



# **Model R2**

## **Concrete Reclaimer**

Installation, Operation & Maintenance Manual      **MR210.4**

Your Serial No.:

Rxxxx-yyyy

MR210.4

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# BFK Technologies Model R2 Concrete Reclamation System

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## **SAFETY FIRST!**

**High voltage and rotating parts can cause serious or fatal injury.** Safe installation, operation and maintenance **MUST** be performed by **qualified personnel only**. Familiarization with and adherence to NEMA MG2, the National Electric Code and local codes is recommended.

**It is important to observe ALL safety precautions to protect personnel from possible injury.**

**EVERY DAY**, prior to use, make sure ALL Safety Guards are in place and properly secured to the equipment.

**EVERY DAY**, prior to use, inspect ALL Safety Stickers and **CLEAN** or **REPLACE** if covered or damaged.

	<b>WARNING!</b> <b>FAILURE TO OBSERVE SAFETY PRECAUTIONS COULD CAUSE EQUIPMENT DAMAGE, PERSONAL INJURY OR EVEN DEATH.</b>
	<b>DANGER!</b> <b>DO NOT OPERATE WITHOUT PROPER GUARDS IN PLACE. ROTATING PARTS MAY CAUSE SERIOUS OR FATAL INJURY.</b>
	<b>DANGER!</b> <b>HIGH VOLTAGE MAY CAUSE SERIOUS OR FATAL INJURY.</b>
	<b>WARNING!</b> <b>DISCONNECT ALL POWER WHILE ADJUSTING UNITS. USE APPROPRIATE LOCK-OUT EQUIPMENT TO PREVENT ACCIDENTAL EQUIPMENT START-UP.</b>

## **SAFETY FIRST !**

The following safety precautions are basic requirements for attending to, operating, installing, maintaining, or cleaning equipment, and should **ALWAYS** be followed. ***NO EXCEPTIONS!***

- **ANY AND ALL PERSONNEL WHO WILL BE INSTALLING, OPERATING OR MAINTAINING THIS EQUIPMENT SHOULD READ THRU THE ENTIRE MANUAL BEFORE WORKING ON OR NEAR THE EQUIPMENT.**
- **ONLY QUALIFIED, TRAINED PERSONNEL SHOULD INSTALL, OPERATE AND MAINTAIN THE EQUIPMENT.**
- **FAILURE TO READ AND UNDERSTAND ALL SAFETY PRECAUTIONS MAY CAUSE INJURY OR DEATH!**
- THIS PREFACE IS INTENDED TO ALERT ALL INSTALLERS, OPERATORS, USERS AND PERSONNEL OF THE POTENTIAL SAFETY HAZARDS. **OTHER SAFETY WARNINGS AND DANGERS ARE LISTED FURTHER THROUGHOUT THIS MANUAL. READ THE ENTIRE MANUAL!**
- **ALL ELECTRICAL INSTALLATION, MAINTENANCE AND REPAIR SHOULD BE PERFORMED ONLY BY A QUALIFIED, CERTIFIED ELECTRICIAN.**
- **REMEMBER, NO MANUAL CAN PREVENT SLOPPY OR IRRESPONSIBLE BEHAVIOR WHEN INSTALLING, OPERATING OR MAINTAINING THIS EQUIPMENT. SAFETY IS UP TO YOU!**
- **ALWAYS ALWAYS ALWAYS DISCONNECT AND LOCK-OUT ELECTRICAL POWER** from the service to the control panel before performing any maintenance, repair or service functions OF ANY KIND. Always!
- **NEVER NEVER NEVER OPERATE EQUIPMENT WITHOUT ALL GUARDS IN PLACE.** They were installed for a reason.
- **Observe good safety habits at all times.** Use care to avoid personal injury or damage to equipment.
- **Keep clothing and hands away from rotating or moving parts even when equipment is NOT running, in the event of an unexpected or automatic start-up.**
- Always use safety glasses to protect your eyes.
- Always use hearing protection. Avoid extended exposure to equipment with high noise levels.

## **SAFETY FIRST !**

- Use proper electrical installation wiring and controls consistent with local and national electric codes, using a qualified electrician.
- Refer to motor name plates and control panel documents for proper power supply requirements. Be sure connections are tight and adequately secured to prevent shorts and to assure maximum protection against moisture and corrosion.
- Be sure equipment is electrically grounded in accordance with code requirements.
- Avoid contact with energized circuits or rotating parts.
- Act with care in accordance with prescribed procedures in handling and lifting the equipment.
- Be sure mounting and assembly bolts are secure.
- Be sure equipment is properly enclosed or guarded to prevent access by children or other unauthorized personnel, to prevent possible accidents.
- Be sure shaft keys on gearmotors are fully captive before unit is energized.
- Provide proper safeguards for personnel against rotating parts.
- Be familiar with the equipment and read all instructions thoroughly before installing, operating or working on it.



**THE EQUIPMENT SHOULD NOT BE ENTERED BY PERSONNEL.**

### **Concrete Reclaimer Systems:**

A Concrete Reclaimer System includes the Concrete Reclaimer AND the Slurry Collection System, i.e. Settling Ponds. Both need to be properly maintained for proper function of the SYSTEM. If the concrete reclaimer SYSTEM is properly maintained, build-up inside the machine housing should be minimal, and not cause equipment problems. **If substantial build-up occurs, the SYSTEM is not being properly maintained.**

**FIRST LOCK-OUT/TAG-OUT THE EQUIPMENT, THEN DISCONNECT AND REMOVE THE SUB-ASSEMBLIES (i.e. Rotary Screen and Sand Auger) FROM THE MACHINE HOUSING FOR CLEANING.**

MORE FREQUENT POND CLEAN-OUTS SHOULD BE SCHEDULED, AND PROPER HOUSE-KEEPING SHOULD BE COMPLETED, TO MINIMIZE INTERNAL CEMENTITIOUS BUILD-UP.

## **SAFETY FIRST !**

### **Systems that use compressed air:**

- **HIGH PRESSURE AIR SHOULD BE PROPERLY BLED FROM SYSTEM PRIOR TO MAINTENANCE OR ADJUSTMENT.**
- Always wear safety glasses and other personal protection devices when installing, operating, adjusting or maintaining this equipment.



### **WARNING!**

**COMPRESSED AIR. LOCK OUT source and BLEED OFF pressure before servicing equipment.**

### **Systems that use Flocculants:**

#### **First-aid measures for handling and using Flocculant(s)**



**Inhalation** If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop. If not breathing, give artificial respiration or give oxygen by trained personnel. To avoid inhalation problems, it is recommended that a respirator be worn by all personnel involved in using or handling flocculant(s).

**Skin contact** Immediately flush skin with running water for at least 20 minutes. Get medical attention if irritation develops or persists. It is recommended that all personnel involved in using or handling flocculant(s) wear protection covering exposed skin, including long sleeve shirts, long pants, gloves, etc.

**Eye contact** Immediately flush eyes with plenty of water for at least 20 minutes. Get medical attention if irritation develops or persists. It is recommended that all personnel involved in using or handling flocculant(s) wear protective eye-wear and face shield.

**Ingestion** Have victim rinse mouth thoroughly with water. If ingestion of a large amount does occur, seek medical attention.

**Consult Flocculant Manufacturers current Safety Data Sheet for further information.**

## SECTION 1.0 MECHANICAL INSTALLATION

### 1.01 EQUIPMENT DESCRIPTION

Thank you for choosing the Model R2 Reclaimer. By reading and understanding these written instructions, and following all operational, safety and maintenance procedures, the R2 should give you many years of service with minimal maintenance.

The R2 Concrete Reclaimer is designed for ease of operation and low maintenance. The simplicity of the central shafted rotor design provides high efficiency with minimum wear and low energy usage. High quality standard parts provide long life and availability.

A large infeed hopper allows the user to discharge wet concrete and wash water into the R2.

Wet concrete is fed into the R2 for washing and screening with a rotating STAR Prefeeder. The feeder discharges directly into the screen/wash area for a consistent flow of wet concrete from the infeed hopper, preventing over-feeding of material.

The material is spray washed while tumbling thru a rotary screen, allowing the waste cement (and some very fine sand) to pass through. The screen is typically 35 mesh stainless steel, allowing recovery of all but the finest sand particles. A 12" auger removes the aggregates from the Reclaimer to stockpile.

Fines and cement slurry separated from the returned concrete gravity flow out of (2) or (3) 6"Ø drain pipes.



Assembled  
LEFT-hand  
auger discharge

Assembled  
RIGHT-hand  
auger discharge

The R2 may be field - assembled as either a LEFT- or RIGHT-hand auger discharge by removing the rear auger lid, turning the auger around and bolting to the rear of the Rotary Screen housing, moving the spray bar and rear nozzle to the opposite side of the rotary screen, then replacing the rear auger lid.

**“HAND” of the machine is determined by viewing the assembled machine FROM THE DISCHARGE END OF THE ROTARY SCREEN!** See Section 1.04

If desired for ease in field wiring or access to the motors, the Star Feeder can also be re-assembled with the gearmotor on the opposite side.



## 1.02 OFF-LOADING

Depending on the options ordered with your equipment, you should receive some or all of the following items with each system:

- One (1) R2 Rotary Screen assembly, mounted on frame.
- One (1) Aggregate Auger assembly.
- One (1) Electrical Control Panel.
- One (1) Infeed Hopper Assembly, complete with STAR Prefeeder
- One or more boxes containing water pump, installation and assembly hardware, and instruction manual.

**▲ CAUTION!** SEVERE EQUIPMENT DAMAGE AND/OR PERSONAL INJURY OR DEATH MAY RESULT FROM IMPROPER OFF-LOADING AND LIFTING OF EQUIPMENT!

STANDARD RIGGING PRACTICES AND PROCEDURES SHOULD BE UTILIZED TO AVOID DAMAGE OR INJURY. DAMAGE CAUSED BY IMPROPER OFF-LOADING IS EASILY DETECTABLE AND NOT COVERED UNDER WARRANTY.

TOTAL SHIPPING WEIGHT OF THE SYSTEM IS APPROX. 3500-4000#, depending on options, hopper size/shape, etc.

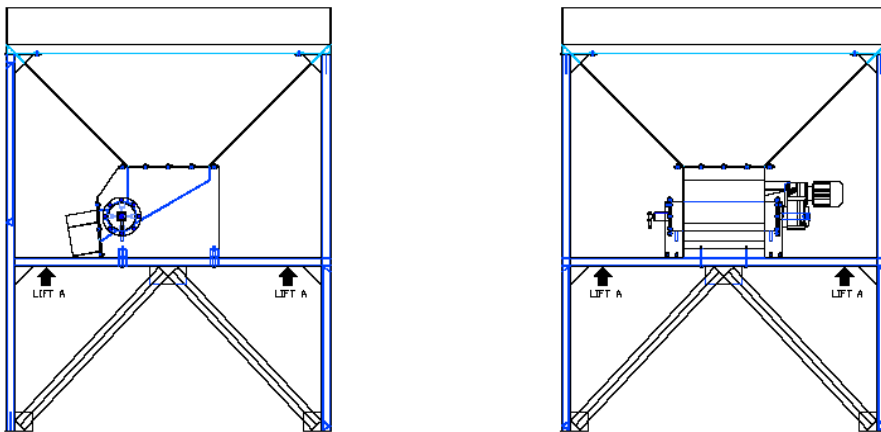
Infeed Hopper/STAR Prefeeder Assembly: 1500-2000# or more, depending on design  
**If unknown, consult factory before lifting!**

Rotary Screen Assembly: 600#

Aggregate Auger Assembly: 600-1100#, depending on design

Misc. including Control Panel, Pump, Hardware, etc.: 300#

### 1.02.01 Infeed Hopper/STAR Prefeeder:



Lift Star Prefeeder/Hopper assembly underneath frame tubing as shown.

