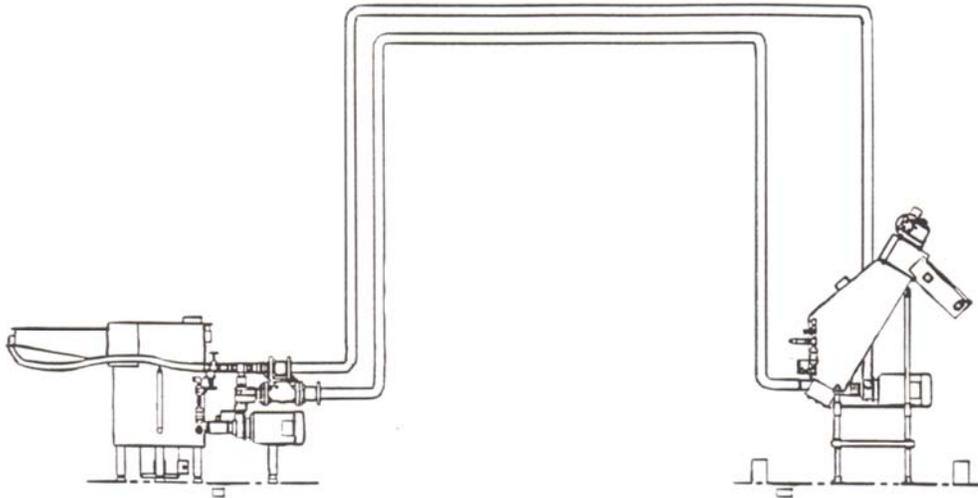


## ***SOMAT TRAINING HANDBOOK***



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Rev 1/09



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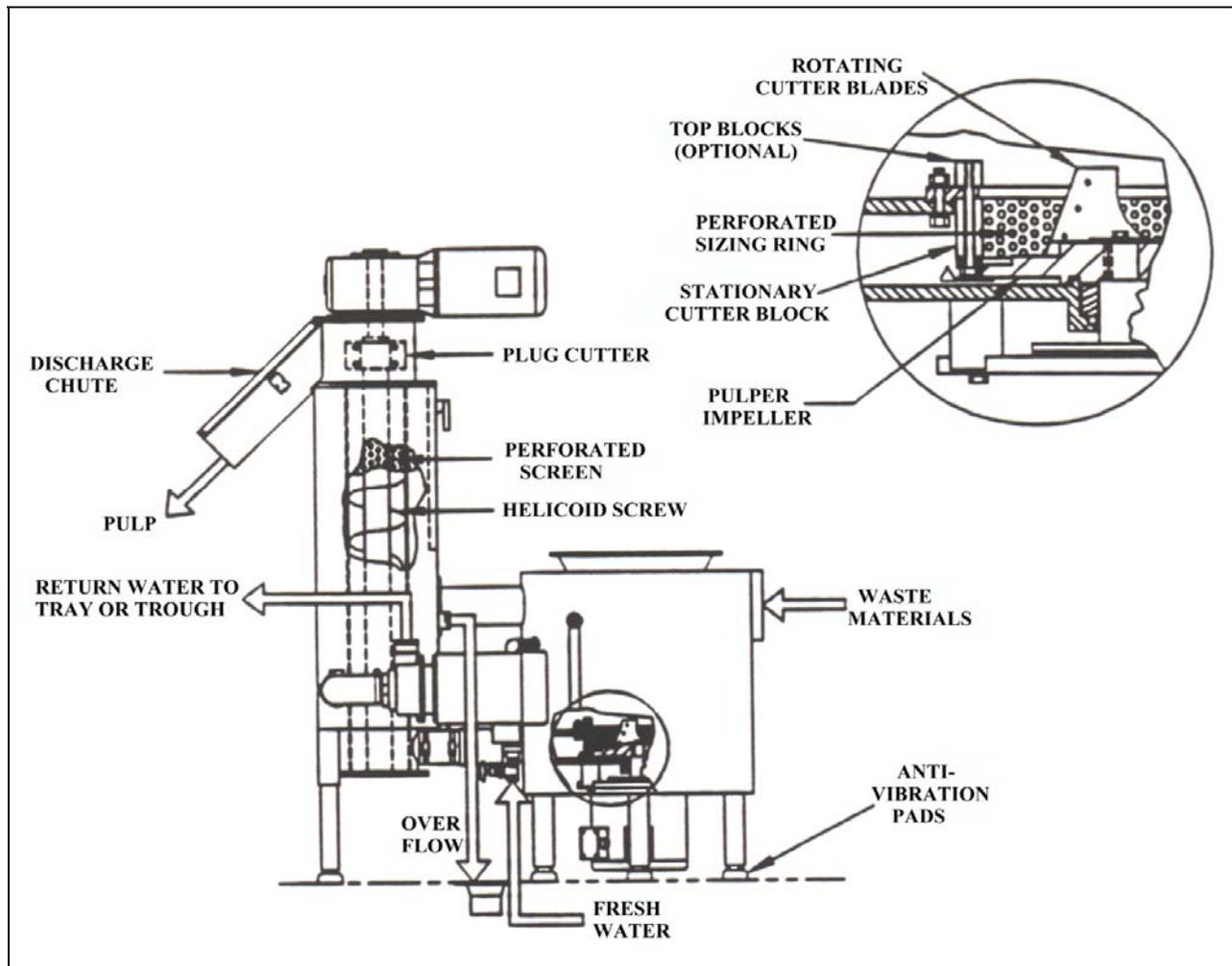
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## GENERAL DESCRIPTION

The Somat® system prepares solid waste materials for disposal by transforming the materials, with water, into a pulp. This transformation takes place in a unit called a Pulper, which is designed to pulp all forms of paper, plastic, Styrofoam, cardboard, foil and food waste. The waste material is fed manually or automatically to the Pulper. The continual down flow of water and the rotation of the Pulper impeller create a strong vortex action, which pulls the waste down against the cutting blades of the impeller. The resultant slurry is then forced through a perforated stainless steel Sizing Ring surrounding the impeller.

Items such as tin cans, silverware, nails, bolts and other non-pulpable objects that may be inadvertently fed into the Pulper are separated out by centrifugal force and gravity.



