

Vertical Fertilizer Blender

Owner's Manual

PNEG-2093

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PNEG-2093

All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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1. Introduction

General Information

InterSystems reserves the right to improve its product whenever possible and practical to do so. We reserve the right to change, improve and modify products at any time without obligation to make changes, improvements and modifications on equipment sold previously. This manual covers the installation and operation for the Vertical Fertilizer Blender.

This manual provides guidelines for installing the product. You must retain a qualified contractor to provide on-site expertise. The Vertical Fertilizer Blender units are available with 14 Ton, 16 Ton and 18 Ton capacities. InterSystems is not responsible for the installation of this product.

General Safety Statements

1. The Vertical Fertilizer Blender is designed and manufactured with operator safety in mind. However, residual hazards remain due to the nature of fertilizer. Use extreme caution at all times.
2. Modifications to equipment may cause extremely dangerous situations that could result in damage to the equipment as well as serious injury or death. Never modify the equipment.
3. InterSystems recommends that you contact the local power company to have a representative survey the installation to ensure wiring is compatible with their system and adequate power is supplied to the unit.

Receiving Inspection

1. Carefully inspect the shipment for damage as soon as it is received. Verify that the quantity of parts or packages actually received corresponds to the quantity shown on the packing slip. One or more cartons containing the fasteners required for assembly are included with the shipment. Report any damage or shortage to the delivering carrier as soon as possible.
2. InterSystems responsibility for damage to the equipment ended with acceptance by the delivering carrier. Refer to the bill of lading for more detailed information.
3. Save all paperwork and documentation furnished with any of the Vertical Fertilizer Blender components.

Pre-Installation Preparation

1. Before starting Fertilizer Blender installation, review this manual, the drawing(s) furnished with the equipment and other applicable documents, including but not limited to, O.S.H.A. Regulations and the National Electrical Code and all other applicable federal, state and local codes and regulations.
2. InterSystems does not assume responsibility for the installation.
3. The installation recommendations contained within this manual are for consideration only. The user or installer will want to consult a civil or structural engineer regarding the design, construction and supervision of the entire installation.
4. The MOST IMPORTANT preparations are retaining a licensed engineer to plan the installation and a qualified millwright or contractor to install the Vertical Fertilizer Blender and the accompanying equipment and structures.

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Save these safety guidelines for future reference.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in **SERIOUS INJURY** or **DEATH**.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001-3

Cautionary Symbols Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.



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



This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**



This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**



This symbol is used to address practices not related to personal injury.



This symbol indicates a general hazard.



This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005-2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection



Respiratory Protection



Foot Protection



Hearing Protection



Head Protection



Fall Protection



Hand Protection

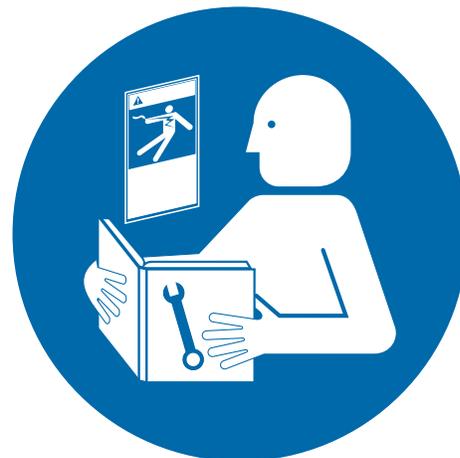


- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

Follow Safety Instructions

- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.



ST-0002-1

2. Safety

Stay Clear of Hoisted Equipment

- Always use proper lifting or hoisting equipment when assembling or disassembling equipment.
- Do not walk or stand under hoisted equipment.
- Always use sturdy and stable supports when needed for installation. Not following these safety precautions creates the risk of falling equipment, which can crush personnel and cause serious injury or death.



ST-0047-1

Install and Operate Electrical Equipment Properly

- Electrical controls must be installed by a qualified electrician and must meet the standards set by applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe).
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Make sure all equipment and bins are properly grounded.



ST-0027-3

Fall Hazard

- Keep access door closed while on a platform to avoid falls.
- Always use proper personal protective equipment and proper clothing when using equipment. Failure to follow safety precautions can result in severe injury or death.



ST-0042-2

Maintain Equipment and Work Area

- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.



ST-0003-1

Fall Hazard

- Ladders, stairways and platforms are for use by competent and trained personnel only. Do not allow children or other unauthorized persons to have access to the equipment.
- Access to the equipment must be restricted by the use of security fencing and lockable gates.
- Lower sections of ladders must be fitted with a lockable safety gate to prevent unauthorized access.
- Make sure that hot surfaces have had adequate time to cool before working on or in the equipment.
- Lock out and tag out power supplies and fuel supplies to all equipment.
- Do not attach lifting equipment to ladders or platforms.
- Do not go outside of the safety rails provided on elevated platforms.
- Do not work at heights during high winds, rain, snow, or ice storms.



ST-0056-1

Toxic Fume and Dust Hazard

- Remove paint before welding or heating.
- Avoid potentially toxic fumes and dust. Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.
- Do all work outside or in a well-ventilated area. Dispose of paint and solvent properly.
- Remove paint before welding or heating:
 - If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
 - If you use solvent or paint-stripper, remove stripper with soap and water before welding.
 - Remove solvent or stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



ST-0043-1

Confined Space Hazards and Entry Procedures

- Note that the interior of this equipment is considered a confined space. Maintenance of this equipment can require access to the confined space.
- Access doors must be shut and locked except when access is required.
- Doors giving access to dangerous equipment must be safety interlocked.
- The following entry procedures must be followed:
 - Be aware of all possible hazards present inside the confined space and wear personal protective equipment (PPE) as needed.
 - Complete a permit to work and follow all permit required confined space entry procedures defined by the site manager.
 - Make sure that the area has been purged of any hazardous products or gases. Check the atmosphere for harmful gases or vapors with a suitable gas analyzer and make sure levels are safe before entering.
 - Do not smoke or use naked flames.
 - Lock out and tag out power supplies and fuel supplies to all equipment.
 - Do not work alone. Work in teams of at least three so that help is immediately available in the event of an emergency.
 - Confirm that all personnel have safely exited the equipment and tools have been recovered once work is complete.