**Keep forks on fork lift spread as wide as possible.  
Fork extensions may be required.**

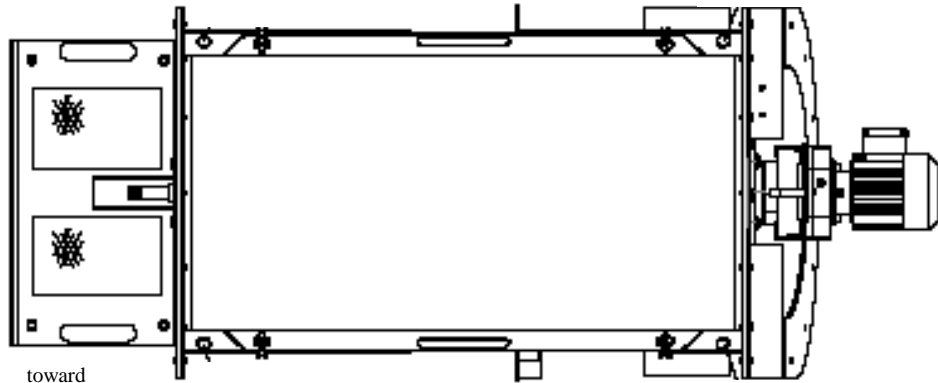
**CAUTION:**

Assembly is **TOP HEAVY!!!**

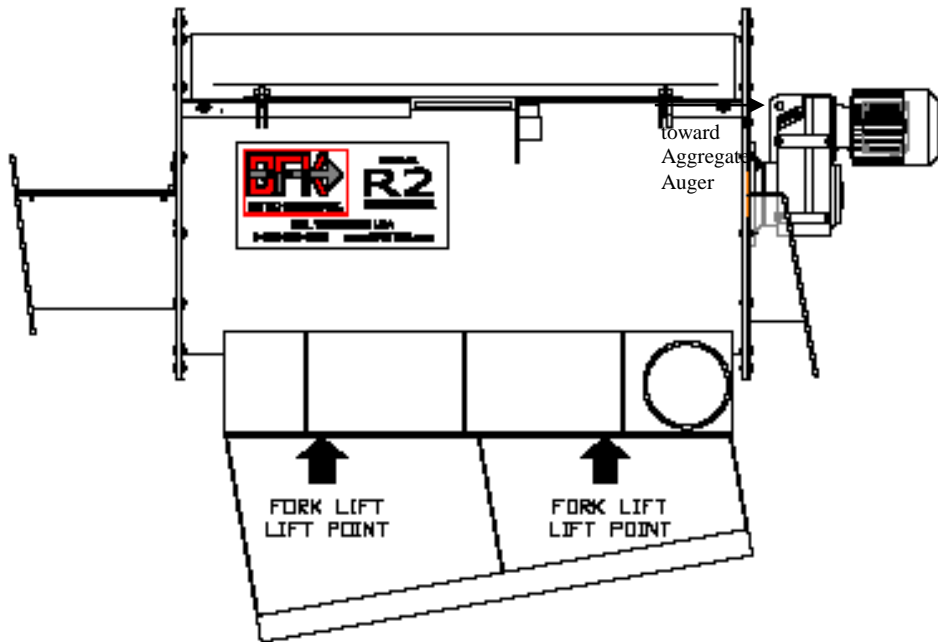
**Clamp or secure assembly to forks** prior to lifting and moving to eliminate the potential for tipping!

Set unit in place where desired, ensuring Prefeed outlet points in the proper direction to feed rotary screen.

1.02.02 Rotary Screen Assembly:



toward  
Infeed  
Hopper



toward  
Aggregate  
Auger



FORK LIFT  
LIFT POINT

FORK LIFT  
LIFT POINT

Lift Rotary Screen assembly from underneath [thru base frame] with fork lift.

When using Forklift, **keep forks on fork lift as wide as possible.**

**CAUTION:**

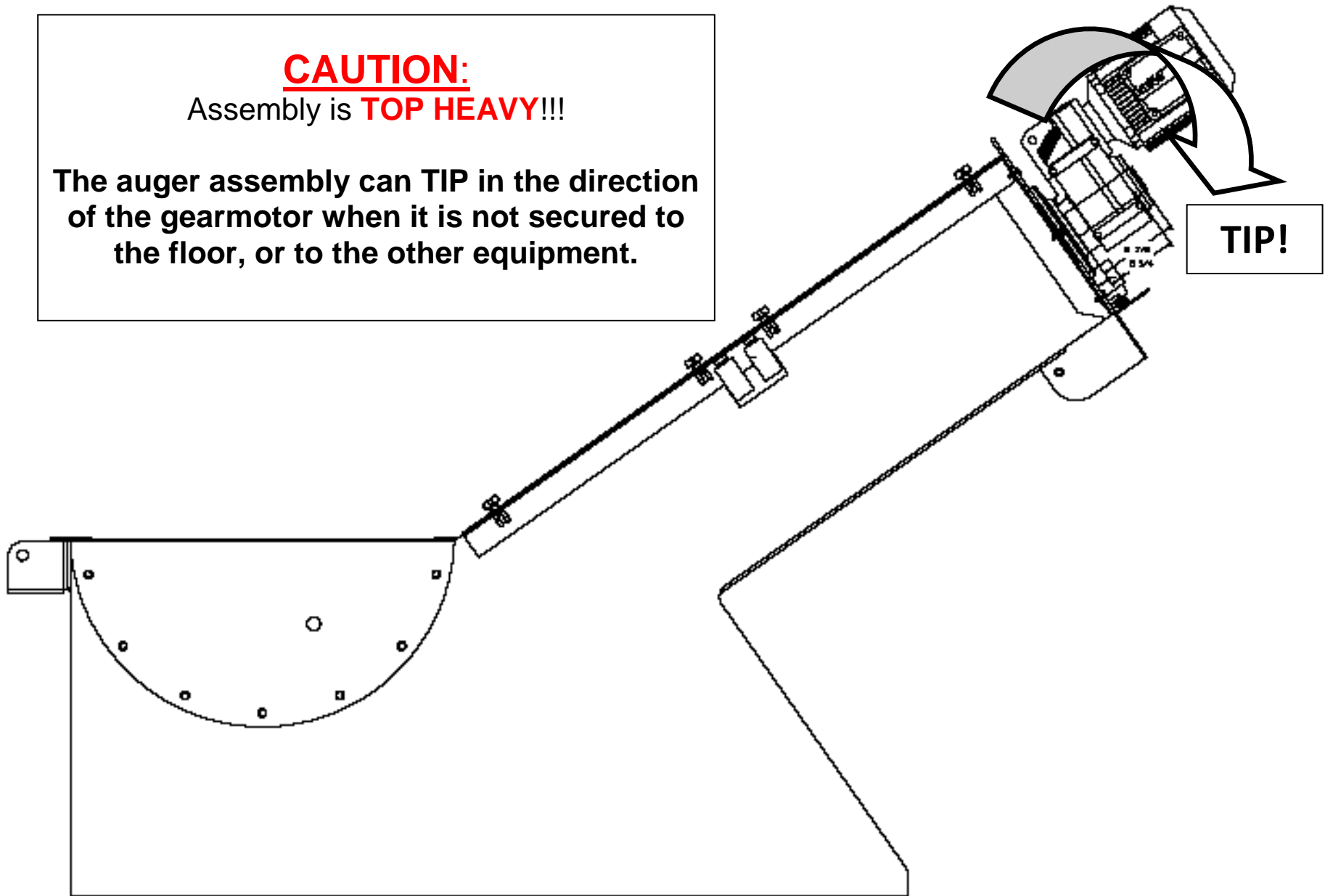
Assembly is **TOP HEAVY!!!**

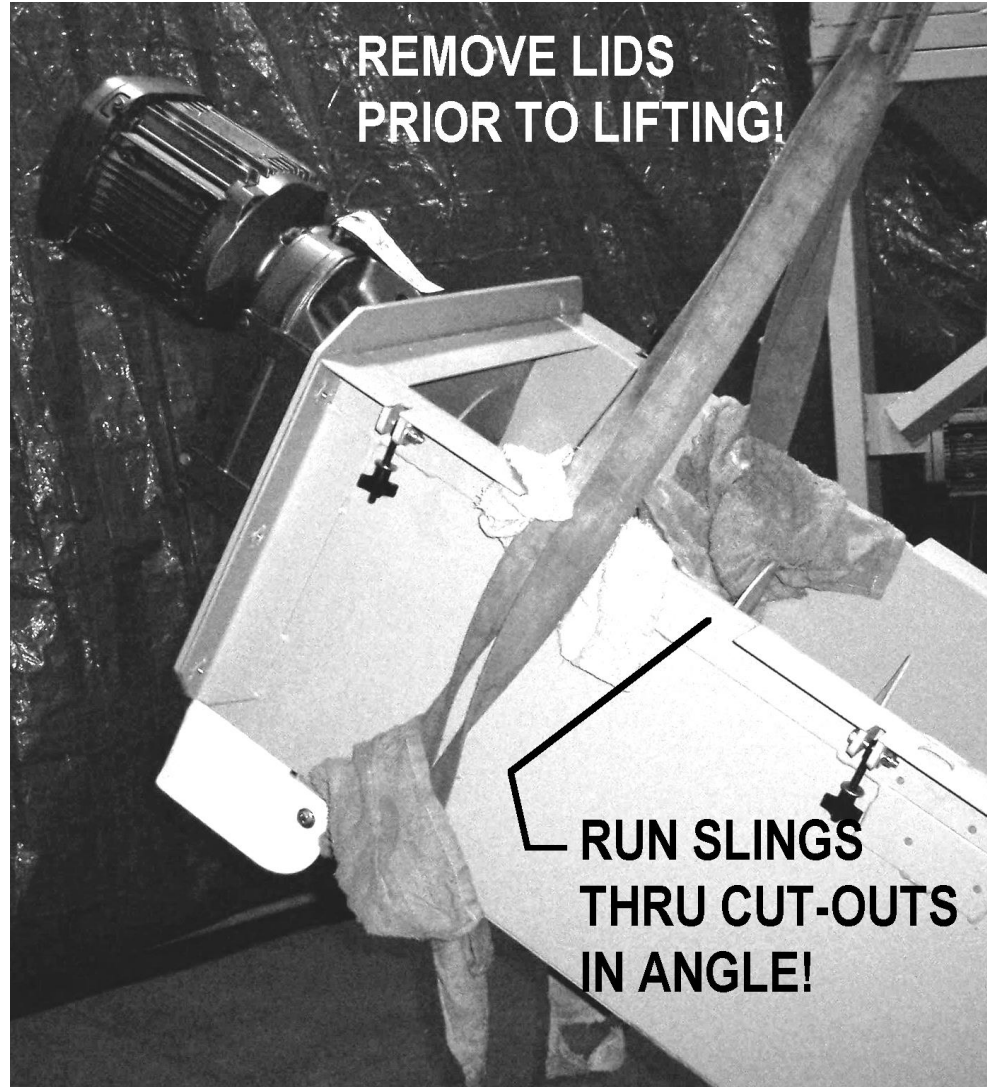
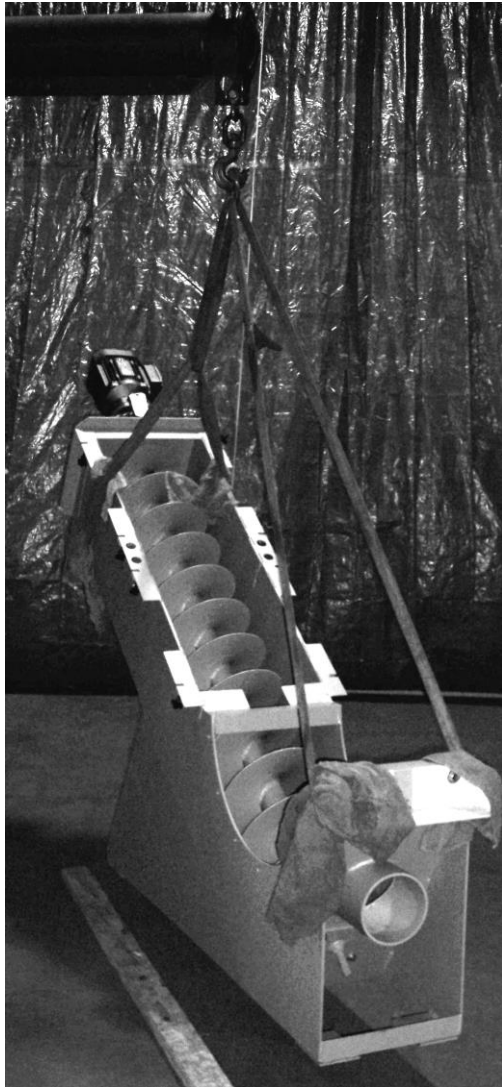
**Clamp or secure assembly to forks** prior to lifting and moving to eliminate the potential for tipping!

Set unit in place ensuring trough points toward the STAR Prefeeder flange.

**CAUTION:**  
Assembly is **TOP HEAVY!!!**

The auger assembly can **TIP** in the direction of the gearmotor when it is not secured to the floor, or to the other equipment.





Lift Aggregate Auger assembly where shown.

Preferred method is using slings. Cover painted areas with rags to protect finish.

Set unit in place pointing in the discharge direction desired, ensuring flange aligns with rear end of Rotary Screen.

### 1.03 PREPARATION

Prior to beginning installation of the R2, the following should be completed and available:

All foundation work must be completed. Before your reclaimer arrives, the lay-out of this installation should have been predetermined.

Allow one day for installation, barring unnecessary delays. Labor and equipment which *may* be required are listed below. Circumstances at any given location may vary, and it is up to the personnel involved to provide the proper tools. The following list is for planning purposes only, and may need to change based on your own requirements.

#### A. Labor

- ◆ 1 General laborer
- ◆ 1 Mechanic
- ◆ 1 Electrician
- ◆ 1 Fork-lift Operator

#### B. Equipment

- ◆ 1 Fork lift with lifting capacity of 5000Lbs.
- ◆ Slings, straps, hooks, clamps, etc. as needed.
- ◆ 1 Set of standard mechanics tools.

#### C. Hardware and miscellaneous (for *each* R2 to be installed):

**NOTE:** Hose lengths to be determined during installation. This list is intended as a guide only, and may or may not be all-inclusive, depending on unique plant requirements.

#### Mechanical Assembly

Silicone Caulk, as needed. Caulk all flanges between pieces prior to assembly to avoid leakage. Hardware is supplied for flange connections. Hardware for mounting equipment to foundation by user or others.

#### Gearmotors:

**Are shipped WITH oil.** Before operating system, ensure oil is at proper level [See SECTION 1.10]

Electrical connections and mounting should be performed by qualified electrician, following all local and national codes. Electrician to determine use of junction boxes, water-tight fittings, etc. to meet codes. Some items which *may* be required include:

(1) 6" x 6" junction box for pump connection, where needed.