**TYPICAL CLOSE-COUPLED SP-75 PULPER**

## SYSTEM OPERATION

### A. Component identification

1. Drive motor (pulper)
2. Slurry pump assembly
3. Return water assembly
4. Fresh water package
5. Stand pipe assembly\*
6. Cutting mechanism
7. Limit switch (pulper)
8. Drive motor (extractor)
9. Return pump
10. Screw and Screen assembly
11. Drain M.O.V. (Motor Operated Valve)
12. Spray rinse assembly
13. Limit switch (chute)
14. Bottom pin and bushing
15. PLD (Pulp Level Detector)\*

\* - Denotes optional or older model application

### B. Start-up with Safety Feature Review

1. Extractor chute lid must be closed
2. Pulper lid must be on or closed and latched
3. Turn power ON
4. Close drain valve
5. Unlock stop button
6. Empty/Run switch in 'Run' position
  - \* Newer systems incorporate a PLC (computer controller) to automatically fill the pulper if all lids are closed. The 'Empty/Run' switch has been replaced with a momentary pushbutton to activate the cleaning cycle.
7. Press 'Start' button, system operates

### C. Types of waste permitted during operation

1. All food waste
2. Paper and napkins
3. Styrofoam
4. Cardboard
5. Plastic

#### D. Shut down

1. Feed cardboard (recommended)
2. Run system for 5 minutes after last feed, for processing.
3. Turn switch to 'Empty'  
\* The 'Empty/Run' switch has been replaced with a momentary pushbutton to activate the cleaning cycle.
4. Wait for pulper to shut down
5. Open drain valve
6. Turn power 'OFF'
7. Clean out pulper

#### E. Cleaning cycle

1. Turn switch to empty (timer will start)  
\* The 'Empty/Run' switch has been replaced with a momentary pushbutton to activate the cleaning cycle.
2. Spray bar solenoid valve will come on
3. Drain M.O.V. will open (throttling drain valve 1-1/2 turns open pre-set)
4. Hot water will go through piping during the cleaning cycle to help clean
5. System will shut off at the end of the cycle

#### F. Cleaning

1. Turn main disconnect off
2. Open pulper lid
3. Scoop any non pulped floatable waste off the top with a strainer
4. Open drain valve to pulper
5. Using a brush and hot water, clean the inside of the pulper including under the lip of the pulper
6. Open the access door on the extractor shell. Using the brush and hot water hose, clean the inside of the extractor shell. Use the brush to clean the backside of the screen as best as possible.
7. Open the chute lid and clean the material in the head area. You do not need to dig the plug area out.

## **ELECTRICAL PANELS**

The electrical panels hold the controls of the system which need to be accessed from time to time for both routine preventive maintenance and troubleshooting. In this section the individual components will be discussed in their relationship to the whole system for both operation and troubleshooting. There may be one or more panels depending on the type or size of the system. In 'CLOSE COUPLED' systems there is only one panel. In 'REMOTE' systems there are two or more panels, depending on the number of pieces in the system.

A. TRANSFORMER - The transformer converts the higher voltage used to operate the motors to 115 volts for operation of the many smaller components. It is easily tested for proper operation as follows:

1. Check incoming line voltage.
2. Check the data plate on the transformer for the proper location for the incoming line voltage taps. Then check to insure the connections are correct and properly fastened.
3. Check to insure the proper secondary lugs are used for 115 volts and are properly fastened.
4. Turn off the circuit breaker on the line side to avoid damage to components if voltage is not correct.
5. Use a meter to confirm proper step down.

B. MOTOR STARTERS/CONTACTORS - The motor contactors are activated with control voltage, which must go through a number of checks before allowing the motor to operate. They have a coil which pulls the contacts together quickly and evenly to avoid single phasing the motors. They may also have auxiliary contacts attached either to the side or the front to operate other components that must be controlled simultaneously.

C. RELAYS AND THEIR FUNCTION - Control relays work similar to the contactors. They have a coil that operates on 115 volts. The coil controls a set of contacts that can be wired in different configurations. Relays may have a single or multiple number of poles. Each pole has three connections, one incoming, one NO (Normally Open), and one NC (Normally Closed).

The operation is as follows; when the coil is **not** energized the NO contacts are open and no current will pass, also the NC contacts are closed and current will pass (from the incoming terminal). Once the coil **is** energized the position of the contacts is reversed. Now the NO (Normally Open) contacts will be closed allowing current to pass and the NC (Normally Closed) contacts will be open not allowing current to pass.

D. WATER LEVEL CONTROL\*: A constant supply of air is pumped by the air pump, through the air line, past the pressure switch and into the pulper, via the stand pipe. The pressure switch senses the head pressure of the water as resistance thereby activating the freshwater solenoid valve as needed. The 'Snubber' is between the tee fitting in the air line and the pressure switch. Its function is to eliminate chattering of the pressure switch contacts by allowing air to pass but to buffer out the spikes

caused by the turbulence in the pulper. Adjustment and troubleshooting are covered elsewhere in this text.

Water level controls consist of the follow parts:

1. Pressure switch
2. Air pump
3. Snubber
4. Air line
5. Stand pipe
6. Freshwater solenoid valve

Water level control (with PLC and sensor system) parts:

1. PLC
2. Water level sensor

\* Units manufactured after 1/08 have a PLC (computer controller) installed to control operation of the pulper. The water level control system has been upgraded as well. This new system utilizes a sensor located within the pulper tank. Its main function is to set the 'pre-fill' level for the pulper as well as ensure that water is in the tank during operation. If the pulper runs low or out of water for a 30 second duration, the sensor will "see" the loss of water and shutdown the system to prevent clogging of pipes. The PLC will now control "make-up" water. The PLC automatically times a fill cycle of 15 seconds. In normal operation, the PLC will turn on the cold water solenoid for 15 seconds and will turn off the solenoid for 15 seconds. This will ensure proper overflow at the extractor and that there is an adequate amount of water being introduced into the pulper.

E. TIME & AUTO-RINSE FUNCTION\*: The timer is adjustable from 0-10 minutes and is activated when the selector switch is turned to 'EMPTY'. When activated two things will happen: First, the spray rinse in the extractor turns on, and second, the drain M.O.V. (Motorized Operated Valve) opens. This function is to rinse down the extractor screen while circulating hot water through the system to help clean. At the same time the drain M.O.V. is opened to begin draining off the dirty water from inside the extractor.

\* Units manufactured after 1/08 have a PLC (computer controller) installed to control operation of the pulper. With this change, the 'Time & Auto-rinse function has changed from a selector switch to a pushbutton. This pushbutton is a momentary switch. Pressing the button will activate the "Timed Stop" in which the spray rinse system in the extractor will activate and aid in cleaning the screw and screen. It will also activate the HOT water solenoid in order to help clean the system. The standard time for the 'Timed Stop' is approximately 10 minutes. If pushbutton is activated accidentally it can be pressed a second time to return to 'Normal Operation'.

- F. OVERLOADS: There are a few different overloads that will be encountered. The 'Main Disconnect' circuit breaker, Transformer Circuit Breakers 'Primary' and 'Secondary,' and adjustable manual 'Motor overloads'.

Main Disconnect Circuit Breaker: In a 'CLOSE COUPLED' system the 'Main Disconnect' circuit breaker operates with the large handle on the outside of the panel. It will control all the power inside the panel for both control and motor operation.

In a 'REMOTE' system the 'Main Disconnect' circuit breaker at the 'Extractor' operates not only all the power in that panel, but also all the control voltage in the entire system. (All panels)

Transformer Circuit Breakers: The 'Primary' Circuit Breaker protects the transformer on the line side. The 'Secondary' Circuit Breaker protects the transformer from damage if there should be a short in the control circuitry. Both of these breakers, if tripped, have a small toggle in the center to reset.

