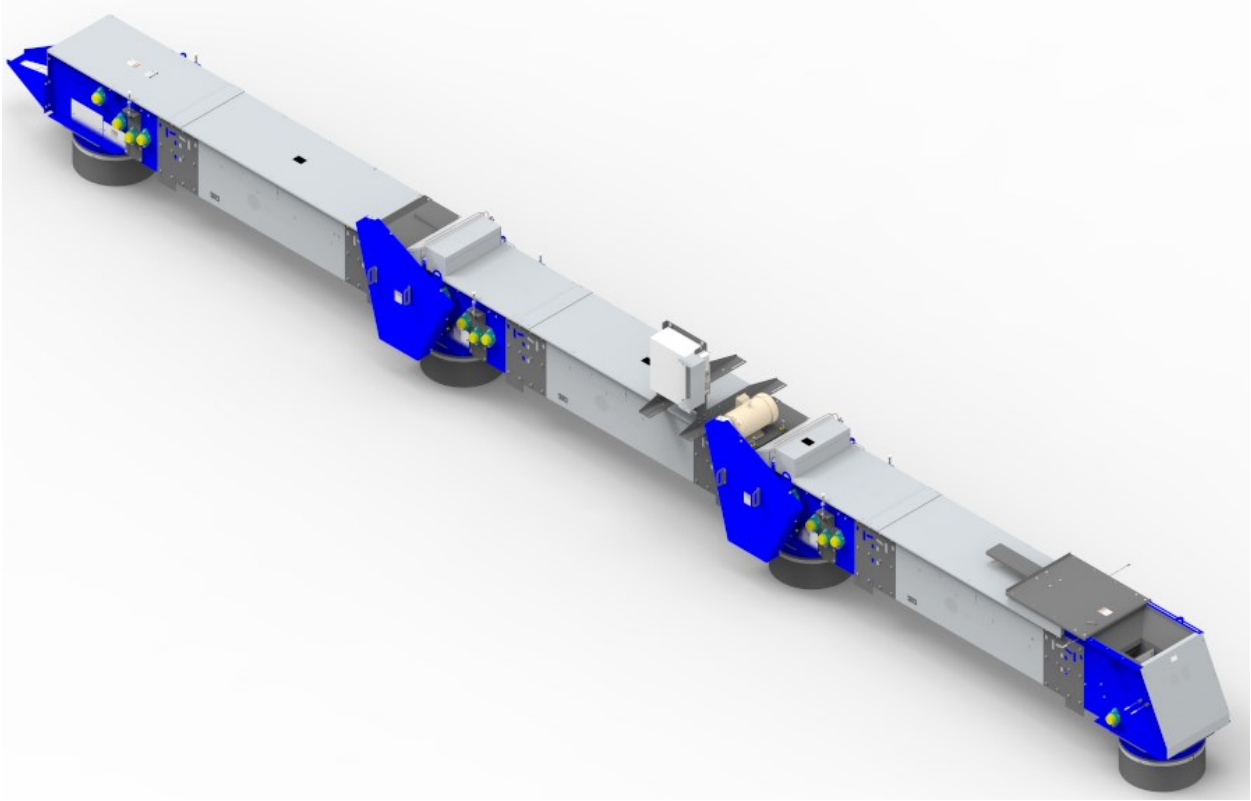
OVERBIN CONVEYOR



Operators Manual

Document: TD-09-06-1082 **Revision: A** **Effective Date: Dec. 2023**






2320 124th Road Sabetha, Kansas 66534 Phone (785) 431-7900 www.uscllc.com

INTRODUCTION

Thank you for choosing USC LLC for your equipment needs. We appreciate your business and will work diligently to ensure that you are satisfied with your choice.

OVERVIEW

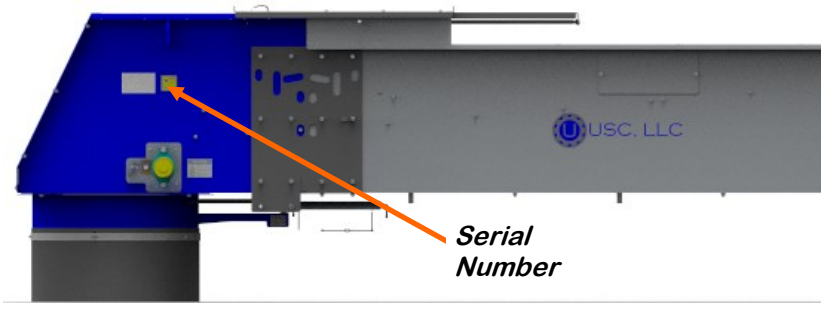
The purpose of this manual is to provide you with the basic information needed to operate and maintain the Overbin Conveyor. It does not hold USC LLC liable for any accidents or injuries that may occur.

The technical information provided in this document is based on extensive testing under controlled conditions at the USC research and development facility. This information is given without guarantee as the conditions of operation and storage of the equipment are beyond our control. Variables such as temperature, humidity, and changes in seed size or variety may all effect the conveying of seed.

RECEIVING YOUR EQUIPMENT

As soon as the equipment is received, it should be carefully inspected to make certain that it has sustained no damage during shipment and that all items listed on the packing list are accounted for. If there is any damage or shortages, the purchaser must immediately notify USC LLC. Ownership passes to purchaser when the unit leaves the USC LLC. premises. The purchaser is responsible for unloading and mounting all components of the equipment.

Document the serial number of the machine for future reference. The serialization label is located on the inlet side of the conveyor.



SERIAL NUMBER:_____

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SECTION A SAFETY INSTRUCTIONS

Every year accidents in the work place maim, kill and injure people. Although it may be impossible to prevent all accidents, with the right combination of training, operating practices, safety devices and operator vigilance, the number of accidents can be significantly reduced. The purpose of this section is to educate equipment users about hazards, unsafe practices and recommended hazard avoidance techniques.

SAFETY WORDS AND SYMBOLS

It is very important that operators and maintenance personnel understand the words and symbols that are used to communicate safety information. Safety words, their meaning and format, have been standardized for U.S. manufacturers and published by the American National Standards Institute (ANSI). The European Community (E.C.) has adopted a different format based on the International Standards Organization (I.S.O.) and applicable machinery directives. Both formats are presented below. Graphic symbols are not standardized but most manufacturers will use some variation of the ones seen in this manual.

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

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

Indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury and/or property damage.

Provides additional information that the operator needs to be aware of to avoid a potentially hazardous situation.

Mandatory Lockout Power Symbol. Disconnect, lockout and tagout electrical and other energy sources before inspecting, cleaning or performing maintenance on this panel.

International Safety Alert Symbol. The exclamation point (!) surrounded by a yellow triangle indicates that an injury hazard exists. However, it does not indicate the seriousness of potential injury. The exclamation point (!) is also used with the DANGER, WARNING and CAUTION symbols so the potential injury is indicated.

Electrocution Hazard Symbol. This symbol indicates that an electrocution hazard exists. Serious injury or death could result from contacting high voltage.

International Electrocution Hazard. This symbol indicates that an electrocution hazard exists. Serious injury or death could result from contacting high voltage.

Mandatory Read Manual Action Symbol. (I.S.O. format) This symbol instructs personnel to read the Operators Manual before servicing or operating the equipment.

Mandatory Read Manual Action Symbol. This symbol instructs personnel to read the Operators Manual before servicing or operating the equipment.

NOTICE

Notice is used to notify people of important installation, operation or maintenance information which is not hazard related.

LOCKOUT / TAGOUT PROCEDURES

Lockout/Tagout is the placement of a lock/tag on an energy isolating device in accordance with an established procedure. When taking equipment out of service to perform maintenance or repair work, always follow the lockout/tagout procedures as outlined in OSHA Standard 1910.147. This standard "requires employers to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices and to otherwise disable machines or equipment to prevent unexpected energizing, start-up, or release of stored energy in order to prevent injury to employees."

CONTROLLED STOP

This is the stopping of machine motion by reducing the electrical command signal to 0 (zero) once the stop signal has been recognized.

HAZARD REVIEW

Electrocution Hazard

Electrocution accidents are most likely to occur during maintenance of the electrical system or when working on or near exposed high voltage wiring. This hazard does not exist when the electrical power has been disconnected, properly locked, and tagged out.

Automatic Start Hazard

This equipment may be controlled by an automated system and may start without warning. Failure to properly disconnect, lockout, and tagout all energy sources of remotely controlled equipment creates a very hazardous situation and could cause injury or even death. PLEASE STAY CLEAR AND BE ALERT.

DANGER! RISK OF ELECTRIC SHOCK AND ARC FLASH

Avoid any alteration to the equipment. Alterations may produce dangerous situations, where serious injury or death may occur. This equipment shall be installed in accordance with local installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made. Owners/operators are responsible for knowing what requirements, hazards, and precautions exist with this equipment. Owners/operators are responsible for informing all personnel associated with the equipment and all who are in the general area of the equipment, the requirements, hazards, and precautions that exist with this equipment. Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation and has received safety training to recognize and avoid the hazards involved. Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and/or with this product. Owners/operators must ensure that all authorized persons have sufficient technical training, knowledge, and experience and be able to foresee and detect potential hazards that may be caused by using the product, by changing the settings and by the mechanical, electrical, and electronic equipment of the entire system in which the product is used. All persons working on and with the product must be fully familiar with all applicable standards, directives, and accident prevention regulations when performing such work. Servicing and maintaining the equipment should only occur if the equipment is deenergized and properly locked out and tagged out. If it is unfeasible to service or maintain the equipment while deenergized, the following standards shall be referenced to ensure safe practices are being followed and proper PPE is being used: 29 CFR § 1910.333 and 29 CFR § 1910.137. No responsibility is assumed by USC, LLC for any consequences arising out of the use of this material.

YOU are responsible for the **SAFE** operation and maintenance of your USC LLC equipment . **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the equipment be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alert you to good safety practices that should be adhered to while operating the equipment

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

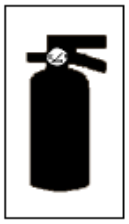
- Equipment owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.
- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think SAFETY! Work SAFELY!

GENERAL SAFETY

1. Read and understand the operator's manual and all safety labels before operating, maintaining, adjusting or unplugging the equipment .
2. Only trained persons shall operate the equipment . An untrained operator is not qualified to operate the machine.

3. Have a first-aid kit available for use should the need arise, and know how to use it.
4. The use of fall protection is required at all times during the installation process, as well as maintenance functions.

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



5. Do not allow children, spectators or bystanders within hazard area of machine.
6. Wear appropriate protective gear. This includes but is not limited to:

- A hard hat
- Protective shoes with slip resistant soles
- Protective goggles
- Heavy gloves
- Hearing protection
- Respirator or filter mask
- Safety harness

7. Place all controls in neutral or off, stop motor, and wait for all moving parts to stop. Then disable power source before servicing, adjusting, repairing, or unplugging.