Conduit and/or cable for connecting reclaimer rotor and sand screw.

See SECTION 1.08:

Drains:

- (2) 6" diameter Schedule 40 PVC pipe **AS NEEDED**. **NOTE:** Length may vary depending on pit lay-out.
- (2) 6" diameter rubber coupling (Fernco-type Coupling).
- (1) 6" diameter Expansion Plug (to plug un-used drain on rotary screen)

**NOTE:** Some users may wish to use all three (3) available drains. Adjust quantities above as needed.

Hose Connections using 3/4"ID Hose and hose clamps

- Aggregate Auger Upper Back-wash water connection
- Aggregate Auger Lower Bushing water connection
- Front Rotary Screen Bushing assembly connection
- Rotary Screen Nozzle Connections
- Star Prefeeder Connections

Water Supply:

In some installations, water will be provided by the plant. We recommend a minimum of 25 gpm @ 10-15 psi. **Higher flow and/or pressure may be needed in some installations**, due to equipment supplied, customers water source, etc. BFK has no control over the installation of the equipment, including but not limited to, the distance from the water source to the reclaimer, the connection method used (Hose vs. different types of pipe, for instance), fittings used, etc. Therefore, it remains the end-users responsibility to ensure proper water flow and pressure is delivered to the reclaimer, whether the user supplies their own water, or uses the BFK-supplied pump(s).

An optional 1.3HP submersible pump may have been included with your system. If this is the case, you will need the required hose and hose clamps to bring the pumped water to the R2.

Connecting Pump to Reclaimer:

2" Water Hose **AS NEEDED**. **NOTE:** Length varies depending on pit lay-out.

**NOTE:** It is up to the customer to provide the proper fittings to connect from the pump or water supply, to the various fittings and connections listed above.

Options: (where purchased)

**Optional** Loop Detector:

16 AWG THHN stranded Copper wire for Loop Detector, Length as needed, depending on Loop size and shape  
Silicone Caulk or Epoxy for sealing detector loop on ramp

**Optional** Pump Puller Pump Winch:

(4) 1/2" x 4" anchor bolts

**Optional** Sand Screw Heater package:

No additional hardware required.

**Optional** Vibrator for Infeed Hopper:

Mounting Hardware is supplied.

**IMPORTANT NOTE:**

**ALL dimensions, weights and technical specifications are subject to change, at BFK's discretion, from previously published information. In some applications, NON-standard or custom pieces may be supplied, which may or may not be covered in this manual.**

**The manual attempts to show common, typical installations. YOUR actual Installation may vary.**

**This manual is intended as a guideline only, and may or may not represent the actual equipment supplied. Some pictures and/or drawings may show earlier revisions of the same machine, and may not totally represent the revision of the machine you have.**

**IN ALL CASES, IT IS THE REponsibility OF THE CUSTOMER TO ENSURE PROPER SIZES AND DESIGNS OF ALL CONNECTIONS, FITTINGS, WIRING, ETC. ARE PROVIDED BEFORE INSTALLING AND OPERATING EQUIPMENT, and BFK shall be held harmless from problems occurring from improper installation and operation of the system.**

**Please consult factory if any discrepancies arise BEFORE the system is installed and operated.**

**Metric equivalents are provided for reference only.**

## 1.04 MECHANICAL ASSEMBLY

### 1.04.01 Reclaimer Assembly

First, Set Infeed Hopper/STAR Prefeeder assembly into position. After completion of field assembly, it is recommended that the Hopper is secured to foundation.

**NOTE:** An *optional* vibrator may be shipped for use on the Infeed Hopper, and must be installed in the field. Reference Vibrator Instruction Manual, shipped with the vibrator, for proper installation requirements.

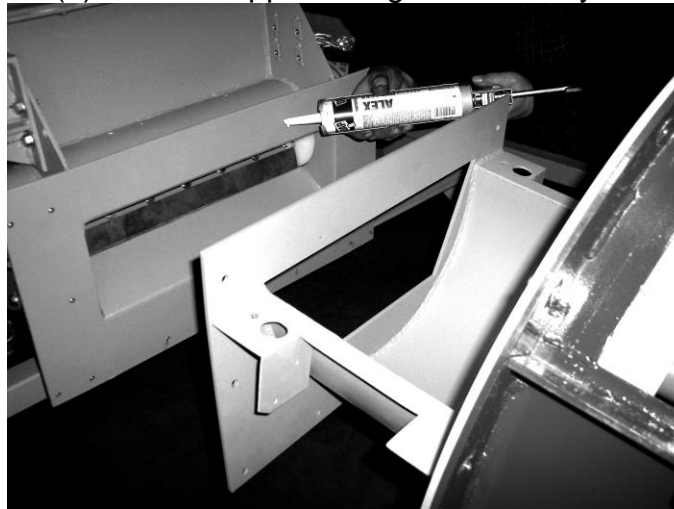


Mount vibrator to the infeed hopper, with hardware supplied with vibrator.

**Follow all instructions supplied with the vibrator. Most vibrator manufacturers recommend the use of a tether to catch the vibrator in the event of hardware failure. This is the responsibility of the end-user.**

**NOTE:** Some shimming may be required in order to get all 3 main pieces (Infeed Hopper, Rotary Screen, and Aggregate Auger) to properly align, especially if foundation is not level.

Set Rotary Screen assembly in-line with STAR Prefeeder discharge. Before bringing 2 flange surfaces completely together, apply Silicone Caulk to flange surface. Slide Rotary Screen into position assuring proper alignment of bolt holes – shim one piece or the other, if needed, to assure alignment. Install (7) ¼ bolts supplied. Tighten securely.



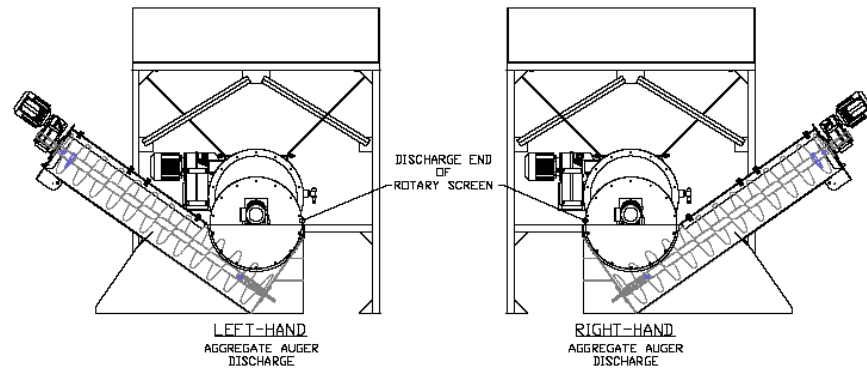


Lastly, set Aggregate Auger in-line with Rotary Screen discharge, pointing in the desired discharge direction (Right or Left-hand). Before bringing 2 flange surfaces completely together, apply Silicone Caulk to flange surface. Slide Aggregate Auger into position assuring proper alignment of bolt holes – shim one piece or the other, if needed, to assure alignment. Install (7) ¼ bolts supplied. Tighten securely.

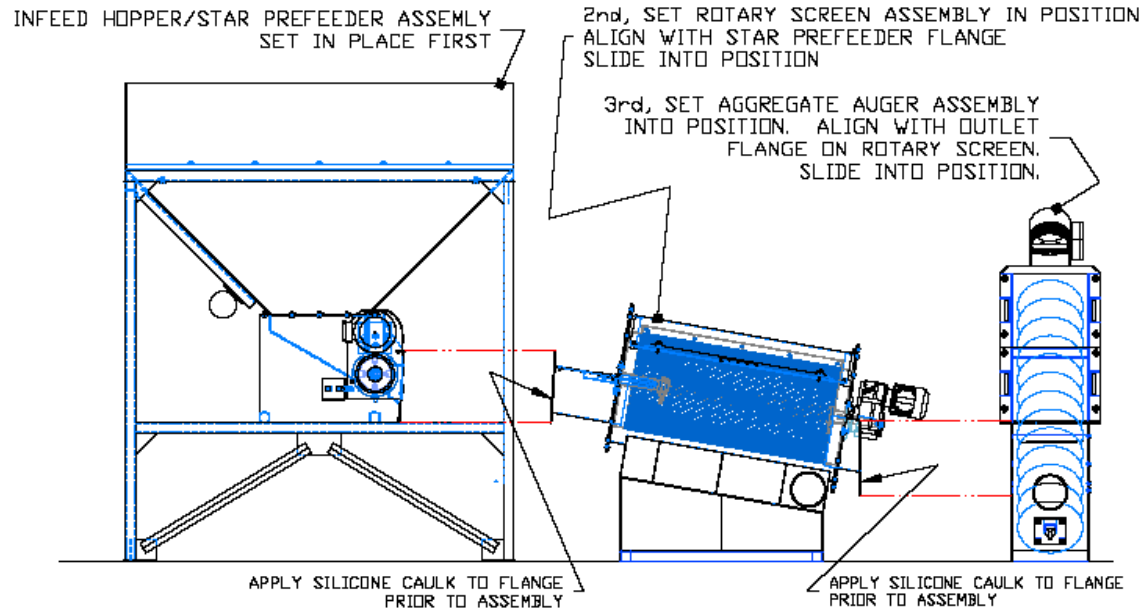
**NOTE:** Determining whether machine is LEFT-hand or RIGHT-hand:

**“HAND” of the machine is determined by viewing the assembled machine FROM THE DISCHARGE END OF THE ROTARY SCREEN!**

**CAUTION:**  
 Assembly is **TOP HEAVY!!!**  
 The auger assembly can **TIP** in the direction of the gearmotor when it is not secured to the floor, or to the other equipment.



Secure equipment to foundation using bolt flanges on each piece.



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### **1.04.03 PUMP INSTALLATION**

The system *may* be supplied with one (1) Submersible 1.3HP pump. Suspend the pump near the surface of the water, off of the pit wall in the settling pond farthest from the reclaimer. It is important to keep the submersible pump above the bottom of the pit to prevent the fine solids from being sucked up and run through the water system of the reclaimer. The pump has 2 lift eyes integral to the pump for suspending the pump properly. It is up to the purchaser to develop the best way to install the pump for their installation.

### **1.04.04 CONTROL PANEL INSTALLATION**

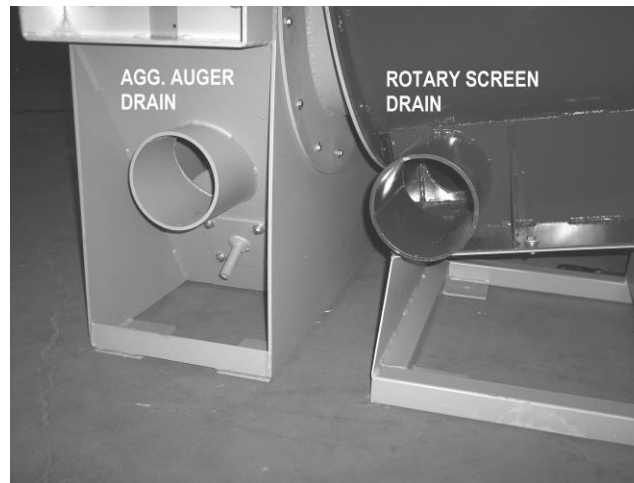
The Control Panel needs to be mounted in accordance with local and national codes.

### **1.04.05 DRAIN INSTALLATION**

The drain pipes should be installed with a negative slope. 6"Ø PVC Pipe and a rubber coupling (Fernco type) are typically used. They may also need 90° or 45° elbows to drain properly into the first pit (closest to the reclaimer). On especially long runs, support stands are recommended.

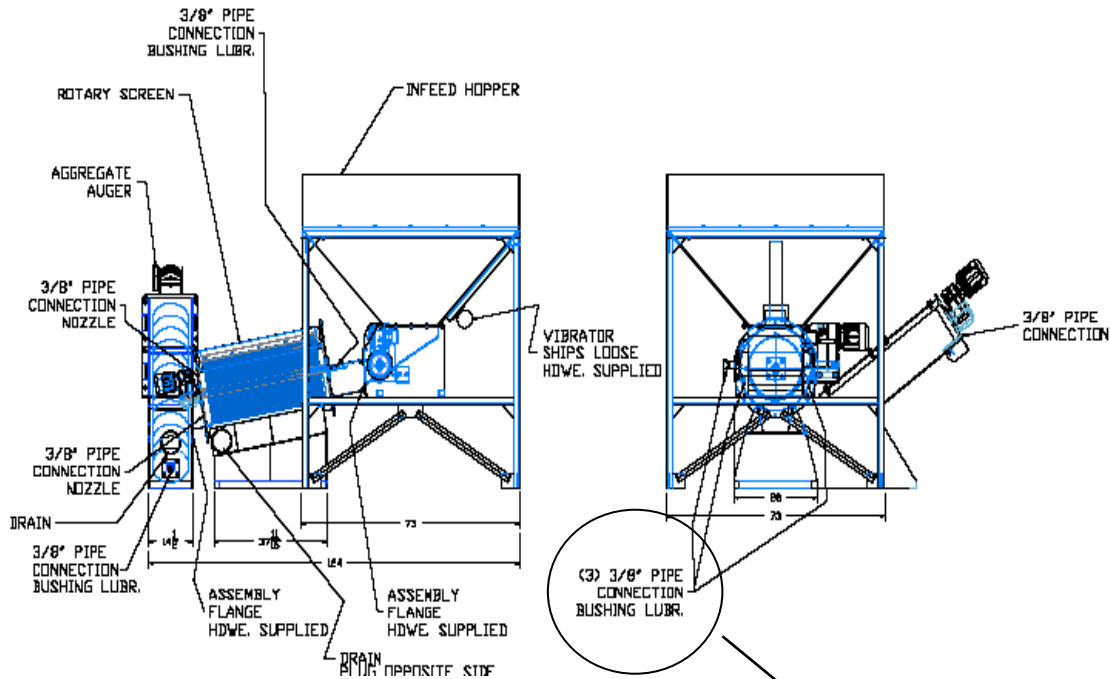
The system has (3) drains total. Typically only (2) are used. There are (2) drains located on the Rotary Screen housing (discharging out each side), and (1) located on the Agg. Auger. In most cases, the drain on the Rotary Screen housing located on the same side as the drain on the Agg. Auger (depending on assembled auger direction) is used, with the opposite Rotary Screen housing drain being plugged with a suitable expansion-type plug (supplied).

