Field Loader Top Drive

Portable Grain Belt Conveyor Assembly Manual

This manual applies to the following brands and models:

Batco BCX², Westfield WCX², Hutchinson HCX²:

1500 Series: 1539, 1544, 1549

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: P1512158 R0

Revised: October 2018

New in this Manual

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

Description	Section
Implemented the new model naming strategy for conveyors. Added 1544 conveyor.	Multiple
Updated the conveyor tube layouts.	Figure 6 on page 24, Figure 7 on page 25, Figure 8 on page 25, Figure 9 on page 26, Figure 10 on page 26
Added installation instructions for hopper latch hardware.	Section 3.14. – Install the Hopper Latch Hardware on page 36
Updated the installation instructions for collapsible hopper cloth.	Section 3.19. – Install the Collapsible Hopper Cloth on page 47
Added new section for angle indicator.	Section 3.21. – Attach the Angle Indicator on page 54
Updated installation instructions for electric motor mount.	Section 3.28.2 – Electric Top Drive on page 65

CONTENTS

1. Safety

1.1. Safety Alert Symbol and Signal Words

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

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

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

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

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

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

1.2. General Product Safety

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

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

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

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

1.3. Moving Conveyor Belt Safety

⚠ WARNING

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

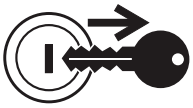
1.4. Rotating Parts Safety

⚠ WARNING

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

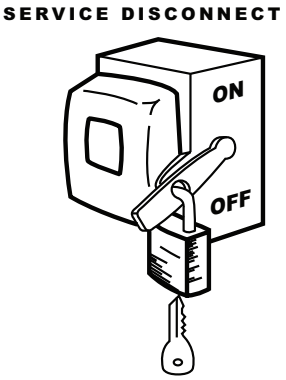
1.5. Drives and Lockout Safety

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



1.5.1 Electric Motor Safety

⚠ WARNING **Power Source**



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

Lockout

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

1.5.2 Hydraulic Power Safety

⚠ WARNING **Power Source**

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

Lockout

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

1.6. Tire Safety

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

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

1.7. 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.

1.8. Personal Protective Equipment

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

Safety Glasses

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

Work Gloves

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

Steel-Toe Boots

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

Coveralls

- Wear coveralls to protect skin.

Hard Hat

- Wear a hard hat to help protect your head.

1.9. Safety Equipment

The following safety equipment should be kept on site:

Fire Extinguisher

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

First-Aid Kit

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

1.10. Safety Decals

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

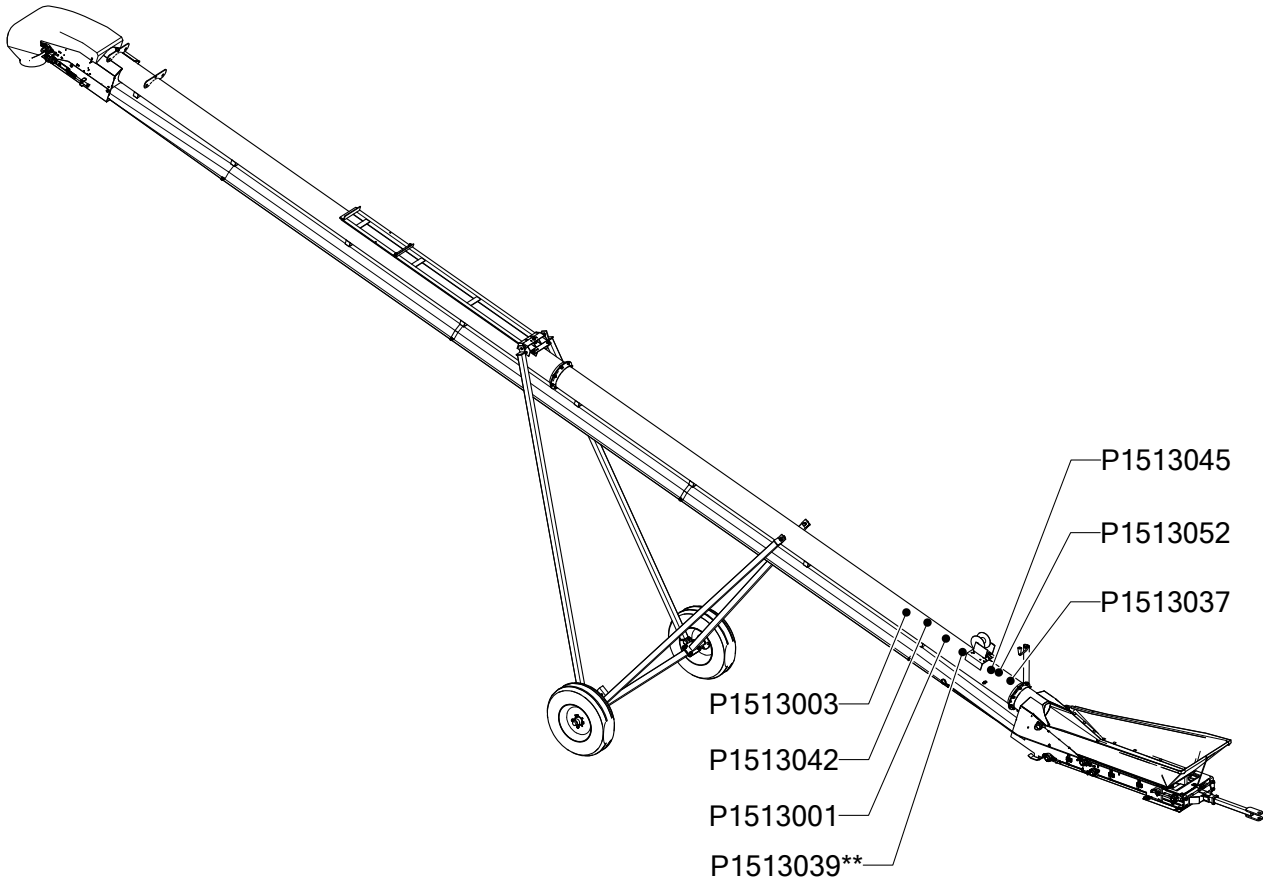
1.10.1 Decal Installation/Replacement

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

1.10.2 Safety Decal Locations and Details

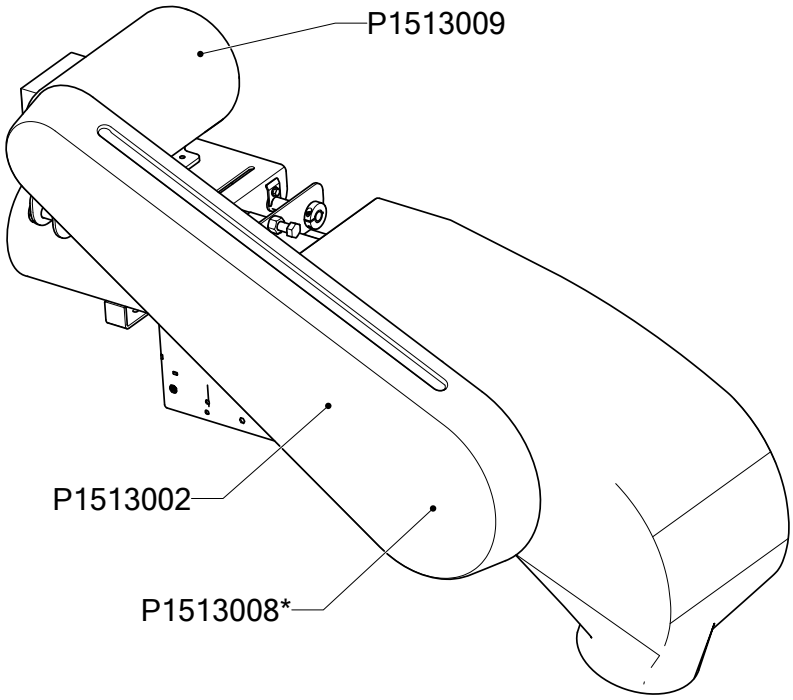
Replicas of the safety decals that are attached to the conveyor and their messages are shown in the figure(s) that follow. Safe operation and use of the conveyor requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well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

Figure 1. Conveyor Safety Decal Locations



** if equipped with hand winch

Figure 2. Electric Top Drive Safety Decal Locations



* behind guard

Figure 3. Hydraulic Top Drive Safety Decal Locations

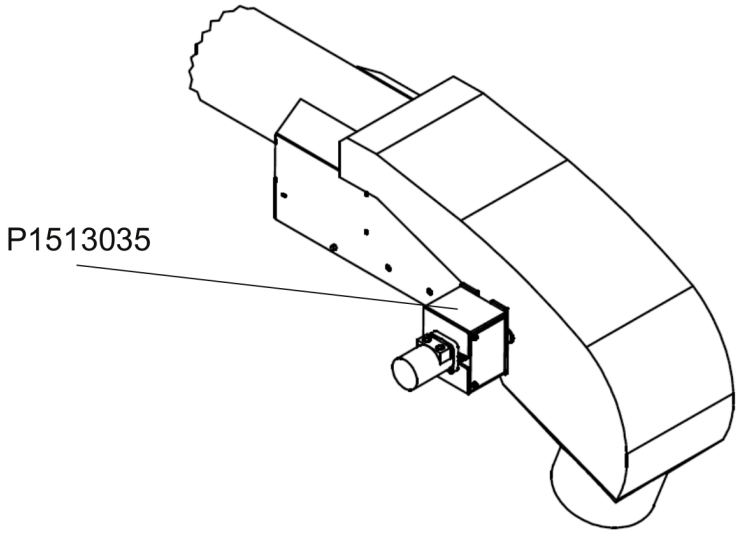


Table 1. Safety Decals

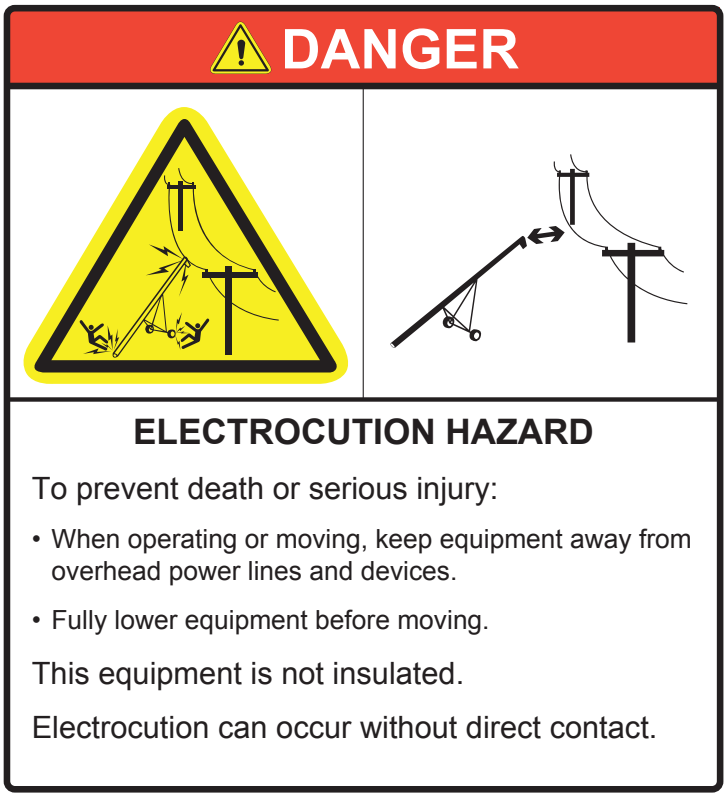
Part Number	Description
P1513003	
P1513045	

Table 1 Safety Decals (continued)

Part Number	Description
P1513037	

Table 1 Safety Decals (continued)

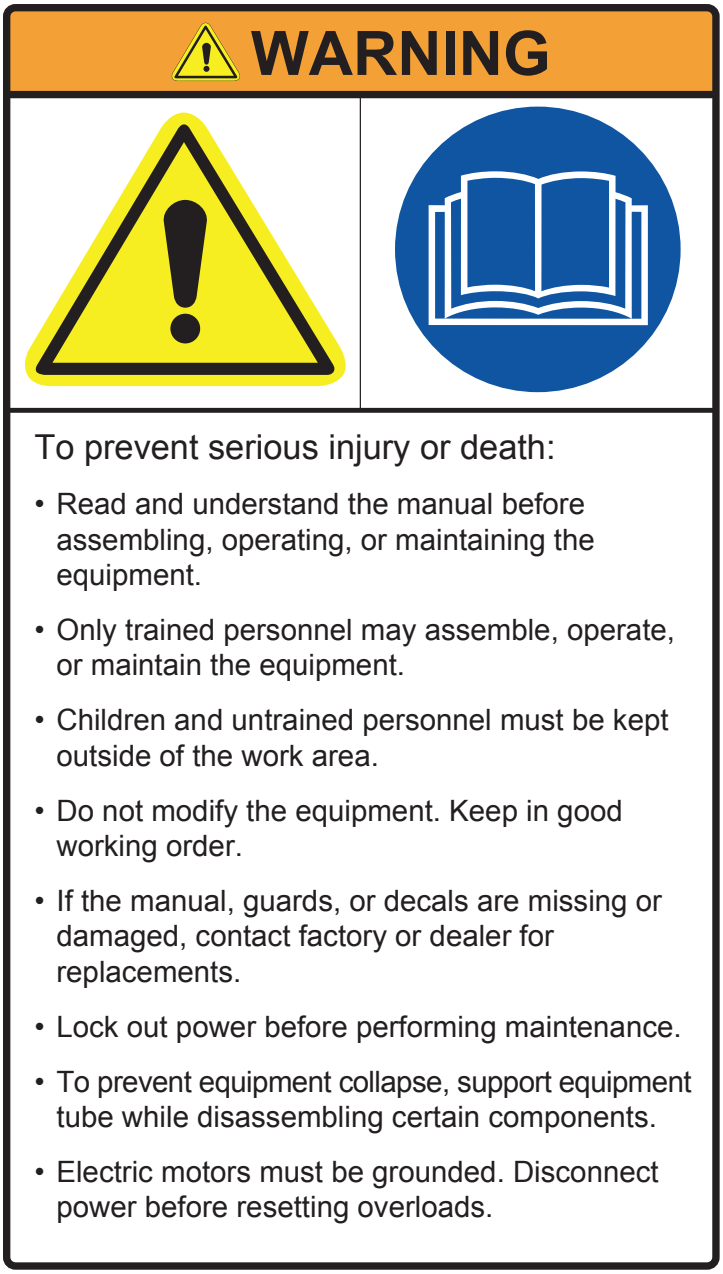
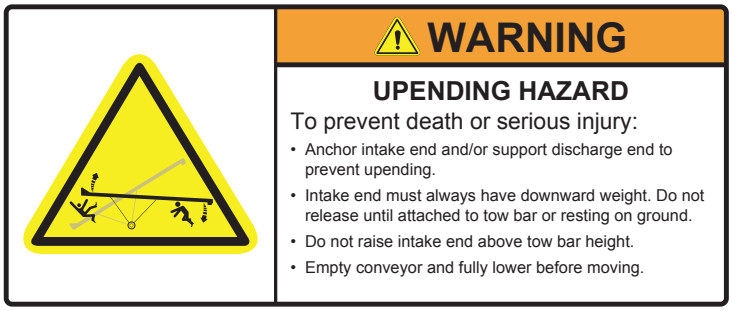
Part Number	Description
P1513001	
P1513042	

Table 1 Safety Decals (continued)

Part Number	Description
P1513002	
P1513008	

Table 1 Safety Decals (continued)

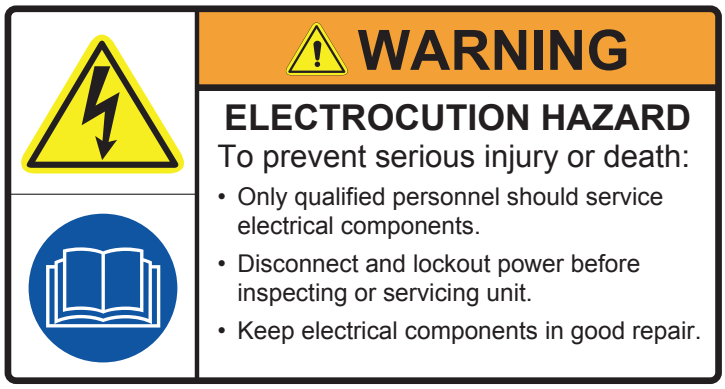
Part Number	Description
P1513009	
P1513035	

Table 1 Safety Decals (continued)

Part Number	Description
P1513039	**⚠ CAUTION** For proper raising and lowering of equipment: • After lowering equipment, always tighten brake lock by turning winch handle clockwise at least two clicks. • Rotate winch handle until cable has light tension, when in towing position. • Do not lubricate winch brake discs. • Inspect lift cable periodically; replace if damaged. • Inspect cable clamps periodically; tighten if necessary.
P1513052	***NOTICE*** To prevent damage, wheels must be free to move when raising or lowering equipment. When equipment is positioned, chock all wheels.

2. Features

This section covers the main features of the conveyor.

Figure 4. Typical Field Loader Top Drive Components

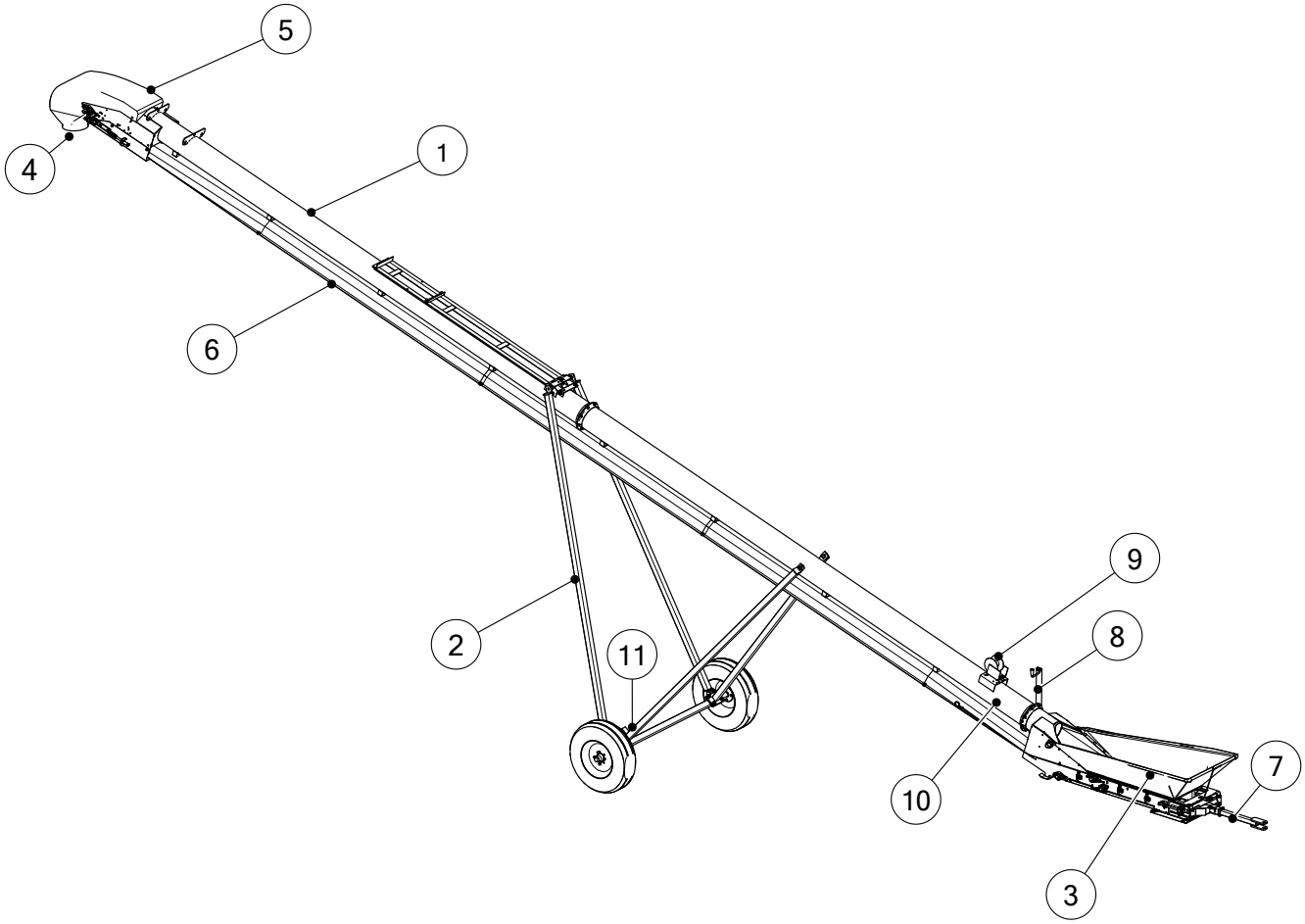


Table 2. Typical Field Loader Top Drive Components

ITEM	DESCRIPTION
1	Tube
2	A-Frame
3	Hopper
4	Spout Assembly
5	Hood
6	Belt Return and Weather Guard

ITEM	DESCRIPTION
7	Hitch
8	Jack
9	Winch
10	Collapsible Hopper Control
11	Hitch Tongue Holder

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 AGI 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 76. 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 77.

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.

