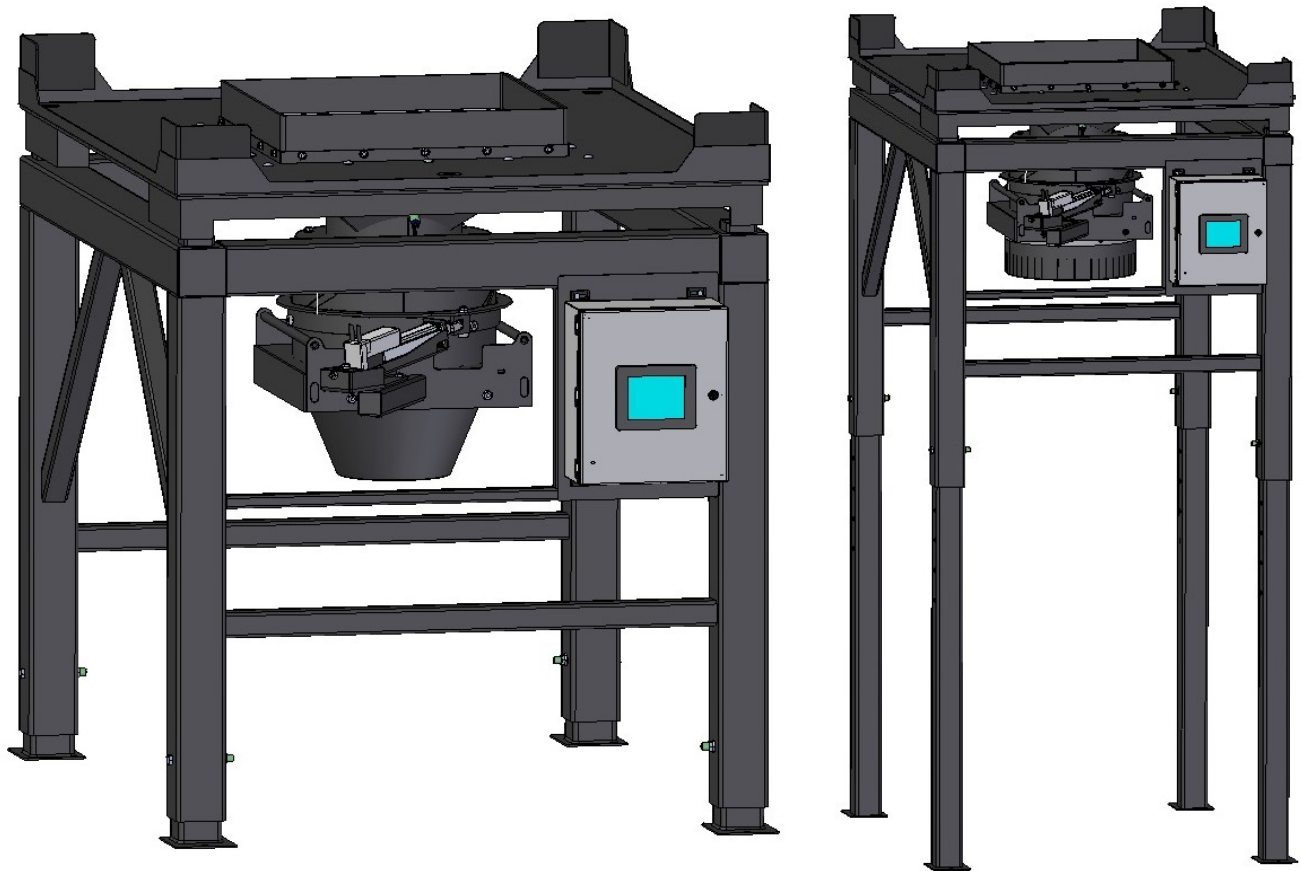




BOX TO BOX LOSS IN WEIGHT

Operators Manual



Software Release: LIW Box to Box Manual v2.0

Document: TD-09-06-1017

Revision: B



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 Box to Box Loss in Weight. 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, viscosity of chemical products and changes in seed size or variety may all effect the accuracy of application and seed coverage. Periodically check the equipment calibration while treating and make adjustments as required. This will insure the optimum seed coverage.

OPERATOR RESPONSIBILITIES

As the purchaser/owner/operator of this equipment and control system, you have an obligation to install, operate, and maintain the equipment in a manner that minimizes the exposure of people in your care to any potential hazards inherent in using this equipment. It is critical that the owner of this equipment:

- Has a clear and documented understanding of the process this machine is being used in and of any resulting hazards or special requirements arising from this specific application.
- Allow only properly trained and instructed personnel to install, operate or service this equipment.
- Maintain a comprehensive safety program involving all who work with this machine and other associated process equipment.
- Establish clear areas of staff responsibility (e.g. operation, setup, sanitation, maintenance, and repairs).
- Provide all personnel with necessary safety equipment.
- Periodically inspect the equipment to insure that the doors, covers, guards, and safety devices are in place and functioning, that all safety instructions and warning labels are intact and legible, and that the equipment is in good working order.
- In addition to the operating instructions, observe and enforce the applicable legal and other binding regulations, national and local codes.

BOX TO BOX LOSS IN WEIGHT

As the person with the most to gain or lose from working safely, it is important that you work responsibly and stay alert. By following a few simple rules, you can prevent an accident that could injure or kill you or a co-worker.

- Disconnect, lockout, and tagout electrical and all other energy sources before inspecting, cleaning, servicing, repairing, or any other activity that would expose you to the hazards of electrical shock.
- Do not operate, clean, or service this equipment until you have read and understood the contents of this manual. If you do not understand the information in this manual, bring it to the attention of your supervisor, or call USC at (785) 431-7900 for assistance.
- Any operator who is known or suspected to be under the influence of alcohol or drugs should not be allowed to operate the equipment.
- Understand and follow the safety practices required by your employer and this manual.
- **PAY ATTENTION** to what you and other personnel are doing and how these activities may affect your safety.
- **Failure to follow these instructions may result in serious personal injury or death.**

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.

SERIAL NUMBER: _____



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SAFETY INSTRUCTIONS

SECTION A

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.

BOX TO BOX LOSS IN WEIGHT



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 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 ANSI Z344.1 and/or 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.”

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.

BOX TO BOX LOSS IN WEIGHT

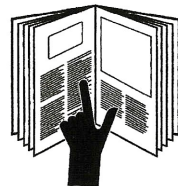
YOU are responsible for the **SAFE** operation and maintenance of your USC, LLC equipment . **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the equipment be familiar with the operating and maintenance procedures and related **SAFETY** information contained 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!

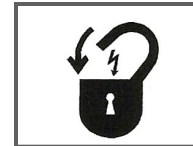
GENERAL SAFETY

1. Read and understand the operator's manual and all safety signs 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.



BOX TO BOX LOSS IN WEIGHT

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
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 signs 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.
6. Stay away from overhead obstructions and power lines during operation and transporting. Electrocutation can occur without direct contact.
7. Do not operate machine when any guards are removed.
8. Inspect welds and repair if needed.

PLACEMENT SAFETY

1. Move only with the appropriate equipment
2. Stay away from overhead power lines when moving equipment. Electrocutation can occur without direct contact.
3. Be familiar with machine hazard area. If anyone enters hazard areas, shut down machine immediately. Clear the area before restarting.
4. Operate the equipment on level ground free of debris. Anchor the equipment to prevent tipping or upending.



Before placement of the equipment , be sure that ground is reasonably level. The equipment may topple or work improperly if the ground is too uneven, damaging the equipment and/or causing personal injury.

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 signs clean. Replace any sign that is damaged or not clearly visible.



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 USC at (785) 431-7900 .

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.



Part # 09-02-0001



Part # 09-02-0002



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

**SECTION
B**

INSTALLATION



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

Permanent installation may require additional electrical cords, liquid hose, and air lines, since each installation is unique.

SET-UP

The following steps outline the initial set-up of your USC Box to Box Loss in Weight :

1. Clear the area of bystanders, especially small children, before moving.
2. Be sure there is enough clearance from overhead obstructions and power lines or other equipment to move the machine into its working position.
3. Using a forklift, place the Box to Box Loss in Weight in the desired position on a level surface.

NOTICE

USC highly recommends that the Box to Box Loss in Weight be set up inside a building or any covered structure to protect the machine from weathering.

4. Inspect Box to Box Loss in Weight thoroughly for screws, bolts, fittings, etc. which may have come loose during shipping.
5. If your system is the above treater version, mount the Control box in a location convenient for the operator.
6. Two PJ-Ethernet connectors are provided for connecting to an automated system.
7. Connect the 2-wire cable (PJ1212) to the auxiliary receptacle located on the bottom of the seed treater control panel. This will allow the operator to control the Loss-n-Weight system in the AUTO mode. For more information refer to the electrical operation section (see page 16).

