



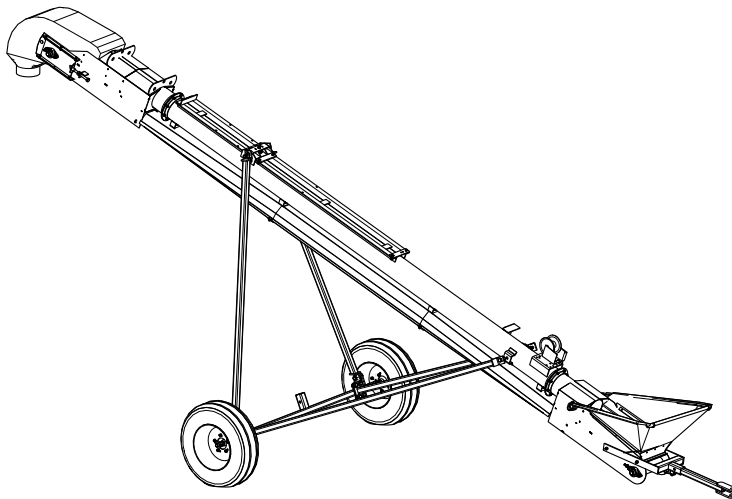
Top-Drive Standard Conveyor

Portable Grain Belt Conveyor Assembly Manual

This manual applies to:

Brands: AGI Batco, AGI Westfield, AGI Hutchinson

Models: 1222, 1227, 1232 Hydraulic/Electric Drive
1232 Hydraulic Drive with Downspout



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: P1512174 R2

Revised: November 2021

Original Instructions

New in this Manual

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

Description	Section
Added 1222 Model	various sections
Added Guided Rollers	Section 3.19 – Install the Guided Rollers on page 40
Added Electric Drive	Section 3.27 – Drive Assemblies on page 51

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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.



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



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



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



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

1.2. General Safety Information

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 in the work area. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- Use for intended purposes only.
- Do not modify the conveyor in any way without written permission from the manufacturer and is not covered by the warranty.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.
- Follow applicable local codes and regulations.



1.3. Moving Conveyor Belt Safety



- 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

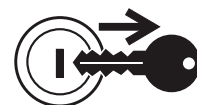
WARNING

- 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 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

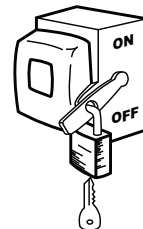
Power Source

- Electric motors and controls shall be installed and serviced by a qualified electrician and must meet all local codes and standards.
- Use a magnetic starter to protect the electric 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.
- Ensure electrical wiring and cords remain in good condition; replace if necessary.

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.

SERVICE DISCONNECT



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 and tracking properly 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 decal 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. Safety Decal Locations

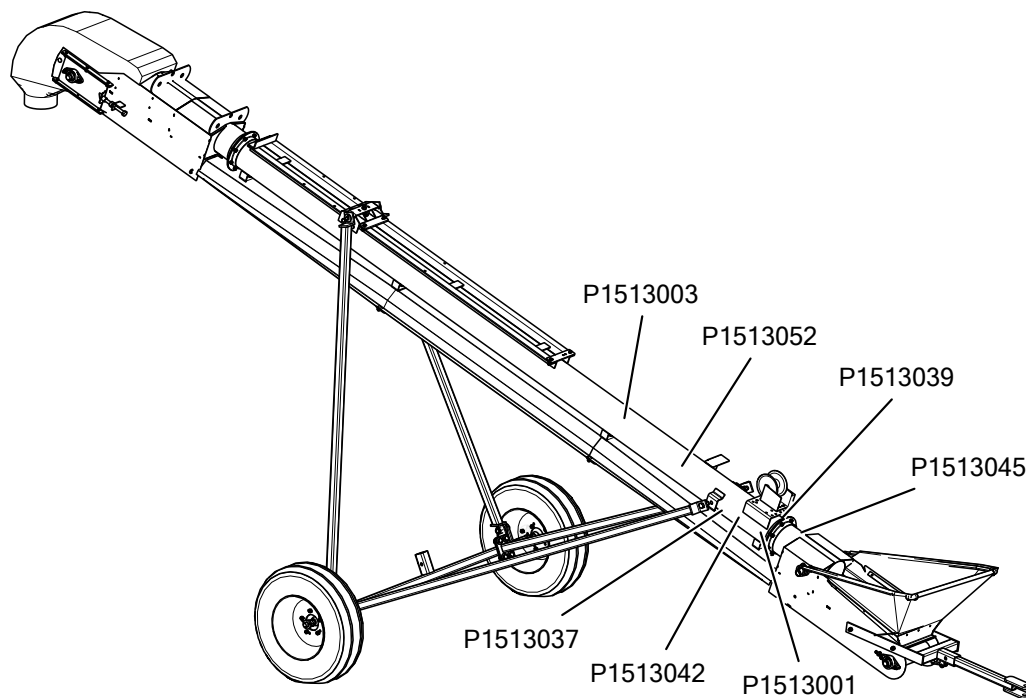


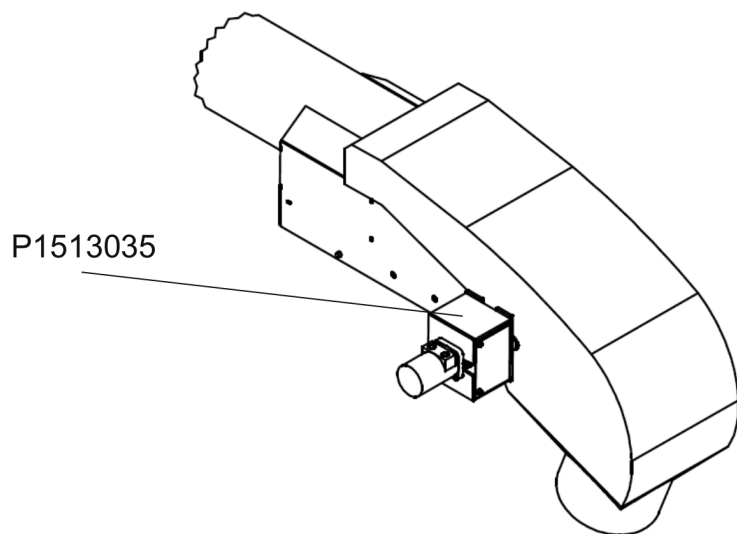
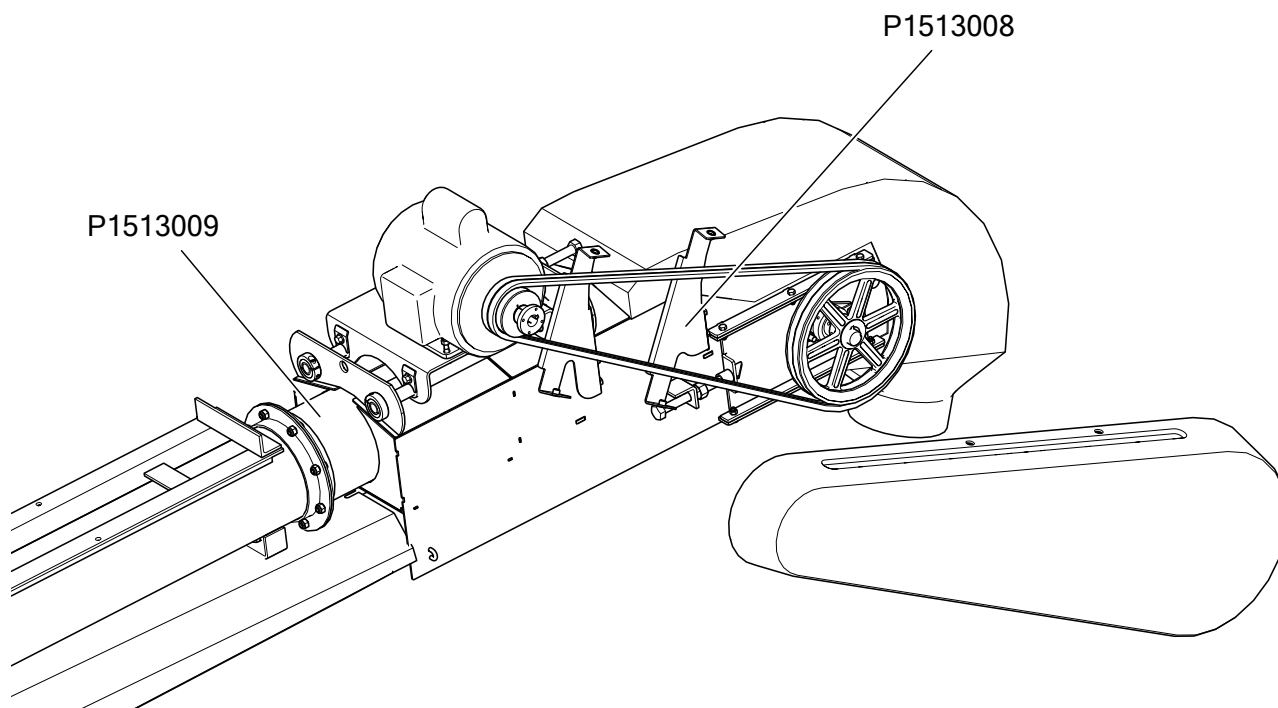
Figure 2. Hydraulic Top Drive Safety Decal Locations**Figure 3. Electric Top Drive Safety Decal Locations**

Table 1. Safety Decals




Part Number	Description
P1513001	<div data-bbox="360 275 1070 678">  <div data-bbox="375 380 699 659">  </div> <div data-bbox="751 380 1032 659">  </div> </div> <p data-bbox="391 699 911 737">To prevent serious injury or death:</p> <ul data-bbox="391 758 1032 1612" style="list-style-type: none"> • Read and understand the manual before assembling, operating, or maintaining the equipment. • Only trained personnel may assemble, operate, or maintain the equipment. • Children and untrained personnel must be kept outside of the work area. • Do not modify the equipment. Keep in good working order. • If the manual, guards, or decals are missing or damaged, contact factory or representative for free replacements. • Lock out power before performing maintenance. • To prevent equipment collapse or upending, support equipment tube while disassembling certain components. • Follow grain storage structure manufacturer's warnings when loading and unloading. • Electric motors must be grounded. Disconnect power before resetting overloads.

Table 1 Safety Decals (continued)

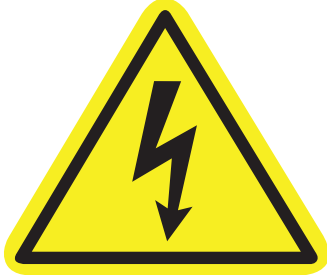
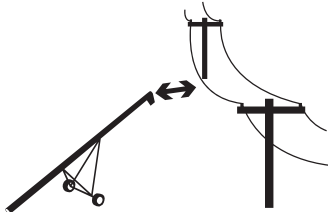


Part Number	Description
P1513003	<div>   </div> <p>ELECTROCUTION HAZARD</p> <p>To prevent death or serious injury:</p> <ul style="list-style-type: none"> • When operating or moving, keep equipment away from overhead power lines and devices. • Fully lower equipment before moving. <p>This equipment is not insulated.</p> <p>Electrocution can occur without direct contact.</p>
P1513045	<div>   </div> <p>OPEN BELT CONVEYOR</p> <p>To prevent death or serious injury:</p> <ul style="list-style-type: none"> • DO NOT step on or touch moving conveyor belt. • Shut off and lock out power to adjust, service, or clean.

Table 1 Safety Decals (continued)





Part Number	Description
P1513037	<div data-bbox="365 279 1065 642">  WARNING TRANSPORT HAZARD To prevent serious injury or death: <ul style="list-style-type: none"> • Securely attach equipment to vehicle with correct pin and safety chains. • Use a tow vehicle to move equipment. </div>
P1513035	<div data-bbox="365 699 1065 1503">  WARNING <div data-bbox="378 804 703 1083">  </div> <div data-bbox="751 804 1027 1083">  </div> HIGH PRESSURE FLUID HAZARD Hydraulic fluid can cause serious injury if it penetrates the skin. If it does, see a doctor immediately. <ul style="list-style-type: none"> • Relieve system pressure before repairing, adjusting or disconnecting. • Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands. </div>

Table 1 Safety Decals (continued)










Part Number	Description
P1513042	<div data-bbox="362 275 1068 363">  WARNING </div> <div data-bbox="362 363 1068 678">  </div> <div data-bbox="524 695 906 737">UPENDING HAZARD</div> <div data-bbox="391 758 911 800">To prevent death or serious injury:</div> <div data-bbox="391 816 1040 1121"> <ul style="list-style-type: none"> • Anchor intake end and/or support discharge end to prevent upending. • Intake end must always have downward weight. Do not release until attached to tow bar or resting on ground. • Do not raise intake end above tow bar height. • Empty tube and fully lower before moving. </div>
P1513039	<div data-bbox="362 1209 1068 1297">  CAUTION </div> <div data-bbox="391 1314 1040 1356">For proper raising and lowering of equipment:</div> <div data-bbox="391 1373 1040 1677"> <ul style="list-style-type: none"> • 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. </div>

Table 1 Safety Decals (continued)

Part Number	Description
P1513052	<div style="border: 1px solid black; padding: 10px;"> <div style="background-color: #0056b3; color: white; text-align: center; padding: 5px;">NOTICE</div> <p>To prevent damage, wheels must be free to move when raising or lowering equipment.</p> <p>When equipment is positioned, chock all wheels.</p> </div>
P1513008	<div style="border: 1px solid black; padding: 10px;"> <div style="background-color: #ff9900; color: black; text-align: center; padding: 5px;">  WARNING </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">   </div> <div> <p>MISSING GUARD HAZARD</p> <p>To prevent serious injury or death, shut off power and reattach guard before operating machine.</p> </div> </div> </div>
P1513009	<div style="border: 1px solid black; padding: 10px;"> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">   </div> <div> <div style="background-color: #ff9900; color: black; text-align: center; padding: 5px;">  WARNING </div> <p>ELECTROCUTION HAZARD</p> <p>To prevent serious injury or death:</p> <ul style="list-style-type: none"> • Only qualified personnel should service electrical components. • Disconnect and lockout power before inspecting or servicing unit. • Keep electrical components in good repair. </div> </div> </div>

2. Features

Read this section to familiarize yourself with the basic component names and functions of the conveyor.

Figure 4. Typical Top Drive Standard Conveyor Component

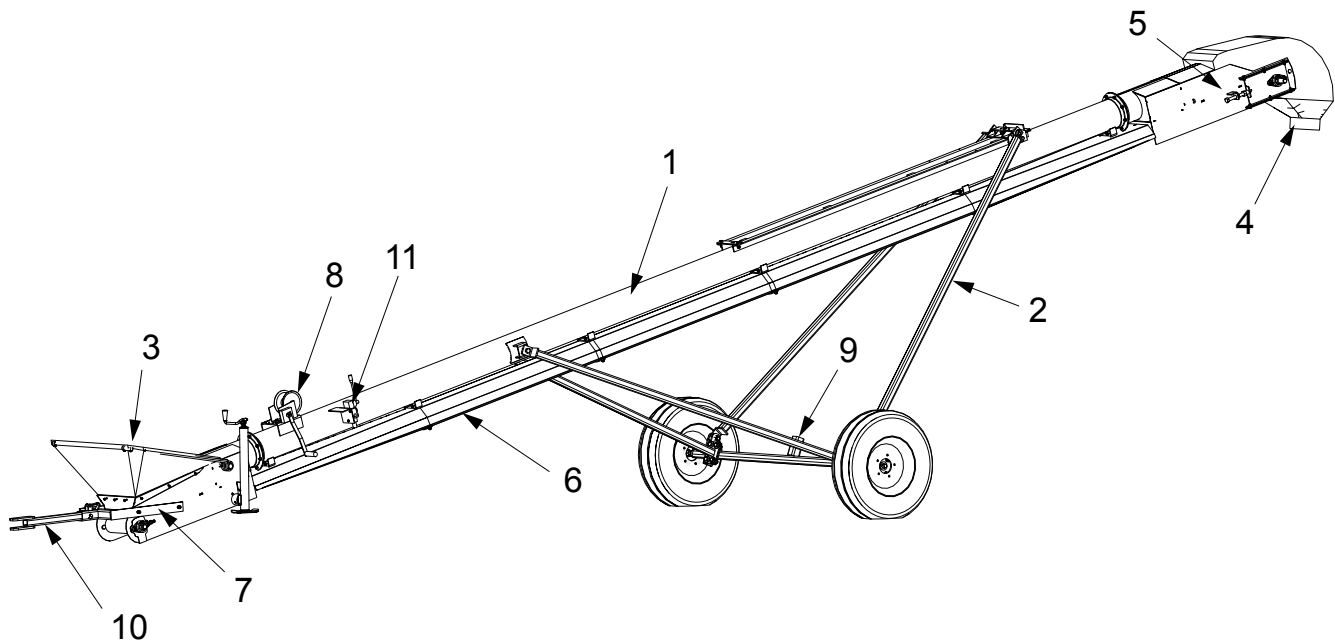


Table 2. Typical Top-Drive Standard Conveyor Components

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Tube	7	Hitch
2	A-Frame	8	Winch
3	Hopper	9	Hitch Tongue Holder
4	Hood	10	Straight Tongue
5	Spout Assembly	11	Hydraulic Valve – For 1232 Hydraulic with Downspout only
6	Belt Return and Weather Guard	12	Top Drive Motor (Not Shown)

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. Take pictures of shipments prior to or just after unloading if there are any damaged parts.

Report missing or damaged parts immediately to ensure that proper credit is received from Batco or your representative, 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) | • 1 | tape measure(s)
(100' [30.5 m]) |
| • 2 | sawhorse(s)
(1200 lb [544.3 kg]) | • 1 | ratchet strap |
| • 1 | standard socket set(s) | • 2 | C-clamp(s) or vise grip(s) |
| • 2 | wrench set(s) | • 1 | fish tape
(100' [30.5 m]) |
| • 1 | torque wrench(es) | • 1 | tire pressure gauge |
| • 1 | set(s) of Allen wrenches | • 1 | tire chuck |
| • 1 | hammer and punch | • 1 | propane torch |
| • 1 | drill with bits
3/16", 5/16" | • 1 | picker
with minimum reach of 12' (3.7 m) and
4000 lb to 6000 lb (1814 kg to 2722 kg)
lifting capacity |
| • 2 | tape measure(s)
(25' [7.6 m]) | | |

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 66](#). 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 67](#).