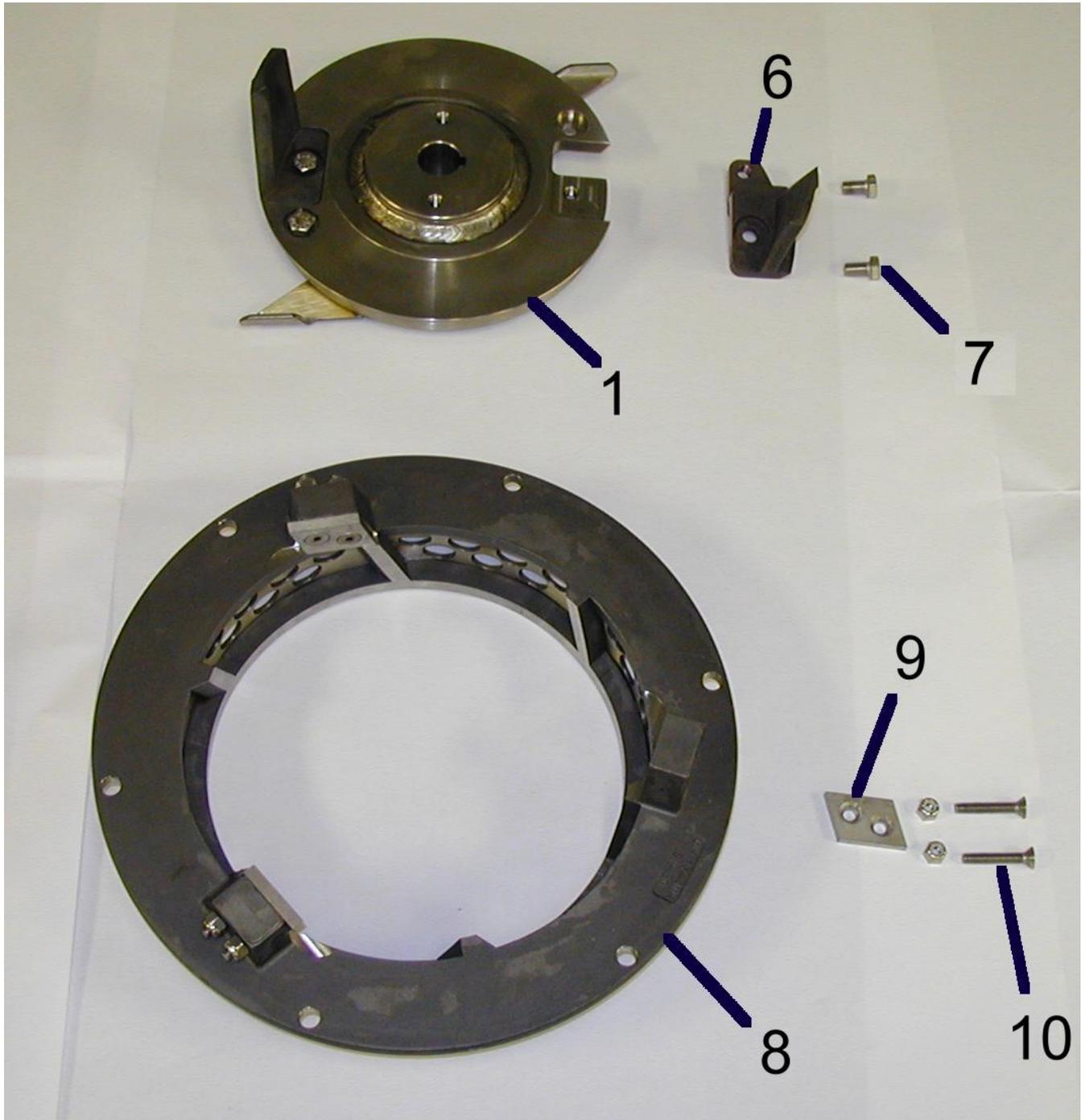
Adjustable Manual 'MOTOR OVERLOADS': These are used to protect the motors individually. Each has a 'Start', 'Stop', and a dial for setting the overload range. Setting the overload range is easily done with a small screwdriver. On the face of the overload is a small dial with a pointer. Turn the pointer to the desired setting (Refer to motor data plate or electrical prints for the proper setting).

- G. EMPTY/RUN SWITCH\*: (1) The 'RUN' position will let the pulper pre-fill with water and operate when the start button is pushed. (2) The 'EMPTY' position activates the spray rinse system in the extractor and times the unit out when it will no longer be used and needs to be cleaned.

\* Units manufactured after 1/08 have a PLC (computer controller) installed to control operation of the pulper. With this change, the 'Time & Auto-rinse function has changed from a selector switch to a pushbutton. This pushbutton is a momentary switch. Pressing the button will activate the "Timed Stop" in which the spray rinse system in the extractor will activate and aid in cleaning the screw and screen. It will also activate the HOT water solenoid in order to help clean the system. The standard time for the 'Timed Stop' is approximately 10 minutes. If pushbutton is activated accidentally it can be pressed a second time to return to 'Normal Operation'.

- H. ELECTRICAL DRAWINGS: All drawings have several important items of information that from time to time may need to be located. To begin with, the drawing number is found in the lower right corner, it contains the unit serial number. The 'Legend' in the upper right explains the symbols and abbreviations. The top right boxes show if any revisions were made, what they were and when they were made. These drawings show all the details of the components and their relationship to each other.

1. Close Couple: The serial number is located in the lower right corner. On the left side the motors are shown with their horsepower and full load amp ratings. In the lower left is shown the layout of the inside of the panel for component identification. Much of the other information is self-explanatory.
2. Remote system: The first sheet will show the wire-sizing guide for the electrician and the number of wires to be pulled to each location. Sheet #2 will give a more detailed explanation of the interconnecting wire's relationship to each other and their wire number.



**HY POINT CUTTING MECHANISM**

<b>ITEM #</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
<b><i>HY POINT CUTTING MECHANISM</i></b>		
-1	Impeller (85555 for SP-50AS; 85576 for SP-75S)	1
	(ATTACHING PARTS)	
-2	Screw, Hex Head, 3/8"-16 X 3/4" Lg., S/S, (not shown)	1
-3	Washer, Lock, 3/8" Split, S/S (not shown)	1
-4	Washer, Flat, 3/8" Special, S/S (89201) (not shown)	1
-5	Key, 1/4" X 1/4" X 1" (not shown)	1
	---*---	
-6	Impeller Cutter Ear (24950 for SP-50AS; 24975 for SP-75S)	2*
	(ATTACHING PARTS)	
-7	Screw, Hex Head, 3/8"-16 X 5/8" Lg., S/S	4*
	---*---	
-8	Security Ring (87061 for SP-50AS; 87075 for SP-75S)	1
-9	Stationary Cutter Block (with shim stock) (80988)	3 (SP-50S)* 4 (SP-75S)*
	(ATTACHING PARTS)	
-10	Screw, Flat Head-Socket Head, 1/4"-20 X 1-1/2" Lg., S/S w/Nyloc nut	6 (SP50S)* 8 (SP-75S)*
	---*---	

\*Recommended Spare Parts

A. **BALANCING RETURN WATER AND IT'S IMPORTANCE:** Return water is balanced by adjustment of the gate valves. There are three main considerations when balancing. They are, pump motor amperage, overflow at the extractor, and return flow into the pulper. As the pulper grinds up the waste, it pumps the slurry ("Slurry" Mixture of solids and liquids) to the extractor, which in turn separates the solids out and pumps (via 'Return Pump') the return water back to the pulper to be used again. In order to keep the return water from becoming too thick from constant reuse a small amount (usually 1-3 gpm) is adjusted to overflow from the extractor. This water is made up as needed through the water level control system. When balancing, an amp meter is placed on the return pump to avoid over amping the motor. Next the return gate valves are throttled in order to give the appropriate overflow (at Extractor) and return flow (at Pulper) staying within operating amp's of the return pump motor. This may take a few adjustments and readjustments to get correct depending on the size and complexity of the system. After each adjustment a few minutes must be given to let the system settle to see where it ends up. It is wise not to make large or numerous changes at one time to avoid bouncing back and forth.

