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INSTALLATION, OPERATION AND

MAINTENANCE

MANUAL

THE FIBERPREP SLOTTED DIABOLO

(DIABOLO-S)

dblslot.96

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FIBERPREP/LAMORT SLOTTED DIABOLO

GENERAL INFORMATION

INTRODUCTION

The Fiberprep/Lamort Diabolo-S represents the most advanced development in reject screen design. This compact, high-efficiency pressurized screen gently but effectively separates contaminants from the stock as the last stage in slotted screening system. The Diabolo-S features cyclical operation including wash and dewatering steps. This cycle produces fiber-free rejects with a minimum of water loss. The Diabolo-S is available in multiple sizes with a broad range of screen plate sizes to cover a wide range of production and quality requirements.

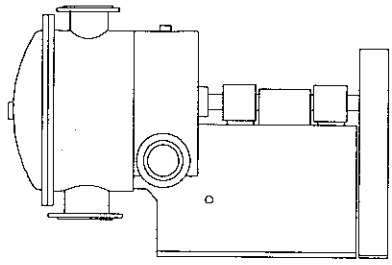

Figure 1
Fiberprep/Lamort DIABOLO-S

SCOPE OF THIS MANUAL

This handbook provides installation, operation and maintenance instructions for the Diabolo-S. It also includes a schedule of recommended maintenance procedures which, if adhered to, will prevent or significantly reduce the incidence of breakdowns or failures, minimizing production interruptions.

Parts lists at the back of this Manual contain all parts of maintenance significance and identify those parts recommended for

FIBERPREP/LAMORT SLOTTED DIABOLO

GENERAL INFORMATION

SCOPE OF THIS MANUAL

spares. For the user's convenience, all foldout drawings are included at the end of the handbook rather than being interspersed within the text at the point of reference.

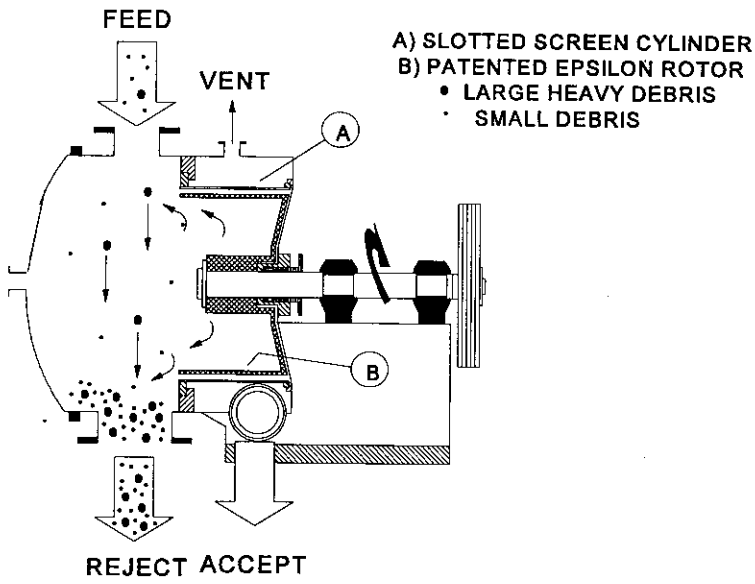

Figure 2 - DIABOLO-S SCREEN CUTAWAY VIEW

FUNCTIONAL DESCRIPTION

The Diabolo-S consists of a cylindrical case with inlet, accept, and reject nozzles; a slotted screen cylinder and unique rotor.

Stock flow enters the inlet chamber which is located at the inlet end of the actual screening compartment. The inlet chamber

FUNCTIONAL DESCRIPTION (continued)

provides a reject storage compartment and also allows heavies to drop into the reject nozzle thus preventing these heavies from entering the screening zone.

As stock flows into the screening zone, the rotation of the rotor sets up a vortex causing lightweight contaminants to concentrate in the center of the screening zone. Stock and other non-lightweight contaminants circulate in an outward direction toward the screen cylinder.

The unique rotor design provides the necessary screening cylinder cleaning pulse to allow flow of acceptable material through the slots while expelling the contaminants back toward the inlet/reject storage compartment.

As described in the Operations section, the Diabolo-S utilizes a cyclical operation, including wash and dewater steps, to produce fiber-free, concentrated rejects. Rejects typically consist of 20 gallons of contaminants and water per dump. Rejects can be handled in a variety of ways, including conveyor, dumpster, or press.

The Diabolo-S case is fitted with a hinged door to provide easy access to the rotor and the screen assembly.

FIBERPREP/LAMORT SLOTTED DIABOLO

INSTALLATION

GENERAL

The Fiberprep-supplied installation drawings included in the "Appendix" section of this manual contains information on:

1. Equipment dimensions and space requirements.
2. Connecting pipe sizes.
3. Foundation/anchor bolting requirements.
4. Drive information (Motor HP, RPM, and frame size. Sheaves and belt information.)

PIPING & INSTRUMENTATION

Fiberprep has included a process or P & I drawing in the Appendix section of this Manual. This drawing provides information on flow rates, controls, sequence, valves and instrumentation requirements for the Diabolo-S screen. Adequate pipe supports and controls must be installed to prevent water hammer, piping vibration, or piping weight from being transferred to the Diabolo-S.

1. The Diabolo-S vent should be piped back to the feed chest and not submerged.

2. As described in the operation section, the Diabolo-S is a cyclical screen. Stock is only removed from this chest during the stock flow portion of the cycle. The feed chest must have sufficient surge capacity to handle the level fluctuations during this cycle.

PIPING & INSTRUMENTATION (continued)

3. Dilution water should be added at the suction of the Diabolo-S feed pump during the stock flow cycle to maintain desired consistency. Excessively high consistency stock will create Diabolo operational problems.

4. The accept line should be directed upward to an elevation above the Diabolo-S (see Schematic - Figure 3, Page 8)

5. The accept valve should be mounted on the Diabolo-S accept flange or as close to this point as possible. This will minimize the amount of liquid draining back into the Diabolo-S and out the rejects during the reject dump step.

6. Pressure drop across the Diabolo-S is typically 4-8 psi. The Diabolo-S requires a minimum accept pressure of 15 psi during the stock flow and wash cycles. Higher accept pressure is permissible as long as inlet pressure does not exceed case design pressure.

7. Diabolo case pressure is 45 psi. The stock, water, and compressed air (if used) must never exceed 45 psi.

8. Pneumatic piping to the valves to be in accordance with standard practice for such piping.

9. Pressure indication should be installed in the feed and accept lines for the Diabolo-S. This will allow field verification of accept pressure and pressure drop.

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PRESTART CHECKUP

Before starting the Diabolo-S for the first time, make the following checks to make sure that the installation is complete and that the unit is ready for operation.

1. Check that the bearings are properly lubricated.

2. Check belt tension. Specific instructions on checking and adjusting belt tension are included in the preventive maintenance section. See Belt Tension Chart in Figure 4.

3. Check Diabolo-S packing gland tightness. The packing water should be turned on and a continuous drip of water should be observed leaking from the packing gland. After the Diabolo has run for several hours, it will be necessary to recheck and adjust the packing gland.

4. Turn Diabolo-S rotor by hand to ensure that there is no binding, scraping, or unusual noise.

5. Check the Diabolo-S drive motor rotation. Diabolo-S rotor rotates clockwise when looking from the drive end of the machine.

6. Activate the starter lock out procedure and confirm that the Diabolo motor will not start.

7. Stroke all of the valves to verify proper operation.

   Diabolo-S Valves:
   - Feed Valve, V1
   - Reject Valve, V2

Diabolo-S Valves:

- Fill/Wash Valve, V3
- Accept Valve, V4
- Recycle Valve, V5
- Vent Valve, V6
- Compressed Air, V7
- Dilution Valve, V8

Any valve limit switches should be checked to verify that they provide proper indication of open or closed position on each respective valve.

8. As a final checkout, the Diabolo-S sequence should be run through dry. This will provide a final verification of the operation of all valves and sequence programming.

FIBERPREP/LAMORT SLOTTED DIABOLO

OPERATION

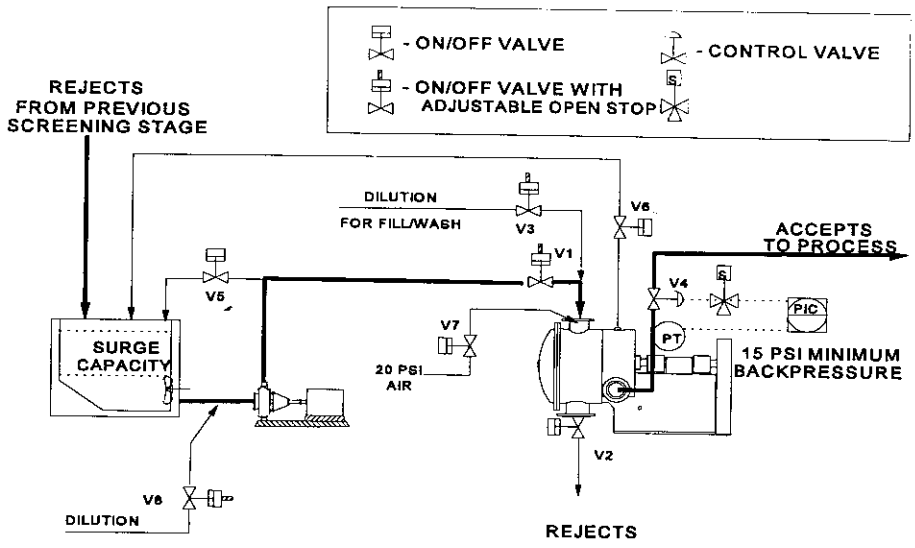

Figure 3 DIABOLO-S CONTROLS OVERVIEW

INTRODUCTION

Diabolo-S reject screens require little or no operator action other than startup, monitoring, and shutdown. The Diabolo-S is relatively insensitive to flow changes, so long as the maximum flow capacity of the screen is not exceeded. It is important that consistency remain within the suggested operating range for the type of furnish and screen cylinder slot size being used in your specific application. High consistency will cause screen plate blinding.

