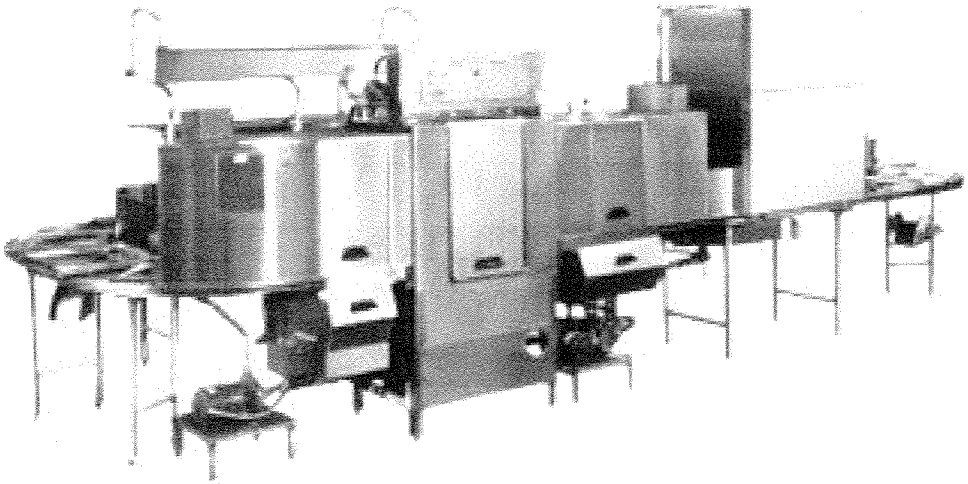
Adamation

"For Creative Dishwashing Solutions"
P.O. Box 95037, 87 Adams Street, Newton, MA 02495-0037
Tel.: (617) 244-7500 Toll Free: (800) 225-3075 Fax: (617) 244-4609



OPERATOR'S MANUAL FOR ADAMATION MODEL CA & CSL-1390 WAREWASHING MACHINE CONTAINS INSTRUCTIONS FOR OPERATION, MAINTENANCE, AND REPAIR

Part Number: 99-9000-006
Price: $ 40.00
Revised April 2002
Printed in U.S.A.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

SECTION 4 PRINCIPLES OF OPERATION (cont.)

SECTION 5 TROUBLE SHOOTING

TABLE OF CONTENTS (cont.)

SECTION 5 TROUBLE SHOOTING (cont.)

SECTION 6 MAINTENANCE

TABLE OF CONTENTS (cont.)

SECTION 7 ILLUSTRATED PARTS LIST

MANUFACTURER'S DISHWASHING MACHINE WARRANTY AND LIMITATION OF LIABILITY

Adamation warrants each Adamation dishwashing system to be free from defects in material and workmanship under "normal use and service" (which does not include normal wear of parts). Within a period of 12 months from date of installation or 3000 operating hours of the dishwasher, or eighteen (18) months from date of shipment from factory, whichever comes first, Adamation, Inc. will repair or replace any parts which in Adamation, Inc.'s sole judgment, are defective in material or workmanship and will furnish or pay for the necessary pre-approved labor to accomplish same.

Warranty part shipment and service can only be obtained by contacting the National Service Department, P.O. Box 95037, 87 Adams Street, Newton, MA 02495-0037 - Toll Free Number 1-800-225-3075. Adamation normally ships warranty parts via ground shipment from its factory in Newton, MA with Adamation assuming the ground shipment charges. If the customer elects to utilize an express method of shipping, then the customer shall pay the difference in cost between express shipping charges and ground shipping charges. Request for shipment must be before 2:30 P.M. E.S.T.

The Adamation Service "Hot Line" is available to discuss any service problem at 1-800-225-3075 from 8:30 A.M. to 5:00 P.M. E.S.T. After working hours, service is available by calling 617-244-7500, which will connect you with an answering service and "beeper" network.

Adamation shall have a reasonable time to make such repairs and/or replacements and all labor is to be performed during regular working hours. All overtime premiums will be billed to the customer. The warranty parts and labor required is an integral part of the sale of the system and as such will not apply if the system is not operated and maintained in strict accordance with the instructions in the proper Adamation manual.

At Adamation's sole discretion, any and/or all terms of the warranty can be cancelled if payment for this system has not been received within agreed upon terms.
This warranty specifically does not cover:

A. Improper plumbing connections by others.
B. Improper electrical connections by others.
C. Malfunction caused by improper cleaning or from overloading.
D. Damage caused by unreasonable neglect and carelessness in operation.
E. Inadequate or excessive water and/or steam pressure.
F. Failures due to deposits resulting from water conditions, detergents, or improper cleaning.
G. Improper cleaning of drain valves, line strainers, pumps, screens, and all wash and/or rinse nozzles.
H. Improper installation or malfunction of chemical dispensing equipment.

Certain specialized equipment not manufactured by Adamation is, at times, supplied by Adamation but is warranted and serviced only by the local representative of the particular manufacturer. The following or similar equipment falls into this category.

1. Electric Powered or gas fired Boosters
2. Disposers

Replacement parts are guaranteed for ninety days or the remainder of the basic dishwasher guarantee, whichever is longer.

This warranty does not apply if the system is started up without an Adamation representative present.

This warranty is applicable only for the initial place of installation. Any change of the original installation terminates this warranty.

Adamation's warranty obligation with respect to machines located outside of the United States or located in the State of Alaska is limited to the furnishing of replacement parts only.

This warranty is in lieu of all other warranties, express or implied and includes without limitation any implied warranty of merchantability or fitness for a particular purpose or any other obligation or liability on the part of Adamation whether in contract, strict liability, tort or otherwise.

In no event will Adamation be liable for loss of use of facilities or other property and such things as-but not limited to-additional labor costs, loss of revenue or anticipated profits and other damages of any kind whether direct, indirect, incidental or consequential.

PARTS IN LIEU OF WARRANTY

In lieu of Adamation's standard equipment warranty, and upon your request, Adamation will supply parts at no cost for warranty work to be performed by your personnel at no cost to Adamation. Parts will be sent as required and their cost deducted from the total amount reserved to cover parts in lieu of warranty, which is approximately 2% of the equipment cost. This system is a cost effective method of supplying you with repair parts only as required by your specific needs to extend the coverage period.