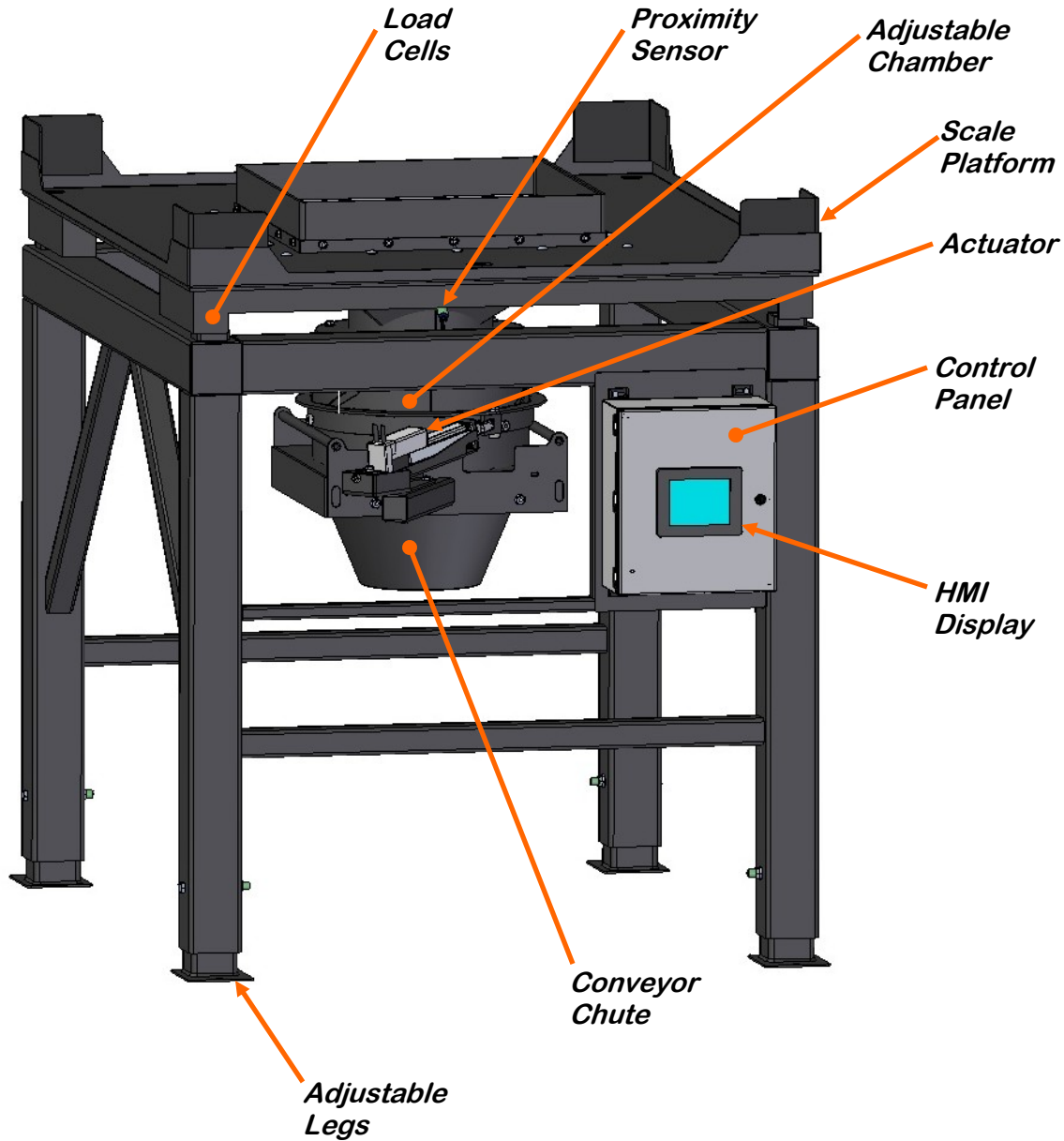
BOX TO BOX LOSS IN WEIGHT

SET-UP

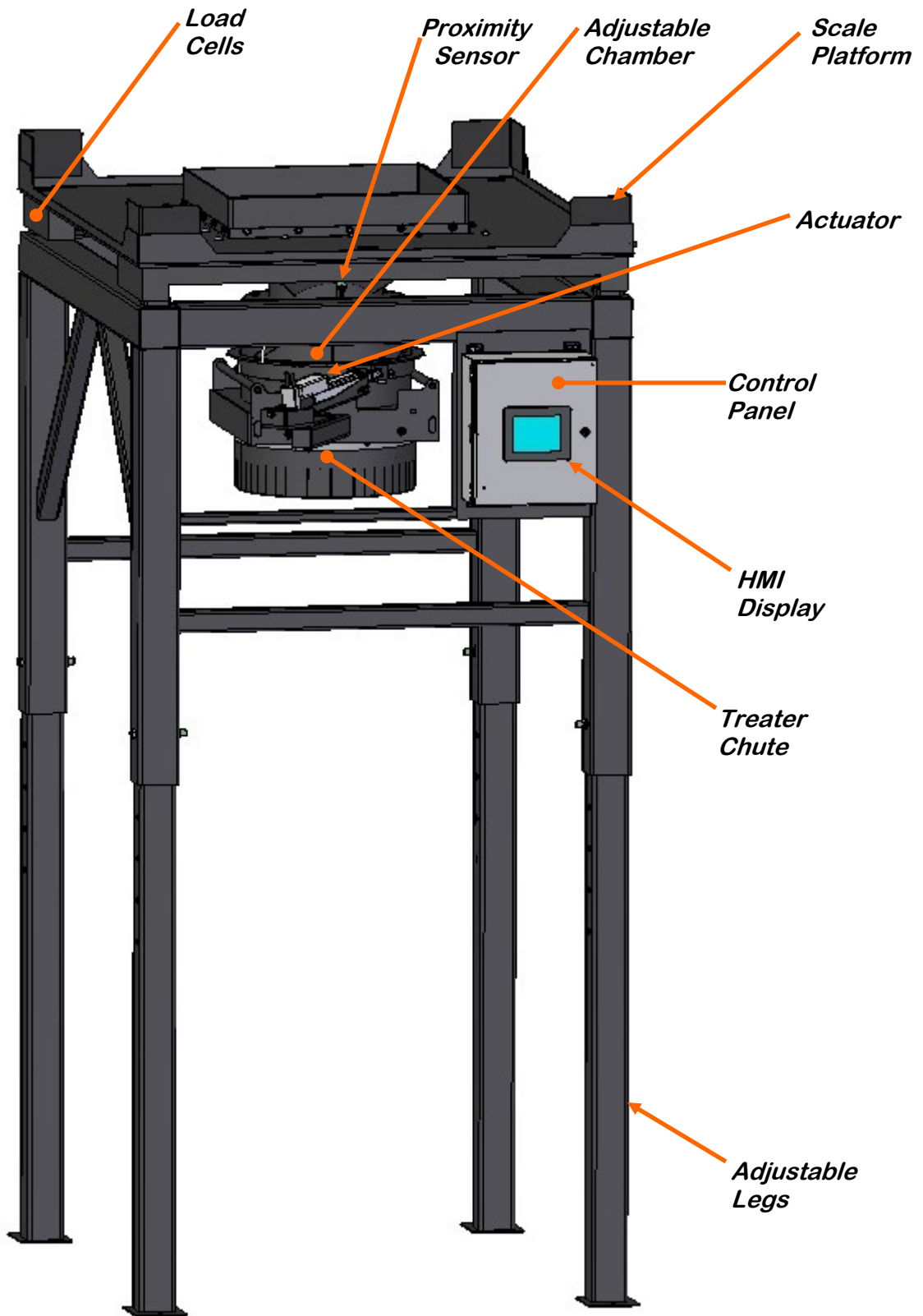
8. Connect the cable from the proximity sensor located in the seed inlet above the adjustable chamber to the PJ1112 connector.
9. Connect the power cable from the Actuator to the PJ1302 connector.
10. Connect the communication cable from the Actuator to the PJ1308 connector.
11. Connect the cable from the Load Cell junction box to the PJ1404 connector.
12. Plug the control panel power cable into any standard 110V outlet



CONVEYOR LOSS IN WEIGHT OVERVIEW



BOX TO BOX TREATER LOSS IN WEIGHT OVERVIEW



SECTION
D

ELECTRICAL OPERATION



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



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



AUTHORIZED PERSONNEL only shall work on the control panel. Never allow anyone who has not read and familiarized themselves with the owner's manual to open or work on the control panels.

This section provides a general overview and description of the operator controls for the Box to Box Loss in Weight. The Control Panel contains the PLC (Programmable Logic Controller) as well as HMI (Human Machine Interface) touch screen. The operator is able to control the entire system through the HMI. Power to this panel is supplied from a standard 110V plug.



USC recommends the use of a surge protection device with a minimum rating of 400 Joules for all automated main control panels.



BOX TO BOX LOSS IN WEIGHT

BOX TO BOX LOSS IN WEIGHT

The following pages explain the function of the touch screen controls.

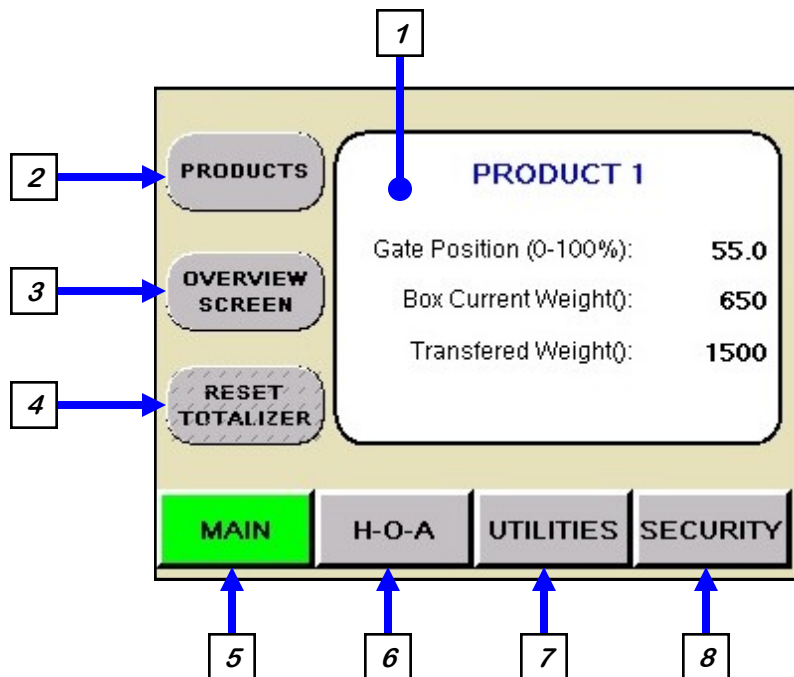
USC START UP SCREEN

While the system is booting up, the touch screen will display a timer bar at the bottom of the Start Up Screen. Once the timer bar reaches the end it will disappear and be replaced with flashing piece of text that reads CLICK TO CONTINUE. Select any where on the screen and it will advance to the Main screen. This screen also displays the version of the software currently installed.



BOX TO BOX LOSS IN WEIGHT

MAIN SCREEN



1. PRODUCT STATUS BOX: Displays the name of the active product at the top of the display, as well as the current Gate Position, Current Box Weight and Transferred weight.

2. PRODUCTS: Pressing this button brings up the Product Selection or Editing popup screen (see page 19).

3. OVERVIEW SCREEN: Pressing this button advances the operator to the Overview screen (see page 21).

4. RESET TOTALIZER: Pressing this button will manually reset the totalizer display after a run is complete. This button is inactive when the system is running.

5. MAIN: This button returns the operator to the main screen from any other screen where the button is visible.

6. H-O-A: This button advances the operator to the H-O-A screen (see page 22).

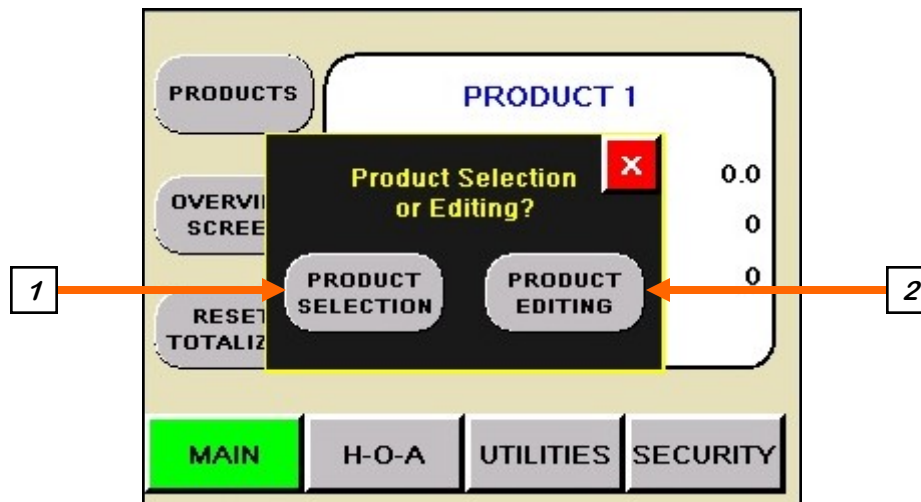
7. UTILITIES: This button advances the operator to the Utilities screen (see page 24).

8. SECURITY: This button advances the operator to the Security screen (see page 27).

NOTICE

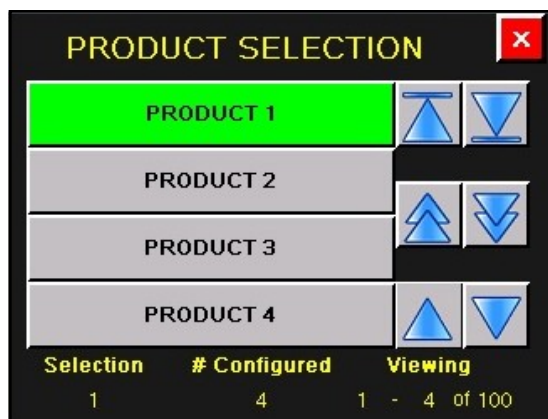
Some of the screens have a round blue button with a question mark in the upper left corner of the screen. Selecting this button will bring up a help screen covering the functions of that screen.