B. **SETTING THE WATER LEVEL\*:** The adjustment of the water level is performed by turning an adjusting screw on the top of the pressure switch. The normal water level pre-set is approximately one inch below the opening of the trough.

\* Units manufactured after 1/08 have a PLC (computer controller) installed to control operation of the pulper. With this change, the water level is set by a sensor located within the pulper tank. This sensor will "see" the water fill level and will turn off the fill solenoid when it reaches the appropriate level.

C. **CLEANING THE STANDPIPE\*:** The standpipe must be kept clean in order for the water control system to operate properly. The procedure only takes a few minutes to perform and is as follows:

1. Remove airline at the top of the standpipe.
2. Using pipe wrench remove standpipe from the side of the pulper tank
3. Using a bottle brush and water, clean the pipe out
4. Check that the 90° ell on the tank is clean
5. Using pipe dope or Teflon tape on threads, reassemble the standpipe back onto the pulper
6. Reconnect the air line to the standpipe

\* Units manufactured with a PLC and a Water Level Control sensor will have no standpipe. The SP-75's no longer have a standpipe if they have a PLC and a WLC sensor.

D. **CUTTING MECHANISM**

**COMPONENT REMOVAL AND REPLACEMENT** - The following steps are required in the removal and replacement of major components, assemblies, or piece parts necessary for corrective action. *NOTE: Loctite #271 must be used during re-assembly on all hardware of the cutting mechanism assembly.*



#### **SECURITY RING REMOVAL -**

- Remove mounting nuts and lift Security Ring Assembly (8) out of machine.

#### **REPLACEMENT OF SECURITY RING STATIONARY CUTTER BLOCK -**

- Remove stationary cutter block mounting screws (10) and replace stationary cutter block (9). Shim if needed to a clearance of 0.005" to 0.010".

#### **IMPELLER REMOVAL -**

- A. Remove impeller hold down bolt (2) and carefully remove the impeller assembly (1) from the motor drive shaft with an impeller puller (Somat® P/N 84150). Remove key (5) from shaft. A jam bar may be needed in order to keep the impeller from rotating while removing.

#### **IMPELLER CUTTER EAR REPLACEMENT -**

- Remove two screws (7) that hold impeller cutter ear (6) to impeller (1).  
*NOTE: Screws may be loosened by gently heating with a propane torch.*

#### **CHANGING THE DRIVE MOTOR AND MECHANICAL SEAL**

1. Turn main disconnect off to pulper
2. Disconnect power leads and conduit to drive motor
3. Remove cutting mechanism assembly
4. Remove the four bolts that hold the motor up to the pulper shell and let the motor down to the floor
5. Using a jack, lift up the pulper high enough so that the shaft on the motor clears the bottom of the pulper chamber. This may require disconnecting other components if they interfere with this procedure
6. Slide motor out from under pulper
7. Remove flinger from motor shaft and install it onto the new motor shaft
8. Remove the mechanical seal inside the pulper
9. Slide the new motor under the pulper so that the shaft can come up through the pulper chamber
10. Slowly let the jack down so that the shaft comes up into the pulper chamber

11. Using long bolts install them through two of the motor mount holes to help guide the motor up
12. Pull the motor up so that you can put a block of wood under the motor
13. Install two of the bolts to secure the motor, then take the two long bolts out and install the other two bolts
14. Clean the seal cavity and moisten the o-ring with oil
15. Tap the seal into the cavity with seal installing tool #89711. The unpolished side of the seal (marked with an x) **must face down.**
16. Lubricate the upper seal ring and slip it over the drive shaft.
17. Slide the retainer spring onto the shaft
18. Install the impeller back onto the shaft
19. With the security ring in place, using 271 loctite on the center bolt tighten the bolt
20. Center the security ring with impeller by using a feeler gauge. Once the security ring is centered using 271 loctite on the nuts tighten them.
21. Install the conduit to motor junction box and wire the motor to the proper voltage
22. Check the motor for proper rotation.

