OWNERS MANUAL

Installation, Operation, Maintenance, Service Parts

BLACK CLAWSON COMPANY
SHARTLE DIVISION
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HYDRAPULPER™

MANUAL(s) DELIVERED TO:

Grays Harbor Industrial Inc.
23rd & Railroad Sts.
Hoquiam, WA 98550

ATTENTION: Steve Heath

cc:

PREPARED FOR: Grays Harbor Industrial Inc.

MILL: Hoquiam, WA

CUSTOMER ORDER No. CHI-3356 *No. of Manuals this order:* 3

BLACK CLAWSON SHOP ORDER No.	BLACK CLAWSON SERIAL No.
2568291	HP93-3652

THANK YOU for purchasing a Black Clawson Product.

READ THIS MANUAL, carefully to learn how to operate and service your machine correctly.

Failure to do so could result in personal injury or equipment damage.

THIS MANUAL should be considered a permanent part of your machine and should remain with the machine.

MEASUREMENTS in this MANUAL are Metric Units and their American Engineering Equivalents.

WARRANTY is provided as part of Black Clawson support programs for customers who operate and maintain their equipment as described in this MANUAL.

This warranty provides you, the customer, with the assurance that Black Clawson backs its products where defects appear within the specified warranty period.

Should the unit be abused, or modified to change its performance beyond the original factory specifications, WARRANTY will become VOID.

PRODUCT IDENTIFICATION NUMBERS are provided to HELP

In tracing the machine should it need servicing. Black Clawson, also, needs these numbers when YOU, the customer, order parts.

Shartle-Pandia Division/Box 160/Middletown, Ohio 45042-0160
Phone (513) 424-7400
TWX 810 451 2944

The Black Clawson Company

HYDRAPULPER®

Gentlemen:

This manual was prepared for general information and guidance only. For specific information concerning parts or items, please refer to the certified prints.

Please distribute copies of this manual to your operating and maintenance personnel. They should become thoroughly familiar with the information it contains.

We trust this will be helpful to you in the operation and maintenance of your equipment.

The Black Clawson Company
Shartle-Pandia Division
Middletown, Ohio

CONTENTS

INTRODUCTION

FOREWORD

Your Black Clawson Hydrapulper is a high quality machine designed to give trouble free operation and minimum maintenance. However, certain precautions and procedures must be observed in handling, installing, operating and servicing the unit in order to obtain optimum performance. The information in this manual should cover most situations. Should questions arise that are not covered in this booklet, additional information can be obtained by contacting the Service Department, The Black Clawson Company, Shartle Division, Middletown, Ohio 45042.

SERIAL NUMBERS

All Hydrapulpers, Hydrapulper Drives and auxiliary equipment (Junk Remover, Ragger, etc.) are assigned SERIAL NUMBERS at the Shartle Division. These identifying numbers will be found stamped into nameplates which are attached to the Hydrapulper and the other pieces of equipment. They will also appear on the certified drawings which you received pertaining to your particular Hydrapulper.

Since all records for each Hydrapulper are compiled under its identifying number, ALWAYS STATE SERIAL NUMBERS as well as size and type of unit when inquiring about service or maintenance problems.

RENEWAL PARTS

Orders for renewal parts should state the serial number(s) and include part number and description as shown on the parts list of the certified drawing.

SAFETY PRECAUTION

TO PREVENT ACCIDENTAL STARTING while the Hydrapulper is being serviced, follow your prescribed safety prodecures.

HYDRAPULPER

II GENERAL SPECIFICATIONS

GENERAL DESCRIPTION

The Black Clawson Hydrapulper is a vertical pulping machine. The function is accomplished by a vaned rotor turning inside a tub which is fitted with perforated plates. Accepted stock is extracted through the perforated plates in either a continuous or batch process. Energy for the rotor is transmitted through a right angle gear box or V-belt drive.

SIZES AND MATERIALS

The Hydrapulper is produced in a variety of sizes and materials to meet the needs of the industry.

COMPONENTS OF THE HYDRAPULPER

TUB ASSEMBLY - The tub assembly is the vessel in which the pulping operation is performed. It contains an extraction chamber which is covered by perforated plates. Accepted stock passes through the perforated plates and into the extraction chamber from where it is passed on to the next piece of equipment in the system.

The tub is constructed of cast iron sections, fabrications (steel, stainless steel, etc.) or tile.

ROTOR - The rotor is the means of imparting energy to the pulping operation. It is keyed to the drive shaft and retained by a thrust plate and screw.

DRIVE - The rotor is driven through a right angle gear box or a V-belt drive. The gear box is usually direct coupled to the prime mover. Occasionally it is coupled to a jack shaft which may be belt driven.

V-belt drives are supported by a right angle bracket fastened to the bottom of the Hydrapulper tub.

Gear box drives are installed on their own foundation and are not connected to the Hydrapulper tub.

TUB SUPPORT - The required elevation of the tub assembly is maintained by the tub support. A fabricated steel framework is the most common, although concrete piers are sometimes used.

AUXILIARY EQUIPMENT

RAGGER - When pulping dirty mixed papers in a Hydrapulper, a Ragger is used to trap and remove rags, wet strength, floating trash, etc. It is installed at the edge of the Hydrapulper tub to facilitate the inserting and withdrawal of the rag rope.

AUXILIARY EQUIPMENT (continued)

JUNK REMOVER - A Junk Remover is used to automatically and continuously remove heavy junk and trash from the Hydrapulper when pulping dirty mixed papers. It is installed alongside the Hydrapulper and is connected to an opening in the bottom of the tub by a junk chute, which permits junk to drop to the boot of the Junk Remover. An endless bucket conveyor, operating on the chain and sprocket principle, removes the junk from the bottom of the boot as fast as it accumulates by lifting it above the level of the stock in the Hydrapulper and discharging it into the junk box.

TYPE OF OPERATION - Hydrapulpers are designed to be operated in one of the following ways:

a) BATCH - The Hydrapulper is charged with pulp or clean waste and enough water to obtain a desired consistency. The charge is left in the Hydrapulper until the desired degree of defibering has been obtained. The batch is then dumped and the process is repeated.

b) CONTINUOUS - A continuous Hydrapulper is arranged to permit pulped material to discharge when correct particle size has been reached. Proportionate amounts of stock and water are continuously added to replace the discharged pulp to maintain a constant flow of pulped stock at a given consistency.

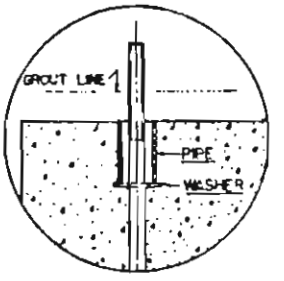
III PRE-INSTALLATION

GENERAL - The customer is to furnish all piping, anchor bolts, lead, welding rods, drive guards, etc. Please refer to the certified installation drawings for the correct list of parts to be furnished by Black Clawson.

FOUNDATION - The certified installation drawing will give the live load for each support column and for the drive. The elevation of the foundations and the allowances for grout are also given.

The location of any auxiliary equipment requiring foundations or anchor bolts will be shown on the certified Hydrapulper installation drawing.

ANCHOR BOLTS - The number and size of anchor bolts, nuts and washers can be determined from the certified installation drawing. We recommend imbedding the the anchor bolts in pipe sleeves, as illustrated.



LEVELING INSTRUMENT - Use a sensitive, graduated tube spirit level reading to 10 seconds per graduation (.0006" per foot). One provided with a screw adjustment is best. The level in an ordinary machinist's square is not accurate enough.

