
- Keep body, hair, and clothing away from rotating pulleys, belts, chains, and sprockets.
- Do not operate with any guard removed or modified. Keep guards in good working order.
- Shut off and remove key or lock out power source before inspecting or servicing machine.

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 Gas Engine Safety



⚠ WARNING **Power Source**

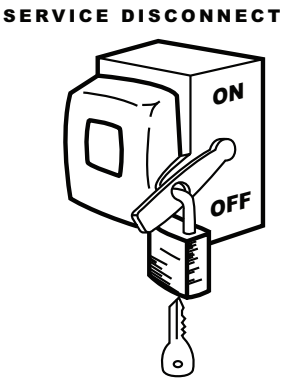
- Keep guards in place and secure.
- Properly ventilate surrounding area.
- Never fill the fuel tank with the engine running, while smoking, or near an open flame. Always shut down and allow engine to cool before filling with fuel.
- Never overfill the tank or spill fuel. If fuel is spilled, clean it up immediately.
- Be sure to use the correct type and grade of fuel. Ground the fuel funnel or nozzle against the filler neck to prevent sparks that could ignite fuel vapors.
- Be sure to replace the fuel fill cap when you are done.

Lockout

- For engines with an electric start, remove the ignition key, the spark plug wire, or the spark plug.
- For engines with a rope or crank start, remove the spark plug wire or the spark plug.

1.5.2 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.

1.5.3 PTO Driveline Safety

⚠ WARNING **Drive**

- Keep body, hair, and clothing away from rotating PTO driveline.
- Make certain the driveline shields telescope and rotate freely on driveline before attaching.
- Make certain the driveline is securely attached at both ends.
- Do not operate conveyor unless all driveline, tractor, and equipment shields are in place and in good working order.
- Do not exceed the specified operating speed.
- Keep universal joint angles small and equal. Do not exceed maximum recommended length for PTO driveline.
- Engage tractor park brake and/or chock wheels.

Lockout

- Position all controls in neutral, shut off tractor's engine, and remove key from tractor.
- If removing key is impossible, remove PTO driveline from tractor.

1.5.4 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. Battery Safety

⚠ WARNING

- Wear safety glasses and protective gloves when working near batteries.
- Make certain the battery or terminal covers are in place and in good working order.
- Keep all sparks and flames away from batteries; gas given off by electrolyte is explosive.
- Avoid contact with battery electrolyte. Wash off any spilled electrolyte immediately.
- Do not tip batteries more than 45° to avoid electrolyte loss.
- To avoid injury from sparks or short circuits, disconnect battery ground cable before servicing any part of an electrical system.

1.8. 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.

1.9. 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.

1.10. 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.

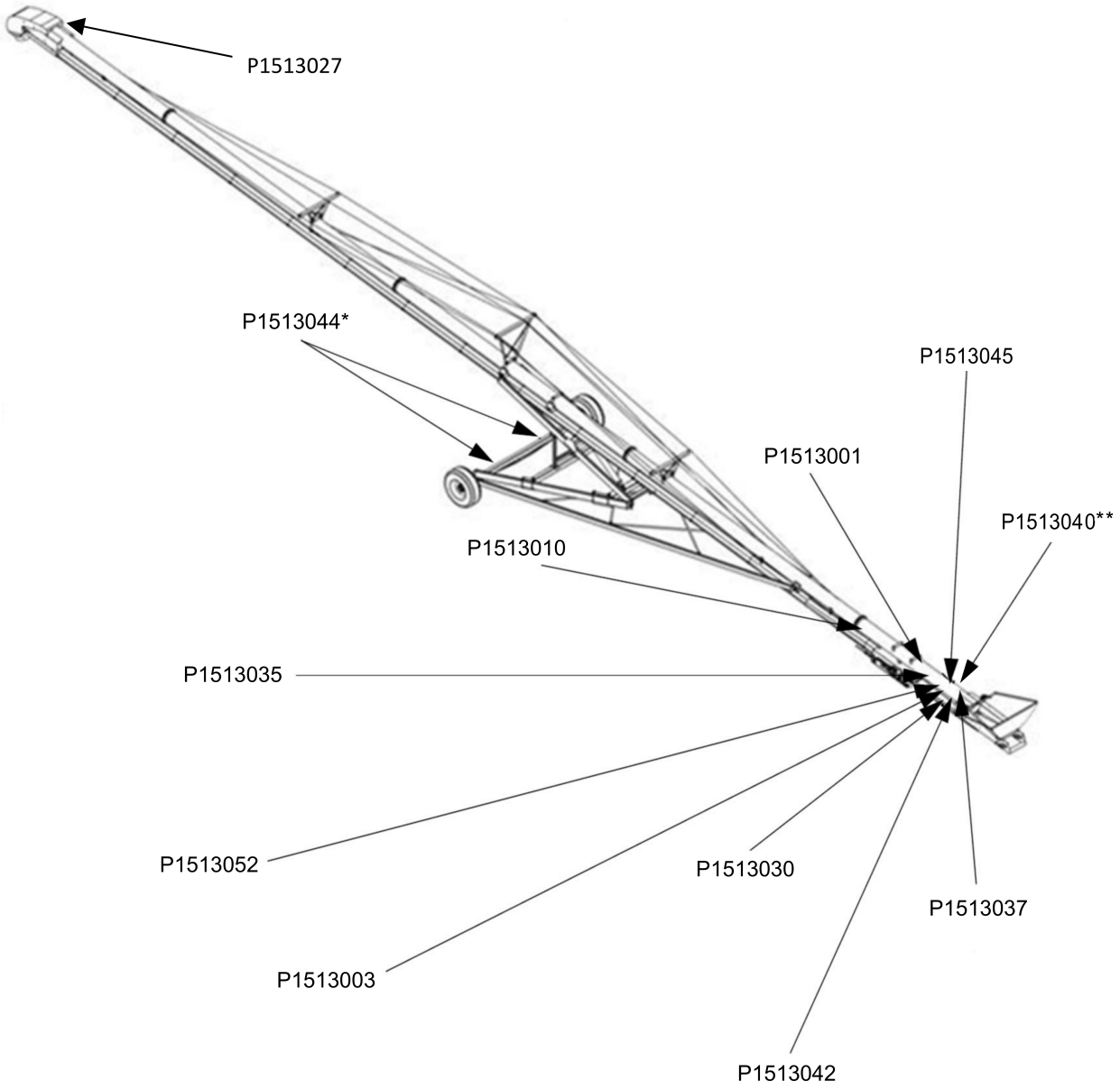
1.10.1 Decal Installation/Replacement

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.

1.10.2 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. Scissor-Lift Conveyor Safety Decal Locations



* if equipped with retractable axles

** if equipped with Mover Kit

Figure 2. S-Drive Safety Decal Locations

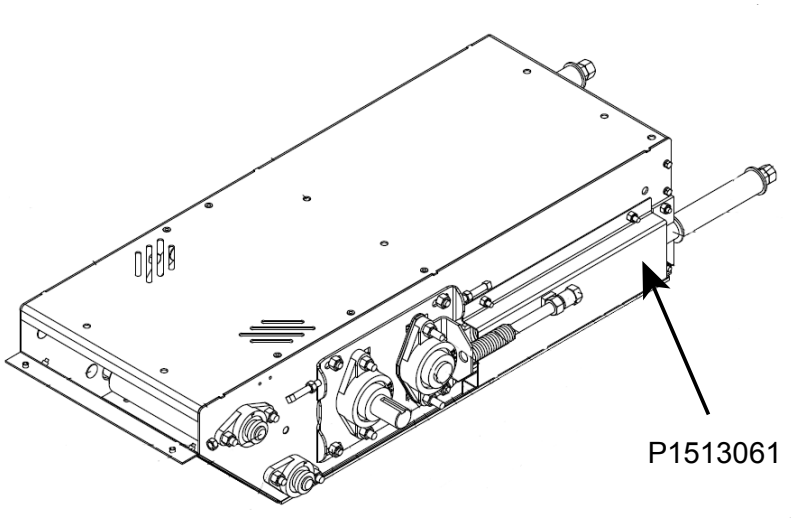


Figure 3. Gas Drive Safety Decal Locations

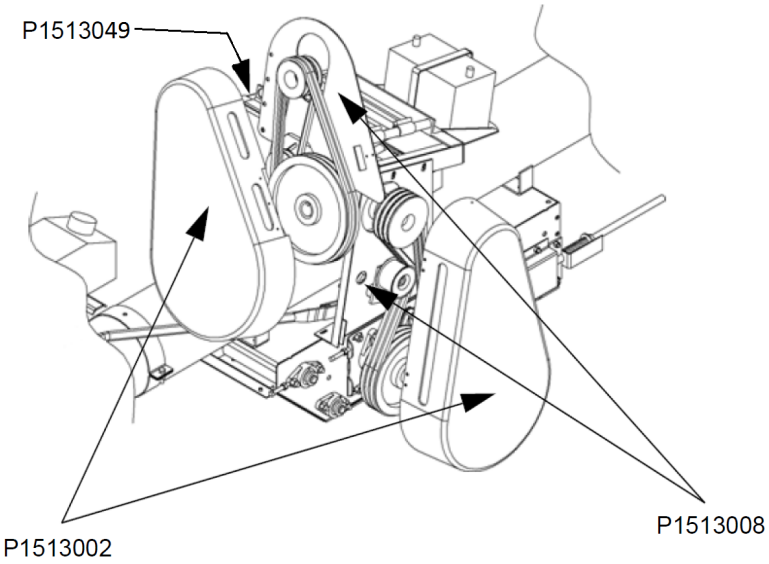


Figure 4. Electric Drive Safety Decal Locations

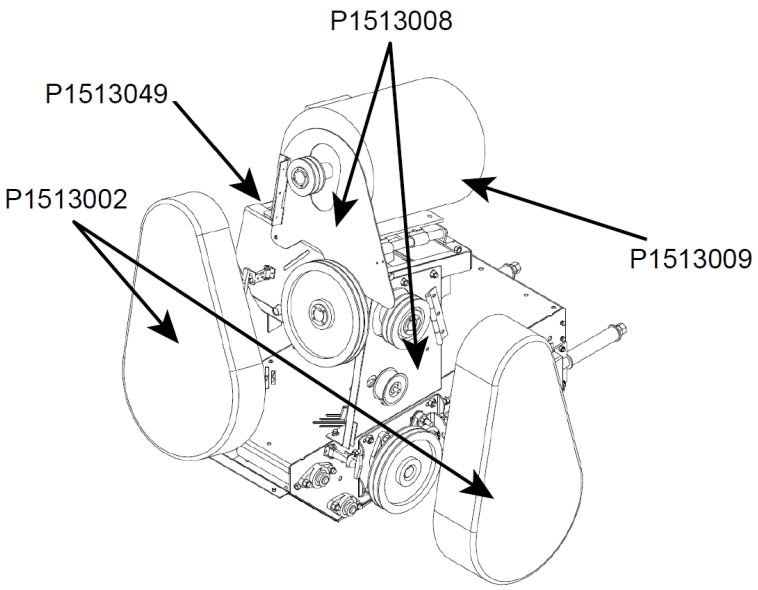


Figure 5. Side PTO Drive Safety Decal Locations

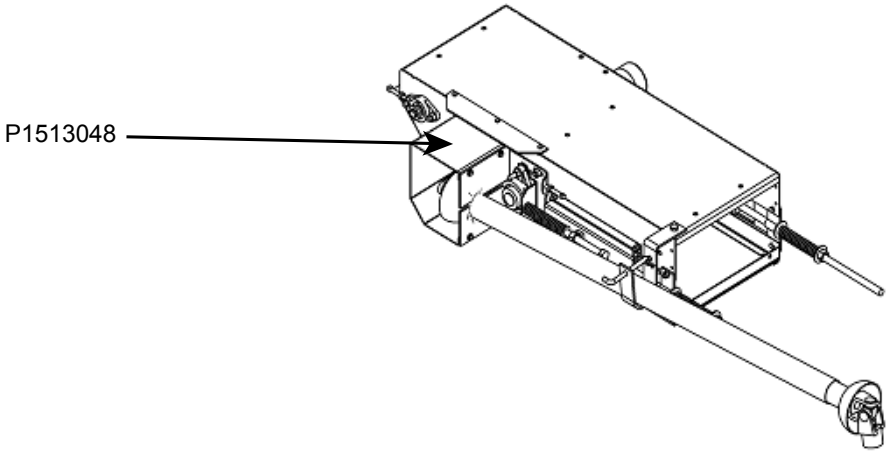


Figure 6. Front PTO Drive Safety Decal Locations

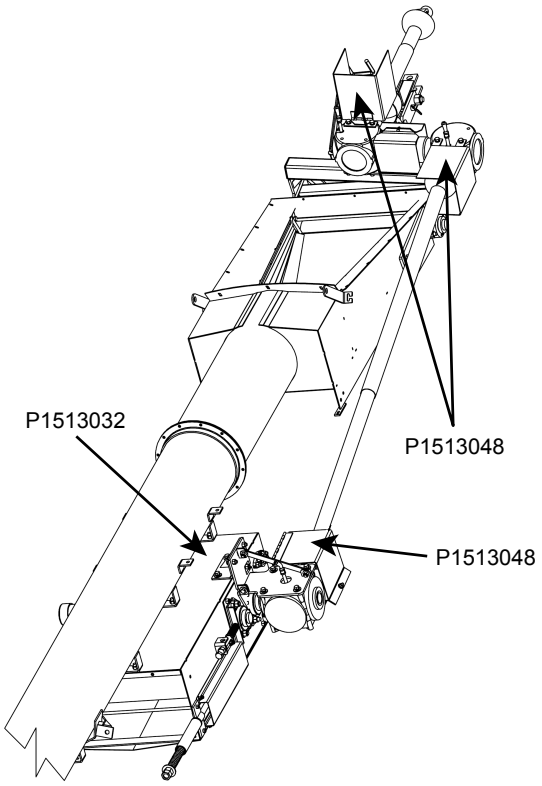


Table 1. Safety Decals

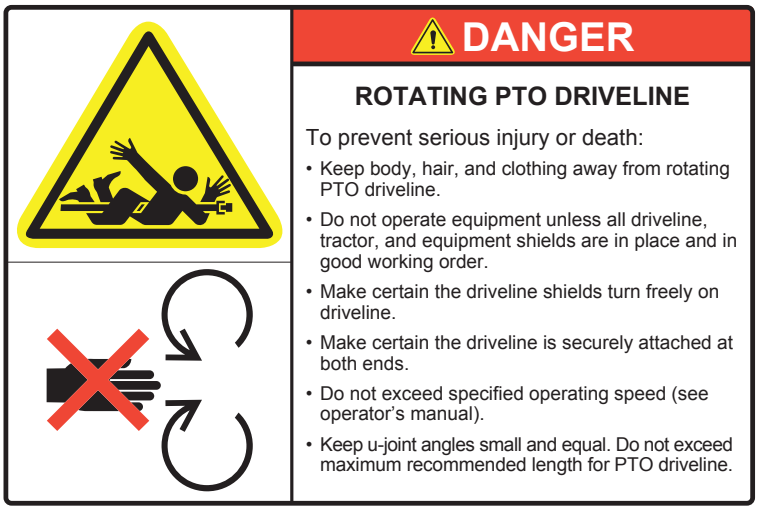
Part Number	Description
P1513003	
P1513048	

Table 1 Safety Decals (continued)

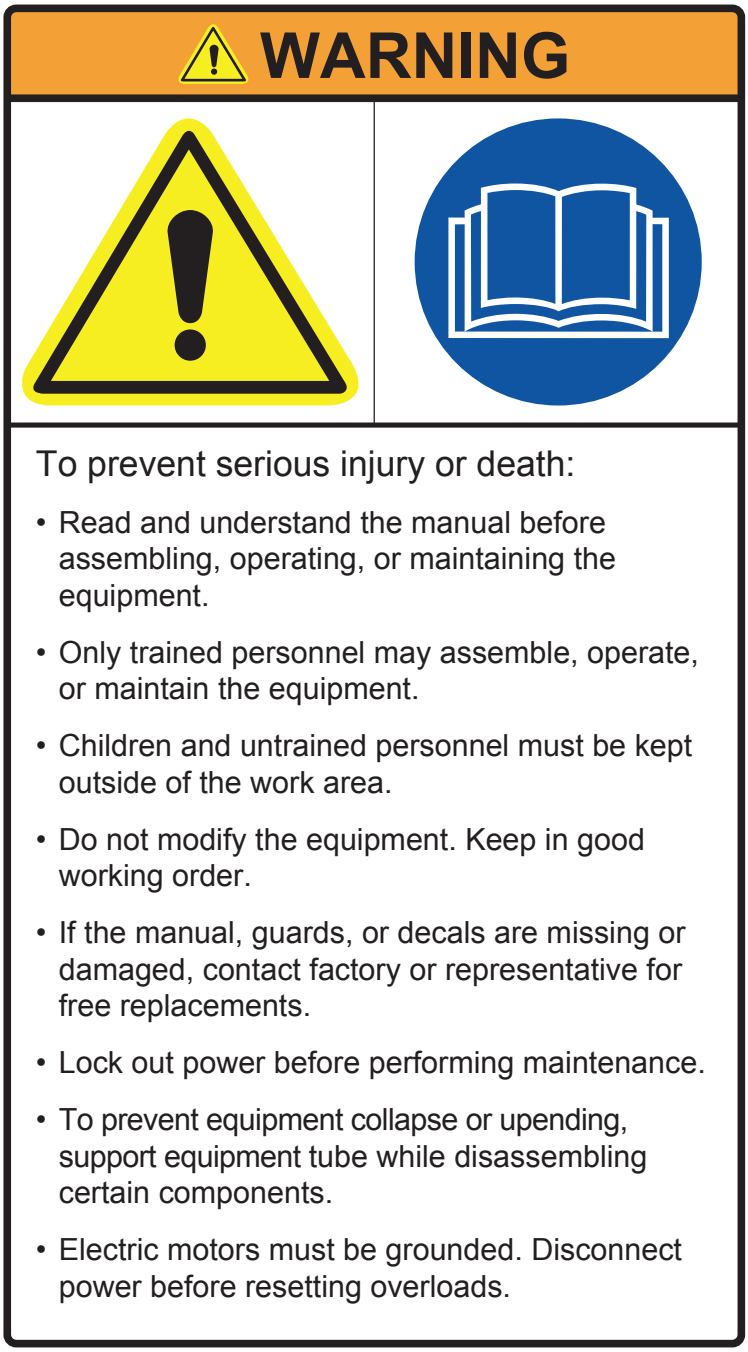
Part Number	Description
P1513001	

Table 1 Safety Decals (continued)

Part Number	Description
P1513002	
P1513008	

Table 1 Safety Decals (continued)

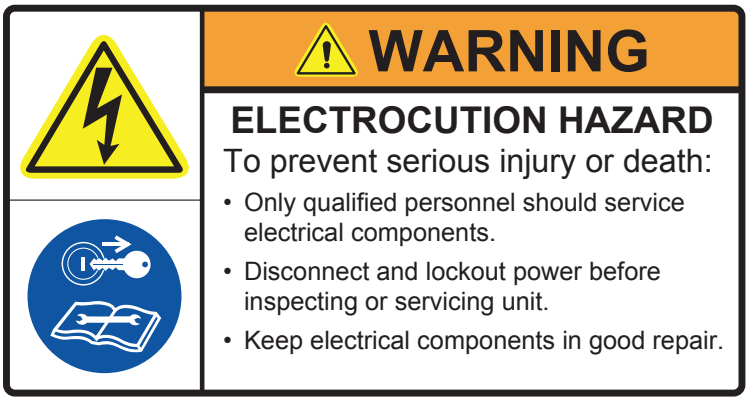
Part Number	Description
P1513009	
P1513040	
P1513035	

Table 1 Safety Decals (continued)

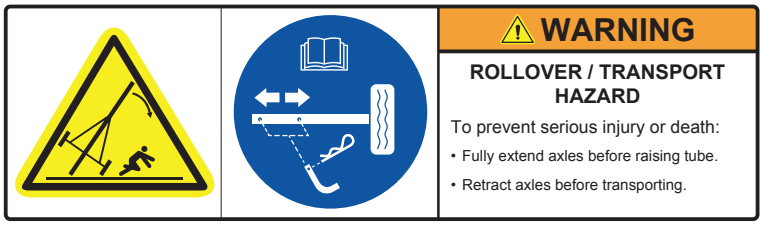
Part Number	Description
P1513045	
P1513044	

Table 1 Safety Decals (continued)

Part Number	Description
P1513042	
P1513037	

Table 1 Safety Decals (continued)

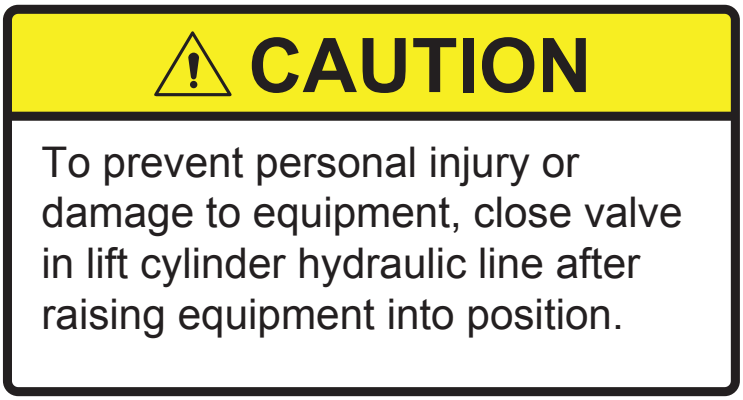
Part Number	Description
P1513010	
P1513030	

Table 1 Safety Decals (continued)

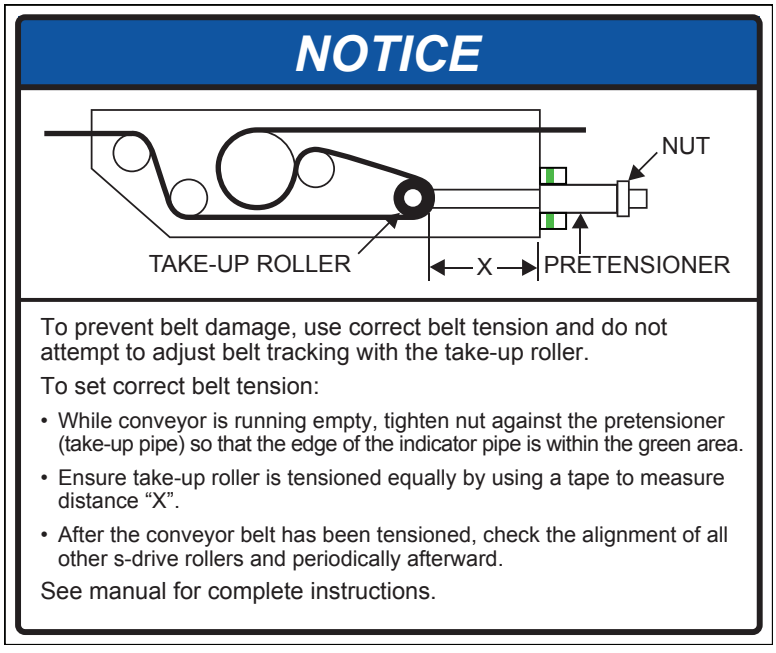
Part Number	Description
P1513002	
P1513061	

Table 1 Safety Decals (continued)

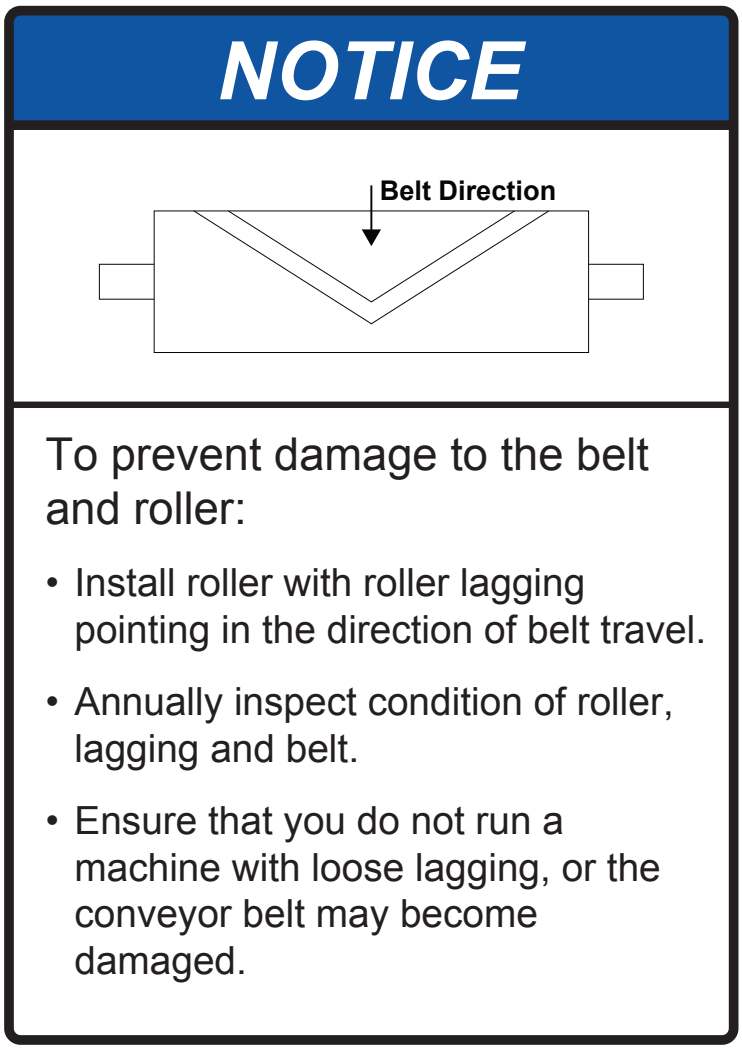
Part Number	Description
P1513027	

Table 1 Safety Decals (continued)

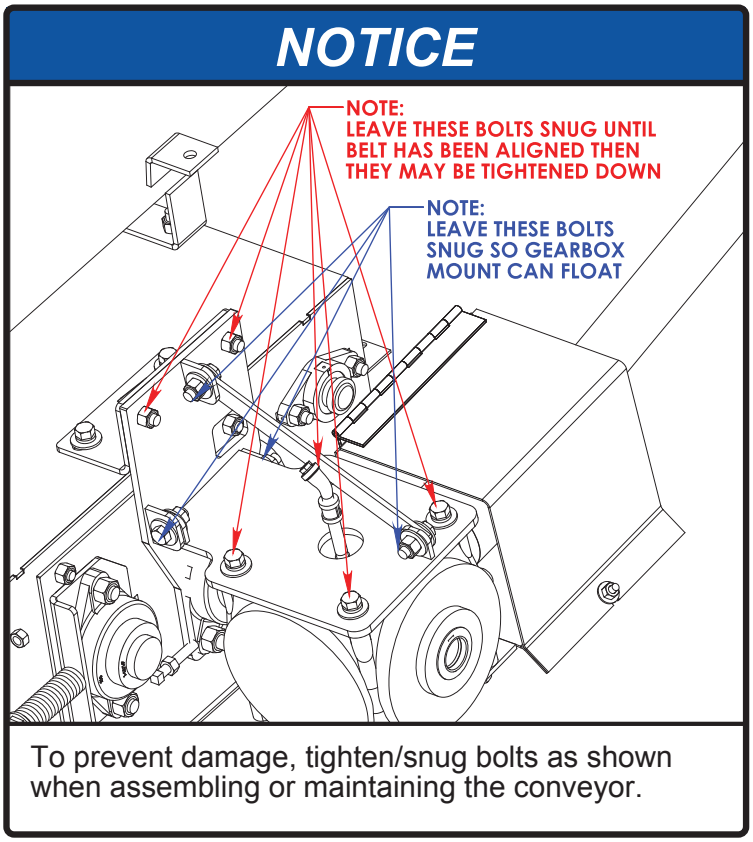
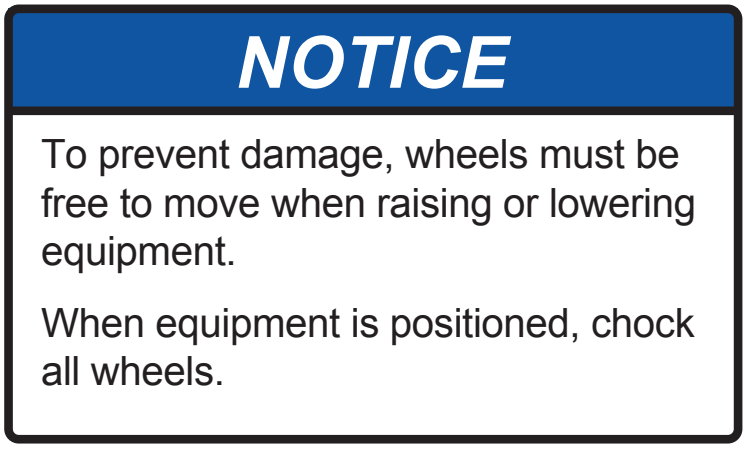
Part Number	Description
P1513032	
P1513052	

Table 1 Safety Decals (continued)

Part Number	Description
P1513049	

2. Features

This section covers the main features of the conveyor.

Figure 7. Typical S-Drive Standard Conveyor Components (Scissor-Lift Conveyor)

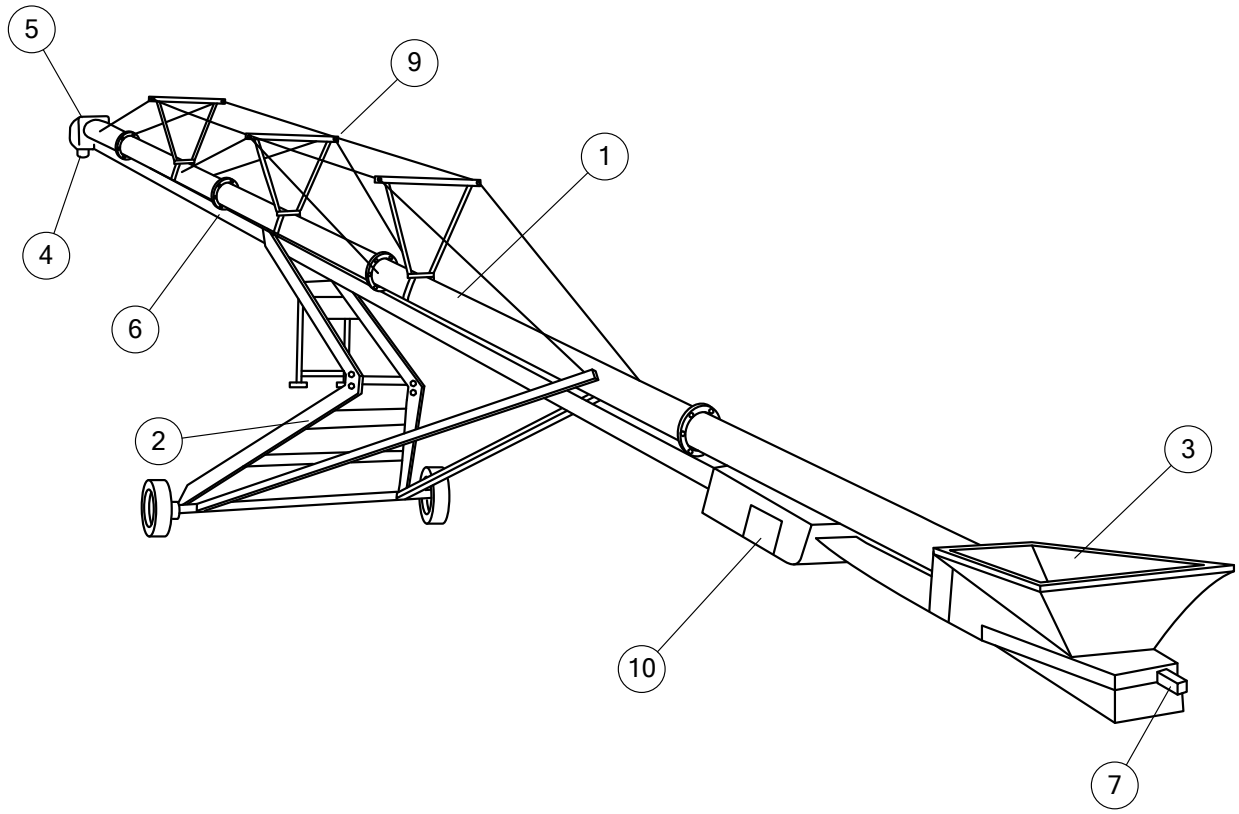
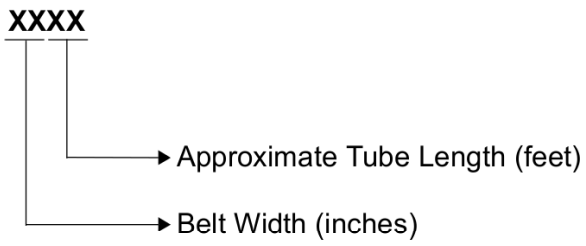


Table 2. Typical S-Drive Standard Conveyor Components (Scissor-Lift Conveyor)

Item	Description
1	Tube
2	Scissor Frame
3	Hopper
4	Spout Assembly
5	Hood

Item	Description
6	Belt Return and Weather Guard
7	Hitch
8	Jack (not shown)
9	Cable Truss
10	S-Drive

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.
- Stay away from overhead power lines and other obstructions during assembly. Contact with power lines can cause electrocution.
- Do not work in high winds.

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 Batco 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

- 2–3 pipe stand(s)
- 2 sawhorse(s) (1200 lb [544.3 kg])
- 1 standard socket set(s)
- 2 wrench set(s)
- 1 torque wrench(es)
- 1 drill with bits 3/16", 5/16"
- 2 tape measure(s) (25' [7.6 m])
- 1 tape measure(s) (100' [30.5 m])
- 1 ratchet strap
- 2 C-clamp(s) or vise grip(s)
- 1 fish tape (100' [30.5 m])
- 1 tire pressure gauge
- 1 tire chuck
- 1 propane torch
- 1 picker with minimum reach of 12' (3.7 m) and 4000 lb to 6000 lb (1814 kg to 2722 kg) lifting capacity

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 142. 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 143.

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

3.6. Component Locations

Layout Drawing

Be sure to select the proper layout drawing. The dimensions change for each machine depending on the drive option selected. Incorrect placement of the components affects machine balance and can cause a heavy or light intake. The layout drawing is attached to the packing list.

Mark the Tube

Always ensure that the hopper remains level during the attachment of all components that bolt to the conveyor tubing. Use a tape measure to mark out component locations that bolt to the tube. Mark locations on the top side of the tube. Refer to the tube drawing attached to the packing list for layout measurements and component locations.

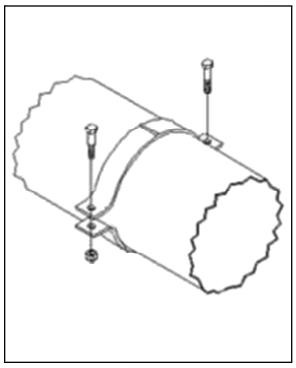
Tightening Brackets

For all bolt-on brackets and u-clamps, tighten nuts part-way on one side of bracket, then tighten part-way on opposite side. Do this until bracket is fully tightened and ensure it remains level during this procedure.

Note

During the installation of all u-clamps on the grain conveyor tubes, tighten until the tube begins to deform or crimp. This locks the u-clamps into place. The term “crimp” will be used to describe this technique throughout this manual.

Figure 8. U-Clamp



3.7. Assemble the Remainder of the S-Drive

Note

The s-drive normally comes mostly pre-assembled when delivered from the factory. The steps below are the remaining assembly which must be performed.

For each side of the s-drive:

1. Remove the shipping wire holding the square nut (2) onto the take-up roller bolt assembly (1), and thread off the square nut from the take-up roller bolt (see Figure 9).

   Note

   The take-up roller bolt assembly (1) is comprised of the take-up roller bolt, a flat washer, spring, bushing, pre-tensioner (take-up pipe), and hex nuts. This is factory pre-assembled.

2. Remove the take-up bracket (3), which was factory pre-assembled onto the s-drive.
3. Slide the take-up roller bearing units (4) to the spout-end of the s-drive.
4. Insert the square nut (2) into the take-up roller bearing unit (4).
5. Slide the take-up bracket (3) onto the take-up roller bolt assembly (1).

6. Thread the take-up roller bolt assembly (1) into the square nut (2).
7. Hammer the spring pin (5) through the square nut (2) and take-up roller bolt (1).
8. Re-fasten the take-up bracket (3) with the heads of the 3/8" x 1" hex bolts (6) on the inside of the s-drive and the 3/8" locknuts (7) on the outside of the s-drive, to keep the bolt shafts away from the belt.

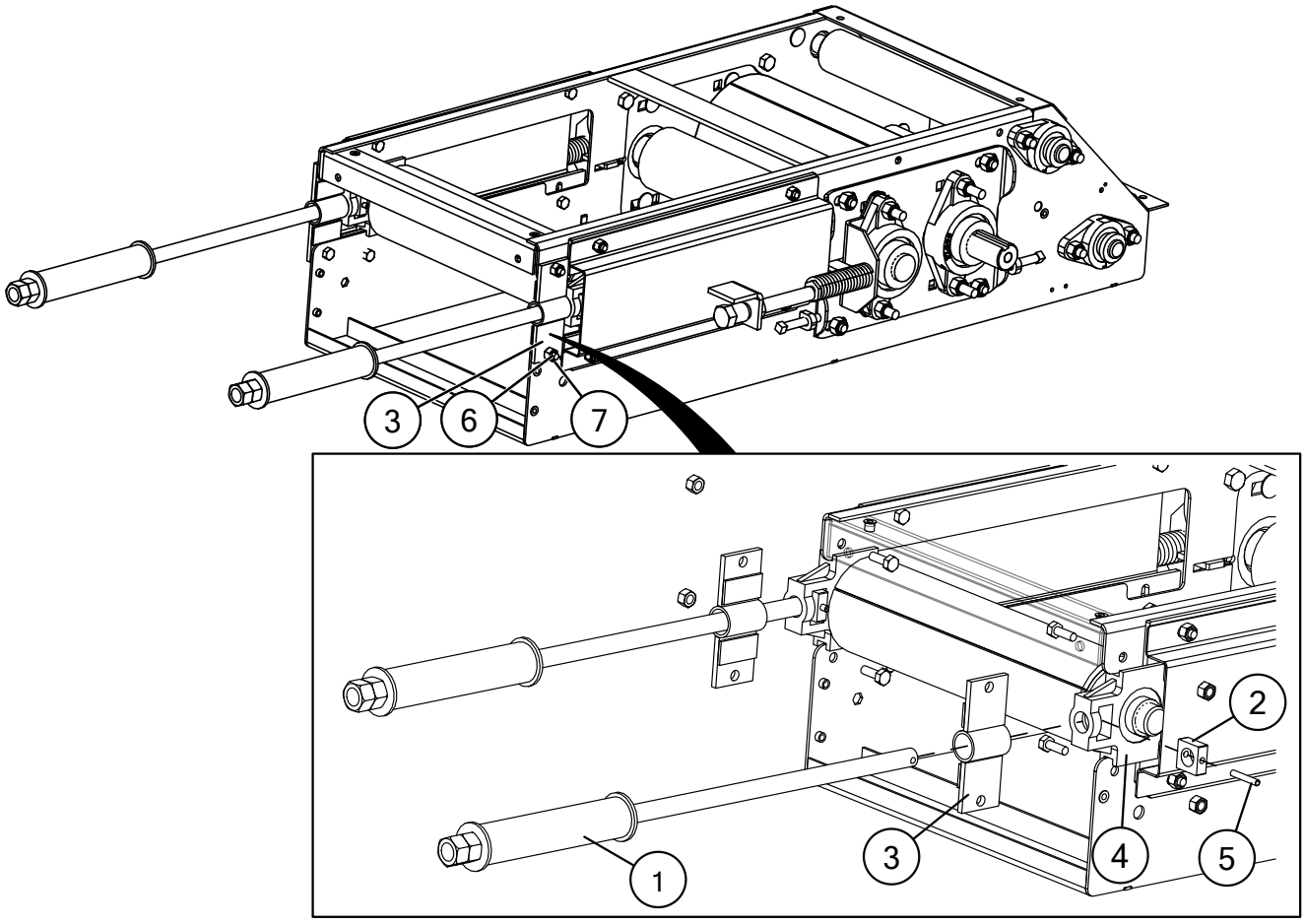
Note

The s-drive bottom guard will be assembled onto the conveyor later, after belt tensioning and alignment.

Table 3. S-Drive Components to Assemble

Item	Description	Quantity
1	Take-up Roller Bolt Assembly	2
2	Square Nut	2
3	Take-up Bracket	2
4	Take-up Roller Bearing Unit	2
5	Spring Pin 1/4" x 1–1/2"	2
6	Hex Bolt 3/8" x 1"	4
7	Nylon Locknut 3/8"	4

Figure 9. S-Drive Components



3.8. Assemble the Conveyor Tube

1. Review the tube layout figure below for your specific conveyor model to determine the order in which the tubes must be connected together. Part numbers are shown for tube identification.
2. Place the tubes on two support stands to support each tube section. The support stands must be set at equal height (see Figure 10). Anchor the tubes to the stands if necessary to prevent rolling.

   ⚠ CAUTION Failure to secure the tubes may result in personal injury.