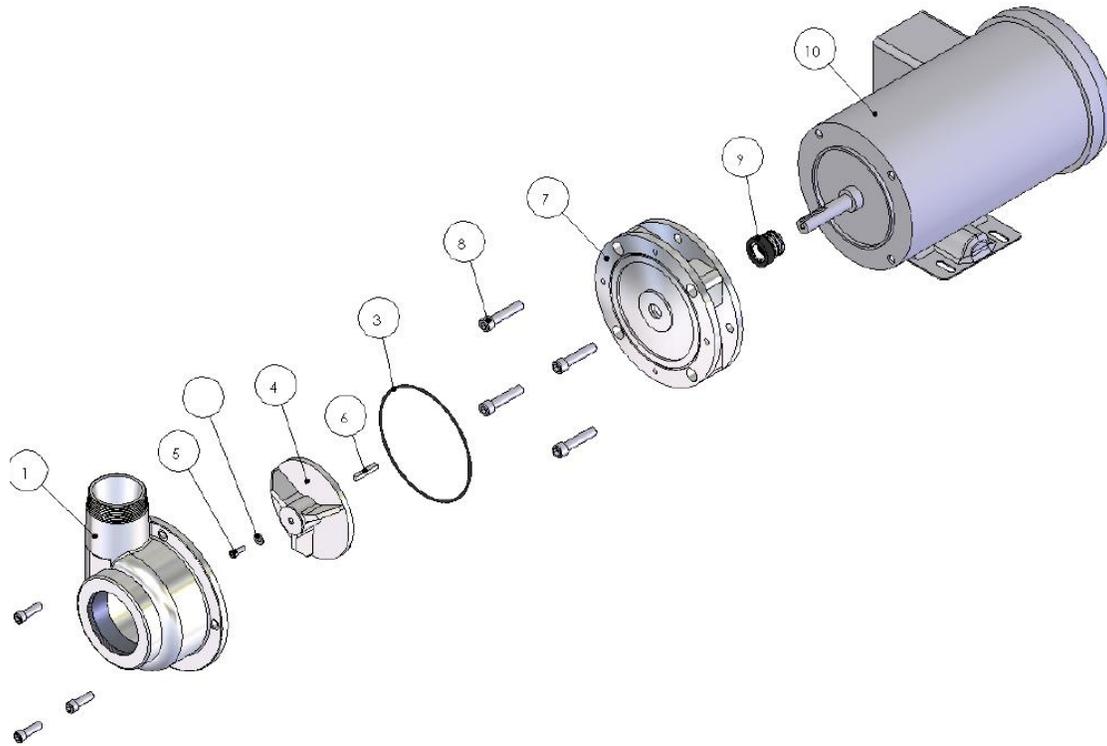
## **SLURRY AND RETURN PUMPS**

### A. Inspection of volute, spacer ring, mechanical seal, o-ring and impeller.

1. Volute - Check for thin spots in the walls, the wear pattern will normally occur at the bottom of the volute but could develop in any area.
2. Spacer Ring - The spacer ring connects the motor to the pump volute. It is also where the mechanical seal seats to prevent leakage around the motor shaft. There is also a groove for the o-ring to seat in to keep it in the proper location and prevent leakage between the two halves. These two places will see the most wear. Inspect for the ability to have a proper seal fit.
3. Mechanical Seal - The mechanical seal is located between the motor and spacer ring. When this starts to wear you will get water passing through at the motor shaft. This must not be let go or it may cause water to damage the motor.
4. O-Ring - The o-ring seats inside the groove of the spacer ring. Inspect for nicks, cracks, or breaks if damaged must be replaced to prevent leaks.
5. Impeller - Inspect the vanes on the impeller for any wear. If it starts to wear, the pumping capabilities will decrease.

### B. Motor Replacement/Inspection

1. Turn main disconnect off to electrical panel.
2. Remove conduit and wire leads from motor
3. Remove the four bolts that hold the motor assembly to the volute
4. Remove the impeller, spacer ring and mechanical seal
5. Inspect motor shaft for damage, if damaged mechanical seal will not work
6. When installing new motor, always install a new mechanical seal to assure no leaks



**KW DIRECT DRIVE PUMP EXPLODED VIEW**

As of 12-1-07 all close-coupled or SPC-75S and SPC-75UDT machines will be using an MP pump instead of the KW pump. The MP pump promotes more efficient pumping while reducing energy draw. Below are procedures for removing the suction head if renewal to the impeller or the mechanical seal is necessary.

	<b>WARNING!</b>	
<b>TURN THE MAIN POWER OFF AND LOCKOUT BEFORE DOING ANY MAINTENANCE OR CLEANING.</b>		

**MP PUMP  
REMOVAL AND INSTALLATION OF MECHANICAL SEAL or MOTOR**

**MECHANICAL SEAL:**

1. Turn off power and lock out machine
2. Remove (4) 5/16-18 hex nuts from Impeller housing
3. Remove housing from pump-pak assembly

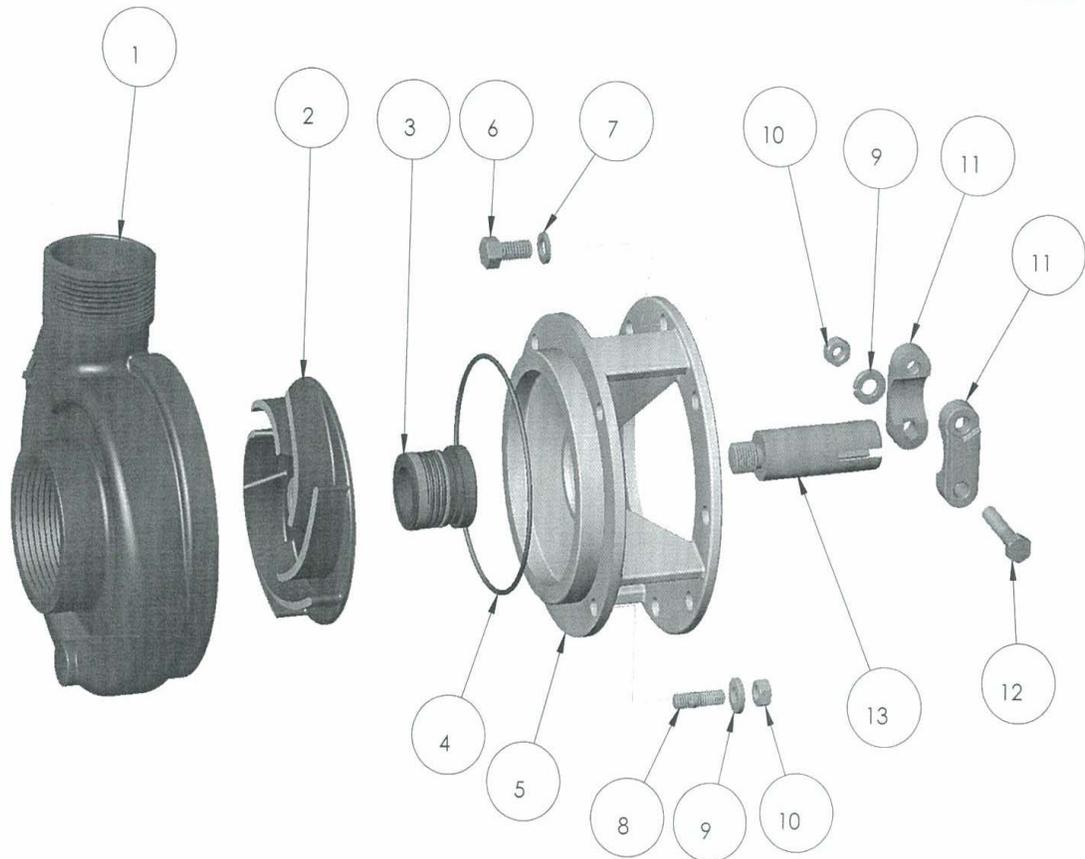
4. The impeller will now be visible, take care to **NOT** place anything in impeller vanes. This will cause damage to the vane and will not be covered under warranty.
5. Loosen 2 bolts holding drive sleeve to motor shaft.
6. Remove impeller with drive sleeve as an assembly, mechanical seal should come off with drive sleeve.
7. Replace mechanical seal. Install with raised carbon face towards motor. Take care to install straight onto sleeve. Install ceramic disc into adapter seat bore with polished side up. Take extreme caution to not damage polished side as this will cause immediate leaks. Ensure seal is seated to bottom of adapter seat bore. If needed use a wooden dowel and gently tap into place to ensure tight seat into bore.
8. Replace impeller assembly back onto motor shaft. Use a light coating of anti-seize on motor shaft to ensure smooth seating.
9. Push down onto impeller head using a gloved hand to reach a gap of .030 between the bottom of impeller to top of adapter.
10. Tighten sleeve clamp while maintaining .030 clearance
11. Check rotation of impeller to ensure proper seating and gap clearance
12. If rotation and clearance are ok, then replace housing to adapter
13. Install (4) 5/16-18 nuts and lock-washers onto studs and tighten to 15-ft.lbs.
14. Verify that impeller does **NOT** hit or scrape housing.

#### **MOTOR REPLACEMENT:**

1. Turn off power and lock out machine.
2. Remove (4) 5-16-18 hex head nuts from impeller housing
3. Remove housing from pump-pak assembly
4. Loosen 2 bolts holding drive sleeve to motor shaft
5. Remove impeller with drive sleeve as an assembly, **taking care not to damage mechanical seal or pumping vanes**
6. Remove (4) 3/8 – 16 x 3/4 hex head screws from adapter plate to motor.
7. Remove adapter unit from motor.
8. Replace motor as required properly wiring unit. Ensure that wiring is for correct voltage.