8. Review safety related items annually with all personnel who will be operating or maintaining the equipment.

OPERATING SAFETY:

1. Read and understand the operator's manual and all safety labels before using.
2. Disconnect and disable electrical supply completely and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Clear the area of bystanders, especially children, before starting.
4. Be familiar with the machine hazard area. If anyone enters hazard area, shut down machine immediately. Clear the area before restarting.
5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

MAINTENANCE SAFETY

1. Review the operator's manual and all safety items before working with, maintaining or operating the equipment .
2. Place all controls in neutral or off, stop motors, disable power source, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Follow good shop practices:

   Keep service area clean and dry.
   Be sure electrical outlets and tools are properly grounded.
   Use adequate light for the job at hand.
4. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
5. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.
6. Before resuming work, install and secure all guards when maintenance work is completed.
7. Keep safety labels clean. Replace any sign that is damaged or not clearly visible.
8. The use of fall protection is required at all times during the installation process, as well as maintenance functions.
9. Proper footwear should be worn during the installation process, as well as any maintenance functions.

SAFETY LABELS

1. Keep safety labels clean and legible at all times.
2. Replace safety labels that are missing or have become illegible.
3. Replaced parts that displayed a safety label should also display the current label.
4. Replacement safety labels are available. Contact your authorized dealer

How to Install Safety Labels:

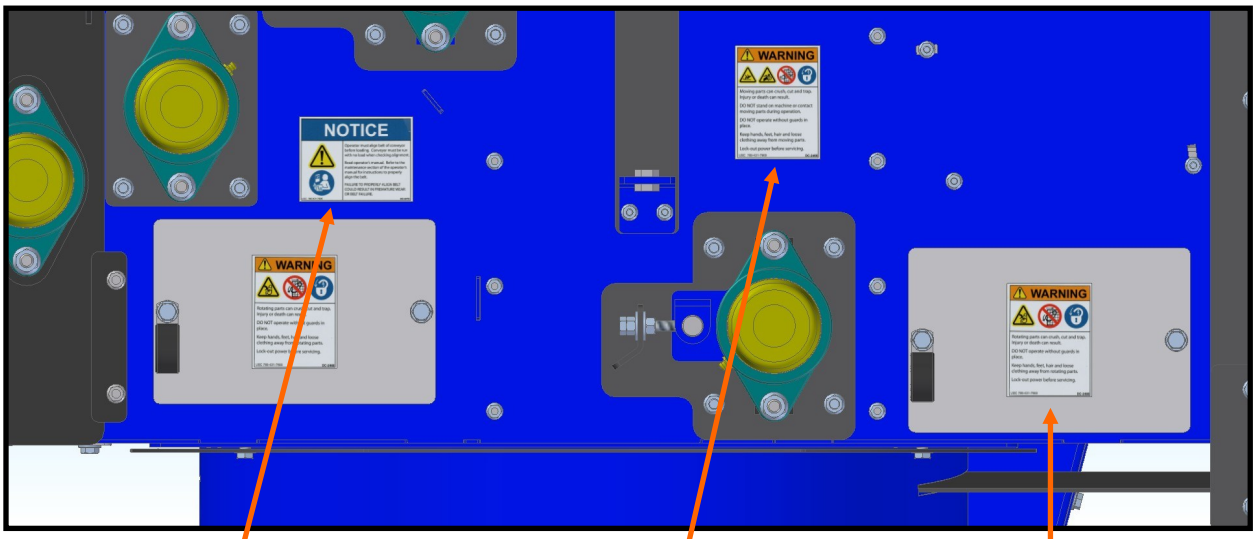
- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Decide on the exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

Located on the USC equipment you will find safety labels. Always be sure to read and follow all directions on the labels.

Guards provided with USC equipment are to remain in place during operation.

Think **SAFETY!** Work **SAFELY!**

REMEMBER—If safety labels have been damaged, removed, become illegible, or parts replaced without safety labels, new labels must be applied. New safety labels are available from your authorized dealer.



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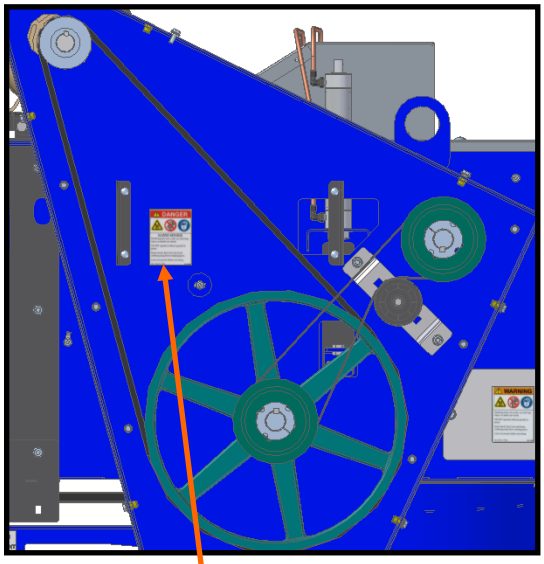

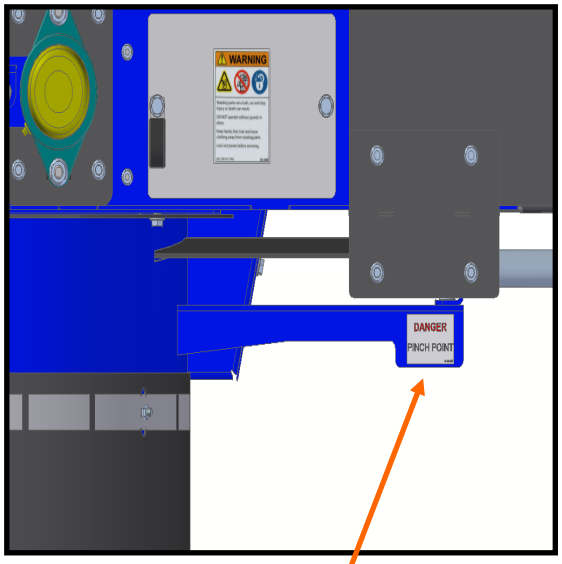

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SECTION B INSTALLATION

⚠ WARNING

Be sure to use safe working habits when installing your equipment. Installation of the USC overbin requires physical strength and strain, make sure you are in healthy physical condition. USC is not liable for any injuries that occur while installing.

⚠ DANGER

HIGH VOLTAGE ~ Always disconnect the power source before working on or near the control panel or lead wires.

⚠ DANGER

HIGH VOLTAGE ~ Use insulated tools when making adjustments while the controls are under power.

NOTICE

Installation of the Overbin and catwalk is handled by USC, but the purchaser will need to facilitate the electrical and air connections for their operation. It's essential to coordinate with USC to understand the specific electrical and air requirements for these systems to ensure a seamless installation process.

USC equipment may operate within a Group II, Division 2, Class G hazardous area which contains seed dust. If so, the equipment must be certified for use in this area. To avoid the possibility of an explosion ignited by static electricity, all USC equipment should be grounded by attaching a bonding strip to the metal frame and securing that strip to the factory ground point.

If labeled accordingly, USC products are designed to comply with CSA 22.1 for use in a Class II, Division 2, Group G environment. When connecting the USC system power cord into a power supply, first determine if the supply is also within the hazardous area where the USC system is located. If so, we recommend that the power be hard wired into the source. Do not use a standard electrical plug for this purpose. For other acceptable methods of connecting to a power source, or any other additional miscellaneous equipment to the USC system within a hazardous location, please consult CSA 22.1, Section 18-200 and 18-274. Review the appropriate section and ensure compliance with one of the options given.

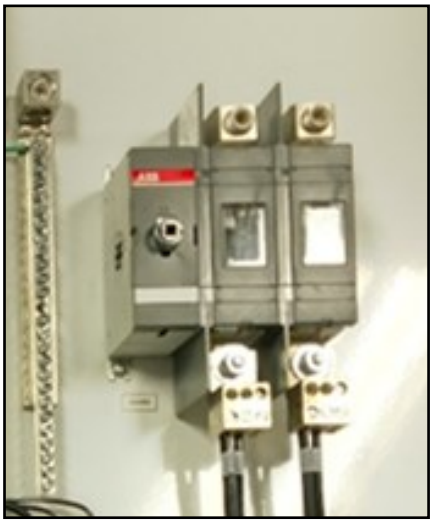
When connecting to USC equipment from a remote location, and the USC equipment is in a hazardous Class II, Group G environment, customers are advised to follow the requirements within CSA 22.2 no. 25. More details may also be found in CSA 22.1 18-252 (wiring methods). There are various options covered within this section for wiring in a Class II, Group G (dust) environment. Select the best method suited for your specific location.

CONTROL PANEL CONNECTIONS

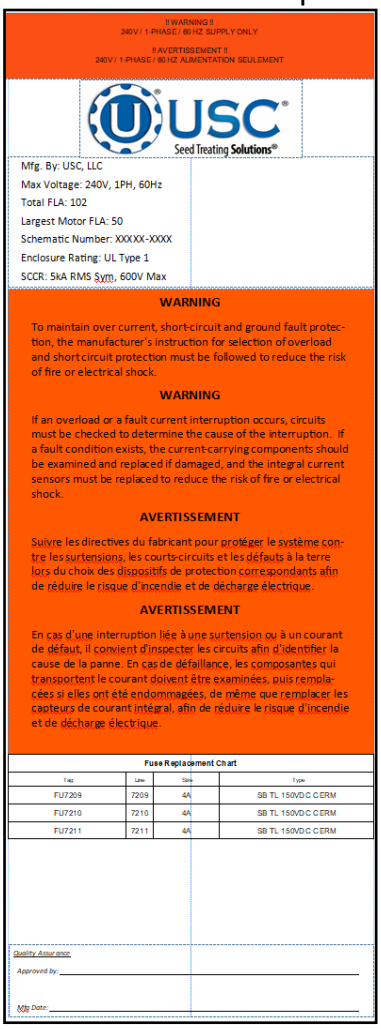
Have a certified electrician provide power to the Overbin system as listed by the control panel nameplate located inside of each control panel. Wire in all necessary customer supplied wiring and all provided cables as listed in your provided site schematics. Provide convenient shutdown switches and comply with local electrical codes. USC recommends that flexible conduit be used wherever possible.

All Incoming site power to control panels will be to each control panel disconnect and ground bar terminals.

Control Panel Disconnect and Ground Bar



Control Panel Nameplate



!! WARNING !!
240V / 1-PHASE / 60 HZ SUPPLY ONLY
!! AVERTISSEMENT !!
240V / 1-PHASE / 60 HZ ALIMENTATION SEULEMENT

USC Seed Treating Solutions®

Mfg. By: USC, LLC
Max Voltage: 240V, 1PH, 60Hz
Total FLA: 102
Largest Motor FLA: 50
Schematic Number: XXXXX-XXXX
Enclosure Rating: UL Type 1
SCCR: 5kA RMS Sym, 600V Max

WARNING

To maintain over current, short-circuit and ground fault protection, the manufacturer's instruction for selection of overload and short circuit protection must be followed to reduce the risk of fire or electrical shock.

WARNING

If an overload or a fault current interruption occurs, circuits must be checked to determine the cause of the interruption. If a fault condition exists, the current-carrying components should be examined and replaced if damaged, and the integral current sensors must be replaced to reduce the risk of fire or electrical shock.

AVERTISSEMENT

Suivre les directives du fabricant pour protéger le système contre les surtensions, les courts-circuits et les défauts à la terre lors du choix des dispositifs de protection correspondants afin de réduire le risque d'incendie et de décharge électrique.

