S-Drive Field Loader

Portable Grain Belt Conveyor
Assembly Manual

This manual applies to the following brands and models:

Batco FX, Westfield WCX, Hutchinson HCX:

2000 Series: 2045FL

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: P1512142 R4

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 Spout Roller on page 38
Added New Hutchinson HCX 2045 Conveyor Tube Layout	Section 3.8 – Assemble the Conveyor Tube on page 33
New primer bulb (replaced fuel pump) section added	Section 3.31.3 – Gas Drive — Install Primer Bulb on page 102
Revised Specification Section	Section 4. – Specifications on page 115

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.

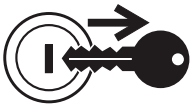
1.4. Rotating Parts Safety

⚠ WARNING

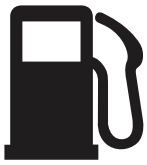
- Keep body, hair, and clothing away from rotating pulleys, belts, chains, and sprockets.
- Do not operate with any guard removed or modified. Keep guards in good working order.
- Shut off and remove key or lock out power source before inspecting or servicing machine.

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**

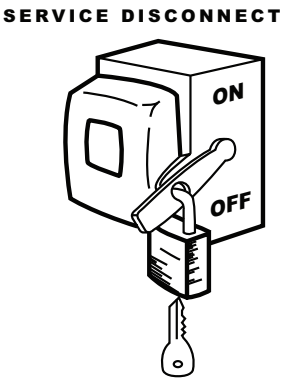
- Keep guards in place and secure.
- Properly ventilate surrounding area.
- Never fill the fuel tank with the engine running, while smoking, or near an open flame. Always shut down and allow engine to cool before filling with fuel.
- Never overfill the tank or spill fuel. If fuel is spilled, clean it 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 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. Hand Winch Safety

⚠ WARNING **When Equipped:**

- Inspect lift cable before using. Replace if frayed or damaged. Make sure lift cable is seated properly in cable sheaves and cable clamps are secure.
- Tighten brake lock by turning winch handle clockwise at least two clicks after lowering the conveyor.
- Lower the conveyor fully before towing, then rotate winch handle until cable has light tension.
- Do not lubricate winch brake discs.

1.9. Hydraulic Winch Safety

⚠ WARNING **When Equipped:**

- Keep away from rotating cable drum and winch cable. Do not touch or grab cable while winch is being operated or use hands to guide the cable. Failure to heed could result in serious injury.
- Inspect cable and cable clamps before installing and using hydraulic winch. Replace cable if frayed or damaged. Tighten cable clamps if necessary.
- Do not continue to supply power to hydraulic winch after the conveyor has reached full up position.
- Do not disconnect hydraulic quick couplers when lines are pressurized.
- Make sure lift cable is seated in cable pulley.
- Always keep a minimum of 3 cable wraps on the cable drum.

1.10. 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.

1.11. 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.

1.12. 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.

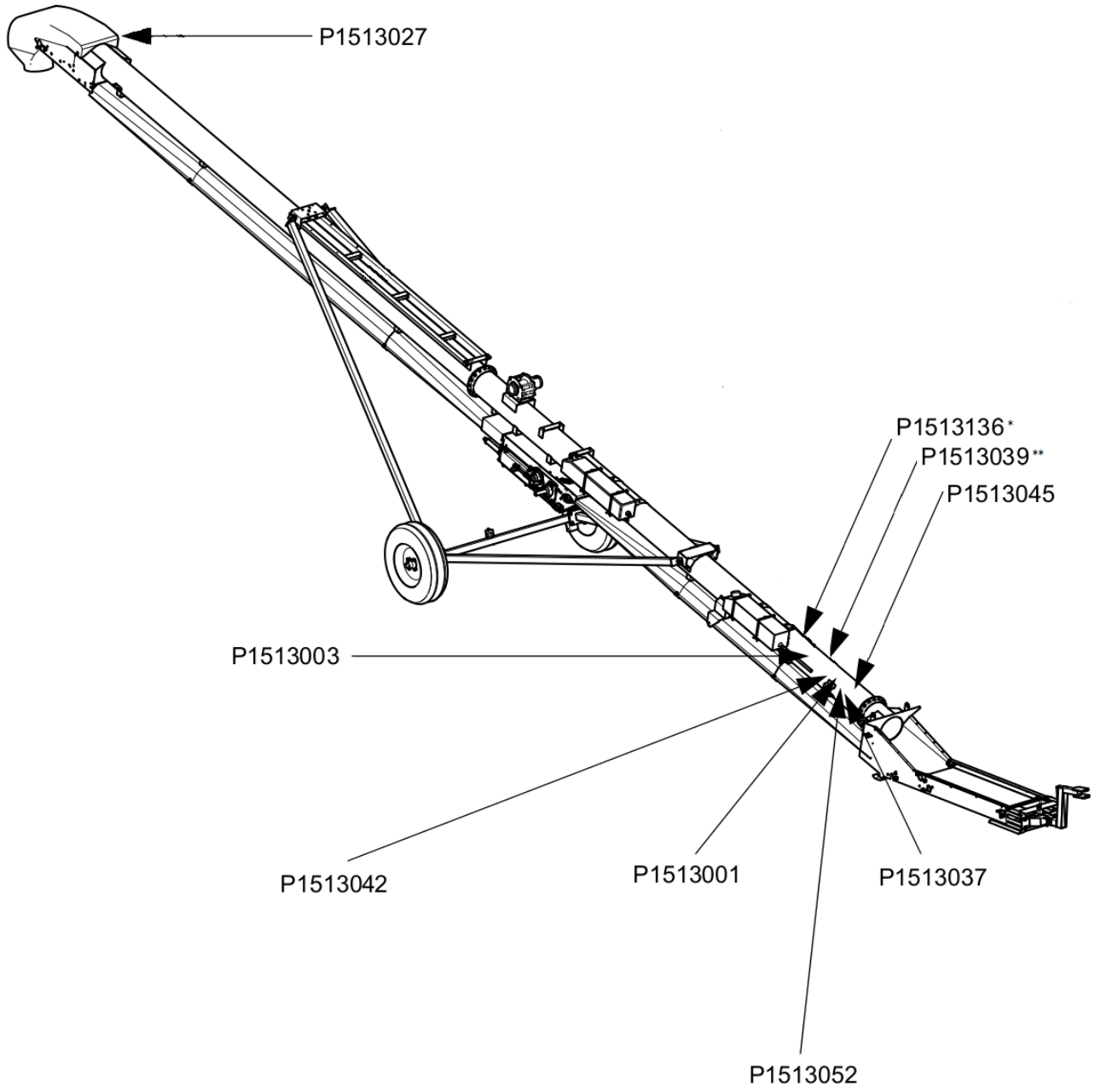
1.12.1 Decal Installation/Replacement

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.

1.12.2 Safety Decal Locations and Details

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

Figure 1. Safety Decal Locations



* if equipped with EPA gas tank
** if equipped with hand winch

Figure 2. S-Drive Safety Decal Location

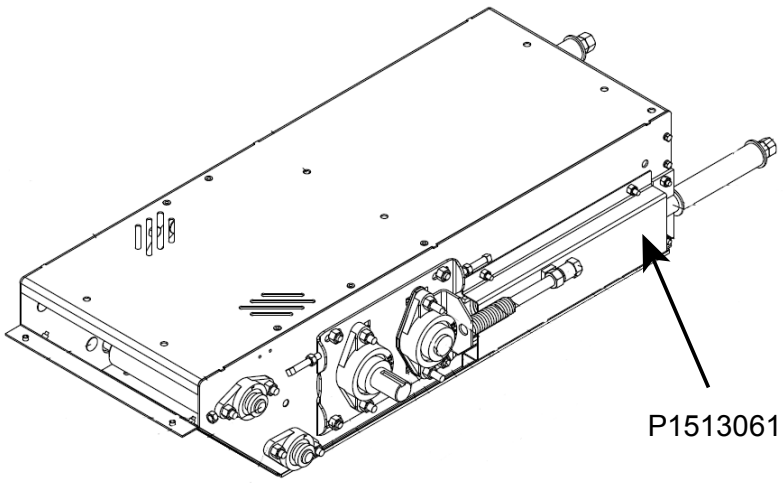


Figure 3. Gas Drive Safety Decal Locations (Over-Mount)

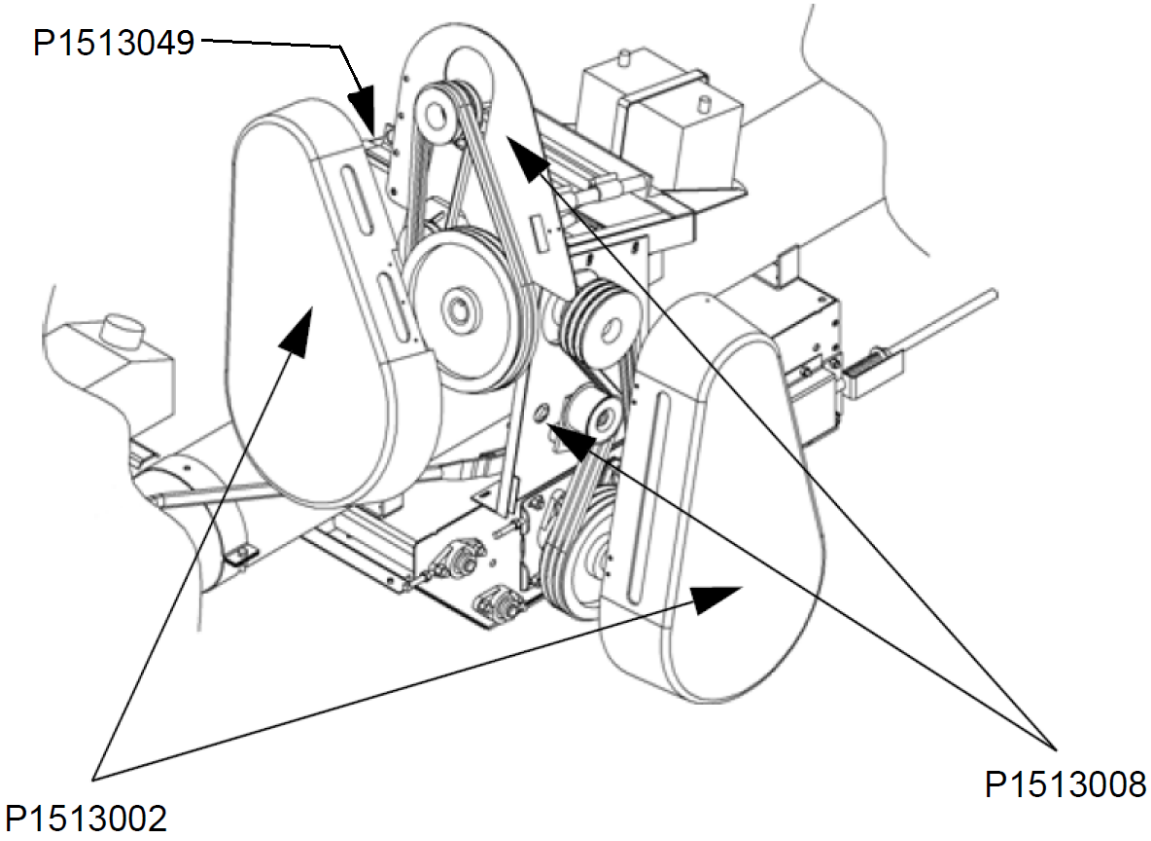


Figure 4. Electric Drive Safety Decal Locations (Over-Mount)

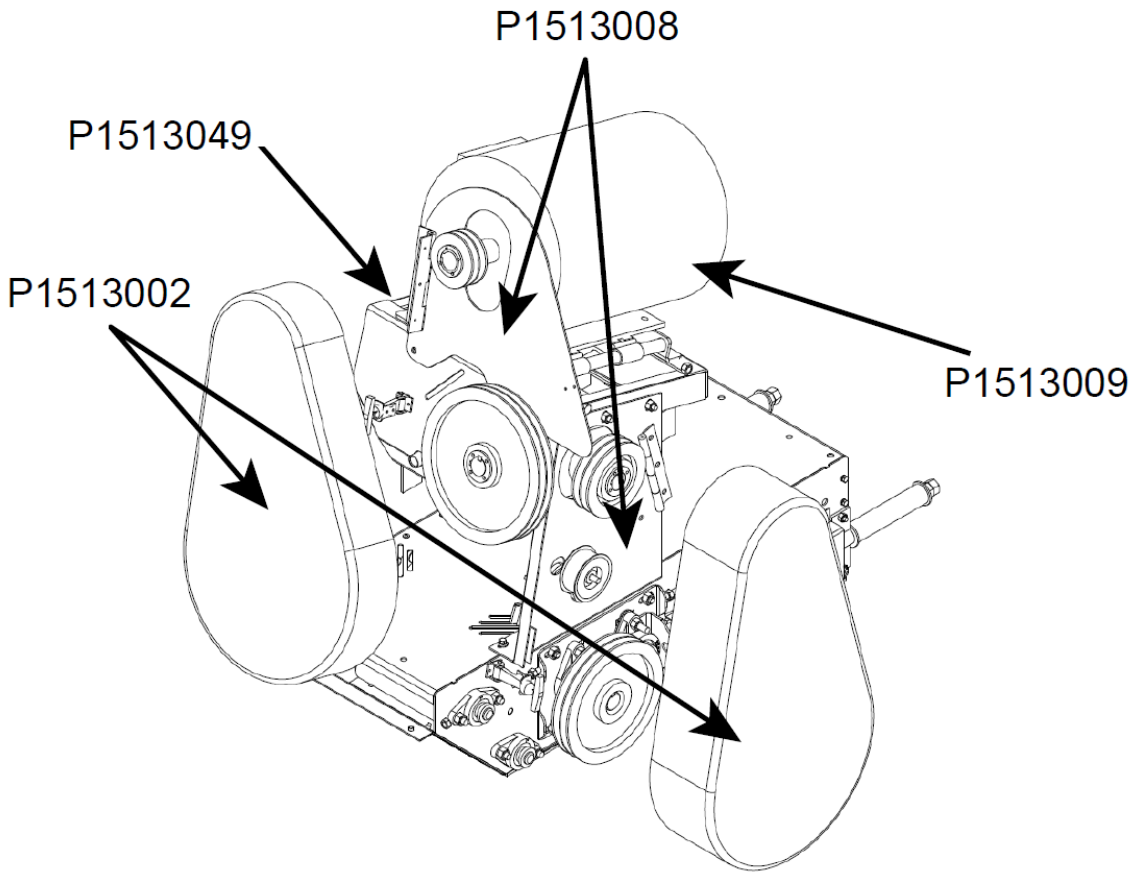


Figure 5. Hydraulic Winch Decal Locations (If Equipped)

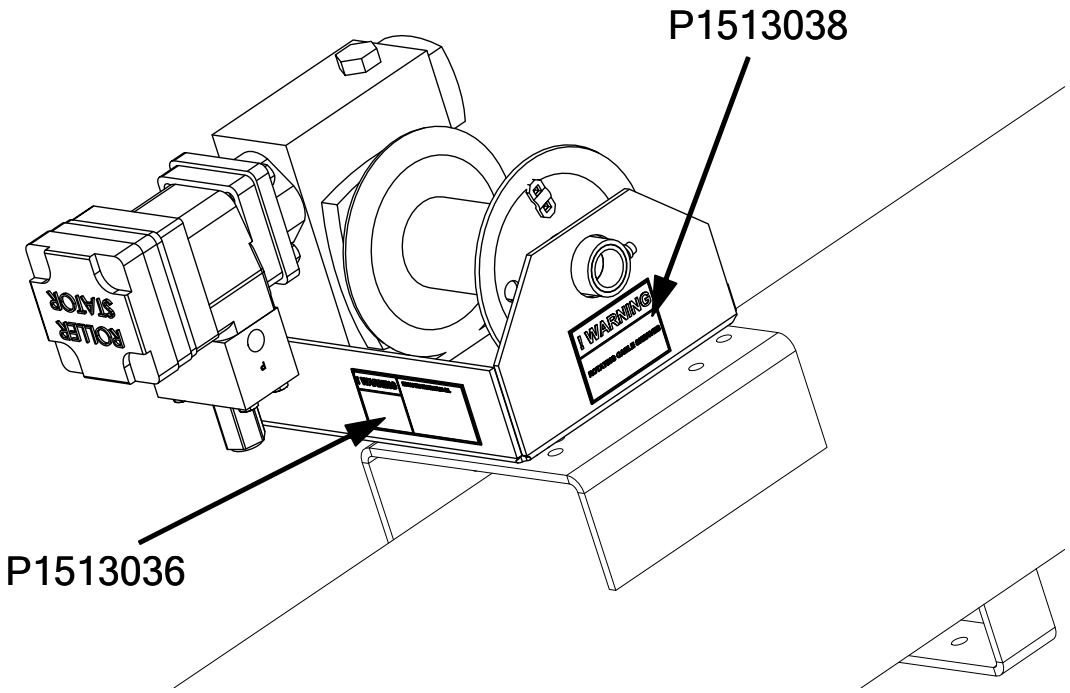


Table 1. Safety Decals

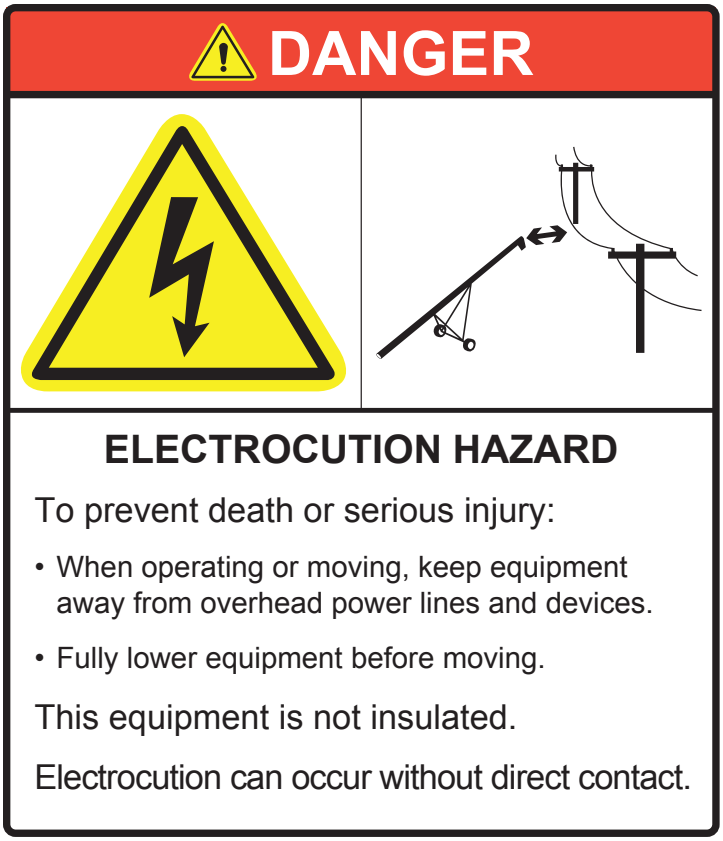
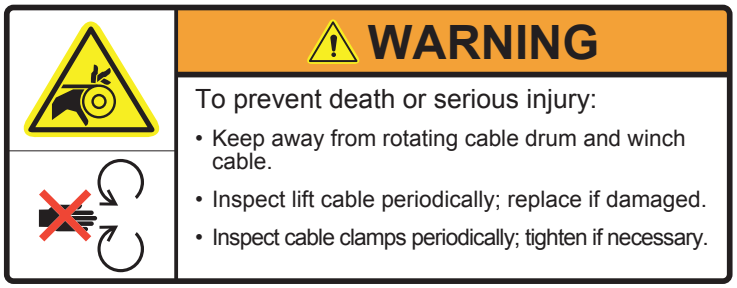
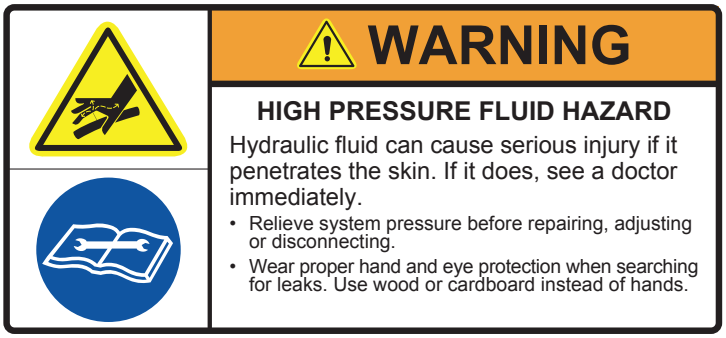
Part Number	Description
P1513003	
P1513038	
P1513036	

Table 1 Safety Decals (continued)

Part Number	Description
P1513045	
P1513037	

Table 1 Safety Decals (continued)

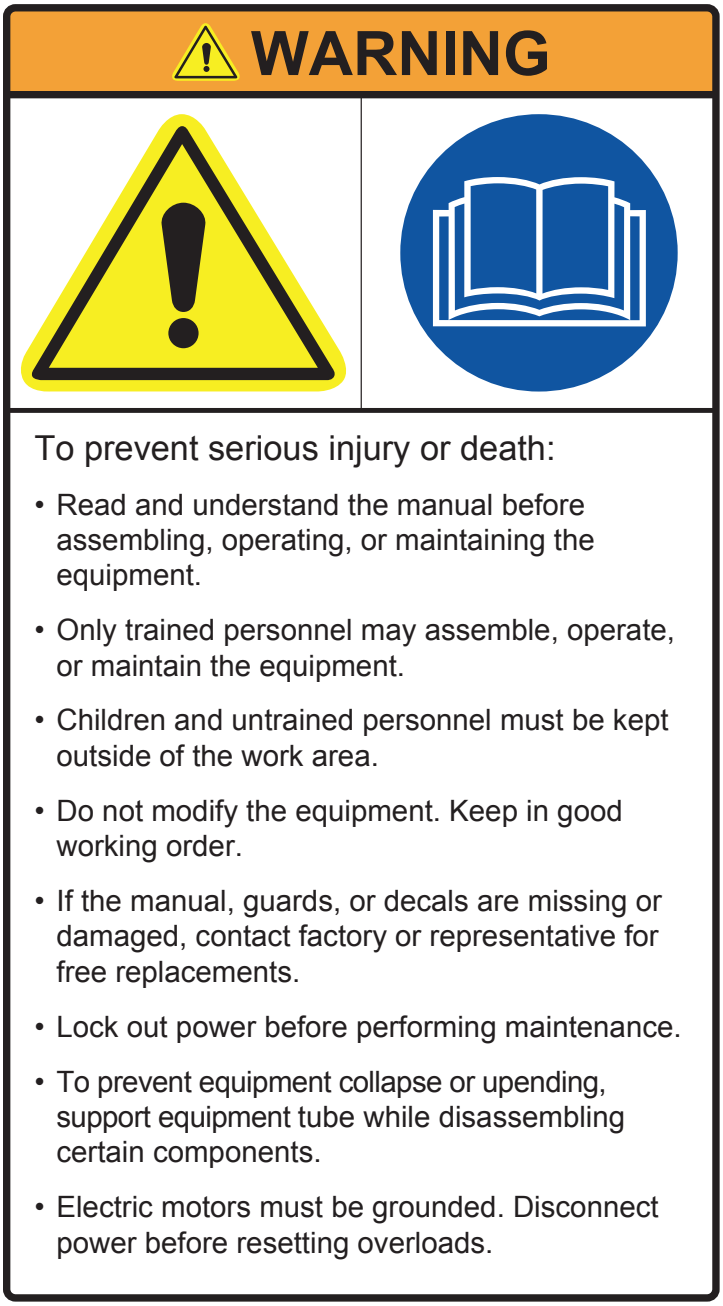
Part Number	Description
P1513001	

Table 1 Safety Decals (continued)

Part Number	Description
P1513042	

Table 1 Safety Decals (continued)

Part Number	Description
P1513002	
P1513008	

Table 1 Safety Decals (continued)

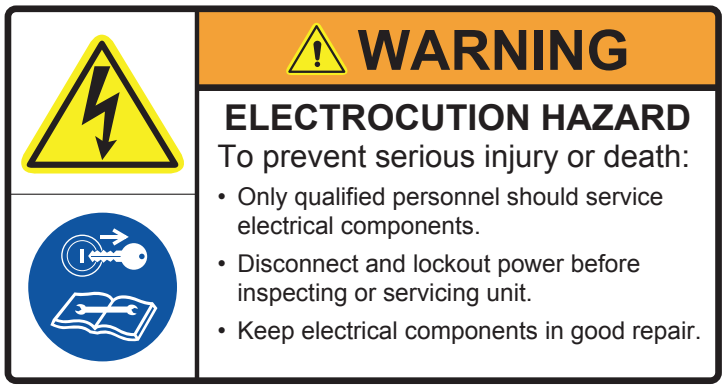
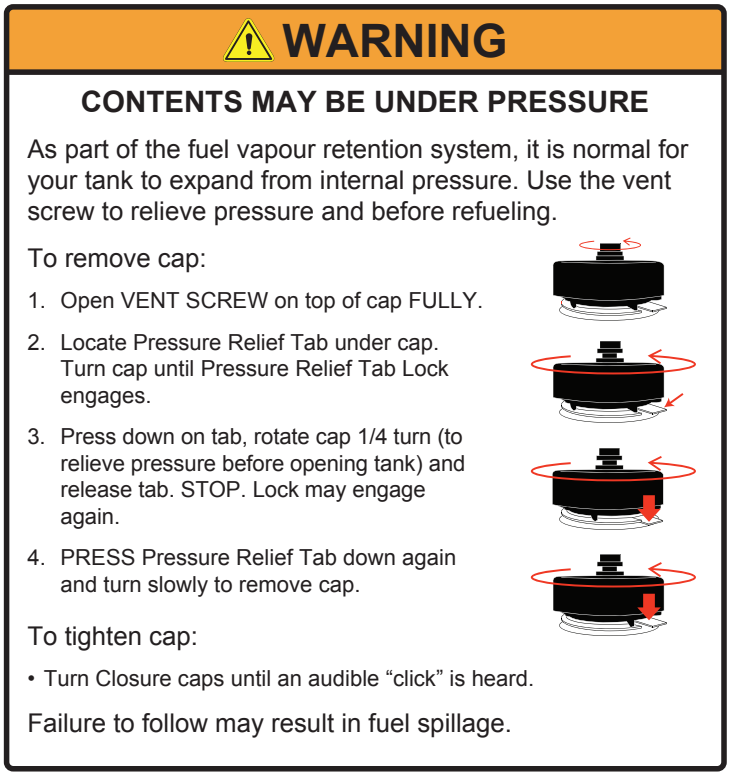
Part Number	Description
P1513009	
P1513136	

Table 1 Safety Decals (continued)

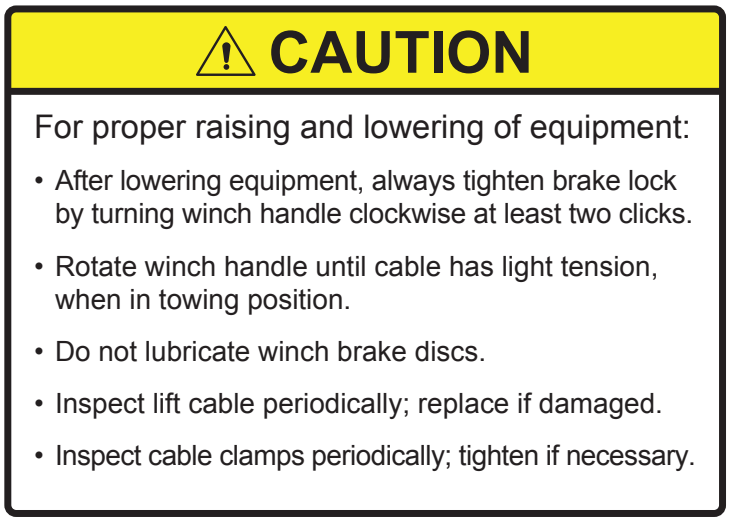
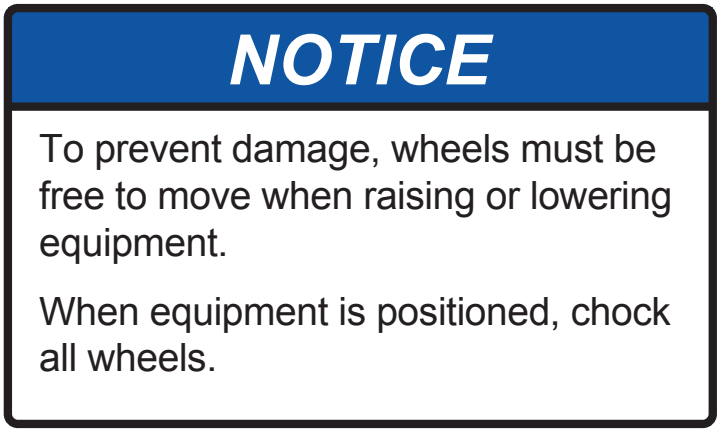
Part Number	Description
P1513039	
P1513052	

Table 1 Safety Decals (continued)

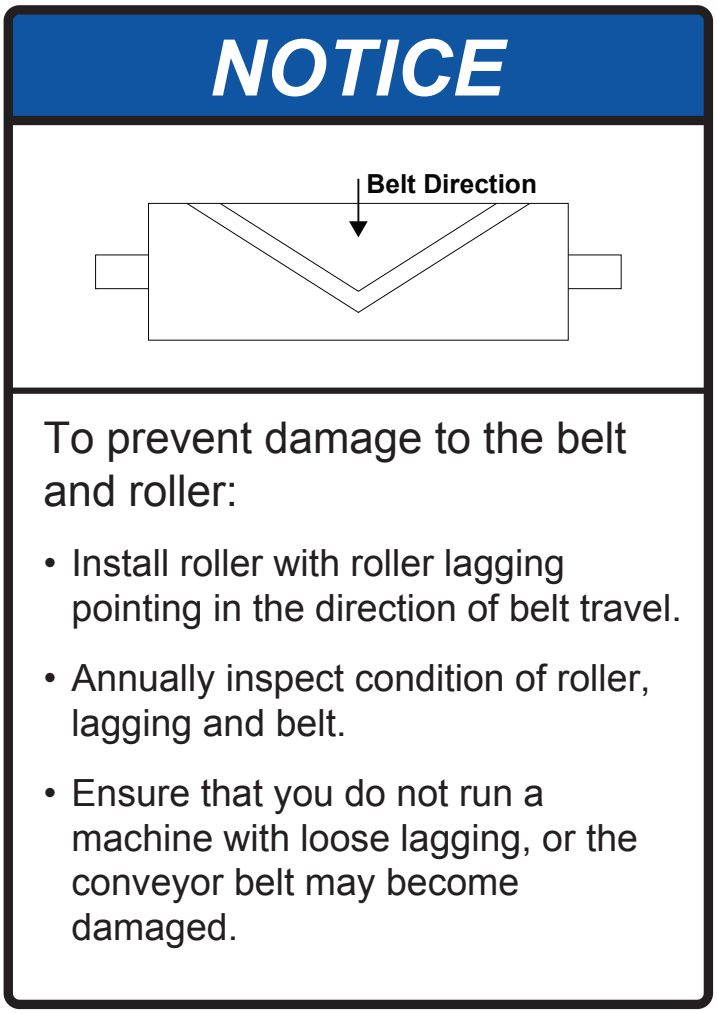
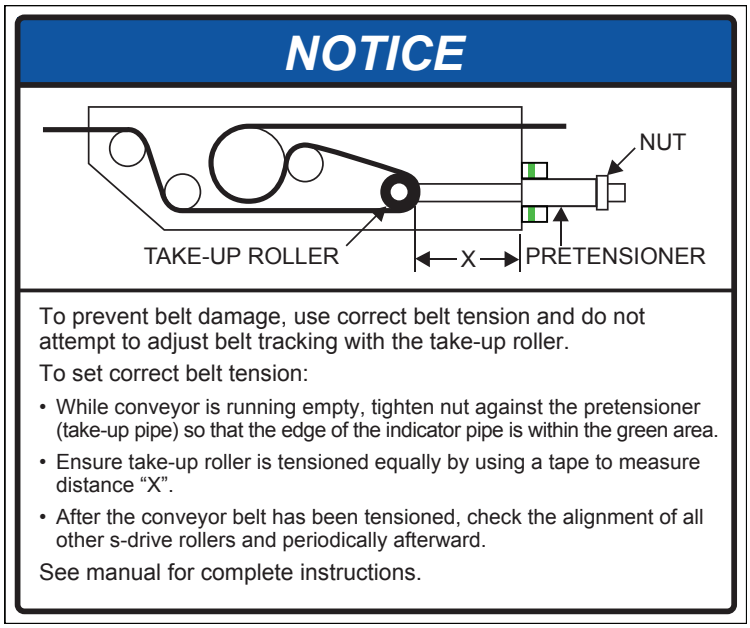
Part Number	Description
P1513027	

Table 1 Safety Decals (continued)

Part Number	Description
P1513061	
P1513049	

2. Features

This section covers the main features of the conveyor.