3. Confirm that all tubes are set level and oriented correctly.
4. Fasten tube flanges together with 7/16" x 1" bolts (2) and 7/16" locknuts (1) as each tube section is placed, starting at the hopper end and working toward the spout end. Ensure the tubes are aligned and 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 4. Tube Connection Components

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

Figure 10. Typical Tube Connection

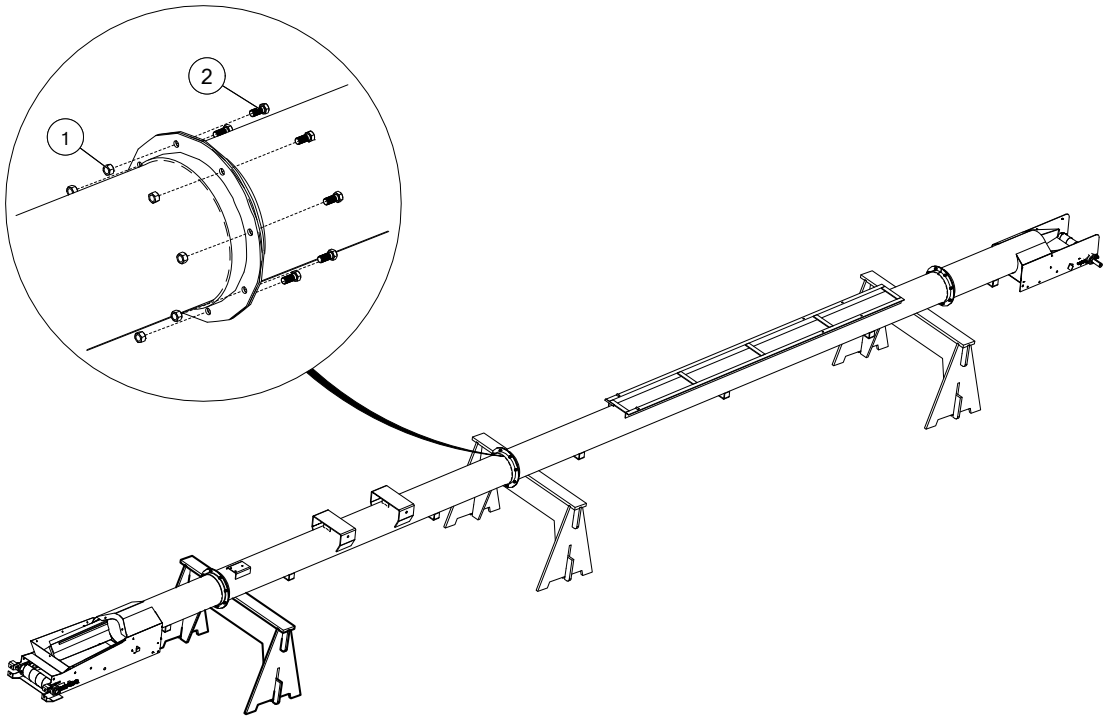


Figure 11. Conveyor Tube Layout for 1565 Model (Batco & Westfield)

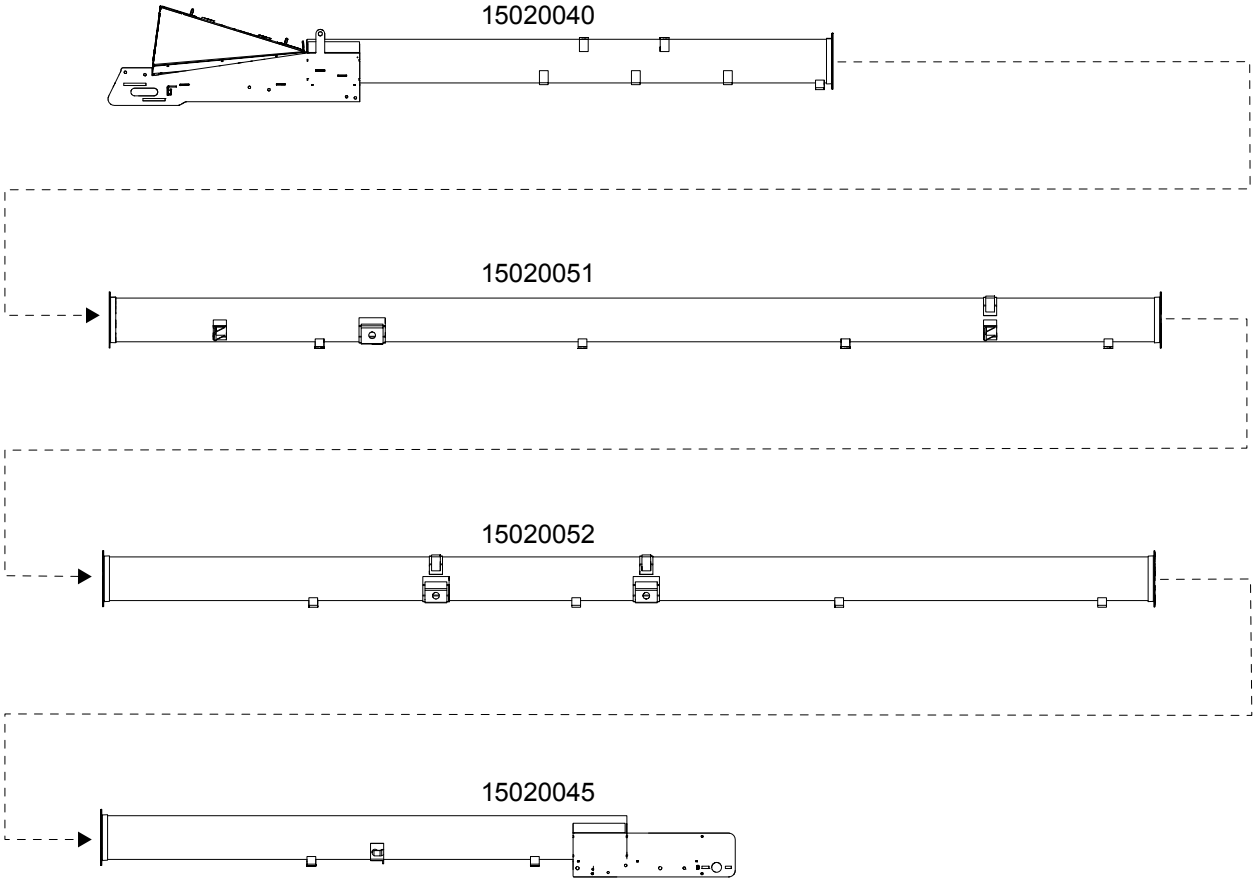


Figure 12. Conveyor Tube Layout for 1565 Model (Hutchinson)

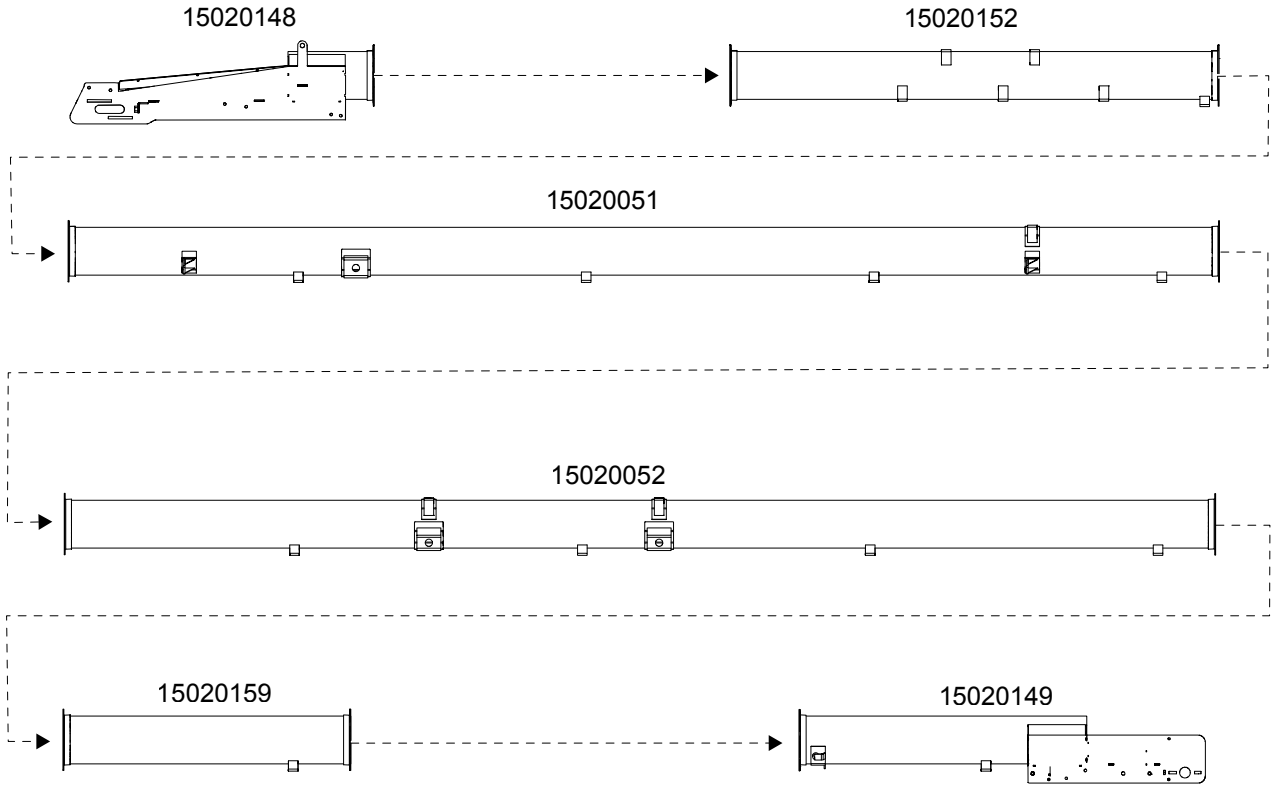


Figure 13. Conveyor Tube Layout for 1575 Model (Batco & Westfield)

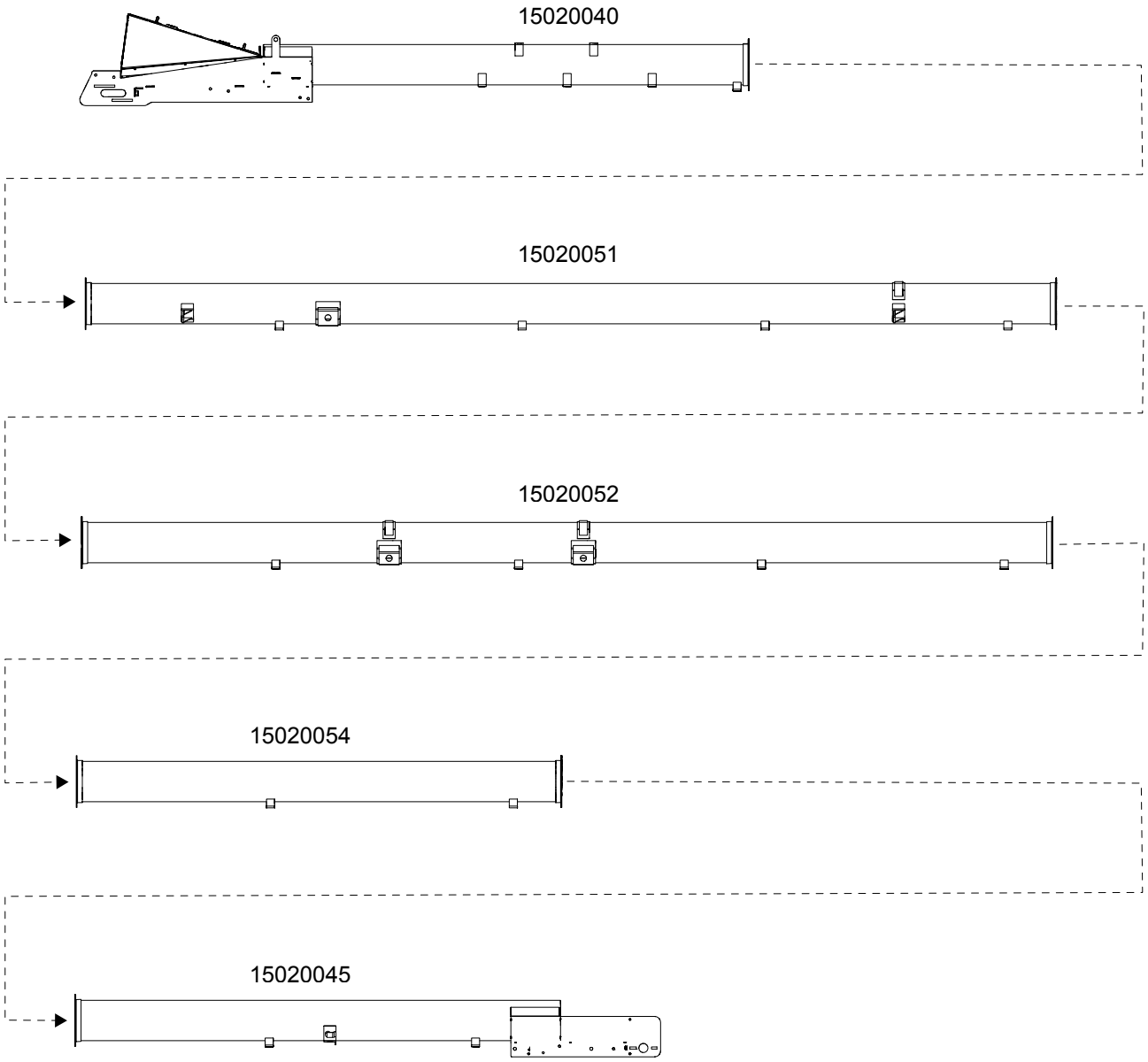


Figure 14. Conveyor Tube Layout for 1585 Model (Batco & Westfield)

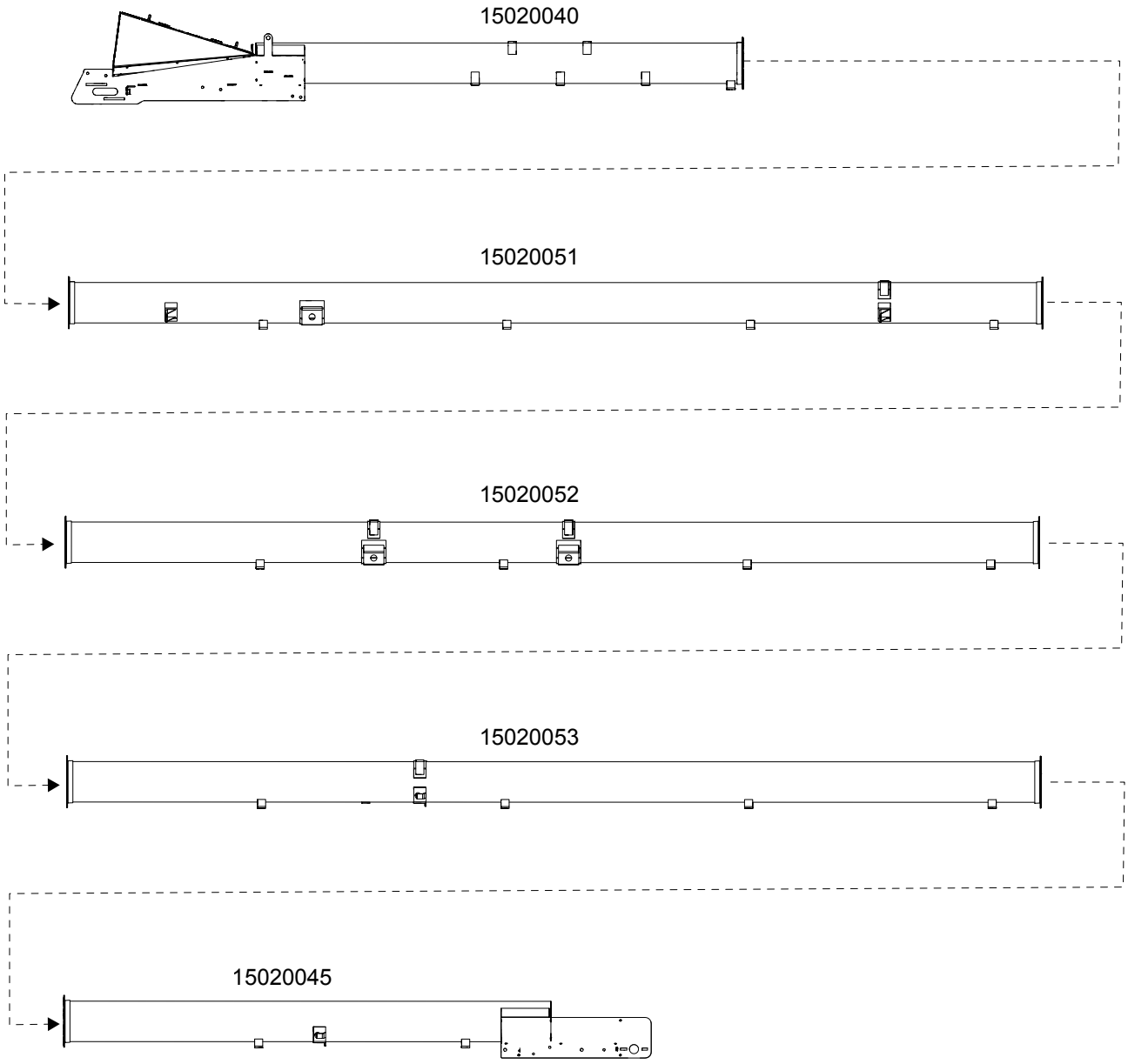


Figure 15. Conveyor Tube Layout for 1590 Model (Batco & Westfield)

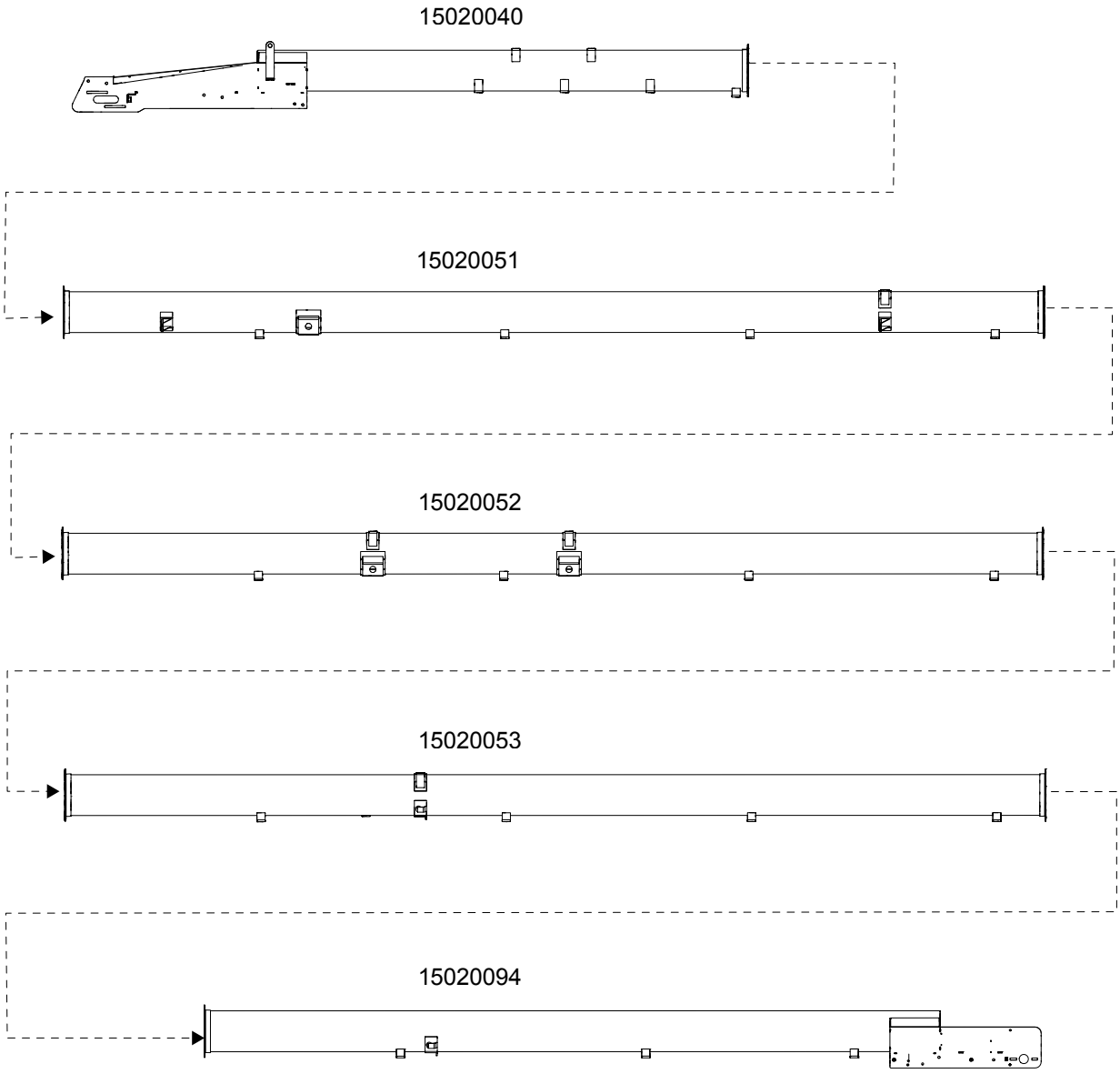


Figure 16. Conveyor Tube Layout for 1590 Model (Hutchinson)

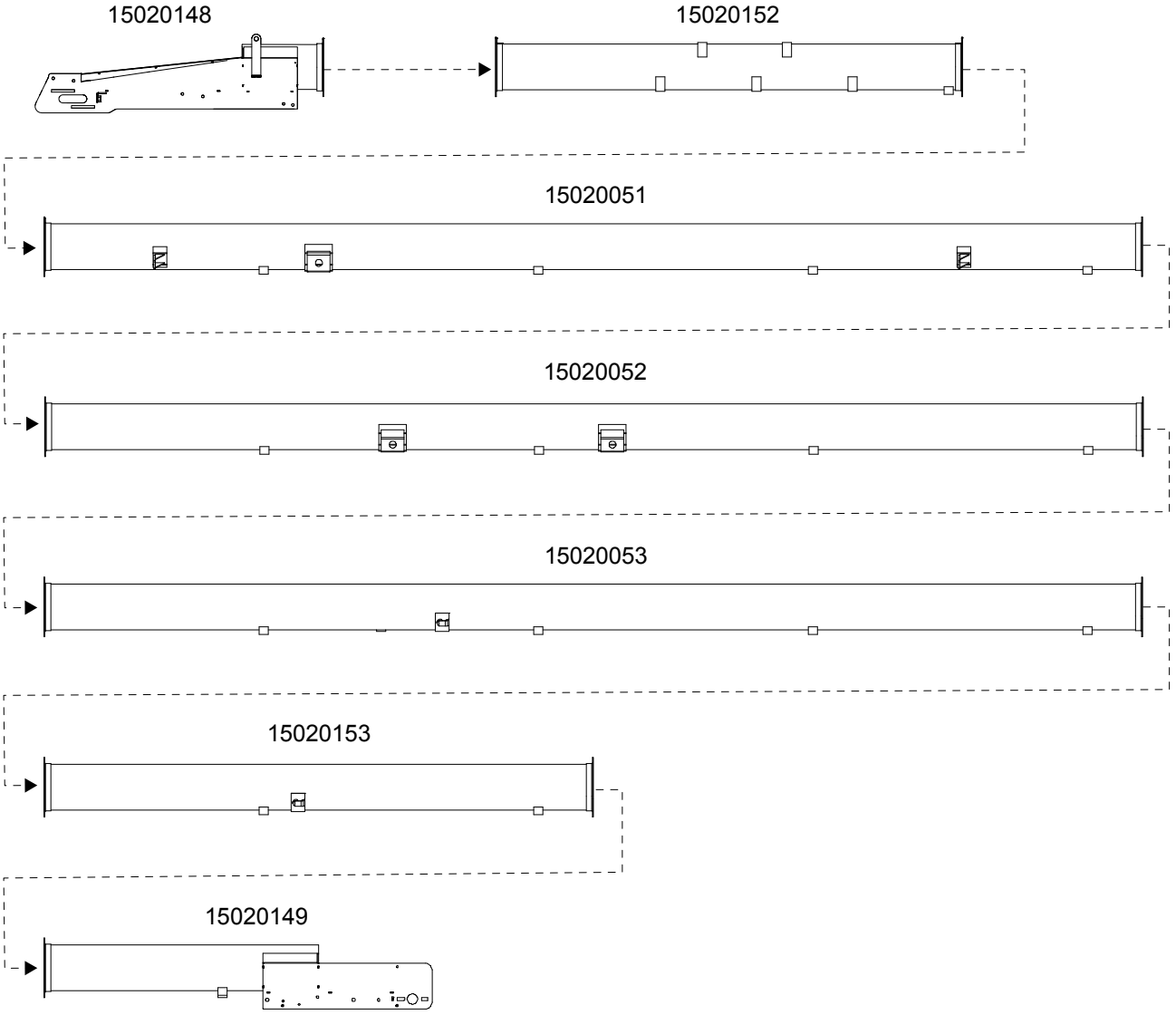
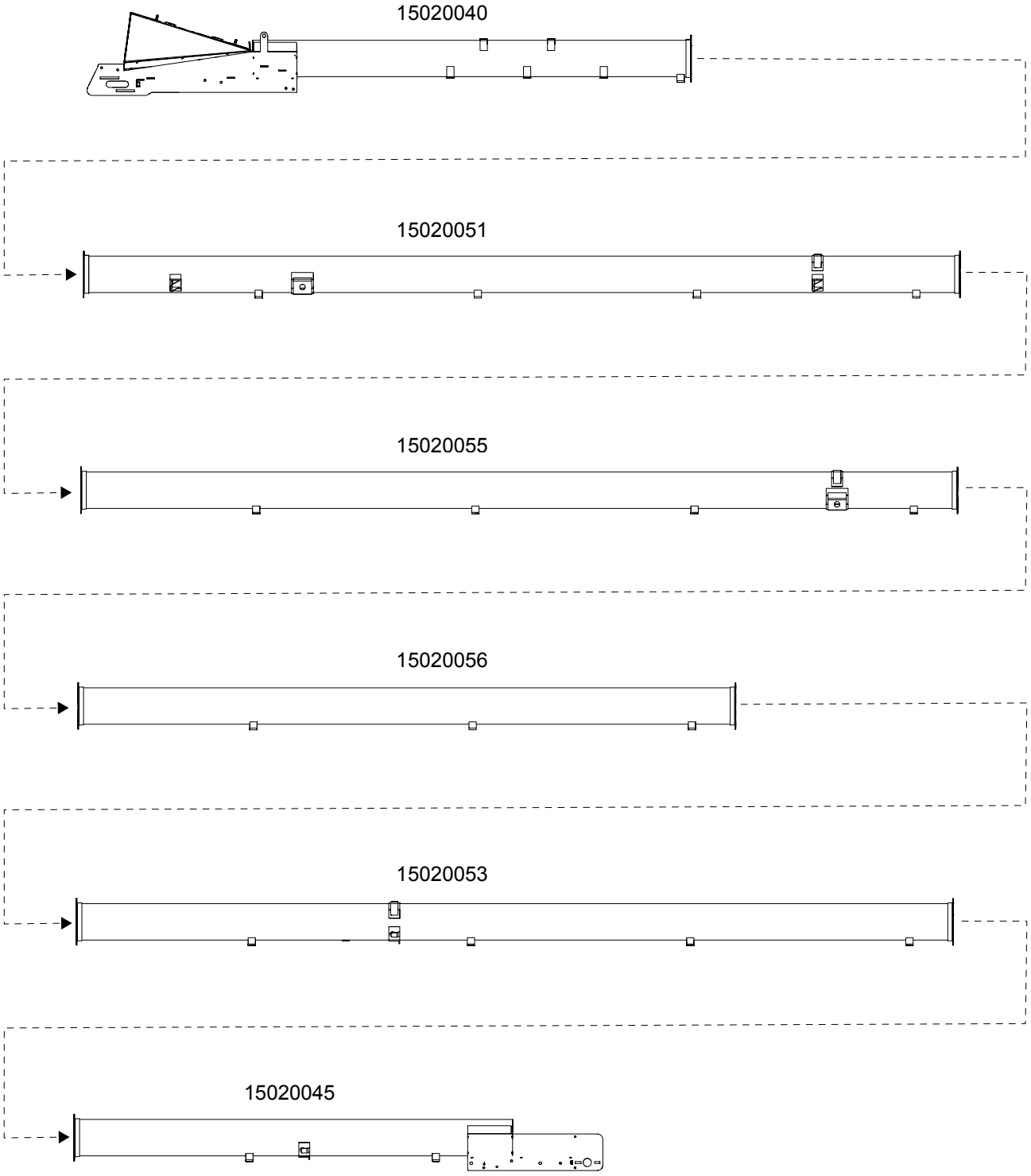


Figure 17. Conveyor Tube Layout for 15100 Model (Batco & Westfield)



3.9. Brand and Model Decal Placement

Important

Do not cover any existing safety or instruction decals with the brand and model decals. Also make sure the decals do not interfere with any welded-on brackets or tube flanges.

- The decals should be placed as follows (see Figure 18):
  - Brand (B): as near as possible to the conveyor spout
  - Model (M): slightly above the lower suspension bracket

  Examples of the appearance of brand and model decals are in Figure 19 and Figure 20.

Figure 18. Brand (B) and Model (M) Decal Placement

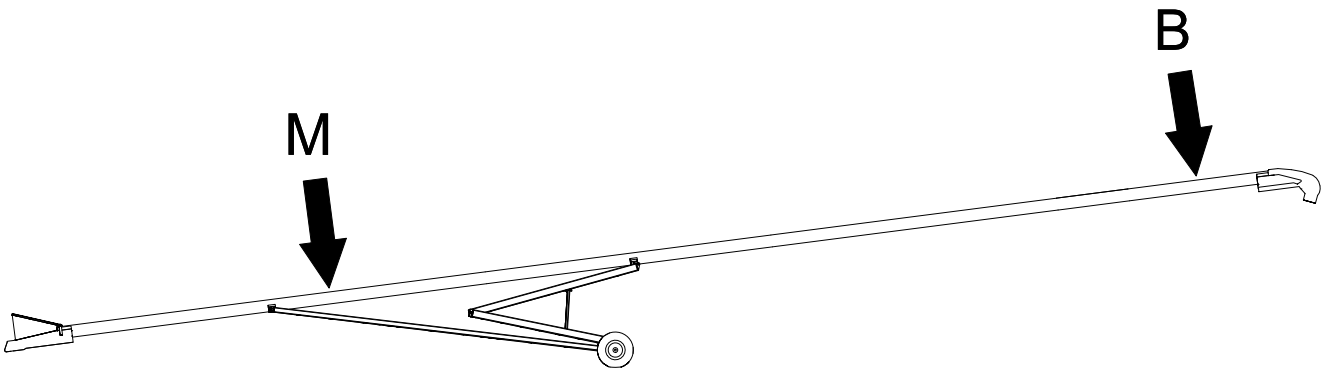


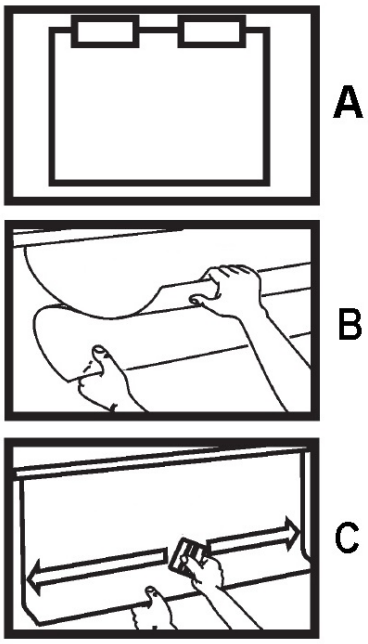
Figure 19. Brand Decal

Figure 20. Model Decal (example)

- Apply decals to both sides of conveyor tube.
- For each decal:
  1. Prepare surface by cleaning thoroughly with soap and water. Surface must be clean and free of dirt, grime, rust and oil. To clean oily surface, wipe with clean cloth and solvent cleaner or isopropyl alcohol.
  2. Position the decal by centering it vertically on the tube and apply masking tape along the top, creating a gate hinge (see Detail A in Figure 21).
  3. Remove backing paper from decal 6” from the top and use the squeegee to adhere decal to the tube (see Detail B). Start at the top center of the decal and work your way outward both left and right using overlapping strokes.
  4. As you work your way down the decal, peel back the backing paper 6” at a time. Repeat Step 3 until the entire decal has been applied to the tube (see Detail C as an example).
  5. Once the entire decal has been properly adhered to the tube, remove tape hinge from front of decal. Remove the front application tape at a sharp 180° angle.

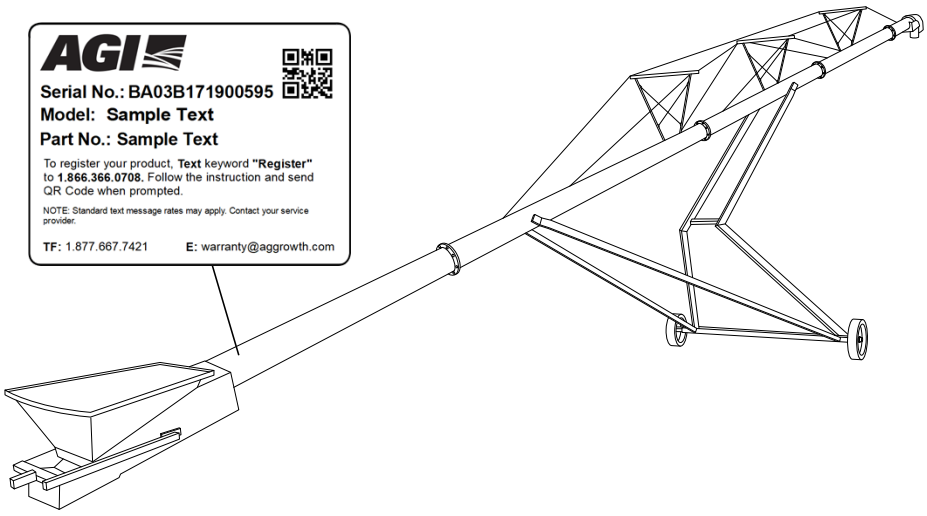
6. Inspect the entire decal for air pockets; if found, remove them by punching a tiny hole with a pin and then squeegee the surface flat.
7. Squeegee the corners and edges of the decal to ensure proper adhesion and to prevent premature peeling.

Figure 21. Decal Placement Technique



3.10. Serial Number Decal Placement

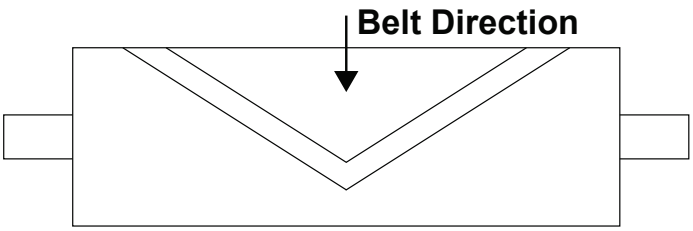
Place the serial number decal on the conveyor as shown below.



3.11. Install the Hopper Roller and Hex Roller

1. Insert the roller (2) into the front end of the hopper (1) (see Figure 23), with the roller lagging pointing in the direction of belt travel (see Figure 22).

Figure 22. Roller with Lagging Pointing in Belt Travel Direction



2. Slide a 1-1/2" bearing (8) on each end of the roller and secure to the hopper using 1/2" x 1-1/2" carriage bolts (3), 0.531" square flat washers (7), and 1/2" 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 hopper.
4. Make sure the roller (2) is positioned straight by measuring from each end of the roller to each end of the hopper weldment sidewall (it should be the same distance on both sides).
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. Attach a 3/4" x 7" tap bolt (4) on each hopper bracket and secure with 3/4" hex nut (5).

   Note

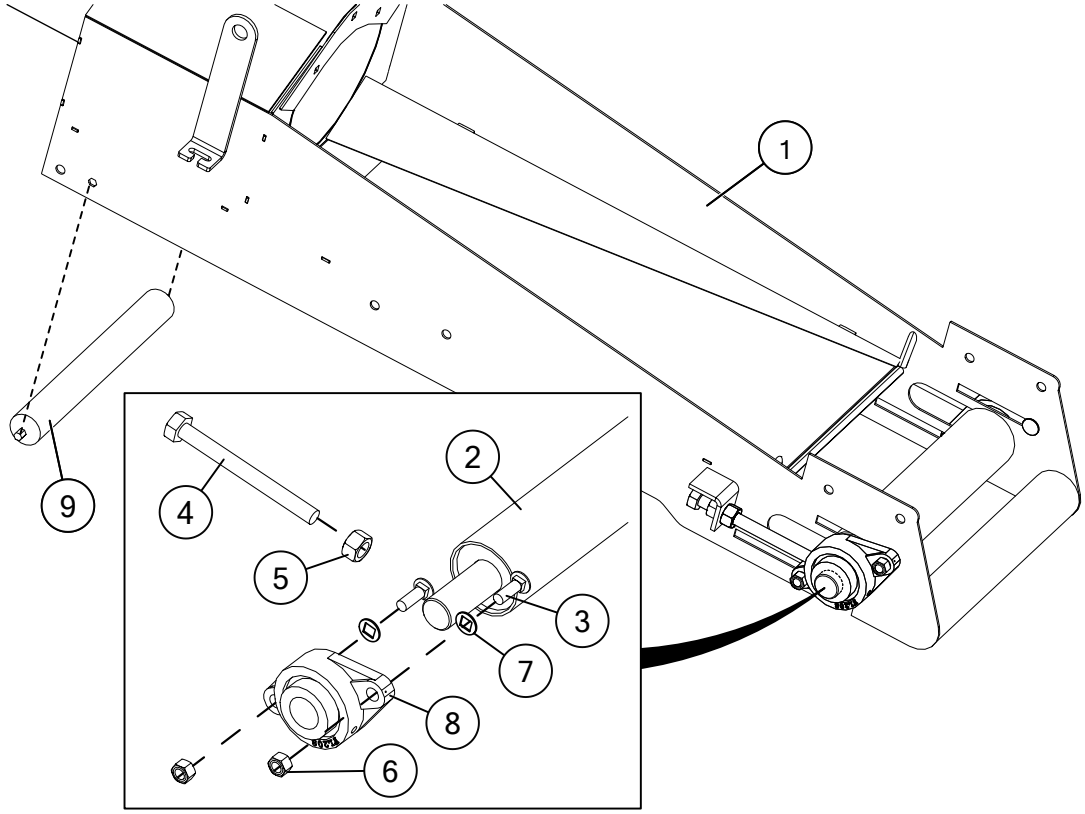
   The tap bolt will be used to set the alignment of the belt, after the belt is installed.

7. Insert the hex roller (9).

Table 5. Hopper Components

Item	Description	Quantity
1	Hopper Section	1
2	Lagged Roller	1
3	Carriage Bolt 1/2" x 1-1/2"	4
4	Tap Bolt 3/4" x 7"	2
5	Nut Hex 3/4"	2
6	Nylon Locknut 1/2"	4
7	Flat Washer 0.531 Square -1.00-0.060	4
8	Bearing Flange Unit 1-1/2" (FL208)	2
9	Hex Roller	1

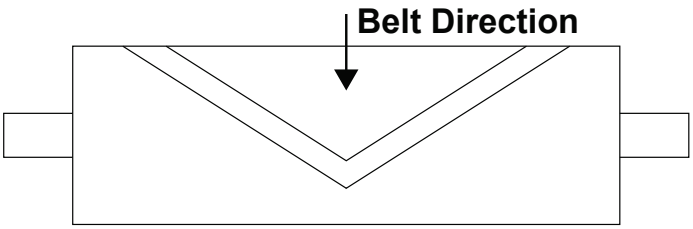
Figure 23. Installing Hopper Roller and Hex Roller



3.12. Install the Spout Roller

1. Insert the roller (2) into the spout (1) (see Figure 25), with the roller lagging pointing in the direction of belt travel (see Figure 24).

Figure 24. Roller with Lagging Pointing in Belt Travel Direction



2. Slide a bearing (5) on each end of the roller and secure to the spout using 1/2" x 1–1/2" carriage bolts (3), square flat washers (4), and 1/2" 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.

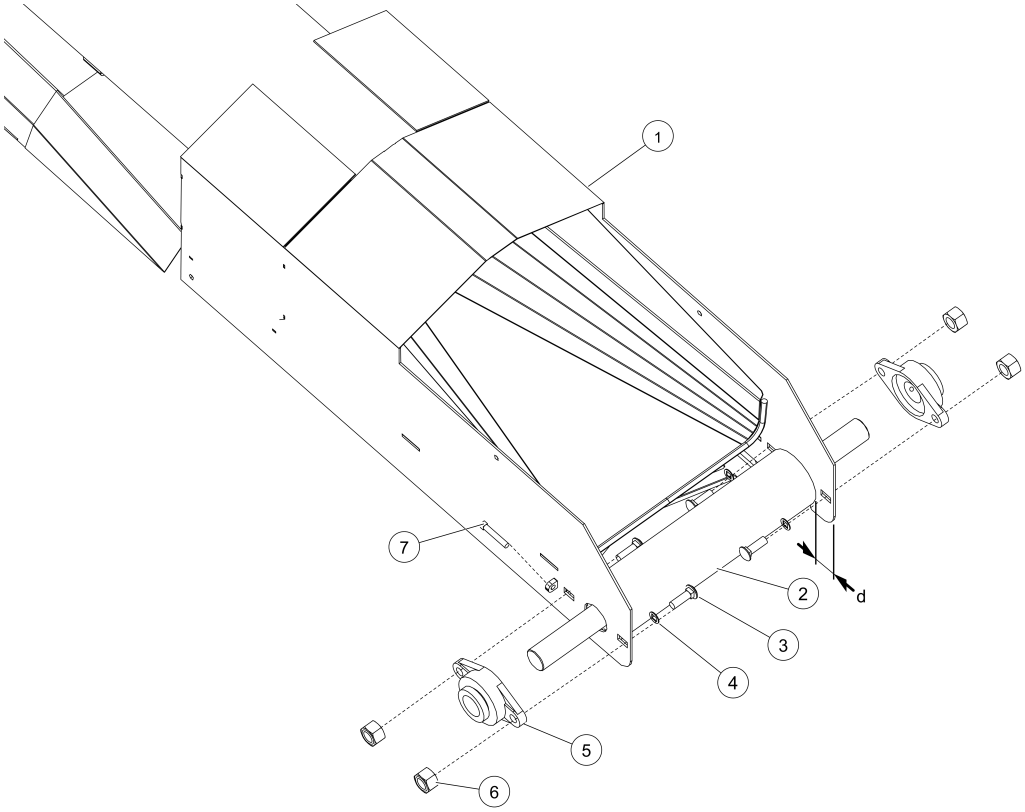
Note

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

Table 6. Spout Roller Components

Item	Description	Quantity
1	Spout	1
2	Lagged Spout Roller	1
3	1/2" x 1–1/2" Carriage Bolt	4
4	Square Flat Washer (0.531"-1.00"-0.060")	4
5	1-1/2" Bearing Flange Unit (SAFL208–24)	2
6	1/2" Nylon Locknut	4
7	7/16" x 2-1/2" Square-Head Set Screw	2

Figure 25. Installing Spout Roller



3.13. Attach the Hitch

1. Attach the hopper catch hook (7) to the hitch with a 1/2" x 2–1/4" bolt (8) and 1/2" locknut (3) (see Figure 26).
2. Attach the hitch (1) to the hopper weldment using 1/2" x 2" bolts (2) and 1/2" nuts (3) (see Figure 27).
3. Insert the tongue (4) into the tongue stub and secure using 5/8" x 3" hitch pin (5) and 3/16" x 3–1/4" hairpin (6).
4. Assemble the clevis (10) onto the tongue (4).

Table 7. Hitch Components

Item	Description	Quantity
1	Hitch	1
2	Carriage Bolt 1/2" x 1-1/2"	8
3	Nylon Locknut 1/2"	9
4	Non-Adjustable Tongue 15	1
5	Hitch Pin 5/8" x 3"	1
6	Hairpin 3/16" x 3-1/4"	2
7	Hopper Catch Hook	1
8	Hex Bolt 1/2" x 2–1/4"	1
9	Nylon Locknut 1"	1
10	Clevis 15	1
11	Hitch Pin 1" x 3–1/2"	1
12	Hex Bolt 1" x 4–1/2" GR8	1

Figure 26. Hopper Catch Hook

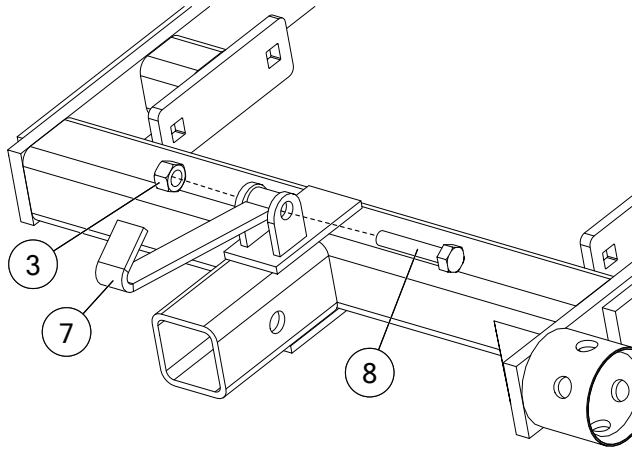
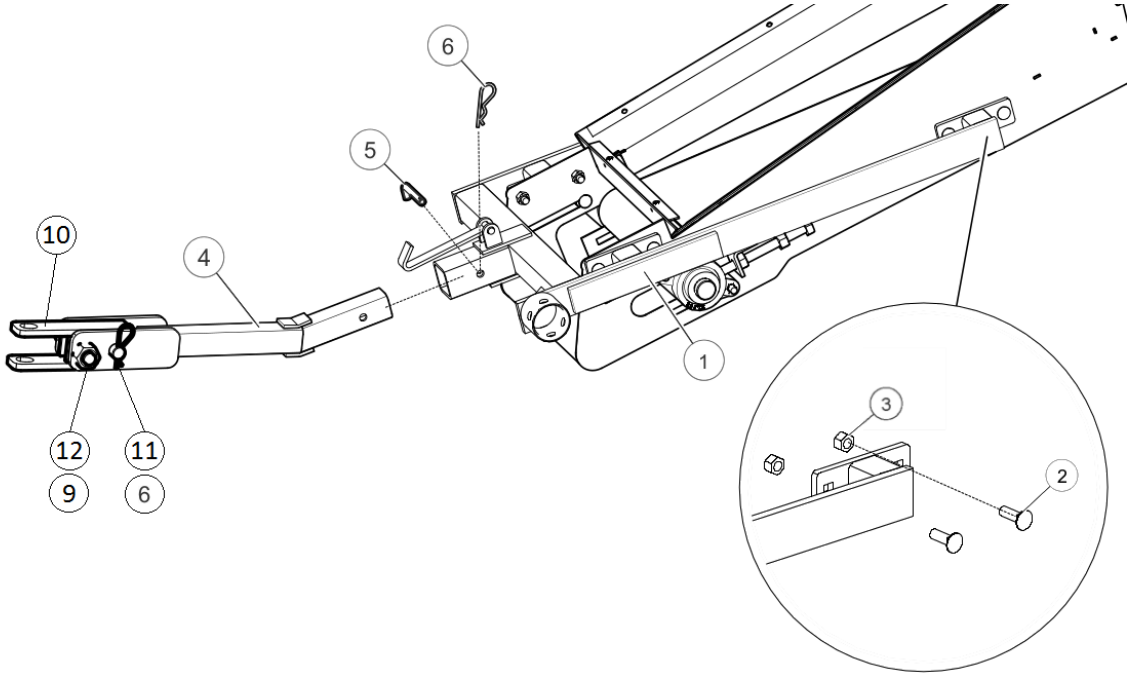


Figure 27. Hitch Components



3.14. Install the Cable Bridge

1. Locate the proper cable bridge brackets welded onto the tube for your model (see Figure 28 or Figure 29).
2. Attach cable bridge:
   a. **For 65' — 90' Models:** Attach a cable bridge (1) to each cable bridge bracket with 7/16" x 1–1/2" bolts (2) and 7/16" nuts (3) (see Figure 30).

      Note

      - 65’ to 75’ Models have one cable bridge
      - 85’ to 90’ Models have three cable bridges

      Important

      Some models may have extra cable bridge brackets welded onto the tube. Make sure you do not attach a cable bridge on the wrong bracket.

   b. **For 100' Models:**

      i. Attach a cable bridge with tab (7) to the center cable bridge bracket with 7/16" x 1–1/2" bolts (2) and 7/16" nuts (3) (see Figure 32).

      ii. Attach a cable bridge (1) and a truss rod anchor (6) to the upper and lower cable bridge brackets with 7/16" x 1–1/2" bolts (2) and nuts (3) (see Figure 31).
3. Install cable clamps (4):
   a. **For 65' — 75' Models:** Loosely install two cable clamps (4) on the center bridge.
   b. **For 85' — 100' Models:** Loosely install two cable clamps (4) on the lower and upper bridges, and attach four cable clamps (4) on the center cable bridge.

Important

Before installing cable clamps, replace the existing cable clamp hex nuts with 3/8" nylock nuts (5).