AVERTISSEMENT

En cas d'une interruption liée à une surtension ou à un courant de défaut, il convient d'inspecter les circuits afin d'identifier la cause de la panne. En cas de défaillance, les composantes qui transportent le courant doivent être examinées, puis remplacées si elles ont été endommagées, de même que remplacer les capteurs de courant intégral, afin de réduire le risque d'incendie et de décharge électrique.

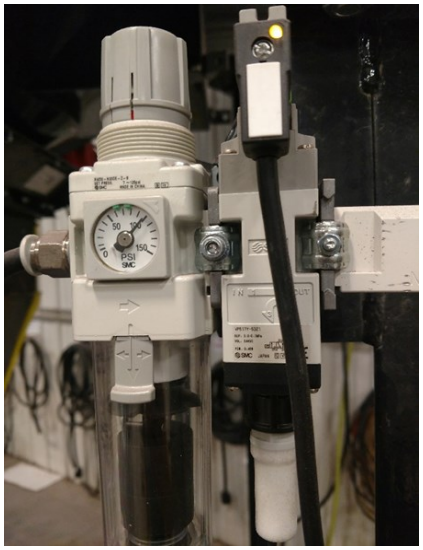
Fuse Replacement Chart

Tag	Line	Data	Type
FU7209	7209	4A	SB TL 150VDC CERM
FU7210	7210	4A	SB TL 150VDC CERM
FU7211	7211	4A	SB TL 150VDC CERM

Quality Assurance
Approved by: _____
Mfg Date: _____

AIR FILTER / REGULATOR

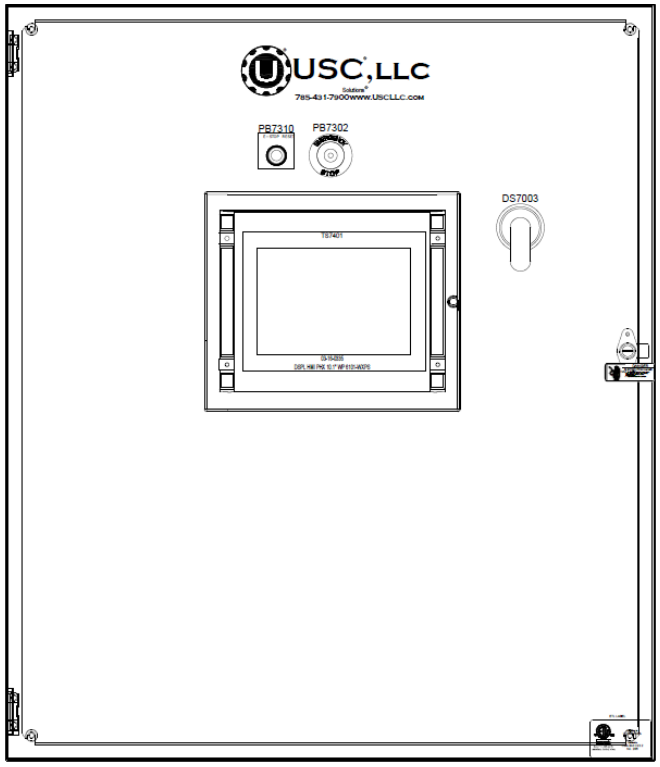
Supply approximately 100-110 psi of consistent air pressure to the air filter& regulator. The regulator is located on the Automated main control panel for the Overbin.



⚠ WARNING

There are four interlocked Emergency Stop Circuits located on the Overbin Automated Main Control Panel (AMCP). The total cable length of each circuit should not exceed 150 feet. Use Additional circuits for additional bin rows.

CONTROL PANEL CONNECTIONS

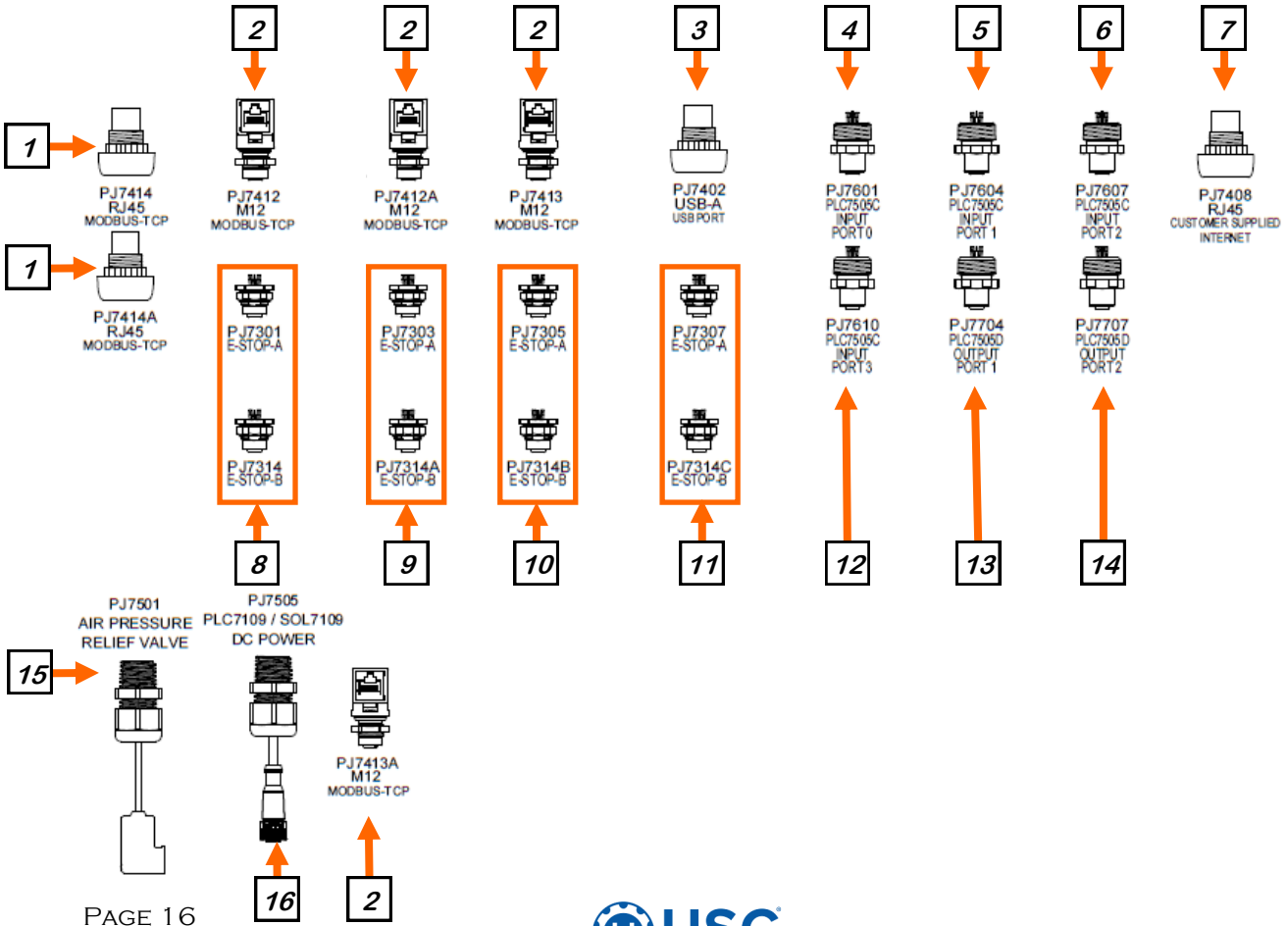


Overbin Automated Main Control Panel

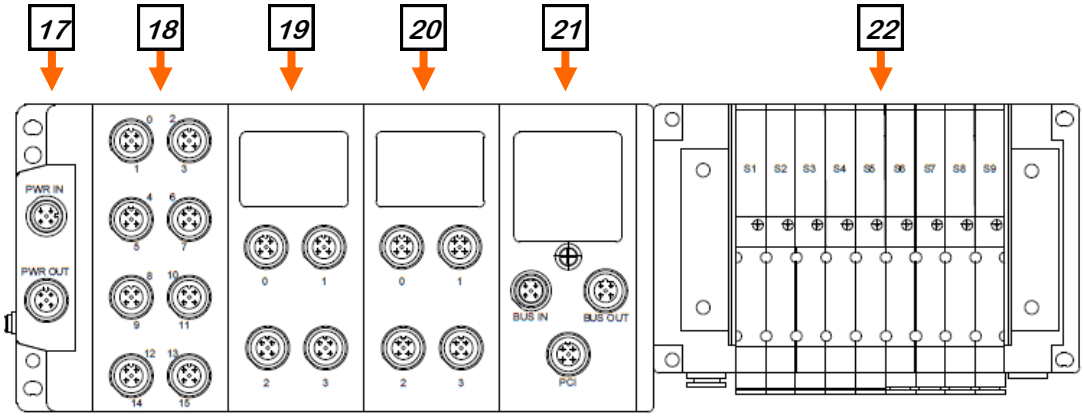
The Overbin Automated Main Control Panel (AMCP) is where all the Automation, Leg / Bin Fill conveyor, & Inlet diverter controls for the Overbin Conveyor system are located.

Physical controls Located on the panel are the Emergency Stop Button, the Emergency Stop Reset Button, Panel Disconnect Switch, & Touch Screen.

There are several panel connection points located on the bottom of the control panel, the side of the control panel, and on the external IO controller of the control panel.



CONTROL PANEL CONNECTIONS

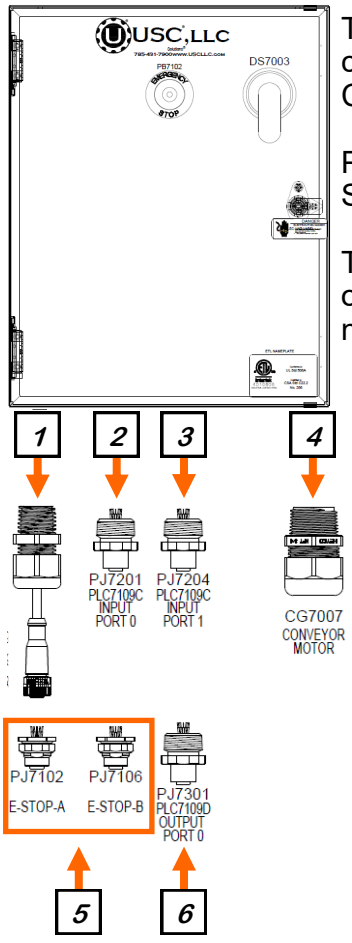


1. Modbus-TCP RJ45 Connections for Standard Ethernet Cables.
2. Modbus-TCP M12 Connections for M12 Ethernet Cables, Used for Control panel interconnections.
3. USB Port used for data management tasks.
4. M12 connection to PLC Card D (19) Port 0 on AMCP External IO to AMCP.
5. M12 connection to PLC Card D (19) Port 1 on AMCP External IO to AMCP.
6. M12 connection to PLC Card D (19) Port 2 on AMCP External IO to AMCP.
7. Customer Supplied Internet. RJ45 Standard Ethernet cable. Used to connect the panel to the Internet for U-Connect capabilities.
8. Emergency Stop Circuit 1. Connect cables in a daisy chain from Port A on source panel to Port B on the next panel. Use loop back cables to complete the circuit on each end of the chain.
9. Emergency Stop Circuit 2. Connect cables in a daisy chain from Port A on source panel to Port B on the next panel. Use loop back cables to complete the circuit on each end of the chain.
10. Emergency Stop Circuit 3. Connect cables in a daisy chain from Port A on source panel to Port B on the next panel. Use loop back cables to complete the circuit on each end of the chain.
11. Emergency Stop Circuit 4. Connect cables in a daisy chain from Port A on source panel to Port B on the next panel. Use loop back cables to complete the circuit on each end of the chain.
12. M12 connection connects PLC Card D (19) Port 3 on AMCP External IO to AMCP.
13. M12 connection connects PLC Card E (20) Port 1 on AMCP External IO to AMCP.
14. M12 connection connects PLC Card E (20) Port 2 on AMCP External IO to AMCP.
15. Air pressure relief valve connection. The Valve will release the pressure in the system when the E-Stop is activated.
16. M12 Power connection to PLC Card A (17) AMCP External IO to AMCP.

