SULZER | Papertec

BIRD L5 CLEANER

ABSTRACT

CUSTOMER AUBURN VPS PARTNERSHIP

ADDRESS AUBURN ME.

ORDER DATE 3/1/94 SALES ORDER NO. 25582-12

C.O.NUMBER 04358-M-018 SERIAL NO. HC-134

SYSTEM DESIGN

STAGE:			
1 ST	2	BANKS OF 36	CLEANERS
2 ND	1	BANKS OF 24	CLEANERS
3 RD	1	BANKS OF 8	CLEANERS
4th	1	BANKS OF 4	CLEANERS
		BANKS OF	CLEANERS

ELUTRICONES: [✓] YES [ ] NO STAGE 4th

TAGGING: Tag One: Primary Forward Cleaners Equip. No. 3020-61037

Tag One: Primary Forward Cleaners Equip. No. 3020-61137 (36 BANK)

Tag: Secondary Forward Cleaners Equip. No. 3020-66037 (24 BANK)

APPLICATION: Tag: Tertiary Forward Cleaners Equip. No. 3020-71037 (8 BANK)

REMARKS: Tag: Quaternary Forward Cleaners Equip. No. 3020-76037 (4 BANK)

CERTIFIED BY: E. DELGROSSO DATE: 5/12/94

DESCRIPTION

DEFINITION

The BIRD L-5 Cleaners are hydrocyclones that separate acceptable papermaking fibers from shive, sand, fiber bundles and other hard-to-remove debris by the difference in specific gravity.

BANK SIZES

The BIRD L-5 Cleaners are presently available in bank sizes of:
4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, and 48.
This manual covers all sizes.

TYPES

There are two (2) styles of cones available in two (2) types of material for a total of four (4) different cones.

The two styles available are:

1. Smooth Cone
2. Ribbed Cone

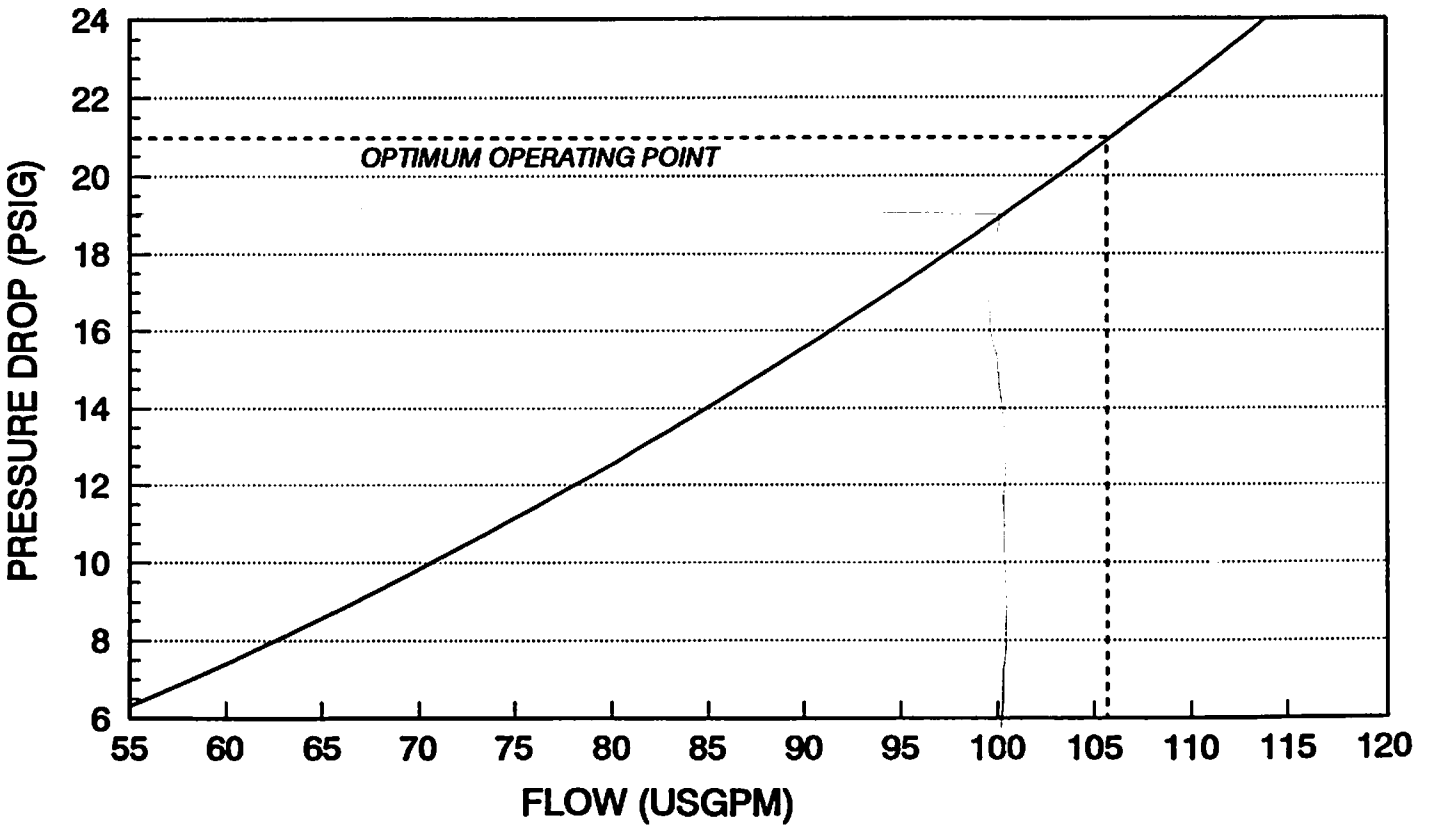
The two materials available are:

