INSINGER
MACHINE COMPANY
6245 State Rd.
Philadelphia
PA 19135-2996
Tel. 215-624-4800
FAX: 215-624-6966

TECHNICAL MANUAL

MODEL P3-NSU

WASTE DISPOSAL SYSTEM

NSN 7310-01-445-2978

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TECHNICAL MANUAL

FOR

MODEL P3-NSU WASTE DISPOSAL SYSTEM

NSN 7310-01-445-2978

INSINGER MACHINE COMPANY
6245 STATE ROAD
PHILADELPHIA, PA 19135-2996
1-800-344-4802

REVISION RECORD

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Rev.	Date	Effective Serial No.	Description
A	3/10/99	All	Includes feed chute change effective SN 990158 & higher.
B	4/1/00	000151	New D2882 electric ball valve in 7.5, 8.1.4, & Fig. 8.2.
C	2/26/02	000151	Add Fig. 6-6. More info Fig. 2-1, 4-2, 7-3, 7-4, 8-3.

RECORD OF MANUALLY ENTERED CHANGES

CHANGE NO.	DATE	TITLE OR BRIEF DESCRIPTION	ENTERED BY

TABLE OF CONTENTS

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (con't)

LIST OF TABLES

LIST OF ILLUSTRATIONS

SAFETY SUMMARY

The following general safety notices supplement the specific warnings and cautions appearing in this manual:

All service except for routine shut-down procedures and operator's troubleshooting procedures must be performed by qualified maintenance personnel.

Prior to performing any service on the Model P3-NSU food waste disposal system, the system shall be de-energized by turning the disconnect switch on the electrical control panel to the "Off" position. Tag the system "Out of Service".

The following is a summary of the warnings and cautions appearing in the text of this manual to alert personnel to potentially hazardous situations:

WARNINGS

Warning definition: A warning designates potential bodily harm if not followed.

Page 2-5 and 2-6: Do not under any circumstances attempt to clean the machine or place your hands inside the pulper tank during this inspection. If non-pulpable objects must be removed, FIRST de-energize the system by turning the disconnect switch (Figure 2-1, item 2) on the electrical control panel to the "Off" position.

Page 2-9: Do not under any circumstances attempt to clean the machine or place your hands inside the pulper tank during this temporary shut-down cycle.

Page 2-11: Food wastes have a high bacteria content. Broken glass or other sharp refuse may be present inside the pulper tank and drain chamber and cutting members have sharp edges. Exercise extreme caution when reaching into these areas. Wear rubber gloves while performing the following steps. Do not drink, eat or smoke.

Page 2-15: Hazardous reactions to this chemical occur upon exposure to acetone, M-E-Ketone, ammonia, aniline (alkaline), pyridine and flame or spark.

WARNINGS (con't)

Page 2-16: Food wastes have a high bacteria content. Exercise caution and wear rubber gloves while performing the following steps. Do not drink, eat or smoke.

Page 4-2 and 6-1: Prior to performing any work on the Model P3-NSU food waste disposal system involving placing the hands or any tools inside the pulper tank, the system shall be de-energized by turning the disconnect switch on the electrical control panel to the "Off" position. Tag the system "Out of Service".

Food wastes have a high bacteria content. Exercise caution and wear rubber gloves while performing maintenance operations. Do not drink, eat or smoke.

Page 4-3 and 6-6: Broken glass and/or other sharp refuse may be present in debris in the interior of the pulper tank. Exercise caution and use rubber gloves to remove debris.

Cutting edges are sharp. Exercise caution in applying force to tools inside the pulper tank.

Page 4-12 and 4-13: Do not under any circumstances put anything or place hands inside the pulper with the feed chute removed. Exposed rotating cutter assembly will cause severe injury if touched. Safety glasses must be worn.

Page 5-1: Prior to any work on the Model P3-NSU food waste disposal system involving placing the hands or any tools inside the pulper tank, the system shall be de-energized by turning the disconnect switch on the electrical control panel (Fig. 2-1, item 2) to the "Off" position. Tag the system "Out of Service".

Food wastes have a high bacteria content. Broken glass or other sharp refuse may be present inside the pulper tank. The cutting members have sharp edges. Exercise extreme caution when reaching into these areas. Wear rubber gloves while performing the following steps. Do not drink, eat or smoke.

Troubleshooting of certain electrical functions require access to live electrical circuits inside the electrical control panel. This requires that the safety interlock on the electrical control panel door be defeated exposing dangerous high voltage electrical connections. Troubleshooting or repair of the electrical apparatus should only be attempted by a qualified electrician.

WARNINGS (con't)

Page 8-4: Dangerous voltages are present on live connections inside certain components of the food waste disposal system. Observe normal safety precaution with high voltage electrical apparatus prior to connecting to ship's local distribution panel or closing the external circuit to energize the system. A mechanical interlock automatically opens the main circuit breaker when the control panel door is opened. This circuit breaker de-energizes all electrical components except the incoming leads from the ship's local distribution panel. Defeat of this device to permit electrical troubleshooting should only be attempted by a qualified electrician.

CAUTIONS

Caution definition: A caution designates potential equipment harm if not followed.

Page 2-1: The operator should become thoroughly familiar with the equipment, Figures 2-1, and 2-2, and these operating instructions prior to starting the machine. Visual observation of abnormal operation and rapid reaction to stop the machine when conditions so require is essential to safe and sanitary operation.

Page 6-5: Support drive motor while attaching bolts are being removed. Exercise caution to avoid dropping the motor.

Page 6-7: Use care in lifting the impeller off the shaft to ensure that key (Fig. 4-1, item 7) does not adhere to the shaft or impeller as it is removed. The key should be separated and set aside for reuse.

Page 6-8: The impeller should bottom on the shaft using only hand pressure. If binding occurs, remove the impeller and clean/polish the impeller hub and/or motor shaft as needed to correctly install the impeller.

Page 6-9: The impeller and sizing ring have been machined to close tolerances to assure proper fit in the pulper with the required clearances (See Fig. 3-2). These clearances cannot be readily checked in the field. Under no circumstances may shims be used to obtain interference-free impeller rotation.

CAUTIONS (con't)

Page 6-10: The shaft seal is handled and installed as an assembly. Handle with care. Do not attempt to re-use individual components of the seal assembly.

Page 8-3: The backflow preventer is provided with a vent outlet that can emit a discharge. The backflow preventer must be installed so that any discharge will not flow onto a food preparation area.

Page 8-6: Do not permit the pulper to operate for more than one minute at a time during this operation. Damage to the shaft seal could result from extended operation in the dry state. If electrical malfunctions occur indicating the need for troubleshooting operations, it is recommended that approximately 2 gallons of water be added to the pulper to wet the seal area before proceeding.

CHAPTER 1

1.0 GENERAL INFORMATION

1.1 INTRODUCTION

This technical manual provides information for the installation, operation, inspection and maintenance of the Model P3-NSU Waste Disposal System manufactured by Insinger Machine Company, Philadelphia, PA.

1.2 SCOPE OF THE MANUAL

Chapters 1, 2, 3, and 8 provide information required for installation, start-up and operation of the equipment. Chapters 4, 5, 6 and 7 provide information on maintenance operations.

1.3 EQUIPMENT DESCRIPTION

The Model P3-NSU Waste Disposal System is a self-contained system for size reduction of food wastes including table and galley scraps, paper, cardboard and assorted small bones at rates of up to 200 pounds per hour, making the waste suitable for overboard discharge in a water borne slurry.

The system is designed for manual feeding but must be installed under an existing "Dresser Table", under a new scrapping table, or under a sink. The installation details must be developed by the user or installer.

Small non-pulpable objects that are rejected by the cutting mechanism will collect around the inside periphery of the unit for removal during manual cleaning.

All Model P3-NSU units are equipped with inlet water flow regulators and an outlet water dam, installed in the discharge line of the unit, that maintains an optimum water level in the pulper.

Operation of the food waste disposal system is controlled through an electrical control panel and a "Start/Stop" pushbutton station.

1.4 EQUIPMENT SUPPLIED

The food waste disposal system is shipped from the factory assembled and attached to a shipping pallet. Loose parts are also attached to the shipping pallet. These parts require separate mounting adjacent to the installed system, and include:

a. An electrical control panel.

b. Valves and related controls for water supply lines.

c. A remote "Start/Stop" pushbutton station.

Interconnecting electrical cables and external pipe and fittings are to be furnished by the installing activity.

TABLE 1-1

DEFINITIONS

Pulper - Alternate name for the pulping or grinding unit.

Impeller - Horizontally rotating, round metal plate, equipped with two cutting lugs, each having two cutting edges.

Tank - Pulping or grinding chamber of the pulper.

Sizing Ring - Perforated stainless steel ring surrounding the impeller through which all slurry must pass after waste is pulped. The dimensions of the sizing ring holes determine the extent and rate of waste destruction.

Stationary Cutters - Vertical blades (4) welded to the sizing ring which, together with the impeller cutting lugs, provide the shearing action.

Slurry - A water solution containing a low percentage (approximately 3%) of solids.

Electrical Control Panel - Enclosure (NEMA 4) containing motor and valve controls for operation of the system.

Dam - A specially constructed 6" square metal canister, installed in the discharge line, which is used to maintain the water level in the pulper.

Flow Regulator - Controls the flow of water entering the pulper.

TABLE 1-2

DATA CHARACTERISTICS

Manufacturer:

Insinger Machine Company, Philadelphia, PA

Type:

Insinger Model P3-NSU

Characteristics:

Type - Miscellaneous, galley and table waste disposal

Capacity - 200 lbs./hr. maximum at rated water flow

Flush Water Characteristics:

Rated flow - 6 gpm at 15 to 125 psi (fresh or sea water)

Inlet Size - 3/4 inch for fresh water and sea water

Outlet Size - 2 inch flanged outlet, MIL-F-20042, 150 series plain

Electrical Power Requirements:

Power supply - 440 VAC, 3 phase, 60 Hz.

Operating current - approximately 4.3 Amperes

Maximum power demand - 15 Amperes (limited by main circuit breaker)

TABLE 1-2 (con't)

DATA CHARACTERISTICS

Weight:

Shipping: 440 lbs. (approximately)

Operating: Pulper Tank Subassembly with Feed Chute - 180 lbs.
Electrical Control Panel - 50 lbs.
Start/Stop Pushbutton Station - 5 lbs.
Loose Piping Parts - 30 lbs.

Volume:

Crated - 33 cu. ft. (38" lg. x 38" w. x 39" h.)

Unit Height - adjustable up to 34" + 1"

Unit Length - 32 3/8" overall

Space Requirements:

See Figure 8-3.

CHAPTER 2

2.0 OPERATION

2.1 INTRODUCTION

The Model P3-NSU food waste disposal system is a heavy duty machine designed for daily use in a naval shipboard environment. It has been designed with a minimum of automatic controls to reduce downtime associated with the maintenance of such controls.

CAUTION

The operator should become thoroughly familiar with the equipment, Figures 2-1, and 2-2, and these operating instructions prior to starting the machine. Visual observation of abnormal operation and rapid reaction to stop the machine when conditions so require is essential to safe and sanitary operation.

2.2 CONTROLS AND INDICATORS

TABLE 2-1

CONTROLS AND INDICATORS

Item no. on Fig. 2-1	Name	Type	Function
2	System Disconnect Switch	Lever actuated interlock switch on control panel door.	Electrical isolation of pulper system for electrical or mechanical maintenance.

TABLE 2-1 (con't)

Item no. on Fig. 2-1	Name	Type	Function
4	Start	Momentary contact pushbutton pulls in holding circuit on contactor.	Application of power to system components
5	Stop	Momentary contact pushbutton interrupts holding circuit on contactor.	Removal of power from system components
6	Power On Pilot Light	Red Light	Indicates feed chute not in place and and power not available to pulper motor contactor and water inlet valve.
7	Motor Run Pilot Light	Green Light	Indicates feed chute in place and that motor will run, water inlet valve will open after start button is depressed.

TABLE 2-1 (con't)

Item no. on Fig. 2-1	Name	Type	Function
8	Water Inlet Valve	Motor operated ball valve	Starts or stops flow of fresh or sea water to pulper tank.
9	Electric Interlock	Magnetic reed switch	Electrical isolation when feed chute is removed.
11	Shut-off Valve	Manually operated gate valve	Opens and closes fresh or sea water line for maintenance.
14	Feed Chute	Removable cover with feed opening	Provides easy feeding, eliminates splashing.
17	Selector Switch	2 position maintained	Permits selection of fresh water in port, salt water at sea.

TABLE 2-1 (con't)

Item no. on Fig. 2-1	Name	Type	Function
21	Drain Valve	Manually operated ball valve	Opens bypass permitting drainage of pulper and dam assemblies

2.3 START-UP PROCEDURE

2.3.1 The Model P3-NSU pulper is designed to withstand the occasional accidental injection of hard non-pulpable objects such as silverware, glass, or small metal objects. However, serious damage to the cutting mechanism or the drive system can result from attempts to process hard or non-pulpable material. Do not introduce such materials into the pulper.

Before starting the machine, remove the feed chute and inspect inside of pulper tank for non-pulpable objects.

WARNING

Do not under any circumstances attempt to clean the machine or place your hands inside the pulper tank during this inspection. If non-pulpable objects must be removed, FIRST de-energize the system by turning the disconnect switch (Figure 2-1, item 2) on the electrical control panel to the "Off" position.

NOTE

The feed chute actuates an electrical interlock switch, therefore, the chute must be correctly positioned before the unit can be started (See Figure 2-2).

2.3.2 When the system is started, the water level in the pulper will stabilize approximately two-thirds of the way up the inside of the pulper tank with a large vortex in the center of the tank. Wait two minutes after starting the pulper to allow this vortex to stabilize.

TABLE 2-2

START-UP PROCEDURE

Operation	Item no. on Fig. 2-1	Result
1. Remove feed chute	14	Inspect interior of pulper for non-pulpable items.

WARNING

Do not under any circumstances attempt to clean the machine or place your hands inside the pulper tank during this inspection. If non-pulpable objects must be removed, FIRST de-energize the system by turning the disconnect switch (Figure 2-1, item 2) on the electrical control panel to the "Off" position.

2. Fully close drain valve by turning handle 90 degrees from open position	21	Closes bypass to ship's drain system.
3. Turn selector switch on control panel to "fresh water" for in port use or "salt water" for at sea use	17	Electrically powers either fresh water or salt water valve when "Start" push-button is pressed.
4. Fully open gate valve on proper water supply line (fresh water in port - salt water at sea)	11	Admits selected water supply to the inlet side of the appropriate motor operated valve.

TABLE 2-2 (con't)

Operation	Item no. on Fig. 2-1	Result
5. Turn system disconnect switch electrical control panel to "On" position	2	Power available to pulper motor contactor and water inlet valve (Red light on).
6. Replace feed chute	14	Red "Power On" light goes off and green "Motor Run" light comes on.
7. Depress "Start" button	4	Water inlet valve opens, pulper motor starts.
8. Wait two minutes	None	Water level stabilizes in pulper tank and water dam.
9. Begin feeding food waste into the feed chute	14	Food waste ground and discharged.

2.4 SHUT-DOWN PROCEDURE

2.4.1 The end of day shut-down procedure (Table 2-4) assumes that the pulper is utilized continuously in a single daily run for disposal of all accumulated food wastes. However, conditions may require operation for more than one period during a day. Interrupted runs in a single day are considered as temporary shut-downs and the temporary shut-down procedure (Table 2-3) should be used.

2.4.2 The detergent used to wash the interior and exterior surfaces of the food waste disposal system shall comply with MIL-D-16791, clear liquid detergent, obtainable under NSN 7930-00-282-9699 (one gallon bottles) or NSN 7930-00-985-6911 (five gallon cans). Mix with hot fresh water in accordance with instructions.

TABLE 2-3

TEMPORARY SHUT-DOWN PROCEDURE

This procedure should be used when the equipment is operated for specific time periods, such as a breakfast period, a lunch period and a dinner period. Use the following procedure at the end of each period.

Operation	Item no. on Fig. 2-1	Result
1. Allow the pulper to run for 5 minutes after last pieces of waste are fed to the machine	None	Clears the machine, dam and associated piping of any accumulations of waste.
2. Depress "Stop" button	5	Closes the water inlet valve and stops the pulper motor.

WARNING

Do not under any circumstances attempt to clean the machine or place your hands inside the pulper tank during this temporary shut-down cycle.

TABLE 2-4

SHUT-DOWN PROCEDURE (END OF DAY)

Operation	Item no. on Fig. 2-1	Result
1. Allow the pulper to run for 5 minutes after last pieces of waste are fed to the machine	None	Clears the machine, dam and associated piping of any accumulations of waste.
2. Depress "Stop" button	5	Closes the water inlet valve and stops the pulper motor.
3. Fully open drain valve by turning handle 90 degrees from closed position	21	Opens bypass port to ship's drain system, drains pulper.
4. Fully close water supply shut-off valves	11	None
5. Turn system disconnect switch to "Off" position	2	Green "Motor Run" light goes off and all power is removed from system.
6. Remove feed chute	14	Exposes interior of pulper for inspection and cleanout.

TABLE 2-4 (con't)

Operation	Item no. on Fig. 2-1	Result
WARNING **Food wastes have a high bacteria content. Broken glass or other sharp refuse may be present inside the pulper tank and drain chamber and cutting members have sharp edges. Exercise extreme caution when reaching into these areas. Wear rubber gloves while performing the following steps. Do not drink, eat or smoke.**		
7. Remove accumulated debris from the pulper tank	None	Clears interior of extraneous material.
8. Fully close drain valve by turning handle 90 degrees from open position	21	Closes bypass port to ship's drain system system.
9. Pour bucket full (2 gal.) of hot fresh water/detergent solution into pulper tank	15	Washes lower part of the pulper tank and impeller assembly
10. Wash down the feed chute, the interior of the pulper tank, and the gasket area with a bristle brush and hot detergent solution	None	Ensures that all interior surfaces are cleaned.
11. Turn system disconnect switch on electrical control panel to "On" position	2	Red "Power On" light comes on.

TABLE 2-4 (con't)

Operation	Item no. on Fig. 2-1	Result
12. Replace feed chute	14	Red "Power On" light goes out and green "Motor Run" light comes on.
13. Depress "Start" button and run pulper for 2 minutes	4	Pulper drive motor starts. Water inlet valve opens but no water enters. Part of wash water is "pumped" out through dam assembly.
14. Depress "Stop" button	5	Pulper drive motor stops; stops; water inlet valve closes.
15. Fully open drain valve by turning handle 90 degrees from closed position	21	Opens bypass port to ship's drain system, drains pulper.
16. Fully close drain valve by turning handle 90 degrees from open position	21	Closes bypass port to ship's drain system.
17. Remove feed chute	14	Provides access to pulper interior. Red light comes on.

TABLE 2-4 (con't)

Operation	Item no. on Fig. 2-1	Result
18. Fill pulper tank with approximately 5 gallons of hot fresh water, rinse feed chute and allow to set for 2 min.	15	Rinses feed chute, pulper tank and dam assembly.
19. Replace feed chute	14	Red "Power On" light goes out and green "Motor Run" comes on.
20. Depress "Start" button and run pulper for 2 minutes	4	Pulper drive motor starts. Water inlet valve opens but no water enters. Part of rinse water is "pumped" out through dam assembly.
21. Depress "Stop" button	5	Closes the water inlet valve and stops the pulper motor.
22. Fully open drain valve by turning handle 90 degrees from closed position	21	Opens bypass port to ship's drain system, drains pulper.
23. Scrub all exterior surfaces with a bristle brush and hot detergent solution	None	Ensures that all exterior surfaces are cleaned.