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 or more 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

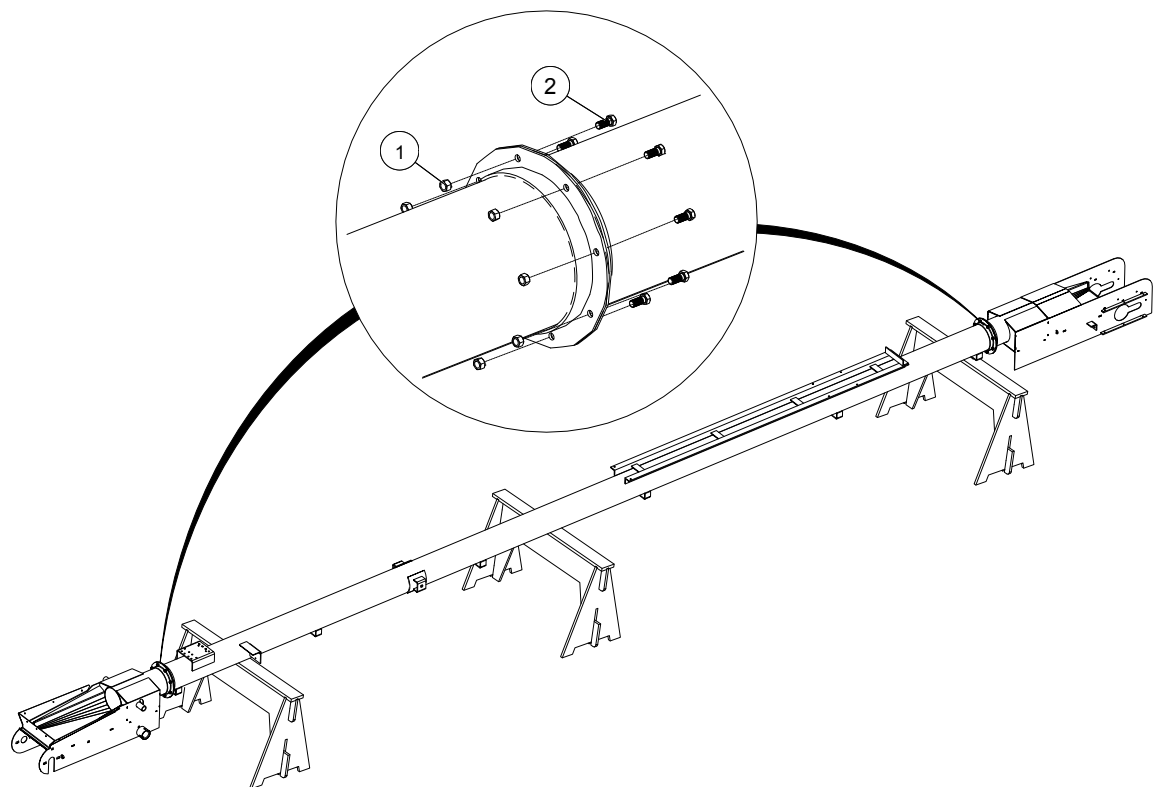
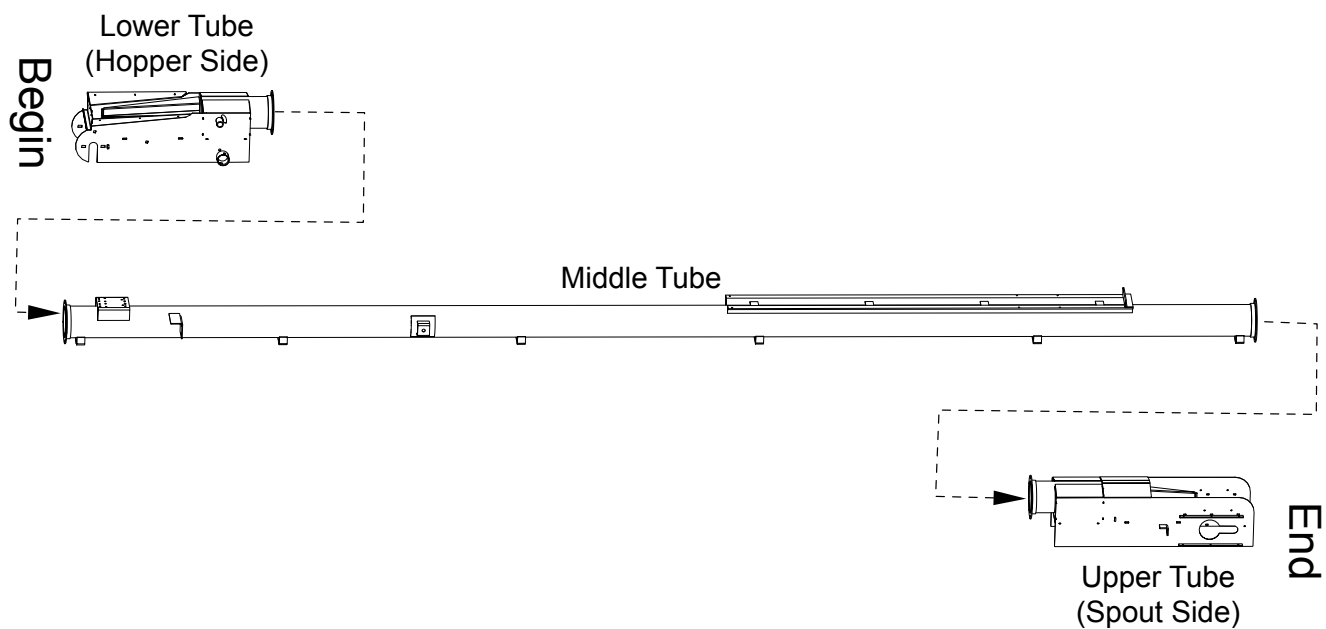


Figure 6. Conveyor Tube Layout for 1200 Series Top Drive Models



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 7](#)):
 - AGI Decal (both sides of the tube): place at the top of the tube, next to the spout.
 - Brand Decal (both sides of the tube): place mid to low tube, where it is visible and not covered by frame arms/trussing/brackets.
 - Model Decal (both sides of the tube): place mid tube, between the “AGI” and the brand. Ensure it is not covered by frame arms/trussing/brackets.

Examples of the appearance of brand and model decals are in [Figure 9](#), [Figure 10](#) and [Figure 8](#).

Figure 7. Brand and Model Decal Placement

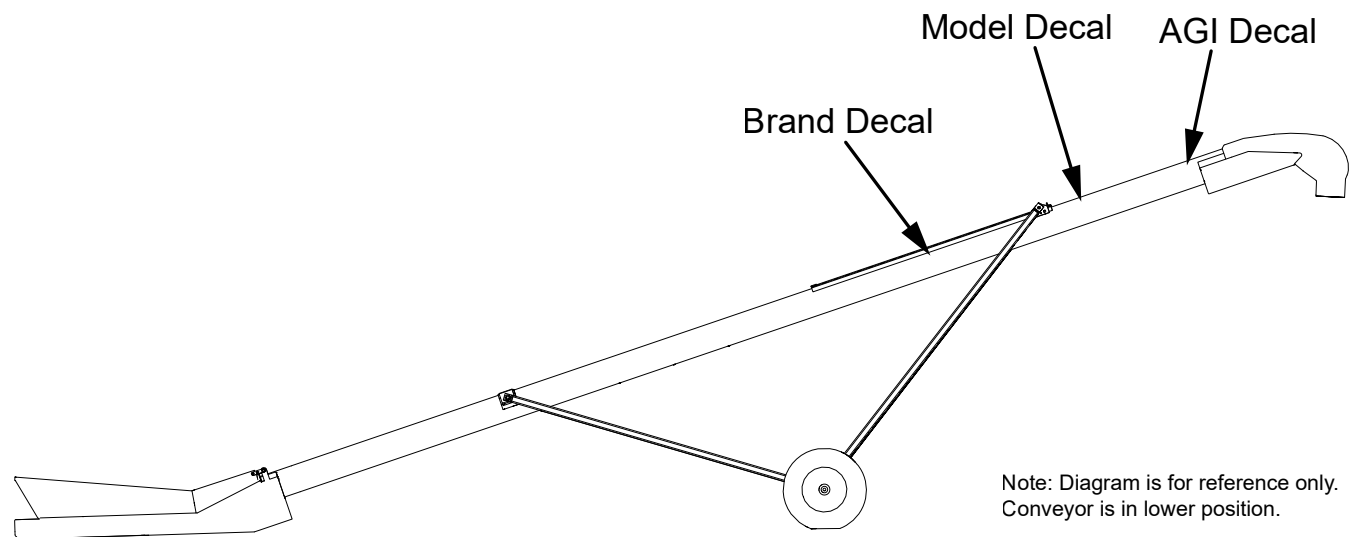


Figure 8. AGI Decal



Figure 9. Brand Decal (example)



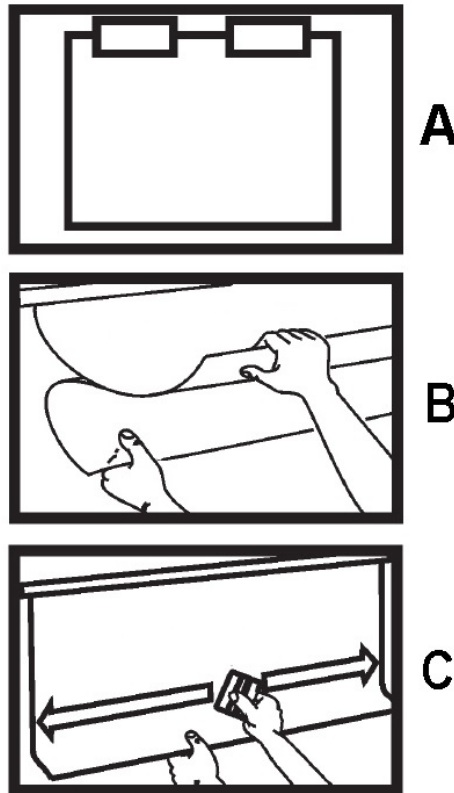
Figure 10. Model Decal (example)



- Apply decals to both sides of conveyor tube.
- For each decal:

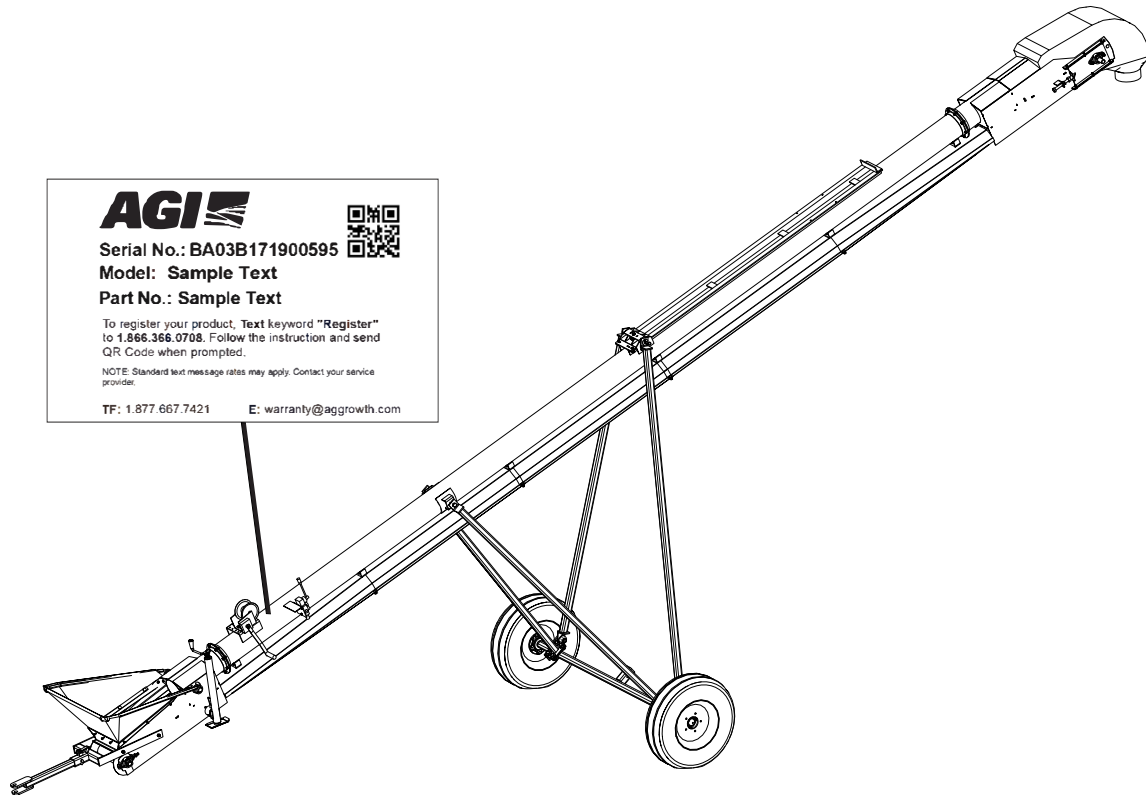
1. Prepare surface by cleaning thoroughly with soap and water. Surface must be clean and free of dirt, grime, rust and oil. To clean oily surface, wipe with clean cloth and solvent cleaner or isopropyl alcohol.
2. Position the decal by centering it vertically on the tube and apply masking tape along the top, creating a gate hinge (see Detail A in [Figure 11](#)).
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 11. Decal Placement Technique



3.9. Serial Number Decal Placement

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



3.10. Install the Hopper Roller

1. Insert the roller (2) into the front end of the hopper (1).
2. Slide a 1-1/2" bearing (7) on each end of the roller and secure to the hopper using 1/2" x 1-1/2" carriage bolts (3), 0.531" square flat washers (6), and 1/2" locknuts (4).

Important

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

3. Center the roller (2) in the hopper.
4. Make sure the roller (2) is positioned straight by measuring from each end of the roller to each end of the hopper weldment sidewall (it should be the same distance on both sides).
5. For each bearing, use a hammer and punch to rotate the lock collar so that it seats onto the inner race of the bearing. Tighten the lock collar securely to the shaft with its hex set screw.

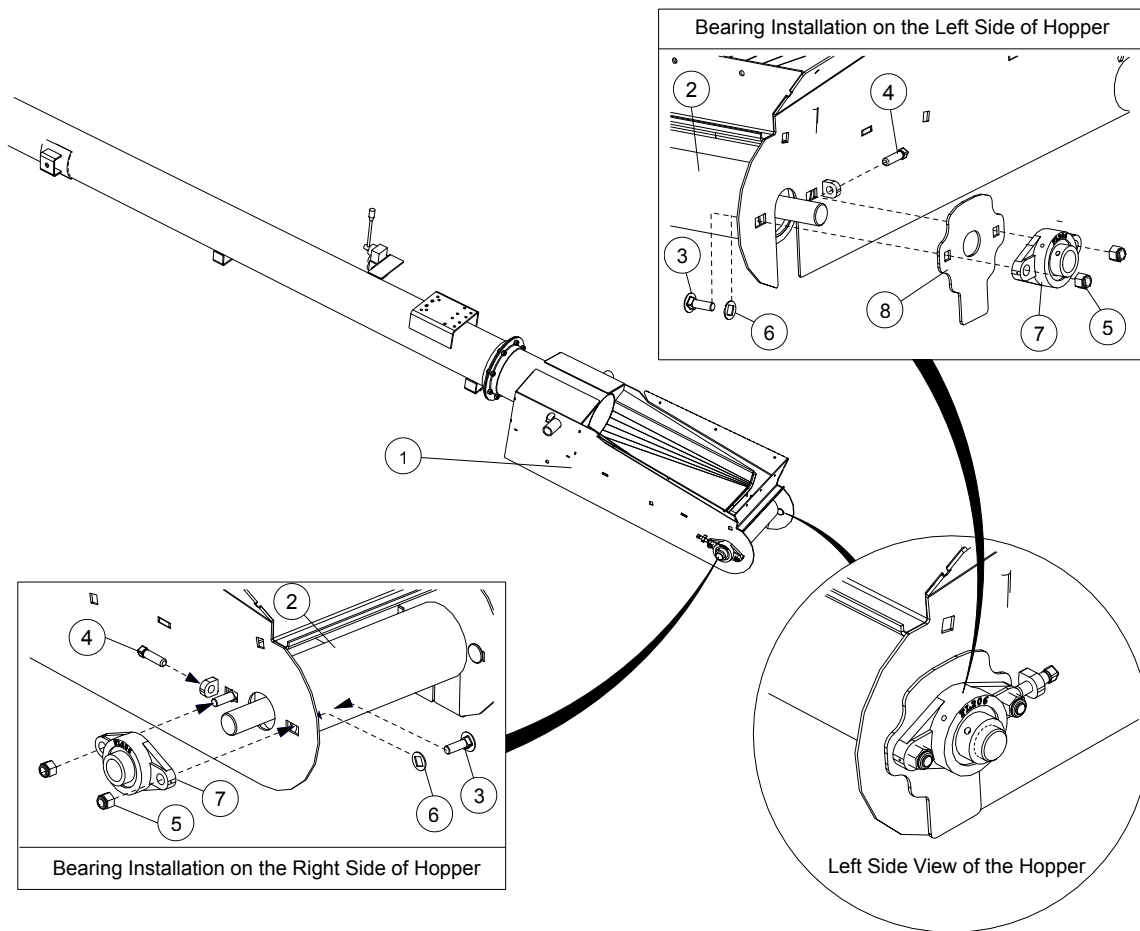
Note

Make sure to install the Bearing Mount Plate (8) for the left side bearing installation.

6. Insert the square-head set screw (4) as in [Figure 12](#) on both sides of the hopper section (1).

Note

This set screw will be used to adjust the hopper roller after installing the belt.

Figure 12. Installing Hopper Roller**Table 4. Hopper Components**

Item	Description
1	Hopper Section
2	Vulcanized Roller
3	1/2" x 1-1/2" Carriage Bolt
4	7/16" x 1-1/2" Square-Head Set Screw
5	1/2" Nylon Locknut
6	0.531 Square -1.00-0.060 Flat Washer
7	1-1/4"-SAFL206-20 Bearing Flange Unit
8	Bearing Mount Plate (only for left side of the hopper)

3.11. Install Belt Tightener and Belt Guide

Figure 13. Install Belt Tightener Plate and Belt Guide Flashing

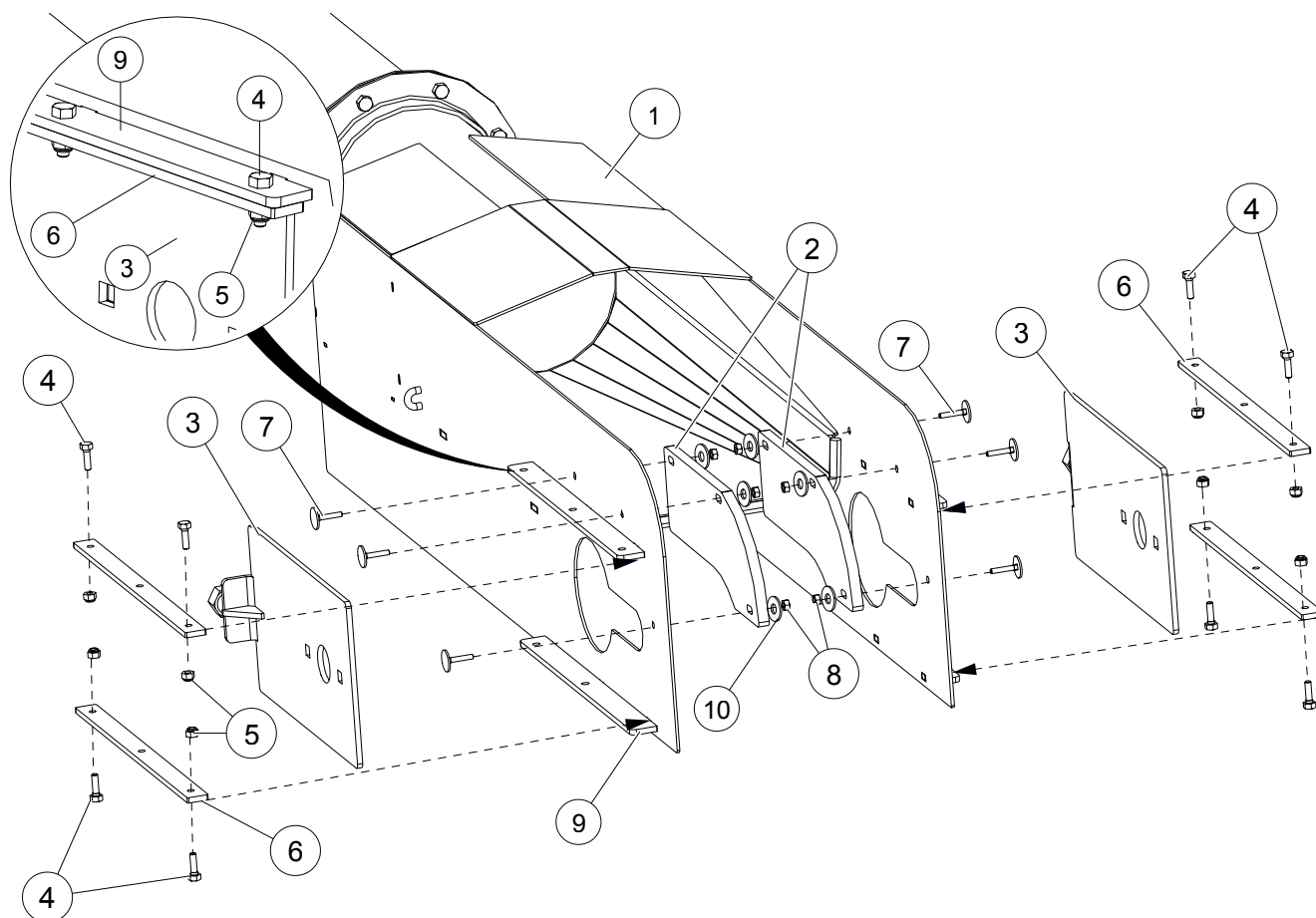


Table 5.

