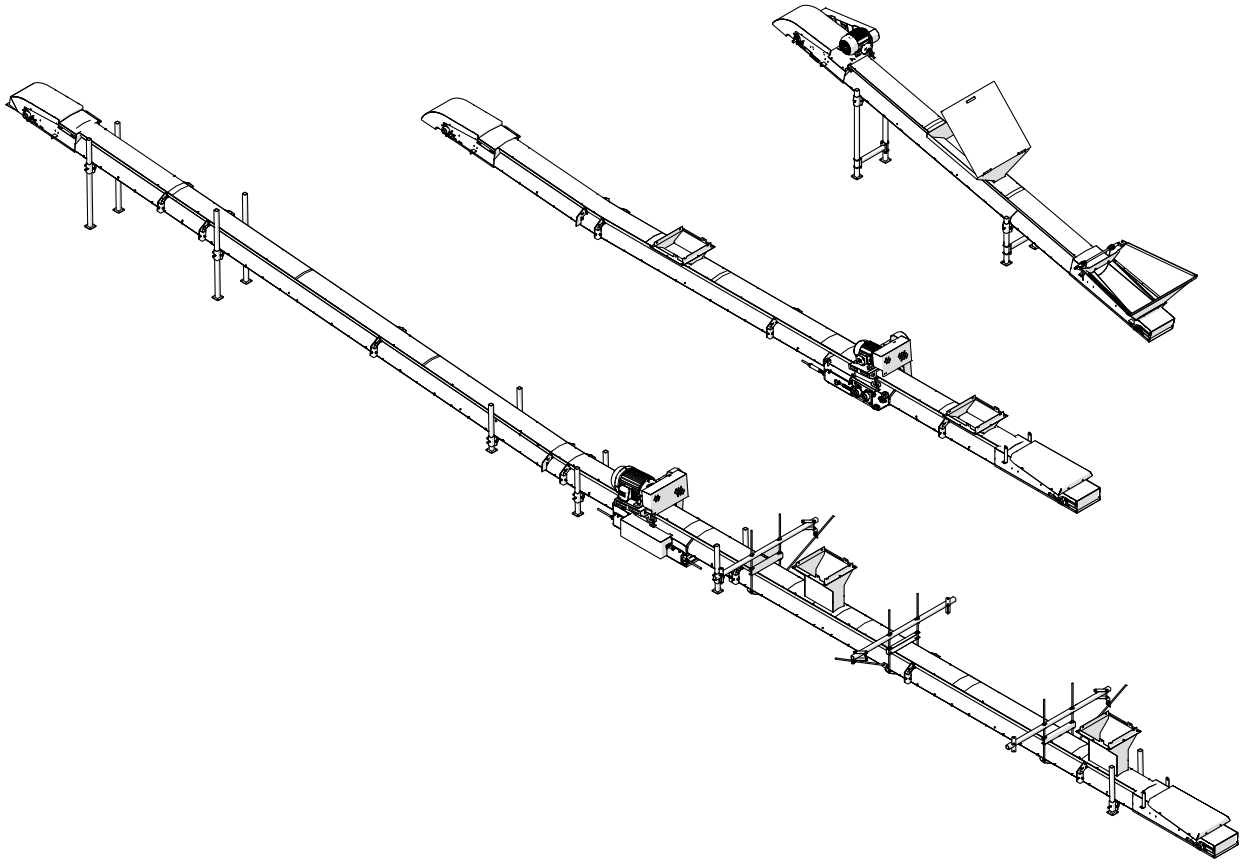
UNDER-BIN CONVEYORS



1300 - 1500
Operating Instructions

NORWOOD
Sales Inc.
11202 38th St S, Horace, ND 58047

Read this manual before operating your Norwood equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all the adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

Use only genuine Norwood service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

Model: _____ Date of Purchase: _____

Serial Number: _____

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.

This Safety-Alert Symbol indicates a hazard and means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

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

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed

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

Indicates that failure to observe can cause damage to equipment.

Indicates helpful information.

Table of Contents

General Information

The purpose of this manual is to assist you in operating and maintaining your Underbin Conveyor. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance. These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying operating conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

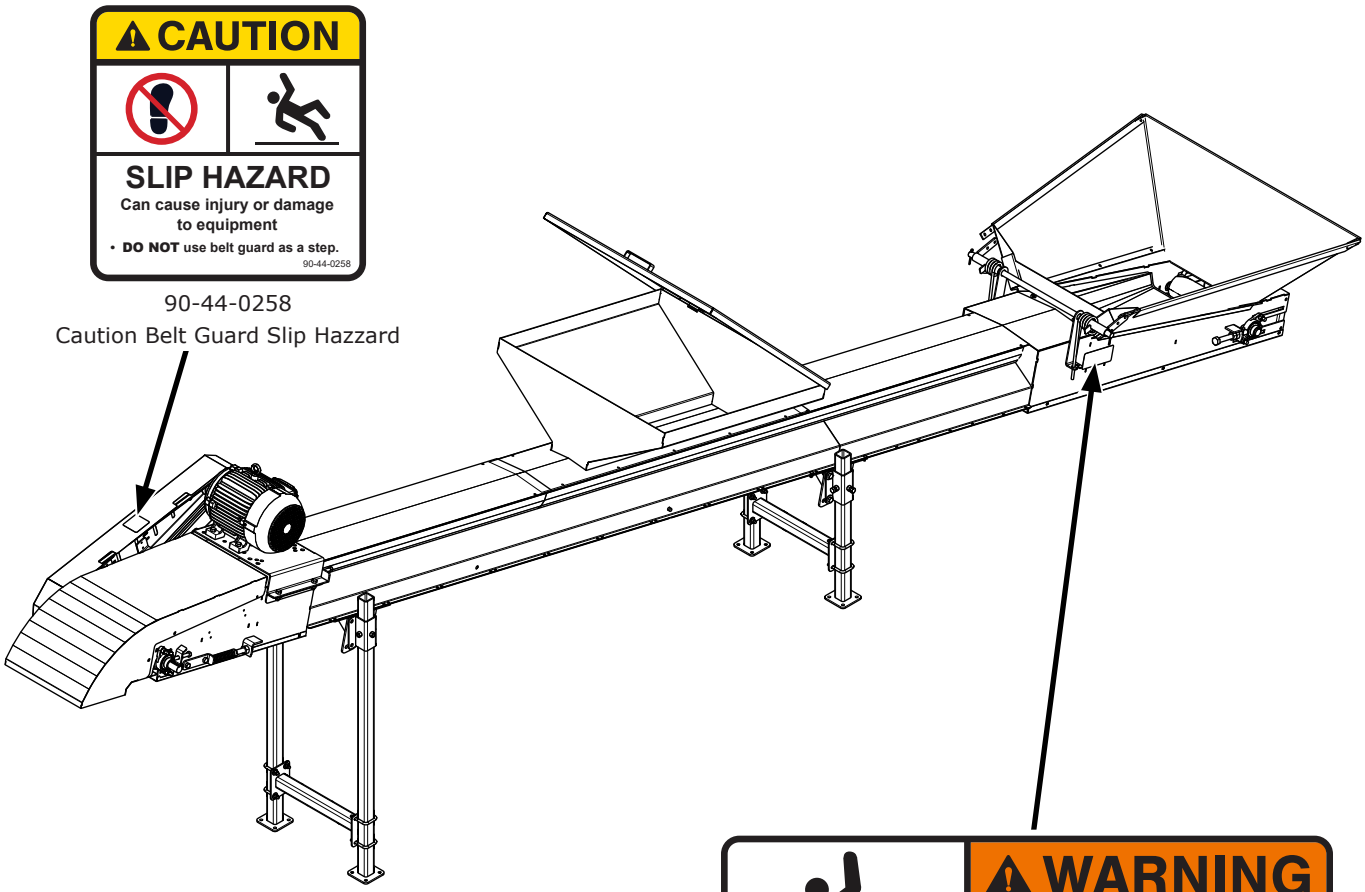
The illustrations and data used in this manual were current at the time of printing, but due to possible in-line production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

Some illustrations in this manual show the Underbin Conveyor with items removed to provide a better view. The Underbin Conveyor should never be operated with any items removed.

Throughout this manual, references are made to right and left direction. These are determined by standing behind the equipment facing the direction of forward travel.