TABLE 2-4 (con't)

Operation	Item no. on Fig. 2-1	Result
24. Rinse all exterior surfaces with hot fresh water	None	Removes wash water and dislodged waste particles.
25. Turn system disconnect switch to "Off" position.	2	Shut-down completed.

2.5 PREPARATION FOR AN EXTENDED PERIOD OF INACTIVITY

2.5.1 The Model P3-NSU pulper assembly disposes of food waste that contains materials that may dry into rigid solids. The procedure in paragraph 2.4 must be extended to include a more thorough cleaning of the internal passages if the unit is to remain idle for periods beyond 7 days. The procedure in Table 2-5 extends and is accomplished after completion of the shut-down procedure in Table 2-4.

2.5.2 Either of the chemical disinfecting agents listed herein are recommended for use in sanitizing the food waste disposal system.

2.5.2.a Disinfectant, food service, (chlorine-iodine type), NSN 6840-00-810-6396. Complete directions for use are given on the package.

WARNING

Hazardous reactions to this chemical occur upon exposure to acetone, M-E-Ketone, ammonia, aniline (alkaline), pyridine and flame or spark.

2.5.2.b Sodium hypochlorite solution, NSN 6810-598-7316 (one gallon bottle). Recommended dosage levels are:

Gallons of Water	Amount to Add
25	7 oz.
10	3 oz.
5	2 oz.

Rinsing is not required after completing the following steps.

TABLE 2-5

SHUT-DOWN PROCEDURE FOR AN EXTENDED PERIOD

Continued from Table 2-4

Operation	Item no. on Fig. 2-1	Result
26. Fully close drain valve by turning handle 90 degrees from open position.	21	Closes bypass port to ship's drain system.
27. Remove feed chute	14	Provides access to pulper for scrubbing.
28. Dump 5 gallons of hot water/sanitizing solution into pulper tank.	15	Washes lower part of the pulper shell and impeller assembly

WARNING

Food wastes have a high bacteria content. Exercise caution and wear rubber gloves while performing the following steps. Do not drink, eat or smoke.

29. Scrub feed chute and exposed gasket area with a bristle brush and hot sanitizing solution.	14	Ensures that all interior surfaces are cleaned.
30. Leave sanitizing solution in pulper tank for 10 minutes.	15	Ensures that all crevices are soaked to sanitize interior surfaces.
31. Turn system disconnect switch on electrical control panel to "On" position.	2	Red "Power On" light comes on.

TABLE 2-5 (con't)

Operation	Item no. on Fig. 2-1	Result
32. Replace feed chute	14	Red "Power On" light goes out and green "Motor Run" light comes on.
33. Depress "Start" button and run pulper for 2 minutes.	4	Pulper drive motor starts. Water inlet valve opens but no water enters. Part of sanitizing water is "pumped" out through dam assembly.
34. Depress "Stop" button.	5	Pulper drive motor stops, water inlet valve closes.
35. Fully open drain valve by turning handle 90 degrees from closed position.	21	Opens bypass port to ship's drain system, drains pulper.
36. Turn system disconnect switch to "Off" position.	2	Shut-down completed.

ITEM	DESCRIPTION
1	ELECTRICAL CONTROL PANEL
2	SYSTEM DISCONNECT SWITCH
3	START/STOP PUSHBUTTON STATION
4	START PUSHBUTTON
5	STOP PUSHBUTTON
6	POWER ON LIGHT
7	MOTOR RUN LIGHT
8	ELECTRICALLY OPERATED VALVE
9	FEED CHUTE INTERLOCK SWITCH

ITEM	DESCRIPTION
10	DRIVE MOTOR
11	MANUAL SHUTOFF VALVE
12	FLOW REGULATOR
13	STRAINER
14	FEED CHUTE
15	PULPER TANK
16	PULPER LEG
17	SELECTOR SWITCH
18	DAM
19	BACKFLOW PREVENTER
20	VENT TUBE
21	DRAIN VALVE, 2" FIPS
22	OUTLET FLANGE, 2" 150 LB NAVY BRONZE, SIZE CODE 0390
23	TABLE GASKET

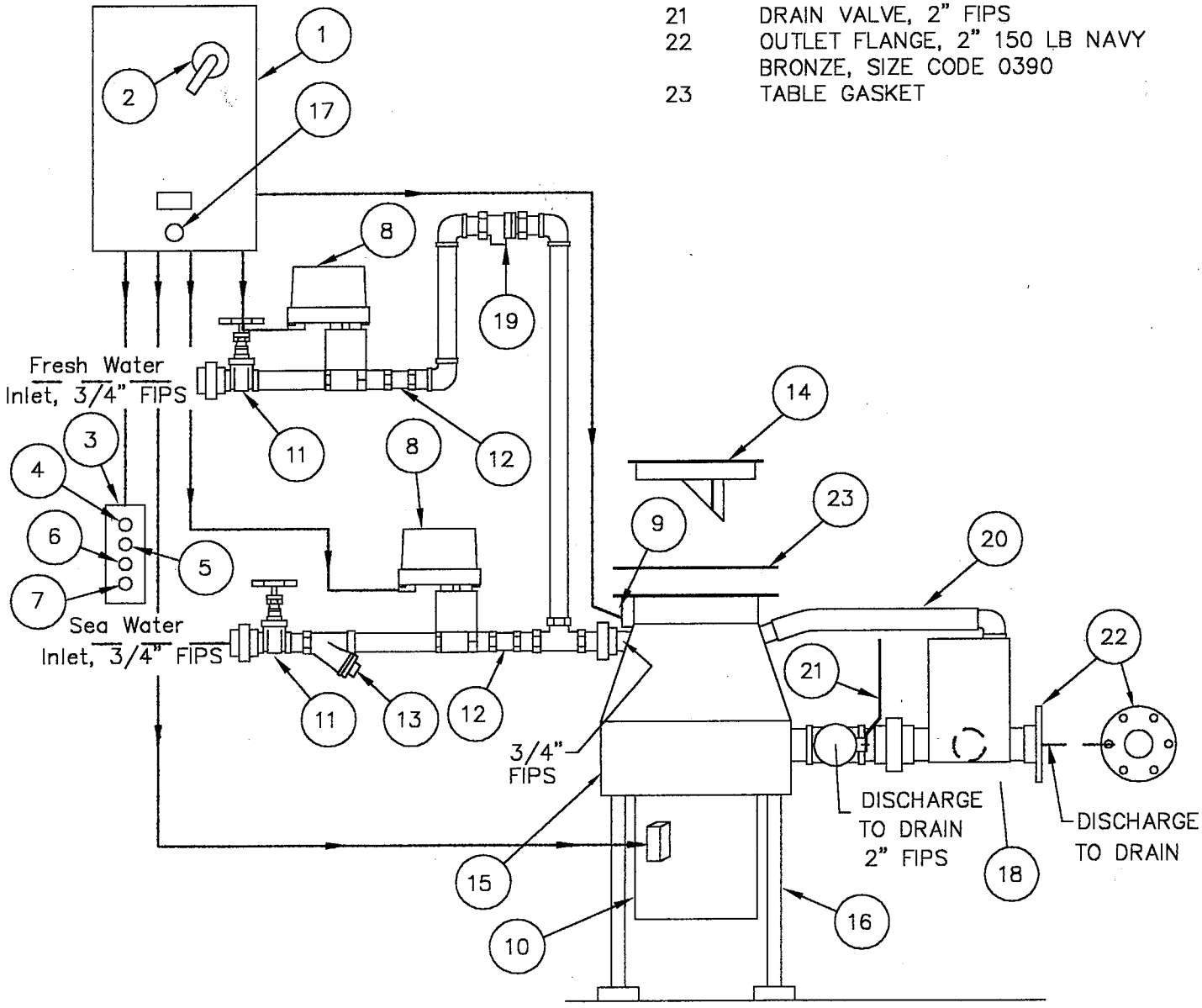

FIGURE 2–1

MODEL P3–NSU WASTE DISPOSAL SYSTEM

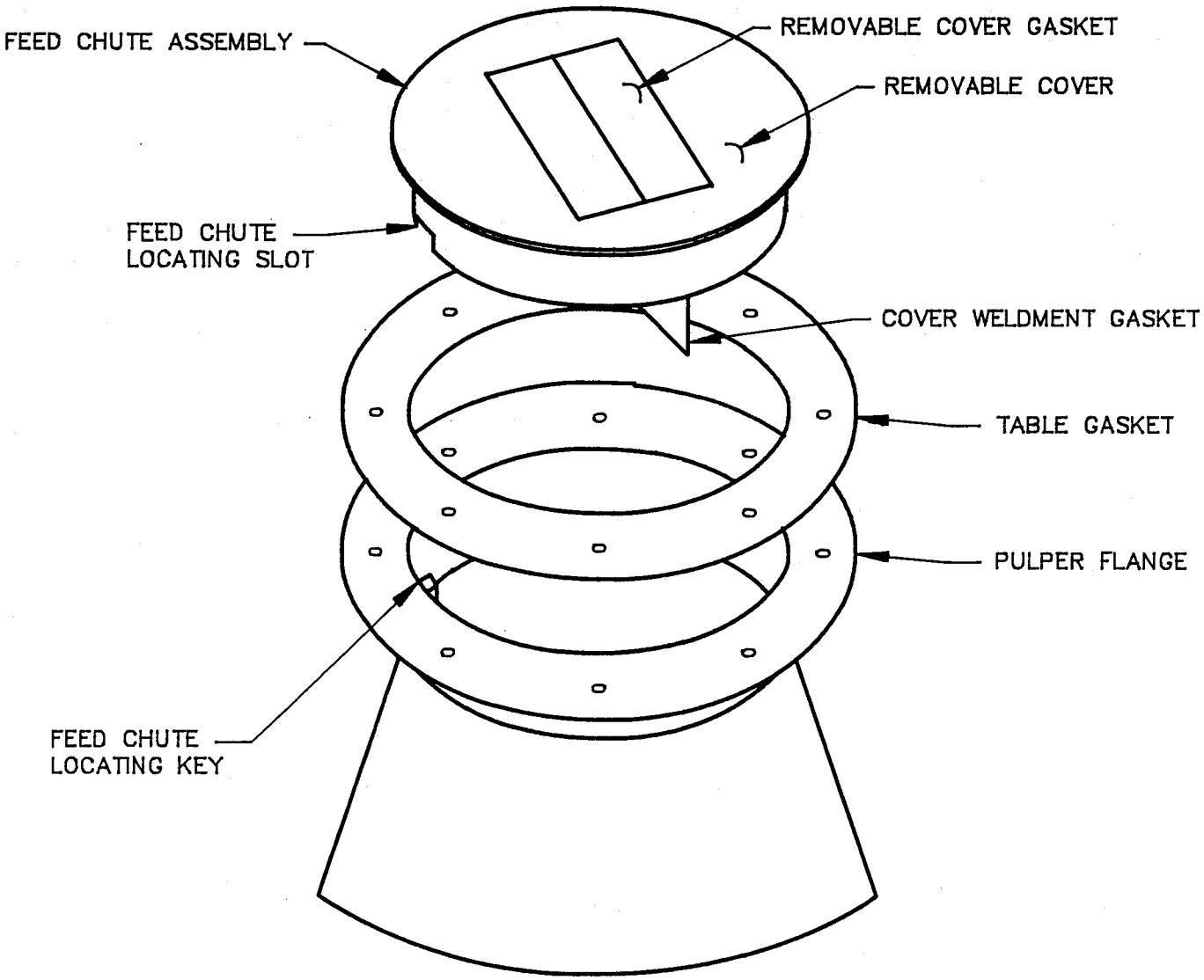

FIGURE 2–2
FEED CHUTE AND LOCATING KEY

CHAPTER 3

FUNCTIONAL DESCRIPTION

3.1 SYSTEM DESCRIPTION (See Figures 4-1, 4-2, and 4-3)

The Model P3-NSU food waste disposal system is a continuous duty motor driven system for the processing of galley and table wastes. The processed waste is discharged as a water-borne slurry. The equipment is installed in four separate component subassemblies.

3.1.1 Refer to Figures 4-1 and 4-3. The pulper tank subassembly includes a 3 hp. drive motor (item 26), sizing ring (item 21), impeller (item 18), mechanical seal assembly (item 22), two support leg assemblies (item 4), with four adjustable bolts (item 2), feed chute (item 27), feed chute safety interlock switch (item 11), and drain assembly (Fig. 4-3).

3.1.2 Refer to Figure 4-2. Water inlet flow control components (shipped as loose parts for shipboard installation) include (2) manually operated shut-off valves (item 40), (2) flow regulators (item 42), (2) electrically operated ball valves (item 44), a "Y" strainer, (item 43) and a backflow preventer (item 41).

3.1.3 An electrical control panel contains a main circuit breaker and disconnect switch, a magnetic contactor, overload protection for the drive motor, control relays and a selector switch. This panel is mounted on an adjacent bulkhead, convenient to the unit.

3.1.4 A remote "Start/Stop" pushbutton station is mounted in a location convenient to the operator.

3.2 SYSTEM OPERATION (Refer to Fig. 3-1)

Food wastes are fed into the pulper system through the opening in the cover gasket of the feed chute. The feeding area can be a stainless steel scrapping table, a modified dresser table, or a sink bottom at the Navy's option.

Water enters the upper portion of the pulping chamber through the inlet valves and flow regulator. The flow of the incoming water and the rotation of the impeller create a vortex which pulls the food waste down against the rotating cutter blades of the impeller, where pulping is accomplished.

Solids adhering to the internal surface of the sizing ring are sheared by the rotating impeller cutting blades against stationary blades mounted in the sizing ring assembly.

The input solid waste is retained in the pulping chamber until particle size is sufficiently reduced to permit passage through the holes in the sizing ring.

The resultant water/food waste slurry exits the pulping chamber into a collection chamber outside the sizing ring, and then passes through an outlet pipe and over a dam contained in the dam box. This dam controls the level of water in the pulping chamber to maintain a vortex.

Sizeable non-pulpables, such as silverware, glass, or small metal objects are ejected to the periphery of the pulping chamber by centrifugal force in the water/food waste vortex. Non-pulpables should be removed promptly, so that the cutting mechanism is not damaged. When sounds indicate that non-pulpables are in the pulper, the unit should be shut-down by pushing the stop button and turning the disconnect switch to the off position. Manually drain unit and carefully remove the non-pulpable object.

The vent tube on the dam prevents syphoning of water out of the pulping chamber, should the drain line run full of slurry at any time. A manually operated ball valve is provided to drain the dam and the pulper when the food waste disposer is secured for cleaning.

System operation is controlled by two pushbuttons in an operator station. A black "Start" pushbutton activates the system when depressed with the green "Run" light on. A red "Stop" pushbutton deactivates the system when depressed.

Pilot lights show system status. A red "Power On" light indicates that power is on to the control system but is interrupted by the feed chute interlock. A green "Motor Run" light indicates that power is on to the control system and the feed chute interlock switch is actuated, making power available to start the system.

3.3 CUTTER CLEARANCES

Fig. 3-2 illustrates the nominal clearances designed into the Model P3-NSU food waste disposal system. The clearances shown can be expected with new parts set up with optimum centering of the sizing ring assembly.

Fig. 3-2 is intended for reference only. Positioning of parts to the degree of accuracy indicated is not essential to satisfactory system performance, and significant increases in clearances can be expected over the life of the cutting elements.