Warranty parts shipment can only be obtained by contacting the National Service Department, 87 Adams Street, Newton, MA 02495-0037 - Toll Free Number - 800-225-3075. Adamation normally ships warranty parts via ground shipment from its factory in Newton, MA with Adamation assuming the ground shipment charges. If the customer elects to utilize an express method of shipping, then the customer shall pay the difference in cost between express shipping charges and ground shipping charges. Request for shipment must be before 2:30 P.M. E.S.T.

The Adamation Service "Hot Line" is available to discuss any service problem at 1-800-225-3075 from 8:30 A.M. to 5:00 P.M. E.S.T. After working hours, service personnel is available by calling 617-244-7500 which will connect you with an answering service and "beeper" network.

This warranty is in lieu of all other warranties, express or implied and includes without limitation any implied warranty of merchantability or fitness for particular purpose or any other obligation or liability on the part of Adamation whether in contract, strict liability, tort or otherwise.

In no event will Adamation be liable for loss of use of facilities or other property and such things as-but not limited to-additional labor costs, loss of revenue or anticipated profits, and other damages of any kind, whether direct, indirect, incidental or consequential.

SECTION 1 - INTRODUCTION

This instruction manual contains general information, installation, operation, principles of operation, trouble-shooting and maintenance information for Adamation CA/CSL Series dishwashing machines. A considerable number of options and accessories are available with each CA/CSL Series dishwashing machine. These are described in this manual. Parts lists with accompanying exploded views of all replaceable parts of a CA/CSL Series dishwashing machine are included in Section 7.

BASIC CA/CSL SERIES DISHWASHING MACHINE

The Basic CA/CSL series Adamation dishwashing machine consists of an oval shaped rack conveyor table upon which an endless conveyor train, carrying dishracks, is automatically driven through a series of enclosed cabinets in which wash and rinse functions are performed on soiled dishware. An outline drawing of the basic CA/CSL Series dishwasher, identifying the major sections of the machine, is shown in Figure 1-1.

The manner in which this machine operates to perform its dishwashing function is described briefly below.

Soiled tableware is placed in the dishracks at the loading station. Heavy food soil (garbage) is deposited directly onto the conveyor table (or into an optional garbage trough or garbage spiral.) The rack conveyor carries the loaded dishracks into and through the cabinets where the following functions are performed:

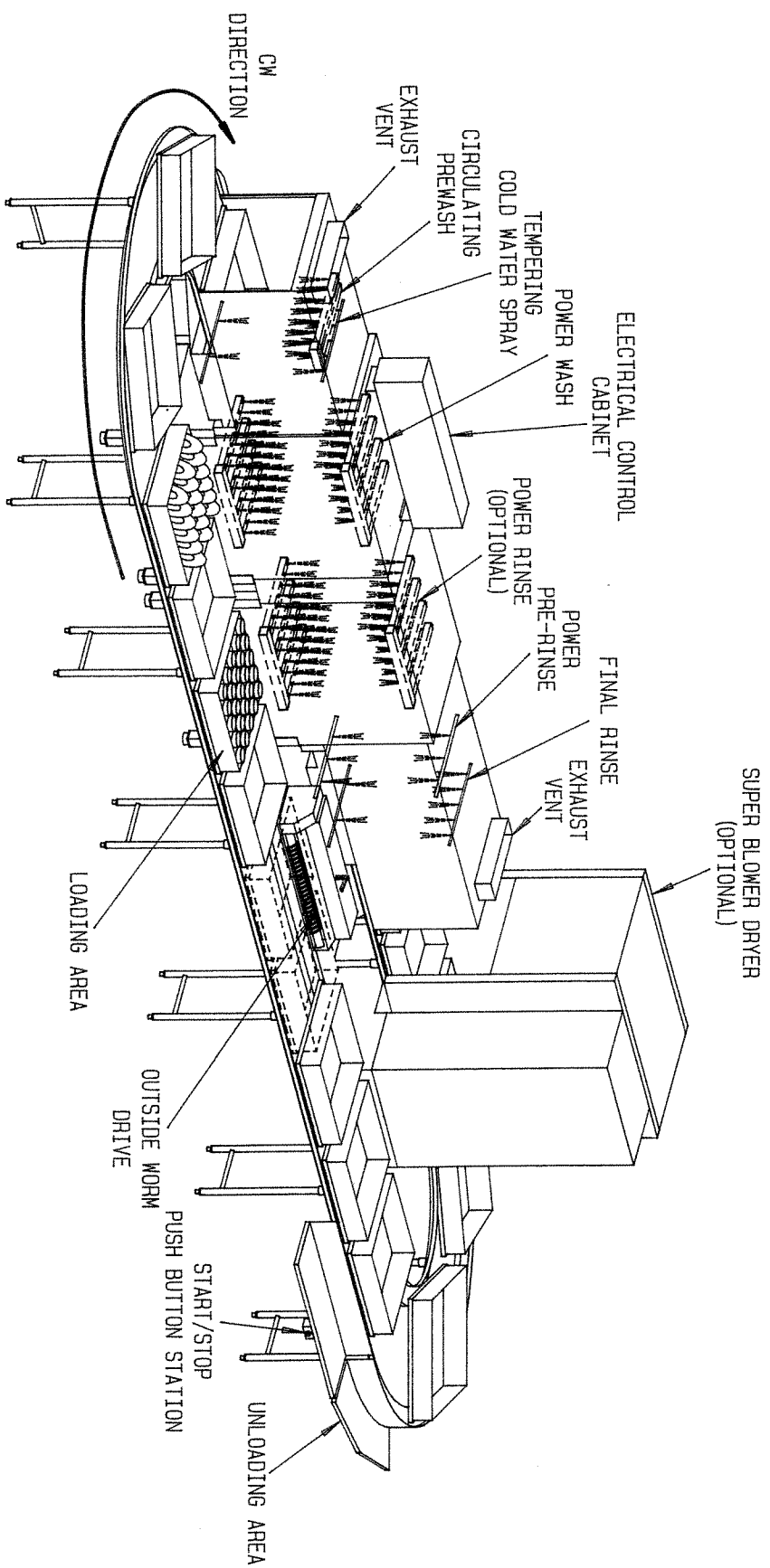
1. PREWASH HOOD AND SINK

Tableware is sprayed with tempered hot water at 110 degree F. The water temperature is maintained at a level which will remove the remaining surface food soil and liquids from the tableware surface without baking the soil onto the tableware. One round perforated hommel pot food soil basket in the prewash hommel pot sink located outside the prewash cabinet or two standard deep-well baskets located in the prewash sink retain(s) all larger pieces of food soil and garbage. The prewash water drains through the perforated basket(s) into a prewash (Hommel Pot) sink where it is then recirculated.