3.7. 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 5). 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 3. Tube Connection Components

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

Figure 5. Typical Tube Connection

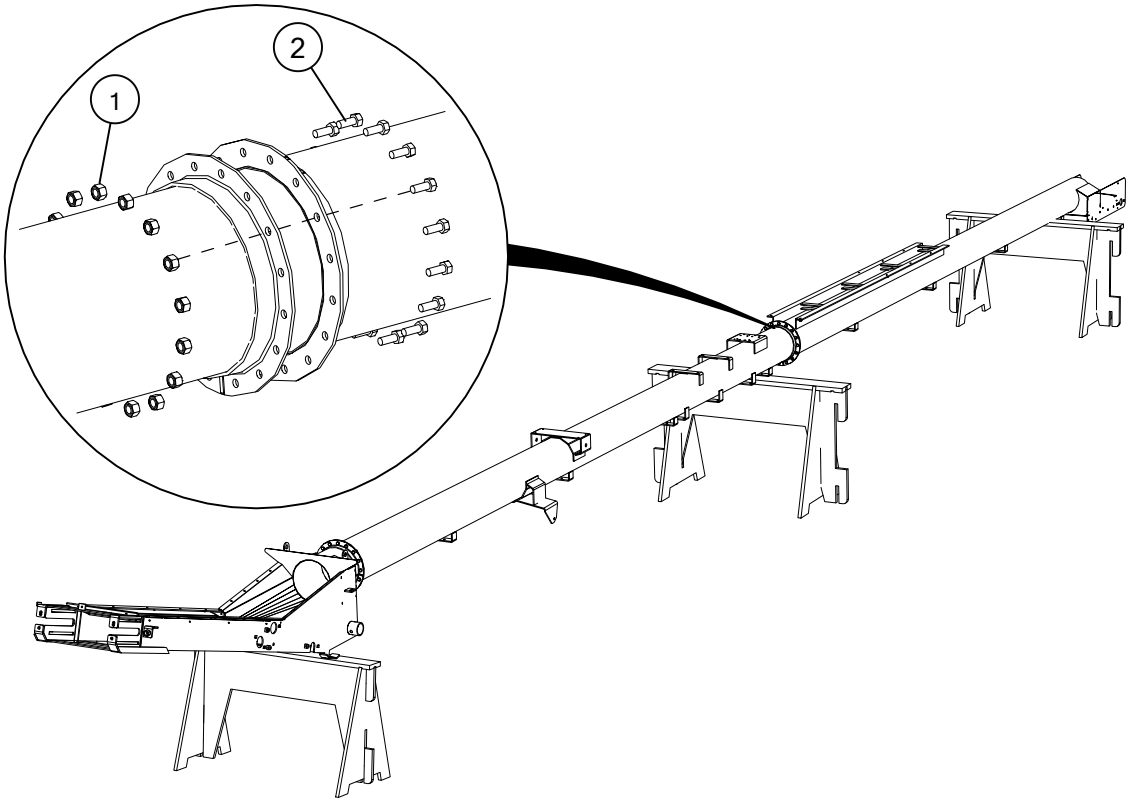
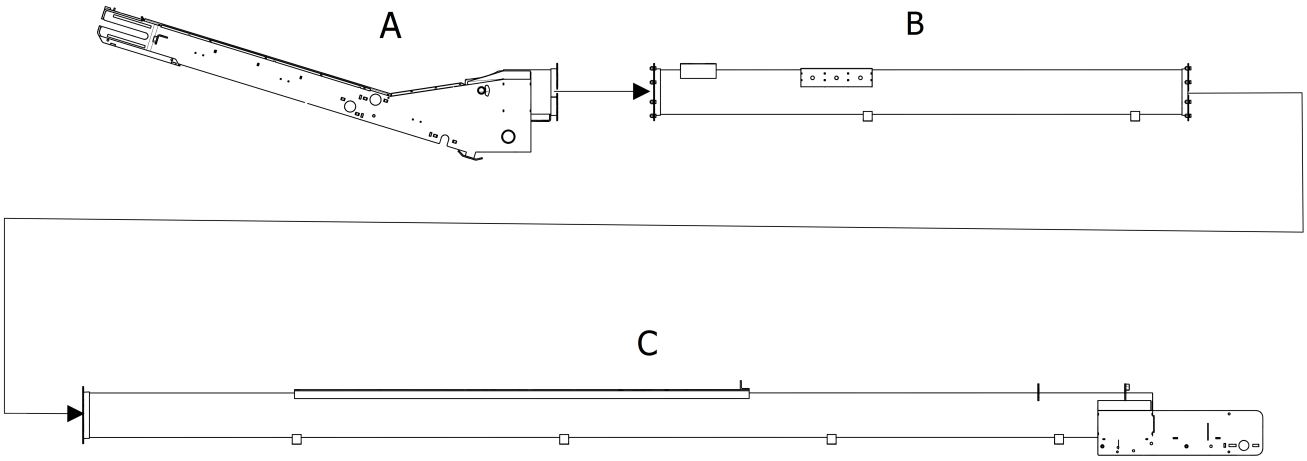
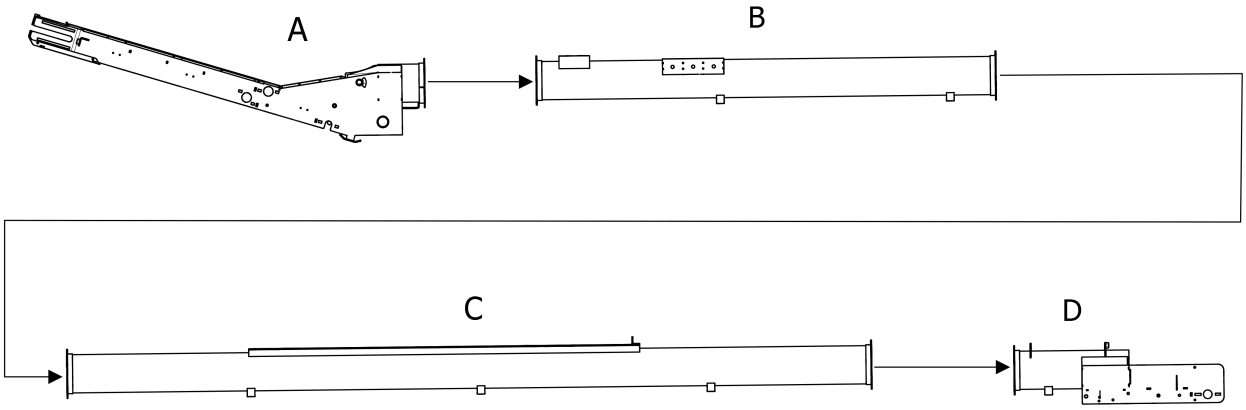


Figure 6. Conveyor Tube Layout for CX² 1539 Model (Batco & Westfield)



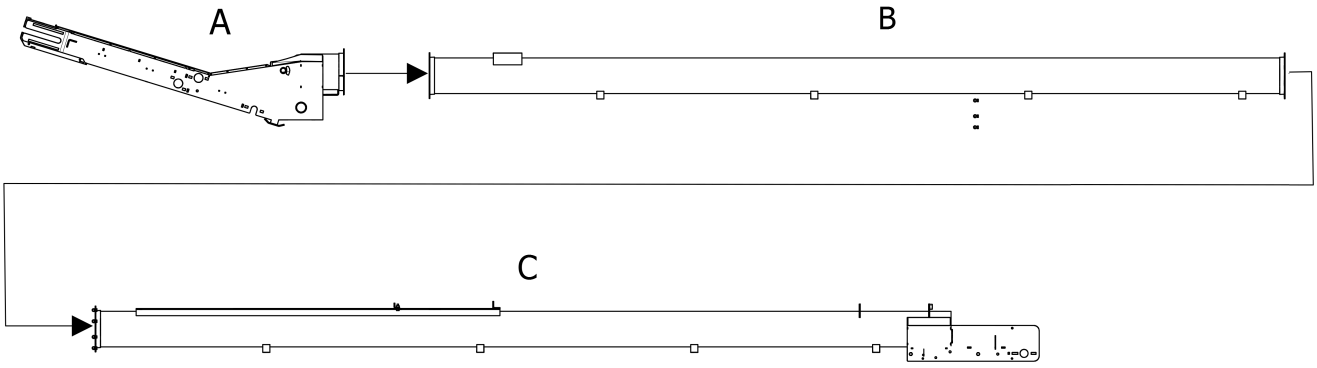
A	15555547, 15555548 (Short)
B	15020114, 15020104 (Short)
C	15020068

Figure 7. Conveyor Tube Layout for CX² 1539 Model (Hutchinson)



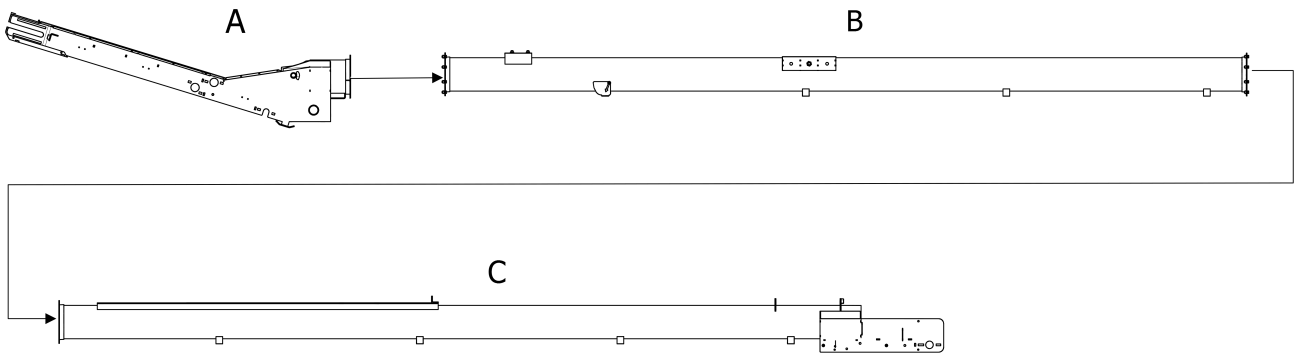
A	15555547
B	15020114GA
C	15020154GA
D	15020147

Figure 8. Conveyor Tube Layout for CX² 1544 Model (Batco & Westfield)



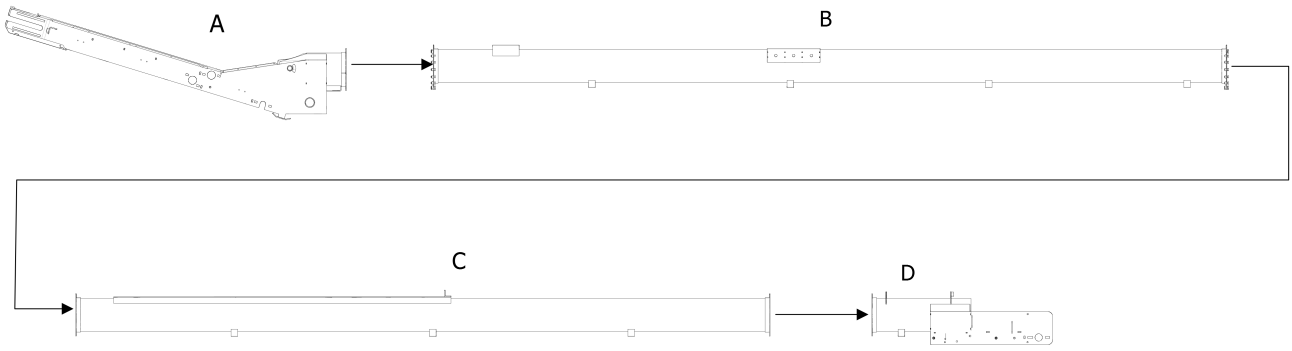
A	15555547, 15555548 (Short)
B	15020116, 15020106 (Short)
C	15020068

Figure 9. Conveyor Tube Layout for CX² 1549 Model (Batco & Westfield)



A	15555547, 15555548 (Short)
B	15020118, 15020108 (Short)
C	15020069

Figure 10. Conveyor Tube Layout for CX² 1549 Model (Hutchinson)



A	15555547
B	15020118GA
C	15020150GA
D	15020147

3.8. 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 11):
  - 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 12 and Figure 13.

Figure 11. Brand (B) and Model (M) Decal Placement

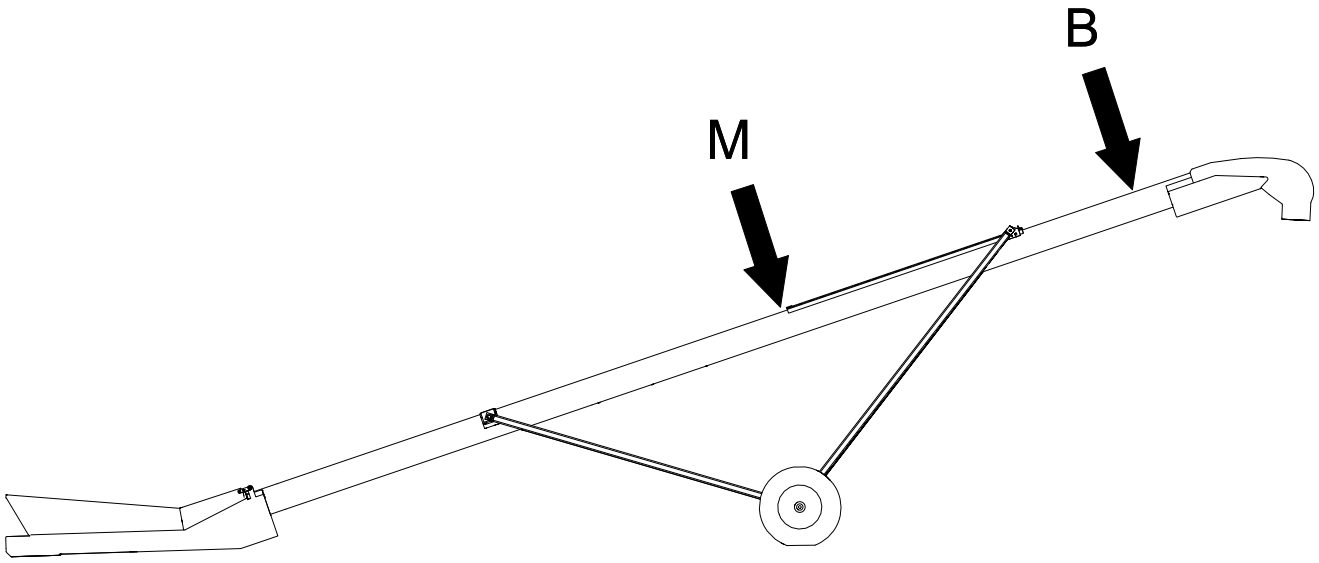


Figure 12. Brand Decal (example)

AGI BATCO

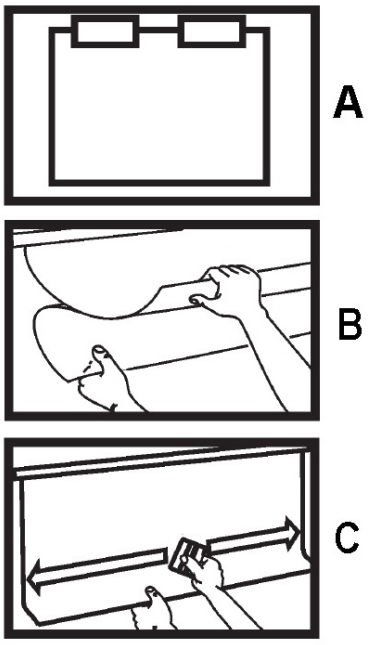
Figure 13. Model Decal (example)

BCX² 1549

- 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 14).
  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.

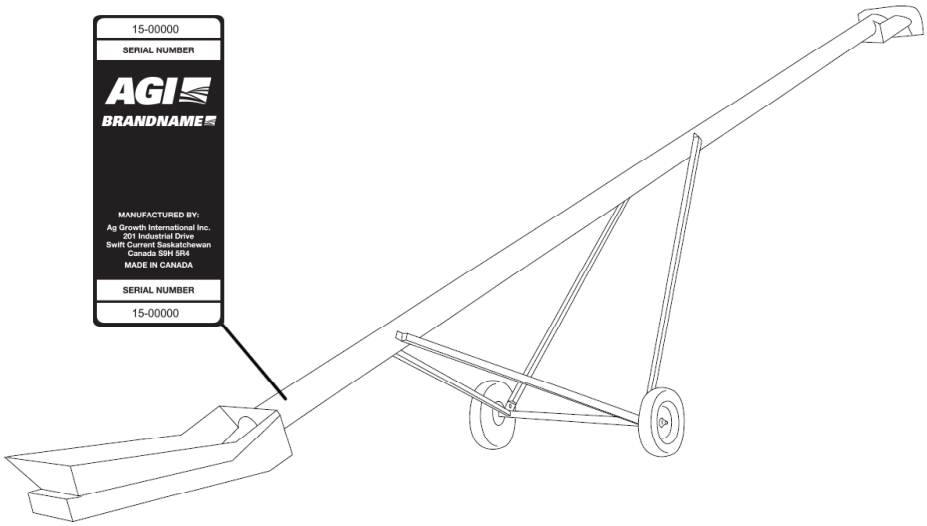
4. As you work your way down the decal, peel back the backing paper 6” at a time. Repeat Step 3 until the entire decal has been applied to the tube (see Detail C as an example).
5. Once the entire decal has been properly adhered to the tube, remove tape hinge from front of decal. Remove the front application 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 14. Decal Placement Technique



3.9. Serial Number Decal Placement

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



3.10. Install the Spout Roller

1. Insert the roller (2) into the spout (1) (see Figure 15).

   Important

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

2. Slide a bearing (5) on each end of the roller and secure to the spout using 1/2" x 1–1/2" carriage bolts (3), square flat washers (4), and 1/2" locknuts (6).
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.

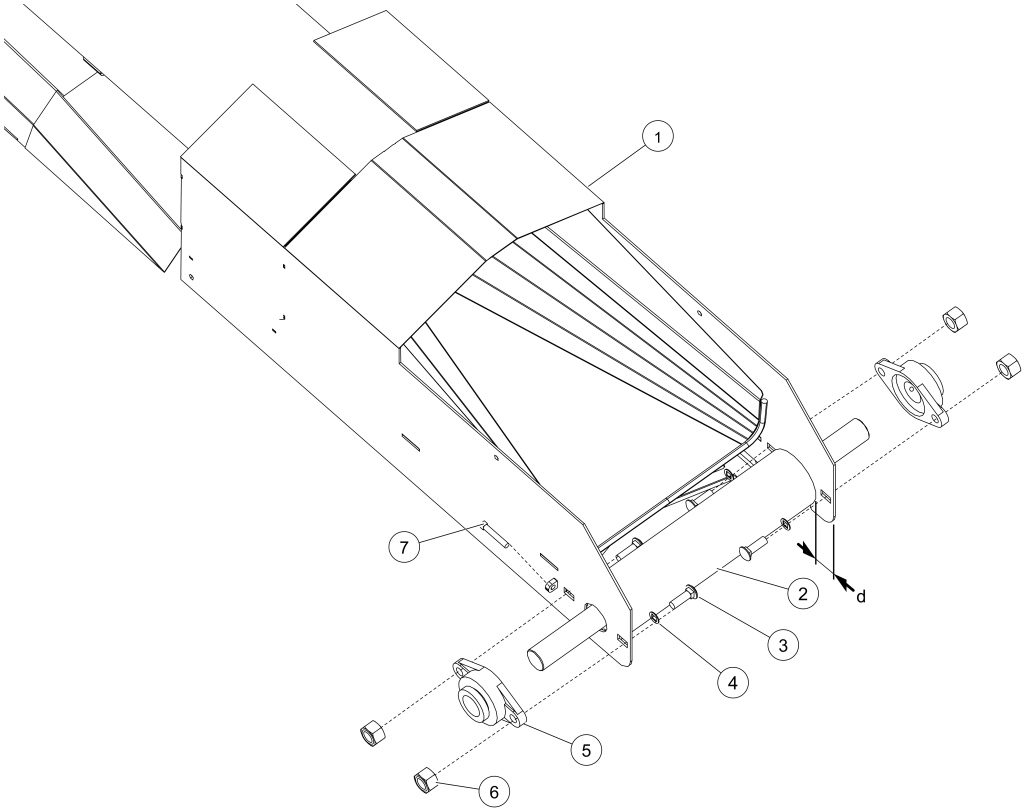
Table 4. Spout Roller Components

Item	Description	Quantity
1	Spout	1
2	Vulcanized Spout Roller	1
3	1/2" x 1–1/2" Carriage Bolt	4
4	Square Flat Washer (0.531"-1.00"-0.060")	4

Table 4 Spout Roller Components (continued)

5	1-1/2" Bearing Flange Unit (SAFL208–24)	2
6	1/2" Nylon Locknut	4
7	7/16" x 2-1/2" Square-Head Set Screw	2

Figure 15. Installing Spout Roller



3.11. Install the Hand Winch

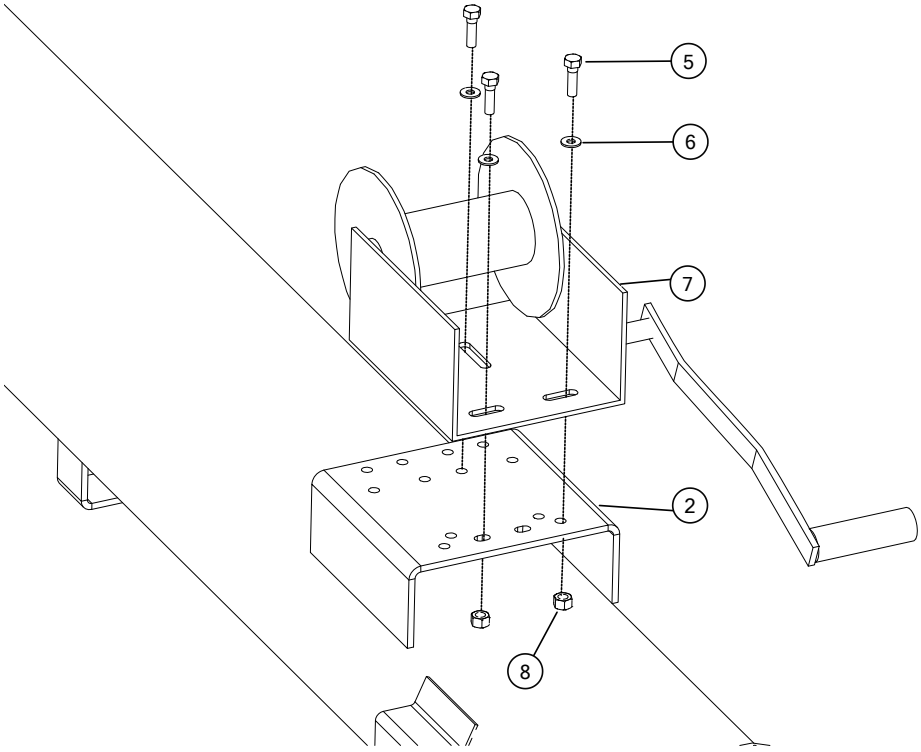
Depending on your conveyor model, it may be equipped with either a hand winch or a hydraulic winch.