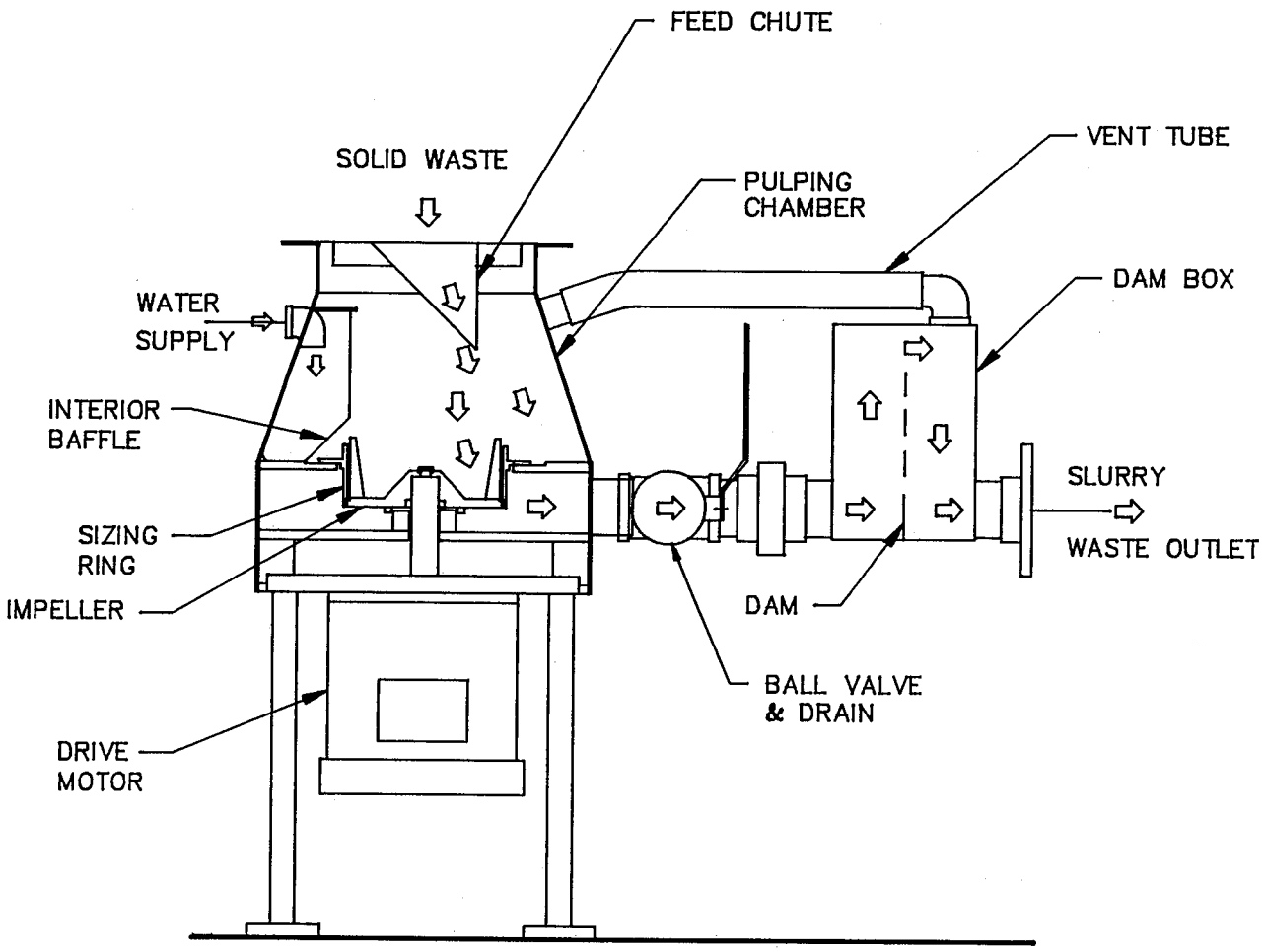

FIGURE 3–1
FLUID FLOW DIAGRAM

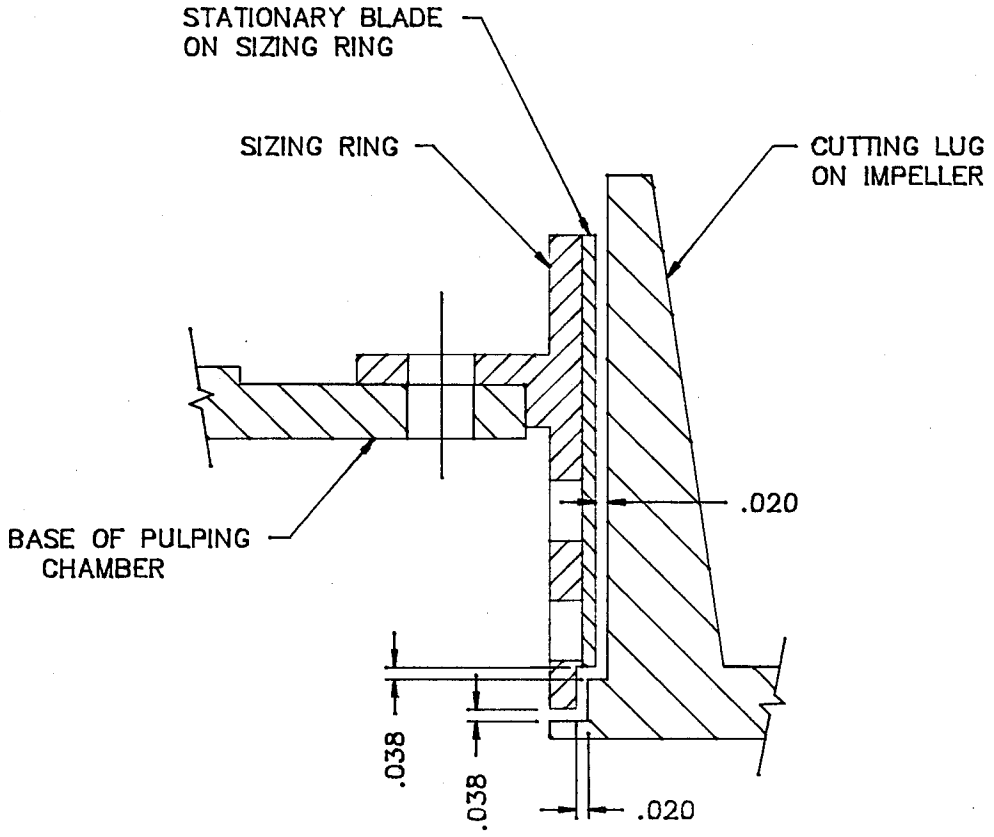

FIGURE 3–2
CUTTER CLEARANCES

CHAPTER 4

SCHEDULED MAINTENANCE

4.1 INTRODUCTION

The scheduled maintenance described in this chapter is a system of planned periodic inspections and replacement of critical components in advance of actual breakdown of these components. The schedule is directed at efficient utilizing of maintenance personnel, minimizing system downtime, and providing for orderly acquisition of spare parts.

These preventative maintenance operations and schedules are based on similar commercial equipment operated in an institutional environment. Adjustment of inspection and repair intervals or procedures may be required in light of shipboard operating experience.

Particular attention should be paid to the cutting elements of the impeller and sizing ring. These parts are most susceptible to wear or damage due to severity of service and potential for ingestion of foreign materials.

4.2 PREVENTIVE MAINTENANCE ACTION INDEX

In the absence of a ship's maintenance index plan, preventive maintenance should be performed as shown in Table 4-1.

TABLE 4-1

PREVENTIVE MAINTENANCE ACTION INDEX

Item	Frequency	Description	Paragraph
1	W	Weekly requirements for inspection of critical fasteners, feed chute gaskets, and safety interlock switch.	4.4
2	Q	Quarterly requirements for inspection and maintenance of components.	4.5
3	S	Semi-annual requirements for inspection and maintenance of components.	4.6
4	C	Maintenance requirements to be performed at ship overhaul frequencies.	4.7

WARNING

Prior to performing any work on the Model P3-NSU food waste disposal system involving placing the hands or any tools inside the pulper tank, the system shall be de-energized by turning the disconnect switch on the electrical control panel to the "Off" position. Tag the system "Out of Service".

Food wastes have a high bacteria content. Exercise caution and wear rubber gloves while performing maintenance operations. Do not drink, eat or smoke.

4.3 PREPARATION FOR MAINTENANCE

Access to internal components of the pulper assembly requires removal of the feed chute assembly (Figure 4-1, item 27). The feed chute assembly lifts vertically out of the pulper. No fastener removal is necessary.

WARNING

Broken glass and/or other sharp refuse may be present in debris in the interior of the pulper tank. Exercise caution and use rubber gloves to remove debris.

Cutting edges are sharp. Exercise caution in applying force to tools inside the pulper tank.

Maintenance operations on the inlet water system require closing the shut-off valves (Figure 4-2, item 40). Tag the system "Out of Service".

4.4 WEEKLY REQUIREMENTS FOR INSPECTION AND MAINTENANCE

4.4.1 Inspection of critical fasteners.

4.4.1.1 De-energize the system by turning the disconnect switch on the electrical control panel to the "Off" position. Tag the system "Out of Service".

4.4.1.2 Remove feed chute assembly.

4.4.1.3 Open drain valve (Fig. 4-3, item 60).

4.4.1.4 Remove any residual waste in chamber and rinse chamber with water.

4.4.1.5 Using a suitable wrench, check tightness of the following fasteners:

The bolt and lock tab washer (Fig. 4-1, items 17 and 29) holding impeller on motor shaft. If bolt is loose, tighten per 6.2.5.4.

The four hex head bolts and lock tab washers (Fig. 4-1, items 19 and 20) holding sizing ring to pulper shell. If bolts are loose, tighten per 6.2.5.5.

4.4.1.6 Rotate impeller by hand to ensure that no mechanical interference is present.

4.4.2 Inspection of feed chute gaskets.

Inspect rubber gaskets and fasteners on feed chute for damage or deterioration. Tighten or replace as necessary.

4.4.3 Inspection of safety interlock switch.

Inspect safety interlock switch (Fig. 4-1, item 11) and magnet (Fig. 7-1, item 12) attachment hardware for tightness and tighten as necessary.

4.4.4 Re-energize the system by turning the disconnect switch on the electrical control panel to the "On" position. Remove "Out of Service" tag and return system to its normal readiness condition.

4.5 QUARTERLY REQUIREMENTS FOR INSPECTION AND MAINTENANCE

4.5.1 Clean seawater line strainer

4.5.1.1 Close shut-off valve (Fig. 4-2, item 40), in seawater line to secure water flow.

4.5.1.2 Locate the "Y" strainer (Fig. 4-2, item 43), in seawater feed line and remove bushing from leg of the "Y".

4.5.1.3 Remove strainer and flush with water or blast of compressed air.

4.5.1.4 Replace strainer and bushing.

4.5.1.5 Open shut-off valve in seawater line and return equipment to normal readiness condition.

NOTE

Residual liquid will be present in the drain piping components. A bucket should be placed under each take down connection as it is disassembled.

4.5.2 Clean and inspect waste drain piping.

4.5.2.1 De-energize the system by turning the disconnect switch on the electrical control panel to the "Off" position, and tag "Out of Service."

4.5.2.2 Open drain valve (Fig. 4-3, item 60), and check that pulper chamber is fully drained.

4.5.2.3 Loosen clamps (Fig. 4-3, item 65), remove plastic vent tube (Fig. 4-3, item 64) between dam and pulping chamber, and set aside.

4.5.2.4 Disconnect pipe union (Fig. 4-3, item 63), in line between pulping chamber and dam.

4.5.2.5 Disassemble discharge piping flange connection to ship's drain piping.

4.5.2.6 Remove dam (Fig. 4-3, item 66), and associated piping and set aside.

NOTE

To facilitate removal of hardened or jammed debris in the drain piping attached to the pulper, further disassembly at the various threaded fittings may be necessary.

4.5.2.7 Visually inspect drain piping still attached to pulper and remove any debris present.

4.5.2.8 Remove drain cap (Fig. 4-3, item 67), from side of dam.

4.5.2.9 Rinse dam and vent line in deep sink with warm water and detergent.

4.5.2.10 Replace drain cap.

4.5.2.11 Re-install waste drain piping in reverse order of removal.

4.5.2.12 Close drain valve.

4.5.2.13 Remove "Out of Service" tag and re-energize the system by turning the disconnect switch on the electrical control panel to the "On" position.

4.5.2.14 Without feeding waste, operate pulper in normal operating mode; first with drain valve closed and then with drain valve open.

4.5.2.15 Check all discharge piping connections for leakage.

4.5.2.16 Secure pulper operation and repair leaks as required.

4.5.2.17 Return system to normal readiness condition.

4.5.3 Inspect drive motor, bolts and shaft seal.

4.5.3.1 Inspect the four bolts (Fig. 4-1, item 6) attaching motor adapter plate (Fig. 4-1, item 25) to bottom of pulper for tightness and integrity. Tighten or replace as necessary.

4.5.3.2 Inspect the four bolts (Fig. 4-1, item 2) and eight nuts (item 3) attaching pulper legs to deck plate for tightness and integrity. Tighten or replace as necessary.

4.5.3.3 Wipe underside of pulping chamber to remove moisture and dirt.

4.5.3.4 Fully close drain valve.

4.5.3.5 Depress start button.

4.5.3.6 Allow unit to run three minutes to obtain normal operating level in pulper.

NOTE

Minor wetting of the underside of the pulper from condensation may safely be ignored. Leakage sufficient to justify seal replacement is indicated as a steady trickle or stream of water sufficient to form a puddle.

4.5.3.7 Inspect underside of pulper tank for leaking water.

4.5.3.8 Depress stop button and allow unit to sit for three minutes.

4.5.3.9 Re-inspect underside of pulper tank for leaking water.

4.5.3.10 If leakage is detected while pulper is either rotating or stationary, replace shaft seal assembly (See 6.2.6).

4.5.3.11 If seal is not leaking, return system to normal readiness condition.

4.5.4 Inspect electric controls.

4.5.4.1 De-energize the system by turning the disconnect switch on the electric control panel to the "Off" position. Tag the system "Out of Service".

4.5.4.2 Open control panel door.

4.5.4.3 Test with multimeter to ensure electrical circuit is de-energized.

4.5.4.4 Inspect wiring for broken conductors, cracks, cuts and frayed insulation.

4.5.4.5 Measure insulation resistance of control circuit and take corrective action for any reading less than 1 megohm.

4.5.4.6 Clean inside of control panel.

4.5.4.7 Inspect electrical and mechanical fasteners and tighten loose connections. Use lock washers and jam nuts where necessary to keep connections tight.

4.5.4.8 Inspect contacts for pitting, rough spots and seating, dress with sandpaper if necessary.

NOTE

The brown discoloration found on silver and silver plated contacts is harmless and need not be removed. These contacts should not be filed or dressed unless sharp projections extend beyond the contact surface.

4.5.4.9 Inspect moving parts; ensure that they are free to function.

4.5.4.10 Inspect overload assembly for proper setting.

4.5.4.11 Close control panel door.

4.5.4.12 Open start/stop pushbutton station.

4.5.4.13 Perform steps 4 through 9, as applicable, for the pushbutton station.

4.5.4.14 Inspect indicating lights; replace any cracked or broken lenses.

4.5.4.15 Inspect start/stop button rubber covers for cracks, tears, cuts and wear; replace if damaged.

4.5.4.16 Close push button station.

4.5.4.17 Remove "Out of Service" tag and energize the system by turning the disconnect switch on the electrical control panel to the "On" position.

4.5.4.18 Remove feed chute and verify that pulper chamber is clean and impeller is free to rotate.

NOTE

In the following steps, replace any burned out bulbs that fail to light.

4.5.4.19 Install feed chute and verify that the red "Power On" indicator light on the pushbutton station goes out and the green "Motor Run" indicator light comes on.

4.5.4.20 Open manually operated fresh water and seawater supply valves.

4.5.4.21 Position water selector switch on control panel to the fresh water position.

4.5.4.22 Depress start button and verify:

1. Motor operated fresh water inlet valve (Fig. 4-2, item 44) opens.

2. Pulper drive motor runs.

4.5.4.23 With pulper motor running, remove feed chute and verify:

1. The green "Motor Run" indicator light goes out and the red "Power On" indicator light comes on.

2. Motor operated fresh water inlet valve closes.

3. Pulper drive motor stops.

4.5.4.24 Re-install feed chute and verify:

1. The red "Power On" indicator light goes out, and the green "Motor Run" indicator light comes on.

2. Pulper drive motor does not start, and fresh water inlet valve does not open.

4.5.4.25 Depress start button and verify:

1. Motor operated water inlet valve opens.

2. Pulper drive motor runs.

4.5.4.26 Depress stop button and verify:

1. The green "Motor Run" indicator light remains on and the red "Power On" indicator light remains out.

2. Motor operated water inlet valve closes.

4.5.4.27 Position the water selector switch on the control panel to the seawater position.

4.5.4.28 Repeat steps 22 through 26.

4.5.4.29 Return system to normal readiness condition.

4.6 SEMI-ANNUAL INSPECTION AND MAINTENANCE

4.6.1 Clean and inspect drive motor.

4.6.1.1 De-energize system by turning the disconnect switch on the electrical control panel to the "Off" position. Tag "Out of Service".

4.6.1.2 Close manually operated shut-off valves (Fig. 4-2, item 40).

4.6.1.3 Remove feed chute for access to interior to pulping chamber.

4.6.1.4 Remove any residual waste in chamber and rinse chamber with water.

4.6.1.5 Clean exterior of motor.

4.6.1.6 Remove fan cover at base of motor.

4.6.1.7 Clean fan and fan enclosure.

4.6.1.8 Replace fan cover.

4.6.1.9 Rotate cutting impeller inside pulping chamber by hand and feel for any significant or rough vibration that may be transmitted through the motor shaft due to a damaged or worn bearing and note observation.

4.6.1.10 Replace feed chute.

4.6.1.11 Energize the system by turning the disconnect switch on the electrical control panel to the "On" position. Remove "Out of Service" tag and start pulper but do not admit water. (Water supply valves were turned off in 4.6.1.2).

NOTE

The pulper may be operated without water flow for the few minutes to perform steps 12 and 13. Ambient noise levels must be low to allow for listening for audible evidence of a bad bearing.

4.6.1.12 Listen for motor noise indicative of a bad bearing and note observation.

4.6.1.13 Feel motor housing to check for motor shaft vibration or rough running bearings and note observation.

4.6.1.14 Stop pulper.

4.6.1.15 If the observation in steps 9, 12 and 13 indicates that bearings are good, proceed to step 17.

4.6.1.16 If the observation in steps 9, 12 and 13 indicates that bearings are bad, tag "Out of Service", and refer to 6.2.4 for motor replacement.

4.6.1.17 Open manually operated inlet water supply valves.

4.6.1.18 Remove "Out of Service" tag.

4.6.1.19 Start pulper and operate 10 minutes in accordance with normal operating procedure but without feeding waste to assure pulper is ready for use.

4.6.1.20 Stop pulper and return system to normal readiness condition.

4.6.2 Reverse direction of drive motor rotation.

NOTE

The cutting mechanism is designed to operate in either a clockwise or counterclockwise rotation. By periodically reversing direction, wear can be distributed on both sides of the cutting lugs and impeller life can be extended.

4.6.2.1 De-energize system by turning the disconnect switch on the electrical control panel to the "Off" position and tag "Out of Service".

4.6.2.2 Close manually operated shut-off valves.

4.6.2.3 Remove feed chute for access to interior of pulping chamber.

4.6.2.4 Remove any residual waste in chamber and rinse chamber with water.

4.6.2.5 Replace feed chute.

4.6.2.6 Turn disconnect switch to the "On" position.

4.6.2.7 Depress the black "Start" button on the start/stop pushbutton station.

NOTE

The pulper may be operated without water flow for the short time required to perform steps 9 through 17.

WARNING

Do not under any circumstances put anything or place hands inside the pulper with the feed chute removed. Exposed rotating cutter assembly will cause severe injury if touched. Safety glasses must be worn.

4.6.2.8 Remove feed chute and note direction of rotation of cutter assembly as it stops.

NOTE

Removal of the feed chute will open the safety interlock switch and de-energize the motor. If the motor is not de-energized, immediately replace feed chute and depress "Stop" button. Refer to weekly requirement for inspection and repair.

4.6.2.9 Replace feed chute.

4.6.2.10 De-energize system by turning the disconnect switch on the electrical control panel to the "Off" position.

4.6.2.11 Open control panel.

4.6.2.12 Locate motor terminal block connections labeled 1T1, 1T2 and 1T3.

4.6.2.13 Reverse position of any two wires connected to these points.

4.6.2.14 Shut control panel door.

4.6.2.15 Remove "Out of Service" tag from the control panel and turn disconnect switch to the "On" position.

4.6.2.16 Depress the black "Start" button on the Start/Stop pushbutton station.

WARNING

Do not under any circumstances put anything or place hands inside the pulper with the feed chute removed. Exposed rotating cutter assembly will cause severe injury if touched. Safety glasses must be worn.

4.6.2.17 Remove feed chute and verify opposite direction of rotation from step 4.6.2.8.

4.6.2.18 Replace feed chute.

4.6.2.19 Open manually operated shut-off valves.

4.6.2.20 Return system to normal readiness condition.

4.7 MAINTENANCE PERFORMED AT SHIP OVERHAUL FREQUENCIES

4.7.1 Replace motor shaft seal, cutting mechanism, and table gasket.

Replacement of the shaft seal requires removal of the motor from the pulper tank subassembly. Removal of the motor requires removal of the cutting mechanism (impeller and sizing ring). Hence, replacement of the seal and cutting mechanism should be performed at the same time.

Replacement of the table gasket requires some disassembly of the pulper system. This disassembly is more easily performed when the weight of the motor is removed from the pulper.

4.7.1.1 Remove and replace seal assembly. See 6.2.6.1 through 6.2.6.4, which covers removal of cutting mechanism and motor and removal and replacement of seal.

4.7.1.2 Lower pulper. See 6.2.1.2 through 6.2.1.8.

4.7.1.3 Remove old gasket. Thoroughly clean top surface of pulper flange and bottom surface of table.

4.7.1.4 Install a new table gasket and raise pulper. See 6.2.3.3 through 6.2.3.6.

4.7.1.5 Install drive motor. See 6.2.4.10 through 6.2.4.14.

4.7.1.6 Install a new impeller and sizing ring. See 6.2.5.4 through 6.2.5.5.

4.7.2 Replace backflow preventer.

4.7.2.1 Close manually operated shut-off valves (Fig. 4-2, item 40) in the water inlet lines.

NOTE

The backflow preventer is located above the scrapping table in the fresh water supply line.