Table 8. Cable Bridge Components

Item	Description
1	Cable Bridge
2	7/16" x 1-1/2" Bolt GR8
3	7/16" Locknut
4	3/8" Cable Clamp
5	3/8" Locknut
6	Truss Rod Anchor (for **15100** Model)
7	Cable Bridge with Tab (for **15100** Model)

Figure 28. Cable Bridge Locations (65' – 75' Models)

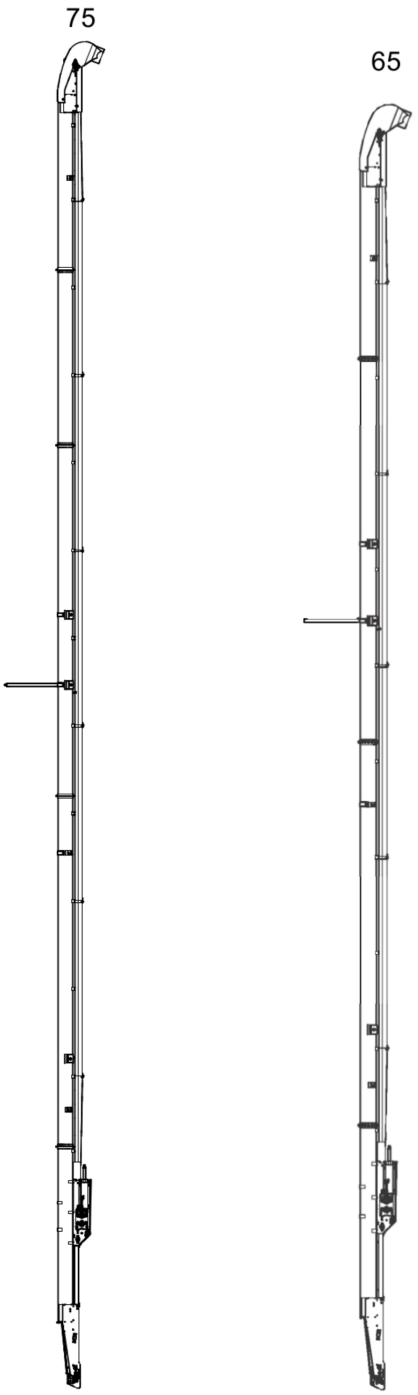


Figure 29. Cable Bridge Locations (85' — 100' Models)

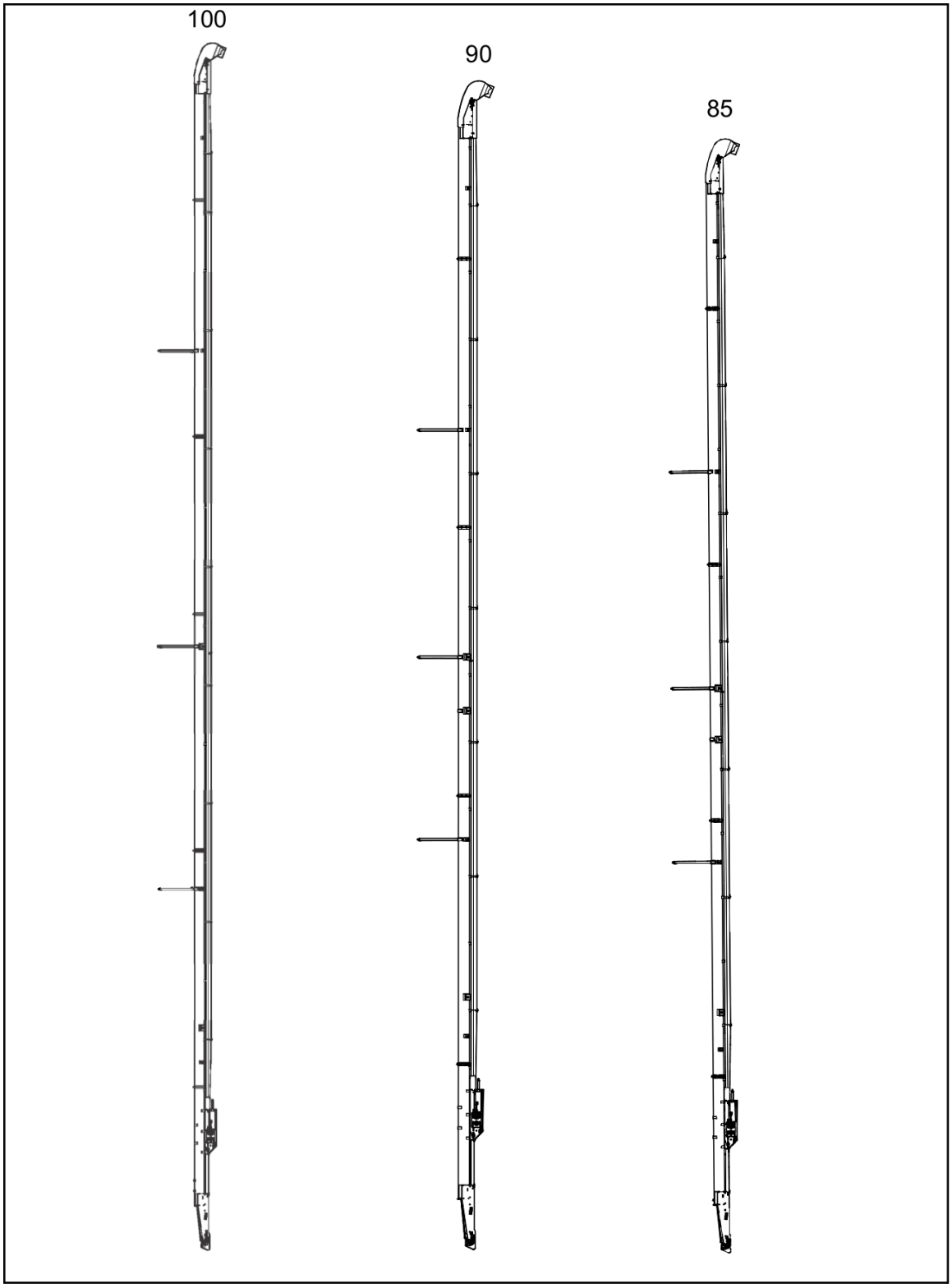


Figure 30. Center Cable Bridge (65' — 90' Models)

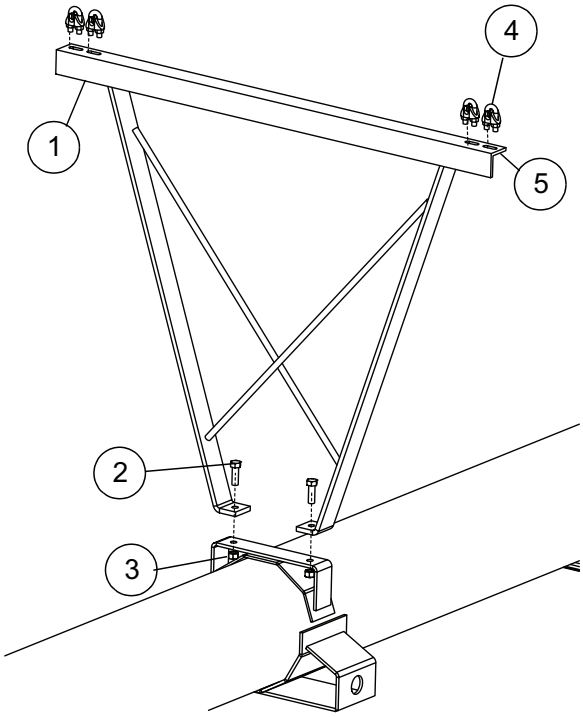
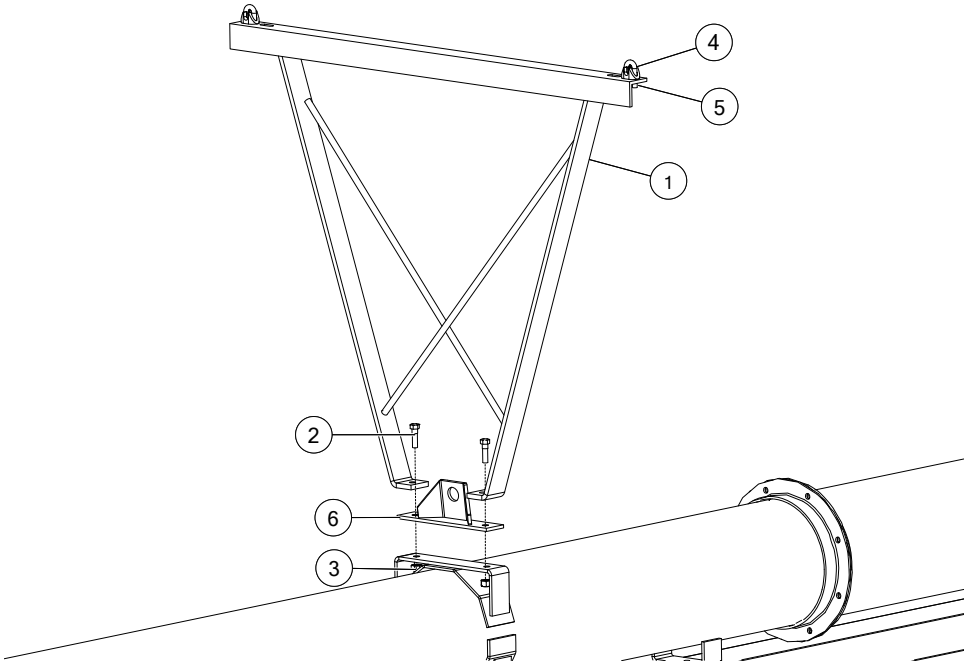


Figure 31. Lower Cable Bridge (100' Model)



3.15. Attach the Truss Tube (100')

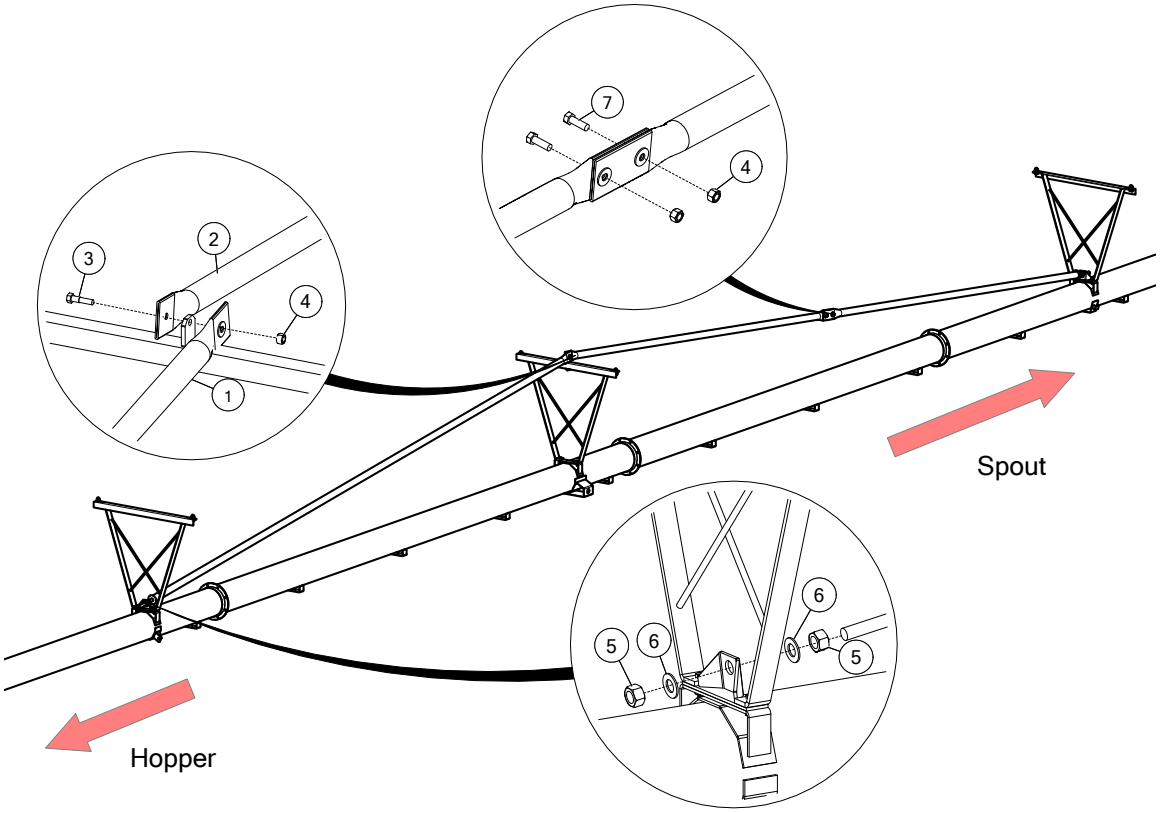
1. Connect the upper truss tubes (2) using 1/2" x 1–1/2" bolt (7) and 1/2" nut (4) (see Figure 32).
2. Attach the upper (2) and lower (1) truss tubes to the center bridge using 1/2" x 2" bolt (3) and 1/2" nut (4).

3. Attach the threaded end of the truss tube to the truss anchor using 1" flat washers (6) and 1" nuts (5).

Table 9. Truss Tube Components

Item	Description
1	Lower Truss Tube
2	Upper Truss Tube
3	1/2" x 2" Hex Bolt Gr8 Plated
4	1/2" Nylock Nut Gr8
5	1" Hex Nut Gr8 Plated
6	1" Flat Washer USS Plated
7	1/2" x 1–1/2" Hex Bolt Gr8 Plated

Figure 32. Attaching Truss Tubes (15100)



3.16. Install the Truss Cables (65' — 75' Models)

1. Thread the truss cable through the cable return located under the tube at the spout end.
2. Pull the cable through the cable return until there is an equal amount of cable on either side.
3. Working towards the hopper end, thread both ends of the cable through the cable clamps of the center cable bridge all the way to the anchor bracket.
4. Verify there is an equal amount of cable on either side of the conveyor.

Table 10. Truss Cable (65' — 75' Models)

Item	Description	Length
2	3/8" Cable — 65' Conveyor	93' (28.3 m)
3	3/8" Cable — 75' Conveyor	112' (34.1 m)

Figure 33. Truss Cable Layouts (65' — 75' Models)

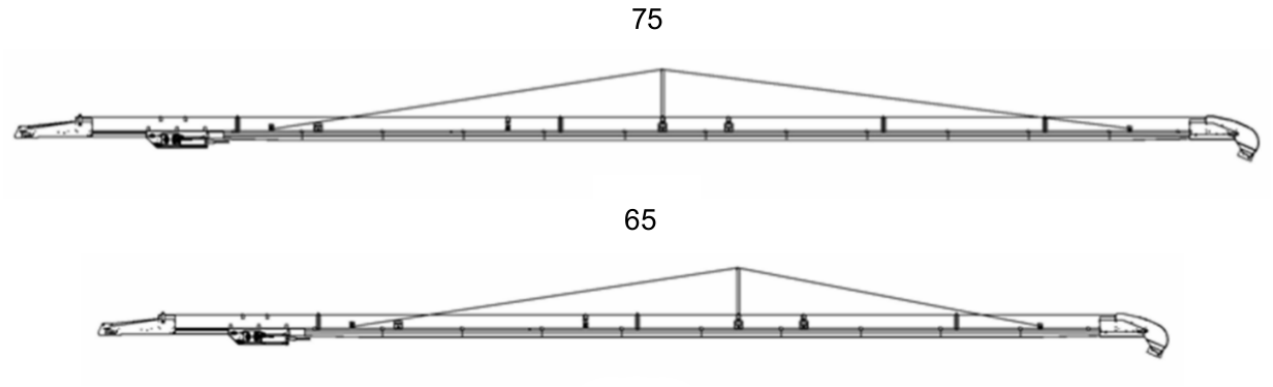
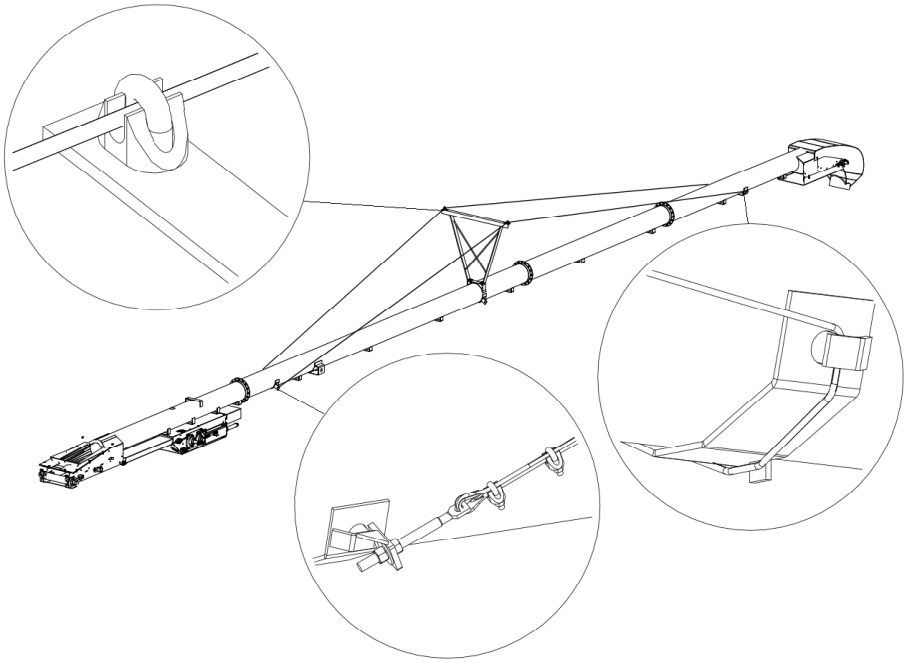


Figure 34. Threading the Truss Cable

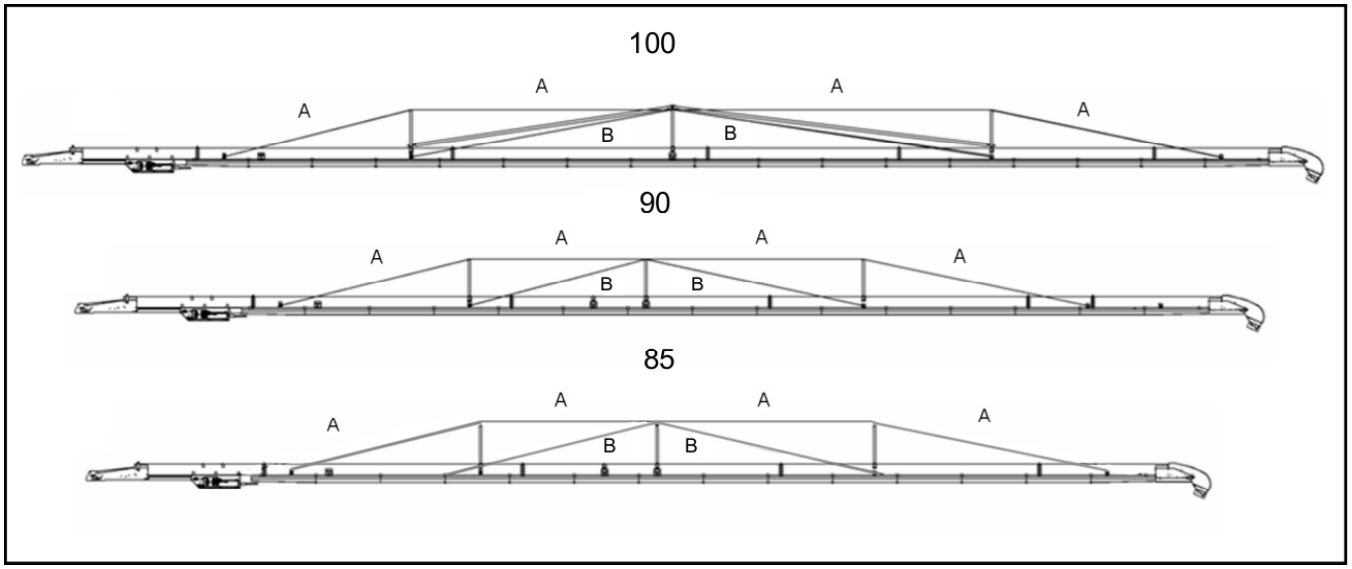


3.17. Install the Truss Cables (85' — 100' Models)

Table 11. Truss Cables (85' — 100' Models)

Item	Description	Length	
		A	B
1	3/8" Cable — 85' Conveyor	136' (41.45 m)	68' (20.7 m)
2	3/8" Cable — 90' Conveyor	136' (41.45 m)	68' (20.7 m)
3	3/8" Cable — 100' Conveyor	162' (49.38 m)	98' (29.9 m)

Figure 35. Truss Cable Layouts



Thread the Long Cable (A)

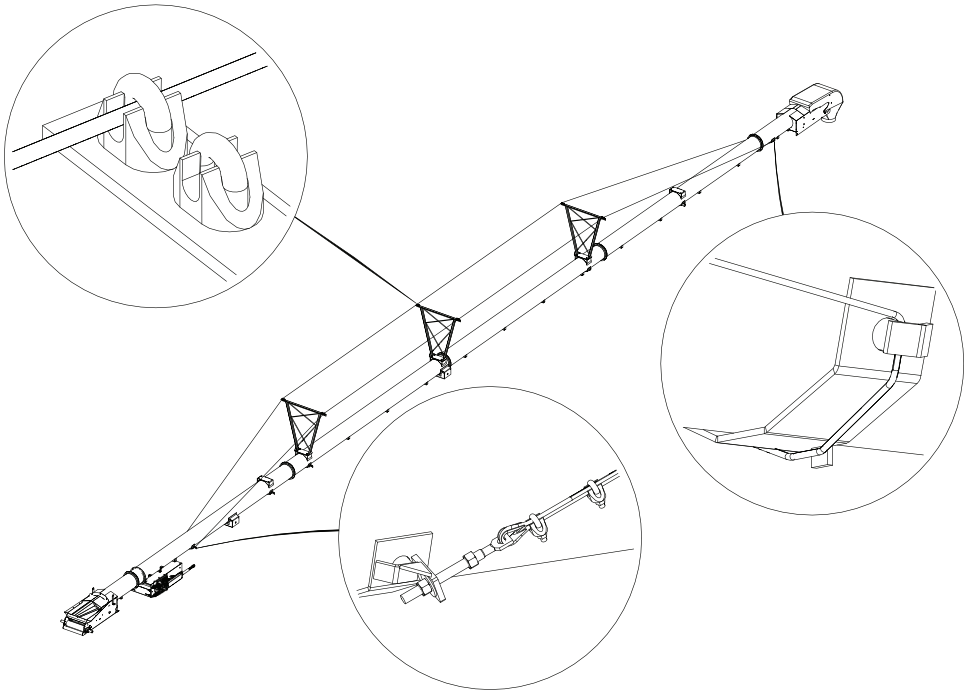
1. Thread the long cable (A) through the cable return located under the tube at the spout end.

   Important

   Some models may have extra cable returns welded onto the tube. Make sure you do not use the wrong cable return.

2. Pull the cable through the cable return until there is an equal amount of cable on either side.
3. Working towards the hopper end, thread both ends of the cable through the outermost cable clamps of the three cable bridges all the way to the anchor bracket.
4. Verify there is an equal amount of cable on either side of the conveyor.

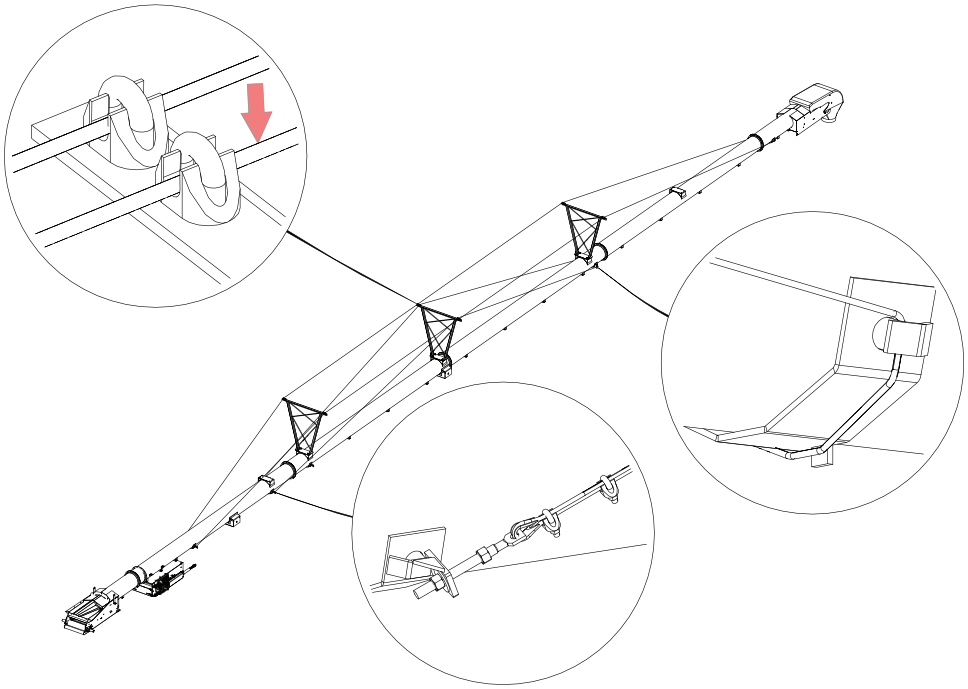
Figure 36. Threading the Long Cable (A)



Thread the Short Cable (B)

1. Thread the short cable (B) through the cable return located under cable bridge closest to the spout.
2. Pull the cable through the cable return until there is an equal amount of cable on either side.
3. Working towards the hopper end, thread both ends of the cable through the innermost cable clamps of the center cable bridge all the way to the anchor bracket.
4. Verify there is an equal amount of cable on either side of the conveyor.

Figure 37. Threading the Short Cable (B)



3.18. Secure the Truss Cables to the Anchor Brackets

Perform the following steps for each cable end.

1. Slide a 3/8" thimble (1) through a 5/6" x 6" eyebolt (2).
2. Slide two 3/8" cable clamps down one end of the cable.
3. Slide the end of cable over the thimble and through the eyebolt.
4. Thread the end of the cable back through both cable clamps.
5. Tighten the first cable clamp next to the thimble.
6. Tighten the second cable clamp 12" away from the first.
7. Attach the eyebolt to the anchor bracket using 5/8" hex nuts and a flat washer.

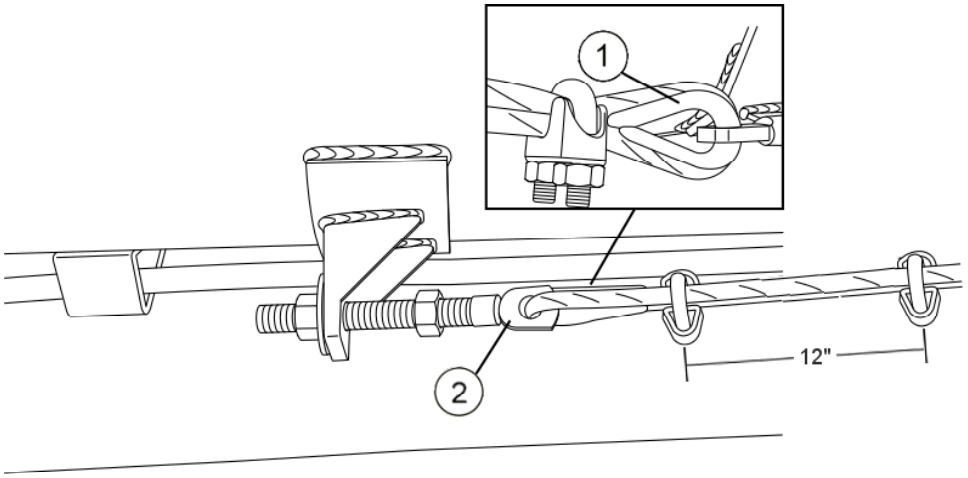
   Note

   Leave several inches between the two nuts to allow for proper tightening later.
8. Trim excess cable and apply tape to the loose end.

   Note

   Ensure the cable is pulled tight before securing the second end of the cable.

Figure 38. Securing the Cable to the Anchor Bracket.



Item	Description
1	3/8" Thimble
2	5/6" x 6" Eyebolt

3.19. Tighten the Truss Cables

Important

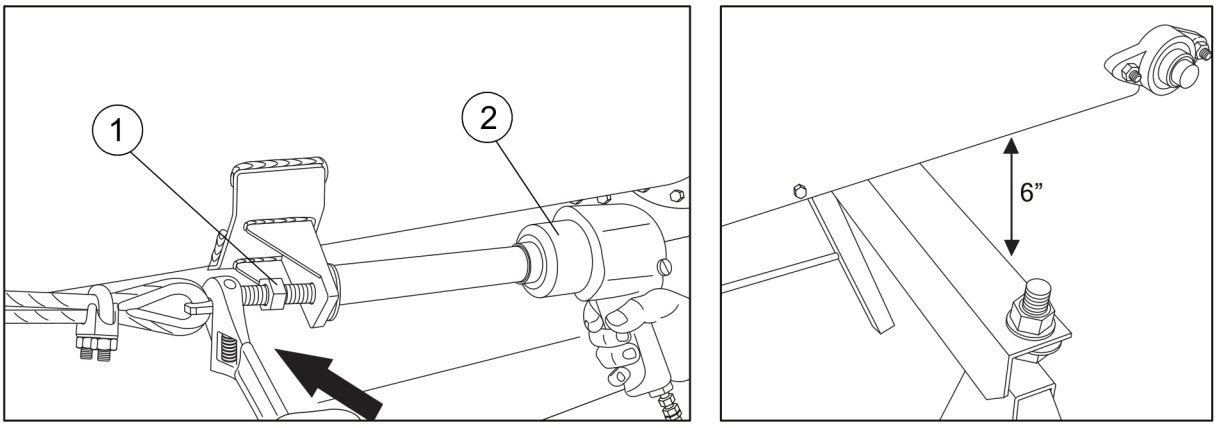
Ensure that the hex nut closest to the thimble (1) is backed off to allow for adjustment (see Figure 39).

1. Tighten both sides of the long truss cable evenly using the hex nut furthest from the thimble until it is snug.

Note

The long truss cable is properly tightened when the spout end lifts 6" above the stand.

Figure 39. Tightening the Truss Cables and the Position of the Spout End

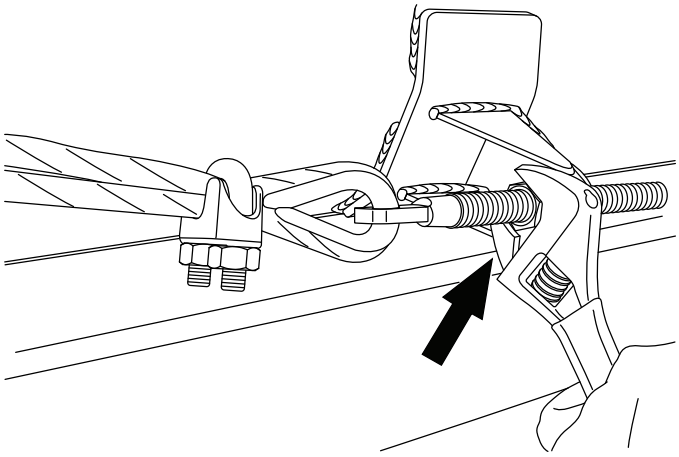


1	5/8" Hex Nut
2	Impact tool

2. Tighten both sides of the short truss cable evenly using an impact tool (2) until it is snug.

3. Stand at the hopper end and visually inspect the tube for side-to-side straightness.
4. Adjust the cable tension to remove any side-to-side bowing.
5. Tighten the hex nut to the lock the eyebolt (see Figure 40).

Figure 40. Locking the Eyebolt



6. Tighten all of the 3/8" cable clamps on the cable bridges.

3.20. Attach the S-Drive

Important

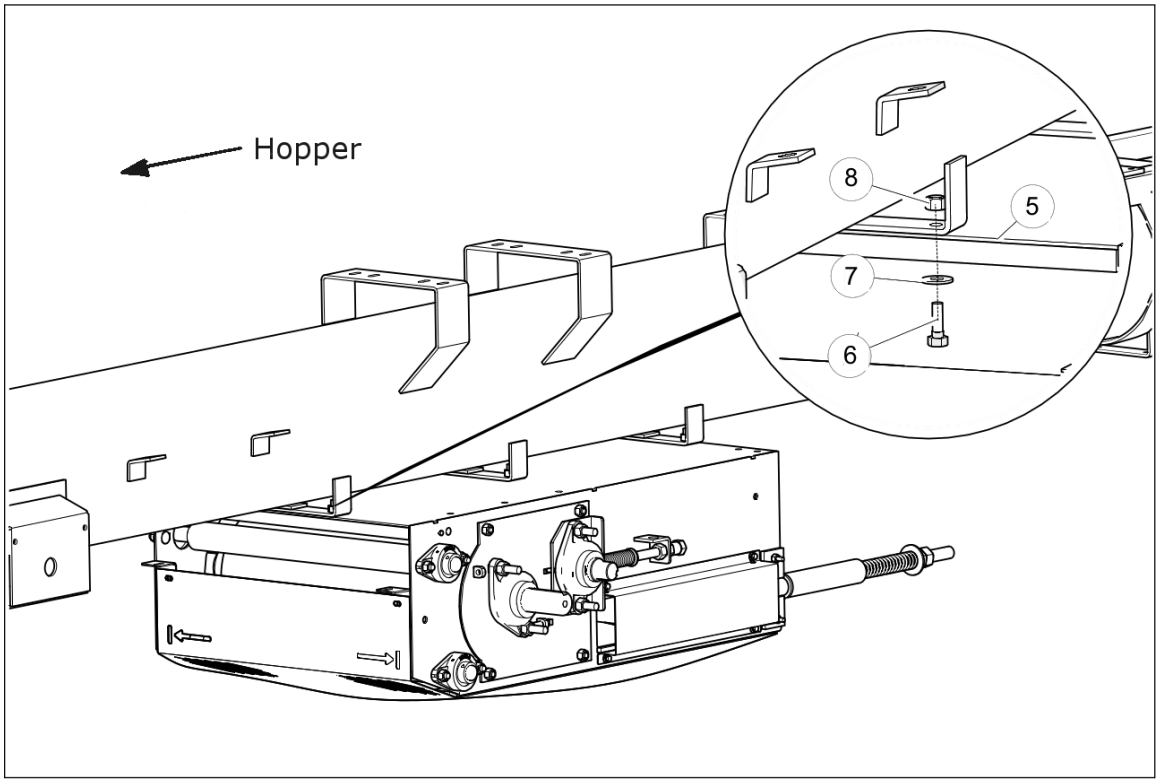
If your conveyor is equipped with a Front PTO Drive, perform the steps in Install the Swing Gearbox onto the S-Drive on page 104 before attaching the s-drive.

1. Attach the s-drive (5) to the brackets with 7/16" x 1" bolts (6), 7/16" flat washers (7), and 7/16" locknuts (8) (see Figure 41).

Table 12. Components to Install S-Drive

Item	Description	Quantity
5	S-Drive	1
6	7/16" x 1" Hex Bolt	6
7	7/16" Flat Washer USS	6
8	7/16" Nylock Nut	6

Figure 41. Attaching the S-Drive



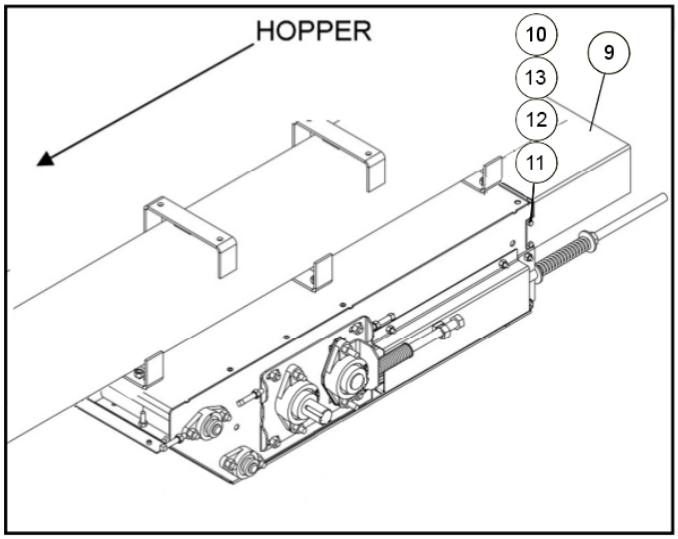
3.21. Install the S-Drive Front Guard

1. Attach the pinch drive front guard (9) to the s-drive with 1/4" x 3/4" bolts (10), 1/4" lock washers (13), 1/4" flat washers (12), and threaded inserts (11) (see Figure 42).

Table 13. Parts Required to Install S-Drive Front Guard

Item	Description	Quantity
9	Pinch Drive Front Guard	1
10	1/4" x 3/4" Hex Bolt	4
11	Threaded Insert 1/4" -20-.027-.165	4
12	1/4" Flat Washer	4
13	1/4" Lock Washer	4

Figure 42. Attaching the S-Drive Front Guard



3.22. Assemble the Weather Guard

1. Install the types of weather guard sections in Table 14 which are indicated by the identifier letters as shown on your particular conveyor model schematic that follows.
2. Connect each weather guard section to the tube brackets as indicated by the position arrows on your particular conveyor model schematic that follows. Use a uni-mount cast plate (1), 3/8" x 1-1/4" capscrew (2), and 3/8" locknut (3). Leave the 3/8" locknuts loose (see Figure 43).

   NOTICE Overlap of the weather guard sections must be as shown to prevent belt damage.
3. Confirm all weather guard mount bar holes are aligned.
4. Tighten the 3/8" locknuts (3) after all of the weather guards have been installed.

Table 14. Identifiers for Types of Weather Guard Sections

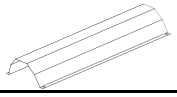
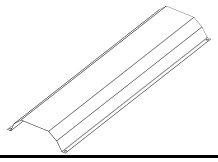
Identifier	Type of Weather Guard Section	
A	3' (0.91 m) Standard	
B	5' (1.52 m) Standard	

Table 14 Identifiers for Types of Weather Guard Sections (continued)

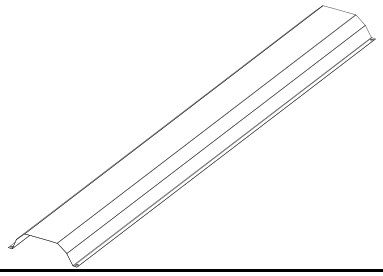
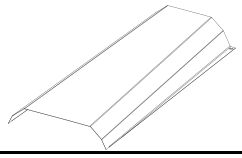
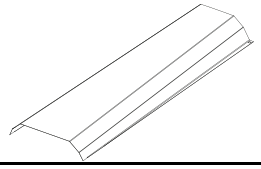
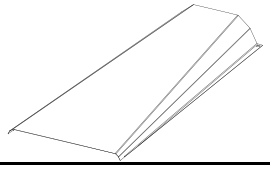
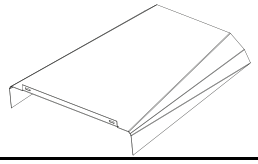
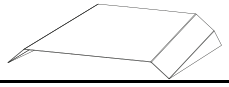
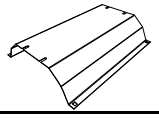
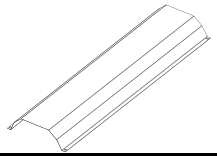
Identifier	Type of Weather Guard Section	
C	10' (3.05 m) Standard	
D	4' (1.22 m) Flared	
E	5' (1.52 m) Flared	
F	5' (1.52 m) Flat	
G	Guard -Above S-Drive	
H	Upper Transition	
J	2' (0.61 m) Standard	
K	6' (1.83 m) Standard	

Table 15. Components to Install Weather Guard onto the Tube Bracket

Item	Description	Quantity
1	Uni-Mount Plate Cast	1
2	Capscrew 3/8" x 1-1/4" Flat Head Socket	1
3	Nylon Locknut 3/8"	1

Figure 43. Installing a Weather Guard Section

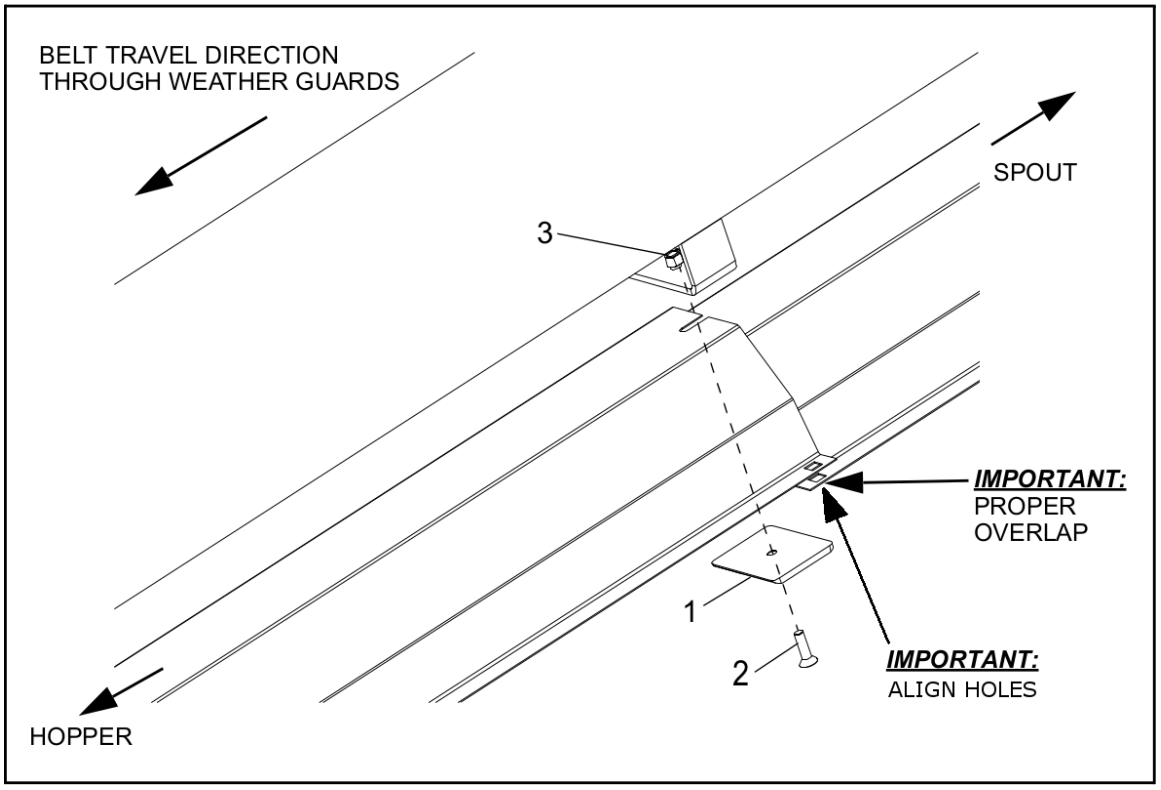


Figure 44. Weather Guard Section Locations (65' — 75')

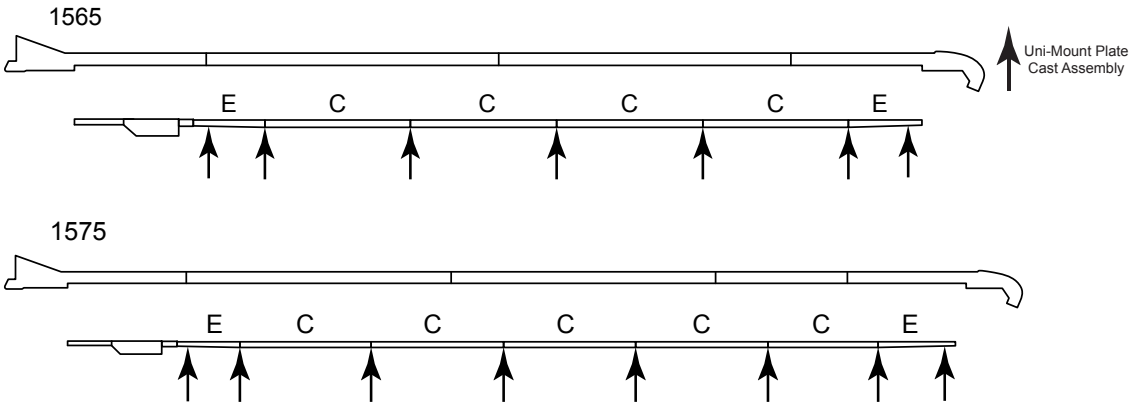
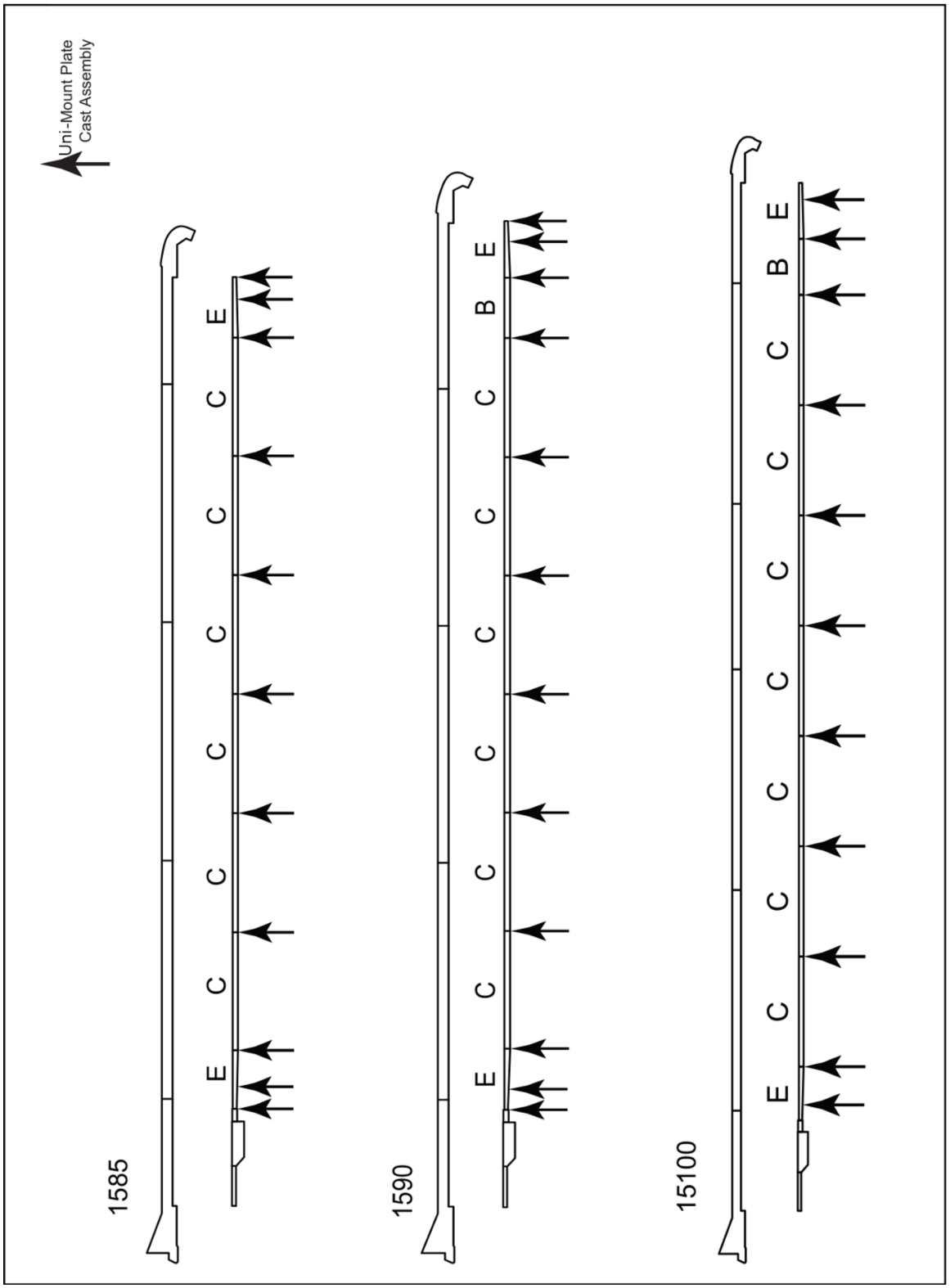


Figure 45. Weather Guard Section Locations (85' — 100')



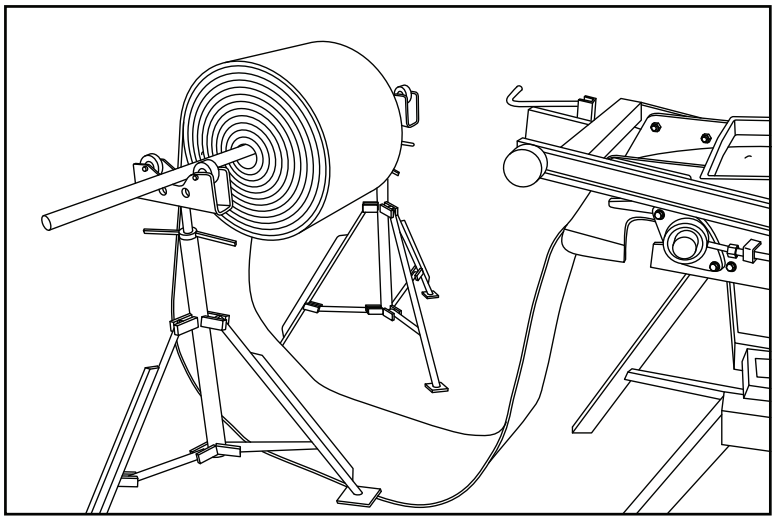
3.23. Install the Belt

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

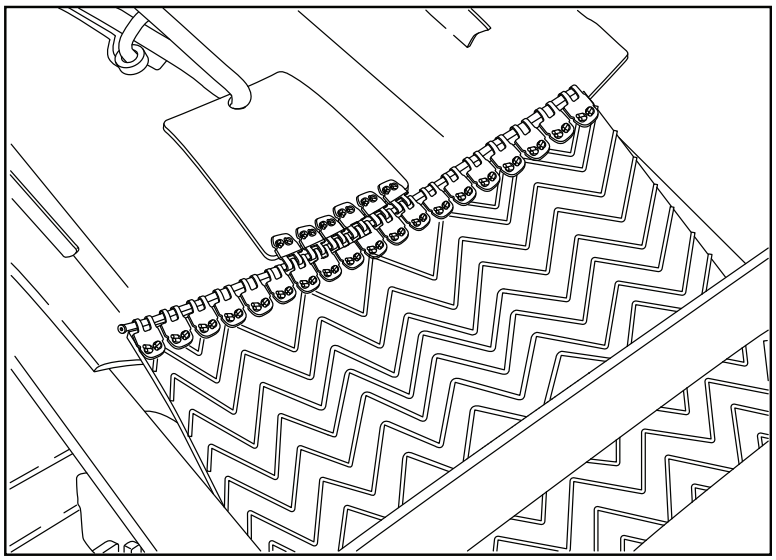
1. Place the rolled belt on a stand behind the hopper.
2. Pull the conveyor belt over the top of the hopper roller, until just inside the hopper, as shown below.

Figure 46. Rolled Belt Behind a Typical Hopper



3. Feed a fish tape in at the spout, through the tube, and into the hopper.
4. 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.

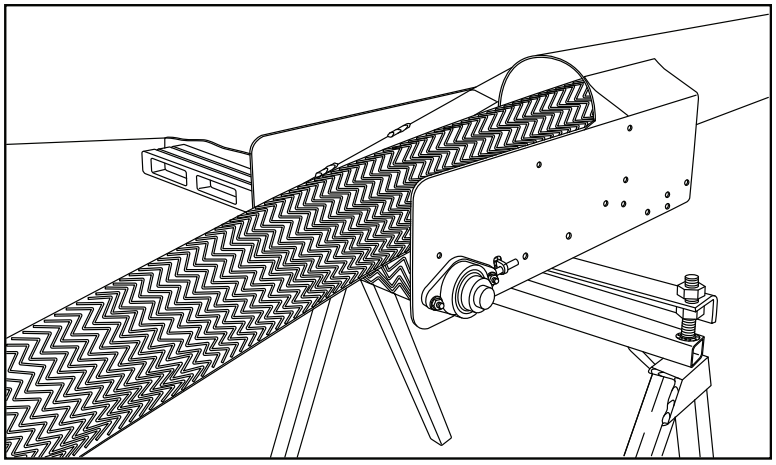
Figure 47. Fish Tape Connected to a Short Piece of Belt



Thread the Conveyor Belt

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

Figure 48. Conveyor Belt Pulled Through the Spout



2. Wrap the belt around the spout roller and pull it back under the conveyor tube up to the s-drive.
3. Remove the s-drive bottom guard.
4. Loosen the s-drive pinch roller bolts and take-up roller bolts (on both sides of s-drive) to the end of their threads.

   Note

   Do not tighten the nuts on the pinch roller bolts and take-up roller bolts on the s-drive until the belt is fully installed.

5. Guide the belt through the s-drive as shown in the figure below.
6. Pull the conveyor belt out from the back of the s-drive until approximately 6' (1.8 m) of excess belt remains on the stand behind the hopper.