The Diabolo-S must be operated with a minimum of 15 psi accept pressure.

FIBERPREP/LAMORT SLOTTED DIABOLO

OPERATION

STARTUP (Typical Sequence)

1. Physically inspect the Diabolo-S area to be sure the drain valves are closed and all personnel are notified the unit will start.

2. Verify packing water is on.

3. Verify Diabolo-S feed chest level is adequate and the feed chest level permissive is satisfied.

4. The automatic Diabolo-S sequence can now be started through either the Fiberprep control panel (if supplied), or the mill's DCS.

OPERATION SEQUENCE

The Fiberprep/Lamort Diabolo-S Reject Screen is a pressurized auxiliary screen. This screen features a unique rotor and a slotted screen cylinder. The Diabolo-S is operated on a cycle which employs washing to minimize the rejected fiber. The cycle also includes a dewatering step to concentrate the rejects.

Compressed Air: Compressed air is added to the Diabolo-S during the dewatering step. The compressed air forces the water through the screen plate and to the accept destination. Compressed air rate should be approximately 100 CFM and air pressure should be regulated at the lowest pressure setting that will overcome the static back pressure imposed by the accept piping network. Pressure setting of 15-20 psi is common.

FIBERPREP/LAMORT SLOTTED DIABOLO

OPERATION

OPERATION SEQUENCE (continued)

The contaminants are concentrated in the inlet compartment, washed to recover the good fiber, dewatered and then rejected. The normal operating sequence is as follows:

0. Standby
1. Fill Diabolo
2. Stock Flow
3. Wash
4. Reject Dewatering (Drain)
5. Reject

At the end of the reject step, the cycle may return to the fill step, or if the feed chest has insufficient level, then the Diabolo-S is stopped and remains in standby until the level permissive is satisfied. Typical step times are as follows:

1.	Fill Screen	30 seconds
2.	Stock Flow	3 - 20 minutes
3.	Wash Rejects	60 seconds
4.	Dewater Rejects	30 seconds
5.	Reject	20 seconds

Stock flow time varies with debris concentration in the furnish.

This cycle is normally controlled by the mill's DCS to provide an automatic sequence of events with minimum operator intervention required. A Fiberprep PLC based Control Panel is available as Optional Supply.

OPERATION SEQUENCE (continued)

Step 0 - Standby

0.1 System is in standby before startup. No motors are running and all valves are in their fail-safe position, normally closed for all valves except the reject valve, V2, and the recycle valve, V5, which are normally open. If there is stock in the feed chest, then the feed pump is running and stock is recirculating back to the feed chest through the recycle valve, V5.

Step 1 - Fill

1.1 The operator initiates screen operation by pressing the start button.

1.2 When the feed chest level permissive is satisfied, the reject valve, V2, is closed.

1.3 When the level permissive is satisfied and the reject valve closed limit switch is made, the vent valve, V6, and the Fill/Wash valve, V3, will open to fill the Diabolo-S. The fill timer starts and water is added to the Diabolo-S. Typical fill times are 20-30 seconds, depending on the water source available.

1.4 When the fill timer times out, V3 and V6 are closed and the Diabolo-S motor is started.

OPERATION

OPERATION SEQUENCE (continued)

Step 2 - Stock Flow

2.1 With feedback from the drive auxiliary interlock that the Diabolo-S is running, the inlet valve, V1, is opened, the stock dilution valve, V6, is opened, and the recycle valve, V5, is closed.

The accepts valve, V4, is released to pressure control, allowing stock to be screened through the Diabolo-S.

With the opening of V1, the stock flow timer will start. The duration of the stock flow timer will be dependent on debris load, but typically is 3-20 minutes.

If high amps are measured during stock flow, the cycle will advance to the wash step.

Step 3 - Wash

3.1 When the stock flow timer times out, V5 opens, V1 closes, and V6 closes. Stock is recycled to the feed tank. The fill/wash valve, V3, now opens, and the wash timer starts. The wash water forces the remaining good fiber to pass through the screen plate and out the accepts line. The wash step is typically 40-80 seconds duration.

OPERATION SEQUENCE (continued)

Step 4 - Reject Dewatering

4.1 Compressed Air When the wash timer times out, V3 closes. The compressed air valve, V7, will then open, and the dewatering timer will start. This step will "push" the water within the Diabolo-S case through the accepts line. Typical reject dewatering time is 20-40 seconds.

Step 5 - Reject

5.1 After the dewatering timer times out, V4 and V7 will close.

After V4 has closed, the reject valve, V2, and the vent valve, V6, will open to reject the contaminants. The reject timer will start.

5.2 After the reject timer times out, typically 10-30 seconds, the cycle will return to Step 1, fill. If the level permissive is not satisfied or the operator has pressed the Stop button, then the Diabolo-S motor will stop and the system will remain in Standby until the level permissive is satisfied and/or the Start button is pressed.

FIBERPREP/LAMORT SLOTTED DIABOLO

OPERATION

NORMAL OPERATION

Pressure differential across the Diabolo-S cycle is the best parameter for monitoring operation. The pressure differential, measured by the difference between the feed and accept pressure, is a good indicator of changes in throughput or of blinding. Normally, there is only a 4-8 psi pressure differential. However, the pressure differential will increase with an increase in Diabolo-S feed consistency or contaminant level. If the screen blinds, the accept pressure will drop to 0 psi while the feed pressure will rise rapidly.

ABNORMAL OPERATION

Blinding. Usually, the only abnormal condition that can be expected is blinding of the screen plate.

Blinding is indicated by a rapid increase in the pressure differential. Blinding is generally a light plugging situation which occurs when the stock dewaters rapidly, causing a fiber mat to form over the surface of the screen plate. (See Chart on next page for corrective actions for Blinding.)

Stapling. This occurs when relatively long fibers bridge the gap between two slots and form a staple that is difficult to remove. This will typically occur when the mill changes to a much longer fiber length furnish than the screen plate was originally selected for.

Individual Slot Plugging. This occurs when particles of debris lodge in the screen plate slots. It typically results from excessive throughput over an extended period of time.

ABNORMAL OPERATION

BLINDING		
Symptom	**Most Probable Cause**	**Corrective Action**
High dP early in stock flow cycle	Consistency too high	Decrease consistency by increasing opening of dilution valve (V8)
	Flow rate too high	Decrease flow rate by reducing opening of accept valve (V4)
High dP late in stock flow cycle	Stock flow time excessive for contaminant load	Decrease stock flow timer setting

FIBERPREP/LAMORT SLOTTED DIABOLO

OPERATION

CORRECTIVE ACTIONS

To clear a plugged screen:

The Diabolo-S should advance to the wash step of the cycle. This will provide water into the Diabolo-S which should clear the plugged screen and wash the good fiber into the accepts. Any contaminants within the screen which could be causing the plugging situation will be purged during the reject step.

If corrective actions in preceding table have been taken and the Diabolo-S continues to plug during each cycle, it is probably caused by either one or a combination of the following: low accept pressure, or individual slot plugging. The following actions, taken in the order listed, should prevent reoccurrence of the problem:

A. Check the Diabolo-S to be sure that the screen has at least 10 psi accept pressure during stock flow.

B. If the preceding corrective action steps do not resolve the problem, the screen plate should be inspected and any deficiencies corrected.

C. If problems persist, please contact Fiberprep.

FIBERPREP/LAMORT SLOTTED DIABOLO

OPERATION

SHUT DOWN AND FLUSH

As the Diabolo-S is a cyclical screen, normal shutdown of the unit does not require any additional flushing. The wash, dewater, and reject steps will clear the screen of any fiber or debris.

SAFETY PRECAUTIONS

The Diabolo-S controls should include several recommended safety precautions. The controls should be set up such that the feed valve (V1) and fill/wash valve (V3) will not open unless the reject valve (V2) closed limit switch is made.

The area below the reject valve (V2) should be clearly marked with warnings to prevent personnel being in the area when the Diabolo-S is operating.

An emergency stop should be installed and be clearly visible near the Diabolo-S unit.

FIBERPREP/LAMORT SLOTTED DIABOLO

PREVENTIVE MAINTENANCE

MAINTENANCE PHILOSOPHY

The objective of a planned maintenance program is to maintain the Diabolo-S in a state of optimum readiness and performance and to ensure uninterrupted production. To achieve these ends, it is recommended that a sequence of periodic maintenance inspections and procedures be developed and followed.

The factors having the greatest impact on reliable operation are lubrication, cleanliness, the drive belts, and to a degree, the shaft packing. If these items are cared for properly, on a routine basis, the Diabolo will give continuous, trouble-free service.