4.7.2.2 The inlet side of the backflow preventer has the word "INLET" cast into the valve body. Mark pipe adjacent to inlet side of backflow preventer with the word "INLET".

4.7.2.3 The backflow preventer has integral union end connections. Break both unions and remove old valve body. Remove and discard gasket on pipe side of each union half.

4.7.2.4 Install a new valve body using two new union gaskets. Make sure that inlet side of backflow preventer aligns with inlet side of piping, as marked in 4.7.2.2.

4.7.2.5 Open manually operated shut-off valves in water inlet lines.

4.7.2.6 Return equipment to normal readiness condition.

ITEM	DESCRIPTION
1	DECK PLATE
2	DECK PLATE BOLT
3	JAM NUT
4	LEG ASSEMBLY
5	ADAPTER TO MOTOR BOLT
6	ADAPTER TO PULPER BOLT
7	KEY
8	INTERLOCK SWITCH BRACKET
9	PULPER BODY
10	SCREW
11	INTERLOCK SWITCH
12	TABLE GASKET
13	SCREW
14	NUT
15	
16	
17	IMPELLER BOLT
18	IMPELLER ASSEMBLY
19	SIZING RING BOLT
20	SIZING RING LOCK TAB WASHER
21	SIZING RING
22	SEAL
23	SLINGER
24	O RING
25	MOTOR ADAPTER
26	MOTOR
27	FEED CHUTE
28	LOCKWASHER
29	IMPELLER LOCK TAB WASHER

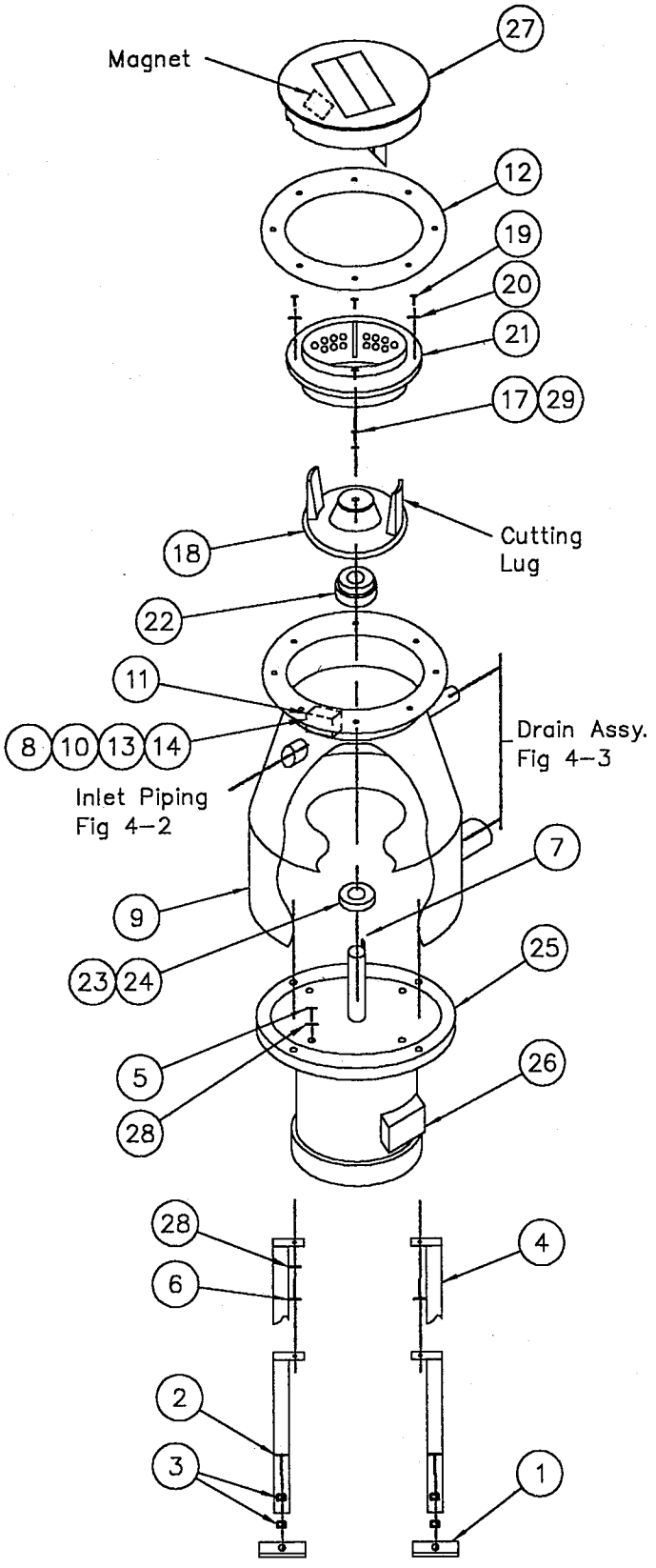

FIGURE 4-1
PULPER TANK SUBASSEMBLY

ITEM	DESCRIPTION
40	MANUALLY OPERATED SHUT-OFF (GATE) VALVE, 3/4" FIPS
41	BACK FLOW PREVENTER, 3/4" FIPS
42	FLOW REGULATOR, 3/4" FIPS
43	"Y" STRAINER, 3/4" FIPS
44	ELECTRICALLY OPERATED BALL VALVE, 3/4" FIPS
45	UNION, 3/4" FIPS (AS REQUIRED AT INSTALLATION)

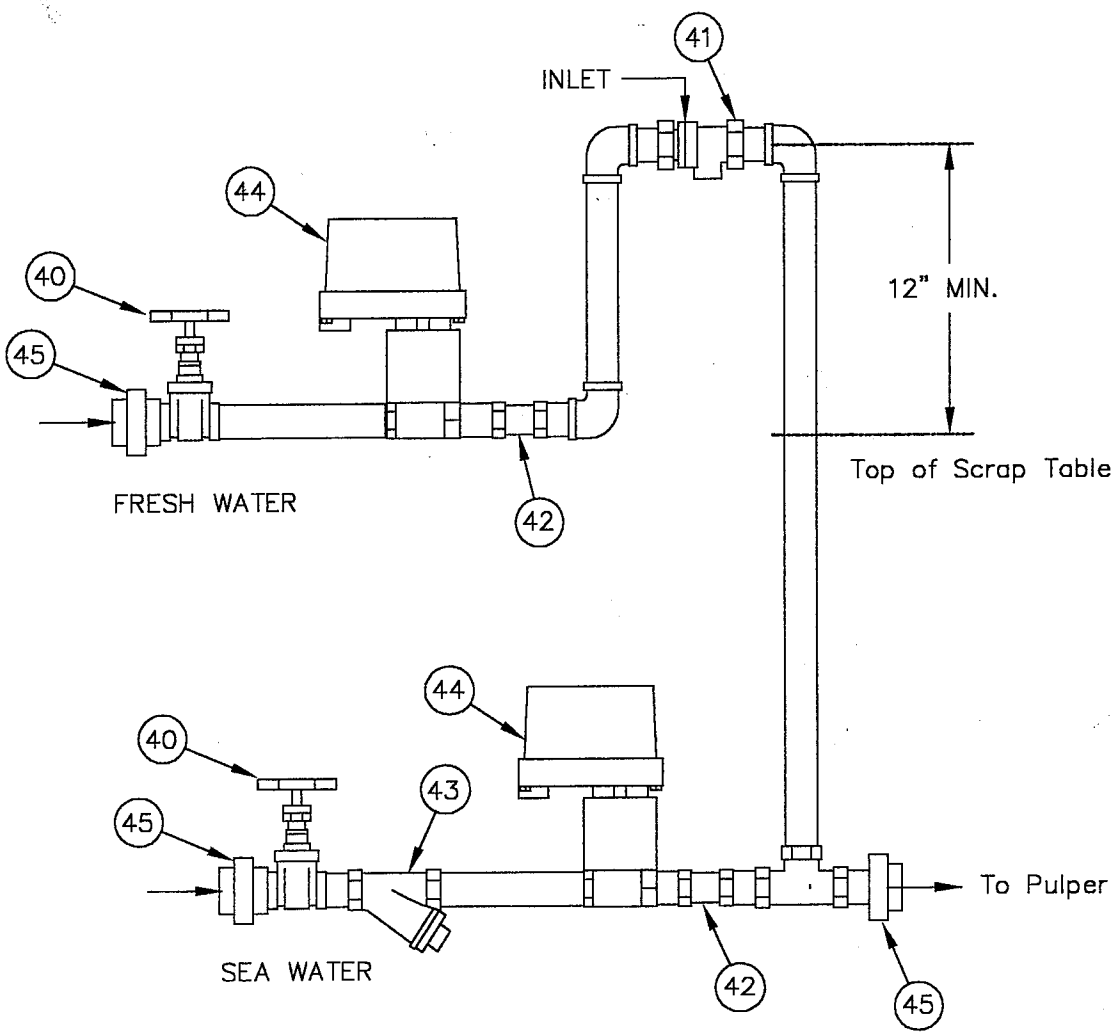

FIGURE 4-2
INLET PIPING

ITEM	DESCRIPTION
60	DRAIN (BALL) VALVE
61	NIPPLE
62	TEE
63	UNION
64	VENT TUBE
65	CLAMP
66	DAM
67	CAP

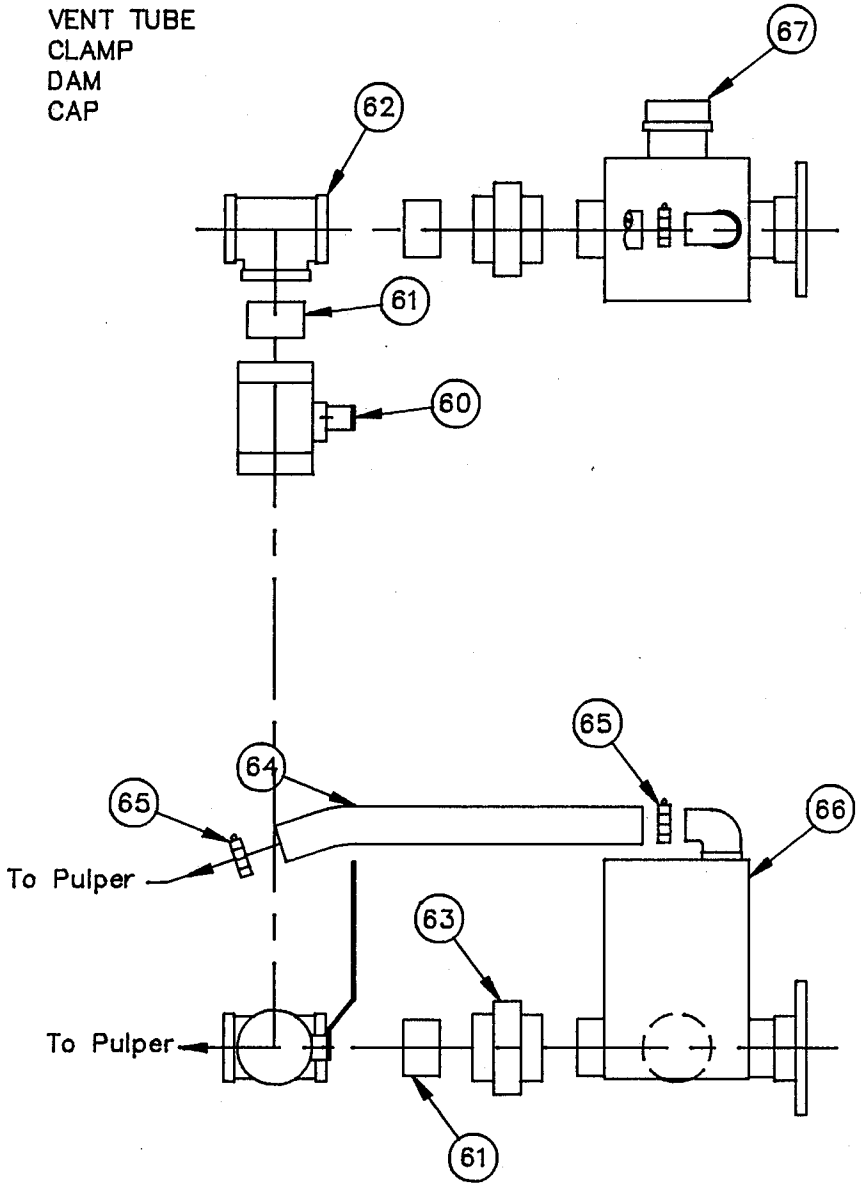

FIGURE 4–3
DRAIN ASSEMBLY

CHAPTER 5

TROUBLESHOOTING

This chapter contains information to assist the operator and/or maintenance personnel in troubleshooting abnormal operation. Personnel involved must be familiar with the description of the equipment and the functioning of all components, as described in Chapter 3.

The following tables list the more common symptoms which may be experienced, their causes, and the recommended corrective action. The tables are separated into operator and maintenance actions.

WARNING

Prior to any work on the Model P3-NSU food waste disposal system involving placing the hands or any tools inside the pulper tank, the system shall be de-energized by turning the disconnect switch on the electrical control panel (Fig. 2-1, item 2) to the "Off" position. Tag the system "Out of Service".

Food wastes have a high bacteria content. Broken glass or other sharp refuse may be present inside the pulper tank. The cutting members have sharp edges. Exercise extreme caution when reaching into these areas. Wear rubber gloves while performing the following steps. Do not drink, eat or smoke.

Troubleshooting of certain electrical functions require access to live electrical circuits inside the electrical control panel. This requires that the safety interlock on the electrical control panel door be defeated exposing dangerous high voltage electrical connections. Troubleshooting or repair of the electrical apparatus should only be attempted by a qualified electrician.

TABLE 5-1

OPERATOR'S TROUBLESHOOTING GUIDE

NOTE

This section covers actions that can be performed by the operator, without the use of tools.

Symptom	Possible Cause	Remedy
Pulper fails to start.	1. Feed chute not in place.	1. Verify that feed chute is in place. Red light indicates feed chute not in place.
	2. Disconnect switch in "Off" position.	2. Verify that disconnect is "On" position.
	3. External power off.	3. Check external disconnect. Close if open.
	4. Pulper impeller jammed.	4. De-energize system. Remove feed chute and verify that impeller is free to rotate.If jammed call maintenance.

TABLE 5-1 (con't)

Symptom	Possible Cause	Remedy
Pulper once started stops during use.	1. Pulper overloaded by high feed rate.	1. Adjust feed to a more uniform load (8 lbs/min). If overloading persists with normal feed rate, shut down for maintenance.
	2. Impeller retarded by foreign material jammed in clearance spaces.	2. De-energize system. Remove feed chute and examine for jams in gap between impeller and sizing ring. If foreign material is visible, call maintenance.
	3. Feed chute vibrated out of position.	3. Re-position feed chute over locating key. Red light indicates feed chute not in place.
Noisy operation	1. Heavy non-pulpable material.	1. De-energize system. Remove feed chute. Check for non-pulpable materials and remove if present.

TABLE 5-1 (con't)

Symptom	Possible Cause	Remedy
	2. Motor bearing(s) worn.	2. Shut-down and call maintenance.
Pulping rate below normal	1. Dull cutting edges.	1. Shut-down and call maintenance.
	2. Excessive quantities of harder to pulp solids such as cardboard or plastic.	2. Shut-down. Remove feed chute and examine for solids. Remove if present.
	3. Inadequate water supply rate.	3. Inspect water supply. Verify that shut-off valve is open.
Flooding or excessive high water levels in pulper.	1. Clogged sizing ring.	1. De-energize system. Remove feed chute. Examine sizing ring. Remove foreign material from sizing ring openings if present.
	2. Clogged external drain.	2. Shut-down and call maintenance.

TABLE 5-1 (con't)

Symptom	Possible Cause	Remedy
	3. Excessive feed rate.	3. Adjust feed to a more uniform load (8 lbs/min). If flooding persists with normal feed rate, shut down and call maintenance.
Excessive leakage	1. Damaged or defective motor shaft seal.	1. Inspect for leakage. Call maintenance.
	2. Damaged, loose or defective plumbing.	2. Inspect for leakage. Call maintenance.
	3. Damaged or defective scrapping table gasket.	3. Inspect gasket and call maintenance.

TABLE 5-2

MAINTENANCE TROUBLESHOOTING GUIDE

NOTE

This section covers actions that should be performed by qualified maintenance personnel.

Symptom	Possible Cause	Remedy
Pulper fails to start.	1. Impeller jammed.	1. De-energize system. Remove feed chute. Remove jammed material. Serious jam may require removal of sizing ring (see 6.2.5.2).
Pulper once started stops during use.	1. Impeller jammed by foreign material in clearance spaces.	1. De-energize system. Remove feed chute. Remove jammed material. Serious jam may require removal of sizing ring (see 6.2.5.2).
	2. Incorrect motor overload setting.	2. Verify that overload setting matches motor nameplate and reset if needed.

TABLE 5-2 (con't)

Symptom	Possible Cause	Remedy
	3. Motor overloaded; overload relay tripped.	3. Wait 5 min. for overload relay to automatically reset. If reset fails, check relay. (see 6.2.11).
Noisy Operation	1. Worn or broken cutting elements.	1. De-energize system. Remove feed chute. Inspect cutting elements. Replace impeller or sizing ring if necessary. See 6.2.5.
	2. Loose sizing ring.	2. Inspect cutting ring elements for permanent damage. Reposition and tighten sizing ring if reusable.
Pulping rate below normal.	1. Worn or broken cutting elements.	1. De-energize system. Remove feed chute. Inspect cutting elements. Replace impeller or sizing ring if necessary. See 6.2.5.

TABLE 5-2 (con't)

Symptom	Possible Cause	Remedy
	2. Inadequate water supply.	2. Check supply line manual and electrically operated valves.
	3. Motor single phasing.	3. Will occur while system is running. Operator will have heard a loud hum. Check electric power from initial source through to motor. Replace defective part
Flooding or excessive high water levels in pulper.	1. Drain line or dam is plugged.	1. Locate blockage and clear necessary. Check water supply for adequate rate of flow.
	2. High water flow from source.	2. Check metering orifice for erosion or enlargement.
Excessive leakage.	1. Damaged or defective scrapping table gasket.	1. Inspect table gasket and replace as necessary. See 6.2.2.
	2. Damaged or defective motor shaft seal.	2. Inspect for leakage and replace as necessary. See 6.2.6.

TABLE 5-2 (con't)

Symptom	Possible Cause	Remedy
	3. Damaged, loose, or defective plumbing joints.	3. Inspect for leakage. Tighten or repair as necessary.
Pulper fails to start.	1. Circuit protecter tripped.	1. Check to see if green "Motor Run" light is lit. If lit, check motor overload 1OL. If red "Power On" light is not lit, check circuit breaker 1CB.
	2. Defective interlock switch. (red light lights, but green "Motor Run" fails to light when feed chute is installed).	2. Apply a temporary jumper across terminals 1 and 5 in the the control panel. If pulper now starts when start is depressed, replace interlock switch.
	3. Defective "Start" pushbutton. (green indicator light lights, but pulper fails to start).	3. Apply a temporary jumper across terminals 2 and 3 in the control panel. If pulper now starts, replace "Start" pushbutton.

TABLE 5-2 (con't)

Symptom	Possible Cause	Remedy
	4. Defective motor contactor.	4. If green "Motor Run" light is lit and water is flowing, motor contactor is defective and should be replaced.