1. Nylon
2. Ceramic

The cones can be identified by the molded-in part number on the side of each cone.

In addition, an Elutricone is available for the BIRD L-5 Cleaner which recovers usable fiber from the rejects by the injection of dilution water.
The Elutricone is available only in the smooth style and ceramic material.

FLOW VS. PRESSURE DROP CAPACITY CURVE



L-5 CLEANER

SECTION FIVE

PRINCIPLES OF OPERATION

PRINCIPLES OF OPERATION

GENERAL

BIRD L-5 Cleaners are hydrocyclones which remove unwanted particles from pulp stock by a combination of centrifugal force and fluid shear. They work on the principle of a free vortex, generated by the force applied to a fluid by a pump to develop centrifugal action.

Bird L-5 Cleaner

INSTALLATION

INSTALLATION CONSIDERATIONS

FOUNDATION

The foundation should be designed to support the static weight of the cleaner unit when filled with water, and should be provided with adequate drainage.

Refer to the installation drawing supplied in the drawing section of this manual for size, number and location of anchor bolts. All concrete and anchor bolts are supplied by the customer.

Chart for approximate weights of the various banks of Bird L-5 Cleaners:
Pounds (Kilograms)

BANK SIZE	EMPTY WEIGHT W/OUT CLEANERS	FULL WEIGHT W/CLEANERS	POSITION OF CLEANERS
4	530 (241)	810 (368)	HORIZONTAL
8	550 (250)	1010 (459)	
12	1268 (576)	2285 (1039)	VERTICAL
16	1338 (608)	2532 (1151)	
20	1740 (791)	3940 (1791)	
24	1800 (818)	4211 (1914)	
28	2052 (933)	5073 (2306)	
32	2150 (977)	5389 (2450)	
36	2596 (1180)	6823 (3101)	
40	2666 (1212)	7105 (3230)	
44	2961 (1346)	8089 (3677)	
48	3030 (1377)	8370 (3804)	

If ceramic cones are ordered, add 8 lbs. per cleaner.

INLET, ACCEPTS, AND REJECT PIPING

The piping to the inlet, accept, and reject connections should be as free-flowing as possible. A minimum of 5 psi (35 kPa) back pressure is needed on the accept line.