Figure 6. Typical S-Drive Field Loader Components

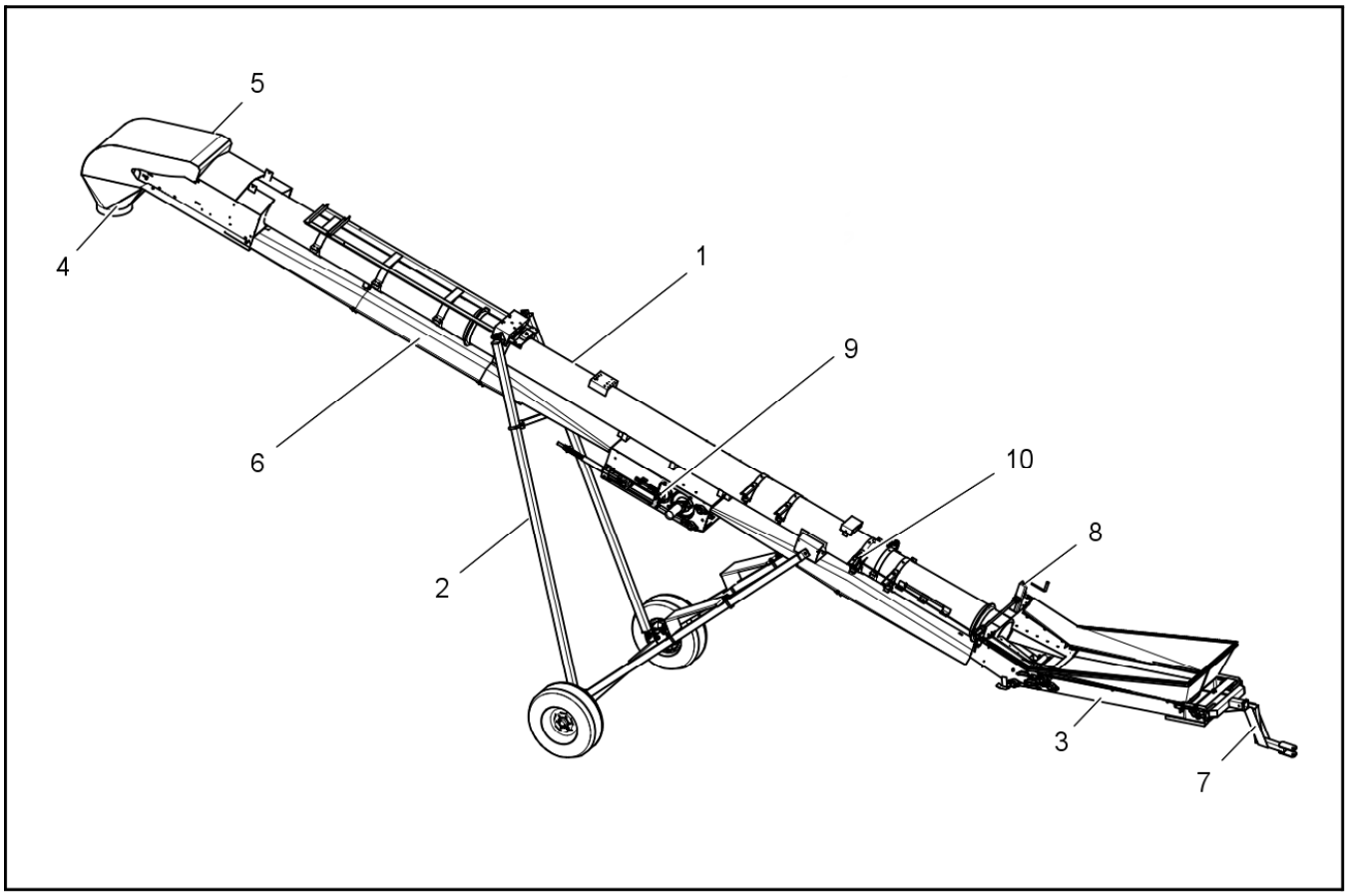
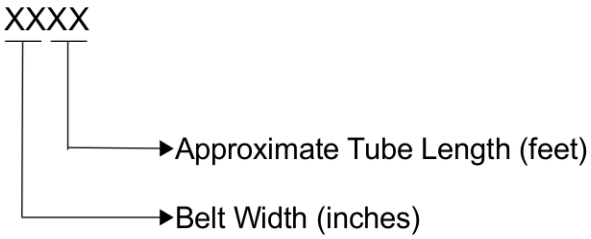


Table 2. Typical S-Drive Field Loader Components

ITEM	DESCRIPTION
1	Tube
2	A-Frame
3	Hopper
4	Spout Assembly
5	Hood

ITEM	DESCRIPTION
6	Belt Return and Weather Guard
7	Hitch
8	Jack
9	S-drive
10	Collapsible Hopper Control

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 set(s) of Allen wrenches
- 1 hammer and punch
- 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 116. 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 117.

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.

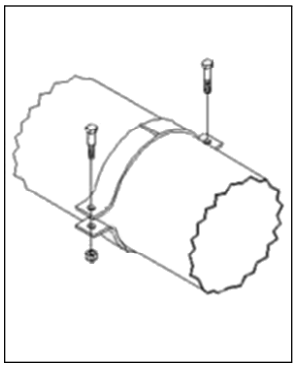
Tightening Brackets

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 7. 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 8).

   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.

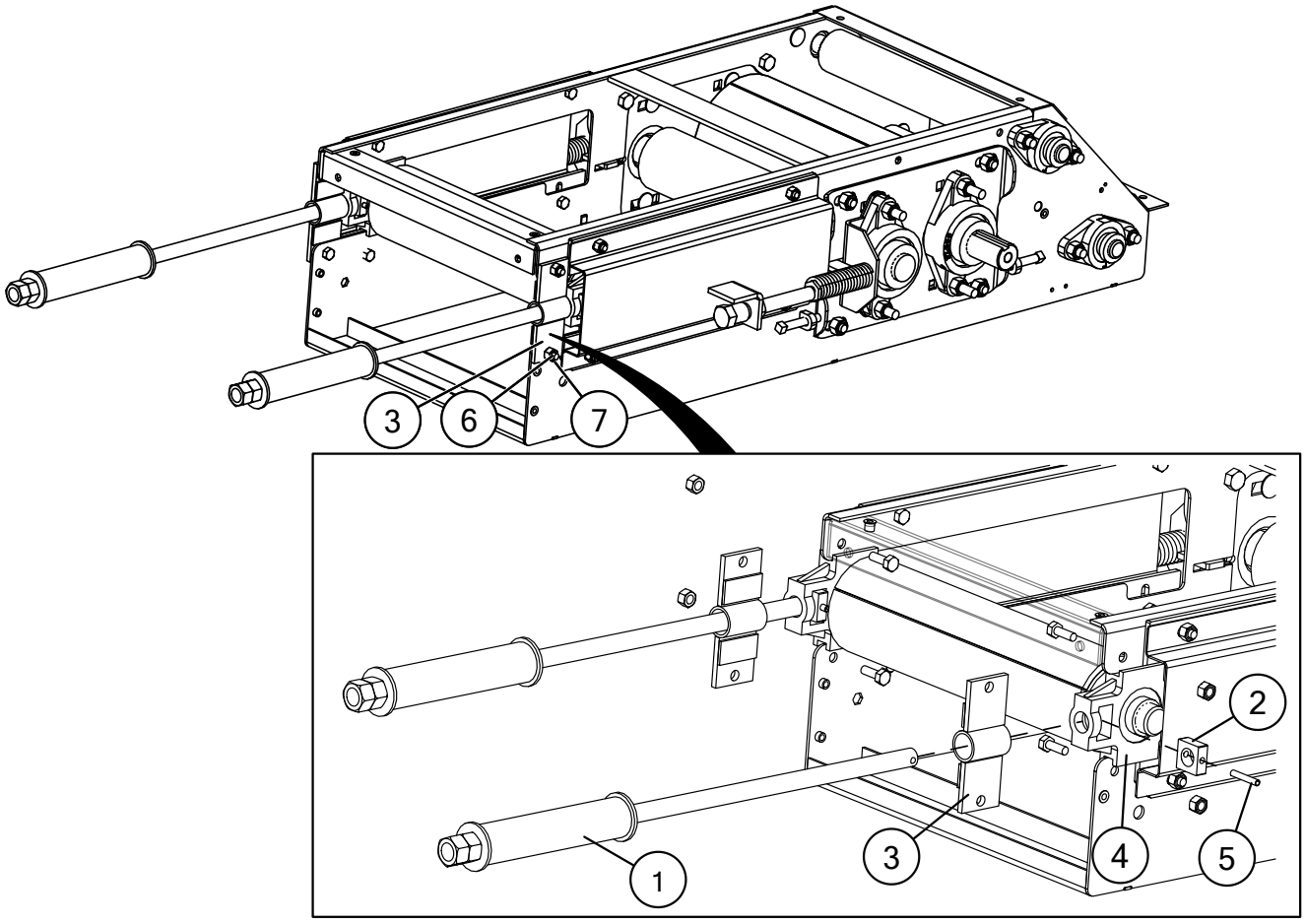
Note

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 8. 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 9). 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 9. Typical Tube Connection

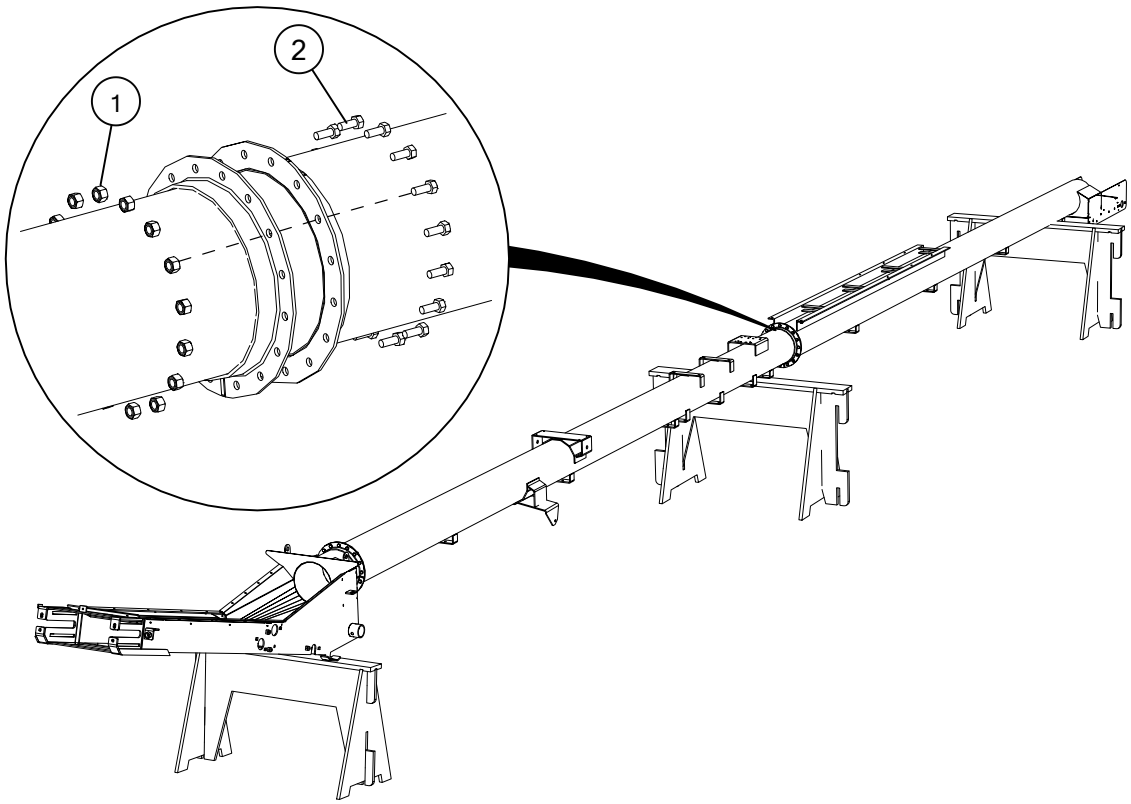
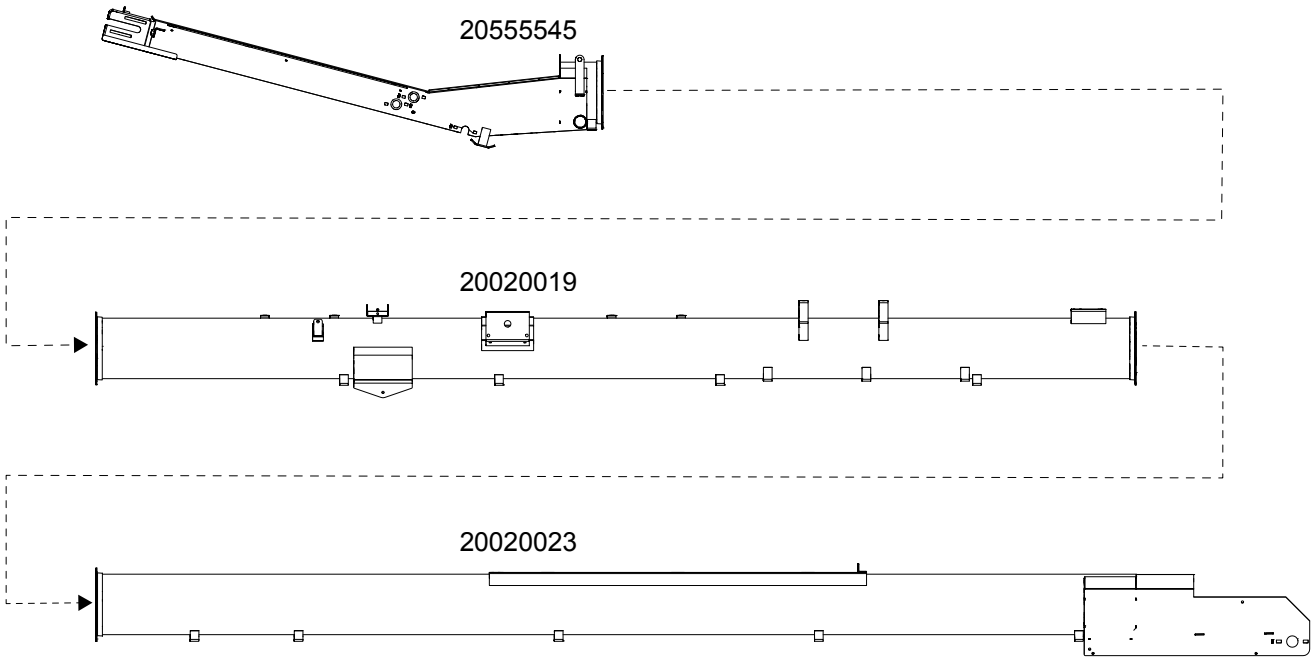


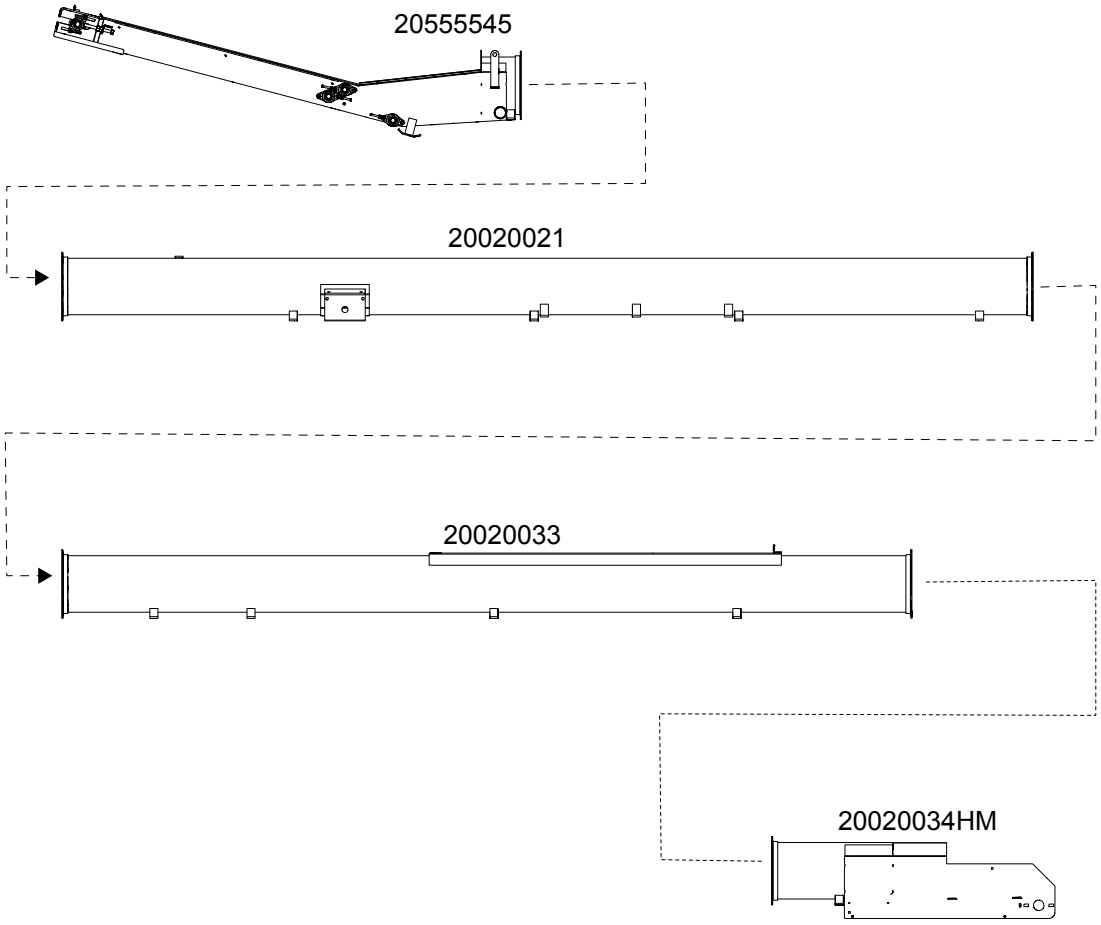
Figure 10. Conveyor Tube Layout for 2045FL Model (Batco and Westfield)



Note

- For models having electric drive option, center tube part number is 20020020.

Figure 11. Conveyor Tube Layout for 2045FL Model (Hutchinson)



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 12):
  - Brand (B): as near as possible to the conveyor spout
  - Model (M): as near as possible to the bottom end of the track

  Examples of the appearance of brand and model decals are in Figure 13 and Figure 14.

Figure 12. Brand (B) and Model (M) Decal Placement

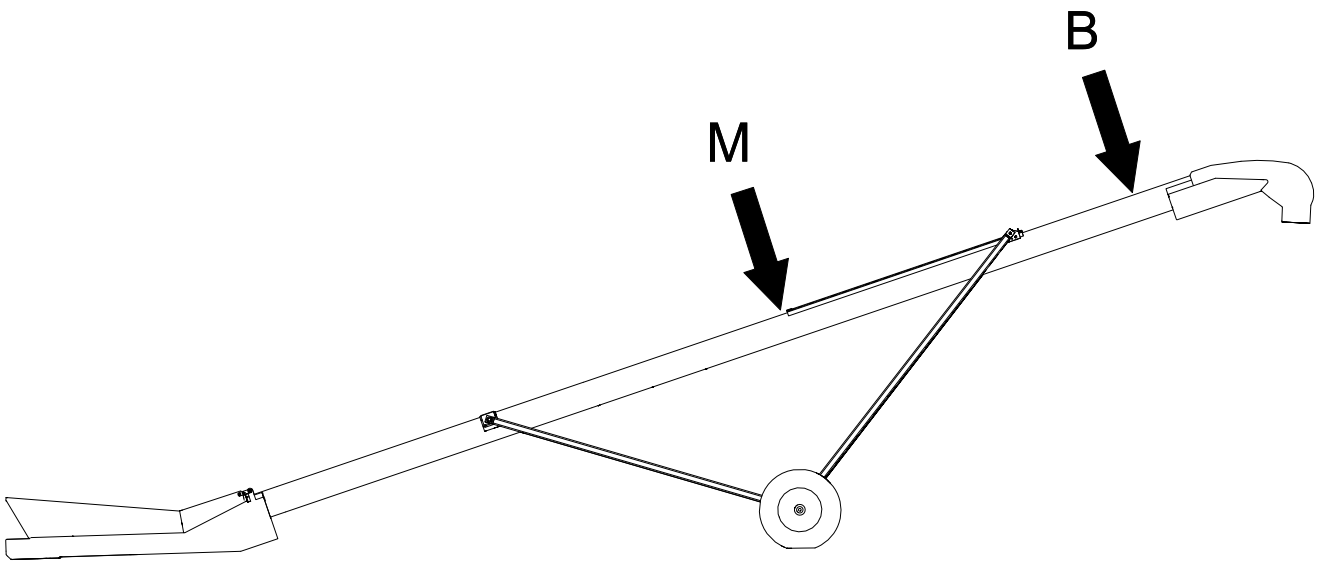
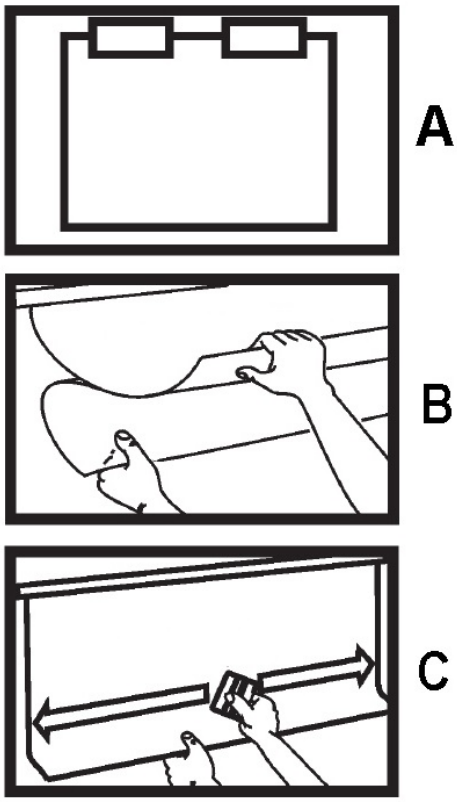


Figure 13. Brand Decal (example)

Figure 14. Model Decal (example)

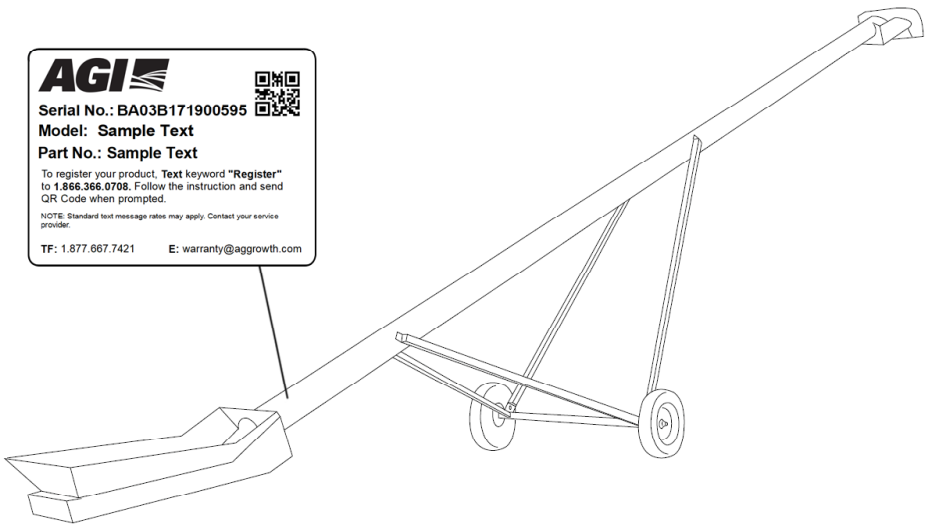
- Apply decals to both sides of conveyor tube.
- For each decal:
  1. Prepare surface by cleaning thoroughly with soap and water. Surface must be clean and free of dirt, grime, rust and oil. To clean oily surface, wipe with clean cloth and solvent cleaner or isopropyl alcohol.
  2. Position the decal by centering it vertically on the tube and apply masking tape along the top, creating a gate hinge (see Detail A in Figure 15).
  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 15. Decal Placement Technique



3.10. Serial Number Decal Placement

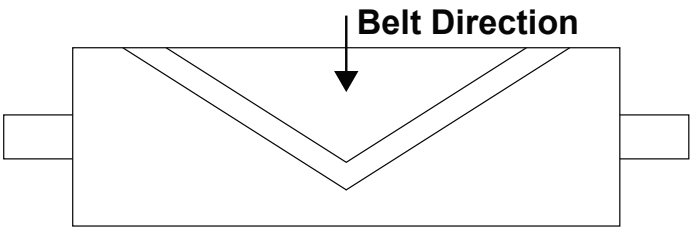
Place the serial number decal on the conveyor as shown below.



3.11. Install the Spout Roller

1. Insert the roller (2) into the spout (1) (see Figure 17), with the roller lagging pointing in the direction of belt travel (see Figure 16).

Figure 16. 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 carriage bolts (3), square flat washers (4), and locknuts (6).

   Important

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

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

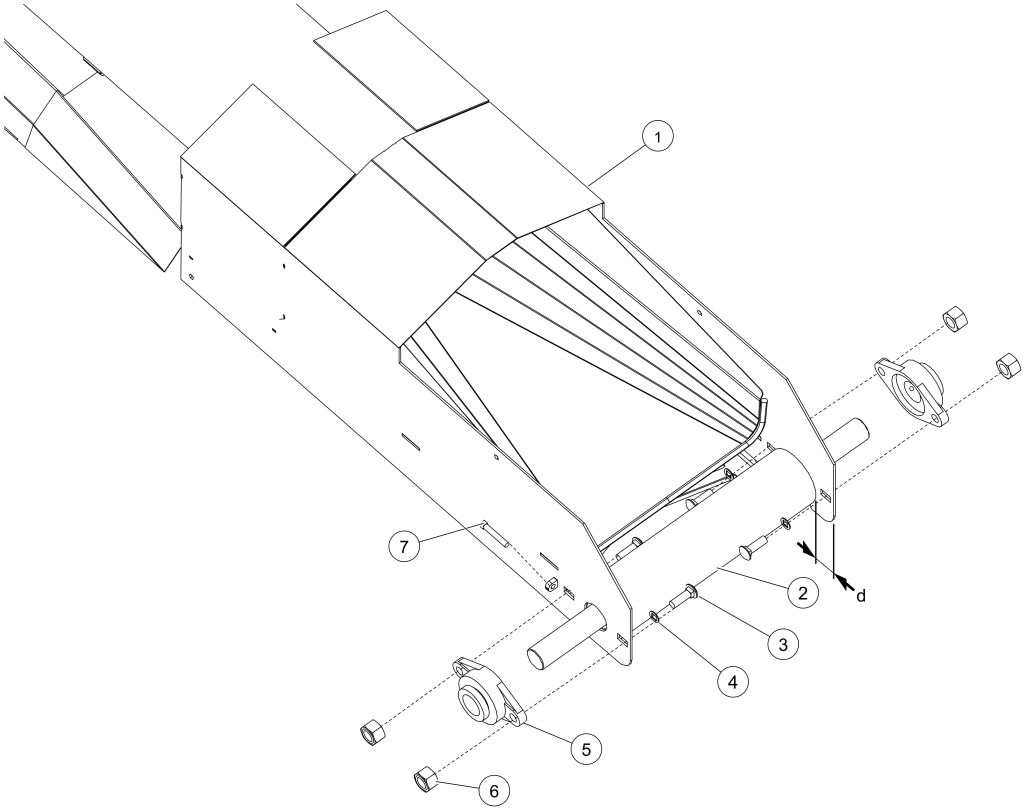
   Note

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

Table 5. Spout Roller Components

Item	Description	Quantity
1	Spout	1
2	Lagged Spout Roller	1
3	5/8" x 2" Carriage Bolt (plated)	4
4	Square Flat Washer (0.656" -1.25"-0.060")	4
5	1-15/16" Bearing Flange Unit (SAF FL210–31)	2
6	5/8" Nylon Locknut	4
7	7/16" x 2-1/2" Square-Head Set Screw	2

Figure 17. Installing Spout Roller



3.12. Install the Frame Slider

1. Slide the slider (2) onto the track (see Figure 18).
2. Install the cable attach (5) on the track with 7/16" x 1-1/2" bolts (3) and 7/16" locknuts (4).
3. Install the trackstop (1) on the track with 7/16" x 1-1/2" bolts (3) and 7/16" locknuts (4).

Note

You may need to drill holes to install the trackstop. Refer to your layout drawing to determine the location of the trackstop.

Note

Some conveyors do not require a trackstop. Refer to your layout drawing to determine if your conveyor requires a trackstop.

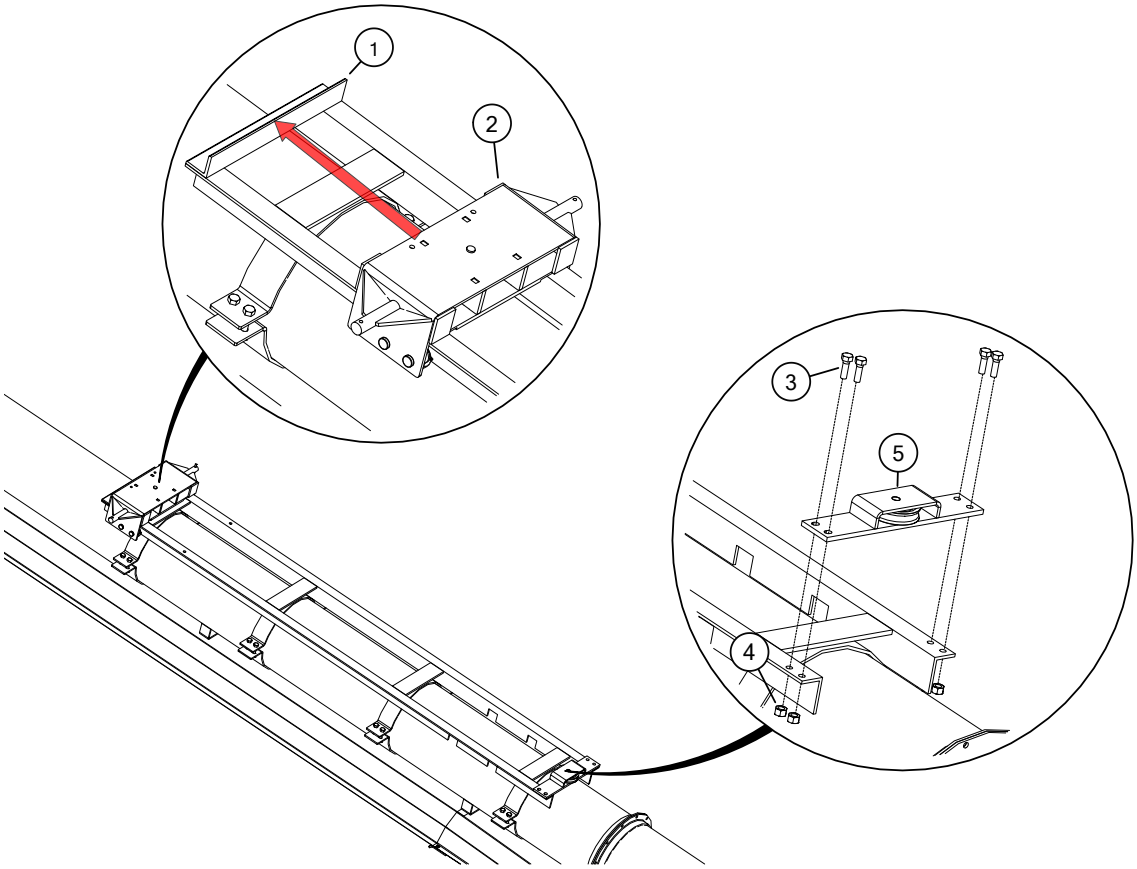
Table 6. Frame Slider Components

Item	Description
1	Trackstop
2	Slider
3	7/16" x 1-1/2" Hex Bolt (GR8)

Table 6 Frame Slider Components (continued)

Item	Description
4	7/16" Nylock Nut
5	Large Cable Attach

Figure 18. Installing the Frame Slider



3.13. Install the Hydraulic Winch

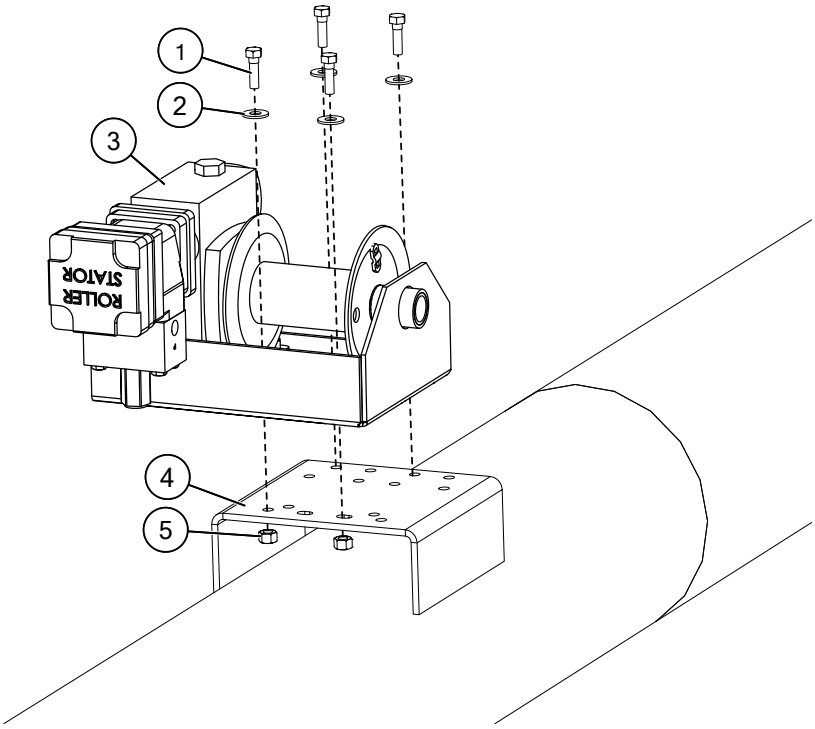
Depending on your conveyor model, it may be equipped with either a hand winch or a hydraulic winch.

1. Attach the winch (3) to the winch mount bracket (4) with 3/8" x 1" bolts (1), 3/8" flat washers (2), and 3/8" locknuts (5) (see Figure 19).

Table 7. Hydraulic Winch Components

Item	Description
1	3/8" x 1" Hex Bolt (GR8)
2	3/8" Flat Washer
3	Winch
4	Winch Mount Bracket
5	3/8" Nylon Locknut

Figure 19. Attaching the Winch to the Tube Bracket



Attach the Hydraulic Hose

1. Wrap threaded seal tape around the exposed thread of the hydraulic fittings.
2. Attach the hydraulic fittings (1, 2, 3) and hoses (4) (see Figure 20).