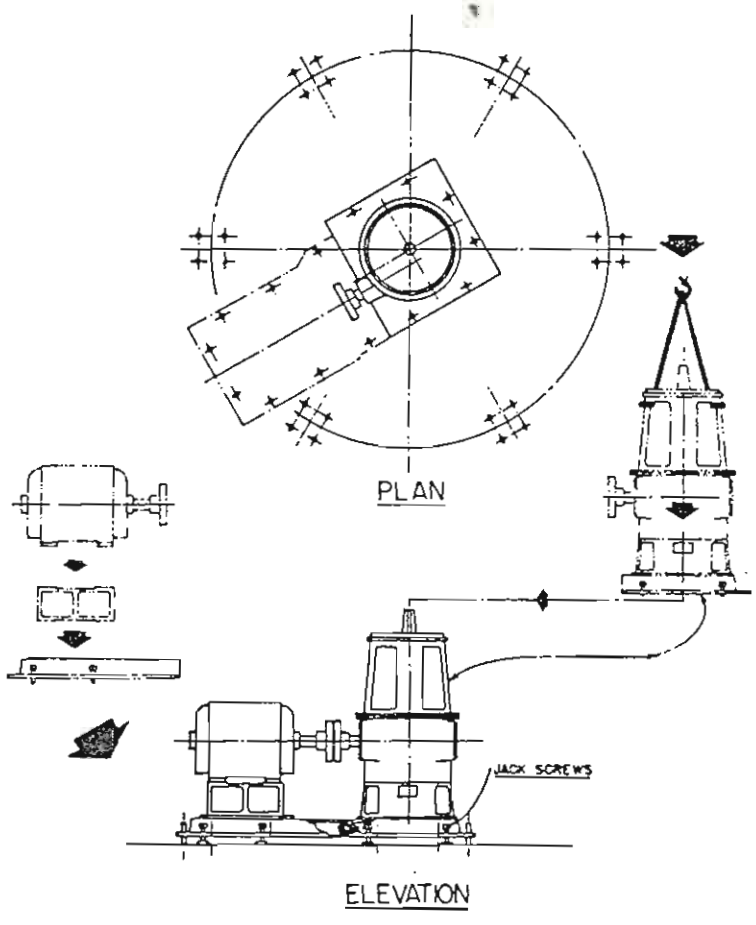
CAUTION - UNDER NO CIRCUMSTANCES SHOULD THE HYDRAPULPER TUB BE BOLTED, GROUTED, WELDED OR OTHERWISE CONNECTED TO BUILDING BEAMS, FLOORS, WALLS OR OTHER STATIONARY MEMBERS. THE TUB MUST BE FREE TO EXPAND OR CONTRACT UNDER VARIOUS TEMPERATURE AND LOAD CONDITIONS.

IV INSTALLATION

INSTALL THE DRIVE

1 - Attach a sling to the drive (as illustrated) and raise to a position over the anchor bolts. Extend the leveling screws until they project about 3/4" below the bottom of the base. Lower the drive over the anchor bolts and place a small steel plate (3" x 3" x 1/2") under each leveling screw.

2 - Lower the motor base onto the anchor bolts in the same manner.



3 - Refer to the certified installation drawings for the proper drive elevation and allowance for grout. If necessary, add additional steel plates under the leveling screws.

4 - Use the top machined surface of the upper gear case to check the drive for level and adjust the leveling screws as required. Use a flat washer and nut on each anchor bolt. Tighten the anchor bolts and recheck the drive for level. Repeat adjusting the leveling screws until the drive is dead level when the anchor bolts are tight.

CAUTION - Do not use the top of the drive shaft to check the drive for level.

DRIVE INSTALLATION (continued)

5 - Clean the machined pads on the motor base.

6 - The motor base and drive base have been drilled and tapped respectively for fastening together. Raise the motor base to the required elevation and install the fasteners but do not tighten. Level the motor base and tighten the anchor bolts. Tighten the fasteners holding the two bases together.

CAUTION - Care should be taken not to bump the drive out of alignment.

7 - Assemble the motor to the motor rails and move into position to make a rough coupling alignment. The motor half coupling should be .015" to .020" low to allow for shimming during final alignment. Normally, the motor base must be drilled and tapped in the field using the motor rails as a template.

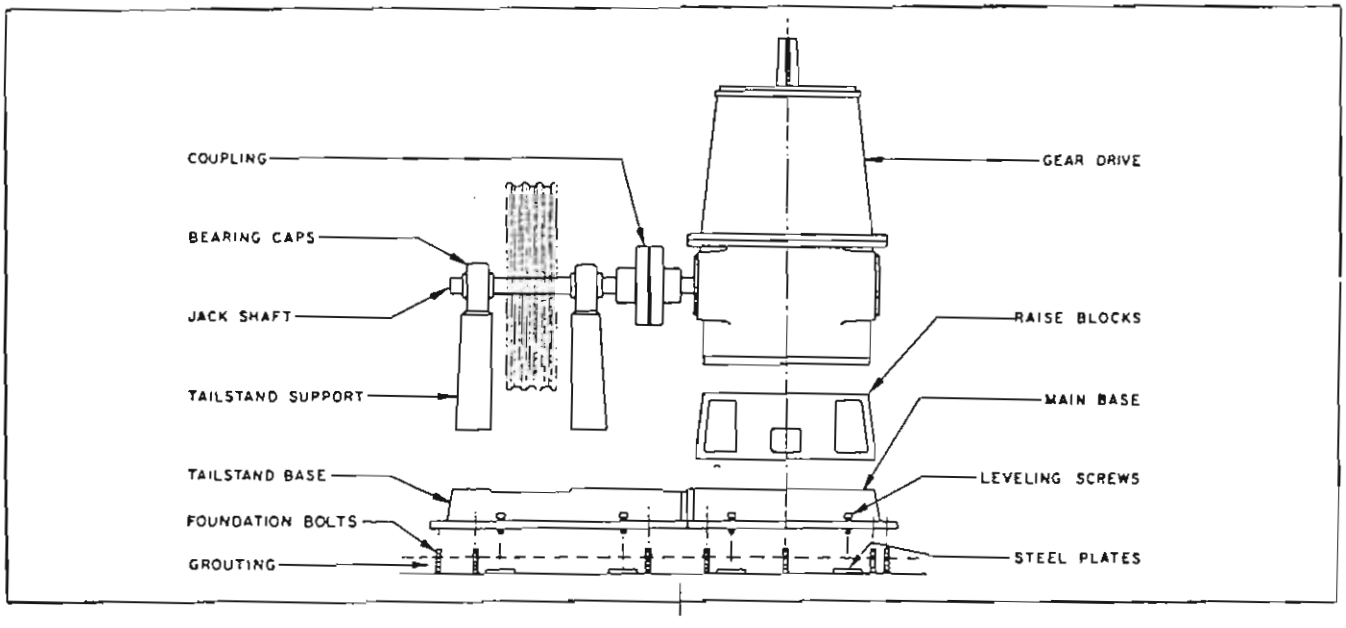
Do not make a final alignment of the coupling at this time.

Do not grout the drive at this time.

8 - Working from the certified lubrication drawing, pipe up the lubrication system which was removed for shipment.

INSTALLATION OF TAILSTAND GEAR DRIVE

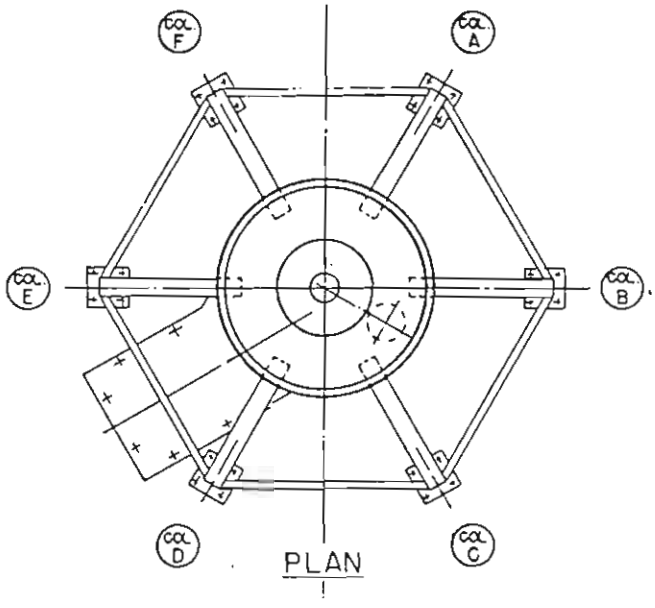
If a jack shaft and V-belt drive are used in conjunction with a gear drive, the installation is similar to that of a direct coupled drive.



SET THE SUPPORT STEEL & EXTRACTION CHAMBER

1 - Insert leveling screws in all the supporting columns until they extend about 1/2" beyond the bottom of the base.