Inlet, accept, and reject control valves and pressure gauges should be on all stages to properly control the system. Pressure relief valves should be installed to insure that system pressure does not exceed 60 psi (414 kPa).

If Elutricones are utilized, a control valve and pressure gauge should be installed in the elutriation piping.

Inlet control valves should be slow-opening so as not to subject the cleaner system to shock loading.

V-port ball valves are recommended for control of flow from reject headers.

The pressure gauges should be of diaphragm type with the gauge itself filled with a suitable oil and should be placed in view of each respective control valve for ease in system control.

Each pressure gauge should be placed at the same elevation as the header for which it serves. This will eliminate pressure measurement errors due to elevation changes.

VENT CONNECTIONS

(Applicable to 12 through 48 cleaner units.)
Vent openings are provided on each accept header.
Shut-off valves should be installed at these connections to permit occasional venting, such as is needed during start-up or shut-down.

DRAIN CONNECTIONS

(Applicable to 12 through 48 cleaner units).
Drain openings are provided on each feed and accept header:
one to drain the feed line and the other to drain the accept line.
Remove plugs to drain unit, and replace plugs before start-up.

INSTALLATION

SAMPLING

Sample valves should be located in all feed, accept, and reject lines of each stage. The best location is on vertical lines or on the sides of horizontal lines and away from fittings.
The sample lines should be at least one inch (1") dia. (25 mm).

ELECTRICAL

All electrical systems, hardware, and installations must be in accordance with the latest applicable section of NEMA, IEEE, and UL standards. They should also meet the requirements of the latest federal electrical code, OSHA, and any state or local codes. The most stringent of these requirements should be met.

EQUIPMENT INSPECTION

Thoroughly inspect this equipment before accepting shipment from the transportation company. If any of the goods called for in the bill of lading or express receipt are damaged, or the quantity is short, DO NOT accept until the freight or express agent makes an appropriate notation on your freight bill or express receipt. If loss or damage is discovered later, notify the freight or express agent at once and request an inspection. The transportation company is responsible for material or equipment lost or damaged in transit.

UNPACKING AND LIFTING

Carefully remove all hold-down fastenings before removing the BIRD L-5 Cleaner from the shipping skid.

CAUTION:

Lift the machine by the lifting eyes on the frame ONLY, as shown on the installation drawing.

CAUTION:

Cranes, lifting rigs, chains, cables, etc., used for lifting must be carefully checked before use to insure they are sound and that the lifting capacity has a safety factor beyond the maximum weights to be handled, including resulting forces in cables or chains due to angle of lift.

CAUTION:

Slings, cables or chains should be placed so as to avoid dangerous tipping of parts or unit. Test cautiously for balance before raising unit or large parts clear of supporting bases, frames, or floor. Stand clear when heavy parts are being lifted.

CAUTION:

Be sure lifting equipment cannot come in contact with electrical wiring or overhead electrical cables located in or around work area. Turn off power in such wiring or cables if there is any possibility of contact, however remote, before attempting to lift.

CAUTION:

Be careful of fingers and feet when setting machine down.

INSTALLING THE BIRD L5 CLEANER

GENERAL

The BIRD L-5 Cleaner header unit is shipped separate from the cleaners. The cleaners are shipped fully assembled as individual units.

MOUNTING

After the foundation requirements have been met, set the header unit in its place on its foundation. Tighten all mounting bolts securely. Never tighten foundation nuts in such a way as to create stresses on the header assembly which will cause mis-alignment of the cleaners . Grout base as shown on the Installation Drawing furnished in Section 10 of this manual.

PIPING

Attach all piping to the BIRD L-5 Cleaner System as shown on Installation Drawing in Section 10 of this manual. Be sure that pipes are properly supported. Forceful closing of gaps between flange connections could cause the cleaner ports to become misaligned, which will cause problems when cleaners are being installed.

Pipe supports should be adequate to restrain any dymanic loads occuring during startup or shutdown of the system.