ST-0055-1

Stay Clear of Rotating Parts

- Do not enter while the equipment is in operation.
- Entanglement in rotating augers will cause serious injury or death.
- Keep all shields and covers in place at all times.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.



ST-0008-2

Flying Material Hazard

- Flying material can cause severe eye injury or blindness.
- Wear safety glasses around operating equipment.



ST-0063-1



Failure to heed may result in serious injury or death. The installation should be planned by a qualified structural engineer. Each installation is unique; this manual is meant to serve only as a general guideline for installation.

Do not use for purposes other than weight measurement.

Do not exceed the rated load limit of the unit.

Do not make alterations or modifications to the unit.

General Guidelines

1. The mounting surface for the base and top plate must be level. After installation, the top and bottom plates must be level within $\pm 0.5^\circ$. If the mounting surfaces are not level, shims and/or grout may be used to level the mount. If possible, check that the module is level when the Vertical Fertilizer Blender is fully loaded. Excessive deflections in legs and supporting structures may cause additional side forces which can greatly affect accuracy.
2. If the actual load cells are used during installation of the weigh module, extreme care must be taken to prevent overload damage. A tank or hopper weighing several tons can exert huge forces when dropped only a fraction of an inch. Dummy load cells can be used during installation.
3. Load cells should not be installed in the modules until all welding is completed. The heat generated from welding current passing through a load cell can damage the adhesive holding the strain gauge to the body. If possible, use a dummy load cell when welding to maintain finished height. If welding is unavoidable after load cell installation, connect the ground in such a way that the current does not flow through the load cell. For example, if welding on the module top plate, the ground must be connected to the vessel, not to the mount base or support structure. Also, protect the load cell and cable from weld splatter.
4. All support points should be equally stiff so that they deflect by the same amount as the bin is loaded.

Installation Guidelines

1. Assemble the modules by attaching the load cell (H) to the load plate and clamp (C) using the lock washer (F) and clamp bolt (G). Then, insert the load pins through the base plate and load cell. Secure the load pins with washers and cotter pins (D).

NOTE: *The arrow on the load cell should point in the direction of the load.*

2. Lift the Vertical Fertilizer Blender to the same height as the assembled modules.
3. As the module is being fitted under the leg of the blender, verify that the leg's centerline passes through the center of the load plate (through the center of the load cell.) *(See Figure 3A on Page 14.)*

3. Load Cell

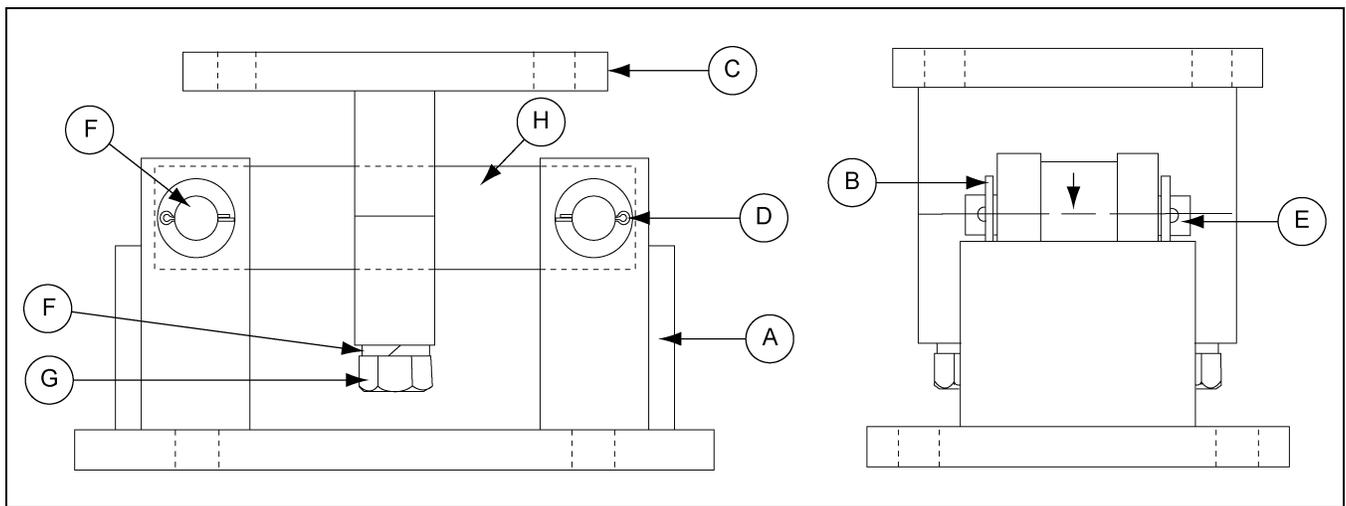


Figure 3A Load Cell

Ref #	Description
A	Weigh Module Base
B	Washer
C	Load Plate and Clamp
D	Cotter Pin

Ref #	Description
E	Pin
F	Lock Washer
G	Clamp Bolt
H	Load Cell

Load Cell Wiring

1. Route the load cell cables so they will not be damaged or cut. Cable should not be routed near heat sources greater than 150°F.
2. Provide a drip loop in all cables. This will prevent water and other liquids from running down the cables onto load cells or the junction box. Attach the load cell cable to the dead structure, not the blender.
3. Connect cables for load cells to the summing board in the junction box according to the guide shown below and the labels on the terminal strips of the junction box. To verify the wiring scheme, see the certification shipped with each load cell.

Load Cell Wire Color	Function
Red	+EXC
Black	-EXC
Green	+SIG
White	-SIG
Gray or Bare	SHIELD

4. Refer to the junction box manual for trimming details. Refer to the indicator manual for system calibration details.

General Guidelines

Make sure all personnel are wearing person protection equipment such as hard hats, steel toe boots, respiratory masks and gloves. Lift only at designed lifting points. Protect the mounting surface from damage. Lifting is done with lifting lugs (B) and hooks (A) as shown in [Figure 4A on Page 16](#).