2 - Refer to the certified installation drawing for the correct location of each lettered column. Place column "A" in position "A", column "B" in position "B", etc. (Illustration in this manual may not agree with the certified drawing).

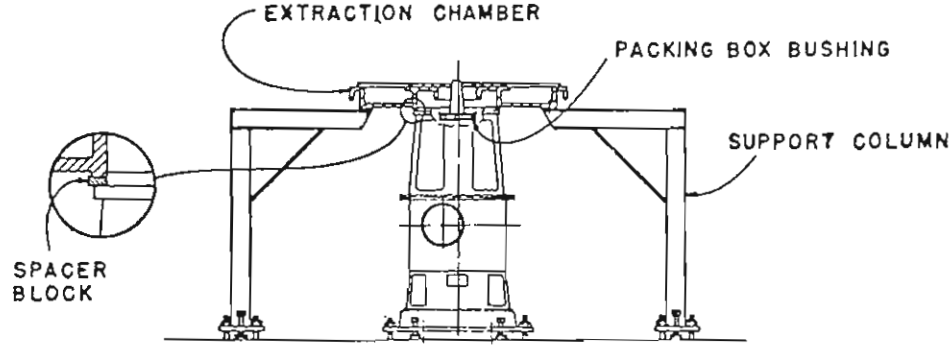


PLAN

3 - Install each column on its anchor bolts and place steel pieces (3" x 3" x 1/2") under each leveling screw. Put a flat washer and nut on each anchor bolt and tighten until snug. Proceed until all columns are in place.

4 - A set of spacer blocks is provided for setting the extraction chamber to the drive. They are normally shipped in a small cloth bag. Locate the blocks and space them evenly around the machined flange on the upper gear case as illustrated.

NOTE: The blocks must be removed after the Hydrapulper assembly has been completed.



ELEVATION

SUPPORT STEEL & EXTRACTION CHAMBER (continued)

5 - Place the packing box bushing over the drive shaft. It will be installed later.

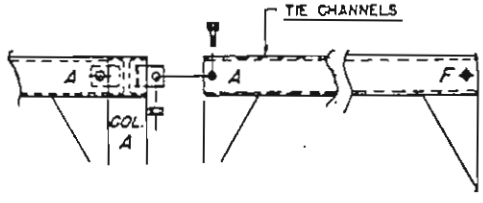
6 - Lower the extraction chamber over the drive until it rests on the spacer blocks. Refer to the certified installation drawing for proper orientation of the extraction chamber, support steel and drive.

The machined pilot fit centers the extraction chamber on the drive.

7 - With a crane or hoist, raise each support column until its horizontal member just barely touches the underside of the extraction chamber and bolt together loosely. Adjust the leveling screws so that the horizontal member is level and tighten the anchor bolts.

NOTE: Do not allow the leveling screws to extend more than 3/4" through the base. If necessary, add additional steel pieces.

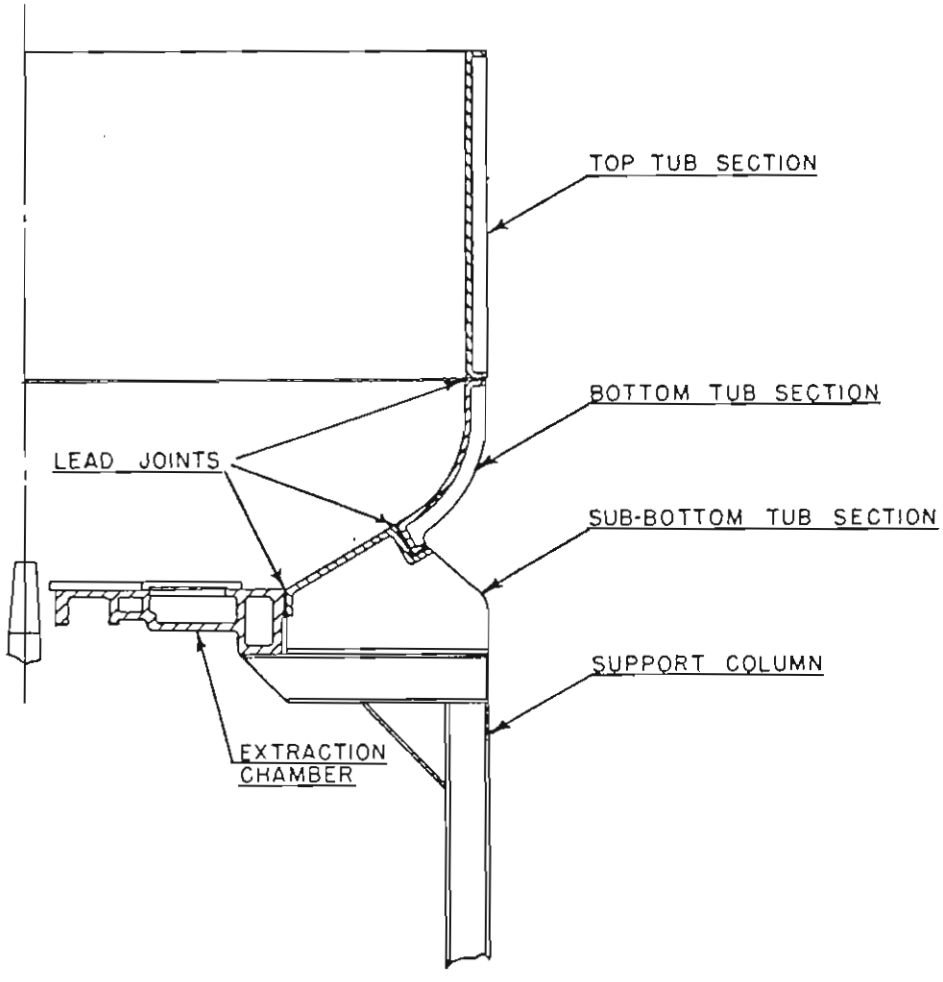
8 - Assemble the tie channels to the columns. Each channel is match marked to identify its proper location at assembly. Snug the bolts, but do not tighten them.



NOTE: If the certfieid drawing calls for additional bracing, it should not be installed until after the tub has been assembled.

ASSEMBLE THE TUB

The Hydrapulper tub is made up of cast iron sections which are bolted together and leaded at the joints to form a water tight fit. When erecting the tub, try to maintain a 1/4" gap between all sections. This will not always be possible as some sections will have to be shifted to facilitate assembly as other sections are added. The gap may vary from 1/8" to 1/2" without affecting the installation or operation of the Hydrapulper.

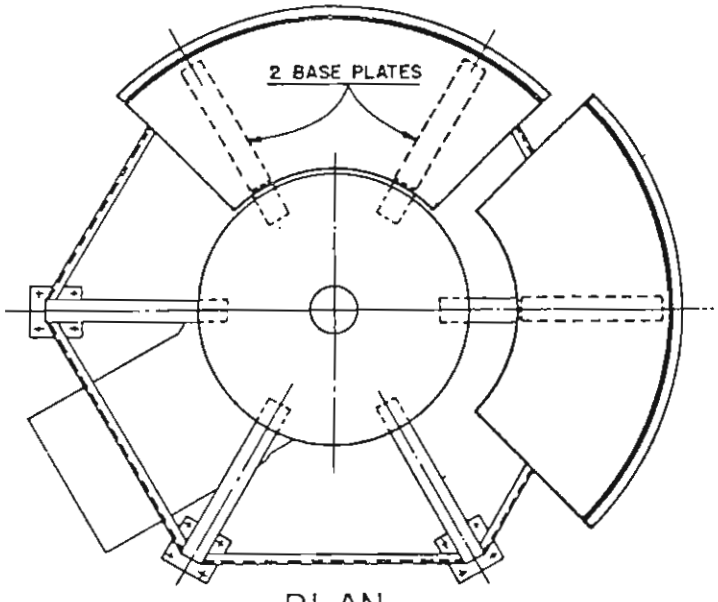


TYPICAL CAST IRON TUB ASSEMBLY

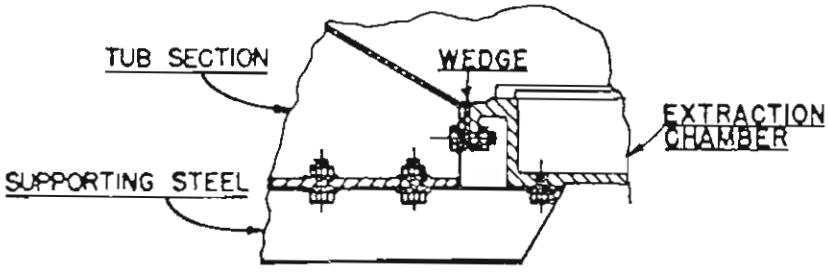
1 - Sub-Bottom Tub Section - The sub-bottom tub sections span from the center of one support column to the center of the next column. They are bolted to the horizontal members of the support columns, the O.D. of the extraction chamber and to each other.