When the garbage is deposited directly onto the rack conveyor table (and no optional garbage container is used), squeegees attached beneath some of the dollies of the rack conveyor train sweep this garbage into the food soil basket(s). If an optional garbage trough to a pulper or disposer is included in the dishwashing system, over-flow water from the prewash is pumped to the garbage trough for further use.

2. POWER WASH CABINET

A dishrack with tablewares passing through the power wash cabinet is subjected to a high volume spray of 140 to 150 degree F. water, with detergent added. The wash water is retained in a heated tank beneath the cabinet and recirculated. A one and one-half gallon per minute make-up supply freshens the cleaning water. Here, all remaining food soil, grease and soluble material is removed from the dishware.



CA/CSL SERIES DISHWASHING MACHINE
FIGURE 1-1

3. POWER RINSE CABINET (OPTIONAL)

Same as power wash cabinet except with 160 degree to 170-degree F. water, no detergent added, and make-up water supply from prerinse and/or final rinse.

4. PRERINSE (OPTIONAL ON 14" SINKS)

After the dishrack leaves the power wash or power rinse cabinet, it passes through a recirculating hot water spray which removes all of the detergent and wash water from the surfaces of the dishes.

5. FINAL RINSE

The dishrack now passes between spray arms which subjects the surfaces of the tableware to 180 degree to 195 degree F. water at a flow pressure of 20 PSI maximum, 17 PSI minimum. Provision is made for the installation of a rinse additive injector if the user so desires.

The high temperature of the final rinse water performs the final cleaning function, sanitizes the tableware and preheats it for rapid air drying. The dishrack emerges from the final rinse cabinet through a spray curtain. Steam exhaust vents at the exit end of the final rinse cabinet are adjusted so as to prevent steam from escaping from the cabinet. If a rinse additive is used in the final rinse water, dishes will dry in room atmosphere in about 20 seconds; without a rinse additive it may require as long as one minute.

NOTE:

This is not the only, or necessarily the primary, reason for using a rinse additive. Consult a rinse additive vendor for the full advantages.

6. SUPER BLOWER (OPTIONAL)

The dishrack exits the final rinse cabinet and enters the blower cabinet which subjects the surfaces of the tableware to triple jets of recirculated (optional heated) air. No hot air is discharged into the dishroom and a venting system is not required. Stripped water off the passing tableware is discharged down the sink located below the blower cabinet.

The tablewares are unloaded from the dishrack within a few feet from the exit end of the final rinse or super blower cabinet. Clean wares are stacked on optional landing ledges or directly onto carts (supplied by others).

RACK ROTATION

In Figure 1-1, the rack conveyor is shown operating in a clockwise direction (when viewed from above) and the wash and rinse cabinets are installed from left to right. The CA/CSL Series machines can be supplied with either clockwise or counterclockwise rack conveyor rotation. In most cases, the information contained in this manual applies to either. If differences are significant, an explanation will be included. In parts lists and exploded views, where alternate parts are required for clockwise or counterclockwise rotation, these are so identified and different part numbers are assigned.

CABINET DOOR LOCATIONS

Normally CA/CSL Series dishwashing machines are supplied with cabinet doors which open on the outboard side (outside perimeter) of the cabinets. Machines may be supplied with cabinet doors on the inboard side (inside perimeter) of the cabinets. This has no effect on the information contained in this manual.

HOOD DIMENSIONS

The standard CA/CSL Series dishwashing machine cabinets are designed to accept a normal sized serving tray (14" x 18") placed vertically in the dishrack.

CA/CSL SERIES OPTIONS

Almost every user of an Adamation dishwashing machine will have some special need or particular specification which will require modifications or additions to the basic machine configuration described previously. For this reason, most dishwasher installations will differ in some respect from the descriptions given in this manual. These changes always entail additions or minor modifications to the basic configuration or to its functions and do not invalidate the information given in this manual. Look towards the back of this manual for specific information concerning the option on your particular dishmachine.

SECTION 2 - INSTALLATION

GENERAL

At the time of order, the Adamation engineering department prepares a floor plan drawing for each dishwashing machine installation. The floor plan drawing, based upon the physical layout of the building (or room)in which the machine is to be installed, shows the location of the machine, the location of all required service connections, significant dimensions and tolerances and all other information needed to locate the machine so as to meet the user's requirements. This drawing, together with warranty information, a copy of the factory packing list and the customer's copy of the instruction manual are enclosed in a service information envelope which is supplied to the user by an Adamation representative prior to delivery of the machine. If the particular installation requires options or accessories which are wired to the machine (boosters, disposers, etc), the service installation envelope will also contain a special wiring diagram showing the connections to these options and accessories.

Since each dishwashing machine, due to individual use requirements, nearly always differs in some respect from all other machines, the drawings and other materials contained in the service information envelope apply only to the machine for which it is delivered. This service information envelope must be retained and controlled by a responsible person at the user's establishment; loss or disposal of its contents may result in serious installation delay of the machine.

FLOOR PLAN VERIFICATION

The service information envelope contains a floor plan drawing of the machine installation at the user's location. This drawing must be thoroughly checked against the site and verified as to the dimensions and clearances, location of walls, doors and the like. Any discrepancies should be immediately reported to the Adamation sales representative. Also, the buyer should immediately report any anticipated building changes which might affect either the installation or the efficient operation of the machine.

UTILITY REQUIREMENTS

When the dishwashing machine was ordered, the buyer was provided with an Adamation survey report describing the exact utility requirements (electricity, rinse hot water, steam, wash tank hot water, etc.). Before the installation supervisor arrives, all utility ratings must be checked and verified. The machine can be assembled and installed in a very short time (if necessary), but it cannot be operated unless the incoming utilities meet the requirements of the machine and of the National Sanitation Foundation.