1. Use four (4) lifting hooks to connect the crane's lifting straps to the module.
2. Use two (2) lifting lugs as a bottom lifting point.
3. Lower the bottom point and increase the top lifting point to bring the blender vertical.
4. When lifting modules across the open ground, have personnel on the field to guide it and minimize sway with the lifting lugs.
5. Carefully lower the blender so that the scale base located on the module are touching and can be connected with nuts and bolts, however, **DO NOT** lower fully at this time.
6. Line up connecting holes so that nuts and bolts can be loosely inserted at this time.
7. Once all holes have a nut and bolt installed, tighten with power impact.

4. Lifting

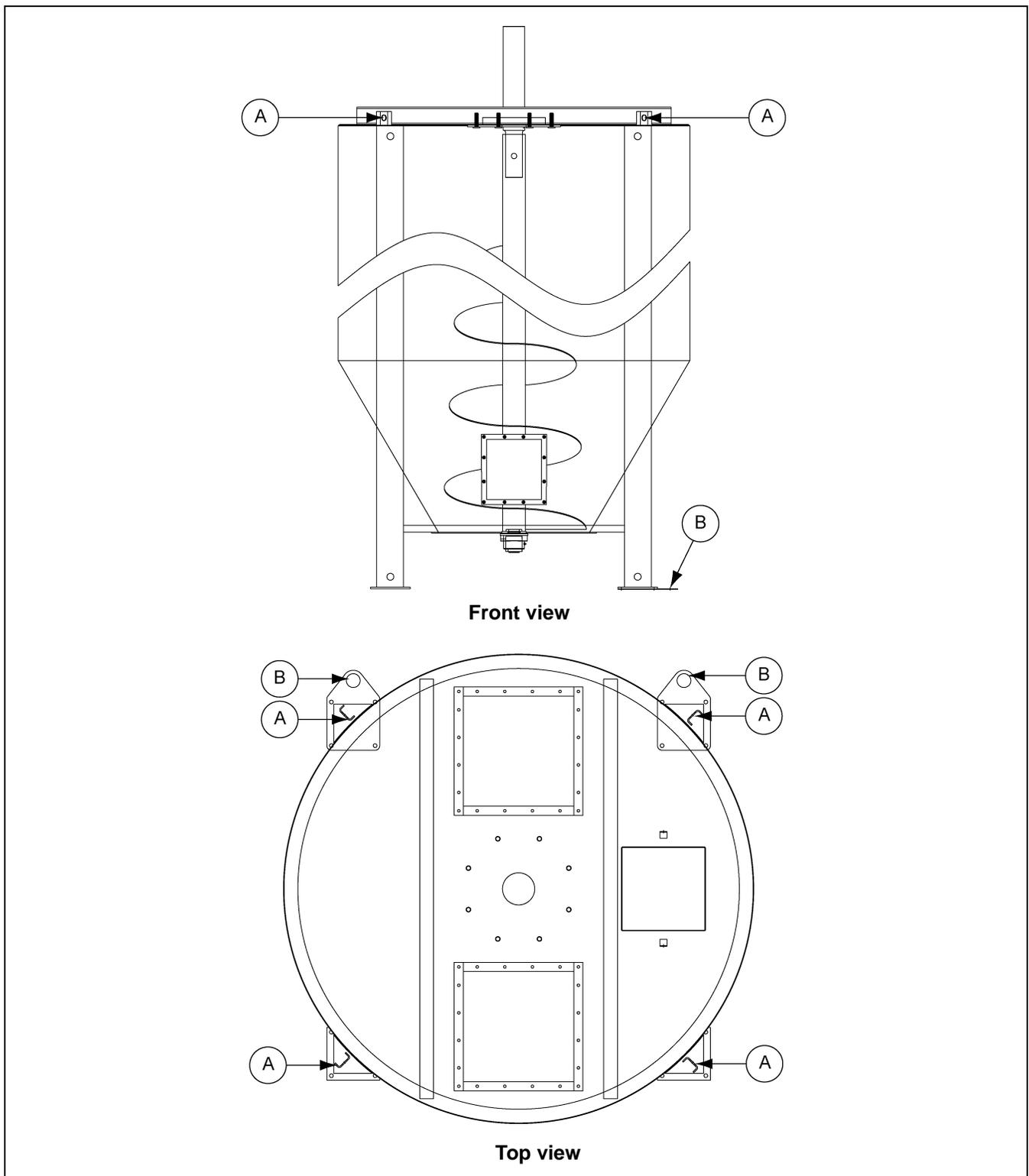


Figure 4A Blender Lifting Points

Ref #	Description
A	Blender Lifting Hooks
B	Lifting Lugs

Reducer (Gearbox) Installation

The reducer gearbox must be rigidly supported and the shafts accurately aligned. Refer to the manufacturer data, which should have been saved when the components were unpacked or consult the manufacturer or a local supplier of the component.

NOTE: Refer to the owner's manual supplied with the reducer gearbox for proper vent plug, fill plug and drain plug locations.