Safety & Instructional Decals

Top Drive Conveyor w/ Inlet Hopper

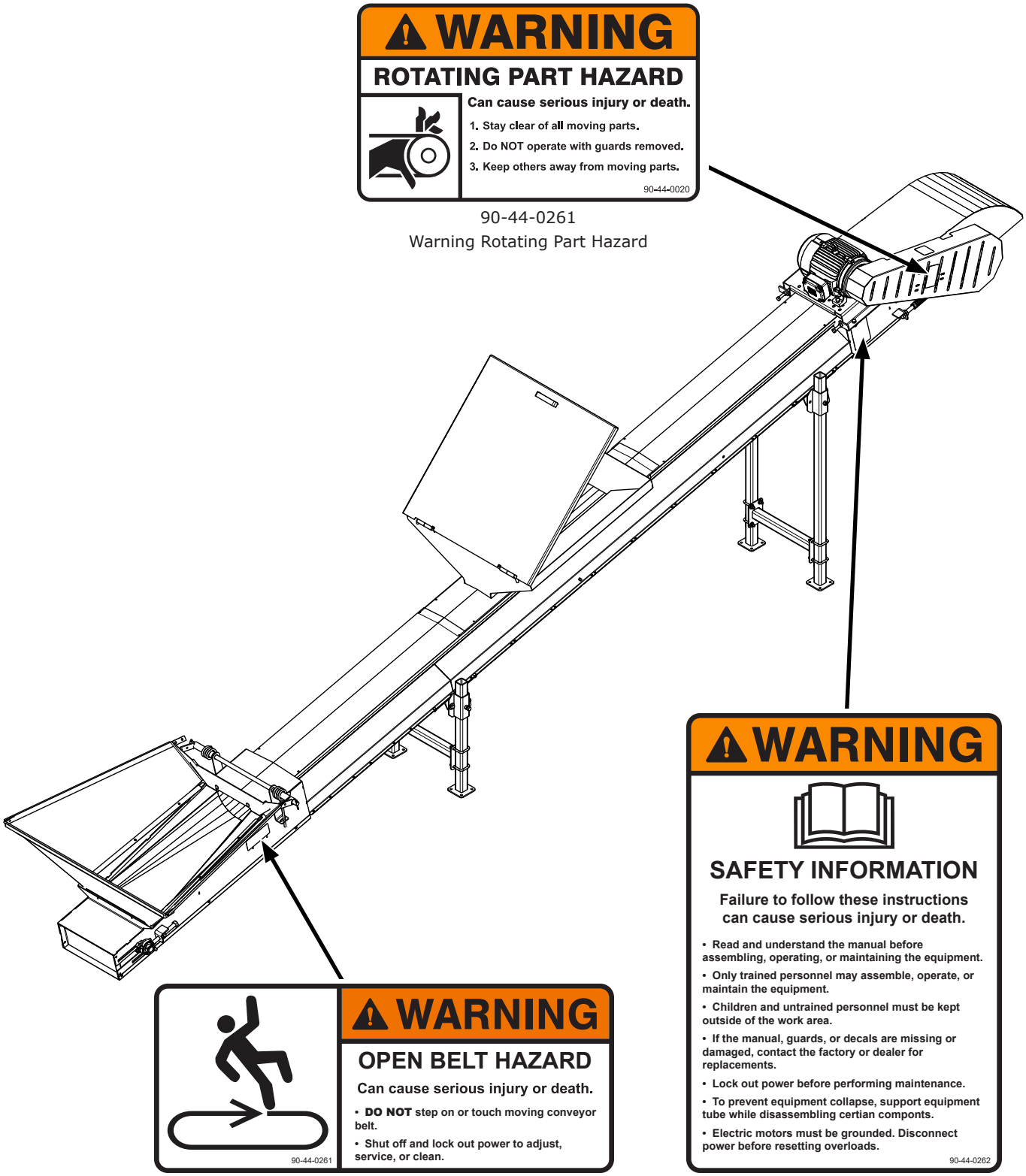


90-44-0258
Caution Belt Guard Slip Hazzard

90-44-0261
Warning Open Belt Hazard

Safety & Instructional Decals

Top Drive Conveyor w/ Inlet Hopper



90-44-0261
Warning Rotating Part Hazard

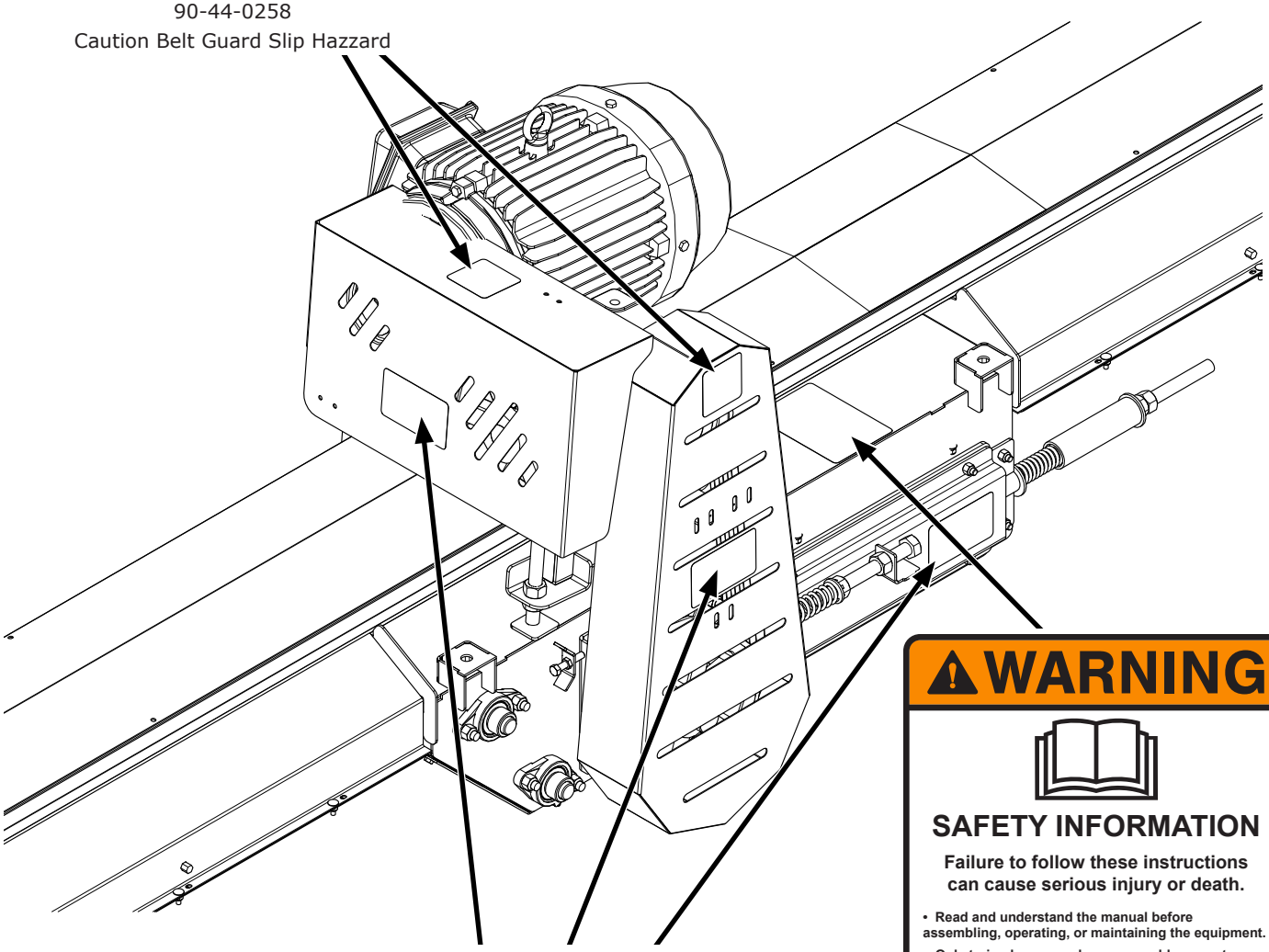
90-44-0261
Warning Open Belt Hazard

90-44-0262
Warning Belt Conveyor Safety

Safety & Instructional Decals

S-Drive Conveyor

90-44-0258
Caution Belt Guard Slip Hazzard

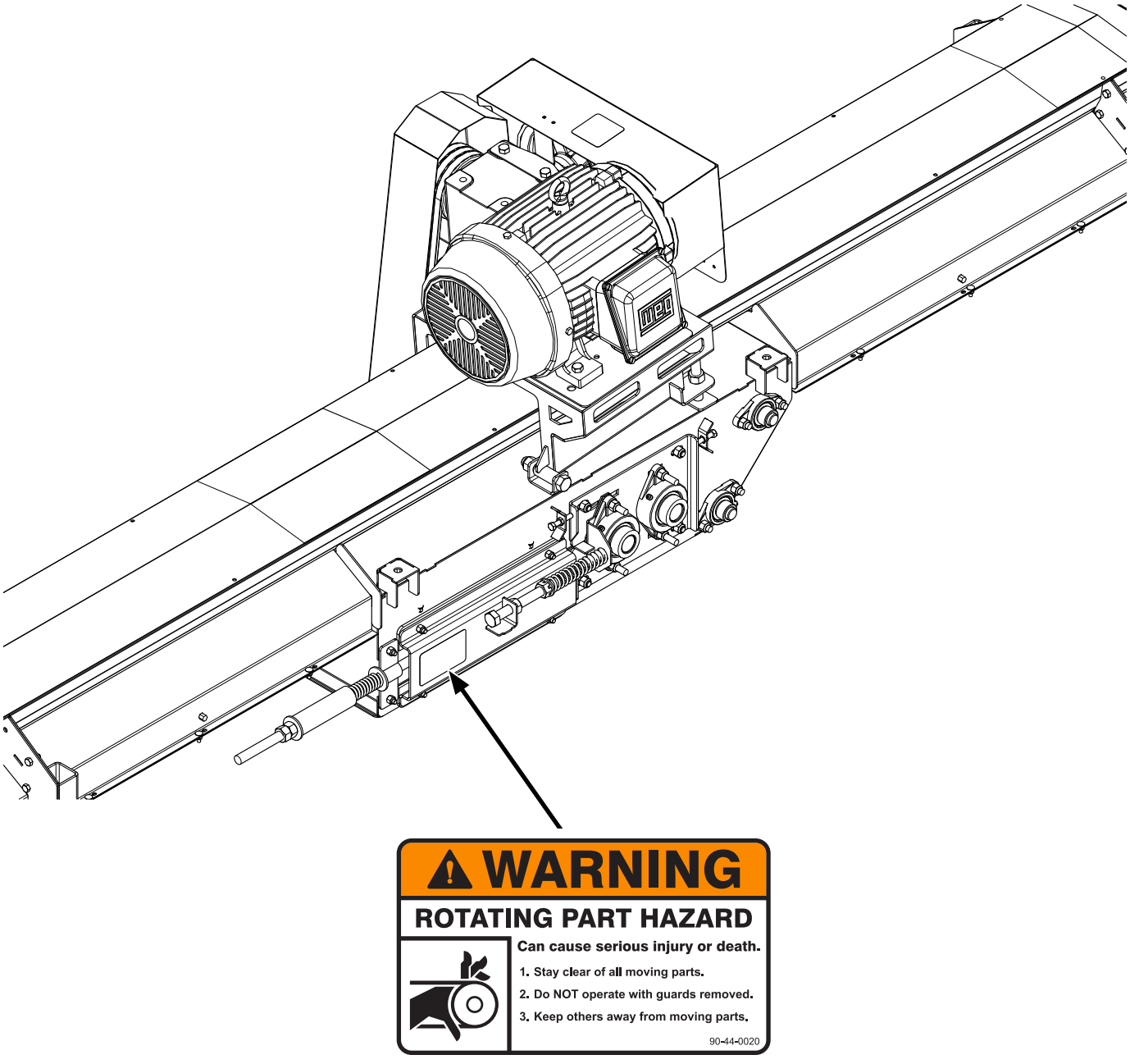


90-44-0261
Warning Rotating Part Hazard

90-44-0262
Warning Belt Conveyor Safety

Safety & Instructional Decals

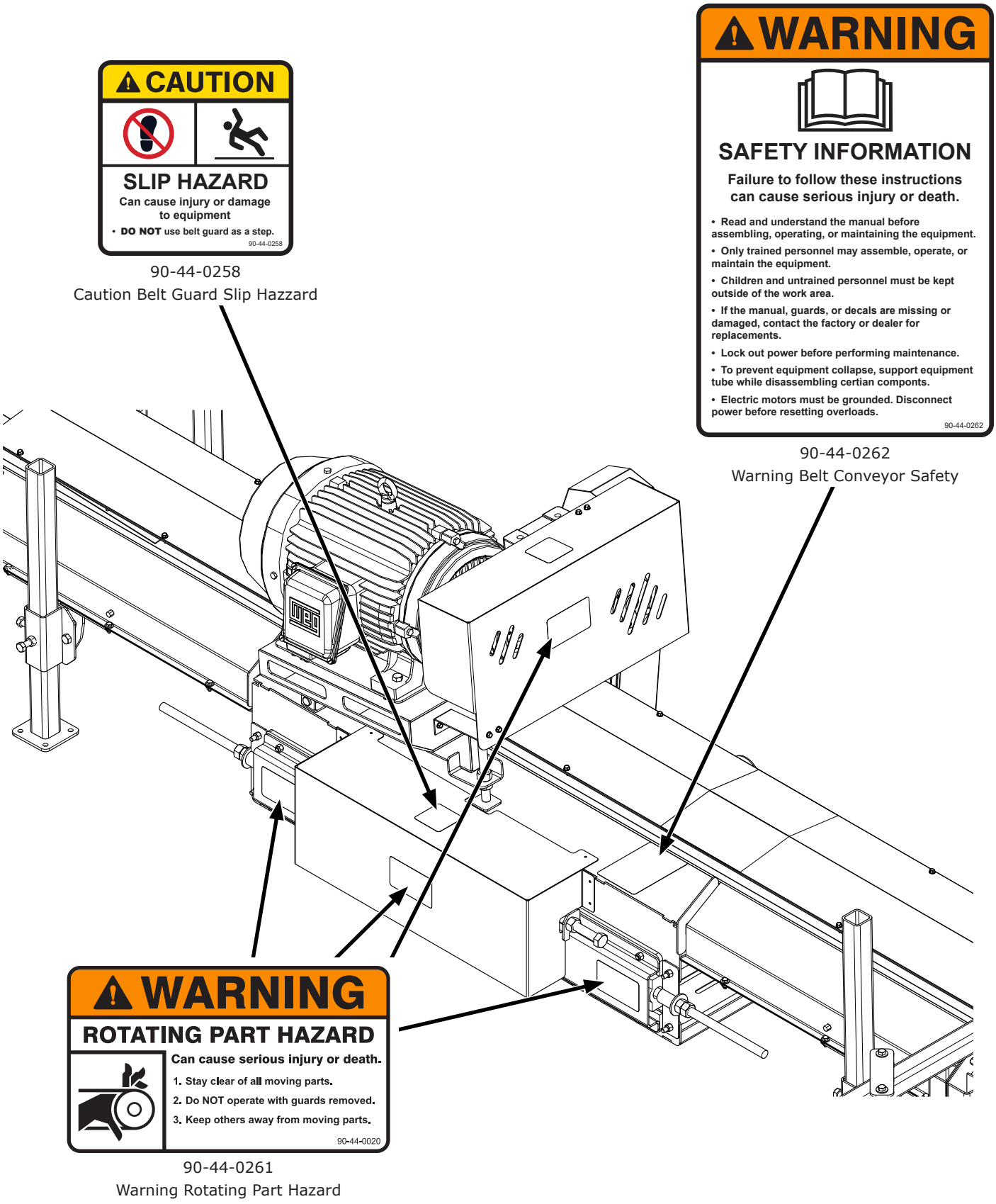
S-Drive Conveyor



90-44-0261
Warning Rotating Part Hazard

Safety & Instructional Decals

Bi-Directional Drive Conveyor



90-44-0258
Caution Belt Guard Slip Hazzard

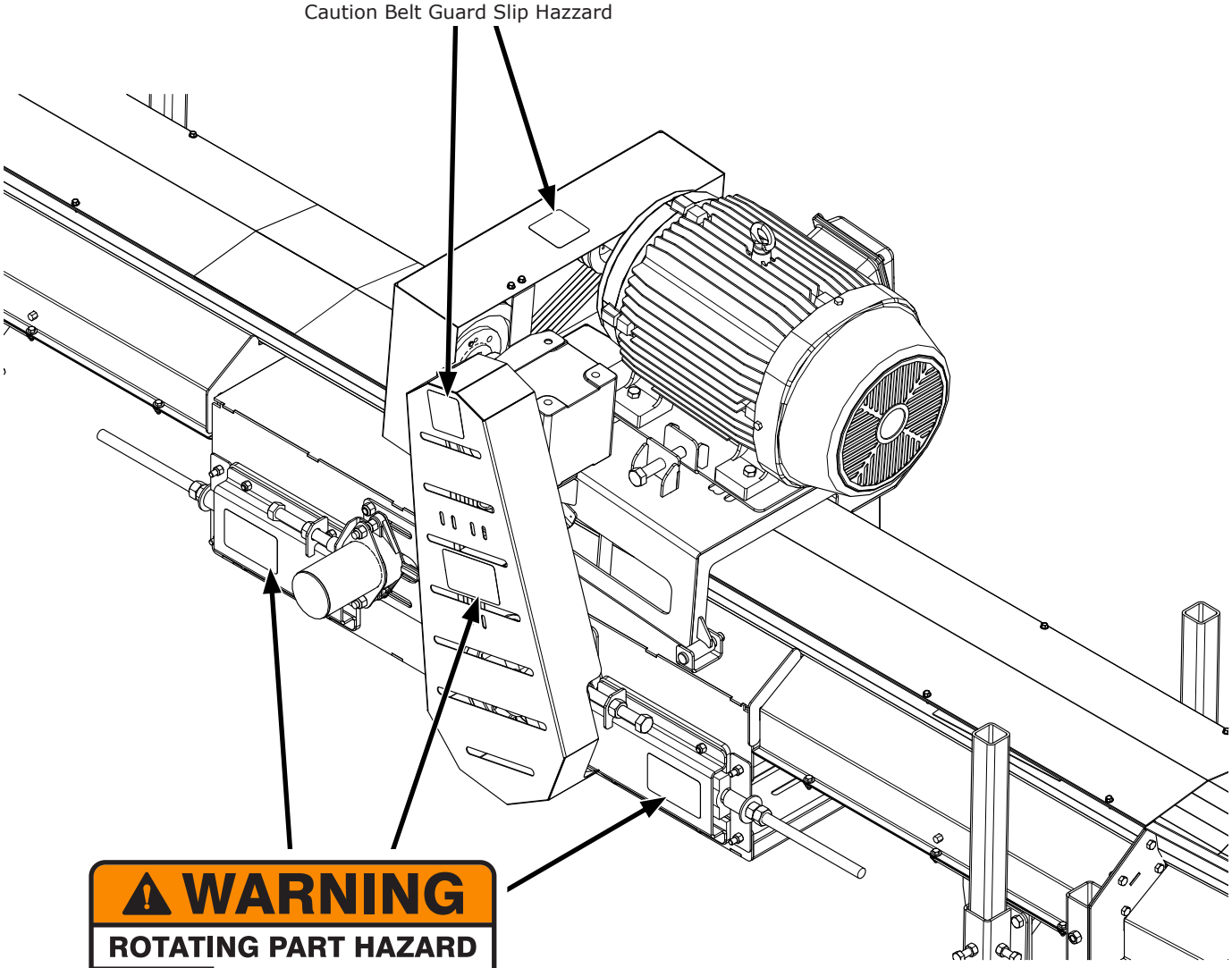
90-44-0262
Warning Belt Conveyor Safety

90-44-0261
Warning Rotating Part Hazard

Safety & Instructional Decals

Bi-Directional Drive Conveyor

90-44-0258
Caution Belt Guard Slip Hazzard



90-44-0261
Warning Rotating Part Hazard

Safety

Safety is a primary concern in the design and manufacturing of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said "The best safety device is an informed, careful operator." We ask you to be that kind of an operator.

General Safety

- Read and understand the Operator's Manual before operating, maintaining, adjusting or unplugging the Kwik-Till.
- Only trained competent persons shall operate the Kwik-Till. An untrained operator is not qualified to operate the machine.
- Have a first-aid kit available for use should the need arise and know how to use it.
- Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.
- Wear appropriate protective equipment. This list includes but is not limited to:
  - ✓ Hard Hat
  - ✓ Protective Shoes
  - ✓ Protective Goggles
  - ✓ Heavy Gloves
  - ✓ Hearing Protection
  - ✓ Respirator or Filter Mask
- Review safety related items annually with all personnel who will be operating or maintaining the Underbin Conveyor.
- Be familiar with machine hazard area. If anyone enters hazard areas, shut down machine immediately. Clear the area before continuing.
- Keep hands, feet and clothing away from all moving parts.
- Clear the area of bystanders when carrying out any maintenance and repairs or making any adjustments.
- Equipment shall be installed in accordance with current installation codes and applicable regulations should be followed. Authorities with jurisdiction should be consulted before installing.
- **NEVER** attempt to assist conveyor operation or remove trash while in operation.
- Keep all shields and guards in place during operation.

Storage Safety

- Store the unit in an area away from human activity.
- Store in a level dry area.
- Do not permit children to play on or around the stored machine.
- Be sure wheels are blocked and all hoses are in proper storage positions.

Electrical Safety

- Electricity can kill! Use extreme caution around electrical components.
- Electric motors and controls shall be installed and serviced by a qualified electrician and must meet all local coades and standards.