DAMAGE INSPECTION

Immediately upon arrival, all shipping containers received should be checked against the bill of lading. Report any missing containers to the carrier and also to the Adamation production control group (immediately by phone). At this time, all containers received should also be inspected visually for external evidence of damage in transit. If any container shows such evidence, notify the carrier and have his representative present when the container is opened. Transit damage claims must be made to the carrier, not to Adamation. Notify the Adamation production control group of any damaged equipment received. In most cases, the larger sections of the machine are shipped uncrated. Small parts are packed together in one or more shipping cartons. Where the larger parts of the machine are attached to skids for shipment, do not twist or bend the machine sections when removing the straps and other hardware, which secure the machine to the skid, or while separating the machine from the skid.

If any of the cartons, which contain the smaller parts, arrive damaged to the extent that parts may be missing, immediately request a complete listing of all parts shipped in that container from the Adamation production control group. Notify Adamation and the carrier of any missing parts.

UNPACKING

Except in the case of cartons or containers damaged in transit, as described above, DO NOT open or uncrate any of the shipping containers prior to the arrival of the Adamation installation supervisor at the site. He will inspect all parts as they are unpacked and check the shipment for completeness. If containers are opened before the installation supervisor arrives, Adamation cannot accept responsibility for missing parts.

ASSEMBLY

Prior to shipment, each Adamation dishwashing machine is completely assembled and tested at the factory. It is then disassembled to the extent necessary for shipment and delivered to the installation site. Unpacking and reassembly of the machine is always done under the supervision of an Adamation representative. He will check the contents of the shipping containers against the packing list (in the service information envelope) and immediately report any deficiencies to the home office. Detailed procedures for the assembly of each CA/CSL Series machine are provided to all Adamation service personnel; the user must never attempt to assemble the machine prior to the arrival of the Adamation service representative. (see Warranty).

INSTALLATION

For each installation, the Adamation engineering department prepares a floor plan drawing. This drawing shows the location of all utility connections in the dish room to the machine and the required rating of each input. The specific requirements for each installation will vary depending upon the type of heater(s) used in the power wash and optional power rinse tanks and whether accessory equipment (disposer, steam booster, etc.) is installed with the machine. The utility connections described here are for a basic CA/CSL dishwashing machine and for standard accessory equipment. For connections required for optional accessory equipment, please refer to general connection schedule on floor plan (Purchase Order Verification) drawing.

ELECTRIAL CONNECTIONS

Each machine is manufactured to operate on the customer's specified electrical service. A power disconnect switch or similar device in the incoming line must be installed and supplied by the customer in the dishroom and be readily accessible at the machine. Ampere rating for incoming power will depend on the individual machine configuration (See plan drawing for this requirement). Incoming electrical connections are made in a splice box located on the back of the electrical control cabinet. [Do not apply power to the machine prior to the final checkout.]

HOT WATER CONNECTION

Hot water must be supplied to the machine at a temperature and flow rate which assures that the water at the manifold of the final rinse tank will be no less than 180 degrees F nor more than 195 degrees F at a minimum flow pressure of 17 PSI. Minimum hot water requirements (without options and accessories) are 6.9-8.4 gallons-per-minute for CA-CA1, 4.8-6.3 gallons-per-minute for CSL1390-CA2-CA3-CA4. The incoming hot water line is connected to the hot water harness located behind the final rinse hood. The harness is equipped with a 3/4-inch female pipe thread.

COLD WATER CONNECTION

Cold water must be supplied at a flow pressure of no less than 17 PSI. Minimum requirement, (without accessories), is 4.8 gallons-per-minute. The incoming cold water line is connected to the cold water harness located behind the prewash hood. The harness is equipped with a 3/4-inch female pipe thread.

DRAIN CONNECTIONS

The drainpipe, which runs the length of the machine below the cabinets, can be connected to the building's drain at either (Prewash or Final Rinse) end. Both fittings are equipped with a 2-inch female pipe thread. Install the plug provided into the end not used. A grease trap may be required between the machine drain and the building's drain system (check local codes for the type of grease trap, as required, to be installed). If a right angle turn is required in the drain line, between the machine drain and the grease trap, use a tee connection with a threaded plug to facilitate cleaning.

INSTALLATION CHECK-OUT

After the dishwashing machine is completely assembled and all required service connections are made, the machine must be given a thorough and complete checkout before it is put into operation. This check-out consists basically of testing each operational function of the machine separately before placing everything in operation simultaneously. Before making this checkout, the personnel involved must be thoroughly familiar with the operating procedures in Section 3 and with the function of each control.

CAUTION:

Since the equipment check-out may entail repeating certain procedures, there are two important precautions which must always be observed: (1) Never run any pump without water in its pumping circuit and (2) for machines which have electric tank heaters, be certain that the power wash tank is full of water whenever the heaters are on.

INITIAL CONTROL SETTINGS

1. All manual overload breakers in the electrical control cabinet should be in the "OFF" position.
2. The selector toggle switch should be in the "OFF" position.
3. The building's power source to machine should be turned off.
4. Both the hot and cold water fill valves should be closed.
5. All the wash tank, rinse tank, and hommel pot drain valves should be closed.
6. The drive worm should be disengaged.

FILL AND CHECK THE TANKS

1. Using the prewash fill valve, fill the prewash sink or external hommel pot to the top of the overflow standpipe.
2. Using the power wash and power rinse (if equipped) fill valves, fill the wash or rinse tank to the top of the overflow standpipe. (Remove the scrap screen to observe this water level.) Run a few more gallons into the tank to check that the standpipe drains properly. Turn off the fill valve and check that the water level remains at the top of the standpipe. If it does not, the drain valve is jammed, not completely closed or the standpipe gasket may be leaking.

NOTE:

If system is equipped with auto fill/level control circuit, place the selector toggle switch and the automatic fill toggle switch(es) to the "ON" position. The power wash and power rinse (if equipped) tank(s) will fill automatically and maintain its water level during operation.

3. Using the final rinse fill valve, fill the final rinse tank to the top of the overflow system. Close the door while filling the tank and then turn off the fill valve and remove the scrap screen to check that the water level remains at the top of the overflow system. If it does not, the overflow system is not operating correctly. If the front tank does not maintain its water level, then the valve may be jammed or not closed properly. Close the door and run a few more gallons into the tank to assure that the overflow drains properly. Replace the scrap screen.