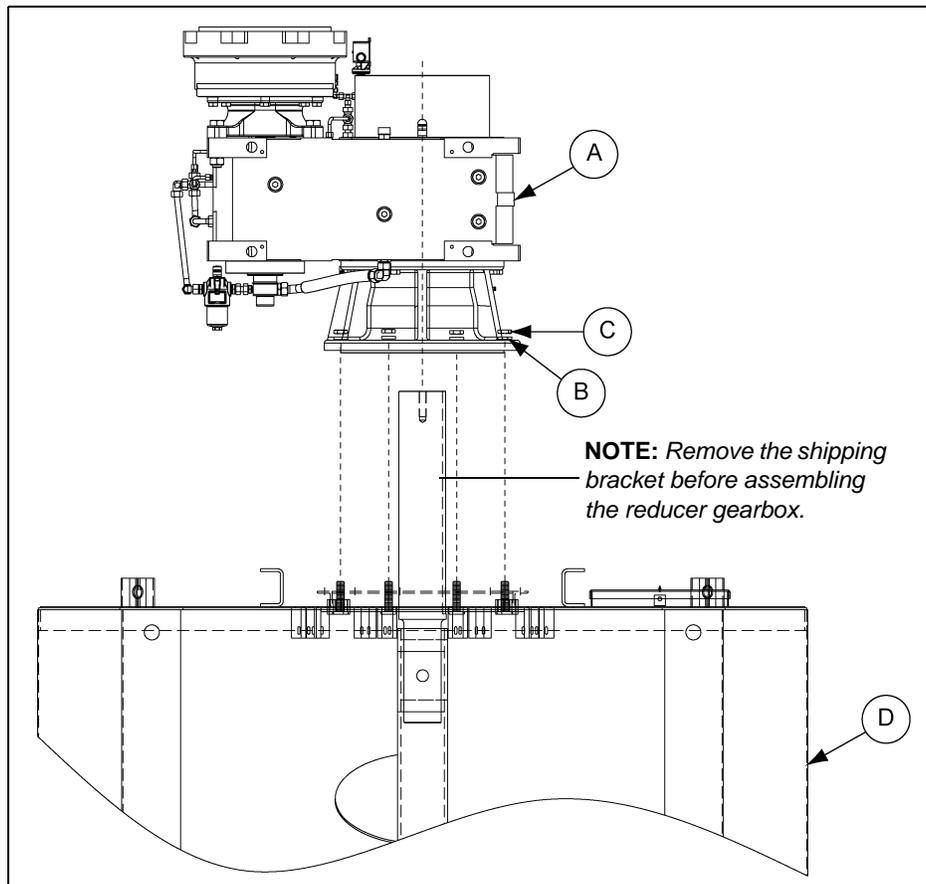


Figure 5A Reducer Assembly

Ref #	Description
A	Reducer Gearbox
B	Lock Washer 3/8"
C	Hex Nut 3/8"-8 Grade 8
D	Blender

1. Remove the shipping bracket which holds the blender shaft before installing the reducer gearbox (A) onto the shaft.
2. Align the holes in the reducer gearbox flange.
3. Line up the keyway on reducer gearbox with key on the shaft and slide the reducer gearbox onto the drive shaft.
4. Once reducer gearbox is in place, fully tighten the fasteners (B and C). (*See Figure 5A.*)

5. Installation

Motor Installation

The motor drives the auger through an in-line reducer gearbox. A label is located on the motor designating the correct direction of rotation. Verify that the motor is turning the proper direction of rotation when wiring the system. On initial setup, jog the motor to insure proper rotation.

NOTE: Do not run the motor in the wrong direction. Damage to the limit switch arm may result.

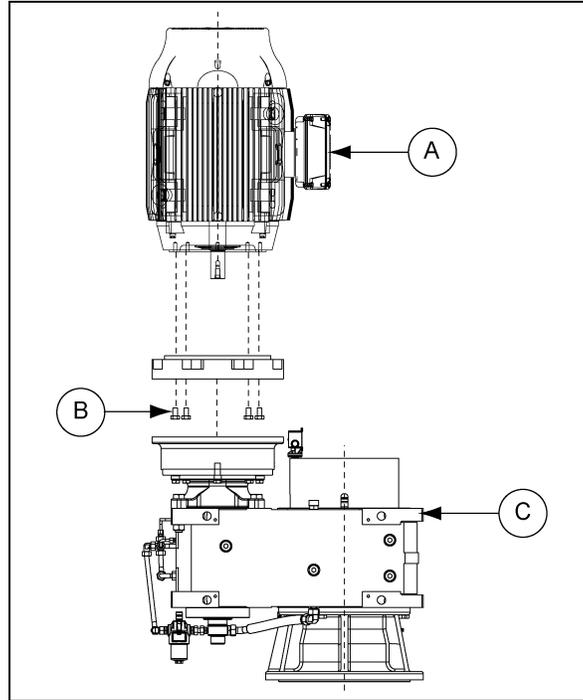


Figure 5B Motor Assembly

Ref #	Description
A	Motor
B	Heavy Hex Bolt 5/8"-11 UNC x 4" A325N
C	Reducer Gearbox

1. Mount the motor (A) to the reducer gearbox (C) and make sure to align the key and the keyway on the shaft. (See Figure 5B.)
2. Bolt (B) the motor to gearbox reducer (C).
3. Connect the motor to a power source according to the motor manufacturer's instructions and recommendations.

NOTE: A certified electrician must perform the motor wiring.

4. An emergency shut off switch must be placed near the motor.



WARNING

Electric motors and controls shall be installed by a qualified electrician and must meet the standards set by the National Electrical Code and all other applicable federal, state and local codes and regulations. Reset and motor starting controls shall be located where the operator has unrestricted access to the controls. Do not make alterations or modifications to the unit.

Blender Installation

1. Ensure the load bearing portion at the bottom is rigid and properly supported.
2. Securely mount scale base to the tower/floor.
3. The load cell (F) is mounted on the scale base (H) using the hardware provided (C, D and E).
4. Connect the load cells (F) to the summing board in the junction box.
5. Adapter plate (B) is mounted onto the load cell (F) with the attaching parts.
6. The blender (A) is positioned over the adapter plate (B) and assembled as shown in *Figure 5C*.