PRODUCT SELECTION OR EDITING SCREEN

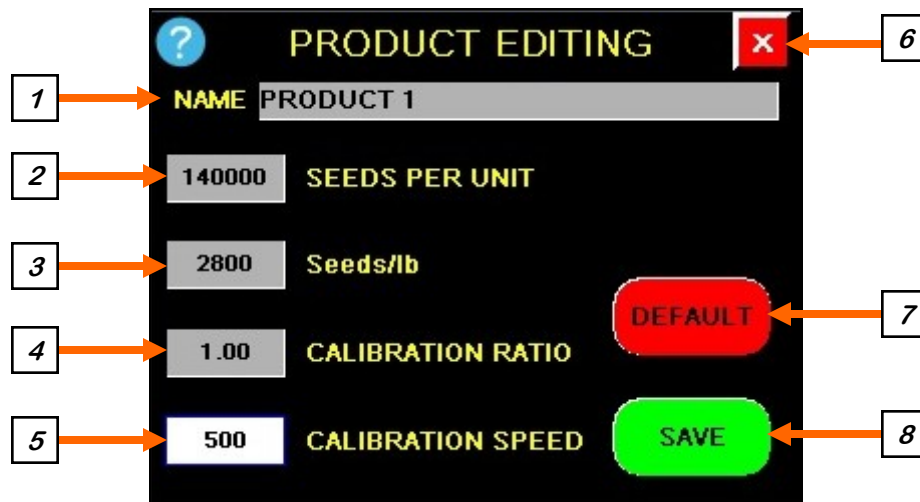


1. PRODUCT SELECTION: Pressing this button advances the operator to the Product Selection screen (bottom, left). Use the arrows to scroll through the list to find the product you wish to use. The system can store up to 100 different product entries. Each product type will have its own name and calibration ratio. Selecting an existing product will return you to the main screen.

2. PRODUCT EDITING: Pressing this button advances the operator to the Product Editing screen (bottom, right). Select a product from the list to modify or an unused box to create a new product entry. The Product Editing screen will appear (see page 20).



BOX TO BOX LOSS IN WEIGHT
PRODUCT EDITING SCREEN



1. PRODUCT NAME: Pressing this button brings up an alpha numeric keypad allowing the operator to change an existing product name. If an unused box was selected from the list, the name will be blank and the Calibration Ratio will be 1.0, allowing the operator to enter a new product into the system. Once saved, it will be added to the list.

2. SEEDS PER UNIT: Pressing this button brings up a numeric keypad allowing the operator to enter the number of seeds in a unit for the current seed profile when operating in the SCU mode.

3. SEEDS /LB: Pressing this button brings up a numeric keypad allowing the operator to enter the number of seeds per pound for the current seed profile when operating in the SCU mode.

4. CALIBRATION RATIO: The calibration ratio is automatically entered when the system calibration is performed. This is also a button allowing the operator to manually enter a number for the calibration factor if Auto Calibrate is not active on the Utilities screen (see page 24).

5. CALIBRATION SPEED: This display represents the flow rate specified in either pounds per minute or seed count units per minute during the last run that a calibration was made.

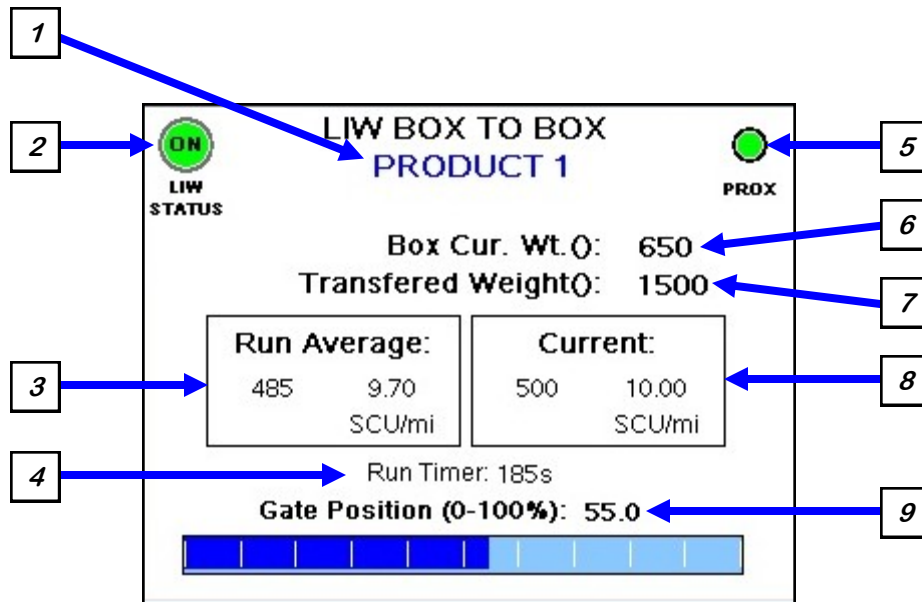
6. SCREEN EXIT BUTTON: This button is used to return to the previous screen. Its function is the same throughout the HMI display.

7. DEFAULT BUTTON: This button deletes the name and resets the Calibration Ratio. After a new name and calibration factor has been entered, press the save button. This is another way to enter a new chemical name in the system.

8. SAVE BUTTON: Pressing this saves the changes made to the product editing screen for this product.

BOX TO BOX LOSS IN WEIGHT

OVERVIEW SCREEN



1. PRODUCT NAME: Displays the name of the active product.

2. LIW STATUS: Displays the current gate status. If it is OFF or closed, it will be red. If it is ON or open, a run is in progress and it will be green.

3. RUN AVERAGE: Displays the average flow rate for the entire run in pounds per minute and seed count units.

4. RUN TIMER: Displays the number of seconds that have elapsed since the beginning of the run.

5. PROX INDICATOR: Displays the state of the proximity sensor in the hopper above the adjustable gate. When it is green the sensor detects seed, when red it does not.

6. BOX CUR. WT.: Displays the current weight from the load cells in real time.

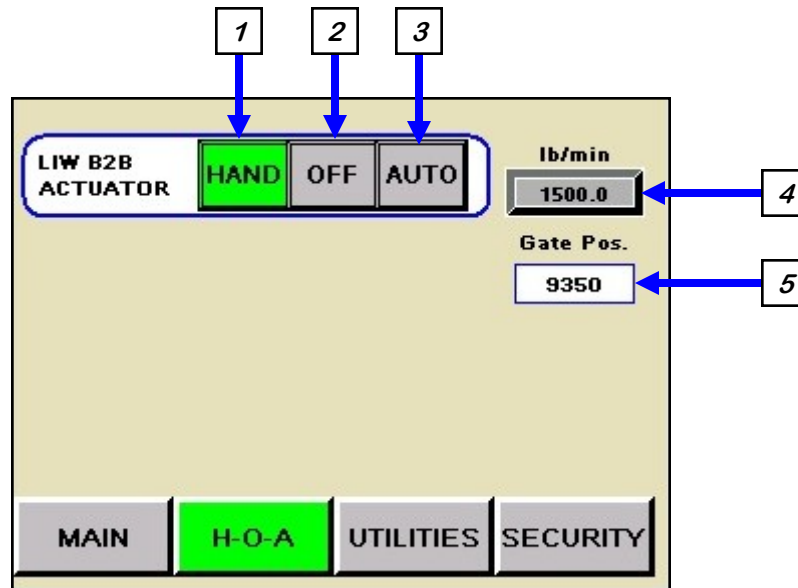
7. TRANSFERRED WEIGHT: Displays the weight that has been removed from the pro box by subtracting the current weight from the weight the system recorded before the start of the run.

8. CURRENT: Displays in real time the current flow rate of seed since the last move of the actuator in pounds per minute and seed count units.

9. GATE POSITION (0-100%): Displays the amount the gate is open in two percent increments. The example above is at fifty five percent.

BOX TO BOX LOSS IN WEIGHT

H-O-A SCREEN



1. HAND: Once all the parameters for the run have been set, pressing the HAND button opens the seed gate to start the run when operating in the manual mode. When active the button turns green.

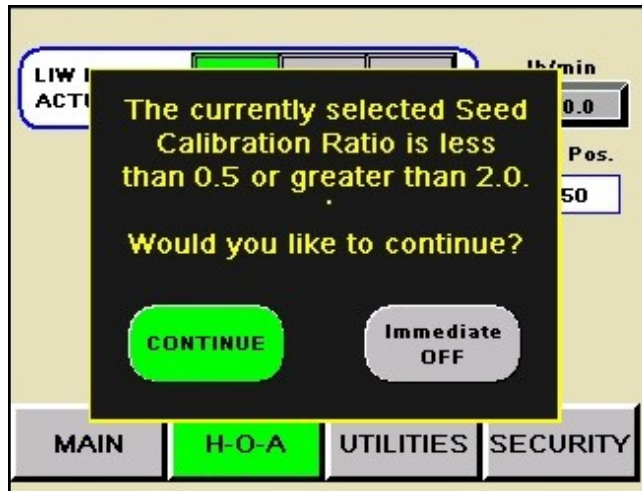
2. OFF: Pressing this button stops the run and closes the adjustable chamber stopping the flow of seed.

3. AUTO: This button is used to operate in AUTO mode. AUTO mode opens the seed gate when the proximity sensor detects seed. It also closes the seed gate when it no longer detects seed. On the Utilities screen, there is an Auto Start in seconds and Auto End in seconds, the operator uses these settings to control how many seconds before the seed gate opens or closes after receiving a signal from the proximity sensor. Auto mode also automatically resets the Transferred Weight Totalizer. This allows the operator to treat multiple boxes of seed without touching the HMI screen. When active the button turns yellow.

4. GATE INDICATOR: Pressing this button brings up a keypad for the operator to enter the speed for the run. The value may be for flow rate or gate percentage (see page 26, item 3). In flow rate mode, you will enter the amount by weight or SCU's per minute and standard or metric units depending on the settings on the Tools & Options page. Gate percentage mode will display what percentage of fully open the actuator is currently at. The system setting will be displayed above the button. The example above shows it operating in flow rate mode by weight in U.S. measurement.

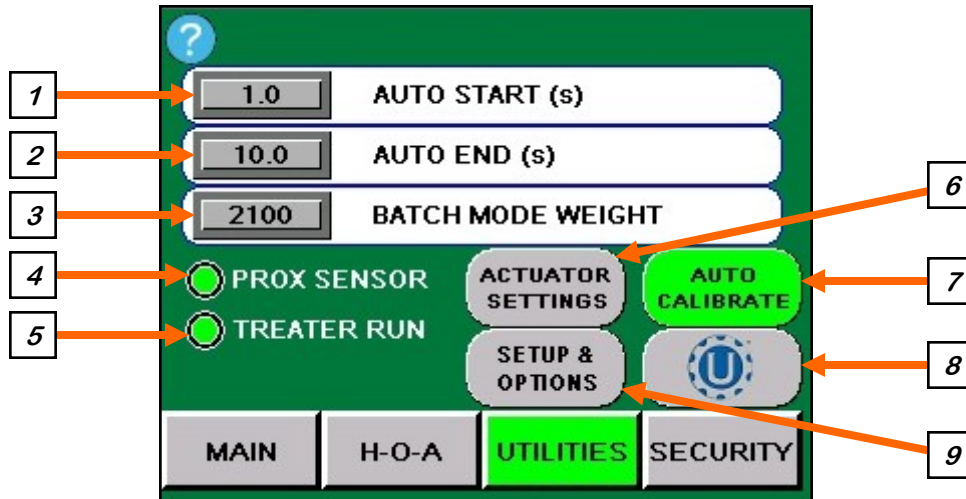
5. GATE POS.: The actuator has the capability to move to 20,000 different positions from closed to fully open. This display shows the current position in that range at any given time.