Figure 49. S-Drive Conveyor Belt Path

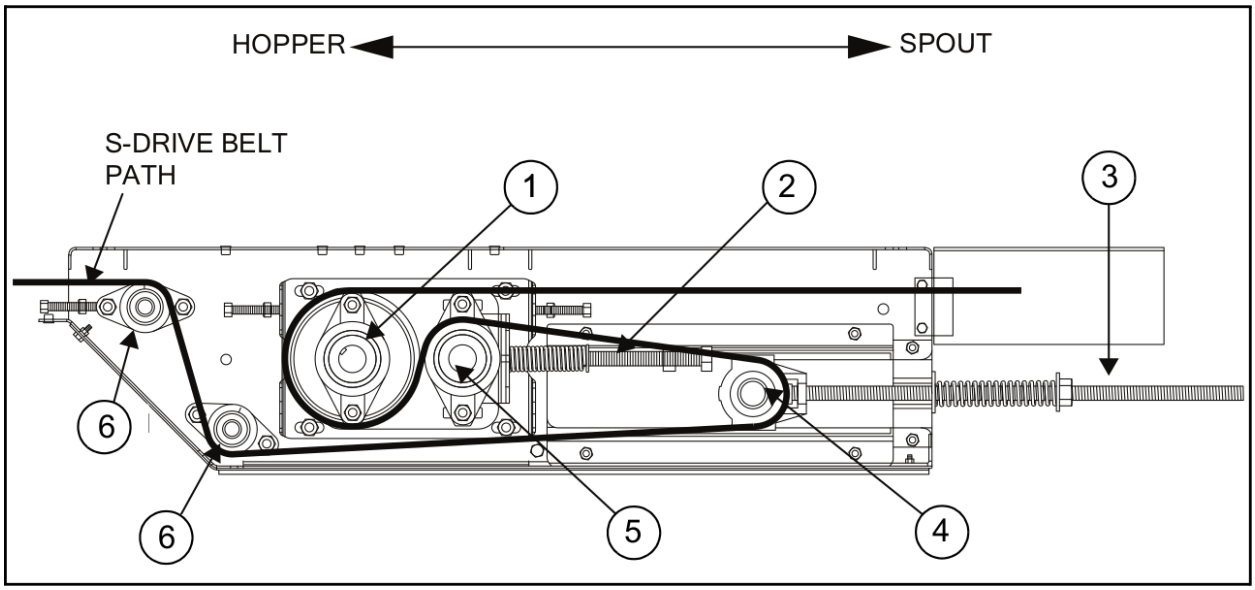
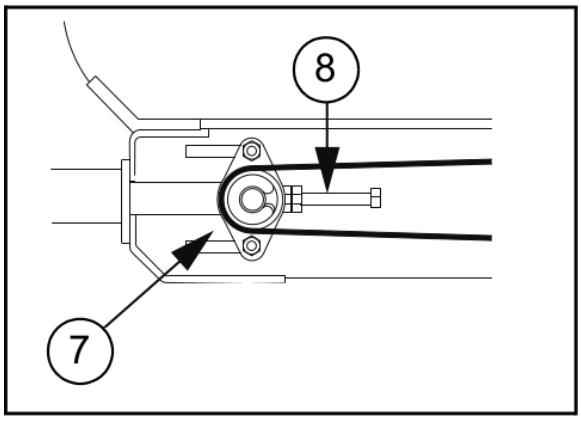


Figure 49 S-Drive Conveyor Belt Path (continued)

Item	Description
1	Drive Roller
2	Pinch Roller Bolt
3	Take-up Roller Bolt
4	Take-up Roller
5	Pinch Roller
6	Return Roller

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

Figure 50. Conveyor Belt Around Hopper Roller



Item	Description
7	Hopper Roller
8	Take-up Bolt

The conveyor belt is now ready to be connected.

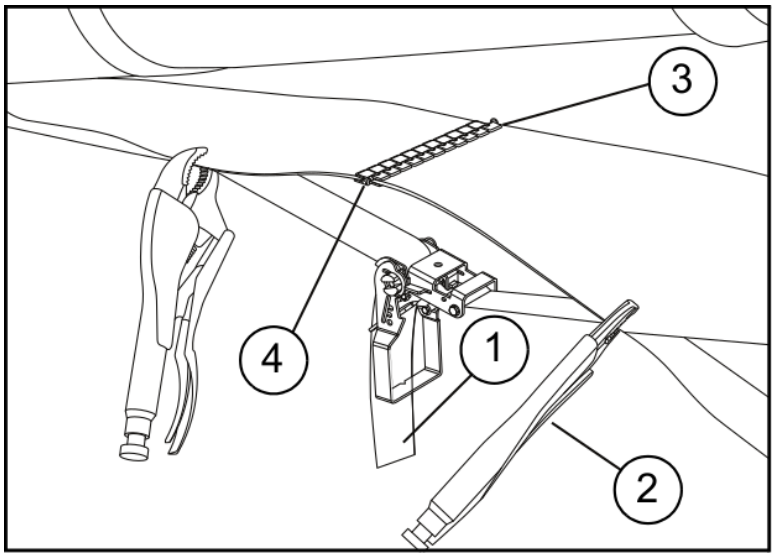
Connect the Conveyor Belt

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).

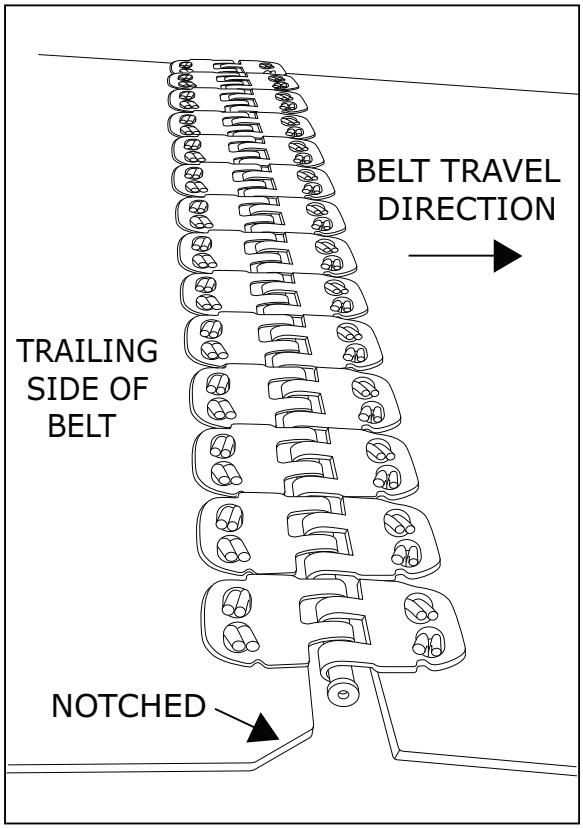
Figure 51. Using a Strap Puller



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 52. Tapering the Trailing Edge of the Belt

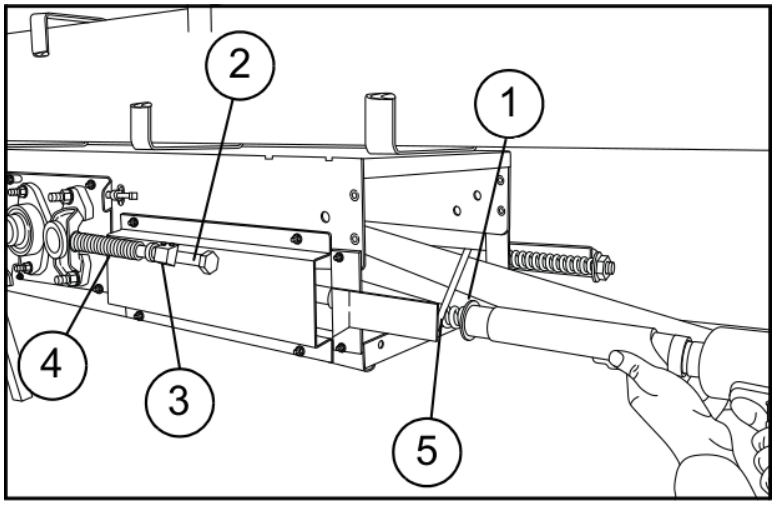


Tighten the Conveyor Belt

Use the s-drive take-up roller bolts to set the belt tension.

1. Tighten the take-up roller bolts (1) until the take-up springs are not visible.
2. Measure to be sure both sides are set at the same position.
3. Tighten the pinch roller bolts (2, both sides of s-drive) until the head of bolt contacts the pinch pipe (3).
4. Check to make sure the bolts on the pinch roller bearings are just loose enough to allow the pinch roller to kick back 1/4" during operation (when the belt seam passes through).
5. Re-attach the s-drive bottom guard.

Figure 53. S-Drive Roller Bolts and Pipes



Item	Description
1	Take-up Roller Bolt
2	Pinch Roller Bolt
3	Pinch Pipe
4	Spring
5	Take-up Pipe

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

3.24. Install the Hopper Belt Guard

1. Attach the hopper guard bracket (3) to the conveyor hopper (1) with 7/16" x 1" bolts (4) and 7/16" locknut (7) (see Figure 54).
2. Slide the s-drive hopper belt guards (2) on the hopper guard bracket (3) and the s-drive angled guard mount (see Figure 55).
3. Use two 1/4" x 3/4" bolts (5), 1/4" lock washers (8), and 1/4" flat washers (9), to secure the center of belt guard (2). Screw the bolts into the threaded inserts located on the belt guard.
4. Use four 1/4" x 3/4" bolts (5), 1/4" flat washers (9), and 1/4" lock washers (8) to attach the belt guard (2) into the threaded inserts in the guard bracket (3) and s-drive angled guard mount (see Figure 56).

Table 16. Hopper Belt Guard Components

Item	Description	Quantity
1	Conveyor Hopper	1
2	S-Drive to Hopper Belt Guard 13.8125 x 40.125	2
3	Hopper Guard Bracket	1
4	Bolt Hex 7/16" x 1"	2

Table 16 Hopper Belt Guard Components (continued)

Item	Description	Quantity
5	Bolt Hex 1/4" x 3/4"	6
7	Nut Nylock 7/16"	2
8	Lock Washer 1/4"	6
9	Flat Washer 1/4" USS Plated	6

Figure 54. Installing Hopper Guard Bracket

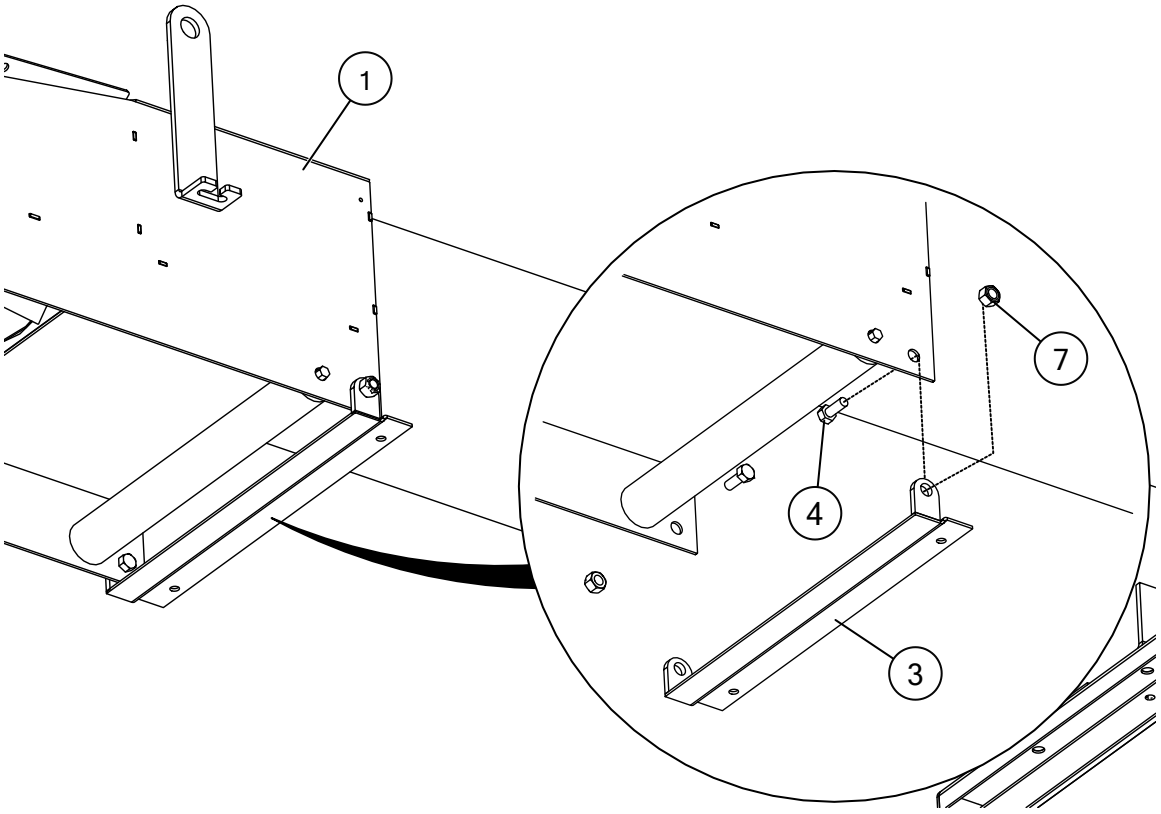


Figure 55. Positioning Hopper Belt Guard

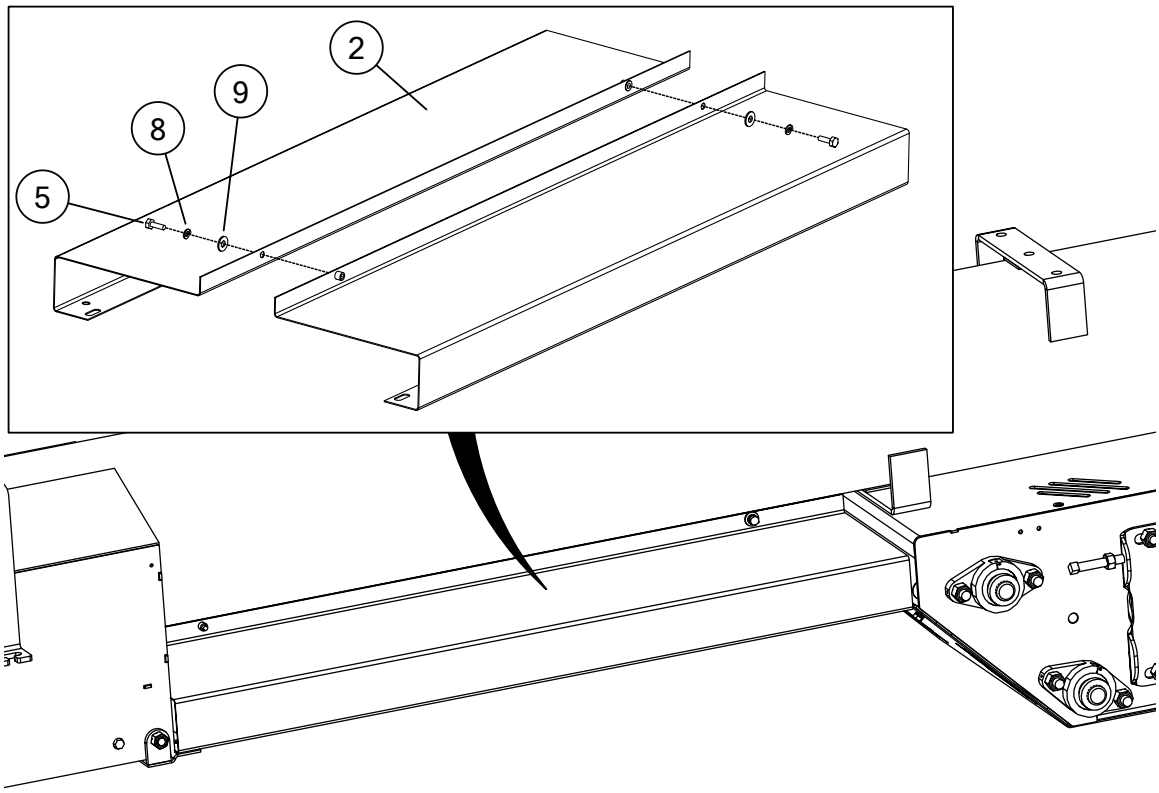
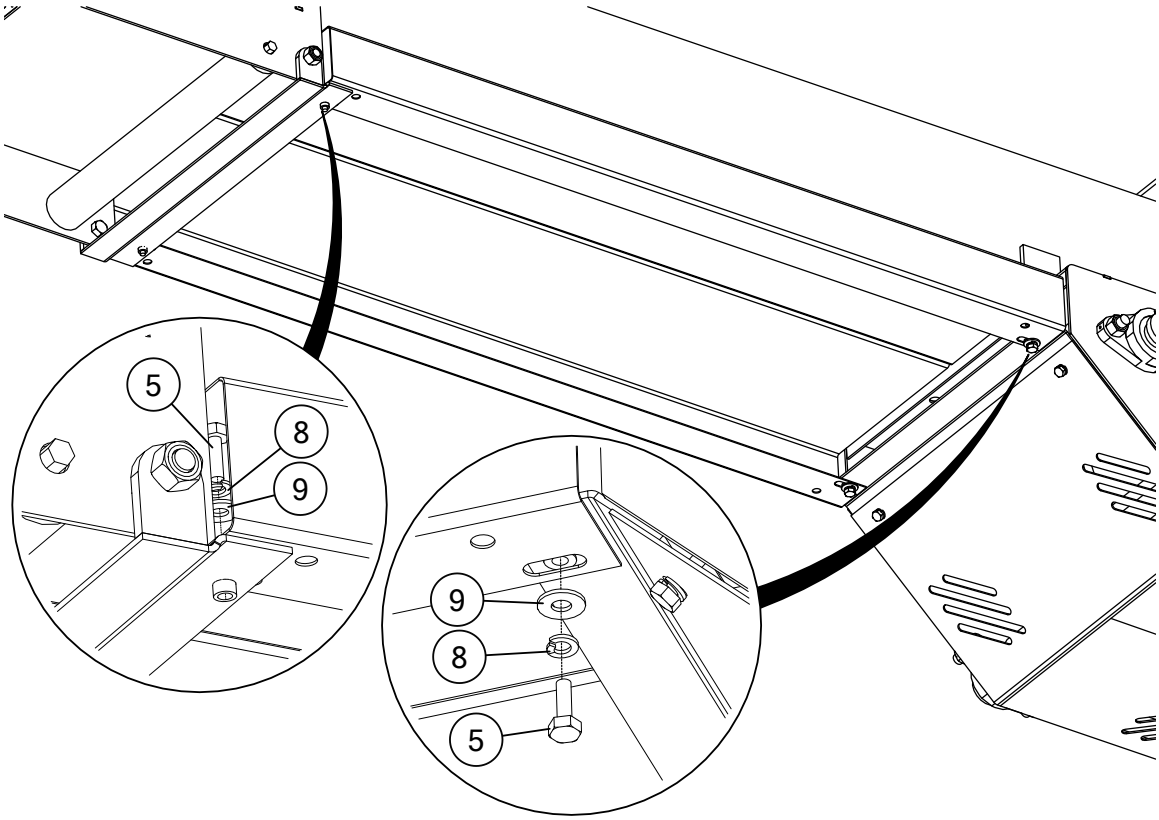


Figure 56. Fastening Hopper Belt Guard



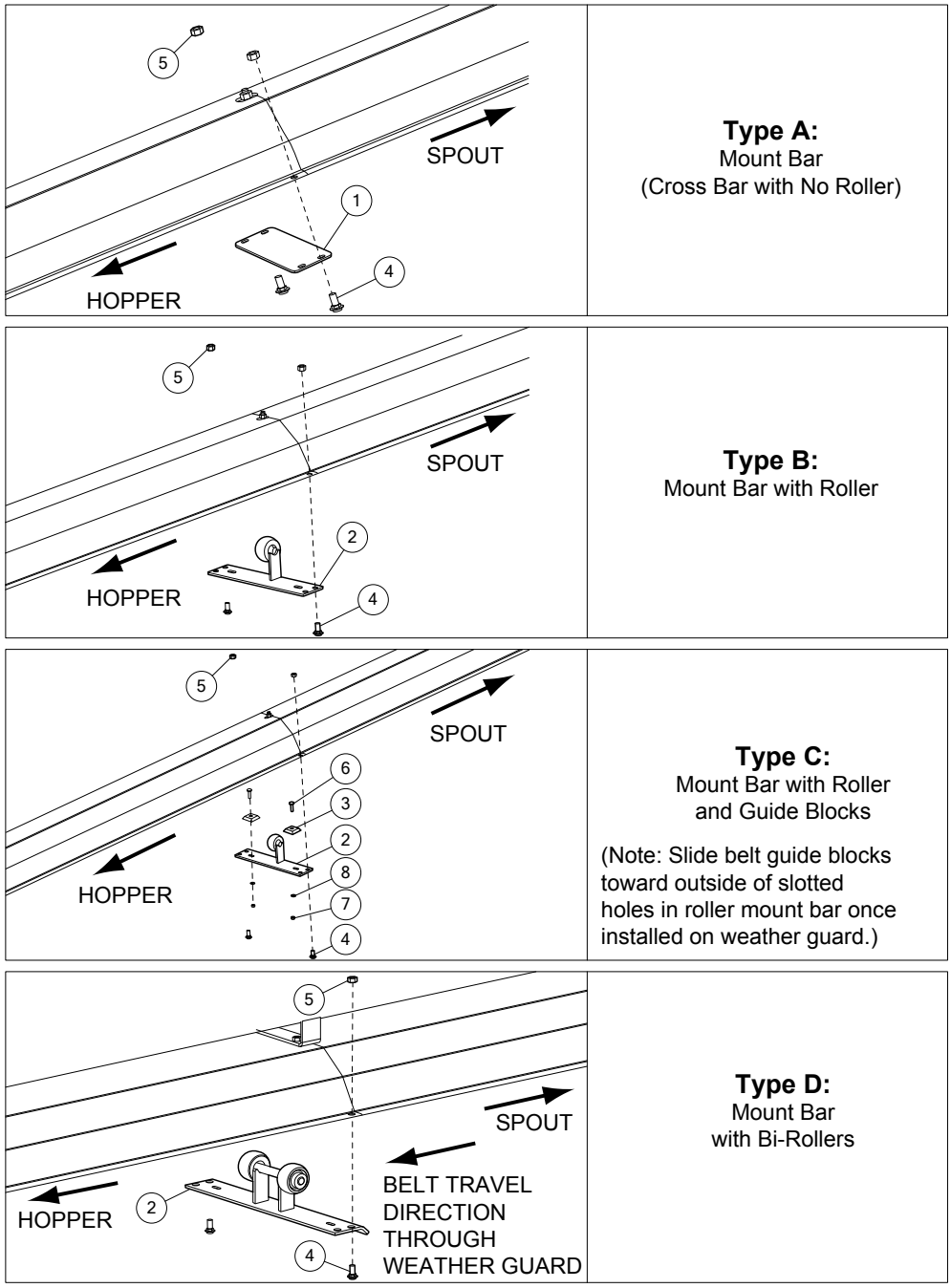
3.25. Install the Weather Guard Mount Bars

1. Install the types of mount bar assemblies in Figure 57 which are indicated by the position arrows and identifier letters as shown on your particular conveyor model schematic that follows.
2. Adjust the position on all weather guards and mount bars to achieve the best fit.
3. Tighten all nuts.

Table 17. Weather Guard Mount Bar Components

Item	Description
1	Mount Bar (Cross Bar with No Roller)
2	Mount Bar with Roller
3	Belt Guide Nylon Blocks
4	7/16" x 1" Carriage Bolt
5	7/16" Nylon Locknut
6	5/16" x 1-1/2" Carriage Bolt
7	5/16" Hex Nut
8	5/16" Lock Washer

Figure 57. Types of Mount Bar Assemblies



Type A:
Mount Bar
(Cross Bar with No Roller)

Type B:
Mount Bar with Roller

Type C:
Mount Bar with Roller
and Guide Blocks

(Note: Slide belt guide blocks toward outside of slotted holes in roller mount bar once installed on weather guard.)

Type D:
Mount Bar
with Bi-Rollers

Figure 58. Mount Bar Schematics (65’ – 75’)

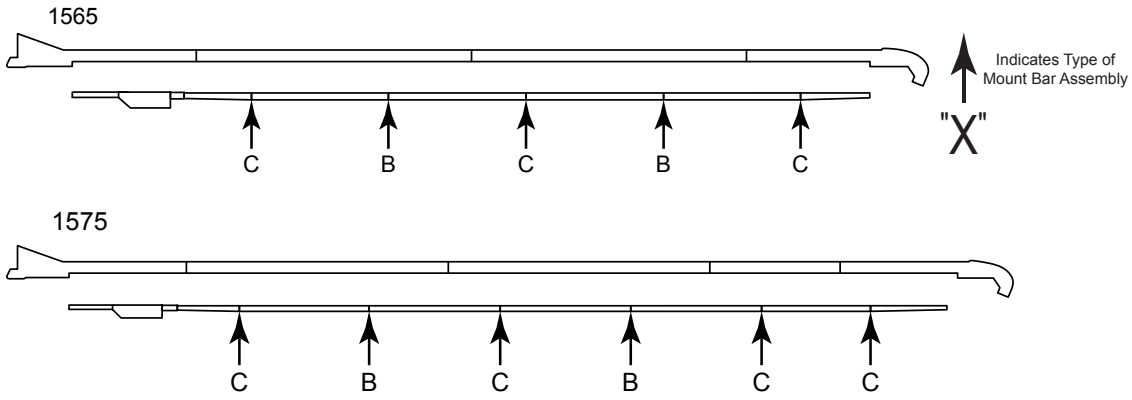
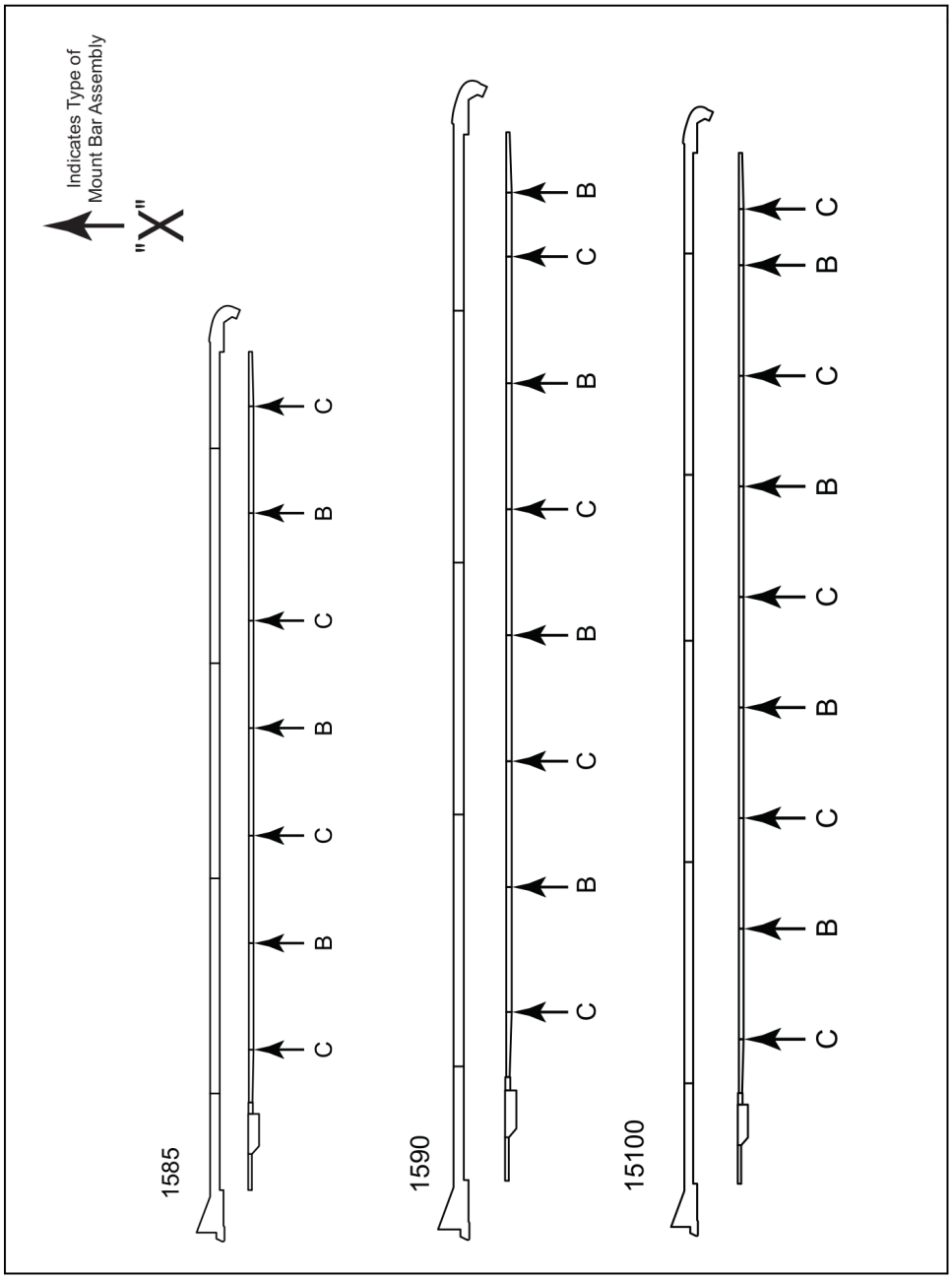


Figure 59. Mount Bar Schematics (85’ – 100’)



3.26. Install the Collapsible Hopper Cloth

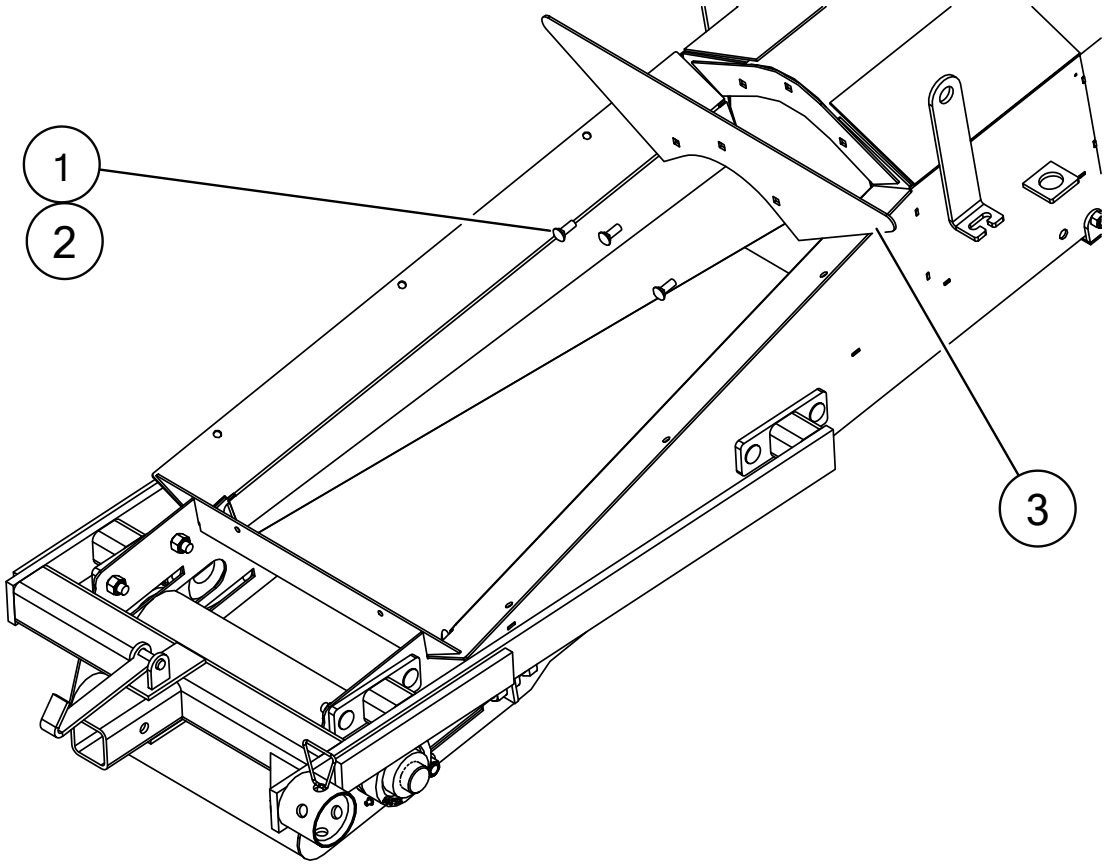
Install the Hopper Shield

1. Install the hopper shield (3) onto the conveyor frame using 3/8" x 1" carriage bolts (1) and 3/8" nuts (2) (see Figure 60).

Table 18. Hopper Shield Components

Item	Description
1	3/8" x 1" Carriage Bolt
2	3/8" Nut
3	Hopper Shield

Figure 60. Installing the Hopper Shield



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 61).

   Note

   The textured side of the flashings should be facing down.

2. 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.

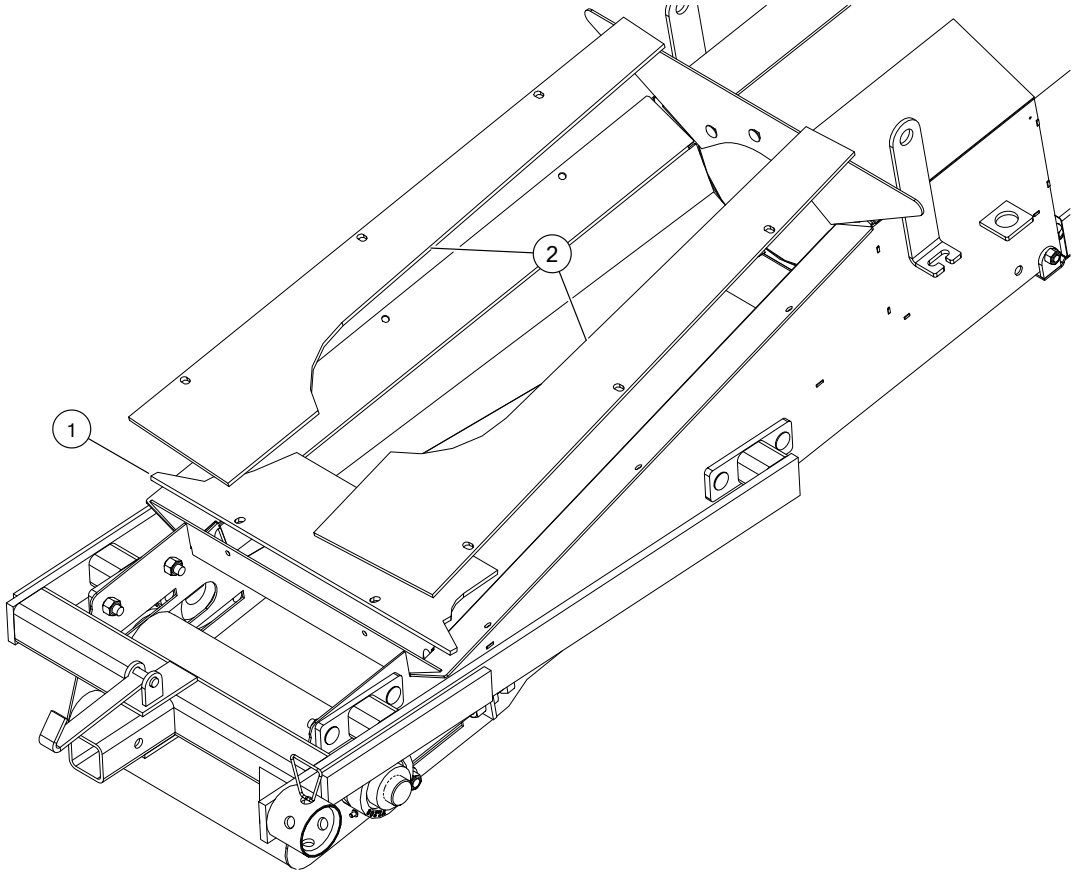
   Note

   Ensure there is no gap between front flashing and belt.

Table 19. Flashing

Item	Description
1	Front flashing
2	Side flashing

Figure 61. Installing the Flashing



Install the Pivot Shaft

1. Slide the pivot shaft (1) through the mounting holes (see Figure 62).
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).

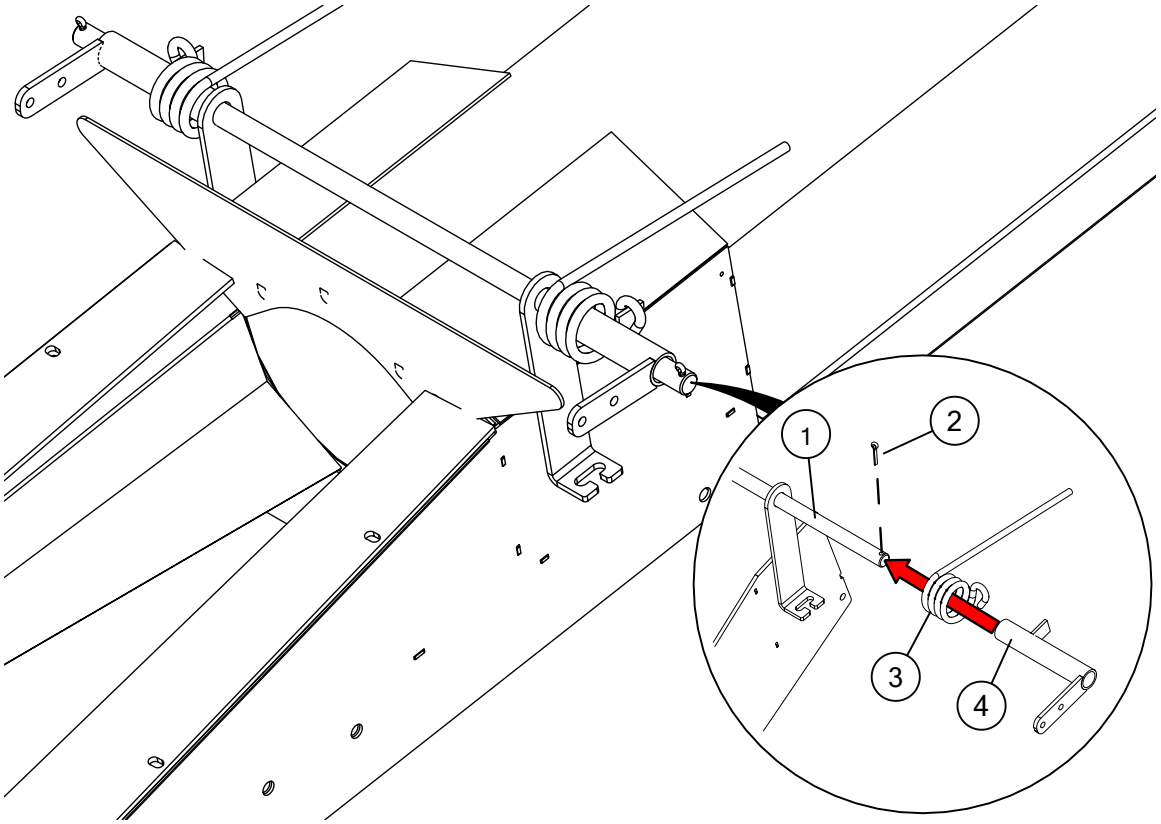
Table 20. Pivot Shaft Components

Item	Description
1	Pivot shaft
2	Cotter pin

Table 20 Pivot Shaft Components (continued)

Item	Description
3	Hopper spring
4	Shaft bracket

Figure 62. Installing the Pivot Shaft, Hopper Springs, and Shaft Brackets



Install the Hopper Cloth Frame

1. Slide the two upper side frames (1, 5) into the hopper cloth (2) (see Figure 63).

   Note

   Apply grease to frame pieces if required.

2. Slide the upper front frame (7) into the hopper cloth.
3. Fasten the upper side frames to the upper front frame using 3/8" x 1" hex bolts (8) and 3/8" nuts (9).

   Note

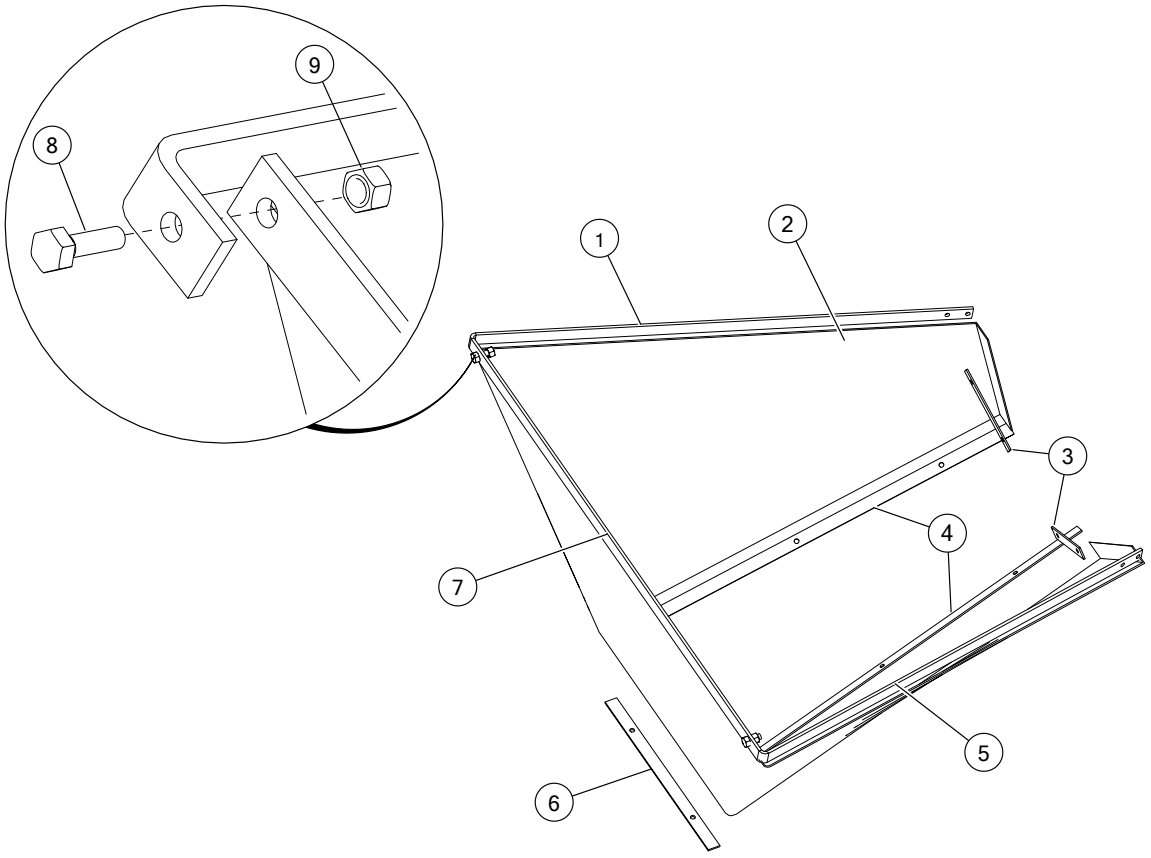
   Steps 4–6 will be performed later in the hopper cloth installation.

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

Table 21. Hopper Cloth Frame Components

Item	Description
1	Upper side frame (left)
2	Hopper cloth
3	Lower back frame
4	Lower side frame (long)
5	Upper side frame (right)
6	Lower front frame
7	Upper front frame
8	3/8" x 1" Hex bolt
9	3/8" Nut

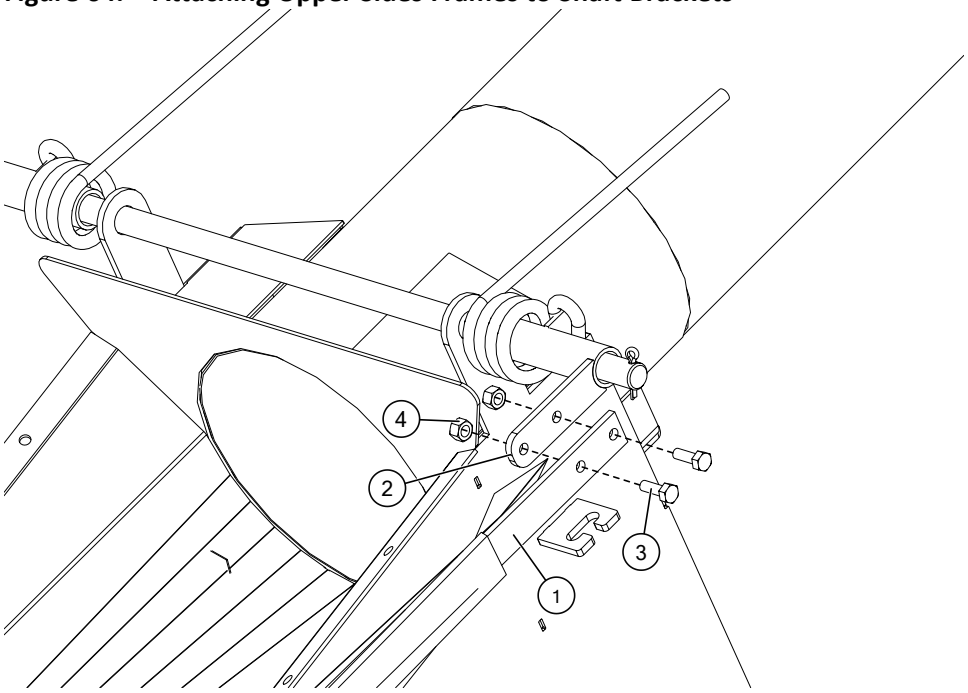
Figure 63. Installing the Hopper Cloth Frame



Install the Hopper Cloth

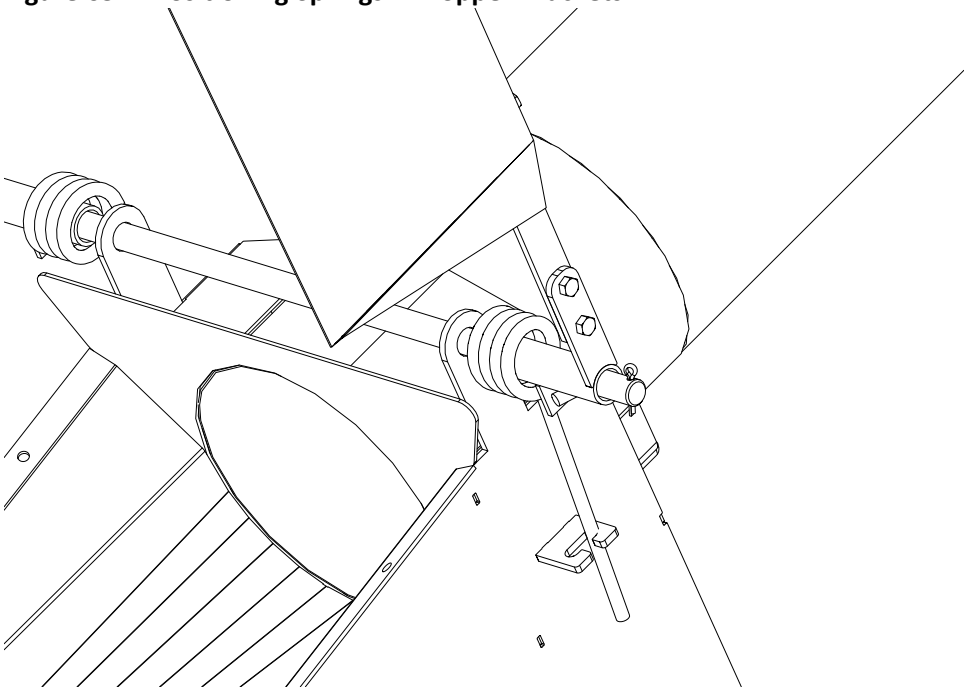
1. Attach the upper side frames (1) to the shaft brackets (2) using 3/8" x 1" hex bolts (3) and 3/8" nuts (4) (see Figure 64).

Figure 64. 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 65).