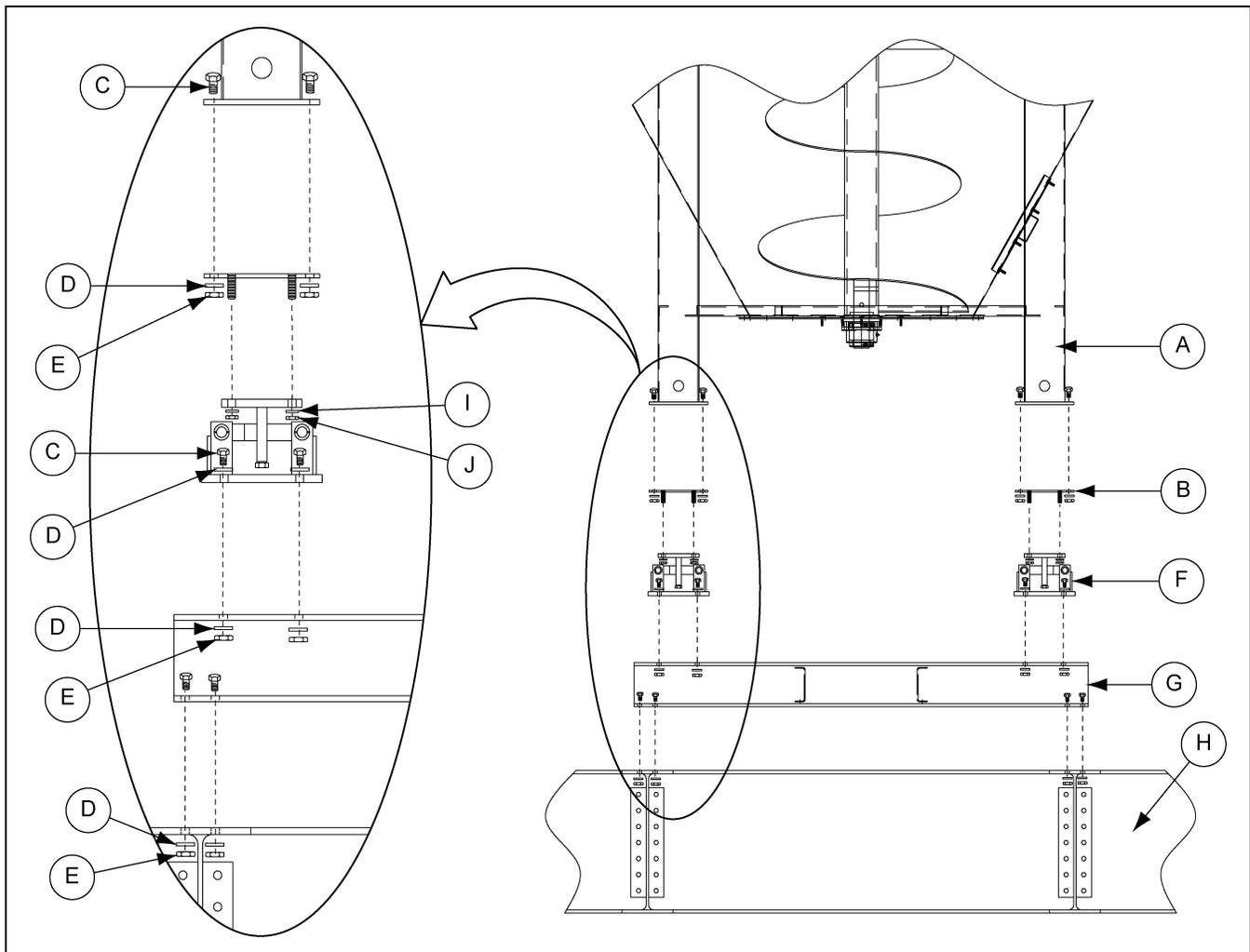


Figure 5C Load Cell Assembly

Ref #	Description	Ref #	Description
A	Blender	F	Load Cell
B	Adapter Plate	G	Scale Base
C	Heavy Hex Bolt Galv. 3/4"-10 UNC x 2" A325N	H	Base
D	Flat Washer Galv. 3/4" F436 Type 1 Hardened	I	Flat Washer 3/4" UNC SS
E	Heavy Hex Nut Galv. 3/4"-10 UNC A563 Grade DH	J	Hex Nut 3/4"-10 UNC SS

6. Chemical Rings (Optional)

Assemble the chemical ring kit (A), which includes two (2) large injection rings (33.95") (A1) and two (2) small injection rings (29.95") (A2) together. These rings will be mounted to the top plate of blender as shown in [Figure 6A](#).