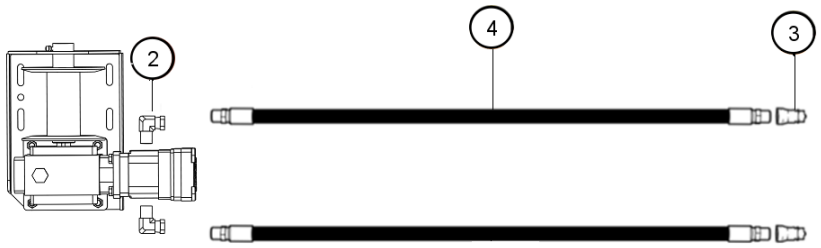
Note

Protect hose ends from dirt.

Table 8. Hydraulic Winch Fittings and Hoses

Item	Description	Quantity
2	Swivel 3/8" PT/90D	2
3	Quick Coupling Nipple 1/2" FPT	2
4	Hose 3/8"	2

Figure 20. Attaching the Hydraulic Hoses



3.14. Install the Hand Winch

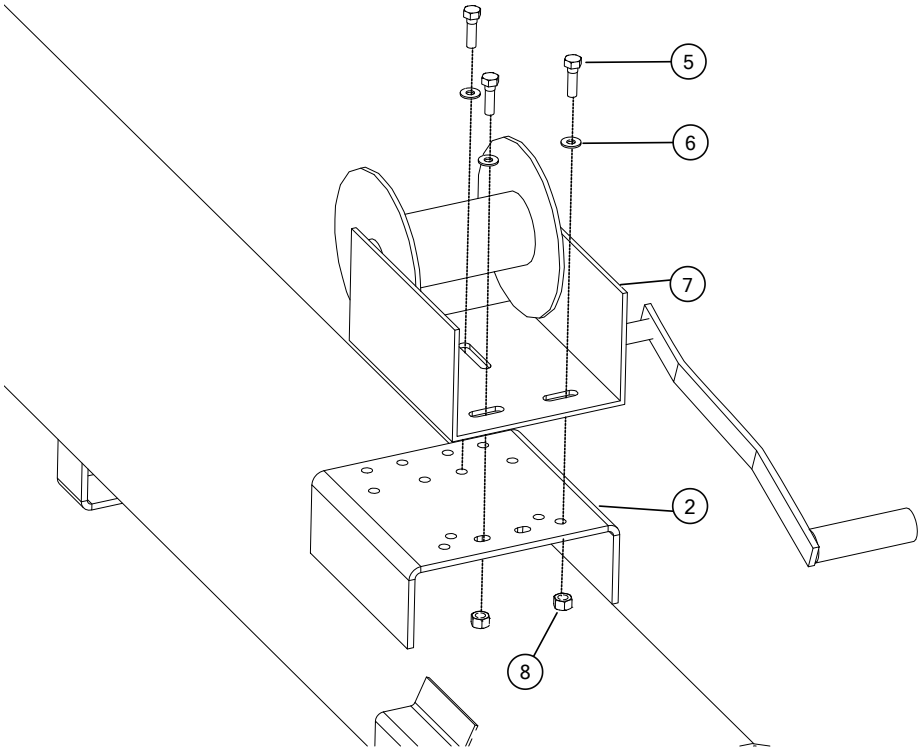
Depending on your conveyor model, it may be equipped with either a hand winch or a hydraulic winch.

1. Attach the winch (7) to the winch mount bracket (2) with 3/8" x 1" bolts (5), 3/8" flat washers (6), and 3/8" locknuts (8) (see Figure 21).

Table 9. Hand Winch Components

Item	Description
2	Winch Mount Bracket
5	3/8" x 1" Hex Bolt (GR 8)
6	3/8" Flat Washer
7	Hand Winch
8	3/8" Nylock Nut

Figure 21. Installing the Hand Winch



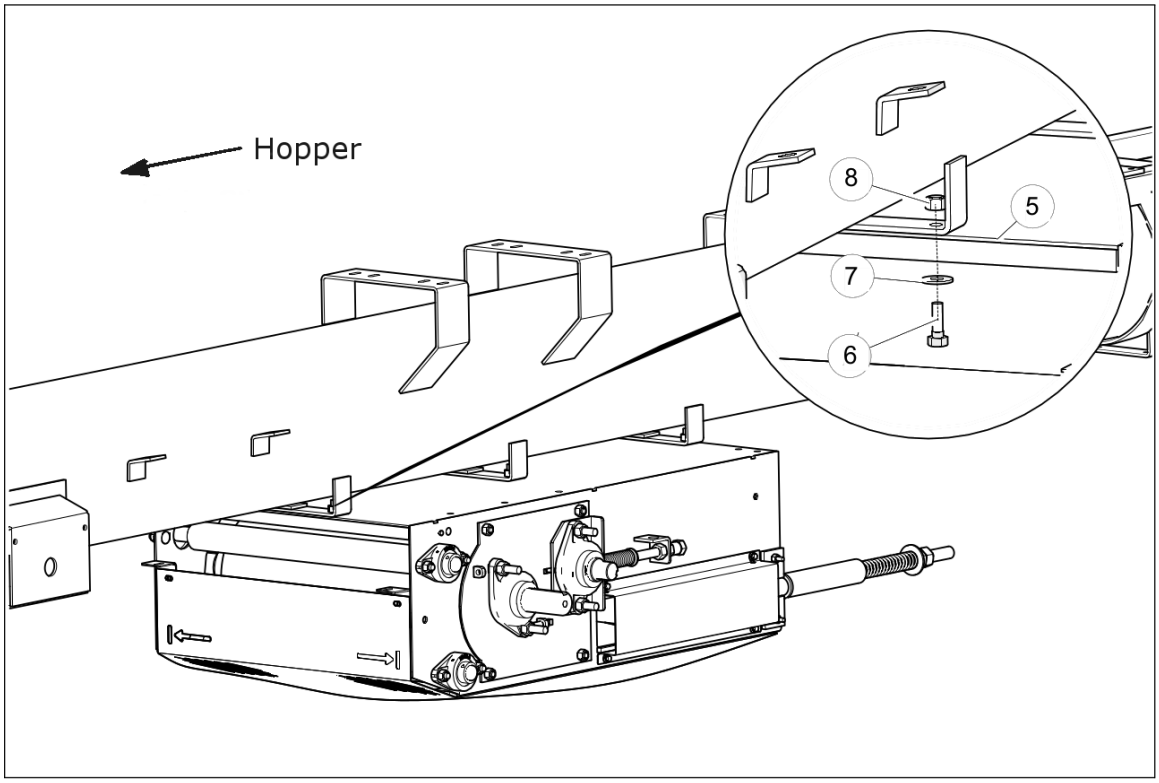
3.15. Attach the S-Drive

1. Attach the s-drive (5) to the brackets with 1/2" x 1–1/2" bolts (6), 1/2" flat washers (7), and 1/2" locknuts (8) (see Figure 22).

Table 10. Components to Install S-Drive

Item	Description	Quantity
5	S-Drive	1
6	1/2" x 1–1/2" Bolt Hex	6
7	1/2" Flat Washer USS	6
8	1/2" Nut Nylock	6

Figure 22. Attaching the S-Drive



3.16. Assemble the Weather Guard

1. Install the types of weather guard sections in Table 11 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 bi-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 23).

   NOTICE Overlap of the weather guard sections must be as shown to prevent belt damage.

   Note

   Weather guard type "G" is fastened directly into 1/4" threaded inserts in the top of the s-drive with two 1/4" x 1" hex bolts and two 1/4" flat washers.
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 11. Identifiers for Types of Weather Guard Sections

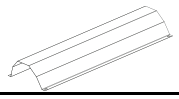
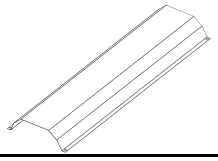
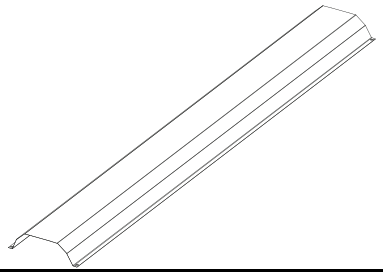
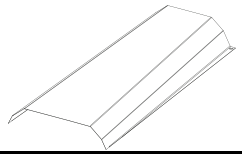
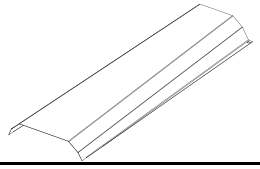
Identifier	Type of Weather Guard Section	
A	3' (0.91 m) Standard	
B	5' (1.52 m) Standard	
C	10' (3.05 m) Standard	
D	4' (1.22 m) Flared	
E	5' (1.52 m) Flared	

Table 11 Identifiers for Types of Weather Guard Sections (continued)

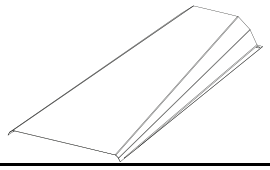
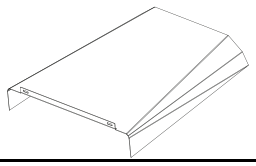
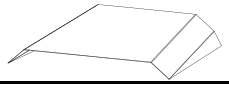
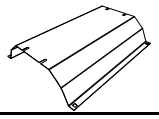
Identifier	Type of Weather Guard Section	
F	5' (1.52 m) Flat	
G	Guard -Above S-Drive	
H	Upper Transition	
J	2' (0.61 m) Standard	

Table 12. Components to Install the Weather Guard onto the Tube Bracket

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

Figure 23. Installing a Weather Guard Section

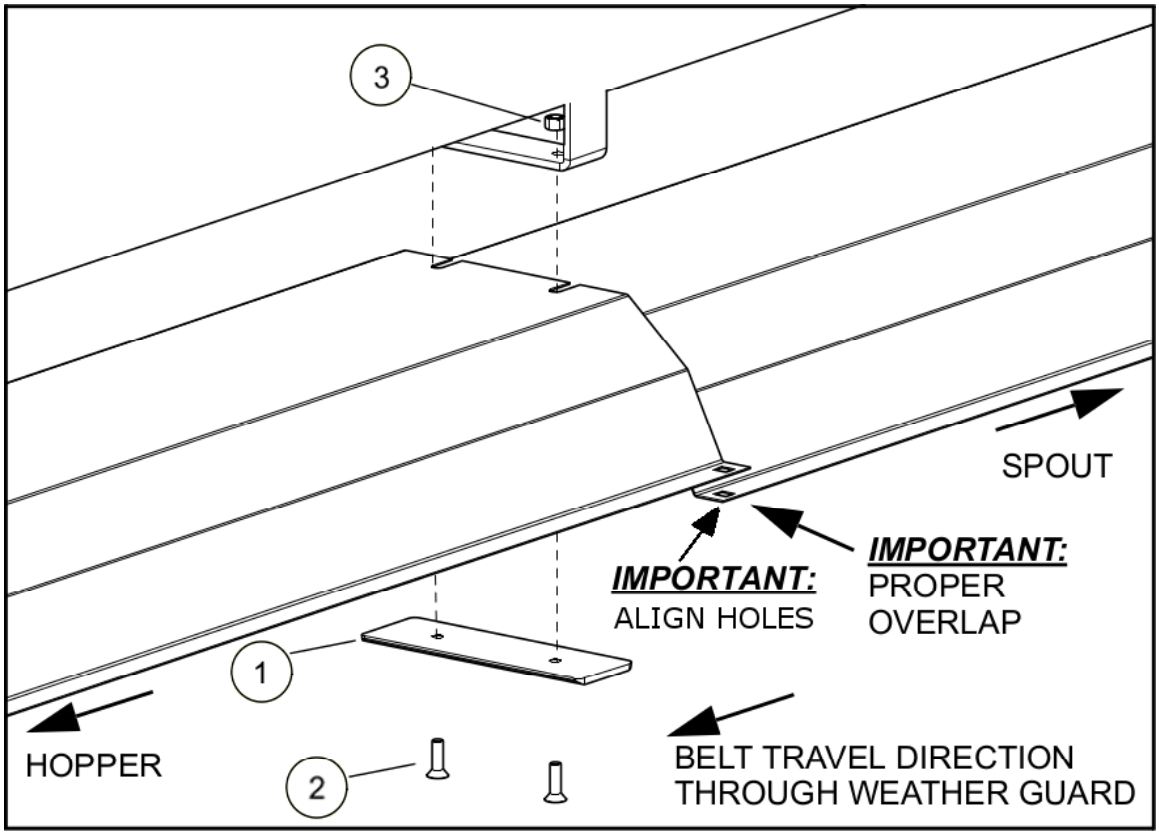


Figure 24. Weather Guard Section Locations (Batco and Westfield)

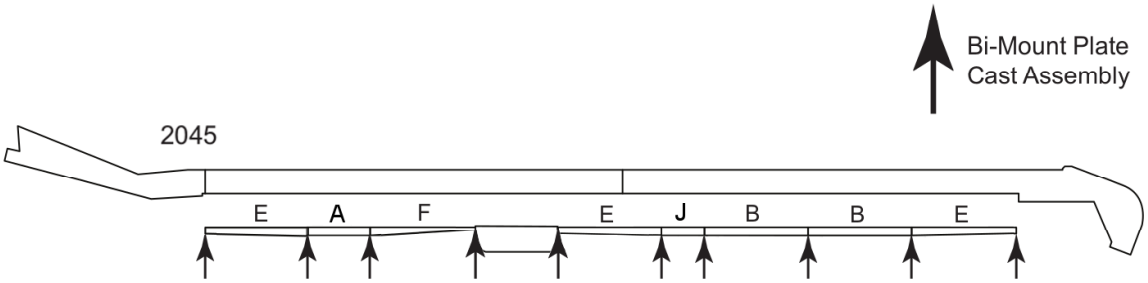
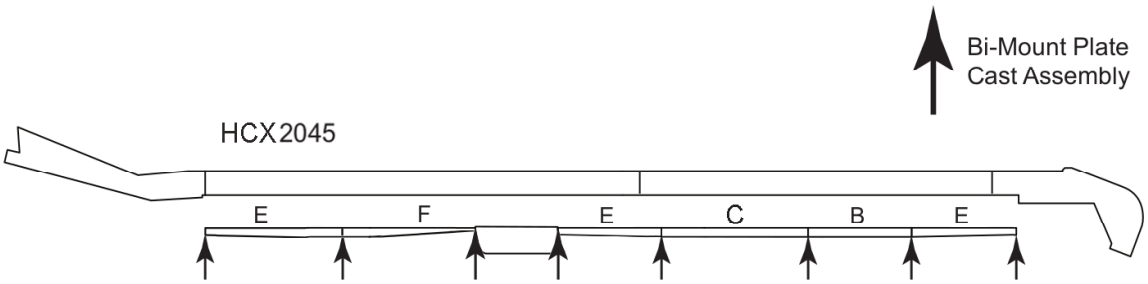


Figure 25. Weather Guard Section Locations (Hutchinson)



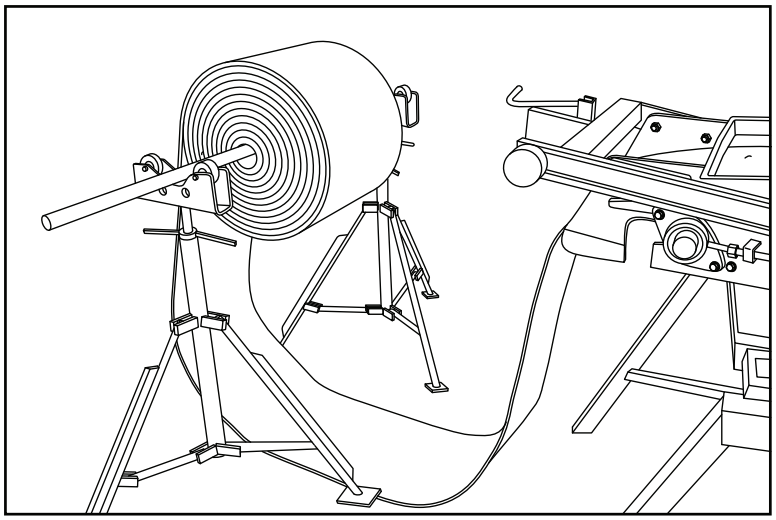
3.17. Install the Belt

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

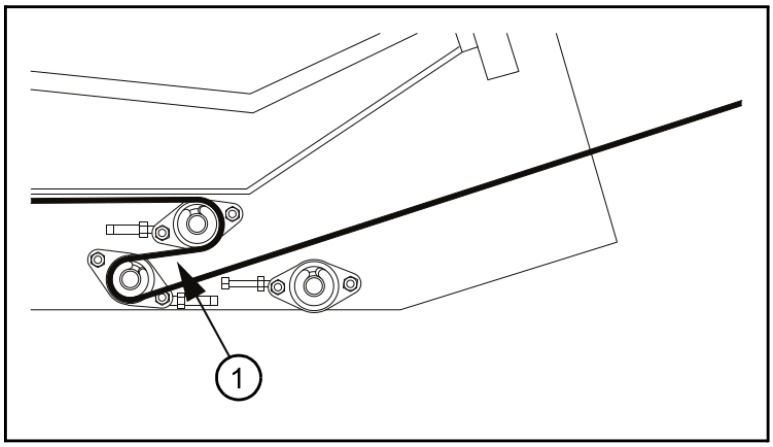
1. Place the rolled belt on a stand behind the hopper.
2. Pull the conveyor belt over the top of the hopper roller, until just inside the hopper, as shown below.

Figure 26. Rolled Belt Behind a Typical Hopper



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

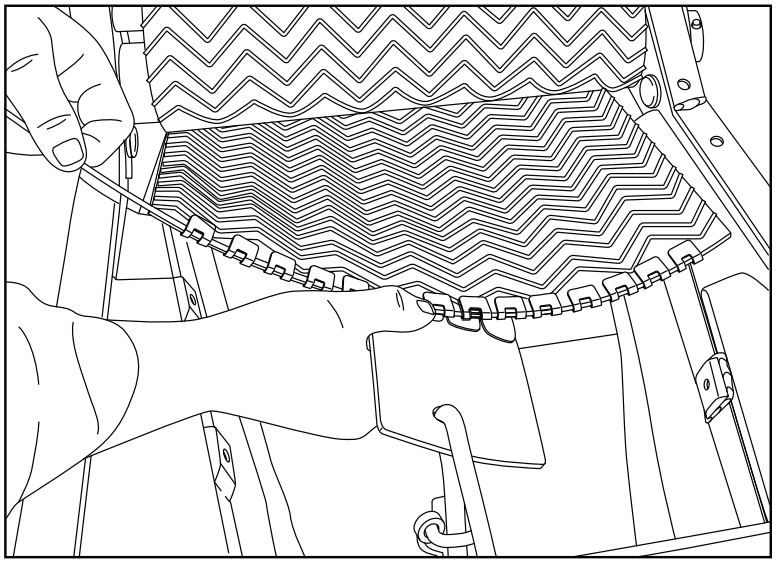
Figure 27. Belt Through Transition Rollers



Item	Description
1	Transition Roller

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

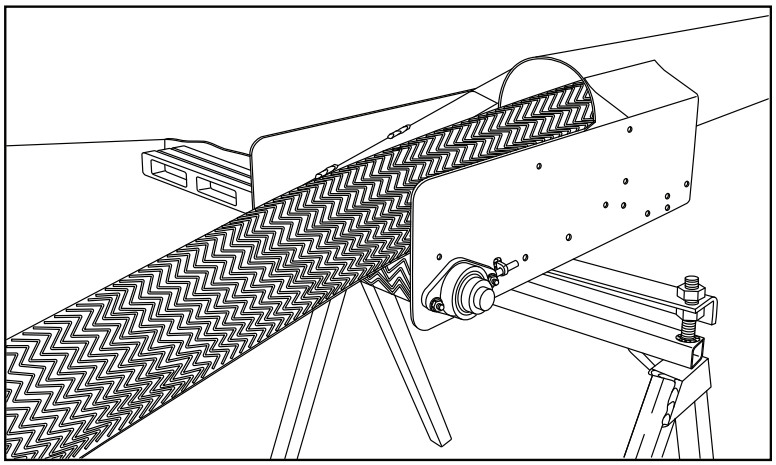
Figure 28. Attaching the Short Belt Piece to the Belt



Thread the Conveyor Belt

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

Figure 29. Conveyor Belt Pulled Through the Spout



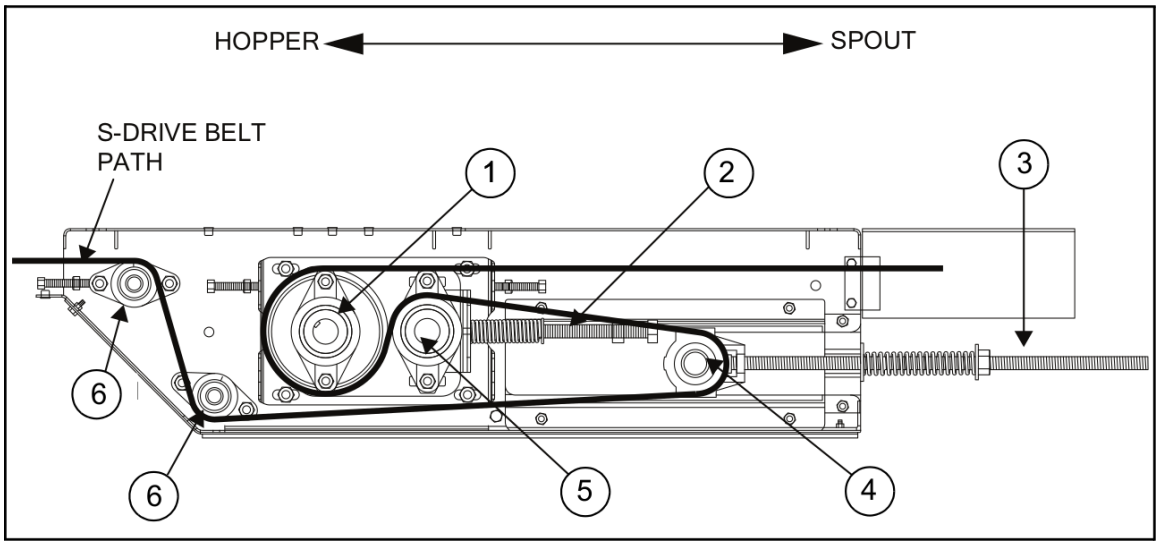
2. Wrap the belt around the spout roller and pull it back under the conveyor tube up to the s-drive.
3. Remove the s-drive bottom guard.
4. Loosen the s-drive pinch roller bolts and take-up roller bolts (on both sides of s-drive) to the end of their threads.

   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.

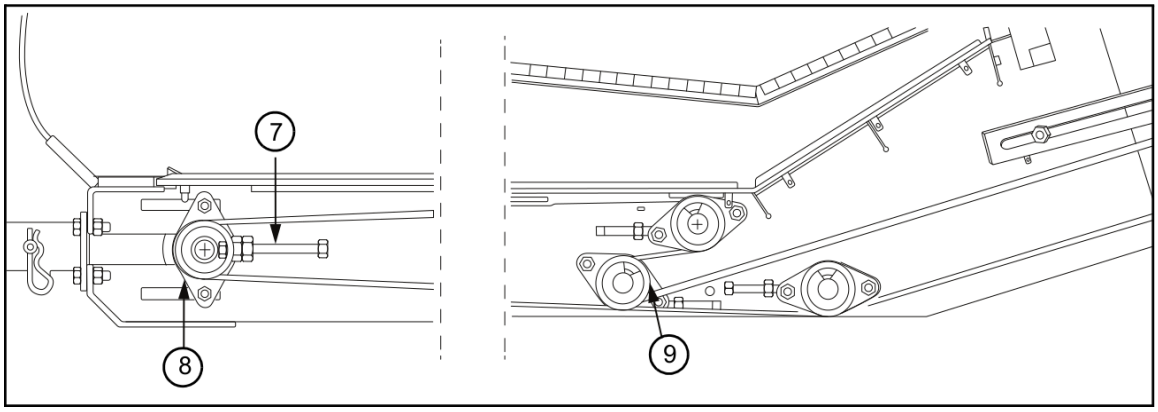
Figure 30. S-Drive Conveyor Belt Path



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 belt around the spout roller and back under the conveyor tube to the hopper.
8. Wrap the remaining conveyor belt around the hopper roller and under the tube.

Figure 31. Conveyor Belt Bottom Path



Item	Description
7	Hopper Roller
8	Take-up Bolt
9	Transition Roller

The conveyor belt is now ready to be connected.

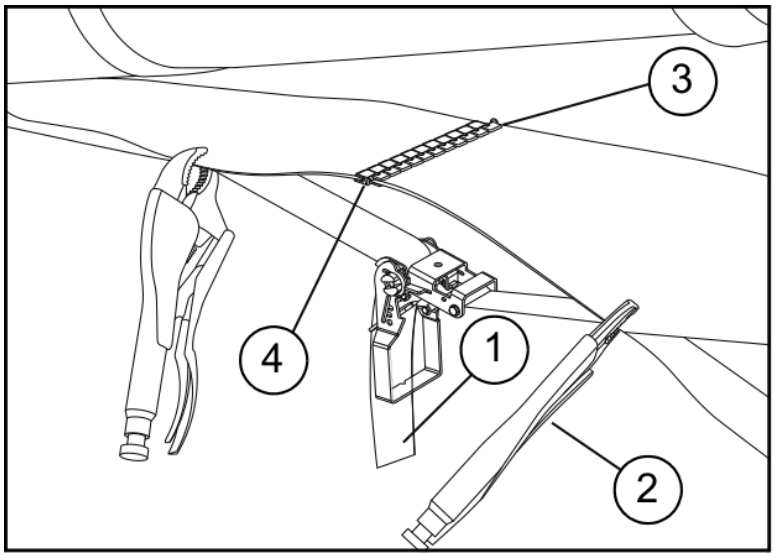
Connect the Conveyor Belt

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).

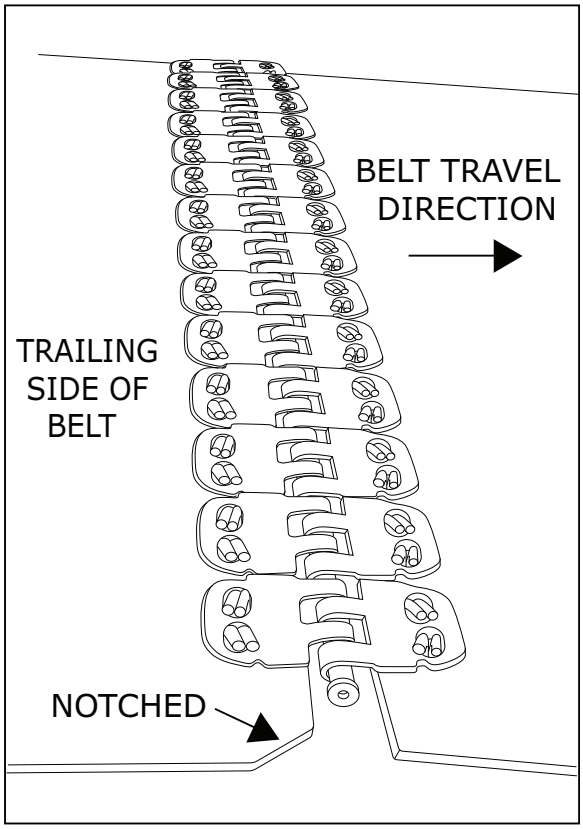
Figure 32. Using a Strap Puller



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 33. Tapering the Trailing Edge of the Belt

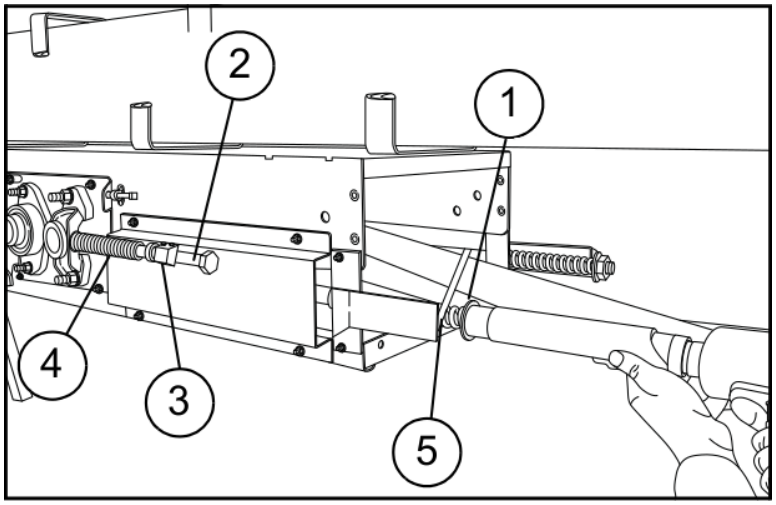


Tighten the Conveyor Belt

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 34. 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.

3.18. Install the Weather Guard Mount Bars

1. Install the types of mount bar assemblies in Figure 35 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 13. 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

Table 13 Weather Guard Mount Bar Components (continued)

Item	Description
7	5/16" Hex Nut
8	5/16" Lock Washer

Figure 35. Types of Mount Bar Assemblies

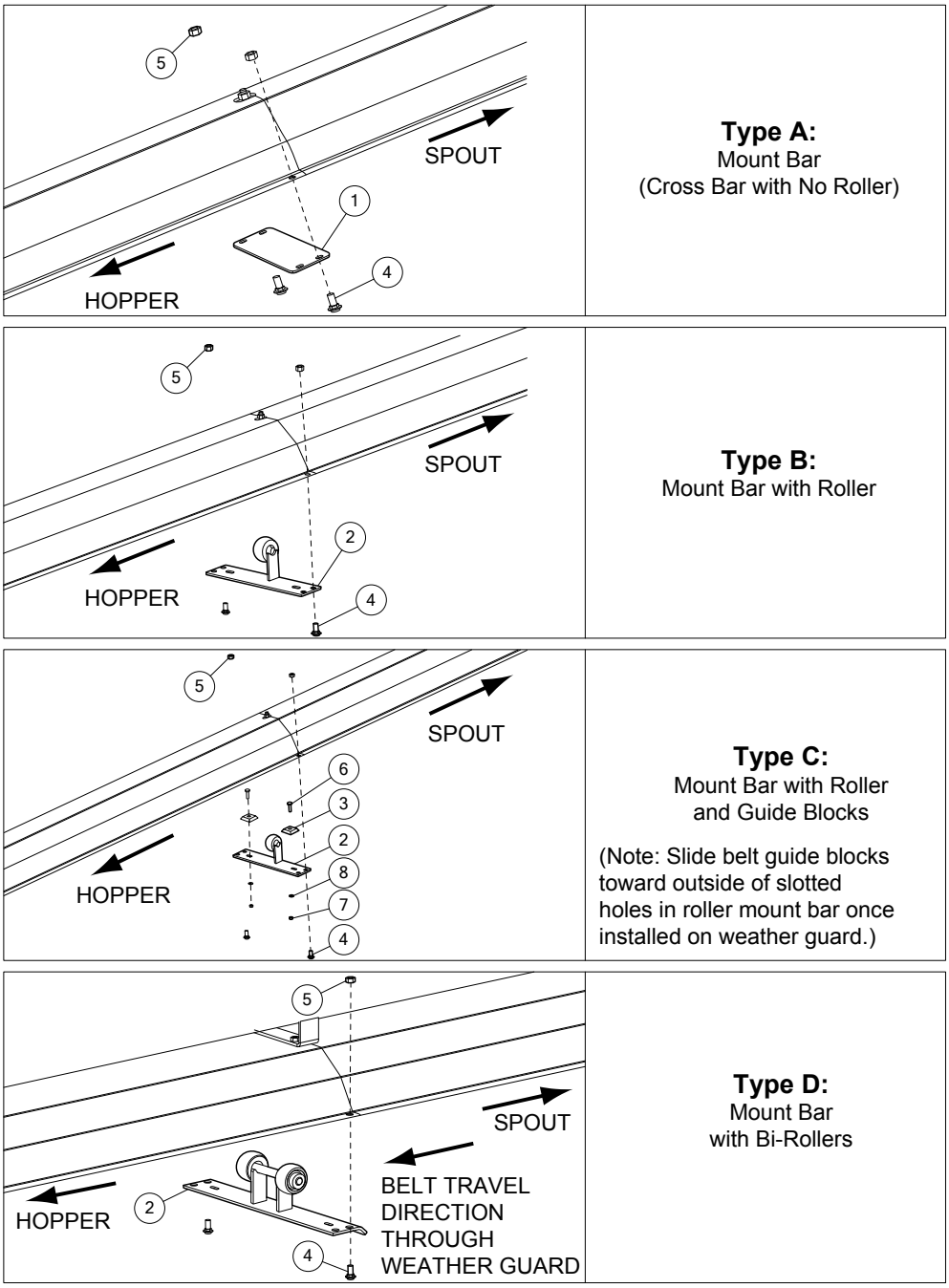


Figure 36. Mount Bar Schematic Diagram (Batco and Westfield)

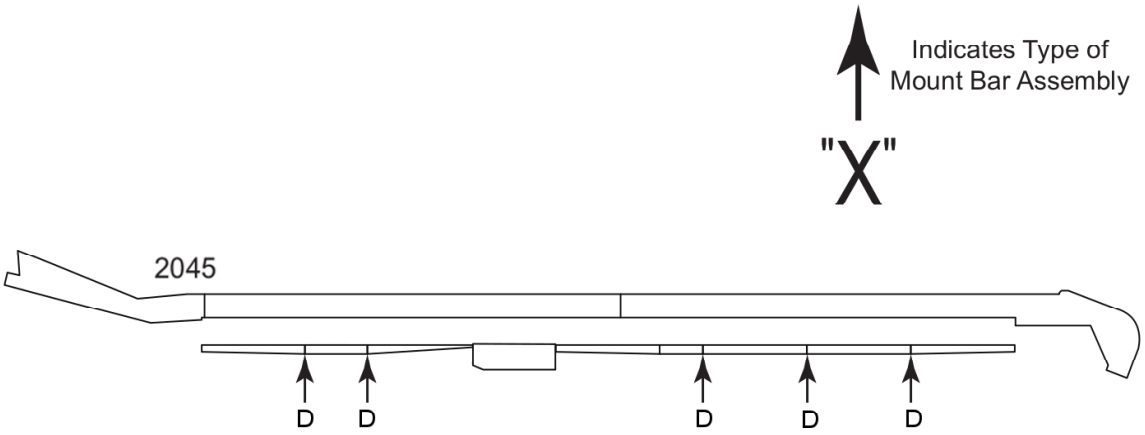
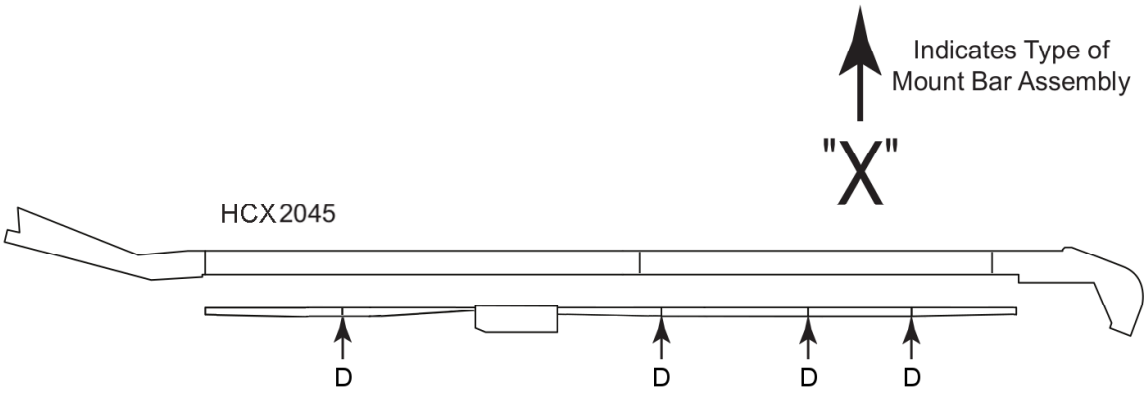


Figure 37. Mount Bar Schematic Diagram (Hutchinson)



3.19. Install the Collapsible Hopper Cloth

Install the Flashing

1. Lay the front flashing (1) on the hopper while ensuring it is flush with the edge of the main hopper frame (see Figure 38).