- All electrical devices used on this machine shall operate in a "fail safe" mode. Fail safe mean that in the case of a power or device failure, the machine must not restart itself.
- Use an enclosed electric motor if operating in extremely dusty conditions.
- Device controls must be located so that the operator has full view of the entire operation.
- The main power disconnect should be in the locked position when not in use or whenever maintenance is performed.
- If equipped with a reset and a reset is required, disconnect all power before resetting the motor.

Operator Sign-Off Record

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said "The best safety device is an informed, careful operator." We ask you to be that kind of an operator.

American Society of Agricultural & biological Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA).

Anyone who will be operating and/or maintaining the Underbin Conveyor must read and clearly understand all Safety, Operating, and Service & Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until this information has been reviewed. Review this information annually, before the season start-up. Make periodic reviews of the Safety and Operation sections a standard practice for those using any of your equipment.

Use the following Operator Sign-off Record to verify that each operator has read and understood the information in this manual and has been instructed in the safe operation of the Underbin Conveyor.

Date	Operator's Name	Operator's Signature

Operation

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said "The best safety device is an informed, careful operator." We ask you to be that kind of an operator.

Recommendations

- One person must monitor the conveyor at **ALL** times. Monitoring includes inspecting the conveyor before and during operation. Be alert to any unusual vibrations, noises, and loosening components.
- For smoother startups, don't start conveyor with tube full. This will ensure efficient operation.
- In cold weather, run conveyor empty for two minutes to warm up belt.
- The conveyor must break in when new and at the beginning of each season.
- Allow conveyor to fully empty before shutting down.

⚠WARNING

- Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals are available from your Norwood dealer.) Failure to follow instructions or safety rules can result in serious injury or death. Never allow children or untrained persons to operate equipment.
- Keep hands, feet, hair, and clothing away from equipment while machine is running. Stay clear of all moving parts.
- Do not allow bystanders in the area when operating, or servicing equipment.
- Be familiar with the Underbin Conveyor before operating.
- The owner is responsible for training operators in the safe operation of the Underbin Conveyor.

⚠CAUTION

- Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

Operation

Principle Components

The Norwood Underbin Conveyor consists of a head section, a tail section, middle section, covers and a drive.

The Underbin conveyor combines long transition head and tail stocks with deep smooth center sections and a powerful effiecient drive system to quickly and safely transfer product.