CONTROL PANEL CONNECTIONS

17. PLC Card A; Power Supply Card. 24VDC Power from the AMCP.
18. PLC Card B; 16x Input Card. Diverter Position Inputs. See schematic for specific device connections.
19. PLC Card C; 8x Input Card. AMCP Panel Inputs. See schematic for specific device connections.
20. PLC Card D; 8x Output Card. AMCP Panel Outputs. See schematic for specific device connections.
21. PLC Card E; Control Module with 2 port switch (M12 Ethernet). See Schematic for IP Address, and Dip switch configuration settings.
22. Air Solenoid stack; Air solenoid module with 9 air solenoid valves. See the schematic for specific device control.

Overbin Conveyor Control Panel



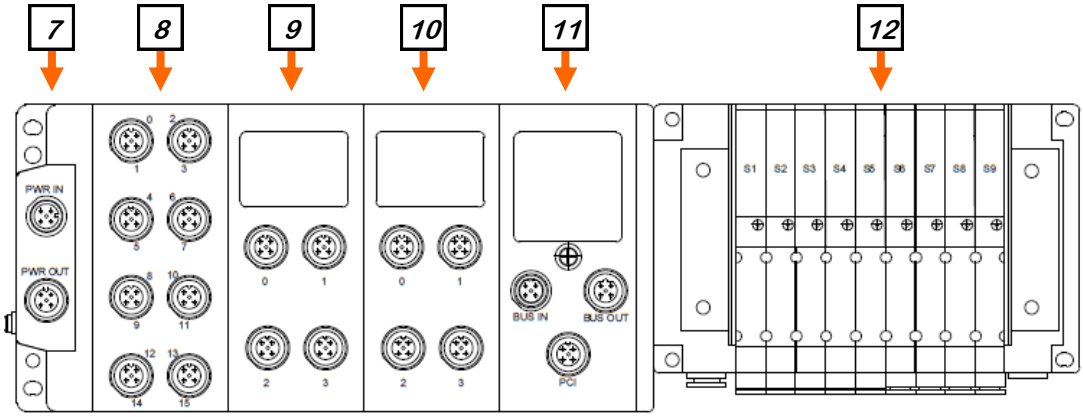
The Overbin Conveyor Control Panel (CCP) is where all the conveyor motor & bin gate controls are located for the Overbin Conveyor system .

Physical controls Located on the CCP panel are the Emergency Stop Button, & Panel Disconnect Switch.

There are several panel connection points located on the bottom of the control panel, the side of the control panel, and on the external IO controller of the control panel.

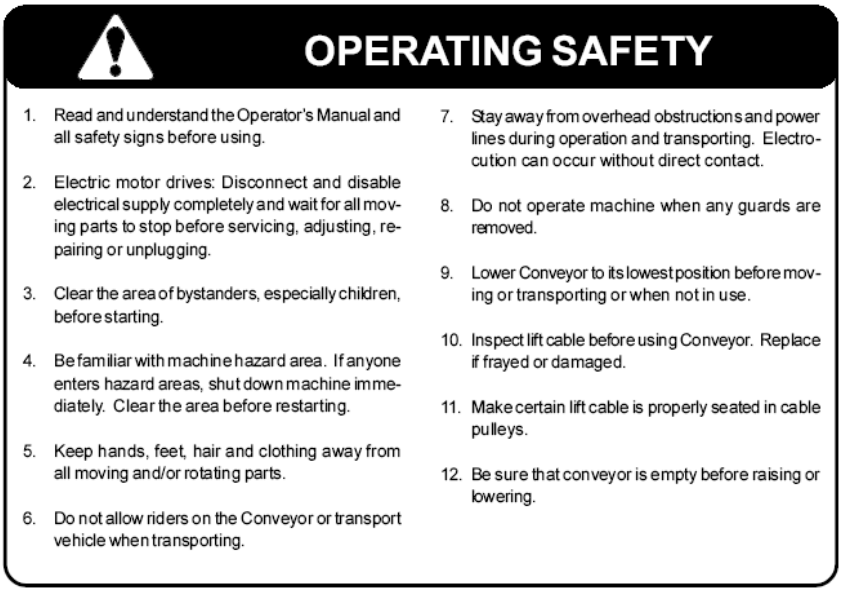
1. M12 Power connection to PLC Card A (7) AMCP External IO to AMCP.
2. M12 connection to PLC Card C (9) Port 0 on Conveyor External IO to Conveyor Control Panel.
3. M12 connection to PLC Card C (9) Port 1 on Conveyor External IO to Conveyor Control Panel.
4. Cord Grip for Motor Power Cable
5. Emergency Stop Circuit. Connect cables in a daisy chain from Port A on source panel to Port B on the next panel. Use loop back cables to complete the circuit on each end of the chain.
6. M12 connection to PLC Card D (10) Port 0 on Conveyor External IO to Conveyor Control Panel.

CONTROL PANEL CONNECTIONS



7. PLC Card A; Power Supply Card. 24VDC Power from the Conveyor Control Panel (CCP).
8. PLC Card B; 16x Input Card. Bin Gate and Bin Diverter Position Inputs. See schematic for specific device connections.
9. PLC Card C; 8x Input Card. Conveyor Control Panel Inputs. See schematic for specific device connections.
10. PLC Card D; 8x Output Card. Conveyor Control Panel Outputs. See schematic for specific device connections.
11. PLC Card E; Control Module with 2 port switch (M12 Ethernet). See Schematic for IP Address, and Dip switch configuration settings.
12. Air Solenoid stack; Air solenoid module with 9 air solenoid valves. See the schematic for specific device control.

SECTION C MECHANICAL OPERATION



OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before using.
2. Electric motor drives: Disconnect and disable electrical supply completely and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Clear the area of bystanders, especially children, before starting.
4. Be familiar with machine hazard area. If anyone enters hazard areas, shut down machine immediately. Clear the area before restarting.
5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
6. Do not allow riders on the Conveyor or transport vehicle when transporting.
7. Stay away from overhead obstructions and power lines during operation and transporting. Electrocution can occur without direct contact.
8. Do not operate machine when any guards are removed.
9. Lower Conveyor to its lowest position before moving or transporting or when not in use.
10. Inspect lift cable before using Conveyor. Replace if frayed or damaged.
11. Make certain lift cable is properly seated in cable pulleys.
12. Be sure that conveyor is empty before raising or lowering.

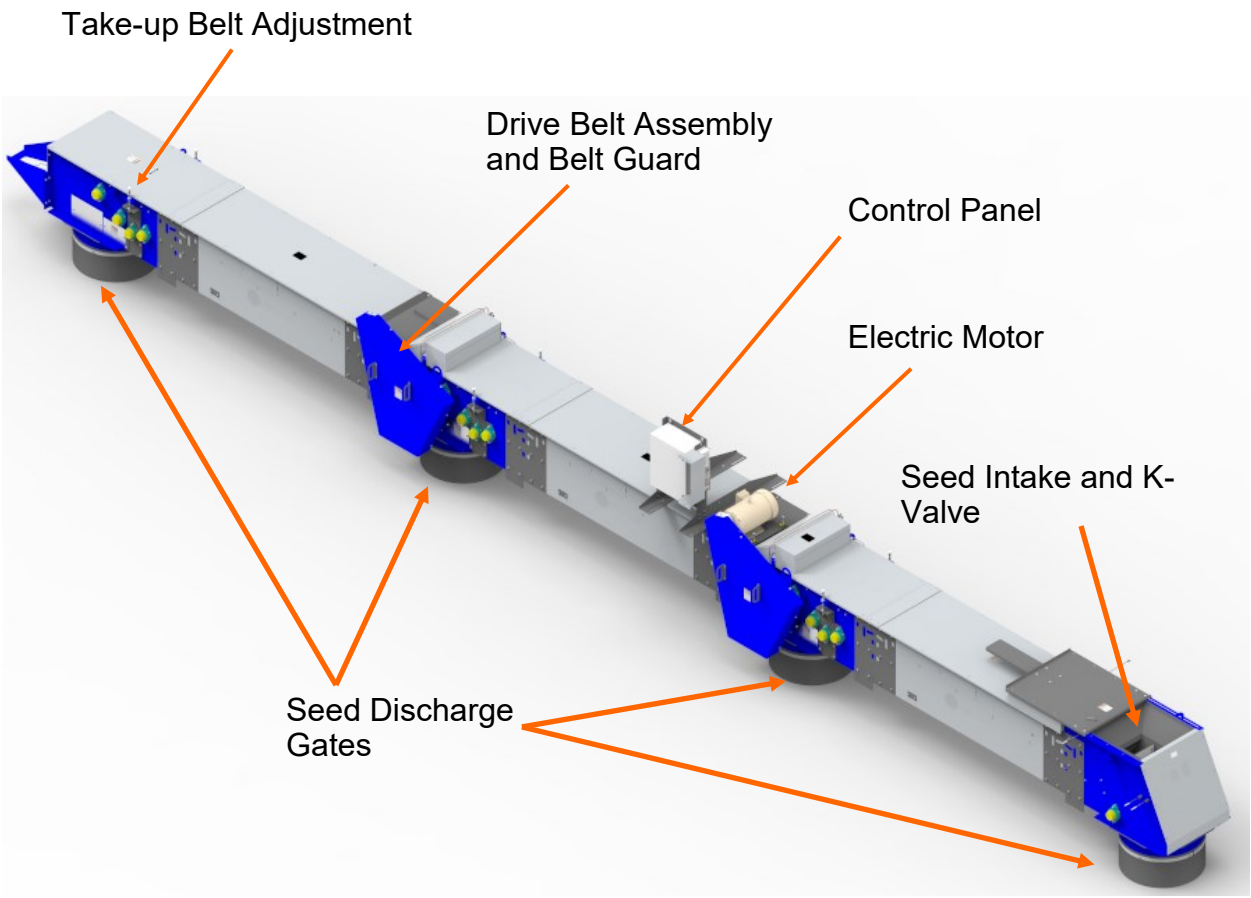
The USC Overbin Conveyor is designed to efficiently move seed into bins. Power is provided by an electric motor(s). Be familiar with the machine before starting.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, and prudence of personnel involved in the operation, transport, maintenance and storage of equipment or in the use and maintenance of facilities.