   Note

   The textured side of the flashings should be facing down.

2. Install the transition flashing (3) with 1/4" x 1" self-tapping screws (4) and 1/4" flat washers (5) (see Figure 44 on page 62 for screw positions)
3. Lay the side flashings (2) on the hopper while ensuring they are flush with the edge of the main hopper frame and overlapping the front flashing.

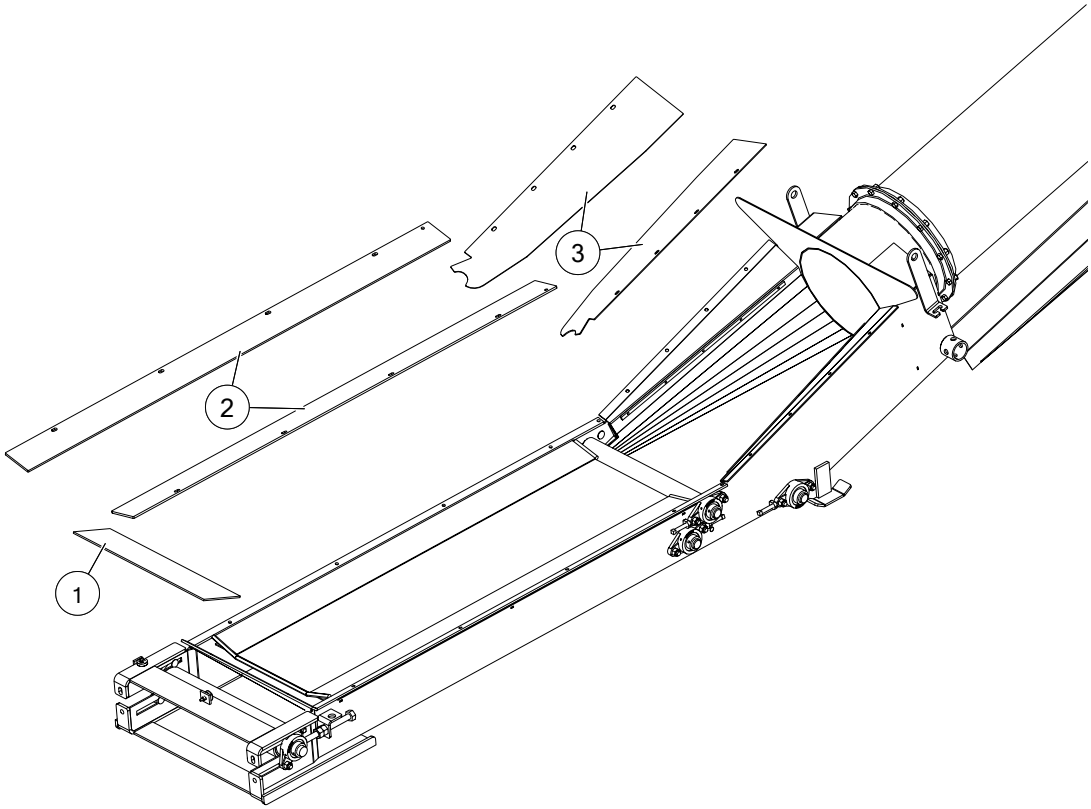
Table 14. Flashings

Item	Description	Quantity
1	Front Flashing	1
2	Side Flashing	2

Table 14 Flashings (continued)

Item	Description	Quantity
3	Transition Flashing	2
4	1/4" x 1" Self Tapping Screw	10
5	1/4" Flat Washer	10

Figure 38. Flashings



Install the Pivot Shaft

1. Slide the pivot shaft (1) through the mounting holes (see Figure 39).
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).

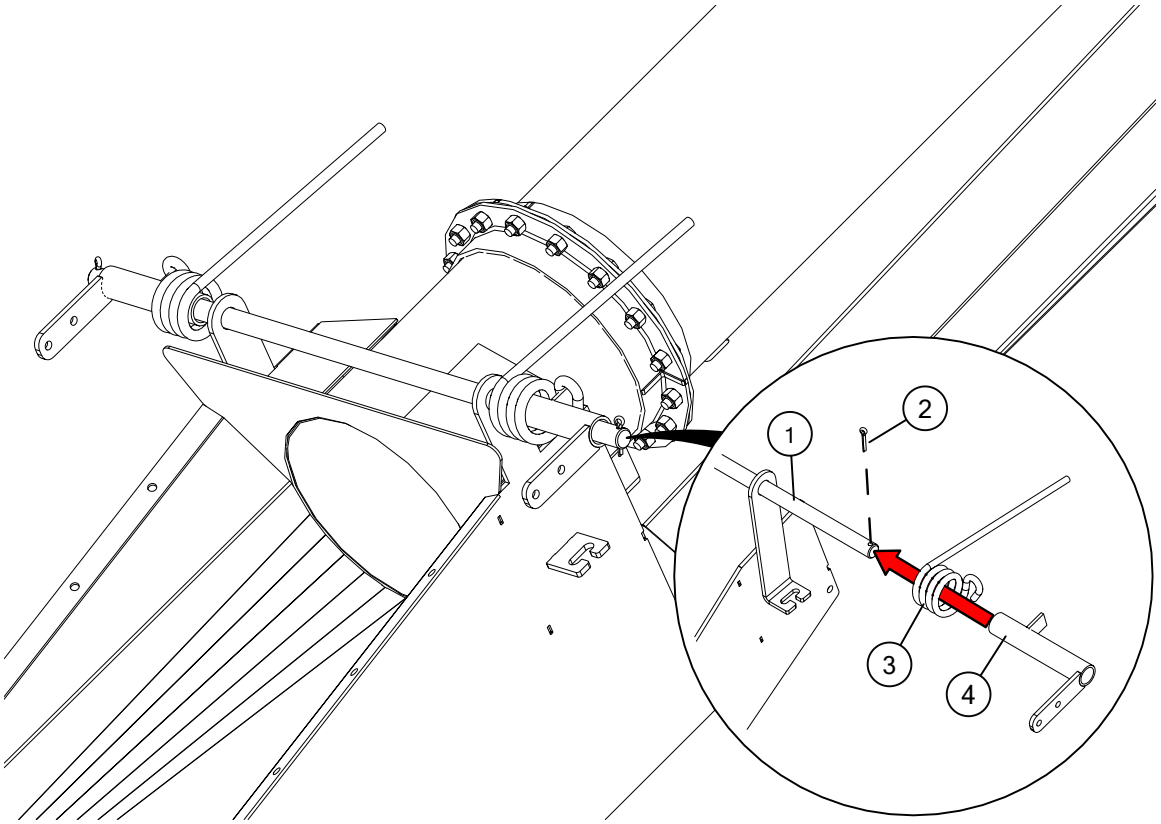
Table 15. Pivot Shaft Components

Item	Description
1	Pivot Shaft
2	Cotter Pin

Table 15 Pivot Shaft Components (continued)

3	Hopper Spring
4	Shaft Bracket

Figure 39. Installing the Pivot Shaft, Hopper Springs, and Shaft Brackets



Install the Hopper Cloth Frame

1. Slide the two upper side frames (1, 6) into the hopper cloth (2) (see Figure 40).
2. Slide the upper front frame (8) into the hopper cloth.
3. Fasten the upper side frames to the upper front frame using 3/8" x 1" hex bolts (9) and 3/8" nuts (10).

   Note

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

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

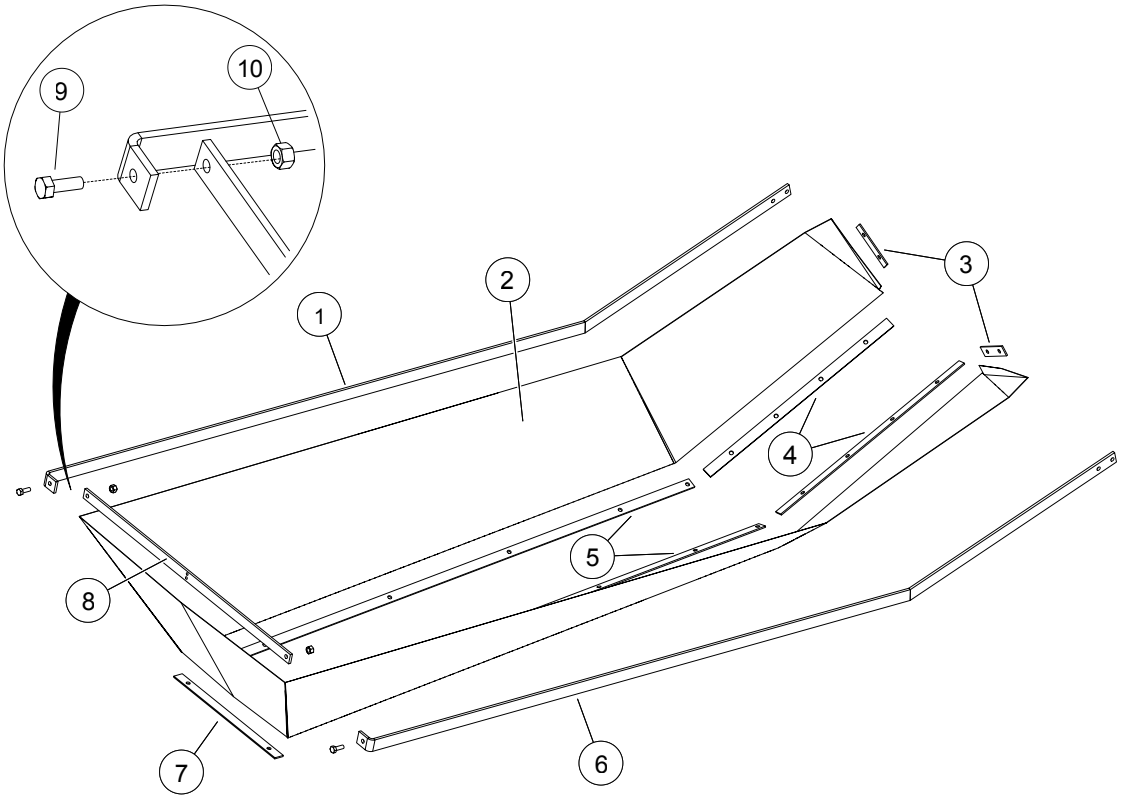
Table 16. Hopper Cloth Frame Components

Item	Description
1	TR Upper Side Frame (left)
2	Hopper Cloth

Table 16 Hopper Cloth Frame Components (continued)

Item	Description
3	TR Lower Back Frame
4	TR Lower Side Frame (short)
5	TR Lower Side Frame (long)
6	TR Upper Side Frame (right)
7	TR Lower Front Frame
8	TR Upper Front Frame
9	3/8" x 1" Hex Bolt
10	3/8" Nut

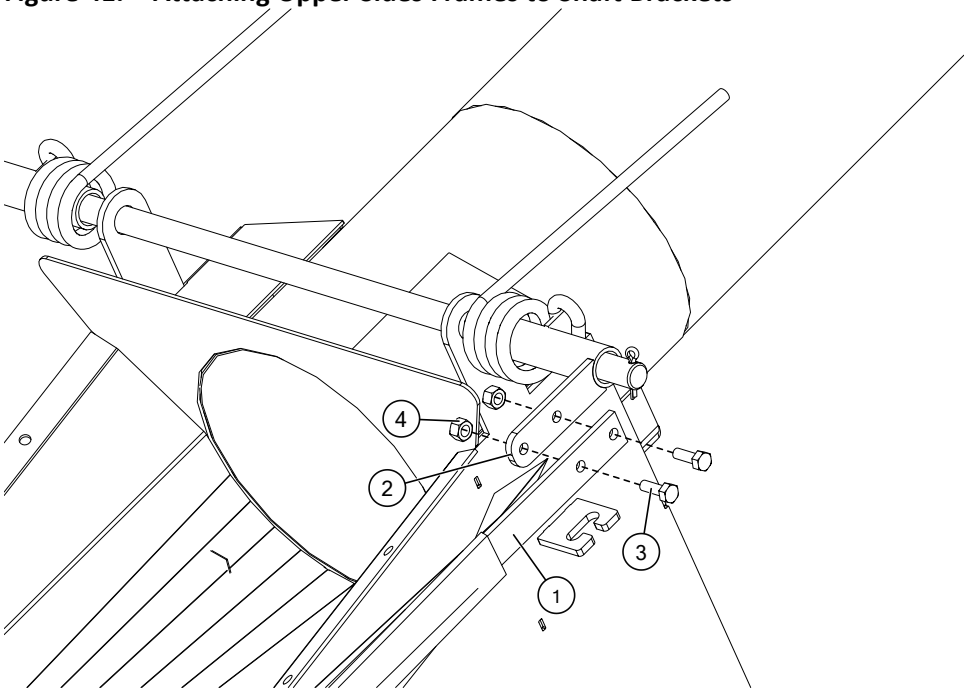
Figure 40. Installing the Hopper Cloth Frame



Install the Hopper Cloth

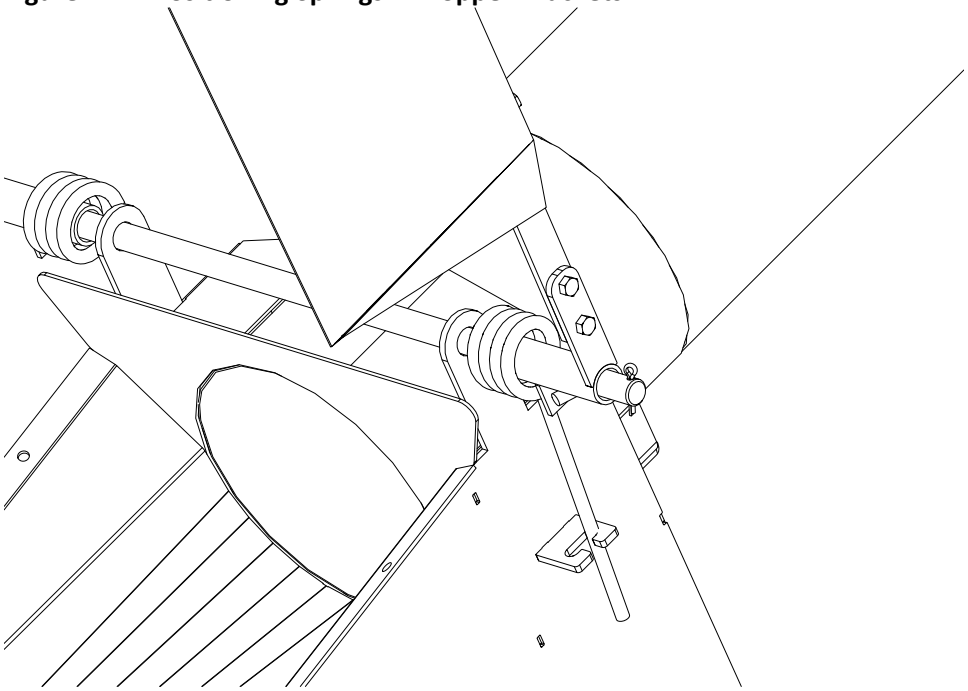
1. Attach the upper side frames (1) to the shaft brackets (2) using 3/8" x 1" hex bolts (3) and 3/8" nuts (4) (see Figure 41).

Figure 41. 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 42).

Figure 42. Positioning Springs in Hopper Brackets

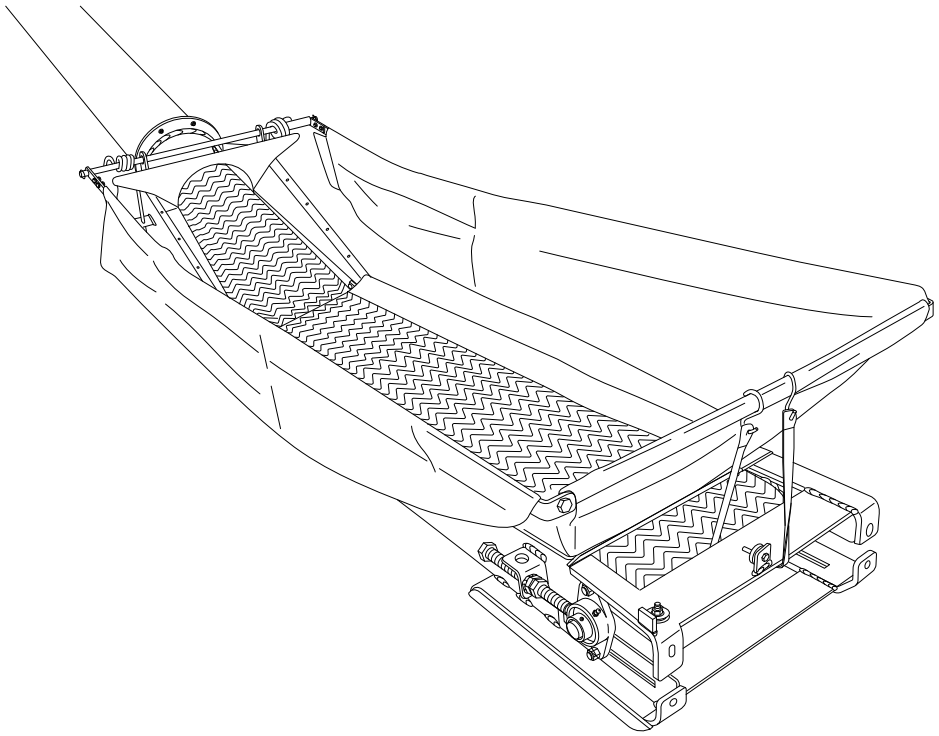


3. Pull the upper front frame down until the bottom of the cloth touches the front flashing, and hold it in place with a bungee cord around the front frame of the hopper weldment (see Figure 43).

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 43. 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 40 on page 59).
5. Attach the hopper cloth to the conveyor (see Figure 44):
   - First, attach the front of the hopper cloth to the front flashing. Afterward, attach the sides.
   - Drill through the hopper cloth and use the existing holes as a guide through the lower frames, flashings, and hopper weldment.
   - Fasten using 1/4" x 1-1/4" elevator bolts (5) and 1/4" nuts (6).
6. Attach the lower back frames to the hopper using 1/4" x 1" self-tapping screws (7), 1/4" flat washers (8), and vinyl screw caps (10).
7. Install trimlock (9) onto the upper frame of the hopper cloth.

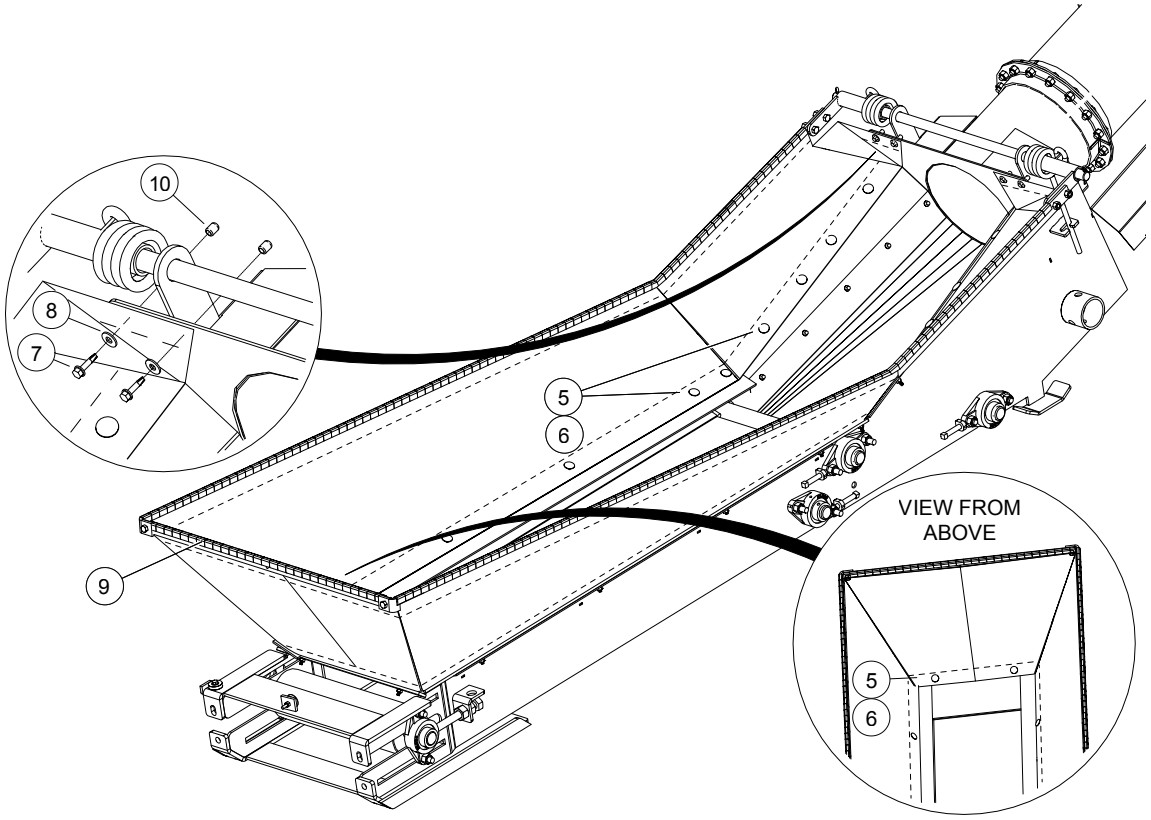
Table 17. Components for Installing the Hopper Cloth onto the Conveyor

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	20

Table 17 Components for Installing the Hopper Cloth onto the Conveyor (continued)

Item	Description	Quantity
6	1/4" Nut	20
7	1/4" x 1" Self-tapping Screw	4
8	1/4" Flat Washer	4
9	Trimlock (length in feet)	19
10	Vinyl Screw Cap	4

Figure 44. Installing the Hopper Cloth onto the Conveyor



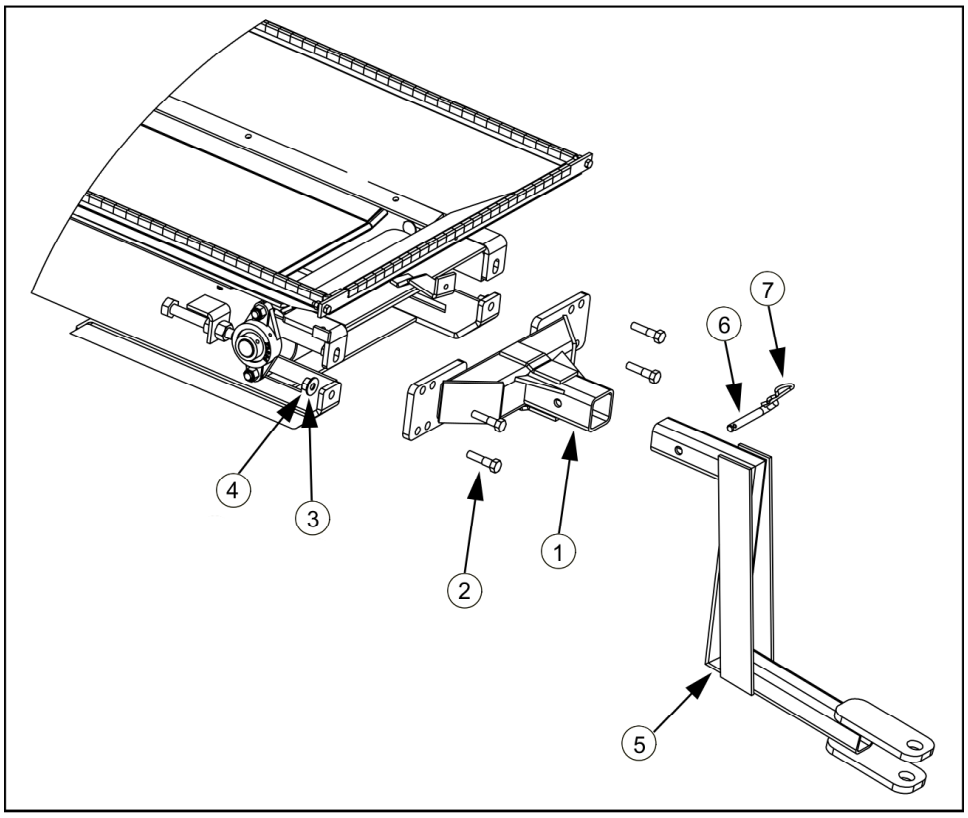
3.20. Attach the Hitch

1. Attach the hitch (1) to the hopper weldment using 1/2" x 2" bolts (2), 7/16" flat washers (3) and 1/2" nuts (4).
2. Insert the tongue (5) into the tongue stub.
3. Secure the tongue in place using 3/4" x 3-1/2" hitch pin (6) and 3/16" x 3–1/4" hairpin (7).

Table 18. Hitch Components

Item	Description	Quantity
1	Hitch FL (1 PC)	1
2	1/2" x 2" Bolt	4
3	7/16" Flat Washer	4
4	1/2" Nylock Nut	4
5	Tongue - Drop FL	1
6	3/4" x 3-1/2" Hitch Pin	1
7	3/16" x 3-1/4" Hairpin	1

Figure 45. Hitch Components



3.21. Install the Collapsible Hopper Cloth Controls

Install the Hopper Handle

1. Attach the hopper handle (3) to the handle bracket using a 3/8" x 1–1/2" bolt (1), 3/8" nylon washer (5), and two 3/8" hex nuts (2) (see Figure 46).

Figure 46. Installing Hopper Handle

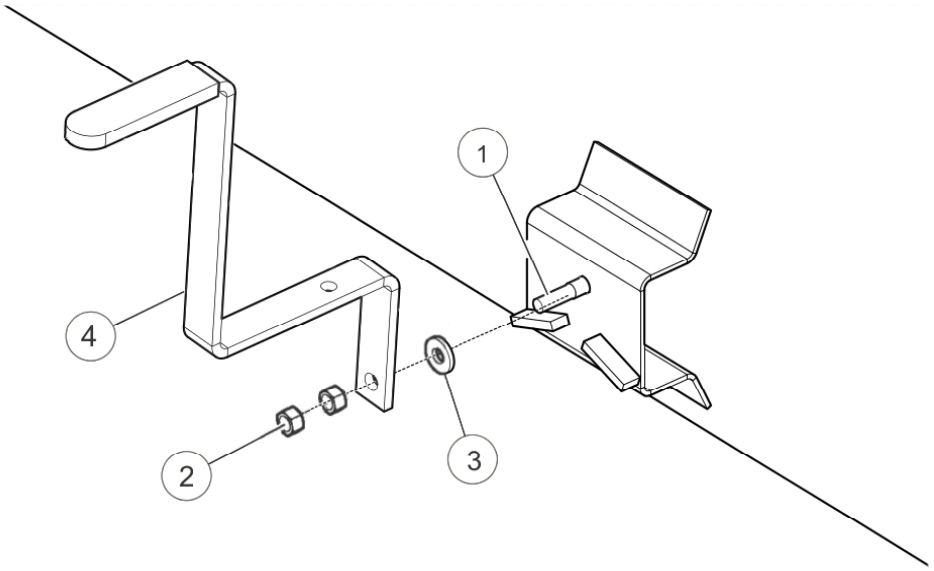


Table 19. Handle Components

Item	Description
1	3/8" x 1-1/2" Hex Bolt Gr8 Plated
2	3/8" Hex Nut
3	3/8" Nylon Washer (USS)
4	Hopper Handle

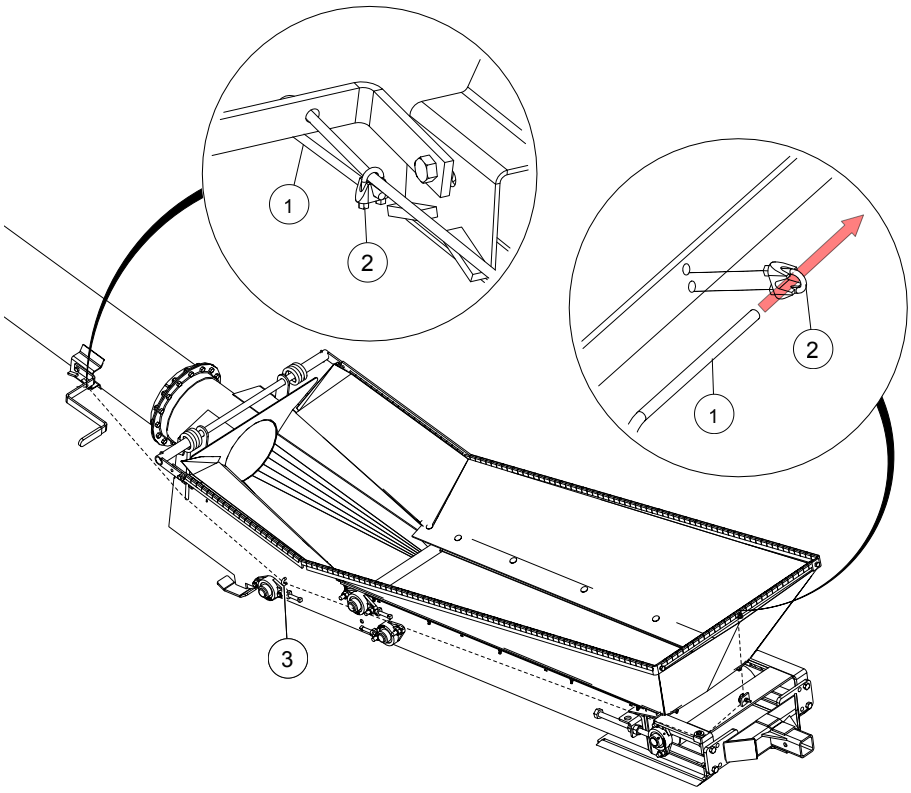
Install the Cable and Clamps

1. Point the hopper handle toward the hopper (see Figure 47).
2. Secure the cable (1) to the handle with a cable clamp (2).
3. Route the cable through the cable rung (3) and around the cable sheaves.
4. Secure the cable (1) to the hopper frame using a cable clamp (2) and the pre-drilled holes in the frame.
5. Test the function of the collapsible hopper cloth controls by raising and lowering the handle. Adjust cable tension as required.

Table 20. Cable and Clamp Components

Item	Description
1	1/8" Cable - 14' [4.3 m]
2	1/4" Cable Clamp
3	Cable Rung

Figure 47. Installing the Cable and the Clamps



3.22. Install the Spout Hood

1. Place the hood (2) around the bearing assembly (see Figure 48).
2. Use 1/4" x 1–1/2" self-tapping screws (3) and 1/4" flat washers (4) to tighten the hood (2) to the conveyor spout (1).

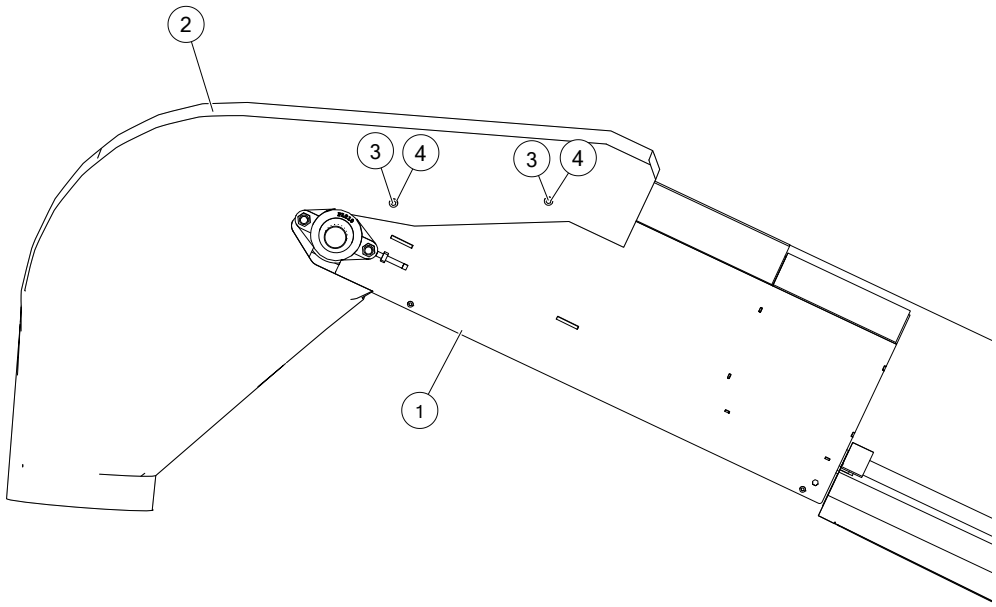
Note

Make sure the screws will not interfere with belt operation.