Raise each section into position and insert the fasteners but do not tighten.

TUB ASSEMBLY (continued)



PLAN



ENLARGED SECTION THRU TUB

2 - Assemble the remaining sections in the same manner as described above. As each section is added, insert the bolts holding the sections together but do not pull tight.

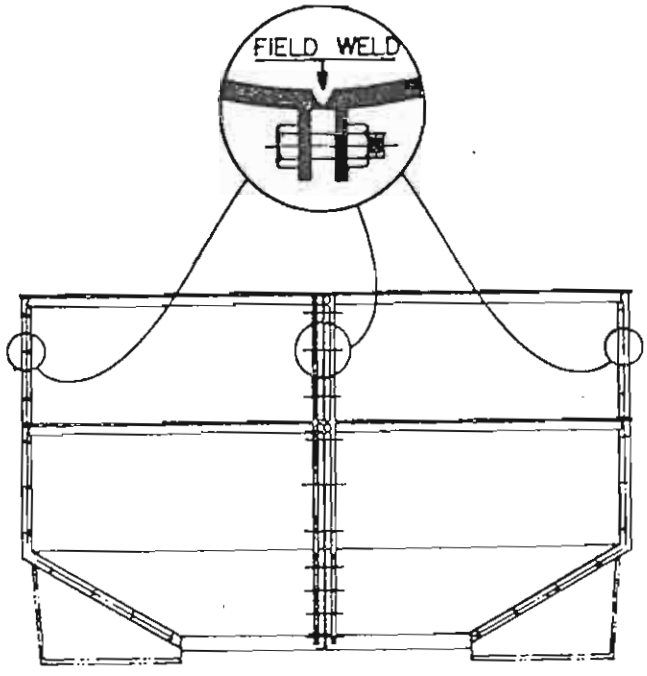
3 - After the tub assembly is complete, tighten the bolts holding the tub sections together. Work around the tub several times so that it pulls together evenly.

4 - To make sure that the tub rests flat on the supporting steel, loosen the leveling screws and anchor bolts on one column; then tighten the bolts holding the tub to the horizontal member of that support column. Run the leveling screws down until they are snug. Tighten the anchor bolts.

Repeat this procedure, one column at a time.

TUB ASSEMBLY (continued)

5 - Tack weld the tub sections in several places to help prevent distortion. Using the back-step method, weld the tub sections together.



ELEVATION

6 - Recheck the alignment of the drive to the extraction chamber and adjust as necessary.

7 - Remove the wedges from the gap between the extraction chamber O.D. and the tub bottom I.D. Seal the underneath side of this gap with an adhesive foil tape and back-up tape or with asbestos rope. When using asbestos rope it can be held in place by tying with wire. Seal the edges where the rope contacts the sides of the gap by applying a thin bead of Babbit-Rite.

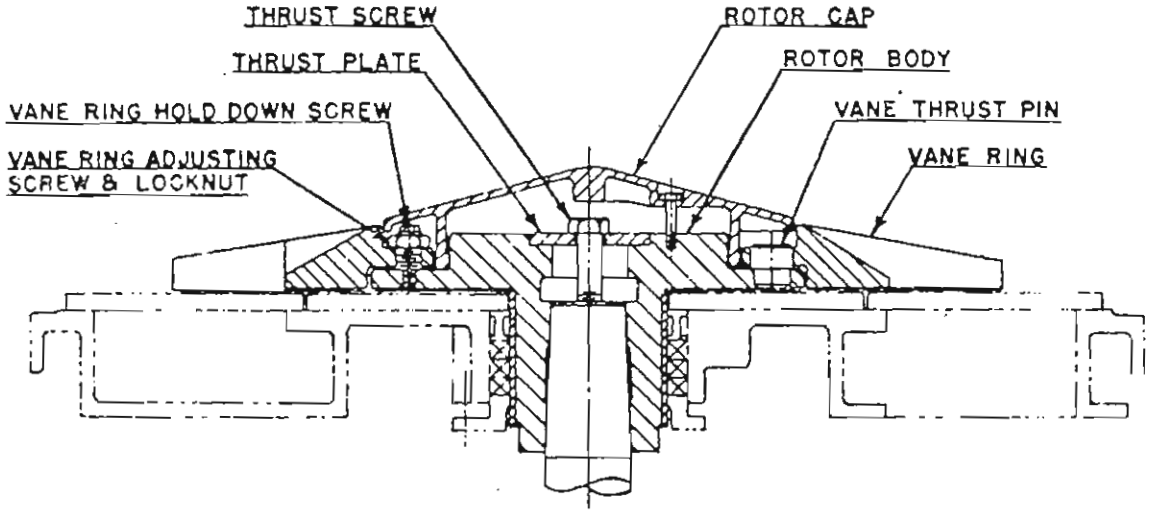
An example of the adhesive tape is Johns-Manville #330 Aluminum Foil Type Tape and #90-T Tuck Tape for back-up.

8 - Fill the gap with hot lead.

9 - Tighten the bolts holding the extraction chamber to the tub. Calk all joints and chip off excess lead.

ROTOR INSTALLATION

The AW-1 Vokes rotor is a three piece rotor consisting of a rotor hub, an adjustable vane ring and a rotor cap. It has been assembled in our plant and adjusted to the clearance indicated on the certified installation drawing of the rotor assembly.



TYPICAL SECTION THRU AW-1 VOKES ROTOR

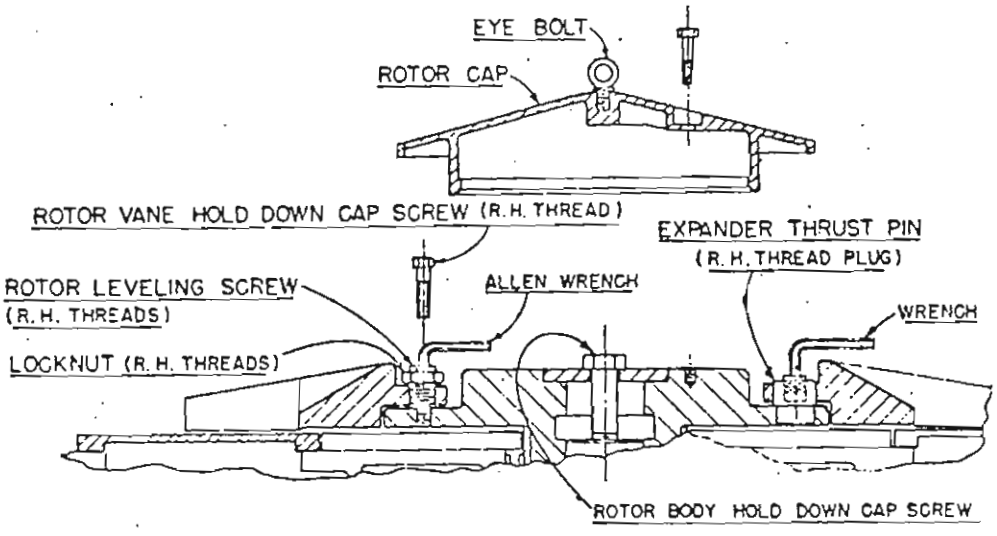
TO INSTALL THE ROTOR

1 - Position the key in the drive shaft.
2 - Coat the drive shaft and key with a mixture of white lead and light machine oil.
3 - Remove the rotor cap from the assembled unit.
4 - Match-mark the vane ring and rotor body.
5 - Remove the vane ring hold down screws and the thrust pin expander plugs.
NOTE: DO NOT LOOSEN VANE RING ADJUSTING SCREWS AND LOCKNUTS.
6 - Remove the vane ring from the rotor body.
Note: Normally the extraction chamber is shipped with the under rotor wear plate and extraction plate assembled to it. If for some reason they were shipped separately, assemble them before installing the rotor.