Item	Description
1	Spout Section
2	1/2" Belt Guide Flashing
3	1/4" Spout Tightener Plate
4	5/16" X 1" Hex Bolt
5	5/16" Nylon Lock Nut
6	Spout Retainer Plate
7	1/4" X 1-1/4" Elevator Bolt
8	1/4" Nut
9	1/4" Spout Bearing Mount Tab (Pre-attached)
10	1/4" Washer

3.12. Install the Spout Roller

1. Prior to installing the spout roller, please check [Figure 13](#) in [Section 3.11 – Install Belt Tightener and Belt Guide on page 26](#) for belt tightener and belt guide installation.
2. Insert the roller (2) into the spout (1) (see [Figure 14](#)).

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).

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

Important

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

4. Center the roller (2) in the spout.
5. Make sure the roller (2) is positioned straight by measuring the distance from the end of the roller to the end of the spout weldment sidewall on both sides (it should be the same distance).
6. 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.
7. Insert the 3/4" x 7" tap bolt (7) and 3/4" hexnuts (8) in the spout tightener plate on both sides the spout end as in [Figure 14](#).

Note

The tap bolts are used to set the alignment of the belt, after the belt is installed.

Figure 14. Installing Spout Roller

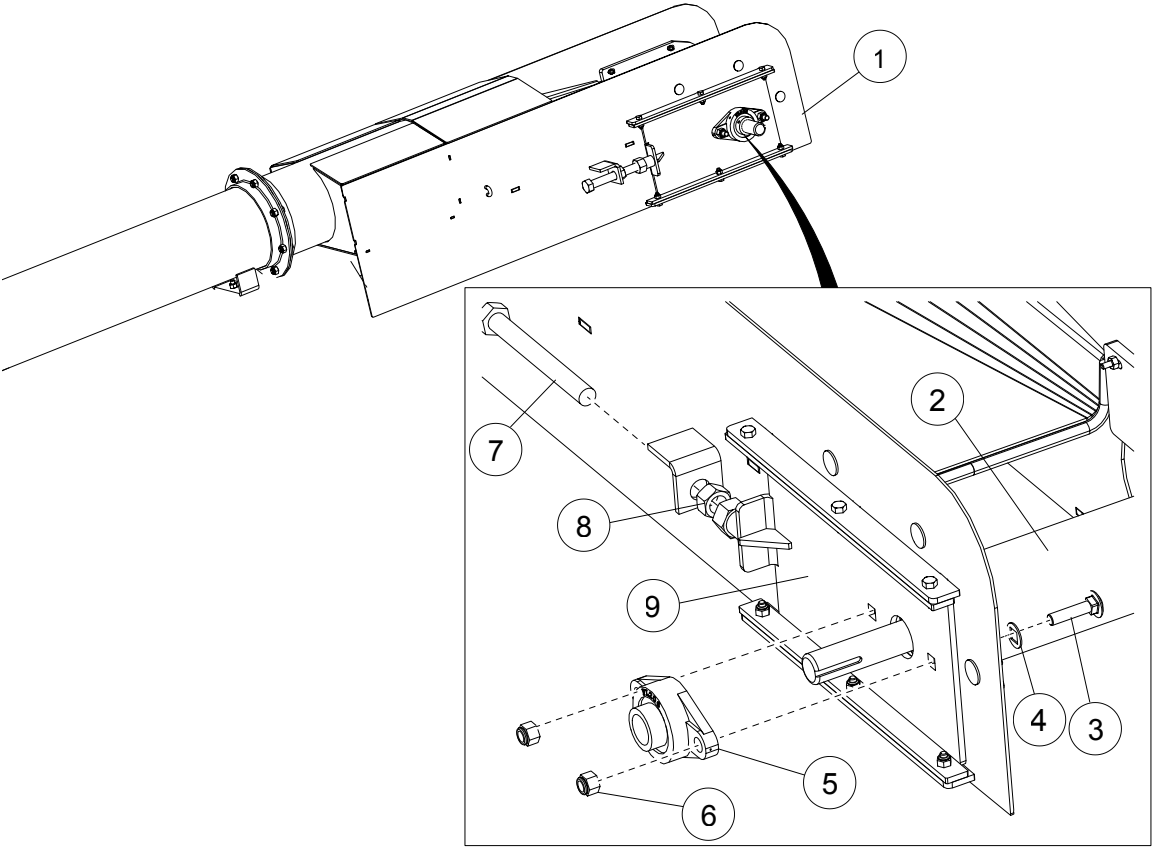


Table 6. Spout Roller Components

Item	Description	Item	Description
1	Spout Section	5	1-1/2" Bearing Flange Unit (SAFL208–24)
2	Vulcanized Spout Roller	6	1/2" Nylon Locknut
3	1/2" x 2" Carriage Bolt	7	3/4" x 7" Tap Bolt
4	Square Flat Washer (0.531"-1.00"-0.060")	8	3/4" Hex Nut

3.13. Attach the Hitch

Refer to [Figure 15](#)

1. Attach the hitch (2) to the hopper weldment using 1/2" x 1-1/2" bolts (6) and 1/2" nuts (7).
2. Insert the tongue (3) into the hitch (2).
3. Secure the tongue in place using 5/8" x 3" hitch pin (4) and 3/16" x 3-1/4" hairpin (5).

Figure 15. Installing Hitch

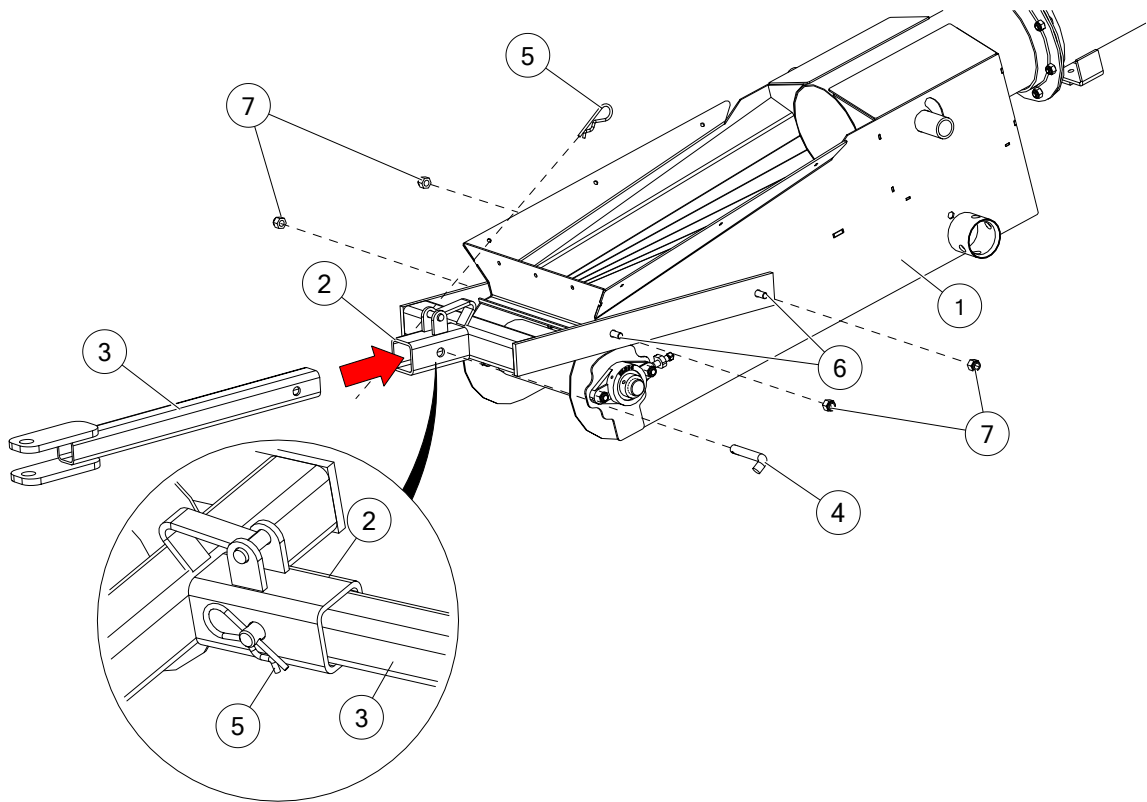


Table 7. Hitch Components

Item	Description	Item	Description
1	Hopper Section	5	3/16" x 3-1/4" Hairpin
2	Hitch	6	1/2" x 1-1/2" Carriage Bolt
3	Straight Tongue	7	1/2" Nylon Locknut
4	5/8" x 3" Hitch Pin		

3.14. Install the Hand Winch

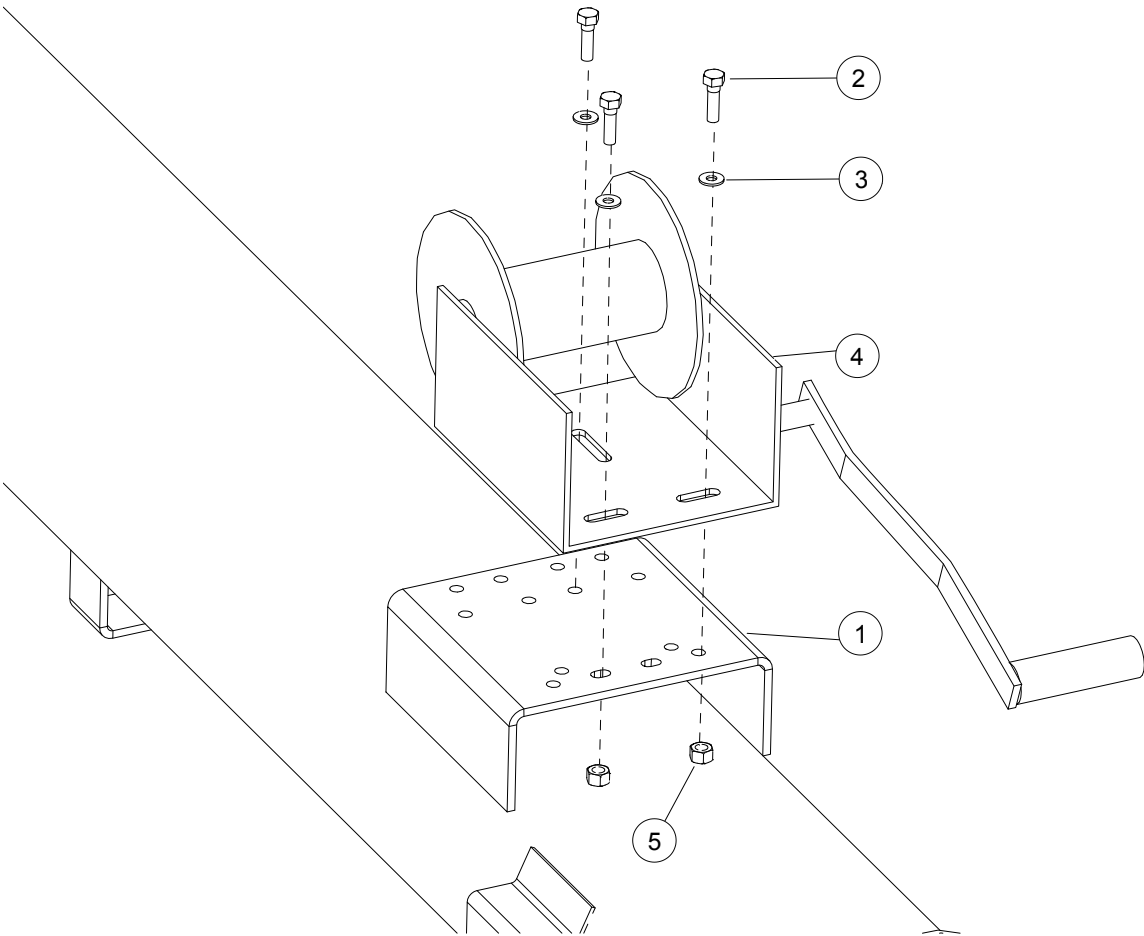
Depending on your conveyor model, it may be equipped with either a hand winch or a hydraulic winch.

1. Attach the winch (4) to the winch mount bracket (1) with 3/8" x 1" bolts (2), 3/8" flat washers (3), and 3/8" locknuts (5) (see [Figure 16](#)).

Table 8. Hand Winch Components

Item	Description	Item	Description
1	Winch Mount Bracket	4	Hand Winch
2	3/8" x 1" Hex Bolt (GR 8)	5	3/8" Nylock Nut
3	3/8" Flat Washer		

Figure 16. Installing the Hand Winch



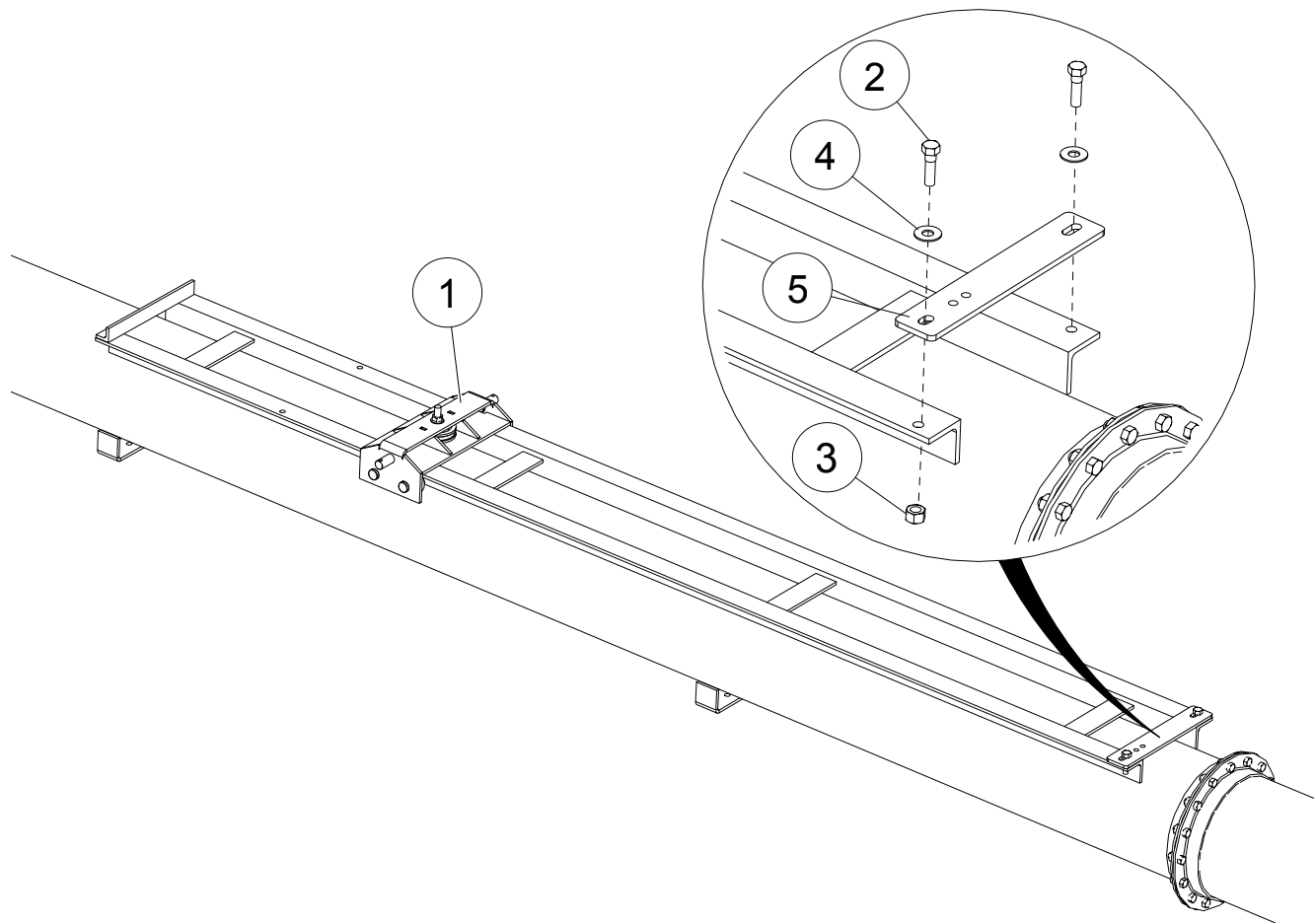
3.15. Install the Frame Slider

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

Table 9. Frame Slider Components

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

Figure 17. Installing the Frame Slider



3.16. Assemble the Weather Guard

1. Install the types of weather guard sections in [Table 10](#) 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 10. Identifiers for Types of Weather Guard Sections

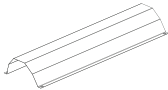
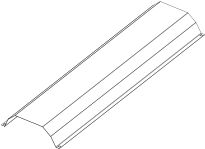
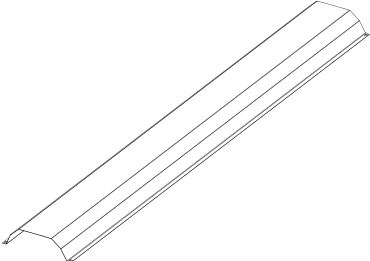
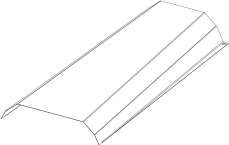
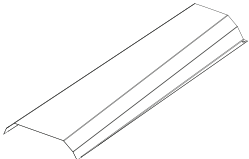
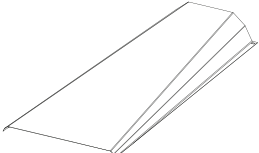
Identifier	Type of Weather Guard Section	
A	3' (0.91 m) Standard	
B	5' (1.52 m) Standard	
C	10' (3.05 m) Standard	
D	4' (1.22 m) Flared	
E	5' (1.52 m) Flared	
F	5' (1.52 m) Flat	

Table 10 Identifiers for Types of Weather Guard Sections (continued)