Table 21. Spout Hood Components

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

Figure 48. Installing Spout Hood



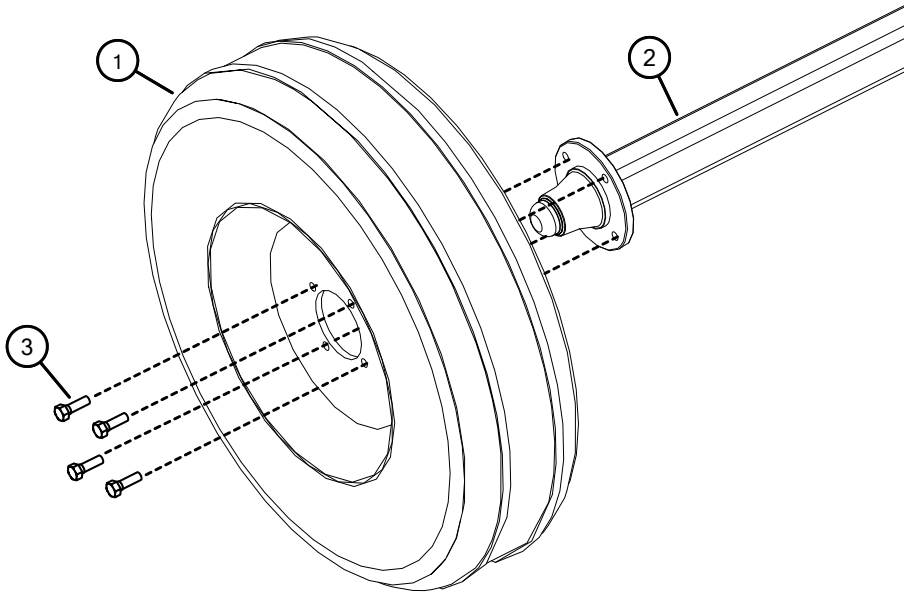
3.23. Install the Wheels

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 49).

Table 22. Components to Attach the Wheels to the Axle

Item	Description
1	Tire Assembly
2	Axle
3	Wheel Bolt

Figure 49. Attaching the Wheels to the Axle



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

3.24. Assemble the A-Frame

Ensure the wheels are mounted to the axle before beginning this procedure.

1. Loosely fasten the axle arms (5) to the mount plate on the axle (4) using 3/4" x 2" bolts (18), 3/4" flat washers (19), and 3/4" nuts (8).

   Note

   The axle arms will be tightened after the upright arms have been installed.

2. Fasten the axle arms to the suspension bracket using 1" x 2-1/2" hex bolt (7) and 1" nylock nuts (9).
3. Secure the slider (1) to the end of the track (towards the spout) using vise-grips.
4. Fasten the upright arms (3) to the slider (1) using 1" flat washers (12) and 1/4" x 2" cotter pins (11).
5. Fasten the rail frame cross brace (14) to the mount plate on the upright arms (3) using 3/4" x 2" bolts (15), 3/4" flat washers (16), and 3/4" locknuts (8).
6. Lift the spout end of the tube until the loose ends of the upright arms align with their brackets on the axle.
7. Fasten the upright arms to the axle using 1" x 3" hex bolts (6) and 1" nylock nuts (9).
8. Tighten the bolts that fasten the axle arms to the axle.
9. Lower tube and remove vise grips.

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

Table 23. A-Frame Components

Item	Description	Quantity
1	35/45 Slider	1
3	45FL Upright Arm	2
4	Axle Assembly	1
5	Axle Arm	2
6	1" x 3" Hex Bolt	2
7	1" x 2-1/2" Hex Bolt	2
8	3/4" Nylock Nut	12
9	1" Nylock Nut	2
11	1/4" x 2" Cotter Pin	2
12	1" Flat Washer USS Plated	4
14	Rail Cross Brace	1
15	3/4" x 2" Hex Bolt	8
16	3/4" Flat Washer USS	8

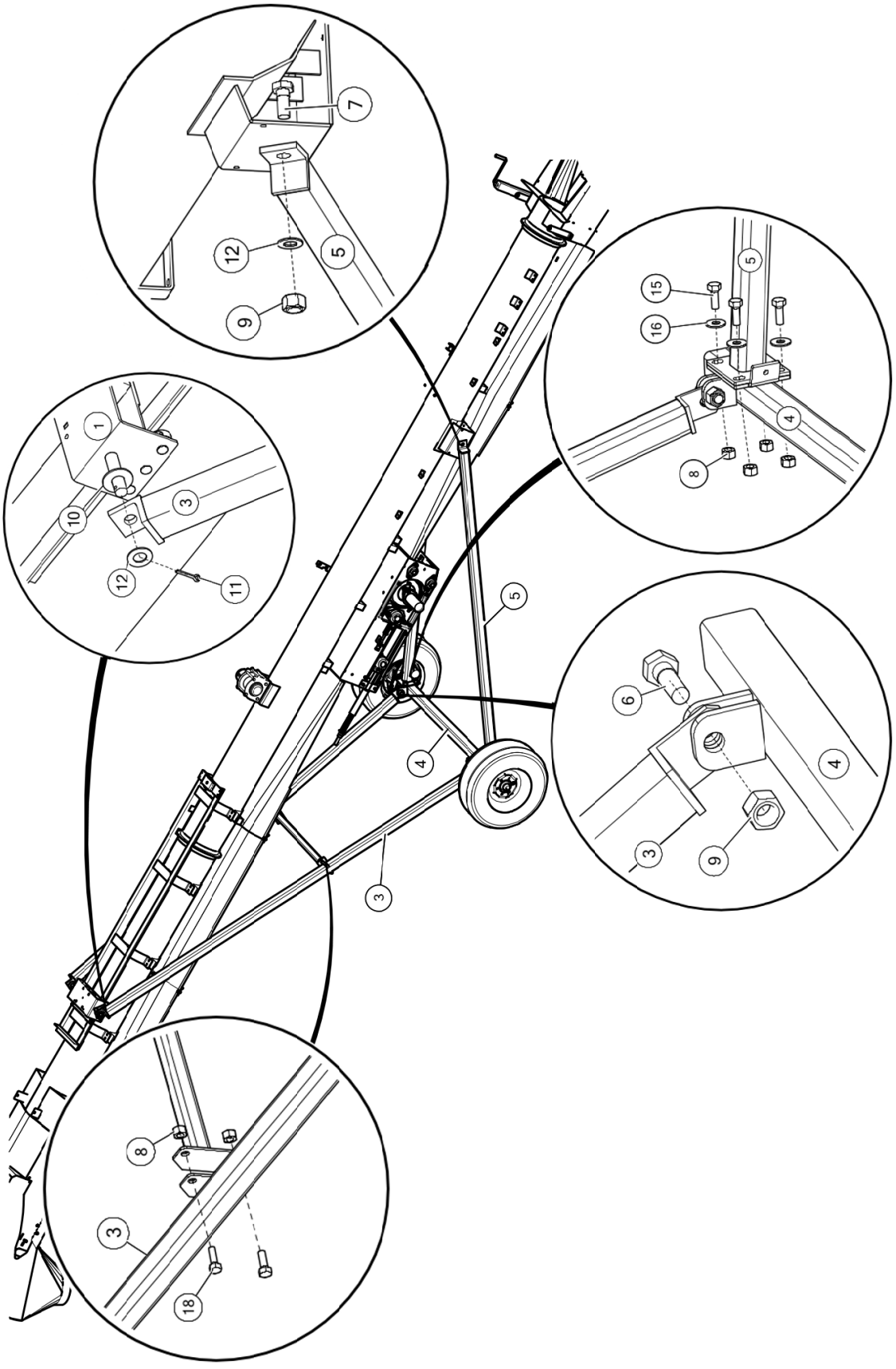


Figure 50. A-Frame Components

3.25. Install the Tube Lift Cable

1. Wrap the cable (1) around the bottom side of the winch drum with three complete wraps around the drum when conveyor is in transport position (see Figure 51).

   ⚠ WARNING Failure to follow could result in conveyor collapse and cause serious injury.

2. Thread cable onto drum and secure with spool anchor.
3. Run the cable towards the spout.
4. **For models with a hand winch:** Route the cable through the motor mount pipe (see Figure 52).

   Note

   If your model has a hydraulic winch, then the winch is mounted closer to the spout than the s-drive, so routing the cable through the motor mount pipe is not necessary in that case.

5. Thread the cable through the top slider pulley (see Figure 53).
6. Run the cable from the top slider pulley towards the hopper and thread it through the cable attach pulley.
7. Run the cable towards the spout and thread it through the bottom slider pulley.
8. Run the cable from the bottom slider pulley towards the hopper and stop at the cable attach (3).
9. Loop the cable under and around the cable attach and secure it with two 5/16" cable clamps (2).
10. Trim excess cable.
11. Test the function of the winch by lifting the conveyor to its raised position.

    ⚠ WARNING Crushing/impact hazard

    Do not stand under the conveyor while testing the winch. The conveyor may drop unexpectedly. Ensure all equipment and personnel are clear of the conveyor while testing the winch.

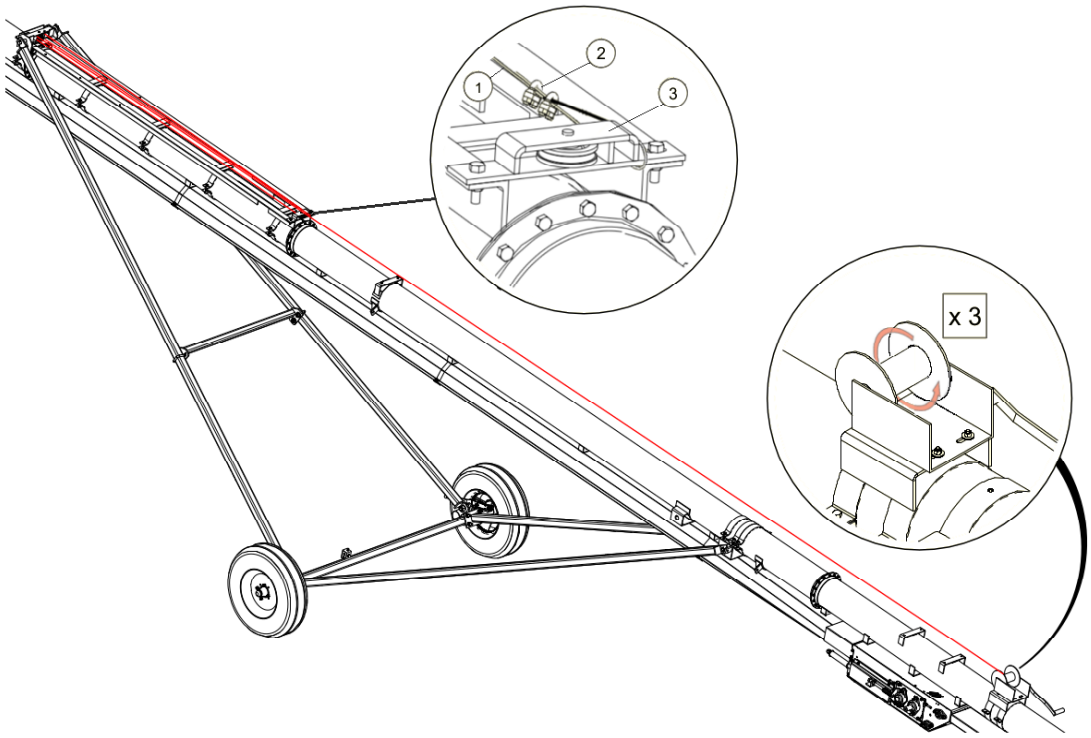
    NOTICE The tube lift components may become damaged.

    Stop the test if anything should slide, slip, or jam. Correct the issue before continuing.

Table 24. Tube Lift Cable Components

Item	Description	Quantity
1	5/16" 7 x 19 GAC Cable (For Hydraulic Winch)	40'
	5/16" 7 x 19 GAC Cable (For Hand Winch)	54'
2	Slider	1
3	5/16" Clamp Cable	2
4	Large Cable Attach	1

Figure 51. Installing the Tube Lift Cable



Note

The preceding figure depicts a hand winch.

Figure 52. Routing Cable through Motor Mount Pipe (if equipped with Hand Winch)

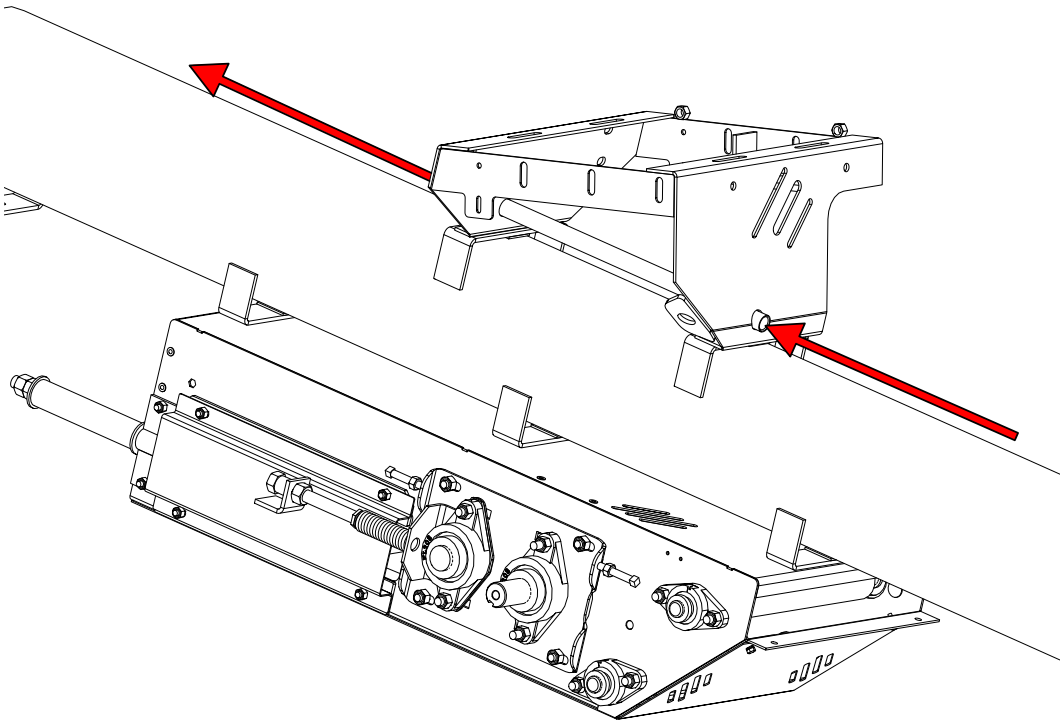
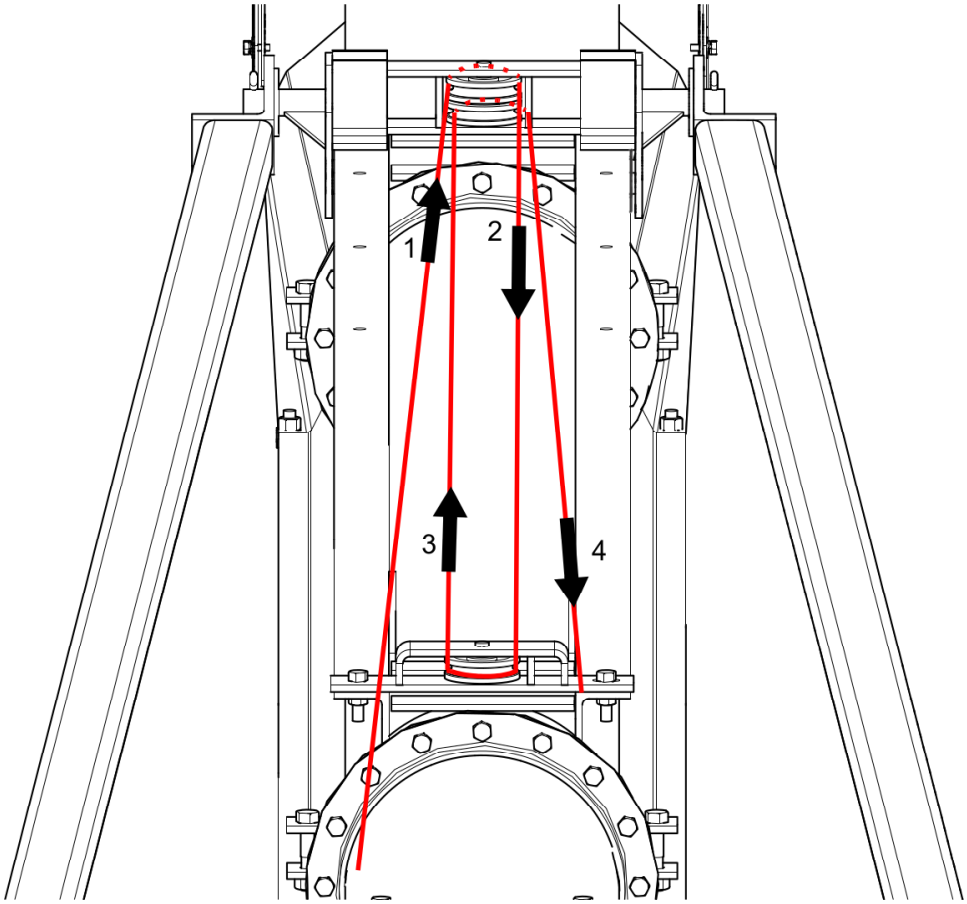


Figure 53. Tube Lift Cable Routing



3.26. Align the Winch

This procedure describes the alignment of the winch.

1. Check the alignment of the winch by watching the cable wrapping on the drum as the conveyor is raised. Proper alignment is achieved when the cable indexes, filling each row on the drum evenly and not piling up against one side.
2. Lower the conveyor fully if the cable does not index properly until there is slack in the cable.
3. Loosen the bolts holding the winch, adjust the winch, re-tighten bolts and retest.

3.27. Install the Electric Drive (2000 Series)

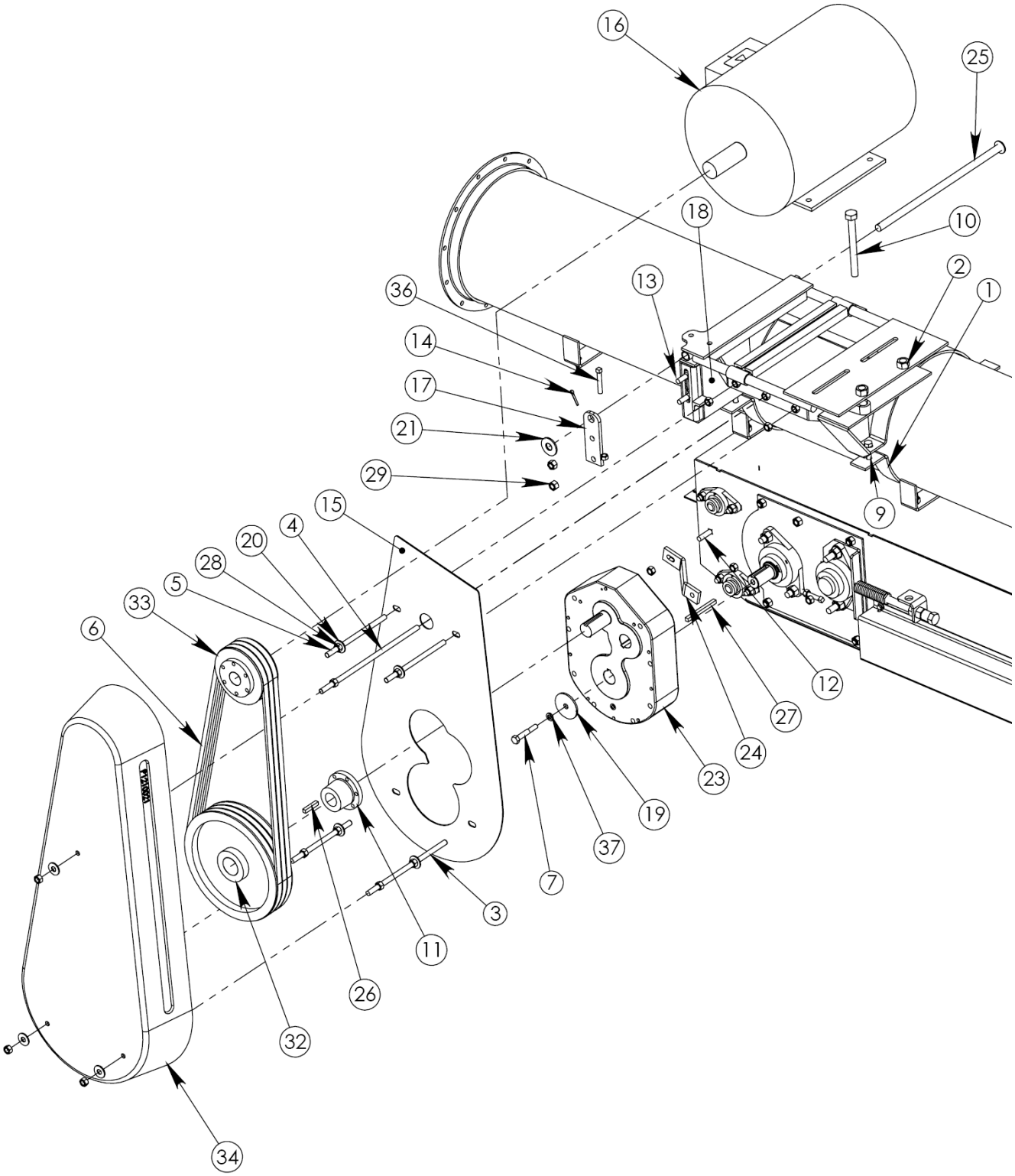
1. Place the electric offset clamp (18) and u-clamp (1) on the tube (see Figure 54). Secure with 1/2" x 1-1/2" bolts (9) and 1/2" nylock nuts (29). Do not tighten.
2. Attach the electric mount adjuster (17) to the electric offset clamp (18) with 1/2" x 1-1/2" carriage bolts (13) and 1/2" nylock nuts (29). Do not tighten.
3. Install set screw (36) on the electric offset clamp.
4. Take the motor mount plate (2) and line up the tube with the hinge holes on the electric offset clamp (18) and electric mount adjuster (17). Insert the electric mount pin (25). Place a 3/4" washer (21) on the electric mount adjuster side and secure with a 3/16" x 1–1/2" cotter pin (14). Ensure that the motor mount plate is level before tightening all fasteners.
5. Mount gearbox stabilizer (24) on s-drive with a 1/2" x 2" bolt (12) and 1/2" nut (28).
6. In breather kit, install the vent and plug on the back side of the gearbox. Install the plug towards the bottom of the gearbox and install the vent towards the top of the gearbox.
7. Install 3/8" x 4-3/8" key (27) on drive roller shaft and attach the gearbox (23) to the shaft with 1/2" x 2" bolt (7), 1/2" lock washer (37), and end cap (19).
8. Prevent the gearbox from rotating, insert the 1/2" x 12" adjuster rod (3) through the gearbox (23) and gearbox stabilizer (24) with 1/2" nut nylock (29) at the back end. Insert another 1/2" x 12" adjuster rod (3) on the other side of the gearbox.
9. Install one 1/2" x 15" adjuster rod (4) and two 1/2" x 9" adjuster rod (5) to the black plate mount bar using two 1/2" nuts (28). This will hold the rods straight, allowing you to mount the remaining components.
10. Insert a 1/2" hex nut (28) onto the 1/2" x 9" adjuster rods (5).
11. Place the back plate (15). Ensure the back plate is level and tight against the gearbox.
12. Insert 1/2" flat washer (20) and 1/2" hex nut (28) onto the four adjuster rods (3, 5). Tighten to secure the back plate in place.
13. Attach electric motor (16) to mount plate (2).
14. Install pulleys/bushing (26, 11,32) on gearbox (23) and the electric motor with pulley (33). Ensure all pulleys are lined up.
15. Thread a set of 1/2" hex nut (28) onto the three adjuster rods (4,3). The 3-hex nut should be 1-5/8" higher than the pulley or more.
16. Place the pulley guard (34); align the three holes with the adjuster rods against the 1/2" hex nut (28). Tighten with 1/2" flat washer (20) and 1/2" nut nylock (29).

Table 25. Electric Drive (2000 Series) Components

Item	Description	Quantity
1	2" U-clamp	2
2	20 Series Motor Mount Plate	1
3	1/2" x 12" Adjuster Rod	2
4	1/2" x 15" Adjuster Rod	1
5	1/2" x 9" Adjuster Rod	2
6	Belt B80	3
7	1/2" x 2" Hex Bolt	1
9	1/2" x 2-1/2" Bolt Tap	4
10	3/4" x 7" Bolt Tap	1
11	1-1/2" Bushing Q1	2
12	1/2" x 2" Carriage Bolt	1
13	1/2" x 1-1/2" Carriage Bolt	2
14	1/4" x 2" Cotter Pin	1
15	Electric Back Plate Pinch	1
16	10hp Electric Motor	1
17	Electric Mount Adjuster	1
18	Electric Offset Clamp	1
19	End Cap For Axle	1
20	1/2" Flat Washer USS Plated	7
21	3/4" Flat Washer USS Plated	1
23	Gearbox Par 4:1 Cw/cw 1-1/2" M590a	1
24	Gearbox Stabilizer	1
25	Hd Electric Mount Pin	1
26	3/8" x 2" Key	1
27	3/8" x 4-3/8" Key	1
28	1/2" Hex Nut	21
29	1/2" Nylock Nut	7
32	Pulley 3B120Q	1
33	Pulley 3B60Q	1
34	Pulley Guard - 46-1/2" L -7" To 16"	1
36	7/16" x 2-1/2" Sq Hd Setscrew	1
37	1/2" Lock Washer	1

NOT SHOWN: ATTACH TO M590 GEARBOX TO VENT PRESSURE BUILD UP	**QTY**
3/8" x 1/4" Bushing Black Pipe	1
1/4" Elbow Street 90	1
1/4" x 4" Nipple Black Pipe	1
1/4" Coupling Black Pipe	1
1/4" NPT Brass Vent	1

Figure 54. Installing Electric Drive (2000 Series) onto S-Drive



3.28. Install the Gas Drive

3.28.1 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 55).

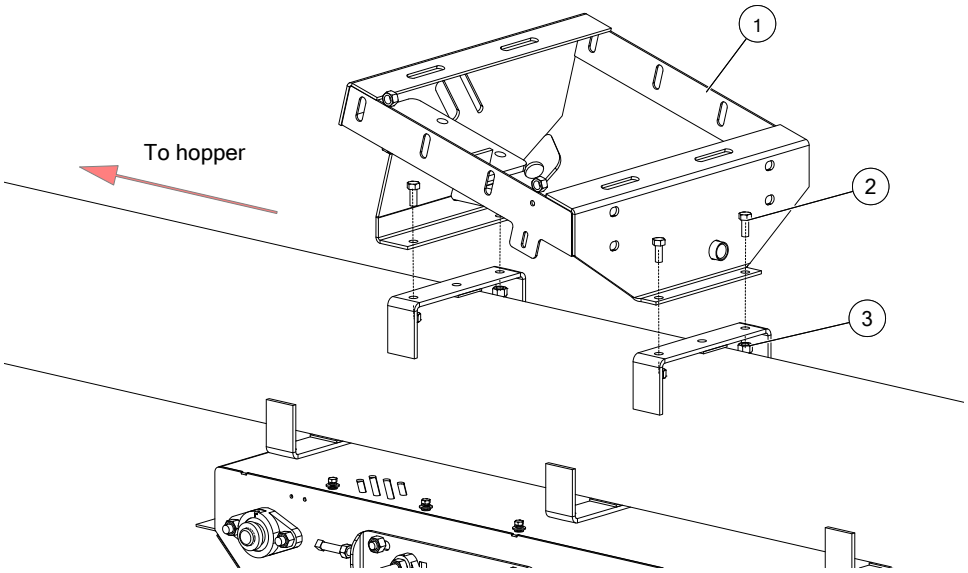
   Note

   Orient the motor mount precisely as shown in Figure 55.

Table 26. Drive Mount Components

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

Figure 55. Motor Mount



Note

The weld-on tube bracket configuration may vary depending on the conveyor model.

3.28.2 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 1-1/2" bolts (2) and 1/2" lock washers (3) (see Figure 56).

   Note

   Do not tighten the gearbox bolts.

3. Connect the gearbox breather (fitting, hose, vent) (4) to the gearbox breather hole (see Figure 57).

Table 27. Gearbox Components

Item	Description
1	Gearbox 4190 2:1 1–1/2 Shaft
2	1/2" x 1-1/2" Bolt Gr8 Plated
3	1/2" Lock Washer Plated USS
4	Breather Direct Drive

Figure 56. Installing the Gearbox

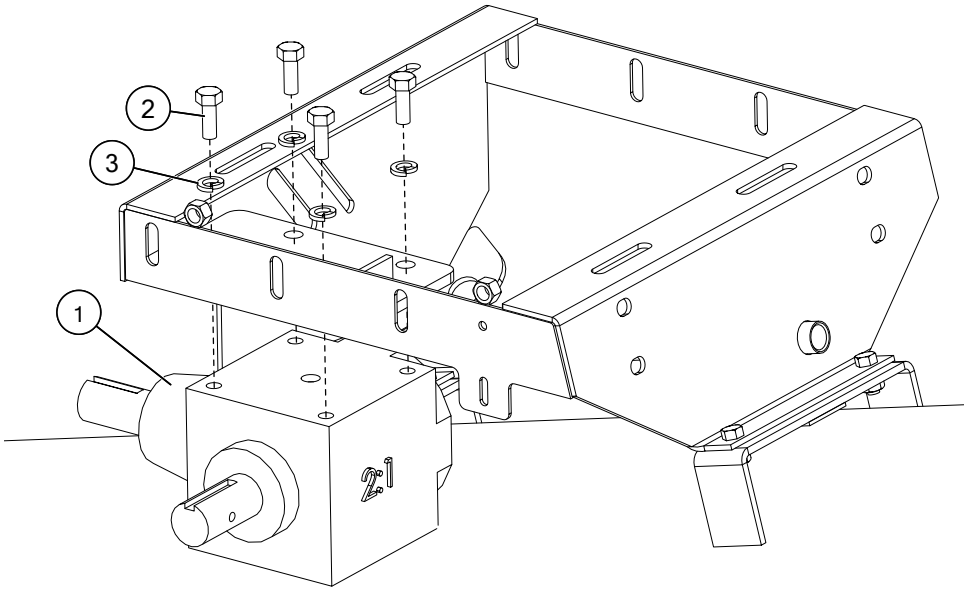
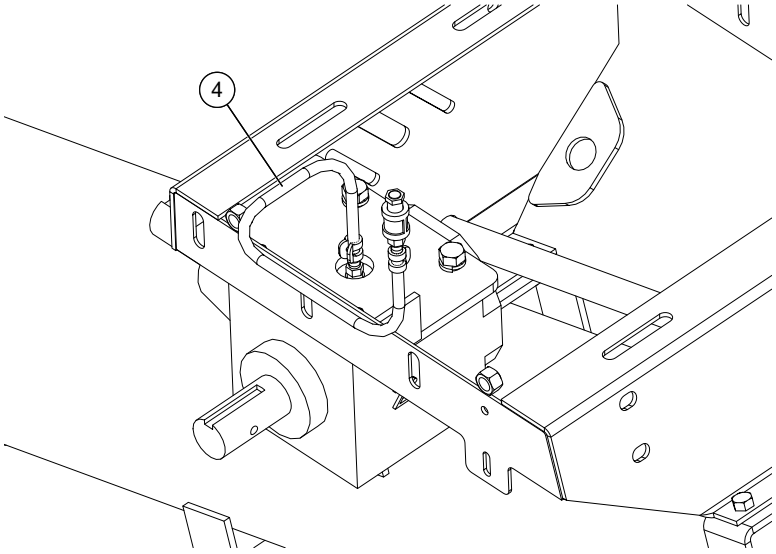


Figure 57. Gearbox Breather



3.28.3 Install the Slider Mount

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

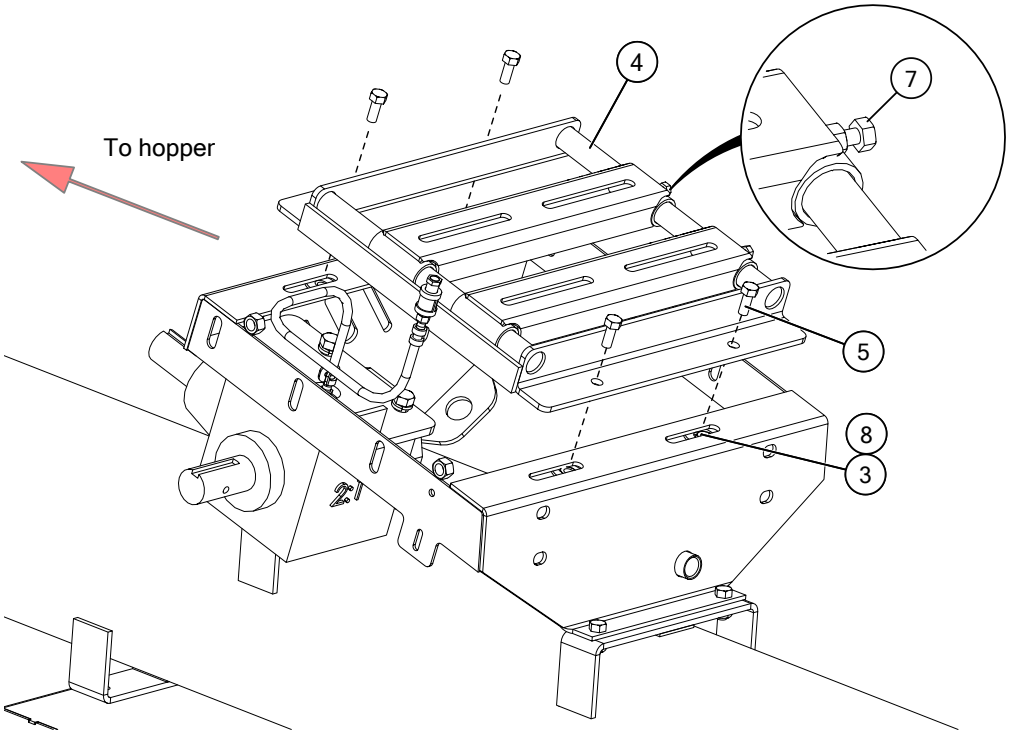
   Note

   Orient the slider mount exactly with the 5/16" x 3/4" bolts (7) on the side they are shown on in Figure 58. 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 28. Slider Mount Components

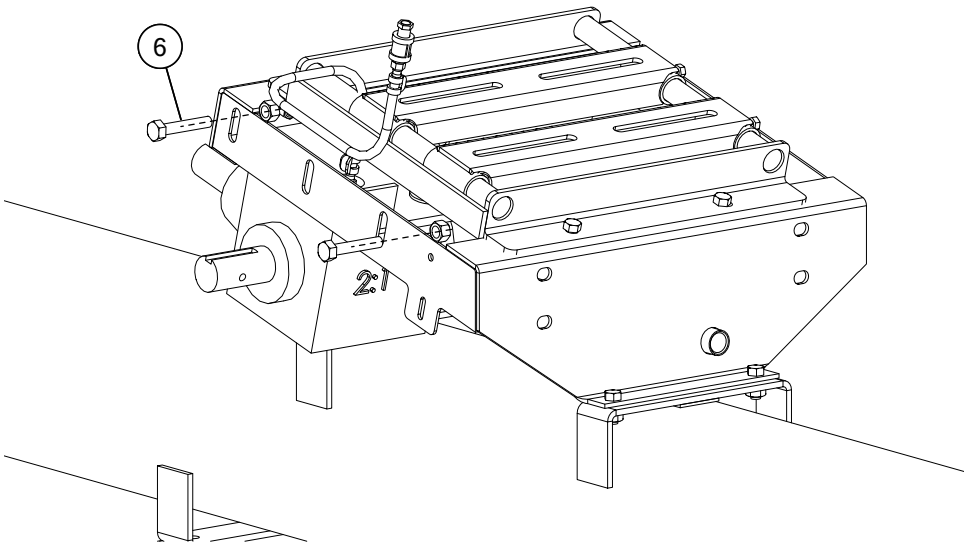
Item	Description
3	7/16" Nylon Locknut Gr8
4	Slider Mount
5	7/16" x 1" Bolt Gr8 Plated
6	1/2" x 2-1/2" Tap Bolt Gr8 Plated
7	5/16" x 3/4" Bolt
8	7/16" Flat Washer

Figure 58. Slider Mount



2. Feed the gearbox breather hose and vent through the slider mount (see Figure 59).
3. Insert the 1/2" x 2-1/2" tap bolts (6) to the motor mount.