If the customer desires more drain capacity, using both drains on the Rotary Screen housing is acceptable (eliminating the need for the expansion plug).



## 1.04.06 HOSE CONNECTIONS & SPRAY NOZZLES

It is the customers' responsibility to provide suitable plumbing and/or hoses to make the following connections:



Connecting Star Prefeeder:

Connection A:

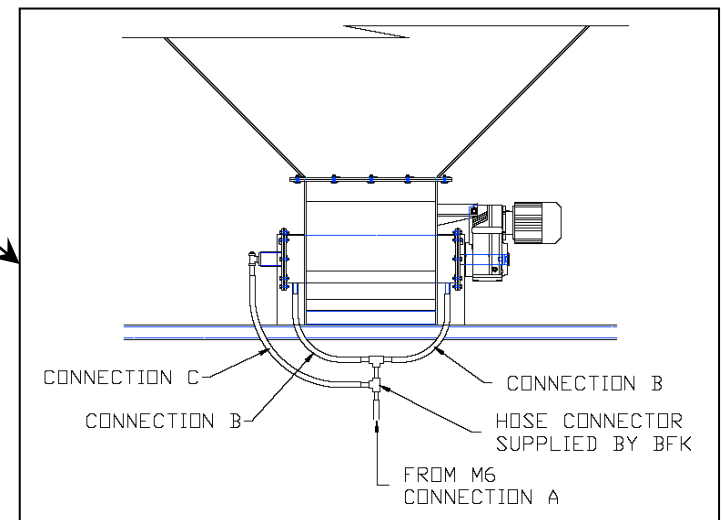
(1) 3/4" ID Hose and Hose Clamps

Connection B:

(2) 3/4" ID Hose x 15" and Hose Clamps

Connection C:

(1) 3/4" ID Hose x 24" and Hose Clamps



## **ROTARY SCREEN SPRAY BAR and REAR NOZZLE ASSEMBLY**

There are 2 nozzle assemblies located within the Rotary Screen assembly. They provide most of the washing power of the system, washing the fines off of the coarse material tumbling thru the Rotary Screen before they enter the Agg. Auger.

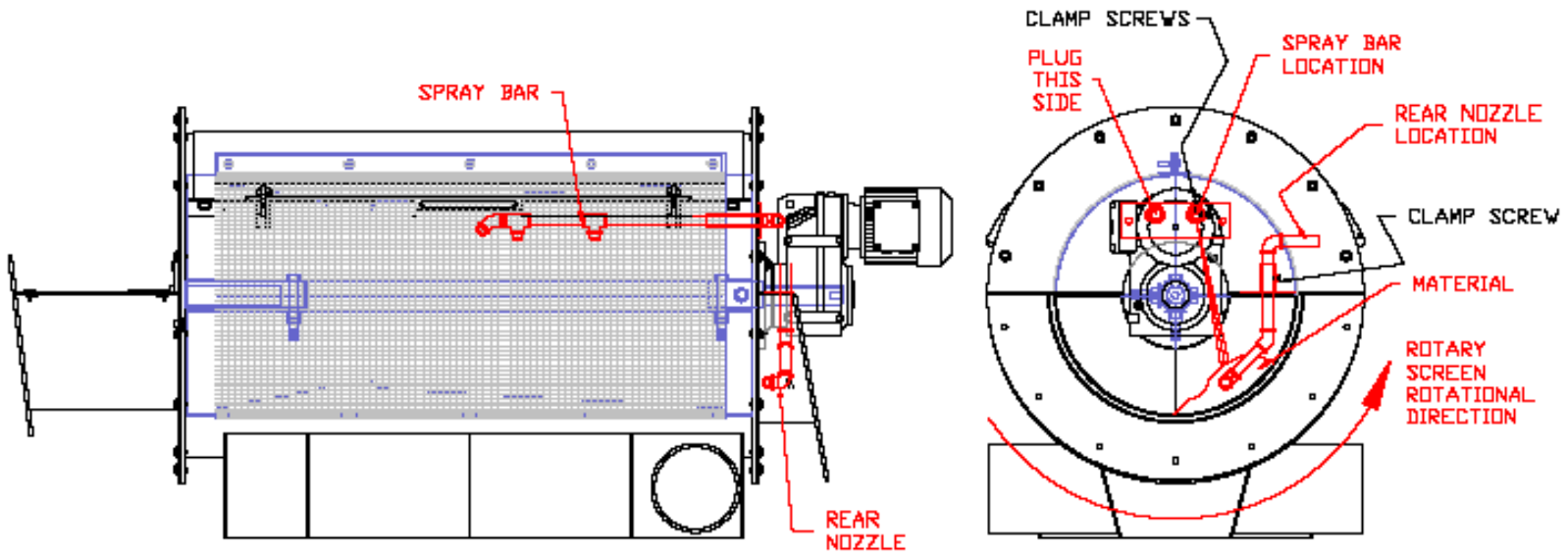
NOTE: Refer to Section 1.04.01 Reclaimer Assembly for HAND of machine.

NOTE: Refer to Section 3 Initial Equipment Start-up for rotation direction.

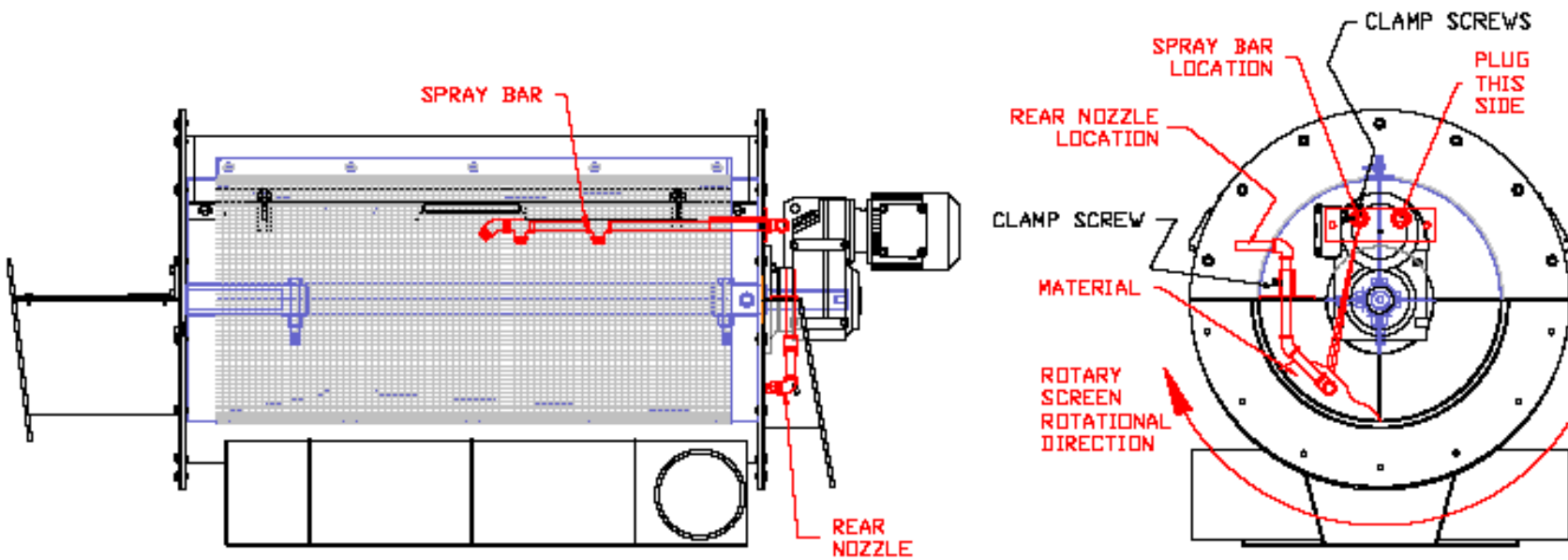
The main “pile” of material kept in the screen will ride around the rotary screen at about the **5 o’clock position** (when viewed from the discharge end) when the R2 is assembled with a **RIGHT-Hand** Agg. Auger.

The main “pile” of material kept in the screen will ride around the rotary screen at about the **7 o’clock position** (when viewed from the discharge end) when the R2 is assembled with a **LEFT-Hand** Agg. Auger.

The Spray Bar should be mounted in the dual-position mounting bracket as shown below **DEPENDING ON HAND OF AUGER DICHARGE**. In addition, the spray bar should be pointed (rotated) so that it sprays down on top of the material as it passes thru (5 o’clock or 7 o’clock, depending on HAND). (2) ¼” screws are used to clamp the spray bar at the proper angle.



**RIGHT-HAND AGG, AUGER DISCHARGE**

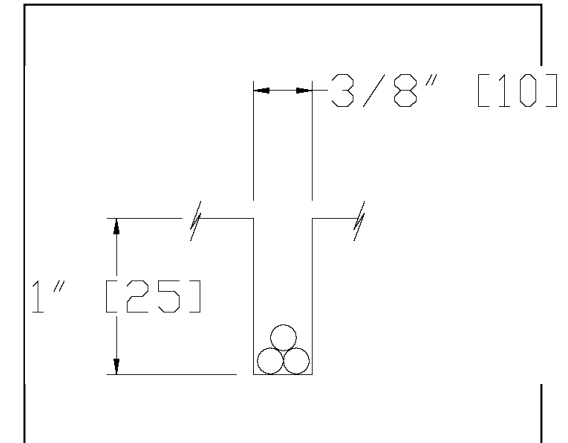
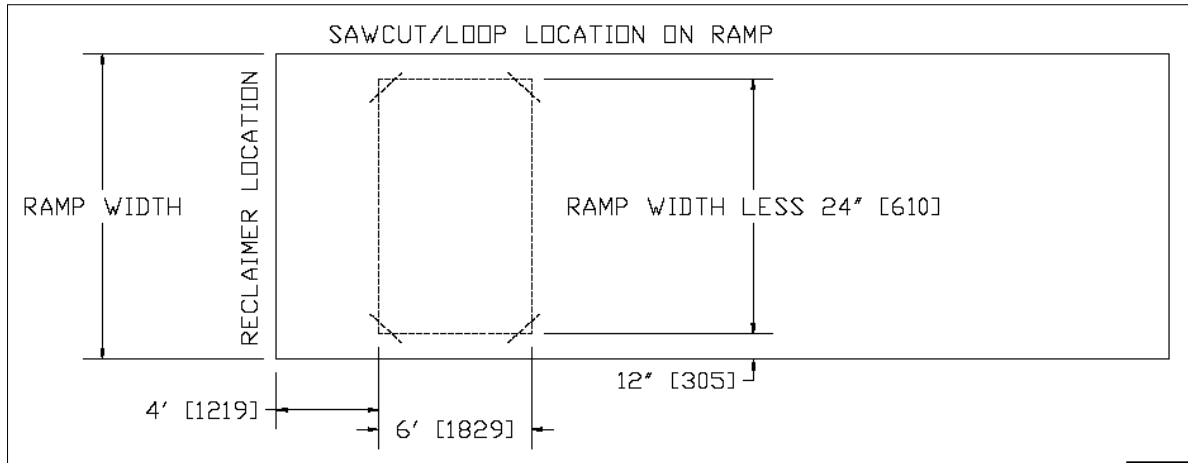


**LEFT-HAND AGG, AUGER DISCHARGE**

## 1.04.07 Optional LOOP DETECTOR

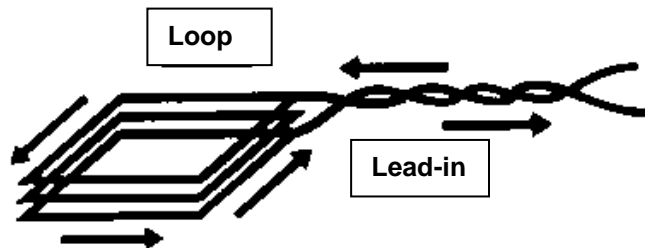
If optional loop detector was not purchased, you may skip this page.

The loop detector is designed to automatically sense the presence (or absence) of trucks at the reclaimer. It is tied into the “start” relay in the control panel. When a truck is sensed, the system will automatically turn on. Also, when the loop detector senses the absence of a truck, it will initiate the shut down cycle.