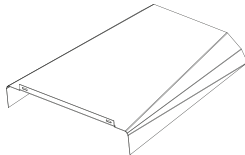
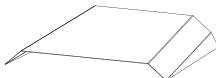
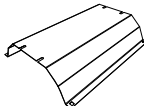
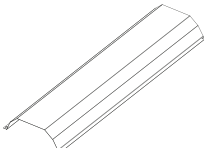
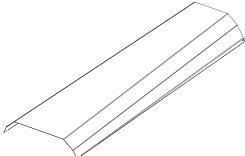
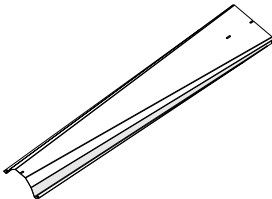
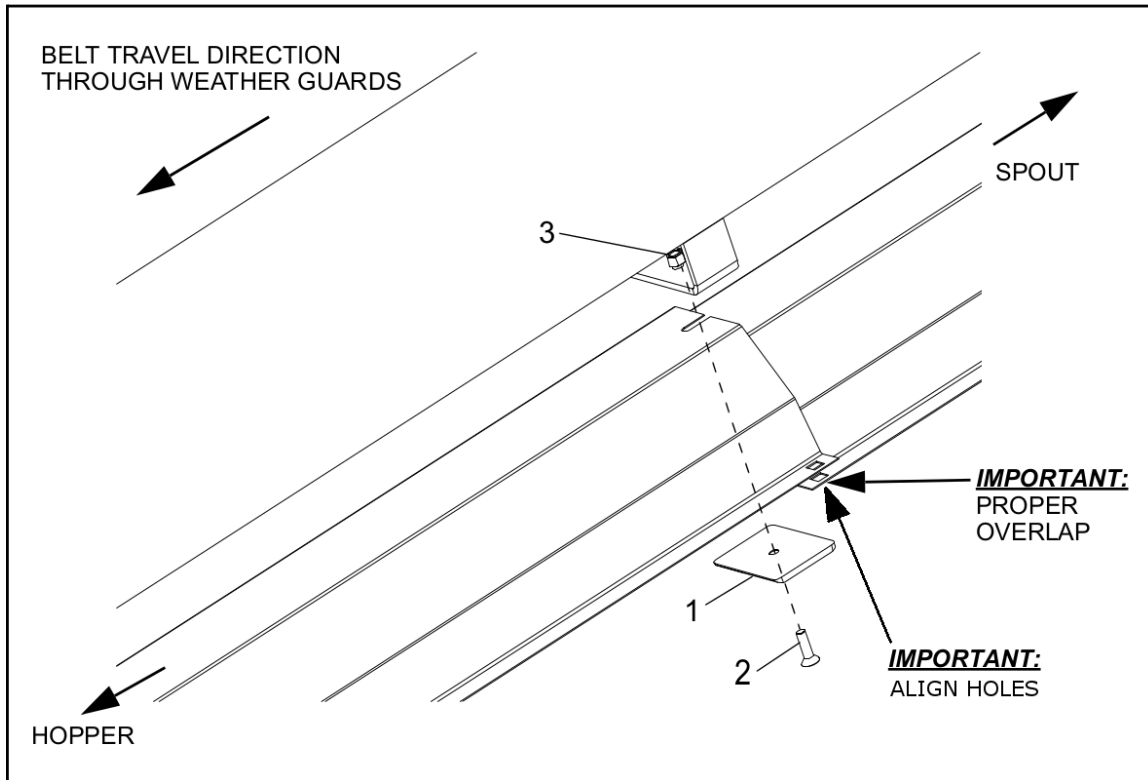
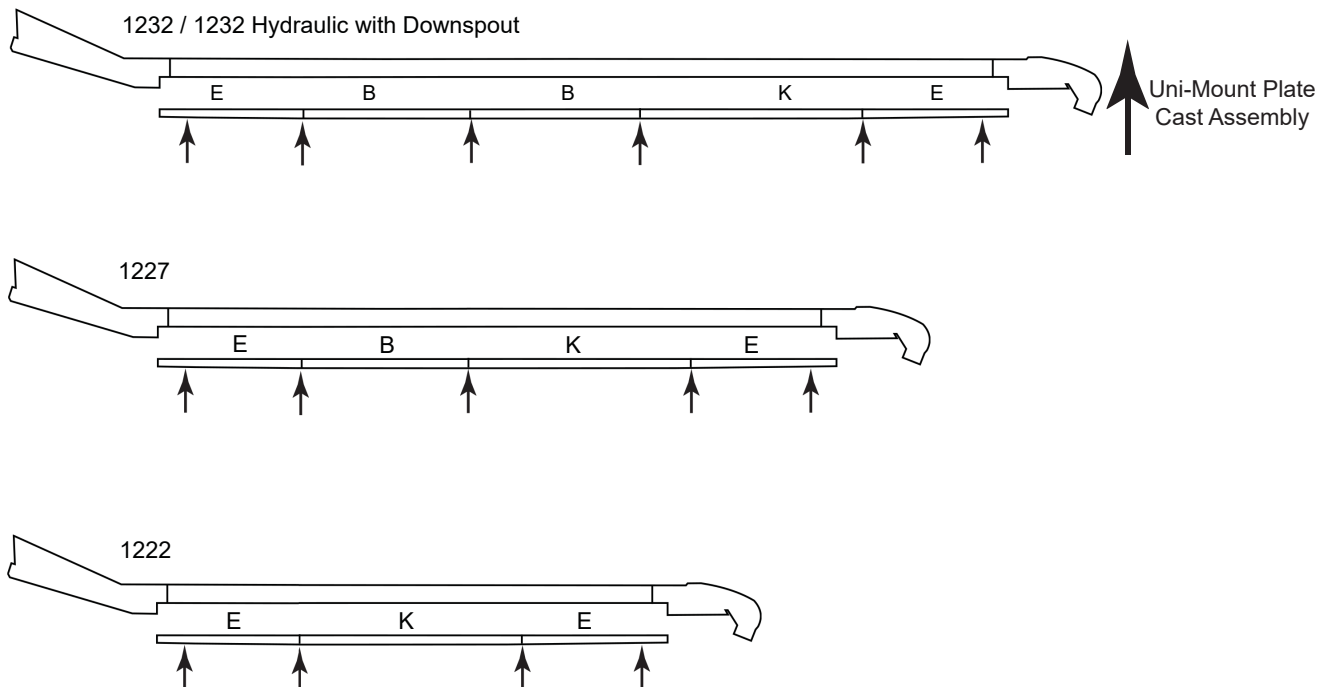
Identifier	Type of Weather Guard Section	
G	Guard -Above S-Drive	
H	Upper Transition	
J	2' (0.61 m) Standard	
K	6' (1.83 m) Standard	
L	5.5' (1.68 m) Flared	
M	7' (2.13 m) Flat	

Table 11. Components to Install Weather Guard onto the Tube Bracket

Item	Description	Quantity
1	Uni-Mount Plate Cast	1
2	3/8" x 1-1/4" Flat Head Socket Capscrew	1
3	3/8" Nylon Locknut (GR8)	1

Figure 18. Installing a Weather Guard Section**Figure 19. Weather Guard Section Locations**

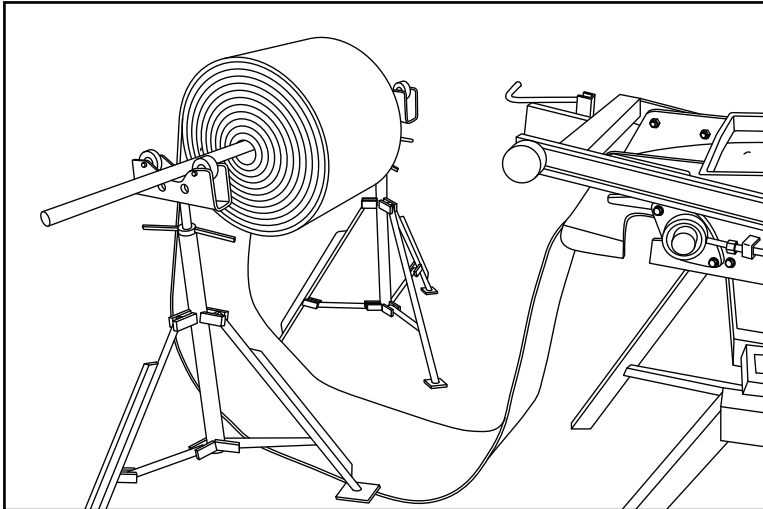
3.17. Install the Belt

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

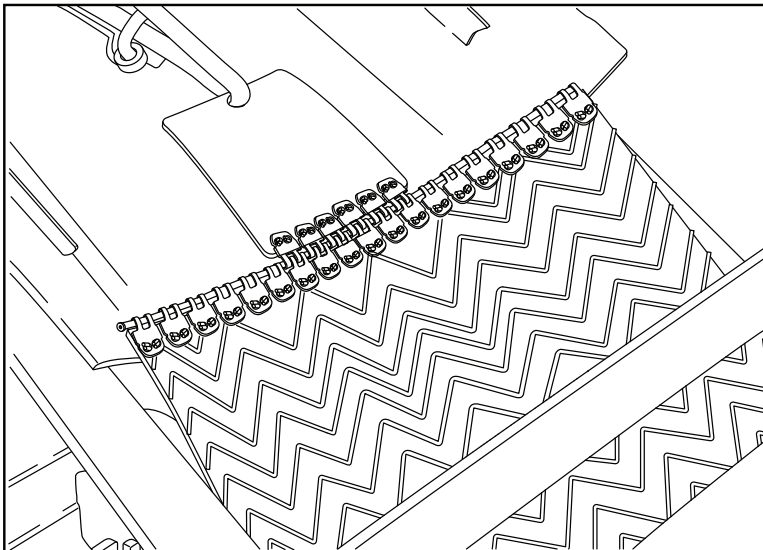
1. Place the rolled belt on a stand behind the hopper.
2. Pull the conveyor belt over the top of the hopper roller, until just inside the hopper, as shown below.

Figure 20. Rolled Belt Behind a Typical Hopper



3. Feed a fish tape in at the spout, through the tube, and into the hopper.
4. Attach the end of the belt to the fish tape using a clamp, or use a short piece of belt and thread the connector wire through the lacing clips to connect.

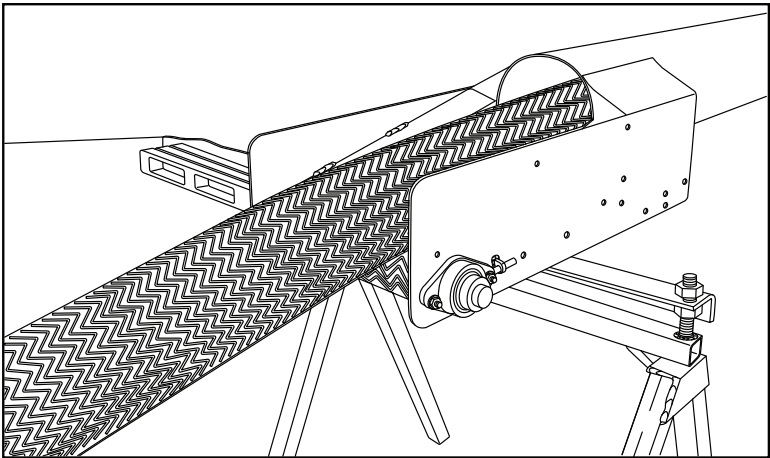
Figure 21. Fish Tape Connected to a Short Piece of Belt



Thread the Conveyor Belt

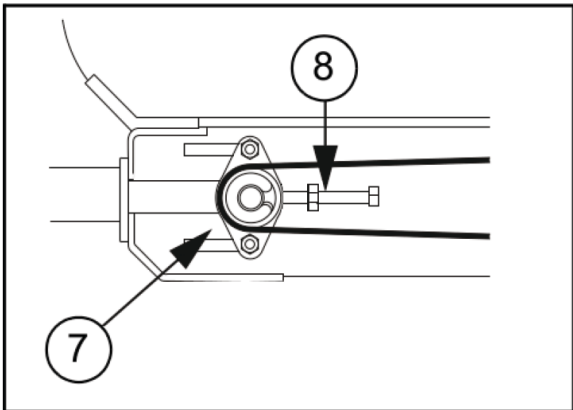
1. From the spout end, pull the fish tape until the belt emerges from the spout.

Figure 22. 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.
3. Wrap the remaining conveyor belt around the hopper roller (7) and under the tube.

Figure 23. Conveyor Belt Around Hopper Roller

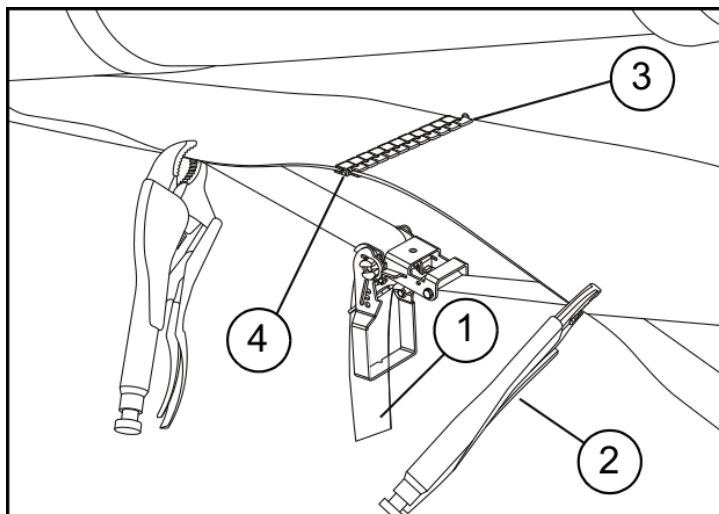


Item	Description
7	Hopper Roller
8	Set Screw

The conveyor belt is now ready to be connected.

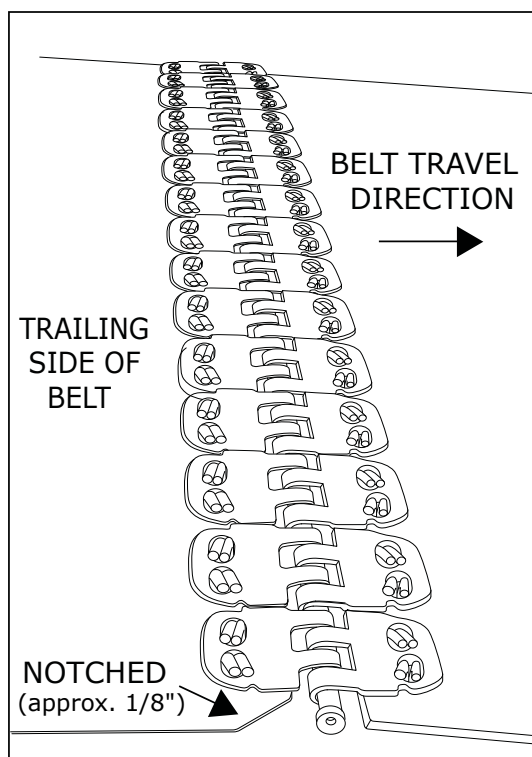
Connect the Conveyor Belt

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 24. 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 1/8" off the tip of the corner to prevent fraying.

Figure 25. 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.

3.18. Install the Weather Guard Mount Bars

1. Install the mount bar assemblies (refer to [Figure 26](#)) at the positions indicated by arrows on the conveyor model schematic diagram ([Figure 27](#)).
2. There are four mount bars are required to install in each joint of the five weather guard sections.
3. Adjust the position on all weather guards and mount bars to achieve the best fit.

Note

Ensure the steel guide plates are sitting tight against the edge of weather guard to avoid the belt trap in.

4. Tighten all bolts and nuts.

Figure 26. Types of Mount Bar Assemblies

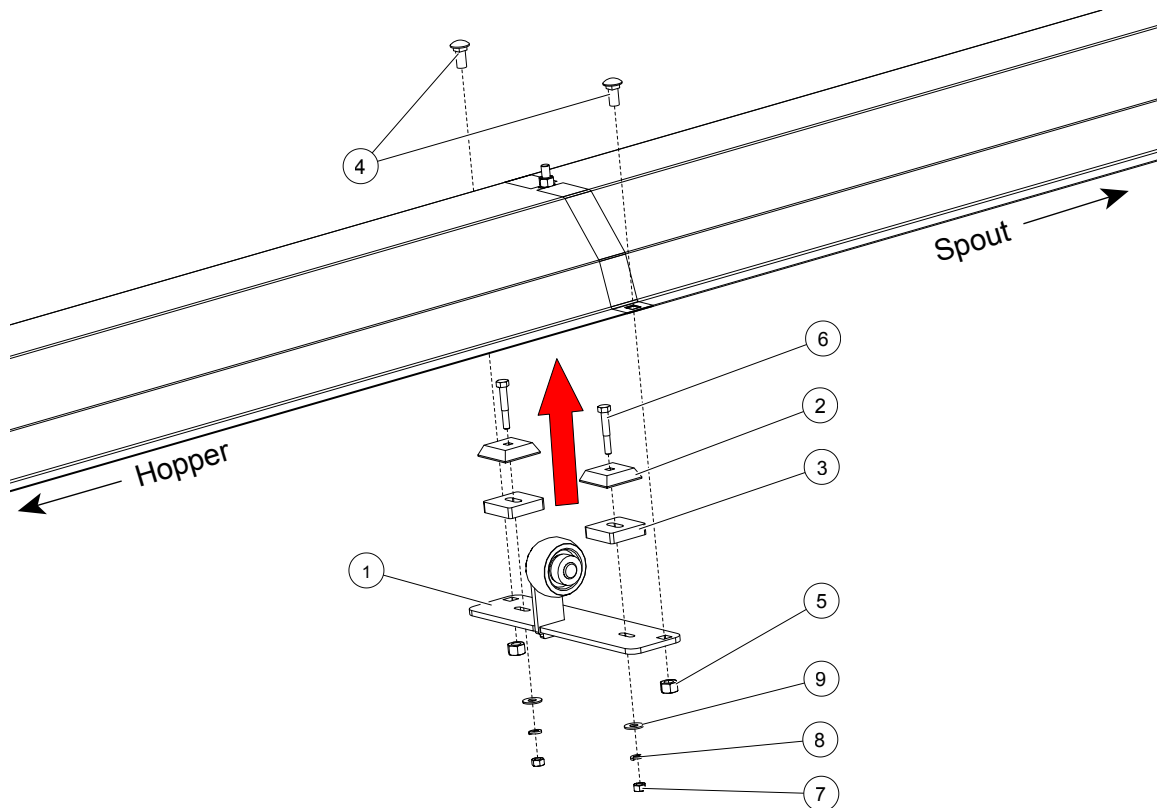
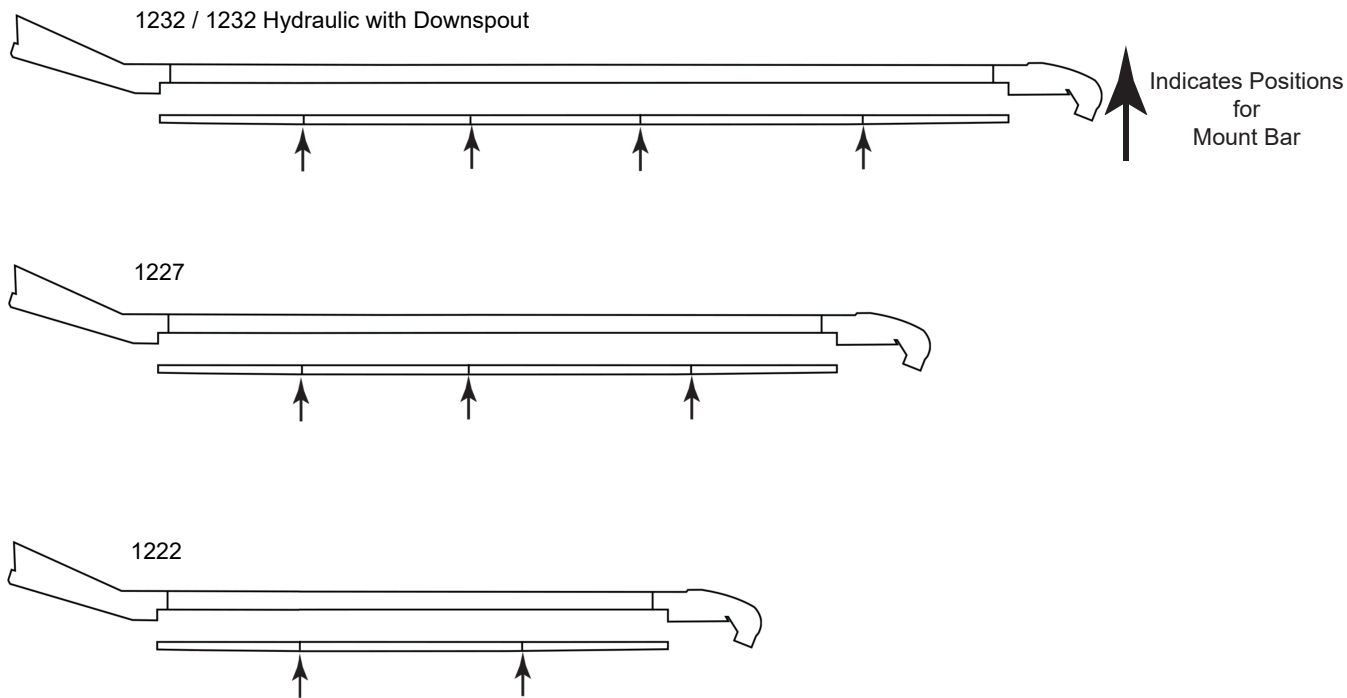


Table 12. Weather Guard Mount Bar Components

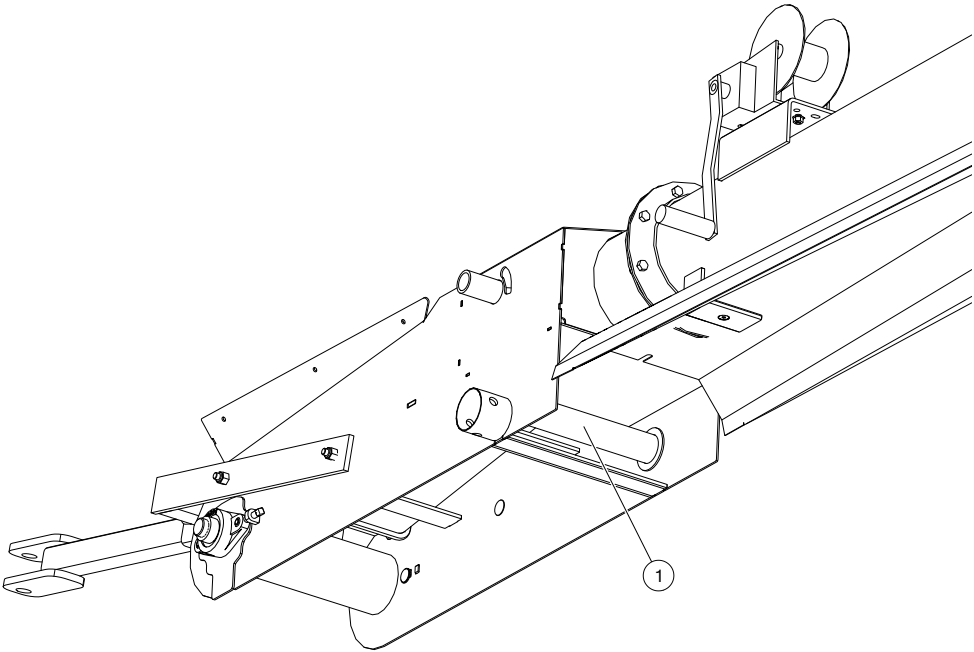
Item	Description	Item	Description
1	Mount Bar with Roller	6	5/16" x 2" Hex Bolt
2	Belt Guide Block	7	5/16" Hex Nut
3	Belt Guide Plate	8	5/16" Lock Washer
4	7/16" x 1" Carriage Bolt	9	5/16" Flat Washer
5	7/16" Nylon Locknut		