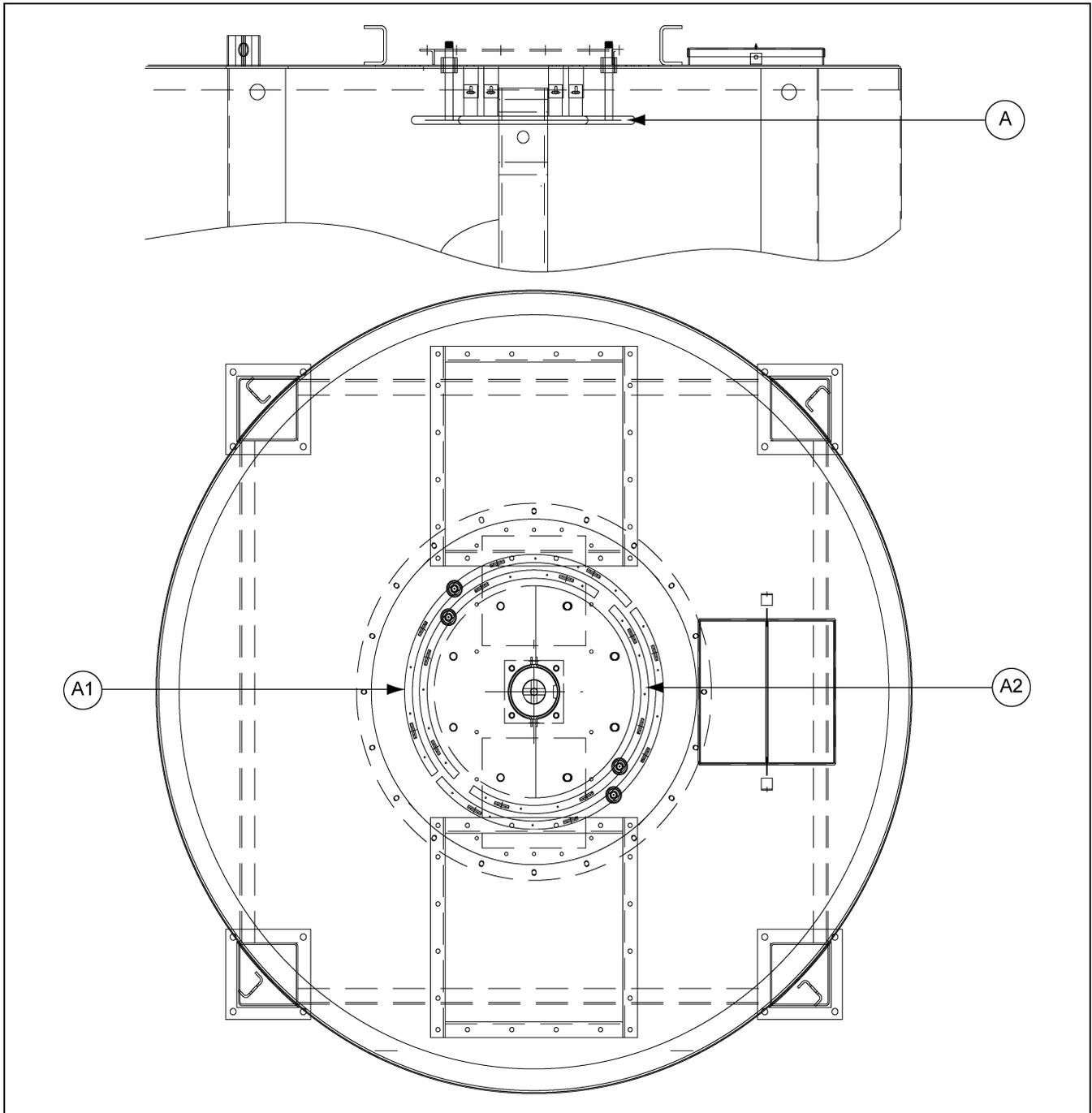


Figure 6A Chemical Rings

Ref #	Part #	Description	Qty
A	559813	Chemical Ring Kit	1
A1	XR9582	Chemical Ring Assembly Diameter 33.95"	2
A2	XR9580	Chemical Ring Assembly Diameter 29.95"	2

The salem valve discharger is connected to the bottom of blender.

1. Position the salem valve (A) to the bottom of the blender (B) in the correct orientation.
2. Tighten with nuts (D) to secure the salem valve (A) as shown in *Figure 7A*.

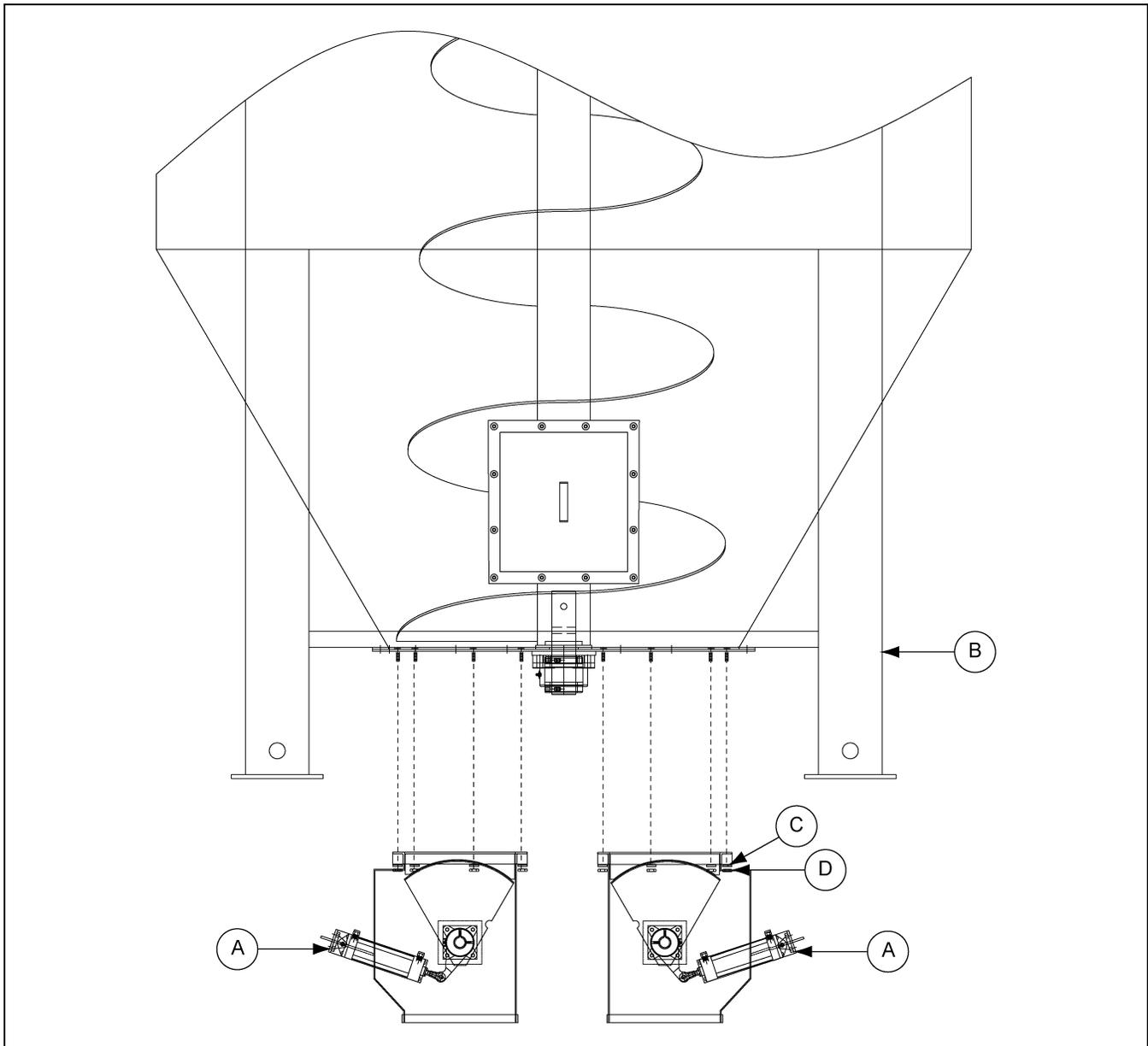
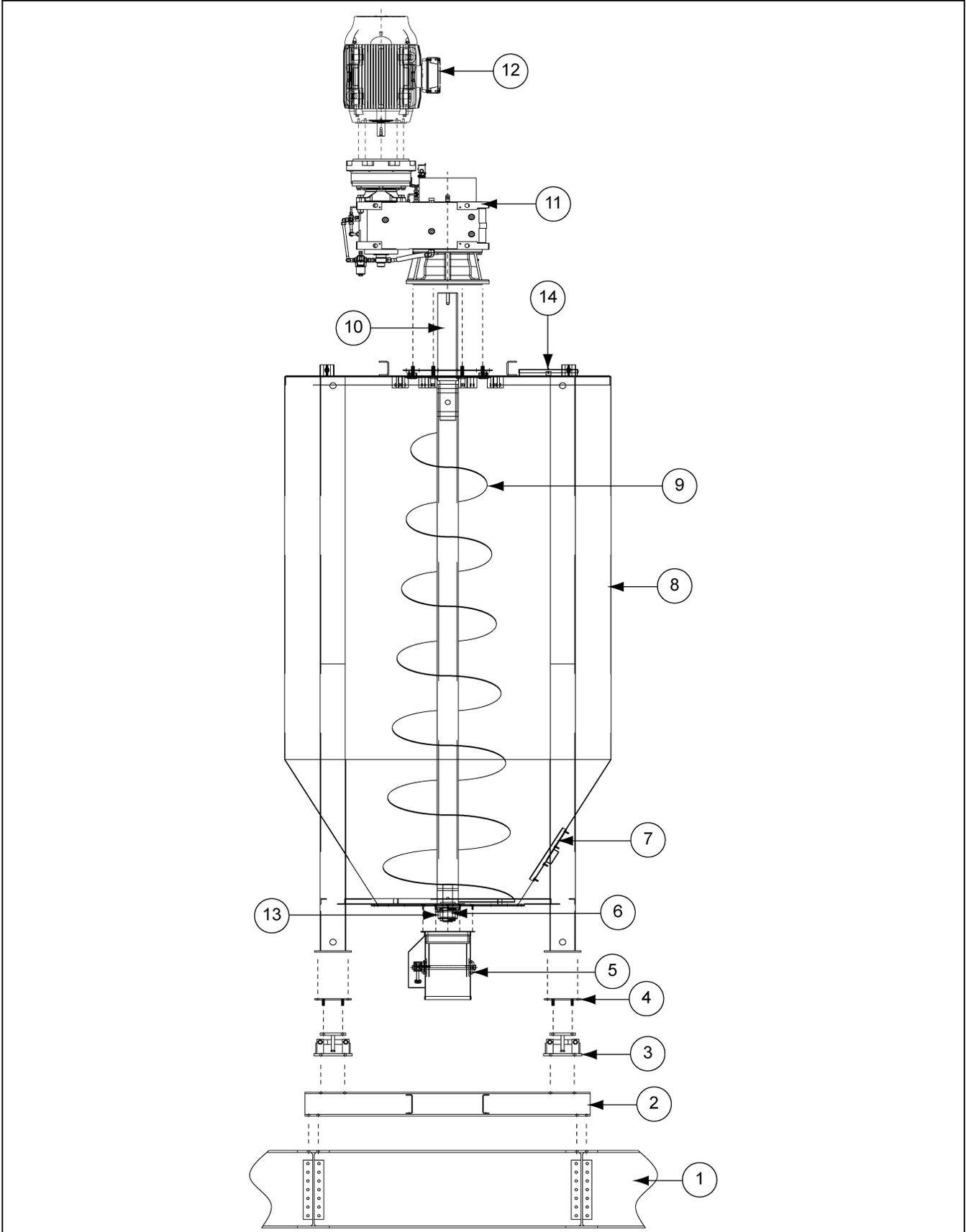