H-O-A CALIBRATION RATIO POPUP SCREEN



The majority of product calibration ratios range from 0.5 to 2.0. When a run is started in Hand or Auto mode, and the product selected for that run has a calibration ratio defined as less than 0.5 or greater than 2.0, a popup screen will appear. This screen gives the operator the opportunity to return to the product editing screen to modify the ratio, or press continue to start the run.

UTILITIES SCREEN



1. AUTO START (s): This button is for entering the number of seconds delay the system waits to start after the proximity sensor detects seed. This setting is only relevant when operating in AUTO mode.

2. AUTO END (s): This button is for entering the number of seconds delay the system waits to shutdown after the proximity sensor no longer detects seed. This setting is only relevant when operating in AUTO mode.

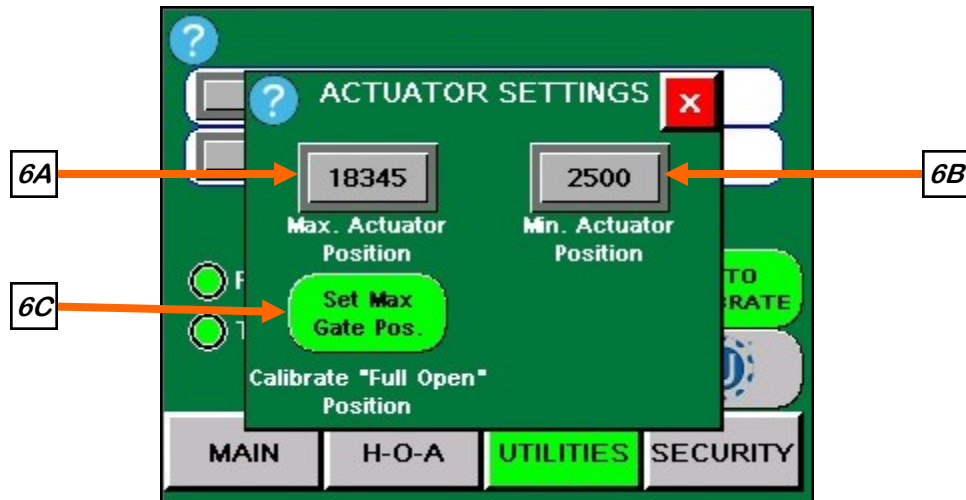
3. BATCH MODE WEIGHT: Batch mode allows the operator to run less than a full box of seed. Press the button and a keyboard will appear, enter a value for desired weight for the run. This button will only be present if the Batch Mode button is active. The number entered will represent the unit of measurement selected on Setup & Options screen (see page 26).

4. PROX SENSOR INDICATOR: Displays whether there is seed present in the adjustable chamber or not. If the sensor detects seed it will be green, if it does not it will be red.

5. TREATER RUN INDICATOR: This indicator informs the operator that the PLC in the control panel is sending an output signal to the treater control panel which tells it to run. The proximity sensor must detect seed and the gate must be open. Also, the time delays entered on the Setpoints screen have elapsed (see page 28).

UTILITIES SCREEN

6. ACTUATOR SETTINGS: Pressing this button opens a popup screen allowing the operator to set the maximum and minimum actuator settings



6A. MAX. ACTUATOR POSITION: Pressing this button allows the operator to manually enter a value for the maximum position the actuator may travel.

6B. MIN. ACTUATOR POSITION: Pressing this button allows the operator to manually enter a value for the minimum position the actuator may travel. Place a pro box on the scale and open the manual gate. Start with this set at 500. Gradually increase the value in increments of 500 until there is a slow but steady flow of seed from the adjustable chamber.

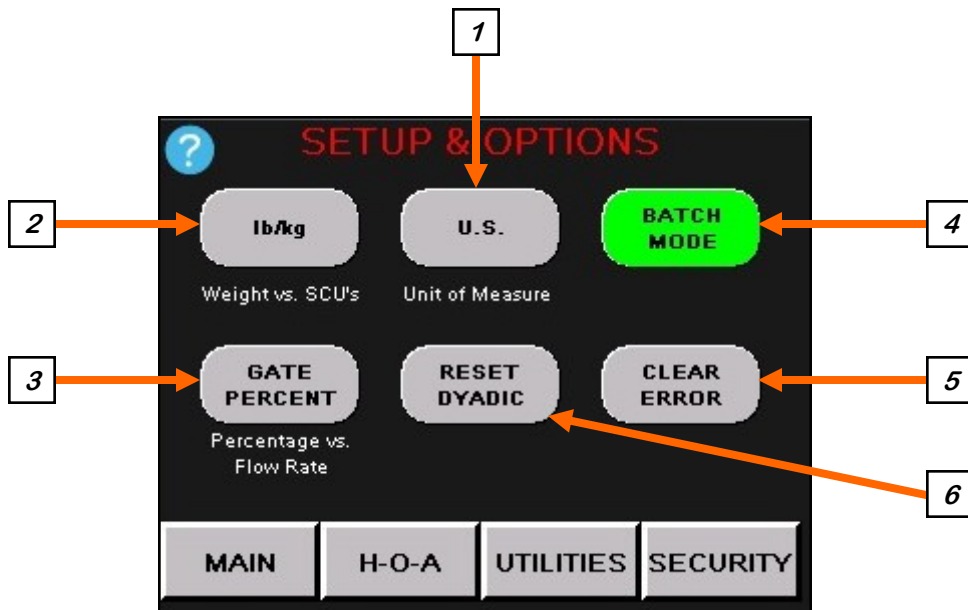
6C. CALIBRATE "FULL OPEN" POSITION: Pressing this button will automatically open the gate to the maximum position. That number will be displayed on the maximum actuator button.

7. STORE CALIBRATION ON EACH RUN: This button activates the Auto Calibrate feature which allows the system to more accurately assume the desired gate position at the beginning of the each run of seed. In Auto Calibrate mode, the currently selected seed type calibration ratio and calibration speed will be automatically updated. The button will turn green when active.

8. START-UP SCREEN: This button returns the operator to the starter screen (see page 17).

9. SETUP & OPTIONS: Pressing this button advances the operator to the Setup & Options screen (see page 26).

SETUP & OPTIONS SCREEN



1. UNIT OF MEASUREMENT: Pressing this button toggles between Standard or Metric units of measurement

2. WEIGHT VS. SCU'S: Pressing this button toggles the target seed flow rate unit of measurement in either pounds or seed count units per minute.

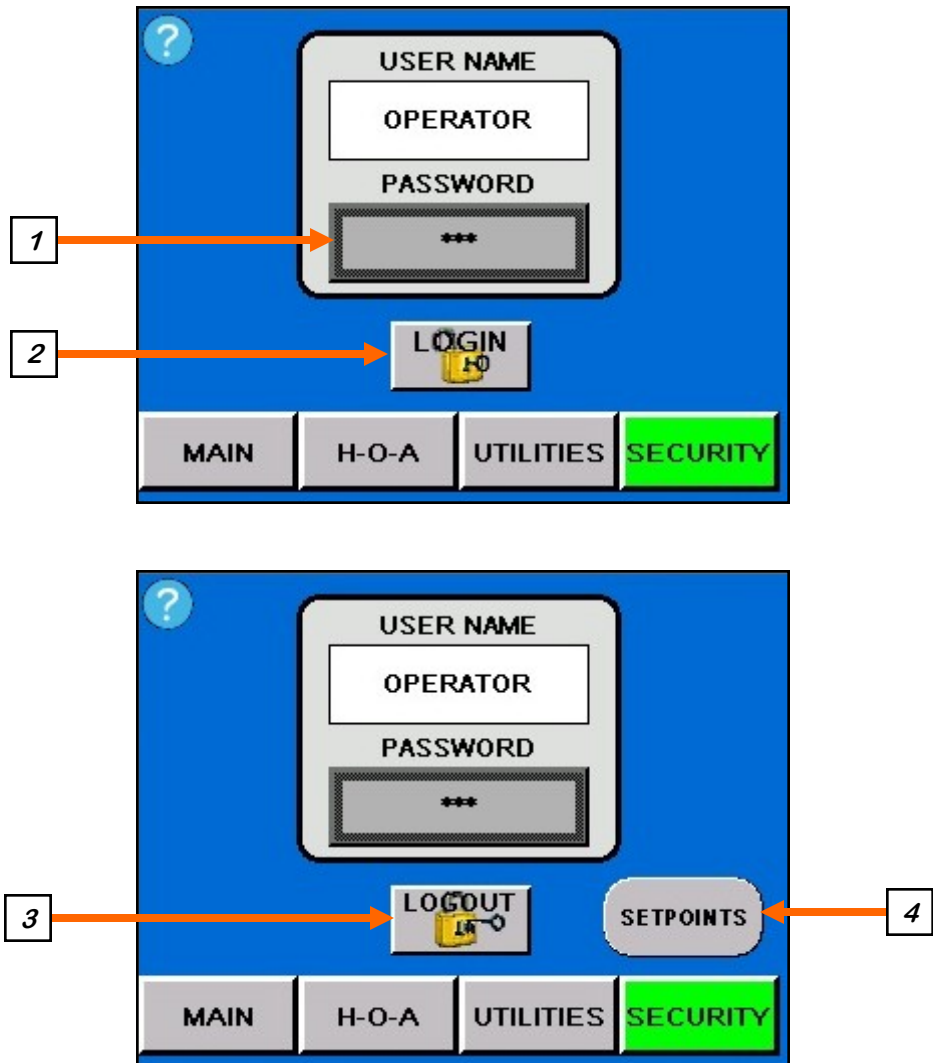
3. PERCENTAGE VS. FLOW RATE: Pressing this button toggle between Gate percentage, that moves the gate to a given percentage and then stays there throughout the run, and Flow rate mode that adjusts constantly during the run so that the actual flow rate matches the desired flow rate based on a specified amount of pounds or seed count units per minute.

4. BATCH MODE: Pressing this button allows the operator to run less than a full box of seed. Entering an amount in the Batch Mode Weight box enables batch mode. Selecting the Disable Batch Mode button returns the system to normal operation.

5. CLEAR ERROR: After a communication error between the scale or actuator and the PLC has occurred, and the problem has been resolved, this button will clear the error message from the main screen and allow the run to continue.

6. RESET DYADIC: Pressing this button sends a reset command to the actuator to reset it and clear any current actuator alarms.