9. Replace pump-pak as described in MECHANICAL SEAL REMOVAL SECTION #'s 8-14

34637



ITEM NO.	PART NO.	DESCRIPTION	QTY.	ITEM NO.	PART NO.	DESCRIPTION	QTY.	
1	34520	HOUSING- S.S.	1	8	30321	STUD S.S. 5/16-18 X 1.13	4	
2	34631	IMPELLER- 4.60" DIA. S.S.	1	9	21238	LOCKWASHER S.S. 5/16	6	
*	3	22273	SEAL ASSY. 1" T-2100	1	10	21284	HEX NUT- 5/16-18	6
*	4	34555	O RING VITON	1	11	21954	CLAMP S.S. 7/8 SL	2
	5	34521	ADAPTER - S.S.	1	12	21264	HEX HEAD SCREW 5/16-18 X 1 3/4	2
	6	21701	HEX HD. SCREW - 3/8-16 X 3/4	4	13	30670	DRIVE SLEEVE S.S. 7/8	1
	7	21266	LOCKWASHER S.S. 3/8	4				

\*- RECOMMENDED REPLACEMENT PARTS

## HYDRA-EXTRACTOR

### A. Causes of Jamming and Remedies

1. Worn screw - brushes and flighting worn down. **“Rebuild or replace screw”**
2. Bottom pin and bushing worn, which also contributes to wear of brush and screw. **“Replace with new”**.
3. Excessive bulging of screen. **“Replace with new”**.
4. Over feeding pulper. **“Slower feed rate and do not slug feed”**.

### B. Removal Procedure for Screw, Screen and Reducer (HE-6)

1. Turn main disconnect off at panel.
2. Remove the chute and limit switch.
3. Disconnect the conduit and wire leads to the motor.
4. Remove the extractor motor from the reducer.
5. Loosen the four setscrews holding the screw shaft in the reducer (two in the top collar and two in the bottom). **Note:** older units only.
6. Remove the dust cap on the top of the screw shaft (one center bolt).
7. Remove the four bolts that hold the reducer to the extractor head and pull the reducer off the screw.
8. Pull the screw out through the top of the head.
9. Remove the four bolts that hold the head to the extractor shell and pull the head and screen out the top of the extractor shell.
10. Remove the two bolts that hold the screen to the head and remove the screen.

## REASSEMBLE THE EXTRACTOR

1. Assemble the new screen to the head (two bolts), install it into the extractor shell and fasten it with the (4) attaching bolts.
2. Slide the new screw down through the top of the head.
3. Before installing the reducer to the screw, use Anti-seize on the shaft. Next place the key in keyway then slide the reducer onto the shaft.
4. Install the dust cap and bolt.
5. Install the extractor motor to reducer using Anti-seize on the shaft. Reconnect the conduit and wire leads.
6. Reassemble the chute and limit switch back onto the extractor.
7. Check the rotation of the extractor motor (clockwise)

### DISASSEMBLE EXTRACTOR (HE-9)

1. Turn power off at the main panel
2. Disconnect motor leads and conduit at motor junction box.
3. Remove drive guard from head assembly.
4. Remove drive belts.
5. Remove the (4) bolts attaching the motor to the head and remove motor.

6. Disconnect and remove speed reducer.
7. Loosen the setscrews in the collar of the upper bearing, then the 4 mounting bolts and lift off.
8. Remove the 4 mounting bolts from the head assembly, lift head assembly with screen and screw from extractor shell.
9. Remove the screw from the screen by pulling it through the bottom of the screen, while turning.
10. Remove the 2 bolts that hold the screen to the head and disassemble. (Reassemble in reverse)

#### D. Motor Service

1. Checking rotation and AMP draws on motor: Place amp meter on each leg of motor, the amp draw on each should be within a few tenths. The screw should spin clockwise looking from the top.
2. If equipped with grease fitting apply water resistant grease once a month.
3. If removed or disconnected check bearings for excessive play or roughness.

#### E. How to detect if Extractor needs repaired:

1. If you get what's known as a **blown plug**, when the slurry water comes out the chute with the pulp.
2. The holes in the screen are clogged, due to worn brush or system not being cleaned properly.
3. Bottom pin and bushing are worn.
4. Scraping noise in extractor.
5. The return nozzles clog with pulp.
6. The overload to the extractor drive motor trips frequently.

F. Auto-Rinse System Function - When the system is put into the empty cycle the spray bar solenoid comes on, the M.O.V. opens (throttling valve after M.O.V. is Pre-set at 1-1/2 turns open) and the timer starts to time down. This will do two things, it will spray down the extractor screen while draining off the dirty water and it will circulate hot water through the lines to help keep them clean. In 10 min. the timer will shut the system off. If you stop the system with the stop button the auto-rinse in the extractor will come on but it will not circulate the hot water through the lines.

G. Bottom Pin and Bushing Inspection/Replacement - Remove the six bolts that hold the bottom plate to the extractor shell. When inspecting the pin and bushing, look for the following:

1. Wear on the pin. If the system is a close couple unit the wear will normally be even all around the pin. If the system is a remote unit the wear will be on the topside of the pin. If you see any wear on the pin it is best to install a new pin.
2. Wear on the bushing. Check the hole in the center of the bushing for wear. To check the wear on the bushing slide a new pin into it, and if there is more than .050 clearance install a new bushing.

To remove the bushing:

1. Drill holes up from the bottom in four different places so that you can break the bushing into small pieces
- Or
2. Using a reciprocating saw cut the bushing in three different places so that you can pull it out.

To remove the pin from the plate. Remove the ½ bolt that goes through the plate and into the pin. You may have to heat up the pin because of the loctite used on the threads.

To install new bushing, use a mallet to pound the new bushing into place. The new bushing will stick out the bottom of the screw about 1/8 of an inch.

To install new pin. Use RTV on the bottom of the pin and loctite on the threads of the bolt, put the bolt through the plate and turn the pin down until it gets hand tight. Using a pipe wrench holding onto the pin tighten the bolt.

Reinstall the bottom plate with gasket to the bottom of the extractor shell. Reinstall all the hardware and tighten.

## **DISPOSERS**

Disposers are commonly added into the Somat system in the Veg. Prep and Pot wash area's of the kitchen. Here there are high volumes of food waste with no trash to be pulped. There is a fresh water solenoid valve, that whenever the disposer is running is activated and fresh water is injected into the seal to ensure it is kept wet at all times. The fresh water valve is adjusted first and should be approximately 1 ½ turns open. For proper operation there is a throttling valve on the 1½" line leading to the slurry pump, this 1½" gate valve should be adjusted to 1¼ turns open. When adjusted properly the disposer will not backup and will keep the pump from cavitating with air. The fresh water valve to the bowl is adjusted so that the product is carried into the disposer; adjust it to its max. without splashing out of the bowl. The angle of the nozzles may also have to be adjusted. When adjusting the throttling valve you need to use an AMP meter. The AMP meter should be placed on the slurry pump motor for adjustments of the return water-throttling valve. This valve should be adjusted to approximately 1.5 AMPS below the full load rating of the motor.