Figure 27. Mount Bar Schematic Diagram

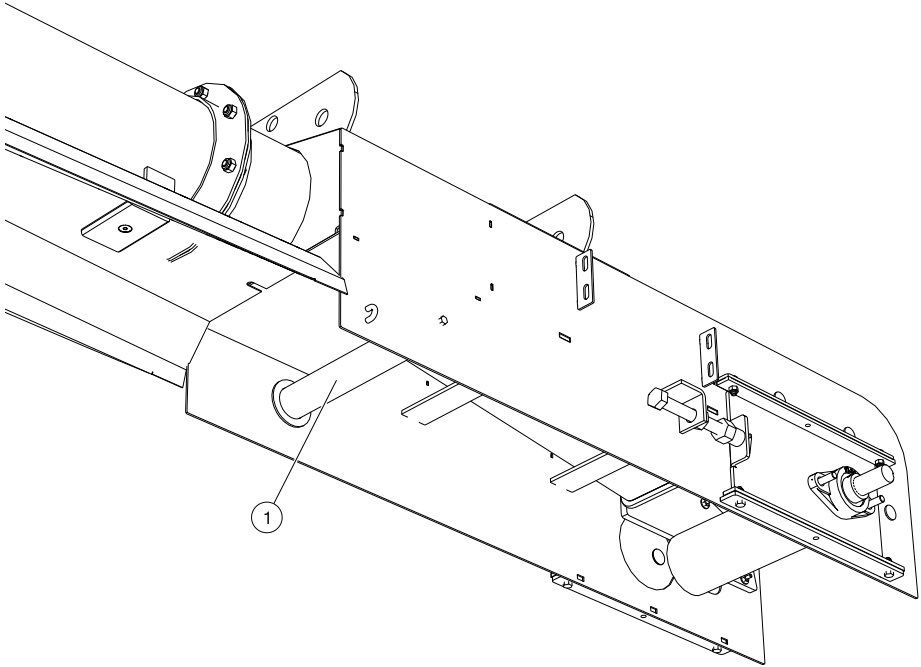


3.19. Install the Guided Rollers

Hopper



Spout



1	Guided Roller
---	---------------

3.20. Install the Collapsible Hopper Cloth

Refer to the [Table 13](#) below for a list of items used for installing the hopper cloth.

Table 13. Components for Installing the Hopper Cloth onto the Conveyor

Item	Description
1	1/2" Pipe Sch 40 (Side)
2	1/2" Pipe Sch 40 (Front)
3	1/2" Elbow Rail Fittings
4	Hopper Cloth
5	1/4" x 1-1/4" Elevator Bolt
6	1/4" Nut
7	1/4" x 1" Tek Screw
8	1/4" Flat Washer
9	Front Flashing

Install the Hopper Spring

1. Slide hopper spring over tubes on the sides of the hopper. See [Figure 28](#) 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 29](#).

Figure 28. Installing the Hopper Springs

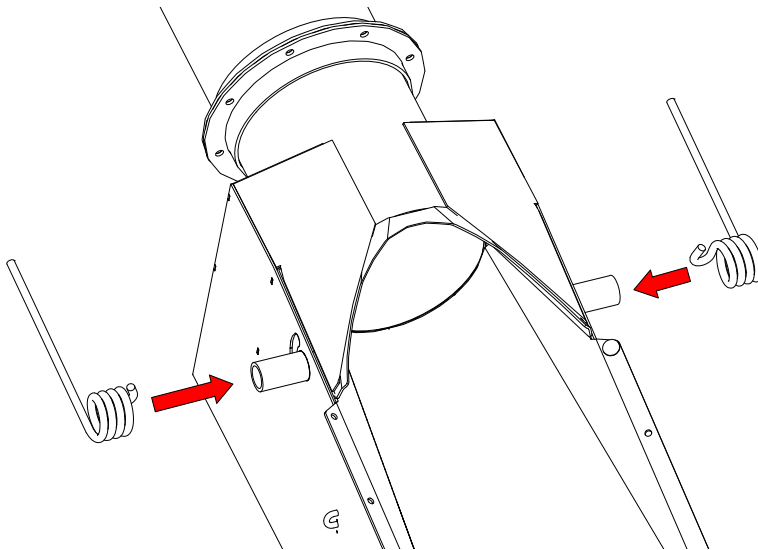
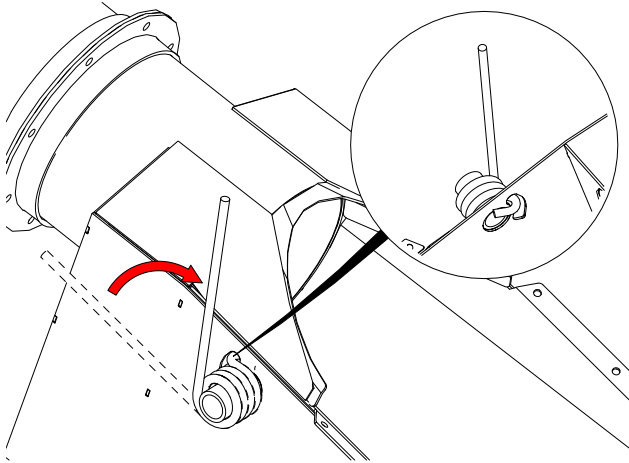


Figure 29. Lock the Hopper Spring**Install the Front Flashing**

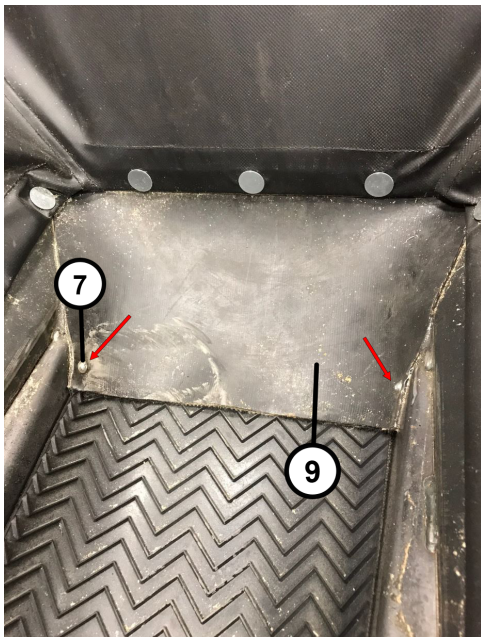
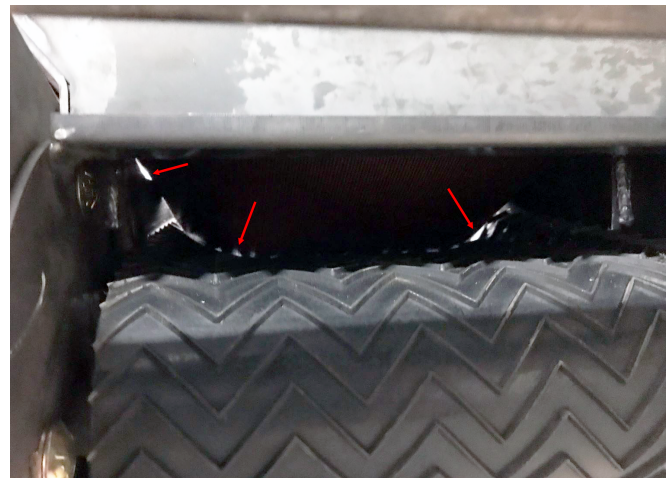
Refer to [Figure 30](#).

1. Set the front flashing (9) on the hopper before installing the hopper cloth as showing in [Figure 30](#).
2. Using two tek screws (7) and washers (8) attach the flashing on both sides of the hopper weldment.

➡ When attaching the flashing kit, make sure there is no gap or opening. Use as much tek screws as necessary to prevent any leakage. Check from the down (roller side) of the hopper that there is no light (or least amount of light) coming from the contact. Please check the [Figure 31](#) for better understanding.

Important

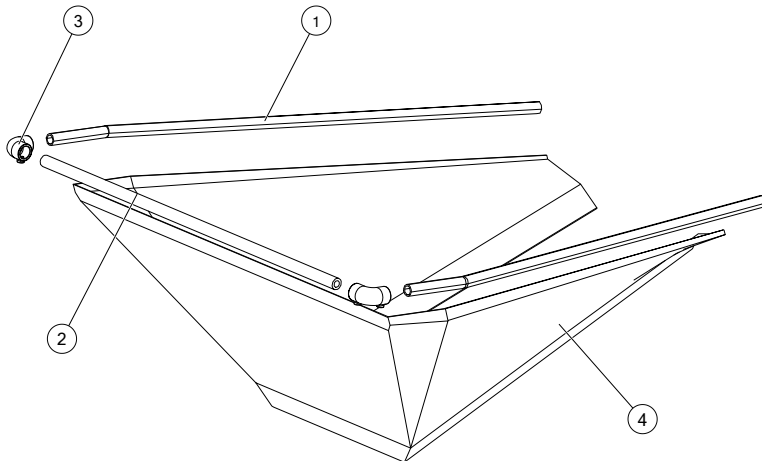
Ensure the tek screws are not catching the belt after installation.

Figure 30. Installing Front Flashing**Figure 31. Leakage of Hopper**

Install the Hopper Cloth

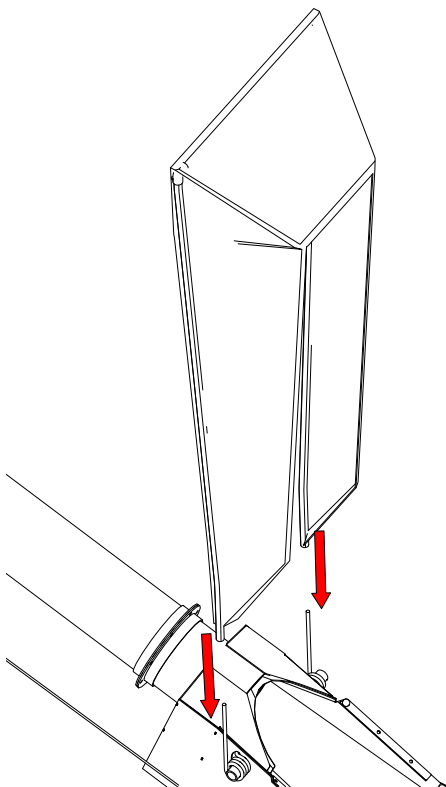
1. Slide the tubes (1, 2) into the hopper cloth (4).
2. Connect the front corners with the slip-on rail fittings (3). Orient the fittings so that the Allen screws are facing down. See [Figure 32](#).

Figure 32. 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 33](#).

Figure 33. Installing the Hopper Cloth



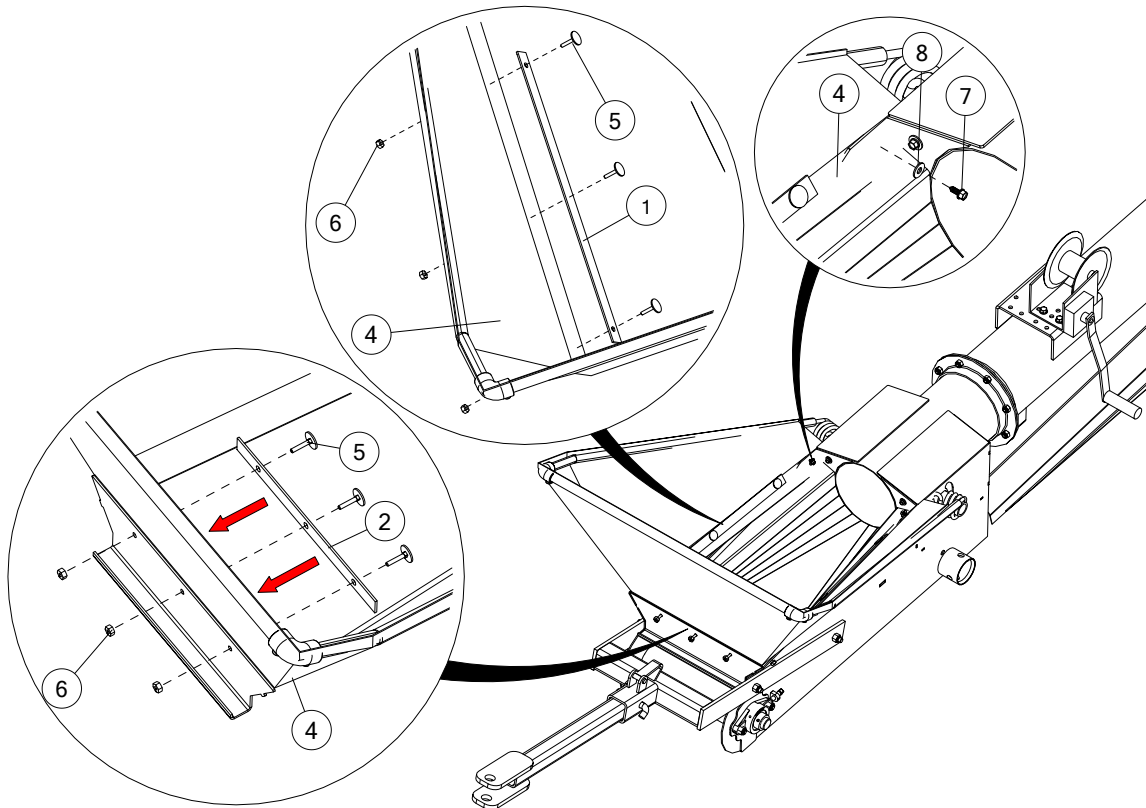
5. Pull down the tube with the hopper cloth and attach the hopper cloth to the conveyor (see [Figure 34](#)):

- 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).

Important

When attaching the elevator bolts make sure the flashing is covered under the hopper cloth. Install the bolts (5) through the flashing.

Figure 34. Installing the Hopper Cloth onto the Conveyor



6. Use tek screws (7) and washers (8) to attach the corder of the hopper cloth to the side plates of the hopper weldment (see [Figure 34](#)).

3.21. Install the Hood

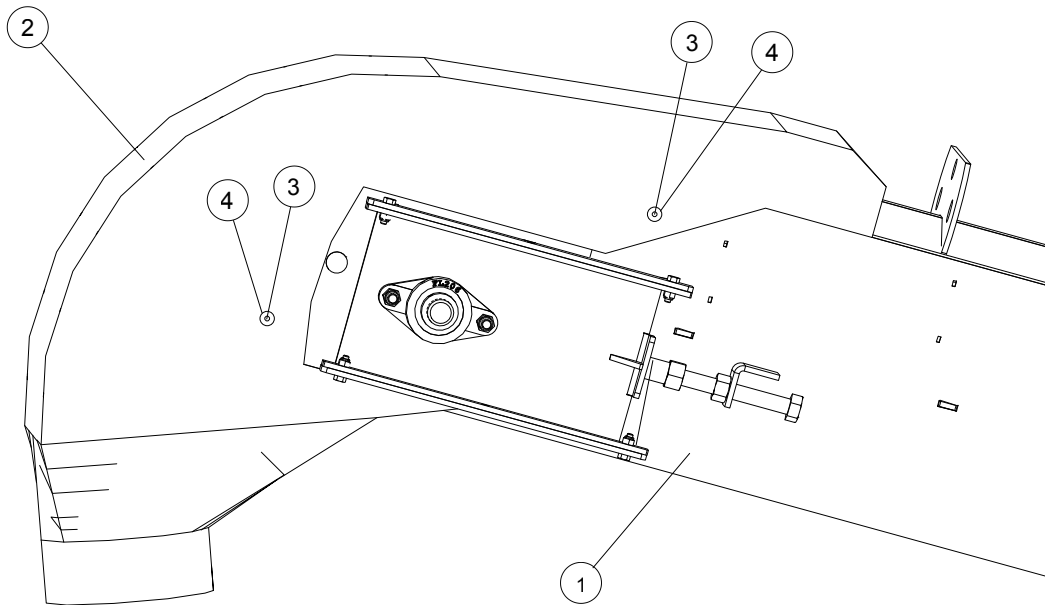
1. Place the hood (2) around the bearing assembly (see [Figure 35](#)).
2. Use 1/4" x 1" self-tapping screws (3) and 1/4" flat washers (4) to tighten the hood (2) to the conveyor spout (1).

Note

Make sure the screws will not interfere with belt operation.

Table 14. Hood Components

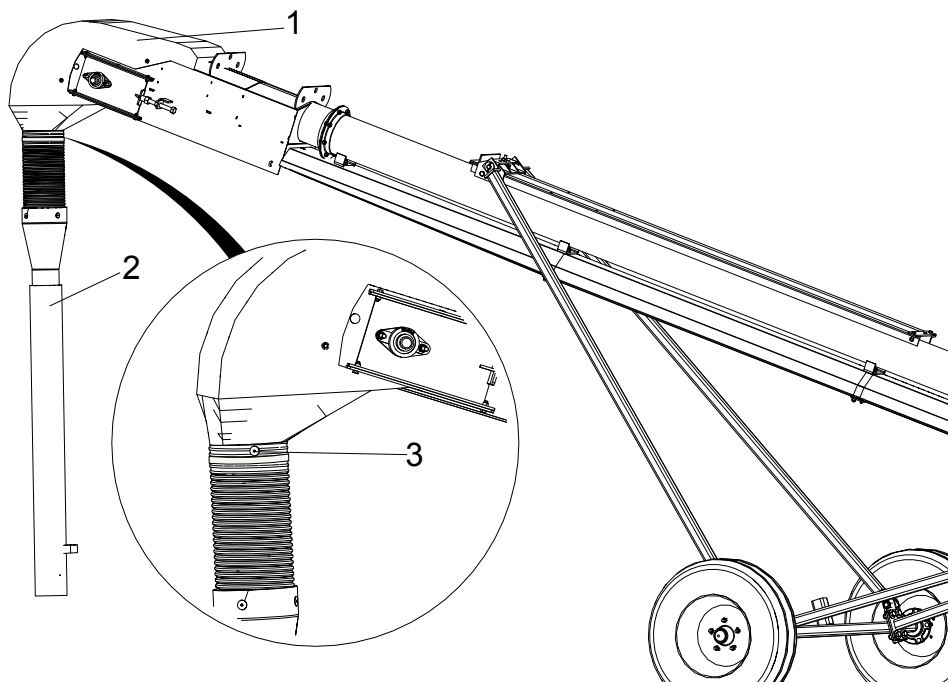
Item	Description	Quantity
1	Spout Assembly	1
2	Hood	1
3	1/4" x 1" Self-Tapping Screw	4
4	1/4" Flat Washer	4

Figure 35. Installing Spout Hood

3.22. Install the Telescopic Downspout (1232 Hydraulic with Downspout Only)

1. Secure the Downspout to the hood using ¼" tek screw and washer. See [Figure 36](#).
2. Attach hook snap, chain link and quick link to the strap of the Downspout as shown in [Figure 37](#).
3. Attach the Downspout to the side of the chain link as needed (when not in use). See [Figure 38](#).