SECURITY SCREEN



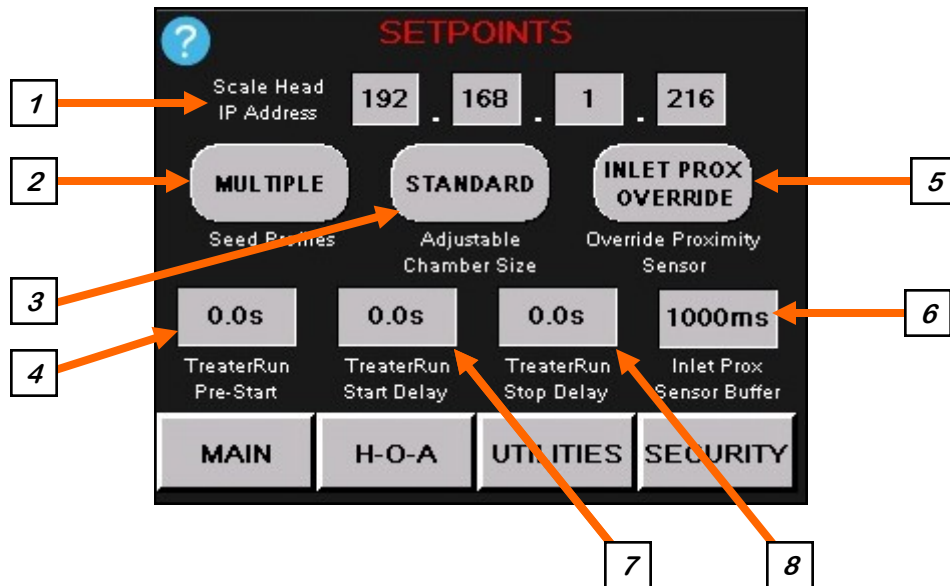
1. PASSWORD ENTRY: The operator uses this input to obtain access to the Setpoints screen. When this button is pressed an alpha numeric keypad will appear. The password is **USC** and should only be made accessible to personnel qualified to operate the system.

2. LOGIN: Pressing this button **after** the password has been entered will activate the SETPOINTS button.

3. LOGOUT: Pressing this button will de-activate the Setpoint button.

4. SETPOINTS: Pressing this button advances the operator to the Setpoints screen (see page 28).

SETPOINTS SCREEN



1. SCALE HEAD IP ADDRESS: Pressing these buttons allow the operator to enter the scale head IP address for the scale to communicate with the control panel. This will be factory set during assembly.

2. SEED PROFILES: Pressing this button toggles between the Single and Multiple settings. If this button is set to Multiple, the Products button on the main screen allows the operator to enter and modify up to 100 product profiles in the listing. If it is set to Single, the Products button changes to a button that brings up a numeric keypad to enter the seed count profile for only one seed type.

3. ADJUSTABLE CHAMBER SIZE: There are two sizes of adjustable chambers available with this product. The standard and the small or low flow chamber. Pressing this button toggles back and forth between them. This will be factory set. The operator will only need to change this setting if they change from one size adjustable chamber to the other.

4. TREATER RUN PRE-START: Pressing this button allows the operator to enter the number of seconds prior to starting the run for the system to send the output signal to start the treater.

SETPOINTS SCREEN

5. OVERRIDE PROXIMITY SENSOR: If the proximity sensor fails, this button allows the operator to still operate in the manual mode. The button will turn green when active

6. INLET PROX SENSOR BUFFER: Pressing this button allows the operator to set the sensitivity of the proximity sensor. This setting determines how long it must wait to change from one state to another. As an example, if we have a setting of 1000ms, it needs to detect seed for one second before turning on and it needs to not detect seed for one second before turning off. The default setting will work in most cases.

7. TREATER RUN START DELAY: Pressing this button allows the operator to enter the number of seconds after starting the run for the system to send the output signal to start the treater. If the Treater Run Pre-Start timer is greater than zero, this entry is ignored.

8. TREATER RUN STOP DELAY: Pressing this button allows the operator to enter the number of seconds after the run is complete for the system to send the output signal to stop the treater.

SYSTEM SETTINGS

If this is the first time using the equipment, check the Setup & Options and Setpoints screens to see if you need to change any of your basic parameters.

1. From the setup and options screen, select weight or seed count units for flow rate and standard or metric for unit of measurement. Select flow rate mode. Return to the Utilities screen and activate the auto calibrate button, this will record the calibration information and increase the speed it takes to move to the correct gate position on the next run.
2. From the setpoints screen, set the Treater Run Start Delay and Treater Run Stop Delay in seconds. If the adjustable chamber is positioned directly above the treater, a one second delay for both is a good number to start with. This setting will vary depending on the height of the inlet hopper and how far above it the adjustable chamber has been installed. If the adjustable chamber is dumping into a conveyor running to the treater inlet hopper, a 5 second delay for both would be more appropriate. The length and type of conveyor will vary between different installations. After the first box of seed an adjustment may be required.
3. From the utilities screen enter a time for Auto Start in seconds and Auto End in seconds.
4. If you do not have a product profile for the type of seed you will be treating, create one now. Choose the product for this run.
5. From the HOA screen, press the AUTO button.

TREATING A BOX OF SEED IN AUTO MODE

NOTICE

Do not touch, place items or lean anything up against the scale during the treating process. Doing this will give the scale a false reading and reduce the accuracy of the treatment being applied.

1. Place a box of seed on the scale.
2. Prime the Atomizer lines so the chemical is at but not entering the Atomizer chamber.
3. Start the treater drum and the Atomizer.
4. Have a stop watch ready to record the travel time on the first run.
5. Open the seed gate on the Pro Box and start the stopwatch as soon as seed begins to flow from the adjustable chamber. When the adjustable chamber opens the Treater Run Start Delay timer will begin to count down. After that time elapses, the signal will be sent to the treater to start the chemical pumps. Stop the watch as soon as seed begins to enter the Atomizer chamber on the treater. Record the time.
6. Observe the first seed as it nears the end of the treater drum discharge. If the seed is not properly coated, the Start Delay time will need to be shortened before running the next box. Use the time recorded by the stopwatch as a reference. When the adjustable chamber closes the Treater Run Stop Delay timer will begin to count down. After that time elapses, the signal will be sent to the treater to stop the chemical pumps. Observe the last of the seed leaving the treater drum, if it is not completely coated adjust the delay time accordingly.
7. If the seed coverage is not uniform from beginning to end. Modify the Treater Run Start Delay and Treater Run Stop Delay settings as required. It may take several boxes to find the correct delay settings for your installation. Once the delay times are set correctly, they will not need to be modified unless there is a change to the mechanical configuration of the system.
8. Remove the Pro Box from the scale and replace it with a full one. Because AUTO mode resets the scale and the Transferred Weight Indicator for you, all the operator needs to do is open the seed gate on the Pro Box and the treating process continues. After each box is run, the calibration ratio and calibration speed will be automatically updated. At the beginning of the second run, the actuator will move faster to the proper gate setting because of the information recorded from the first run. The system is continually adjusting the seed gate to increase accuracy.

TROUBLESHOOTING

Below is a table describing the most frequent problems and solutions with the USC Box to Box Loss in Weight . For further assistance, contact the USC Service department at (785) 431-7900.

Problem	Possible Cause	Solution
Actuator will not move.	<ol style="list-style-type: none"> Adjustable Chamber mechanism jammed with debris. One or both of the two connectors linking the actuator to the control panel are not connected. 	<ol style="list-style-type: none"> Clear all debris and make sure mechanism moves freely. Make sure both connectors are properly engaged.
Actuator will not return to the closed position after all seed has emptied from the box.	<ol style="list-style-type: none"> Proximity switch is dirty. Proximity switch is set too sensitive. The system is running in HAND mode. 	<ol style="list-style-type: none"> Clean proximity switch. Adjust the pump proximity switch sensitivity (see page 33). Change to AUTO mode.
Actuator will not move in AUTO.	<ol style="list-style-type: none"> Proximity switch is not staying covered. Proximity switch is not set sensitive enough. HMI screen not set to AUTO. 	<ol style="list-style-type: none"> Make sure proximity switch is staying covered with seed. Adjust pump proximity switch sensitivity by turning the adjustment screw clockwise. Set HMI screen to AUTO.
Actuator will not close completely.	<ol style="list-style-type: none"> Debris may be keeping it from closing completely. 	<ol style="list-style-type: none"> Open the seed gate, remove debris and power cycle the entire system. When the system is turned back on, the gate will automatically close and find it's "Home" position.

PROXIMITY SWITCH ADJUSTMENT GUIDE

The proximity switches mounted in the supply hopper above the adjustable chamber detect when seed is present.

The proximity switch is used to automatically close the adjustable chamber at the end of a run.

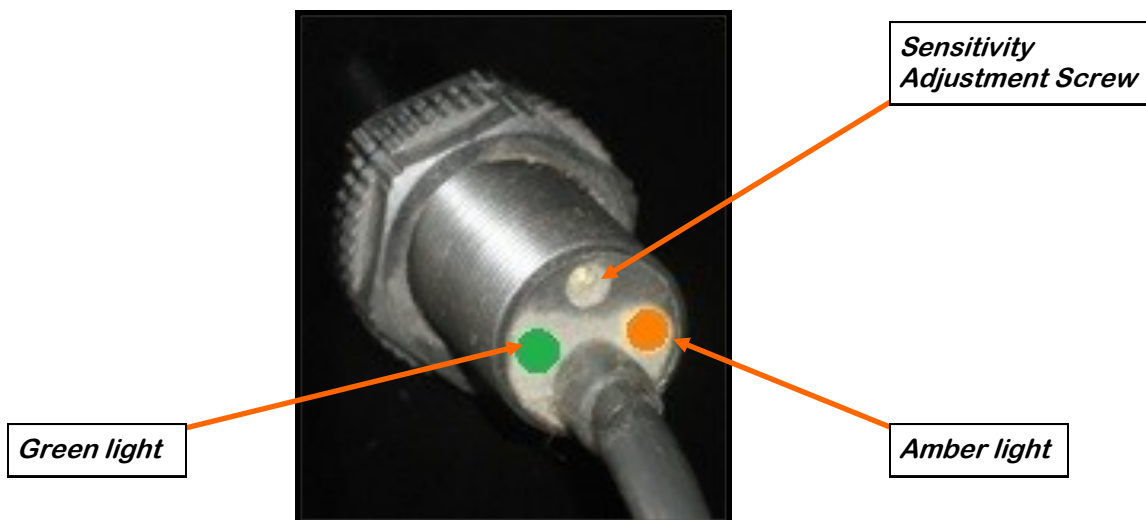
If the proximity switch is not working properly, this can be caused by wear, dust, or even moisture. The first step is to clean the lens of the proximity switch. If this does not solve the problem, the next step would be to adjust the sensitivity of the proximity switch.

The green light indicates the power status. If it is active the device is powered.

The amber light indicates when seed is being detected. If it is active it detects seed, if inactive it does not detect seed.

Using the small screwdriver provided inside the control panel, you can adjust the proximity switch by turning the adjusting screw on the back of the proximity switch.

- Turn Clockwise to make the proximity switch more sensitive.
- Turn Counterclockwise to make the proximity switch less sensitive.



Proximity Switch Screwdriver

Proper maintenance of the Box to Box Loss in Weight 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.

ELECTRICAL PANEL

- Check quick connects on end of Auxiliary cord.
 - Check and tighten wire connections.
 - Check relay and fuse holder.
 - Check power cords for cuts or frays and ensure ground is present.
-

ACTUATOR

- Check for vibration and sound. Sound level should not be higher than usual.
- Check for excessive dust , dirt or oil. Clean with compressed air or clean cloth.
- Check for loose screws and tighten if necessary.

When storing the Box to Box Loss in Weight for long periods of time, the following procedure must be followed to reduce the chance of rust, corrosion and fatigue of the pump stand. You can also use these steps when storing the machine for the winter.



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

1. Clear the area of bystanders, especially small children.
2. Disconnect power to the machine and all of the components.
3. Clean the adjustable chamber and actuator of any seed or residue that may have built up. Compressed air may be used.
4. Thoroughly clean the area around the load cells to remove all residue from the equipment..
5. Inspect all moving or rotating parts to see if anything has become entangled in them. Remove the entangled material.
6. Touch up all paint nicks and scratches to prevent rusting.
7. Move to storage area.
8. Select an area that is dry, level and free of debris.
9. Store machine in an area away from human activity.
10. Do not allow children to play on or around the stored machine.
11. Place a Tarp over the entire machine to keep out any dirt or unwanted pests.