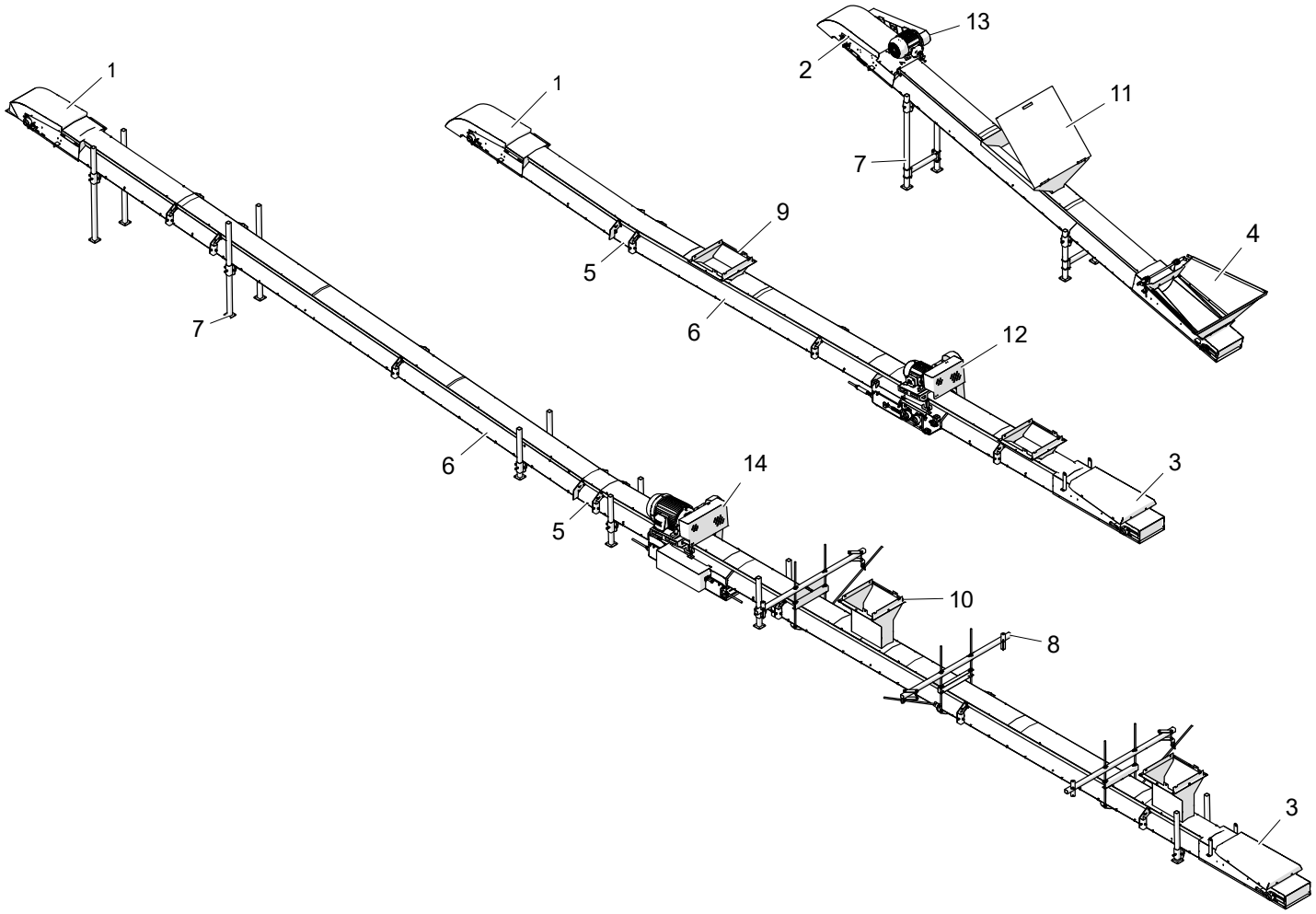


Figure 1. *Underbin Conveyor Principle Components*

1. Standard Head Section
2. Top Drive Head Section
3. Standard Tail Section
4. Inlet Hopper Tail Section
5. Incline Section
6. Middle Section
7. Leg Support
8. Bin Hanger Support
9. Standard Inlet Hopper
10. Inlet Hopper Extension
11. Tote Inlet Hopper
12. S Drive System
13. Top Drive System
14. Bi-Directional Drive System

Operation

Pre-Operation Check List

(OWNER'S RESPONSIBILITY)

IMPORTANT *This Pre-Operation Check List is provided for the operator. It is important to follow for both personal safety and maintenance of the Conveyor.*

✓ Check all lubrication points and grease as instructed in Lubrication Schedule.

✓ Check that all hardware is tight. Tighten any loose hardware, refer to the Bolt Torque Chart (pg 50) for recommended torque values.

✓ Verify the conveyor discharge and intake areas are clear of obstructions

✓ Watch conveyor alignment and tensions, check they don't vary under loaded conditions.

✓ Inspect drive belt tension and alignment. Replace if damaged.

✓ Inspect all bearings, make sure all bearings spin freely. Replace if damaged.

Break-in

To ensure safe and reliable operation of the Underbin Conveyor, use the following guidelines.

NOTE *A new belt may ear at the edges and throw small pieces for the first 5 minutes. Check tension and alignment closefly during this time.*

1. Any conveyor that is new or has set idle needs to go through a break-in period.
2. Follow Pre-Operation Check List before following the procedure below.
3. Run the conveyor at partial capacity until several hundred bushels of grain have ran through. This step allows the belt and tube to polish allowing the belt to move freely and effieciently.
4. During the first 15 minutes of operation, check belt alignment. Refer to maintenance section for adjustment procedures.
5. A new belt may stretch during operation, retighten if neccessary. Refer to maintenance section for adjustment procedures.

Startup

To ensure safe and reliable operation of the Underbin Conveyor, use the following guidelines.

1. Follow "Pre-Operation Check List" before following the procedure below.
2. Start conveyor, operate normally. Refer to "Electric Motor Operation" for more details.
3. Listen for unusual sounds. If any are heard Refer to "Emergency Shutdown". Follow "Maintenance" to correct the problem before resuming operation. If unsure of the problem or procedure, contact your local dealer. If product is still on the belt, follow "Restarting with Full Tube" procedures.
4. Do not run conveyor for long periods of time without material on the conveyor belt. Failure to follow this rules will result in excess wear.

Cold Weather Startup

Follow Startup procedure above with the addition of the steps below in cold weather environments.

1. Remove all snow and ice from conveyor intake and discharge areas.
2. Run belt for atleast two minutes empty before running product through to allow belt to warm up. (More time may be neccessary in colder environments)
3. After all product has been conveyed, run conveyor for atleast two minutes to remove any moisture that may have built up around the belt.

Operation

Electric Motor Operation

To ensure safe and reliable operation of the Underbin Conveyor, use the following guidelines.

1. Turn on electric motor.
2. Run conveyor till its empty.
3. Turn off motor and lock out power source.
4. If equipped with a disconnect, disconnect the power supply to the conveyor.

Emergency Shutdown

To ensure safe and reliable operation of the Underbin Conveyor, use the following guidelines.

1. In the case of an emergency, shutdown and lockout the power source immediately.
2. Stop the flow of material if applilcable.
3. Ensure all machine components have come to a complete stop before inspecting the machine.
4. Correct the emergency situation.
5. Remove as much grain as possible from conveyor before restarting.
6. If grain can't be removed from conveyor, follow "Restarting with Full Tube" procedures.
7. Follow "Startup" procedure to resume operation.

Restarting with Full Tube

If a conveyor is shutdown inadvertently or due to an emergency, the conveyor may still be filled with grain.

To ensure safe and reliable operation of the Underbin Conveyor, use the following guidelines.

1. With the power source shut down and locked out, verify all components have come to a complete stop.
2. Remove as much grain as possible from the conveyor. Use a vaccum or other tools. Do not sure your hands, as conveyor may contain sharp edges.

NOTE *Starting under load may result in damage to the conveyor if grain is not removed as much as possible.*

3. If any guards or shields were removed, close or replace them before restarting.
4. It may be necessary to tighten the drive belts slightly to handle heavier then normal loads.
5. Once the conveyor has been started, run the conveyor till all grain has been emptied.
6. Shutdown the conveyor and lockout the power.
7. Adjust belt tension back to normal, refer to "Maintenance" for tensioning procedures.

Operation

Shutdown

To ensure safe and reliable operation of the Underbin Conveyor, use the following guidelines.

1. Once conveyor is clear of grain, shutdown and lockout the power source.

2. Reinstall any inlet and discharge covers if applicable.

3. If the conveyor will not be used for awhile, its recommended that the "Cleanout" procedures be performed.

Clean-Out

To ensure safe and reliable operation of the Underbin Conveyor, use the following guidelines.

Failure to clean conveyor can cause buildup of product. Buildup of product can cause the following, damage to roller shafts, grain spillage, roller misalignment, excess wear/damage to belt.

1. Verify the power source is shutdown and locked out and that all conveyor components have come to a complete stop.

2. Remove any remaining product from the conveyor.

3. Remove any debris from drive belts, sheaves, and shafts.

4. Once the conveyor is clean of all product, check belts and lacing for damage. Refer to Maintenance for replacing and relacing procedures.

IMPORTANT *Ensure conveyor is free of all product and debris to prevent buildup. Any buildup on the belt or shafts becomes a source of spillage and can cause belt misalignment. Belt misalilgnment can cause excess wear on belt edges. Buildup on the inlet and discharge areas will increase drag, causing the belt to wear faster.*

5. Once cleaned, cover intake and discharge areas to prevent moisture from collecting in conveyor.

Service & Maintenance

⚠WARNING

- Before performing any service or maintenance, follow these steps:
  - ✓ Shutdown & Lockout Power Source
  - ✓ Verify all components have come to a complete stop.
  - ✓ Remove any excess product from the conveyor.
- Before working underneath, read manual instructions, securely block up, and check stability.
- Keep all persons away from operator control area while preforming adjustments, service or maintenance.

⚠CAUTION

- Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head, and respirator or filter mask where appropriate.
- Make certain all movement of equipment components has stopped before approaching for service.

LUBRICANTS

Use the Service Record (Page 24), to keep a record of all scheduled maintenance.

- **Grease**

  Use and SAE multi-purpose hight temperature grease with extreme pressure (EP) performance. A SAE multi-purpose lithium-based grease is also acceptable.

- **Storing Lubricants**

  Your unit can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contaminants.

GREASING

1. Use a hand-held grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

Service & Maintenance

Service Record

Note: See prior pages for details.
Copy this page to continue service records.

L = Lubricate C = Check

Date:	Serviced By:	Daily					Weekly		
		L	C	C	C	C	C	C	C
		All Roller Bearings	Drive Belt\Chain Tension	Conveyor Belt Tension	Conveyor Belt Alignment	Conveyor Belt Lacing	Drive Chain/Belt	Bearing Bolt Tightness	Hardware

Service & Maintenance

Inspection

Check the following while completing an inspection.

1. Ensure guards are in working condition and installed correctly.
2. Examine conveyor for excess wear or damage.
3. Check tightness of all hardware. Refer to "Bolt Torque Chart" for recommened torque values.
4. Ensure all safety decals are in place and in legible condition. Contact your local dealer for replacement decals.
5. Ensure instake and discharge areas are free of obstructions.
6. Inspect hopper flashing for excess wear or damage. Damaged flashing can cause grain leakage.
7. Inspect roller bearings for damage. Any rollers making noise or that get hot while running should be replaced.
8. Inspect roller lagging for signs of wear. Operating conveyor with damaged rollers will result in damaging the conveyor belt.
9. Inspect conveyor belt for damage or excess wear.
10. Inspect conveyor belt lacing for damage. If any clips are worn through replace all lacing.

Conveyor Belt Care

1. Inspect conveyor belt for damage or excess wear. Replace if neccessary.
2. Inspect conveyor belt lacing for damage or excess wear. Replace if neccessary.
3. At the end of each season the "Cleanout" procedures should be performed.
4. Its recommended to wash off the conveyor belt at the end of each season.

NOTE *To allow for water to drain out of the conveyor, remove the tail cover and run the conveyor till the splice is on the top side of the tube.*

Service & Maintenance

Top-Drive Conveyor

Conveyor Belt Tension

IMPORTANT *Do not operate conveyor is belt is slipping. Stop conveyor and tighten belt before continuing operation. Failure to do so will result in damage to the conveyor belt and may void warranty.*

1. Clear area of bystanders.
2. Lockout power source.

⚠WARNING **Ensure power source is locked out before servicing conveyor.**

3. Loosen bearing bolts and jam nut at tightening roller.
4. Tighten adjustment bolts equally, using a tape measure to verify. The belt should deflect 1/4”-1/2” when pushed down with a 5lb force. (Some covers may need to be removed for this)
5. Tighten bearing bolts and jam nuts.
6. Check belt tension by running conveyor for one minute. If belt is not slipping then proceed to next step, otherwise repeat previous steps.