LOCKOUT PROCEDURE

Before any maintenance procedure, the following precautions should be taken. These steps are intended as minimum requirements. All additional steps required to safely work on the equipment for a specific mill should be taken prior to beginning any maintenance work. If additional safety steps are required, these steps must be appended to this lockout procedure and posted so all mill personnel are notified.

1. **Alert all personnel that maintenance work will be done.**

2. **De-energize the drive motor circuit breaker. De-energize the feed pump. Tag and lockout both circuit breakers.**

3. **Verify that all valves around the Diabolo-S are closed, including the feed dump valve V1, and the fill/wash valve, V3. Verify the reject valve, V2, is open.**

LOCKOUT PROCEDURE (continued)

4. Remove pneumatic lines from the feed valve, V1, and the fill/wash valve, V3, and any other valves which could expose personnel to process elements.

5. Have the operators attempt to start the motor and feed pump. Energize all disconnected valves to ensure lockouts have been completed. During this procedure, personnel should physically verify no valves operate and that the motor and feed pump do not start.

6. At the conclusion of the maintenance activity, valve pneumatic lines should be reconnected and lockouts removed.

7. Notify all personnel that the Diabolo-S is ready to run.

RECOMMENDED MAINTENANCE SCHEDULE

Table 1 is a recommended schedule for routine maintenance of the Diabolo-S. It is based on past experience and represents the anticipated minimum requirements for keeping the machine in good operating condition. The frequencies indicated in the schedule assume nearly continuous operation under normal load conditions. They may be adjusted to suit local operating conditions, but the intervals between maintenance actions should not be increased without consulting Fiberprep.

FIBERPREP/LAMORT SLOTTED DIABOLO

PREVENTATIVE MAINTENANCE

TABLE 1. RECOMMENDED MAINTENANCE SCHEDULE

ITEM	FREQUENCY	ACTION
Packing Gland	Each Shift	Check for excessive water leakage. Adjust gland or replace packing as needed.
Bearings	Weekly	Lubricate.
Drive Belts	Weekly	Visually check belt tension and adjust as needed. Annually inspect for wear or cracks, measure and adjust tension. Replace belts as needed.
Diabolo-S	Annually	Disassemble and inspect. Replace parts as needed. Pay particular attention to bearings, seals, and drive belts.
Rotor Screen Plate	Six Months	Visually inspect for plugging or damage. Remove and clean if necessary. Examine rotor clearance. Rotor clearance should be .08" above the screen plate, at the closest point.

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PREVENTATIVE MAINTENANCE

BEARING LUBRICATION

Once each week, lubricate both bearings with a moderate amount of grease (approximately two or three squirts from a hand-held grease gun). Use only a No. 2 water-resistant grease. Before applying the grease gun, wipe the grease fittings clean to prevent entry of any contaminant with the grease. After lubricating, wipe up off any excess grease with a clean, lint-free cloth or towel.

Refer to the motor manufacturer's instructions for motor bearing lubrication requirements.

DRIVE BELTS

DANGER! MAKE SURE ALL MOTOR LOCKOUT STEPS DETAILED IN THE LOCKOUT PROCEDURE SECTION ARE FOLLOWED BEFORE ATTEMPTING ANY INSPECTION, ADJUSTMENT OR REPLACEMENT OF DRIVE BELTS. SERIOUS INJURY OR DEATH MAY OCCUR IF LOCKOUT PROCEDURES ARE NOT FOLLOWED!

Inspection

Once each week, visually inspect drive belts for excessive slack. Adjust tension as required. If belts are frayed, cracked or otherwise damaged, replace them. Recheck the tension of new belts several times during the first 50 hours of operation and readjust tension as necessary. Thereafter, a weekly visual check is adequate with an annual check of actual tension.

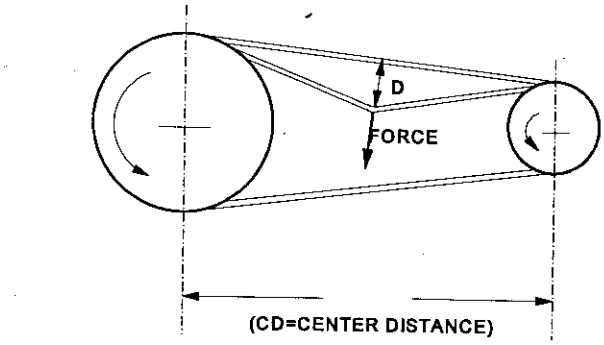
FIBERPREP/LAMORT SLOTTED DIABOLO

PREVENTATIVE MAINTENANCE

DRIVE BELTS

Inspection (continued)

To check belt tension, refer to BELT TENSION table in Figure 4. The applied force (F) to obtain the proper deflection (D) is shown for the Diabolo-S Models. The force should be applied perpendicular to the midpoint of the belt span. A simple tool for measuring the force and deflection is typically obtained from your belt supplier.



	APPLIED FORCE LBS. "F"		DEFLECTION "D"
	NORMAL	NEW BELTS	INCHES
DBL II	13	19	1/2
DBL III	16	23	2/3

Figure 4 Diabolo-S Belt Tension Chart

To adjust the belt tension:

1. Increase tension as follows:
   A. Loosen the locking nuts on the motor slide base several turns.
   B. Turn the adjusting bolts on the side of the base so as to tighten the belts.
   C. When the motor has been moved enough to provide the required tension, retighten the locknuts on the motor slide base.

2. Decrease the tension as follows:
   A. Loosen the locking nuts on the motor slide base several turns.
   B. Turn the adjusting bolts on the slide base so as to loosen the belts.
   C. When the motor has been moved enough to provide the required tension, tighten the locknuts on the motor slide base.

Replacement of Drive Belts

CAUTION - The drive belt assembly used on the Diabolo-S is a matched set. Do not replace individual belts; replace the entire set even though only one belt in the set may appear worn or damaged.

1. Shut down the Diabolo-S. Make sure the Diabolo-S is locked out according to the Lockout Procedure in this Manual.
2. Remove the belt guards.
3. Loosen the locknuts on the motor.
4. Turn the adjusting bolts until the belts are slack enough to clear the grooves of the drive pulley.
5. Remove and discard old belts.
6. Install new belts on pulleys and adjust tension as described previously.
7. Replace guards and remove tags from controls.
8. During the first 50 hours of operation with new belts, check and adjust tension several times. This is required to allow the new belts to stretch.

FIBERPREP/LAMORT SLOTTED DIABOLO

PREVENTATIVE MAINTENANCE

PACKING

Inspection:

Once each week, make a visual inspection of Diabolo-S packing to assure that all leakage is at an acceptable level. Some leakage from the shaft packing is required to lubricate the shaft as it turns in the packing. When properly adjusted, the packing gland will leak at only a few drops of water per minute. Tighten the gland as needed by taking up evenly and alternately on the gland nuts. When the gland can no longer control the leakage, replace the packing.

Replacement:

To replace the packing:

DANGER! MAKE SURE ALL LOCKOUT STEPS DETAILED IN THE LOCKOUT PROCEDURE SECTION ARE FOLLOWED BEFORE WORKING ON THE PACKING. SERIOUS INJURY OR DEATH MAY OCCUR IF LOCKOUT PROCEDURES ARE NOT FOLLOWED!

1. Shut down Diabolo-S and follow all steps listed in the lockout procedure at the start of this maintenance section.

2. Shut off fresh water supply to packing gland.

3. Remove gland adjusting nuts, and slide gland out and away from the stuffing box. Allow gland to hang on shaft.

PREVENTATIVE MAINTENANCE

PACKING

Replacement (continued)

4. Using a suitable tool, reach in to pull out the packing and lantern ring between the shaft and stuffing box. Note the location of the packing and lantern rings. Check the number of rows of packing on each side of the lantern ring.

5. Turn on packing water supply to make sure the packing water line is clear. If required, clear any plugs in this line. Contamination could restrict water distribution to the packing.

6. Clean the lantern ring to remove any corrosion or contamination that could restrict water distribution to the packing.

7. **PACKING INSTALLATION INSTRUCTION**

THE IMPORTANCE OF PACKING BEING CORRECTLY INSTALLED CANNOT BE OVEREMPHASIZED. MANY PACKING FAILURES ARE DUE TO INCORRECT INSTALLATION OF THE PACKING. THE FOLLOWING STEPS HAVE BEEN DEVISED TO ENSURE EFFECTIVE INSTALLATION OF PACKING IN FIBERPREP, INC. MACHINES.

OF EQUAL IMPORTANCE FOR A RELIABLE PACKING INSTALLATION IS A SUPPLY OF PACKING GLAND FEED WATER WHICH IS FREE OF CONTAMINANTS AND AT A PRESSURE SUFFICIENTLY HIGHER THAN THE OPERATING PRESSURE OF THE EQUIPMENT TO ENSURE STOCK IS EXCLUDED FROM CONTAMINATING THE PACKING GLAND.

WATER MUST BE FILTERED TO 50 MICRONS.

7. PACKING INSTALLATION INSTRUCTIONS (continued)

REQUIRED FLOW AND PRESSURE WILL BE INDICATED ON YOUR INSTALLATION DRAWING.

The recommended packing is a (PTFE) Graphite Filament Graphite filled, rated for at least 3000 FT/MI. Use of lesser packings may cause very short service life of the packing.