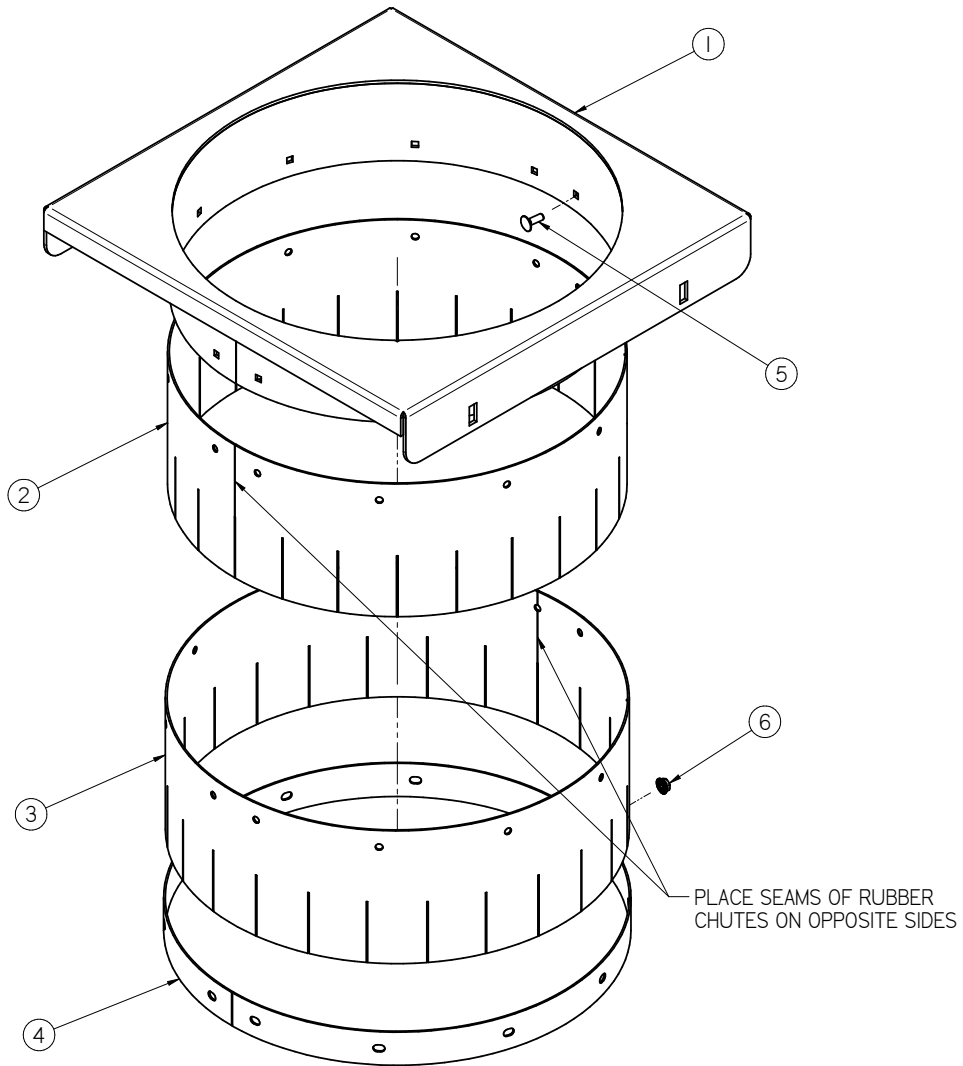
BOX TO BOX LOSS IN WEIGHT

NOTES:

MECHANICAL DRAWINGS

SECTION I

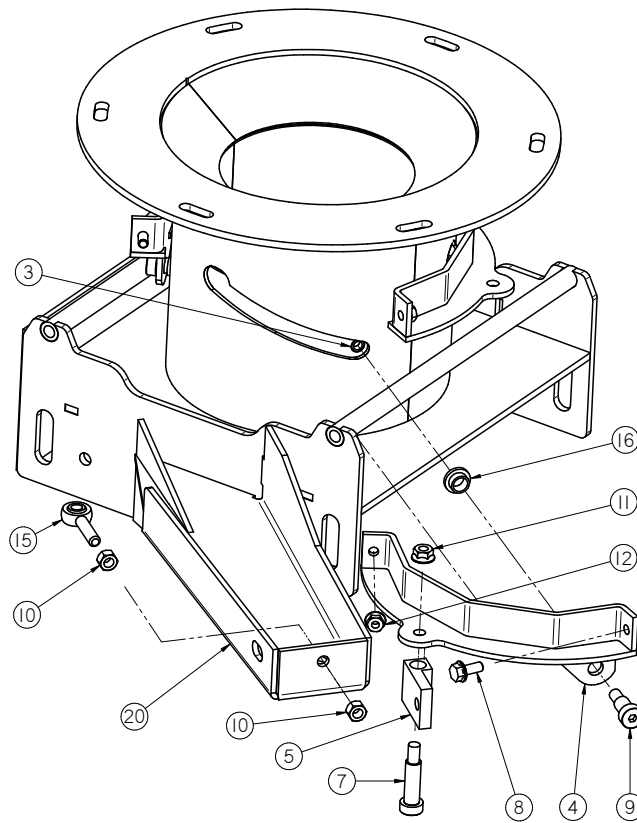
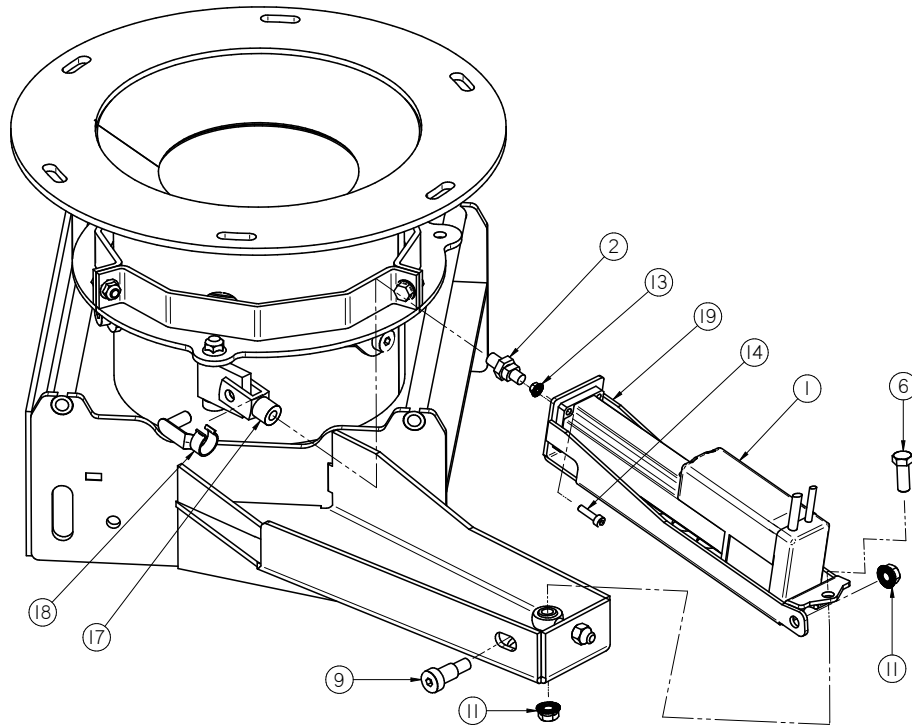
TREATER CHUTE ASSEMBLY (05-07-0706)



Item #	Part #	Description	Qty
1	05-07-0707	WDMT CHUTE TRTR LIW	1
2	5/10/4272	CHUTE RBBR FLX INNER	1
3	5/10/4273	CHUTE RBBR FLX OUTER	1
4	5/10/4274	PLT CLAMP CHUTE LIW FLX	1
5	06-01-0122	BOLT, CARRIAGE, .250-20x.75 G5 ZP	12
6	06-03-0013	NUT, LOCK, FLG .250-20 ZP SERRATED	12

BOX TO BOX LOSS IN WEIGHT

ADJUSTABLE CHAMBER 300 ASSEMBLY (18-01-0242)



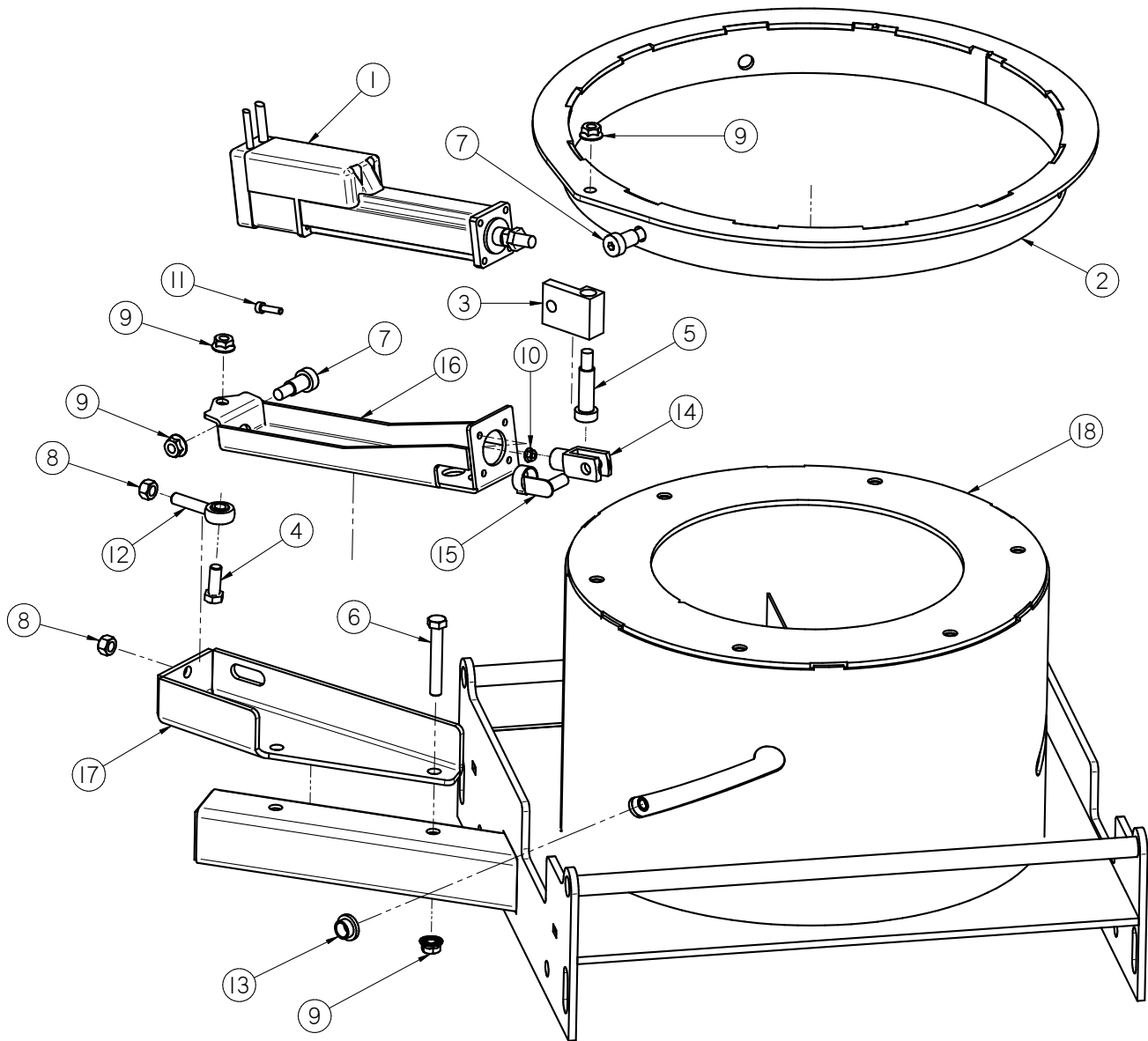
BOX TO BOX LOSS IN WEIGHT

ADJUSTABLE CHAMBER 300 ASSEMBLY (18-01-0242)