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 16).

Table 5. 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 16. Installing the Hand Winch



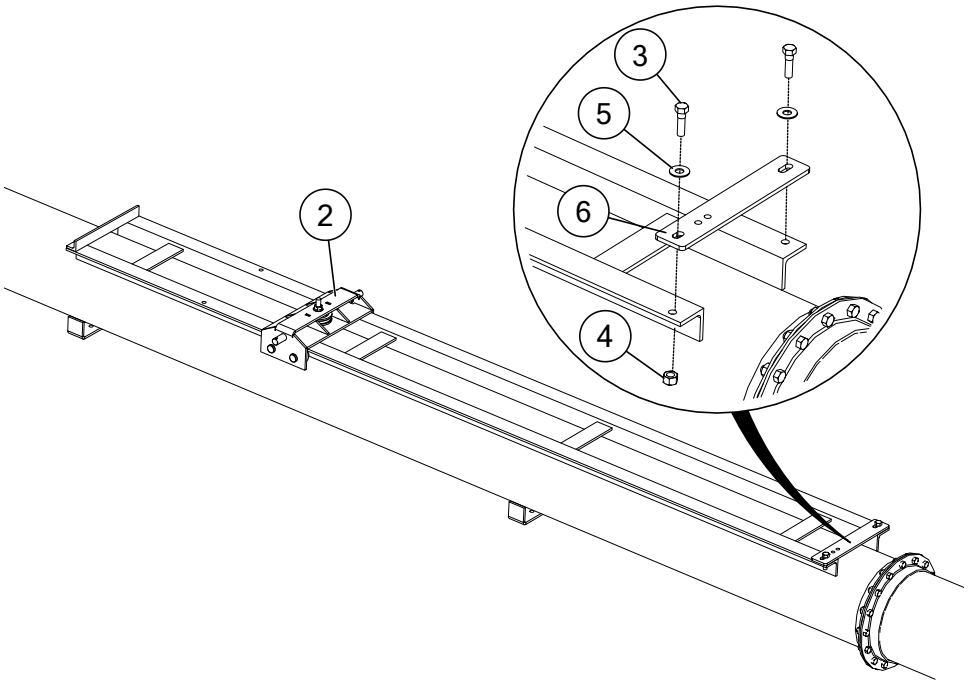
3.12. Install the Frame Slider

1. Slide the slider (2) onto the track (see Figure 17).
2. Install the cable attach (6) on the track with 7/16" x 1-1/2" bolts (3), 7/16" locknuts (4), and flat washers (5).

Table 6. Frame Slider Components

Item	Description
2	Slider
3	7/16" x 1-1/2" Hex Bolt (GR8)
4	7/16" Nylock Nut
5	7/16" Flat Washer
6	Cable Attach

Figure 17. Installing the Frame Slider



3.13. Assemble the Weather Guard

1. Install the types of weather guard sections in Table 7 which are indicated by the identifier letters as shown on your particular conveyor model schematic that follows.
2. Connect each weather guard section to the tube brackets as indicated by the position arrows on your particular conveyor model schematic that follows. Use a uni-mount cast plate (1), 3/8" x 1-1/4" capscrew (2), and 3/8" locknut (3). Leave the 3/8" locknuts loose (see Figure 18).

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

3. Confirm all weather guard mount bar holes are aligned.
4. Tighten the 3/8" locknuts (3) after all of the weather guards have been installed.

Table 7. Identifiers for Types of Weather Guard Sections

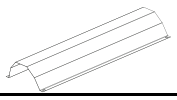
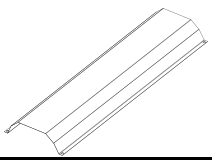
Identifier	Type of Weather Guard Section	
A	3' (0.91 m) Standard	
B	5' (1.52 m) Standard	

Table 7 Identifiers for Types of Weather Guard Sections (continued)

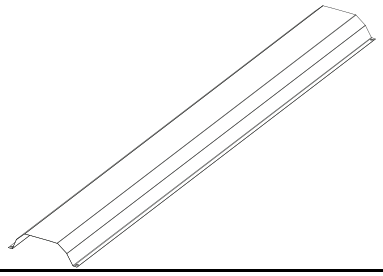
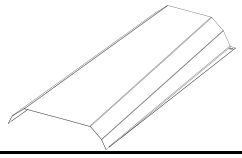
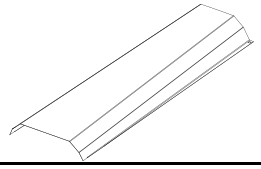
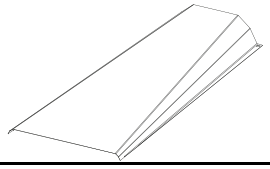
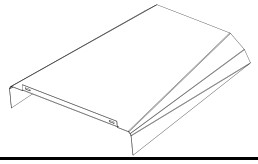
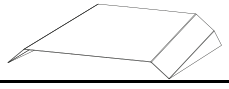
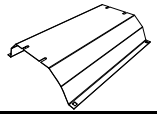
Identifier	Type of Weather Guard Section	
C	10' (3.05 m) Standard	
D	4' (1.22 m) Flared	
E	5' (1.52 m) Flared	
F	5' (1.52 m) Flat	
G	Guard -Above S-Drive	
H	Upper Transition	
J	2' (0.61 m) Standard	

Table 8. Components to Install Weather Guard onto the Tube Bracket

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

Figure 18. Installing a Weather Guard Section

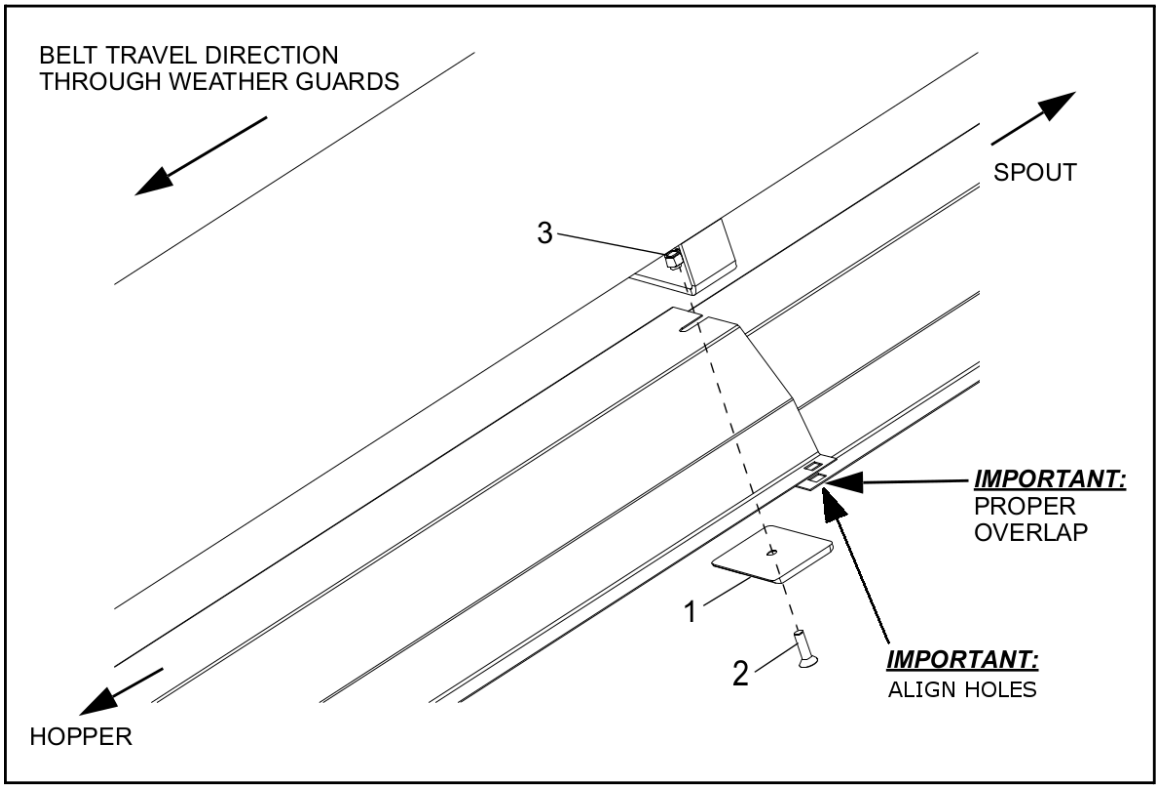
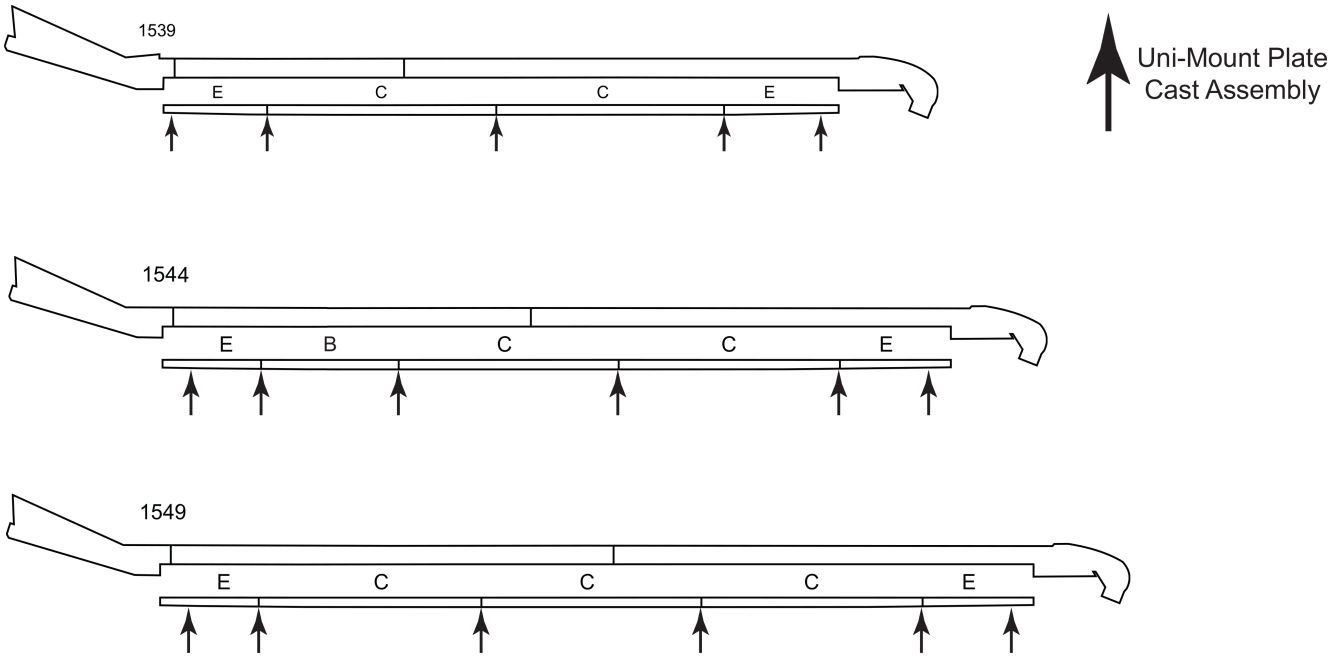


Figure 19. Weather Guard Section Locations

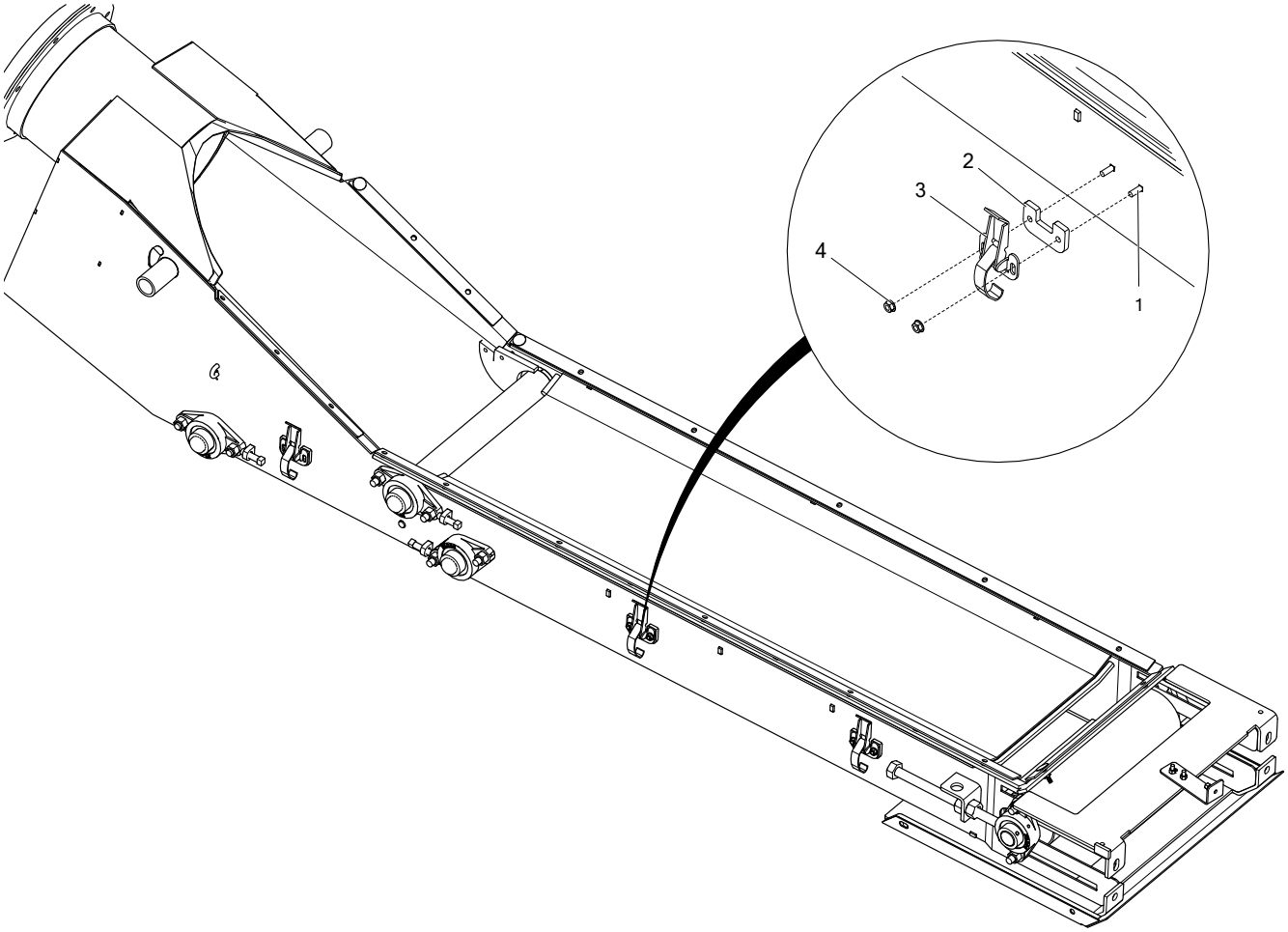


3.14. Install the Hopper Latch Hardware

Table 9. Latch Hardware

Item	Description
1	1/4" x 3/4" Carriage Bolt
2	Spacer
3	Tension Latch Clamp
4	1/4” Flanged Nut

Figure 20. Installing the Latch Hardware



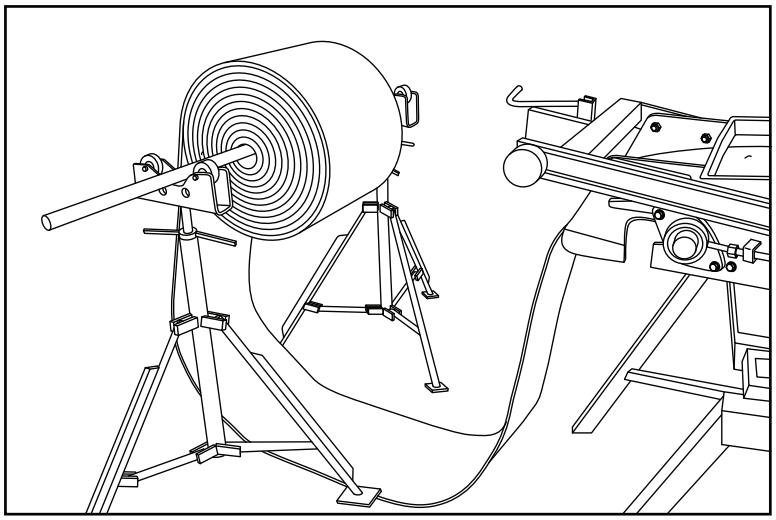
3.15. Install the Belt

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

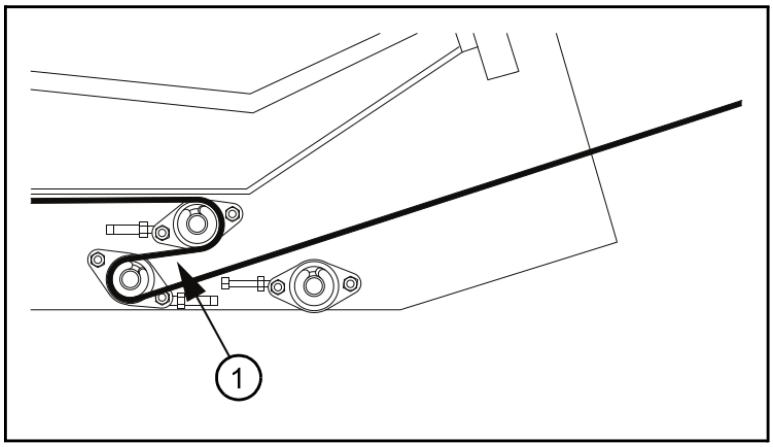
1. Place the rolled belt on a stand behind the hopper.
2. Pull the conveyor belt over the top of the hopper roller, until just inside the hopper, as shown below.

Figure 21. 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.

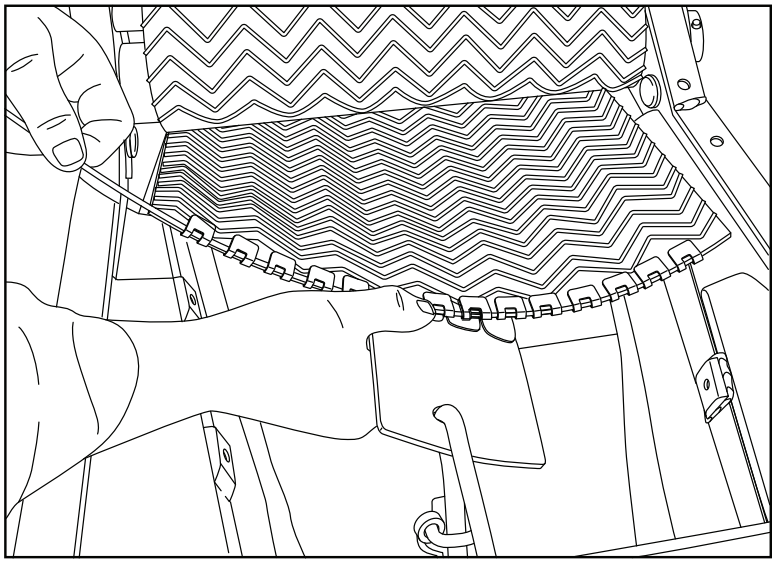
Figure 22. Belt Through Transition Rollers



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.