Figure 59. Motor Mount Tap Bolts



3.28.4 Install the Motor and Back Plates

1. Install the gas engine (1) on the slider mount. At the same time, secure the ground wires for the battery, to the motor mount bolt (location indicated by the red arrow) using a flat washer (see Figure 60).

   Important

   Installation and wiring for the gas engine 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. Secure the engine drain hose on the engine base (not shown).
3. Install the choke and throttle cables to the engine and route them to the control box.
4. Fasten the top end of the muffler support bracket onto the muffler shield and muffler (not shown).
5. 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.
6. Fasten the bottom end of the muffler support bracket to the top of the base of the engine block with a motor mount bolt.
7. Fill engine with oil up to the dipstick line (see Table 29).

Table 29. Oil Quantity Required

Engine	Approximate Oil Quantity Required
Kohler	2 L
Vanguard	2 L

8. Attach the engine back guard (2) to the motor mount using 7/16" x 1" bolts (3) and 7/16" locknuts (4) (see Figure 60).
9. 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 61).
10. 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 30. Motor and Guard Components

Item	Description
1	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	1/2" x 1–1/2" Bolt Gr8 Plated
7	1/2" Threaded Insert
8	1/2" Lock Washer Plated
9	1/2" Flat Washer Plated USS
10	7/16" Flat Washer Plated USS

Figure 60. Installing the Engine/Motor Back Guard

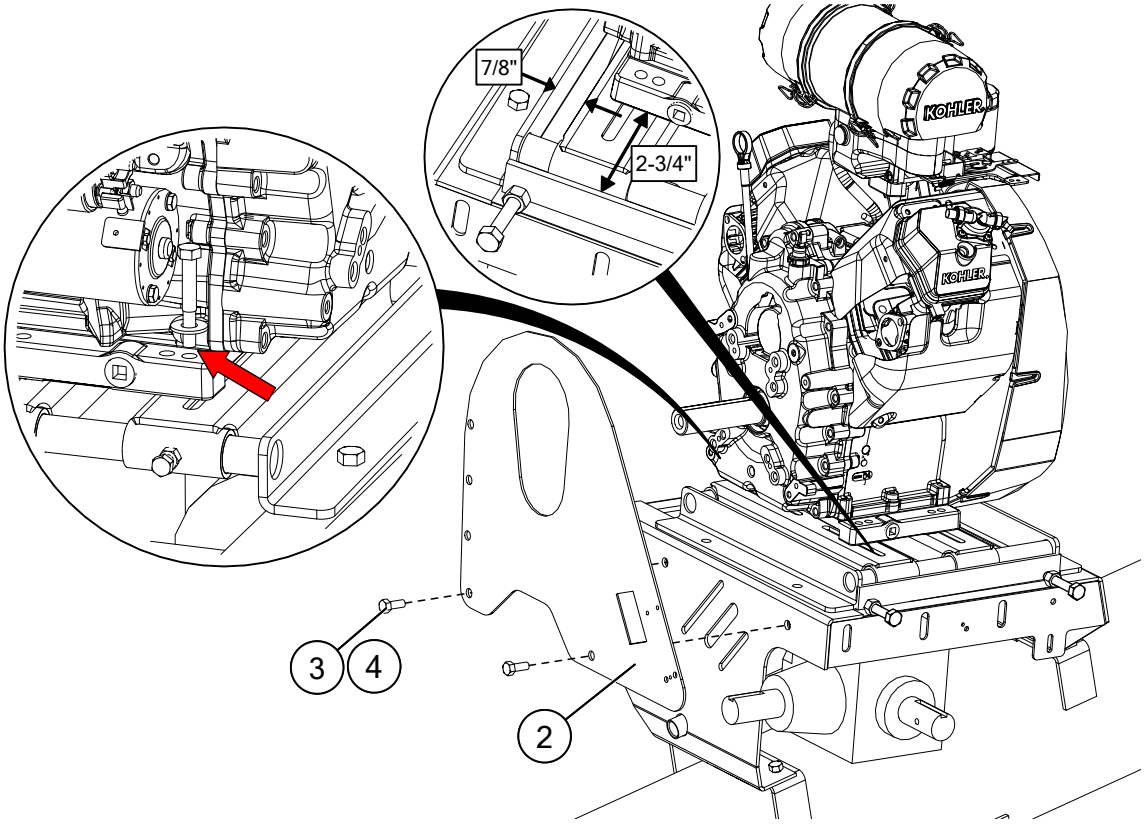
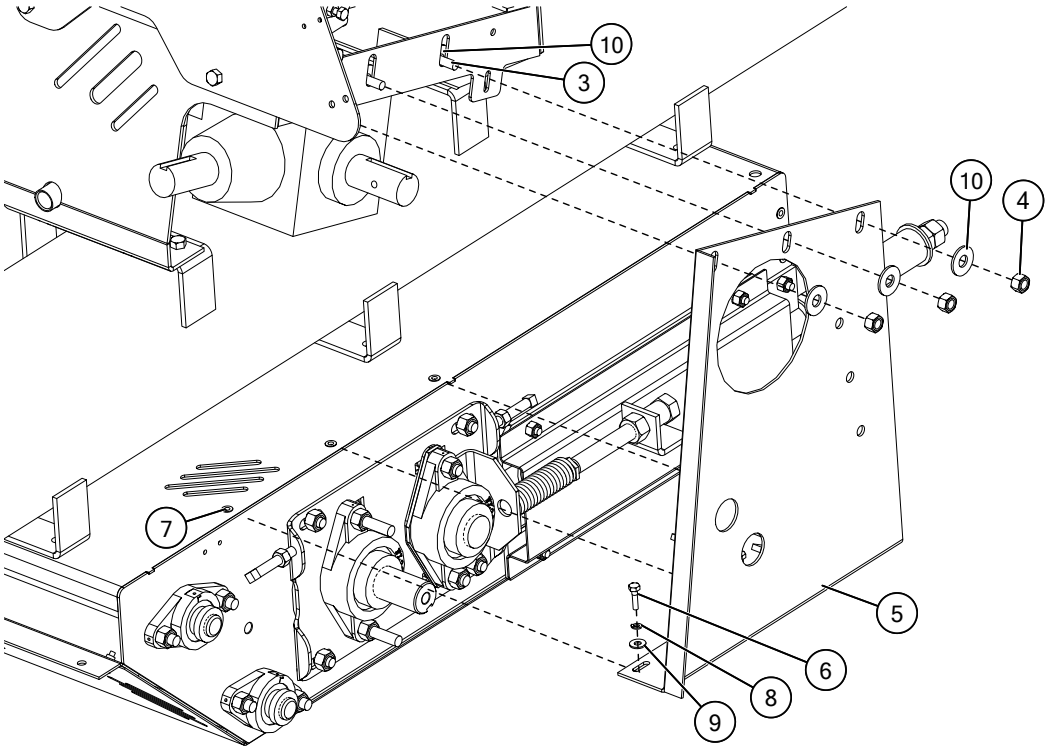


Figure 61. Installing the Motor Mount Side Plate



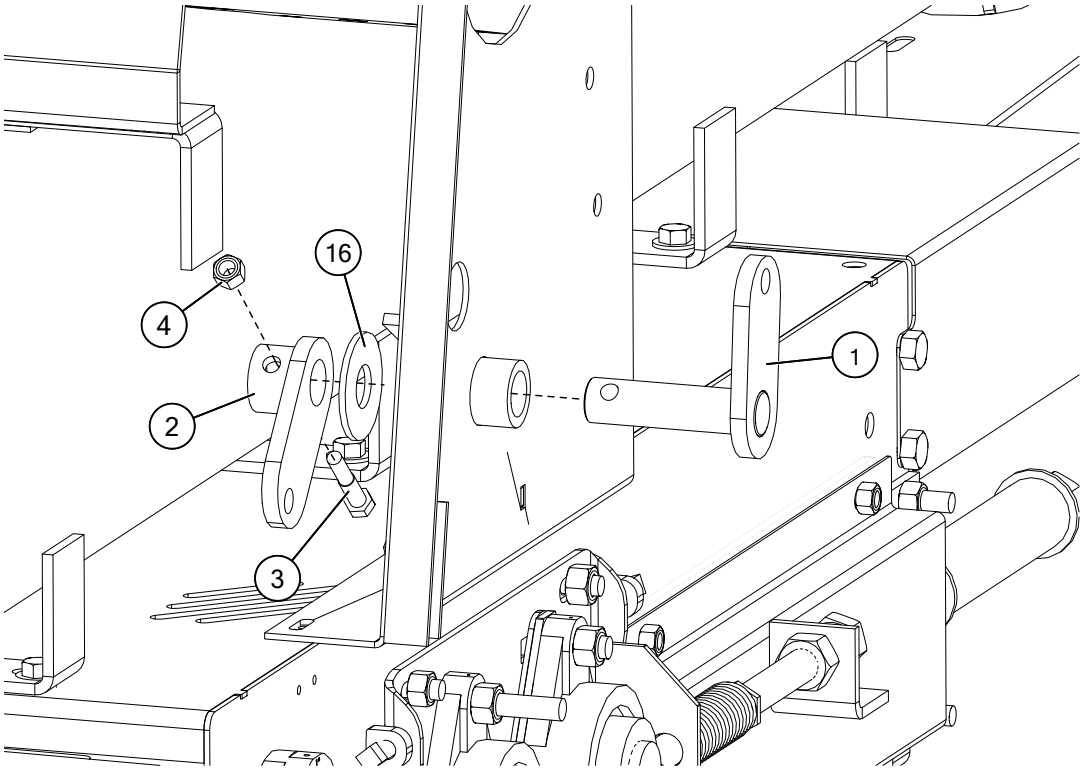
3.28.5 Install the Rocker Arm

1. Insert the rocker arm pivot shaft (1) into the motor mount back plate (see Figure 62).
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 31. 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 62. Installing the Rocker Arm Pivot Shaft



3.28.6 Install the Overcenter Handle

1. Attach the overcenter linkage (5) to the rocker arm sleeve with a 1/2" x 1–1/2" bolt (6) and 1/2" locknut (7) (see Figure 63).

   Note

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

2. Attach swivel mount weld (8) to the tube bracket with two 7/16" x 1–1/2" bolts (9) and two 7/16" locknuts (10). See Figure 64.
3. Insert rocker arm pivot shaft (11) into the swivel mount weld (8). Secure with a pin (12).

4. Attach overcenter push rod (13) and overcenter linkage (5) to the rocker arm pivot shaft (11) with a 1/2" x 1–1/2" bolt (6) and a 1/2" locknut (7). See Figure 65.
5. Thread the overcenter adjuster (14) into the push rod (13).

Table 32. Push Rod Components

Item	Description
5	Overcenter Linkage
6	1/2" x 1–1/2" Hex Bolt
7	1/2" Nylon Locknut
8	Swivel Mount Weld
9	7/16" x 1–1/2" Bolt Gr8 Plated
10	7/16" Nylon Locknut
11	Rocker Arm Pivot Shaft
12	Pin Roll Slotted M10 x 40 mm
13	Overcenter Push Rod
14	Overcenter Adjuster

Figure 63. Installing the Overcenter Linkage

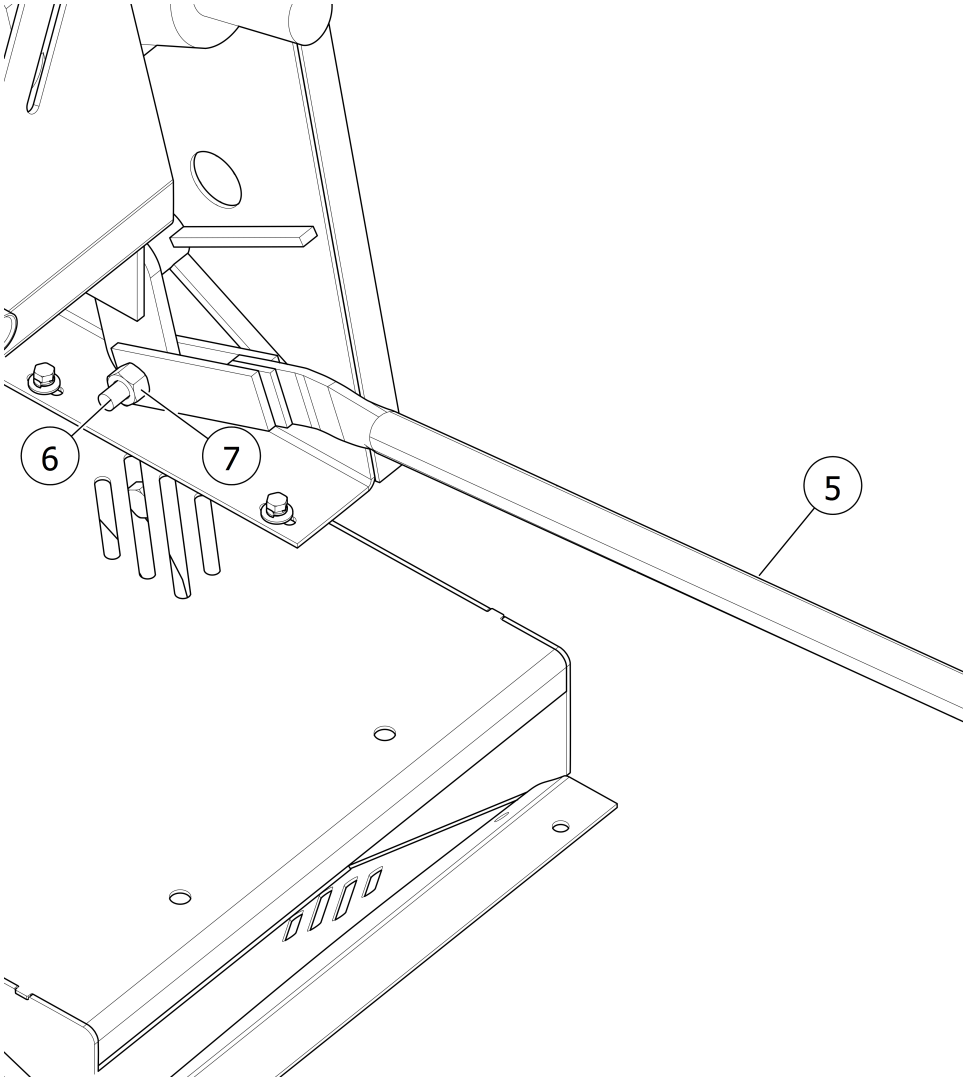


Figure 64. Installing the Swivel Mount Weld

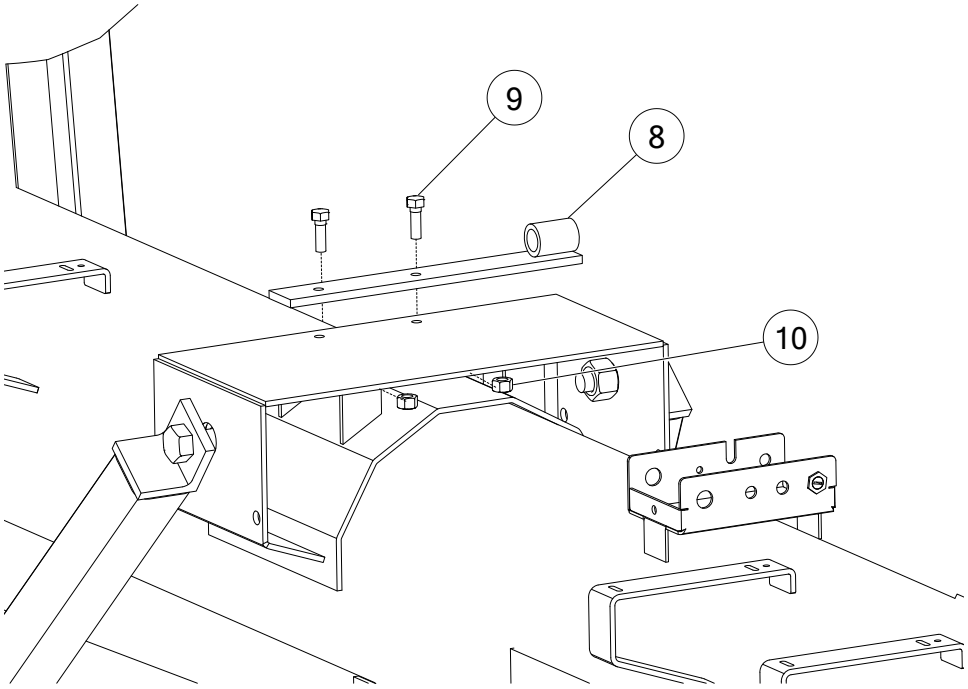
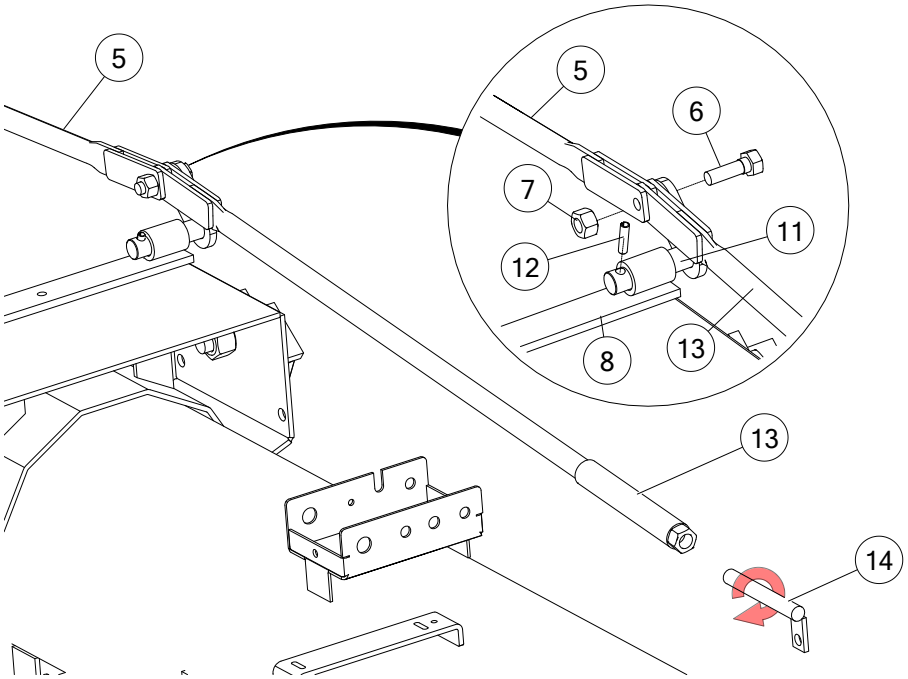


Figure 65. Connecting the Overcenter Linkage and Push Rod

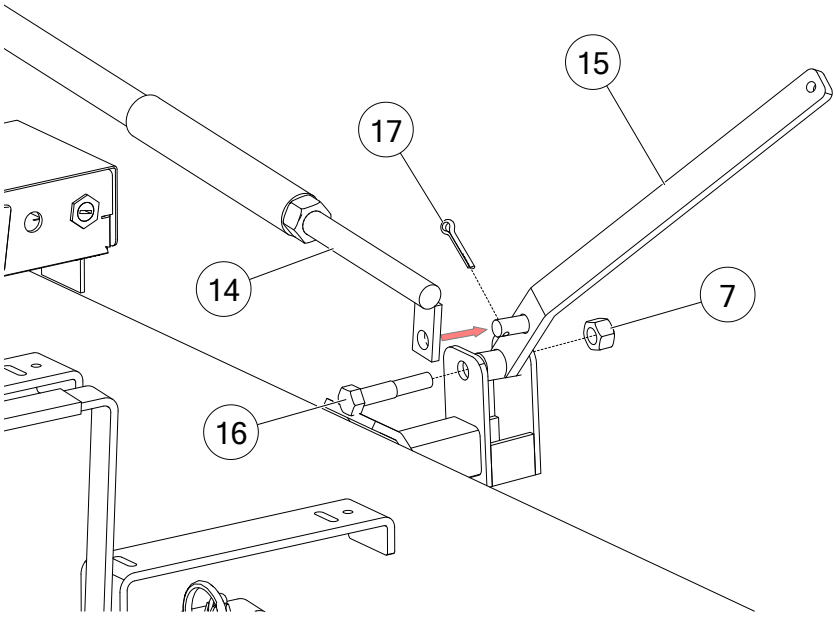


6. Bolt the overcenter handle (15) to handle bracket with a 1/2" x 2-1/2" bolt (16) and 1/2" locknut (7).
7. Connect the overcenter adjuster (14) to the handle with a 3/16" x 1-1/2" cotter pin (17). Secure the cotter pin by spreading the prongs in opposite directions.

Table 33. Overcenter Handle Components

Item	Description
15	Motor MT Overcenter Handle
16	1/2" x 2-1/2" Hex Bolt Gr8 Plated
17	3/16" x 1-1/2" Cotter Pin

Figure 66. Installing the Overcenter Handle



3.28.7 Install the Pulleys and Belts

1. Install the idler pulley (1) onto the rocker arm pivot shaft using a 1/2" x 4" bolt (2), 1/2" flat washers (3), two bushings (12), and a 1/2" locknut (4) (see Figure 67). The side of the idler pulley with an inset hub faces away from the engine.
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 3.32 – Hydraulic Wet Kit on page 105 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 shaft for the pulley.
7. Install the pulley (7) onto the engine shaft (see Figure 68). Do not tighten pulley set screws until pulleys are aligned.
8. Install the 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.
9. Align the pulleys with a straightedge.

10. Install the belts (10, 11).
11. 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.

12. 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 34. Pulleys, Belts, and Electric Clutch Components

Item	Description
1	Idler Flat 4" Triple 2-7/16" Wide
2	1/2" x 4" Hex Bolt
3	1/2" Flat Washer
4	1/2" Nylon Locknut
5	Pulley Triple 6" with 1-1/2" Bore
6	Pulley Triple B-Q13.6" with 3" Bore
7	Pulley Triple B-4.6" H
8	Pulley Triple B-Q13.6" with 3" Bore
9	3/8" x 2" Key
10	Belt 3RB92 Triple Banded
11	Belt 3RB59 Triple Banded
12	Bushing 3/4" OD x 1/2" ID x 1" Bronze

Figure 67. Installing the Pulleys and Belts to the S-drive and Gearbox

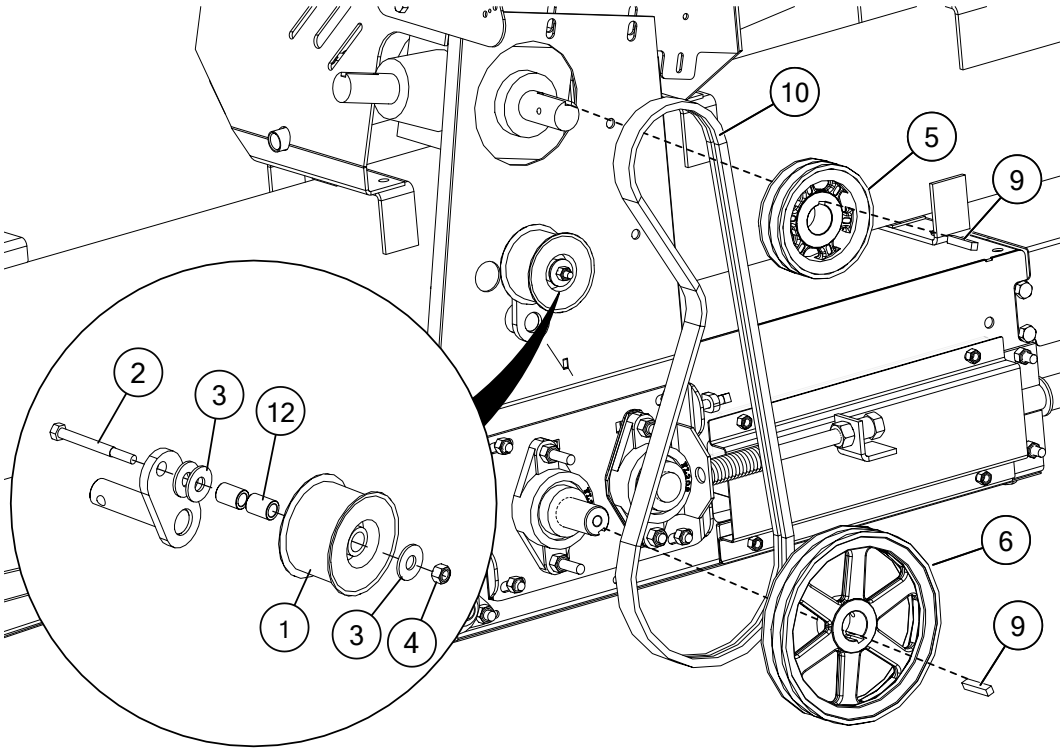
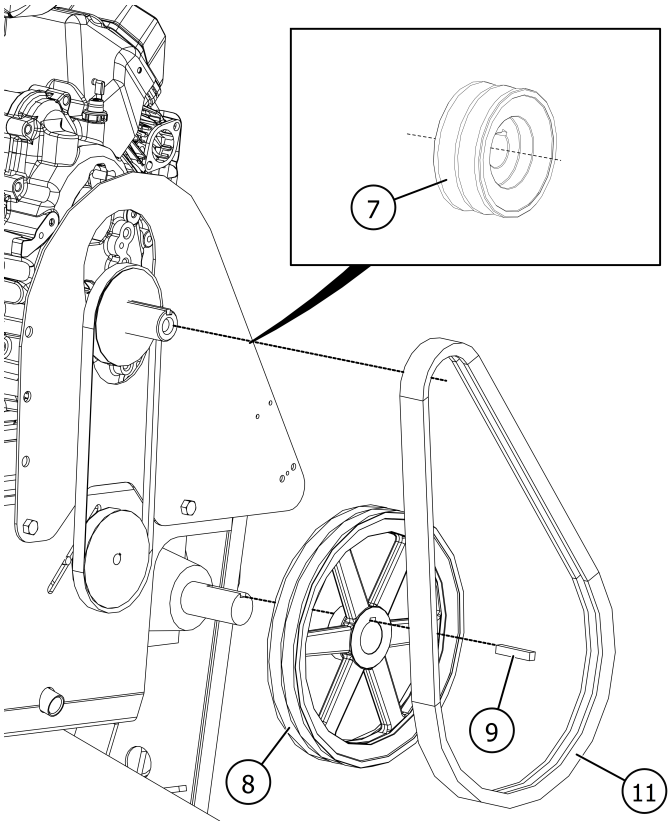


Figure 68. Installing the Pulleys and Belts to the Motor Shaft and Gearbox



3.28.8 Install the Pulley Guards

1. Attach the safety decals on and under the pulley guards (1, 2) (see Figure 69 and Figure 70). 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 3.33 – Install the Shaft Guard on page 111).