Item	Description	Qty
1	Hood	1
2	Telescopic Downspout	1
3	Tek Screw and Washer	4
4	Quick Link, 3/16"	1
5	Chain Link, 5/16"	2 ft
6	Hook Snap, 1/4"	1

Figure 36.**Figure 37.****Figure 38.**

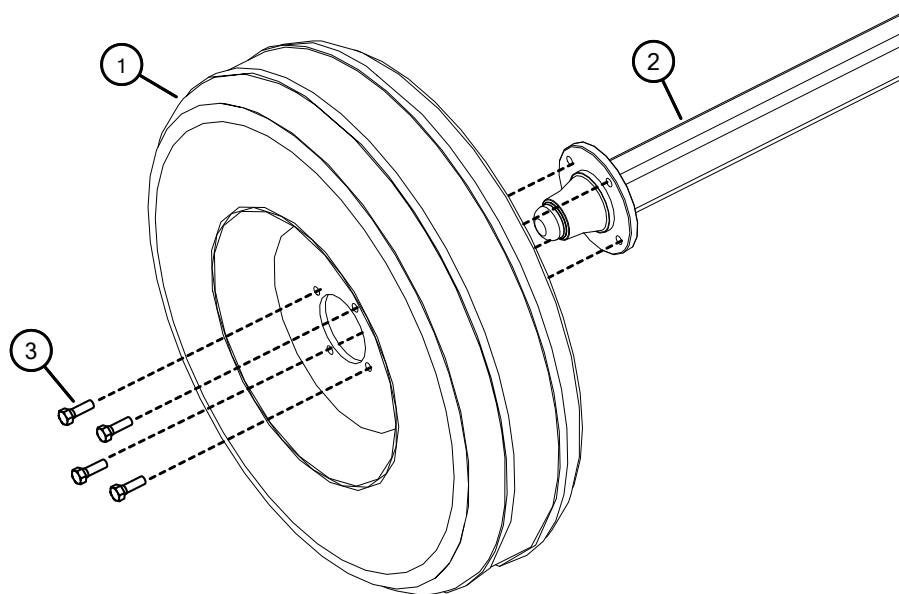
3.23. Install the Wheels

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 39](#)).

Table 15. Components to Attach the Wheels to the Axle

Item	Description
1	Tire Assembly
2	Axle
3	Wheel Bolt

Figure 39. 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 (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 using 3/4" x 2" hex bolts (11) and 3/4" nylon locknuts (10).
3. Secure the slider (4) to the end of the track (towards the spout) using vise-grips.

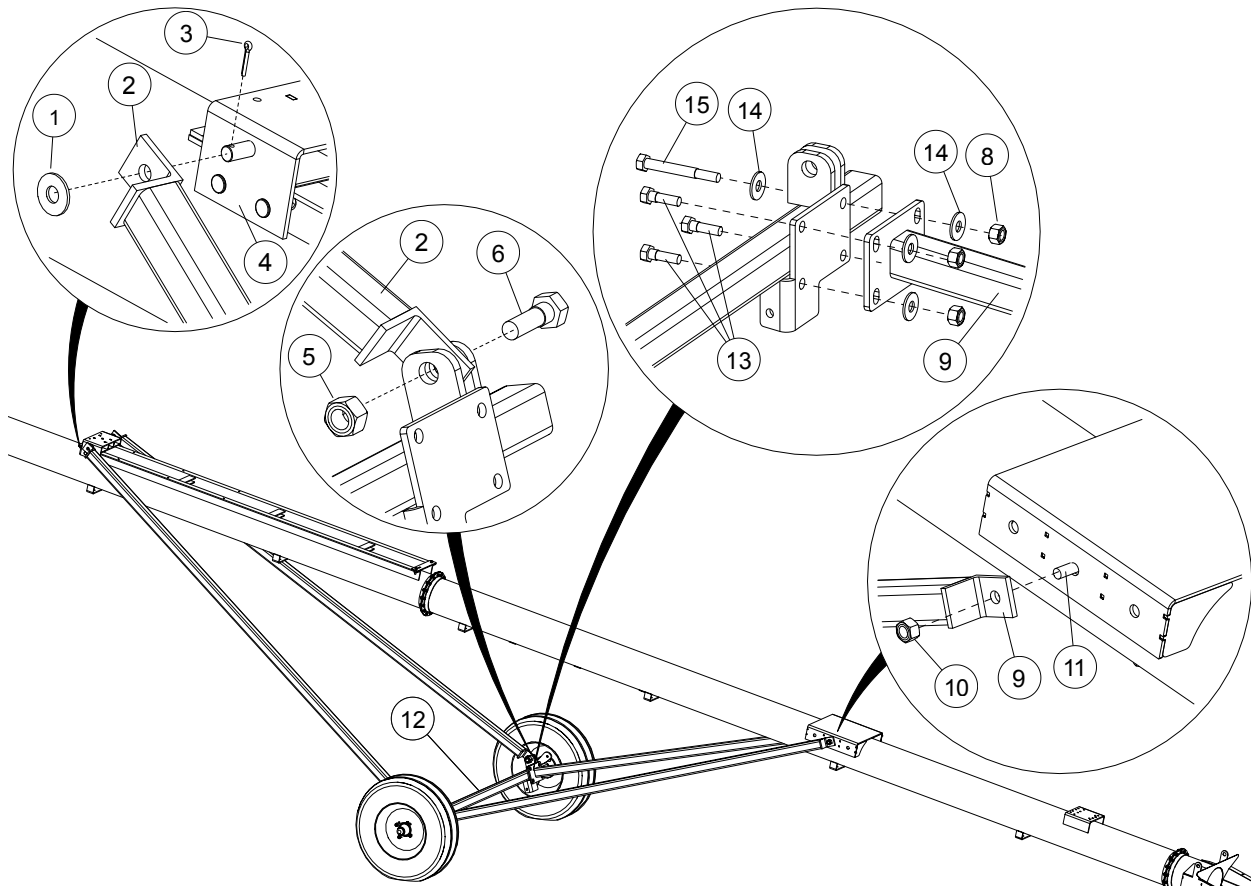
4. Fasten upright arms (2) to the slider (4) using 3/4" flat washers (1) and 1/4" x 2" cotter pins (3).
5. Lift the spout end of the tube until the loose ends of the upright arms align with their brackets on the axle.
6. Fasten the upright arms to the axle using 1" x 3" hex bolts (6) and 1" nylon locknuts (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 16. 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

Figure 40. Assembling the A-Frame

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 41](#)).

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.

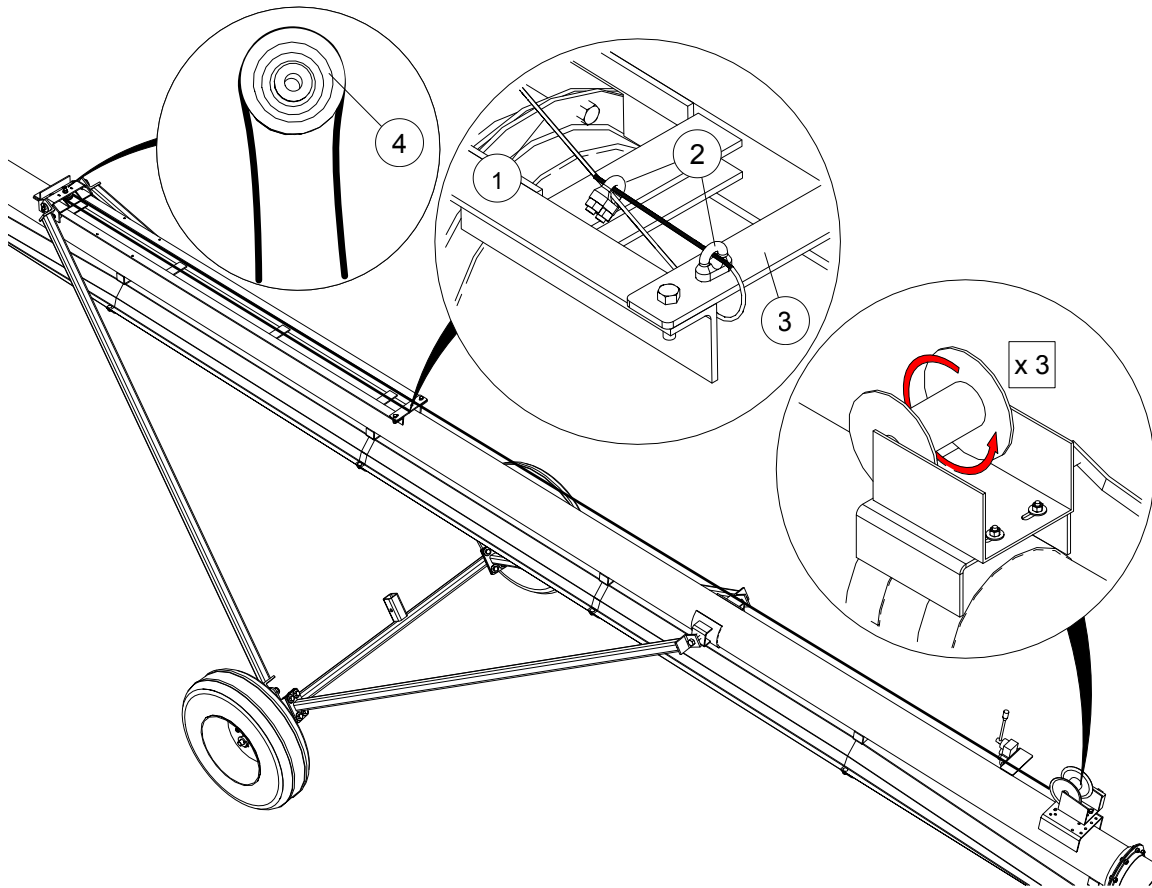
WARNING Crushing/impact hazard

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.

Figure 41. Installing the Tube Lift Cable**Table 17. Tube Lift Cable Components**

Item	Description
1	Cable length: 40'
2	5/16" Cable Clamp
3	Small Cable Attach
4	Cable Pulley

3.26. Align the Winch

This procedure describes the alignment of the winch.

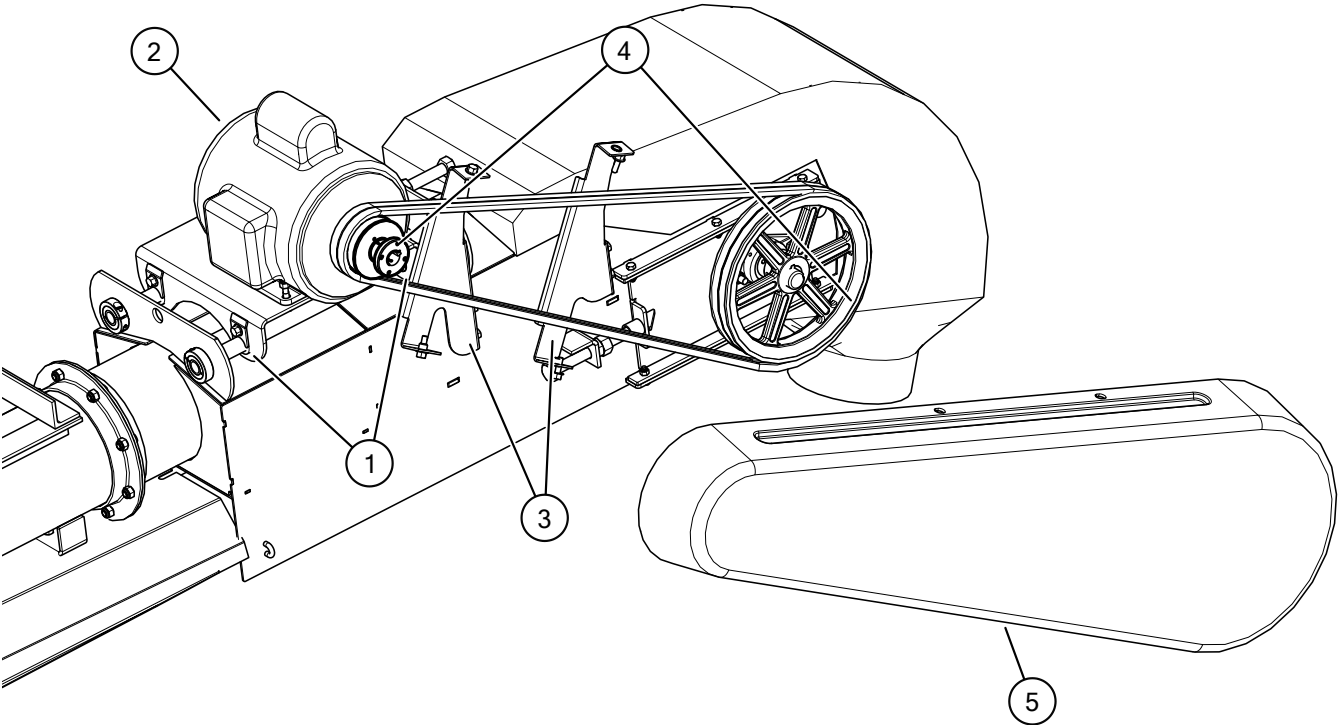
1. Check the alignment of the winch by watching the cable wrapping on the drum as the conveyor is raised. Proper alignment is achieved when the cable indexes, filling each row on the drum evenly and not piling up against one side.
2. Lower the conveyor fully if the cable does not index properly until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

3.27. Drive Assemblies

3.27.1 Install the Electric Drive

Assembly Overview

Step	Task
1	Install the Motor Mount Plates
2	Install the Motor
3	Install the Guard Mounts
4	Install the Pulleys and Belts
5	Install the Guard

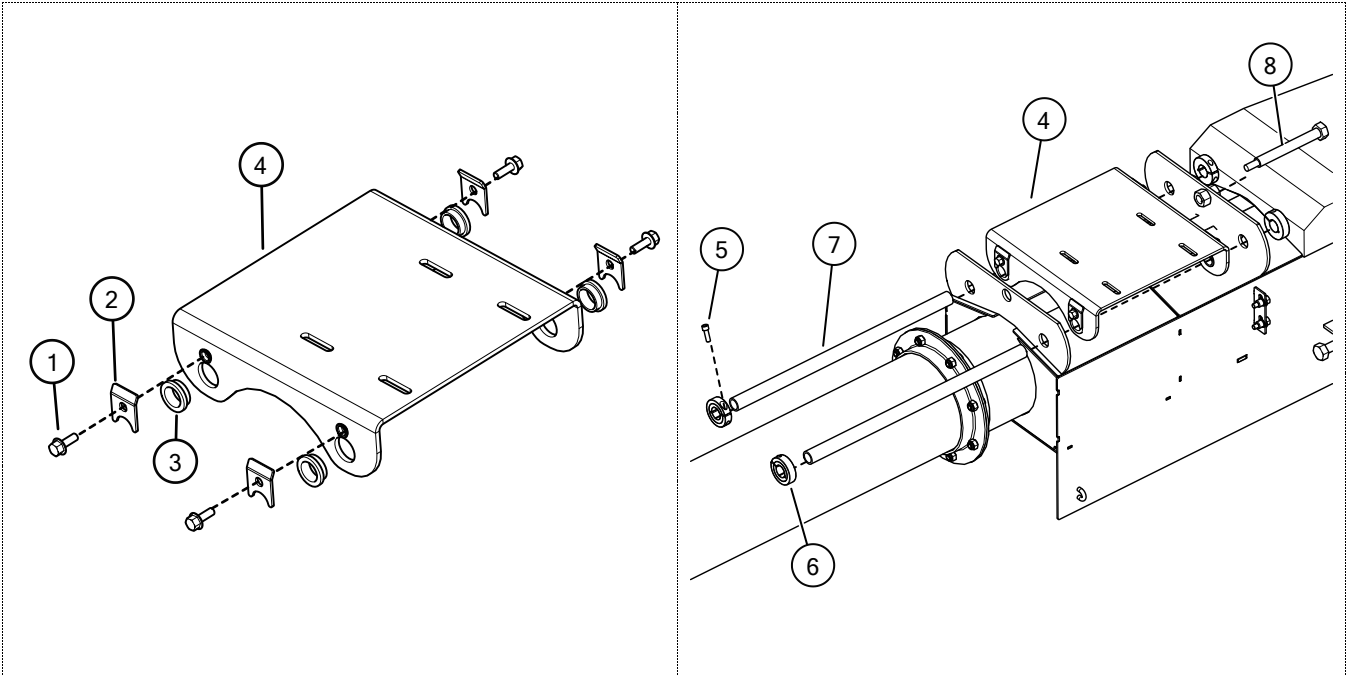


Note

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 the motor

Install the Motor Mount Plates

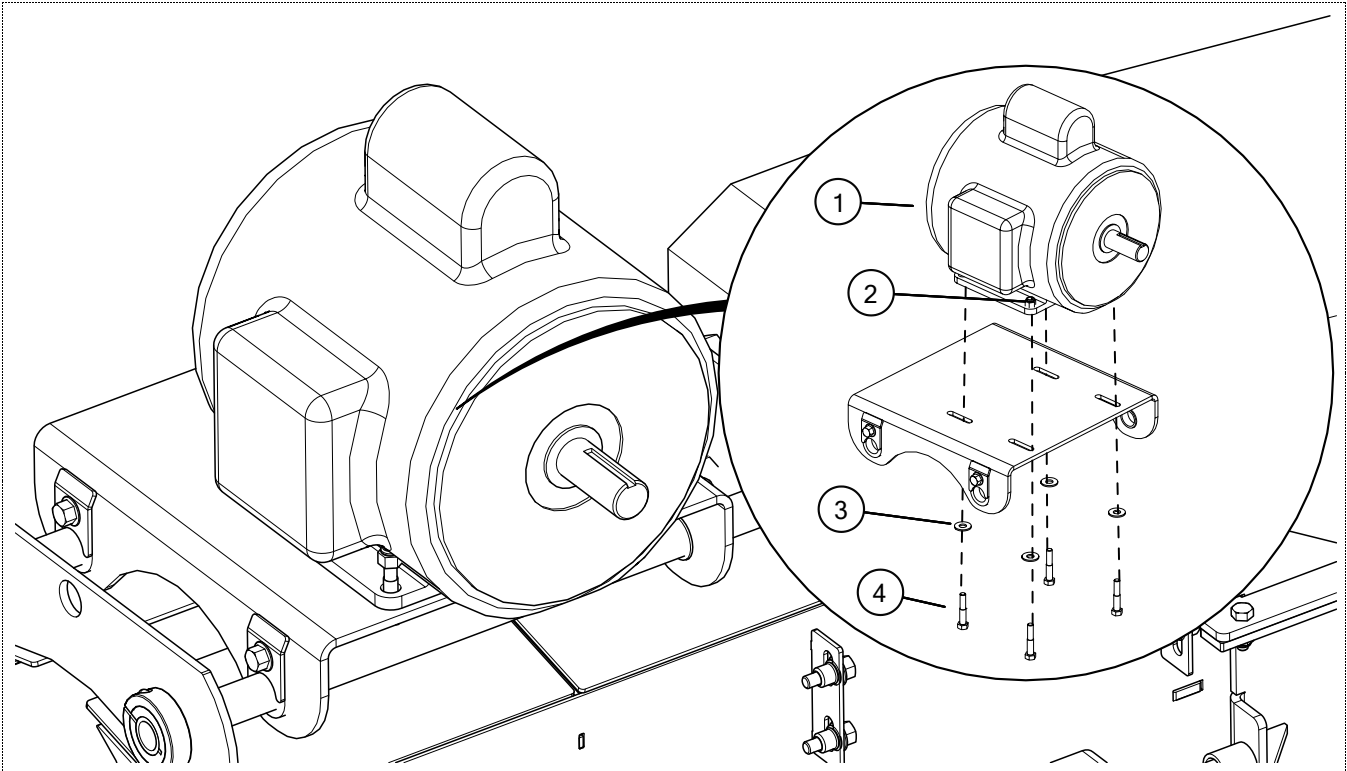


Assembly Notes:

- Secure the four shaft collars using their set screws.
- The tap bolt (8) is used to tension the drive belt.