NOTE *Some belts may have uneven edges, appearing to be misaligned. Wait until the belt makes the belt makes a complete recolution before adjusting roller.*

7. If belt is not slipping, but is running to one side, the tension roller needs to be realigned. Refer to Conveyor Belt Alignment for procedure.
8. Ensure that all covers and guards are securely in place before operation.

Helpful Tip:

- If the belt is slipping and adjustment bolts are fully tightened, the belt must be shortened. **See Belt Lacing and Length Adjustment** section for instructions.

Conveyor Belt Alignment

The Underbin Conveyor belt should be checked weekly to ensure it is properly aligned. If the belt is tracking to one side, use the following steps to correct the problem.

1. Clear area of bystanders.
2. Ensure the conveyor is completely empty of all product.
3. Lockout power source.

⚠WARNING **Ensure power source is locked out before servicing conveyor.**

4. Loosen bearing bolts and jam nuts if equipped.
5. Start checking belt alignment at the Tightening Roller (Tail Section) followed by the Drive Roller (Head Section).
6. If belt is not centered, adjust the bearing on the side the belt is moving toward. The bearing should be moved in the direction which would tighten the belt.

NOTE *If Drive Roller is adjusted, Pinch Roller may need to be adjusted. The springs on the pinch roller tensioner should be compressed to 3-3/4” in length.*

7. Start the conveyor and run empty for one minute.
8. Stop conveyor and lockout the power source.
9. If belt is centered continue to the next step, otherwise repeat previout steps.
10. Tighten bearing bolts and jam nuts if equipped.
11. Ensure that all covers and guards are securely in place before operation.

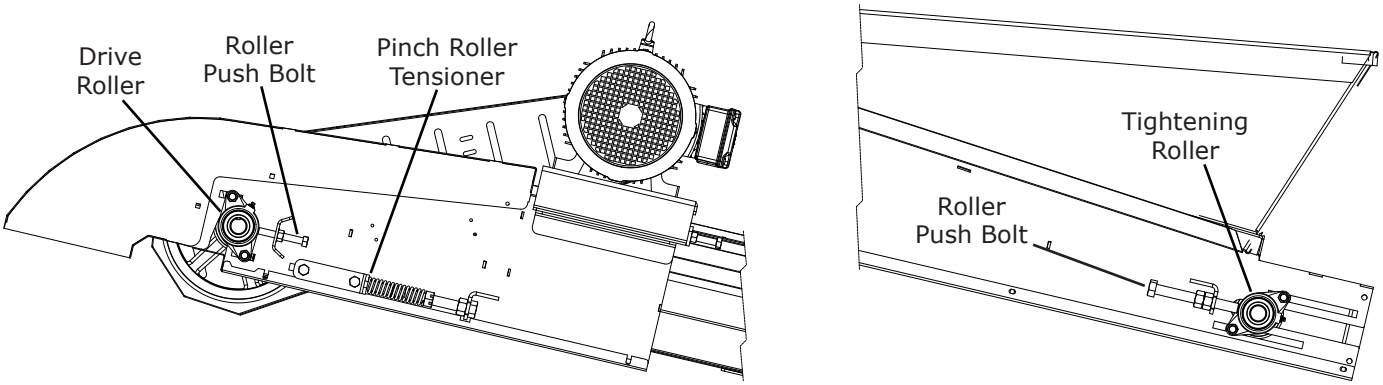


Figure 2. *Top Drive Conveyor Belt Adjustments*

Service & Maintenance

Top-Drive Conveyor

The Underbin Conveyor Drive Belt should be checked weekly to ensure it is properly aligned and tensioned. Follow the steps below to properly adjust the belt.

Drive Belt Replacement

1. Clear area of bystanders.
2. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

3. Loosen Mount bolts and Tension bolts
4. Remove existing belt and replace with new belt.
5. Follow belt alignment and tension procedures below.

Drive Belt Alignment

1. Clear area of bystanders.
2. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

3. Use a Straight Edge across the Motor pulley and the Drive Pulley to check alignment
4. Adjust the pulley on the shaft to achieve proper alignment.
5. Tighten hub bots or set screws to secure the pulley.
6. Check the belt tension.

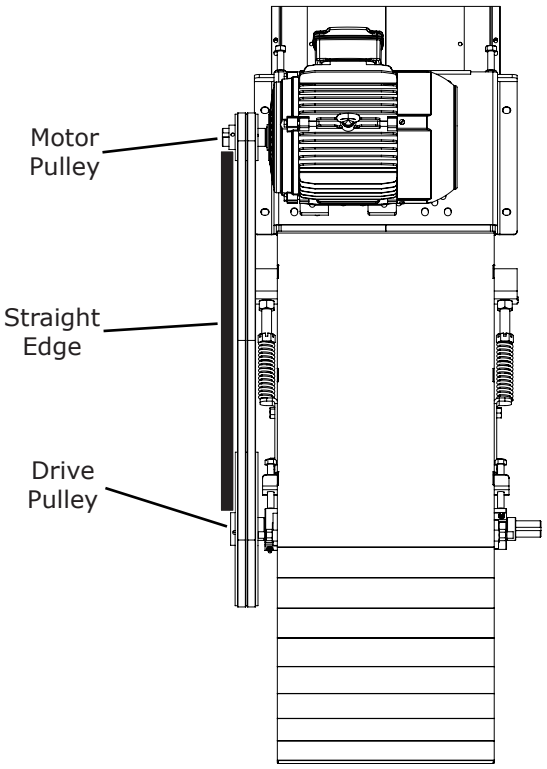


Figure 3. *Drive Belt Alignment*

Drive Belt Tension

1. Clear area of bystanders.
2. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

3. Drive Belt should deflect 1/4” to 1/2” at the center of the span with a 5lb force applied.
4. Loosen Mount bolts and use the Tension bolts to properly tension the belt.
5. Tighten Mount bolts and replace any guards that may have been removed.

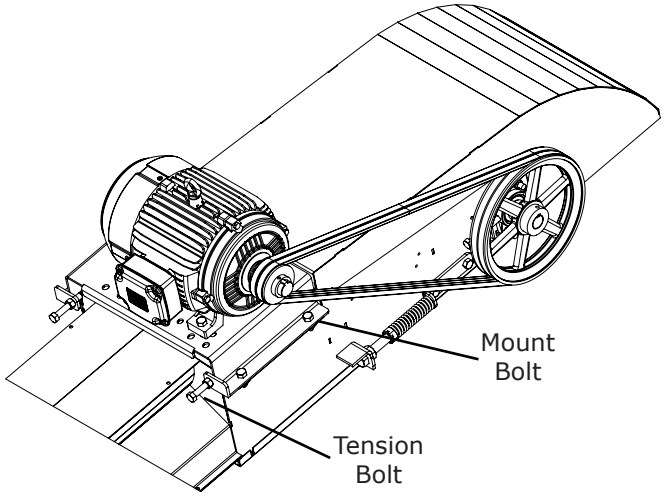


Figure 4. *Drive Belt Tension*

Service & Maintenance

S-Drive Conveyor

Conveyor Belt Tension

IMPORTANT *Do not operate conveyor is belt is slipping. Stop conveyor and tighten belt before continuing operation. Failure to do so will result in damage to the conveyor belt and may void warranty.*

1. Clear area of bystanders.
2. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

3. Tighten Take-Up Roller Tensioner till spring is completely covered by the spring cover.

NOTE *If Tension Roller runs out of travel, adjust tail roller to take up slack. Otherwise, continue to Step 7.*

4. Loosen bearing bolts and jam nut at tail roller.
5. Tighten roller push bolts equally, using a tape measure to verify.
6. Tighten bearing bolts and jam nuts.
7. Check belt tension by running conveyor for one minute. If belt is not slipping then proceed to next step, otherwise repeat previous steps.

NOTE *Some belts may have uneven edges, appearing to be misaligned. Wait until the belt makes the belt makes a complete recolution before adjusting roller.*

8. If belt is not slipping, but is running to one side, the tension roller needs to be realigned. Refer to Conveyor Belt Alignment for procedure.
9. Ensure that all covers and guards are securely in place before operation.

Conveyor Belt Alignment

The Underbin Conveyor belt should be checked weekly to ensure it is properly aligned. If the belt is tracking to one side, use the following steps to correct the problem.

1. Clear area of bystanders.
2. Ensure the conveyor is completely empty of all product.
3. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

4. Loosen bearing bolts and jam nuts if equipped.
5. Start checking belt alignment at the Tail Roller followed by the Discharge Roller. In rare cases the Drive Roller may need to be realigned.
6. If belt is not centered, adjust the bearing on the side the belt is moving toward. The bearing should be moved in the direction which would tighten the belt.

NOTE *If Drive Roller is adjusted, Pinch Roller may need to be adjusted. The springs on the pinch roller tensioner should be compressed to 3-3/4" in length.*

7. Start the conveyor and run empty for one minute.
8. Stop conveyor and lockout the power source.
9. If belt is centered continue to the next step, otherwise repeat previout steps.
10. Tighten bearing bolts and jam nuts if equipped.
11. Ensure that all covers and guards are securely in place before operation.

Helpful Tip:

- If the belt is slipping and adjustment bolts are fully tightened, the belt must be shortened. **See Belt Lacing and Length Adjustment** section for instructions.

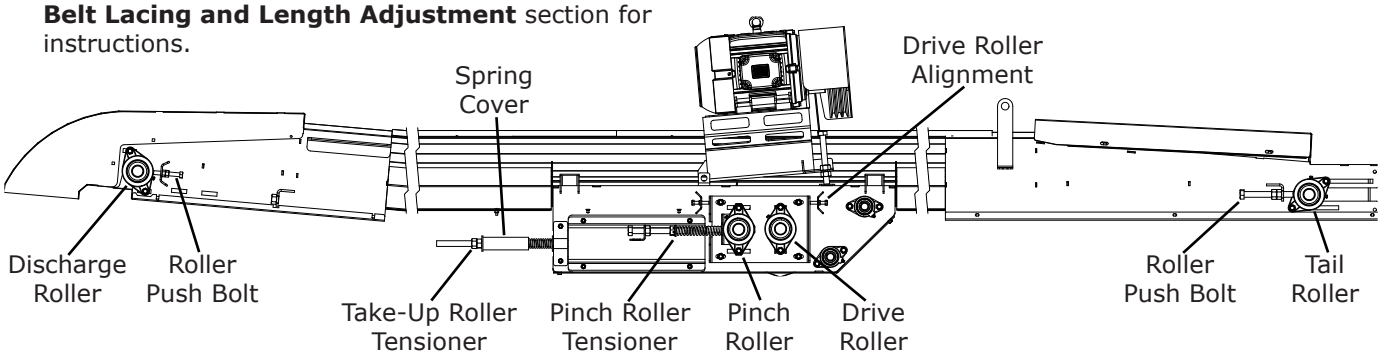


Figure 5. *Top Drive Conveyor Belt Adjustments*

Service & Maintenance

S-Drive Conveyor

The Underbin Conveyor Drive Belt should be checked weekly to ensure it is properly aligned and tensioned. Follow the steps below to properly adjust the belt.