### INSTALLATION INSTRUCTIONS:

1. Saw rectangle 3/8" wide by 1" deep at locations shown above.
2. Include corner chamfer cuts, approx. 12" chamfer.
3. Lay wire in cut (use chamfer cuts, not square corners) a total of three (3) turns – DO NOT TWIST!
4. Twist wire five (5) times per foot between cut-out and control panel (Lead-In section).
5. Fill cut-out with sealant.



**NOTE: Customer to supply actual loop wire.  
Use #14 Stranded THHN Wire.**

BFK supplies the Loop Detector Sensor only, mounted and pre-wired inside Control Panel Enclosure.

### LOOP INSTALLATION TIPS

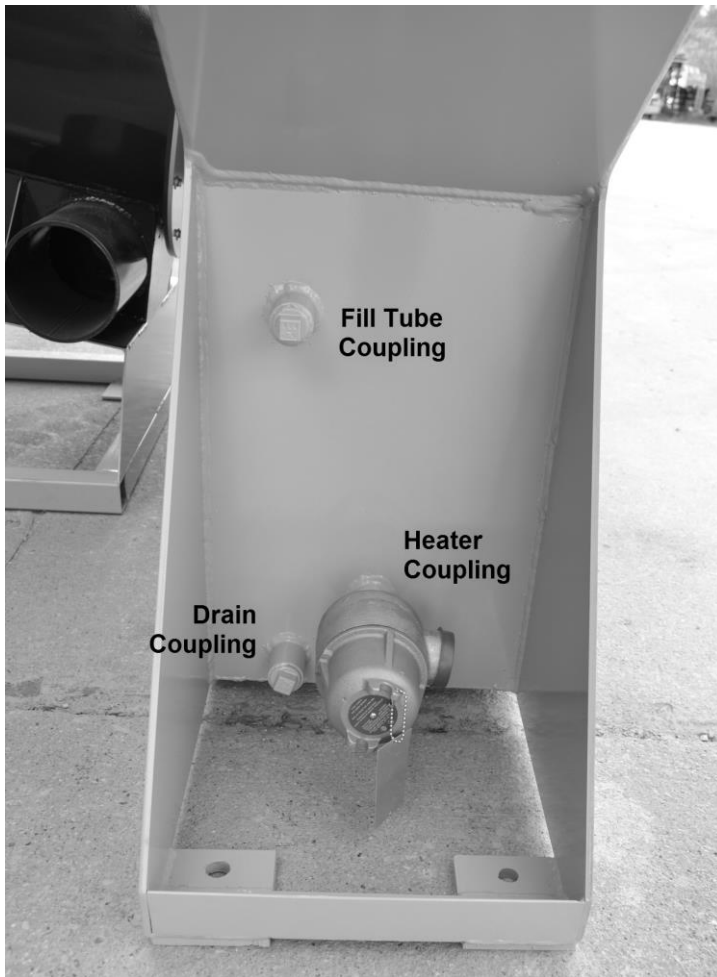
- The loop consists of stranded wire suitable for direct burial with low AC and DC resistance.
- The loop should be not less than 6' [1828mm] wide, the length being 2' [610mm] less than the overall width of your ramp (allowing 1' [305mm] off of each edge of the ramp).
- The depth of the saw cut is typically 1" [25mm] deep by 1/4" to 3/8" [6-10mm] wide.
- Cut the corners of the loop to 45° angles to avoid pulling loop wires around a 90° and risk damaging the wires.
- Do not push the loop wires into the saw cut with any sharp object.
- Always stay a minimum of 2" [50mm] above any rebar or wire mesh.
- The loop wire is wound to form a coil. Ideally there should be no splices in the loop i.e. take your loop wire and go out to your saw cut, go around your saw cut 3 times, and come back to your detector. Twist the lead-in portion 5 times per foot. The loop is one continuous wire.
- Twist only the lead-in, the part from the edge of the loop back to the detector. **Do not twist the loop.**

### 1.04.08 Optional AUGER HEATER

The screw box heater is designed to minimize the possibility of freezing the water in the bottom (lower end) of the sand dewatering screw during extended shut-down periods.

Remove 1" square head pipe plug shipped on unit. Locate electric heater (shipped in accessory box), and screw into coupling, being careful not to damage the heating elements. Tighten to eliminate leakage.

Fill heat box with approximately 18 U.S. gallons of anti-freeze. Installation of a street elbow and nipple pipe may aid in filling. Plug or Cap when done to complete installation.



Locations of Fill, Heater and Drain, and Couplings shown.

If optional Sand Screw Heater was purchased, installation of a 1" Street elbow, nipple and 1" cap to create a Heat Box Fill Tube (as shown below) will aid in proper filling of anti-freeze.





#### **1.04.09      GEARMOTOR OIL FILL**

**Oil level should be checked prior to operation of the equipment, to make sure no oil was lost in transport. DAMAGE CAUSED BY RUNNING THE EQUIPMENT WITHOUT OIL IS EASILY DETECTABLE AND NOT COVERED UNDER WARRANTY!**

##### **1.04.07A      STAR PREFEEDER GEARMOTOR**

- Unit filled with 5.0Liters [appx. 1.32 US Gal] Mobil Gear 630.

##### **1.04.07B      ROTARY SCREEN GEARMOTOR**

- Unit filled with 1.5Liters [appx. 0.40 US Gal] Mobil Gear 630.

##### **1.04.07C      STANDARD AGGREGATE AUGER GEARMOTOR**

- Unit filled with 1.5Liters [appx. 0.40 US Gal] Mobil Gear 630.

**NOTE: If you purchased custom or non-standard equipment, such as the EXTENDED AGG AUGER, your capacities may vary. Consult factory if unsure.**

## **SECTION 2            ELECTRICAL INSTALLATION**

### **2.01   SCHEMATICS AND FIELD WIRING**

Schematic drawings and VFD Operation Manuals are sent in the inside door pocket of the electrical control panel enclosure. It is up to the qualified electrician on-site to run the appropriate conduit and cable for proper connection of all equipment supplied with your system.

### **2.02   OPERATIONS**

The R2 Control Panel will be assembled for your specific application and optional equipment purchased. The basic system is the “heart” of all applications. Discussions of optional equipment will follow.

#### **Basic System – MANUAL OPERATIONS**

The basic package consists of a NEMA 12 enclosure, complete with all required fuses, heaters, motor starters, relays and terminal strips, on/off and e-stop switches, and alarm horn.

In addition, there are (3) internal relays with the following functions:

TR1    Start Delay Relay            When system is turned on, relay energizes alarm horn for 10 sec. prior to energizing equipment. Time delay (amount of time from when on/off switch is turned on, until reclaimers begin to operate, also amount of time alarm horn sounds) is adjustable on the face of the relay, but is factory preset for 10 seconds.

TR2    Stop Delay Relay              When system is turned off, relay goes into shut-down cycle. The relay allows the reclaimers to continue to run for a time after the on/off switch is turned off, to allow the reclaimers to clean-out prior to shut-down. The time delay is adjustable on the face of the relay, and is factory preset for 6 minutes (shown as 36 x 10 sec.).

**NOTE: The operator should consider how long it will take the Infeed Hopper to completely feed thru the Star Prefeeder, and adjust the Shut-Down Timer accordingly. As an example, the R2 can reclaim approx. 2 yards per hour, therefore if you wash out ½ yard of concrete, this should take approx. 15 minutes to completely empty the infeed hopper. This thru-put rate should be tested for during the early stages of operation with known quantities of waste concrete.**

**The TR2 Timer should be set for the time to completely empty a full infeed hopper, plus an additional 4-6 minutes in order to ensure all has been rinsed thru the system prior to shut-down.**

### TR3 Latch up Timer

This timer is energized by the manual start switch (or loop detector). As long as the On/Off switch remains in the ON position (or there is a truck sensed by the loop detector) for 2 seconds, the relay energizes to latch up the motor starters.

On the front door, the switches consist of:

- Main Disconnect
- On/Off Switch
- E-Stop Switch
- Water Pump Off/Auto

To operate the machine, the Main Disconnect must be in the ON position (door closed), with the E-Stop pulled out. Simply turn the On/Off Switch to the ON position.

At this point, the alarm horn will sound for approx. 10 seconds (thru TR1), and then the equipment will begin to operate.

After you are done using the reclaimer, simply turn the On/Off switch to the OFF position. The reclaimer will continue to run for additional minutes (depending on customer setting) prior to shutting down (thru TR2).

**Water Pump Off/Auto Switch:** This switch allows the user to run the reclaimer without turning on the water pump. This is beneficial during housekeeping, such as spraying the screens with acid, or while troubleshooting the equipment. Simply turn the switch to OFF to turn off the pump. Make sure to put the switch back into the AUTO position prior to using the reclaimer.

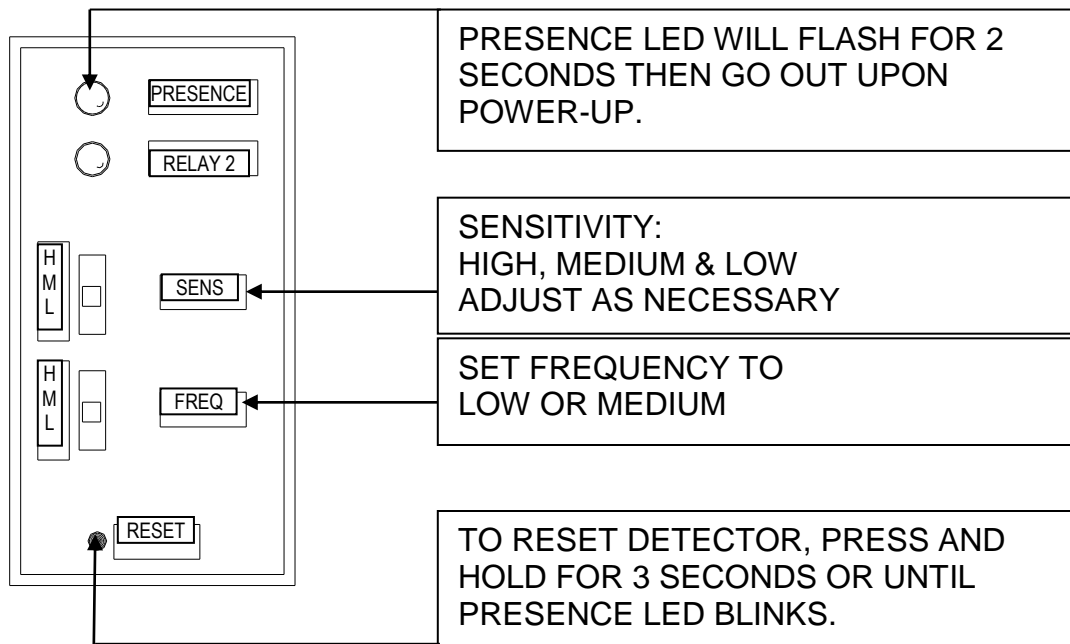
In addition, there are (2) Variable Frequency Drives (VFD's) for speed adjustment for both the STAR Prefeeder and the Aggregate Auger. The Agg. Auger should run at 60Hz (maximum speed) unless a slow-down is necessary.

The STAR Prefeeder is typically set at approx. 20 Hz – operator should adjust the speed down so as not to overwhelm the Rotary Screen and/or Agg. Auger. See SECTION 3 INITIAL EQUIPMENT START-UP below.

**OPTIONAL EQUIPMENT:  
LOOP DETECTOR/PRESENCE SENSOR:**

The Loop Detector option provides the user the ability for fully automatic operation of their reclaimer. It eliminates the need to rely on the truck drivers to turn the reclaimer on and off.

When a truck drives over the loop (installation covered on page 19), the presence sensor senses its presence and initiates the START operation of the reclaimer. The alarm horn sounds for 10 seconds, and the machine turns on. After the truck leaves, the presence sensor senses its absence, and initiates the shut-down cycle (6 minutes). Should another truck arrive before the shut-down cycle is complete, the presence sensor resets and keeps the system running until this truck leaves, and then initiates the 6 minute shut-down cycle once again.



**QUICK SET-UP**

1. VERIFY POWER TO THE DETECTOR.  
Presence LED should come ON and flash for 2 seconds, then go out.
2. SET SENSITIVITY TO MEDIUM.
3. ADJUST FREQUENCY TO LOW.
4. DEPRESS RESET BUTTON FOR 3 SECONDS, UNTIL PRESENCE LED FLASHES, RELEASE BUTTON, YOU ARE NOW READY TO OPERATE.

### SECTION 3 INITIAL EQUIPMENT START-UP

At this point, all items should be mechanically mounted, electrical connections completed, and all hoses and drains have been connected. It is time to start up the R2 for the first time. **NOTE: It is also assumed, at this point, that either the pit system is full of water, or the water supply is available and connected to the machine.**

The goal here is to determine the following:

STAR Prefeeder is rotating in the proper direction, and operating at proper speed.