CLEANER INSTALLATION INTO HEADER PORTS

1. Refer to installation drawing for proper lubrication of all three port O-rings. BEW recommends "P-80" Rubber lubricant which is manufactured by Inter Products Corporation.
2. Insert reject end of cleaner into "reject" header port using a slight twisting motion. Check that the O-ring is properly seated. See Figure 1.

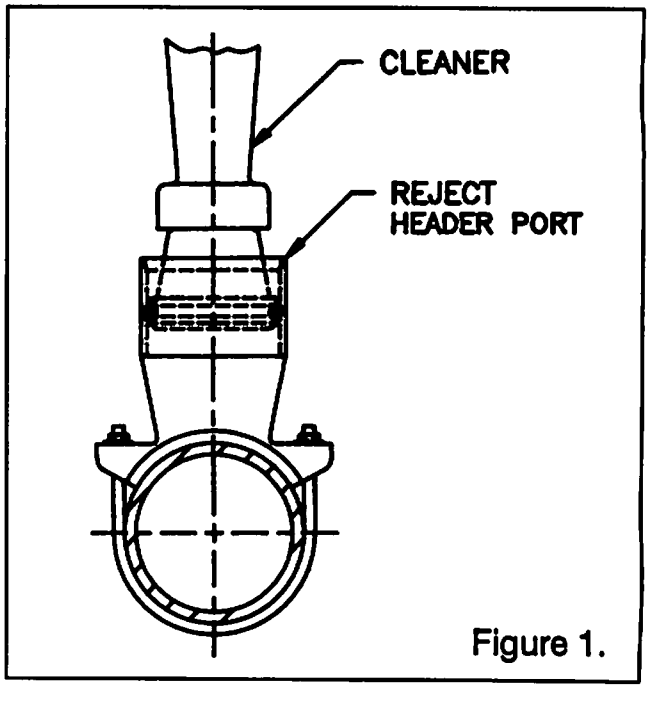


Figure 1.

CLEANER INSTALLATION INTO HEADER PORTS

3. Align feed and accept connections with the "feed-accept" module ports.
4. In the cleaner assembly box are (2) loose plastic clamps. Place one of of these clamps against the "feed-accept" module aligned with the threaded inserts of the module and with the open side of the clamp facing the cleaner. Refer to Figure 2.

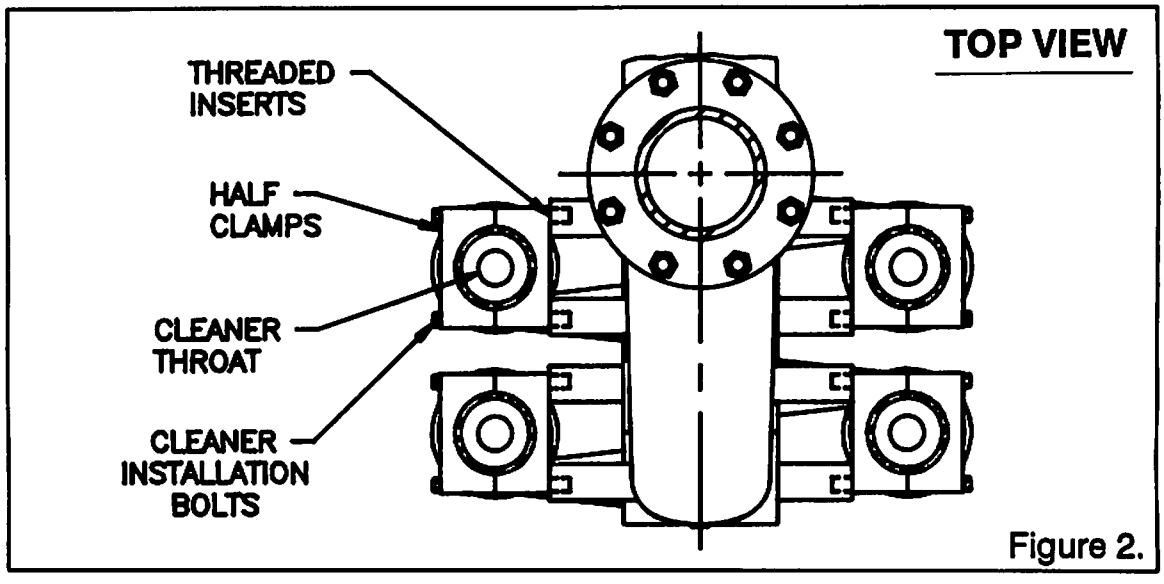


Figure 2.