NOTICE Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the worksite. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum efficiency. By following the operating instructions in conjunction with a good maintenance program, your conveyor will provide many years of trouble free service.

SYSTEM OVERVIEW



PRE-OPERATION CHECKLIST

Efficient and safe operation of the USC LLC Overbin Conveyor requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both the personal safety and maintaining the good mechanical condition of the conveyor that this checklist is followed.

Before operating the conveyor and each time thereafter, the following areas should be checked off:

1. Service the machine per the schedule outlined in Section G, Maintenance. (see page 33).

2. Use only an electric motor of adequate power to operate the machine.

3. Check that all guards are installed, secured and functioning as intended. Do not operate with missing or damaged shields.

4. Check worksite. Clean up working area to prevent slipping or tripping.

5. Check that drive belts and conveying belts are not frayed or damaged and that they are properly adjusted and aligned.

OPERATION

1. Clear the area of bystanders before starting the equipment.

2. Review the workplace Hazards schematic and use extra care when inside the hazard area. Keep all bystanders out of this area. Should anyone enter this area, stop the machine immediately.

3. Turn the Overbin conveyor on and open the overbin slide gate to begin conveying seed into your bin.

4. To stop the conveyor, shut the bin gate and run until the belt is clear of material. Then, turn off the conveyor motor.

OPERATING HINTS

- Always listen for any unusual sounds or noises. If any are heard, stop the machine and determine the source. Correct the problem before resuming work.

- Never allow anyone into the workplace hazard area. If anyone enters, stop immediately. Make them LEAVE before resuming work.

- Do not run the machine for long periods of time with no material on the belt. It increases the belt wear. Try to run the conveyor only when performing maintenance or moving material.

- Always check and make sure the belt is properly aligned. Neglecting your belt may lead to pre-mature wear and possible breakage.

- When reversing the overbin conveyor, you need to check the alignment before and after reversing. The alignment may shift when you change drive directions.

EMERGENCY STOPPING

Although it is recommended that the machine be emptied before stopping, in an emergency situation, stop or shutdown the power source immediately. Correct the emergency before resuming work.

RESTARTING

When the machine is shut down inadvertently or for an emergency, the belt may still be covered with material. It may be necessary to tighten the drive belt slightly to handle the heavier-than-normal starting loads.

MACHINE BREAK-IN

Although there are no operational restrictions on the Conveyor when used for the first time, it is recommended that the following mechanical items be checked:

Before Starting

1. Read the Conveyor Operator's Manual.
2. During the conveyors first few minutes of operation, check each conveyor belt alignment to ensure belts are tracking correctly when running empty and also during loaded conditions.

After Operating for 1/2 Hour

1. Re-torque fasteners and hardware.
2. Check that all safety decals are installed and legible. Apply new decals if required.
3. Check the drive belts tension and alignment. Tension or align as required.
4. Check the conveying belt tensions and alignments. Tension or align as required.
5. Check that all guards are installed and working as intended.

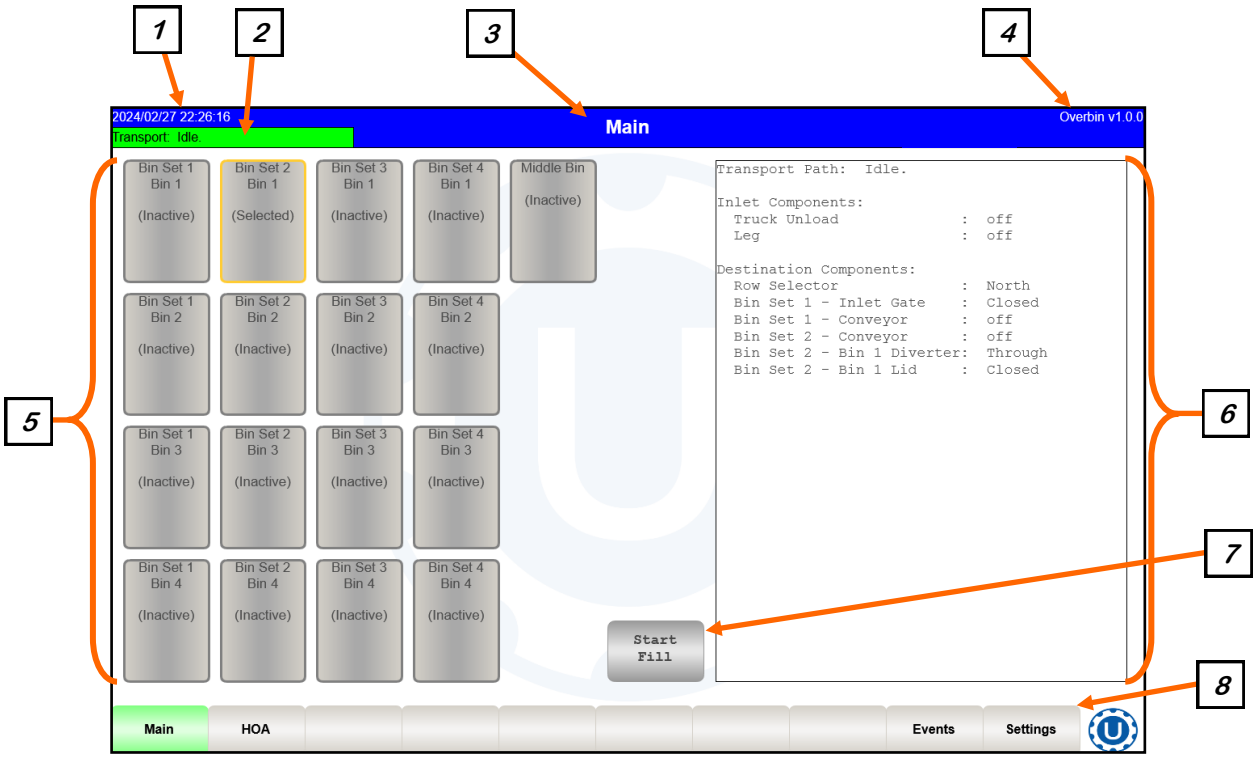
After Operating for 5 Hours and 10 Hours

1. Re-torque all bolts, fasteners and hardware.
2. Check that all guards are installed, secured and functioning as intended. Do not operate with missing or damaged shields.
3. Check safety decals. Install new ones if required.
4. Check the drive belts, and all conveying belts tension and alignment. Tension or align as required.
5. Then, begin the normal servicing and maintenance schedule as defined in the Maintenance Section.

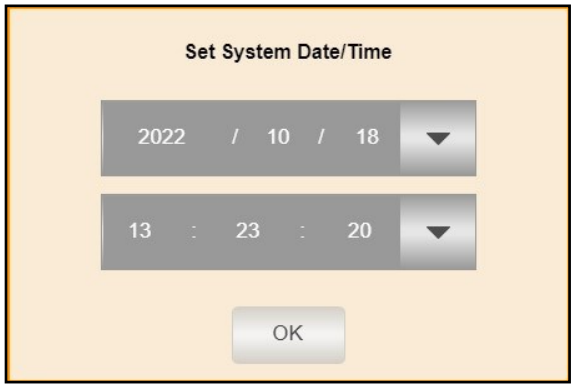
SYSTEM OVERVIEW

MAIN SCREEN

This screen informs the operator of the status of all relevant devices and allows for automated control of the system.



MAIN SCREEN DESCRIPTIONS



1. DATE & TIME: The date and time are displayed in the upper left corner of the screen. If pressed, a popup will appear and allow modifications to the Date and Time of the system. Select the top dropdown to set the year, month, and day. Pressing each numeric will allow these values to be manually set. Select the bottom three numeric to set the time. The system is based on a 24 hour clock. When keying in the hour, 2:00 P.M. is 14 hours as in the example below. Press the OK button in the center of the screen to save your entries.

2. TRANSPORT STATUS DISPLAY: Displays the current status of the Transport Control System from Idle to various other operational states.

3. SCREEN TITLE DISPLAY: Displays the current screen title.

4. PROGRAM VERSION DISPLAY: Displays the current program release version.

5. DESTINATION BINS: These clickable objects represent all the destination bins you can deliver seed to. They can also provide various little status tidbits as well. They will be listed in order of hardware assignment from top to bottom and left to right. If your system has more than one inlet path option, when you select a destination bin you will be prompted about which inlet path to use. If only one exists in the system, it will be automatically selected for you and no prompting will occur.

6. HARDWARE STATUS: Per the selected destination bin on the left of the screen, this area shows all the devices that will be involved in the seed transport. Everything is listed in order, top to bottom, seed source to seed destination. Each line item details one device and its operational status.

7. START FILL BUTTON: This button has 3 operational states to it: Start Fill, Shutdown and Terminate. Start Fill will begin the equipment start up sequence but first secures all diverters to their home positions. Once equipment begins starting up, this button changes to the Shutdown mode allowing you to immediately stop the startup operation. Once fully started up, hitting Shutdown begins a proper, timed/sequenced shutdown operation. At this point the button changes to Terminate mode and it will then allow you to immediately stop everything.

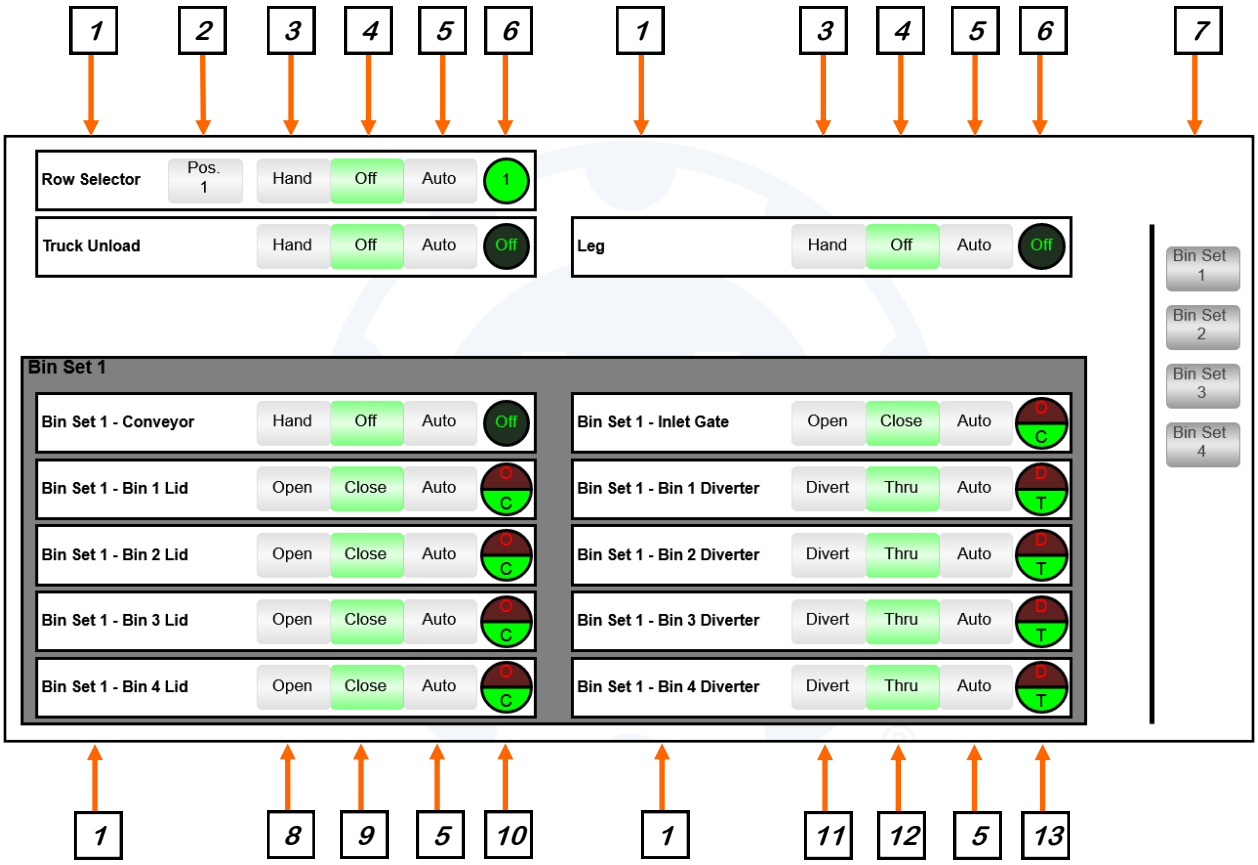
8. NAVIGATION BAR: Pressing any of the buttons on this bar will navigate you to another screen. A green button will indicate the currently active screen.