Figure 7A Salem Valve Assembly

Ref #	Description
A	Salem Valve
B	Blender
C	Lock Washer 3/8"
D	Hex Nut 3/8"-8 Grade 8

Vertical Fertilizer Blender Parts



18 Ton Vertical Fertilizer Blender Parts List

Ref #	Part #	Description
1		Tower
2	XR6985	Scale Base
3	XR6983	Load Cell RL 1600 Series 4 x 15K PKG
4	XR6979	Adapter Plate 11-1/2" x 11-1/2"
5	XV0280	Salem Valve
6	XR3342	Shaft 3 Blender Bottom
7	559387	Inspection Cover Blender HSG
8	559383	HSG Weld Blender 18T
9	559382	Auger Blender
10	559401	Shaft 160 mm TD 4-15 Blender 18T
11	556124	Reducer Gear 31.3 Ratio Nord 125 HP
12	556129	Motor 125 HP 3 PH TEFC 444TC 460V Drip Cover
13	XR3326	BRG FRG 4 Bolt 3 Type E
14	XR6975	Inspection Cover 18.00 x 18.00 Blender SS

14 Ton and 16 Ton Vertical Fertilizer Blender Parts List

Ref #	Part #	Description
1		Tower
2	XR6985	Scale Base
3	XR6983	Load Cell RL 1600 Series 4 x 15K PKG
4	XR6979	Adapter Plate 11-1/2" x 11-1/2"
5	XV0280	Salem Valve
6	XR3342	Shaft 3 Blender Bottom
7	559387	Inspection Cover Blender HSG
8	559807	HSG Weld Blender 14T/16T
9	559382	Auger Blender
10	559811	Shaft 125 mm TD 4-15 Blender 14T/16T
11	556123	Reducer Gear 31.8 Ratio Nord
12	556126	Motor 100 HP 3 PH TEFC 405TC 460V Drip Cover
13	XR3326	BRG FRG 4 Bolt 3 Type E
14	XR6975	Inspection Cover 18.00 x 18.00 Blender SS

General Maintenance and Periodic Inspection



Always disconnect and lockout all power sources to equipment before performing any service or maintenance of equipment.