4. Close and secure all the cabinet doors.

CONTROL CIRCUIT CHECK

1. Turn on the building's power source to machine.
2. Place the selector toggle switch to the "MANUAL" position. The contacts of the magnetic contactor in the cabinet should close with an audible click. If not, momentarily push the start station button located at the workstation. All other manual overload breakers should remain off.
3. Place the selector toggle switch to the "AUTOMATIC" position.
4. At the control stations on the conveyor table, depress each low voltage push button, one at a time. Each time a low voltage push button is depressed, there should be an audible click from the contacts of the magnetic contactor in the electrical control cabinet. (This may take two people.)
5. Return the selector toggle switch to the "OFF" position.

POWER WASH PUMP MOTOR ELECTRICAL PHASING CHECK

1. In the electrical control cabinet, place the power wash pump manual overload breaker to the "ON" position.

CAUTION:

Be sure the wash tank is filled with water. (See Section 2, Fill and Check The Tanks, Number 2.) Operating the pump when the tank is dry will damage the pump seal.

2. Place the selector toggle switch to the "MANUAL" position. The power wash pump should operate.
3. Check the direction of rotation of the pump motor. To do this, check the end of the motor shaft that projects through the motor housing. An arrow stenciled on the pump housing end plate shows the correct shaft rotation. If the pump is rotating in the wrong direction, perform steps 4 through 9; otherwise proceed to step 10.
4. Place the selector toggle switch to the "OFF" position.
5. Place the power wash pump manual overload breaker to the "OFF" position.
6. Turn off the building's power source to the machine.
7. Interchange any two of the three L1, L2, and L3 incoming power connections to the Adamation control panel.
8. Turn on the building's power source to the machine and place the power wash pump manual overload breaker to the "ON" position.
9. Place the selector toggle switch to the "MANUAL" position and recheck the motor rotation. It should now be correct.

NOTE:

All CA/CSL-Series dishwashing machines have accessories also using 3 phase motors. If such accessories are included in the machine installation, and all connections were made correctly, these motors will now be rotating correctly. They should, however, be checked at this time. If necessary, interchange phases at the individual motor manual overload breakers.

10. Place the selector toggle switch to the "OFF" position.
11. Place the power wash pump manual overload breaker to the "OFF" position.

CONVEYOR WORM DRIVE CHECK

1. Close the hot water shut-off valve.
2. Place the conveyor worm drive (labeled "single drive", "low speed drive" or "high speed drive" manual overload breaker to the "ON" position.
3. Place the selector toggle switch to the "MANUAL" position. The drive worm should now start to rotate in a downward direction.
4. Lower the worm drive cabinet into the operating position, thus engaging the drive worm with the worm follower blocks located on the dollies. The conveyor train will now start to move. Latch the drive cabinet to the operating position (down). It should not vibrate or rock. If it does, see Section 6, Worm Drive Block Alignment, for adjustment.
5. Mark one dolly for identification and allow the conveyor train to operate through several complete revolutions. Watch each dolly as it is driven along the drive worm and check the following:
   A. All worm followers on the dollies should engage and disengage the drive worm freely.
   B. The worm followers must not hang up on the drive cabinet while either entering or leaving the drive area.
   C. All the worm followers must have good engagement with the drive worm for the full length of the worm. The teeth on the worm followers should engage the drive worm to a depth of approximately 1/2 - 5/8 inch through its length. If not, see Section 6, Worm/Drive Block Alignment.
6. Place the conveyor worm drive manual overload breaker and selector toggle switch to the "OFF" position.
7. Open the hot water shut-off valve.

FINAL RINSE, PRERINSE AND PREWASH SPRAY CHECK

WARNING:

Never attempt to check the spray patterns in the cabinets by opening the cabinet doors while the machine is operating. This will not only throw water out of the machine, but in the case of prerinse and final rinse water, will subject the observer to a spray of water at scalding temperatures. To check the spray patterns, lift or separate the spray curtains on the prewash and final rinse hoods.

1. Close all cabinet and hood doors securely.
2. Place the conveyor worm drive, prerinse pump and prewash pump manual overload breakers to the "ON" position, one at a time.
3. Place the selector toggle switch to the "ON" position. Hot water will now flow through the final rinse and prerinse spray arms and tempered hot water will be pumped through the spray arms of the prewash cabinet.

4. If the machine is equipped with door safety switches - machine will not operate if doors are open.

NOTE:

The conveyor drive worm will also operate, moving the conveyor train through the dishmachine.

5. In each cabinet, check to see that all nozzles in the top and bottom spray arms is discharging equal amounts of water. Any nozzle producing less water than the others is probably plugged. Turn off the machine by putting the selector toggle switch to the "OFF" position and remove the plugged nozzle and clean it.
6. Check that all spray arms are producing a vertical spray pattern. The correct spray pattern can be viewed from the ends of the spray arms. While it is not possible to observe the spray patterns from this position while checking them through the spray curtains, it is still possible to detect a misaligned spray pattern.
7. If the spray pattern is obviously tilted, the entire spray arm must be rotated so as to produce a vertical pattern. To do this, proceed as follows:
   A. Place the selector toggle switch to the "OFF" position.
   B. Rotate the spray arm to the correct position.
   C. Recheck the spray pattern.
8. Close and secure all the cabinet and hood doors.
9. Place the selector toggle switch to the "OFF" position.
10. Place the conveyor worm drive, prerinse pump and prewash pump manual overload breakers to the "OFF" position.

PREWASH COLD WATER CHECK

1. Place the selector toggle switch to the "ON" position.
2. Visually check through the lower access door or hommel pot sink curtain to be sure that cold water is spraying out of the two high pressure prewash spray arms.
3. Place the selector toggle switch to the "OFF" position and the prewash pumps manual overload breaker to the "OFF" position.
4. Replace all parts previously removed. Close and secure the cabinet and hood doors.

POWER WASH MAKE-UP WATER CHECK

1. Place all manual overload breakers to the "OFF" position.
2. Open the power wash cabinet door.
3. Place the selector toggle switch to the "MANUAL" (ON) position.
4. Check that the hot water (180 degree F) is flowing into the tank from the pipe located inside the rear of the cabinet at the top. (If the machine is equipped with door safety switches, depress latch of switch before inspection)

NOTE:

The wash tank make-up adjustment valve controls the rate of flow of make-up water. This valve is located on the outside rear of the wash cabinet. Initially, this valve is set for a maximum flow of 1-1/2 gallons-per-minute. The easiest way to obtain this setting is with a one-gallon container and a watch with a second hand. The rate can be decreased later to meet the operating conditions of the machine.