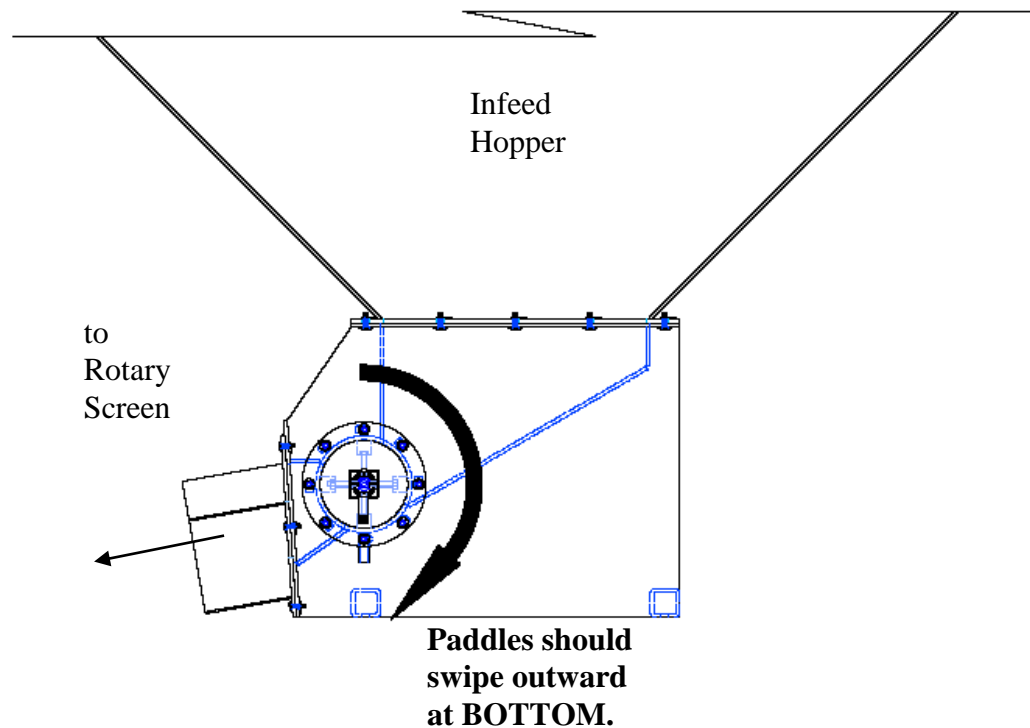
Rotary Screen is rotating in the proper direction.

Aggregate Auger is rotating in the proper direction.

Pump (if used) is rotating in the proper direction.

With the Control Panel operating manually, turn the On/Off switch to the ON position. After the alarm horn sounds, the equipment should begin to operate. Check rotation of the STAR Prefeeder, rotor, aggregate auger and pump, as shown:

**STAR Prefeeder:**



**NOTE:**

At this point, the VFD located inside the Control Panel **should be set to approx. 20 Hz [M3].**

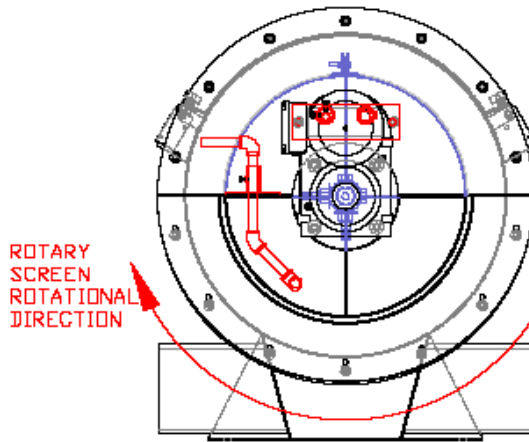
The STAR Prefeeder sets the thru-put rate of the entire system, so it should be **set slow to begin**, until the operator has experience in how the material flows thru.

If set too fast, material could overwhelm both the Rotary Screen and/or the Agg. Auger (depending on waste concrete properties)

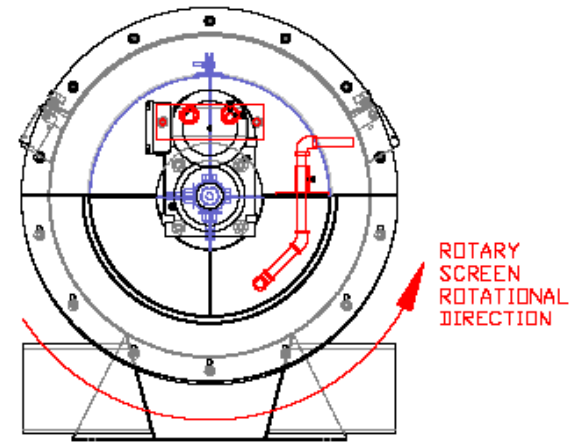
After some time, the operator can always speed up, if desired, being careful NOT to overwhelm the system.

Rotary Screen (viewed from discharge end)

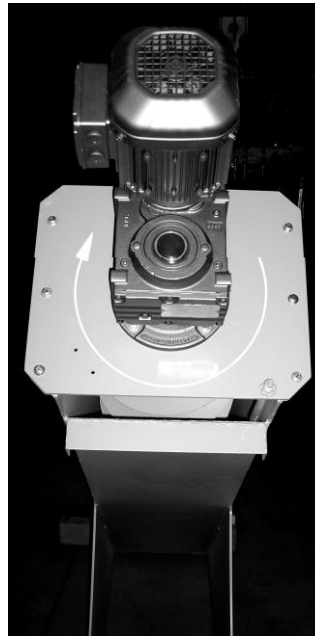
**LEFT-HAND AUGER  
CLOCKWISE**



**RIGHT-HAND AUGER  
COUNTER CLOCKWISE**



**Aggregate Auger (viewed from discharge end)  
CLOCKWISE**

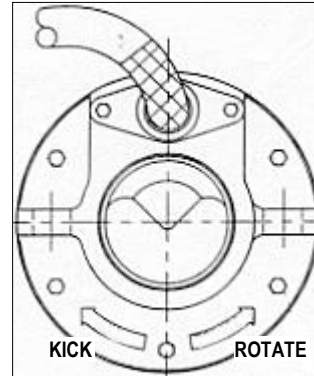


If any of the 3 is turning the wrong direction, turn the reclaimer off, and have electrician reverse the leads for proper operation. Confirm rotation again.

## Pump

To confirm proper pump rotation, pull the pump out of the pit and hold the pump by the 2 integral lifting lugs. HOLD ON TIGHT as the rotational force of the pump will try to “kick” the pump out of your hands. Have someone “bump” the On/Off switch to the ON position, then quickly turning to OFF. While looking down at the top of the pump, notice the directional arrow on the top of the pump. “Bump” the pump on and off 3 or 4 times to confirm that the pump is turning in the direction of the arrow.

**IMPORTANT:** Do NOT just check for water flow into the reclaimer, as the pump is able to pump water in *either* direction. However, if it is running in the wrong direction, the amount of water to the reclaimer will not be sufficient. If pump is turning the wrong direction, have electrician reverse the leads for proper operation. Confirm by “bumping” prior to replacing the pump into the pits.



**Once all rotational items are turning in the proper direction, turn On/Off switch to the ON position, and allow reclaimer to run for 10-20 minutes. While it is running, review all nozzles for water output.**

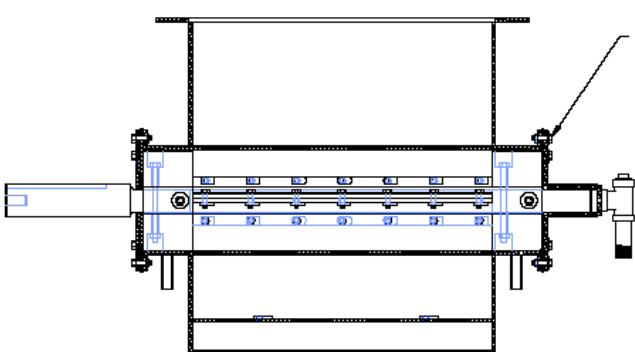
Check for water flow from STAR Prefeeder.



While performing initial 10-20 minute run-in, end-cap seals on STAR Prefeeder may need adjustment to eliminate leaks.

Begin to “snug” bolts (8 per end cap) in an “opposite” fashion, as you would normally tighten the lug nuts on a car tire.

Tighten ½ turn or so, then move opposite across end cap and repeat to that bolt. Select bolt midway between those 2, and repeat, followed by its opposite. Continue around the cap in this fashion until all bolts are snug and leaking water has stopped.

 <p>DURING RUN-IN PERIOD SNUG BOLTS TO ELIMINATE LEAKS.</p>	<p><b>NOTE:</b> Do NOT over-tighten!!!</p> <p>“Snug” bolts enough to eliminate leaking only.</p> <p>If the bolts are too tight, they will force the end caps and seals up against the UHMW bushings, acting as a brake.</p>
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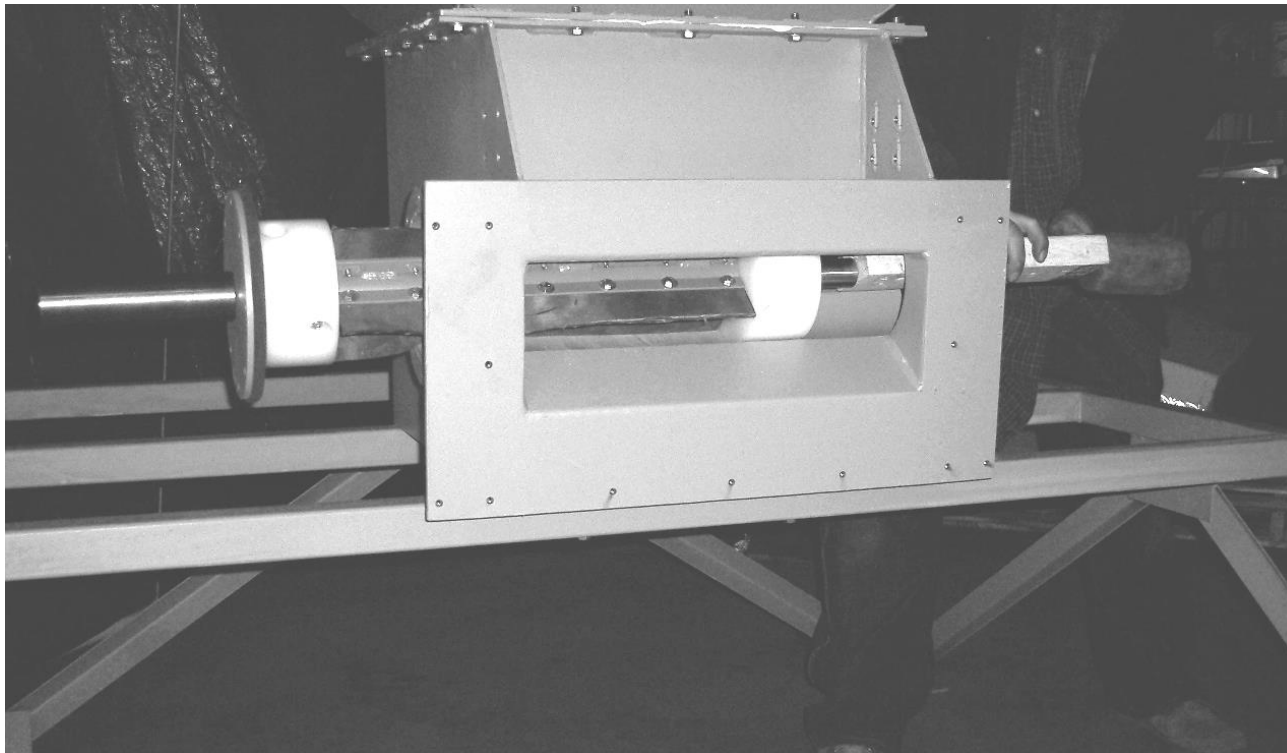
**Assuming that all nozzles are spraying water, and everything is rotating properly, after your 10-20 minute run in time, you are now ready to reclaim your first load of concrete!**



**IMPORTANT OPERATIONAL NOTE:  
What to do if there is Wet Concrete in the Infeed Hopper,  
and the STAR Prefeeder is not operating:**

In an emergency situation, where the Star feeder stops turning with wet concrete in the hopper, **it is imperative that you quickly remove the wet concrete before it sets up.**

1. **FIRST SHUT-OFF AND LOCK-OUT ELECTRICAL CONTROLS!**
2. Next, remove the gearbox from the prefeeder.
3. Remove hardware from BOTH end caps.
4. Use a 3-pound hammer or mallet and a block of wood (between hammer and shaft end to avoid damage!) to remove the Star paddle assembly from either end.
5. Rinse out all wet concrete.
6. Reassemble Star feeder in reverse order.



## **SECTION 4.0 PROCEDURES FOR RECLAIMING CONCRETE**

The R2 is designed to reclaim *wet* concrete.

Note: The capacity and quality of reclaimed aggregates can and will be effected by:

- Fine gradation of material.
- Coarse gradation of material.
- Coarse shape (natural vs. manufactured, for instance).
- High or Low slump.
- Poor pit system design.
- Maintenance and cleaning.
- Other factors.

Keep in mind that it will take some amount of concrete passing thru the reclaimer before any aggregates will be discharged out of the Agg. Auger.

(1) Bring container of waste concrete to Infeed Hopper.

(2) Position so that you are able to discharge concrete into Infeed Hopper.

(3) If automatic operation is in use (i.e. loop detector), the alarm horn will sound upon detection of the vehicle and/or container, followed by the reclaimer starting.

If manual operation is in use (i.e. NO loop detector), operator should turn On/Off Switch to the ON position, the alarm horn will sound, followed by the reclaimer starting.

### Conditions operators should look for:

If the Reclaimer starts up, but the operator notices that there is **NO water flowing**, operator should contact plant/maintenance personnel prior to discharging the waste concrete into the Infeed Hopper. Possible causes of lack of water are plugged or inoperable pump, and/or plugged plumbing.