1. Clear area of bystanders.
2. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

Motor to Gearbox Belt Replacement

3. Loosen Motor bolts and Motor Adjustment bolt.
4. Remove existing belt and replace with new belt.
5. Follow belt alignment and tension procedures below.

Gearbox to Drive Roller Belt Replacement

3. Loosen Motor Mount bolts.
4. Remove existing belt and replace with new belt.
5. Follow belt alignment and tension procedures below.

Drive Belt Alignment

3. Use a Straight Edge across the two pulleys to check alignment. ***(Figure 6 & 7)***
4. Adjust the pulley on the shaft to achieve proper alignment.
5. Tighten hub bots or set screws to secure the pulley.
6. Check the belt tension.

Motor to Gearbox Belt Tension

3. Drive Belt should deflect 1/4" to 1/2" at the center of the span with a 5lb force applied.
4. Loosen motor bolts and use the Motor Adjustment bolt to properly tension the belt.
5. Tighten motor bolts and replace any guards that may have been removed.

Gearbox to Drive Roller Belt Tension

3. Drive Belt should deflect 1/4" to 1/2" at the center of the span with a 5lb force applied.
4. Tighten Motor Mount bolts to properly tension the belt.
5. Replace any guards that may have been removed.

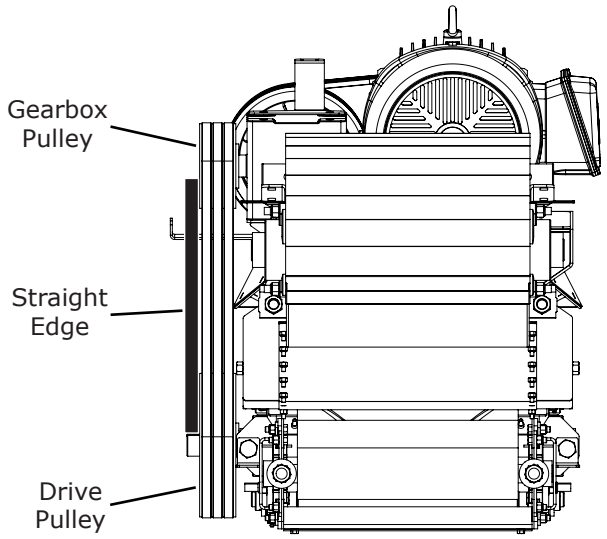


Figure 6. Gearbox to Drive *Roller Belt Alignment*

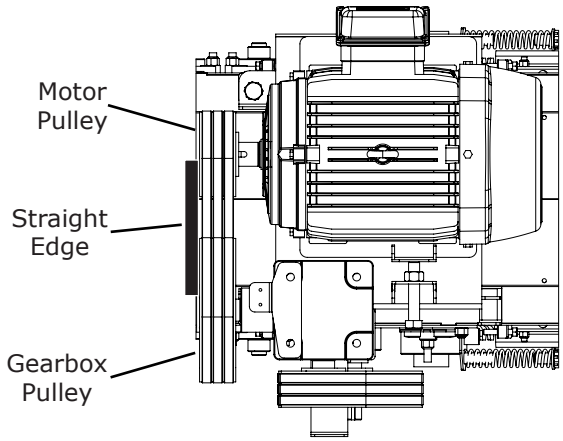


Figure 7. Motor to Gearbox *Belt Alignment*

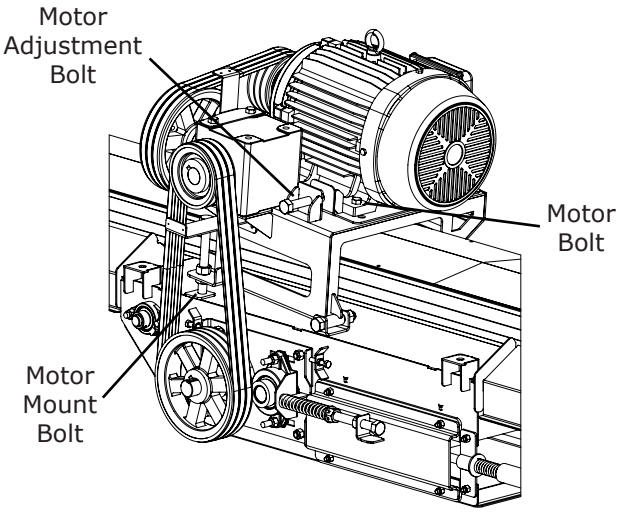


Figure 8. *Drive Belt Tension*

Service & Maintenance

Bi-Directional Drive Conveyor

Conveyor Belt Tension

IMPORTANT *Do not operate conveyor is belt is slipping. Stop conveyor and tighten belt before continuing operation. Failure to do so will result in damage to the conveyor belt and may void warranty.*

1. Clear area of bystanders.
2. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

3. Tighten Take-Up Roller Tensioners equally, using a tape measure to verify. The belt should deflect 1/4”-1/2” when pushed down with a 5lb force.
4. Check belt tension by running conveyor for one minute. If belt is not slipping then proceed to next step, otherwise repeat previous steps.

NOTE *Some belts may have uneven edges, appearing to be misaligned. Wait until the belt makes the belt makes a complete recolution before adjusting roller.*

5. If belt is not slipping, but is running to one side, the tension roller needs to be realigned. Refer to Conveyor Belt Alignment for procedure.
6. Ensure that all covers and guards are securely in place before operation.

Helpful Tip:

- If the belt is slipping and adjustment bolts are fully tightened, the belt must be shortened. **See Belt Lacing and Length Adjustment** section for instructions.

Conveyor Belt Alignment

The Underbin Conveyor belt should be checked weekly to ensure it is properly aligned. If the belt is tracking to one side, use the following steps to correct the problem.

1. Clear area of bystanders.
2. Ensure the conveyor is completely empty of all product.
3. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

4. Loosen bearing bolts and jam nuts if equipped.
5. Start checking belt alignment at the Tail Roller followed by the Discharge Roller. In rare cases the Drive Roller may need to be realigned.
6. If belt is not centered, adjust the bearing on the side the belt is moving toward. The bearing should be moved in the direction which would tighten the belt.

NOTE *If Drive Roller is adjusted, Pinch Roller may need to be adjusted. The springs on the pinch roller tensioner should be compressed to 3-3/4” in length.*

7. Start the conveyor and run empty for one minute.
8. Stop conveyor and lockout the power source.
9. If belt is centered continue to the next step, otherwise repeat previout steps.
10. Tighten bearing bolts and jam nuts if equipped.
11. Ensure that all covers and guards are securely in place before operation.

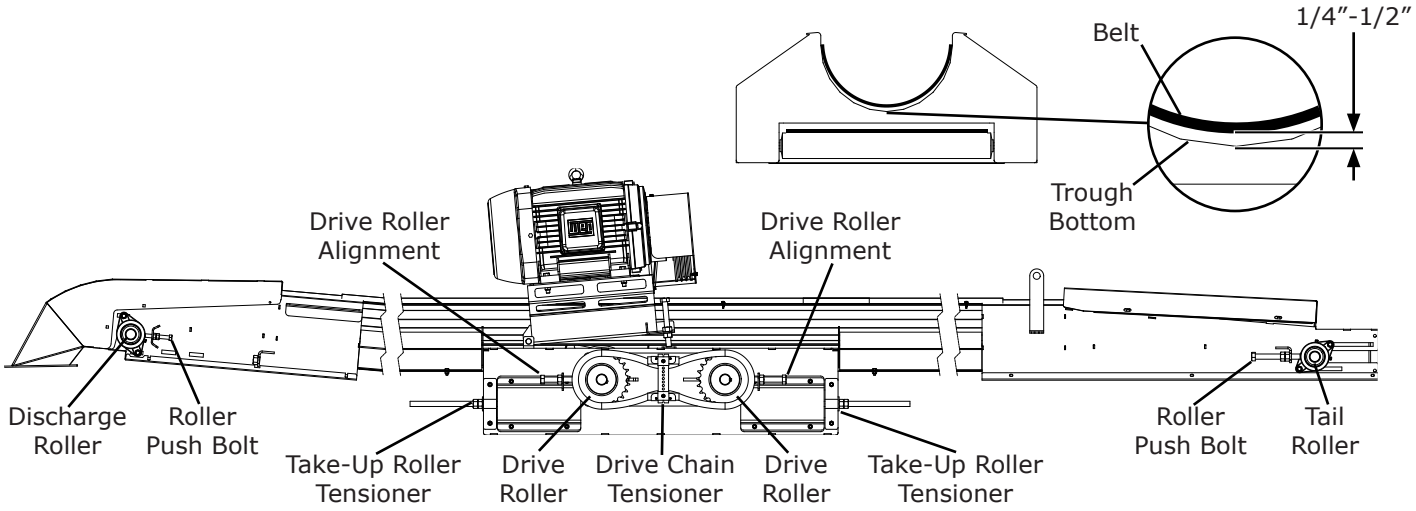


Figure 5. *Top Drive Conveyor Belt Adjustments*

Service & Maintenance

Bi-Directional Drive Conveyor

The Underbin Conveyor Drive Belt should be checked weekly to ensure it is properly aligned and tensioned. Follow the steps below to properly adjust the belt.

1. Clear area of bystanders.
2. Lockout power source.

WARNING **Ensure power source is locked out before servicing conveyor.**

Motor to Gearbox Belt Replacement

3. Loosen Motor bolts and Motor Adjustment bolt.
4. Remove existing belt and replace with new belt.
5. Follow belt alignment and tension procedures below.

Gearbox to Drive Roller Belt Replacement

3. Loosen Motor Mount bolts.
4. Remove existing belt and replace with new belt.
5. Follow belt alignment and tension procedures below.

Drive Belt Alignment

3. Use a Straight Edge across the two pulleys to check alignment. ***(Figure 6 & 7)***
4. Adjust the pulley on the shaft to achieve proper alignment.
5. Tighten hub bots or set screws to secure the pulley.
6. Check the belt tension.

Motor to Gearbox Belt Tension

3. Drive Belt should deflect 1/4” to 1/2” at the center of the span with a 5lb force applied.
4. Loosen motor bolts and use the Motor Adjustment bolt to properly tension the belt.
5. Tighten motor bolts and replace any guards that may have been removed.

Gearbox to Drive Roller Belt Tension

3. Drive Belt should deflect 1/4” to 1/2” at the center of the span with a 5lb force applied.
4. Tighten Motor Mount bolts to properly tension the belt.
5. Replace any guards that may have been removed.