Figure 65. Positioning Springs in Hopper Brackets

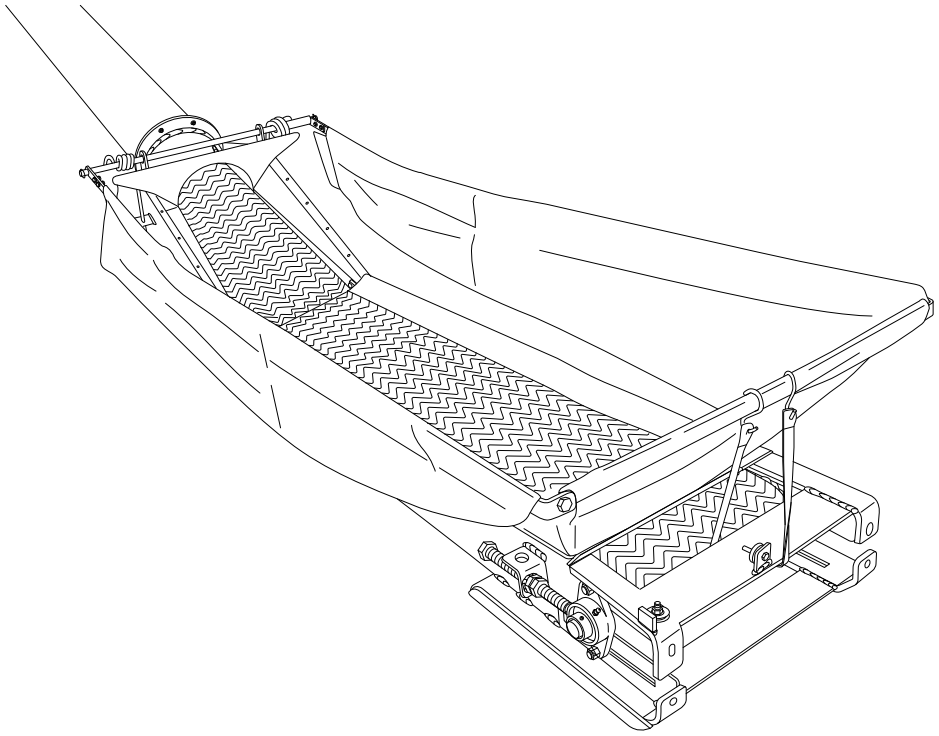


3. Pull the upper front frame down until the bottom of the cloth touches the front flashing, and hold it in place with a bungee cord around the front frame of the hopper weldment (similar to Figure 66).

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 66. 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 63).
5. Attach the hopper cloth to the conveyor (see Figure 67):
   - 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 frame (9) of the hopper cloth to the hopper using self-tapping screws (7), 1/4" flat washers (8), and vinyl screw caps (11).
7. Install trimlock (10) onto the upper frame of the hopper cloth.

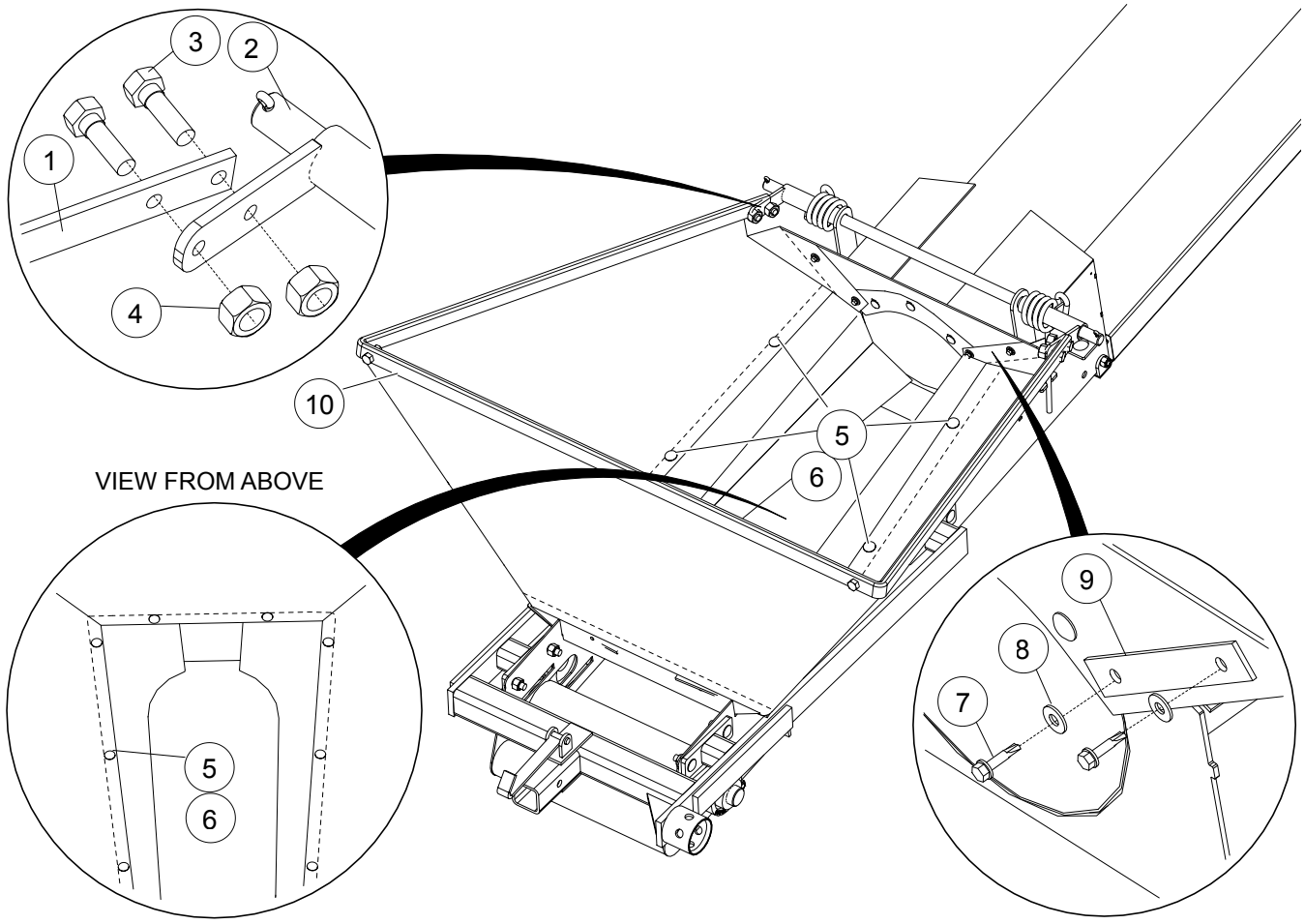
Table 22. Components for Installing the Hopper Cloth onto the Conveyor

Item	Description	Quantity
1	Upper side frame	2
2	Shaft bracket	2
3	3/8" X 1" hex bolt	4
4	3/8" nut	4
5	1/4" X 1-1/4" elevator bolt	8
6	1/4" nut	8
7	1/4" x 1" Self-tapping screw	4
8	1/4" flat washer	4

Table 22 Components for Installing the Hopper Cloth onto the Conveyor (continued)

Item	Description	Quantity
9	Lower back frame	2
10	Trimlock	10 ft [3 m]
11	Vinyl screw cap (not shown)	4

Figure 67. Installing the Hopper Cloth onto the Conveyor



3.27. Install the Spout Hood

1. Place the hood (2) around the bearing assembly (see Figure 68).
2. Use 1/4" x 1" self-tapping screws (3) and 1/4" flat washers (4) to tighten the hood (2) to the conveyor spout (1).

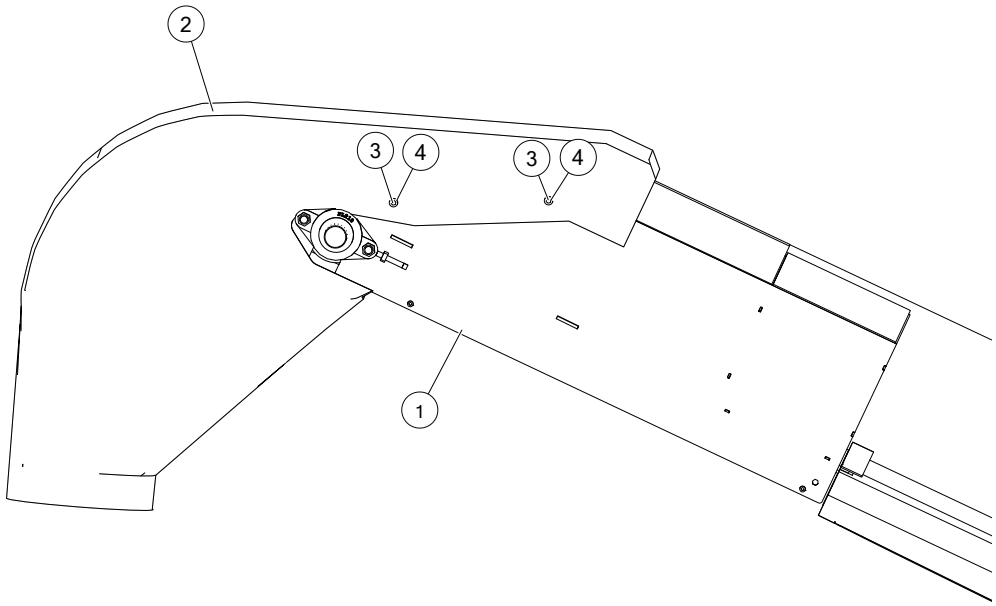
   Note

   Make sure the screws will not interfere with belt operation.

Table 23. Spout Hood Components

Item	Description	Quantity
1	Spout Assembly	1
2	Hood	1
3	1/4" x 1" Self-Tapping Screw	4
4	1/4" Flat Washer	4

Figure 68. Installing Spout Hood



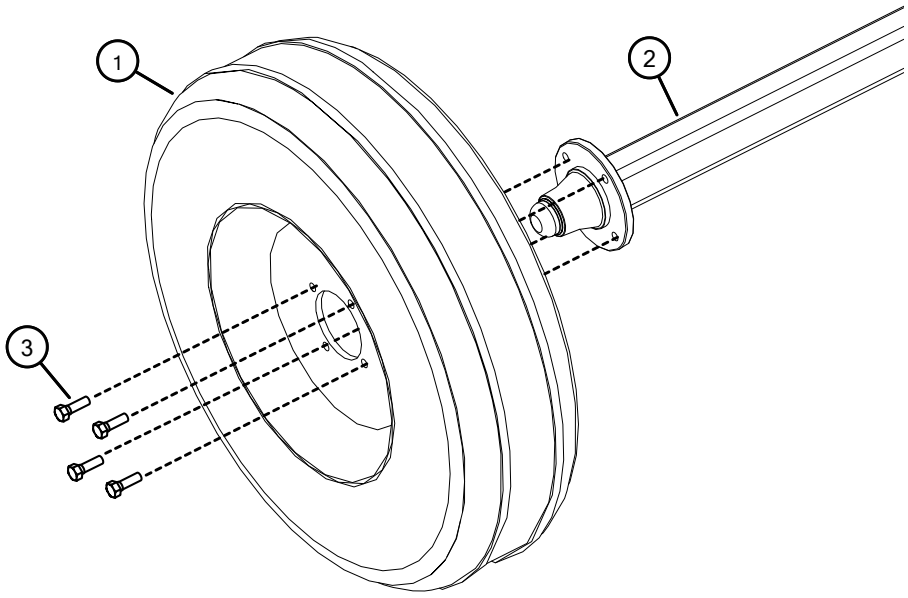
3.28. Install the Wheels

1. Check if the pressure of tires matches the pressure indicated on the tire sidewall.
2. Mount the wheels (1) to the axle (2) with wheel bolts (3) provided (see Figure 69).

Table 24. Components to Attach the Wheels to the Axle

Item	Description
1	Tire Assembly
2	Axle
3	Wheel Bolt

Figure 69. Attaching the Wheels to the Axle



Note

Wheels may have four or six bolts, depending on the model of conveyor.

3.29. Assemble the Scissor-Lift Frame

Position the frame components close to the conveyor tube before assembly.

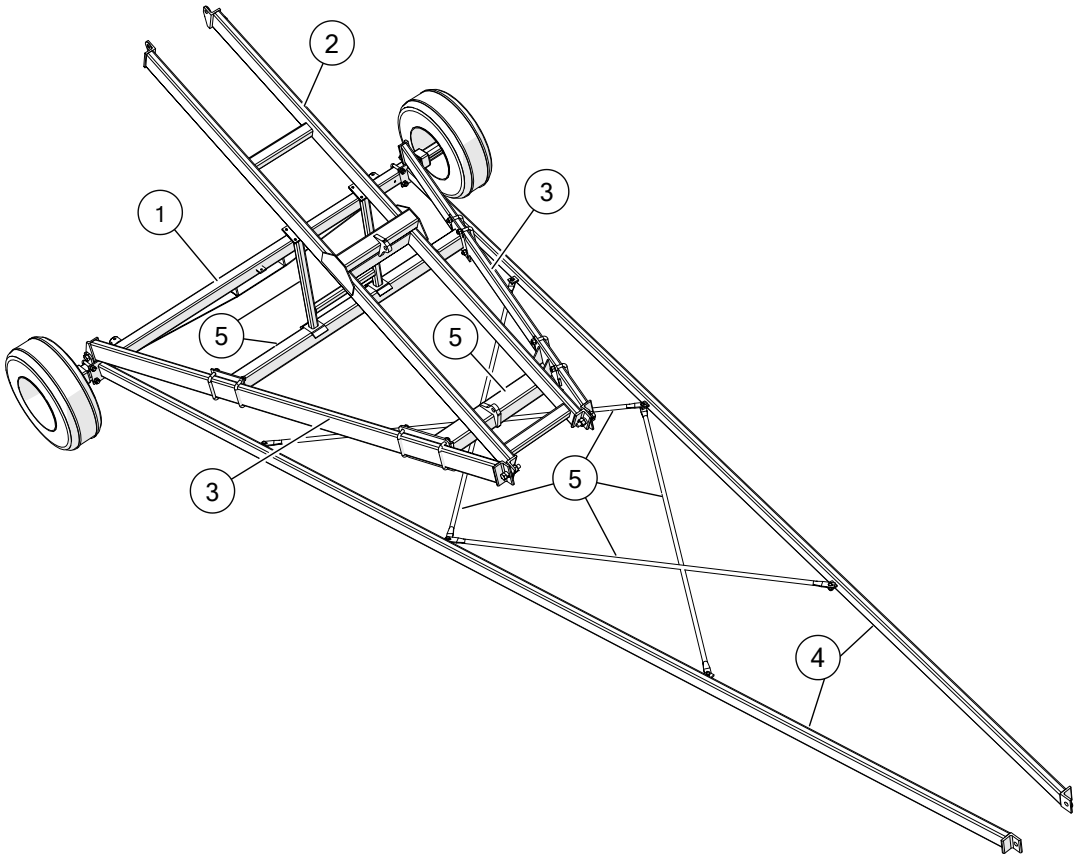
Position the frame components close to the conveyor tube before assembly.

Scissor Frame Component Overview

Table 25. General Components of the Scissor Frame

Item	Description
1	Axle
2	Lift Ladder
3	Lift Arms
4	Axle Arms
5	Supporting Braces

Figure 70. Identifying the Components of the Scissor Frame



Connect the Upper and Lower Axle Arms (15100 Only)

1. Connect the lower axle arm (1) and upper axle arm (2) together with 1/2" x 1-1/2" bolts (3) and 2" nuts (4) (see Figure 71).
2. Fasten the axle arm crossbrace (5) to the axle arms with 4" x 2" x 3/4" u-bolts (6) and 3/4" nylock nuts (7).

Note

The axle arm crossbrace will be tightened after the scissor frame has been connected to the conveyor tube.

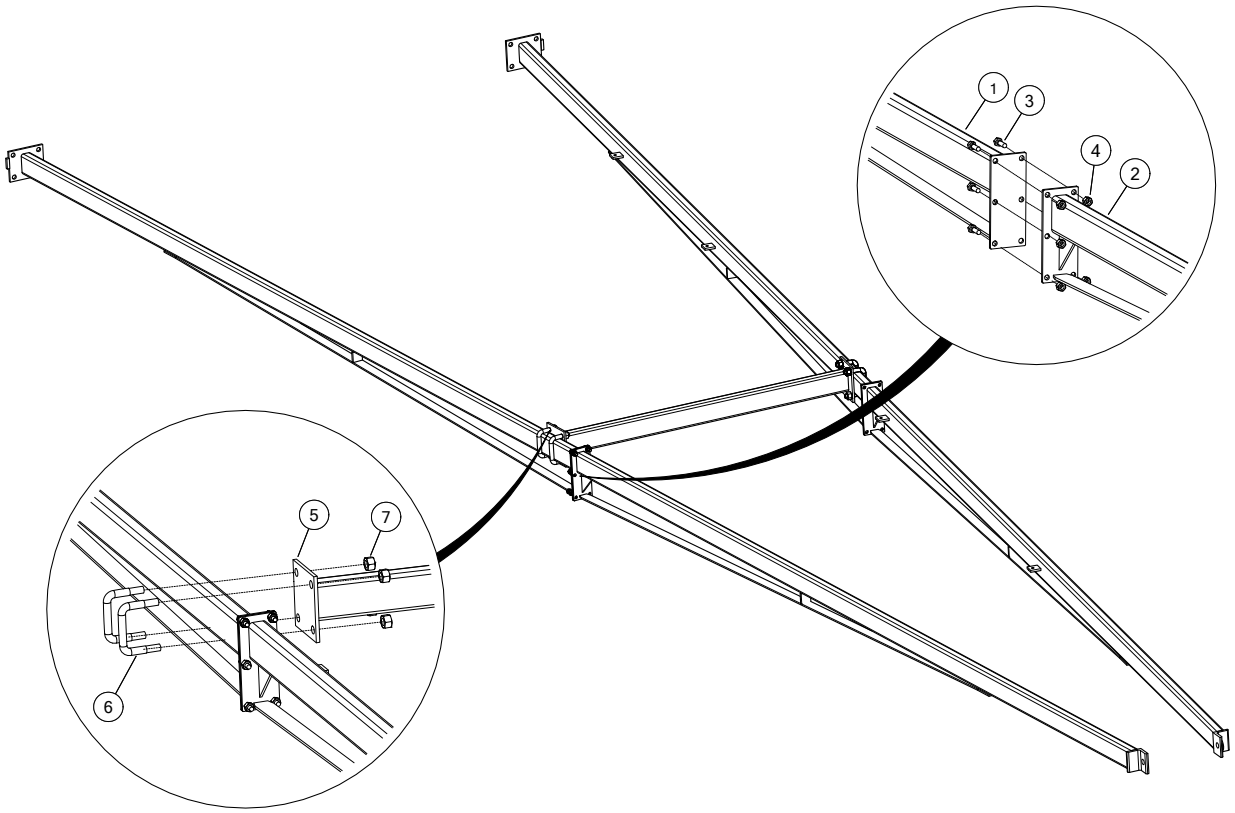
Table 26. Lower and Upper Axle Arm Components (15100)

Item	Description
1	Lower Axle Arm 100 Left
2	Upper Axle Arm 100 Left
3	1/2" x 1–1/2" Bolt GR8 Plated
4	1/2" Nylock Nut
5	Axle Arm Crossbrace 15100

Table 26 Lower and Upper Axle Arm Components (15100) (continued)

Item	Description
6	4" x 2" x 3/4" U-bolt Plated
7	3/4" Nylock Nut

Figure 71. Connecting the Axle Arms and Crossbrace (15100)



Install the Axle Arms on the Axle

1. Fasten the axle arms (6) to the axle assembly with u-bolts (1) and 3/4" locknuts (2) (see Figure 72).
2. Loosely fasten the crossbraces (4) to the axle arms with bolts (3), flat washers (7), and locknuts (5).

   Note

   The crossbraces will be tightened after the scissor frame has been connected to the conveyor tube.

3. Insert the 3/8" x 4–5/16" hitch pin (8) through the extendable axle in the retracted position, and secure with a 3/16" x 3–1/4" hairpin (9).
4. Thread the 1" x 2–1/2" bolt (10) into the axle bottom weld-on nut, and up against the extendable axle.

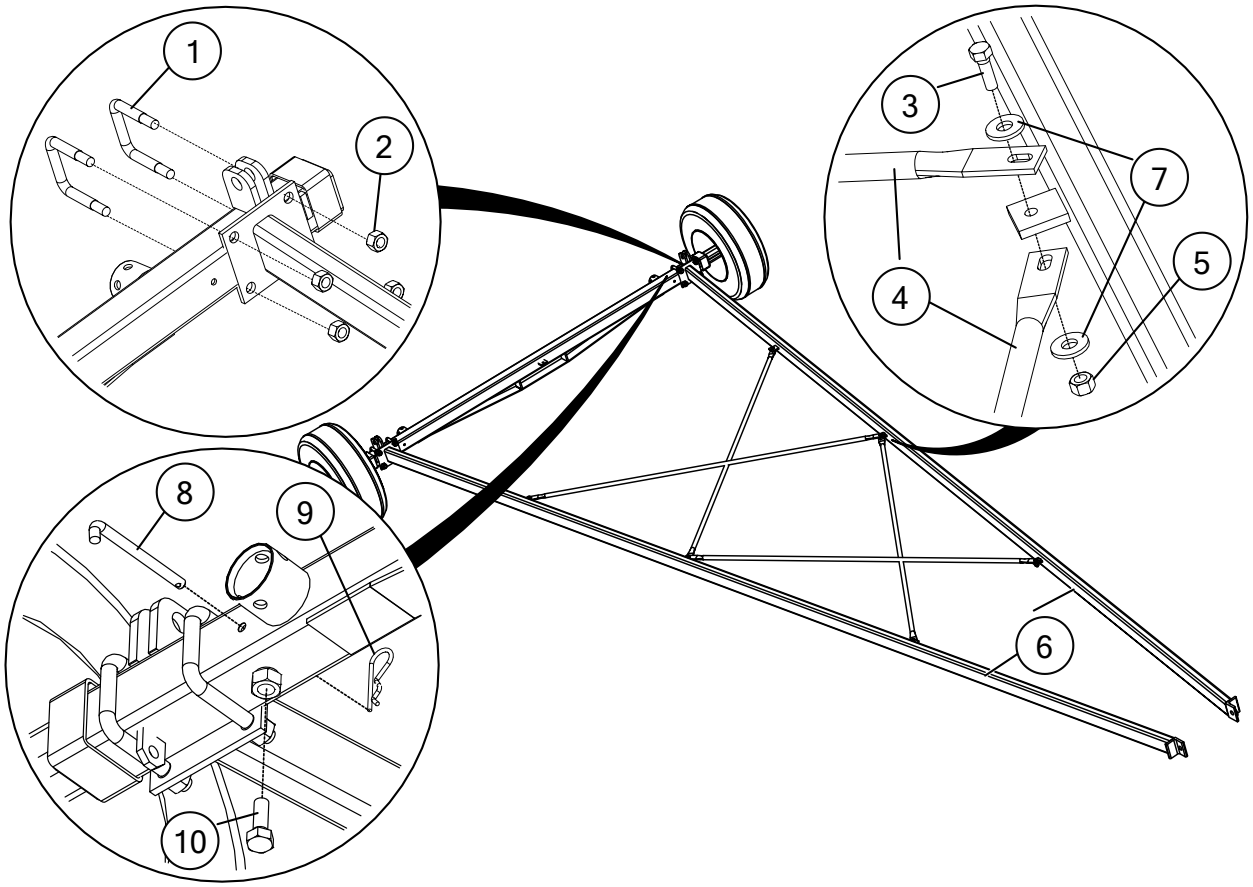
Table 27. Axle Arm Components

Item	Description
1	**1565/75:** U-Bolt 3" x 3" x 3/4" Plated

Table 27 Axle Arm Components (continued)

Item	Description
	1585/90/100: U-Bolt 3-1/2" x 3-1/2" x 3/4" Plated
2	3/4" Nylock Nut
3	**1565–90:** 7/16" x 1–1/2" Bolt GR8 Plated
	15100: 1/2" x 1–1/2" Bolt GR8 Plated
4	Crossbrace
5	**1565–90:** 7/16" Nylock Nut Gr8
	15100: 1/2" Nylock Nut Gr8
6	Axle Arm
7	**1565–90:** 7/16" Flat Washer
	15100: 1/2" Flat Washer
8	3/8" x 4–5/16" Hitch Pin
9	3/16" x 3–1/4" Hairpin
10	1" x 2–1/2" Bolt GR8 Plated

Figure 72. Installing the Axle Arms



Install the Lift Arms on the Axle

The lift arms must be supported while being installed.

1. Fasten the lift arms (3) to the axle with 1" x 3" bolts (1) and 1" locknuts (2) (see Figure 73).
2. Loosely fasten the upper lift arm brace (5) to the lift arms with u-bolts (7) and 3/4" locknuts (6).
3. Loosely fasten the lower lift arm brace (4) to the lift arms with u-bolts (7) and 3/4" locknuts (6).

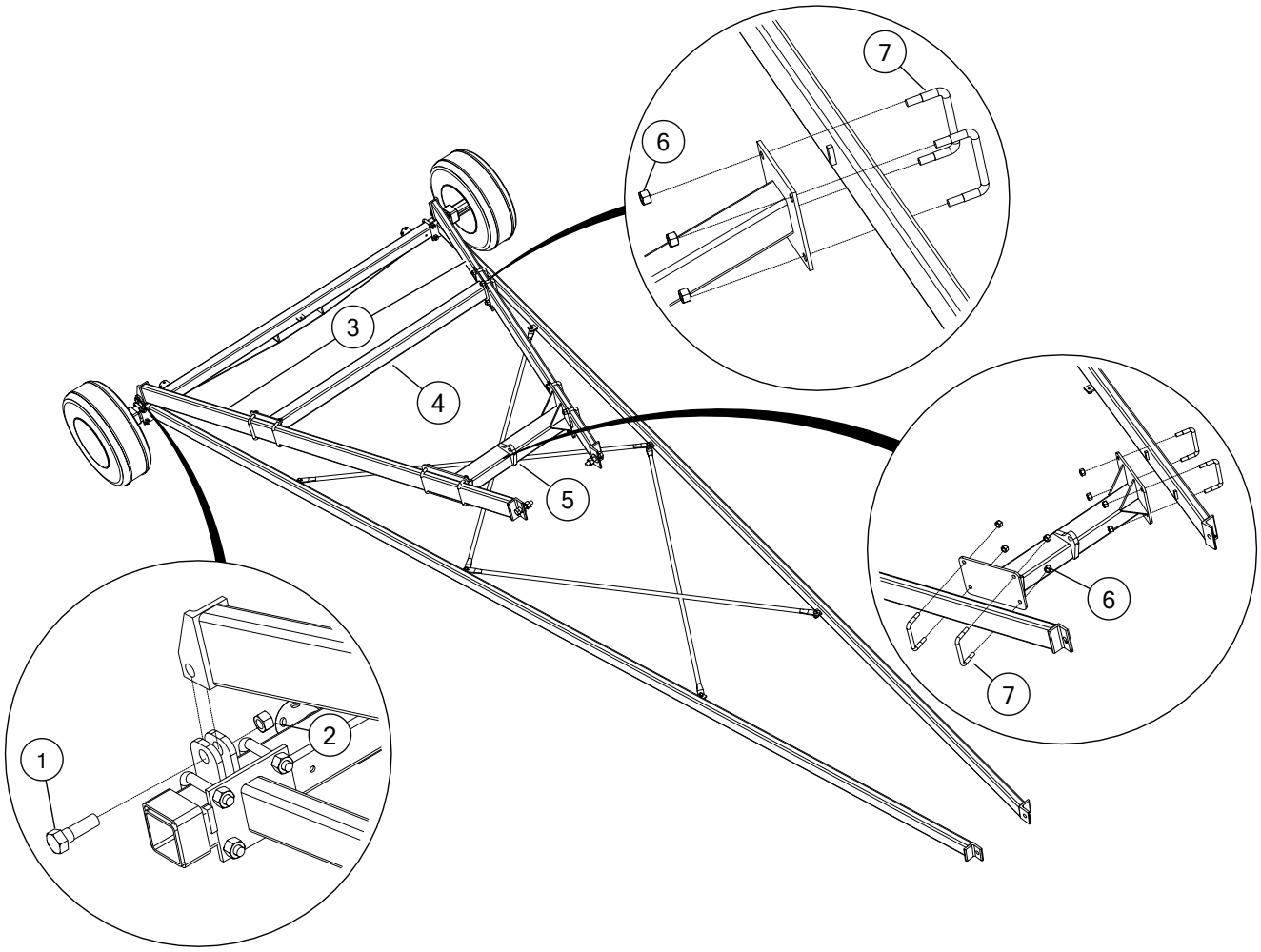
Note

The u-bolts used to install the lift arms will be tightened after the ladder has been installed.

Table 28. Lift Arm Components

Item	Description
1	1" x 3" Bolt GR8 Plated
2	1" Nylock Nut
3	Lift Arms
4	Lower Lift Arm Brace
5	Upper Lift Arm Brace
6	3/4" Nylock Nut
7	**1565/75:** 3" x 3 " x 3/4" U-Bolt Plated
	1585/90: 3–1/2" x 3–1/2" x 3/4" U-Bolt Plated
	15100: 6" x 2 " x 3/4" U-Bolt Plated

Figure 73. Installing the Lift Arms



Install the Ladder on the Lift Arms

1. Fasten the ladder (3) to the lift arms (5) with a 1" x 4-1/2" bolt (8) and 1" locknut (6) on each side (see Figure 74).
2. Tighten the u-bolts on the upper lift arm brace starting with the bottom locknuts.
3. Tighten the u-bolts on the lower lift arm brace starting with the bottom locknuts.

   Note

   Ensure the upper and lower lift arm braces are butted up against the tab stops on the lift arms while tightening the u-bolts.

4. Fasten the transport brace (4) to the ladder with 7/16" x 1-1/2" bolts (2) and 7/16" locknuts (1).

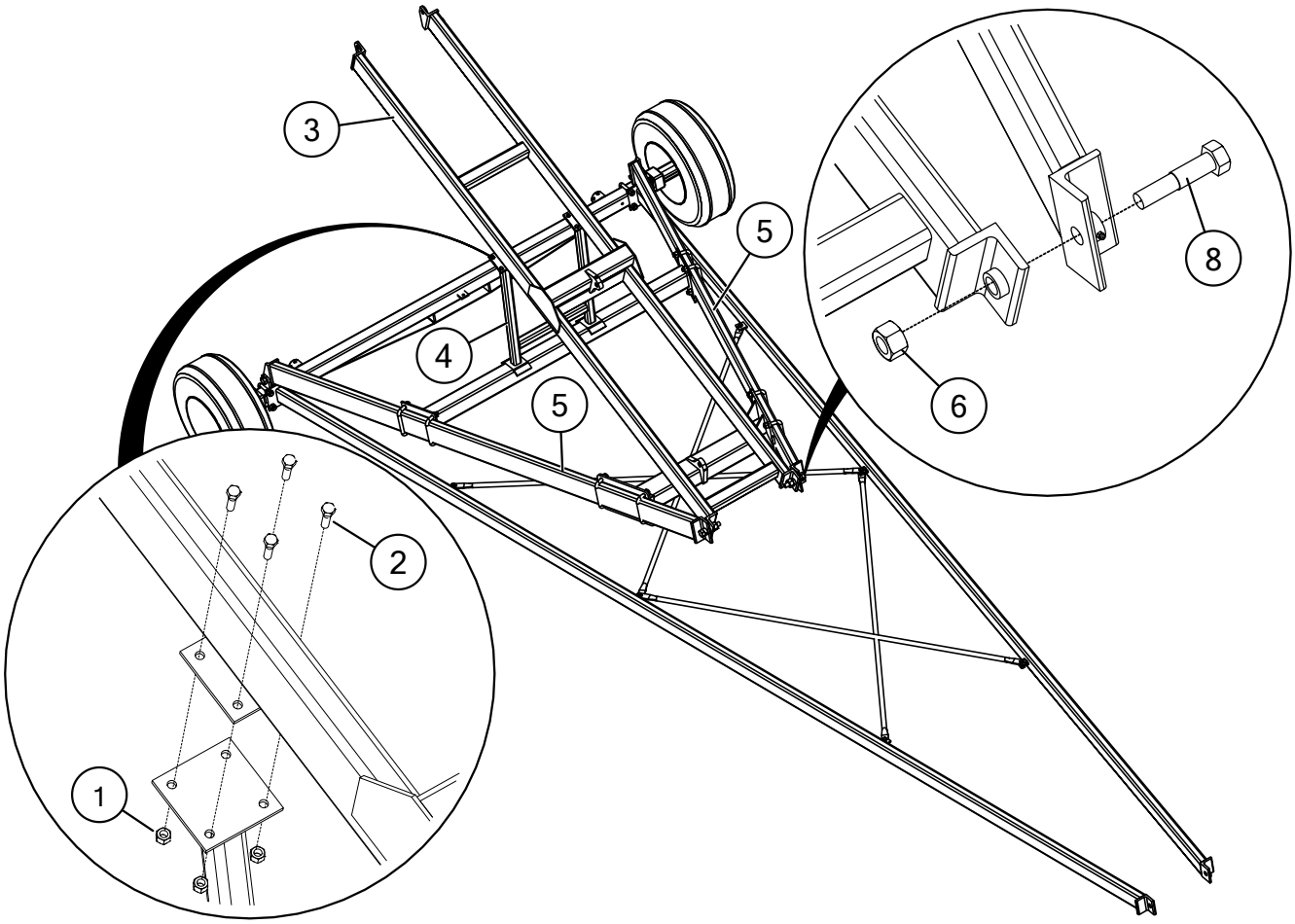
Table 29. Ladder and Transport Brace Components

Item	Description
1	7/16" Nylock Nut
2	7/16" x 1-1/2" Bolt G8 Plated
3	Ladder

Table 29 Ladder and Transport Brace Components (continued)

Item	Description
4	Transport Brace
5	Lift Arm
6	1" Nylock Nut
8	1" x 4-1/2" Bolt

Figure 74. Installing the Ladder and the Transport Brace



Install the Hydraulic Cylinder

1. Attach the hydraulic cylinder (9) as follows using cylinder pins (10) and hairpins (11) (see Figure 75):
   a. attach the rod end to upper lift arm crossbrace (D)
   b. attach the cap end to the ladder crossbrace (C)

   Important

   Ensure the hydraulic cylinder ports are on the left-hand side of the conveyor to prevent binding with the frame.

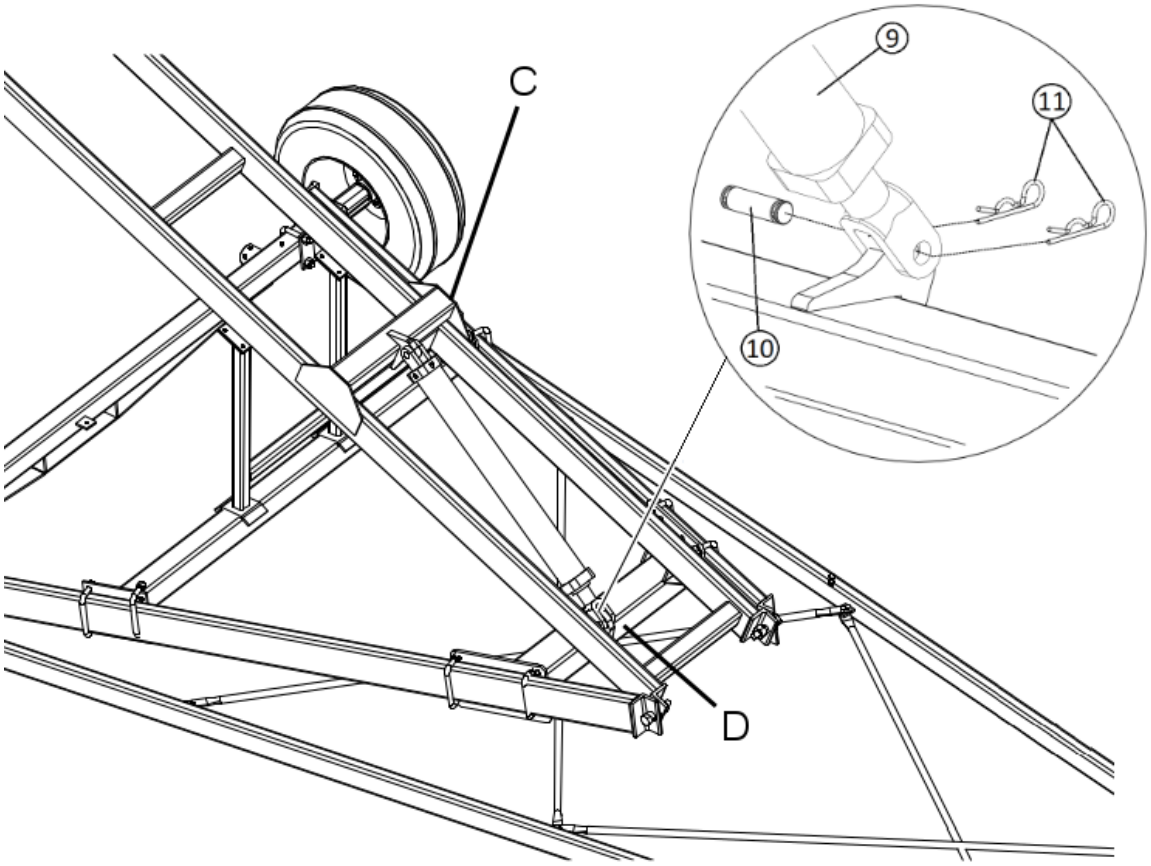
Note

In this case, left-hand and right-hand sides are defined by the conveyor being hooked to a tractor, and in transport mode with the operator seated in the tractor facing in the forward road-transport direction.

Table 30. Hydraulic Cylinder Components

Item	Description
9	Hydraulic Cylinder
10	Cylinder Pin (supplied with cylinder)
11	Hairpin (supplied with cylinder)

Figure 75. Attaching the Hydraulic Cylinder

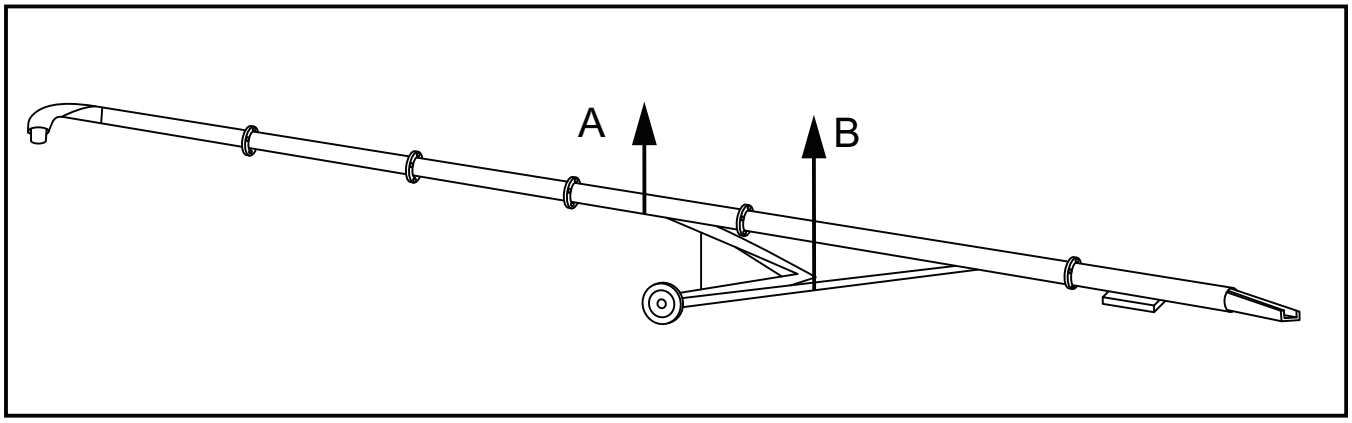


3.30. Connect the Scissor Frame to the Conveyor Tube

Lifting the Conveyor

Connecting the scissor frame to the conveyor tube requires the components be lifted by a crane, front-end loader, or block and tackle system. The two recommended lifting locations are shown in Figure 76.

Figure 76. Lifting Points



Fasten the Ladder to the Conveyor Tube

1. Lift the conveyor tube at point A to a height that allows the scissor frame to be placed underneath the conveyor.
2. Position the scissor frame under conveyor tube (see Figure 77).
3. Lower the conveyor tube onto the frame and align the ladder (6) with the upper suspension bracket (5).

   Important

   As shown in Figure 78, the 65'–90' models have two upper suspension brackets. The connections must be made as follows:

   - The **1565** and **1575** models must align the ladder connection with the upper suspension bracket (C) closer to the hopper.
   - The **1585** and **1590** models must align the ladder connection with the upper suspension bracket (D) closer to the spout.

   The **15100** model only has one upper suspension bracket.
4. Fasten the ladder to the upper suspension bracket with 1" x 3" bolts (1), bushing (3), 1" flat washer (2), and 1" nut (4).

Fasten the Axle Arms to the Conveyor Tube

1. Lift the tube at point A to approximately 10' (3 m).
2. Lift the tube at point B until the axle arms (7) align with the lower suspension bracket (8) (see Figure 77).
3. Fasten the axle arm to the lower suspension bracket with 1" x 3" bolts (1), bushing (3), 1" flat washer (2), and 1" nut (4).
4. Tighten the crossbrace bolts installed while assembling the scissor frame.

Table 31. Connecting the Scissor Frame to the Conveyor Tube Components

Item	Description
1	1" x 3" Bolt GR8 Plated
2	1" Flat Washer Plated USS
3	Bushing
4	1" Nylock Nut

Table 31 Connecting the Scissor Frame to the Conveyor Tube Components (continued)

Item	Description
5	Upper Suspension Bracket
6	Ladder
7	Axle Arm
8	Lower Suspension Bracket

Figure 77. Connecting the Scissor Frame to the Conveyor Tube

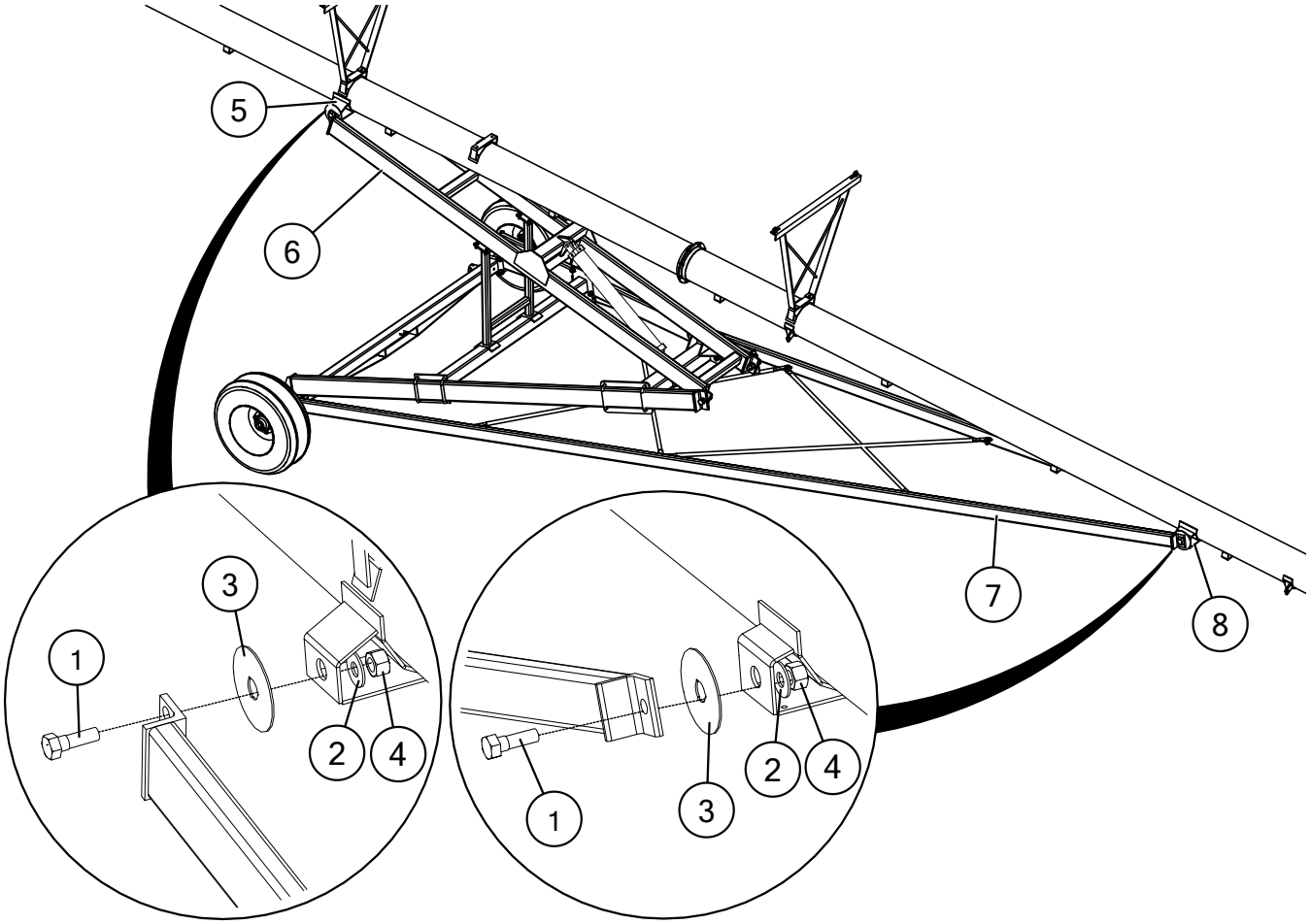
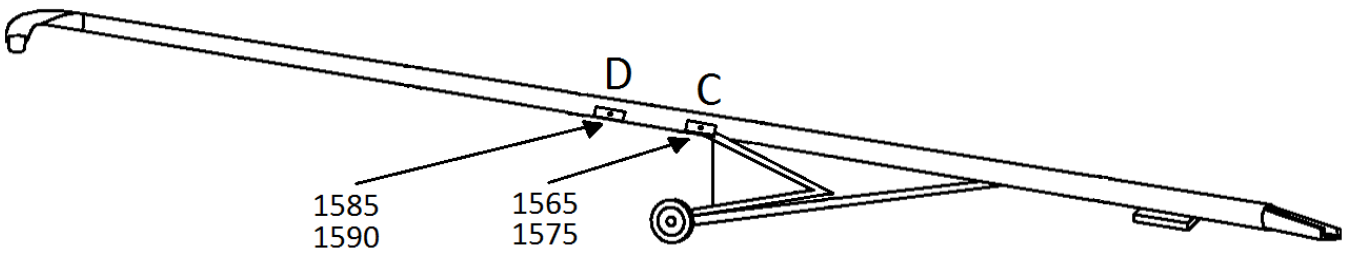


Figure 78. Correct Connection for Upper Suspension Bracket and Ladder for 65'–90' Models



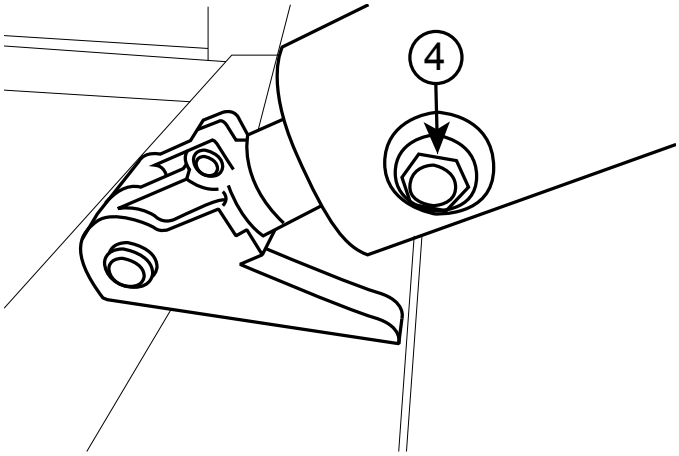
5. Lower tubes until the transport brace rests on the lower lift arm brace.

⚠ WARNING Do not remove the tube support until conveyor is fully assembled.

3.31. Plumb the Hydraulic Cylinder Hoses for the Scissor-Lift Frame

1. Remove plugs from the hydraulic cylinders (8).
2. Install the 1/2" vent (4) on the lower end of the cylinder (8) (see Figure 79).

Figure 79. Vent



3. Use the pipe sealant on the check valve (7) joints. Install the hex nipple (5), check valve (7), and swivel fitting (2) (see Figure 80).
4. Attach the hydraulic hose end (1) to the swivel fitting (2).
5. Lay the hydraulic hose along the ladder and within the weld-on hose clips (see Figure 81). Provide slack or a loop at the suspension bracket.

NOTICE Equipment Damage

Do not make bends in the hydraulic hose too tight. The bends must have a radius of at least 4" to prevent failure of the hose.

6. Route hydraulic hose through the weather guard brackets welded onto the tube, all the way back to the hopper.

Important

Protect hose end from dirt.

7. Install the ball valve (6), hex nipple (5), and a pioneer tip (3) on the end of the hydraulic hose.
8. Insert tip into hose holder on left-hand side of hopper.
9. Tie hose as required with hose ties supplied. Gently tap the weld-on hose clips with a rubber mallet to ensure the hose is secure, but not squashed.