CHAPTER 6.0

CORRECTIVE MAINTENANCE

6.1 INTRODUCTION

This chapter contains instructions for removal and replacement of certain components which are accomplished outside the system of scheduled maintenance covered in Chapter 4.

Certain components are considered to be sufficiently standard as to be repairable by standard procedures. These procedures are:

6.1.1 Replacement of gate valve stem packing.

6.1.2 Replacement of pilot light bulb.

6.1.3 Replacement of pilot light lens.

6.1.4 Replacement of motor contactor coil.

6.1.5 Replacement of electrical components.

6.1.6 Repair of AC motor.

6.1.7 Replacement of plumbing gaskets.

Replacement parts for components, where applicable, are listed in Chapter 7.

6.2 REPAIR PROCEDURES

WARNING

Prior to performing any work on the Model P3-NSU food waste disposal system involving placing the hands or any tools inside the pulper tank, the system shall be de-energized by turning the disconnect switch on the electrical control panel to the "Off" position. Tag the system "Out of Service".

Food wastes have a high bacteria content. Exercise caution and wear rubber gloves while performing maintenance operations. Do not drink, eat or smoke.

6.2.1 Removal of pulper tank subassembly.

6.2.1.1 De-energize the system by turning the disconnect switch on the electrical control panel to the "Off" position. Tag the system "Out of Service".

6.2.1.2 Close manually operated shut-off valves (Fig. 4-2, item 40).

6.2.1.3 Remove feed chute assembly.

6.2.1.4 Remove eight self-locking nuts and flat washers from the studs (or screws) attaching the pulper top flange to the table.

6.2.1.5 Disconnect water input line at a convenient union.

6.2.1.6 Disconnect slurry drain line at flange attached to the dam.

6.2.1.7 Disconnect drain line at ball valve.

6.2.1.8 Using the lower adjustment nuts (Fig. 4-1, item 3), lower the pulper assembly until lower nuts rest on deck plates (Fig. 4-1, item 1).

NOTE

The gasket is sealed to the table and pulping chamber with vulcanizing rubber. As the pulper is lowered, it may be necessary to use a knife to cut the sealing rubber.

6.2.1.9 Disconnect and tag the following electrical connections:

a. Power to drive motor.

b. Control power to feed chute interlock switch.

6.2.1.10 Remove bolts (Fig. 4-1, item 2) from deck plates (Fig. 4-1, item 1).

6.2.1.11 Remove pulper subassembly to a convenient work area.

6.2.1.12 Remove gasket (Fig. 4-1, item 12) and thoroughly clean top flange of pulper tank and underside of table.

6.2.2 Removal and replacement of table gasket.

NOTE

Before replacing the table gasket to correct leakage, consider the use of room temperature vulcanizing rubber to seal small leaks, especially those at the table to flange fasteners.

6.2.2.1 Lower pulper subassembly, following steps 6.2.1.1 through 6.2.1.8.

6.2.2.2 Remove old gasket. Thoroughly clean top surface of pulper flange and bottom surface of table.

6.2.2.3 Install a new gasket, following steps 6.2.3.3 through 6.2.3.6 and steps 6.2.3.9 through 6.2.3.11.

6.2.3 Re-installation of pulper tank subassembly.

6.2.3.1 Set pulper in position underneath table with deck plate bolts (Fig. 4-1, item 2) held in their retracted position by the adjustment nuts (Fig. 4-1, item 3). Line up the 8 holes in pulper flange with studs or bolt holes. To aid in positioning and final adjustment, set shim blocks under motor to aid in supporting the system hook-up.

6.2.3.2 Screw deck plate bolts into each deck plate until the bolt end bottoms on the desk.

6.2.3.3 Apply a light coating of room temperature vulcanizing rubber to upper surface of pulper flange and install a new gasket. Room temperature vulcanizing rubber available under NSN 8040-00-996-7630 in a 2 oz. tube is a suitable material. Next apply a coat of the same material or an equivalent substitute (such as RTV mfg. by G.E.) to top surface of gasket.

6.2.3.4 Using lower adjustment nuts (Fig. 4-1, item 3), raise pulper assembly until the newly installed gasket is uniformly pressed against underside of table or dresser.

NOTE

The pulper support legs are designed to support the pulper tank. These legs should not exert an upward or downward force on the table.

6.2.3.5 Install eight self-locking nuts and flat washers on the studs (or screws) protruding from the table through pulper flange. Tighten until, through visual observation, pressure is uniformly applied to gasket material.

6.2.3.6 Tighten each upper adjustment nut against the foot of the pulper leg.

6.2.3.7 Connect the following electrical connections:

a. Power to drive motor.

b. Control power to feed chute interlock switch.

6.2.3.8 Reconnect all plumbing lines (slurry, drain and input water).

6.2.3.9 Install the feed chute.

6.2.3.10 Re-energize the system by turning the disconnect switch on the electrical control panel to the "On" position, and remove the "Out of Service" tag.

6.2.3.11 Return system to its normal readiness condition.

6.2.4 Removal and replacement of drive motor.

6.2.4.1 De-energize the system by turning the disconnect switch on the electrical control panel to the "Off" position. Tag the system "Out of Service".

6.2.4.2 Remove motor terminal box cover.

6.2.4.3 Verify that the connections are de-energized and disconnect and tag the wires.

6.2.4.4 Remove the feed chute assembly.

6.2.4.5 Remove sizing ring. See 6.2.5.2 for detailed procedures.

6.2.4.6 Remove impeller. See 6.2.5.3 for detailed procedures.

CAUTION

Support drive motor while attaching bolts are being removed. Exercise caution to avoid dropping the motor.

6.2.4.7 Remove four bolts and lockwashers (Fig. 4-1, items 6 and 28), attaching motor adapter plate and leg assembly to the pulper tank. Remove leg assemblies. Lower motor until the shaft clears the bottom of pulper tank.

6.2.4.8 Remove slinger and O ring (Fig. 4-1, items 23 and 24).

6.2.4.9 Tag motor with ship's name, work center and identification and remove to repair facility.

6.2.4.10 With a repaired, new, or original motor, install slinger and O ring on motor shaft.

6.2.4.11 Temporarily attach motor shaft pilot to end of motor shaft (Fig. 6-4), using the impeller attachment bolt (Fig. 4-1, item 17). Lightly lubricate the pilot and end of motor shaft to assist in sliding the shaft through the seal. Use water resistant grease MIL-G-6032, obtainable under NSN 9150-00-149-0926-803, 8 oz. can or NSN 9150-00-257-2360, 1 pound can.

6.2.4.12 Position motor under pulper tank and carefully raise into position. Take care that the shaft pilot and shaft do not hit the opening in bottom of tank. Slip shaft pilot into shaft seal and continue to raise motor until motor adapter plate seats on pulper tank mounting pads.

6.2.4.13 Position the two leg assemblies under the motor adapter plate and install four bolts and lockwashers (Fig. 4-1, items 6 and 28) and tighten securely.

6.2.4.14 Re-connect electrical connections to motor and re-install terminal box cover.

6.2.4.15 Remove motor shaft pilot and install impeller. See 6.2.5.4.

6.2.4.16 Install sizing ring. See 6.2.5.5.

6.2.5 Removal and replacement of cutting mechanism.

The Model P3-NSU food waste disposal system cutting mechanism consists of an impeller (Fig. 4-1, item 18) with two integral cutting lugs that rotate inside of a stationary perforated sizing ring (Fig. 4-1, item 21) having four (4) integral cutters. All cutters are permanently attached in their proper positions and ground to size. Replacement of worn or damaged cutters requires replacement of the impeller and/or sizing ring. Replacement of both components at the same time is recommended.

6.2.5.1 Preparation for removal of cutting components.

1. De-energize the system by turning the disconnect switch on the electrical control panel to the "Off" position.

2. Remove feed chute assembly and clean interior of pulper tank.

WARNING

Broken glass and/or other sharp refuse may be present in debris in the interior of the pulper tank. Exercise caution and use rubber gloves to remove debris.

Cutting edges are hardened and sharp. Exercise caution in applying force to tools inside the pulper tank.

6.2.5.2 Removal of sizing ring.

1. Remove four hex head bolts and lock tab washers (Fig. 4-1, items 19 and 20). Clean, inspect and replace if necessary and set aside for re-use.

2. Lift sizing ring assembly out of pulper assembly.

NOTE

If sizing ring can not be easily removed, use the impeller removal tool (Fig. 6-1) to remove sizing ring. See 6.2.5.3.

3. Thoroughly clean, using a wire brush and detergent solution, the pulper shell, sizing ring and attachment surfaces.

6.2.5.3 Removal of impeller.

NOTE

An 4 inch length of 2 x 4 is recommended for jamming the impeller against rotation.

1. Flatten both corners of the lock tab washer (Fig. 4-1, item 29). Remove the impeller bolt (Fig. 4-1, item 17) and lock tab washer. Clean, inspect, and replace if necessary.

2. Pull impeller off of the shaft using the impeller removal tool (Fig. 6-1) available from Insinger.

If sizing ring could not be easily removed (6.2.5.2), use impeller removal tool to initially lift both sizing ring and impeller until sizing ring is free.

Position impeller removal tool as shown in Fig. 6-1. Lightly oil the flat washers and threads of jack screws before assembly. Screw the jack screws into the threaded holes in impeller until screws are hand tight. Then tighten each jack screw 1/2 turn at a time, alternating between screws.

If the sizing ring is in place, the impeller will be lifted until it contacts the bottom of sizing ring. Then, both sizing ring and impeller will be lifted. When sizing ring is free (lifted about 3/16 inch), disassemble tool and remove sizing ring. Re-assemble tool and continue to lift impeller clear of motor shaft.

CAUTION

Use care in lifting the impeller off the shaft to ensure that key (Fig. 4-1, item 7) does not adhere to the shaft or impeller as it is removed. The key should be separated and set aside for reuse.

3. Thoroughly clean motor shaft and keyway.

6.2.5.4 Installation of impeller.

1. Lubricate motor shaft with water resistant grease MIL-G-6032, obtainable under NSN 9150-00-149-0926-803, 8 oz. can or NSN 9150-00-257-2360, 1 pound can.

2. Inspect key, replace if damaged and re-install in motor shaft keyway.

3. Slide new impeller assembly over motor shaft until top plate bottoms on top of motor shaft.

CAUTION

The impeller should bottom on the shaft using only hand pressure. If binding occurs, remove the impeller and clean/polish the impeller hub and/or motor shaft as needed to correctly install the impeller.

4. Install impeller attachment bolt (Fig. 4-1, item 17) and impeller lock tab washer (Fig. 4-1, item 29). The small hole in lock tab washer fits over pin in top of impeller assembly. Apply MIL-S-46163 locking adhesive to threads of bolt.

5. Jam the impeller to prevent rotation. Torque attachment bolt to 300 inch pounds.

6. Bend up one corner of the tab washer against a flat of the impeller bolt.

6.2.5.5 Installation of sizing ring.

1. Lower new sizing ring into position in pulper tank. Position and install using Fig. 6-6 as a guide.

2. Install four bolts and lock tab washers (Fig. 4-1, items 19 and 20) and hand tighten. The small hole in each lock tab washer fits over pin in sizing ring flange. Apply MIL-S-46163 locking adhesive to threads of bolts.

3. Rotate impeller assembly by hand to ensure that no mechanical interference is present.

4. Torque sizing ring bolts to 190 inch pounds.

5. Rotate impeller assembly by hand to ensure that no mechanical interference is present.

6. Loosen, re-position, re-tighten and re-torque sizing ring bolts as necessary to obtain free rotation of impeller assembly.

7. Bend up one corner of each lock tab washer against a flat of the sizing ring bolt.

CAUTION

The impeller and sizing ring have been machined to close tolerances to assure proper fit in the pulper with the required clearances (See Fig. 3-2). These clearances cannot be readily checked in the field. Under no circumstances may shims be used to obtain interference-free impeller rotation.

7. Install feed chute assembly.

8. Re-energize the system by turning the disconnect switch on the electrical control panel to the "On" position, and remove the "Out of Service" tag.

9. Return system to its normal readiness condition.

6.2.6 Removal and replacement of seal assembly.

6.2.6.1 Remove cutting mechanism. Follow 6.2.5.1 through 6.2.5.3.

6.2.6.2 Remove drive motor. Follow 6.2.4.2 through 6.2.4.8.

6.2.6.3 Remove shaft seal assembly.

1. Position seal removal tool as shown in Fig. 6-3. Lightly oil flat washer and hex nut threads. Press seal out of seal recess by tightening hex nut on mandrel assembly.

3. Clean and polish motor shaft to remove encrusted waste residue.

4. Clean and polish seal recess to remove encrusted waste residue.

6.2.6.4 Replacement of shaft seal assembly.

CAUTION

The shaft seal is handled and installed as an assembly. Handle with care. Do not attempt to re-use individual components of the seal assembly.

1. Remove rubber washer on outside diameter of seal. Lightly coat side of the larger diameter of seal and inside diameter of seal recess with oil.

3. Insert seal assembly, with larger diameter down, into seal recess. See Figure 6-2.

4. Assemble seal installation tool as shown in Figure 6-2. Lightly lubricate flat washer and hex nut threads.

5. Tighten hex nut finger tight. Center threaded rod in seal recess. Make sure that seal collar is completely seated on seal and that seal is not cocked in seal recess.

6. Hold plate to keep it from rotating. Slowly tighten hex nut with a socket wrench. This will force seal downward, into seal recess. Stop tightening when seal is firmly against bottom surface of seal recess. Do not over tighten or use a hammer to seat the seal.

7. Remove all parts of seal installation tool. Immediately wipe off any excess oil and grease with a dry cloth. Replace rubber washer between outside diameter of seal and inside diameter of seal recess. Use hand pressure on the collar of the seal installation tool to press the rubber washer into place.

6.2.6.5 Install drive motor and legs. See 6.2.4.

6.2.6.7 Install impeller. See 6.2.5.4.

6.2.6.8 Install sizing ring assembly. See 6.2.5.5.

6.2.6.9 Check shaft seal for leakage in accordance with 4.6.1.7.

6.2.7 Removal and replacement of electrically operated ball valve (Fig. 4-2, item 44).

6.2.7.1 De-energize the system by turning the disconnect switch on the electrical control panel to the "Off" position. Tag the system "Out of Service".

6.2.7.2 Close manually operated shut-off valves (Fig. 4-2, item 40). Tag the valves "Out of Service".

6.2.7.3 Remove terminal box cover. Verify that circuit is de-energized and disconnect and tag electrical connections.

6.2.7.4 Disconnect piping system at a convenient union and remove valve and actuator.

6.2.7.5 Reverse procedure to replace valve.

6.2.8 Replacement of feed chute flexible gaskets.

6.2.8.1 Remove feed chute assembly.

6.2.8.2 Refer to Figure 7-1. The horizontal removable cover gasket (item 5) is sandwiched between the flat removable cover (item 4) and top of cover weldment (item 13). Remove the 8 flat head screws (item 6) and locknuts (item 2) holding removable cover and cover gasket to cover weldment. Discard old gasket. Clean surfaces of cover and weldment, position a new cover gasket, and install and tighten the 8 flat head screws and locknuts.

6.2.8.3 The lower cover weldment gasket (item 8) is attached to the cover weldment (item 13) with 2 screws and 2 locknuts (items 9 and 2) and a gasket retainer (item 7). Remove hardware and retainer and discard old gasket. Clean surfaces of cover weldment and retainer, position a new gasket and the original retainer, and install and tighten hardware.

6.2.8.4 Replace feed chute assembly.

6.2.9 Removal and cleaning of drain piping. See 4.5.2.

6.2.10 Removal and replacement of backflow preventer. See 4.7.2.

6.2.11 Overload relay settings and functions. See Figure 6-5.

6.2.11.1 Overload current setting. Lift clear plastic cover. With a small screwdriver, align overload setting dial value (for motor nameplate full load current for 440 volts)

with set point. The nominal full load current for 440 volt operation of a typical 3 hp. motor is 4.2 amps.

6.2.11.2 Auto reset selection. The overload relay is factory installed in the auto reset configuration. Always use this configuration. If the manual reset function has been selected (which may be the case with a replacement part), the reset selector will extend beyond the plastic cover and the pointer will align with the "M". To change, lift clear plastic cover, push reset selector in and turn clockwise until square pointer aligns with the "A".

6.2.11.3 Reset test. Lift clear plastic cover. Use a small screwdriver to press recessed test button. With auto reset selected, overload trip indicator will change to yellow and both auxiliary contacts (normally open and normally closed) will change state as long as test button is pressed in.

6.2.11.4 Stop function. Press red stop button to operate normally closed auxiliary contact. This contact (1OL) is wired in series with motor contactor (1CON) and, when opened, will stop drive motor.