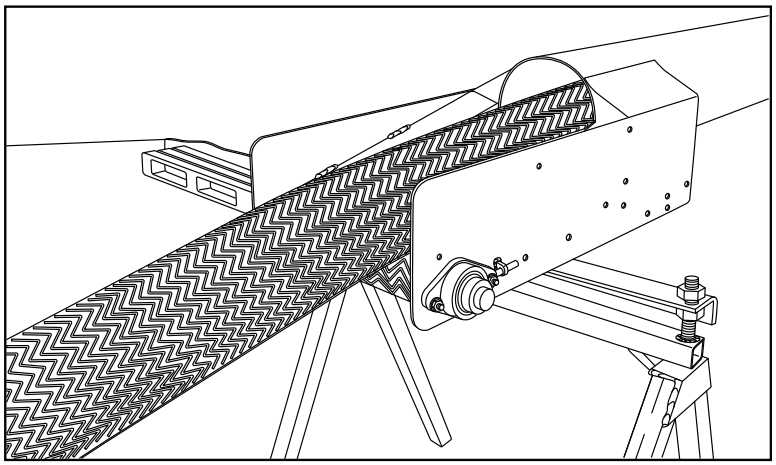
Figure 23. Attaching the Short Belt Piece to the Belt



Thread the Conveyor Belt

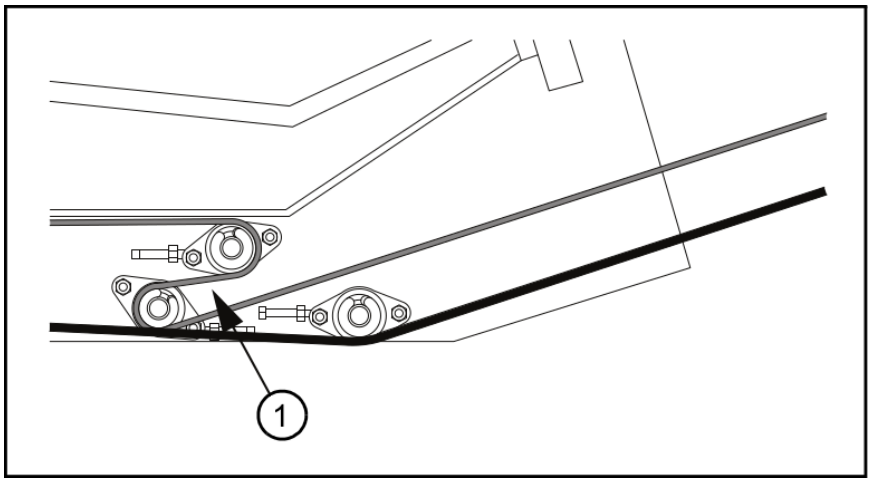
1. From the spout end, pull the fish tape until the belt emerges from the spout.

Figure 24. Conveyor Belt Pulled Through the Spout



2. Wrap the belt around the spout roller and pull it back under the conveyor tube to the hopper until approximately 6' (1.8 m) of excess belt remains on the stand behind the hopper.

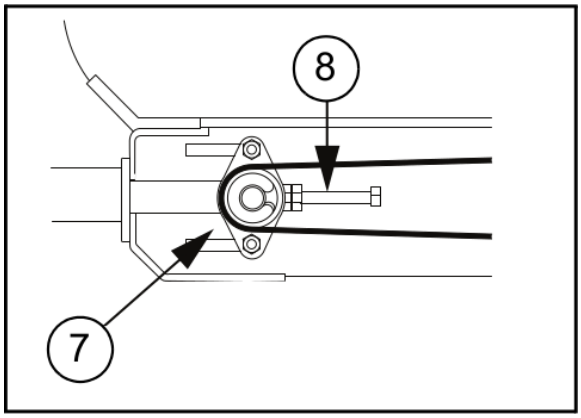
Figure 25. Conveyor Belt Bottom Path



Item	Description
1	Transition Roller

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

Figure 26. Conveyor Belt Around Hopper Roller



Item	Description
7	Hopper Roller
8	Take-up Bolt

The conveyor belt is now ready to be connected.

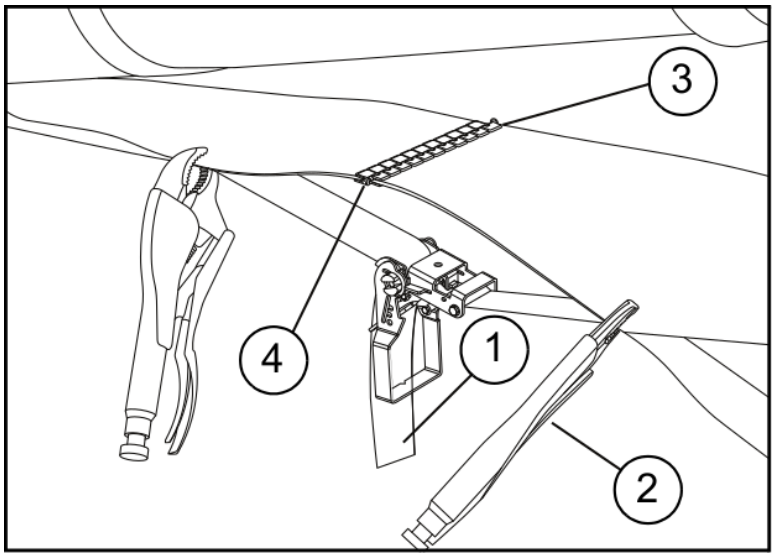
Connect the Conveyor Belt

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

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

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

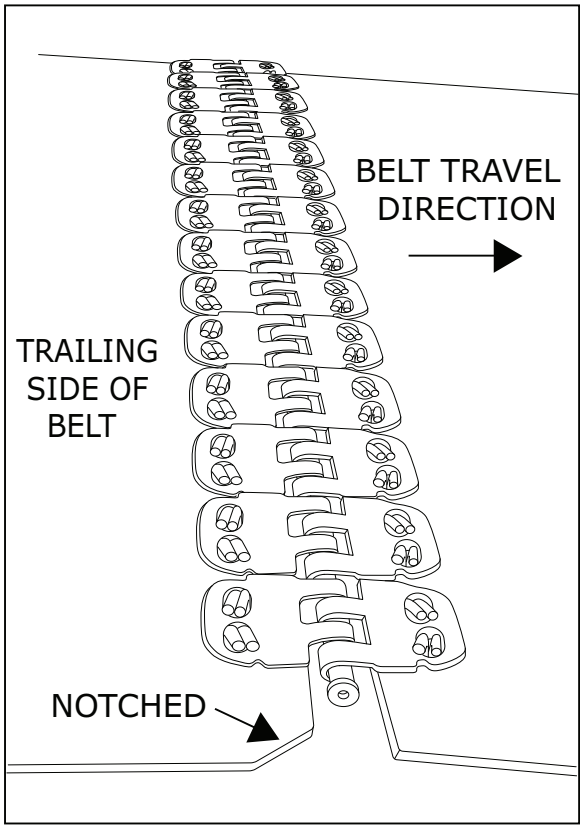
Figure 27. Using a Strap Puller



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 28. Tapering the Trailing Edge of the Belt



Tighten the Conveyor Belt

Use the hopper roller bolts to set the belt tension.

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

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

3.16. Attach the Hopper Underside Covers

Table 10. Underside Covers

Item	Description
1	Underside Cover, Front
2	Pin Spring
3	Underside Cover, Main

Figure 29. Installing the Underside Front Cover

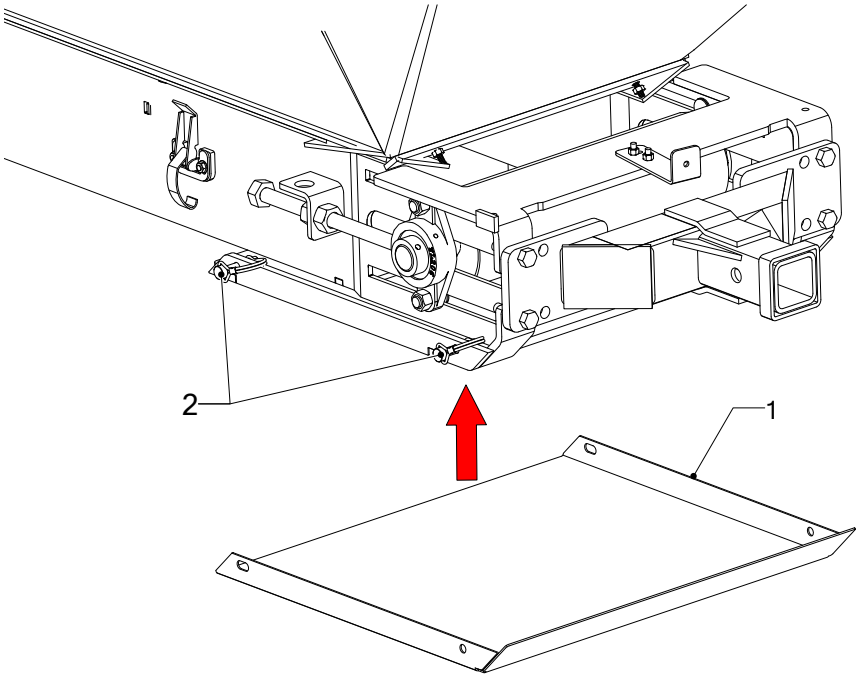
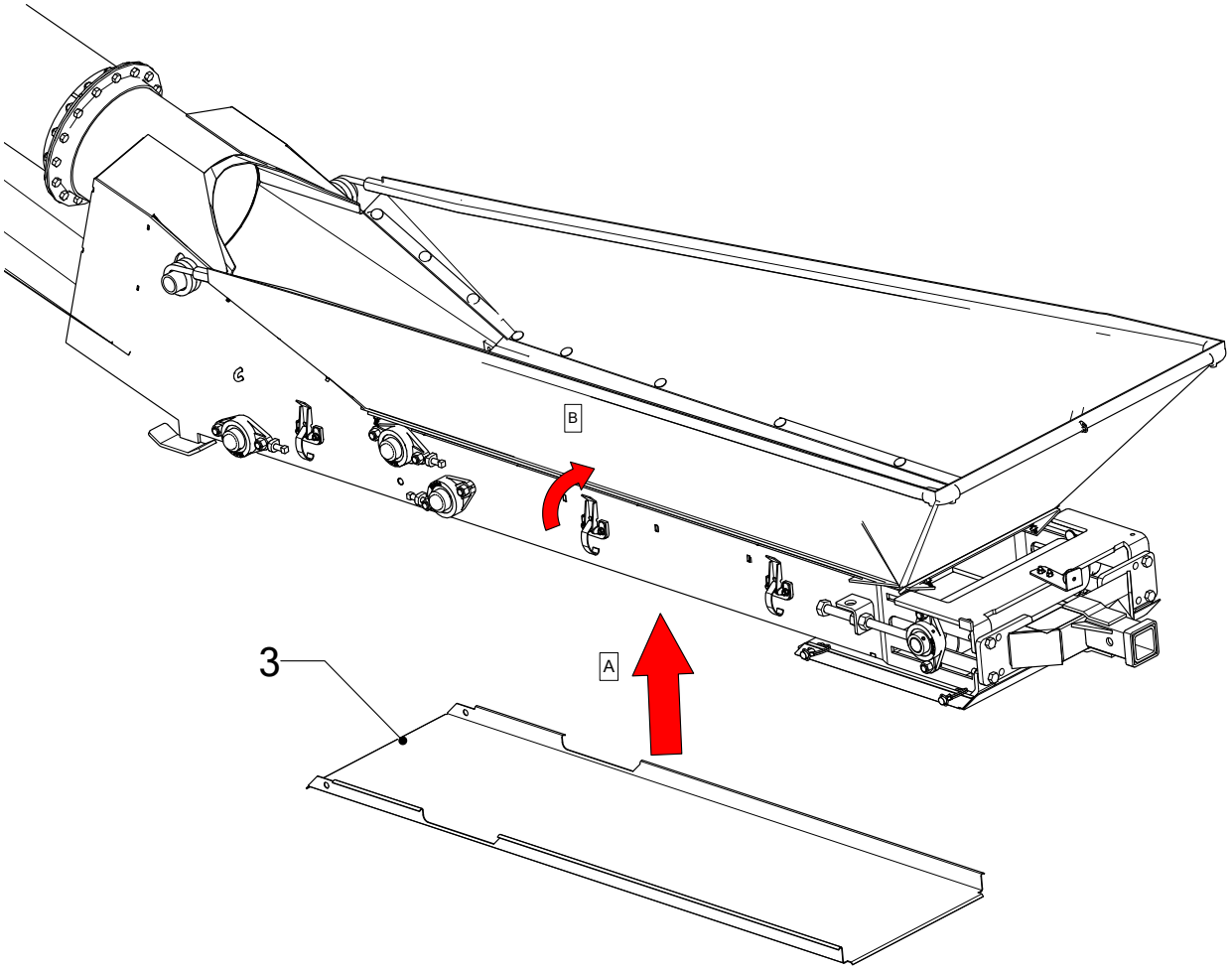


Figure 30. Installing the Underside Main Cover



3.17. Install the Top Drive Pinch Mount

1. Loosen the pinch roller bolts (6) to the end of their threads (see Figure 31).
2. Install the pinch mount (2) onto the spout assembly (1) using 1/2" x 1-1/4" bolts (3) and 1/2" nuts (4).
3. Tighten the pinch roller bolts (6) on both sides of the pinch mount until the head of the bolt contacts the pinch pipe.

Note

Ensure the bolts on the pinch roller bearings are just loose enough to allow the pinch roller the freedom to kick back 1/4" during operation when the belt seam passes through.

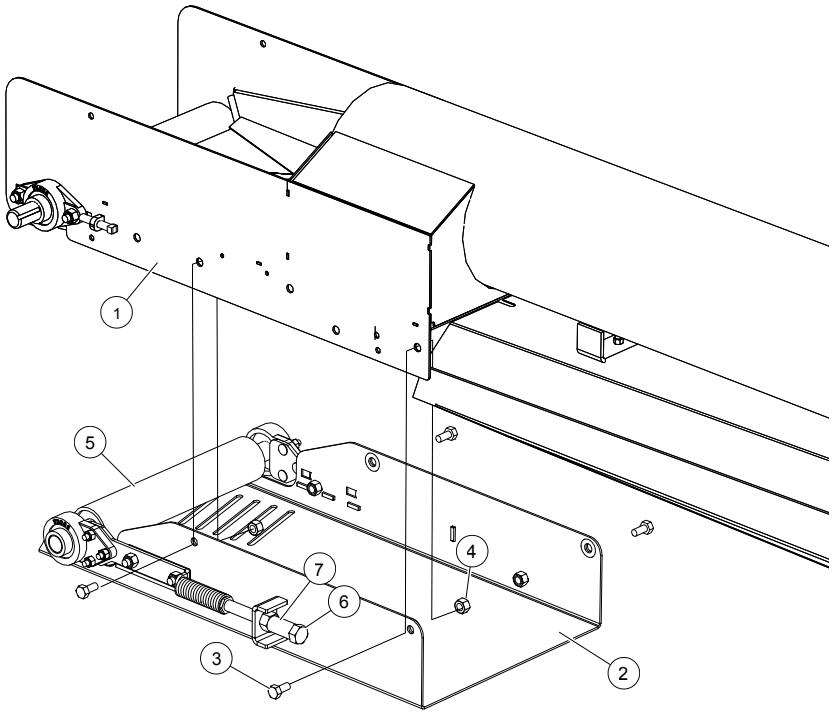
Table 11. TD Pinch Mount Components

Item	Description	Quantity
1	Spout Assembly	1
2	Top Drive Pinch Mount	1
3	Bolt 1/2" x 1-1/4"	4

Table 11 TD Pinch Mount Components (continued)

Item	Description	Quantity
4	Nut Nylock 1/2"	4
5	Pinch Roller	1
6	Pinch Roller Bolt	2
7	Pinch Pipe	2

Figure 31. Installing the TD Pinch Mount



3.18. Install the Weather Guard Mount Bars

1. Install the types of mount bar assemblies in Figure 32 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 12. Weather Guard Mount Bar Components

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

Figure 32. Types of Mount Bar Assemblies

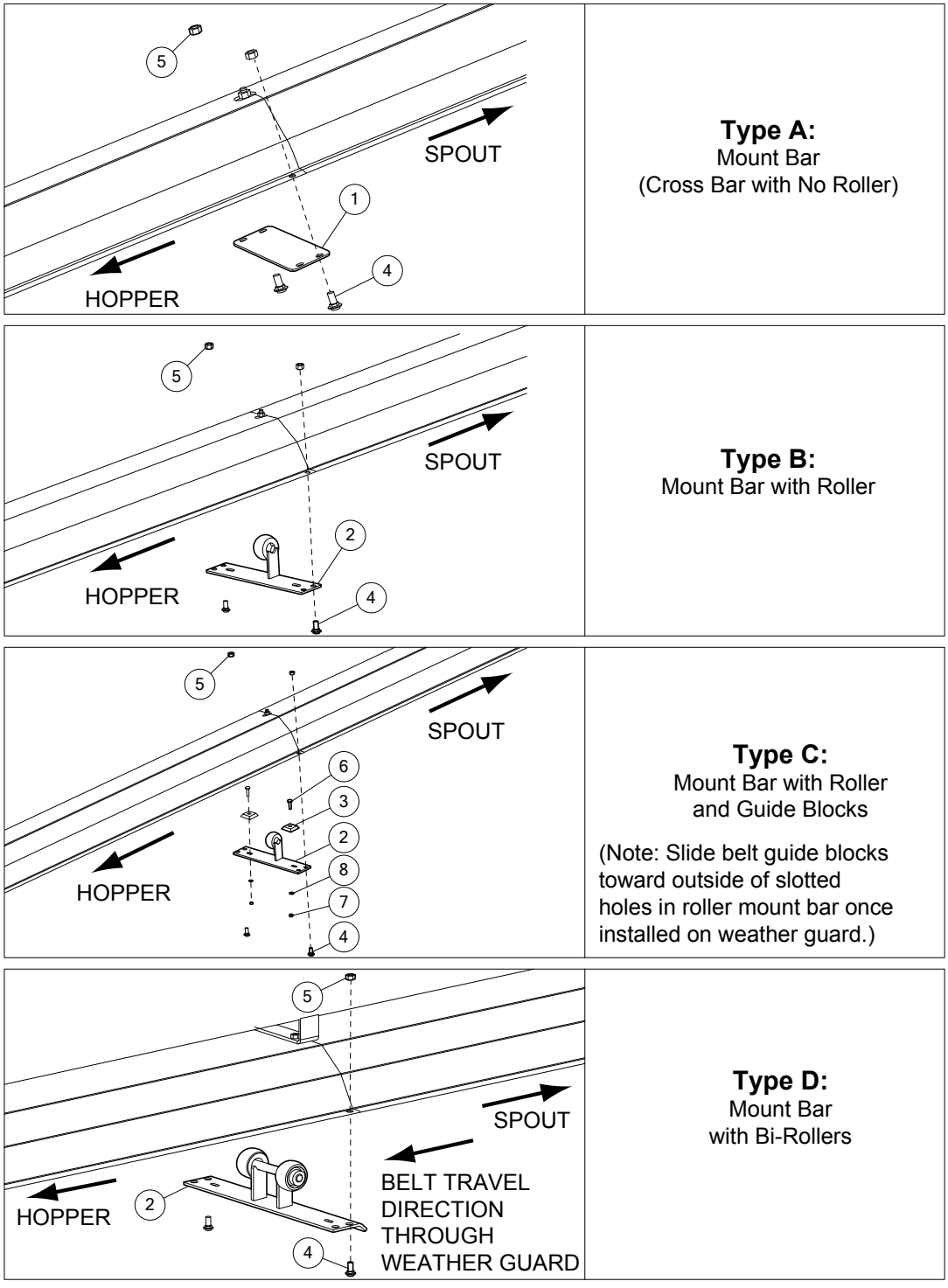
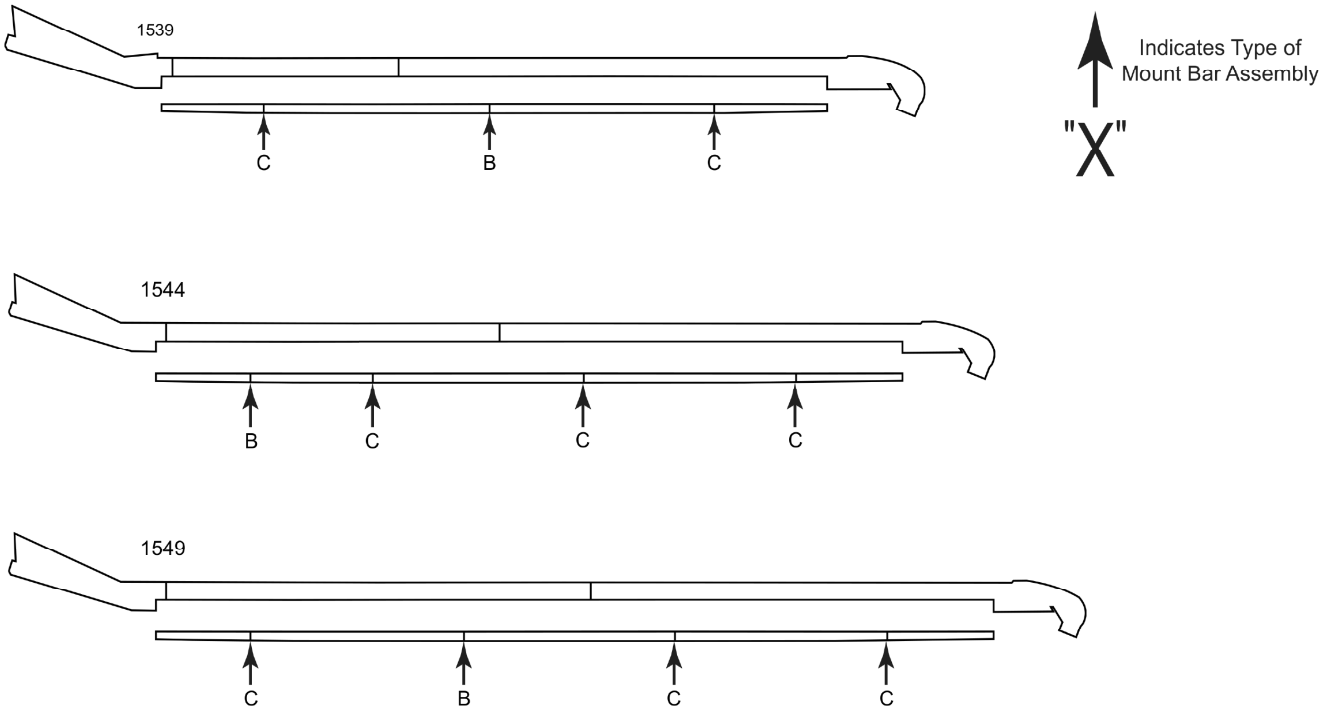


Figure 33. Mount Bar Schematic Diagram



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 34).