In operator training on the disposer there are a few important items the operators must be aware of.

1. Food only should be put through the disposer. The cutting mechanism is not built for plastic, cardboard, or paper.
2. The PLC controls the direction of the disposer alternating directions with each start also the return pump is started for 5 seconds then the disposer drive starts.

3. The PLC controls various functions on the disposer. Firstly, it controls the activation of the drain MOV. Upon the disposer shutting down, the RETURN line MOV will close, and the DRAIN MOV will open allowing all water remaining in the disposer to exit into the drain. Secondly, the PLC controls the 'Time Stop' feature. If the black pushbutton is pressed when the operator is finished, the disposer will run for approximately 5-10 minutes and will shut down on its own, again allowing the drain and return line MOV's to open/close to their respective positions. Thirdly, the PLC controls the stop button operation. If the red stop button is pressed ONCE, it will signal the PLC that the disposer is to shut down as if in between meals. This shutdown will have a duration, meaning that if the stop button is pressed once, the disposer will run for approximately 3-5 minutes to clear the lines before shutting down. If the red stop button is pushed TWICE within one second the unit will immediately shut down.
4. On the PLC itself, there are two 'pots' that control timing features. If the access cover is opened on the PLC, there will be two blue squares housing two yellow set point dials. The UPPER dial is for the 'TIME STOP' duration. This should be set to the 12 o'clock position. The bottom dial is used for duration of the stop button if it is pressed once. By pressing the stop button once, the disposer will run for 3-5 minutes allowing the lines to clear. This is typically used between meals or between prep times. By pressing the stop button once, it will allow the disposer to clear lines and shut down, but it will not activate the clean cycle for the extractor. The operator **MUST** use the black push button in order to put the system in a clean mode. If there are multiple units, the last unit running will tell the extractor to go into the clean cycle once the black pushbutton is pressed on the last machine running.



Seal Flush Valve



Throttling Valve

Fresh Water to Bowl Valve

**CHEMICAL ADDITIVE PUMP**

## Operating Instructions

**INITIAL STARTUP** - Adjust the feed rate control to the "L" position. Turn the feeder switch on and note motor operation. The roller assembly should move intermittently. Gradually move the feed rate setting toward the "10" position. Note the increased roller assembly movement. Insure that the tube assembly is centered on the roller assembly. Allow the feeder to prime in the "10" position and then adjust the feed rate control to the desired setting for your particular output requirements.

**INSPECT THE FEEDER FREQUENTLY. AT THE FIRST SIGN OF LEAKAGE,**

**REPLACE THE PUMPING TUBE.** Remove the tube by following the instructions. Before installing a new tube, wipe the housing clear of any chemical residue and debris. Insure the rollers turn freely. Check the lead tubing and injection point for blockage. Clean if necessary. Tighten the lead tube connecting nuts only finger tight. Over tightening with tools may damage the nut and ferrule causing leakage and may also twist the tube assembly, which could bind the feeder.

Pump **fresh water** through the tubing to clean out chemicals if the unit is to be shut off for a prolonged period.

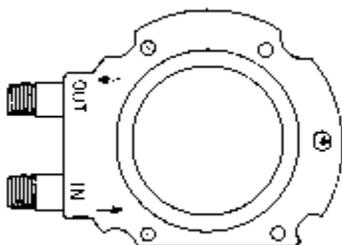
**Use caution when disconnecting the feeder lines or changing the tube where hazardous chemicals are involved. Wear eye protection and protective clothing.**

**Do not** apply lubricating grease or oil to the feeder tube, tube housing or roller assembly. Some types of grease and oil are incompatible with plastic parts and may cause failure.

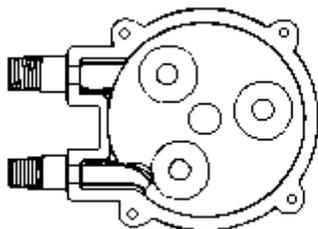
**Do not** mix chemicals in the solution tank while the feeder is running. Keep the suction line away from the bottom of the solution container to prevent residue pickup and possible clogging.

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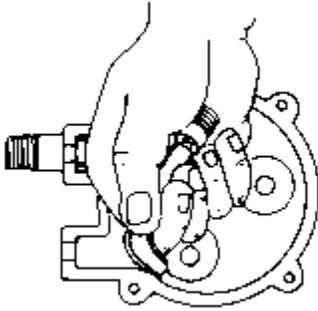
## Tube Replacement Instructions



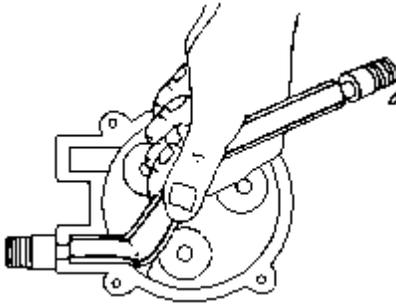
1. Remove the three cover screws. Lift the cover free.



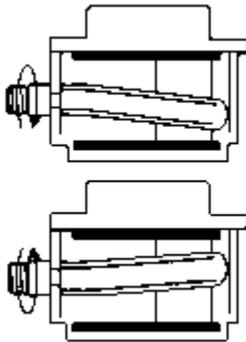
2. Set the Feed Rate Dial on #1. Turn the feeder switch on. Line up the slot in the roller assembly with the lower or "IN" tube fitting.



3. With the feeder dial set on #1, lift the tube housing out of the housing slot and pull it toward the center of the roller. Start the motor while pulling on the tube until it comes completely out of the housing. Turn the feeder off.



4. To install a new tube assembly, position the roller assembly until the slot is again in line with the "IN" or suction fitting (See drawing for roller position). Place the tube fitting into position and push the tube into the slot of the roller assembly. With the feed rate dial set on #1, start the motor and feed the tube into the slot as the roller assembly turns. Be careful of your fingers. Do not force the tube. Avoid kinks. When the roller assembly slot lines up with the "OUT" tube housing slot, quickly pull the tube into position. Turn the feeder off.



5. Replace the cover and the three screws except the one over the "IN" tube fitting. Leave this screw loose enough to turn tube fitting for adjustment. NOTE: To obtain maximum tube life, the tube assembly must ride in the center of the rollers. To center the tube assembly on the rollers, set the feed rate dial on #10, turn the feeder on, turn the "IN" tube fitting not more than 1/8 of a turn in the direction which the tube must move. Observe the tube assembly. It should move toward the center of the rollers. If the tube moves further from the center of the rollers, turn "IN" tube fitting in the opposite direction until the tube centers. Turn the feeder off and tighten the tube housing cover screws left loose.

## Major Components Disassembly/Assembly Instructions

*No tools are necessary*

### TO DISASSEMBLE:

1. Unplug feeder power cord and remove chemical lines.
2. Grasp the mechanical feed rate

### TO ASSEMBLE:

1. Align the mechanical feed rate control with the flat on the gear motor shaft. Push on straight. Turn the feed rate control until mounting rivets on gear motor fit into the keyhole slots in the feed rate control unit. Turn the

control section and turn it clockwise until it stops. Pull straight off shaft.