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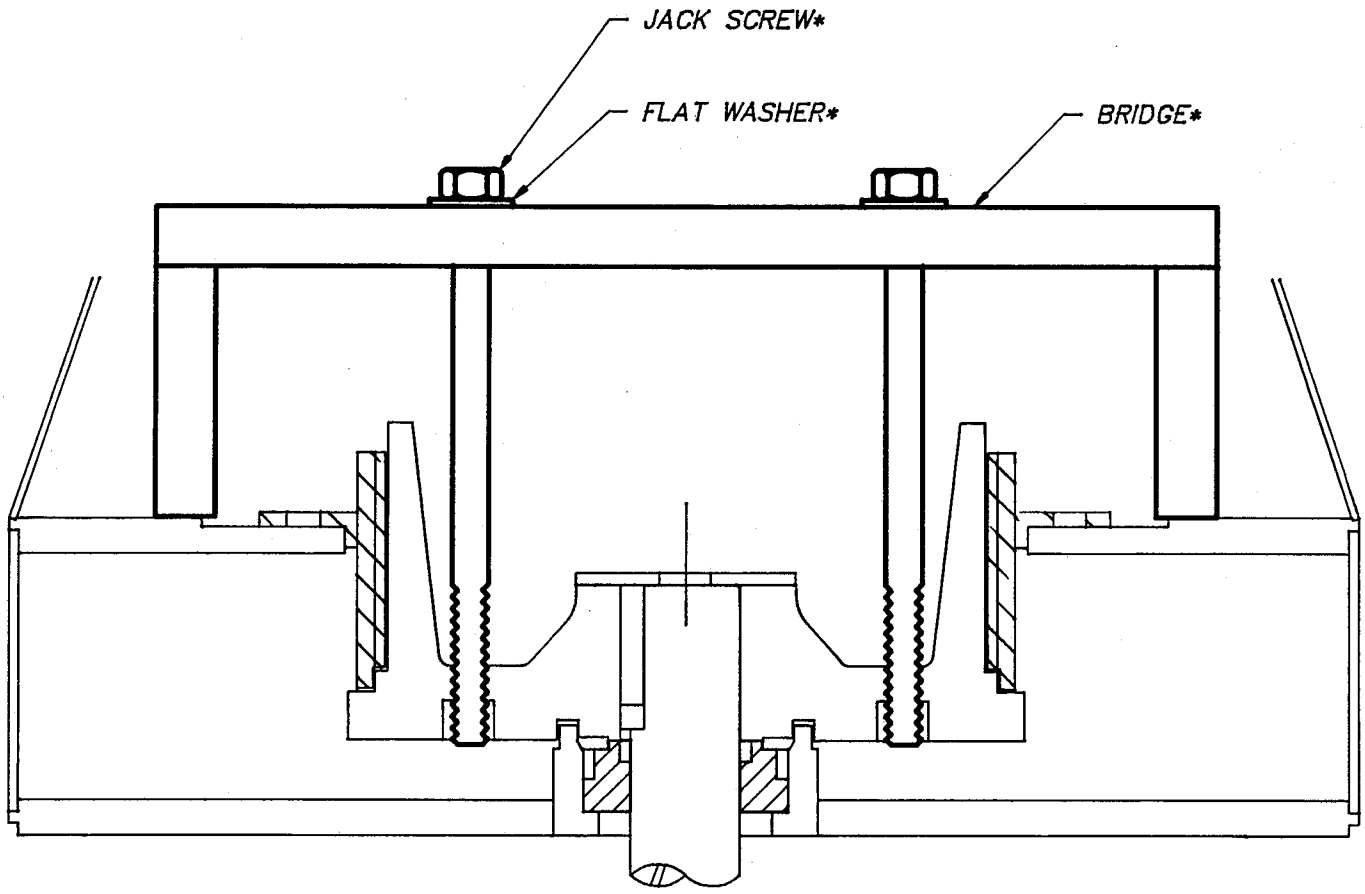
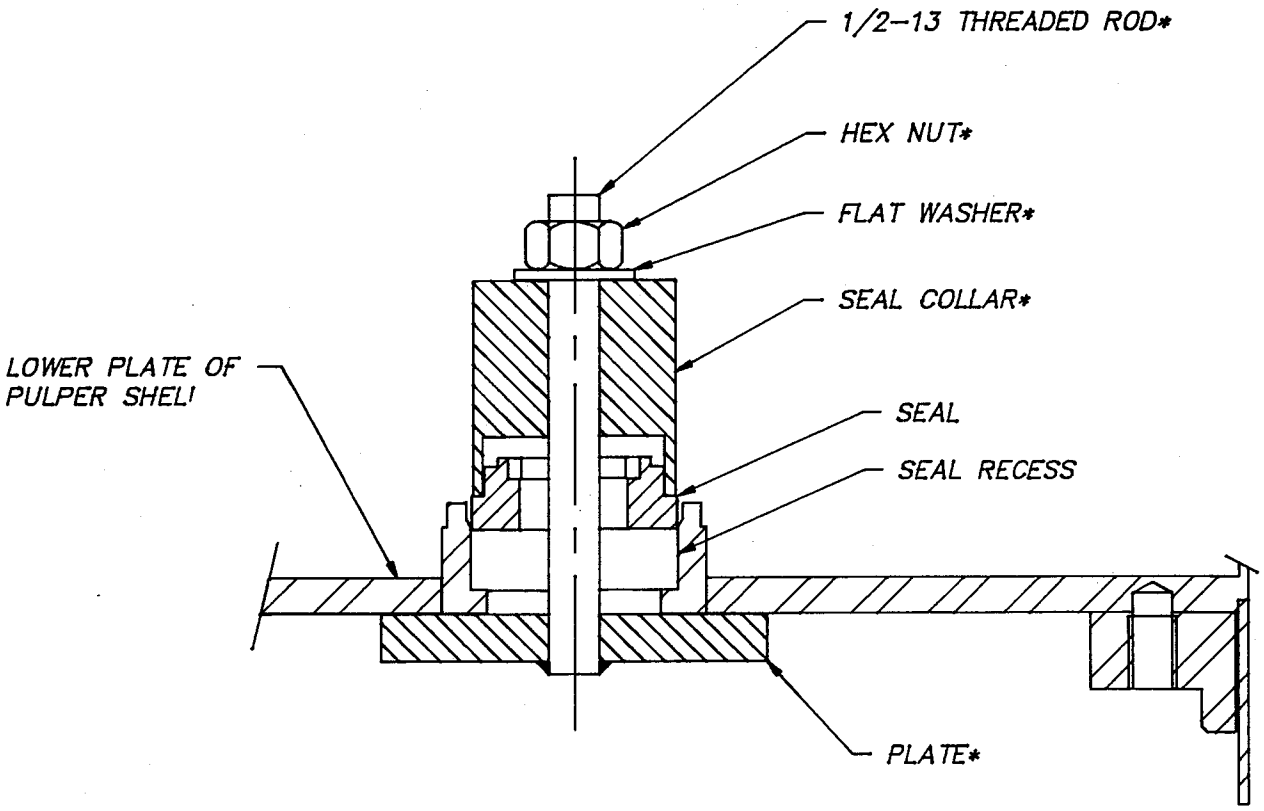


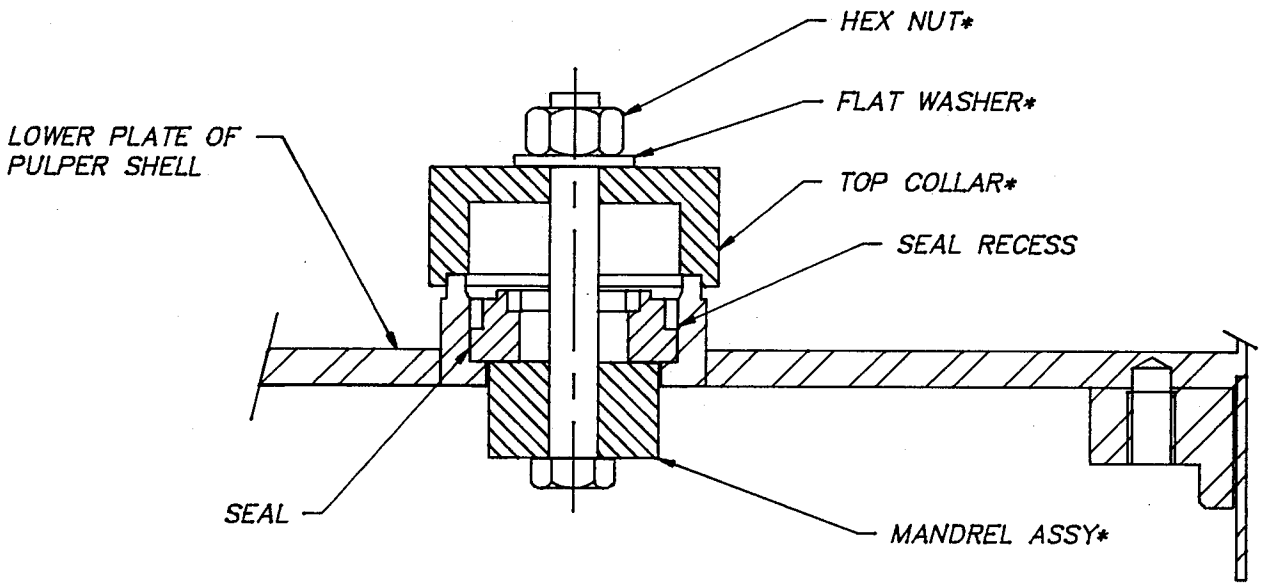
* DENOTES ITEMS FURNISHED WITH
IMPELLER ASSEMBLY REMOVAL TOOL

FIGURE 6-1
REMOVAL TOOL - IMPELLER ASSEMBLY
PN 1429-9



* DENOTES ITEMS FURNISHED
WITH SEAL ASSEMBLY INSTALLATION TOOL

FIGURE 6–2
INSTALLATION TOOL – SEAL ASSEMBLY
PN 1429–8



* DENOTES ITEMS FURNISHED
WITH SEAL ASSEMBLY REMOVAL TOOL

FIGURE 6–3
REMOVAL TOOL – SEAL ASSEMBLY
PN 1429–14

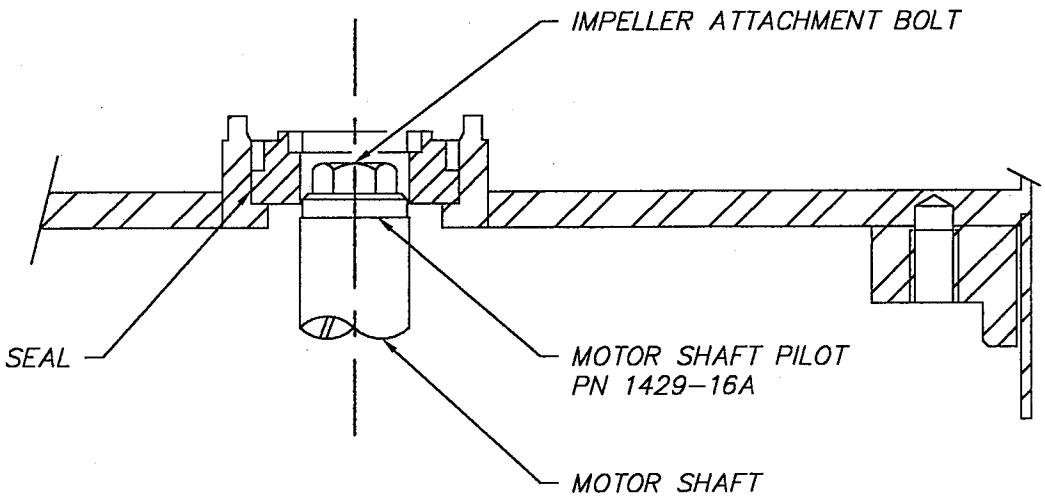


FIGURE 6-4
USE OF MOTOR SHAFT PILOT
PN 1429-16A

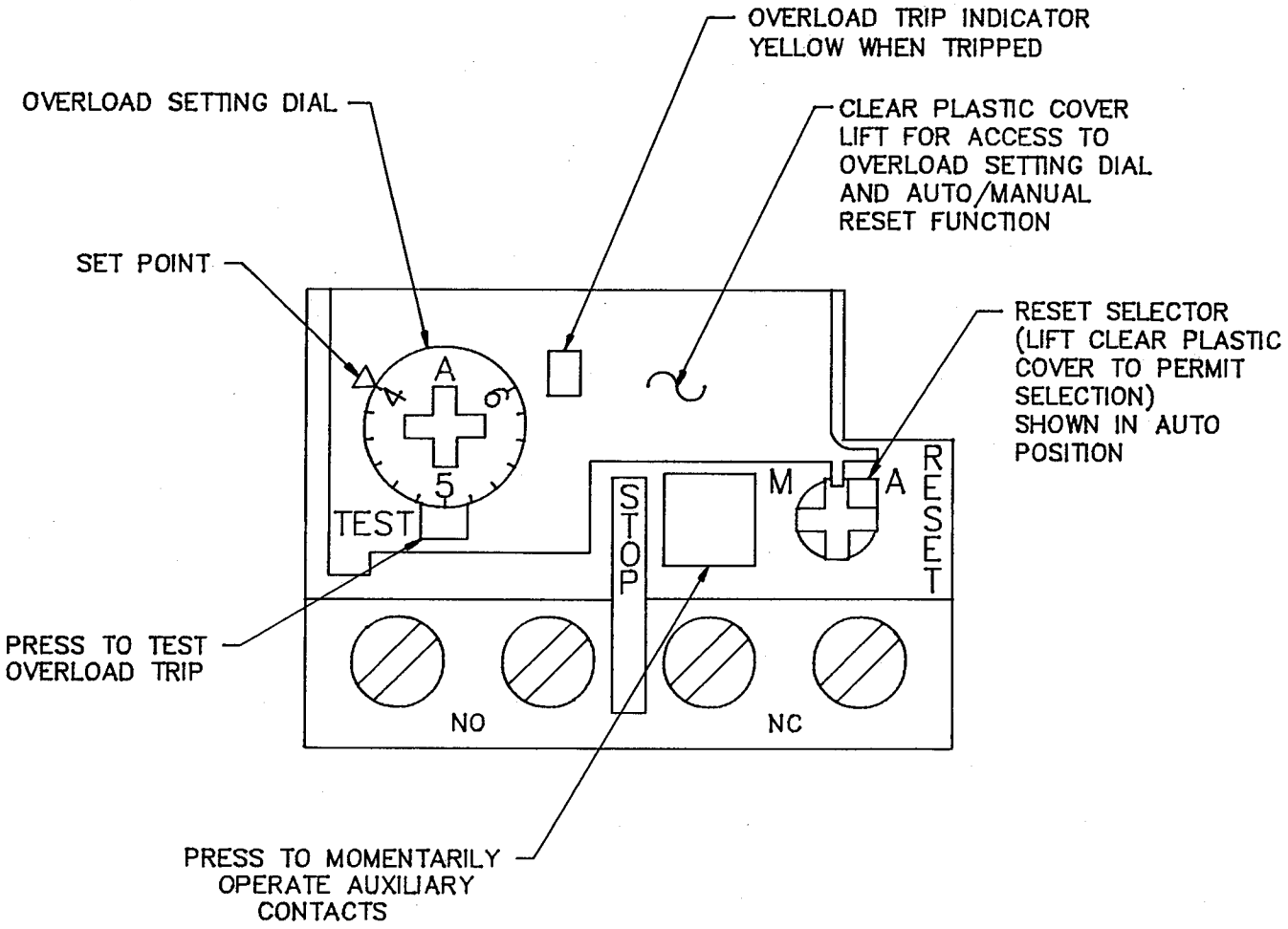


FIGURE 6–5
OVERLOAD RELAY SETTINGS

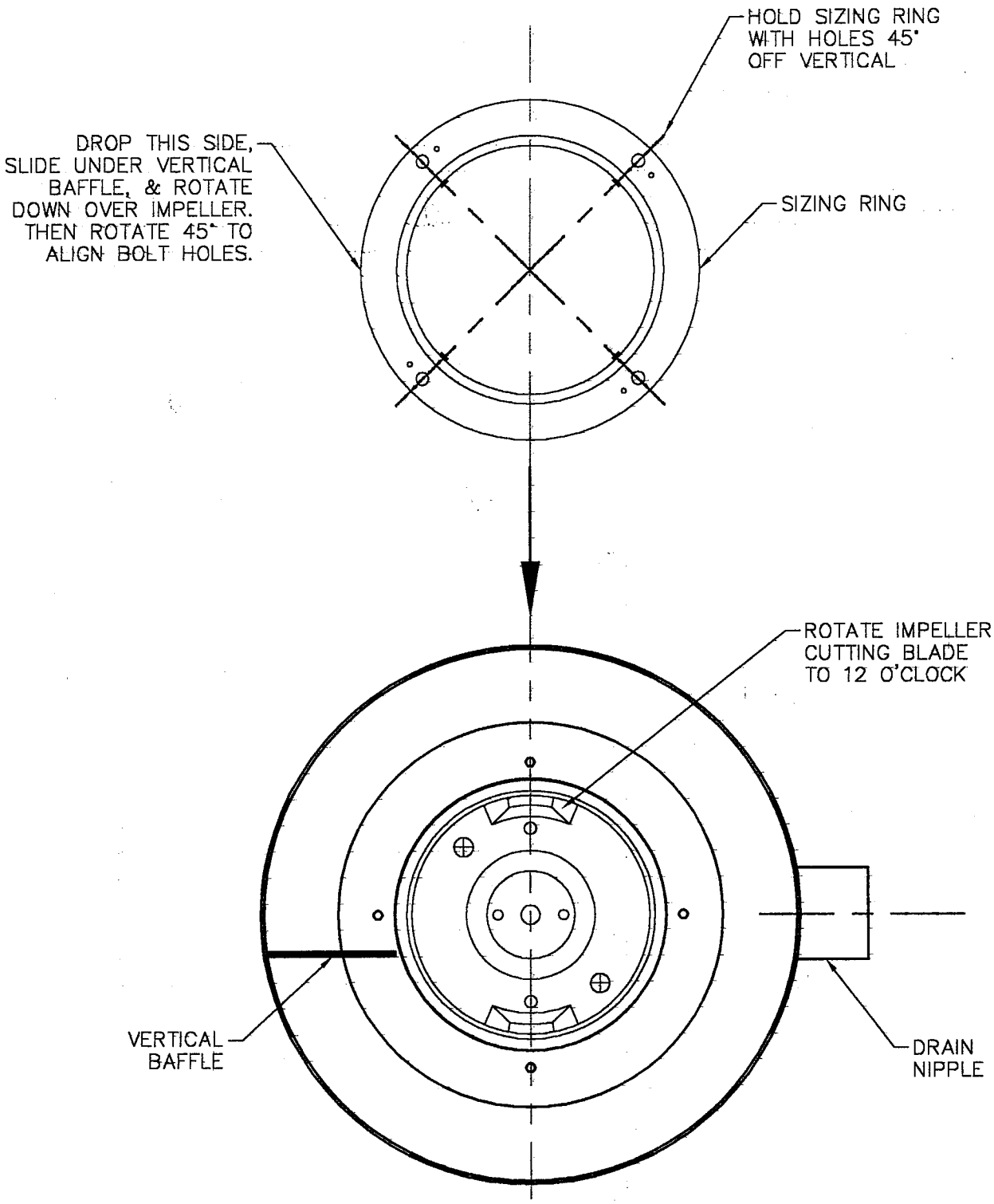


FIGURE 6–6
ORIENTATION OF PULPER TANK,
IMPELLER & SIZING RING
DURING ASSEMBLY

CHAPTER 7.0

PARTS LIST

7.1 INTRODUCTION

This chapter lists replaceable parts, divided into sections for each major subassembly of the food waste disposal system, and referenced to appropriate part breakdown drawings.

No listing has been provided for parts of permanently assembled items, or for those items which are not suited to field replacement.

The following abbreviations are used:

BHCS	Button head cap screw
FHCS	Flat head cap screw
HHMS	Hex head machine screw
NC	Normally closed
NO	Normally open
NPT	National pipe thread
SHCS	Socket head cap screw
SS	300 series stainless steel

7.2 PARTS PROCUREMENT

All parts are available from the Insinger Machine Company, Philadelphia, Pennsylvania 19135.