Table 32. Hydraulic Plumbing Components

Item	Description	Quantity for Model		
		65'/75'	85'/90'	100'
1	3/8" Hydraulic Hose 60'	1	—	—
	3/8" Hydraulic Hose 65'	—	1	—
	3/8" Hydraulic Hose 75'	—	—	1
2	Swivel 90° 1/2" MPT x 1/2" FPT	1	1	1
3	Pioneer Tip	1	1	1
4	1/2" Vent Brass	1	1	1
5	1/2" Hex Nipple	2	2	2
6	1/2" Ball Valve	1	1	1
7	Check Valve	1	1	1
8	4" x 30" Hydraulic Cylinder	1	—	—
	4" x 36" Hydraulic Cylinder	—	1	—
	4" x 48" Hydraulic Cylinder	—	—	1

Figure 80. Hydraulic Plumbing on 65' – 100' Models

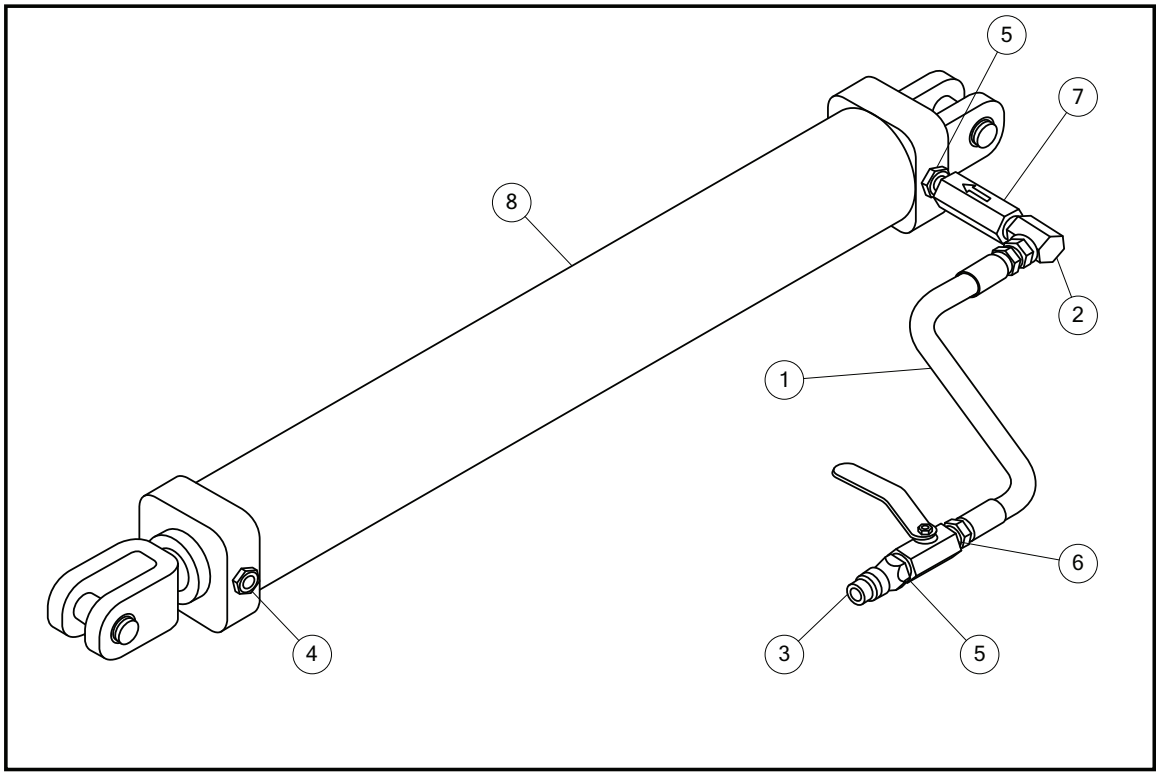
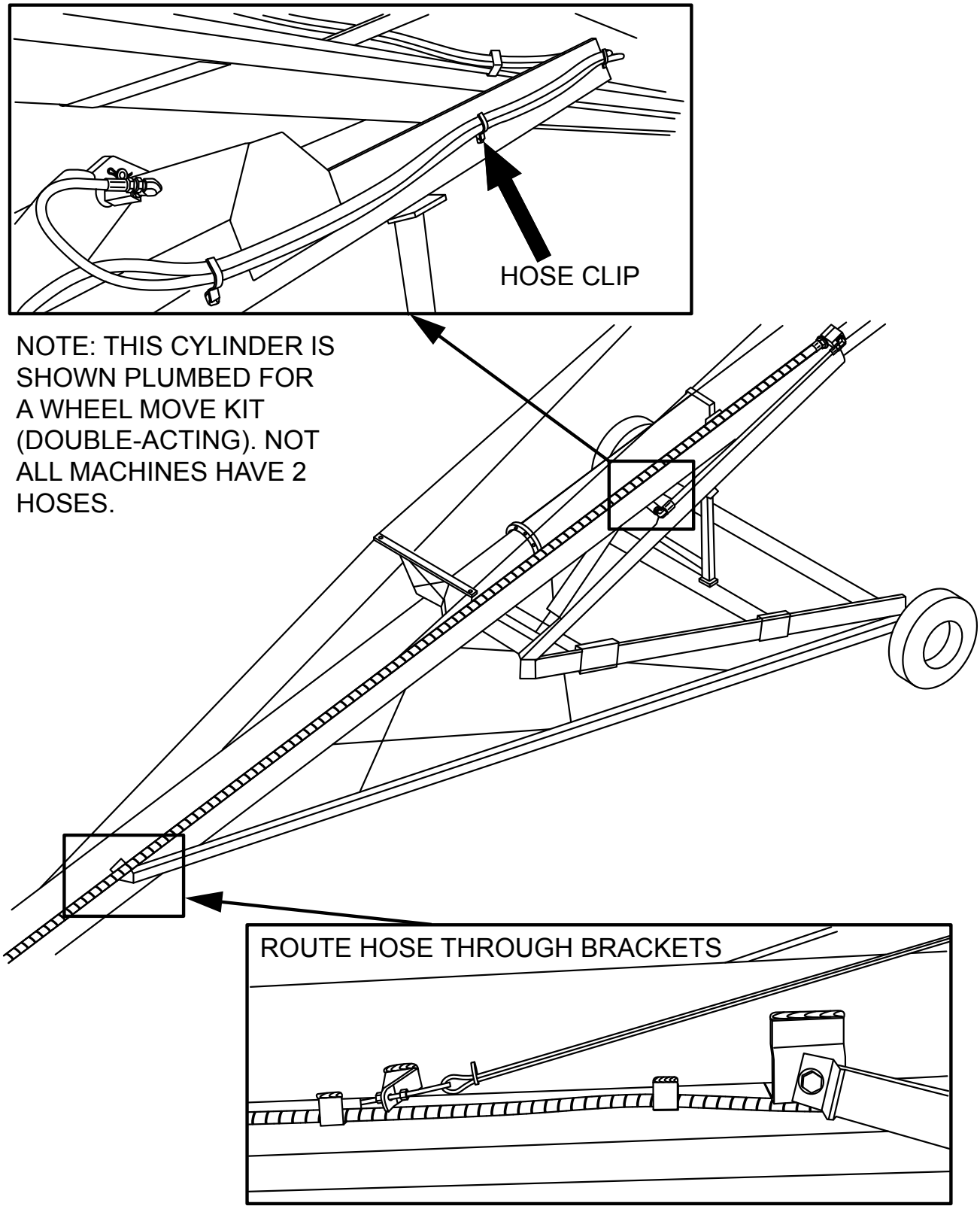


Figure 81. Hydraulic Hose Routing



3.32. Install the Side PTO Drive

1. Insert the 3/8" x 1-1/2" key (2) into the drive roller shaft (see Figure 82).
2. Attach the PTO yoke to the drive roller shaft until it is flush with the end of the shaft. Make sure not to damage the grease fitting during installation.

   Note

   Make sure not to damage the grease fitting during installation.
3. Tighten both set screws on the PTO yoke.
4. Mount the PTO shield (3) with three 1/4" x 3/4" bolts (6), 1/4 flat washers (9), and 1/4 lock washers (10).
5. Install the PTO cradle (1) to the s-drive with a 1/2" x 1" bolt (5) and 1/2" locknut (8).
6. Place the PTO shaft (13) in the cradle and secure with a 1/2" x 5" hitch pin (11) and 3/16" x 3–1/4" hairpin (12).
7. Attach the 1/2" x 5" pin (11) and the 3/16" x 3-1/4" hairpin (12) to secure the shaft.
8. Place the safety decals on the s-drive according to the decal location diagrams shown in the Safety chapter.
9. Install the shaft guard over the shaft of the drive roller on the other side of the s-drive (see Section 3.36 – Install the Shaft Guard on page 137).

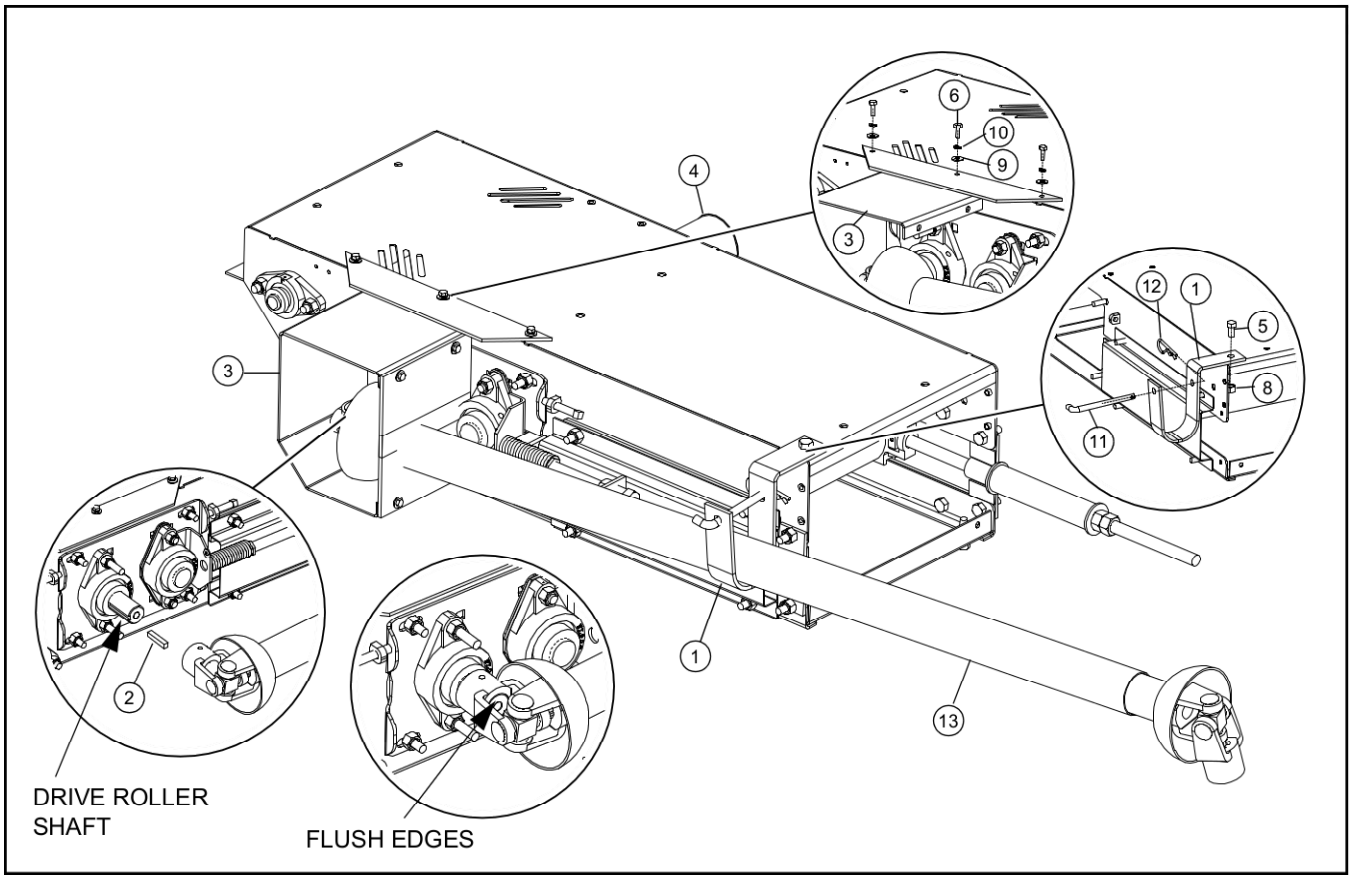
   Note

   Ensure the shaft guard is seated against the bearing. If needed, gently tap the cover for it to seat properly.
10. Place the PTO safety manual in the conveyor manual holder.

Table 33. Side PTO Drive Components

Item	Description	Quantity
1	PTO Cradle	1
2	3/8" x 1-1/2" Key	1
3	PTO Guard	1
5	1/2" x 1" Hex Bolt	1
6	1/4" x 3/4" Hex Bolt	3
7	1/4" x 1/2" Hex Bolt Fine GR8	1
8	1/2" Nut Nylock	1
9	1/4" Flat Washer USS Plated	4
10	1/4" Washer Lock	4
11	1/2" x 5" Pin Hitch	1
12	3/16" x 3-1/4" Hairpin	1
13	1-1/2" x 75" PTO Shaft	1

Figure 82. Side PTO Drive



3.33. Install the Front PTO Drive

This procedure describes the installation of the hitch, gearboxes, drive shafts, and guards.

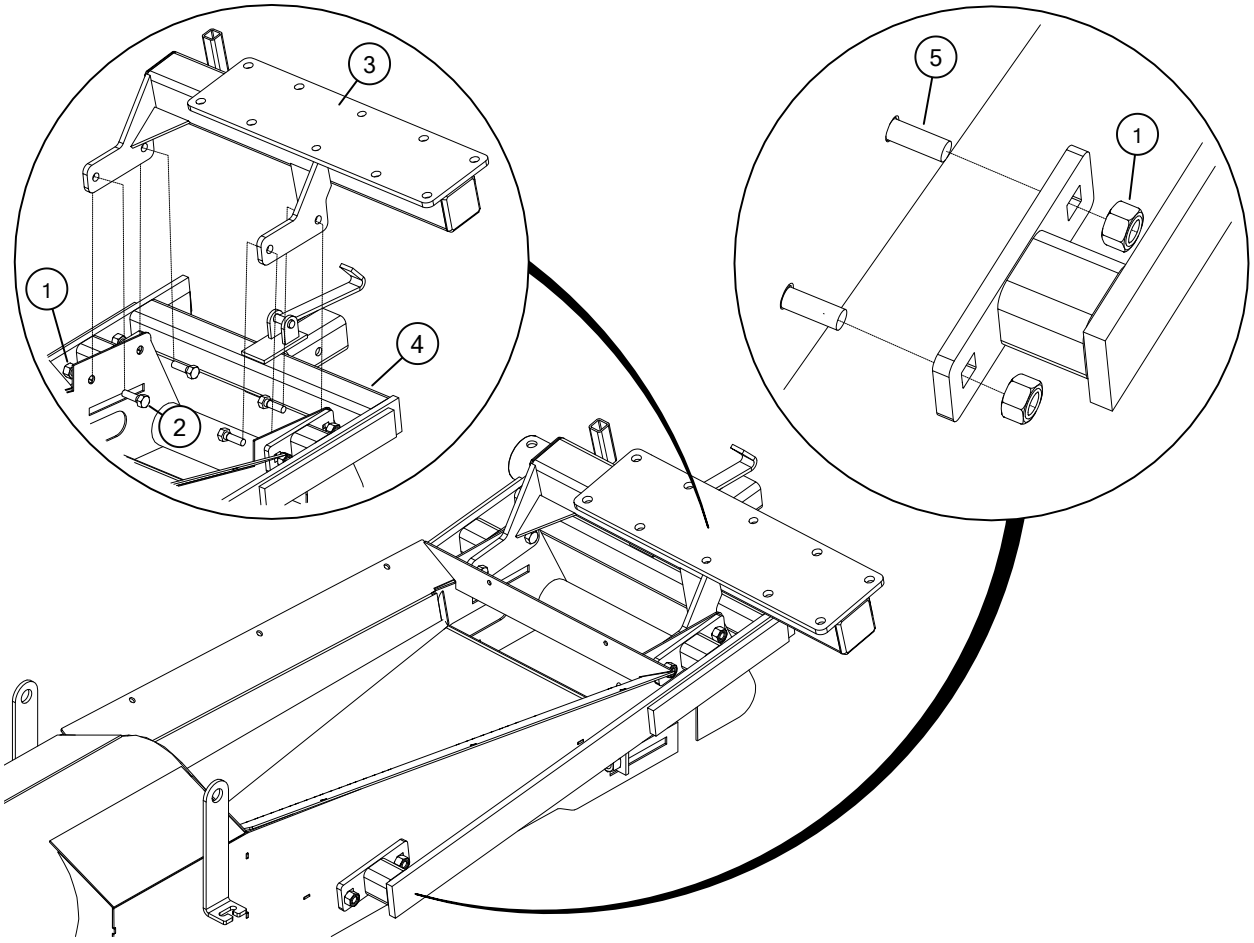
Install the Hitch and Gearbox Mount

1. Attach the hitch (4) and gearbox mount (3) to the hopper (see Figure 83):
   a. Use 1/2" x 1-1/2" hex bolts (5) and 1/2" locknuts (1) at the attachment nearest to the tube.
   b. Use 1/2" x 1-3/4" hex bolts (2) and 1/2" locknuts (1) at the attachment shared by the hitch and the gear mount.

Table 34. Hitch and Gearbox Mount Components

Item	Description
1	1/2" Nut Nylock
2	1/2" x 1–3/4" Hex Bolt GR8
3	Gearbox Mount Platform
4	Hitch
5	1/2" x 1-1/2" Hex Bolt

Figure 83. Installing the Hitch and Gearbox Mount



Install the 4190 Gearboxes

1. Fill each of the two 4190 gearboxes (4, 8) with 80W-90 gear lube until oil flows out the side of the indicator port (see Figure 84).
2. Attach the gearboxes to the gearbox mount with 1/2" x 1–1/2" hex bolts (3), 1/2" flat washers (1), and 1/2" lock washers (2).

   Important

   Position the gearboxes so that the noses match the orientation in Figure 84. Gearbox (4) must be flipped to ensure correct rotation. Swap the plug on gearbox (4) accordingly to ensure the breather and plug are correctly installed.
3. Connect the gearboxes with two sprockets (5), two 3/8" x 2" keys (6), and a chain connector (7).
4. Install the breather (9) to each gearbox.
5. Attach the coupling guard (11) to the gearbox mount with 3/8" x 1" hex bolts (10), 3/8" lock washers (12), and 3/8" locknuts (13).

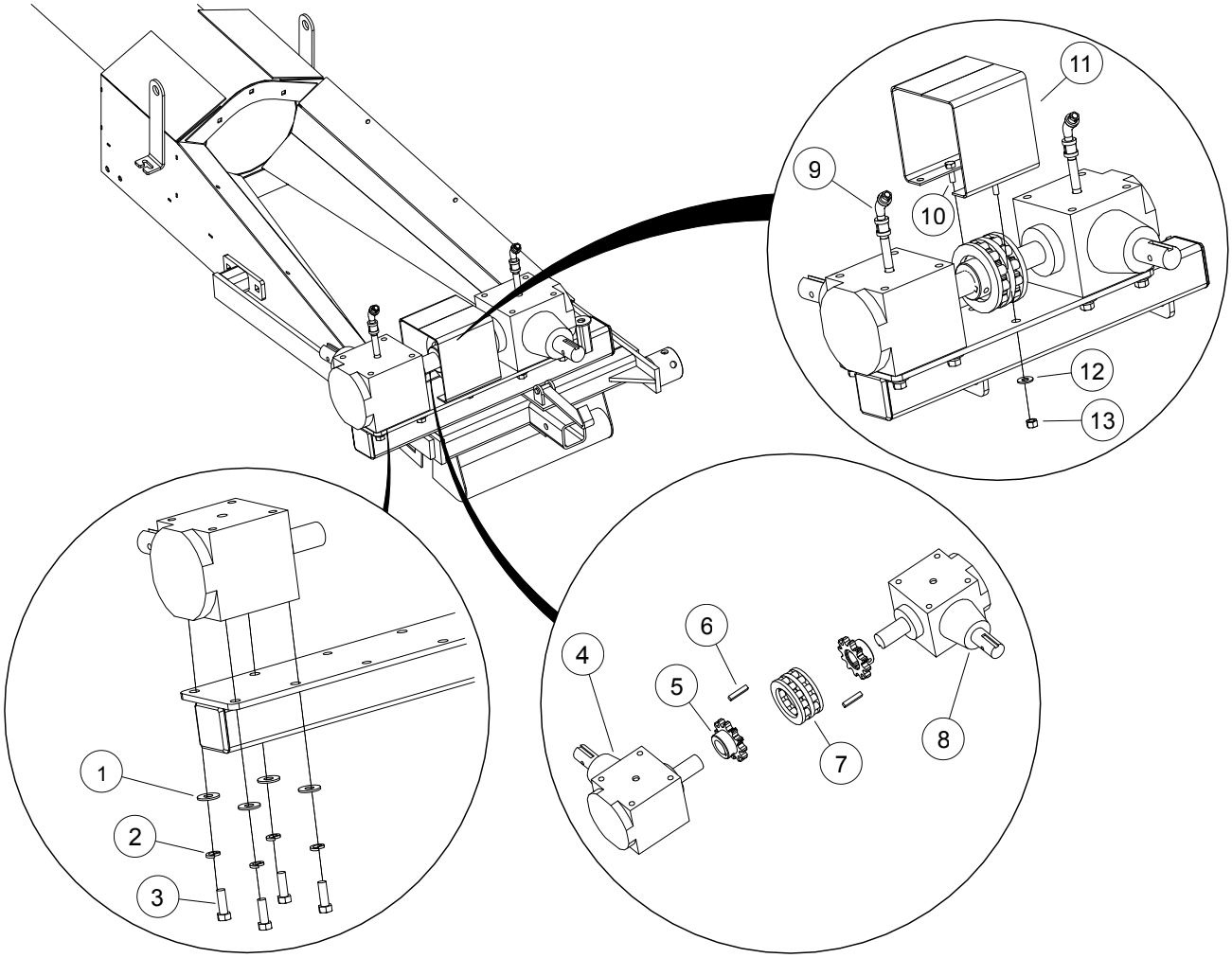
   Note

   Gently pry the coupling guard slightly open and put it overtop of the chain connector.

Table 35. 4190 Gearbox Components

Item	Description
1	1/2" Flat Washer USS Plated
2	1/2" Lock Washer
3	1/2" x 1-1/2" Hex Bolt GR8
4	Gearbox 4190 1:1 Rev (1.5 Shaft) CW/CCW (P0361051) (15591002)
5	Sprocket 8012 X 1.5 (Key 0.375)
6	3/8" x 2" Key
7	Chain Connector Double 80 x 12
8	Gearbox 4190 1:1 Rev (1.5 Shaft) CW/CW (P0361036) (15591000)
9	Breather
10	3/8" x 1" Hex Bolt GR8
11	Coupling Guard
12	3/8" Lock Washer
13	3/8" Nut Nylock

Figure 84. Installing the 4190 Gearboxes



Assemble the Swing Gearbox Side Mount

1. Attach the top plate (5) of the swing gearbox side mount to the side plate (4) with 1/2" x 1–1/2" bolts (3), 1/2" flat washers (2) (2 per bolt), and 1/2" lock nuts (1) (see Figure 85).
2. Attach the link arm (6) to the assembled mount plates with 1/2" x 1–1/2" bolts (3), 1/2" flat washers (2) (2 per bolt), and 1/2" lock nuts (1).

Important

Refer to Table 38 on page 107 before tightening the bolts.

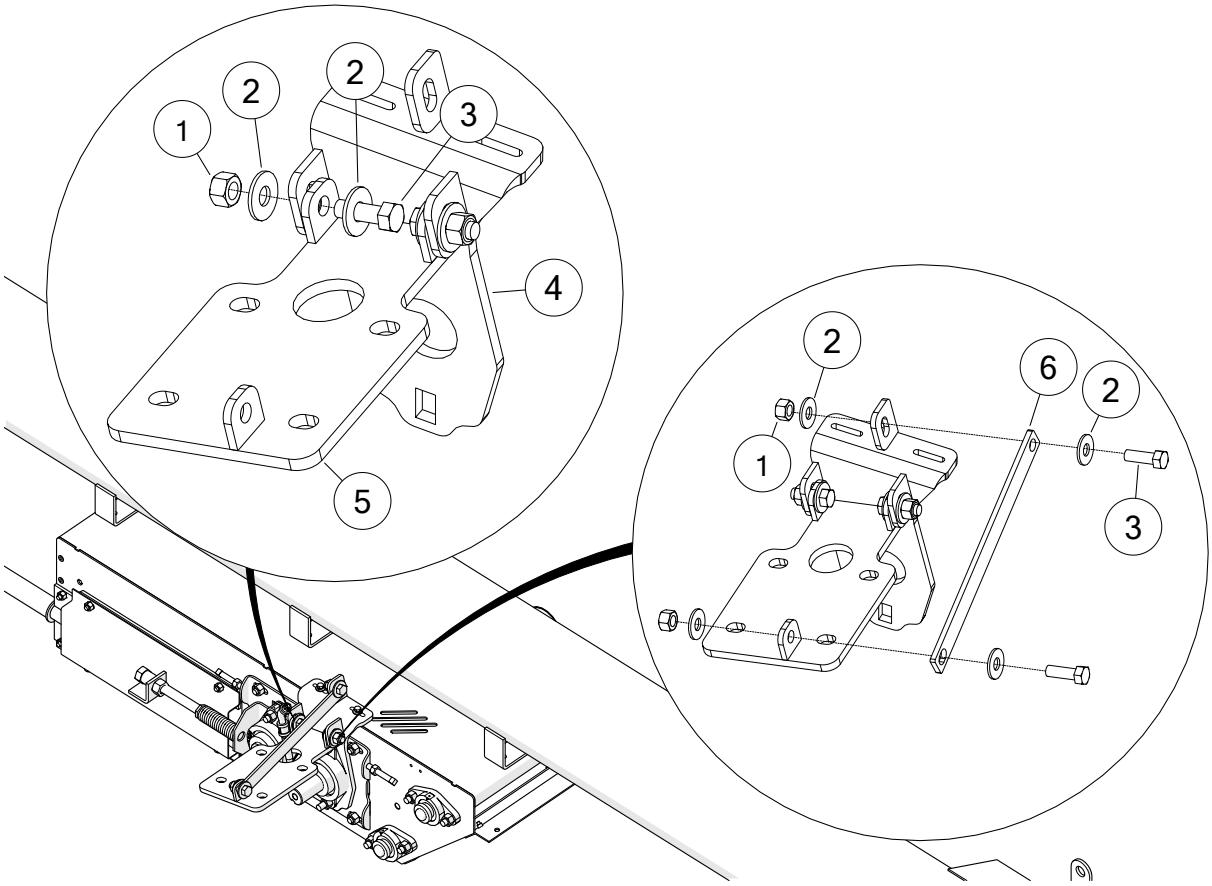
Table 36. Swing Gearbox Side Mount Components

Item	Description
1	1/2" Nylock Nut
2	1/2" Flat Washer (USS Plated)
3	1/2" x 1–1/2" Hex Bolt (GR 8)
4	Swing Gearbox Side Mount (side plate)

Table 36 Swing Gearbox Side Mount Components (continued)

Item	Description
5	Swing Gearbox Side Mount (top plate)
6	Link Arm

Figure 85. Assembling the Swing Gearbox Side Mount



Install the Swing Gearbox onto the S-Drive

1. Fill the 5190 gearbox (12) with 80W-90 gear lube until oil flows out the side of the indicator port (see Figure 86).
2. Remove the locking collar/bearing (2), and 1/2" locknuts (1) from the drive roller shaft of the s-drive.
3. Slide the gearbox side mount (3) over the drive shaft of the s-drive and secure it with 1/4" x 1" bolts (4), 1/4" lock washers (5), and 1/4" flat washers (6).
4. Re-attach the bearing, 1/2" locknuts, and locking collar onto the s-drive.
5. Install the 3/8" x 2" key (11) into the drive roller shaft of the s-drive and secure it with a 1/2" x 1-1/2" bolt (13), 1/2" lock washer (8), and 1/2" flat washer (9).
6. Slide the 5190 gearbox (12) over the drive roller shaft of the s-drive.

Note

Ensure the drive roller turns clockwise.

7. Attach the 5190 gearbox to the gearbox side mount with 1/2" x 2" hex bolts (7), 1/2" lock washers (8), and 1/2" flat washers (9).
8. Install the breather (10) into the 5190 gearbox.

Important

Refer to Table 38 before tightening the bolts.

Table 37. Swing Gearbox Components

Item	Description
1	1/2" Nylock Nut
2	Locking Collar/Bearing
3	Gearbox side mount
4	1/4" x 1" Bolt Hex
5	1/4" Washer Lock
6	1/4" Flat Washer Plated USS
7	1/2" x 2" Hex Bolt GR8
8	1/2" Lock Washer
9	1/2" Flat Washer Plated USS
10	Breather
11	3/8" x 2" Key
12	5190 Gearbox 1.5:1 (P0361055) (15591003)
13	1/2" x 1-1/2" Hex Bolt GR8

Figure 86. Installing the Swing Gearbox

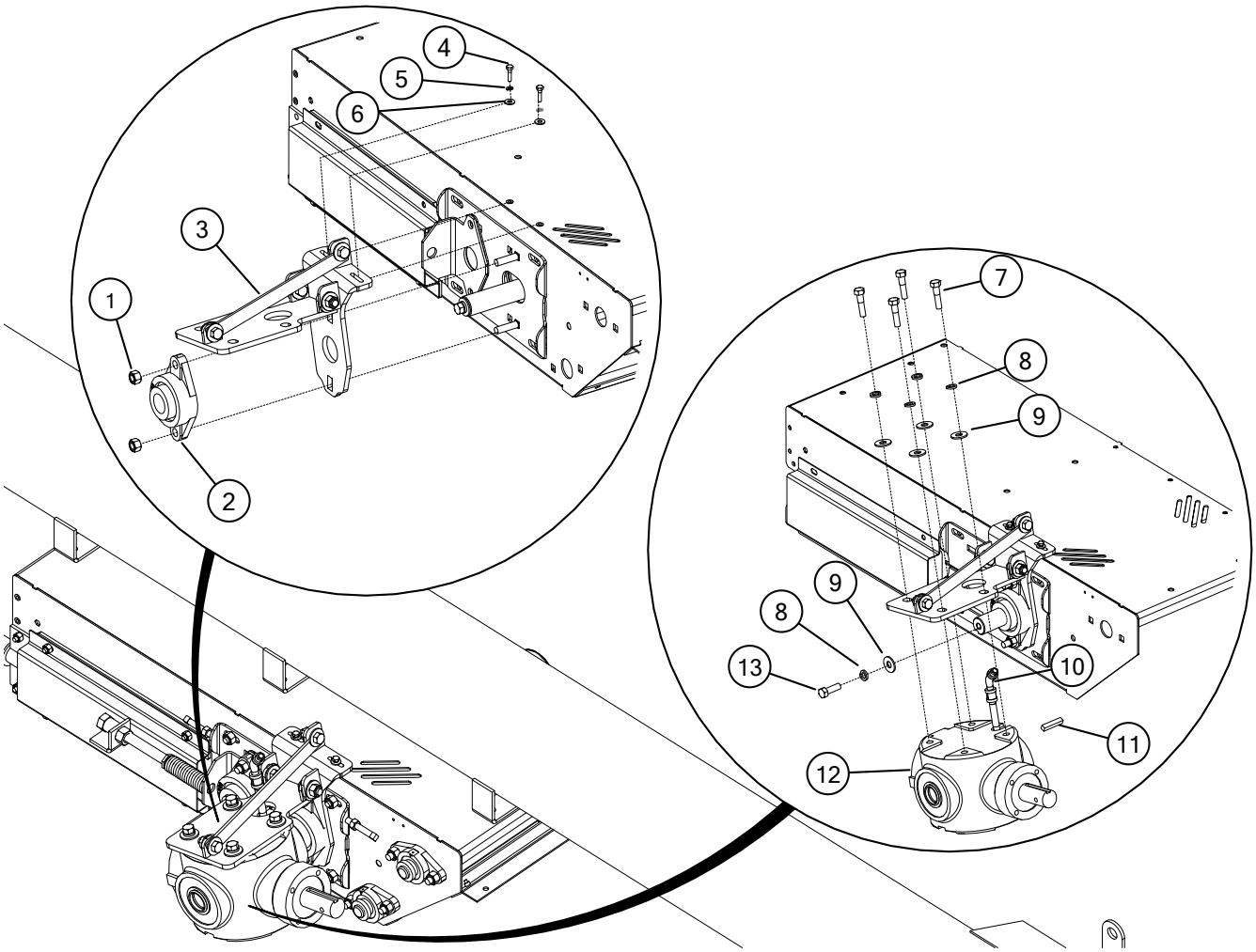
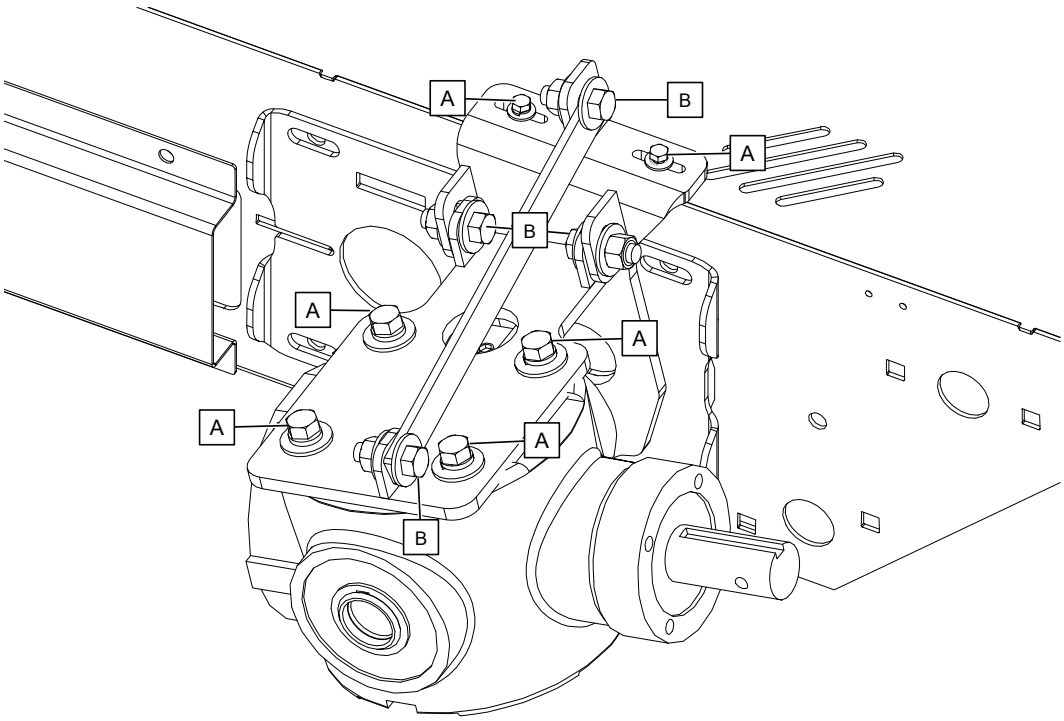


Table 38. Tightening the Bolts of the Swing Gearbox



A	Tighten these normally after the belt is aligned.
B	Do not tighten to a point where the connection is rigid; these connections must allow movement between components.

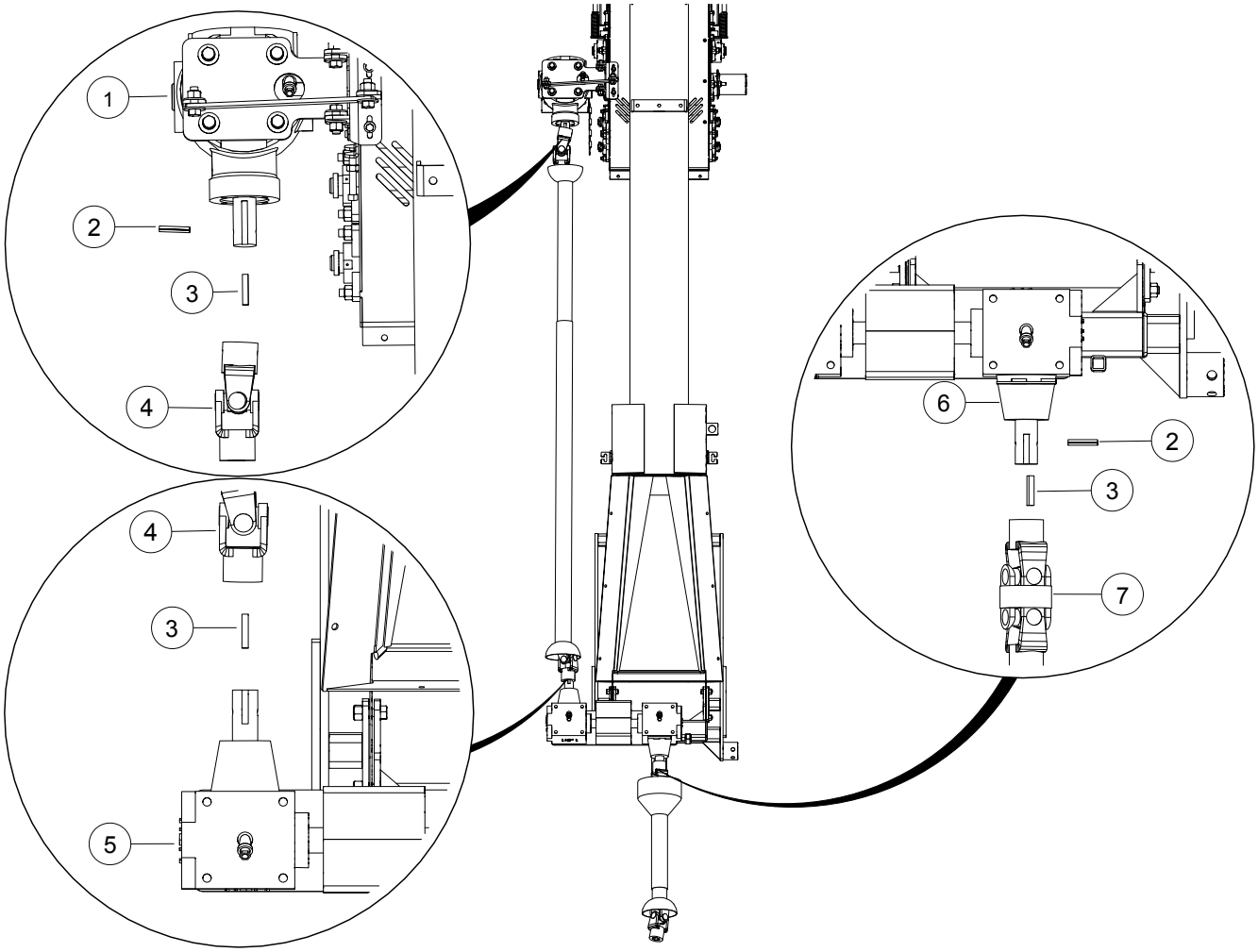
Install the PTO and Drive Shafts

1. Connect the drive shaft (4) to the 5190 gearbox (1) and 4190 gearbox (5) with 3/8" x 2" keys (3), a 3/8" x 3" spring pin (2), and PTO set screws (see Figure 87).
2. Connect the PTO shaft (7) to the 4190 gearbox (6) with a 3/8" x 2" key (3) and a 3/8" x 3" spring pin (2).

Table 39. PTO and Drive Shaft Components

Item	Description
1	5190 Gearbox (P0361055) (15591003)
2	3/8" x 3" Spring Pin
3	3/8" x 2" Key
4	Drive Shaft
5	Gearbox 4190 1:1 Rev (1.5 Shaft) CW/CCW (P0361051) (15591002)
6	Gearbox 4190 1:1 Rev (1.5 Shaft) CW/CW (P0361036) (15591000)
7	PTO Shaft

Figure 87. Installing the PTO and Drive Shafts



Assemble the Hitch Tongue

1. Assemble the three components of the hitch tongue (1, 6, 7) with 1" x 4–1/2" hex bolts (4), 1" locknuts (2), 1" x 3–1/2" hitch pins (5), and 3/16" x 3–1/4" hair pins (3) (see Figure 88).

Figure 88. Assembling the Hitch Tongue

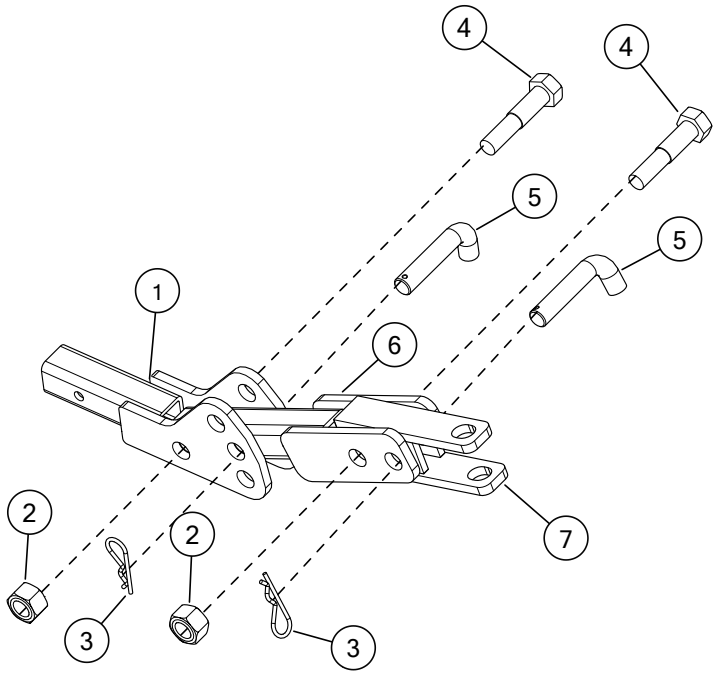


Table 40. Hitch Tongue Components

Item	Description
1	Adjustable Tongue
2	1" Locknut
3	3/16" x 3–1/4" Hairpin
4	1" x 4–1/2" Hex Bolt (GR*)
5	1" x 3–1/2" Hitch Pin
6	Adjustable Clevis
7	Clevis

Install the Guards, Hitch Tongue, and PTO Cradle

1. Attach the guards (4) to the 4190 gearboxes with 1/2" x 2" bolts (3) and 1/2" lock washers (2) (see Figure 89).
2. Insert the PTO cradle (5) into its welded channel on the hitch.
3. Attach the hitch tongue assembly (8) to the hitch using a 1/2" x 3" hitch pin (7) and a 3/16" x 3-1/4" hairpin (6).
4. Attach the guard (1) to the 5190 gearbox with two 1/2" x 2" bolts (3) and 1/2" lock washers (2).

   Note

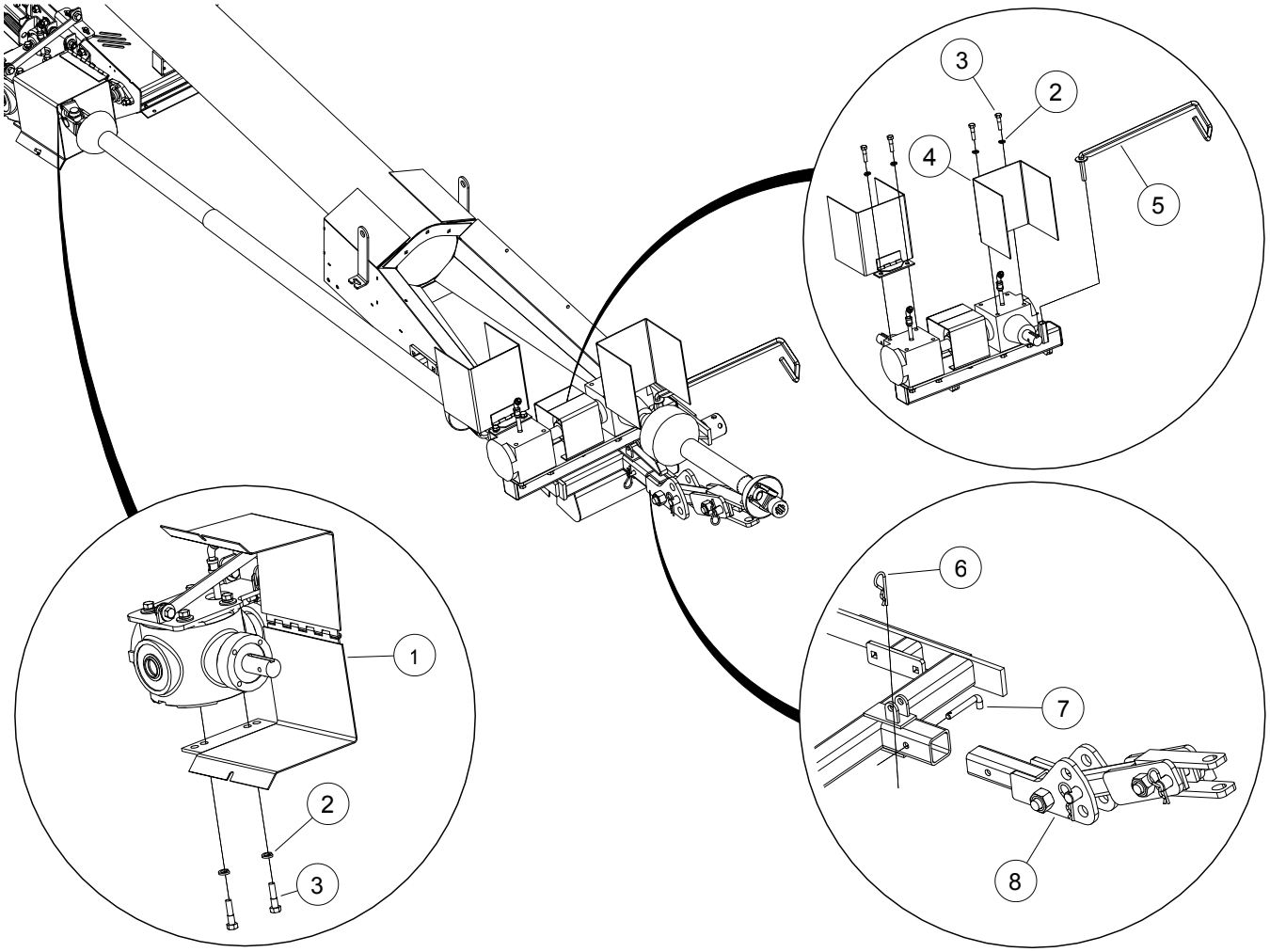
   A 3/8" nut and 3/8" flat washer are used to keep the guard attached to the 5190 gearbox closed during operation.

5. Place the safety decals on each guard according to the decal location figures in the Safety chapter.

Table 41. Guards, Hitch Tongue, and PTO Cradle Components

Item	Description
1	5190 Gearbox Guard
2	1/2" Lock Washer
3	1/2" x 2" Bolt Hex GR8
4	4190 Gearbox Guard
5	PTO Cradle
6	3/16" x 3-1/4" Hairpin
7	1/2" x 3" Pin Hitch
8	Hitch Tongue Assembly

Figure 89. Installing the Guards, Hitch Tongue, and PTO Cradle



3.34. Install the Gas/Electric Drive

➡ See Table 42 for a list of procedures required to install the gas drive.

➡ See Table 43 for a list of procedures required to install electric drive.

Table 42. Gas Drive Installation Procedures

Item	Procedures
1	Section 3.34.1 – Install the Motor Mount on page 111
2	Section 3.34.2 – Install the Gearbox on page 112
3	Section 3.34.3 – Install the Slider Mount on page 113
4	Section 3.34.4 – Install the Motor and Back Plates on page 115
5	Section 3.34.5 – Install the Rocker Arm on page 118
6	Section 3.34.6 – Install the Overcenter Handle on page 118
7	Section 3.34.7 – Install the Pulleys and Belts on page 120
8	Section 3.34.8 – Install the Pulley Guards on page 123
9	Section 3.34.9 – Gas Drive — Battery Kit on page 124
10	Section 3.34.10 – Gas Drive — Control Box on page 125
11	Section 3.34.11 – Gas Drive — Tank Kit on page 128
12	Section 3.34.12 – Gas Drive — Primer Bulb on page 129

Table 43. Electric Drive Installation Procedures

Item	Procedures
1	Section 3.34.1 – Install the Motor Mount on page 111
2	Section 3.34.2 – Install the Gearbox on page 112
3	Section 3.34.3 – Install the Slider Mount on page 113
4	Section 3.34.4 – Install the Motor and Back Plates on page 115
5	Section 3.34.5 – Install the Rocker Arm on page 118
6	Section 3.34.6 – Install the Overcenter Handle on page 118
7	Section 3.34.7 – Install the Pulleys and Belts on page 120
8	Section 3.34.8 – Install the Pulley Guards on page 123

3.34.1 Install the Motor Mount

1. Attach the motor mount (1) to the conveyor tube brackets using with 7/16" x 1" bolts (2) and 7/16" locknuts (3) (see Figure 90).