7 - Assemble the rotor body to the drive shaft. Tap the rotor body down while tightening the thrust screw.

8 - Check the clearance under the rotor body bangors. The certified assembly drawing of the rotor will show the amount of clearance required. Raise the drive to increase clearance; lower the drive to decrease clearance.
9 - Replace the vane ring on the rotor body and tighten the hold down screws and expander plugs.
10 - Check the clearance under one rotor vane. Rotate the rotor 360° checking the clearance under this same vane at intervals in order to locate the highest spot on the extraction plate. Each vane should then be checked for clearance at this same high spot. Assuming the drive to be properly aligned to the extraction chamber the vane clearance should be within ± .010" of the dimension shown on the certified print.
11 - Install the rotor cap.

HOW TO ADJUST AW-1 VOKES ROTOR



1 - Remove rotor cap.

2 - Insert wrench in socket pipe plug of "thrust pin." Loosen plug, it is not necessary to remove plug or thrust pin.

3 - Remove all "rotor vane hold down cap screw" from leveling screw assembly.

4 - Insert Allen wrench in top of leveling screw to keep screw from turning and loosen "locknut."

5 - Adjust leveling screw for desired clearance. To increase clearance turn screw clockwise. To decrease clearance turn counterclockwise.

NOTE: Turn each screw the same amount so all screws are touching the rotor body the same amount.

6 - Using feelers, check the clearance under one vane while rotating the rotor 360° to locate any high spot on the extraction plate. Then set all vanes to this same spot.

7 - Tighten all locknuts. To keep screw from turning, hold leveling screw with the Allen wrench.

8 - Replace and tighten the "rotor vane hold down cap screw."

9 - Before replacing "rotor cap" check to be sure "rotor body hold down cap screw" is tight.

GROUTING

Recheck the following points before grouting:

a) Rotor clearance
b) All support columns must be level and plumb.
c) All assembly bolts must be drawn tight.

Grout in the drive and all support columns.

TIE CHANNELS

Tighten all channel bolts. Tack the ends of the tie channels and gussets to the support columns with 2" long welds in three places. Check the extraction chamber for any misalignment due to welding and correct if necessary. Finish welding the tie channels and gussets.

ALIGN THE COUPLING

Using a dial indicator, align the coupling halves. Both angular and parallel alignment must be within .002" total indicator reading.

Dowel the motor and motor rails after final alignment.

PACKING BOX

Install the water seal ring. Be sure it is fully inserted and not cocked in any direction. Insert braided flax packing of the correct size into the packing box and tighten the packing gland just enough to compress the packing lightly. The packing gland should be loose enough to allow a thin trickle of water to seep through the packing.

The required packing size is given on the certified assembly print.

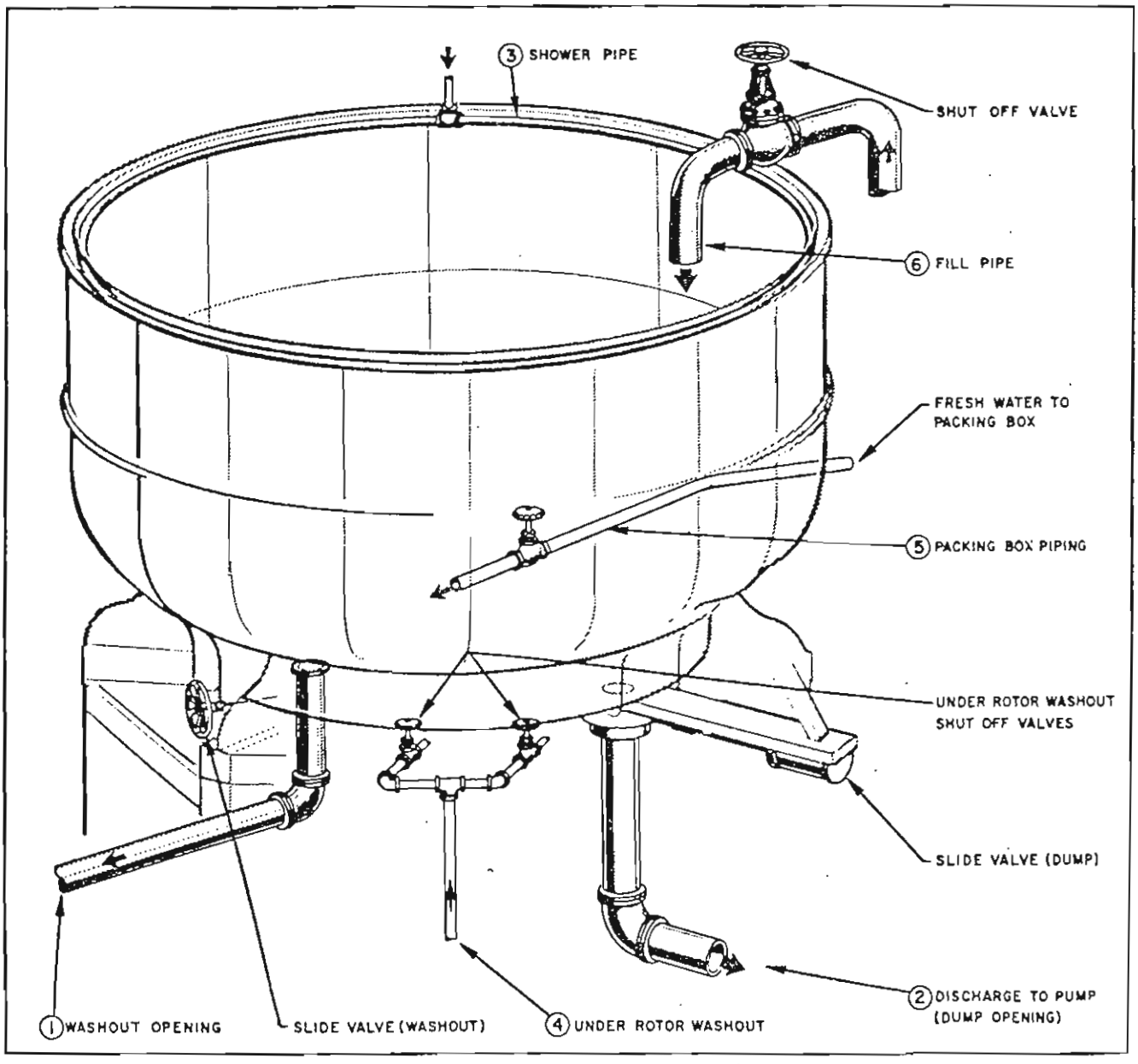
INSTALL AUXILIARY EQUIPMENT

If the Hydrapulper is equipped with a Junk Remover and/or Ragger, please refer to the respective instruction manual for each.

VALVES AND PIPING

Install the piping and valves as required. Valves should be the same size as the lines which they control. Do not use reducers.

Typical piping installations, one for batch operation and one for continuous operation, are shown here for reference.