At regular intervals, perform these inspections:

1. Remove accumulated dirt from the motor, reducer gearbox and bearings.
2. Inspect visually for oil leaks and/or unusual noises and vibrations. Replace any damaged parts.
3. Make sure gearbox pressure vent is free from debris and operating properly.
4. Check the gearbox lubricant level and condition. If lubricant is low or dirty, replace with new lubricant.

At regularly scheduled intervals, while observing all safety precautions, observe the sampler as it operates. Inspect for:

1. Loose or missing hardware.
2. Noisy motor or motor/reducer bearings.
3. Overheated motor or reducer.
4. Adequate lubricant in gear reducer.
5. Structural damage.
6. Rust or corrosion.
7. Damaged wiring or conduit, including exposed conductors and connections.
8. Make sure that all guards and warning labels are in place and legible.

Blender Maintenance

Due to the characteristics of certain materials, a residue may build up. If this is a problem or gets excessive, wash out the blender and around the gate. Allow to dry before using.

Auger Maintenance

1. Ensure that ALL electric motors are operating at the proper speed.
2. Make sure ALL electrical wiring is not damaged and that it meets proper wiring codes.
3. Make sure ALL components are in good working condition before use.
4. Check the auger flighting to make sure it is in good working condition.
5. Grease bearing at least two times each season.

General Guidelines

1. Be aware of any emergency shutdown procedures.
2. Before starting the blender for the first time, make sure that all parts are assembled correctly.
3. Inspect the drive unit for any problems or potential problems.
4. Make sure blender is securely anchored to footing.
5. The blender should have a control gate. The gate should be closed before start-up and closed before shut down to allow the machine to clean out.
6. Before starting the Vertical Fertilizer Blender, bump the starter motor and make sure the screw is turning in a clockwise rotation looking from the top of the blender.

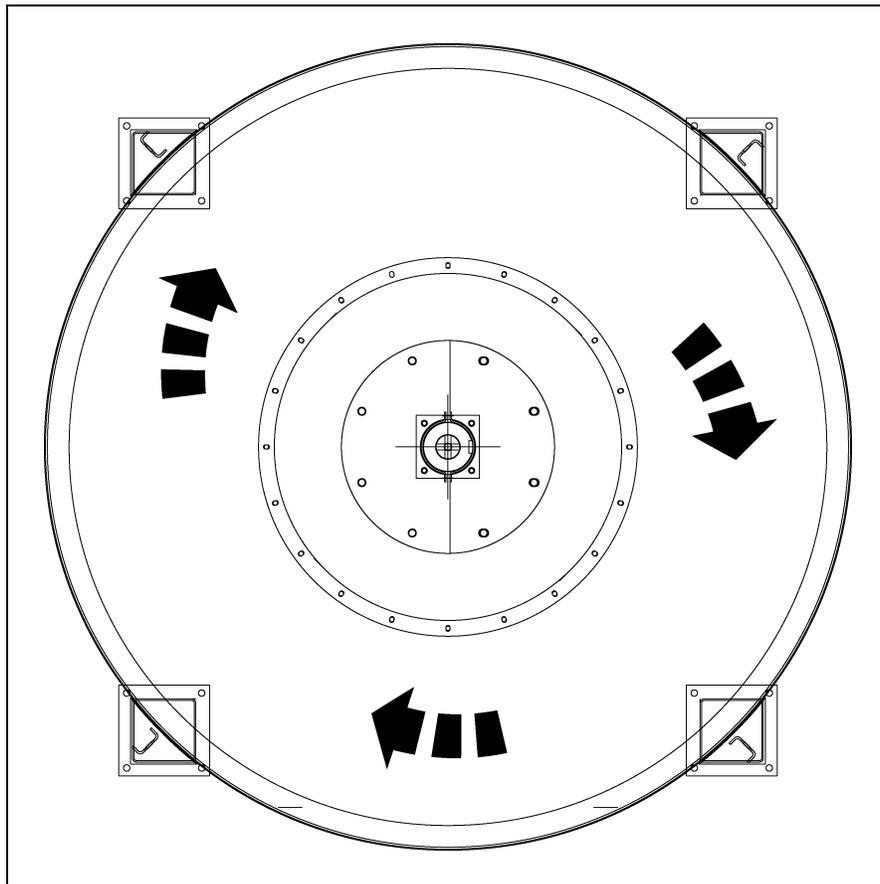


Figure 10A Auger Rotation (Clockwise)

7. The blender should be operating before loading any material.

10. Start-Up and Operation

Normal Shut Down

1. Before shutting down the unit, make certain that blender is empty.
2. Disconnect and lock out the power source before leaving the work area.

Emergency Shut Down

1. Disconnect and lock out the power source.
2. Close the blender bin well control gates.

Lock Out

1. Always disconnect and lock out the power source before leaving the work area or before performing any maintenance or service.

InterSystems, Inc. reserves the right to make changes in design or in construction of equipment and components without obligation to incorporate such changes in equipment and components previously ordered.

WARRANTY, LIMITATION OF LIABILITY, DISCLAIMER OF IMPLIED WARRANTIES: InterSystems, Inc. manufactured equipment and components are guaranteed against defects in workmanship or materials for one year from date of shipment. The obligation of InterSystems, Inc. with respect to any goods is limited to replacement or repair of defective parts and equipment provided those parts are returned, shipping costs prepaid, to InterSystems' factory and provided the product has not been subject to misuse, negligence, or accident, or repaired or altered outside of our factory, or other than by an Authorized Service Representative. This warranty does not cover the replacement of parts inoperative because of wear occasioned by use, the cost of replacing parts by a person other than an InterSystems employee or an Authorized Service Representative, or the adjustment of a product where the product was improperly adjusted by the purchaser. In addition, this warranty does not cover components manufactured by others such as motors, drives, clutches, cylinders, valves, blowers, and the like. On those components the standard Manufacturers' warranty applies. In any event, liability is limited to the purchase price paid, and InterSystems, Inc. will, under no circumstances, be responsible for special or consequential damages, or for incidental damages.

INTERSYSTEMS, INC. NEITHER MAKES NOR AUTHORIZES ANY WARRANTY OTHER THAN AS HEREIN CONTAINED. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



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