A) REMOVE ALL OLD PACKING FROM THE STUFFING BOX:

1. Clean the box and shaft thoroughly and examine the shaft or packing sleeve if furnished for wear and scoring. Replace the shaft or sleeve if wear is excessive.

B) USE THE CORRECT CROSS-SECTION OF PACKING OR DIE-FORMED RINGS:

1. When replacement packing is not available in the correct sizes from FIBERPREP, INC. the correct size of packing to order may be ascertained by referring to the rotating assembly drawing(s) included in the back of this manual.

C) WHEN USING COIL OR SPIRAL PACKING, ALWAYS CUT THE PACKING INTO SEPARATE RINGS:

1. Never wind a coil of packing into the stuffing box. Rings can be cut with a butt (square) or bias of diagonal joints, depending on the method

7. PACKING INSTALLATION INSTRUCTION (continued)

used for cutting. Illustration "A" shows several methods of preparing bulk packing. The best process for cutting packing is to make a mandrel from hardwood of the same diameter as the sleeve in the stuffing box area. The packing is then cut on this mandrel. **DO NOT CUT PACKING ON THE SLEEVE AS SLEEVE DAMAGE IS SURE TO RESULT AND THIS WILL LEAD TO PREMATURE PACKING FAILURE. THE BEST PROCESS IS TO MAKE A MANDREL FROM HARD WOOD OF THE CORRECT DIAMETER AND TO THEN CUT THE PACKING ON THAT MANDREL.**

2. Hold the packing tightly on the mandrel, but do not stretch excessively. Cut the ring and insert it into the stuffing box, making certain it fits the packing space properly. Each additional ring can be cut by the same method, or the first ring can be used as a master from which the balance of the rings are cut.

3. When cutting diagonal joints use a maple miter board so that each successive ring can be cut the correct angle.

4. Packing rings must be cut to the correct size. Otherwise, service life is reduced. This is where die-cut rings are of great advantage, as they give you the exact size ring for the I.D. of the shaft or sleeve and the O.D. of the stuffing box. There is no waste due to incorrectly cut rings.

7. PACKING INSTALLATION INSTRUCTION (continued)

D) INSTALL ONE RING AT A TIME:

1. Joints of successive rings should be staggered and kept at least 90° apart. Each individual ring should be seated with a tamping tool. When enough rings have been individually seated so that the nose of the gland will reach them, individual tamping should be supplemented by the gland.

2. FIBERPREP, INC. recommended PTFE filament and graphite filled packings, must be snugged up very gently, then tightened gradually after the machine is on stream.

E) AFTER THE LAST RING IS INSTALLED:

1. Take up bolts finger tight or very slightly snugged up. Do not jam the packing into place by excessive gland loading. Start the machine and take up on the gland adjusting bolts gradually until leakage is decreased to a tolerable minimum. Make sure the gland bolts are taken up evenly. **STOPPING LEAKAGE ENTIRELY WILL CAUSE THE PACKING TO BURN UP!**

F) ALLOW PACKING TO LEAK FREELY WHEN STARTING UP A NEWLY PACKED MACHINE OR A NEWLY INSTALLED MACHINE:

7. PACKING INSTALLATION INSTRUCTION (continued)

1. A slight excessive leaking during the first hour of operation will result in a better packing job over a longer period of time. Take up gradually on the gland as the packing seals, until leakage is reduced to a tolerable level.

G) MAKE SURE THAT THE WATER SUPPLIED TO THE PACKING GLAND MEETS OR EXCEED 50 MICRON REQUIREMENTS.

1. With the exception of incorrectly installed or adjusted packing the single most common cause for failure is due to contaminated or insufficient supply of water to the packing gland. **CONTAMINATED WATER OR WATER WITH ABRASIVE CONTAMINANTS WILL RESULT IN EXTREMELY SHORT PACKING LIFE AND CAUSE SLEEVE WEAR.**

H) FIBERPREP, INC. RECOMMENDS THE FOLLOWING SEQUENCE FOR PACKING INSTALLATION:

1. One ring of packing in packing gland stuffing box.
2. Lantern Ring. Ensure that the lantern ring lines up with the water feed orifice in the stuffing box.
3. Four additional rings of packing after the Lantern Ring.
4. See Stuffing Box Configuration DISC 6 for arrangement of stuffing in other machines.

PREVENTATIVE MAINTENANCE

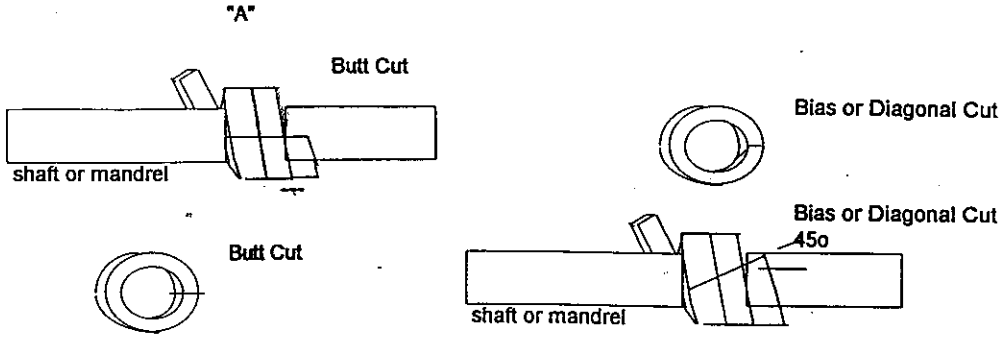
7. PACKING INSTALLATION INSTRUCTION (continued)

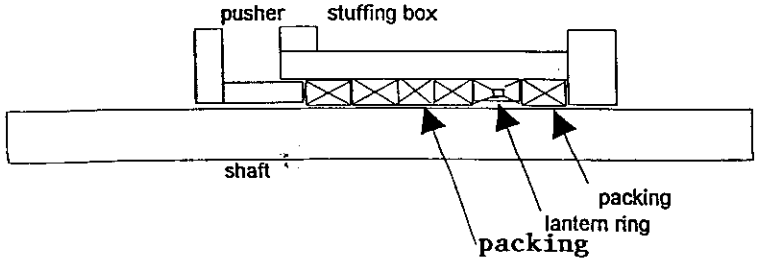
Note: Machines built before 1994 have a different sequence than that noted above. Refer to the ASSEMBLY DRAWING which was supplied with your machine whenever installing packing to ensure that the correct sequence is used when installing packing.

I) **REPLACE PACKING WHEN LEAKAGE CANNOT BE CONTROLLED BY FURTHER TAKE UP ON THE FOLLOWER GLAND.**

J) **PACKING GLAND PACKING WILL TYPICALLY WEAR MOST AT THE OUTER TWO RINGS OF PACKING:**

About 70% of wear is on the outer two packings nearest the packing gland pusher. However, each additional ring does throttle some of the fluid pressure. On most machines, there must be enough rings so if one fails, another does the sealing, and the machine need not be shut down.





FIBERPREP/LAMORT SLOTTED DIABOLO

CORRECTIVE MAINTENANCE

INTRODUCTION

The corrective maintenance procedures in the following sections assume that major corrective maintenance tasks will be limited to removing, disassembling, and reassembling major components or parts of the Diabolo-S.

While some parts may be refurbished or repaired when severely worn or damaged, the time required for these repairs can be days or weeks. As the machine cannot be bypassed, any Diabolo-S down time will result in shutdown of the pulper. While Fiberprep makes a strong effort to support our customers, we cannot guarantee all spare parts will be in stock at all times. For this reason, Fiberprep strongly recommends that all recommended spare parts should be ordered and kept in stock. The spare parts list with recommended spare parts can be found at the back of this manual.

The following general procedures apply to all maintenance actions and are not repeated within each individual procedure. The maintenance technician should be thoroughly familiar with the general procedures before starting any disassembly or other maintenance action.

FIBERPREP/LAMORT SLOTTED DIABOLO

CORRECTIVE MAINTENANCE

DANGER! BEFORE ATTEMPTING ANY MAINTENANCE OPERATION MAKE SURE ALL LOCKOUT STEPS DETAILED IN THE LOCKOUT PROCEDURE SECTION ARE FOLLOWED BEFORE WORKING ON THE DIABOLO. DO NOT ATTEMPT TO LIFT OR HANDLE PARTS WEIGHING MORE THAN 45 LBS. (20 KG) WITHOUT THE HELP OF ANOTHER PERSON OR HOIST. TWO-MAN LIFTS SHOULD NOT EXCEED 100 LBS. (45 KG).

CLEANING AND INSPECTING PARTS

Each time the Diabolo-S is disassembled, all parts should be cleaned in a suitable solvent to remove scale or contaminants. After cleaning, dry the parts and inspect for wear or damage. Replace all damaged or severely worn parts prior to reassembly. Cover bearings that are reusable with grease-resistant paper or plastic sheets until time for reassembly. Protect all other parts with suitable coverings to avoid damage or dirt while awaiting reassembly. Bearings that show signs of corrosion, galling or pitting must be replaced. Other parts may be kept in service provided the fault will not interfere with operation. Deep scratches, gauges, or deformations are causes for replacing parts.

O-Rings, Seals and Packing

It is good maintenance to practice to replace O-rings and packing each time they are disturbed for disassembly. The decision to replace or reinstall such parts must be made individually on a basis of cost, availability, and condition. It is frequently false economy to reassemble a machine with new or refurbished parts only to have a faulty O-ring fail shortly after the job has

O-Rings, Seals and Packing (continued)

been completed. Should an inspection of an O-ring or other seal reveal any sign of deterioration, cracking, change in color, embrittlement, or other abnormal condition, replace it immediately.