   Note

   The textured side of the flashings should be facing down.

2. Install transition flashing (3) using 1/4" x 1" self-tapping screws (4), 1/4" flat washers (5), 1/4" x 1-1/4" flange bolts (6), and 1/4" hex nuts (7).
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.

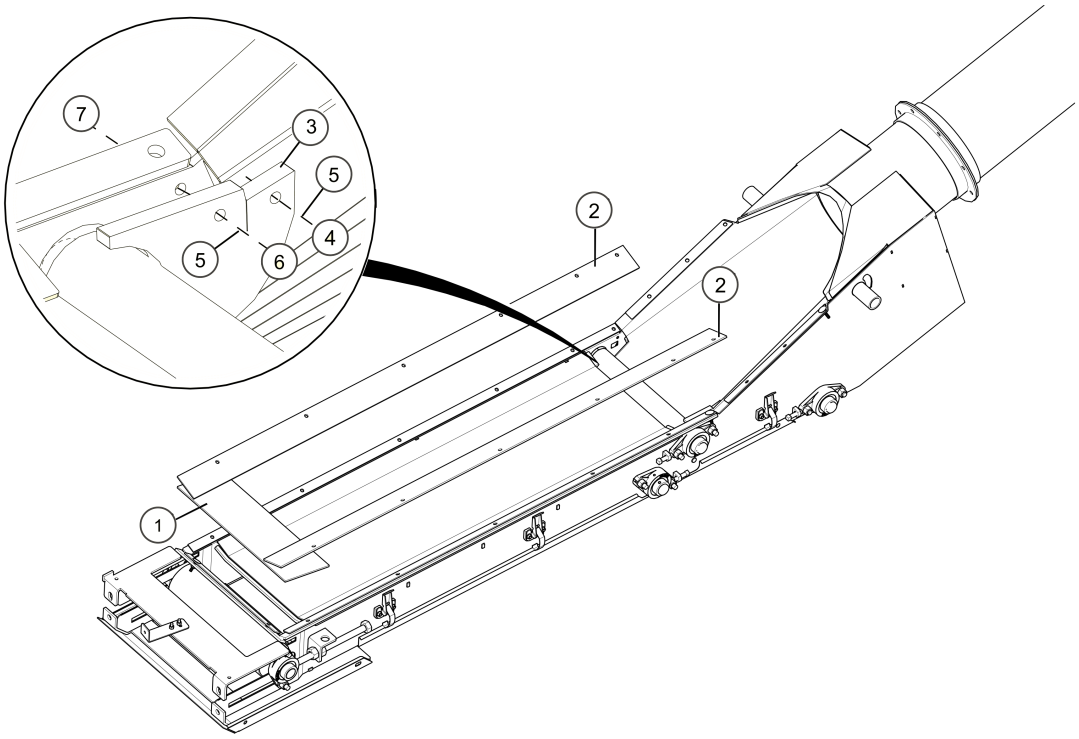
Table 13. Flashings

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

Table 13 Flashings (continued)

6	1/4" x 1-1/4" Flange Bolt
7	1/4" Hex Nut

Figure 34. Flashings



Install the Hopper Spring

1. Slide hopper spring over tubes on the sides of the hopper. See Figure 35 for correct spring orientation.
2. Rotate the spring so that the loop of the spring coil is locked in place by the slot. See Figure 36.

Figure 35. Installing the Hopper Springs

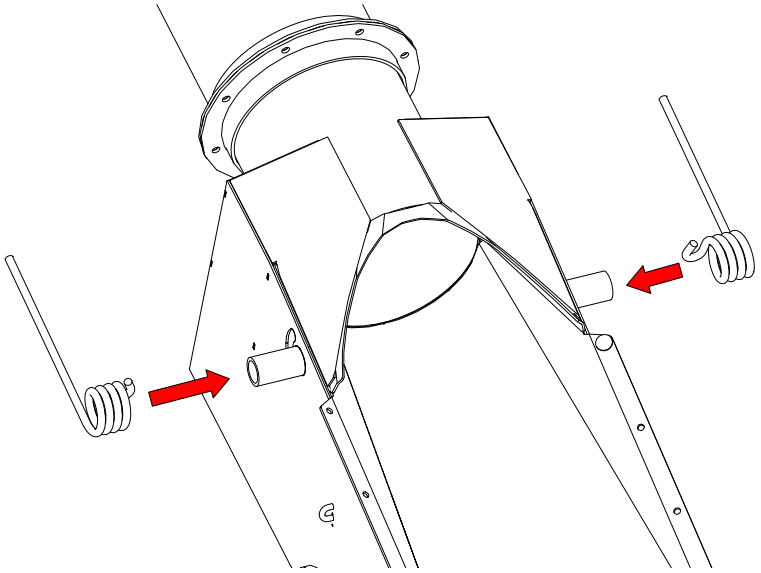
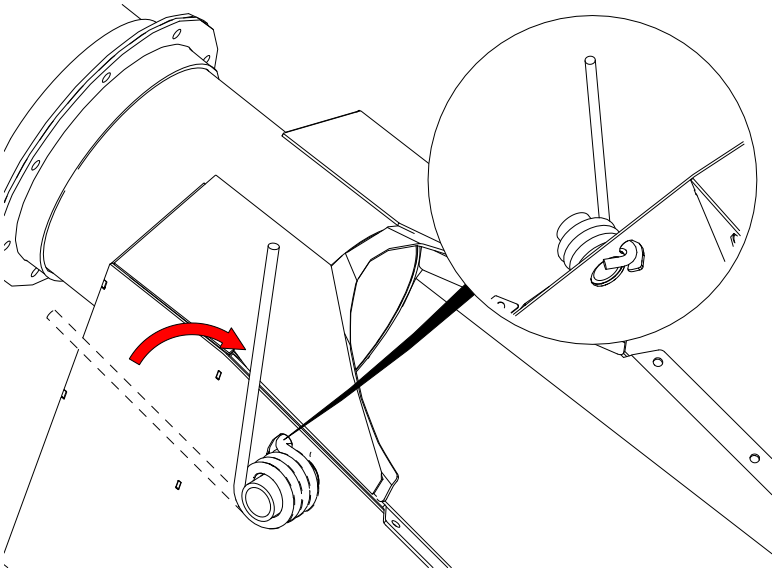


Figure 36. Lock the Hopper Spring



Install the Hopper Cloth

1. Slide the tubes (1, 2) into the hopper cloth (3).
2. Connect the front corners with the slip-on rail fittings (4). Orient the fittings so that the Allen screws are facing down. See Figure 37.

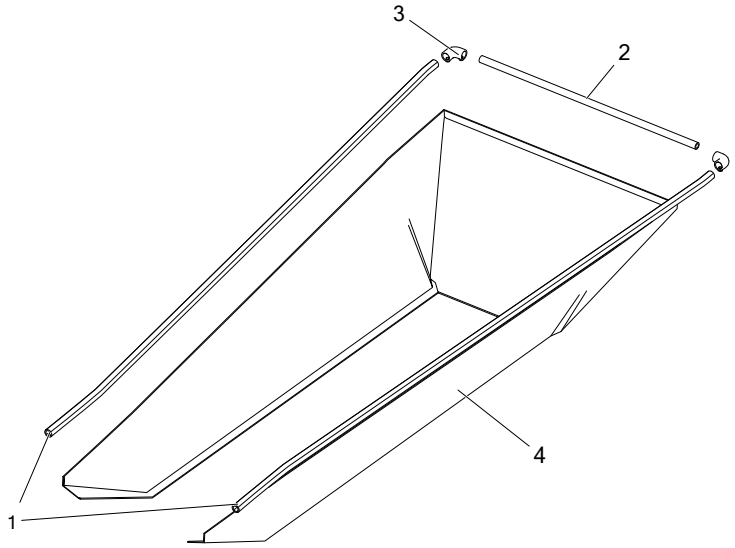
Table 14. Components for Installing the Hopper Cloth onto the Conveyor

Item	Description	Quantity
1	1/2" Pipe Sch 80 (Side)	2
2	1/2" Pipe Sch 80 (Front)	1
3	1/2" Slip-on Rail Fittings	2

Table 14 Components for Installing the Hopper Cloth onto the Conveyor (continued)

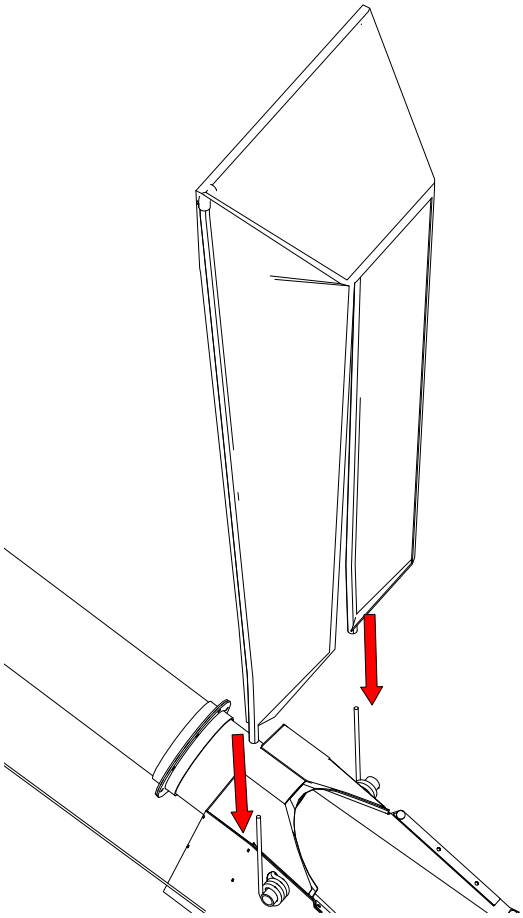
Item	Description	Quantity
4	Hopper Cloth	1
5	1/4" x 1-1/4" Elevator Bolt	20
6	1/4" Nut	20
7	Split Loom (length in feet)	19

Figure 37. Installing the Hopper Cloth Tubes



3. Tighten the Allen screws to secure the tubes in place.
4. Slide the open end of the tubes (1) over the hopper springs. See Figure 38.

Figure 38. Installing the Hopper Cloth

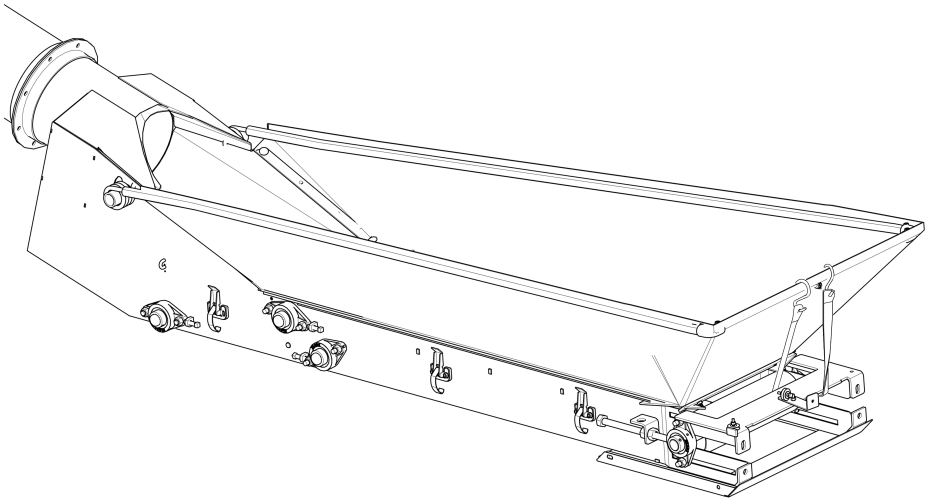


5. Pull the upper front frame down until the bottom of the cloth touches the front flashing, and hold it in place with a bungee cord around the front frame of the hopper weldment (see Figure 39).

   Note

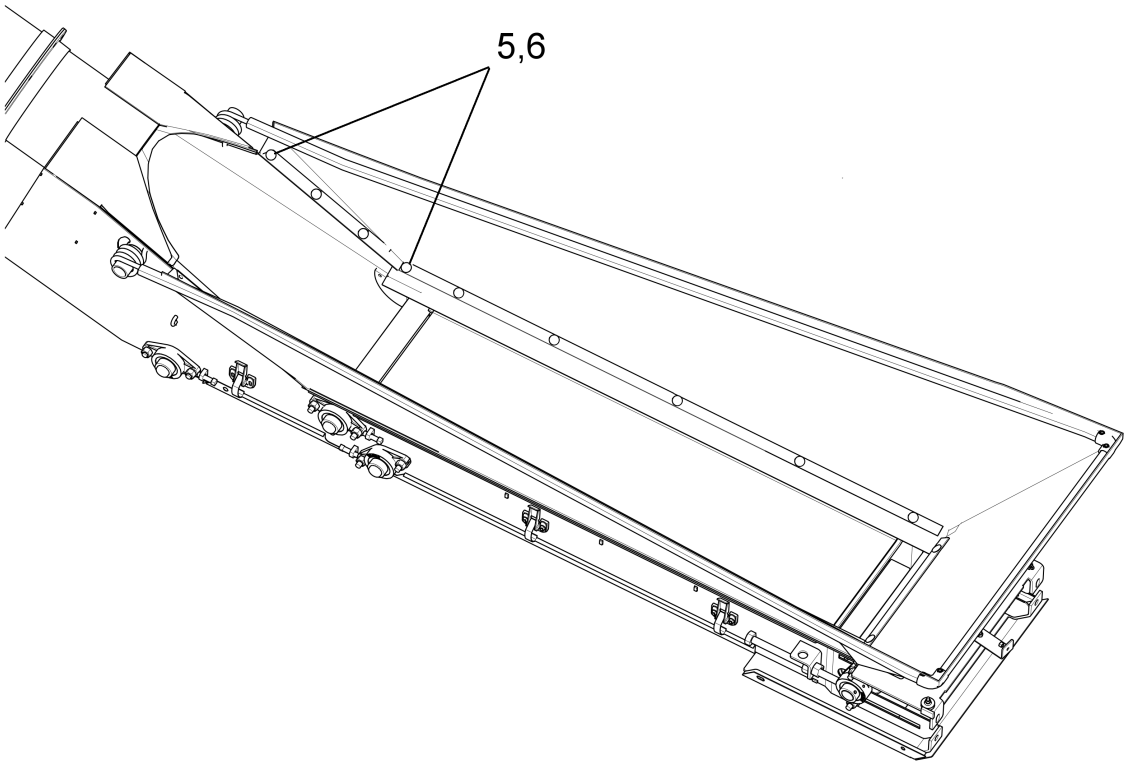
   The length of the upper side frames provides leverage to pull the upper front frame down against the opposing torque of the springs.

Figure 39. Holding Upper Frame with Bungee Cord



6. Attach the hopper cloth to the conveyor (see Figure 40):
   - 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).

Figure 40. Installing the Hopper Cloth onto the Conveyor



7. Open split loom (7) along the slit and snap over the upper frame to secure hopper cloth.

3.20. Install the Collapsible Hopper Cloth Controls

Install the Handle

1. Attach the hopper handle (1) to the handle mount using a 3/8" x 1–1/2" bolt (2), 3/8" nylon washer (3), and two 3/8" hex nuts (4) (see Figure 41).

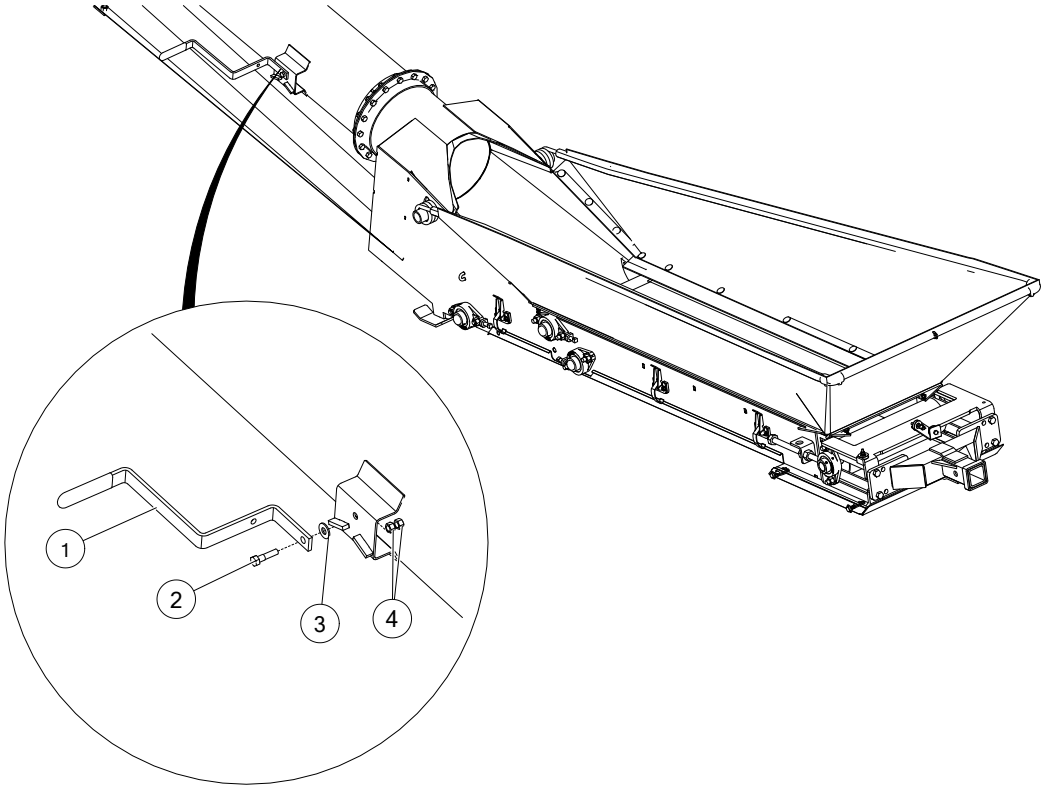
   Note

   Ensure the handle can pivot after tightening the bolt.