5. Draw the feed and accept connections into position using the remaining plastic half clamp and (2) bolts provided. See Figure 3. Check that O-rings are seated properly in the grooves as unit is drawn into the header.
6. Torque bolts to 80 in.lb, ± 10 in.lb (9Nm, ± 1 Nm).
7. Remove the red pins from the cones (nylon only) and store these for later usage. (See Maintenance, Section 8.)

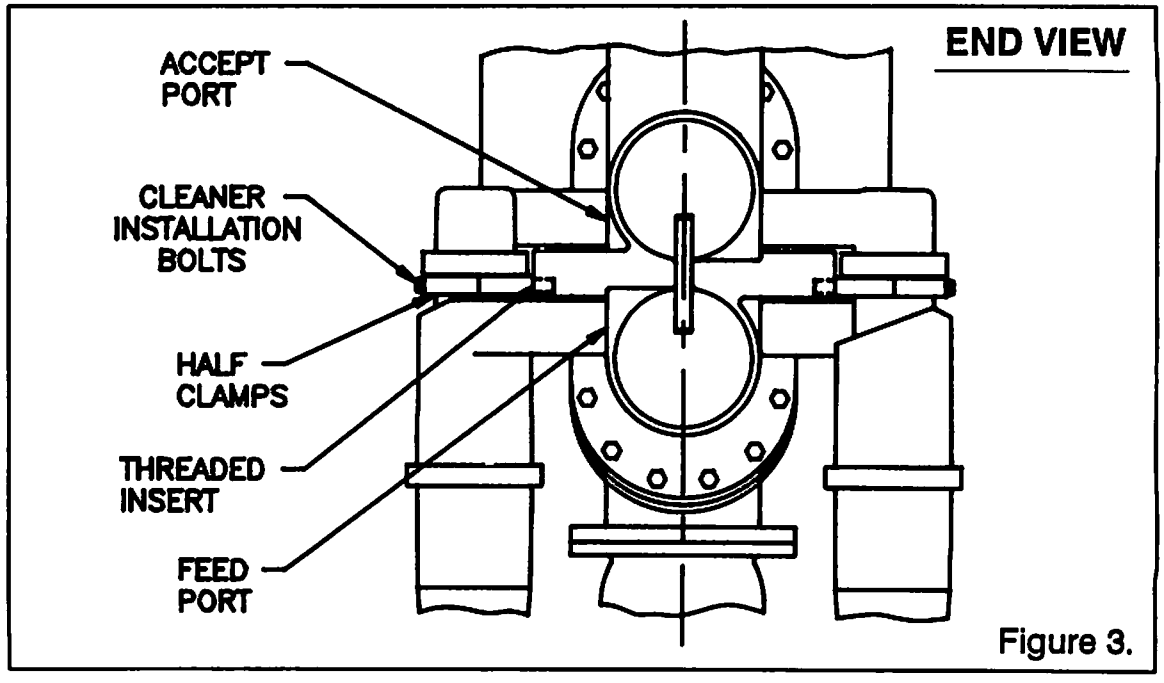


Figure 3.

INSTALLATION OF PLUGS INTO HEADER PORTS

CAUTION: Shut down Cleaner system and drain unit before removing cleaner and installing plugs.

It may be necessary to reduce the number of cleaners within a bank of cleaners for process reasons. Cleaner position plugs should be installed in modules, starting at the end of the bank which connects to the feed pipe from the mill.

Within a module, the cleaner positions nearest the feed and accept connections may be plugged off as shown in Figure 4. Never plug more than four cleaner positions per module. Otherwise a "dead zone" will be created if a plug is installed at the blind end of the bank or the blind end of a module.