H-O-A (HAND-OFF-AUTO) SCREEN

⚠ WARNING

These H-O-A buttons force the selected component to be energized (HAND), de-energized (OFF), or automatically energized by the normal logic sequence (AUTO). The HAND function will cause the component to operate independent of whatever else the system is trying to do automatically. These functions should not normally be used if the automated sequencing is active. **Be sure to understand the impact of energizing or de-energizing a component with the settings before using them. These commands are not a substitute for Lockout/Tagout procedures when working on or near this machine. Use proper lockout/tagout procedures to disable the equipment before servicing it.**

Hand-Off-Auto controls are provided for most of the automated devices in the system, and are accessed on this screen.



H-O-A (HAND-OFF-AUTO) SCREEN DESCRIPTIONS

1. DEVICE NAME DISPLAY: Displays the device name.

2. DIVERTER POSITION SELECTOR: This selector is normally only available on the row selector diverter (usually a post-leg diverter) because it can often have more than 2 positions depending on the site.

3. HAND BUTTON: Pressing this button will put the corresponding device in the Hand state. In the Hand state, the device will energize and run in the standard direction. The Hand button is disabled while in any other state.

4. OFF BUTTON: Pressing this button will put the corresponding device in the Off state. In the Off state, the device will not be energized.

5. AUTO BUTTON: Pressing this button will put the corresponding device in the Auto state. In the Auto state the device will be controlled by the automated process, energizing during a run.

6. INDICATOR LAMP: Indicates a diverter position or the on/off status of a device.

7. BIN SET SELECTOR: This set of buttons allows you to switch your HOA controls from one Bin Set to another.

8. OPEN: Opens the bin lid.

9. CLOSE: Closes the bin lid.

10. MULTI-INDICATOR LAMP: This lamp registers 4 pieces of information. The top half shows the status of the Lid Open sensor and the bottom half shows the status of the Lid Closed sensor. The top half will light up bright red when the sensor is active and will go dark when not active. The bottom half will light up bright green when the sensor is active and go dark when not active.

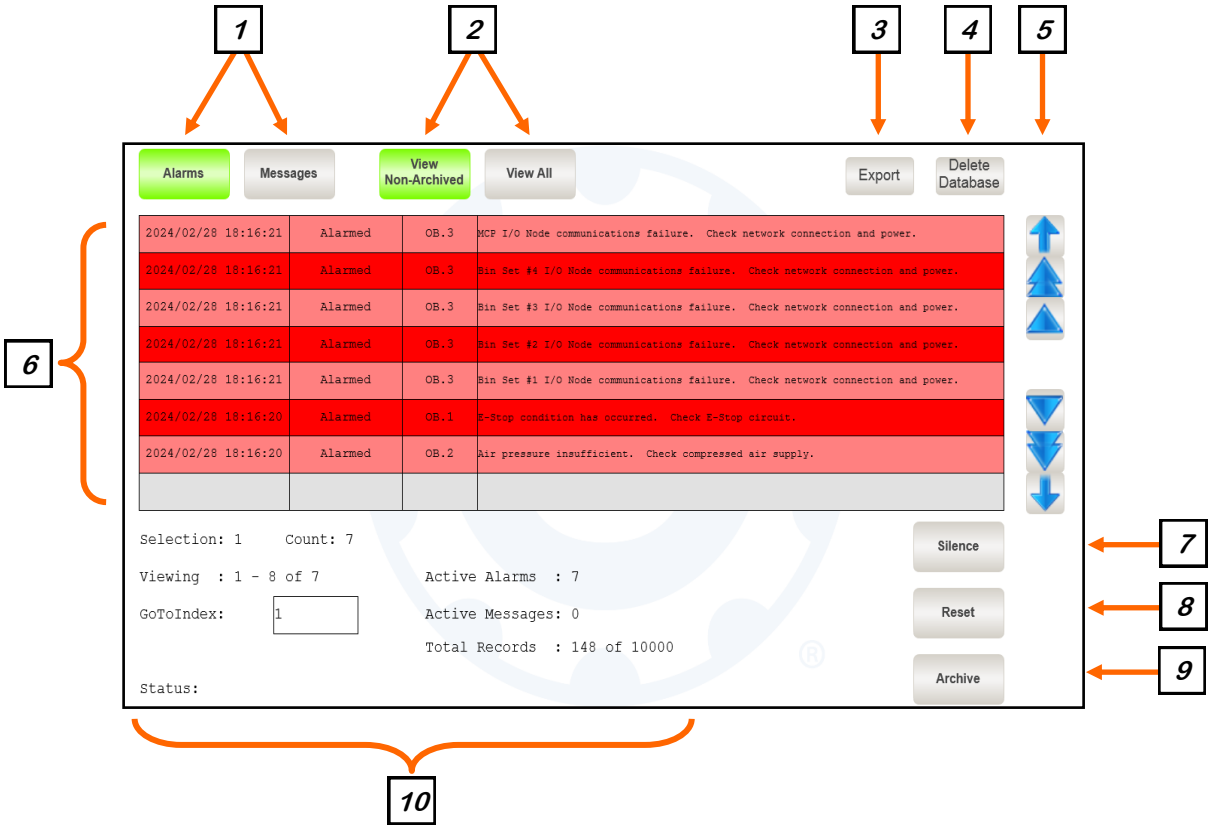
11. DIVERT: This button will divert seed into the indicated bin.

12. THRU: This button will change the bin diverter to the thru (or through) position thus allowing the seed to pass on towards the bins further down the row.

13. MULTI-INDICATOR LAMP: This lamp registers 4 pieces of information. The top half shows the status of the Bin Divert sensor and the bottom half shows the status of the Bin Thru sensor. The top half will light up bright red when the sensor is active and will go dark when not active. The bottom half will light up bright green when the sensor is active and go dark when not active.

EVENTS SCREEN

This screen is where you can work with your alarm and message events.



EVENTS SCREEN DESCRIPTIONS

1. ALARMS/MESSAGES LIST SELECTORS: These two buttons switch between viewing Alarms vs. Messages. Alarms are events that will prevent your system from running or will immediately stop a currently running system. Messages are lower priority issues that won't prevent you from running your system.

2. VIEW NON-ARCHIVED/ALL: These two buttons toggle a filter on the view between only seeing non-archived entries (ie. all your current problems) vs. all entries, including archived entries.

3. EXPORT: Pressing this button will export all alarms and messages events to a USB storage device. Data will be stored in CSV format.

4. DELETE DATABASE: Pressing this button will delete the entire alarms and messages database.

5. NAVIGATION: These buttons allow you to navigate up and down the list of events. They provide single line movement, paging and jumping to top or bottom of the list.

6. EVENT LIST: This is the list of events. Columns of data, left to right, are Date and Time of event, Status of event (Alarmed, Silenced, Acknowledged, Archived), Module and/or Device ID event was generated by and then the Description of the problem which often also includes recommendations for fixing the problem.

7. SILENCE: Pressing this button will silence your current alarms' affect on the alarm horn (if your system is outfitted with one). The event status will be changed to "Silenced" and line items will be marked in yellow.

8. RESET: Pressing this button will reset your alarm or message entries. They will be set to the "Acknowledged" status and line items will be marked in green.

9. ARCHIVE: Pressing this button will archive any events currently in the "Acknowledged" status (it changes their status to "Archived").

10. STATUS AREA: This area provides several general database status and statistical pieces of information concerning the entire list of events in the database. It includes indication of where you have currently navigated within the list, a count of currently displayed events, a total count of records in the database, how many active alarms and how many active messages there currently are.

TROUBLESHOOTING SECTION E

Below is a table describing the most frequent problems and solutions with the Overbin Conveyor. For further assistance, contact your authorized dealer

Problem	Possible Cause	Solution
Conveyor will not run.	1. Not turned on. 2. Conveying belt loose. 3. Drive belt loose.	1. Start power source or turn power on. 2. Tighten and align belt. 3. Tighten drive belt.
Belt edge fraying.	1. Belt not aligned.	1. Align and tension belt.
Low conveying capacity.	1. Slow operating speed. 2. Conveyor belt slipping. 3. Drive belt slipping.	1. Increase operating speed. 2. Tighten belt. 3. Set drive belt tension.
Conveyor plugs up.	1. The conveyor may be jam-ming because too much grain is reaching the conveyor. 2. The conveyor may be jammed with foreign material. 3. The Spout discharge may be plugged.	1. Decrease the amount of grain the conveyor is gathering. 2. Remove any foreign material in the conveyor. 3. Unplug any plugs at the spout discharge.

UNPLUGGING

In unusual moisture or material conditions, the machine may plug. When plugging occurs, follow this procedure:

1. Place all controls in neutral or off, stop motor, disable and lock out power source before unplugging.
2. Unbolt and remove the necessary conveyor covers.
3. Unscrew and open access doors.
4. Remove plugged material.
5. Install and secure conveyor covers, close and re-attach access doors.