**3.** The tube housing complete can be removed from the feed rate control in the same manner

feed rate control unit counter-clockwise until the snap lock engages. Insure the feed rate dial pointer is on the top.

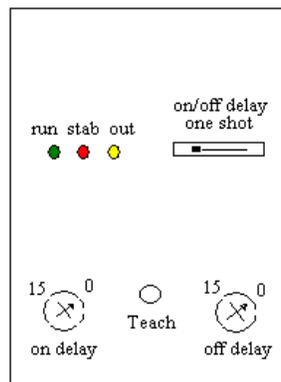
**2.** Align the tube housing complete with the flat on the feed rate control output shaft. Push on straight. The mounting rivets will fit into the keyhole slots on the back of the tube housing complete.

## **TROUBLESHOOTING**

A. Possible causes of shutdown.

1. Jammed Extractor - Worn screw, brushes and flighting. Screen out of round, holes in screen clogged. Bottom pin and bushing worn.

2. Jammed Impeller - Over feeding. Dull stationary cutters or rotating blades worn or excessive clearance between the two. Non-pulpable material in system.
3. Overloads tripped/resetting - When on overload trips, first identify the motor that has tripped. Example: if the pulper motor trips, find what caused it to trip and clear it. Then reset the overload and check the AMP draw of the motor during operation to ensure the motor was not damaged.
4. Limit switch operation - UDT, Plunger style and Magnetic Proximity Sensor (MAG switch).
  - A. UDT Limit switch, lever operating arm (7-1/5 inches long), grommet. UDT limit switch is used with under the table pulpers. The lever-operating arm goes through the grommet, which is mounted on the side of the pulper shell. The lid depressing on the operating arm activates it. (older units)
  - B. Plunger style Limit Switch, may be used on the chute and high tank pulpers. Both of these limit switches are wired NO held closed. This means when you lift the pulper lid or the chute lid it will shut the system down by opening the circuit. (typical older system)
  - C. Magnetic actuated proximity switches. This switch is wired NO held closed; this is for a fail 'safe' operation. The magnet actuated proximity switch may have three wires. The white wire is COM (common) and the black wire is a NC (normally closed) held open.
5. PLD (Pulp Level Detector). Installed on the chute discharge, for when the pulp backs up into the chute it will block the photoelectric beam and shut the system down. This will indicate to the operators to empty the waste container or that a problem has occurred.



- How to 'TEACH' and align the reflector.
- Align the PLD on the reflector using the signals provided by the red and yellow LED's. (Yellow LED on and Red LED off signals correct alignment)
- You have aligned the reflector and are ready to use the teach mode.

- Remove all objects from the detectors field of detection
- Press in and hold the 'TEACH' pushbutton
- The GREEN LED goes out and then comes on again after about 3 seconds.
- Release the pushbutton when it comes on
- The green LED flashes to indicate that environment teaching is in progress.
- Then,
- If the green LED comes on, the detector has been taught the environment and is ready to function.
- If the red LED comes on and flashes rapidly, then the detector may be misaligned, an object passed within the field while teaching, or the reflector is too close to the detector. Readjust, and follow the above steps.
- Set the 'ON' DELAY to **5** seconds, and the 'OFF' DELAY to **0**

6. Control circuit loss

- A. The pulper lid or chute door is open.
- B. One of the motor overloads is tripped.
- C. If equipped with a door interlock switch the door may not be closed properly.
- D. Circuit breaker tripped.
- E. Timer malfunction.
- F. Transformer not working.
- G. No power.

7. Timer - When the system is put into a clean cycle or the system is stopped with the stop button the timer is activated and will shut the system down after 10 minutes when the clean cycle is complete.

B. Causes of poor running.

1. System out of balance.

- A. Return water to trough or tray is slow
  - 1. Someone has closed the throttling valves.
  - 2. There may be a restriction in the line.
  - 3. A drain may be open.
  - 4. The return pump may need service.
  - 5. Water level in pulper tank is low during pre-fill.

2. Drain valve open: This will also cause the system to be out of balance.

3. Clearances too great (blades) - Refer back to Pulper section changing/rotating blades.

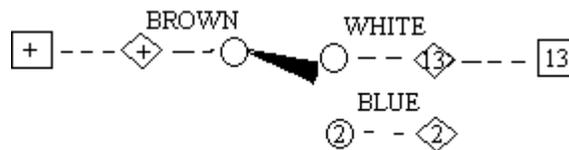
4. Water Level Sensor

- A. Sensitivity too low or too high.
  - a. If sensitivity is too low (water fills above sensor) or too high (water droplets on sensor face will indicate a ready signal)

- b. To correct sensitivity, you will need to remove sensor from mount and disassemble. Remove jamb nut from sensor face, and unscrew the YELLOW sensor from the BLACK housing.
- c. Once sensor is unscrewed, there is a small screw on top of the sensor. This is a 20 turn adjustment. There are NO stops on this adjustment, so you will have to listen/ feel very carefully for the click indicating the stop point. The set point for the sensor is 10 turns. This is the neutral point for the sensor and this setting will be neither too low nor too high a sensitivity.



d.



e.

\* BLACK NOT USED

#### 5. Dull blades

- A. With dull blades or clearances too great the waste will not get cut up efficiently. It will stay inside the pulper tank longer and reduce the throughput capabilities of the system. With a lot of plastic in the waste stream it's best to have the clearances tight so that the cutting action is the most efficient.

### PREVENTATIVE MAINTENANCE

- A. Check blade wear and tolerance - refer back to the pulper section, cutting mechanism checking tolerances.
- B. Standpipe cleaning - refer back to pulper section, setting the water level and cleaning the standpipe.
- C. Check seals at pulper, slurry, return pump and reducer. This is a visual inspection of the seals, to see if any water or oil is coming out the seal area. If there is any water or oil coming out the seal area, then you will have to pull the motor or gear reducer to replace the seal.
- D. Check oil level in reducer
  - 1. Winsmith - This type has a diaphragm mounted on the side and no air vent, check the oil level from the top. Remove the filler plug and the oil should be within 1 inch to the top.

2. Dodge - These have vent plugs on the top and should be filled half way to the top. Check by removing a plug on the side and fill until oil comes out the side plug.
- F. Check bottom pin and bushing on extractor, remove the six bolts that hold the bottom plate to the extractor. Remove the plate to inspect the pin and bushing, replace if worn.
  - G. Check function of auto-rinse system; refer back to “**electrical panels**” under timer and auto-rinse function.
  - H. Check airline connections for leakage; inspect the airline at the top of the standpipe, at the pressure switch and at the air pump to make sure of a good seal. It is also good to check the line itself for any places that may be rubbing and may wear a hole in the line.
  - I. Measure AMP draws on all motors routinely, using your AMP meter check each motor and record your readings. If a motors amp draw changes dramatically it may indicate a problem.

**Technical assistant/support from SOMAT Company;**

Call 717-397-5100 Service (extensions 126 & 176) Parts (extension 133)

Fax 717-291-0877

Monday-Friday 8:30 AM - 5:00 PM (EST)