7.3 FEED CHUTE ASSEMBLY (Refer to Figure 7-1)

Item	Description	Part No.	Qty. in system
-	Feed Chute Assembly (complete)		1
	Prior to SN 990158	1429-75A	
	SN 990158 and higher	1429-75B	
1	Weld Stud, #8-32 x 1/2 SS	D309C-DC-4G	2
2	Nylok Nut, #8-32 SS	D312C-DC-5	2
3	-		
4	Removable Cover	1429-46A	1
5	Gasket, Removable Cover	1429-47A	1
6	FHMS, #8-32 x 5/8 SS	D309C-DC-5C	8
7	Gasket Retainer	1429-71	1
8	Gasket, Cover Weldment	1429-74	1

7.3 FEED CHUTE ASSEMBLY (con't)

Item	Description	Part No.	Qty. in system
9	SHCS, #8-32 x 5/8 SS	D309C-DC-5L	2
10	-		
11	-		
12	Magnet	DE5-67	1
13	Cover Weldment	1429-49A	1

7.4 PULPER TANK SUBASSEMBLY (Refer to Figure 7-2)

Item	Description	Part No.	Qty. in system
1	Deck Plate	1429-11	4
2	HHMS, 3/8-16 x 3-1/2 SS	D309C-JC-28A	4
3	Hex Jam Nut, 3/8-16 SS	D312C-JC-1	8
4	Leg	1429-15	2
5	HHMS, 1/2-13 x 1-1/2 SS	D309C-LC-12A	4
6	HHMS, 1/2-13 x 1-3/4 SS	D309C-LC-14A	4
7	Keystock, 1/4 x 1/4 x 1-3/8 SS	1429-18	1
8	Bracket, Interlock Switch	1429-22	1
9	Housing	1429-19	1
10	SHCS, #8-32 x 5/8 SS	D309C-DC-5L	2
11	Magnetic Interlock Switch	DE5-66	1
12	Gasket, Table	1429-42	1
13	FHMS, #8-32 x 1/2 SS	D309C-DC-4C	2
14	Nylok Nut, #8-32 SS	D312C-DC-5	4
15			
16			
17	HHMS, 1/2-13 x 1 SS	D309C-LC-8A	1
18	Impeller Assembly	1429-60	1
19	HHMS, 5/16-16 x 5/8 SS	D309C-HC-5A	4
20	Lock Tab Washer, Sizing Ring	1429-13	4
21	Sizing Ring	1429-62	1
22	Seal	D2830	1
23	Slinger	1429-67	1
24	O-ring	D3-538	1
25	Adapter, Motor to Housing	1429-69	1
26	Motor - 3 Hp.	1429-70	1
27	Feed Chute Assembly		1
	Prior to SN 990158	1429-75A	
	SN 990158 and higher	1429-75B	
28	Lockwasher, 1/2 SS	D313C-L2	8
29	Lock Tab Washer, Impeller	1429-57	1

7.5 INLET PIPING (Refer to Figure 4-2)

Item	Description	Part No.	Qty. in system
40	Gate Valve	D2816	2
41	Back Flow Preventer	D2812	1
42	Flow Regulator	D2810	2
43	Y Strainer	D2482	1
44	Electrically Operated Ball Valve		2
	Prior to SN 000151	D2811	
	SN 000151 and higher	D2882	

7.6 DRAIN ASSEMBLY (Refer to Figure 4-3)

Item	Description	Part No.	Qty. in system
60	Brass Ball Valve, 2" Full Port	D2757	1
61	Brass Nipple, 2" NPT x Close	D314F-JS-00	2
62	Brass Tee, 2" NPT	D320F-J1-J1-J1	1
63	Brass Union, 2" NPT	D318F-J1-J1	1
64	Vent Tube	D2825	1
65	Clamp	D2826	2
66	Overflow Dam Box with flange	1429-5	1
67	Brass Cap, 2" NPT	D328F-J1	1

7.7 ELECTRICAL CONTROL PANEL (Refer to Figure 7-3)

Item	Description	Part No.	Qty. in system
-	Main Control Enclosure (complete)	1429-3	1
1	Enclosure	DE9-157	1
2	Panel	DE9-158	1
3	Circuit Breaker (1DISC)	DE15-24	1
4	Handle (1DISC)	DE15-25	1
5	Mechanism (1DISC)	DE15-26	1
6	Shaft (1DISC)	DE15-27	1
7	Contactor (1CON)	DE1-91	1
8	Overload (1OL)	DE2-54	1
9	Mounting Block for Overload	DE2-60	1
10	Transformer (1T)	DE6-10	1
11	Terminal Block	DE3-141	1
12	End Cover for Terminal Block	DE3-142	1
13	Partition Plate for Terminals	DE3-143	1
14	End Clamp for Terminals	DE3-144	2
15	Circuit Breaker (1CB)	DE15-23	1
16	Selector Switch (1SS)	DE8-33	1

7.7 ELECTRICAL CONTROL PANEL (con't)

Item	Description	Part No.	Qty. in system
17	Contact Block for 1SS	DE8-36	1
18	Nameplate, Fresh / Salt	1429-6	1
19	Relay (1CR, 2CR)	DE2-6	2
20	Relay Base	DE3-25	2
21	DIN Mounting Rail	DE9-84	AR
-	Coil for Item 7 (1CON)	DE1-92	1

7.8 START/STOP PUSHBUTTON STATION (Refer to Figure 7-4)

Item	Description	Part No.	Qty. in system
-	Pushbutton Station (complete)	1429-4	1
1	Enclosure	DE9-159	1
2	Pushbutton, Black	DE8-20	1
3	Contact Block NO	DE8-39	1
4	Boot, Black	DE9-9	1
6	Pushbutton, Red	DE8-32	1
7	Contact Block, NC	DE8-36	1
8	Boot, Red	DE9-10	1
10	Pilot Light Assy, Red	DE8-18	1
12	Pilot Light Assy, Green	DE8-23	1
-	Bulb for Pilot Light Assy (#755: 6.3 volt, 0.15 amp.)	DE9-161	2
-	Red Lens for Item 10	DE8-19	1
-	Green Lens for Item 12	DE8-29	1

ITEM	DESCRIPTION
1	WELD STUD
2	LOCK NUT, #8–32
3	–
4	REMOVABLE COVER
5	GASKET, REMOVABLE COVER
6	FLAT HEAD SCREW
7	GASKET RETAINER
8	GASKET, COVER WELDMENT
9	SCREW
10	–
11	–
12	MAGNET
13	COVER WELDMENT

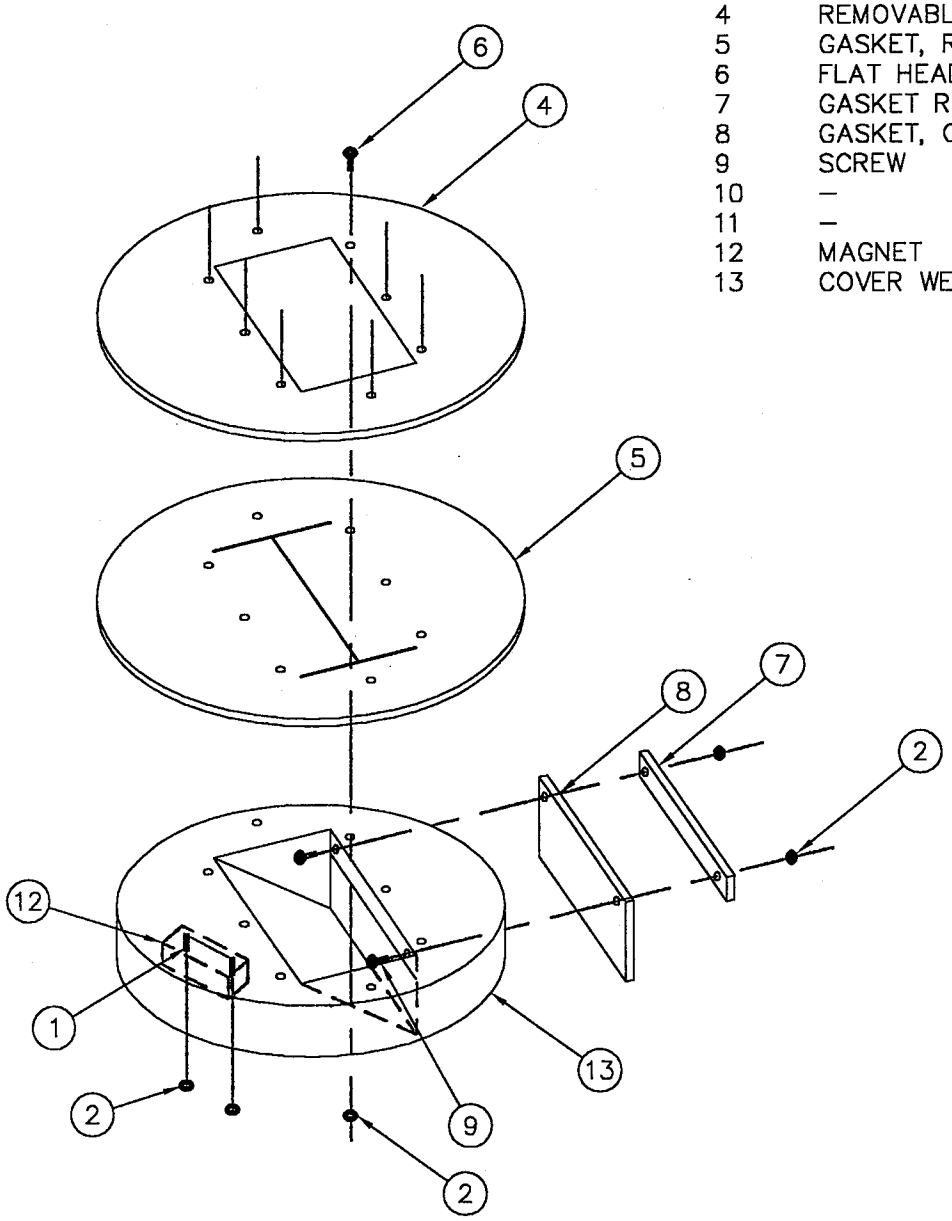


FIGURE 7–1
FEED CHUTE ASSEMBLY

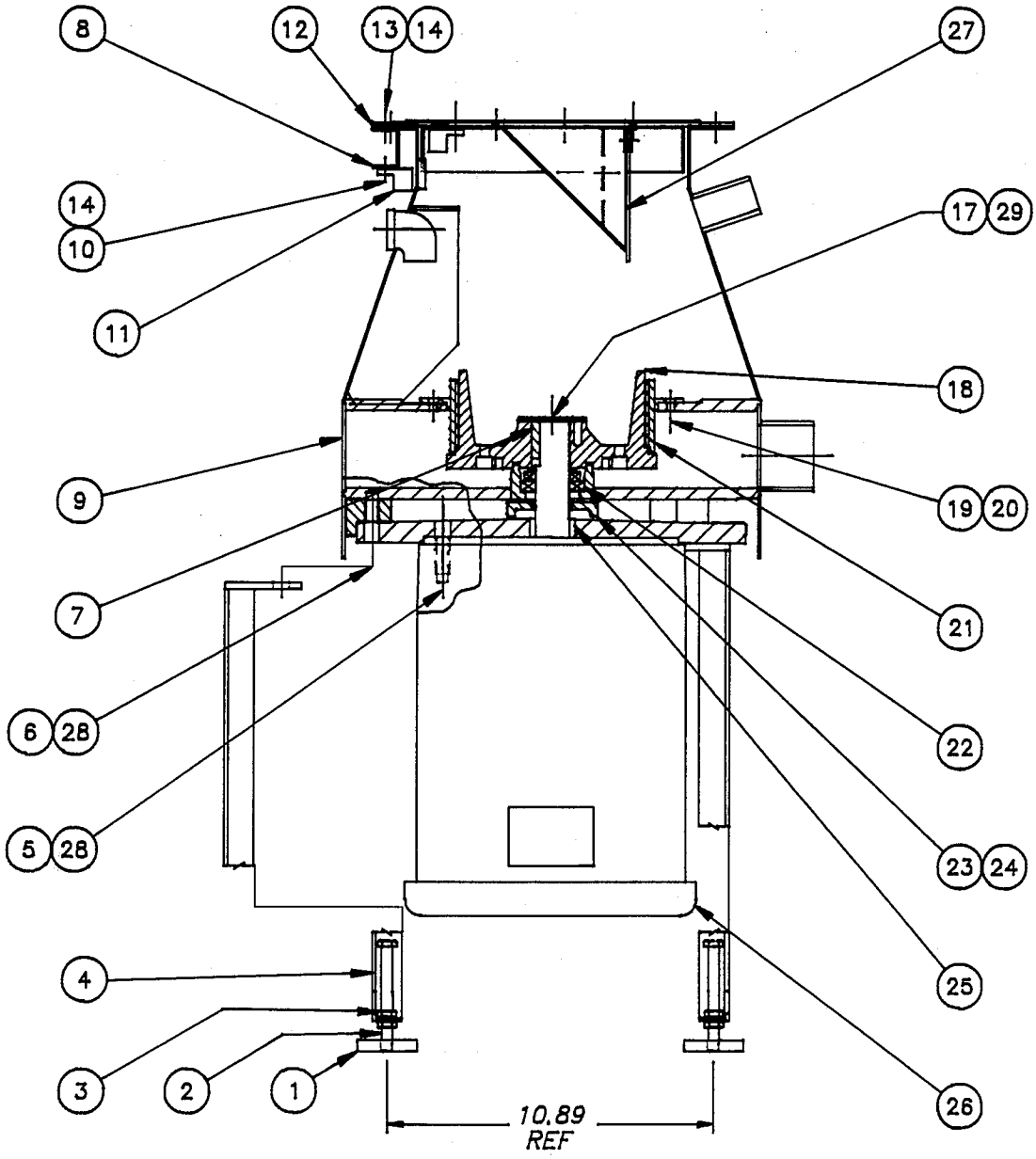


FIGURE 7–2
PULPER TANK SUBASSEMBLY

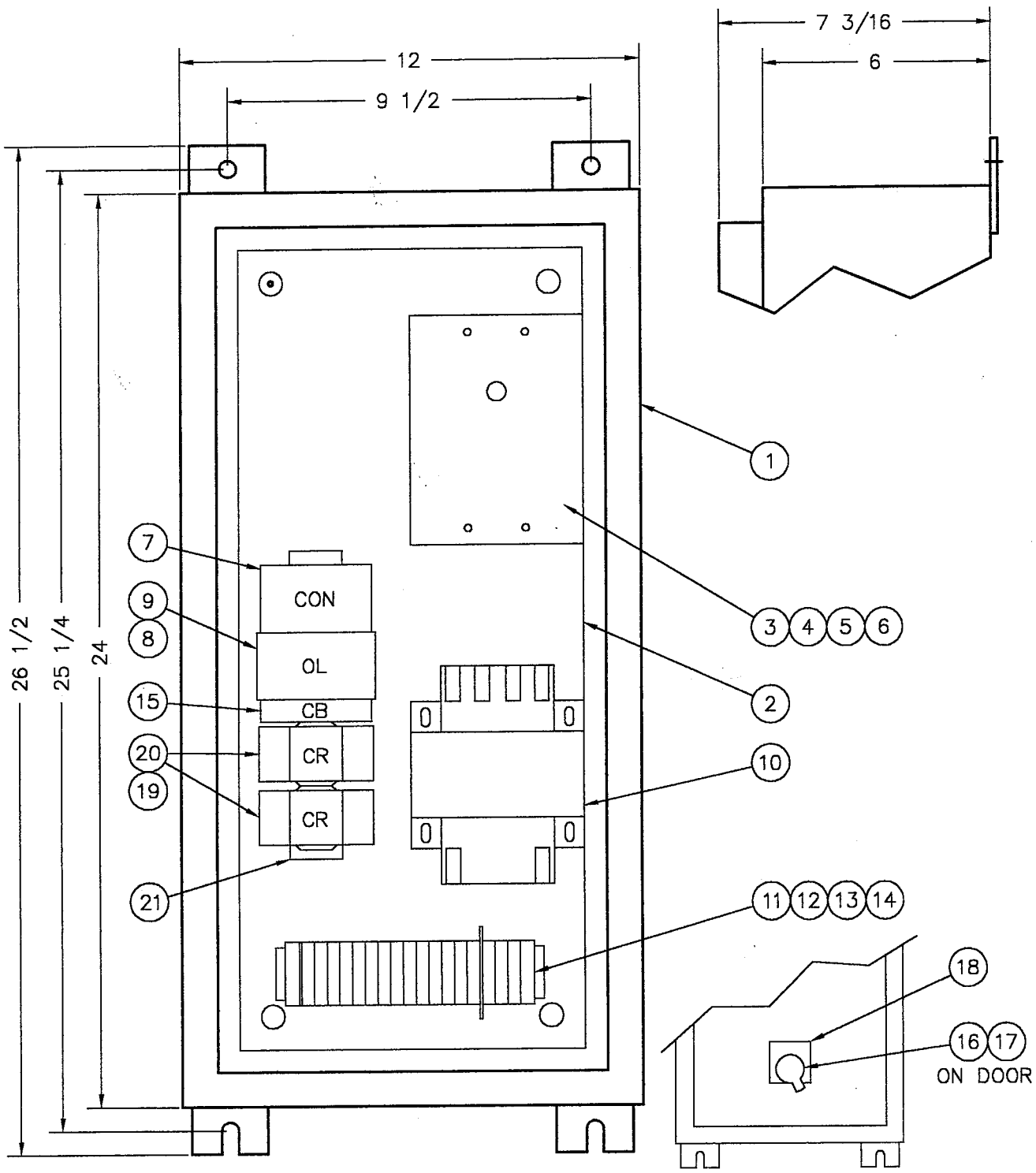


FIGURE 7–3
ELECTRICAL CONTROL PANEL

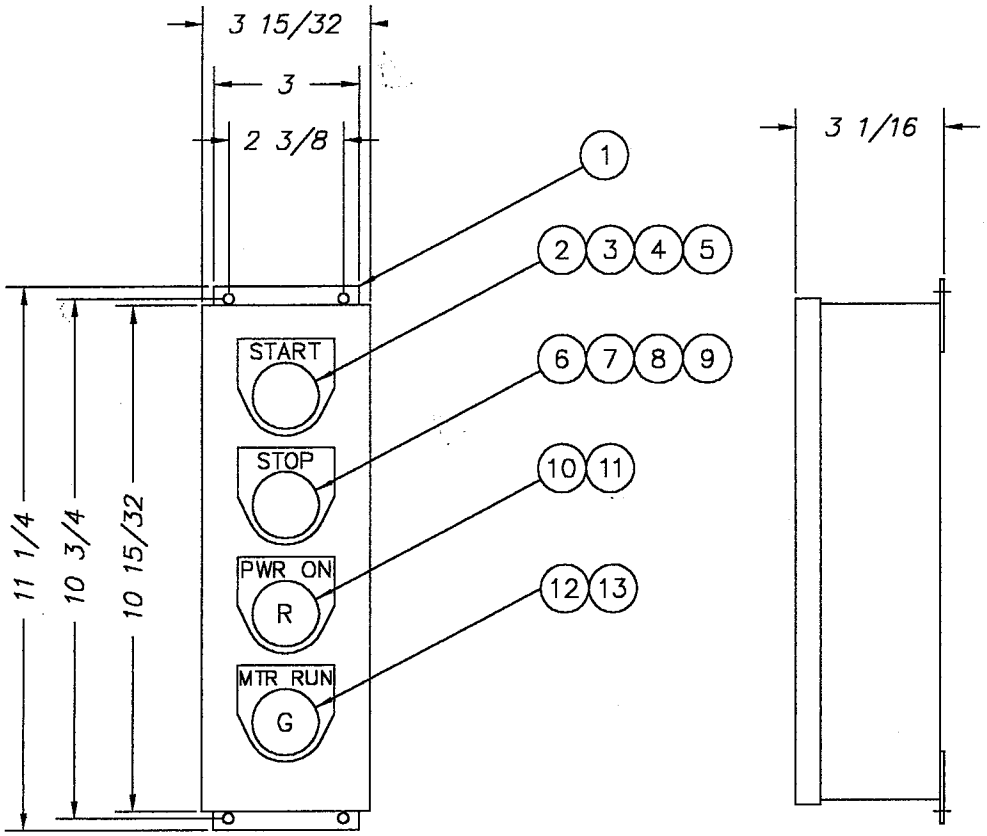


FIGURE 7–4

START/STOP PUSHBUTTON STATION

CHAPTER 8

INSTALLATION

8.1 UNPACKING

The food waste disposal system is shipped from the factory securely bolted to a single shipping pallet and protected by an external wood crate.