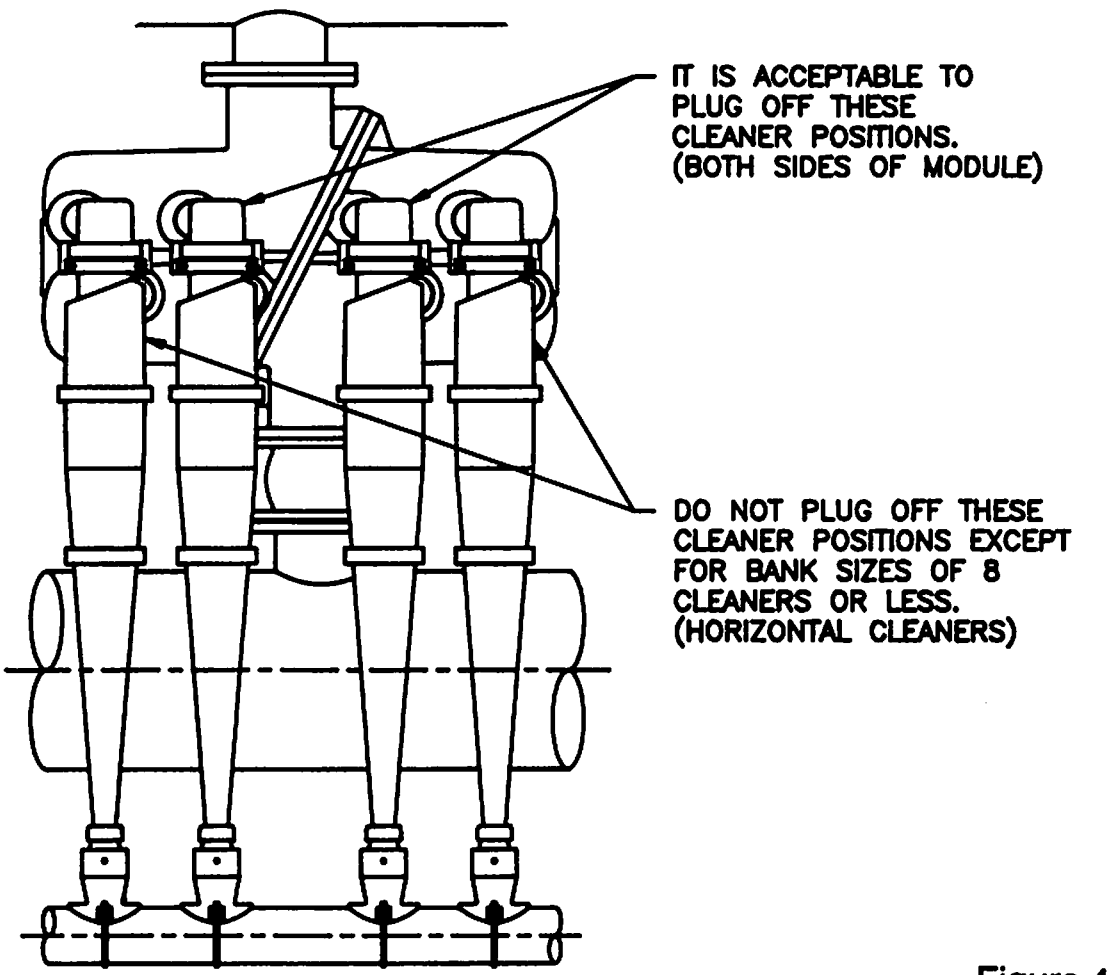


Figure 4.

INSTALLATION OF THE "FEED-ACCEPT" PLUG.