If Reclaimer **does not start up** at all, operators should obviously NOT discharge material into the Reclaimer. Contact plant/maintenance personnel and inform them of this condition. If concrete is discharged without the Reclaimer in operation, the concrete will simply flow down into the Reclaimer and obviously harden. It will require a lot of downtime, and at least one jack-hammer, to get the Reclaimer operable again.

(4) Prior to discharging the concrete, add water as needed to attain a **6" to 10" slump**.

- (5) Discharge concrete and wash water into the Infeed Hopper.
- (6) After discharging the waste concrete, operators should wash-out the infeed hopper and make sure there is no concrete build-up, esp. in the corners.
- (7) If system is in AUTO Mode: Drive away when empty. System automatically shuts off after customer-selected shut-down period on TR2.

If system is in MANUAL Mode: When truck is empty and rinsed out, turn On/Off switch to OFF position. System automatically shuts off after customer-selected shut-down period on TR2.

**IMPORTANT: DO NOT USE THE EMERGENCY STOP FOR NORMAL OPERATION!**

#### APPLICATION NOTES:

*Cold weather operation:* The R2 Reclaimer completes separation of each load of concrete before shutting off. Water in the system drains back to the settling pond.

**IMPORTANT:** Water is always retained in the lower bottom section of the agg. auger housing. Remove the water to eliminate freeze-up. This can be attained by removing the lower tail shaft assembly.

Also, remove the water pump from the ponds.

**CAUTION!**

**DO NOT ATTEMPT TO RUN THE RECLAIMER IF WATER AND AGGREGATES ARE FROZEN IN THE BOTTOM OF THE AGG. AUGER BOX.** Attempting to do so may cause SEVERE damage to the equipment!

You should consider adding the Auger heater package. Consult factory.

## **SECTION 5.0 EQUIPMENT MAINTENANCE**

### SPRAY NOZZLES

Check the spray nozzles **ROUTINELY** (preferably daily) for plugging or obstructions. **It is important the spray nozzles are working properly to keep the screen clean.** A dirty screen reduces the efficiency of the system. If needed, remove and clean.

### SCREEN

Check the screen weekly for wear, blinding, obstructions and fiber.

Notes: Clean screen of cement build up with a liberal amount of straight muriatic acid with an acid-approved “pump up” sprayer. Allow the acid to completely clean – then rinse with water. Screen life is related to how well the pit system is designed and maintained. Poor design and/or maintenance of the pit system will reduce screen life.

### PUMP SUCTION SCREEN.

Inspect DAILY for obstruction.

Notes: *Remove* the pump(s) from the water when cleaning the pit to avoid damage by the loader.

A small winch lift can be installed above each pump for easy removal of the pump(s).

*Fibermesh* concrete reclaiming may require the installation of a screen in Weir #1 between Pits #1 & #2 and a screen around the pump intake. This will minimize the amount of fiber in the pumps and spray nozzles. The screens should be checked daily and fiber build up removed. Plugged pump screens will lower pump output and reduce the efficiency of reclaimer material washing system. Plugged pump screens will also eventually burn up the pump motor, if sufficient water flow is not maintained.

If material recovered from the Agg. Auger begins to clump, it means that too much cement has been left on the aggregates, which could be caused by any of the above 3 (nozzles, screen, pump) being clogged.

## **SECTION 6.0      PIT SYSTEM MAINTENANCE & OPERATION**

1. Check the water level in the pits daily and add water if necessary. The water level should be maintained at the top of the weirs.
2. Pit #1, or the pit that is *closest* to the Reclaimer, where the reclaimer drains into: Remove the spent cement from the bottom of pit #1 every one (1) to three (3) days, or as needed, with a front end loader. This clean-out time will vary with reclaimer use. This time frame allows the spent cement to settle at the bottom of the pit.
3. Pit #2 (where used): Remove the spent cement from the bottom of pit #2 each weekly or monthly with a loader, or as needed.
4. Pit #3 (where used): Remove the spent cement from the bottom of pit #3 each weekly or monthly with a loader, or as needed.
5. Pit #4, or the pit that is *farthest* from the Reclaimer, where the pump is located: Remove the spent cement from the bottom of pit #4 weekly or monthly with a loader, or as needed. **NOTE:** *Always* remove submersible pump during cleaning.

## **SECTION 7.0      SERVICE**

### **7.01      SCREEN**

- There is one (1) screen wrapped around the rotor.
- The screen is held together at the screen edges with 5 screen hold down bolts that pass through a flange welded to the rotor.
- The screen should be inspected weekly.

SCREEN REMOVAL & INSTALLATION (To access rotor and screen, remove lid)

**Warning:** To avoid injury, disconnect and lock out power before attempting screen removal.

The screen is wrapped around the rotor. Remove the screen hold down bolts from the screen and remove the screen from the reclaimer housing.

Reverse the above procedure for installing the screen. If in doubt, see “installation of new screens” below.

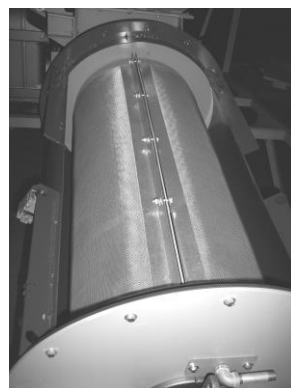
## INSTALLATION of NEW SCREENS

Screen: lay the screen flat on a clean flat surface with the metal bound edges towards the reclaimer. When installed, the bound edges will come together forming a cylinder and be bolted to the rotor tabs.

Install the screen by wrapping it around the inner rotor by feeding the leading edge of the screen under the rotor. Bring the two opposing metal bound edges together, on either side of the screen hold down flange and line up the holes.

Secure the two edges of the screen with the screen hold down bolts going through the screen hold down flange. Tighten the bolts to draw the two edges together and close the gap in the screen.

**NOTE:** While Screen is removed from rotor, this is an EXCELLENT time to inspect (and replace if needed) the Bushing and Bushing Shaft (see next section).



## 7.02 BUSHINGS

**Warning:** To avoid injury, disconnect and lock out power before attempting bushing/shaft removal.

The R2 Reclaimer comes quipped with UHMW Bushings, rather than greaseable bearings, to support the non-drive ends of both rotating assemblies, the Rotary Screen and the Agg. Auger. These bushings are wear items, and must be occasionally replaced. They should be visually inspected at a minimum of every year, however, more often is recommended, depending on usage.

The Bushing and Bushing Shaft used in the both the Rotary Screen and the Agg. Auger are *identical*, and can be interchanged.

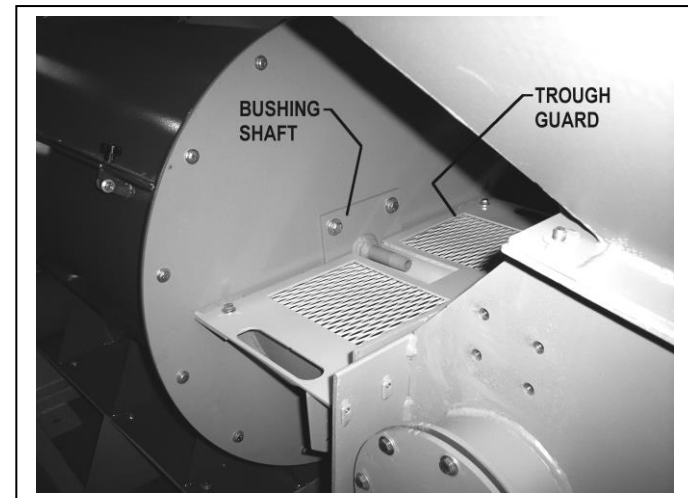
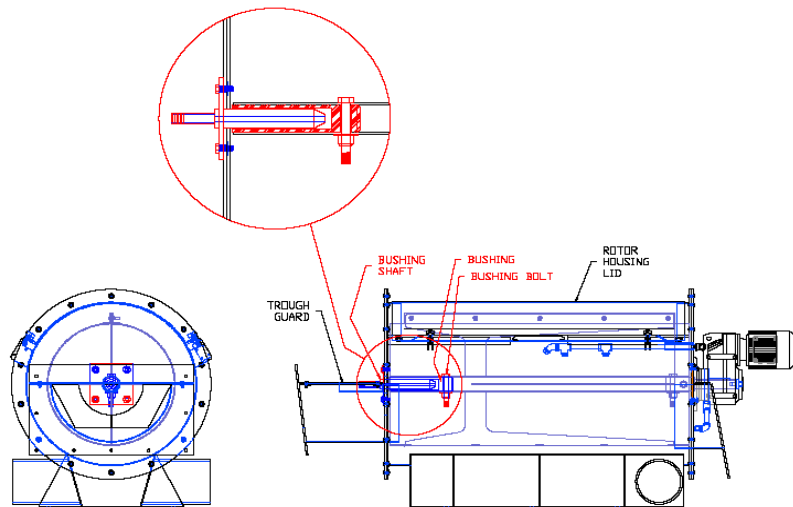
It is impossible to know how often these will need replacement, as there are many factors that affect the life of the bushing. Variations in size and hardness of aggregates (esp. sand), daily or weekly Reclaimer usage, and pit maintenance (*how much spent cement and grit is being pumped back to the Reclaimer, due to pits not being cleaned often enough*) are some of the many factors which will affect operating life.

### 7.02.01 Front Rotary Screen Bushing and Shaft Replacement

Remove the trough guard, and the rotor housing lid. Remove the (4) bolts securing the bushing shaft – slide shaft out of rotary screen pipe thru hole in end plate.

Remove the (5) bolts securing the Screen to the rotor, and lay the screen open. Remove the bushing bolt and slide bushing out of rotary screen pipe thru hole in end plate.

Inspect both Bushing and Shaft for wear – replace as needed. Remount and re-install all hardware in reverse order.



## 7.02.02 Tail Shaft Bushing, Aggregate Auger

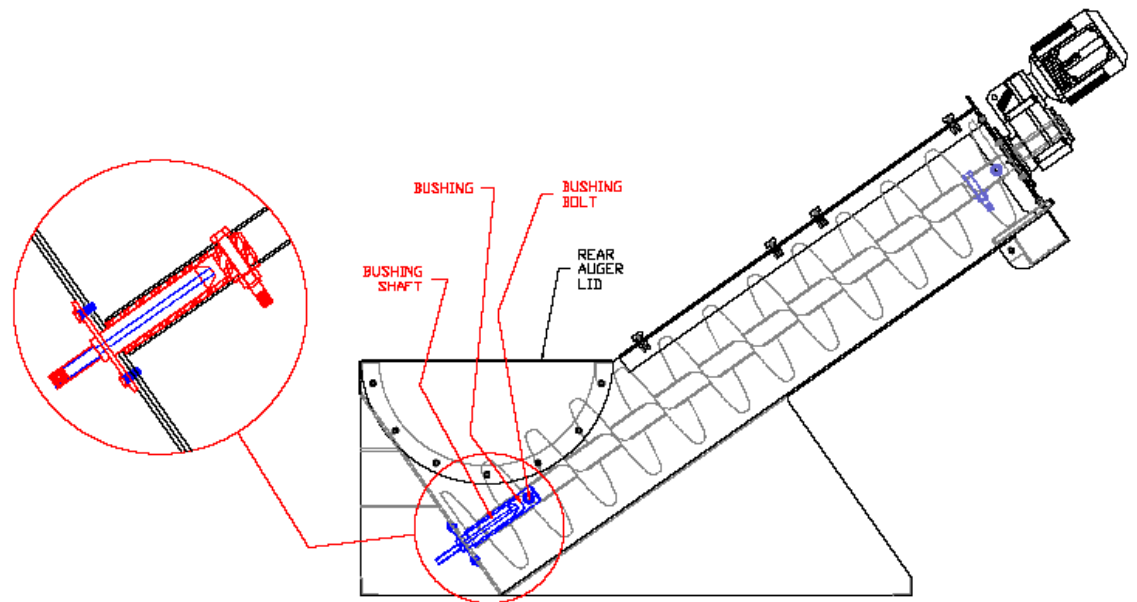
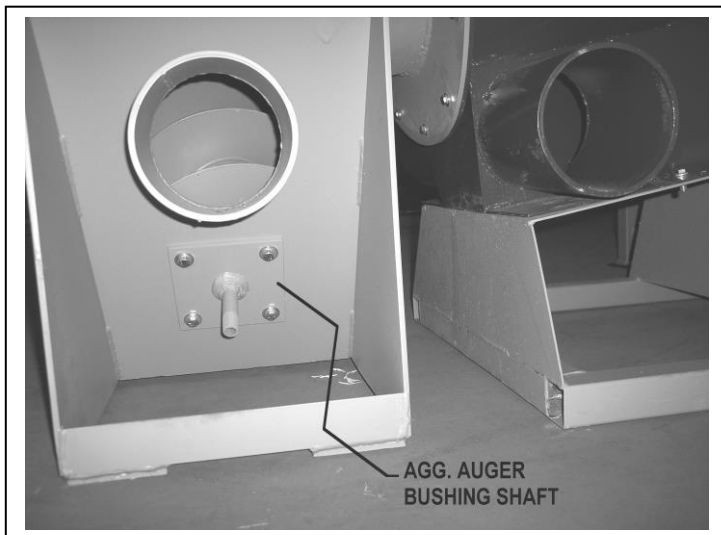
The Agg. Auger tail bushing is located at the lower (bottom) end of the aggregate auger, just below the drain. While it is in a location that is not readily visible, with proper site clean-up (i.e. keep the location around the Reclaimer free from spilled concrete, etc.) it is accessible, and therefore relatively easy to change out when needed.