8.1.1 Carefully remove all external protective crating.

8.1.2 Remove all bolts and fasteners holding pulper, control panel and loose parts container.

8.1.3 Remove protective closures from water inlet and outlet ports.

8.1.4 Open container containing loose parts and, using packing slip, check that the following items have been received:

Qty.	Description	Part No.
2	3/4" Gate Valve	D2816
1	3/4" Back Flow Preventer	D2812
2	3/4" Flow Regulator	D2810
1	3/4" Y Strainer	D2482
2	3/4" Electrically Operated Ball Valve	D2882
4	Deck Plate	1429-11
4	Deck Plate Bolt	D309C-JC-28A
8	Deck Plate Nut	D312C-JC-1
1	Start/Stop Pushbutton Station	1429-4

8.2 INSTALLATION

8.2.1 Installation Under Existing Sink, Dresser or Scrapping Table

8.2.1.1 The sink, dresser or table must be modified, if necessary, to provide a minimum flat surface 12 inches square and approximately 27" off the deck. (Refer to Fig. 8-5 for unit dimensions). It may be necessary to cut supporting legs of unit and to reweld them, if there is less than 27" height under table top. At least 2" clearance should be maintained between the bottom of motor and finished floor.

1. Determine location in the flat area of the sink, dresser, or table for center of pulper hole.

2. Layout and cut an accurate 10" diameter hole in the flat surface. Use caution when cutting opening hole, so that surface is not distorted.

3. On a 10 7/8" bolt circle, stud weld (at 45 degrees to each other) eight (8) 1/4-20 x 3/4" lg. stainless steel studs to underside of table, such that pulper and discharge dam will be oriented in the desired direction. (It may be necessary to drill through table surfaces and install round head stainless steel screws, 1/4-20 x 1" lg., rather than welding on studs, if table material thickness is less than 12 gauge).

8.2.1.2 Remove floor tiles or other floor covering in immediate area of the installation.

8.2.1.3 Set pulper in position underneath table with deck plate bolts (Fig. 4-1, item 2) held in their retracted position by adjustment nuts (Fig. 4-1, item 3). Line up the 8 holes in pulper flange with newly installed stainless steel studs (or bolts if holes were drilled). To aid in positioning and final adjustment, set shim blocks under motor to aid in supporting system hook-up.

8.2.1.4 Screw a deck plate (Fig. 4-1, item 1) onto each deck plate bolt (four places) until bolt end is flush with lower surface of deck plate.

8.2.1.5 Apply a light coating of room temperature vulcanizing rubber to upper surface of pulper flange and install the gasket. Room temperature vulcanizing rubber available under NSN 8040-00-996-7630 in a 2 oz. tube is a suitable material. Next apply a coat of the same material or an equivalent substitute (such as RTV mfg. by G.E.) to top surface of gasket.

8.2.1.6 By alternating in a clockwise direction, move lower adjustment nut (Fig. 4-1, item 3) upwards in 1/4" steps until pulper is positioned securely under table through protruding studs or bolts. Tack weld or otherwise fasten the 4 deck plates to the deck.

8.2.1.7 Lock pulper into position by installing a lockwasher and 1/4-20 nut at each stud location.

NOTE

The pulper support legs are designed to support the pulper tank. These legs should not exert an upward or downward force on the table.

8.2.1.8 Finish welding the 4 deck plates in position.

8.2.1.9 Tighten each upper adjustment nut against foot of pulper leg.

8.2.1.10 Repair floor covering as necessary in installation area.

8.2.2 Installation of Piping - refer to Fig. 4-2

NOTE

Bolts, nuts, flanges, gaskets and interconnecting plumbing downstream of the two drain outlets and required plumbing to install loose parts described in 8.1.4 are to be furnished by the installing activity.

8.2.2.1 Make up and install 3/4" water supply piping between approved fresh and seawater lines as indicated on Fig. 4-2. Inlet water pressure (fresh and sea) should not be less than 15 psi nor more than 125 psi. Backflow preventer must be installed 12" above floodplain. Use unions in piping system to facilitate replacement of individual components.

CAUTION

The backflow preventer is provided with a vent outlet that can emit a discharge. The backflow preventer must be installed so that any discharge will not flow onto a food preparation area.

NOTE

The pulper does not require an eductor in the ship's waste drain pipe to assist transport of the pulped waste slurry. The use of an eductor of sufficient size for the 6 gpm flow will not adversely affect the pulper operation. However, if the pulper discharge is piped into a ship's liquid waste collection, holding, or transfer (CHT) system, an eductor may impose an unacceptable hydraulic load on ship's CHT system. If the eductor is removed, it must be replaced with a spool of the same length.

8.2.2.2 Make up and install 2" drain plumbing from dam assembly flange and from the 2" drain (ball) valve to ship's drain system. Use a union at drain valve to facilitate maintenance.

8.2.3 Installation and Connection of Electrical Controls - Refer to Fig. 8-1

WARNING

Dangerous voltages are present on live connections inside certain components of the food waste disposal system. Observe normal safety precaution with high voltage electrical apparatus prior to connecting to ship's local distribution panel or closing the external circuit to energize the system. A mechanical interlock automatically opens the main circuit breaker when the control panel door is opened. This circuit breaker de-energizes all electrical components except the incoming leads from the ship's local distribution panel. Defeat of this device to permit electrical troubleshooting should only be attempted by a qualified electrician.

NOTE

Mounting hardware for the electrical control and remote pushbutton station, the electrical control cables between the electrical control panel and the ship's local distribution panel, and the electrical control cables interconnecting the components of the food waste disposal system are to be furnished by the installing activity.

Electrical cables interconnecting the electrical control panel, drive motor, start/stop pushbutton station, the feed chute interlock switch, the input water motor operated valves, and the ship's local distribution panel shall be of an approved construction suitable for operation at 440 or 115 VAC (as applicable), with each conductor rated at 15 amperes minimum.

All electrical control enclosures provided with the food waste disposal system are designed to NEMA 4 splash proof standards. Approved splash proof cable connections are to be furnished by the installing activity and installed at all electrical connections to electrical enclosures.

8.2.3.1 Install electrical control panel on a bulkhead adjacent to pulper.

8.2.3.2 Install pushbutton station within reach of operator. It may be mounted on an adjacent bulkhead or on a leg of scrapping table, sink or dresser. It should be located to permit operator to reach the "Start" or "Stop" pushbuttons without moving from his station or reaching over the scrapping table, sink or dresser assembly.

NOTE

See Fig. 8-1 for electrical connections indicated in the following steps 3 through 5 inclusive.

8.2.3.3 Make up and install power cable between ship's local distribution panel and control panel of food waste disposal system.

8.2.3.4 Make up and install power cable between food waste disposal system control panel and pulper drive motor.

8.2.3.5 Make up and install control cables between control panel and remove pushbutton station, interlock switch on pulper tank, and electrically operated ball valves in inlet piping.

8.2.4 Check-Out of the Installation

8.2.4.1 Verify functions of electrical controls as described in 4.5.4.

CAUTION

Do not permit the pulper to operate for more than one minute at a time during this operation. Damage to the shaft seal could result from extended operation in the dry state. If electrical malfunctions occur indicating the need for troubleshooting operations, it is recommended that approximately 2 gallons of water be added to the pulper to wet the seal area before proceeding.

8.2.4.2 Perform the Start-up Procedure, Table 2-2, except do not feed food waste.

8.2.4.3 Inspect all plumbing joints for leakage and verify that water is running freely through drain.

8.2.4.4 Check motor shaft seal for leakage in accordance with 4.5.3.5 through 4.5.3.9.

8.2.4.5 De-energize the system by turning the disconnect switch on the electrical control panel to the "Off" position.

8.2.4.6 Certify the system as "Ready for Operation."

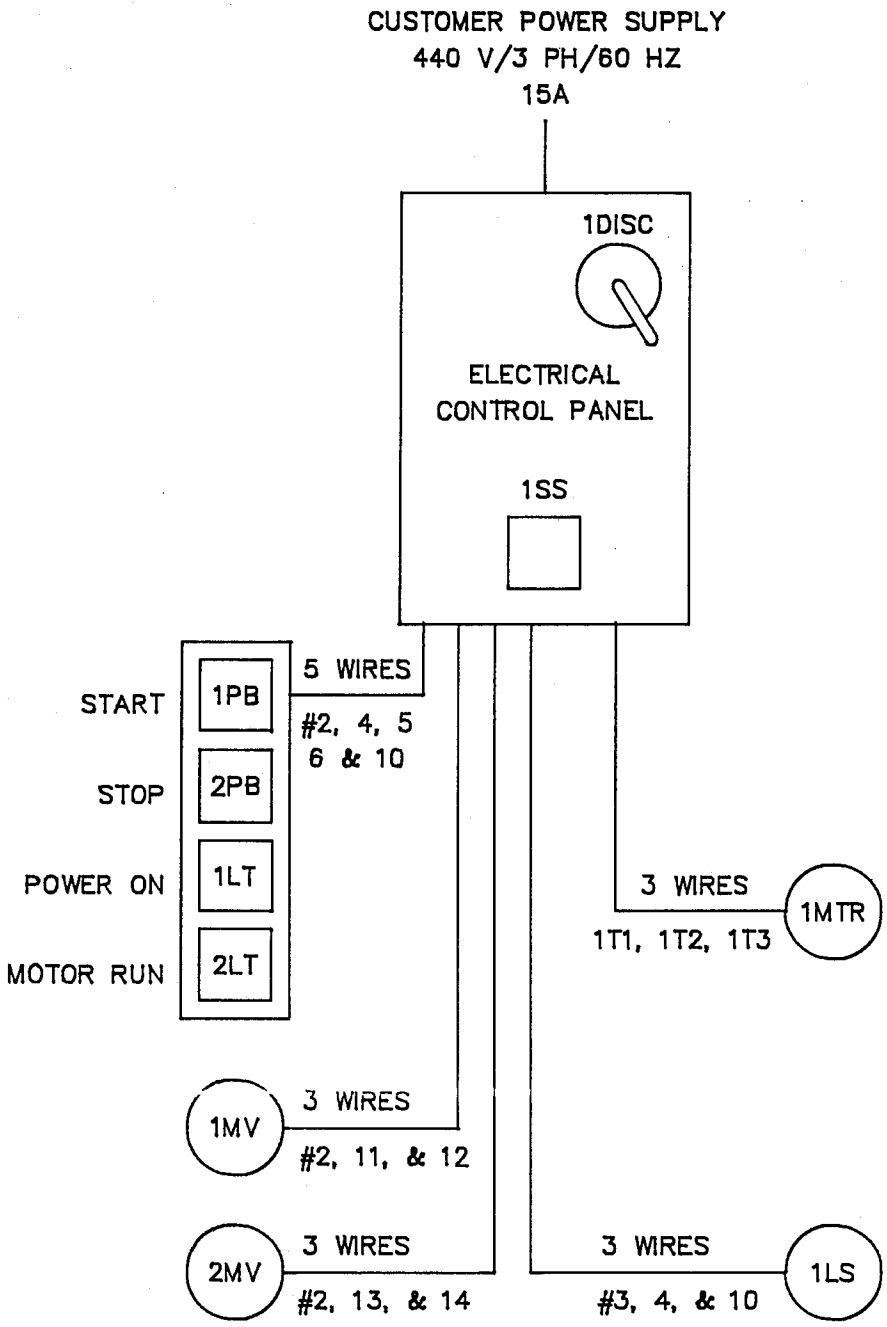


FIGURE 8–1

FIELD POWER & CONTROL WIRING

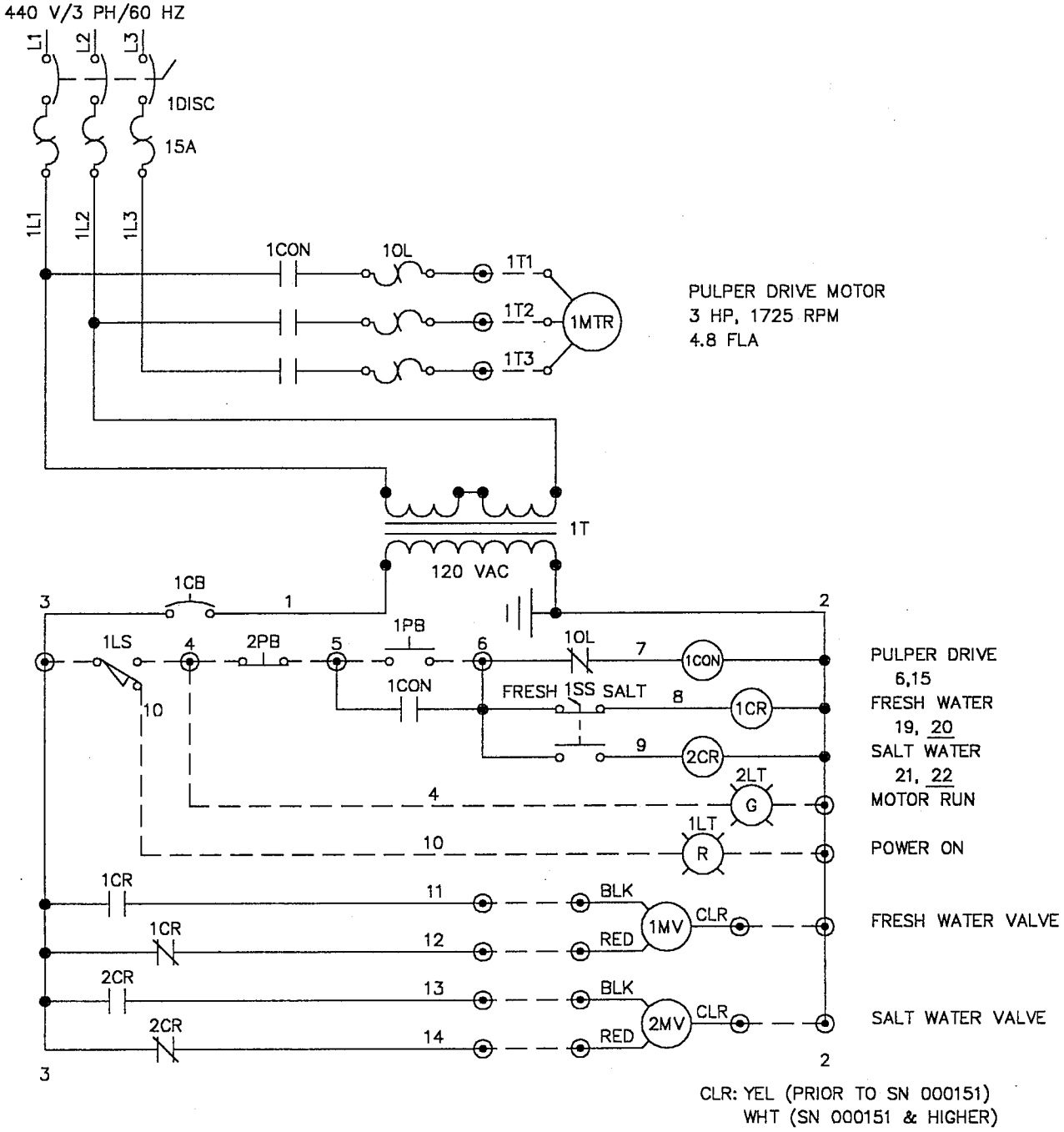


FIGURE 8–2
ELECTRICAL WIRING SCHEMATIC

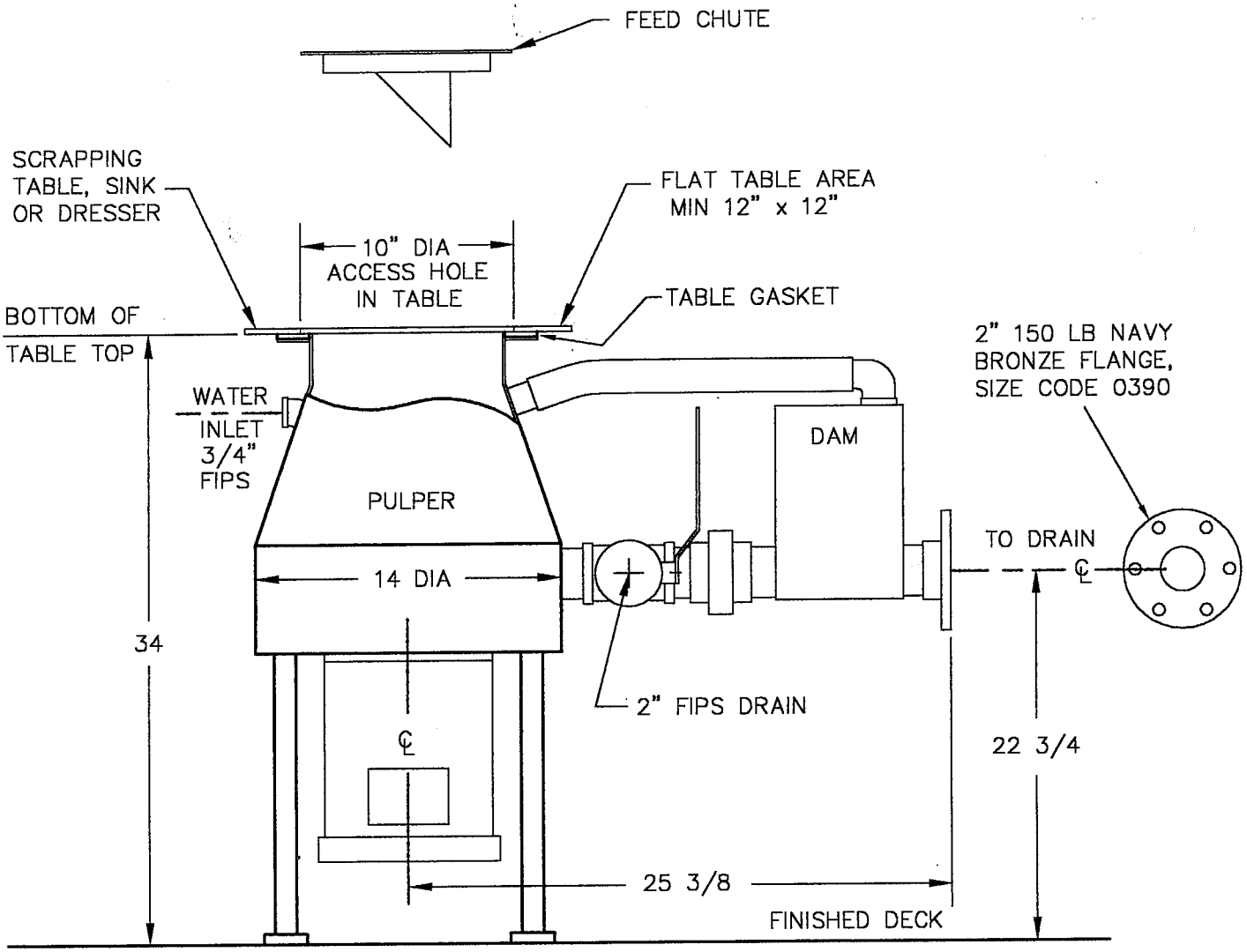


FIGURE 8–3
INSTALLATION DRAWING
MODEL P3–NSU WASTE DISPOSAL SYSTEM