ELECTRICAL & AUTOMATION TROUBLESHOOTING

Problem	Possible Cause	Solution
Diverter, gate or bin lid fails to report that it has reached its commanded position.	1. Air pressure may be insufficient to complete the move. 2. Something may be physically preventing the move. 3. Position sensor itself may be incorrectly adjusted.	1. Ensure air pressure is properly supplied and that it is at proper levels. 2. Inspect the diverter, gate or bin lid for obstructions or inhibitors. 3. Adjust the position sensor.
Diverter, gate or bin lid does not move to commanded position in time before causing an alarm.	1. Air pressure or reserve of air may be insufficient to complete the move fast enough.	1. Increase air pressure and/or readily available reserve of air. 2. Check for inhibitors that might be causing drag on the moving parts.
System reports that there is a communications failure.	1. A communications cable may have become unplugged or damaged. 2. Power might be no longer supplied to the remote panel or device/component.	1. Check communications cables ensuring they are properly plugged in and have no damage. 2. Check supplied power to remote panel and/or to remote device/component, including breakers and fuses.
A motor reports that it is not running after being instructed to turn on.	1. Motor is likely not getting supplied with power.	1. Check power to motor's control panel. 2. In the motor's control panel, check breakers and also the motor starter itself (it has a built-in breaker that may be tripped).
Cannot clear E-Stop condition.	1. A remote control panel might have its E-Stop plunger engaged. 2. A remote control panel might not have power. 3. You might not be holding the E-Stop reset button long enough. 4. There may be something wrong with the E-Stop cabling.	1. The main screen should be able to indicate which remote panel has its E-Stop plunger engaged. 2. Make sure power is properly supplied to each control panel. 3. Try holding the reset button a little longer (1 or 2 seconds should be sufficient). 4. Check the E-Stop cabling for proper connections and also

SECTION F MAINTENANCE

Proper maintenance of the Overbin Conveyor is critical for peak performance, reliability and accuracy of this system. The following is a guideline for the type of maintenance and servicing that should be performed on this unit. Your environment and uses may require additional maintenance and service beyond this list to assure a reliable and safe unit. The operator of this unit has ultimate responsibility to identify areas of concern and rectify them before they become a hazard or safety issue. There is no substitute for a trained, alert operator.

DANGER Do not put this unit into operation with any questionably maintained parts. Poor performance or a hazard may occur.

WARNING Failure to maintain the proper belt tension will cause the belt to slip. This will damage the belt and drive pully. If the belt is not tracking correctly, it can ride along one edge causing the belt to fray and damage the belt splice. Either problem will cause the belt to burn or wear out prematurely.

FLUIDS AND LUBRICANTS

Grease

Use an SAE multipurpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multipurpose lithium-based grease.

Storing Lubricants

Your machine 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.

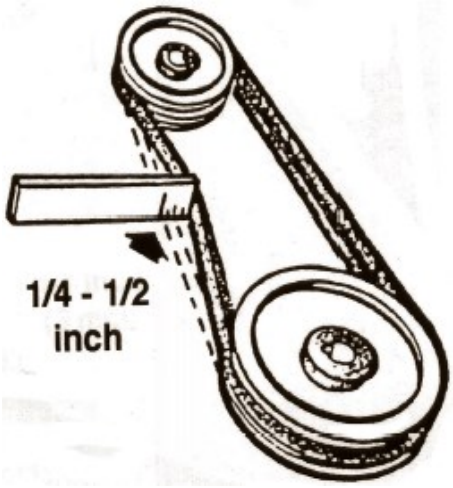
GREASING

Use a Maintenance Checklist to keep record of all scheduled maintenance.

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.

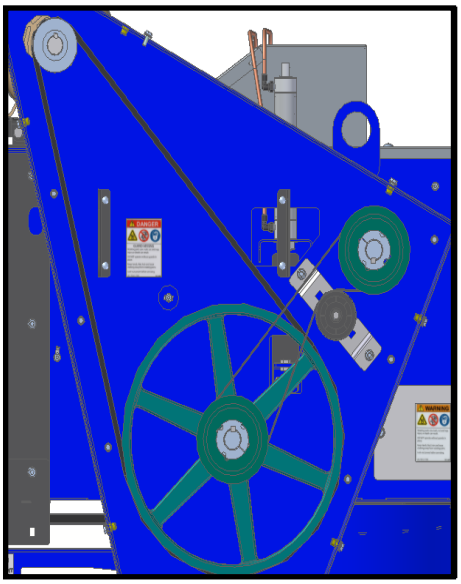
NOTICE If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

CONVEYOR SERVICING INTERVALS



Every 40 hours or Weekly

1. Check the conveyor belt tension and alignment.
2. Grease conveyor bearings.
   A. Two bolt flanged bearings, k-valve bearings, inlet end, right and left (2 locations)
   B. Two bolt flanged bearings, tail end, right and left (2 locations).
   C. Two bolt flanged bearings, discharge sections, right and left (2 locations).
3. Remove guard and check the drive belt tension and alignment. The belts will deflect approximately 1/4 to 1/2 inch when properly tensioned.



Every 200 hours or Annually

1. Check pulley bushing for wear. To inspect pulley:
   - Loosen and remove the belt.
   - Inspect the bushing on the pulley for wear.
   - Reverse steps for re-assembly.

CONVEYING BELT TENSION

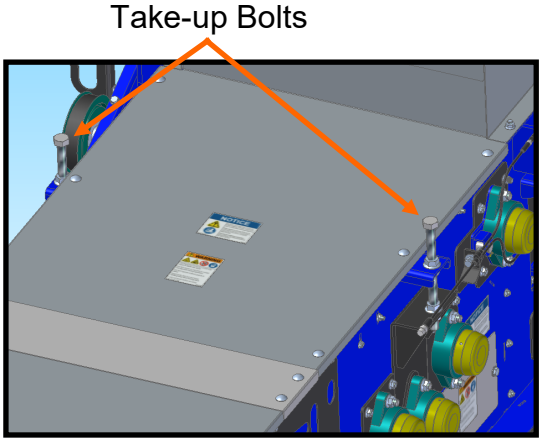
A 24” wide smooth belt is used to convey material along the frame. The tension and alignment of the belt should be checked weekly, or more often if required, to be sure that it does not slip or run to one side. A properly tensioned belt will not slip when it is operating. Operating the belt with less slippage will increase the belt life and causes less stress on bearings, pulleys and shafts.

⚠WARNING Although it is acceptable to align the belt from either the drive or the head rollers. Tightening the belt may only be done from the conveyor discharge sections.

To maintain the belt, follow this procedure:

NOTICE Place all controls in neutral or off, stop motor and disable power source before working on belt.

1. Use the take-up bolts located at the discharge sections to adjust tension of the belt.
2. If the belt needs to be tightened to prevent slippage, use the take-up adjustments on the discharge sections only. (bottom right)
3. The belt is tightened by turning both take-up adjustments an **equal** number of turns. The conveyor belt only needs to be tight enough to not slip on the drive roller. If the belt is too loose, it will slip on the drive roller making a noticeable sound, slowing the belt down.
4. Use the drive roller to check the alignment. The belt should be centered on the roller.
5. Turn the belt 1/2 revolution when the belt is new and check the drive and head roller. If out of alignment, the belt will move to the loose side. Loosen the jam nut and use the bearing position bolts to set the position. Tighten jam nut.
6. Run and check again. Check frequently during the first few minutes of operation and then several times during the first 10 hours. The belt normally seats itself during the first 10 hours of operation and can be checked weekly after that.
7. The belt is properly aligned when the belt runs in the center of the head and drive rollers.



CONVEYING BELT ALIGNMENT

NOTICE

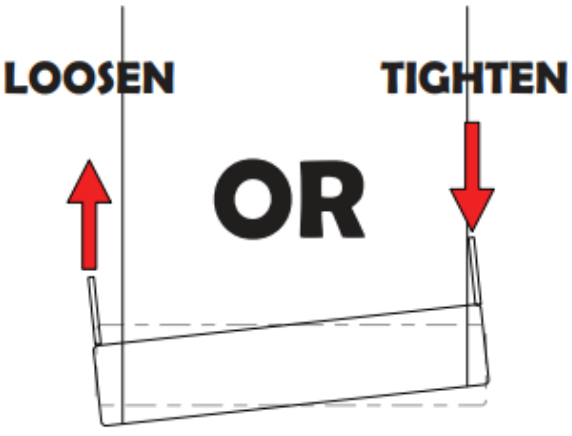
The Overbin Conveyor has a conveying belt in each section. Adjust one belt at a time. Place all controls in neutral or off, stop motor and disable power source before working on belts.

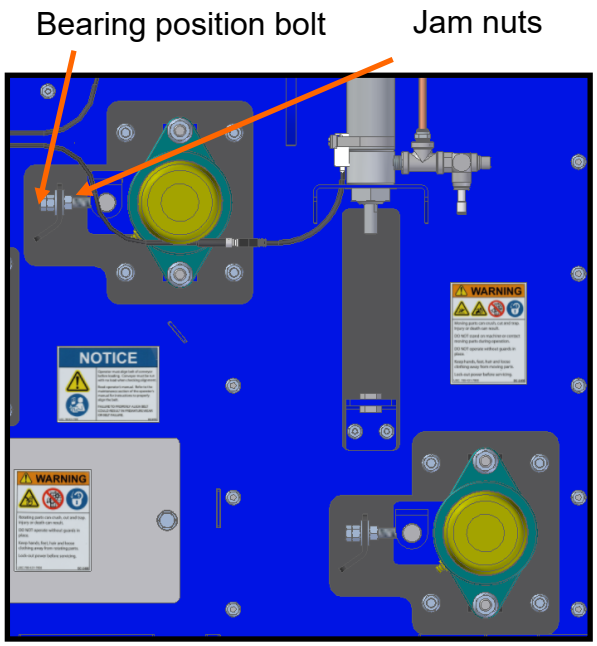
Before Aligning the Belt

1. The conveyer must be empty of all grain.
2. Wait until the belt makes a complete revolution before adjusting the rollers. Some belts may have uneven edges, appearing misaligned.

Adjusting the Rollers

1. Loosen jam nuts situated on the bearing position bolts.
2. Rotate the adjustment bolt 1/2 turn.
3. Restart conveyor and run empty for 1 minute.
4. Stop the conveyor and once again lock out the power source.
5. Check if the belt has centered. If not, repeat steps 2 to 4 until the belt is correctly aligned.
6. Once the belt is centered, securely tighten the jam nuts.
7. Ensure all removed guards are properly replaced before restarting the conveyor system.





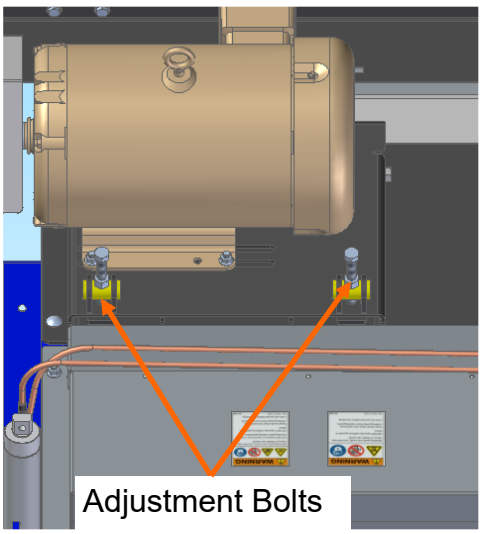
DRIVE BELT TENSION & ALIGNMENT

Power to the conveying belt is transmitted through a V-belt. The V-belt drive system must be maintained at the proper belt tension and pulley alignment to obtain the desired performance and life. When maintaining the belt drive system follow this procedure:

NOTICE Turn motor off and unplug power cord or turn off power and lock out the master panel before starting maintenance on drive belt system.