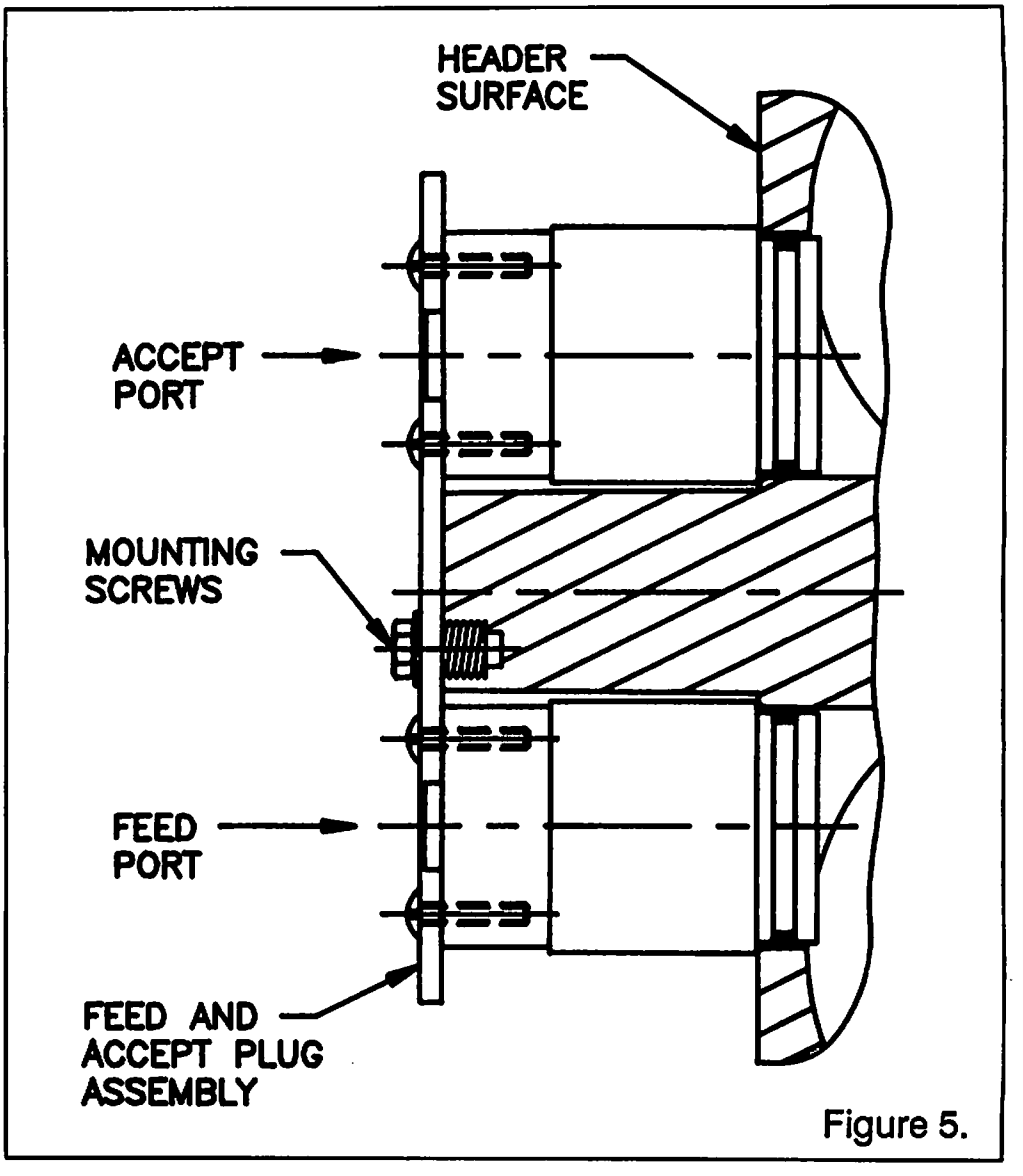


Figure 5.

1. Lubricate the O-Rings on the "feed-accept" plug with "P-80" rubber lubricant or equivalent.
2. Insert the "feed-accept" plug assembly into the respective header ports until the plugs bottom out on the header surface.
   Apply #262 loc-tite or equivalent to the two (2) hex-head screws which were supplied, and install into the two (2) threaded inserts.
   Check that the O-rings are properly seated. Refer to Figure 5.