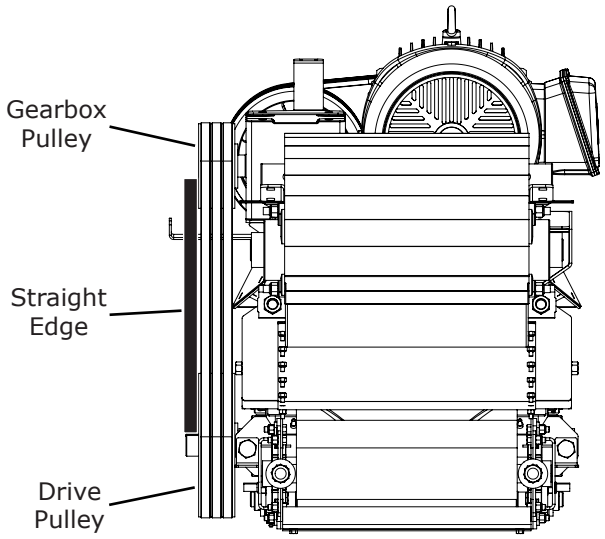


Figure 6. Gearbox to Drive *Roller Belt Alignment*

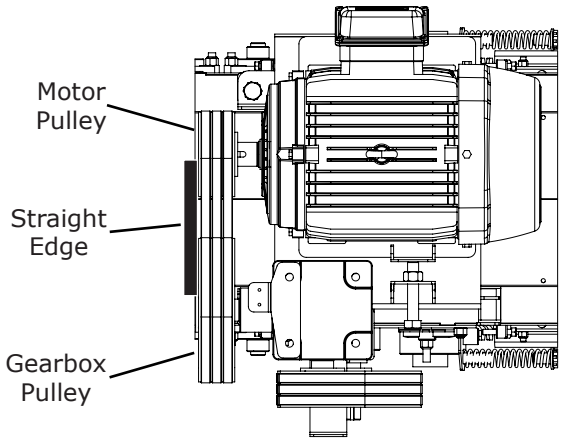


Figure 7. Motor to Gearbox *Belt Alignment*

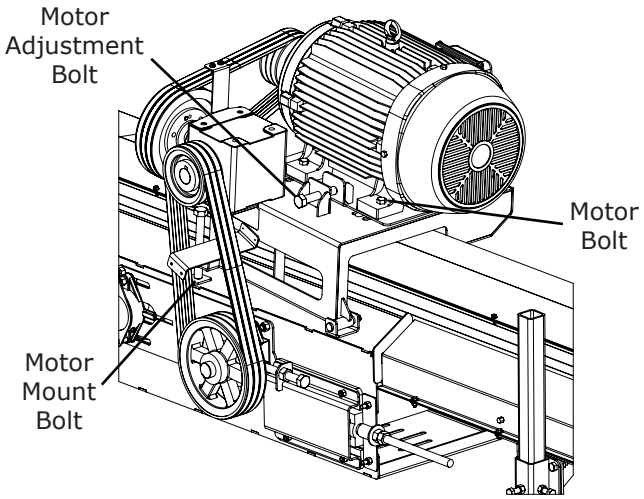


Figure 8. *Drive Belt Tension*

Service & Maintenance

Belt Lacing and Length Adjustment

1. Clear area of bystanders.
2. Rotate conveyor belt unitl lacing is easily accessible.
3. Lockout power source.
4. Loosen conveyor belt and remove lacing retainer clip.
5. Use a square and sharp knife to cut the belt. If just replacing the lacing cut right behind existing lacing. If shortening the belt, cut off the appropriate amount of belt.

IMPORTANT ***THE BELT ENDS MUST BE CUT SQUARE***

6. Use a knife to remove the crescent top patter 1" back from the end of the belt. This ensures that the lacing is centered and fully seated on the belt.
7. Use a lacing tool to install new lacing clips. Lacing clips should be one clip shorter than conveyor belt width. Center lacing on the belt and install the lacing as per instructions on lacing tool.
8. Pull the conveyor belt ends together. If required use a ratchet strap clamped to the belt to pull the ends together.
9. Install the lacing pin and retainer clip on each end of the pin.
10. Remove the ratchet strap if used and tighten the conveyor belt.
11. Follow "Belt Tension" and "Belt Alignment" steps to properly adjust the conveyor belt.
12. Clear area of bystanders and run the conveyor for 30 seconds, Shutdown the conveyor and inspect the lacing and belt alignment.

Conveyor Belt Replacement

1. Clear area of bystanders.
2. Rotate conveyor belt unitl lacing is easily accessible.
3. Lockout power source.
4. Loosen conveyor belt and remove lacing retainer clip.
5. Attach one end of the replacement belt to the belt being removed.
6. Pull the opposite end of the old belt so that the new belt is pulled into and through the conveyor.
7. Disconnect the old belt.
8. Pull the conveyor belt ends together. If required use a ratchet strap clamped to the belt to pull the ends together.
9. Install the lacing pin and retainer clip on each end of the pin.
10. Remove the ratchet strap if used and tighten the conveyor belt.
11. Follow "Belt Tension" and "Belt Alignment" steps to properly adjust the conveyor belt.
12. Clear area of bystanders and run the conveyor for 30 seconds, Shutdown the conveyor and inspect the lacing and belt alignment.

NOTE *A new belt may ear at the edges and throw small pieces for the first 5 minutes. Check tension and alignment closefly during this time.*

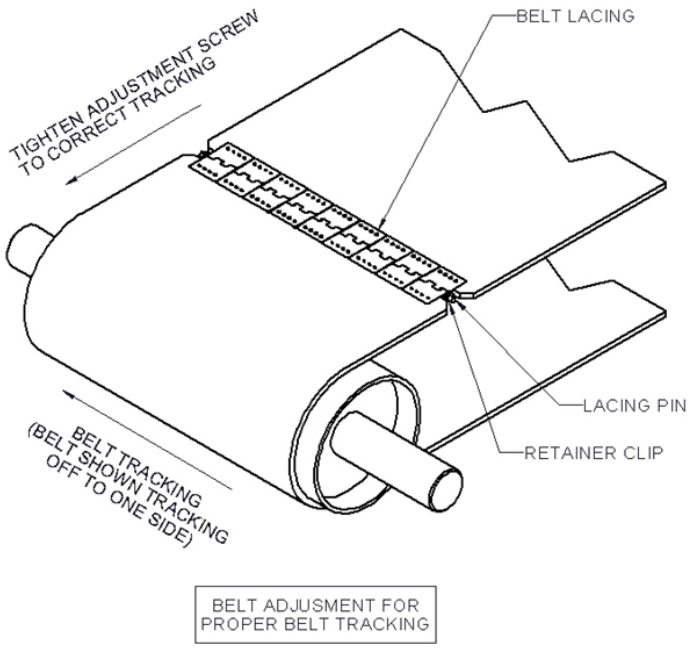


Figure 2. *Belt Lacing Diagram*

Storage

After a season's use, follow the procedures below to ensure trouble-free operating and long life.

1. Perform "Inspection" procedures.

2. Repair any damaged components. Refer to "Maintainance" for procedures.

3. Perform "Cleanout" procedures.

4. Stop machine with belt lacing inside the tube. This reduces rust accumulation on the belt lacing.

5. Touchup any paint damages to prevent rusting.

6. If conveyor is outside, cover motor, inlet and outlet areas with a waterproof tarpaulin.

Trouble Shooting

Problem	Cause	Solution
Conveyor Vibrating	Conveyor Belt Damaged	Inspect belt, if damaged, Refer to "Conveyor Belt Replacement"
	Conveyor Belt Misaligned	Refer to "Conveyor Belt Alignment"
Low Capacity	Low intake flow	Clear any obstructions in intake areas
	Incorrect Belt Speed	Inspect drive belt tension, Refer to "Drive Belt Tension"
		Inspect conveyor belt tension, Refer to "Conveyor Belt Tension"
		Inspect drive roller lagging, Refer to "Drive Roller Replacement"
Conveyor Plugs	High intake flow	Decrease intake flow
	Wet grain	Decrease intake flow
		Higher HP motor may be required
	Foreign object jammed	Verify conveyor is free of foreign objects.
	Discharge area plugged	Clear any plugs in discharge area
	Conveyor belt loose, possible damage to drive pulley and belt	Inspect drive rollers and belt, Refer to "Drive Roller Replacement" or "Conveyor Belt Replacement"
Conveyor Belt Slipping	Conveyor belt tension too low	Inspect conveyor belt tension, Refer to "Conveyor Belt Tension"
	Inside belt surface dirty	Clean traction side of belt, Refer to "Conveyor Belt Replacement"
	Damaged Drive Roller	Inspect drive rollers, Refer to "Drive Roller Replacement"
	Belt frozen to tube	Warm belt to de-ice,
	Pinch roller loose	Refer to "Conveyor Belt Tension"
	Cold weather environment	Conveyor slipping on drive rollers, Refer to "Cold Weather Operation"
Conveyor Belt Side Rubbing	Conveyor Belt Misaligned	Refer to "Conveyor Belt Alignment"
Drive Belt Slipping	Drive belt tension too low	Inspect drive belt tension, Refer to "Drive Belt Tension"
	Belt frozen to tube	Warm belt to de-ice
Grain leaking from intake area	Conveyor Belt Misaligned	Refer to "Conveyor Belt Alignment"
	Flashing leaking	Inspect flashing for damage
	Hopper cloth leaking	Inspect hopper cloth for damage
Hopper cloth collapsing	Misaligned or broken spring	Inspect hopper springs
	Pivot shaft improperly installed	Inspect pivot shaft installation

Trouble Shooting

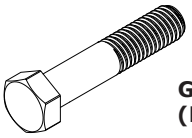
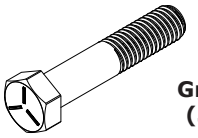
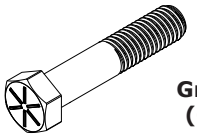
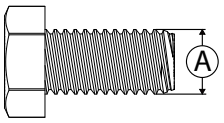
Problem	Cause	Solution
Grain leaking between belt and tube	Conveyor Belt Misaligned	Refer to "Conveyor Belt Alignment"
Grain leaking between discharge hood and belt	Hood plugging, Belt speed too fast	Decrease belt speed
Noisy drive unit	Drive belt loose	Inspect drive belt tension, Refer to "Drive Belt Tension"
	Hot shaft, pulley, or bearing (Bearing Failure)	Replaced failed bearing
	Damaged Drive Roller	Inspect drive rollers, Refer to "Drive Roller Replacement"
Conveyor will not run	Conveyor Belt Tension too low	Inspect conveyor belt tension, Refer to "Conveyor Belt Tension"
	Drive belt tension too low	Inspect drive belt tension, Refer to "Drive Belt Tension"
	Drive belt worn or damaged	Replace drive belt, Refer to "Drive Belt Tension"
	Belt frozen to tube	Warm belt to de-ice

Bolt Torque Chart

Standard Torque Chart

Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application. Fasteners must always be replaced with the same grade as specified in the manual parts list.

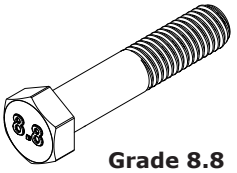
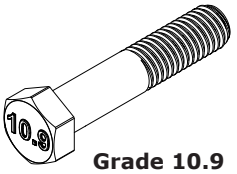
Make sure fastener threads are clean and you properly start thread engagement.