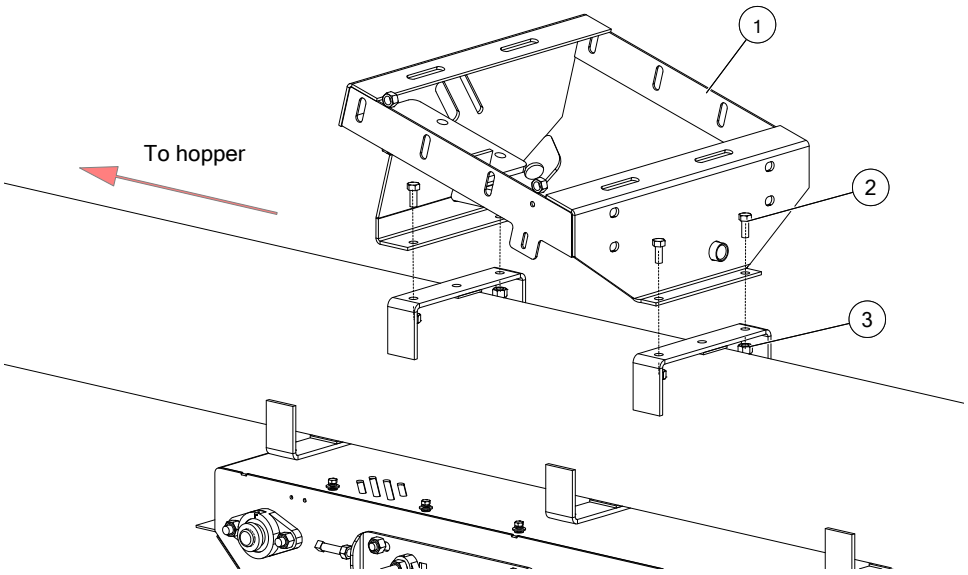
   Note

   Orient the motor mount precisely as shown in Figure 90.

Table 44. Drive Mount Components

Item	Description
1	Motor Mount
2	7/16" x 1" Bolt Gr8 Plated
3	7/16" Nylon Locknut Gr8

Figure 90. Motor Mount



3.34.2 Install the Gearbox

1. Check the oil level in the gearbox. It should be 1/2 full.
2. Attach the gearbox (1) to the motor mount using 1/2" x 1-1/4" bolts (2) and 1/2" lock washers (3) (see Figure 91).

   Note

   Do not tighten the gearbox bolts.

3. Connect the gearbox breather (fitting, hose, vent) (4) to the gearbox breather hole (see Figure 92).

Table 45. Gearbox Components

Item	Description
1	Gearbox 90 1:1 CW/CW 1–1/2 4190 w/Oil (For Electric Drive)
	Gearbox 4190 2:1 1–1/2 Shaft (For Gas Drive)
2	1/2" x 1-1/4" Bolt Gr5 Plated
3	1/2" Lock Washer Plated
4	Breather Direct Drive

Figure 91. Installing the Gearbox

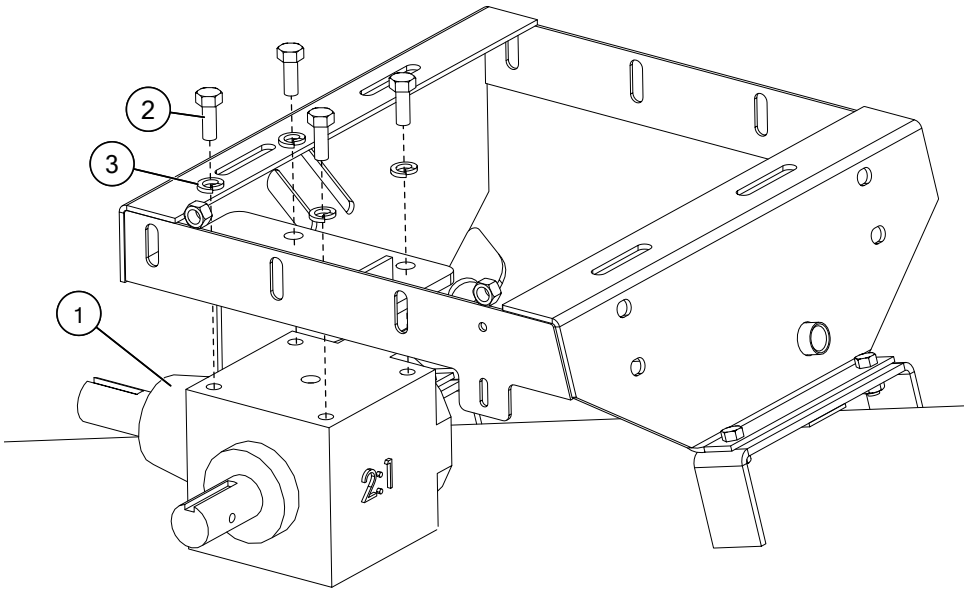
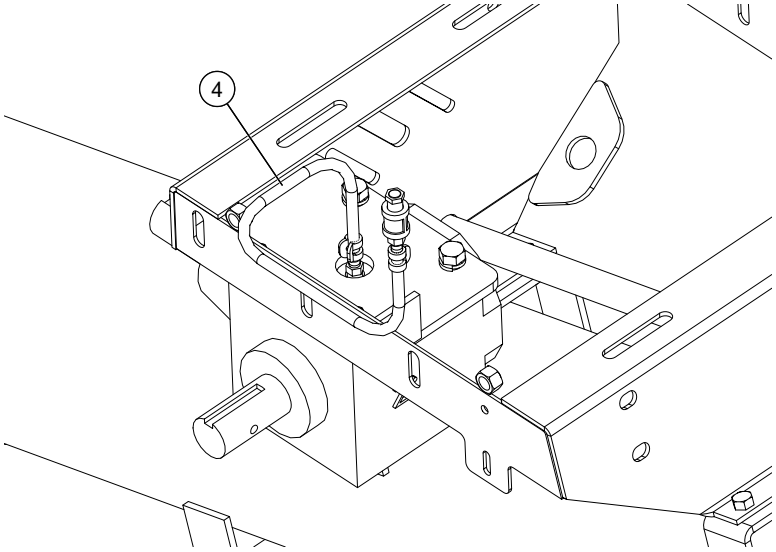


Figure 92. Gearbox Breather



3.34.3 Install the Slider Mount

1. Install the slider mount (4) onto the motor mount using 7/16" x 1–1/2" bolts (5), 7/16" flat washers (8), and 7/16" locknuts (3).

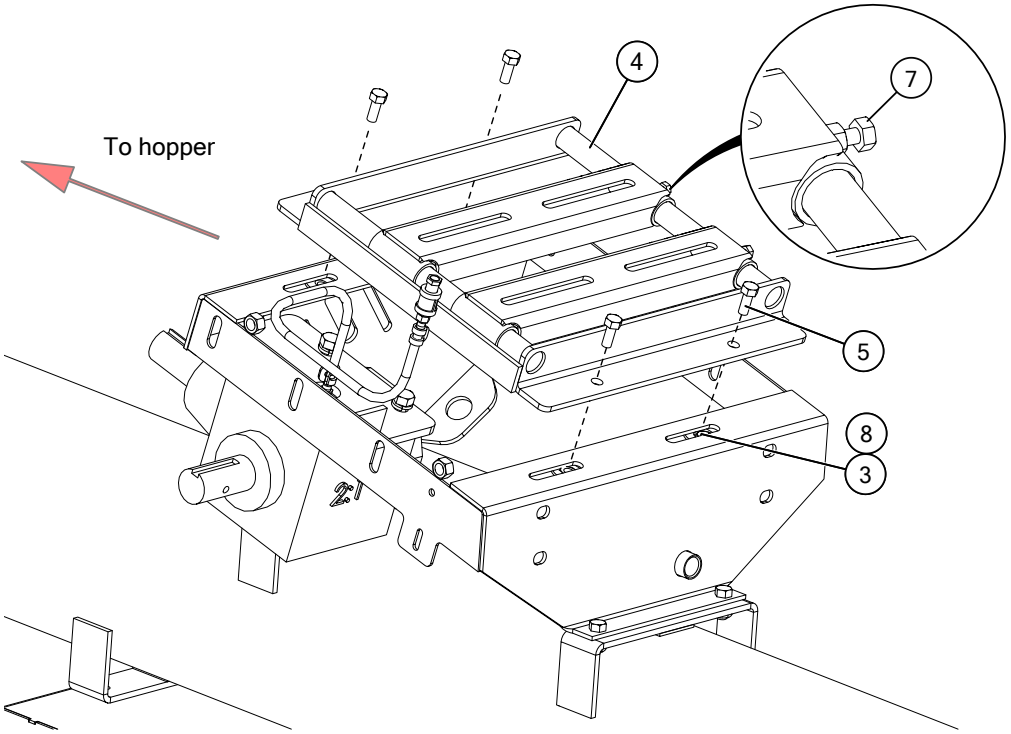
   Note

   Orient the slider mount exactly with the 5/16" x 3/4" bolts (7) on the side they are shown on in Figure 93. Leave the 5/16" bolts loose until the motor/engine is mounted. Push the slider mount up against the welded nuts on the motor mount.

Table 46. Slider Mount Components

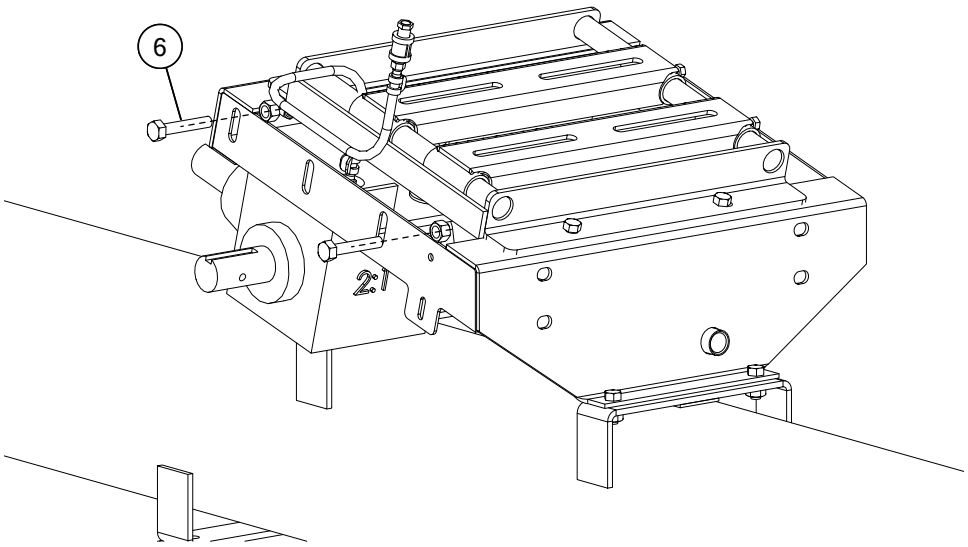
Item	Description
3	7/16" Nylon Locknut Gr8
4	Slider Mount
5	7/16" x 1–1/2" Bolt Gr8 Plated
6	1/2" x 2–1/2" Tap Bolt Gr8 Plated
7	5/16" x 3/4" Bolt
8	7/16" Flat Washer

Figure 93. Slider Mount



2. Feed the gearbox breather hose and vent through the slider mount (see Figure 94).
3. Insert the 1/2" x 2-1/2" tap bolts (6) to the motor mount.

Figure 94. Motor Mount Tap Bolts



3.34.4 Install the Motor and Back Plates

1. Install the gas engine or electric motor (1) on the slider mount. At the same time, secure the ground wires for the battery, and clutch (if equipped), to the motor mount bolt (location indicated by the red arrow) using a flat washer (see Figure 95).

   Important

   Installation and wiring for the gas engine or the electric motor are to be done by a certified technician and should be based on OEM (original equipment manufacturer) specifications. Some hardware has been included in the drive kit. Not all installations will require all parts. After the conveyor is completely assembled, place finishing zip-ties on all cables and wiring to ensure all lines are snug in place.

   Note

   For Kohler engines, for the approximate correct position of the engine on the slider mount, measure 2–3/4" from the engine base to the outer edge of the slider mount pipe. Also measure approximately 7/8" from the slider bar closest to the hopper to the edge of the slider mount closest to the hopper. Then snugly install the motor mount bolts (but do not tighten).

2. **For a gas engine:**

   a. Secure the engine drain hose on the engine base (not shown).

   b. Install the choke and throttle cables to the engine and route them to the control box.

   c. Fasten the top end of the muffler support bracket onto the muffler shield and muffler (not shown).

   d. Install the engine exhaust pipes onto the engine (not shown). Install the muffler and muffler shield onto the engine exhaust pipes. Install the rain cap on the muffler.

   e. Fasten the bottom end of the muffler support bracket to the top of the base of the engine block with a motor mount bolt.

   f. Fill engine with oil up to the dipstick line (see Table 47).

Table 47. Oil Quantity Required

Engine	Approximate Oil Quantity Required
Kohler	2 L
Vanguard	2 L

3. Attach the engine back guard (2) to the motor mount using 7/16" x 1" bolts (3) and 7/16" locknuts (4) (see Figure 95).
4. Attach the top end of motor mount side plate (5) to the motor mount using 7/16" x 1" bolts (3), 7/16" flat washers (10), and 7/16" locknuts (4) (see Figure 96).
5. Secure the bottom end of the motor mount side plate to the s-drive guard using 1/4" x 3/4" bolts (6), 1/4" lock washers (8), 1/4" flat washers (9), and 1/4" threaded inserts (7).

Table 48. Motor and Guard Components

Item	Description
1	Electric Motor or Gas Engine (not included)
2	Engine Back Guard
3	7/16" x 1" Bolt Gr8 Plated
4	7/16" Nylon Locknut
5	Motor Mount Side Plate
6	1/4" x 3/4" Bolt UNC
7	1/4" Threaded Insert
8	1/4" Lock Washer Plated
9	1/4" Flat Washer Plated USS
10	7/16" Flat Washer Plated USS

Figure 95. Installing the Engine/Motor Back Guard

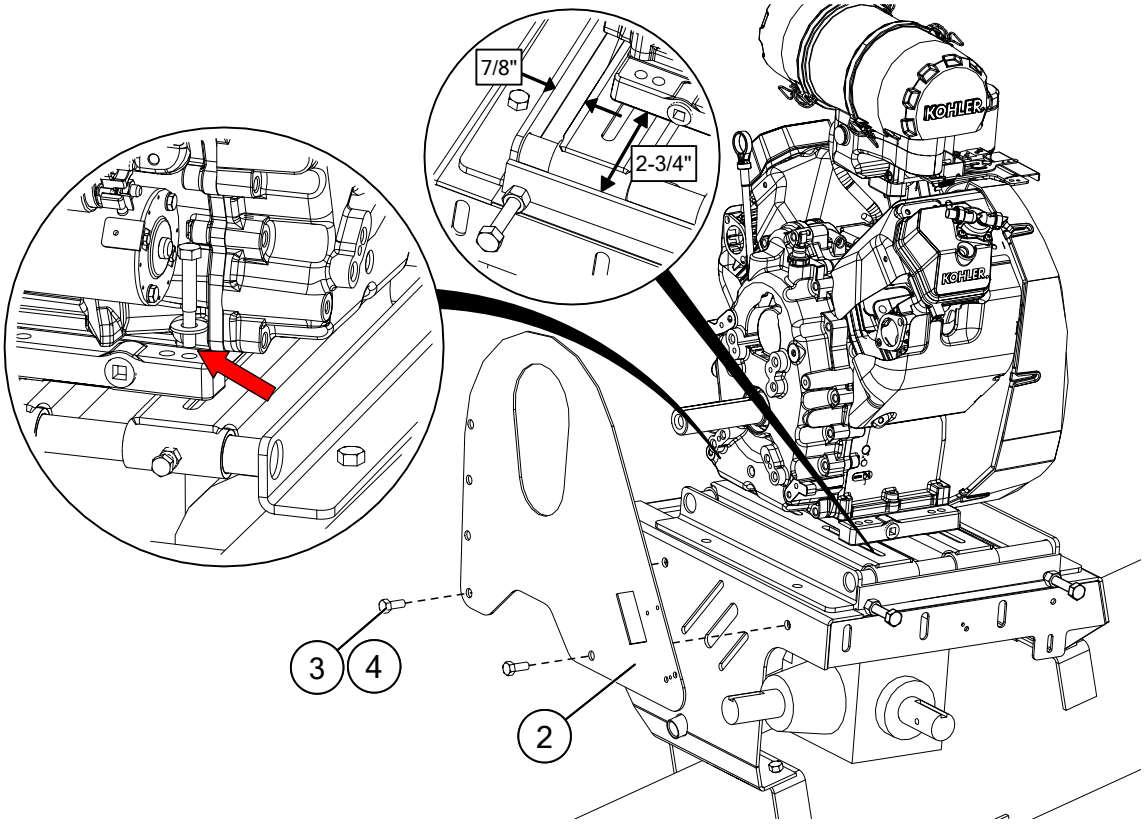
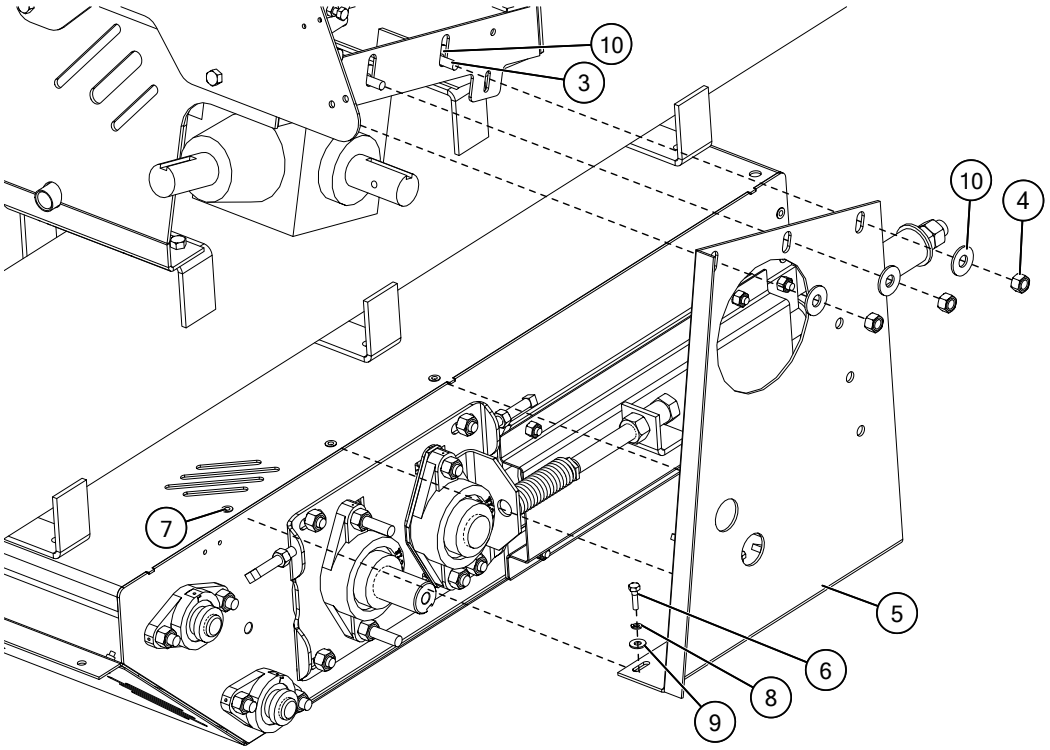


Figure 96. Installing the Motor Mount Side Plate



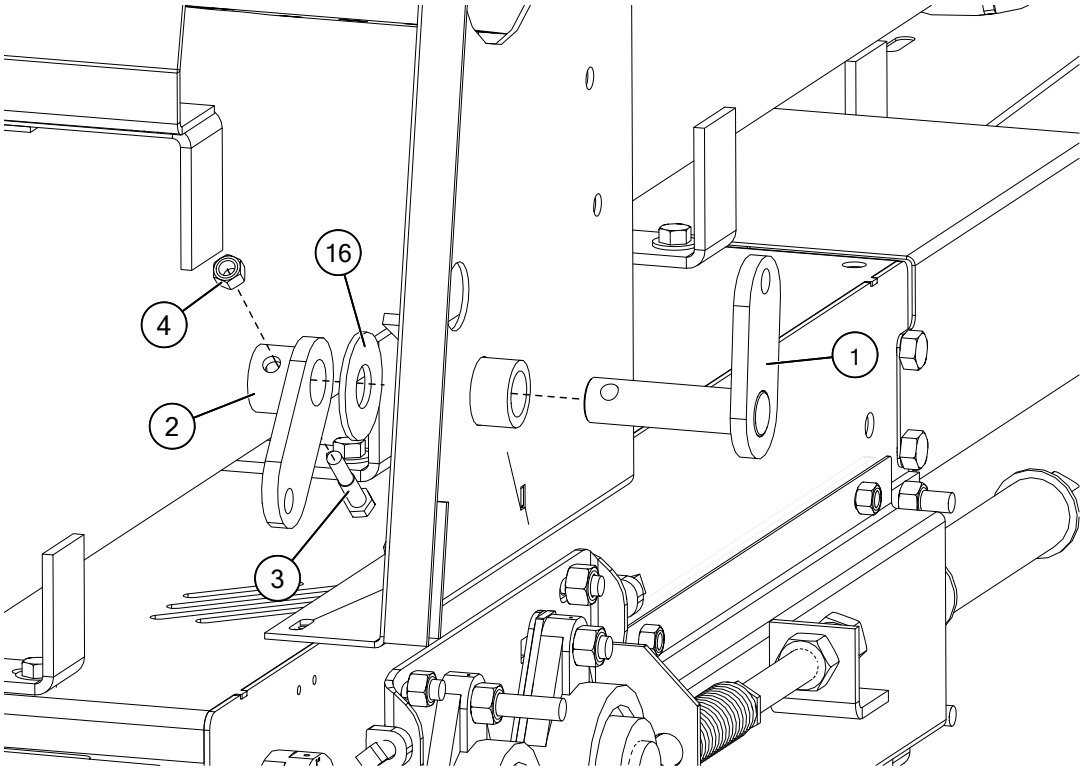
3.34.5 Install the Rocker Arm

1. Insert the rocker arm pivot shaft (1) into the motor mount back plate (see Figure 97).
2. Attach the rocker arm sleeve (2) and a 1" flat washer (16) with a 3/8" x 2" bolt (3) and 3/8" locknut (4).

Table 49. Rocker Arm Components

Item	Description
1	Rocker Arm Pivot Shaft
2	Rocker Arm Sleeve
3	3/8" x 2" Bolt Gr8 Plated
4	3/8" Nylon Locknut
16	1" Flat Washer

Figure 97. Installing the Rocker Arm Pivot Shaft



3.34.6 Install the Overcenter Handle

1. Attach the push rod (5) to the rocker arm sleeve with a bolt (6) and 1/2" locknut (7) (see Figure 98).

   Note

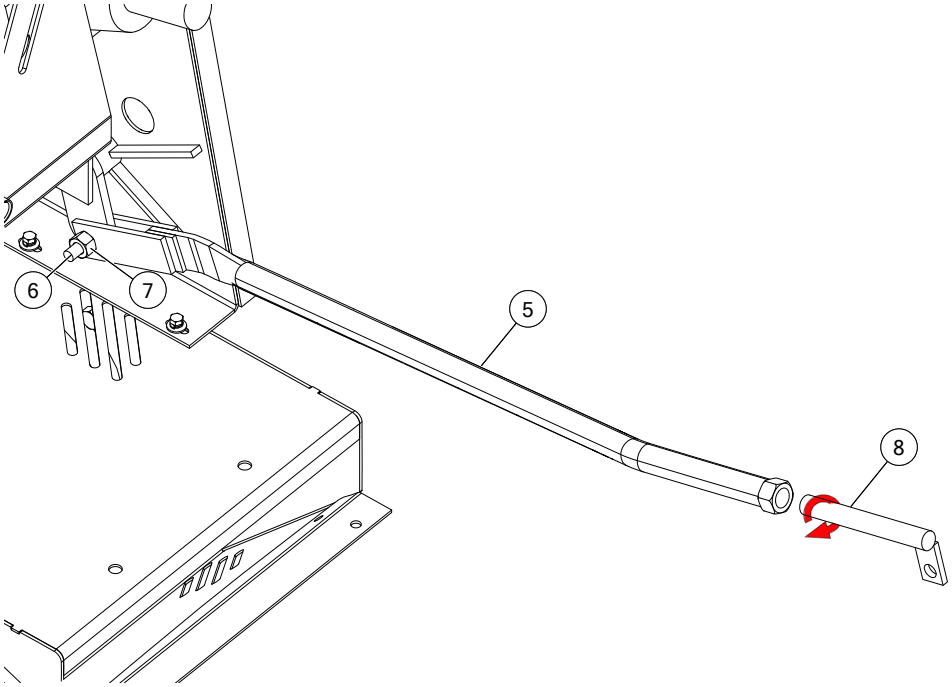
   Rotate the rocker arm pivot shaft to facilitate installation of the bolt through the available hole.

2. Thread the adjuster (8) into the push rod (5).

Table 50. Push Rod Components

Item	Description
5	Motor MT Over-Center Push Rod
6	1/2" x 2" Hex Bolt
7	1/2" Nylon Locknut
8	Over-Center Adjuster

Figure 98. Installing the Push Rod



3. Attach the anchor bracket (9) and 10" x 2-1/2" u-clamp (10) to the tube with 7/16" x 1-1/2" bolts (11) and 7/16" locknuts (12) (see Figure 99).
4. Tighten the u-clamp until the tube begins to crimp.
5. Bolt the handle (13) to anchor bracket (9) with a 1/2" x 2" bolt (14) and 1/2" locknut (7).
6. Connect the adjuster to the handle with a 3/16" x 1-1/2" cotter pin (15).

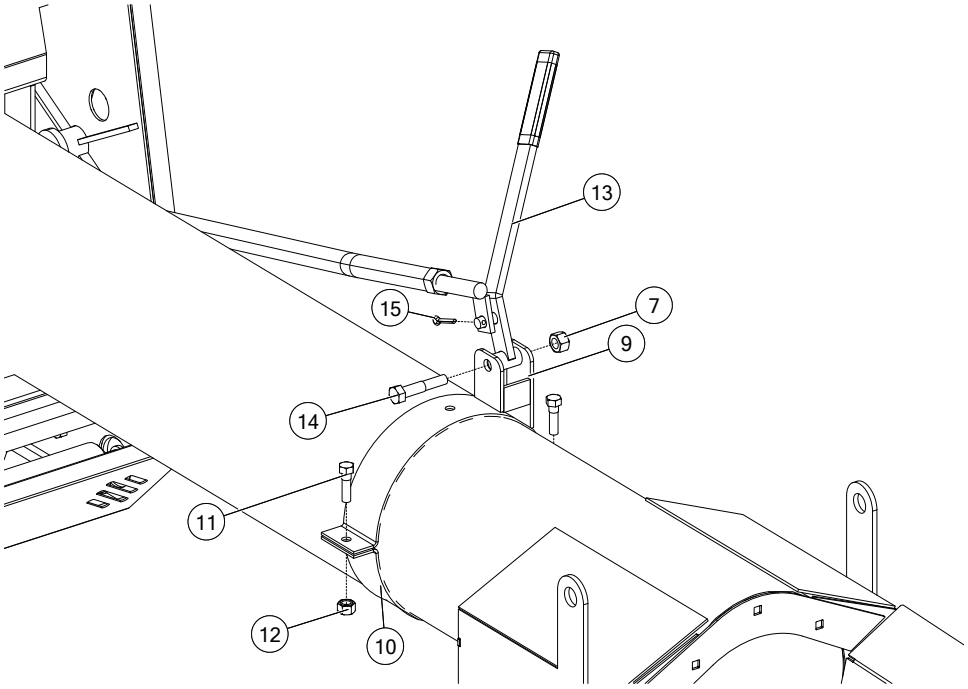
Table 51. Overcenter Handle Components

Item	Description
9	Motor MT Over-Center Anchor Bracket
10	10" x 2-1/2" U-clamp
11	7/16" x 1-1/2" Hex Bolt
12	7/16" Nylon Locknut
13	Motor MT Over-Center Handle

Table 51 Overcenter Handle Components (continued)

Item	Description
14	1/2" x 2-1/2" Hex Bolt
15	3/16" x 1-1/2" Cotter Pin

Figure 99. Installing the Overcenter Handle



3.34.7 Install the Pulleys and Belts

1. Install the idler pulley (1) onto the rocker arm pivot shaft using a 1/2" bolt (2), 1/2" flat washers (3), two bushings (12), and a 1/2" locknut (4) (see Figure 100). The side of the idler pulley with an inset hub faces away from the engine/motor.
2. Apply grease to the idler pulley.
3. Install the pulleys (5, 6) and keys (9) onto the gearbox and s-drive shaft, with the “noses” of the pulleys facing inward toward the gearbox and s-drive. Do not tighten pulley set screws until pulleys are aligned.
4. Align the pulleys with a straightedge.
5. **For models with mover kit:** see Section 3.35 – Hydraulic Wet Kit on page 131 to install the hydraulic pump pulleys and belt.
6. **For models without mover kit:** insert a 1/4" x 3–1/4" square key (not shown) onto the gas engine or electric motor shaft for the double pulley.
7. **For models with a gas engine:** Install the pulley (7) onto the engine shaft (see Figure 101). Do not tighten pulley set screws until pulleys are aligned.
8. **For models with an electric motor:** Install the pulley (7) and bushing (14) onto the motor shaft (see Figure 101). Do not tighten bushing bolts until pulleys are aligned.

Note

If a model has a mover kit, the double pulley (7) and the hydraulic drive pulley that are installed on the engine/motor shaft may be together replaced by a triple pulley.

9. Install the 12" pulley (8) and key (9) onto the gearbox (with the pulley “nose” facing inward toward the gearbox). Do not tighten pulley set screws until pulleys are aligned.
10. Align the pulleys with a straightedge.
11. Install the belts (10, 11).
12. Tighten gearbox bolts, motor base bolts, slider mount bolts, motor mount tap bolts, and tighten the pulley set screws.

Important

Once all bolts and set screws are tightened, re-check alignment. Proper alignment will prolong belt life.

13. Set the belt tension on the s-drive and gearbox using the threaded adjuster rod connected to the overcenter handle.

Note

Belts should deflect 1/2" (1.27 cm) to 3/4" (1.91 cm) when pushed on with a 5 lb (22.2 N) force.

Table 52. Pulleys, Belts, and Electric Clutch Components

Item	Description
1	Idler Flat 4" Triple 2-7/16" Wide
2	1/2" x 3" Hex Bolt (For Electric Drive)
	1/2" x 4" Hex Bolt (For Gas Drive)
3	1/2" Flat Washer
4	1/2" Nylon Locknut
5	Pulley Double 6" with 1-1/2" Bore
6	Pulley Double 10" with 1-1/2" Bore
7	Pulley Double BK 4" H
8	Pulley Double 12" with 1-1/2" Bore
9	3/8" x 2" Key
10	Belt 2B65 Banded
11	Belt B52 (quantity of 2) (For Electric Drive)
	Belt B54 (quantity of 2) (For Gas Drive)
12	Bushing 3/4" OD x 1/2" ID x 1" Bronze
14	Bushing for Pulley

Figure 100. Installing the Pulleys and Belts to the S-drive and Gearbox

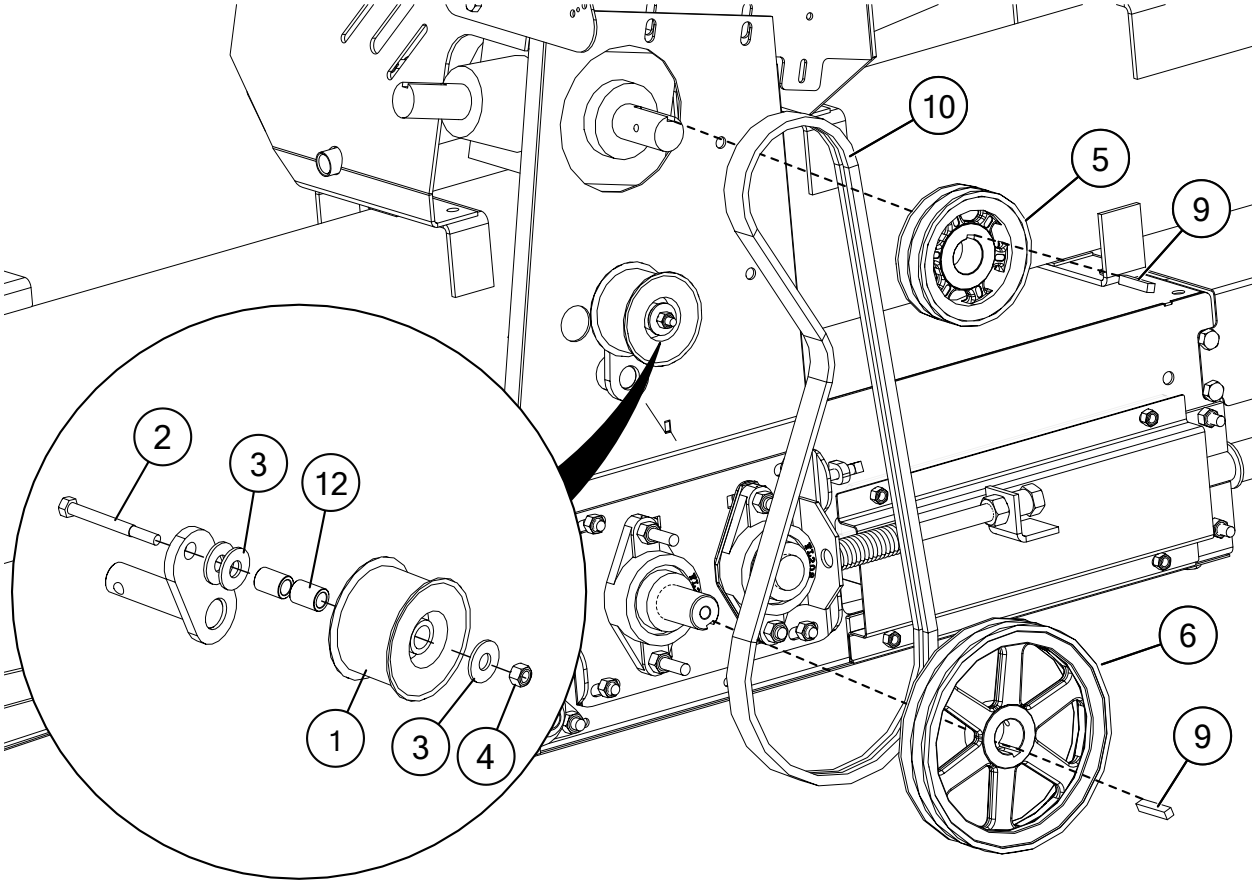
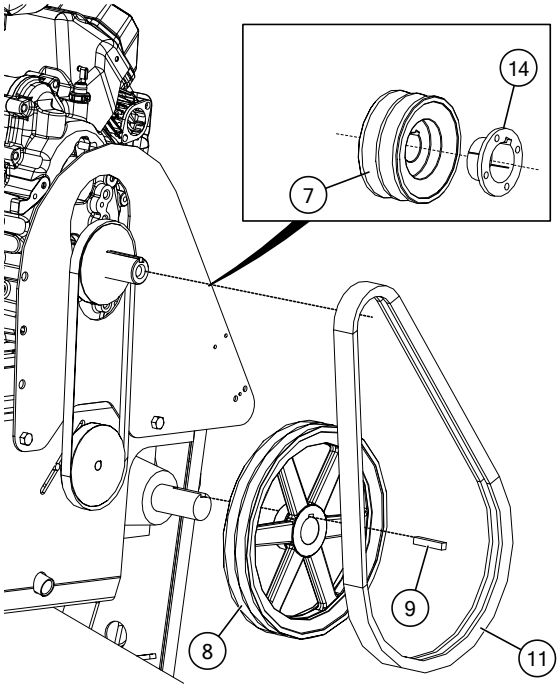


Figure 101. Installing the Pulleys and Belts to the Motor Shaft and Gearbox



3.34.8 Install the Pulley Guards

1. Attach the safety decals on and under the pulley guards (1, 2) (see Figure 102 and Figure 103). See decal location diagram in Safety chapter.
2. For each pulley guard, hold the guard over the belt and attach the hinge to the back plate using 7/16" x 1" bolts (3) and 7/16" locknuts (4).
3. Attach the latch (5) to the s-drive side plate using 3/16" x 1/2" rivets (6).
4. Attach the latch (5) to the motor guard using 3/16" x 1/2" rivets (6).
5. Install the shaft guard (see Section 3.36 – Install the Shaft Guard on page 137).

Table 53. Pulley Guard Components

Item	Description
1	Pinch Guard — Small Assembled
2	Pinch Guard — Medium Assembled
3	7/16" x 1" Hex Bolt Gr8 Plated
4	7/16" Nylon Locknut
5	Latch
6	3/16" x 1/2" Rivet Steel Body

Figure 102. Installing the Pulley Guard on the S-drive and Gearbox

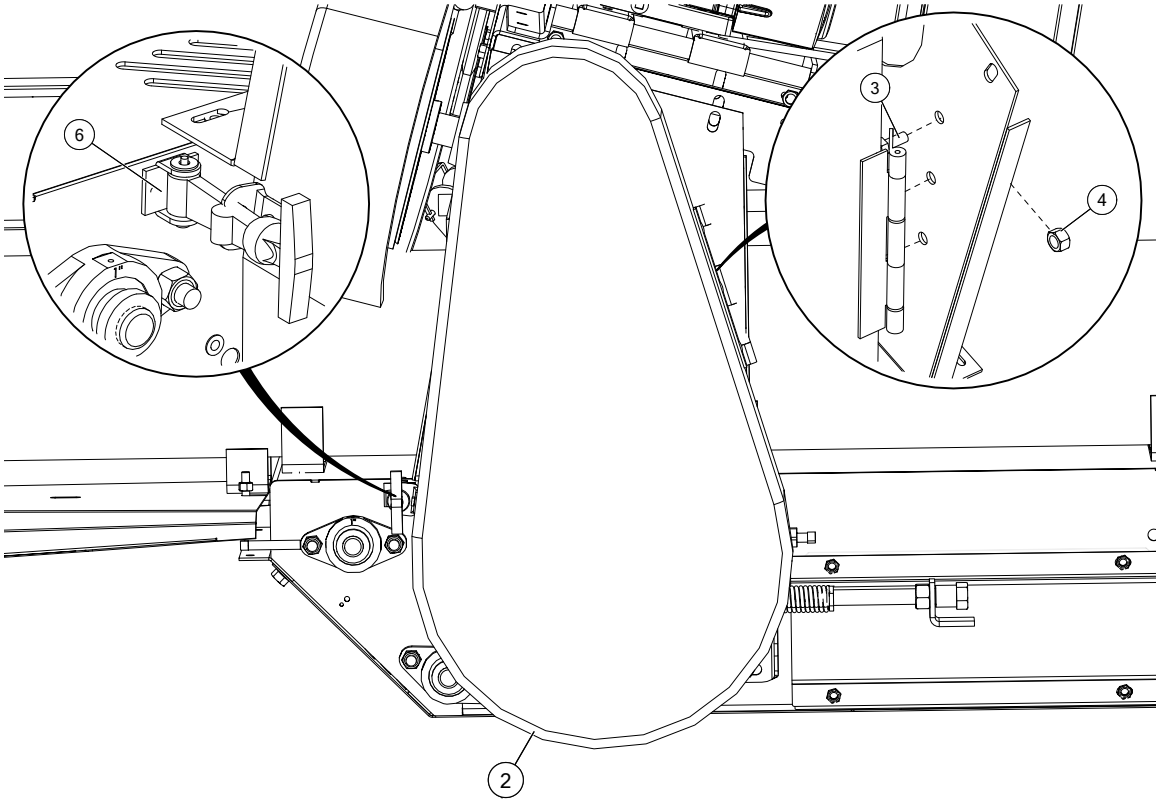
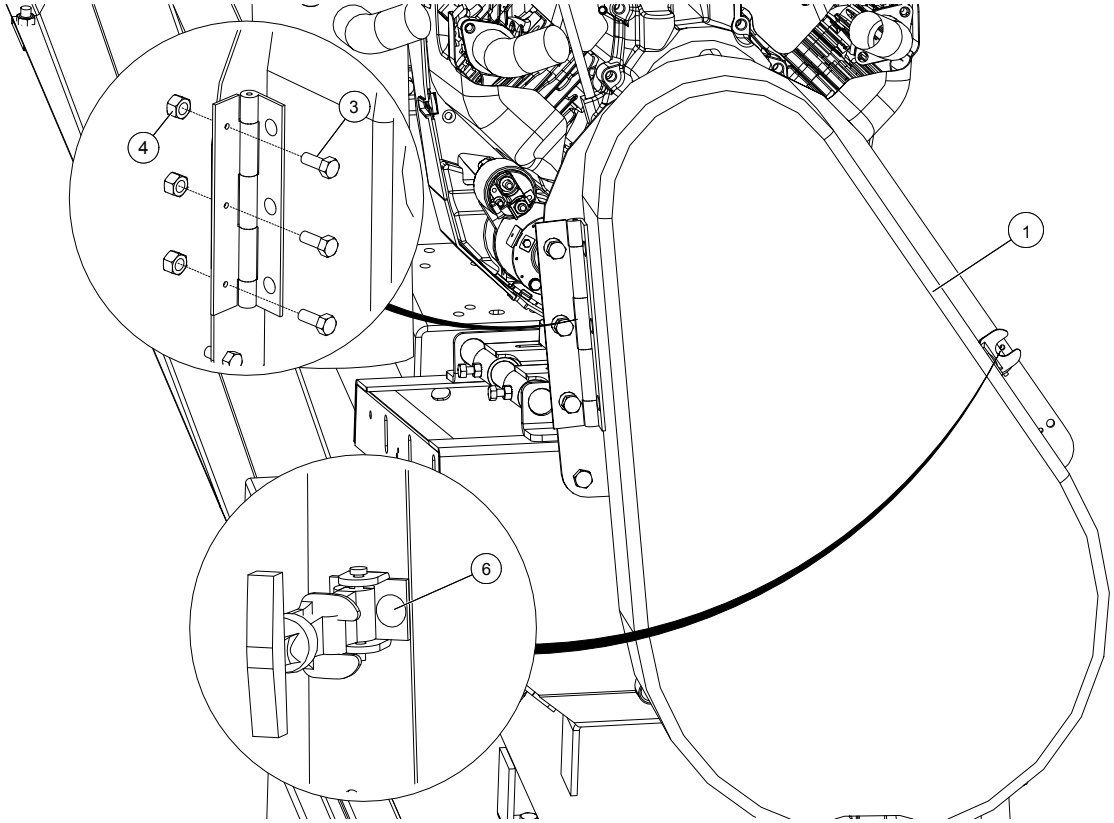


Figure 103. Installing the Pulley Guard on the Engine and Gearbox



3.34.9 Gas Drive — Battery Kit

1. Attach the battery mount (2) to the engine mount with 7/16" x 1" bolts (3), 7/16" flat washers (8), and 7/16" locknuts (1) (see Figure 104).
2. Set the battery (6) in place.
3. Secure the battery with clamp (5) and 3/8" locknuts (7).
4. Connect the battery cables (4) to the engine as follows:
   a. The ground cable is fastened to a motor mount bolt.
   b. The positive cable is connected to the starter.

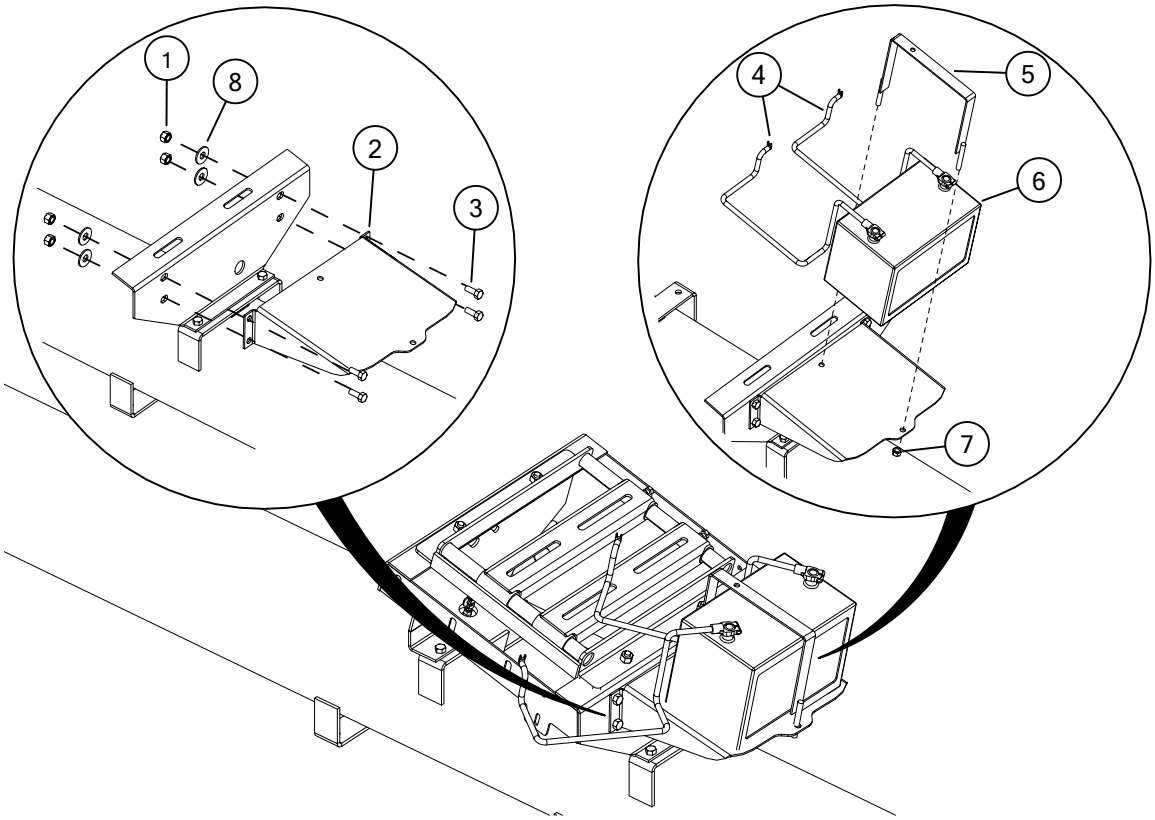
Table 54. Battery Components

Item	Description	Quantity
1	7/16" Locknut	4
2	Battery Mount	1
3	7/16" x 1" Bolt	4
4	37" Battery Cable (94 cm)	2
5	Battery Clamp	1
6	Battery — 12V, min. 420 CCA	1

Table 54 Battery Components (continued)

Item	Description	Quantity
7	3/8" Locknut	2
8	7/16" Flat Washer	4

Figure 104. Installing the Battery



3.34.10 Gas Drive — Control Box

1. **For models that do not have a welded mount bracket:** Attach the control box to the tube with 10" x 2-1/2" u-clamp (9), 7/16" x 1-1/2" bolts (10) and 7/16" nylock nuts (11).
2. Remove the top cover (1) (see Figure 105 on page 126). Tighten the u-clamp until the tube begins to crimp.
3. Mount the throttle cable (2), choke cable (5) (if equipped with a carburetor engine), clutch switch (3) (if equipped with an electric clutch), and ignition switch (4). See Figure 106.
4. Consult the OEM (original equipment manufacturers) manual to make all required electrical connections. Remove the key, plug in the extension wiring harness (12), and fasten it to the side plastic guard on the engine using small self-tapping screws (see Figure 107). After the conveyor is completely assembled, place finishing zip-ties on all cables and wiring to ensure all lines are snug in place.
5. Replace the top cover and secure with 1/4" x 3/4" bolts (8), 1/4" washers (6), and 1/4" lock washers (7).