INSTALLATION OF THE "REJECT" PLUG

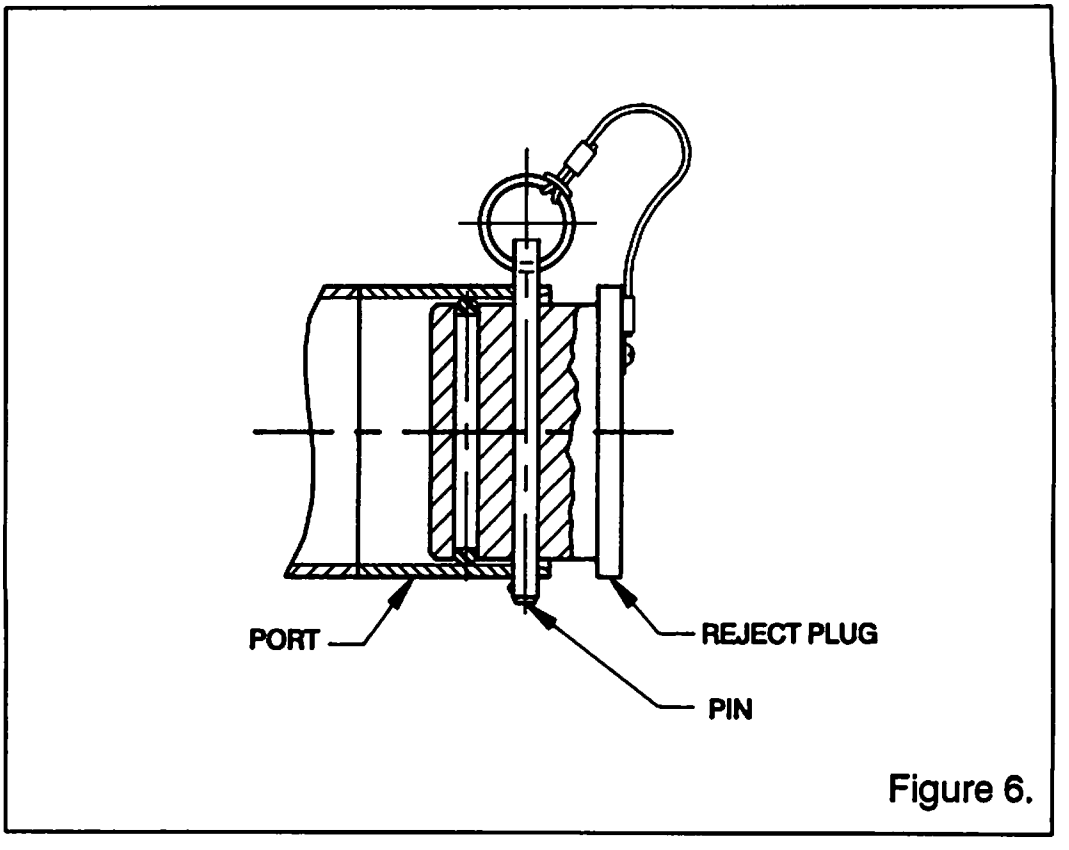


Figure 6.

1. Lubricate the O-Ring on the "reject" plug with "P-80" rubber lubricant or equivalent.
2. Insert plug into "reject" header port using a twisting motion. Check that the O-ring is properly seated.
3. Align the "reject" plug hole with the hole in the "reject" header port.
4. Insert the retaining pin through the assembly until the pin locks in place.

INSTALLATION OF CLEANERS WITH ELUTRICONES

1. Installation of BIRD L-5 Cleaners with an Elutricone into the header ports is identical to that of a standard BIRD L-5 Cleaner. Refer to pages 6-5 and 6-6 of this section.
2. Install the elutriation lines between the connections on the elutriation header and the connections on the individual Elutricones. A length of hose and hose clamps are provided for this purpose. Cut hoses to length for each cleaner position and tighten the hose clamps securely.