Table 35. Pulley Guard Components

Item	Description
1	Pinch Guard — Small Assembled
2	Pinch Guard — Extended 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 69. Installing the Pulley Guard on the S-drive and Gearbox

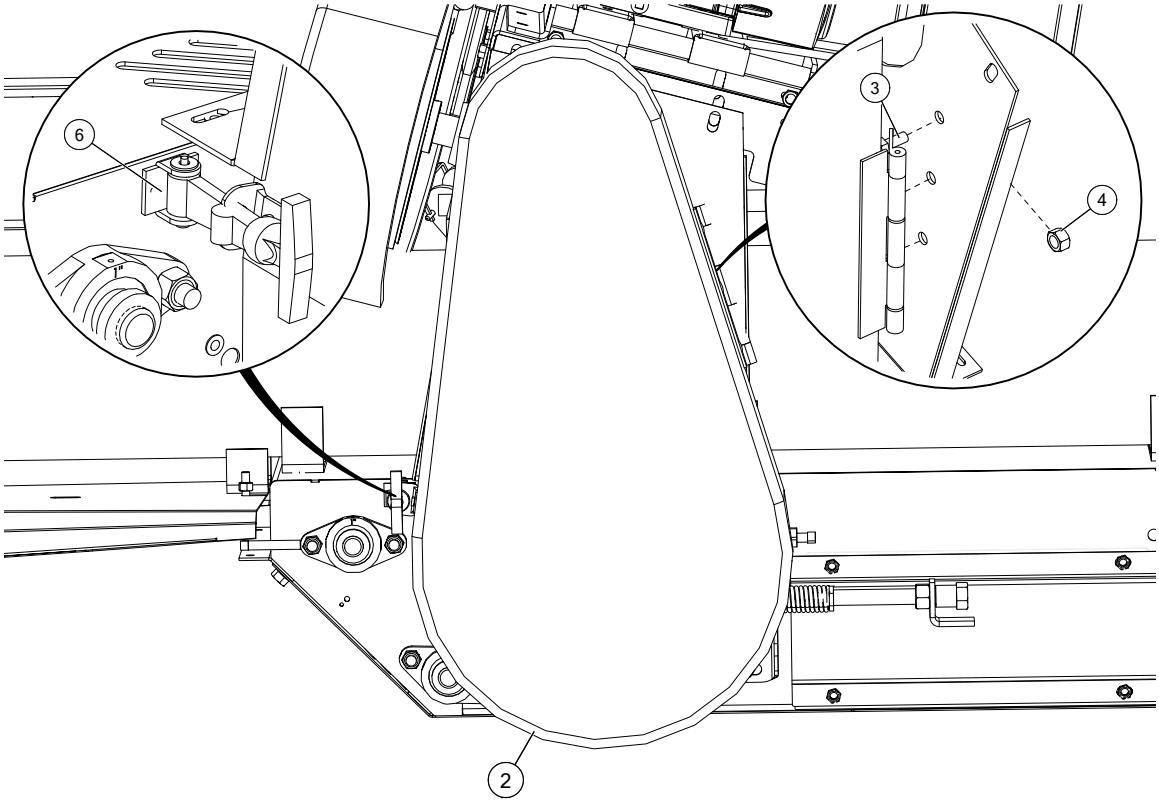
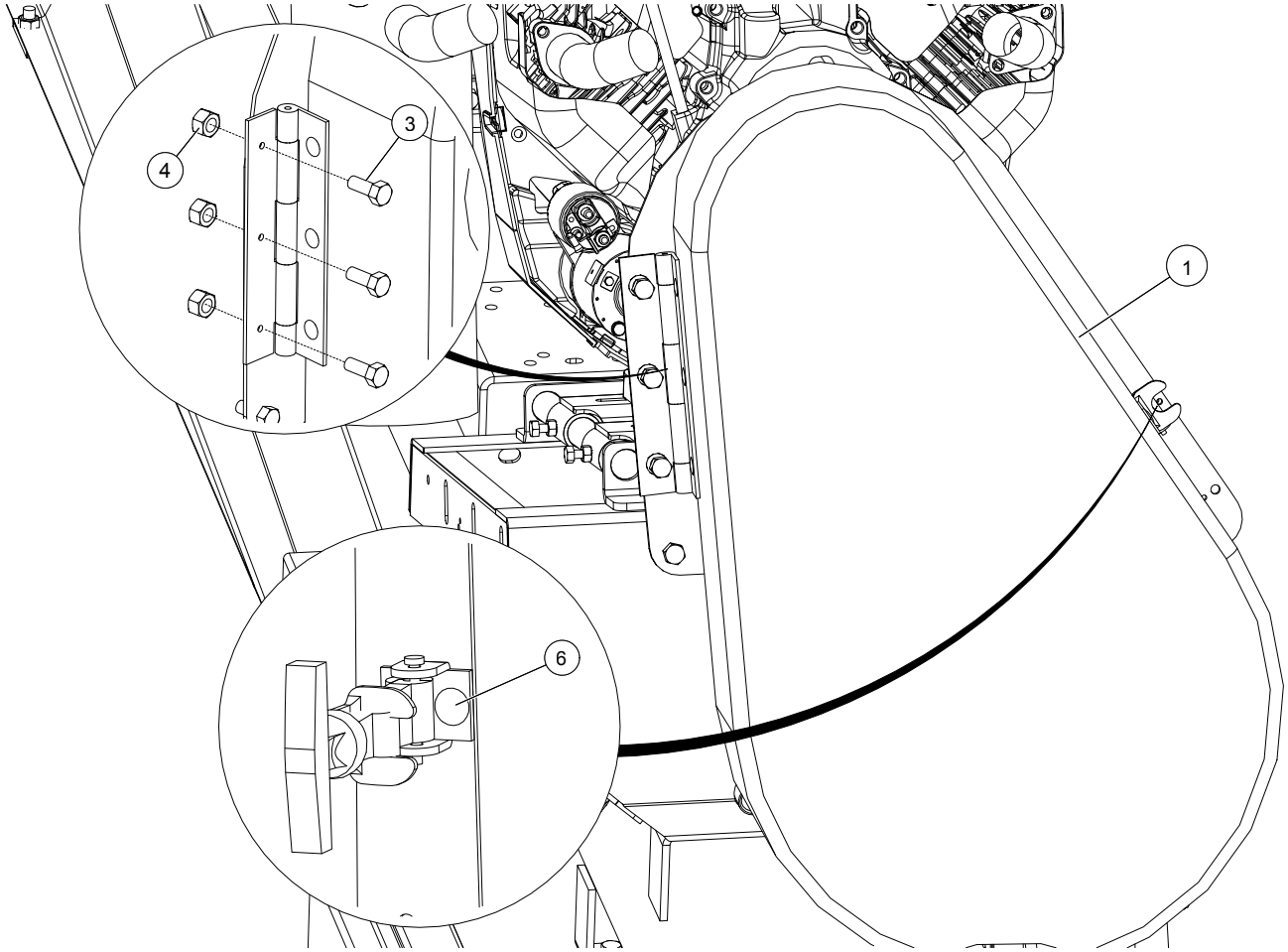


Figure 70. Installing the Pulley Guard on the Engine and Gearbox



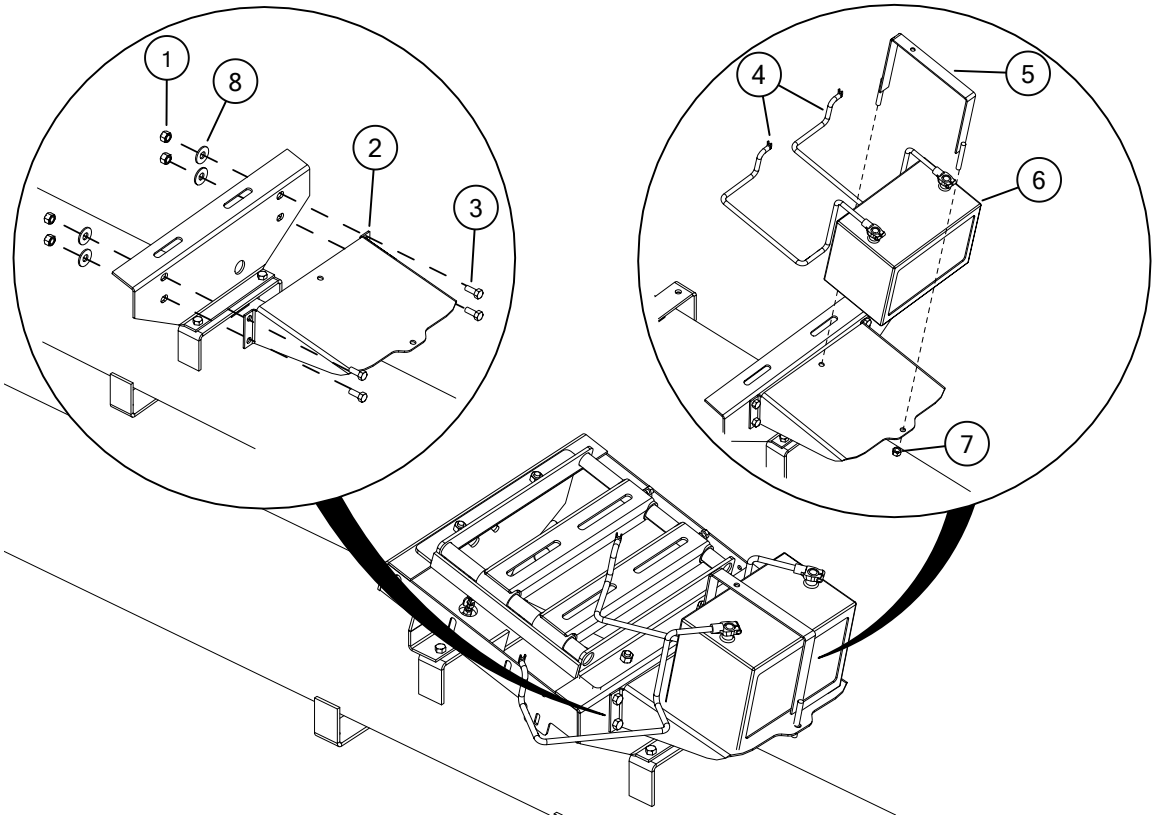
3.29. Gas Drive — Battery Kit

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 71).
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 36. 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
7	3/8" Locknut	2
8	7/16" Flat Washer	4

Figure 71. Installing the Battery



3.30. 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 72 on page 95). 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 73.
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 74). 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 37. 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 72. Control Box Connections and Hardware

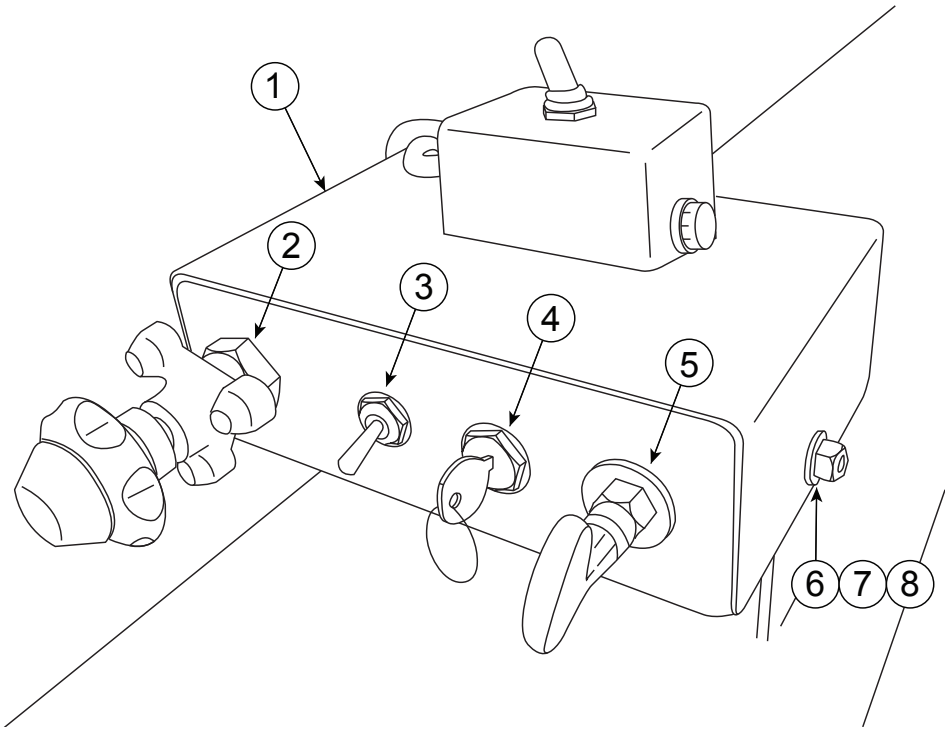


Figure 73. Control Box Inside Connections

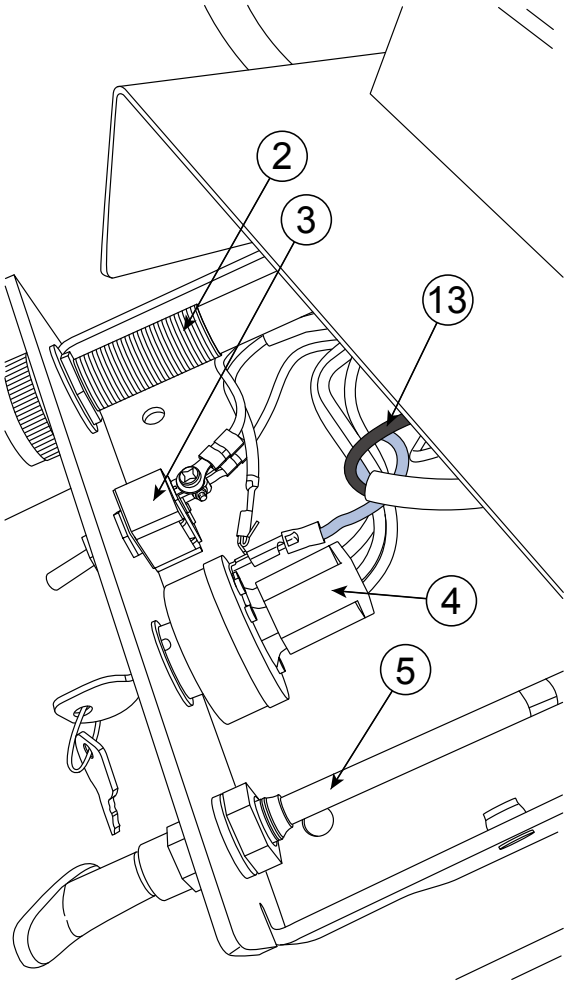
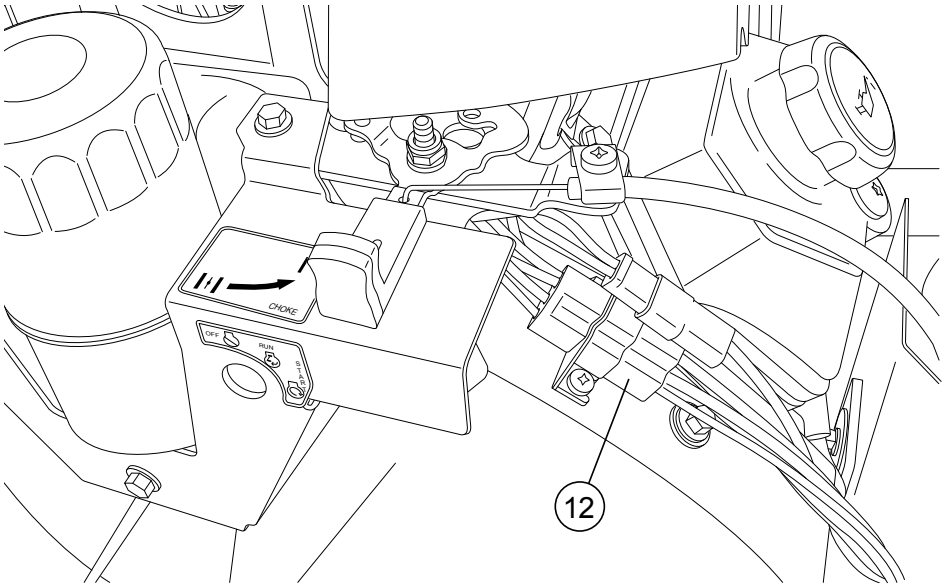


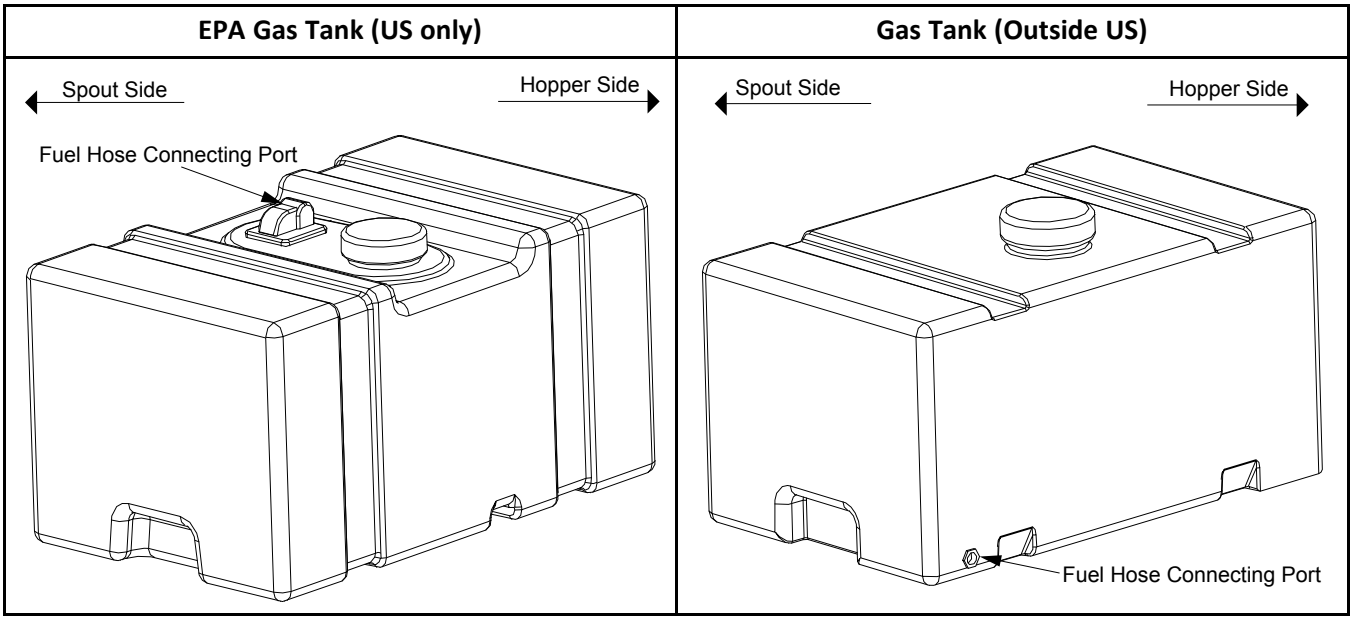
Figure 74. Plugging and Fastening Extension Wiring Harness



3.31. Install the Tank Kit and the Primer Bulb

Depending on the region two different versions of tank kit are provided with the conveyors. The size and shape of the fuel tank can vary depending on the conveyor series. EPA tanks are provided to the conveyor for US only. Examples of EPA and non-EPA tank are shown in Figure 75 below:

Figure 75. Gas Tank Type



3.31.1 Gas Drive — EPA Tank Kit (for 2045 Model in USA only)

1. Attach the plastic tank mount bracket (1) to the tube using 7/16" x 1" bolts (2) and 7/16" locknuts (3) (see Figure 76).
2. Secure the tank (6) to the tank bracket with gear clamps (4) (see Figure 77).
3. Attach the 1/4" hose barb (7) to the tank outlet (see Figure 78).
4. Connect the 1/4" fuel line to the hose barb and primer bulb with hose clamps (8). For more information about primer bulb installation, refer to Section 3.31.3 – Gas Drive — Install Primer Bulb on page 102.
5. Cut the 1/4" fuel line between the hose barb and the primber bulb. Insert the fuel demand valve (10) into the fuel line with hose clamps (8) (see Figure 79).

Table 38. Gas Tank Components

Item	Description	Quantity
1	Plastic Tank Mount Bracket	1
2	7/16" x 1" Hex Bolt	4
3	7/16" Nylock Nut	4
4	36" Gear Clamp	2
6	45 L (12 gal) EPA Gas Tank w/Cap Fitting	1
7	1/4" MPT x 1/4" Hose Barb	1

Table 38 Gas Tank Components (continued)

Item	Description	Quantity
8	1/2" Hose Clamp	4
9	1/4" ID Fuel Line — 14'	1
10	EPA Fuel Demand Valve	1

Figure 76. Tank Mount

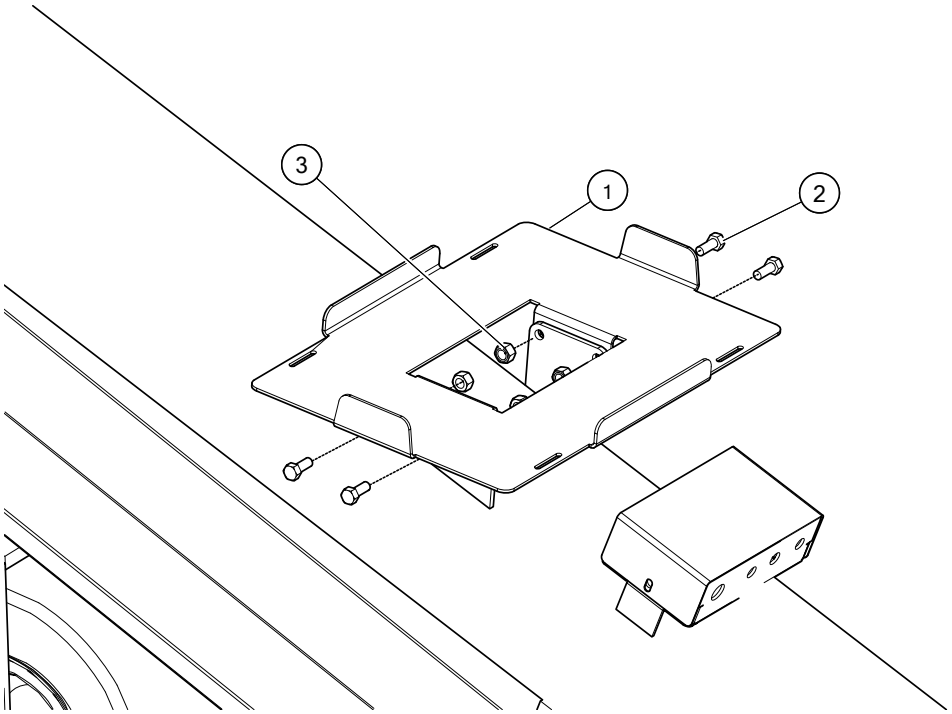


Figure 77. Gas Tank

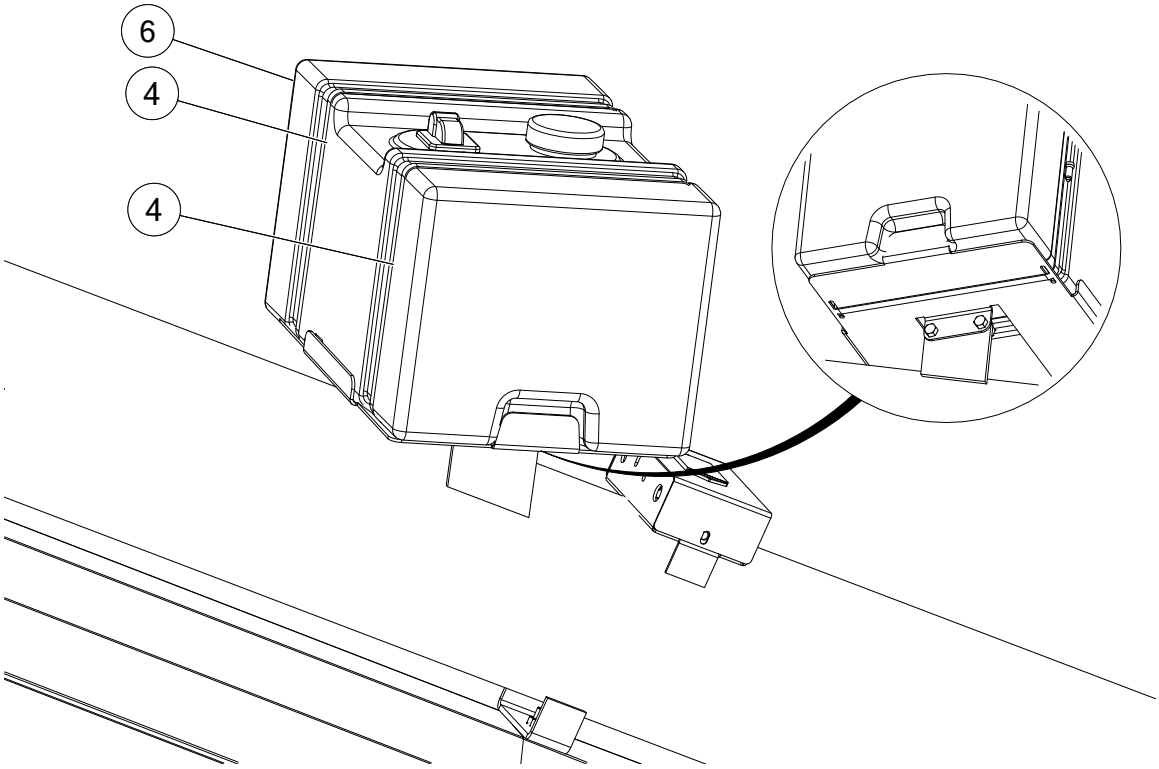


Figure 78. Fuel Line

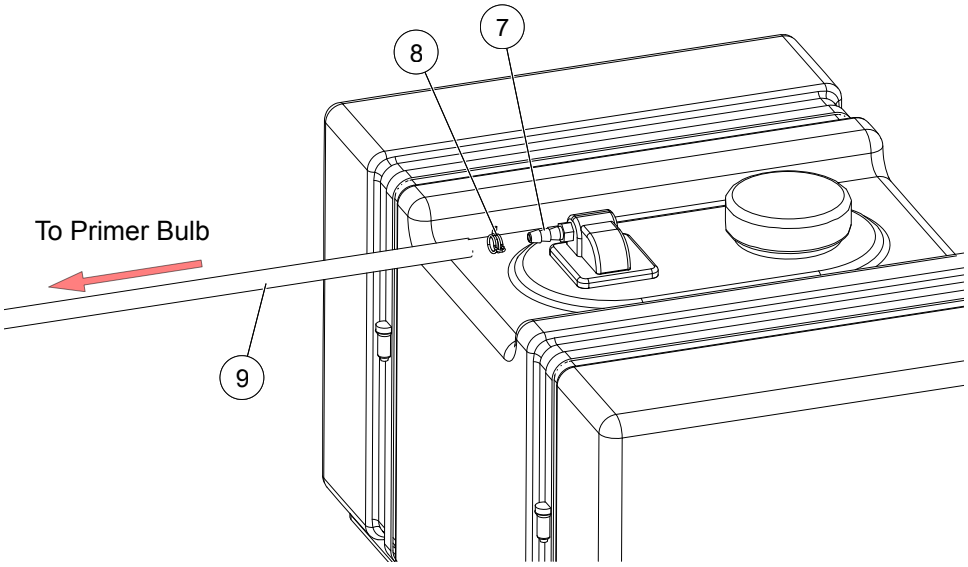
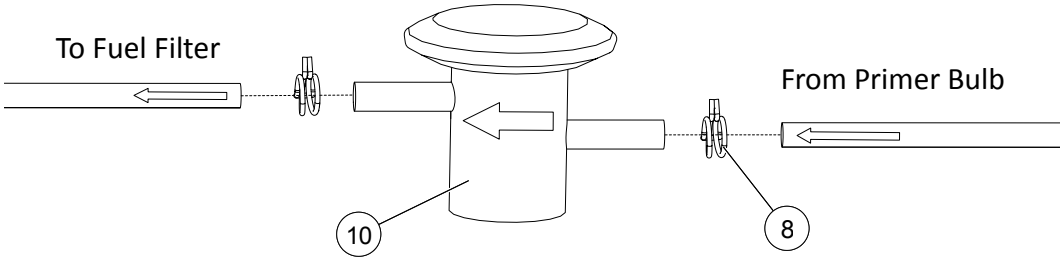


Figure 79. Fuel Demand Valve



3.31.2 Gas Drive — Tank Kit (for 2045 Model outside USA)

1. Attach the plastic tank mount bracket (1) to the tube using 7/16" x 1" bolts (2) and 7/16" locknuts (3) (see Figure 80).
2. Secure the tank (6) to the tank bracket with gear clamps (4) (see Figure 81).
3. Attach the 1/4" hose barb (7) to the tank outlet.
4. Connect the 1/4" fuel line to the hose barb and primer bulb with hose clamps (8). For more information about primer bulb installation, refer to Section 3.31.3 – Gas Drive — Install Primer Bulb on page 102.
5. Insert the square plug (10) into the hole in the bottom of the tank nearer to the spout.

Table 39. Gas Tank Components

Item	Description	Quantity
1	Plastic Tank Mount Bracket	1
2	7/16" x 1" Hex Bolt	4
3	7/16" Nylock Nut	4
4	36" Gear Clamp	2
6	Gas Tank — 22 x 14 x 11.5 — 53 L (14 gal) — red	1
7	1/4" MPT x 1/4" Hose Barb	1
8	1/2" Hose Clamp	2
9	1/4" ID Fuel Line — 14'	1
10	Square Plug (threaded)	1

Figure 80. Tank Mount

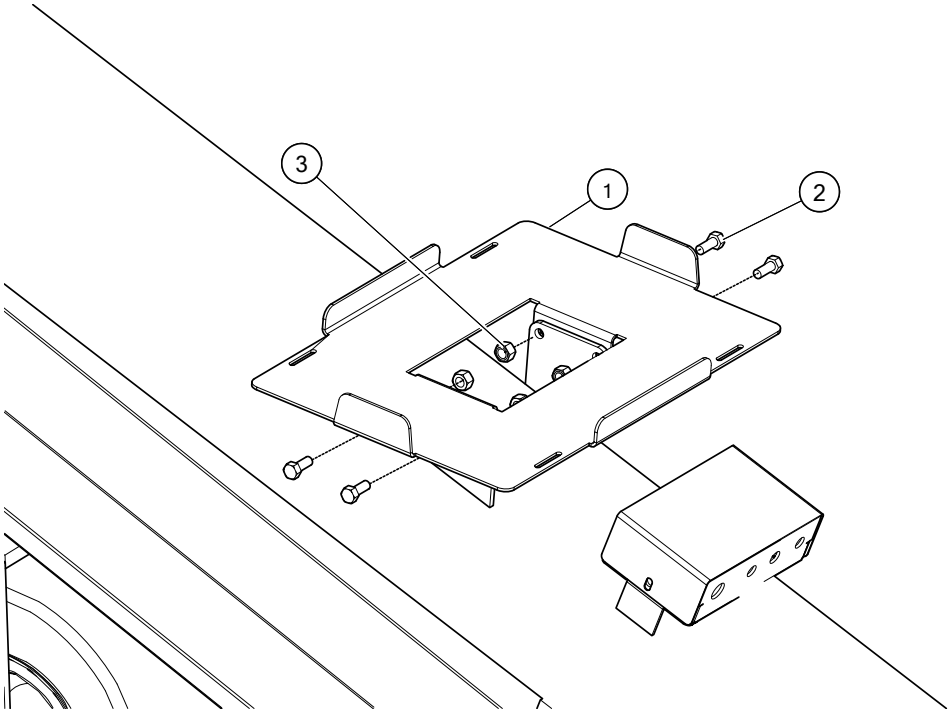
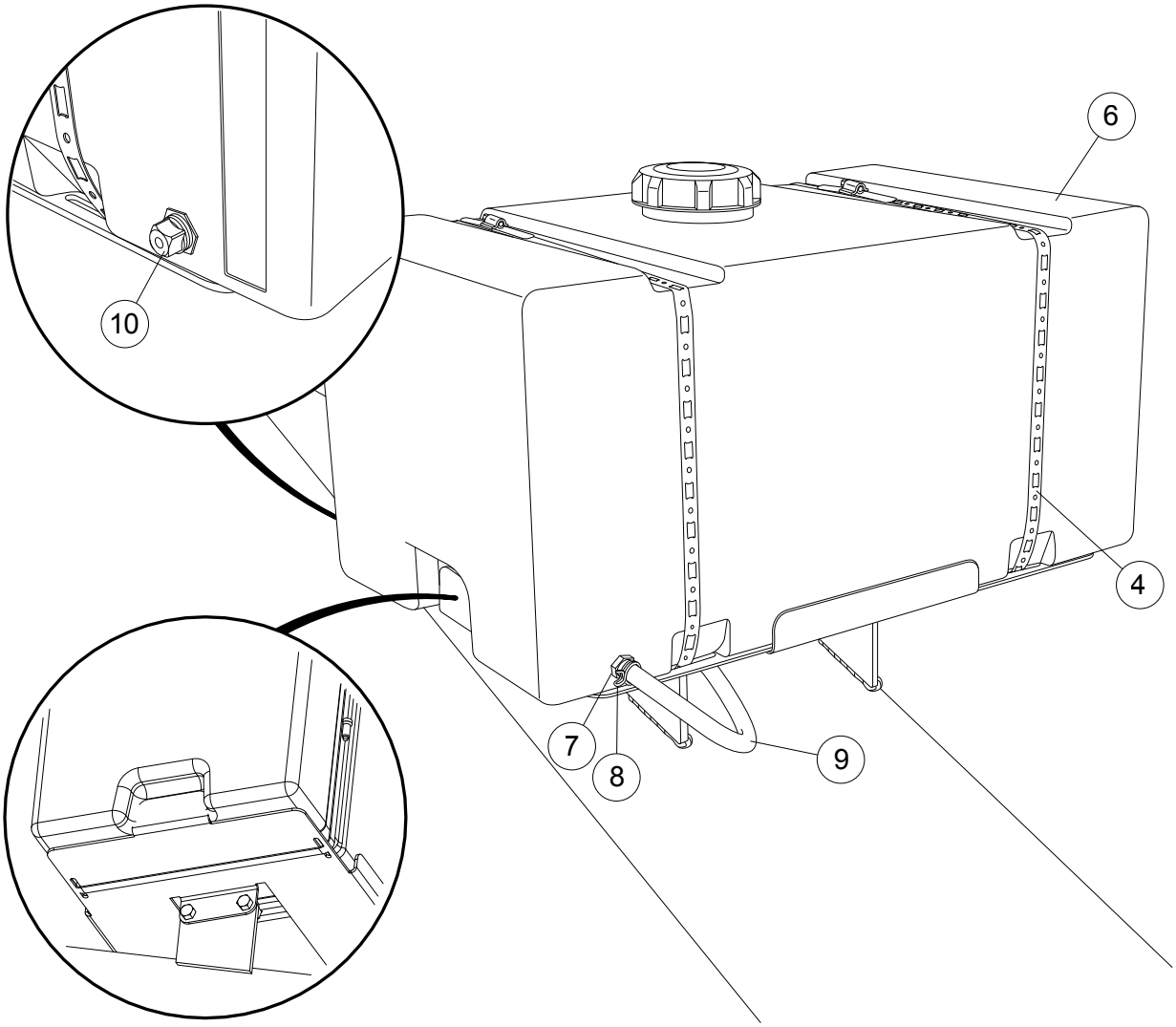


Figure 81. Gas Tank



3.31.3 Gas Drive — Install 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 82 and Figure 83.

Figure 82. Primer Bulb

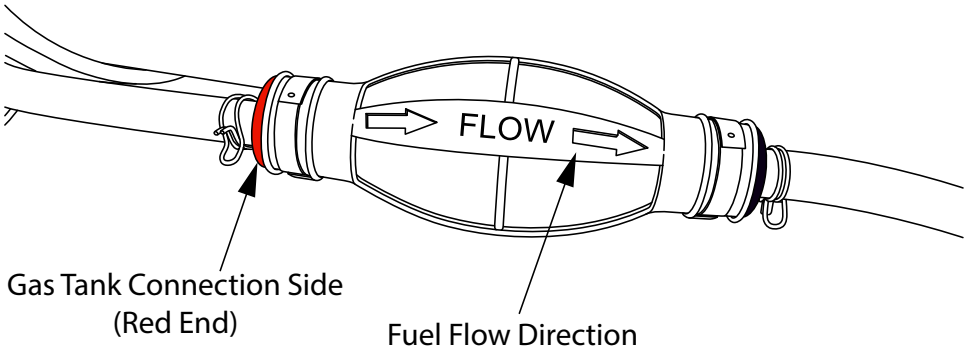
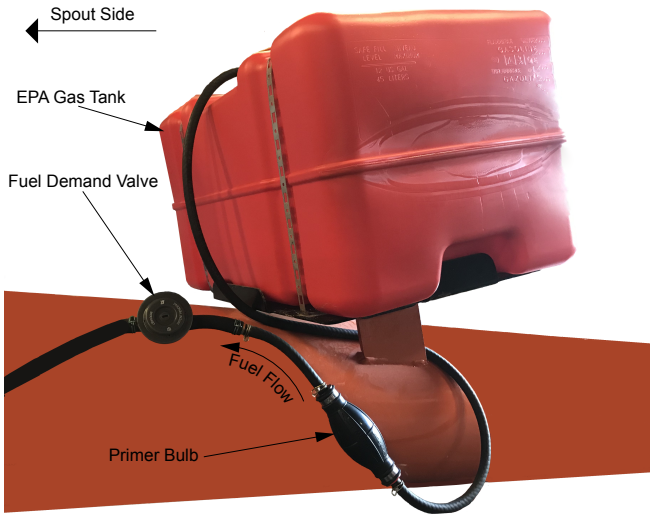
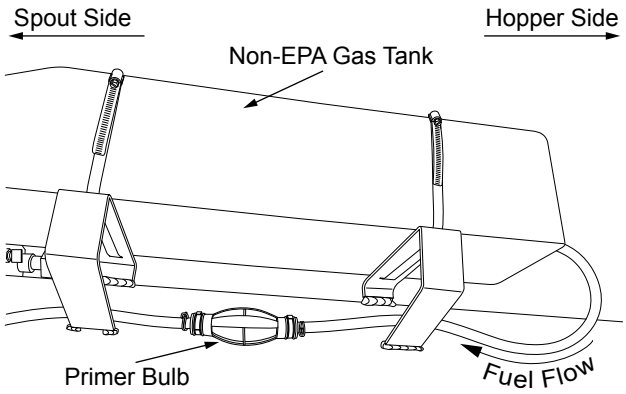
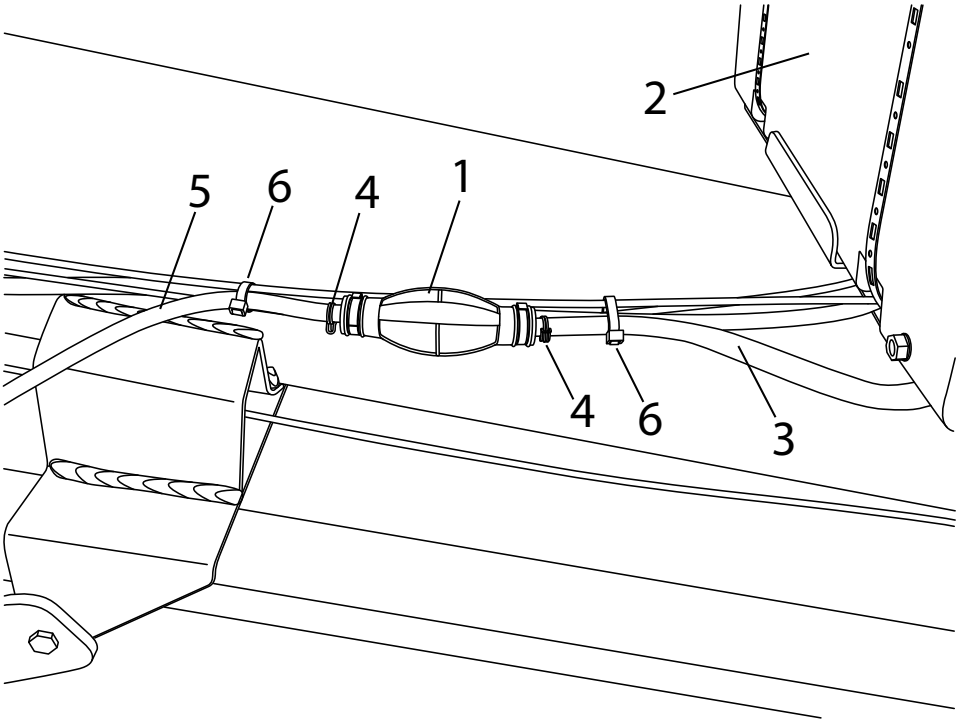


Figure 83. Hose Routing From Fuel Tank

EPA Tank	Non-EPA Tank
	

2. Use hose clamps to secure the hose tightly at each ends of the fuel hose.

Figure 84. Install and Secure the Primer Bulb

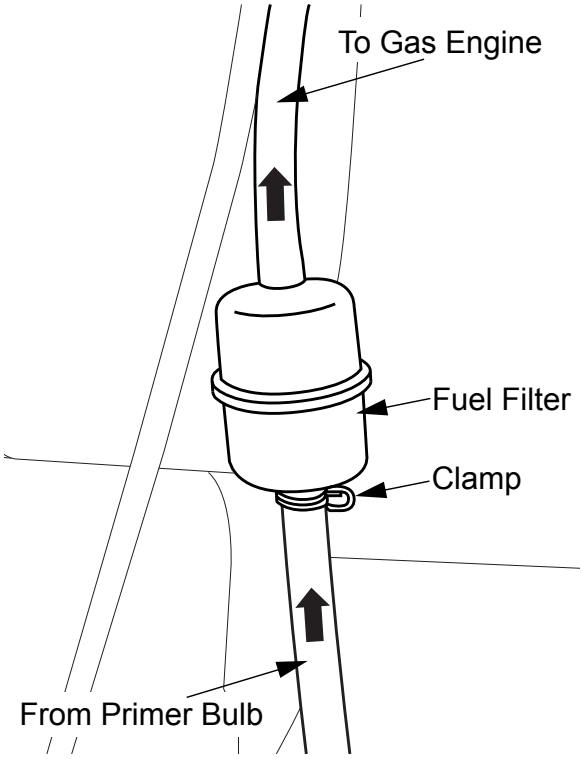


Item	Description	Item	Description
1	Primer Bulb	4	3/4" Hose clamps
2	Gas Tank	5	1/4" Fuel Hose (To Fuel Filter)
3	1/4" Fuel Hose (12")	6	Zip Tie

3. A fuel filter (Figure 85) 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

- If equipped with an EPA tank kit, a fuel demand valve is required to install with the primer bulb (refer to Figure 83). In this case, the fuel filter needs to be attached after the fuel demand valve before the engine.