TYPICAL PIPING INSTALLATION FOR BATCH HYDRAPULPER

PIPING CHART

CONTINUOUS HYDRAPULPER

Key No.	Pipe or Fitting	No. Req.	Connects between:	Best Pressure	Comments
1	*Discharge to pump	1	Hydrapulper and pump	Gravity Flow	
-	Shower Pipe (not shown)	1	Rings top of Hydrapulper	Use available water pressure	To washdown sides of tub when cleaning out Hydrapulper (OPTIONAL)
2	Under-Rotor-Washout	2	Connects into extraction chamber	25 lb. min. 25 GPM max.	Prevents stock from building up beneath rotor
3	Packing Box Piping	1	Connects into extraction chamber	25 lb. minimum	Lubricates rotor hub sleeve; put pressure on packing
4	Fill Pipe	1	Located above Hydrapulper tub	Use available water pressure	Fast delivery saves charging time
8	Junk Remover Washout	1	Junk Remover and waste drain or waste recovery system	Gravity Flow	Provides for complete emptying of Junk Remover
9	Junk Remover white water inlet	1	Junk Remover and white water system	25 lb.	
10	Junk Remover white water outlet	1	Connects beneath junk box	Gravity Flow	
11	White water to Ragger	1	Connected to white water system	Use available water pressure	Washes rag rope
-	*Pump inlet (not shown)	1	Discharge pipe and pump	Gravity Flow	
-	*Pump outlet (not shown)	1	Pump and next piece of equipment in system	Sized for maximum capacity of Hydrapulper	

*To obtain maximum capacity of Hydrapulper, use pipe sizes equal to the flange inside diameter.

V OPERATION

EQUIPMENT CHECK

1 - Remove all tools, scaffolding and other loose objects from inside the Hydrapulper tub.

2 - Open the valve in the water line to the packing box. The packing gland is properly adjusted when a thin trickle of water seeps through the packing.

3 - Turn on the under rotor water just long enough to make sure it is working; then turn it off.

4 - Check the drive.

A. Belt Drive

a) Check the belts for alignment and tension.
b) Grease the bearings. Follow the lubrication instructions in the Drive Chapter of this manual.
c) Start the Hydrapulper drive motor and check the rotation of the rotor. The correct rotation is shown on the certified installation drawing.
d) Check the Hydrapulper tub, tub support, drive and motor for excessive vibrations.
e) Stop the motor.

B. Gear Box Drive

a) Check the oil. See the lubrication instructions in the Drive Chapter of this manual.
b) Open the valve in the water line to the oil cooler.
c) Start the oil pump and check the oil pressure gauge. Normal operating pressure will be 20 to 30 PSIG.
NOTE: SPLASH LUBRICATED DRIVES ARE NOT EQUIPPED WITH A PRESSURE CONTROL AND GAUGE.
d) Start the Hydrapulper drive motor and check the rotation of the rotor. The correct rotation is shown on the certified installation drawing.
e) Check the Hydrapulper tub, tub support, drive and motor for excessive vibration.
f) Check the pressure controls for the lube system for de-energizing the oil pump motor. When the oil pressure drops, the Hydrapulper main drive motor should be shut down automatically. Try starting the Hydrapulper with the main drive motor switch. It should not start. If the drive starts with the oil pump not operating, the wiring is incorrect.
g) Upon completion of the drive check, shut down the drive and oil pump and close the valve in the water line to the oil cooler.

5 - Open and close the washout valve a few times to be certain it is operating smoothly.

6 - Check the operation of the valve in the discharge line.

7 - Check Auxiliary Equipment (if so equipped). (See instruction manuals for Junk Remover and Ragger.)

OPERATION OF BATCH TYPE HYDRAPULPER

GENERAL

Batch pulping is performed by charging a Hydrapulper with pulp or clean waste and enough water to obtain a desired consistency. The charge is left in the Hydrapulper until the desired degree of defibering has been obtained. Then, the batch is dumped and the process is repeated.

CYCLE

One complete cycle consists of the charging, pulping, dumping and, if necessary, the washdown operations. Cycle time is the sum of the times required to perform the operations.

CAPACITY

The capacity of a Hydrapulper (in tons per day) can be calculated by multiplying the number of cycles per 24 hours by the average tonnage per cycle.

CHARGING

Charging is the process of filling the Hydrapulper with the desired amount of furnish and water. The pulper should be filled approximately one-third full of water with the rotor shut off. The full charge is then added, after which the rotor is started. As the furnish pulps up, additional water should be added to bring the level to the desired height or the stock to the desired consistency. Provision should be made to charge the pulper with water and furnish as fast as possible to obtain maximum efficiency from the pulper.

PULPING TIME

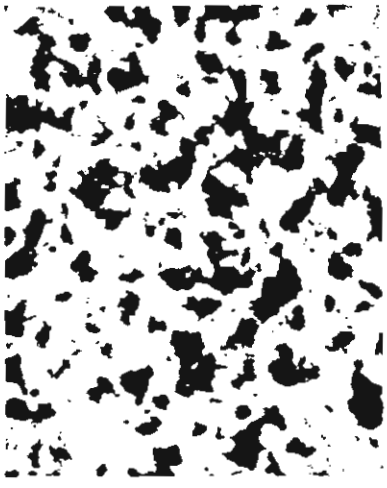
Pulping time is the time required to defibre the stock until it matches a definite defibering standard. A hand sheet of pulping standards is compared to a sheet taken from the Hydrapulper to determine when the desired fibre size has been reached. Numbers 10 and 20 (on the hand sheet) represent slushed stocks. In the range from 30 to 50, the stocks are partially defibered; and, the range from 60 to 100 indicates complete defibering.

Pulping time depends on a number of factors, but, in general it is determined by the type of stock being pulped.

Temperature is also an important factor in pulping and hot water is often used to speed the process.

BATCH OPERATION (continued)

PULPING STANDARDS



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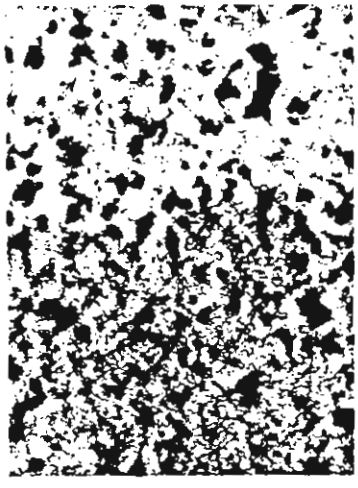

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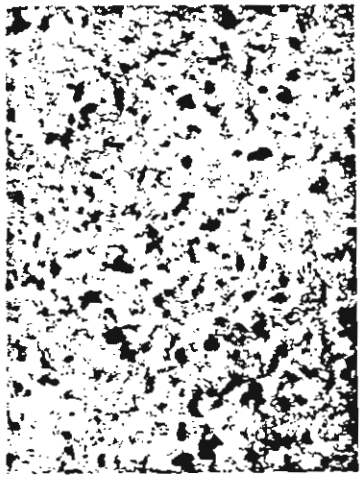

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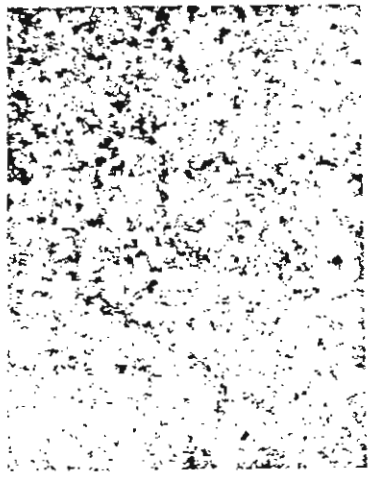

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Actual size photos of hand sheets showing various degrees of defibering.

DUMPING

Dumping is accomplished by opening the valve in the discharge line. This permits the pulped material to discharge from the tub through a dump opening in the extraction chamber.

WASHDOWN

Washdown is not always necessary after each batch is dumped. When the same furnish is used, batch after batch, washdown is generally eliminated.

BATCH OPERATION (continued)

BATCH OPERATING PROCEDURE

1 - Open the water valve to the oil cooler and start the oil pump motor if the Hydrapulper is equipped with a gear box drive.

2 - Turn on the packing box water.

3 - Open the valve in the line for filling the tub. Close the valve when the tub is about one-third full.

4 - Determine the amount of furnish for one batch by weight and feed it into the Hydrapulper.

5 - Start the Hydrapulper main drive motor.

6 - Add water to obtain the desired consistency.

7 - Allow the Hydrapulper to operate until the desired amount of defibering has been reached.

8 - When required defibering has been obtained, open the dump valve and turn on the stock pump.

NOTE: Keep the main drive motor operating during the dumping operation until splashing begins; then stop the motor.

9 - When the tub is empty, close the dump valve and shut down the stock pump.

10 - If another batch is to be pulped immediately and a washdown is not necessary, repeat the process starting with item 3.