Item #	Part #	Description	Qty
1	03-17-0096	ACTR DYADIC SCN5-010-150AS03-NA	1
2	03-17-0097	ADPT TIP SCRW M10-1.25 WITH NUT	1
3	05-03-1224	WDMT FLOW STOP GATE LPX300 CS	1
4	05-04-0171	WDMT RING DRV SGM T LIW 300	3
5	05-11-0394	BRKT FLOW CNTL CLVS 10 MM	1
6	06-01-0016	BOLT .375-16 X 1.00 ZP GR5	1
7	06-01-0057	BOLT SHLD .500SHX.375-16X1.50 GR5	1
8	06-01-0138	BOLT, FLG .315-18 UNC ZP GRADE 5; 3/4" LG	3
9	06-01-0278	BOLT SHLD .500SHX.375-16X.750 GR5	4
10	06-02-0027	NUT FULL .375-24 ZP GR5	2
11	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	3
12	06-03-0019	NUT LOCK FLG .3125-18 ZP GR5	3
13	06-03-0031	NUT LOCK FLG M5-0.8 GR8.8	4
14	06-06-0083	SCRW SH M5-0.8 X 20MM BO	4
15	06-12-0003	REND .375-24 BALL RH	1
16	06-12-0012	BUSH FLG BRZ .500ID X .625OD X .375	3
17	06-12-0043	CLVS 10-1.25 X 10MM	1
18	06-12-0044	PIN CLIP SPRING 10MM	1
19	102EEA	BRKT DYATIC SCN5-010-150 ACTUATOR	1
20	18-01-0243	WDMT ADJ CHMBR LPX300 CS	1

BOX TO BOX LOSS IN WEIGHT

ADJUSTABLE CHAMBER 2000 ASSEMBLY (18-01-0240)



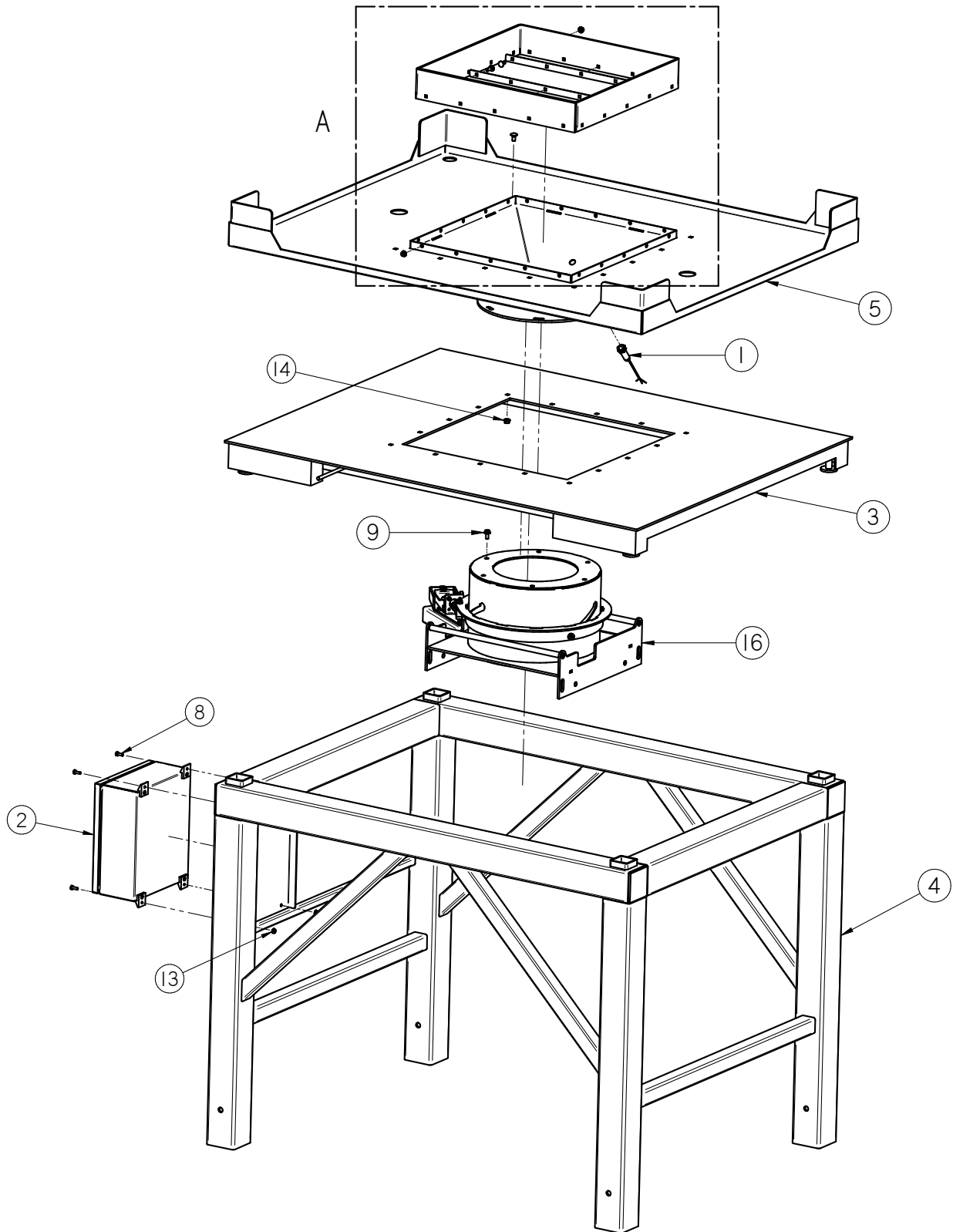
BOX TO BOX LOSS IN WEIGHT

ADJUSTABLE CHAMBER 2000 ASSEMBLY (18-01-0240)

Item #	Part #	Description	Qty
1	03-17-0103	ACTR DYADIC SCN5-010-150AS03-NA	1
2	05-04-0169	WDMT RING DRV LIW SLEEVE	1
3	05-11-0394	BRKT FLOW CNTL CLVS 10 MM	1
4	06-01-0016	BOLT .375-16 X 1.00 ZP GR5	1
5	06-01-0057	BOLT SHLD .500SHX.375-16X1.50 GR5	1
6	06-01-0071	BOLT, .375-16 X 2 1/2 ZP G5 FULL THREAD	2
7	06-01-0278	BOLT SHLD .500SHX.375-16X.750 GR5	4
8	06-02-0027	NUT FULL .375-24 ZP GR5	2
9	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	5
10	06-03-0031	NUT LOCK FLG M5-0.8 GR8.8	4
11	06-06-0083	SCRW SH M5-0.8 X 20MM BO	4
12	06-12-0003	REND .375-24 BALL RH	1
13	06-12-0012	BUSH FLG BRZ .500ID X .625OD X .375	3
14	06-12-0043	CLVS 10-1.25 X 10MM	1
15	06-12-0044	PIN CLIP SPRING 10MM	1
16	102EEA	BRKT DYATIC SCN5-010-150 ACTUATOR	1
17	102EEB	BRKT CYL BASE	1
18	18-01-0241	WDMT ADJ CHMBR LIW 2000 CS	1

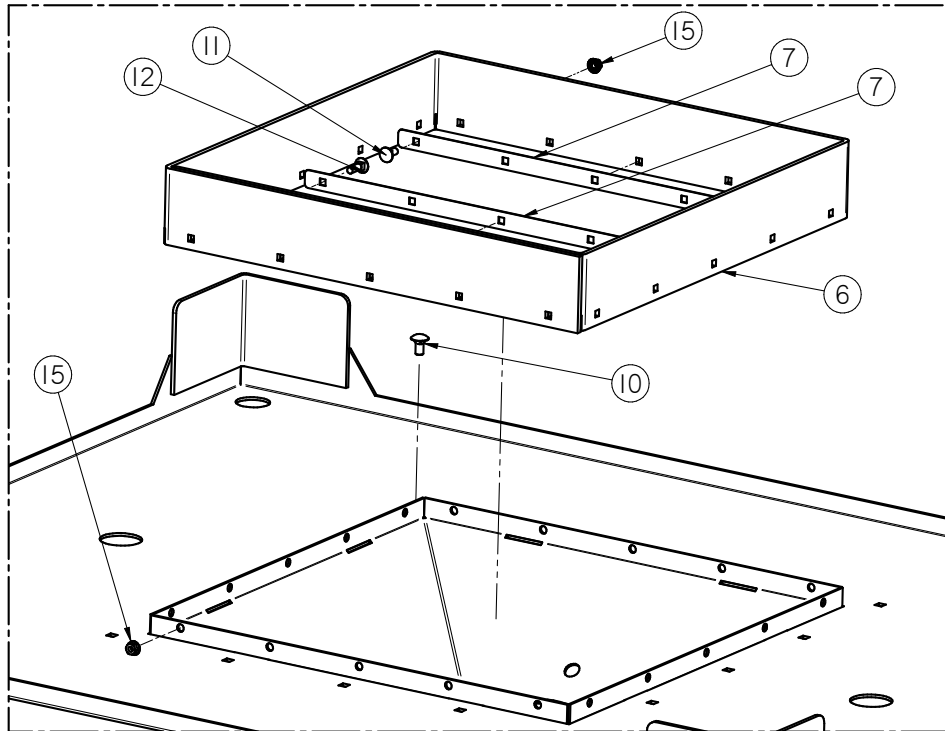
BOX TO BOX LOSS IN WEIGHT

BASE ASSEMBLY (05-07-0705)



BOX TO BOX LOSS IN WEIGHT

BASE ASSEMBLY (05-07-0705)