5. Place the selector toggle switch to the "OFF" position and the conveyor worm drive manual overload breaker to the "OFF" position.
6. Close the power wash cabinet door.

BLOWER MOTOR (OPTIONAL) CHECK

1. In the electrical control cabinet, place the blower motor manual overload breaker to the "ON" position.
2. Place the selector toggle switch to the "MANUAL" position. The blower should operate.
3. Place the blower motor overload breaker to the "OFF" position.
4. Place the selector toggle switch to the "OFF" position.

AUTOMATIC OPERATION/TIMER ADJUSTMENT

The timer is located on the control panel in the right hand side of the electrical control cabinet. For access to the timer, remove the cabinet front. The timer can be set for any interval of automatic operation from 1-1023 seconds. It is pre-set at the factory for 180 seconds. To set the timer, simply slide the dip switch(es) to the desired setting(s) (See Figure 2-1). To check the timer setting and operation of the automatic control circuit, proceed as follows:

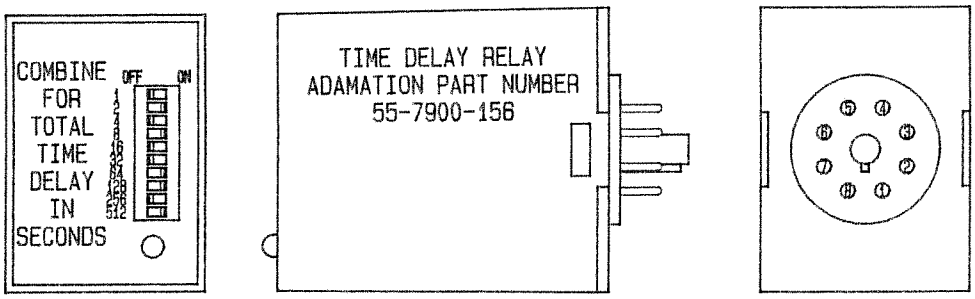


FIGURE 2-1

1. Place the selector toggle switch to the "AUTOMATIC" position.
2. At a control station at the conveyor table, depress a low voltage push button. The rack conveyor will start and operate for the period of time for which the timer was adjusted and then stop automatically.
3. Restart the machine with a low voltage push button. While the machine is operating, again depress the button. The machine should stop.

NOTE:

The primary purpose of the automatic operation is to prevent empty racks from going through the machine. By doing this, hot water, detergent and rinse solution are conserved. The best setting for any particular installation will depend upon the local conditions such as the number of dishroom personnel, the procedure for loading the machine and the like. Usually the best timer setting is one which brings three dish racks up to the loading station at once. The machine then stops and is not restarted until all three racks are fully loaded. A low voltage push button is then depressed and the three full racks move to the prewash cabinet and three empty racks replace them at the loading station.

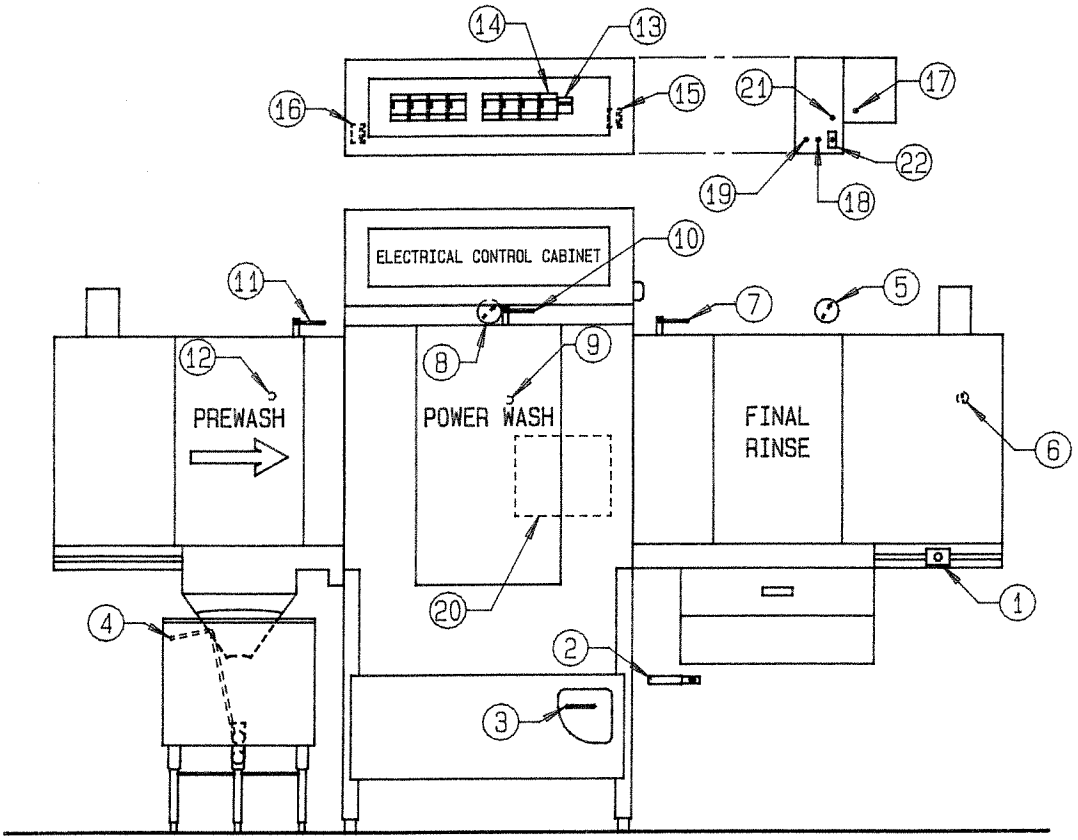
4. Place the selector toggle switch to the "OFF" position.
5. Replace the cabinet front on the electrical control cabinet.

SECTION 3 - OPERATION

OPERATING CONTROLS AND INDICATORS

All of the controls and indicators required to fill, start and operate the dishwashing machine are listed below, together with a short functional description of each.
Figure 3-1 shows the physical location of each control and indicator. All electrical controls are plainly marked either on the machine or on the control itself.