Table 15. Handle Components

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

Figure 41. Installing the Handle



Install the Cable and Clamps

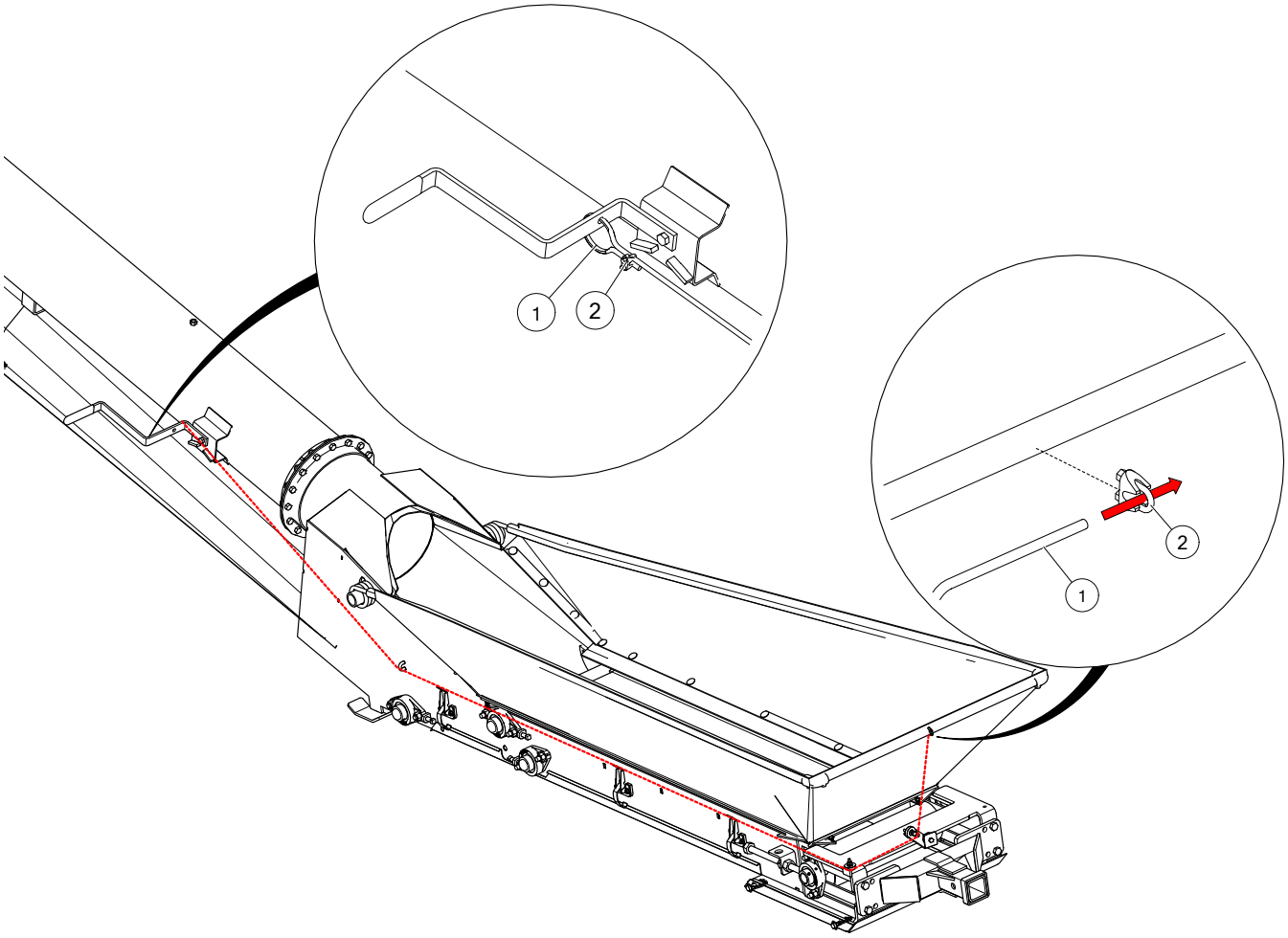
1. Point the hopper handle toward the hopper (see Figure 42).
2. Secure the cable (1) to the handle with a cable clamp (2).
3. Route the cable through the cable rung (3) and around the cable sheaves.

4. Secure the cable (1) to the hopper frame using a cable clamp (2) and the pre-drilled holes in the frame.
5. Test the function of the collapsible hopper cloth controls by raising and lowering the handle. Adjust cable tension as required.

Table 16. Cable and Clamp Components

Item	Description
1	1/8" Cable 13' [4.0 m] or 17' [5.2 m] depending on model
2	1/4" Cable Clamp
3	Cable Rung

Figure 42. Installing the Cable and the Clamps



3.21. Attach the Angle Indicator

Attach the angle indicator bracket (1) to the weather guard bracket using plate (2), 1/4" x 3/4" carriage bolts (3) and 1/4 flanged nuts (4). See Figure 43.

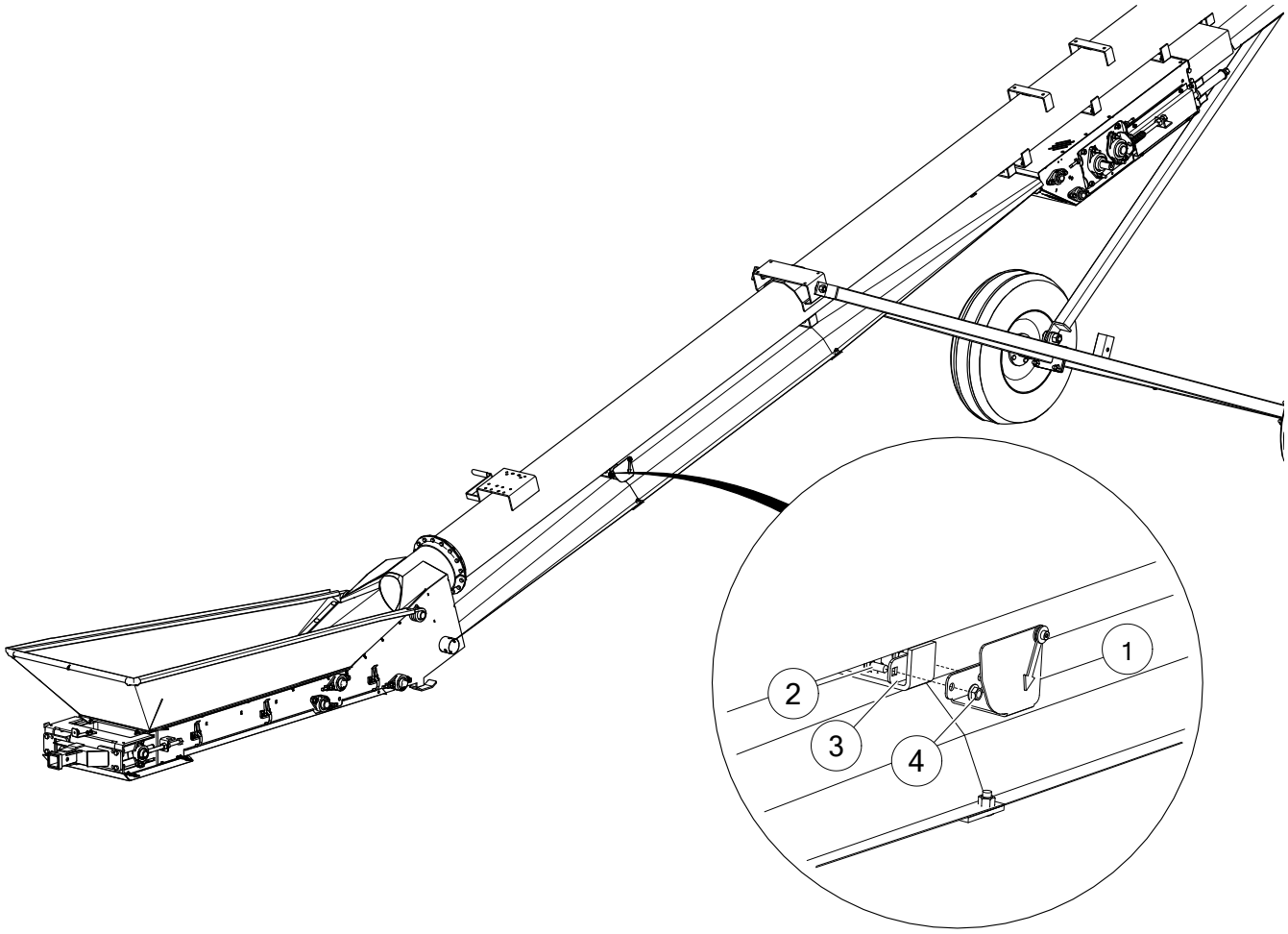
Important

Ensure that the angle indicator base is level with the flat top of the weather guard.

Table 17. Angle Indicator

Item	Description
1	Angle Indicator Bracket
2	Plate
3	1/4" x 3/4" Carriage Bolt
4	1/4” Flanged Nut

Figure 43. Installing the Angle Indicator



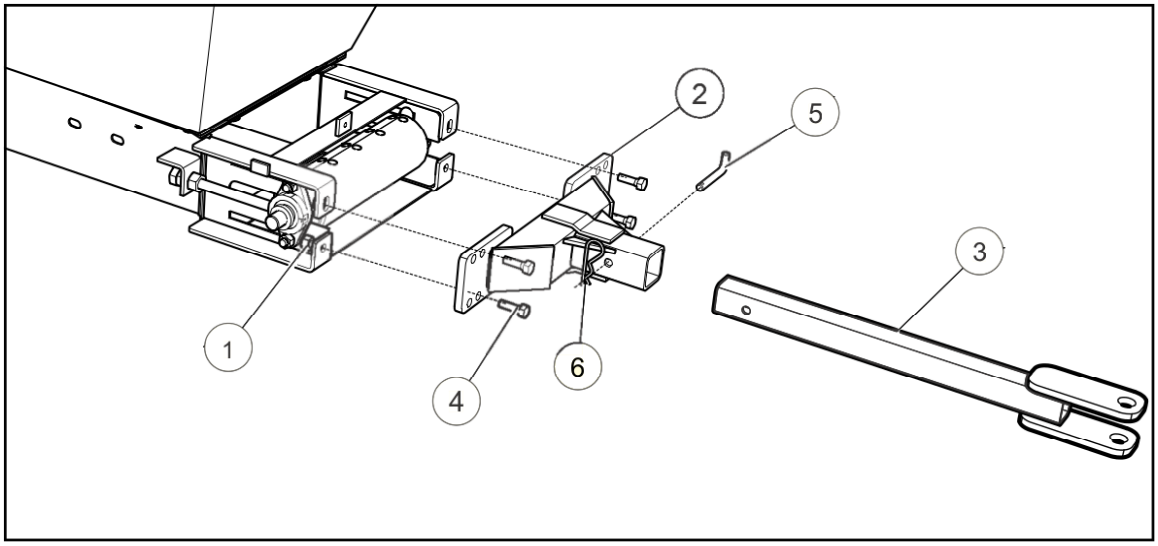
3.22. Attach the Hitch

1. Attach the hitch (2) to the hopper weldment using 1/2" x 1–1/2" bolts (4) and 1/2" nuts (1).
2. Insert the tongue (3) into the tongue stub.
3. Secure the tongue in place using 5/8" x 3" hitch pin (5) and 3/16" x 3–1/4" hairpin (6).

Table 18. Hitch Components

Item	Description	Quantity
1	1/2" Nylock Nut	4
2	Transfer Hitch	1
3	Straight Tongue	1
4	1/2" x 1–1/2" Hex Bolt	4
5	5/8" x 3" Hitch Pin	1
6	3/16" x 3–1/4" Hairpin	1

Figure 44. Hitch Components



3.23. Install the Spout Hood

1. Place the hood (2) around the bearing assembly (see Figure 45).
2. Use 1/4" x 1" self-tapping screws (3) and 1/4" flat washers (4) to tighten the hood (2) to the conveyor spout (1).

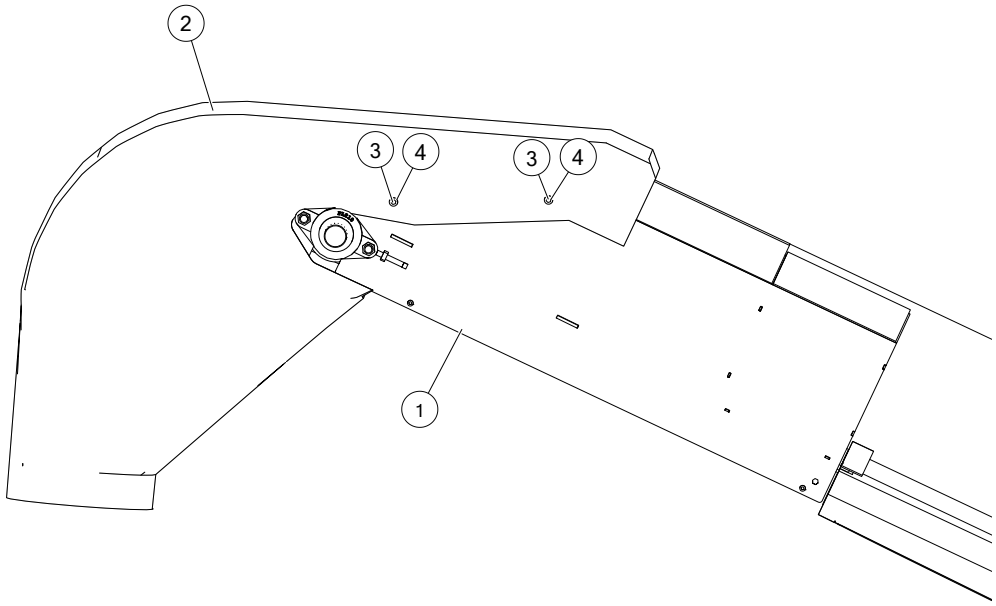
   Note

   Make sure the screws will not interfere with belt operation.

Table 19. Spout Hood Components

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

Figure 45. Installing Spout Hood



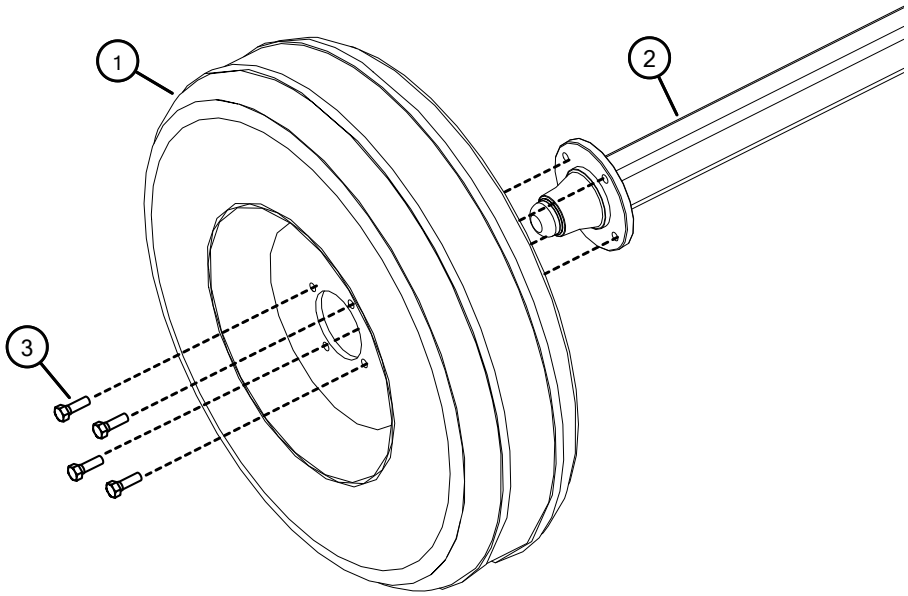
3.24. Install the Wheels

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 46).

Table 20. Components to Attach the Wheels to the Axle

Item	Description
1	Tire Assembly
2	Axle
3	Wheel Bolt

Figure 46. Attaching the Wheels to the Axle



Note

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

3.25. Assemble the A-Frame

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

1. Loosely fasten the axle arms (9) to the axle (12) using one 5/8" x 5" bolt (15), three 5/8" x 2" bolts (13), five 5/8" flat washers (14), and four 5/8" nylon locknuts (8).

   Note

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

2. Fasten the axle arms to the suspension bracket in the bolt hole position in Table 22 using 3/4" x 2" hex bolts (11) and 3/4" nylon locknuts (10).

   Note

   If an electric motor is being installed, bolt hole position B or A may be used depending on whether you prefer a lighter or heavier hitch weight, respectively.

3. Secure the slider (4) to the end of the track (towards the spout) using vise-grips.
4. Fasten upright arms (2) to the slider (4) using 3/4" flat washers (1) and 1/4" x 2" cotter pins (3).
5. Lift the spout end of the tube until the loose ends of the upright arms align with their brackets on the axle.
6. Fasten the upright arms to the axle using 1" x 3" hex bolts (6) and 1" nylon locknuts (5).
7. Tighten the bolts that fasten the axle arms to the axle.
8. Lower tube and remove vise grips.

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

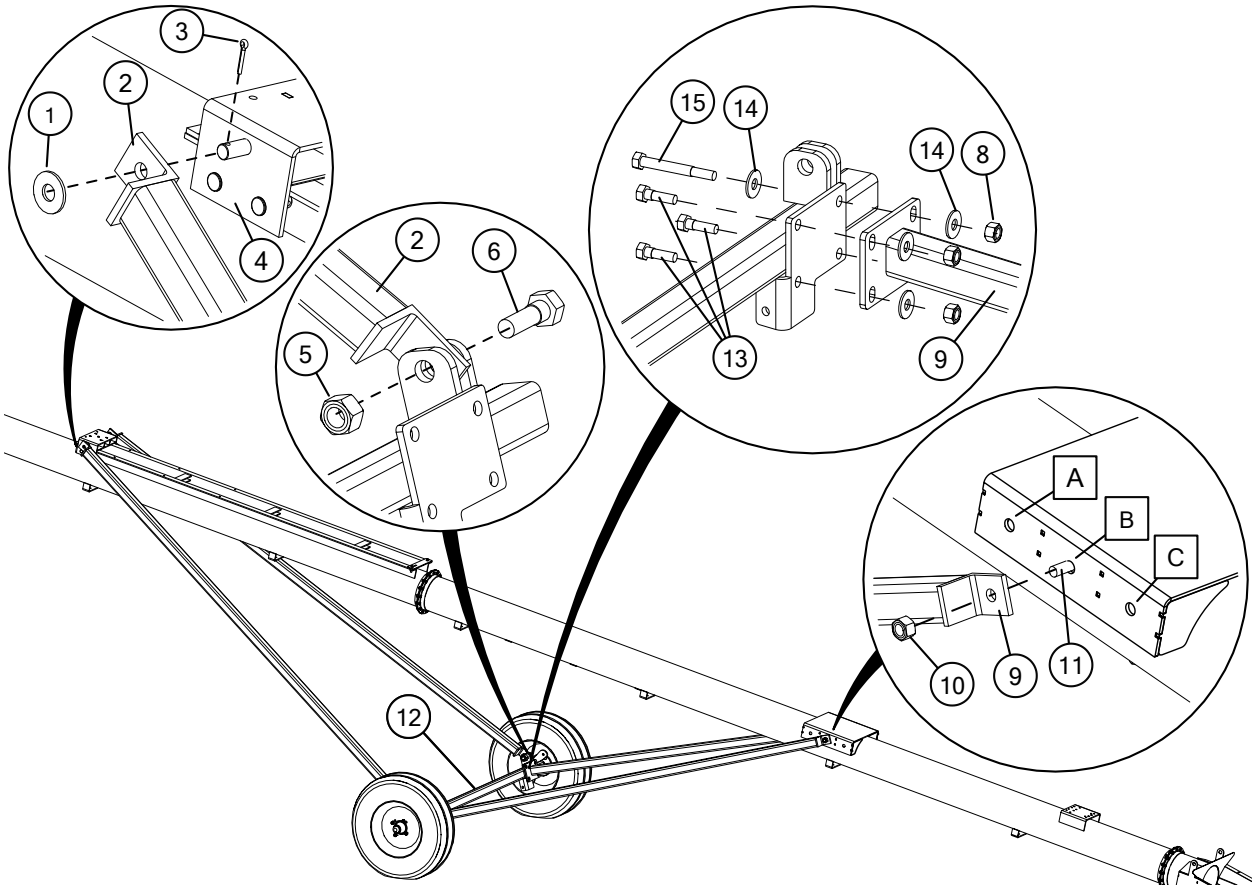
Table 21. Components to Assemble the A-Frame

Item	Description
1	3/4" Flat Washer (plated USS)
2	Upright Arm
3	1/4" x 2" Cotter Pin
4	Slider
5	1" Nylon Locknut
6	1" x 3" Hex Bolt
8	5/8" Nylon Locknut
9	Axle Arm
10	3/4 " Nylon Locknut
11	3/4" x 2" Hex Bolt
12	Axle
13	5/8" x 2" Hex Bolt
14	5/8" Flat Washer (plated USS)
15	5/8" x 5" Bolt

Table 22. Bolt Hole Position for Fastening Axle Arm to Suspension Bracket

Model	Electric Top Drive		Hydraulic Top Drive — Bolt Position
	Motor HP (standard specified)	Bolt Position	
1539	10	B or A	C
1544/ 1549	15	B or A	C

Figure 47. Assembling the A-Frame



3.26. 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 48).

   ⚠ 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 and thread it through the slider pulley.
4. Run the cable from the slider pulley towards the hopper and stop at the cable attach (3).
5. Loop the cable under and around the cable attach and secure it with two 5/16" cable clamps (2).
6. Trim excess cable.
7. 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.