1	3/8" X 1" Hex Flange Bolt (GR 5)	5	Shaft Collar Set Screw
2	Bushing Retainer	6	1" CSC Shaft Collar
3	Bushing	7	Motor Mount Rail
4	Motor Mount Plate	8	3/4" X 7" Tap Bolt (GR 8)

Install the Motor

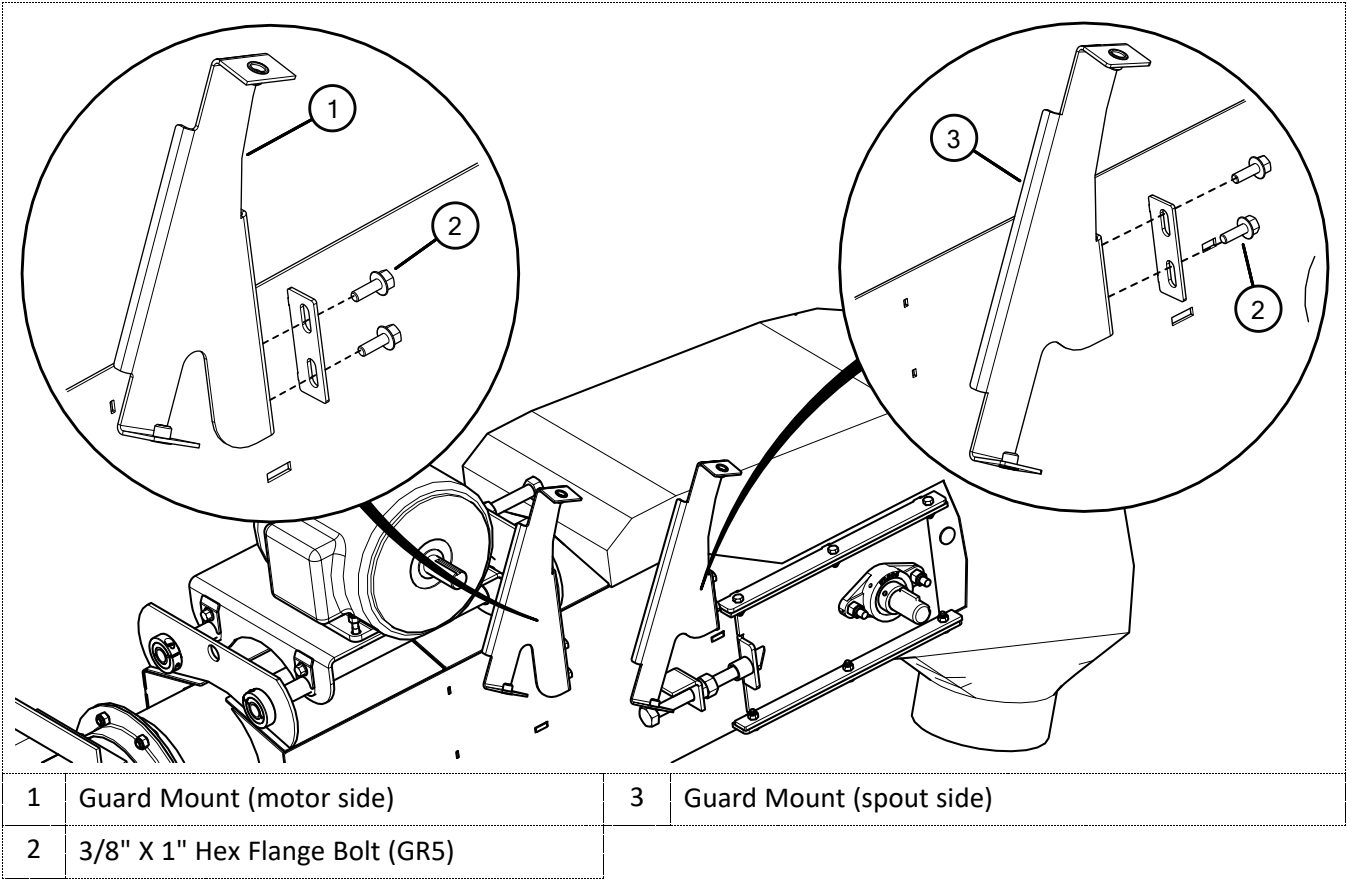


Assembly Notes:

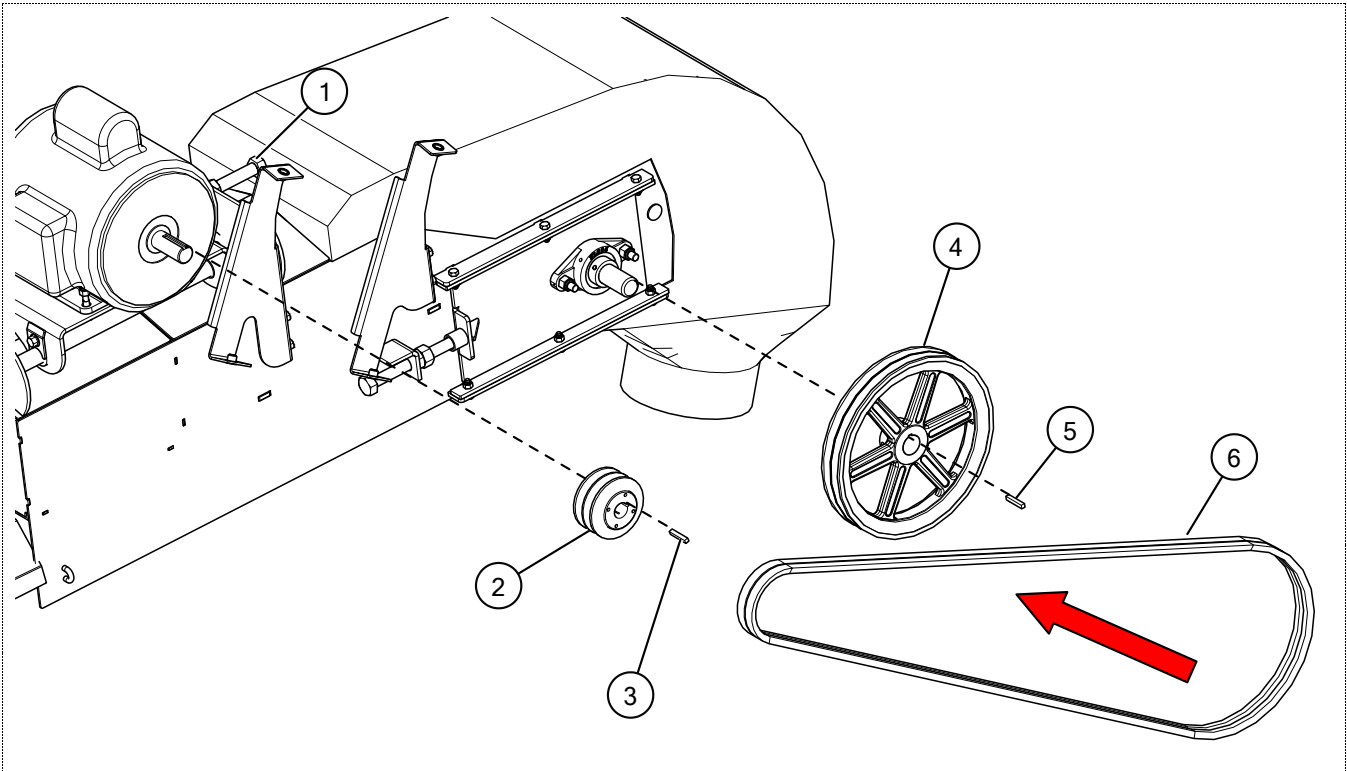
- Do not tighten the motor bolts until after the pulleys and belts are adjusted.

1	Electric Motor	3	3/8" Flat Washer
2	3/8" Lock Nut	4	3/8" X 2" Hex Bolt (GR 8)

Install the Guard Mounts



Install the Pulleys and Belts

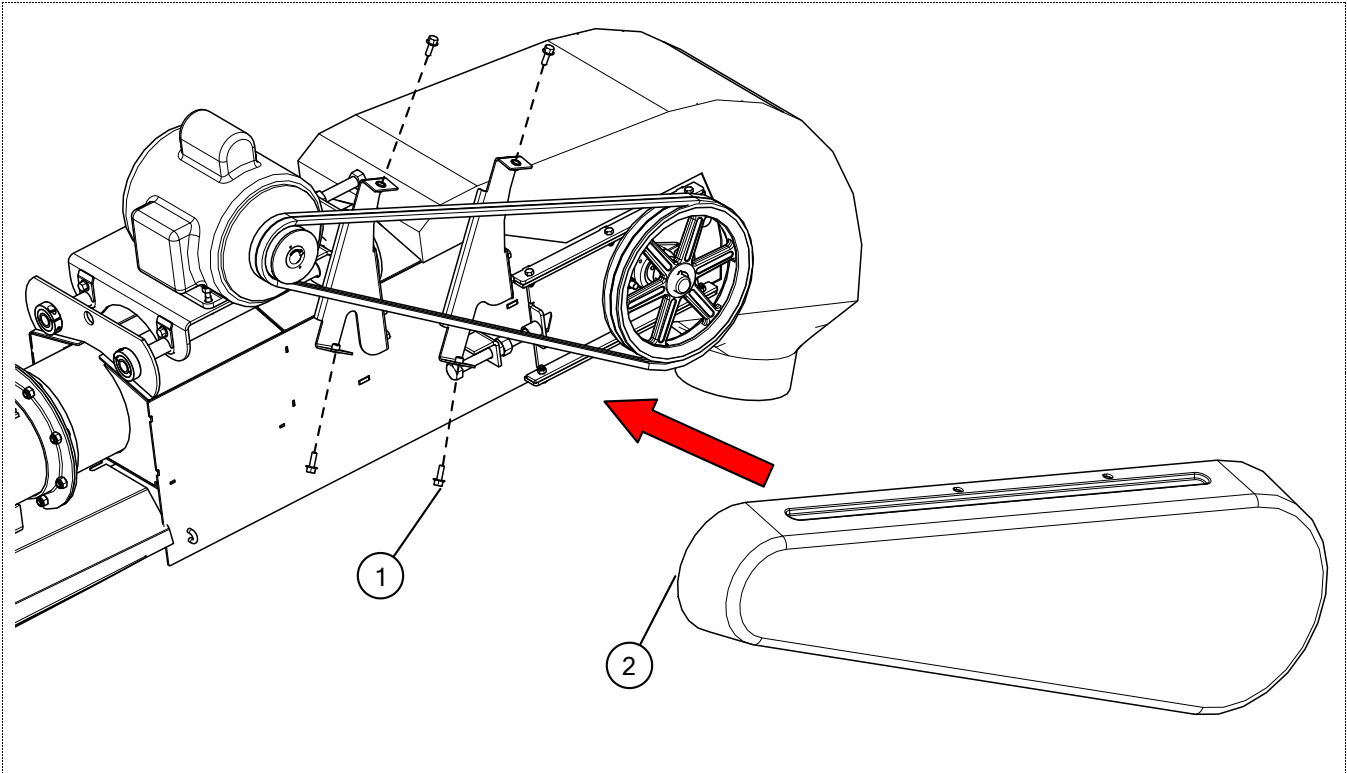


Assembly Notes:

- Align the pulleys using a straight edge before installing the belt. Tighten the set screws and motor bolts after the pulleys are aligned.
- Tighten the tap bolt (1) to tension the belt until the belt deflects 1/2" (1.3 cm) to 3/4" (1.9 cm) if pushed on with a 5 lb (2.3 kg) force.

1	3/4" X 7" Tap Bolt (GR 8)	4	12" DBL Pulley 1-1/4" Bore
2	4" Drive Pulley/Sheave (not supplied)	5	1/4" X 1-1/2" Key
3	Electric Motor Key (not supplied)	6	B96 Belt

Install the Guard



Assembly Notes:

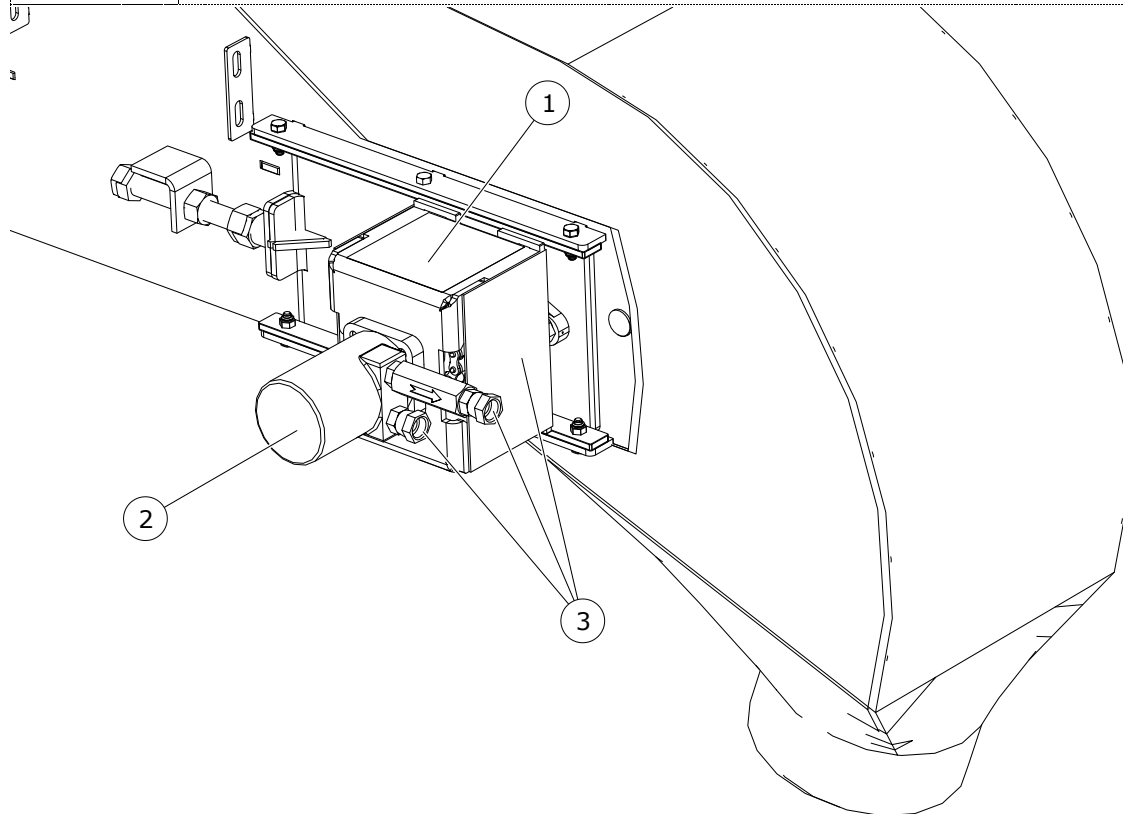
- Verify safety decals are placed correctly (see [Section 1.10.2 – Safety Decal Locations on page 10](#)).
- Install the shaft guard on the other side of the drive roller (see [Section 3.28 – Install the Shaft Guard on page 63](#)).

1	3/8" X 1" Hex Flange Bolt (GR 5)	2	Guard
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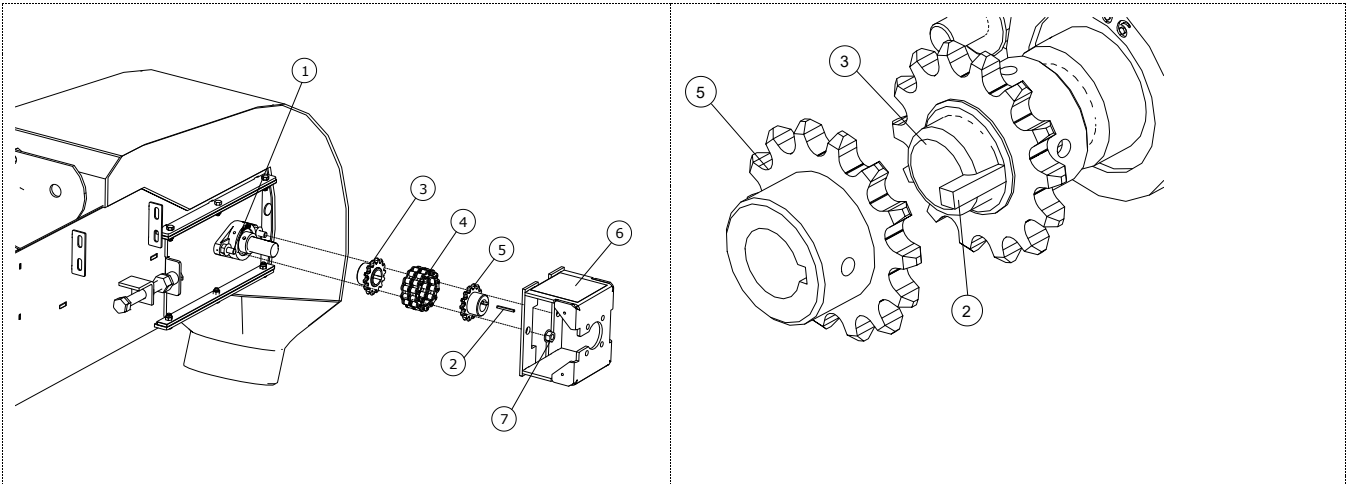
3.27.2 Install the Hydraulic Drive

Assembly Overview

Step	Task
1	Install the Motor Mount and Sprocket/Chain Assembly
2	Install the Motor
3	Install the Hydraulic Fittings and Coupler Guard



Install the Motor Mount and Sprocket/Chain Assembly

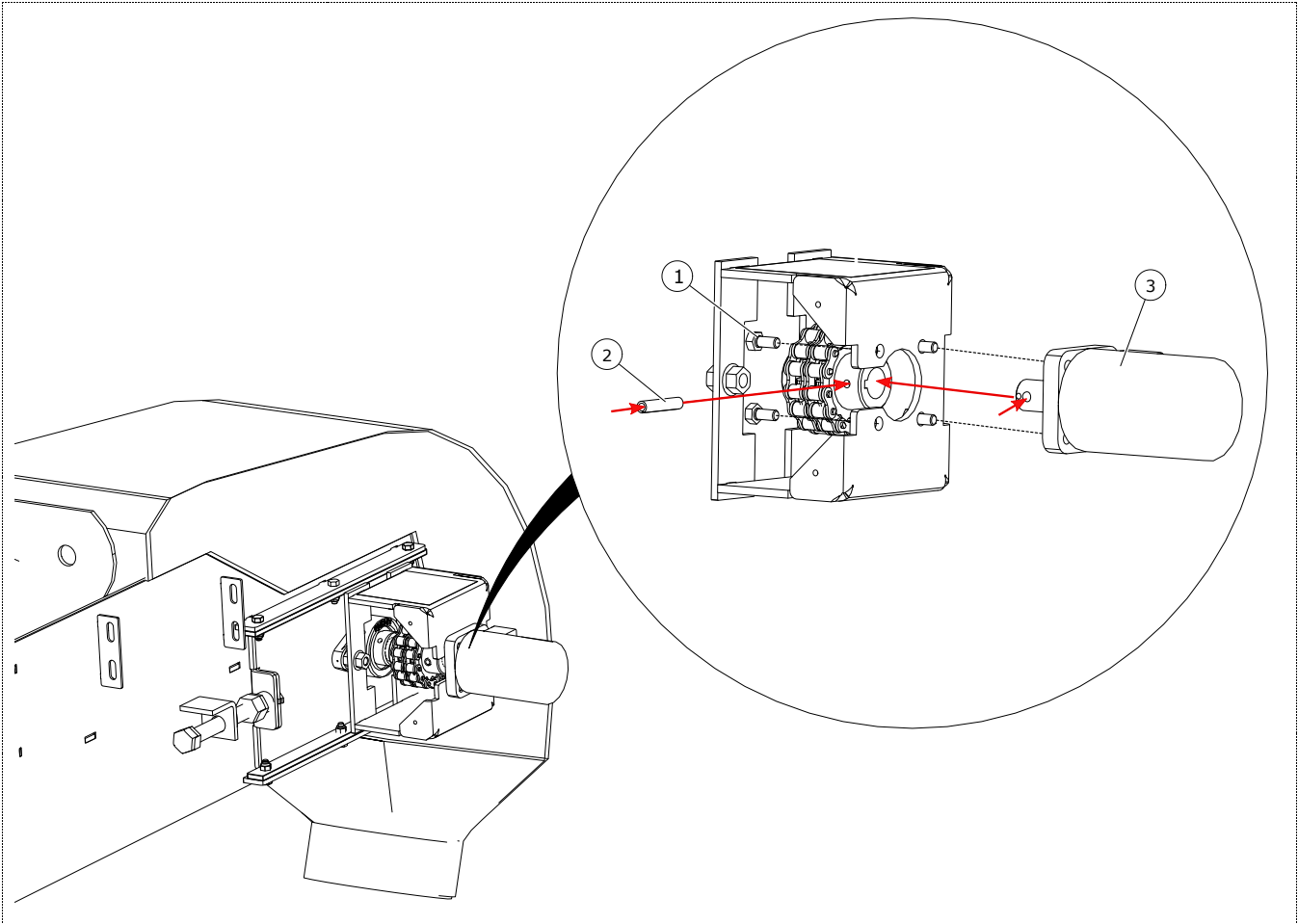


Assembly Notes:

- Assemble then slide the sprockets and chain coupling onto the shaft of the drive roller.
- Orient sprocket and chain assembly to ensure the 1-1/4" sprocket slides onto the shaft first.