Figure 85. Fuel Filter



4. Secure the fuel hoses with zip ties.

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.

3.32. Hydraulic Wet Kit

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

3.32.1 Install the Hydraulic Tank

1. Install the hydraulic tank (1) to the mount brackets with gear clamps (2) (see Figure 86).

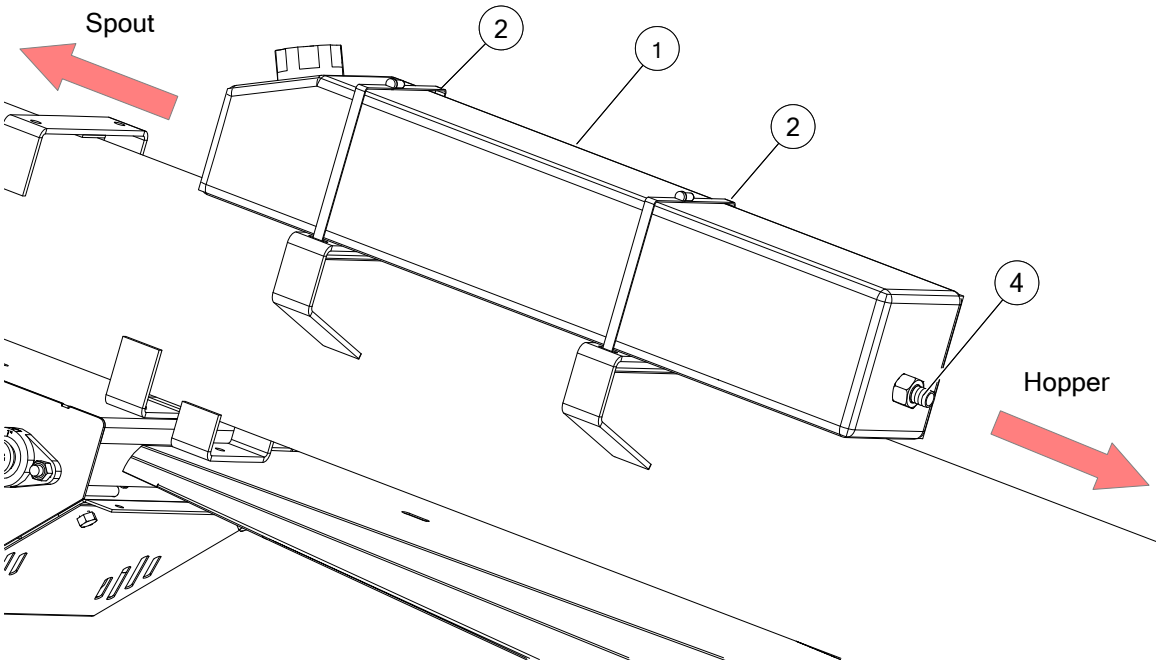
Note

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

Table 40. Hydraulic Tank Components

Item	Description
1	Hydraulic Tank
2	32" Gear Clamp
3	#8 ORB x 1/2 FPT (not shown)
4	10 ORB x 3/4" Hose Barb

Figure 86. Installing the Hydraulic Tank



Note

The preceding figure depicts a weld-on bracket.

3.32.2 Install the Hydraulic Pump

1. Install the fittings (5, 6) on the hydraulic pump (see Figure 87).
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.

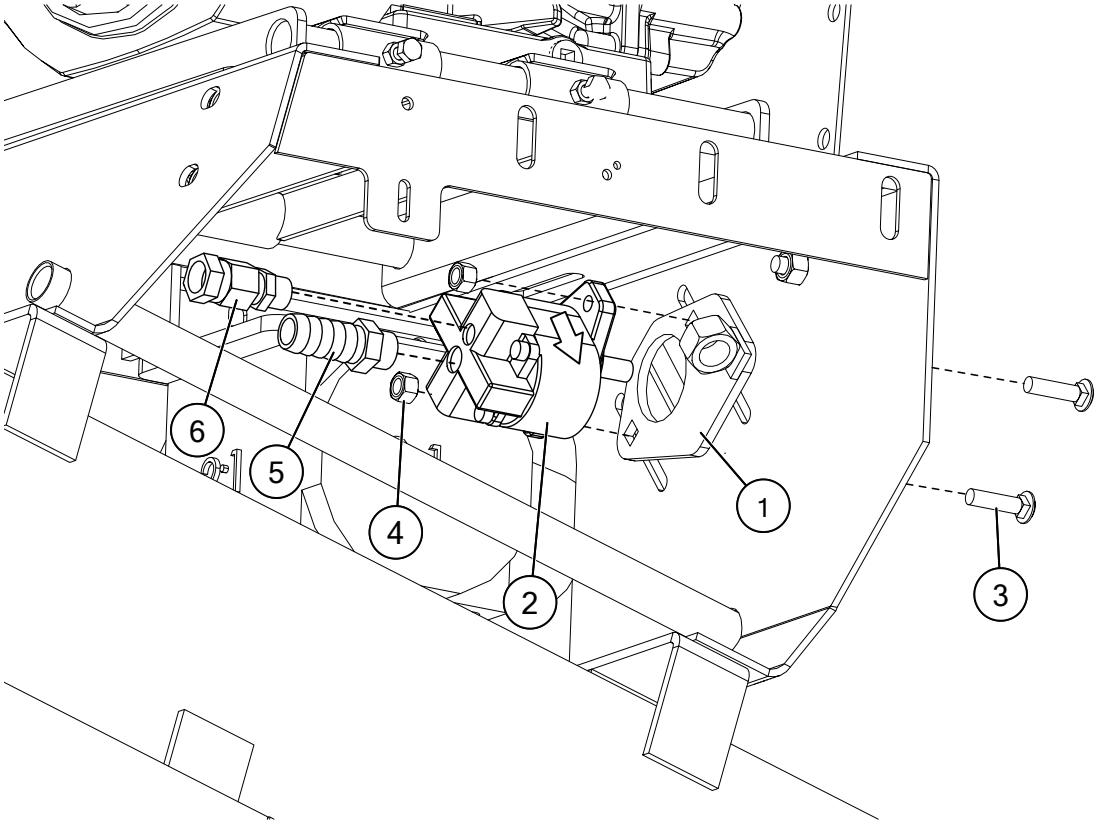
Note

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

Table 41. Hydraulic Pump and Fasteners

Item	Description
1	Pump Mount — Pinch Drive
2	Hydraulic Pump
3	3/8" x 1-1/2" Carriage Bolt Plated
4	3/8" Locknut
5	Hose Barb — 10 MORB x 3/4" Hose
6	Swivel — 8 ORB x 1/2" FPS

Figure 87. Installing Hydraulic Pump (Over-Mount Gas/Electric Drive)



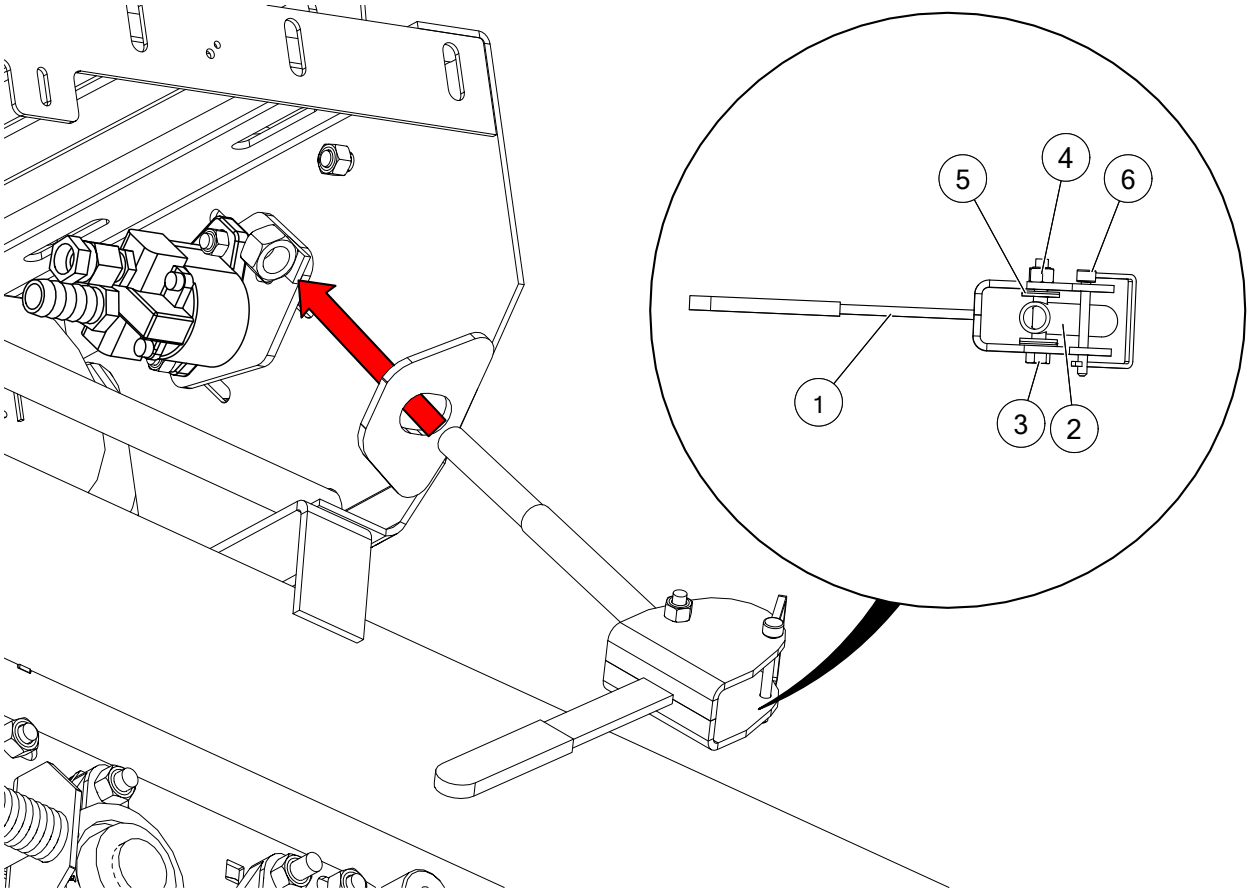
3.32.3 Install the Pivot Handle

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 88).
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 42. 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
5	3/8" Flat Washer
6	1/4" x 2-1/4" Quick Pin

Figure 88. Installing Pivot Handle (Over-Mount Gas/Electric Drive)



3.32.4 Install the Pulleys and Belt

1. Install the hydraulic pump pulley (2) onto the hydraulic pump (see Figure 89).

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.

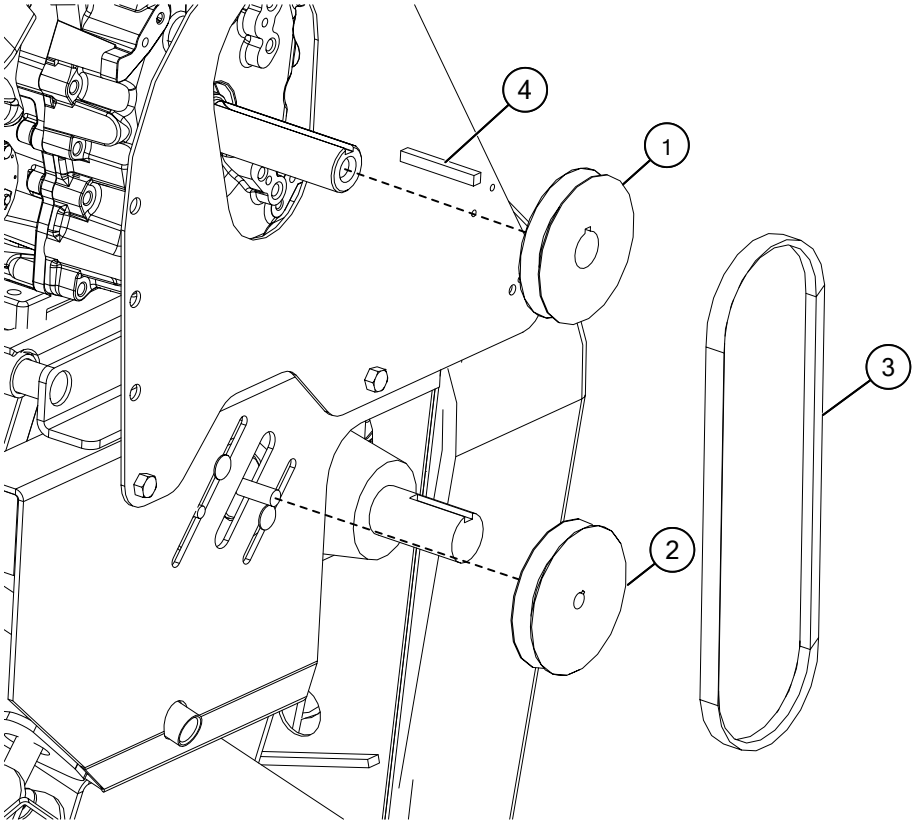
Note

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 43. 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 89. Installing Pulleys and Belt (Over-Mount Gas/Electric Drive)



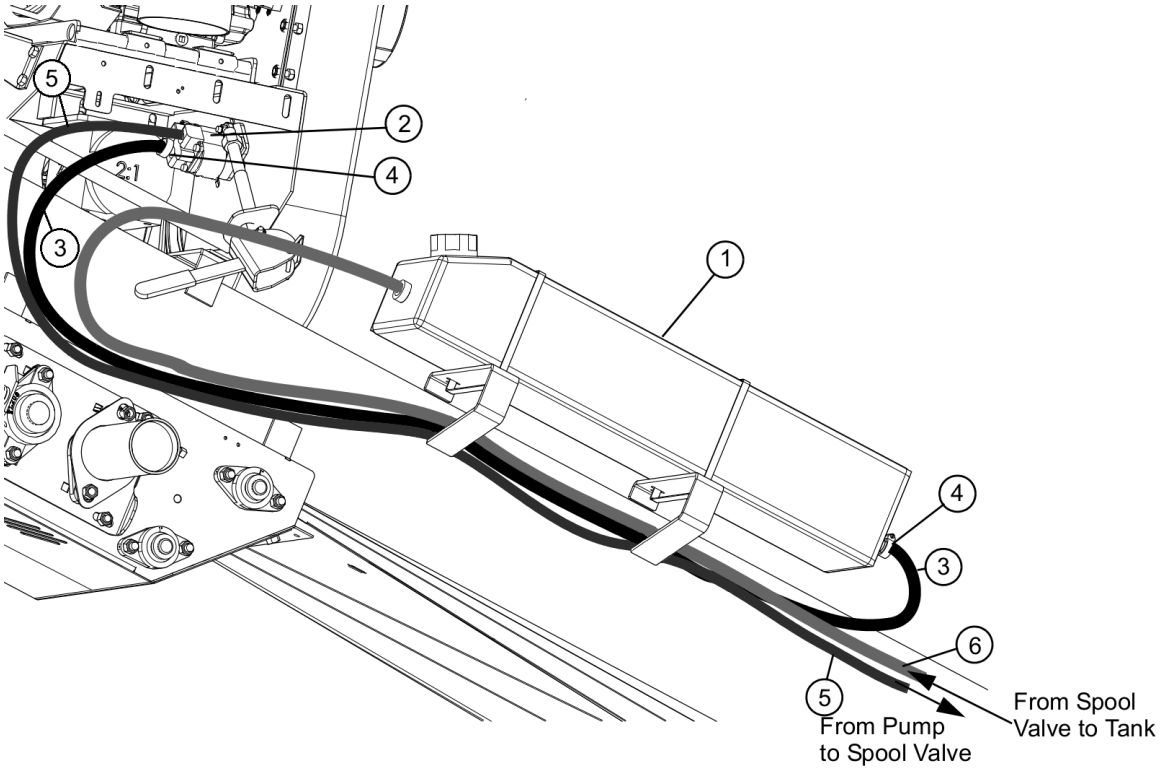
3.32.5 Attach the Hydraulic Hoses

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 90).
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 44. 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 90. Hydraulic Hose Routing



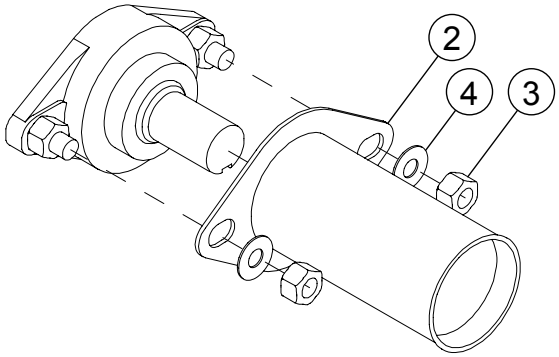
3.33. Install the Shaft Guard

1. Mount the shaft guard (2) over the roller shaft and onto the flange bearing carriage bolts (see Figure 91).
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 91. Installing Shaft Guard



3.34. Install the Inspection Step

The inspection step is used on conveyors with a gas engine or electric motor.

1. Position the inspection step adjacent to the portion of the axle frame with anti-slip tape (and below the gas engine or electric motor) as shown in Figure 92.
2. Attach 5/8" x 2-1/2" u-bolts (2) from the underside of the axle frame and through the inspection step (1) with 5/8" nylock nuts (3) and 5/8" flat washers (4) (see Figure 93).

Table 45. Inspection Step Components

ITEM	DESCRIPTION	QTY
1	Inspection Step	2
2	U-Bolt 5/8" x 2-1/2"	4
3	5/8" Nylon Locknut	8
4	5/8" Flat Washer	8

Figure 92. Anti-Skid Grit Strip

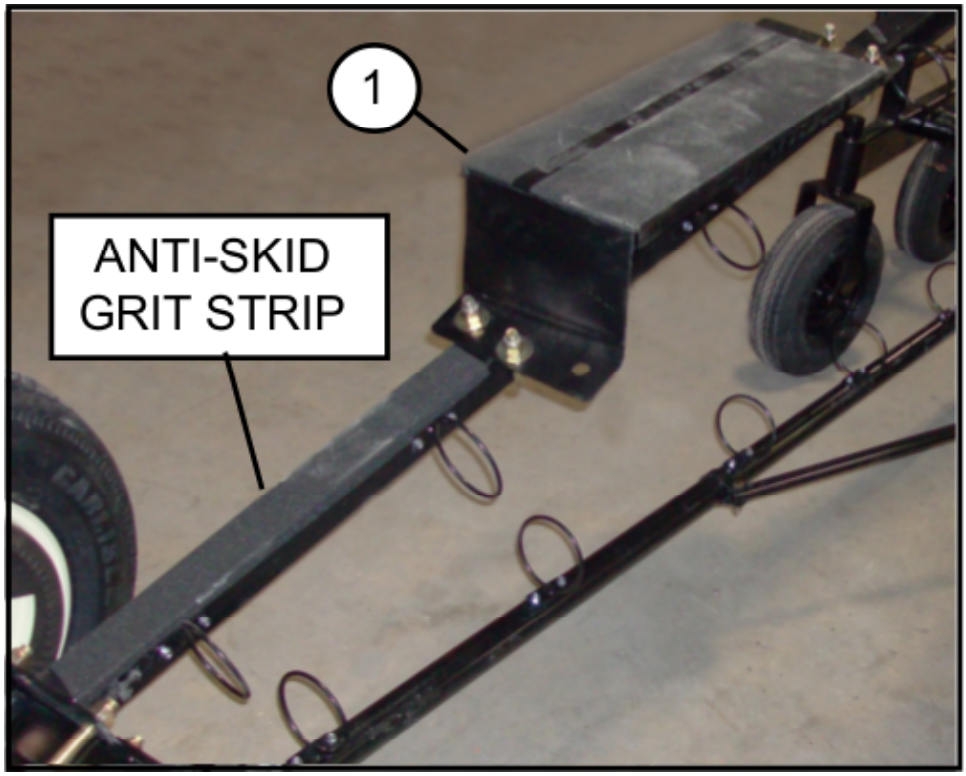
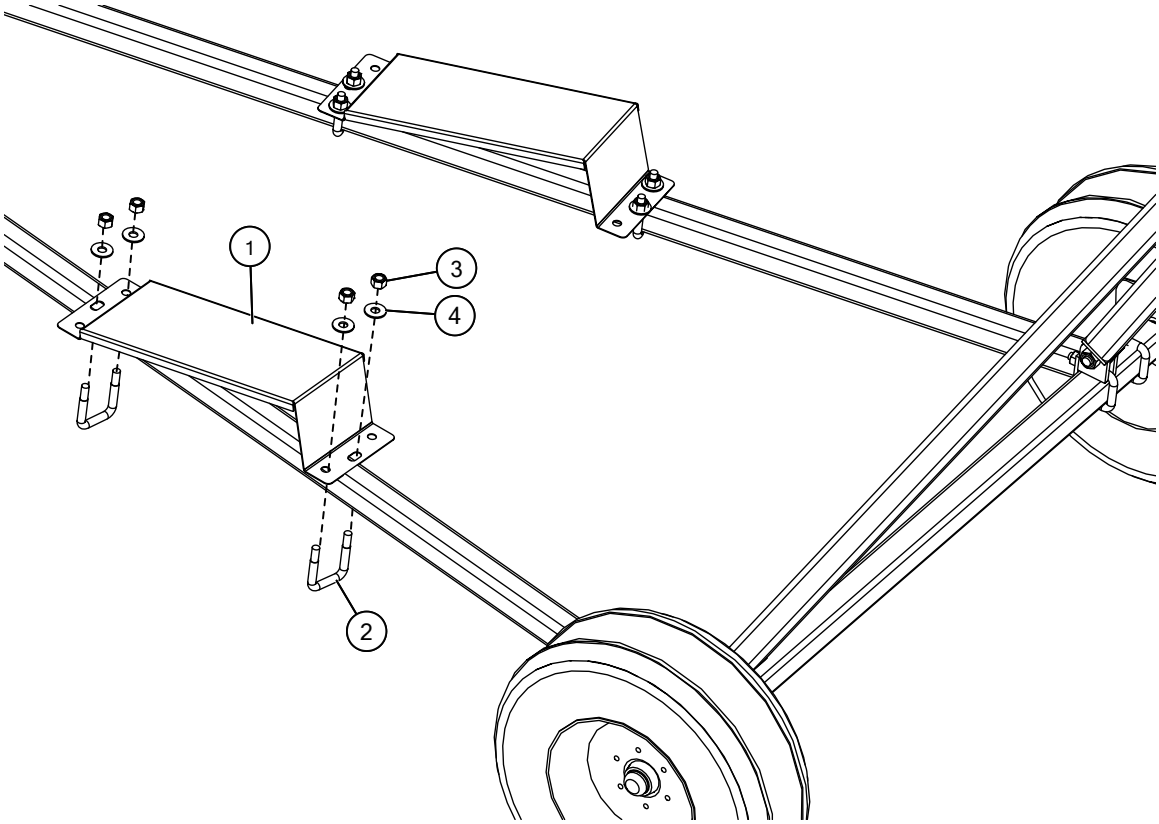


Figure 93. Installing Inspection Step



3.35. 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 94), or
   b. secure with two self-tapping screws (3) (see Figure 95).

Figure 94. Clamp-on Manual Container

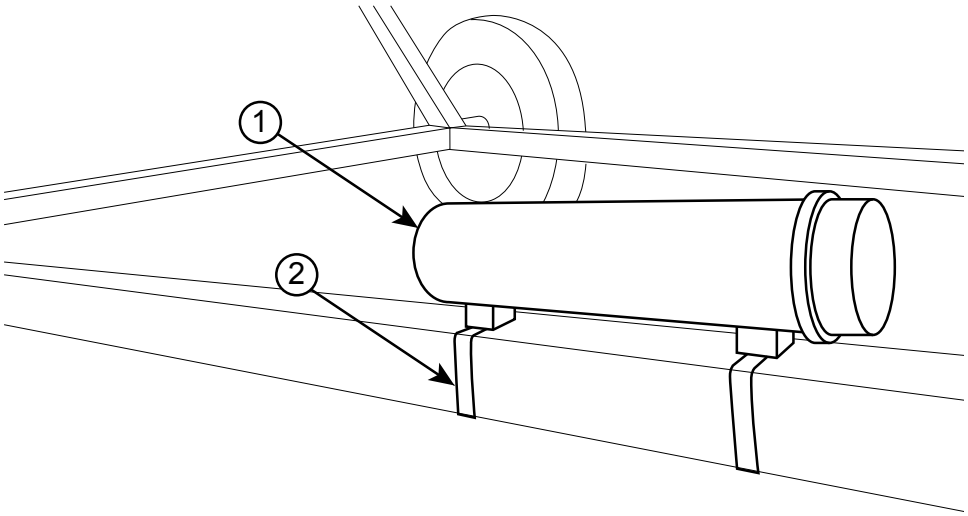
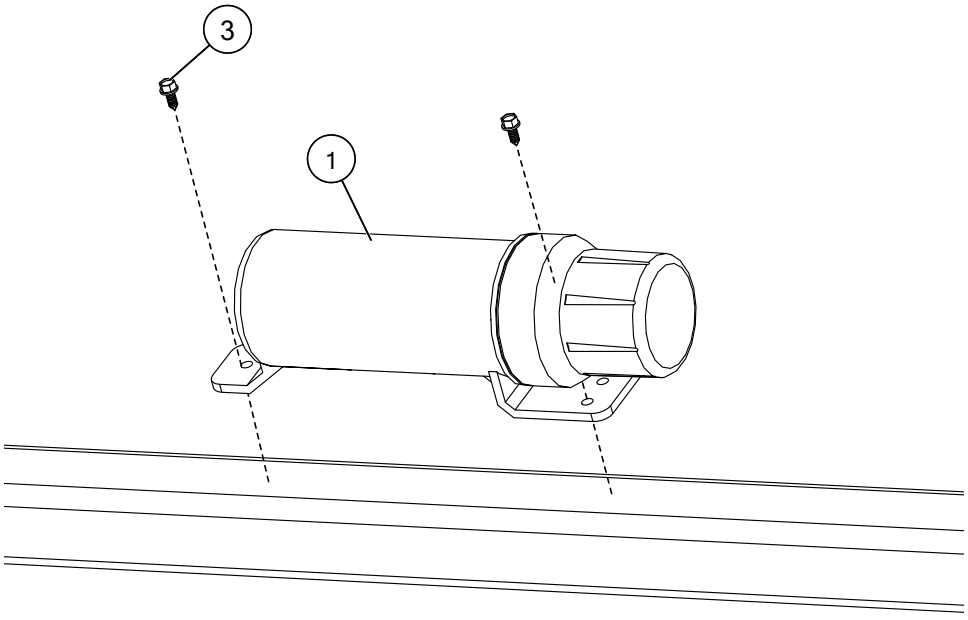


Figure 95. Screw-on Manual Container

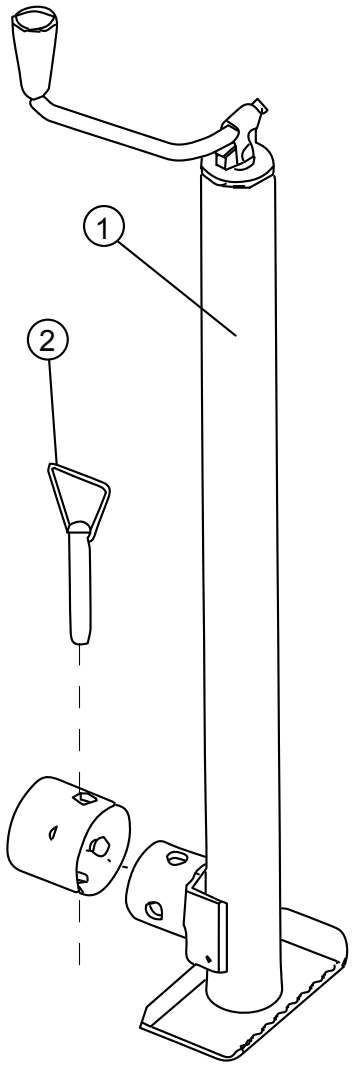


Item	Description
1	Manual Container
2	Gear Clamps
3	Self-Tapping Screw #14 x 5/8"

3.36. Attach the Jack

1. Insert the jack (1) into the jack stub (located on the conveyor hitch) (see Figure 96).
2. Secure the jack in place with the pin (2) provided.

Figure 96. Attaching the Jack



Ref	Description
1	Jack
2	Pin

4. Specifications

Table 46. S-Drive Field Loader Conveyor (2045)

MODEL	2045	2442 Railcar Unloader
DIMENSIONS		
Conveyor Tube Size (Diameter)	14"	
Belt Length	114'	100'4"
OTHER		
Electric Drive (HP)	20	
Gas Drive (HP)	35	
Hitch Pin Size (Min. Diameter x Length)	3/4" x 3–1/2"	
Gear Box Oil Type	SAE Approved 90W or equivalent	
Hydraulic Fluid[1]	ISO 32 Hydraulic Oil or Automatic Transmission Fluid (Dexron 2™) or equivalent	

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

5. Appendix

5.1. Bolt Torque

Table 47 gives the correct torque values for various hardware. Tighten all bolts to the torque specified, unless otherwise noted. Check tightness periodically, using Table 47 as a guide. Replace the hardware with the same strength bolt, contact Batco if you are unsure.

Table 47. 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 48. 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 49. 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 50. 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 50 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 51. 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

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Please include the part number listed on the cover page in your message.