GENERAL

The disassembly procedures are divided according to specific tasks rather than being arranged in complete disassembly sequence. Although there should rarely be a need to completely disassemble a Diabolo-S, the complete disassembly can be accomplished by following the individual procedures.

DANGER! MAKE SURE ALL LOCKOUT STEPS DETAILED IN THE LOCKOUT PROCEDURE SECTION ARE FOLLOWED BEFORE PERFORMING ANY OF THE FOLLOWING MAINTENANCE TASKS. SERIOUS INJURY OR DEATH MAY OCCUR IF LOCKOUT PROCEDURES ARE NOT FOLLOWED!

ROTOR REMOVAL

The rotor can be removed from the Diabolo-S without disturbing other major parts. Remove the rotor as follows:

1. After following the lockout procedure, remove all of the bolts from the door. Swing open the door to gain access to the rotor and screen.

2. Remove O-ring from casing groove. Inspect and replace if not in excellent condition.

FIBERPREP/LAMORT SLOTTED DIABOLO

CORRECTIVE MAINTENANCE

ROTOR REMOVAL (continued)

3. Cover the reject port at the bottom of the vat to ensure no tools or parts are dropped into the rejects.

4. Remove the socket head cap screws on the rotor cap. These cap screws hold the rotor on the shaft.

5. Remove the set screw in the center of the cap.

6. Place the screen/rotor removal tool over the end of the rotor, install a longer screw in the hole in the center of the rotor, jack the rotor free of the shaft.

7. Remove the rotor from the machine.

8. Remove the O-ring between the shaft and sleeve. Inspect and replace if not in excellent condition.

SCREEN PLATE REMOVAL

1. After completing the lockout procedure, remove rotor as described above.

2. Remove the screws which attach the screen to the case.

3. Remove the screen plate.

FIBERPREP/LAMORT SLOTTED DIABOLO

CORRECTIVE MAINTENANCE

ROTOR MECHANISM DISASSEMBLY

(See Dodge Pillow Block Instruction Manual in Appendix Section.)

1. After completing the lockout procedure, remove the rotor as described in previous sections. Refer to the rotating assembly drawing included at the back of this manual while reviewing this procedure.

2. Decrease tension on the belts (as described in the Preventive Maintenance Chapter). Remove the belts.

3. Disconnect packing water line.

4. Remove packing gland nuts and slide packing gland back on shaft.

5. Remove packing and lantern ring.

6. Remove the cap screws that secure the stuffing box and remove the stuffing box. These are located inside the case.

7. Remove the driven pulley by removing screws and bushings that secure the pulley to the shaft. Retain the key for use at reassembly.

8. Remove the cap screws that secure the bearing caps. Then remove the bearing caps.

ROTOR MECHANISM DISASSEMBLY (continued)

9. Lift the shaft with the bearings out of the lower bearing housings and take to a clean work area. Back off set screws that retain bearing to shaft. **Note: There is a retaining ring at the bearing near the sheave. This must also be removed.**

10. Remove the bearing from the sheave end of the shaft.

11. Remove the inboard bearing from the sheave end of the shaft. This bearing may be removed from the rotor end, but the sleeve must be removed first.

12. Inspect the replaceable packing wear sleeve and replace if required. A special puller may be fabricated to make the job easier.

REASSEMBLY (Refer to Rotating Assembly Drawing in Appendix.)

A. Installation of New Bearings

1. Clean shaft and check for straightness and proper dimension. Apply thin coat of light oil to clean shaft surface.

2. Install the "free" bearing. This is the bearing nearest the case.

3. Install the retaining ring.

REASSEMBLY (continued)

4. The outboard bearing is the "held" bearing. Slide the bearing onto shaft and position against retaining ring.

5. Tighten set screws on the "held" bearing.

6. Do not tighten set screws on the "free" bearing until the assembly is placed in the pillow blocks.

B. Installation of Shaft and Bearings

1. Clean lower bearing housings, which should still be in their original undisturbed mounted position. (If it is necessary to replace or move the lower bearing housings, complete and thorough shaft realignment steps will be required on re-assembly.)

2. Install shaft and bearings in the lower halves of the pillow blocks.

3. Clean upper halves of pillow blocks, re-install.

4. Check shaft alignment by mounting dial indicator on shaft and indicating to machine fit for the stuffing box flange. Shaft should be "true" (.002 T.I.R) Re-install stuffing box. Make sure sealing "O"-Ring is in place.

FIBERPREP/LAMORT SLOTTED DIABOLO

C. Completing Reassembly:

1. Reinstall screen plate.

2. Reinstall rotor.

3. Repack stuffing box and reconnect packing water lubrication.

4. Reinstall driven sheave and align.

5. Reinstall belts and tension.

6. Reinstall all guards.

7. Review and complete the Post Maintenance Checkout. (See following section)

FIBERPREP/LAMORT SLOTTED DIABOLO

POST MAINTENANCE CHECKOUT

After any maintenance procedure that requires opening or disassembling any part of the pressure screen, make the following simple checks before restoring the pressure screen to service:

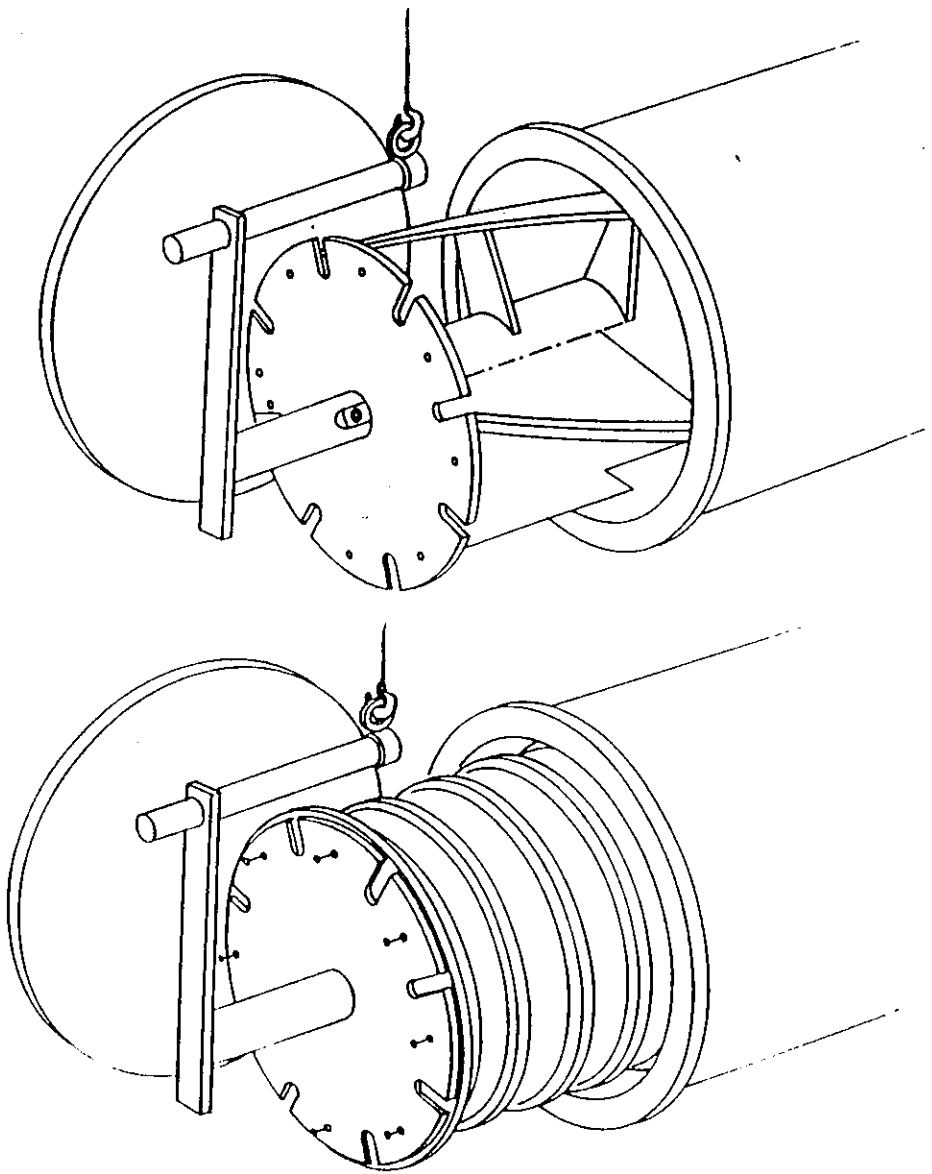
CAUTION! Do not start or apply power to the drive motor until checks 1 through 5, below, have been completed.

1. Check to assure that lube lines have been reconnected and that bearings have been properly lubricated.
2. Check tension of drive belts.
3. Check that nuts on motor retaining bolts have been tightened.
4. Turn the pressure screen slowly by hand to assure that there is no binding, scraping, wobble, or unusual noise.
5. Correct any abnormal conditions before starting drive motor.
6. Start water to the packing gland.
7. Restore power to drive motor and start pressure screen empty. Let pressure screen run in air for a few minutes to assure that it is running well with no interference; then, shut it down.