11 - When washout is required, open the under rotor washout valve and, if the Hydrapulper is so equipped, the valve to the washdown shower. When the tub is clean, turn off the shower and under rotor flush out water and open the washout valve.

12 - If the Hydrapulper is to remain idle for awhile, turn off the oil pump on the drive and the packing box water.

CAUTION: Be sure under rotor washout is off.

OPERATION - CONTINUOUS HYDRAPULPER

GENERAL

A continuous Hydrapulper is arranged to permit pulped material to leave the unit when correct particle size has been reached. Proportionate amounts of stock and water are continuously added to replace the discharged pulp and maintain a constant flow of pulped stock at the desired consistency.

CHARGING THE HYDRAPULPER

Loose or baled furnish is dumped into the Hydrapulper from a conveyor, skip hoist, fork lift or hand truck. Except for the initial charging, the furnish is usually added one bale at a time. Baled material must have the wires cut before it is dumped into the Hydrapulper. This reduces the pulping time by permitting the furnish to spread out upon hitting the water.

When the Hydrapulper is equipped with a Ragger, the baling wires must be cut but should not be removed. They will be picked up in the Hydrapulper in the formation of the rag rope.

When the Hydrapulper is not equipped with a Ragger, the baling wires must be removed before the furnish is fed into the Hydrapulper.

CONSISTENCY

Consistency is the percentage of furnish and water.

WATER TEMPERATURE

Hydrapulper capacities are based on a recommended water temperature of 140°F.

CONTINUOUS OPERATION (continued)

CONTINUOUS OPERATING PROCEDURE

1 - Open the water valve to the oil cooler and start the oil pump motor if the Hydrapulper is equipped with a gear box drive.

2 - Turn on the packing box water.

3 - Turn on the under rotor washout water.

4 - Start the Junk Remover. *(if so equipped)

a) Open the white water inlet valve to the Junk Remover.
b) Open the white water inlet valve to the trash collection box near the top of the Junk Remover.
c) Start the conveyor drive motor.

5 - Fill the Hydrapulper tub with water to approximately 3-1/2 feet below the top of the tub.

6 - Start the Hydrapulper main drive motor.

7 - Add furnish to obtain the desired consistency.

8 - Start the Ragger. *(if so equipped)

a) Drop the free end of the rag rope into the Hydrapulper tub.
b) Set the "ON-TIMER" and "OFF-TIMER" to values which will give the desired operation of the Ragger.
NOTE: If there is no previous experience, the "ON-TIMER" can be set at 2 seconds and the "OFF-TIMER" at 60 seconds.
c) Set the selector switch on Automatic.
d) Turn on the white water used for washing the rag rope.

9 - The desired level in the tub is maintained by adding water via a level controller or manual valve.

10 - Adjust the rate of incoming stock and make-up water to obtain desired production from the Hydrapulper.
NOTE: The major portion of make-up water should enter through the Junk Remover via the white water.

*Please see the separate instruction manuals for Junk Remover and Ragger.

VI MAINTENANCE

PERIODIC INSPECTION

A general inspection and tightening of the Hydrapulper should be performed twice each year. Locating and eliminating minor defects will assure long and dependable service. In many instances, it eliminates costly shut-downs and delays.

> WARNING: To prevent accidental starting while inspecting or servicing the Hydrapulper, follow your prescribed safety procedures.

To prepare for a maintenance check, start by emptying the Hydrapulper completely. Wash down the tub and the rotor.

Inspect the inside of the tub, baffles, rotor vanes, bangor irons, wear plates and extraction plates for excessive wear or damage.

Inspect and tighten, when necessary, all bolts in the Hydrapulper.

Inspect the drive. On a V-belt drive adjust the tension on the belts. On a gear drive remove the inspection plates and check the general condition of the internal drive mechanism.

Inspect gear tooth markings for irregular pattern or uneven wear. Replace the inspection plates. Lubricate in accordance with the instructions in the drive section of this manual.

Inspect the packing, packing sleeve, and water seal ring.

PACKING BOX

A packing box, consisting of a lantern ring, packing and packing gland, is used to seal the drive shaft where it passes through the extraction chamber. A packing sleeve is used to absorb the wear created by the packing. This sleeve is fitted either to the drive shaft or the O.D. of the rotor hub when it extends through the packing area.

The lantern ring contains openings which allow water to reach the packing and sleeve. A water pressure of 35 lbs. should be maintained at all times when the Hydrapulper is operating. A constant flow of water will prevent clogging of the ring and provide proper lubrication of the packing. When the packing box is being repacked, the water ports in the lantern ring should be cleaned and the water flow to the packing box tested.

Lantern rings are split to facilitate assembly into the packing box when replacement is necessary. Be sure it is free to turn when it is fully seated in the packing box.

After repacking the box, tighten the packing gland until the water flows out of the packing box in a slow steady trickle. DO NOT TIGHTEN THE PACKING GLAND TOO MUCH OR WATER WILL NOT FLOW AROUND THE SLEEVE AND LUBRICATE THE PACKING.

REBUILDING WORN ROTOR VANES

When rebuilding rotor vanes by installing face plates, care must be taken in locating the face plates so as to maintain the proper clearance between the bottom edge and the extraction plate.

SD (1 piece) Rotor

Face plates can best be located on an SD rotor while it is in the Hydrapulper. Place a piece of .06" shim stock across the extraction plate under one vane. Allow the bottom edge of the face plate to rest on the shim stock. With the face plate against the face of the rotor vane and set at 10° angle from vertical (the upper edge being forward) tack weld the face plate to the rotor vane. Repeat this process until all the face plates are tacked in place. Turn the rotor to be sure that all vanes clear properly. The rotor can then be removed from the Hydrapulper and the space between the face plates and worn vanes filled with weld.

AW-1 (3 piece) Rotor

Since the vane ring in an AW-1 rotor may have been adjusted from its original setting it is best to remove it from the Hydrapulper and set the face plates to correspond to the original dimensions to which the vane ring was built.

First remove the vane ring from the rotor body. Set the vane ring on a surface plate on a set of spacer blocks placed under the bottom of the counterbored area which fits over the rotor body.

The height of the blocks should be euqal to the original dimension of the vane ring as given in the following list:

Vane Ring Dia.	Height of Blocks
33.6	1.56
45	1.75
53.5	1.69
57	2.00
67.25	2.06
76.8	2.31
81.6	2.25
86.4	2.50

Allow the bottom edge of the face plate to rest on the surface plate. With the face plate set against the face of the rotor vane and set at a 5° angle from vertical (the upper edge being forward) tack weld the face plate to the rotor vane. Repeat the process for each vane; then fill in the space between the face plates and worn vanes with weld.

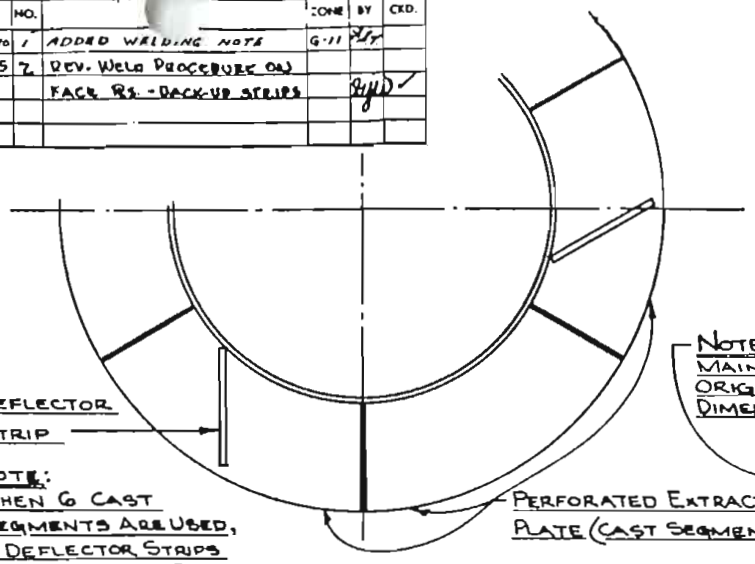
Welding information and sketches are shown on drawing C-SP-1350 which is included in this manual.