Bolt Head Identification		 **Grade 2 Bolt (No Dashes)**		 **Grade 5 Bolt (3 Dashes)**		 **Grade 8 Bolt (6 Dashes)**	
Ⓐ Diameter (In)	Wrench Size (In)	*Ft./Lbs.*	*Nm*	*Ft./Lbs.*	*Nm*	*Ft./Lbs.*	*Nm*
1/4″	7/16″	6	8	10	13	14	18
5/16″	1/2″	12	17	19	26	27	37
3/8″	9/16″	23	31	35	47	49	67
7/16″	5/8″	36	48	55	75	78	106
1/2″	3/4″	55	75	85	115	120	163
9/16″	13/16″	78	106	121	164	171	163
5/8″	15/16″	110	149	170	230	240	325
3/4″	1-1/8″	192	261	297	403	420	569
7/8″	1-5/16″	306	416	474	642	669	907
1″	1-1/2″	350	475	680	925	1020	1383
1-1/8″	1-11/16″	450	610	885	1200		
1-1/4″	1-7/8″	600	815	1255	1700		
1-3/8″	2-1/16″	675	915	1620	2200		
1-1/2″	2-1/4″	920	1250	2200	2900		

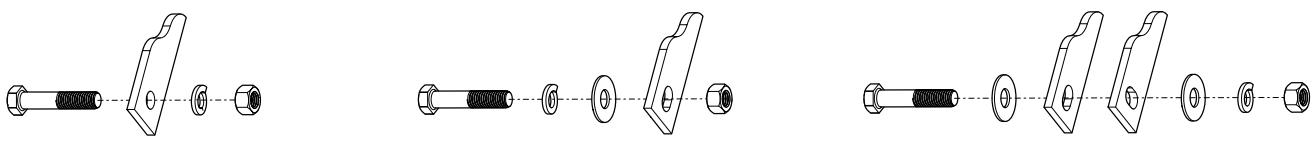
Metric Torque Chart

Use only metric tools on metric hardware. Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application. Fasteners must always be replaced with the same grade.

Make sure fastener threads are clean and you properly start thread engagement.

Ⓐ Diameter & Thread Pitch (Mm)	Wrench Size (Mm)	**Coarse Thread**				**Fine Thread**				Ⓐ Diameter & Thread Pitch (Mm)	***Bolt Head Identification***
		Grade 8.8		***Grade 10.9***		***Grade 8.8***		***Grade 10.9***			
		Ft./Lbs.	*Nm*	*Ft./Lbs.*	*Nm*	*Ft./Lbs.*	*Nm*	*Ft./Lbs.*	*Nm*		
6-M1.0	10	6	8	8	11						 **Grade 8.8**
8-M1.25	13	15	20	20	27	16	21	22	29	8-M1.0	
10-M1.5	16	29	39	40	54	30	41	42	57	10-M1.25	
12-M1.75	18	50	68	70	94	55	75	76	103	12-M1.25	
14-M2.0	21	80	109	111	151	87	118	120	163	14-M1.5	 **Grade 10.9**
16-M2.0	24	125	169	173	234	133	181	184	250	16-M1.5	
18-M2.5	27	172	234	239	323	194	263	268	363	18-M1.5	
20-M2.5	30	244	330	337	457	270	367	374	507	20-M1.5	
22-M2.5	34	332	451	460	623	365	495	505	684	22-M1.5	
24-M3.0	36	421	571	583	790	459	623	635	861	24-M2.0	
30-M3.0	46	867	1175	1199	1626	928	1258	1283	1740	30-M2.0	

Typical Installations



Abbreviations

AG ..... Agriculture
ASAE ..... American Society of Agricultural Engineers
ATF ..... Automatic Transmission Fluid
BSPP ..... British Standard Pipe Parallel
BSPTM ..... British Standard Pipe Taper Male
CV ..... Constant Velocity
CCW ..... Counter-Clockwise
CW ..... Clockwise
DIA ..... Diameter
EP ..... Extreme Pressure
F ..... Female
FO ..... Female O-Ring Boss
FJ ..... Female JIC
FJX ..... Female Swivel JIC
FP ..... Female Pipe
Ft./Lbs. ..... Foot Pounds
GA ..... Gauge
GR (5, etc.) ..... Grade (5, etc.)
HHCS ..... Hex Head Cap Screw
HT ..... Heat Treated
In ..... Inch
JIC ..... Joint Industry Council 37° Flare
Kg ..... Kilogram
Km/h ..... Kilometers Per Hour
Lb ..... Pound
LH ..... Left Hand
LT ..... Left
M ..... Meter
Mm ..... Millimeter
M ..... Male
MO ..... Male O-Ring Boss
MJ ..... Male JIC
MJX ..... Male Swivel JIC
MP ..... Male Pipe
MPa ..... Mega Pascal
MPH ..... Miles Per Hour
N ..... Newton
NC ..... National Course
NF ..... National Fine
NPSM ..... National Pipe Straight Mechanical
NPT ..... National Pipe Tapered
NPTX ..... National Pipe Tapered Swivel
Nm ..... Newton Meter
OSHA ... Occupational Safety & Health Administration
P ..... Pitch
PBY ..... Power Beyond
Psi ..... Pounds per Square Inch
PTO ..... Power Take Off
QD ..... Quick Disconnect
RH ..... Right Hand
ROPS ..... Roll Over Protection Structure
RPM ..... Revolutions Per Minute
RT ..... Right
SAE ..... Society of Automotive Engineers
SMV ..... Slow Moving Vehicle
UNC ..... Unified Coarse
UNF ..... Unified Fine
UNS ..... Unified Special
ZP ..... Zinc Plate

Index

Warranty

Warranty Registration

Customer's Name	Dealer's Name
Address	Address
City State Area Code	City State Area Code
Phone Number	Phone Number
Model	Serial Number
Delivery Date	Check One Below: Commercial Use _____ Farm Use _____

Dealer Inspection Report

_____ Wheel Nuts Tight	_____ Signal Lights Work Properly
_____ Tire Pressure	_____ Safety Chain Installed
_____ Fasteners Tight	_____ Review Operating & Safety Instructions
_____ All Decals Installed	_____ Operator Manual Supplied

I have thoroughly instructed the buyer on the above described equipment including a review of the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date _____ Dealer's Signature _____

I have received the above equipment and Operator's Manual and I have been thoroughly instructed on its care, adjustments, safe operation and applicable warranty policy.

Date _____ Owner's Signature _____

Warranty

Limited Warranty Policy

Norwood Sales Inc. warrants to the buyer that the new machinery is free from defects in material and workmanship.

This warrant is only effective on new machinery, which has not been altered, changed or repaired since its delivery to the buyer.

Norwood Sales Inc. shall only be liable for defects in materials or workmanship and specifically excludes liability for repairs arising as a result of normal wear and tear of the new machinery and without limiting the generality of the foregoing, excludes application or installation of parts not completed in accordance with **Norwood Sales Inc.** operator's manual, specifications, or printed instructions.

Written notice shall be given by registered mail, to **Norwood Sales Inc.** within seven (7) days after the defect shall have become apparent or the repairs shall have become necessary, addressed as follows: **Norwood Sales Inc., 11202 38th Street South, Horace, ND 58047.**

This warranty shall expire one (1) year after the date of delivery of the new machinery.

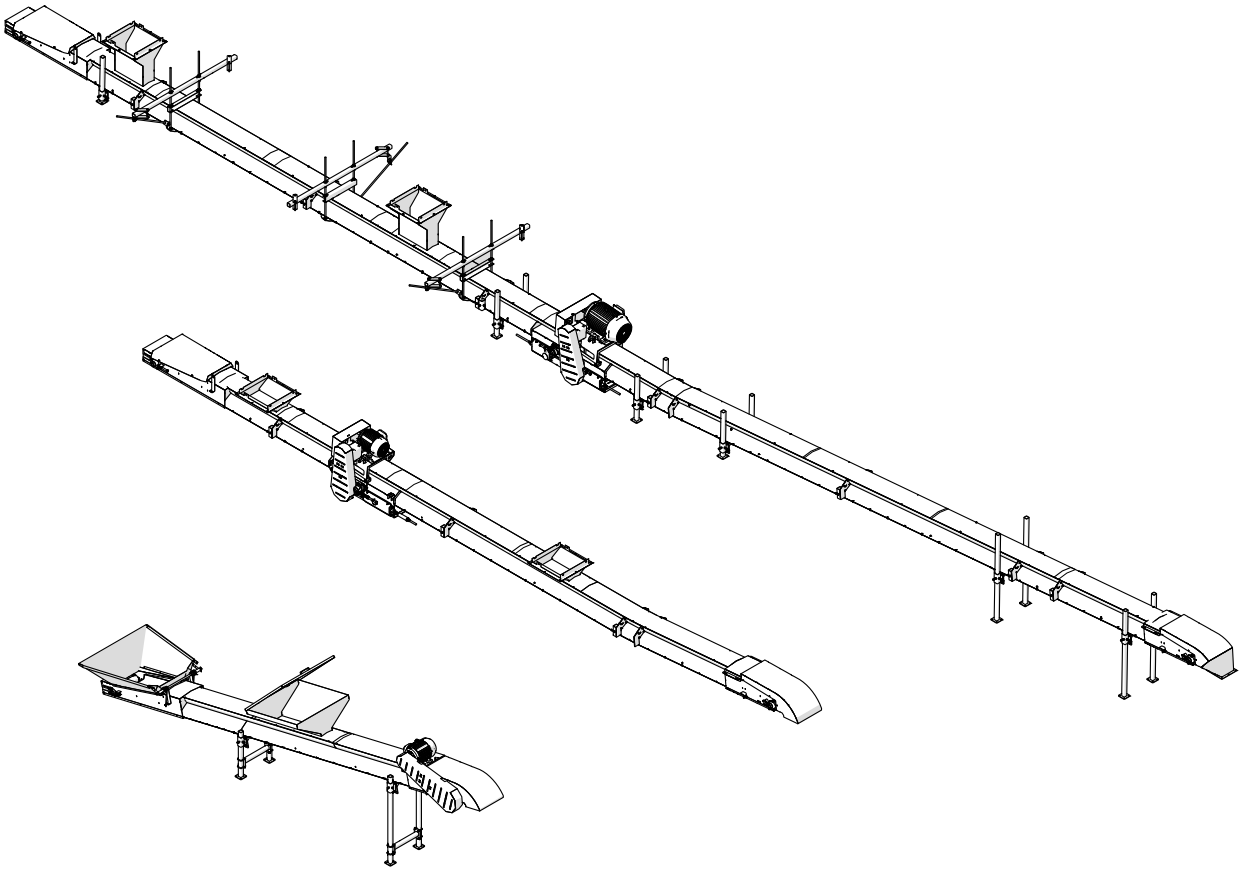
If these conditions are fulfilled, **Norwood Sales Inc.** at its option will either repair or replace any defect. The buyer shall be responsible for all expenses incurred as a result of repairs, labor, parts, transportation or any other work, unless **Norwood Sales Inc.** authorizes such expenses in advance.

The warranty shall not extend to any repairs, changes, alterations, or replacements made to the new equipment other than by **Norwood Sales Inc.** or its authorized dealers.

This warranty extends only to the original owner of the new equipment.

This warranty is limited to the terms stated herein and is in lieu of any other warranties whether expressed or implied, and without limiting the generality of the foregoing, excluded all warranties, expressed or implied or conditions whether statutory or otherwise as to quality and fitness for any purpose of the new equipment. **Norwood Sales Inc.** disclaims all liability for incidental or consequential damages.

This machine is subject to design changes and **Norwood Sales Inc.** shall not be required to retro-fit or exchange items on previously sold units except at its own option.



NORWOOD
Sales Inc.

Norwood Sales Inc.	Toll Free:	800-446-0316
www.norwoodsales.com	Local/Intl:	Fax:
Cooperstown, ND	701-797-3684	701-797-3685
Horace, ND	701-588-4000	701-588-4004
Union, NE	402-263-2100	402-263-2104