Drive Belt Tension

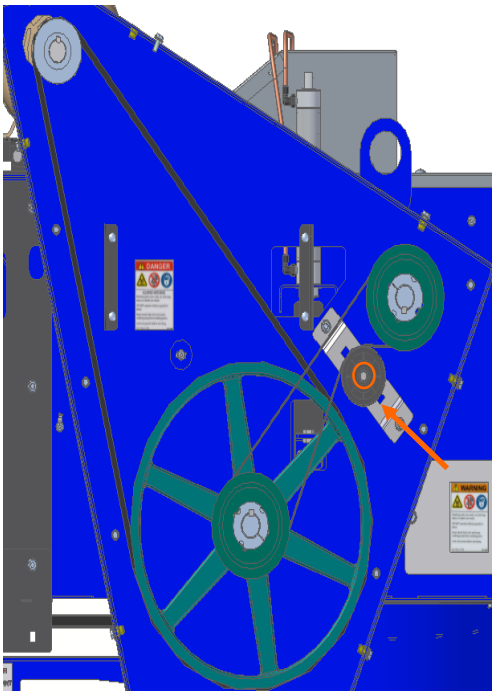
1. Push on the center of the belt span with a force of approximately 5 to 10 lbs.
2. Follow the belt tensioning specification on page 34 to determine proper belt deflection.
3. Move the motor up, using the adjustment bolts, to set drive belt tension (top right).
4. Close and secure guards.



Motor base adjustment

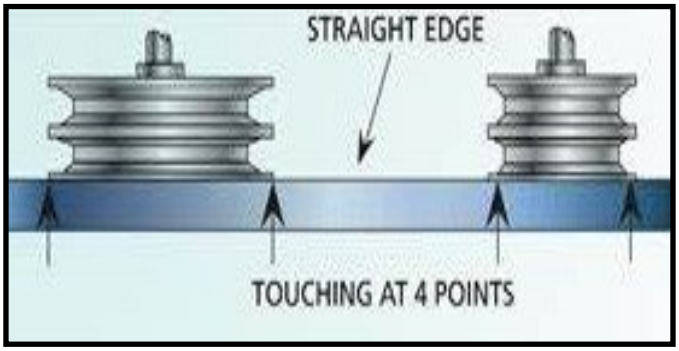
Idler Pulley Tension

1. Use a pry bar to apply gentle pressure upwards on idler pulley, then tighten and torque adjustment bolt. (bottom right)
2. Follow the belt tensioning specification on page 34 to determine proper belt deflection
3. Verify belt tension is correct and repeat step 1 and 2 if not.



Drive Belt Alignment

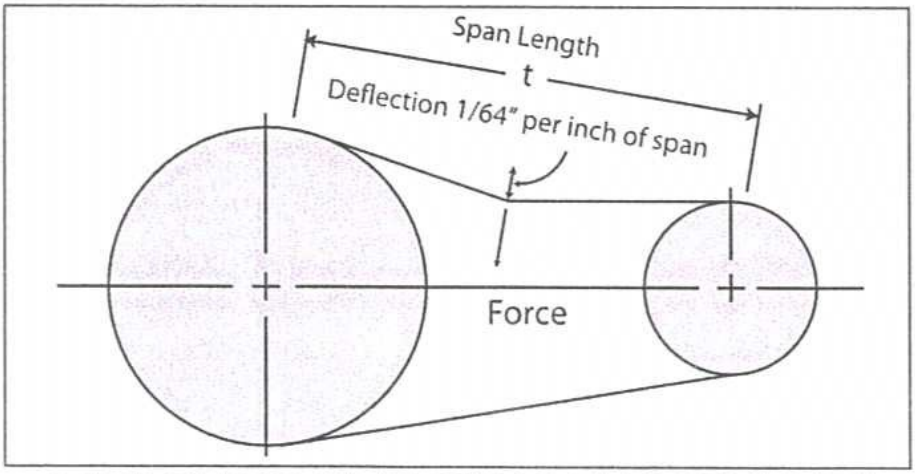
1. Lay a straightedge across the pulley faces to check the alignment (bottom right).
2. Use the pulley hub or the motor mounting plate slots to move the pulley to the required position for alignment.
3. Tighten hub bolts to secure pulley on shaft.
4. Check belt tension
5. Close and secure guards.



Drive Belt Replacement

1. Lower motor to its loosest position.
2. Remove old belt and replace with a new one.
3. Raise motor to set the belt tension.
4. Check pulley alignment. Adjust if required.
5. Close and secure guards.

V-Belt tensioning adjustment can be made using a tension meter or other type spring scale using the following procedure. After seating the belts in the groove and adjusting center distance so as to take up the slack in the belts, further increase the tension until only a slight bow on the slack side is apparent while the drive is operating under load. Stop the drive and using the meter, measure the force necessary to depress one of the center belts 1/64 inch for every inch of belt span (see sketch below). For example, a deflection for a 50 inch belt span is 50/64 or 25/32 inch. The amount of force required to deflect the belt should compare with the deflection forces noted in the table below. Also notice for V- Belts that deflection forces vary from the initial RUN - IN values which are greater (reflecting higher run-in tensioning) to the NORMAL values for after the run-in period.

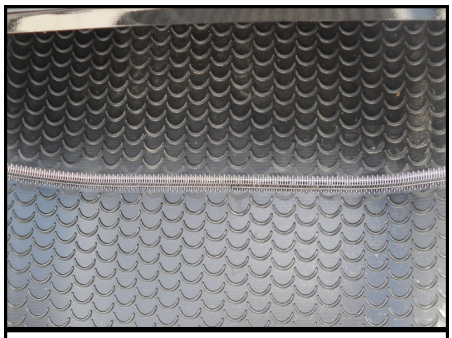


MEASURE THE SPAN LENGTH "T"
AS SHOWN IN THE SKETCH ABOVE.

BELT CROSS SECTION	SMALLER PULLEY DIAMETER RANGE (inches)	DEFLECTION FORCE	
		RUN - IN (lbs.)	NORMAL (lbs.)
AX	3.0 - 3.6 3.8 - 4.8 5.0 - 7.0	4 - 1/8 5 6	2 - 3/4 3 - 1/4 4
BX	3.4 - 4.2 4.4 - 5.2 5.4 - 9.4	5 - 1/4 7 - 1/8 9	3 - 1/2 4 - 3/4 6

BELT REPLACEMENT

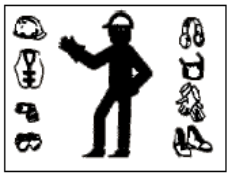
1. Rotate the belt until the seam is visible.
2. Move the belt take-up bolts to their loosest position.
3. Pull all the slack to the seam area.
4. Remove the wire connector and open the belt.
5. Attach one end of the replacement belt to the belt end being removed.
6. Pull the old belt out and the new belt will be threaded into place.
7. Disconnect the old belt.
8. Connect the ends of the new belt together and secure.
9. Set the belt tension.
10. Check belt routing and alignment. Set the belt alignment



Belt Seam

SECTION G STORAGE

When the Overbin Conveyor is not used for long periods of time, the following procedure must be followed to reduce the chance of rust, corrosion and fatigue of the conveyor.



A dust mask and protective rubber gloves shall be used when cleaning the machine.

1. Clear the area of bystanders, especially small children.
2. Thoroughly wash the entire machine to remove all dirt, mud, debris or residue.
3. Inspect all moving or rotating parts to see if anything has become entangled in them. Remove the entangled material.
4. Lubricate all grease fittings. Make sure that all grease cavities have been filled with grease to remove any water residue from the washing. This also protects the bearing seals.
5. Remove drive assembly cover. Clean entire area and ensure drive belt is clean and free of debris.
6. Touch up all paint nicks and scratches to prevent rusting.
7. Cover the electric motor with a water proof tarpaulin and tie securely in place.
8. Do not allow children to play on or around the machine.

NOTES:

SECTION H USC LIMITED WARRANTY

USC, LLC, MANUFACTURER WARRANTY ON SEED TREATING EQUIPMENT

01AUG22

USC, LLC, (Manufacturer) warrants its equipment as follows:

1.Limited Warranty: Manufacturer warrants that the Products sold hereunder will be free from defects in material and workmanship for a period of 18 months from date of shipment by Manufacturer for all seed treating equipment and a period of 12 months from date of shipment by Manufacturer for all grain and fertilizer handling equipment.

If the Products do not conform to this Limited Warranty during the warranty period, Buyer shall notify Manufacturer in writing (on the approved USC warranty claim form) of the claimed defects and demonstrate to Manufacturer satisfaction that said defects are covered by this Limited Warranty (through pictures, video or other objective data). If the defects are properly reported to Manufacturer within the warranty period, and the defects are of such type and nature as to be covered by this warranty, Manufacturer shall, at its expense, furnish replacement Products or, at Manufacturer's option, replacement parts for the defective products. Shipping and installation of the replacement Products or replacement parts shall be at the Buyer's expense.

All replacement parts orders through Manufacturer will carry their specific manufacturer's standard warranty. There is no warranty on replacement parts manufactured by Manufacturer. Manufacturer will not extend any warranty due to replaced parts. The end user is responsible for all shipping and handling expenses for parts returned to Manufacturer under this section which may or may not be included in that specific warranty. Manufacturer will pay shipping expense between USC and its vendor.

2.Other Limits: THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A

PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising from improper installation (where installation is by persons other than Manufacturer), against defects in products or components not manufactured by Manufacturer, or against damages resulting from such non-Manufacturer made products or components. Manufacturer passes on to the Buyer the warranty it received (if any) from the maker of such non-Manufacturer made products or components. This warranty also does not apply to Products upon which repairs and / or modifications have been affected or attempted by persons other than pursuant to written authorization by Manufacturer. This includes any welding on equipment which could damage electrical components. Manufacturer does not warrant against injuries or damages resulting from misuse and / or abuse of Products, improper storage or handling, acts of nature, effects of weather, including effects of weather due to outside storage, accidents, or damages incurred during transportation by common carrier or Dealer/customer arranged freight. Any replacement or repair covered under this warranty will not extend the warranty period. The remainder of the manufacturer's warranty will remain in force until stated expiration.

3.Exclusive Obligation: THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Products in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Manufacturer be liable for lost profits, lost revenue, lost sales (whether direct or indirect damages), incidental, special, punitive, indirect or consequential damages. Buyer shall make no claims for renumeration for any loss as a result of USC equipment and USC shall reject any and all claims that may arise as stated herein.

4.Other Statements: Manufacturer's employees or representatives' oral or other written statements do not constitute warranties, shall not be relied upon by Buyer, and are not a part of the contract for sale or this limited warranty. The USC Warranty Manager is the final decision point for all warranty claims.

5.Return Policy: Approval is required prior to returning goods to Manufacturer irrespective of warranty claim. Manufacturer may give a credit, less a 15% restocking fee, for goods that are returned in new, sellable condition. Items returned for warranty that are found to be not covered by the warranty will remain the property of the Buyer. The Buyer will have the ability to have part returned at their expense or, if in new, sellable condition, receive a credit less a 15% restocking fee and less any USC paid freight for its return.

6.Entire Obligation: This Limited Warranty states the entire obligation of Manufacturer with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect. Other terms included in Manufacturer's Terms of Sale will also apply.

DOCUMENT REVIEW RECORD	
DATE	BY
12/1/23	PWB

USC LLC

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