The most effective way to know when the bushing needs replacing is **by listening** to the auger. When the bushing and/or tail shaft has worn away, the lower end of the auger will no longer be supported, allowing the screw flighting to ride (i.e. drag) on the inside of the housing. This will cause an undue amount of “dragging” noise when the Reclaimer is running, and most users report that they are able to tell by this sound that it is time to replace the lower assembly.

Remove the rear auger lid. Remove the (4) bolts securing the bushing shaft – when these (4) bolts become loose, any standing water remaining in the auger housing will drain. Slide shaft out of rotary screen pipe thru hole in end plate.

Remove the bushing bolt and slide bushing out of rotary screen pipe thru hole in end plate.

Inspect both Bushing and Shaft for wear – replace as needed. Remount and re-install all hardware in reverse order





### 7.02.03 STAR Prefeeder Support Bushings

Remove gearmotor from STAR Prefeeder drive shaft.

Remove both end caps.

Use a 3-pound hammer or mallet and a block of wood (between hammer and shaft end to avoid damage!) to remove the Star paddle assembly from either end.

Bushings and shafts are secured to Star paddle wheel with (2) 5/16 x 4-1/2" Lg. Grade 5 Hex Head Cap Screws and associated hardware.

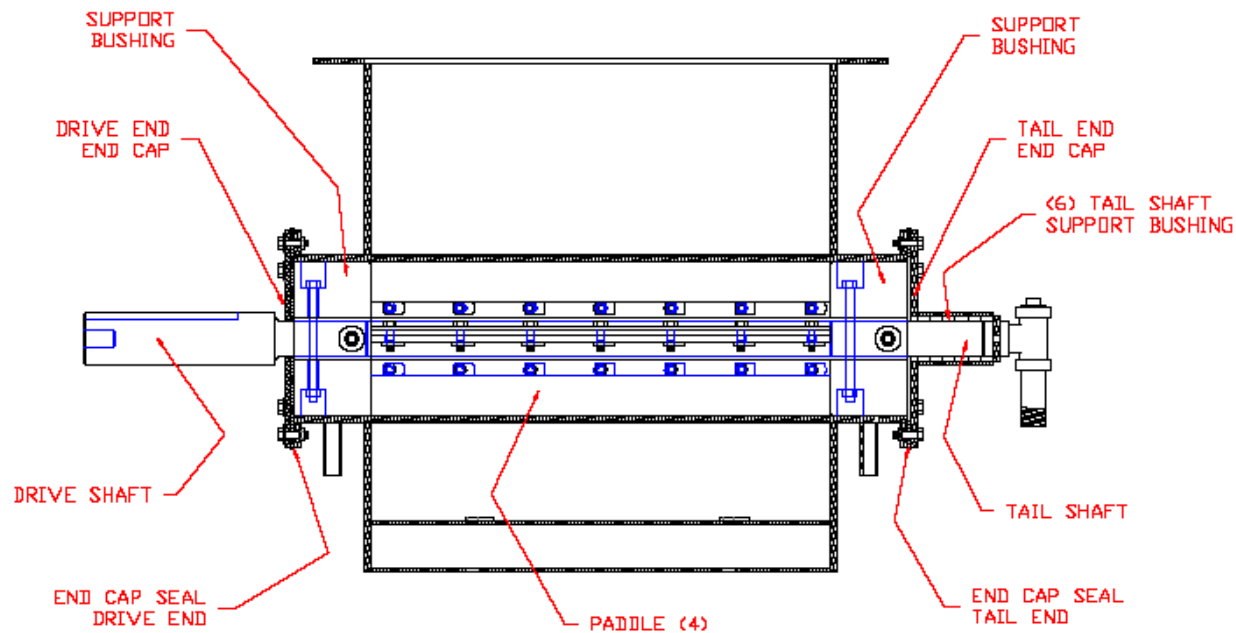
Remove the (4) bolts.

Slide the shafts and bushings off of the paddle wheel.

Replace bushings, and reinstall onto paddle wheel.

Check the non-gearmotor ('tail') end cap. Inside the 2" Square tube that is welded onto the end cap, there are (6) 1/2" thick UHMW support bushings. Inspect and replace, if needed.

Reinstall Star feeder, end caps and hardware, and place into service.



## **SECTION 8.0 INSPECTION CHECKLIST**

### DAILY

1. Submersible pump screens. Clean.
2. Nozzles. Check. Clean if needed
3. Rotary Screen. Inspect. Clean as necessary for proper operation.
4. Infeed Hopper. Check for undue concrete build-up. Clean as necessary.

### WEEKLY: (depending on usage)

1. Clean pit(s).
2. Remove nozzles. Clean cement build-up, fibre, etc. so water flows freely.

### ANNUALLY:

1. Drain all Gearmotors. Refill with proper oil, as defined in Section 1.10.
2. Remove housing/weldment on both rotary screen front shat and agg. auger tail shaft assemblies. Check for wear on housing, shaft, and especially UHMW bushing. Replace as needed.

## **SECTION 9.0 SPARE PARTS LIST**

	<u>BFK Part No.</u>
Screen	00002.935
Bushing [Fits both Rotary Screen and Agg. Auger]	32-DPM-002
Shaft Weldment [Fits both Rotary Screen and Agg. Auger]	32-WBS-004
Submersible Pump, 1.3HP, 3Ph.	WPM-1.3-xxx where xxx = Voltage 230 or 460
Gearmotor, Rotary Screen, 5HP	MDV.GM0.5.021F
Gearmotor, Agg. Auger, 1.5HP	MDV.GM1.5.047F
Gearmotor, STAR Prefeeder, 1HP	MDV.GM1.06.6T.B
Star Feeder Support Bushing, 2 per feeder	10000.900
Star Feeder Tail Shaft Support Bushing, 6 per feeder	10000.722
Star Prefeeder Paddles, 4 per feeder	10000.716
End Cap Seal, Drive End	10000.723
End Cap Seal, Tail End	10000.724

## **SECTION 10.0 TROUBLESHOOTING**

The Troubleshooting Guide will “point you in the right direction” when trying to solve problems with your reclamation system. It does not, and cannot, cover *all* of the problems you may experience in the field. However, it will give you (and a BFK Technician) a good idea of where the trouble may be.

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**PROBLEM:** *Rotary Screen, STAR Prefeeder, Agg. Auger or pump will not run.*

**PROBABLE CAUSES:** Main disconnect is shut off  
Emergency Stop (E-stop) is engaged  
Loss of electrical power  
Blown Fuses  
Motor Starter Relay Heaters are tripped

**POSSIBLE SOLUTIONS:** Check electrical control panel. Replace any blown fuses, if necessary. Consult a qualified electrician.

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**PROBLEM:** *Discharged Aggregate is very wet.*

**PROBABLE CAUSES:** Agg. Auger Nozzle is restricted or clogged

**POSSIBLE SOLUTIONS:** Inspect and clean Nozzle

---

**PROBLEM:** *Concrete will not feed into rotary screen from STAR Prefeeder.*

**PROBABLE CAUSES:** Concrete too “stiff”/bridging  
Vibrator not working

**POSSIBLE SOLUTIONS:** Add water to mix, to 6” to 10” slump  
Make sure vibrator is working

---

**PROBLEM:** *Discharged Aggregate is Dirty.*

**PROBABLE CAUSES:** Screen is dirty/plugged with cement and/or fibre.  
Pump intake is clogged  
Water nozzles clogged, or not positioned properly  
Pump running backwards  
Pit system needs cleaning  
Waste concrete feeding too quickly thru system

**POSSIBLE SOLUTIONS:** Check all nozzles and pump intake for clogged material  
Check nozzle position (direct toward aggregate pile on screen)  
Slow down rotational speed of STAR Prefeeder  
Clean pit system  
Clean screen

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## **SECTION 11.0 WINTERIZING**

For reclaimers operated outdoors, upon completion of the reclaiming season, especially in colder climates, remove pump from pit systems. Store indoors. Pump to be inspected and cleaned accordingly, prior to future use.

Drain entire Reclaimer system.

Disconnect and drain all hoses connecting pump to Reclaimer and Prefeeder.

Prior to start-up in spring, reconnect all hoses, and reinstall and connect pump, etc., as defined in preceding sections. During re-connection, visually inspect all hoses, connections and nozzles for leaks, clogging, etc. Correct as necessary. Also, inspect and replace screen, if required. Clean as needed.

Also, perform all routine maintenance procedures, such as draining and refilling gearmotors, etc. Start-up Reclaimer system as defined in Section 3.0 INITIAL EQUIPMENT START-UP.

## LIMITED WARRANTY

BFK Technologies, Inc. (BFK) warrants to the original purchaser the BFK equipment that is not manufactured by others, to be free from defects in material and workmanship under normal use and service, and when properly maintained by the purchaser. Use or service with corrosive or abrasive chemicals or materials or in a corrosive or abrasive atmosphere shall not be deemed normal. BFK's obligation under this warranty is limited to repairing at BFK's factory or a factory authorized service center or furnishing a replacement for any part, or correcting any workmanship, which shall be demonstrated to BFK's satisfaction to have been defective at the time of delivery and with respect to which a written claim specifying the particular defect or defects shall have been delivered to BFK or a factory authorized service center within one (1) year from the date of start up of the equipment, not to exceed eighteen (18) months from the date of the delivery of the equipment to purchaser. If the equipment is delivered piecemeal, the warranty period for each portion shall commence at its date of delivery.

The removal by purchaser of parts returned to BFK or a factory authorized service center for repair or replacement and the installation by the purchaser of replacement or repaired parts shall be at purchaser's expense. No work will be done by BFK or factory authorized service center at the site of the installation unless in BFK's opinion it is impractical for purchaser to remove the defective part and return it to BFK's factory or a factory authorized service center.

Defective parts shall be returned, after pre-authorization by BFK, to BFK's factory or to a factory authorized service center. Repairs, replacements, or adjustments for which BFK is responsible will be made as promptly as possible within the standard working hours of any day. All costs for freight, duties or any other related costs for sending or receiving parts are the responsibility of the purchaser. Overtime, if required by purchaser, will be paid for by purchaser. BFK does not warrant equipment manufactured by others, but will submit the manufacturer's warranty to the purchaser upon request.

**EXCEPT AS EXPRESSLY STATED HEREIN, THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE OF THE EQUIPMENT OR SERVICES FURNISHED BY BFK OR A FACTORY AUTHORIZED SERVICE CENTER. BFK SPECIFICALLY DISCLAIMS AND EXCLUDES ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ARISING FROM A COURSE OF DEALING OR USAGE OF TRADE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. BFK SHALL NOT BE LIABLE FOR, NOR DOES BFK AUTHORIZE ANY PERSON TO ASSUME FOR BFK, ANY OTHER LIABILITY IN CONNECTION WITH THE EQUIPMENT OR SERVICES FURNISHED BY BFK, INCLUDING WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, LIABILITY FOR LOSS OF PRODUCTION, PRODUCT, EQUIPMENT OR PROFITS OR LIABILITY FOR DIRECT, INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES TO PERSONS OR PROPERTY. BFK will make no allowances for repairs, alterations or other work done unless specifically agreed to in writing. Purchaser agrees that purchaser's sole remedy for liability of any kind, including negligence with respect to the equipment and services furnished by BFK shall be limited to the remedies provided herein.**

Additional BFK Warranty provisions

INSTALLATION, OPERATION AND MAINTENANCE INFORMATION PROVISION: ALL dimensions, weights and technical specifications are subject to change, at BFK's discretion, from previously published information. In some applications, NON-standard or custom pieces may be supplied.

All installation, operation and maintenance instructions, including those shown in the Manual supplied with the equipment, attempt to show common, typical installations. YOUR actual Installation may vary.

The information is intended as a guideline only, and may or may not represent the actual equipment supplied. Some pictures and/or drawings may show earlier revisions of the same machine, and may not totally represent the revision of the machine you have.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE PROPER SIZES AND DESIGNS OF ALL CONNECTIONS, FITTINGS, WIRING, ETC. ARE PROVIDED BEFORE INSTALLING AND OPERATING EQUIPMENT, and BFK shall be held harmless from problems occurring from improper installation and operation of the system.

Please consult factory if any discrepancies arise before the system is installed and operated.

Metric equivalents are provided for reference only.

SUBMERSIBLE PUMP(S) PROVISION: In most cases, your reclaimer was supplied with one or more submersible pumps. The pump has been sized to operate with most installations. However, as BFK has no control over the installation of the equipment, including but not limited to, the distance from the pump to the reclaimer, the connection method used (Hose vs. different types of pipe, for instance), fittings used, etc., it remains the end-users responsibility to ensure proper water flow and pressure is delivered to the reclaimer.

If the pump shipped with the reclaimer does not provide enough flow and/or pressure, the end-user is responsible for purchasing and installing a pump of the proper size, or adding an additional pump(s), as needed to ensure proper operation of the reclaimer.

Failure to provide adequate water flow and pressure resulting in damaged, plugged or otherwise compromised equipment is not covered under warranty, and all costs associated will be the end-users responsibility.