1. Control Station Start/Stop Buttons - depressing the low voltage push buttons (located at the perimeter of the rack conveyor table) starts the machine when the selector toggle switch is in the "AUTOMATIC" position. The machine runs for the pre-set time (see timer adjustment on previous page) and then stops automatically. Depressing a low voltage push button a second time during the cycle will also stop the machine. The buttons will also work in the "MANUAL" position, but will not timeout.
2. Rinse Tank Drain Valve - used to drain the smaller (front) section of the final rinse tank after operation.
3. Wash Tank Drain Valve - used to drain the power wash tank after operation.
4. Hommel Pot Drain Valve - used to drain the prewash hommel pot after operation.
5. Final Rinse Temperature Gauge - displays the temperature of the final rinse water just prior to entering the upper spray arm.
6. Final Rinse Pressure Gauge - displays the flow pressure of the final rinse water just prior to entering the upper spray arm.
7. Final Rinse Fill Valve - is used to fill the final rinse tank with 180 degree F. water prior to starting the machine. This valve remains closed during normal operation. (Note: In case of a final rinse solenoid valve failure, this valve should be left open.)
8. Power Wash/Power Rinse Temperature Gauge - displays the temperature of the wash/rinse water passing through the upper power wash/power rinse manifold, just prior to entering the spray arms. It only indicates when the power wash/power rinse pump is operating.
9. Wash Tank Make-Up Adjustment Valve - controls the flow rate of make-up water to the power wash tank while the machine is operating. This valve is located on the outside rear of the wash cabinet and normally set for one and one-half gallons-per minute.
10. Power Wash/Power Rinse Fill Valve - is used to fill the 22.5 gallon CA power wash/power rinse tank or the 44 gallon super wash/super rinse tank with 110-140 degree F. hot water prior to starting the machine. This valve remains closed during normal operation.
11. Prewash Sink Fill Valve - is used to fill the prewash sink with water prior to starting the machine. This valve remains closed during normal operation.
12. Cold Water Flow Adjustment Valve - controls the flow rate of the cold water to the prewash tank while the machine is operating. This valve is located on the outside rear of the prewash hood and normally set for 4.8 gallons-per-minute.
13. Elapse Timer - measures the amount of time the machine has been used in hours and tenths.
14. Manual Overload Breakers - provide single phase protection, short circuit protection and power disconnect service for the heater or motor circuit.
15. Timer Adjustment - may be set for any time interval from 1 second to 1023 seconds. When the selector switch is in the "AUTOMATIC" position, this setting determines the length of time the machine will run after a control station low voltage push button is depressed. The machine stops automatically at the end of the time cycle.



OPERATING CONTROLS AND INDICATORS

FIGURE 3-1

16. Prewash Transfer Pump Run On Timer Adjustment - this timer is located on the control circuit panel in the left hand side of the electrical control cabinet and may be set for any time interval from 1 second to 1023 seconds. It is pre-set at the factory for 90 seconds. To set the timer, simply slide the dip switch(es) to the desired setting(s) (See Figure 2-1). In either the "MANUAL" or "AUTOMATIC' mode, when the dishmachine stops, the transfer pump will continue to run for the pre-set time interval to send overflow water from the prewash sink or hommel pot to the trough for further use instead of directly into the drain.
17. Main Control Circuit Manual Overload Breaker (25 AMPS) - provides short circuit protection for the entire 24 volt control circuit.
18. Auxiliary #1 Control Circuit Manual Overload Breaker (10 Amps) - provides short circuit protection for the dishmachine contactor coils, relay, and prewash transfer pump circuit.
19. Auxiliary #2 Control Circuit Manual Overload Breaker (5 Amps) - provides short circuit protection for the dishmachine timer control circuit.
20. Branch Control Circuit Manual Overload Breakers (5 Amps) - located in a 24V junction panel on the outside rear of the wash cabinet, provides short circuit protection for solenoids, thermostats, contactor coils on dishmachine accessories.
21. Pilot Light - indicates when the machine and tank heat is in operation. When lit, the machine is on.
22. Selector Toggle Switch "MANUAL/OFF/AUTOMATIC" - This is the main operating switch of the dishwashing machine. In the "MANUAL" position, the machine runs continuously until a low voltage push button is depressed. In the "OFF" position, all pump motors and the rack conveyor drive worm motors are stopped and the hot and cold water circuits are closed. In the "AUTOMATIC" position, the machine will start only when one of the low voltage push buttons at a conveyor table control station is depressed.

Main (building) power disconnect device - provides power disconnect, single phasing protection and short circuit protection in to the incoming 3 phase electrical service. This device normally remains on except during maintenance or when dishroom is unattended.

NOTE:

This switch is not supplied by Adamation. It should be supplied and installed by the user in the dishroom in conformance with local electrical codes.

NOTE:

This section does not contain operating instructions for major equipment and accessories not manufactured or serviced by Adamation, such as garbage disposers, electric hot water boosters and the like.

PRIOR TO FILLING

After each complete shutdown, before filling the dishwashing machine, check the following:
1. Inspect the machine for cleanliness, both inside and out, including all parts, which were removed for cleaning when the machine was shut down.
2. Both the hot and cold water shut-off valves to the machine must be fully opened.
3. All the manual overload breakers in the electrical control cabinet must be in the "ON" position.
4. The selector toggle switch must be in the "OFF" position.
5. The building's power source to the incoming electrical service line must be on.

FILL PROCEDURE

Adamation, Inc. recommends that after each period of heavy use (normally after each meal), the machine should be shut down, drained and cleaned thoroughly. The procedure, which follows, is based upon prior complete shutdown and cleaning, as described in Section 3, Shutdown Procedure and Cleaning.