CAUTION! Do not fill a pressure screen while it is turning. Always make certain that it has stopped turning before opening a fill valve.

8. Fill pressure screen with clear water and check that all joints, seams, and connections are free of leaks. Correct any leaks found before returning the pressure screen to service.

SLOTTED DIABOLO INSTALLATION AND
REMOVAL SHOWING FIXTURE USE TYPICAL



FIBERPREP/LAMORT SLOTTED DIABOLO

ADDENDUM - Optional

FIBERPREP/LAMORT SLOTTED DIABOLO

APPENDIX

FIBERPREP/LAMORT SLOTTED DIABOLO

PREPARATION FOR LONG TERM STORAGE OF FIBERPREP EQUIPMENT

1. Purpose

The purpose of this bulletin is to provide instructions for preparing equipment for long term storage. This enables the user to store the equipment for a long period of time and be confident that it will be ready for use when desired.

2. General

All equipment shall be stored inside a heated building. The minimum recommended temperature is 45° F. All equipment shall be covered with a suitable waterproof cover. Heavy polyethylene or a plastic tarp is ideal for this purpose.

3. Preparation of Gearboxes for Long Term Storage

It is always desirable, when possible, to have the supplier prepare the gearbox for long term storage. If this is not possible, all the oil must be drained from the box and the unit filled with Mobil Vaportech light or equivalent.

All external machined surfaces must be coated with heavy grease to prevent rusting.

The input shaft on the gearbox must be rotated a minimum of twenty turns once every fourteen days to distribute the lubricant and relocate the bearing elements.

FIBERPREP/LAMORT SLOTTED DIABOLO

PREPARATION FOR LONG TERM STORAGE OF FIBERPREP EQUIPMENT

4. Long Term Storage of Valves and Cleaners

All external machine surfaces and moving elements including cylinder rods, etc., must be coated with heavy grease.

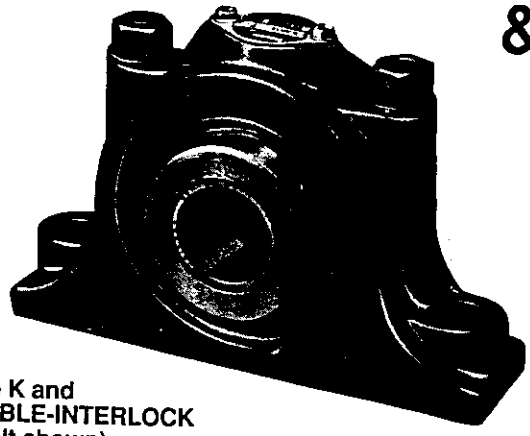
This type of equipment does not require any attention during storage beyond examination, to make sure that rusting is not taking place.

5. Preparation of Machines Utilizing Greased Bearings

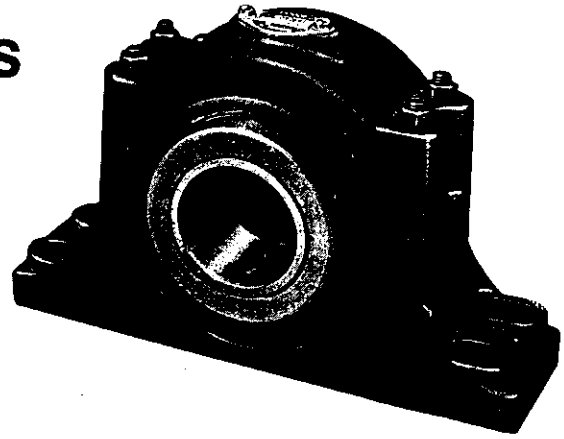
Machines using grease in the bearings need only be prepared and packed as for normal operation. All external machined surfaces must be coated with heavy grease to avoid rusting. Every fourteen days the machine must be rotated about ten turns to distribute the grease and the bearing roller positions.

* * *

DODGE® INSTRUCTION MANUAL
for
Type K, DOUBLE-INTERLOCK® & TAF-XT Pillow Blocks & S-1 Units



Type K and
DOUBLE-INTERLOCK
(2 bolt shown)



TAF-XT
(4 bolt shown)

INSTALLATION INSTRUCTIONS
(Normal Speed and Load)

WARNING
To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

1. Clean shaft and bore of bearing. Lubricate with light oil or anti-seize compound.

2. Slip bearing in position noting step 3.

3. **Expansion Bearing:** Loosen cap bolts in outer housing a little so inner unit is free to align in outer housing. Outer housing shims provide a proper fit and must not be removed. Bolt outer housing to support. Expansion type outer housings should be located so inner unit can move freely in either direction.

Non-Expansion Bearings: Loosen cap bolts in outer housing a little so inner unit is free to align in outer housing. The hold-down bolts should be loose in the bolt holes. If the bolts are tight in bolt holes, the unit should be moved slightly on the shaft to provide looseness. This will help prevent preloading or inducing an initial thrust on bearings. Tighten nuts on hold-down bolts.

4. Tighten set screws to the torque values shown on Table 4. TAF-XT bore sizes 2 11/16" thru 3 1/2" may require removal of cap in order to tighten collar setscrews.

5. Turn shaft several revolutions, or run shaft, if feasible and safe, to allow alignment of inserts in their respective housings. Retighten cap bolts of both the expansion and the non-expansion outer housing to recommended torque in Table 3. Outer housing shims provide a proper fit and must not be removed.

6. The effort required to turn the shaft should be the same before and after bolting bearings to the support.

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Reliance Electric Industrial Company nor are the responsibility of Reliance Electric Industrial Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

DODGE / P.O. Box 499 / 6040 Ponders Court / Greenville, S.C. 29602-0499 / 803-297-4800

RELIANCE ELECTRIC

Printed in U.S.A.

Instruction Manual 499798

INSTALLATION INSTRUCTIONS
(High Speed and/or Light Load)

Use this procedure for mounting pillow block bearings on horizontal or vertical applications, operating at high speed (above 75% of rated speed) or under light load (less than 2% of Dynamic Capacity).

WARNING

To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

1. Shaft must be clean, free of burrs and lubricated. File nicks from housing bases.

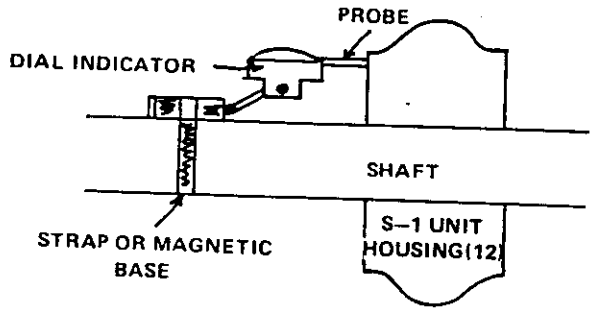
2. Loosen setscrews (52) in collar (50) and slide bearings on shaft. If force is necessary, tap inner race **only** with a light drift. For vertical applications, locate adjusting nut (24) on bearing so nut faces upward.

3. Loosen housing cap bolt nuts one (1) turn.

4. Position expansion (floating) pillow block on mounting surface and tighten base hold-down bolts.

5. Position non-expansion (fixed) pillow block in correct relation to shaft and mounting surface. Tighten base hold-down bolts, then torque setscrews (52) in collar per Table 4.

6. Mount a dial indicator on the shaft near the non-expansion (fixed) bearing. Place the indicator probe so that it contacts the machined surface of the S-1 Unit Housing (12) perpendicular to that surface. See sketch below.



7. Zero the indicator and sweep the machined face 360°, noting the total indicator turnout (TIR).

8. If the TIR is less than or equal to the value shown on Table 1, tighten the housing cap bolts per Table 3.

9. If the TIR is greater than shown on Table 1, gently tap the machined face of the S-1 housing until the TIR is less than or equal to the value shown on Table 1. Then torque the housing cap bolts per Table 3. Sweep machined faces again to verify that the TIR is still less than or equal to the value shown on Table 1.

10. The non-expansion (fixed) bearing is now installed Move to the expansion (floating) bearing.

11. Locate expansion unit in center of its axial travel or at extreme if maximum expansion is required (do not pre-load stop pin) and torque collar setscrews (52) per Table 4.

12. Do not install external grease fittings until completion of final steps below.

13. Torque setscrews of expansion unit. (Table 4)

14. Repeat Steps 6, 7, 8 and 9 for the expansion bearing.

15. The expansion (floating) bearing is now installed.

TABLE 1

Total Indicator Run-out (TIR)	
Shaft Size (Inches)	TIR (Inches)
1 3/16 — 1 7/16	.0030
1 1/2 — 1 11/16	.0035
1 3/4 — 2	.0040
2 3/16	.0040
2 1/4 — 2 1/2	.0045
2 11/16 — 3	.0055
3 3/16 — 3 1/2	.0065
3 15/16 — 4	.0070
4 7/16 — 4 1/2	.0080
4 15/16 — 5	.0085

FLANGE BEARINGS

Follow instructions for Pillow Block Bearings operating at applicable speed and load noting that: setscrew torque and total indicator runout (TIR) are the same for flange bearings and pillow blocks. Use Tables 1 and 3. Refer to Table 2 for housing clamp bolt torque.