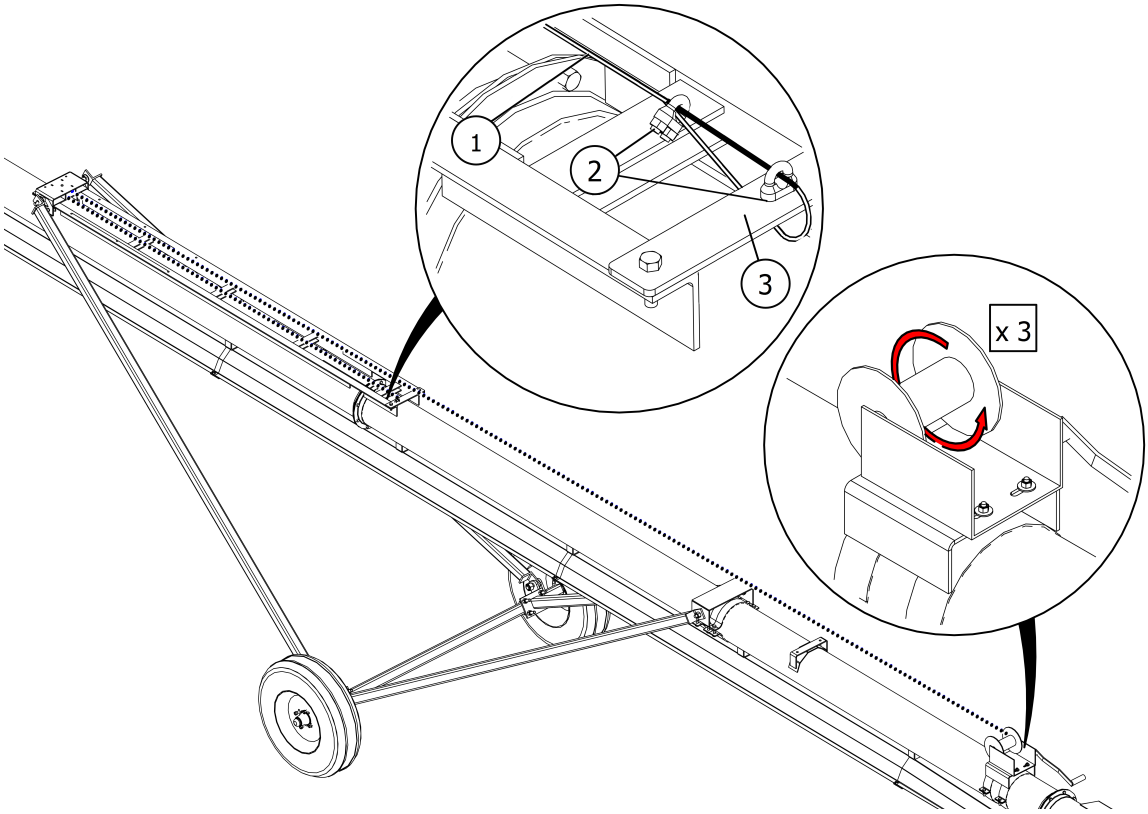
   NOTICE The tube lift components may become damaged.

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

Table 23. Tube Lift Cable Components

Item	Description
1	**39' Conveyor**: 40' Cable 5/16" 7 x 19 GAC
	44’ and 49' Conveyor: 44' Cable 5/16" 7 x 19 GAC
2	5/16" Cable Clamp
3	Small Cable Attach

Figure 48. Installing the Tube Lift Cable



3.27. 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.

3.28. Drive Assemblies

3.28.1 Install the Hydraulic Top Drive

Install the Motor Mount and Sprocket/Chain Assembly

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

   Note

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

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

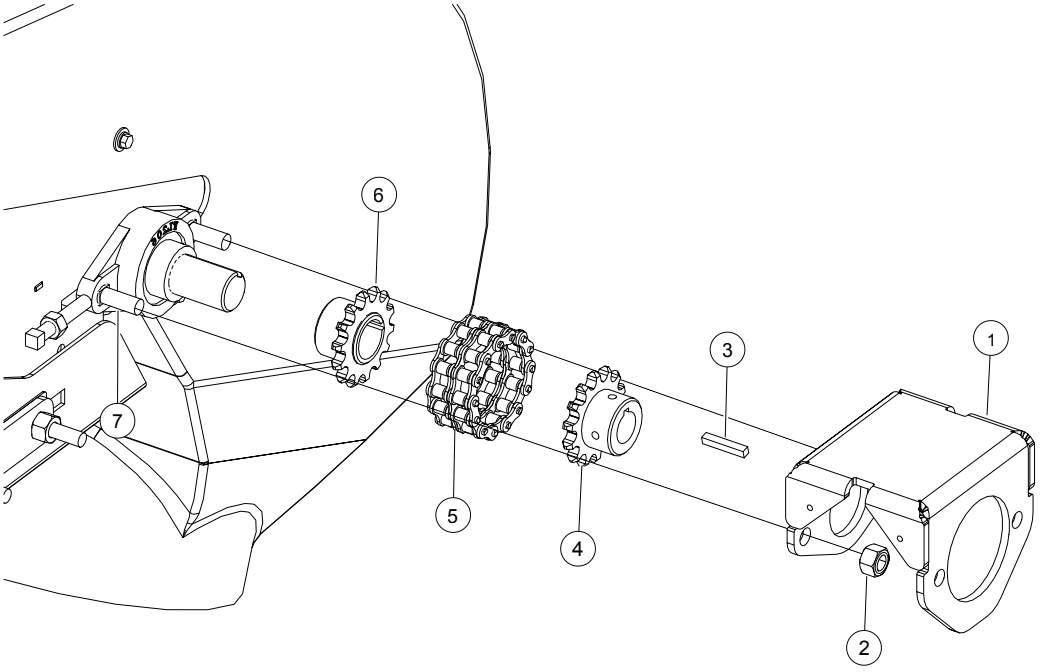
      Note

      Orient sprocket and chain assembly to ensure the 1-1/4" sprocket slides onto the shaft first.

Table 24. Motor Mount and Sprocket/Chain Assembly Components

Item	Description
1	Motor Mount
2	1/2" Nylock Nut (removed from bearing)
3	1/4" x 1-1/2" Key
4	1" Bore Sprocket (5014 W1)
5	Chain Coupling (5014)
6	1-1/4" Bore Sprocket (5014 W1)
7	Drive Roller Flange Bearing

Figure 49. Installing the Motor Mount and Sprocket/Chain Assembly



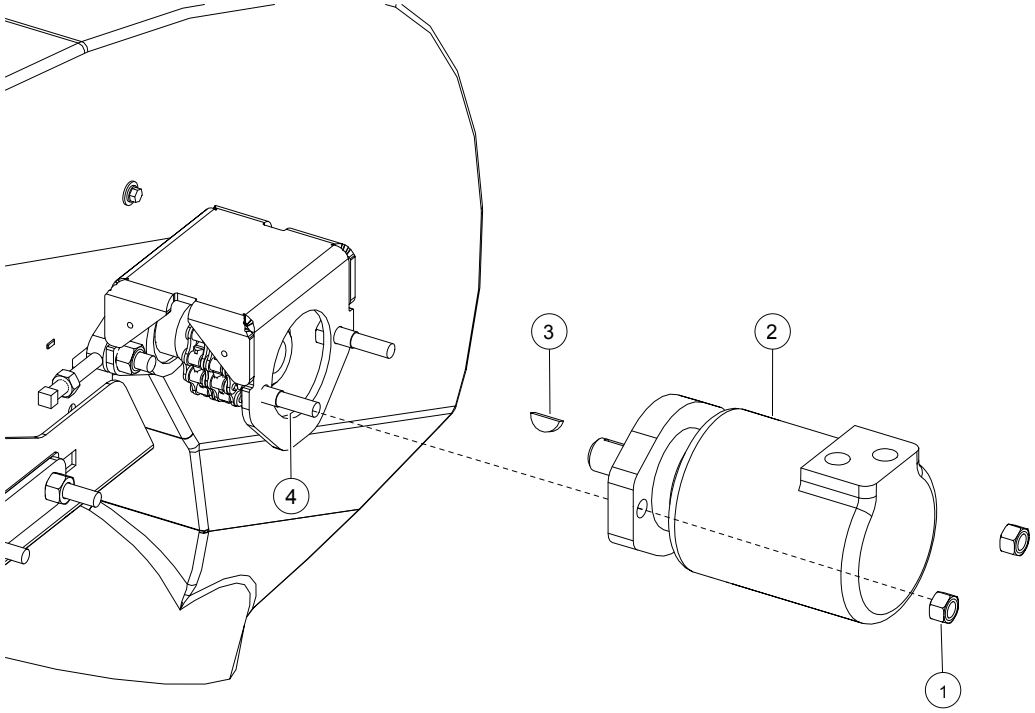
Install the Hydraulic Motor

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

Table 25. Hydraulic Motor Components

Item	Description
1	1/2" Nylock Nut
2	Hydraulic Motor (2000) 6.2 CPR
3	1/4" x 1-1/2" Woodruff Key (#808)
4	1/2" x 2" Hex Bolt GR8

Figure 50. Installing the Hydraulic Motor



Install the Hydraulic Fittings and Coupler Guard

1. Insert the ORB swivels (5) into the hydraulic motor.
2. Insert the 1/2" 90° swivels (4) into the ORB swivels.
3. Insert a 1/2" nipple (3) into the return line ORB swivel.
4. Install a 1/2" check valve (2) onto the return line 1/2" nipple.
5. Insert a 1/2" swivel (1) into the return line check valve (2).
6. Install the coupler guard (8) using 1/4" self-tapping screws (6) and 1/4" flat washers (7).
7. Install the shaft guard (see Section 3.29. – Install the Shaft Guard on page 72 for instructions).
8. Place the safety decal above the hydraulic motor assembly as indicated in 1.10.2 Safety Decal Locations and Details on page 11.
9. Attach and secure hydraulic hoses to the motor.

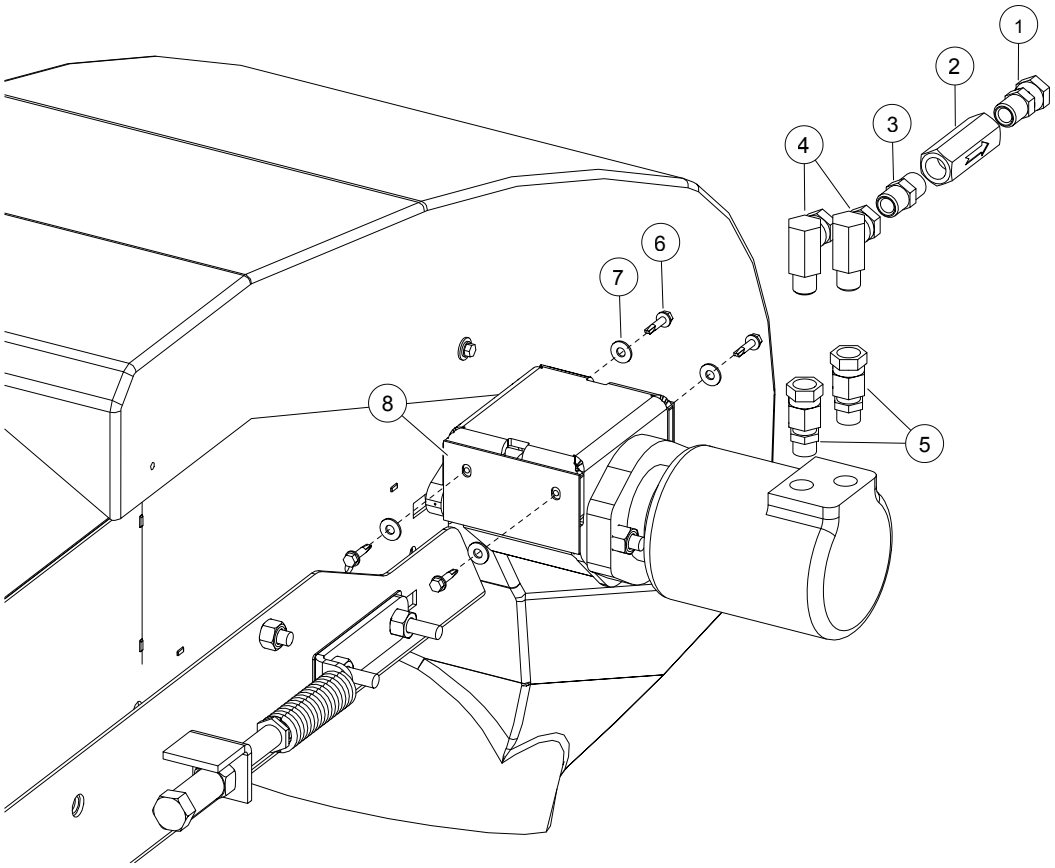
Table 26. Hydraulic Fittings and Coupler Guard Components

Item	Description
1	Swivel-1/2"MPTX1/2"FPT
2	Check Valve-1/2" (No Hole)
3	Nipple-1/2"PT Hex
4	Swivel-1/2"PT/90D
5	Swivel-10MORBX1/2"FPT
6	1/4" Self-tapping Screw

Table 26 Hydraulic Fittings and Coupler Guard Components (continued)

Item	Description
7	1/4" Flat Washer (Plated USS)
8	Hydraulic Coupler Guard

Figure 51. Installing the Hydraulic Fittings and Coupler Guard



3.28.2 Electric Top Drive

Note

The following components are specific to the electric motor you have purchased and are not supplied by AGI:

- Electric Motor
- 4" drive pulley sheave
- key
- drive pulley
- hardware to mount motor

Install the Motor Mount and Motor

1. Insert bushings (7) to the motor base and secure using bushing retainers (9). See Figure 52.

2. Attach the bushing retainers (9) to the motor base using 3/8" x 1" whiz bolts (10).
3. Place the motor base (8) between the spout brackets and insert motor rails (5).
4. Slide a collar (6) on each end of the motor rail. Tighten the set screw on each collar to secure.
5. Loosely fasten the electric motor (1) to the motor base using 3/8" x 1-1/4" hex bolts (2), 3/8" flat washers (4), and 3/8" nylock nut (3). See Figure 53.

Note

The motor will be tightened to the motor base after adjusting the pulleys and belts.

Table 27. Components to Install the Motor Mount and Motor

Item	Description	Qty
1	Electric Motor	1
2	3/8" x 1-1/4" Hex Bolt	4
3	3/8" Nylock Nut	4
4	3/8" Flat Washer	4
5	Motor Rail	2
6	1" CSC Shaft Coller	4
7	1" ID X 1/2" Wide IGUS Bushing	4
8	Motor Base (Painted)	1
9	Bushing Retainer	4
10	3/8" x 1" Whiz Bolt	4

Figure 52. Installing the Motor Mount

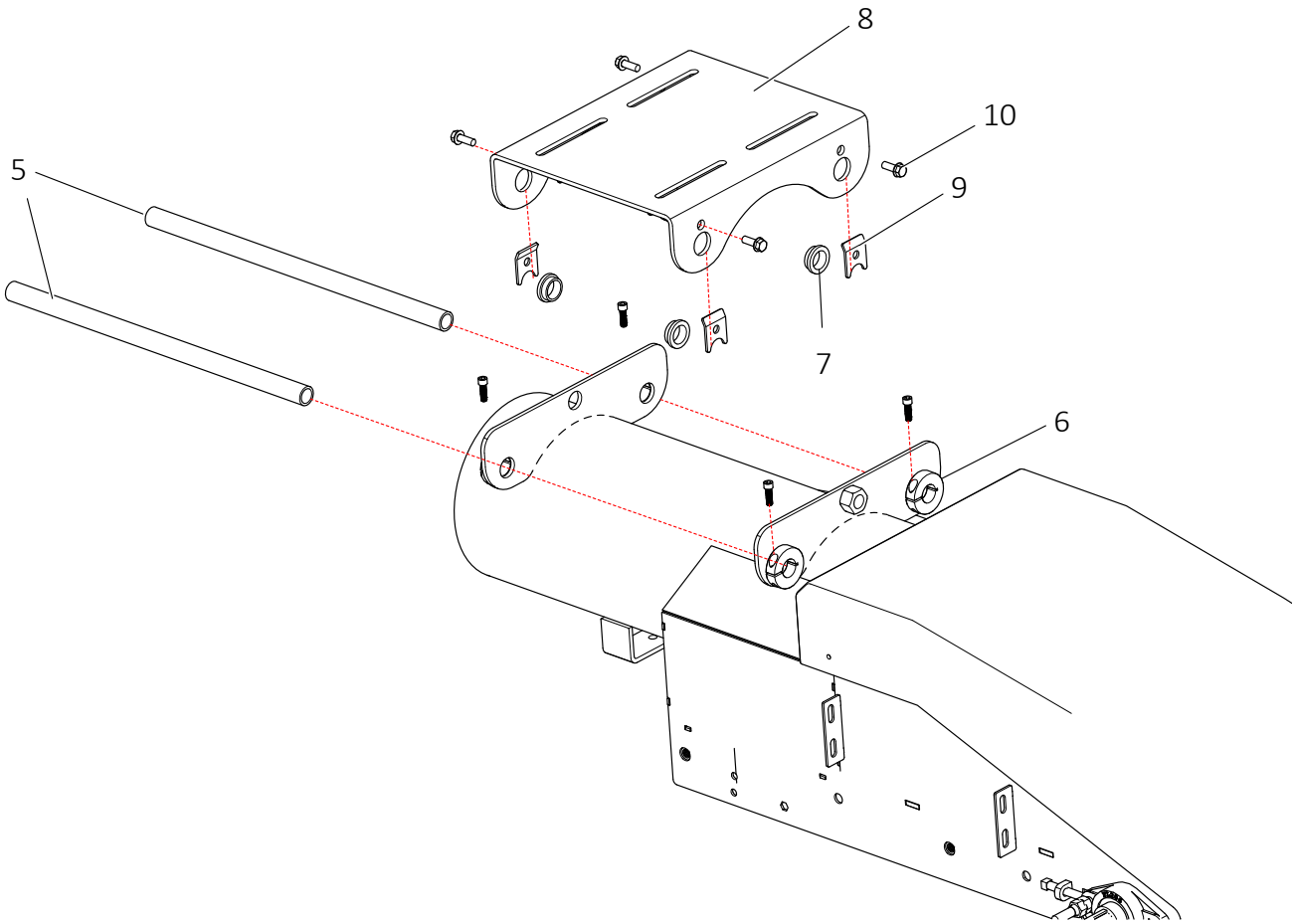
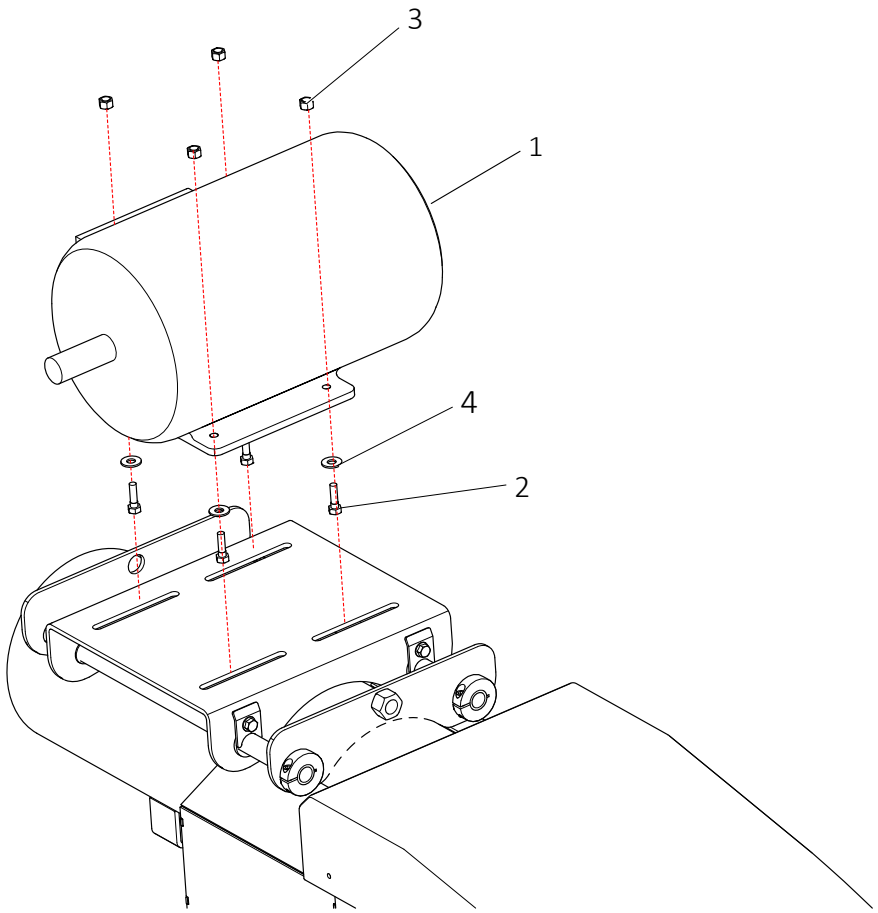


Figure 53. Installing the Motor



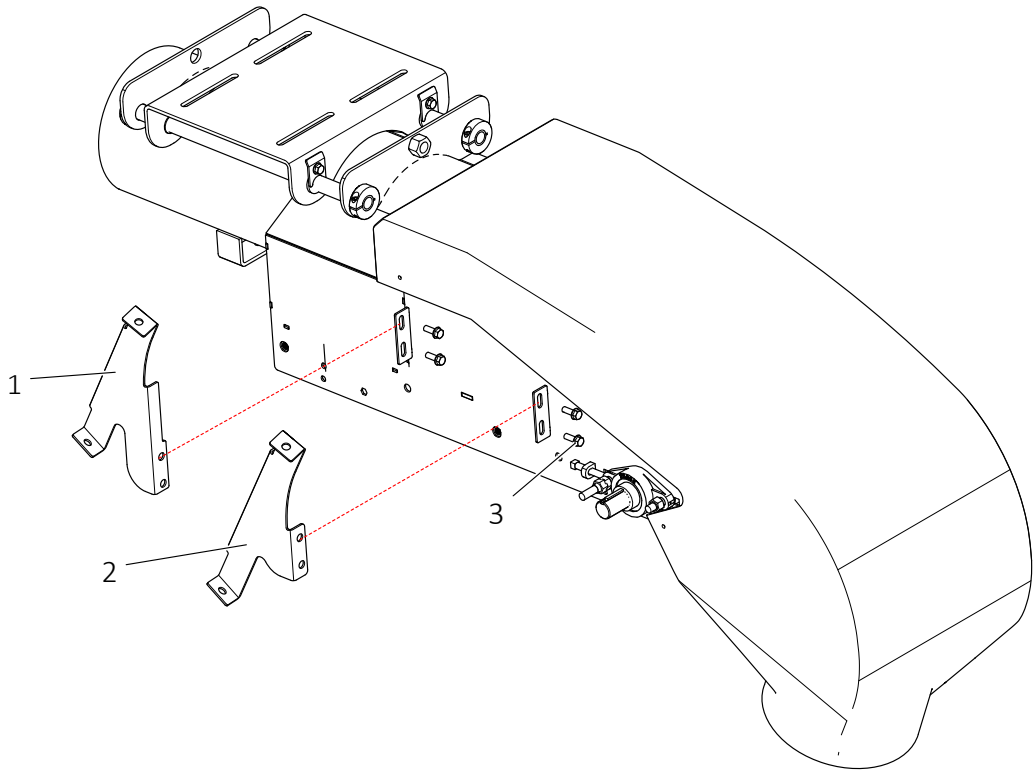
Install the Belt Guard Mounts

Attach the motor side guard mount (1) and hood side guard mount (2) to the spout weldment using 3/8" x 1" whiz bolts (3). See Figure 54.