Table 55. Control Box Components

Item	Description	Quantity
1	Control Box Top Cover	1
2	Throttle Cable	1
3	Clutch Switch	1
4	Ignition Switch	1
5	Choke Cable	1
6	1/4" Flat Washer	2
7	1/4" Lock Washer	2
8	1/4" x 3/4" Hex Bolt	2
9	10" x 2-1/2" U-clamp (Not Shown)	2
10	7/16" x 1-1/2" Bolt (Not Shown)	2
11	7/16" Nylon Locknut (Not Shown)	2
12	Extension Wiring Harness	1
13	Black Wire for Light Kit (Grounded on Control Box)	1

Figure 105. Control Box Connections and Hardware

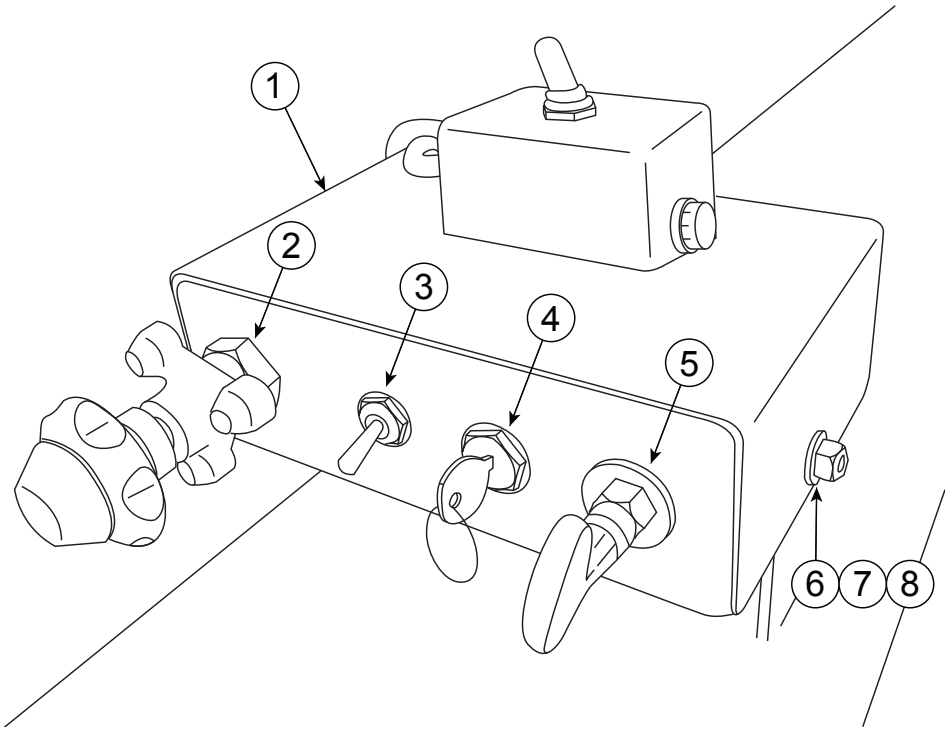


Figure 106. Control Box Inside Connections

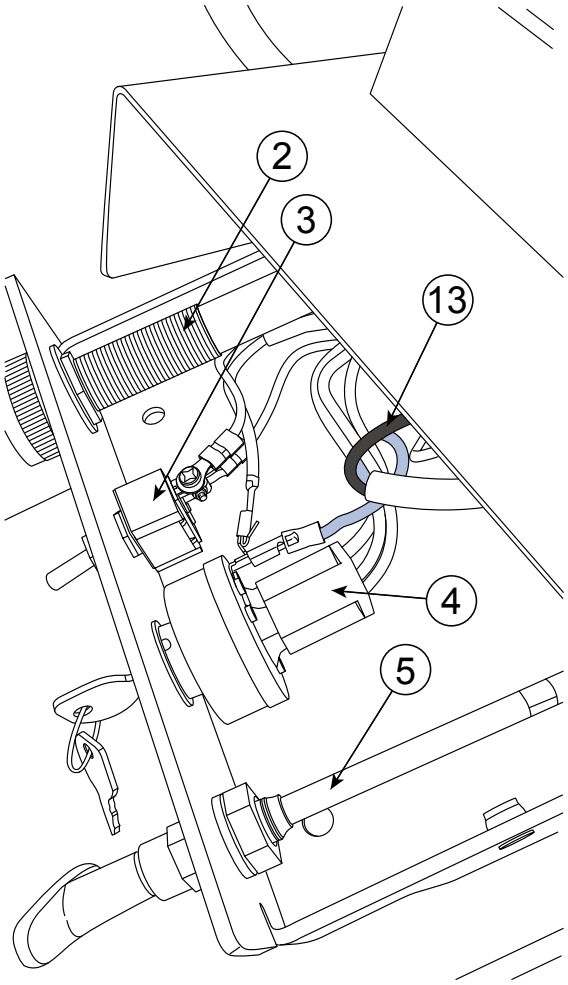
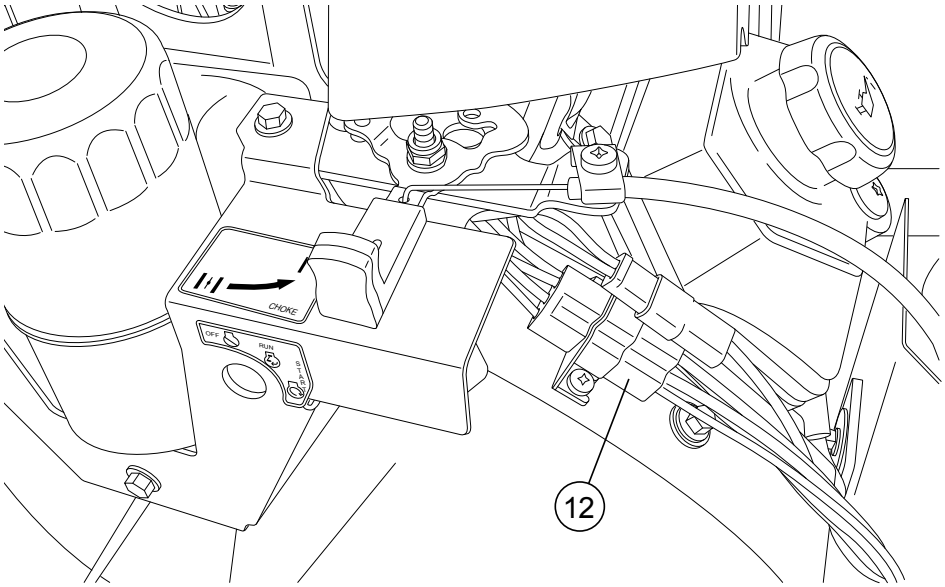


Figure 107. Plugging and Fastening Extension Wiring Harness



3.34.11 Gas Drive — Tank Kit

Install the Gas Tank Mount

1. Position the mount brackets (1) on the tube, closer to the hopper than the s-drive (see Figure 108).
2. Secure the brackets (1) to the tube using 10" x 2-1/2" u-clamps (2), 7/16" x 1-1/2" bolts (3), and 7/16" nuts (4).

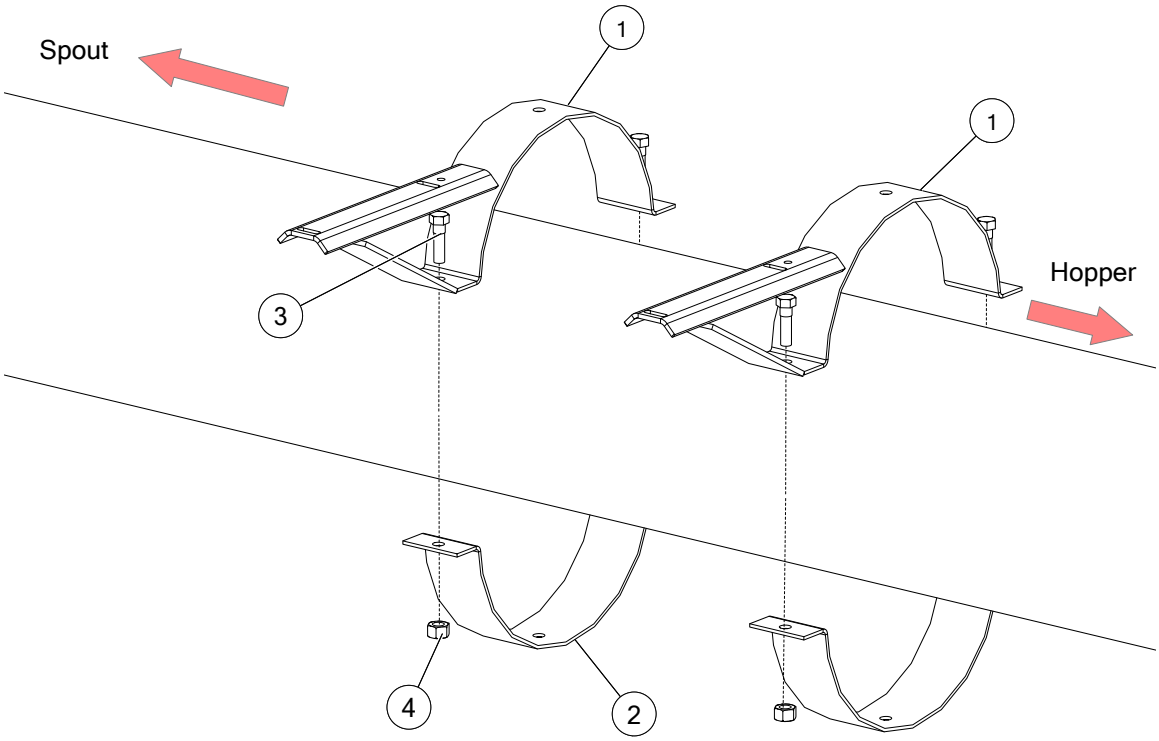
   Note

   For some models, tabs (with holes) are welded onto the tube in place of the 10" x 2-1/2" u-clamps (2).
3. Tighten the u-clamp until the tube begins to crimp.

Table 56. Gas Tank Mount Components

Item	Description
1	Plastic Tank Side Mount Bracket
2	10" x 2-1/2" U-clamp
3	7/16" x 1-1/2" Hex Bolt GR8 Plated
4	7/16" Nylock Nut Gr8

Figure 108. Installing Gas Tank Mount



Install the Gas Tank

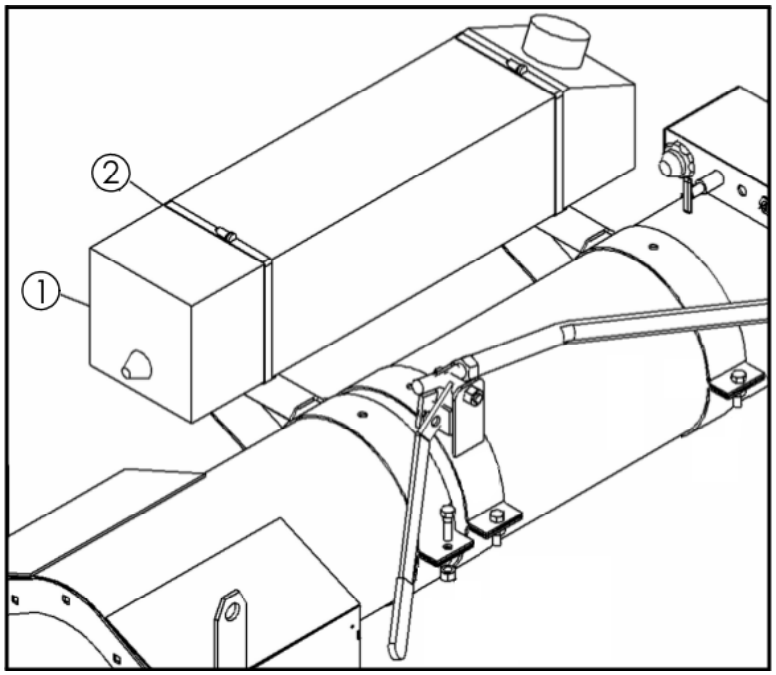
1. Install the gas tank (1) to the mount brackets with gear clamps (2) (see Figure 109).

2. Connect the fuel line (3) to the tank and primer bulb with hose clamps (4).

Table 57. Gas Tank Components

Item	Description
1	Gas Tank (red) w/ Cap Fitting (22 L)
2	32" Gear Clamp
3	1/4" ID Fuel Line — 7'6" (not shown)
4	3/8" Hose Clamp (not shown)

Figure 109. Installing the Gas Tank



3.34.12 Gas Drive — Primer Bulb

Important

Check the primer bulb for setup orientation for proper fuel flow direction. The red end points of the bulb must connect to the gas tank side. Arrows, imprinted on the primer bulb, indicate the direction of fuel flow, which has to be from gas tank to gas engine. Check for any defects in the bulb and hoses prior to installation.

1. Route and install the fuel hose of reasonable length from the fuel tank to the primer bulb. The hose connection settings may very depending on the fuel tank type. Refer to Figure 110 and Figure 111.

Figure 110. Primer Bulb

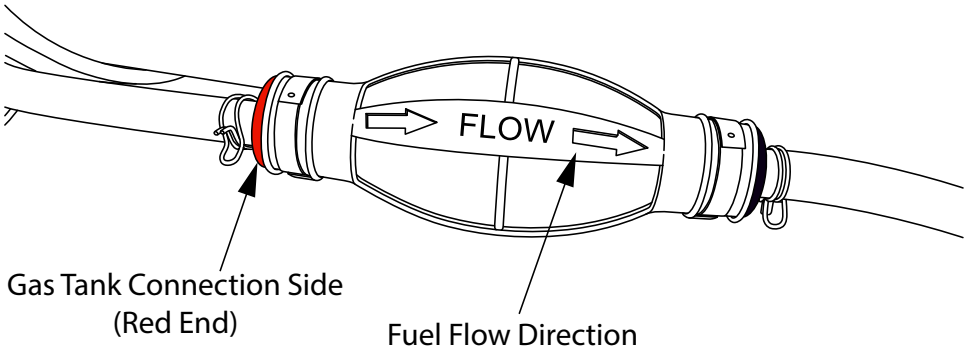
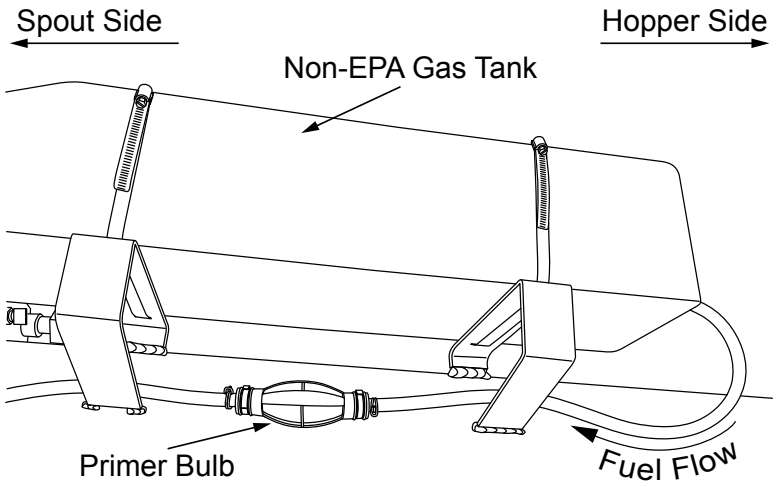
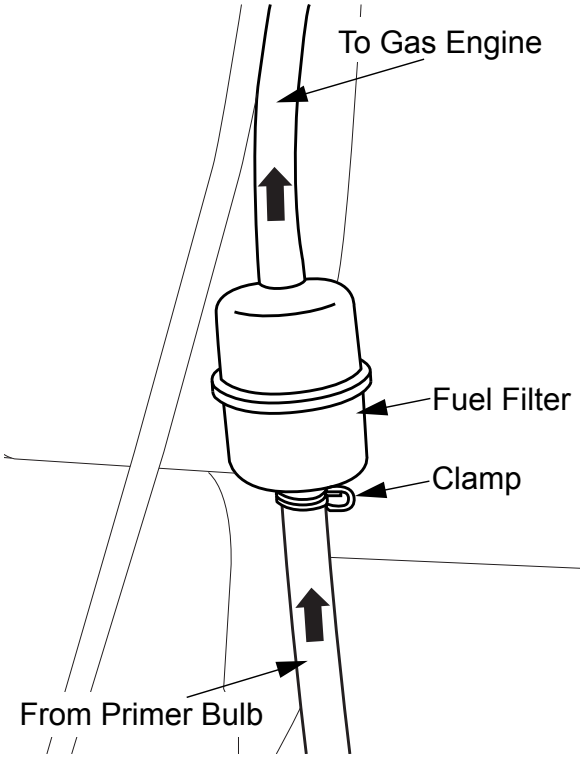


Figure 111. Hose Routing From Fuel Tank



2. Use hose clamps to secure the hose tightly at each ends of the fuel hose.
3. A fuel filter (Figure 112) also is required between the engine and the primer bulb. Connect the fuel filter to the primer bulb using a fuel hose with reasonable length and two clamps for each end of the
4. Secure the fuel hoses with zip ties.

Figure 112. Fuel Filter



After installation check:

Note

Before checking the primer bulb, please proceed and complete all the assemblies first and after the conveyor is completely assembled, place finishing zip-ties on all fuel hoses to ensure all lines are snug in place. Also zip-tie the gearbox breather to the fuel hose above the fuel filter.

1. Prime the fuel system with the primer bulb until fuel is seen in the fuel filter.
2. Run the machine and check all connections for any leaks or loose fitting.

Important

Do not start the engine on empty fuel, before pumping the primer bulb. Otherwise you risk wearing out the battery, and may risk of engine failure.

3.35. Hydraulic Wet Kit

The hydraulic wet kit is an option for gas or electric drives.

3.35.1 Install the Hydraulic Tank Mount

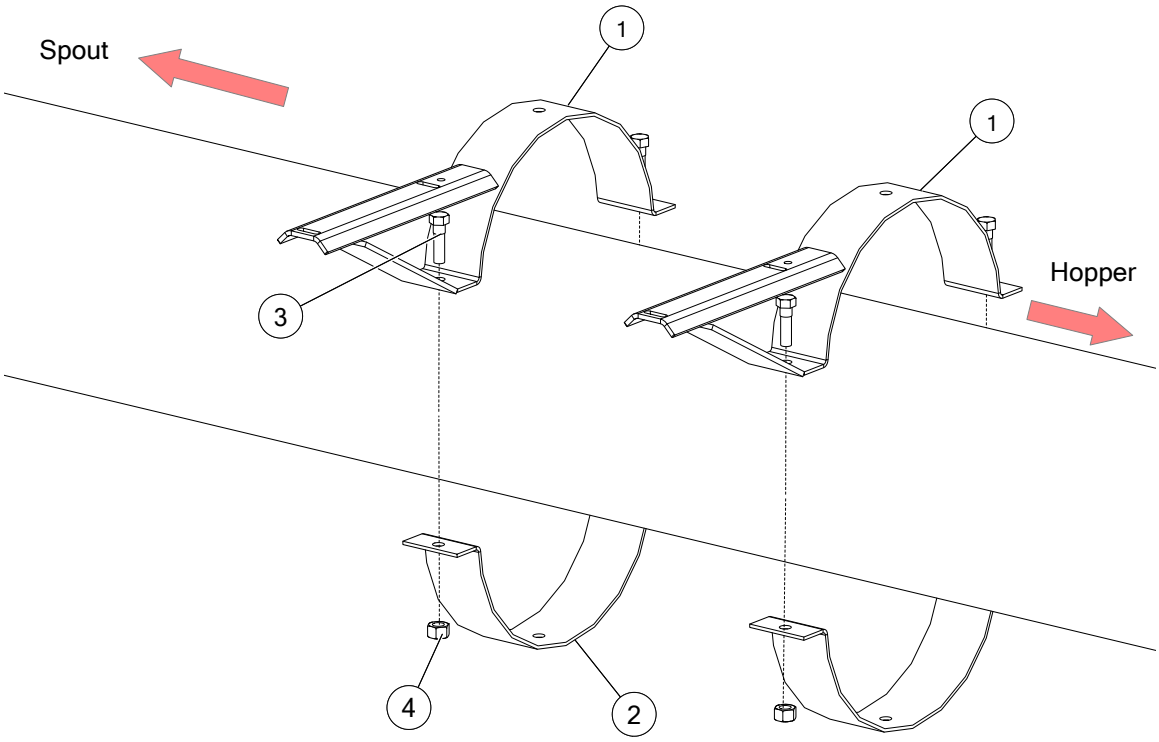
➡ This procedure only applies for models with clamp-on tank mount brackets.

1. Position the mount brackets (1) just above the s-drive (see Figure 113).
2. Secure the brackets (1) to the tube using 10" x 2-1/2" u-clamps (2), 7/16" x 1-1/2" bolts (3), and 7/16" nuts (4).
3. Tighten the u-clamp until the tube begins to crimp.

Table 58. Hydraulic Tank Mount Components

Item	Description
1	Plastic Tank Side Mount Bracket
2	10" x 2-1/2" U-clamp
3	7/16" x 1-1/2" Hex Bolt GR8 Plated
4	7/16" Nylock Nut Gr8

Figure 113. Installing Hydraulic Tank Mount



3.35.2 Install the Hydraulic Tank

1. Install the hydraulic tank (1) to the mount brackets with gear clamps (2) (see Figure 114).

   Note

   Fittings (3, 4) are factory pre-installed on the tank.

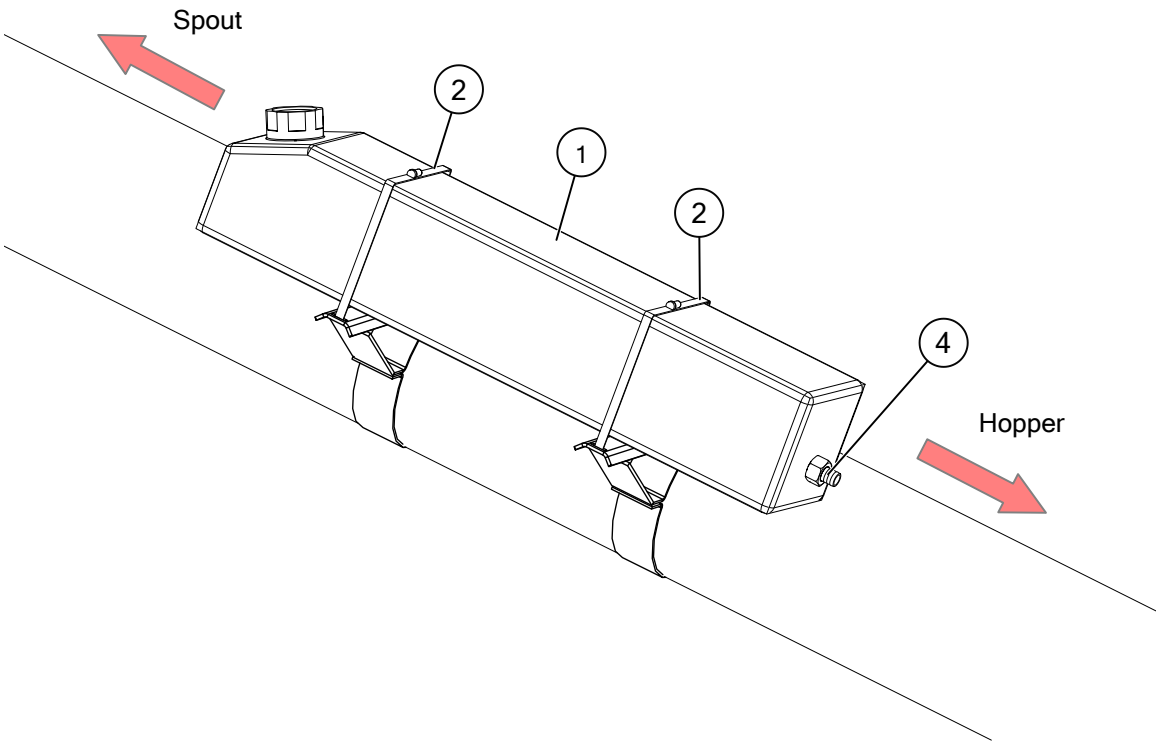
Table 59. Hydraulic Tank Components

Item	Description
1	Hydraulic Tank
2	32" Gear Clamp

Table 59 Hydraulic Tank Components (continued)

Item	Description
3	#8 ORB x 1/2 FPT (not shown)
4	10 ORB x 3/4" Hose Barb

Figure 114. Installing the Hydraulic Tank



3.35.3 Install the Hydraulic Pump

1. Install the fittings (5, 6) on the hydraulic pump (see Figure 115).
2. Secure the pump mount (1) and pump (2) to the slots in the motor back plate using 3/8" x 1-1/2" bolts (3) and 3/8" nuts (4). Leave the bolts loose.

   Note

   Make sure the orientation of the fittings and direction arrow on the pump are as shown as the pump is mounted.

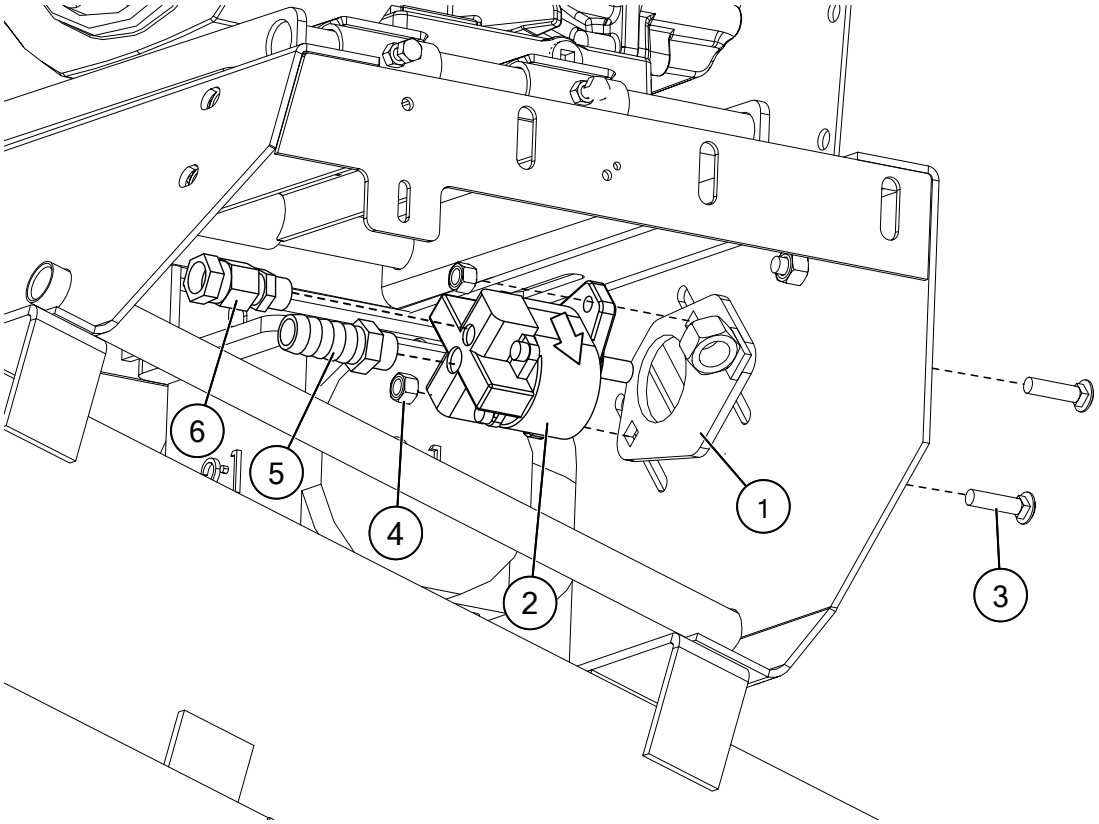
Table 60. Hydraulic Pump and Fasteners

Item	Description
1	Pump Mount — Pinch Drive
2	Hydraulic Pump
3	3/8" x 1-1/2" Carriage Bolt Plated

Table 60 Hydraulic Pump and Fasteners (continued)

Item	Description
4	3/8" Locknut
5	Hose Barb — 10 MORB x 3/4" Hose
6	Swivel — 8 ORB x 1/2" FPS

Figure 115. Installing Hydraulic Pump (Over-Mount Gas/Electric Drive)



3.35.4 Install the Pivot Handle

1. Attach the pivot handle (1) to the pivot shaft (2) using a 3/8" x 2-1/2" bolt (3), a 3/8" locknut (4), and six 3/8" washers (5) (see Figure 116).
2. Attach the 1/4" x 2-1/4" quick pin (6).
3. Thread the end of the pivot shaft (2) into the nut on the pump mount.

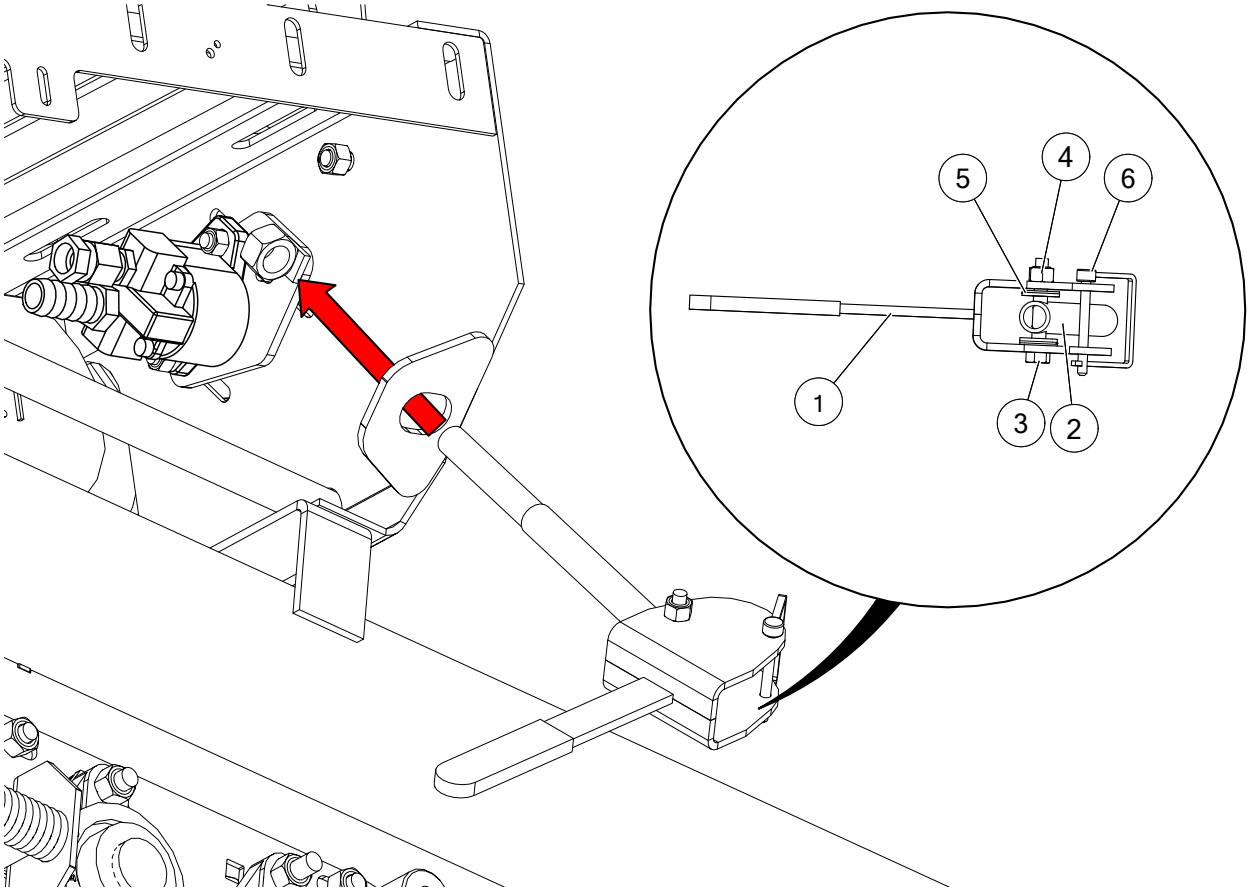
Table 61. Pivot Handle and Fasteners

Item	Description
1	Pivot Handle
2	Pivot Shaft
3	3/8" x 2-1/2" Hex Bolt GR8
4	3/8" Locknut

Table 61 Pivot Handle and Fasteners (continued)

Item	Description
5	3/8" Flat Washer
6	1/4" x 2-1/4" Quick Pin

Figure 116. Installing Pivot Handle (Over-Mount Gas/Electric Drive)



3.35.5 Install the Pulleys and Belt

1. Install the hydraulic pump pulley (2) onto the hydraulic pump (see Figure 117).

   Note

   The key for the pump pulley is factory pre-installed on the hydraulic pump shaft.

2. Install the hydraulic drive pulley (1) onto the engine shaft with a 1/4" x 3-1/4" square key (4).
3. Align the pulleys using a straight edge.
4. Tighten hydraulic pump base bolts and pulley set screws.

   Important

   Once all bolts and set screws are tightened, re-check alignment. Proper alignment will prolong belt life.

5. Install the belt (3).

6. Set the belt tension by adjusting threaded pivot shaft connected to the pivot handle.

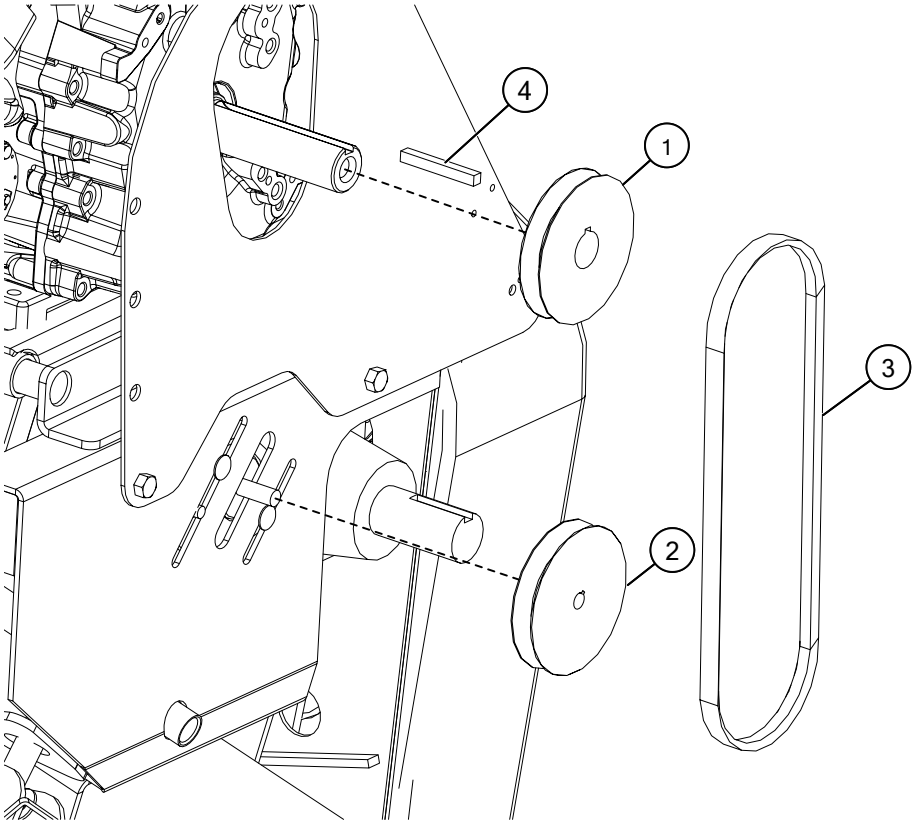
Note

Belts should deflect 1/2" (1.27 cm) to 3/4" (1.91 cm) when pushed on with a 5 lb (22.2 N) force.

Table 62. Pulleys and Belt

Item	Description
1	Pulley 4-1/2" x 1-1/8"
2	Pulley 4-1/2" x 1/2"
3	Belt B35
4	1/4" x 3-1/4" Square Key

Figure 117. Installing Pulleys and Belt (Over-Mount Gas/Electric Drive)



3.35.6 Attach the Hydraulic Hoses

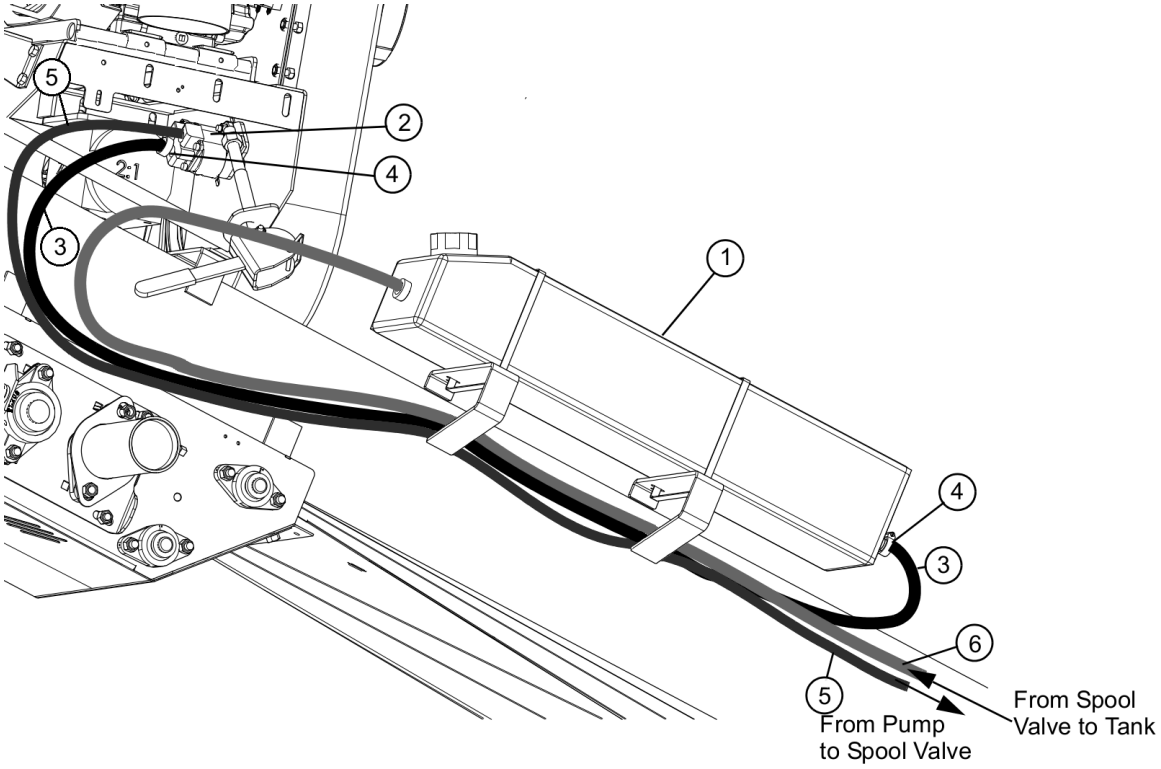
1. Connect the hoses (3, 5, and 6) to the hydraulic pump (2), wheel move spool valve (not shown) and hydraulic oil tank (1) (see Figure 118).
2. Add hydraulic fluid up to approximately 2" [51 mm] from the tank opening. Use the hydraulic fluid noted in the Specifications chapter.
3. Replace tank cap.
4. Test the function of the hydraulic system.
5. Refill hydraulic fluid up to approximately 2" [51 mm] from the tank opening.

6. Replace tank cap.
7. After the conveyor is completely assembled, place finishing zip-ties on all hydraulic hoses to ensure all lines are snug in place.

Table 63. Hydraulic Hoses

Item	Description
1	Hydraulic Tank
2	Hydraulic Pump
3	3/4" Hose (tank to pump)
4	3/4" Hose Clamp
5	1/2" Hose (pump to valve)
6	1/2" Hose (valve to tank)

Figure 118. Hydraulic Hose Routing for Over-Mount Gas/Electric Drive



Note

Use Figure 118 for hydraulic hose routing only, but the hydraulic tank is actually positioned above the s-drive for these conveyor models, as shown in previous images.

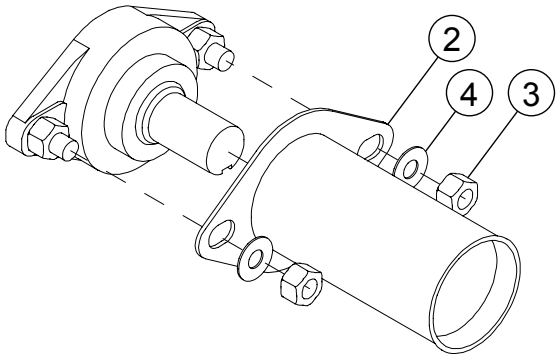
3.36. Install the Shaft Guard

1. Mount the shaft guard (2) over the roller shaft and onto the flange bearing carriage bolts (see Figure 119).
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 119. Installing Shaft Guard



3.37. Install the Manual Container

1. Position the manual container (1) on the axle arm.
2. Depending on your type of container, either:
   a. secure with two gear clamps (2) (see Figure 120), or
   b. secure with two self-tapping screws (3) (see Figure 121).

Figure 120. Clamp-on Manual Container

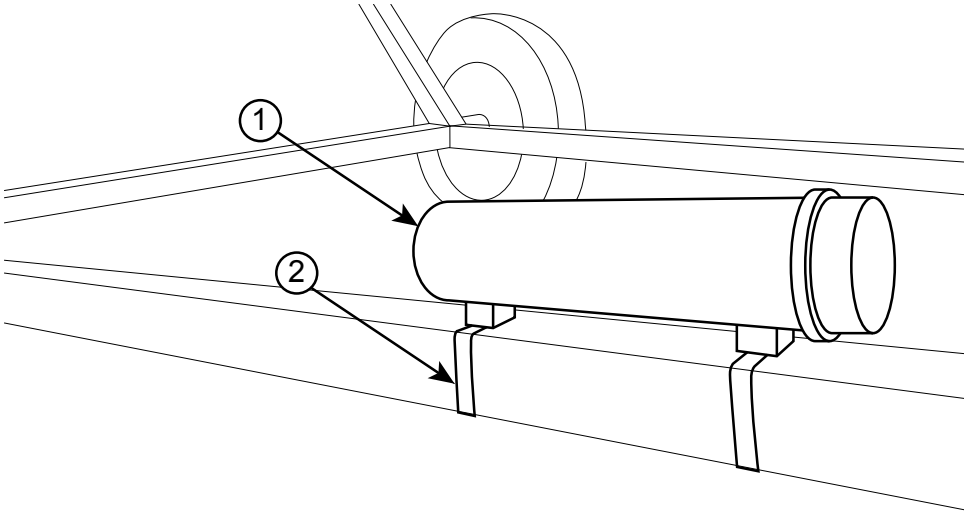
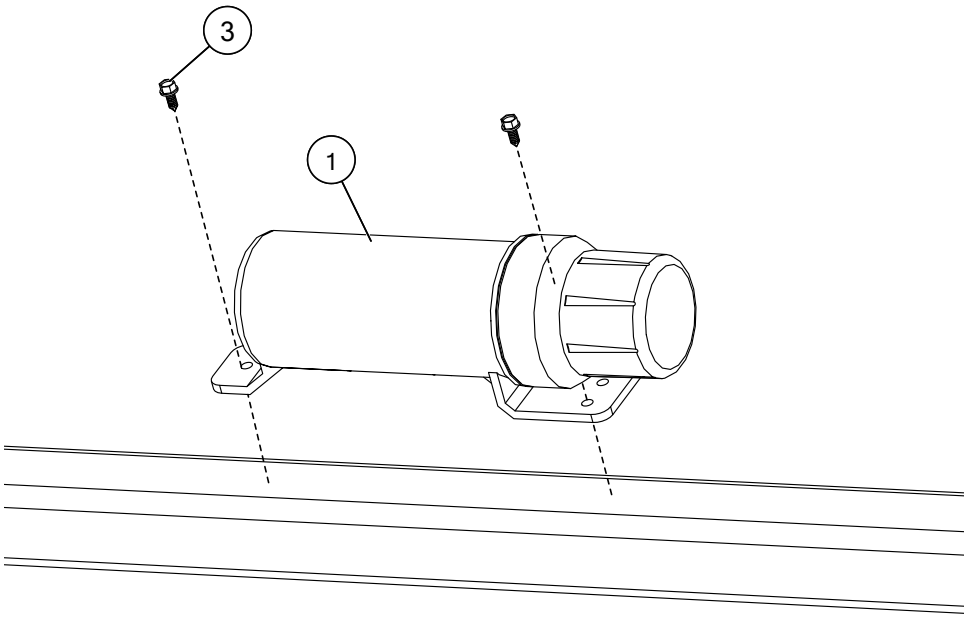


Figure 121. Screw-on Manual Container

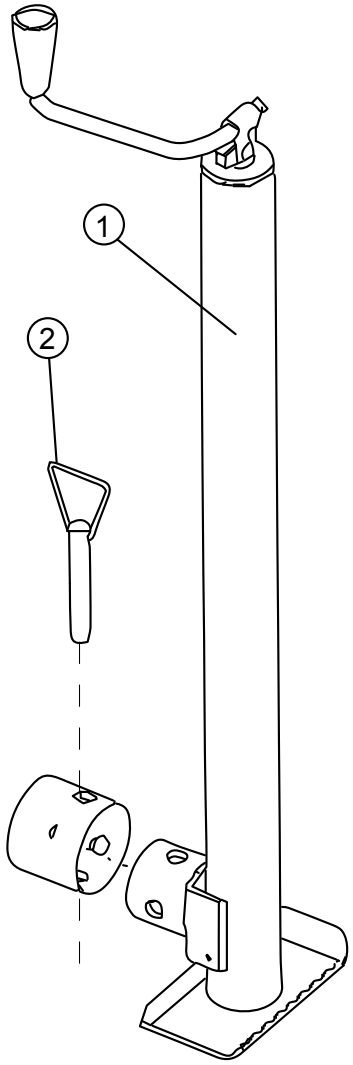


Item	Description
1	Manual Container
2	Gear Clamps
3	Self-Tapping Screw #14 x 5/8"

3.38. Attach the Jack

1. Insert the jack (1) into the jack stub (located on the conveyor hitch) (see Figure 122).
2. Secure the jack in place with the pin (2) provided.

Figure 122. Attaching the Jack



Ref	Description
1	Jack
2	Pin

4. Specifications

Table 64. S-Drive Standard Conveyor Conveyor (65' — 100')

MODEL	1565	1575	1585	1590	15100
DIMENSIONS					
Conveyor Tube Size Please provide this information					
Belt Length Please check this information	135'6"	155'	175'	185'	205'
OTHER					
Electric Drive (HP) Please check this information	15	20	20	25	25
Gas Drive (HP) Please check this information	27	27	35	35	35
Hitch Pin Size (Min. Diameter x Lenth)	5/8" x 3"				
Gear Box Oil Type	SAE Approved 90W or equivalent				
Hydraulic Fluid[1]	ISO 32 Hydraulic Oil or Automatic Transmission Fluid (Dexron 2™) or equivalent				
Minimum Tractor Hydraulic Output Please provide this information					

1. **Do not use “trans-hydraulic fluid”, because this may result in premature pump wear.**

5. Appendix

5.1. Bolt Torque

Table 65 gives the correct torque values for various hardware. Tighten all bolts to the torque specified, unless otherwise noted. Check tightness periodically, using Table 65 as a guide. Replace the hardware with the same strength bolt, contact Batco if you are unsure.

Table 65. 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 66. 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 67. 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 68. 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 68 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 69. 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

Batco | Westfield
201 Industrial Drive, Swift Current
Saskatchewan S9H 5R4, CANADA
Phone: (877) 667-7421 (Canada & USA)
or (306) 773-7779
Fax: (306) 778-2524
Email: info@batcomfg.com
Website: www.batcomfg.com

Hutchinson
514 W. Crawford Street
Clay Center, Kansas, 67432 USA
Phone: (800) 523-6993
or (785) 632-2161
Fax: (785) 632-5964
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Please include the part number listed on the cover page in your message.