TABLE 2

FLANGE BEARING HOUSING CLAMP BOLTS

Shaft Size (Inches)	Bolt Size	Bolt Quantity	Bolt Torque (Ft.-Lbs.)
1 3/8 — 1 7/16	3/8 — 16	2	20
1 1/2 — 2 3/16	1/2 — 13	2	50
2 1/4 — 3	5/8 — 11	2	100
3 3/16 — 3 1/2	3/4 — 10	2	175
3 15/16 — 4	7/8 — 9	2	170
4 7/16 — 4 1/2	1 — 8	2	250
4 15/16 — 5	1 1/8 — 7	2	350

ILLOW BLOCK

3

ectedly started, turn off
ce before proceeding.
utions could result in

each outer housing be-
ing pillow blocks
nd bases match.

before putting on shaft.

and on the base of the
npound.

4. Add or remove shims between cap and base as required to obtain "snug" fit of unit in outer housing with cap bolts tightened to specified torque in Table 3.

5. Check fit by prying against lubrication stud in unit through the lubrication hole in housing cap with a screwdriver or small pinch bar depending upon the size of the pillow blocks.

6. The "snug" fit becomes a matter of judgment. A "loose or sloppy" fit may allow a unit mount to move in its outer housing thus wearing the mating surfaces. Too "tight" a fit will not allow the unit to move and compensate for misalignment and for shaft deflection caused by belt pull and dead weight.

7. Install bearings per installation instruction steps applicable to the operation.

sion & Expansion)*

-INTERLOCK (Cont'd.)		TAF-XT	
A	Torque (ft.-lbs.)	Size ▲	Torque (ft.-lbs.)
½"	100	2 7/16" & 2½" (4 bolt)	20
½"	20	2 15/16" - 3½" (4 bolt)	29
½"	103	3 15/16" - 4" (4 bolt)	58
bolt) bolt)	50 29	4 7/16" & 5" (4 bolt)	103
4"	58	5 7/16" & 6" (4 bolt)	250
	103	6 7/16" & 7" (4 bolt)	350
bolt)	250		
bolt)	350		

on or Expansion bearings.
ings of same shaft diameter are different.

TABLE 4

Set Screw Torque	
Size	In.-Lbs.
5/16	165
3/8	290
1/2	620
5/8	1325
3/4	2150
7/8	5130

LUBRICATION INSTRUCTIONS

If exposed to wet or
rs, extra protection is
at the seals; rotate
the bearing. After
fresh grease before

her speed ranges
ing. The amount of
a particular high
rmined by exper-
below. If excess
ing, it will be neces-
drain plug when fur-
cape. The bearing
is ready to run. When
note that a small
rvals is preferable to

Operation in Presence of Dust, Water or Corrosive Vapors — Under these conditions the bearing should contain as much grease as speed will permit, since a full bearing with consequent slight leakage is the best protection against entrance of foreign material. In the higher speed ranges too much grease will cause overheating — see "High Speed Operation" above. In the lower speed ranges it is advisable to add extra grease to a new bearing before putting into operation. Bearings should be greased as often as necessary (daily if required) to maintain a slight leakage at the seals.

Average Operation — This bearing has been greased at the factory and is ready to run. The following table is a general guide for relubrication. However, certain conditions may require a change of lubricating periods as dictated by experience. See "High Speed Operation" and "Operation in Presence of Dust, Water or Corrosive Vapors" above.

Operating Temperature — Abnormal bearing temperature may indicate faulty lubrication. Normal temperature may range from "cool to warm to the touch" up to a point "too hot to touch for more than a few seconds," depending on bearing size and speed, and surrounding conditions. Unusually high temperature accompanied by excessive leakage of grease indicates too much grease. High temperature with no grease showing at the seals, particularly if the bearing seems noisy, usually indicates too little grease. Normal temperature and slight showing of grease at the seals indicate proper lubrication.

Lubrication Guide

Read Preceding Paragraphs Before Establishing Lubrication Schedule.

Hours Run per Day	Suggested Lubrication Period in Weeks				
	1 to 250 RPM	251 to 500 RPM	501 to 750 RPM	751 to 1000 RPM	1001 to 1500 RPM
8	12	12	10	7	5
16	12	7	5	4	2
24	10	5	3	2	1

Kind of Grease — Many ordinary cup greases will disintegrate at speeds far below those at which DODGE bearings will operate successfully if proper grease is used. DODGE bearings have been lubricated at the factory with No. 2 consistency lithium-base grease which is suitable for normal operating conditions. Relubricate with lithium-base grease or a grease which is compatible with original lubricant and suitable for roller bearing service. In unusual or doubtful cases the recommendation of a reputable grease manufacturer should be secured.

Special Operating Conditions — Refer acid, chemical, extreme or other special operating conditions to DODGE RELIANCE ELECTRIC INDUSTRIAL COMPANY, Greenville, SC 29602

Reference	Name of Part	Req'd. for One Ass'y. N.E. Pil. Blk.	Exp. Pil. Blk.	S-1 Unit	Part Numbers for Various Shaft Sizes 1 3/16, 1 1/4	1 3/8, 1 7/16	1 1/2, 1 5/8, 1 11/16	1 3/4, 1 7/8, 1 15/16, 2	2 3/16	2 1/4, 2 7/16, 2 1/2	2 11/16, 2 3/4, 2 15/16, 3
2	Pillow Block Housing										
	2 bolt Non-Expansion (K/DI)*	1	—	—	056130	056132	056134	056136	056138	056140	056142
	2 bolt Expansion (K/DI)*	—	1	—	056100	056102	056104	056106	056108	056110	056112
	4 bolt Non-Expansion (K/DI)*	1	—	—	—	—	—	—	—	060745	060747
	4 bolt Expansion (K/DI)*	—	1	—	—	—	—	—	—	060746	060748
	4 bolt Non-Expansion (TAF-XT)	1	—	—	—	—	—	—	—	042616	042618
	4 bolt Expansion (TAF-XT)	—	1	—	—	—	—	—	—	042615	042617
4	Lubrication Cover/Nameplate										
	K/DI Expansion	—	—	—	403941	403941	403941	403941	403941	403941	403941
	K/DI Non-Expansion	1	—	—	403870	403870	403870	403870	403870	403870	403870
	TAF-XT Expansion	1	1	—	—	—	—	—	—	403947	403947
	TAF-XT Non-Expansion	1	1	—	—	—	—	—	—	405825	405825
6	Lubrication Cover Screw	2	2	—	411001	411001	411001	411001	411001	411001	411001
↓	Housing Shim										
	2 bolt Housing	2	2	—	427200	427201	427202	427203	427204	427205	427206
	4 bolt Housing	2	2	—	—	—	—	—	—	427170	427171
12	S-1 Unit Housing	1	1	1	056120	060430	060431	060432	060433	060434	060435
14	Cup	2	2	2	390748	390751	390755	390760	390762	390766	390771
16	Lubrication Fitting	1	1	1	405015	405015	405015	405015	405015	405015	405015
18	Lubrication Stud	1	1	1	—	405010	405010	405010	405010	405010	405010
22	Adjustment Shim Pack	1	1	1	391101	391102	391103	391104	391105	391106	391107
26	Snap Ring	1	1	1	401002	401004	401008	401012	401016	401020	401024
	Seal, Single Lip	2	2	2	061355	061356	061357	061358	061359	061360	061361
50	Drive Collar (65° Set Screw Angle)*	+	+	+	060944	040050	040051	040052	040053	040054	040055
52	Drive Collar Screw ▲	‡	‡	‡	400054	400058	400058	400094	400094	400094	400150

Reference	Name of Part	Req'd. for One Ass'y. N.E. Pil. Blk.	Exp. Pil. Blk.	S-1 Unit	Part Numbers for Various Shaft Sizes 3 3/16, 3 1/4, 3 7/16, 3 1/2	3 15/16, 4	4 7/16, 4 1/2	4 15/16, 5	5 7/16	5 15/16, 6	6 7/16, 6 1/2	6 15/16, 7
2	Pillow Block Housing											
	2 bolt Non-Expansion (K/DI)*	1	—	—	056144	—	—	—	—	—	—	—
	2 bolt Expansion (K/DI)*	—	1	—	056114	—	—	—	—	—	—	—
	4 bolt Non-Expansion (K/DI)*	1	—	—	060749	060751	060753	060755	060579	060579	060583	060583
	4 bolt Expansion (K/DI)*	—	1	—	060750	060752	060754	060756	060578	060578	060582	060582
	4 bolt Non-Expansion (TAF-XT)	1	—	—	042620	042622	042624	042626	042628	042630	042632	042634
	4 bolt Expansion (TAF-XT)	—	1	—	042619	042621	042623	042625	042627	042629	042631	042633
4	Lubrication Cover/Nameplate											
	K/DI - Exp.	—	—	—	403941	403940	403940	403940	405043	405043	405043	405043
	K/DI - Non-Exp.	1	1	—	403870	403871	403871	403871	405043	405043	405043	405043
	TAF-XT - Expansion	—	1	—	403947	403948	403948	403948	403949	403949	403949	403949
	TAF-XT - Non-Expansion	—	1	—	405825	405826	405826	405826	405888	405888	405888	405888
6	Lubrication Cover Screw	2	2	—	411001	411001	411001	411001	—	—	—	—
↓	Housing Shim											
	2 bolt Housing	2	2	—	427207	—	—	—	—	—	—	—
	4 bolt Housing	2	2	—	427172	427173	427174	427175	427176	427176	427177	427177
12	S-1 Unit Housing	1	1	1	060436	060437	060438	060439	042720 1)	042720 1)	042721 1)	042721 1)
14	Cup	2	2	2	390776	390779	390782	390785	391826	391826	391829	391829
16	Lubrication Fitting	1	1	1	405015	405015	405015	405015	405015	405015	405015	405015
18	Lubrication Stud	1	1	1	405010	405018	405018	405018	405018	405018	405018	405018
24	Adjustment Nut	1	1	1	060490	060491	060492	060493	—	—	—	—
25	Adjustment Nut Screw	1	1	1	400530	400530	400530	400530	—	—	—	—
30	End Plate	1	1	1	—	—	—	—	060046	060046	060047	060047
32	End Plate Shim Pack	—	—	—	—	—	—	—				
	.002" Thick	2	2	2	—	—	—	—	427065	427065	427068	427068
	.005" Thick	2	2	2	—	—	—	—	427064	427064	427067	427067
	.010" Thick	2	2	2	—	—	—	—	427063	427063	427066	427066
	.020" Thick	2	2	2	—	—	—	—	427061	427061	427062	427062
34	End Plate Screw	8	8	8	—	—	—	—	411576	411576	411577	411577
36	Lockwasher	8	8	8	—	—	—	—	419010	419010	419011	419011
40	Seal, Single Lip	2	2	2	061362	061363	061364	061365	061366	061366	061367	061367
50	Drive Collar (65° Set Screw Angle)*	2	2	2	060945	060946	060947	040059	043384	043384	043385	043385
52	Drive Collar Screw ▲	4	4	4	400154	400186	400186	400190	400238	400234	400252	400251