Table 28. Components to Install the Belt Guard Mounts

Item	Description	Qty
1	Motor Side Guard Mount	1
2	Hood Side Guard Mount	1
3	3/8" x 1" Whiz Bolt Gr5	4

Figure 54. Installing the Belt Guard Mounts



Install the Pulleys and the Belt

1. Install the key in the motor shaft.
2. Install the drive pulley (2) and sheave (1).

   Note
   Ensure the drive pulley is flush with the end of the shaft.
3. Install key (4) in drive roller shaft.
4. Mount driven pulley (5).

   Note
   Ensure the driven pulley is flush with the end of the shaft.
5. Loosely fasten the 3/4" x 6" tap bolt (6) and its 3/4" nut into its bracket on the spout.

   Note
   The tap bolt will be tightened while setting the tension of the drive belt.
6. Align the pulleys with a straight edge.
7. Tighten the electric motor to the motor base.

8. Install and tension the drive belt (3).

   Note

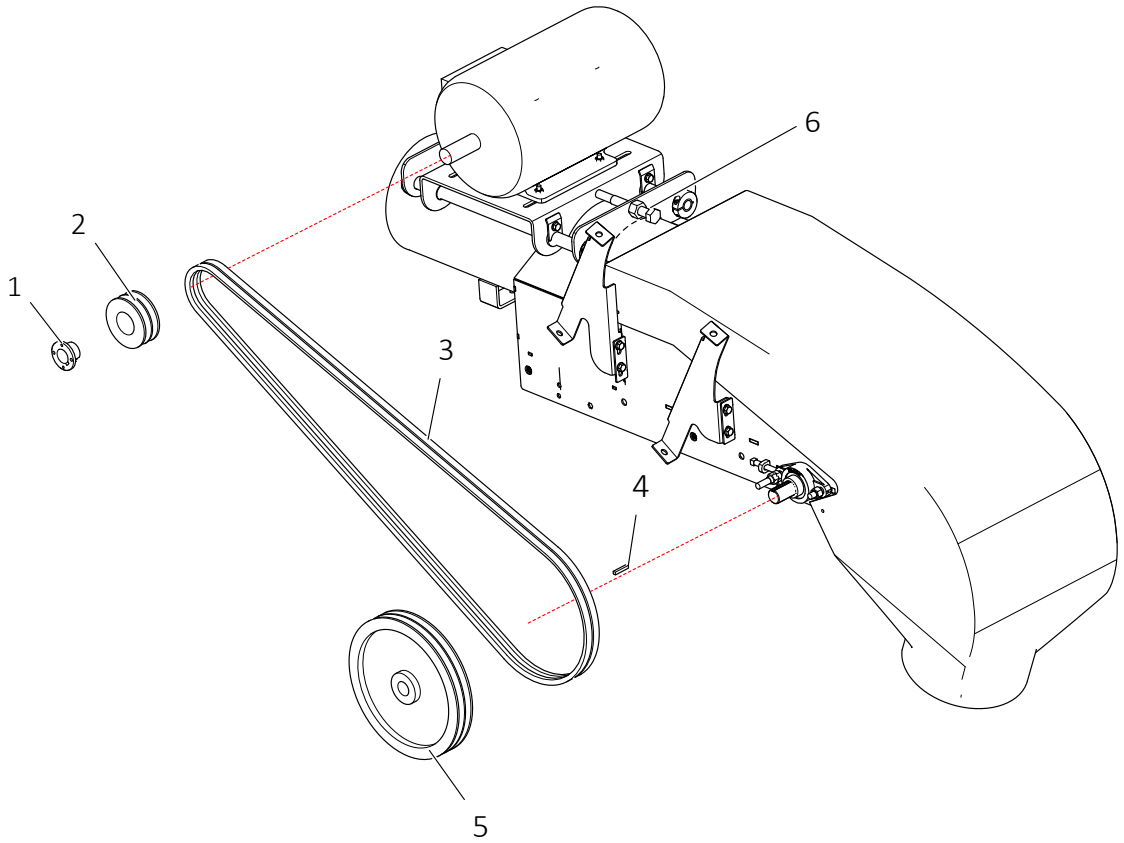
   The correct tension for the drive belt is achieved when it deflects 1/2" (1.3 cm) to 3/4" (1.9 cm) if pushed on with a 5 lb (2.3 kg) force. Set the tension of the drive belt by tightening the tap bolt (6).

9. Tighten the tap bolt's nut, once the correct tension is achieved, to set it in place.

Table 29. Components to Install the Pulleys and the Belt

Item	Description
1	4" Drive Pulley Sheave (Not Supplied)
2	4" Drive Pulley (Not Supplied)
3	Drive Belt B106
4	1/4" x 1-1/2" Key
5	Pulley -DBL-12"W/1-1/4" Bore
6	3/4" x 6" Hex Bolt Gr8

Figure 55. Installing the Pulleys and Belts



Install the Guards

1. Verify the appropriate safety decals are in place on and under the plastic pulley guard.

   Note

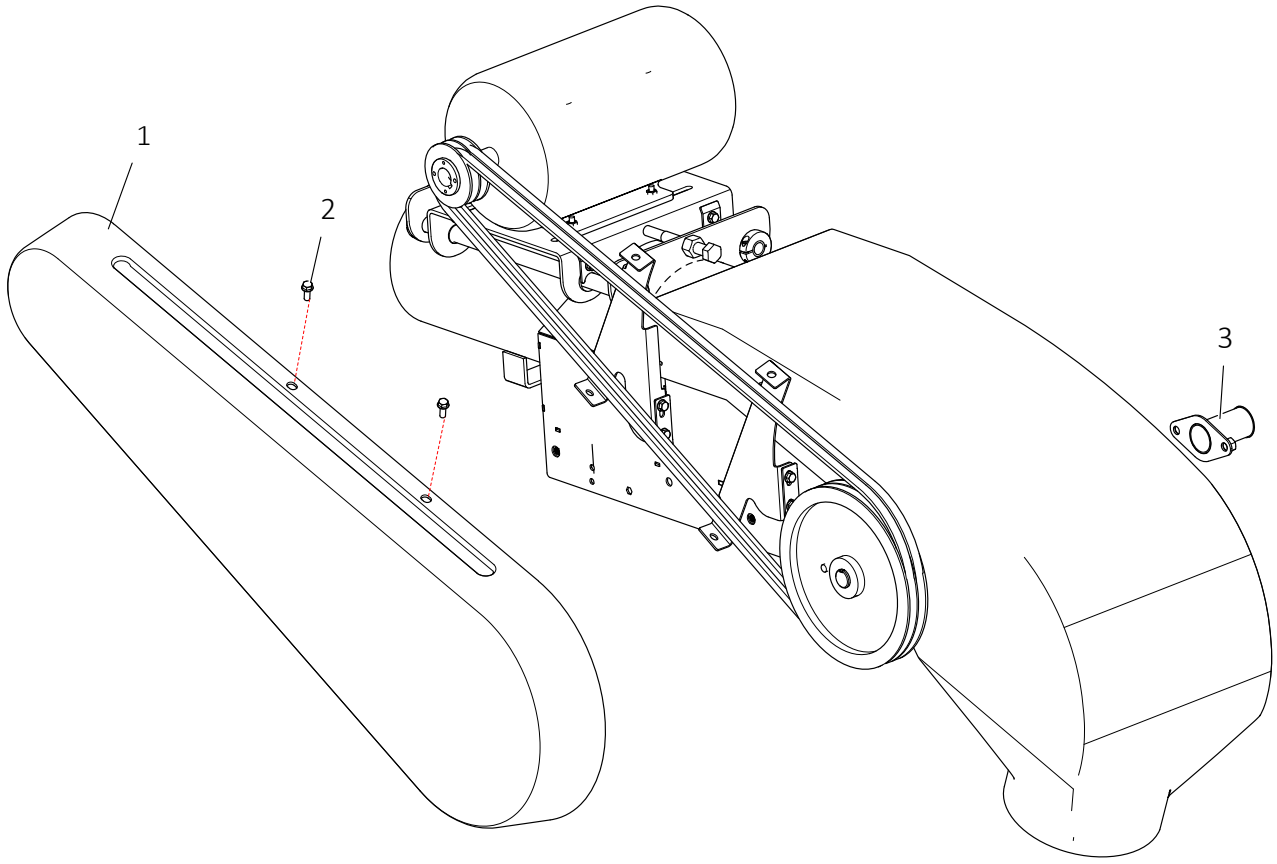
   See the decal location diagram in the Safety Chapter.

2. Hold the plastic belt guard (1) over the belt and pulleys and match the pre-drilled holes on the guard to the guard mounts.
3. Attach the plastic belt guard to the guard mounts with four 3/8" x 1" whiz bolts (2).
4. Attach the shaft guard kit (3) to the opposite side of the spout shaft using the hardware supplied in the kit. See Section 3.29. – Install the Shaft Guard on page 72.

Table 30. Components to Install the Guards

Item	Description
1	Plastic Pulley Guard
2	3/8" x 1" Whiz Bolt Gr5
3	Shaft Guard Kit

Figure 56. Installing the Guards



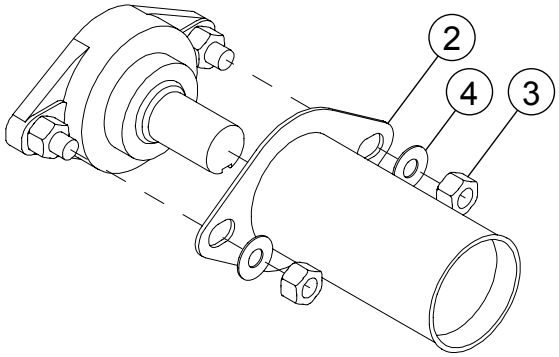
3.29. Install the Shaft Guard

1. Mount the shaft guard (2) over the roller shaft and onto the flange bearing carriage bolts (see Figure 57).
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 57. Installing Shaft Guard



3.30. 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 58), or
   b. secure with two self-tapping screws (3) (see Figure 59).

Figure 58. Clamp-on Manual Container

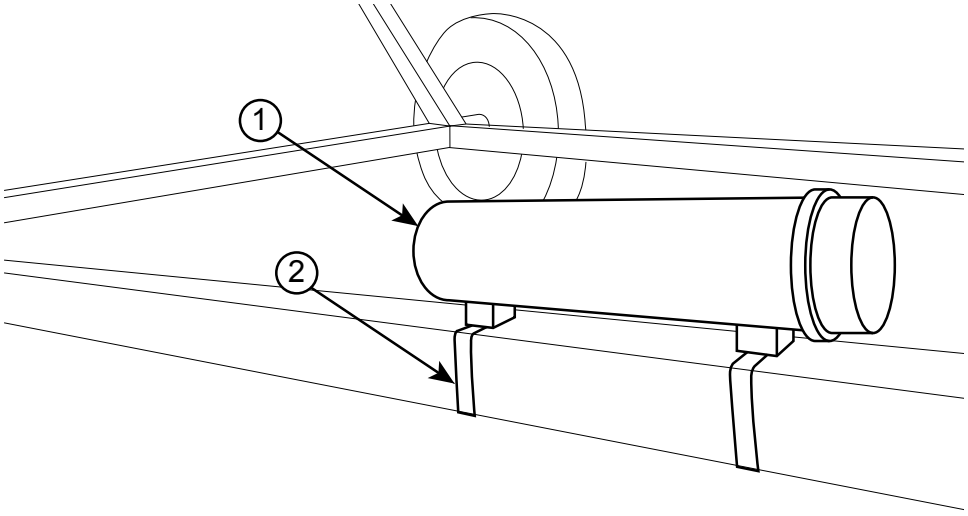
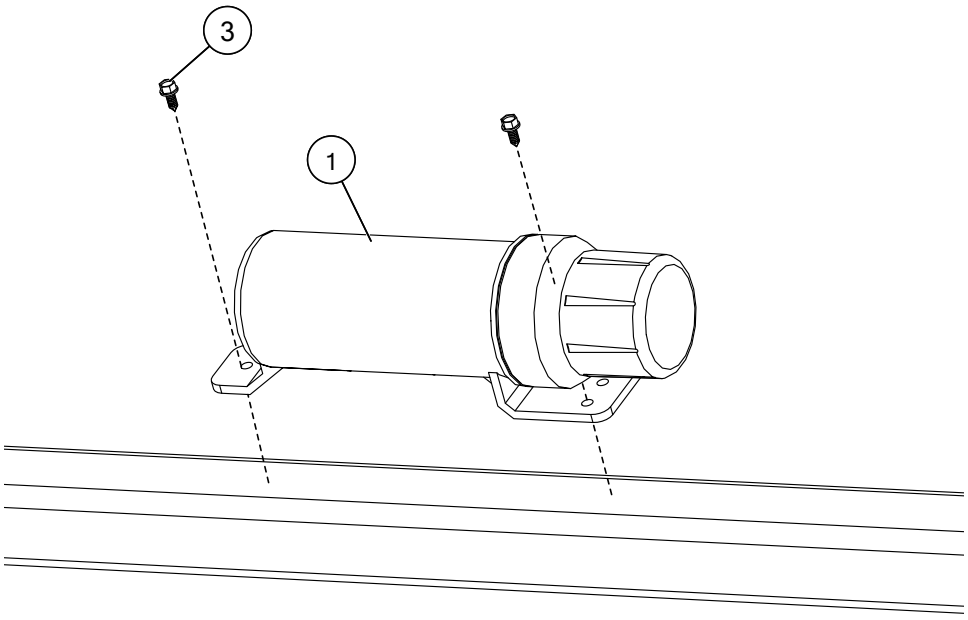


Figure 59. Screw-on Manual Container

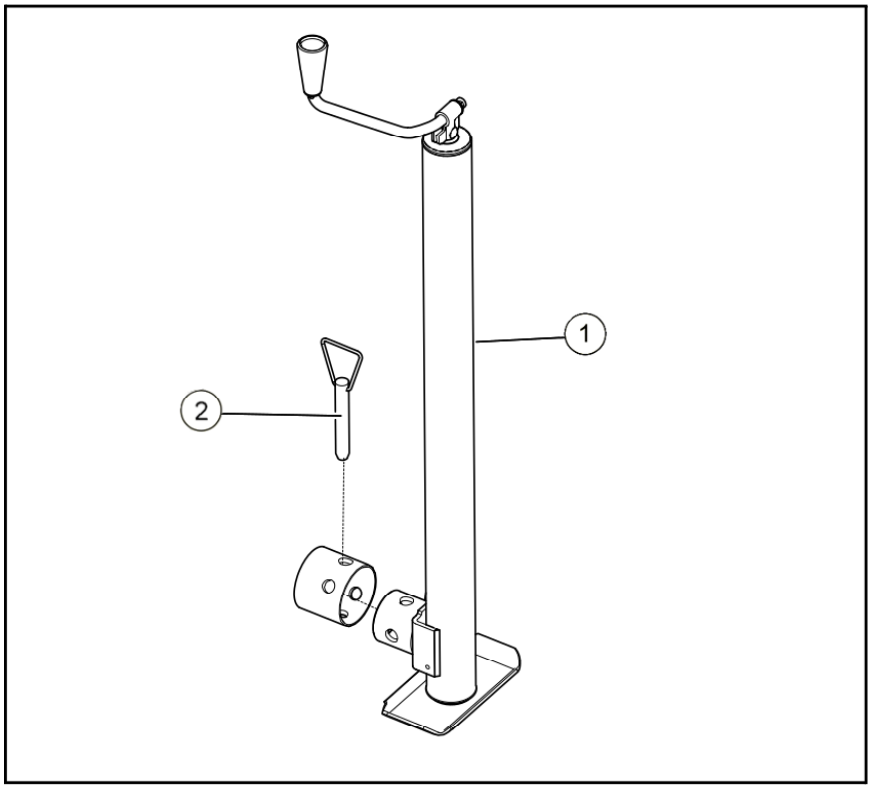


Item	Description
1	Manual Container
2	Gear Clamps
3	Self-Tapping Screw #14 x 5/8"

3.31. Attach the Jack

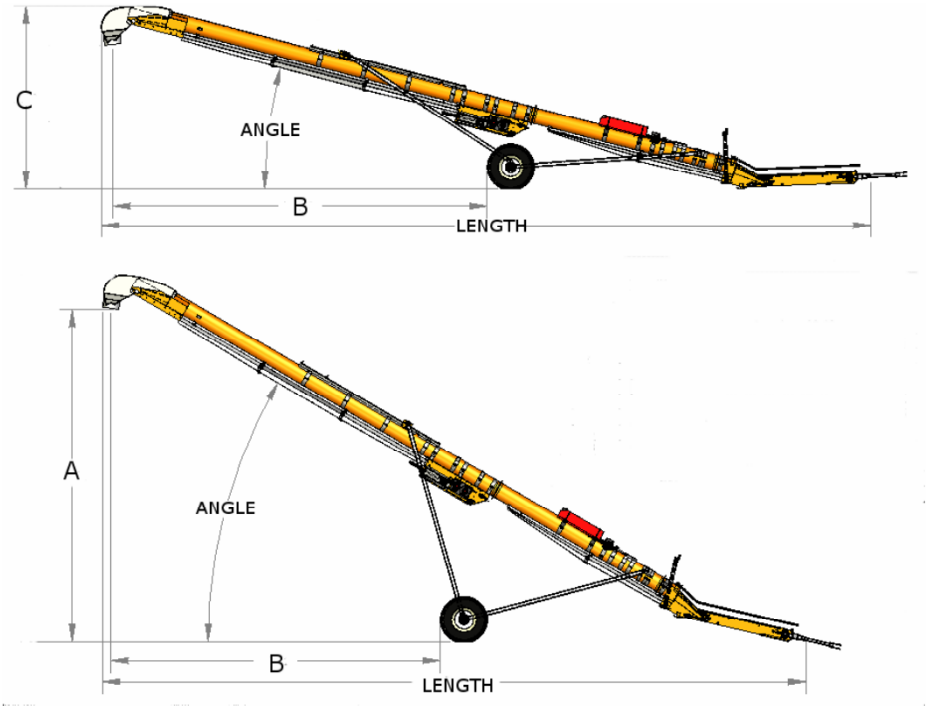
1. Insert the jack (1) into the jack stub (located on the conveyor hitch) (see Figure 60).
2. Secure the jack in place with the pin (2) provided.

Figure 60. Attaching the Jack



Item	Description
1	Jack
2	Pin

4. Specifications



NOTE: ALL ANGLES AND MEASUREMENTS SHOWN ARE MACHINE LIMITS. THE MAX OPERATION ANGLE DEPENDS ON THE PRODUCT BEING CONVEYED, USUALLY LESS THAN 30°.

Table 31. Field Loader Top Drive Conveyor

				UP — OPERATION			DOWN — TRANSPORT						
Model#	Belt Length (w/ Long Hopper)	Belt Length (w/ Short Hopper)	Total Weight (lb)	A (ft)	B (ft)	Angle (°)	C (ft)	B (ft)	Angle (°)	Length (ft)	Overall Width (ft)	Electric (hp)	Hyd (hp) (Motor Series)
1539 ELECTRIC	82' 5"	78' 3"	1796	17.3	15.6	30.0	11.5	17.0	18.0	35.0	7.5	10.0	n/a
1539 HYD	82' 5"	78' 3"	1856	17.2	17.5	30.0	12.5	19.2	20.0	35.0	7.5	n/a	6.2 (2000 Series)
1544 ELECTRIC	92' 5"	90"	2295	17.1	17.0	26	7.8	18.6	14	44.9	45	15	n/a
1544 HYD	92' 5"	90"	2355	17.1	17.0	26	7.8	18.6	14	44.9	45	n/a	6.2 (2000 Series)
1549 ELECTRIC	102' 5"	98' 3"	2379	22.3	21.3	30.0	13.2	22.0	16.0	45.0	7.5	15.0	n/a
1549 HYD	102' 5"	98' 3"	2439	22.4	22.7	30.0	11.5	24.6	14.0	45.0	7.5	n/a	6.2 (2000 Series)

5. Appendix

5.1. Bolt Torque

Table 32 gives the correct torque values for various hardware. Tighten all bolts to the torque specified, unless otherwise noted. Check tightness periodically, using Table 32 as a guide. Replace the hardware with the same strength bolt, contact AGI if you are unsure.

Table 32. 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 33. 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 34. 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 35. 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 35 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 36. 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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