ROTOR CLEARANCE

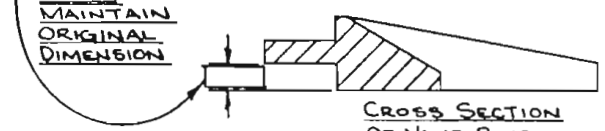
The clearance between the rotor vane and the extraction plates is set during installation. Due to wear it may be desirable to reset the clearance. On Hydrapulpers equipped with an AW-1 (3 piece) Vokes rotor, the vane ring can be adjusted down as explained in the Installation section. When a solid (1 piece) Vokes rotor is used the clearance can be adjusted by shimming under the extraction plates.

DATE	NO.		ZONE	BY	CKD.
4-8-70	1	ADDED WELDING NOTE	G-11		
9-3-75	2	REV. WELD PROCEDURE ON FACE RS. - BACK-UP STRIPS			

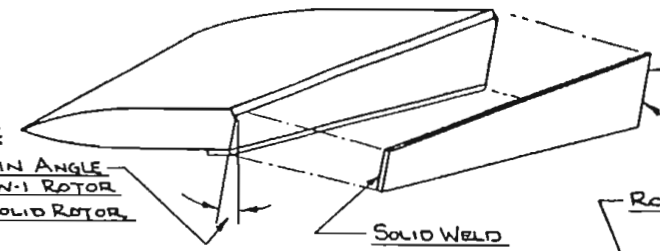
USED ON

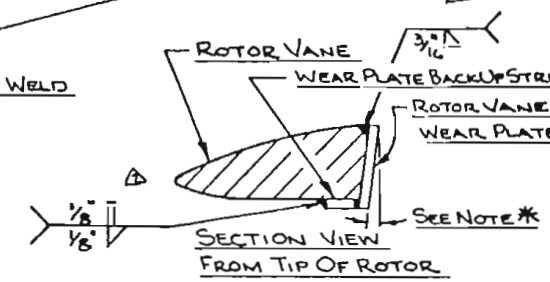


NOTE:
WHEN 6 CAST SEGMENTS ARE USED, 3 DEFLECTOR STRIPS ARE REQUIRED, SPACED AS SHOWN.

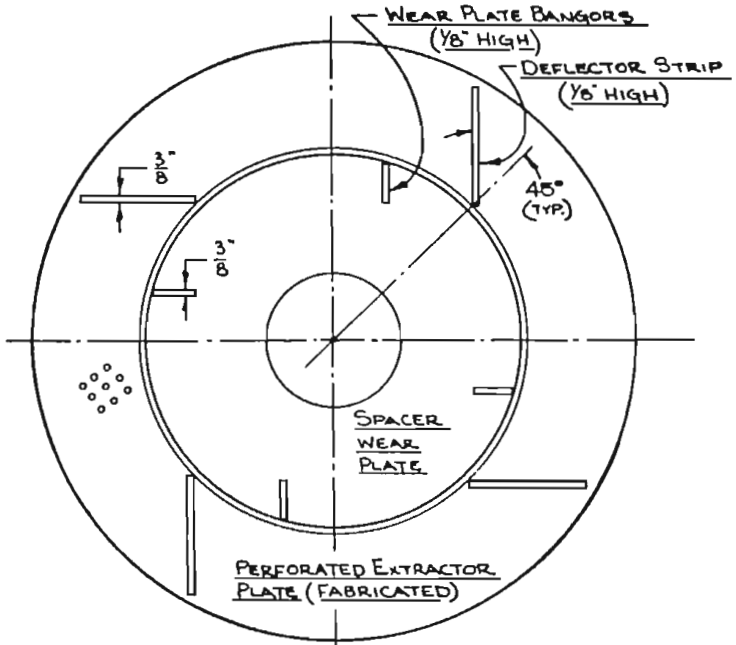


CROSS SECTION OF VANE RING

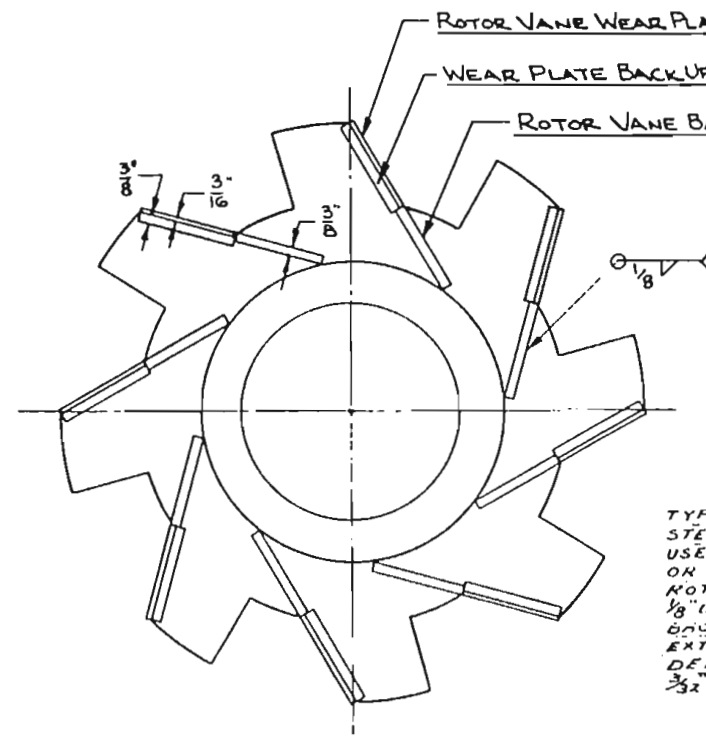




SECTION VIEW FROM TIP OF ROTOR



VIEWED FROM PLAN



BOTTOM VIEW OF ROTOR VANE

TYPICAL WELDING DATA
STELLITE TO CHROME
USE FUTECTIC 680 AC DC ROD OR 316 I.C STAINLESS OR EQUAL.
ROTOR VANE WEAR PLATE - 1/8" DIAMETER - 75 - 115 AMPS.
BACK UP STRIP, BANGOR AND EXTRACTION PLATE DEFLECTOR STRIP - 3/32" DIAMETER - 50 - 90 AMPS.

TOTAL QUANTITY	UNIT	MATERIAL	CODE	DWG. NO.	ITEM	DESCRIPTION

STANDARD TOLERANCE UNLESS OTHERWISE SPECIFIED

FINISHED DIMENSIONS
ONE (1) DECIMAL DIMENSION ± .030"
TWO (2) DECIMAL DIMENSION ± .010"
THREE (3) DECIMAL DIMENSION ± .003"
ANGLES ± 1/2°
UNFINISHED SURFACES ± .125"

NO FINISH NORMALLY REQUIRED. CLEAN UP ONLY TO MAINTAIN DIMENSIONAL STABILITY OR TO REMOVE UNUSUAL SURFACE IRREGULARITIES.

PATT. NO.

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SUPERSEDED BY DATE BY
SUPERSEDES DATE BY

CUSTOMER
SER. NO. SHOP ORDER

THE BLACK CLAWSON COMPANY
MIDDLETOWN, OHIO
Shartle Division / Stock Preparation Systems Pandia Division / Pulp Mill Systems

DATE 10-17-67 SUBJECT DOUBLE STEEL VANE ROTOR
SCALE MAINTENANCE SKETCH
DRAWN BY J. Cox
CHECKED
APPROVED

C-5P1350 REV. 2

DRIVE REMOVAL

GEAR BOX DRIVES

Gear box drives are provided with a sub-base or rails to facilitate drive removal. A procedure for removing the drive follows:

1 - Remove the rotor from the drive shaft.

2 - Disconnect the coupling and remove the motor and rails.

3 - Remove the split packing gland, packing and lantern ring.

4 - Disconnect oil piping (if required).

5 - Remove the fasteners which hold the drive to the sub-base and the sub-base to the base or sole plate.

6 - Insert a lifting eyebolt in the vertical drive shaft.

7 - Using a lifting device, raise the drive slightly to allow removal of the sub-base.

8 - Place pipe rollers on the base or sole plate and lower the drive onto the rollers.

9 - Construct a platform of suitable timber at a height level with the drive base or sole plate to allow the drive to be moved out from under the Hydrapulper.