Reference	BRG. Type	Name of Part	Req'd.	Part Numbers for Various Shaft Sizes 1 3/16	1 1/4	1 3/8	1 7/16	1 1/2	1 5/8	1 11/16	1 3/4	1 7/8
15	Type K DI TAF-XT	Cone	1	389760	389761	389762	389763	389764	389765	389766	389767	—
			1	389782	389783	389784	389785	389786	389787	389788	389789	389790
			1	—	—	—	—	—	—	—	—	—
		Shaft Size →		1 15/16	2	2 3/16	2 1/4	2 7/16	2 1/2	2 11/16	2 3/4	2 15/16
15	Type K DI TAF-XT	Cone	1	389768	389769	389770	389771	389772	389773	389774	389775	389776
			1	389791	389792	389793	389794	389795	389796	389797	389798	389799
			1	—	—	—	—	389795	389796	—	—	389799
		Shaft Size →		3	3 3/16	3 1/4	3 7/16	3 1/2	3 15/16	4	4 7/16	4 1/2
15	Type K DI TAF-XT	Cone	1	389777	389778	—	389779	389780	389781	—	—	—
			1	389800	389801	389802	389803	389804	389805	389806	389807	389808
			1	389800	—	—	389803	389804	389805	389806	389807	389808
		Shaft Size →		4 15/16	5	5 7/16	5 15/16	6	6 7/16	6 1/2	6 15/16	7
15	DI TAF-XT	Cone	§	389809	389810	391826	391826	391826	391828	391828	391828	391828
				389809	389810	391826	391826	391826	391828	391828	391828	391828
20	DI TAF-XT	—	—	—	—	059960	059961	059962	059963	059964	059965	059966
		Sleeve (65° S.S. Angle)	1	—	—	059960	059961	059962	059963	059964	059965	059966

Shaft Tolerances: Up to 1 1/2" + .0000 − .0005 4 7/16" to 6" + .0000 − .0015
1 5/8" to 4" + .0000 − .0010 6 7/16" to 7" + .0000 − .0020

↓ Not shown on drawing
* K = type K; DI = DOUBLE-INTERLOCK

+ 2 required on DOUBLE-INTERLOCK and TAF-XT; 1 required on type K.
‡ 4 required on DOUBLE-INTERLOCK and TAF-XT; 2 required on type K.
§ 1 required on sizes 4 15/16 & 5; 2 required on size 5 7/16 and larger.
1) 5 7/16" - 6" DI Part #060440
6 7/16" - 7" DI Part #060441
• Includes part listed below marked ▲

FIBERPREP/SLOTTED DIABOLOFINER DRAWINGS LIST

SLOTTED DIABOLO DRAWING LIST	
DRAWING NO.	TITLE
DDS2-4308	Diabolo-S Rotating Assembly
DDBS2-4534	Diabolo-S Installation
* 961080F0	Diabolo-S Flow Balance & Typical Operation

*Check with Process Engineering - This drawing is specific for each customer.

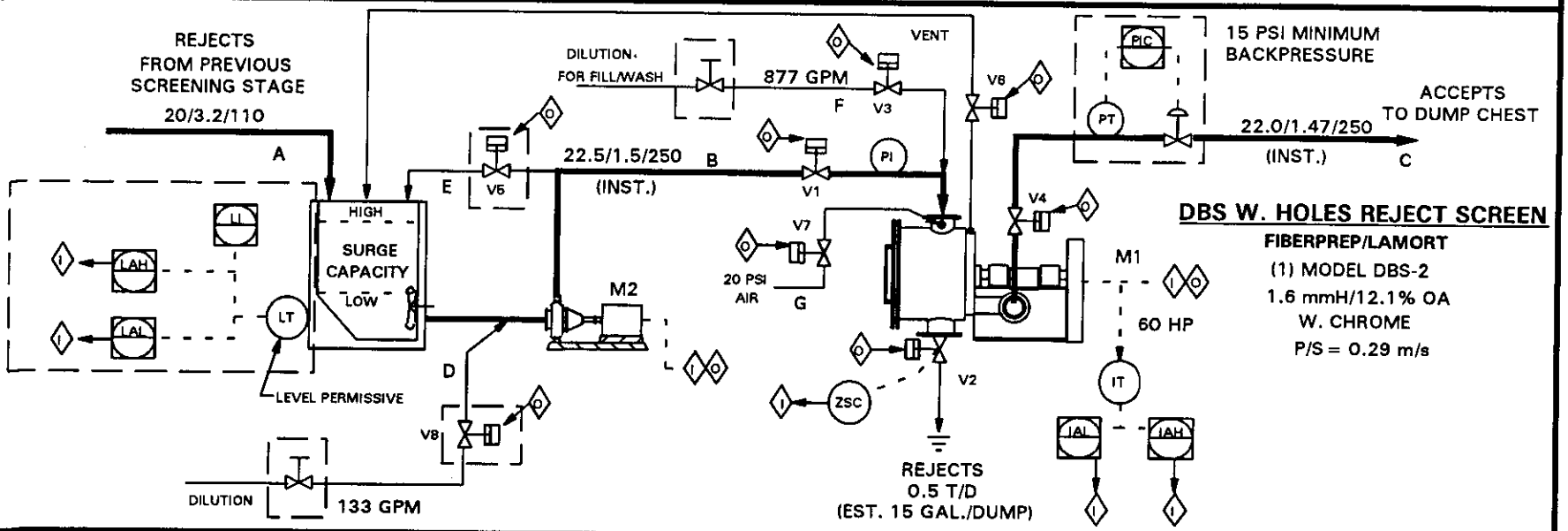
TABLE OF OPERATION

STEP	FUNCTION	V1 NC	V2 NC	V3 NC	V4 NC	V5 NO	V6 NC	V7 NC	V8 NC	M1	M2
0	STANDBY	C	C	C	C	O	C	C	C	*	+
1.1	FILL DIABOLO	C	C	O	C	O	O	C	C	*	+
1.2	FILL DIABOLO	C	C	C	C	O	C	C	C	+	+
2.1	STOCK FLOW	O	C	C	O	C	C	C	O	+	+
3.1	WASH REJECTS	C	C	O	O	O	C	C	C	+	+
4.1	DRAIN	C	C	C	O	O	C	O	C	+	+
5.1	REJECT	C	O	C	C	O	O	C	C	*	+

LEGEND:
O - INDICATES VALVE OPEN
C - INDICATES VALVE CLOSED
+ - INDICATES MOTOR RUNNING
* - INDICATES MOTOR OFF

◇ = INPUT TO PLC
◇ = OUTPUT FROM PLC

- ON/OFF VALVE
- CONTROL VALVE
- MANUAL CONTROL VALVE
- VALVE/CONTROL BY CUSTOMER



DBS W. HOLES REJECT SCREEN

FIBERPREP/LAMORT
(1) MODEL DBS-2
1.6 mmH/12.1% OA
W. CHROME
P/S = 0.29 m/s

DIABOLO - SUGGESTED CYCLE

FLOW RATES - GPM

STEP	TIME MIN.	A	B	C	D	E	F	G
FILL	0.1	110				250	877	
STOCK FLOW	28.1	110	250	250	133			
WASH	0.2	110		877		250	877	
DRAIN	0.1	110		-----		250		100 CFM
DUMP	0.2	110				250		
PAUSE								
TOTAL CYCLE	28.8							

CODE: BDSTPD/%CONS./USGPM (STOCK FLOW CONDITIONS)

ALT. DBS W. HOLES SCREEN FOR TERTIARY COARSE SCREEN

FLOW BALANCE & TYPICAL OPERATION

FIBERPREP SUPPLIED PLC BASED CONTROL PANEL AND VALVE PACKAGE

INTERNATIONAL PAPER
OSWEGO, NY

DATE	BALANCE	BY
10/2/96		GJC

FIBERPREP 961080F0