1	1/2" X 2-1/2" Carriage Bolt (GR 5)	5	1" Bore Sprocket (5014 W1)
2	1/4" X 1-1/2" Key	6	Motor Mount
3	1-1/4" Bore Sprocket (5014 W1)	7	1/2" Flange Nut
4	5014 Chain Coupling		

Install the Motor

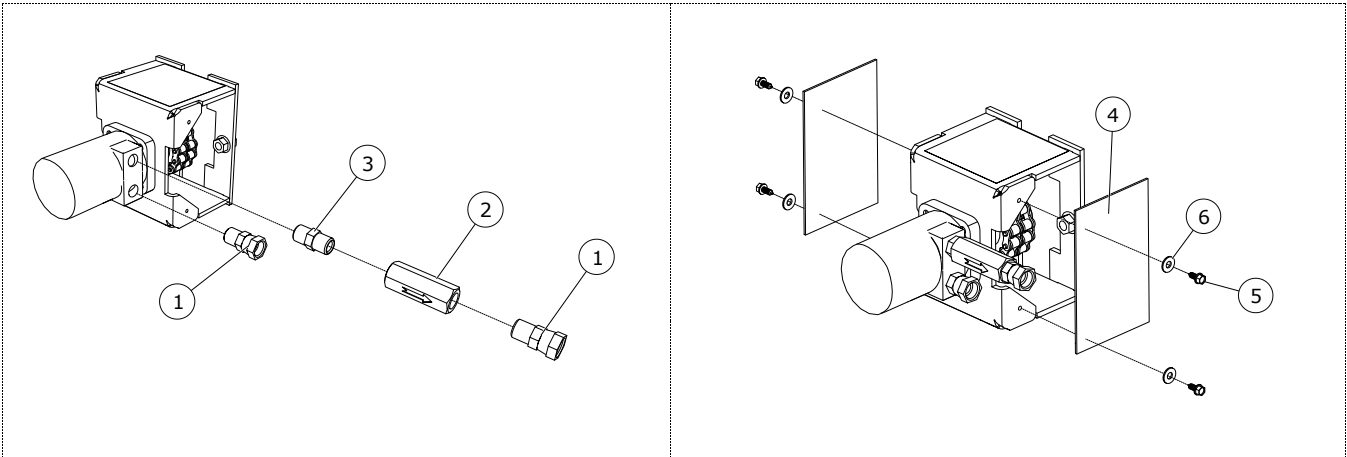


Assembly Notes:

- Slide the drive shaft of the hydraulic motor into the sprocket.
- Install the 3/8" x 2" spring pin into the drive shaft of the hydraulic motor through the sprocket.
- Center the sprocket and chain assembly on the shafts, then loosely tighten the set screws.
- First, tighten 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.

1	3/8" X 3/4" Hex Bolt (GR 8)	3	Motor
2	3/8" X 2" Spring Pin		

Install the Hydraulic Fittings and Coupler Guard

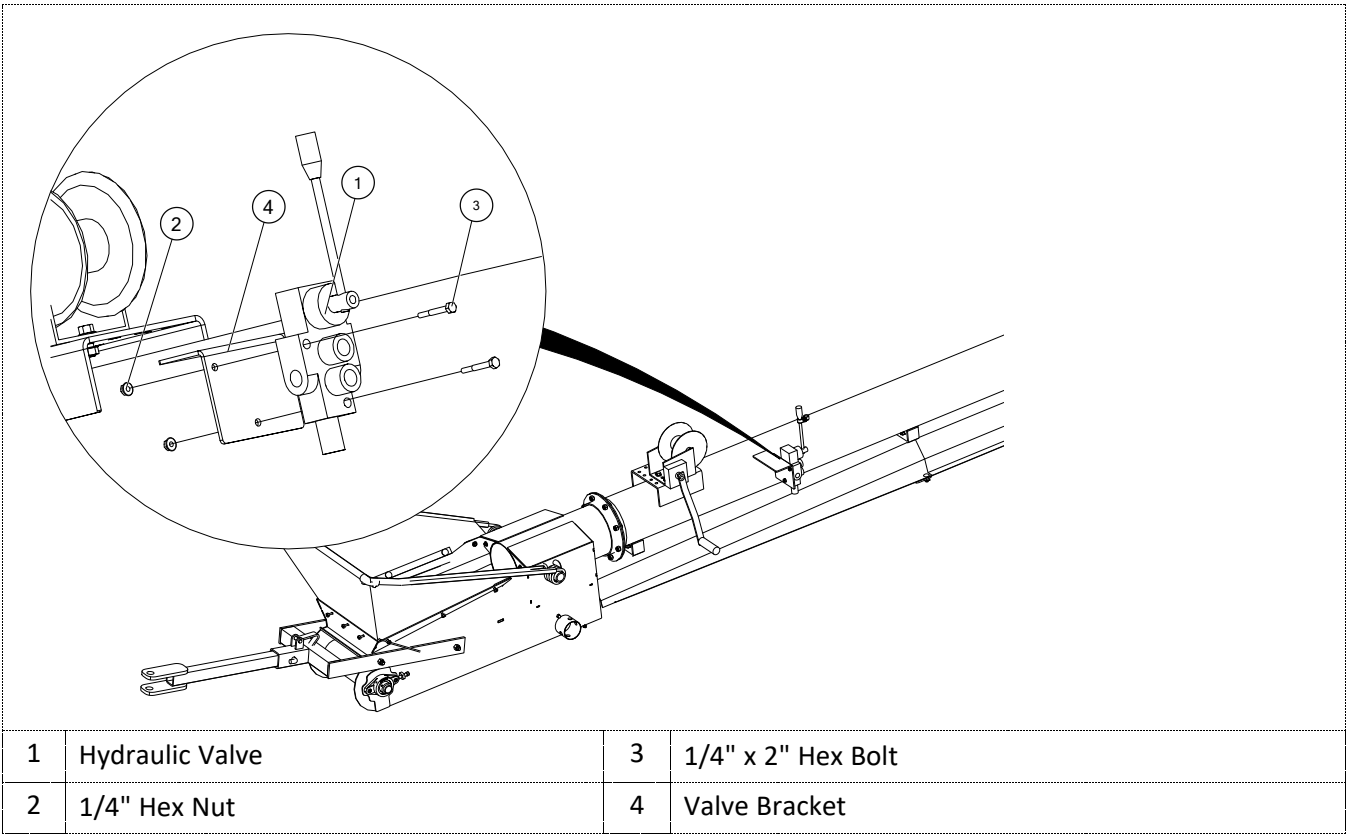


Assembly Notes:

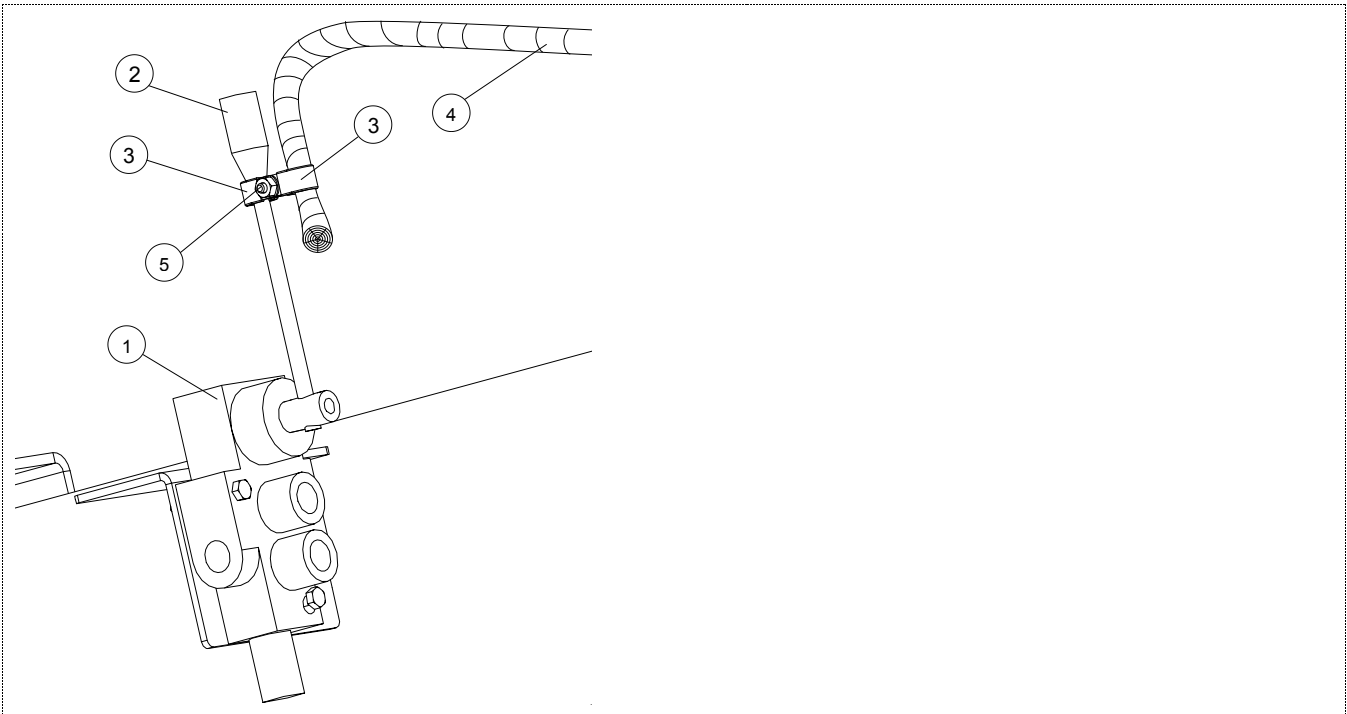
- Attach and secure the hoses to the fittings after they are assembled.
- Install the shaft guard according to [Section 3.28 – Install the Shaft Guard on page 63](#).

1	Swivel-1/2" STRAIGHT (S1120-DD)	4	Hydraulic Motor Guard
2	Check Valve-1/2" (No Rev Flow)	5	Tek Screw, 1/4" x 1"
3	Nipple-1/2" PT HEX	6	1/4" Flat Washer

Install the Hydraulic Valve (1232 Hydraulic with Downspout Only)



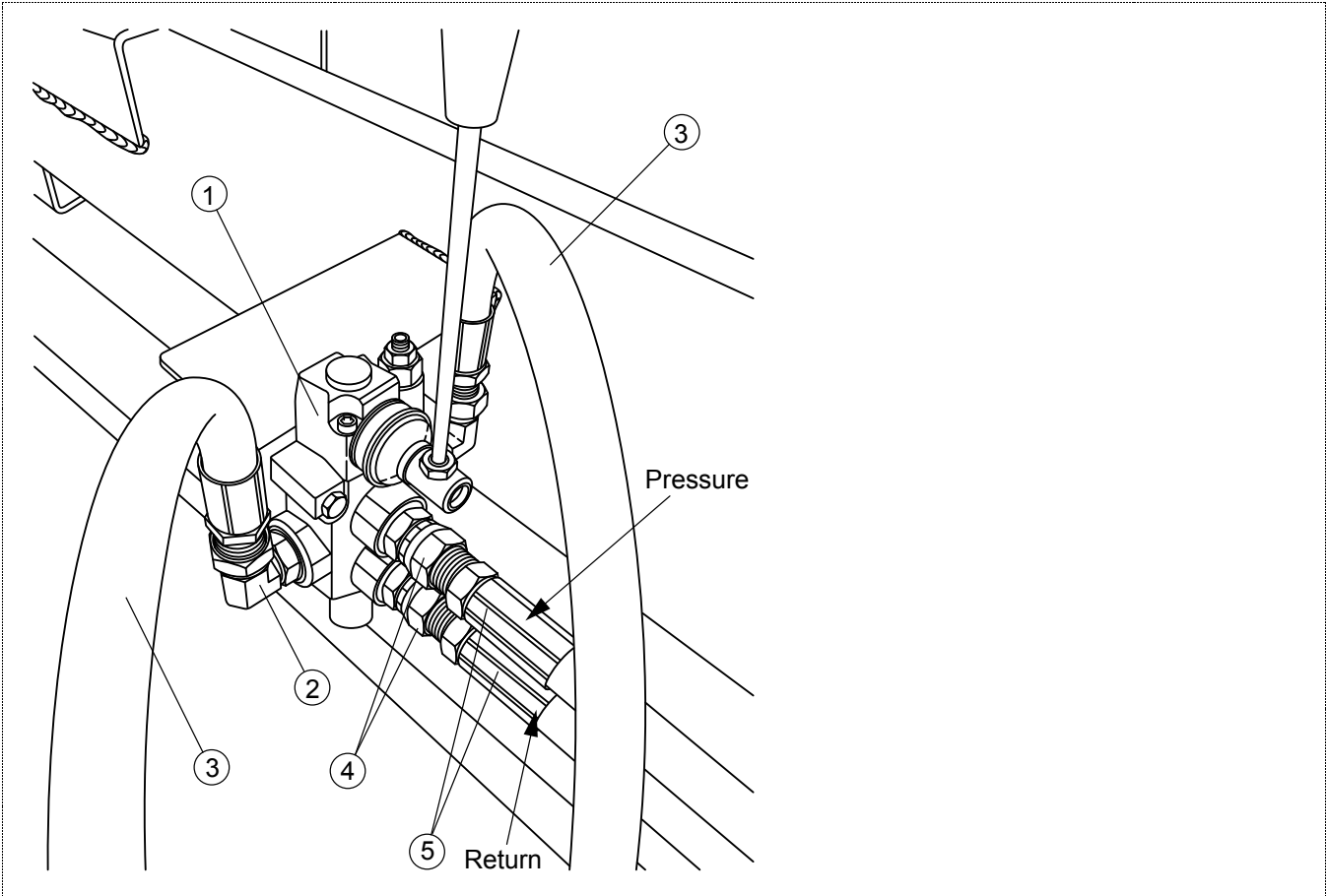
1	Hydraulic Valve	3	1/4" x 2" Hex Bolt
2	1/4" Hex Nut	4	Valve Bracket



Assembly Notes:

- If equipped and required, attach a nylon rope to the valve handle to control the valve.
- Make sure the clamps are tight enough to hold the valve handle and the rope in place.

1	Hydraulic Valve	4	Nylon Rope
2	Valve Handle	5	1/4" x 3/4" Hex bolts and 1/4" Hex Nuts
3	1/4" Cable Clamp		



Assembly Note:

- Make sure to install the pressure and return hose to the proper connection.

1	Hydraulic Valve	4	8MORB X 1/2"FPT Swivel
2	8MORB X 1/2" FPT/90D Swivel	5	1/2 (26')-1/2"MPT-1/2"MPT Hose
3	1/2 (9'6")-1/2"MPT-1/2"MPT Hose		

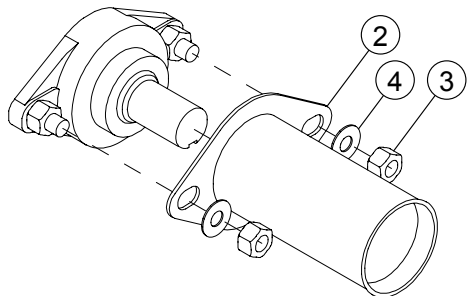
3.28. Install the Shaft Guard

1. Mount the shaft guard (2) over the roller shaft and onto the flange bearing carriage bolts (see [Figure 42](#)).
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 1/2" locknuts and flat washers.

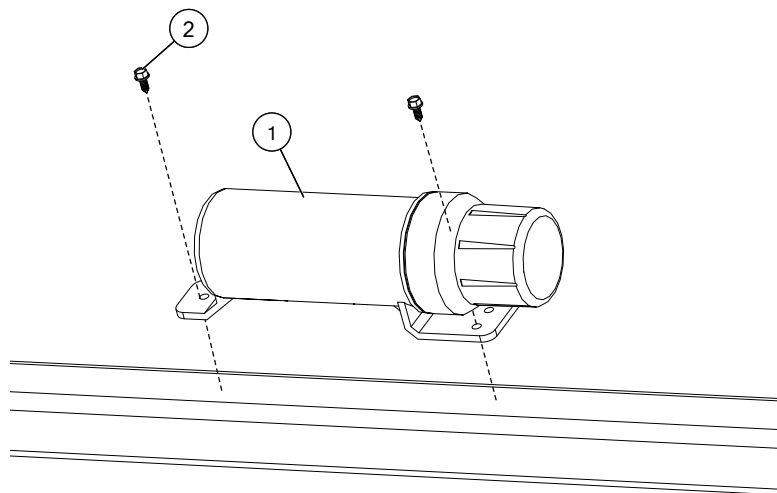
Figure 42. Installing Shaft Guard



3.29. Install the Manual Container

1. Position the manual container (1) on the axle arm.
2. Secure with two self-tapping screws (2).

Figure 43. Screw-on Manual Container

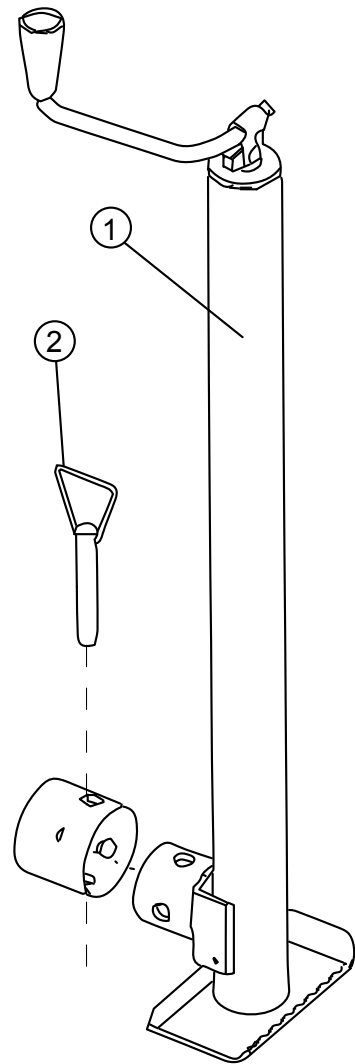


Item	Description
1	Manual Container
2	Self-Tapping Screw #14 x 5/8"

3.30. Attach the Jack (1232 Hydraulic with Downspout Only)

- 1. Insert the jack (1) into the jack stub (located on the conveyor hitch) (see [Figure 44](#)).
- 2. Secure the jack in place with the pin (2) provided.

Figure 44. Attaching the Jack



Item	Description
1	Jack
2	Pin

4. Specifications

Table 18. Top-Drive Standard Conveyor Conveyor

MODEL	1222	1227	1232	1232 Hydraulic with Downspout
Conveyor Tube Size (Diameter)	8"			
Belt Length	46'6"	56'2"	66'3"	66'3"
Electric Drive (HP)	5			
Hitch Pin Size (Min. Diameter x Length)	5/8" x 3"			
Hydraulic Fluid ¹	ISO 32 Hydraulic Oil or Automatic Transmission Fluid (Dexron 2™) or equivalent			
Required Tractor Hydraulic Output	12–16 gal/min			





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

5. Appendix

5.1. Bolt Torque

Table 19 gives the correct torque values for various hardware. Tighten all bolts to the torque specified, unless otherwise noted. Check tightness periodically, using Table 19 as a guide. Replace the hardware with the same strength bolt, contact Batco if you are unsure.

Table 19. Recommended Bolt Torque¹

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	-	-

1. 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 20. 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 21. 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 22. 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
-5	1/2" - 20	17-19	23-26

Table 22 Stud End O-Ring Boss (ORB) SAE (U/UF) – Carbon Steel (continued)

Tube Size	Thread UNF-2A	Max ft-lbs	Max N-m
-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 23. 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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