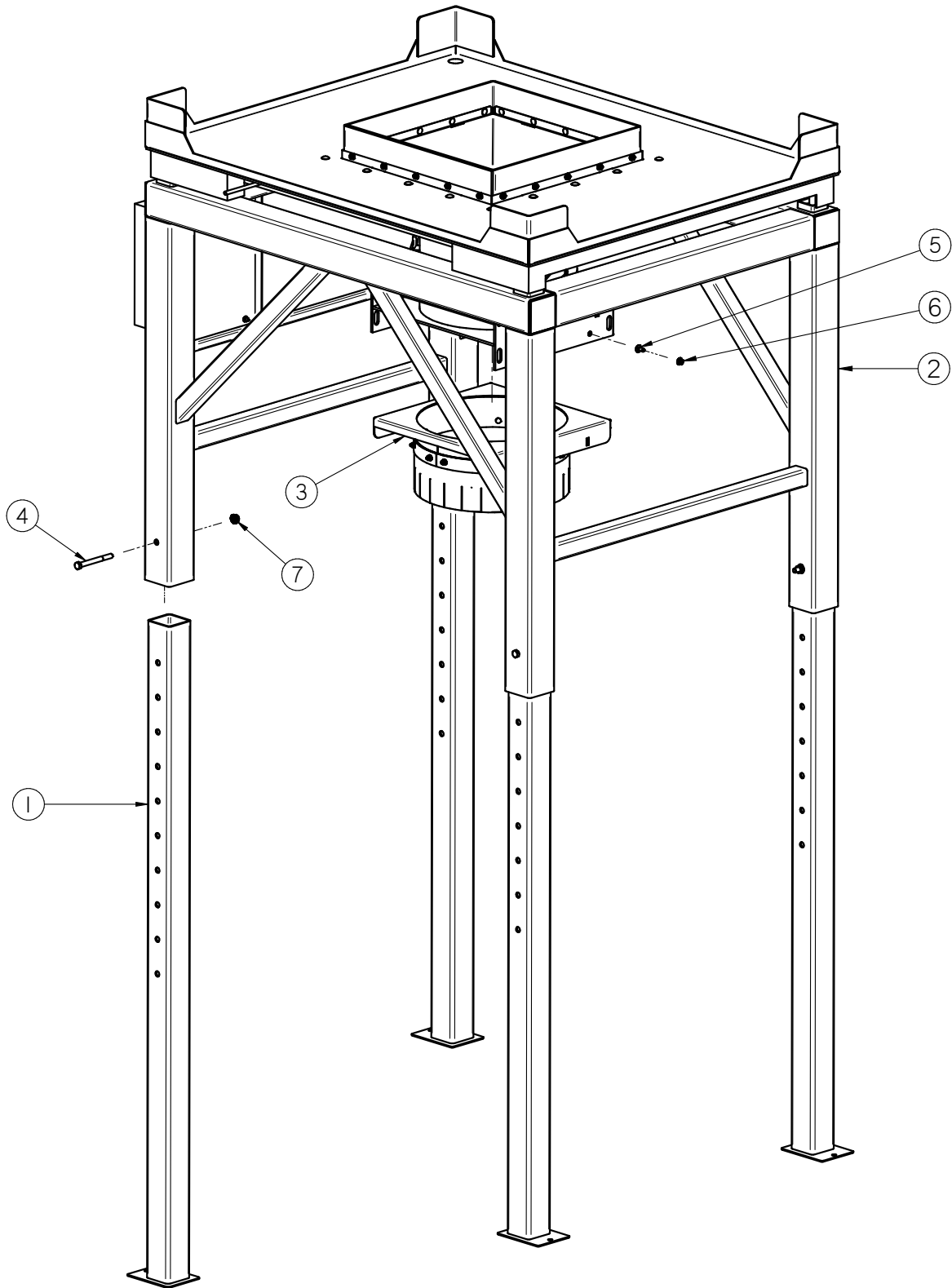


DETAIL A

Item #	Part #	Description	Qty
1	03-10-0136	SENS PROX 24VDC PNP XT218A1PAL2	1
2	03-12-0457	CNTL PNL B2B LIW	1
3	03-19-0066	SCL 5X4FT 5K 2FT CTR CUTOUT*	1
4	05-03-1412	WDMT FR ADJ LEG SCALE LIW	1
5	05-07-0698	WDMT HOPP SCALE GUIDE	1
6	05-10-4270	GUIDE RBBR LIW SCALE HOPP	1
7	05-10-4271	PLT CLAMP HOPP FLEX INLET	4
8	06-01-0006	BOLT, .250-20 X .75 UNC ZP GRADE 5	4
9	06-01-0124	BOLT FLG .375-16 X .750 ZP GR5	6
10	06-01-0153	BOLT CRG .375-16X.750 ZP SHORT NECK	16
11	06-01-0198	BOLT, CARRIAGE, 5/16-18 X 3/4 UNC ZP GRADE 5	15
12	06-01-0223	BOLT CRG .313-18 X 1.00 ZP GR5	5
13	06-03-0013	NUT,LOCK, FLG .250-20 ZP SERRATTED	4
14	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	16
15	06-03-0019	NUT LOCK FLG .3125-18 ZP GR5	20
16	18-01-0240	ASSY ADJ CHMBR LIW 2000 CS	1

BOX TO BOX LOSS IN WEIGHT

TREATER ASSEMBLY (05-07-0701)



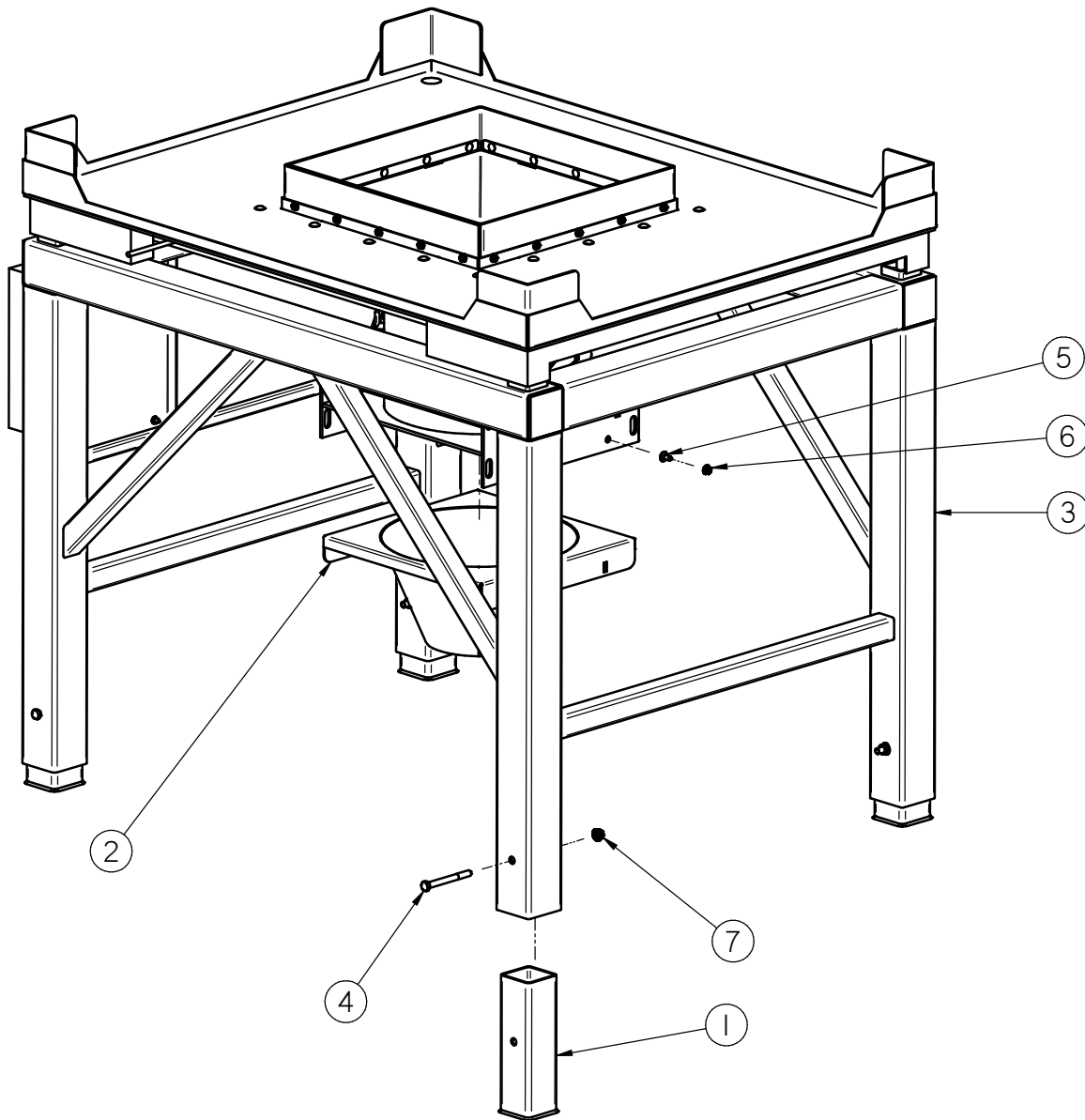
BOX TO BOX LOSS IN WEIGHT

TREATER ASSEMBLY (05-07-0701)

Item #	Part #	Description	Qty
1	05-03-0316	WDMT ADJ LEG	4
2	05-07-0705	BOX2BOX LIW BASE	1
3	05-07-0706	ASSY CHUTE TRTR LIW	1
4	06-01-0119	BOLT, .500-13 X 5.00" UNC ZP GRADE 5	4
5	06-01-0153	BOLT CRG .375-16X.750 ZP SHORT NECK	4
6	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	4
7	06-03-0015	NUT LOCK FLG .500-13 ZP GR5	4

BOX TO BOX LOSS IN WEIGHT

CONVEYOR ASSEMBLY (05-07-0700)



Item #	Part #	Description	Qty
1	05-05-0108	WDMT LEG SHORT	4
2	05-07-0699	WDMT CHUTE CNVR LIW	1
3	05-07-0705	BOX2BOX LIW BASE	1
4	06-01-0119	BOLT, .500-13 X 5.00" UNC ZP GRADE 5	4
5	06-01-0153	BOLT CRG .375-16X.750 ZP SHORT NECK	4
6	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	4
7	06-03-0015	NUT LOCK FLG .500-13 ZP GR5	4

USC LIMITED WARRANTY**SECTION
J**

USC, LLC, (Manufacturer) warrants its seed treating 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. If the Products do not conform to this Limited Warranty during the warranty period, Buyer shall notify Manufacturer in writing of the claimed defects and demonstrate to Manufacturer satisfaction that said defects are covered by this Limited Warranty. 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.

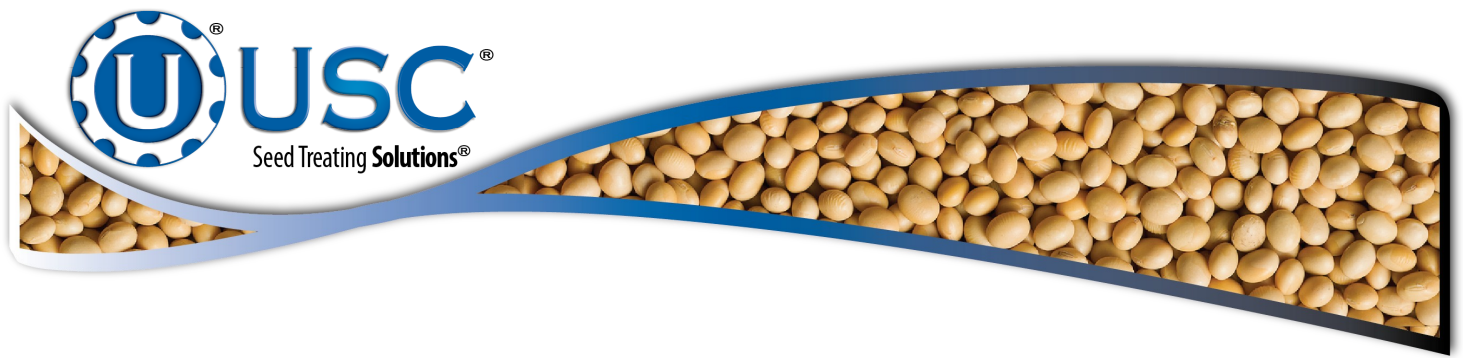
2. **Other Limits:** THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising from improper installation (where 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 effected 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 casualties 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.

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.

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.

5. **Return Policy:** Approval is required prior to returning goods to Manufacturer. A restocking fee will apply.

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.



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