1. Close all lever drain valves.
2. Insert the Hommel Pot Basket in the exterior Hommel Pot of the prewash (if the machine is so equipped).
3. Insert the two deep well food soil baskets in the prewash sink (if the machine is so equipped).
4. Insert the 4"x4" pump inlet screens in the pump inlet hole(s) in the final rinse tank, if the machine is so equipped.
5. Insert the food soil screen on the lower (front) runners of the final rinse tank.
6. Insert the three food soil screens in each of the power wash or power rinse tank/five in the super wash or super rinse tank.
7. Install all eight spray or power rinse arms (4 upper and 4 lower), into the upper and lower manifolds of each power wash or power rinse cabinet, 8 upper and 8 lower in the super wash or super rinse cabinet. Insert each spray arm firmly; twist slightly to lock the arm in the correct position.
8. Using the final rinse fill valve, fill the final rinse sink to the top of the overflow system. The sink level can be checked by closing the fill valve and observing the water level. However, this is not a critical operation and if the fill valve is opened fully for about two minutes, the sink will be adequately filled.
9. Using the power wash tank fill valve, fill the power wash tank to a level of one inch below the scrap screens. Open the cabinet door while the tank is filling and remove one scrap screen to check the level.
10. Fill the detergent dispenser and rinse additive injector in conformance with the detergent manufacturer's instructions.
11. In the electrical control cabinet, place all manual overload breakers in the "ON" position.
12. Use the handle on top of the worm drive cabinet or the optional under table latch rod handle to lower the assembly and engage the drive worm with the worm followers on the dollies. Move the conveyor train slightly by hand if necessary.

OPERATING PROCEDURES

The CA/CSL-Series dishwashing machine has two modes of operation: manual and automatic. During manual operation, the machine runs continuously. During automatic operation, the machine is started manually at the conveyor table and runs for a preset time.

MANUAL OPERATION

To start the machine, place the selector toggle switch to the "MANUAL" position and depress one of the low voltage push button control switches. The machine will continue to run until a low voltage push button control switch is depressed again and the switch is returned to the "OFF" position. This mode of operation is used for emergencies and for servicing the machine, or upon explicit instructions from the establishment's food service manager.

AUTOMATIC OPERATION

1. Place the selector toggle switch to the "AUTOMATIC" position.
2. To start the machine, depress one of the low voltage push buttons located around the edge and under the lip of the rack conveyor table. The machine will run for a period of time determined by the timer setting in the electrical control cabinet. It will then stop automatically.
3. To restart the machine after it has stopped automatically, again depress a low voltage push button. This is the normal mode of operation and should always be used unless otherwise directed by the food service manager.

NOTE:

The machine can be stopped at any time during either the manual or automatic operating cycle by depressing one of the low voltage push buttons.

WASH PROCEDURES-MODE OF OPERATION

Manual operation, during which the machine operates continuously, should be used only under the following circumstances:

1. During emergencies; such as when the automatic mode is inoperative.
2. By an authorized service man during a service call.
3. Upon explicit instructions from the food service manager, whose directive is based upon his judgment of the operational requirements.

At all other times the normal mode of operation is automatic. The purpose of the automatic mode of operation is to prevent empty racks from going through the machine; thus conserving hot water, detergent and rinse additive.

PERSONNEL DUTIES-LOADING

The CA/CSL-Series dishwashing machine provides considerable flexibility with regard to the number and type of personnel who may be assigned to loading the machine. Loading requires no special skills and a minimum of training. It can be performed by dishroom personnel, waitresses or busboys, depending on the normal procedures of the food service establishment.

The dishes do not have to be sorted before loading and garbage can be emptied directly onto the conveyor table, a garbage trough or into an optional garbage receptacle. The waitress or busboy can load soiled dishes directly into the dish racks from a bus box or tray as the person enters the dishroom from the dining area. Where it is customary to bring soiled tableware into the dishroom in larger quantities, or during peak load periods, it is usually necessary to assign the loading operation to one or more permanently stationed dish handlers. Regardless of the personnel assigned to it, the loading procedures are essentially the same.

When the machine is loaded directly from the trays, each tray may be placed on the optional trough at the loading station. The dishroom personnel now have both hands free for loading. Tableware brought to the machine in large quantities is usually loaded directly from the container or mobile cart in which it arrives. The following are a few simple loading rules and recommendations, which will contribute to obtaining maximum efficiency from the machine and its operating personnel:

1. Before placing each dish into a rack, empty all heavy food soil (garbage) onto the conveyor table between the racks or into an optional garbage trough. Be sure that all large pieces of garbage that might not go through the spaces in the rack are removed from dishes before racking. It is not necessary to scrape garbage from the dishes.
2. Load larger dishes and trays at the trailing end of the rack so they will not cover the smaller dishes. Load the rack starting at the inboard edge (farthest from operator) to facilitate complete filling of the rack.
3. Ensure the separation of all dishes. Never nest dishes together in one compartment.
4. Invert all hollow dishes, such as bowls and casseroles.
5. Pre-rack all glasses and cups in separate compartment racks on the slanted overshelf.
6. As soon as each glass or cup rack is filled, remove it from the slanted overshelf and exchange it for an empty dish rack on the rack conveyor.
7. Whether the glasses and cups are pre-racked or random loaded directly into the conveyor racks, empty all the liquids and food soil pieces onto the conveyor table or into an optional garbage trough.

NOTE:

Although Adamation dishracks are designed so that a loaded rack may be fitted on top of an empty one (piggy backed), and thus carried through the wash and rinse cabinets, this does not always produce the best dishwashing results, especially in the case of glassware, cups, and silverware. To obtain better results, remove an empty dishrack from one of the dollies and insert the full dishrack in its place. The empty dishrack can now be placed on the slanted overshelf for refilling with cups and/or glassware.

8. Where piggy-back silverware containers are provided, place silverware, after depositing any large pieces of food soil onto the conveyor, into the container compartments with handles down. Do not put more than 12 to 15 pieces of silverware into each compartment. Be sure the pieces fan out. Do not permit the nesting of like pieces.
9. When piggy-back containers are not provided, silverware is usually washed on a flat rack. Be sure the pieces are spread out so as not to cover each other. Flat racks may be preloaded and carried through the machine on an empty conveyor rack. However, it is recommended they be placed directly on dollies.
10. The average size dish tray will fit into the conveyor racks and can be sent through the machine. These trays should be placed in the racks facing the operator.

NOTE:

Do not permit the loading of trays at right angles to the direction of travel. This will cause carryover of the wash water to the rinse stage. Do not permit loading of oversized pieces, which project outside of the dishrack. This will cause the machine to jam.

11. During automatic operation, when all of the racks at the loading station are filled, depress a low voltage push button at one of the control stations at the rack-conveyor table. This will start the machine, move the full racks towards the prewash cabinet and bring the empty racks up to the loading station.

PERSONNEL-UNLOADING

The unloading station is at the extreme clean dish end of the conveyor table. Unloading is normally a one person job. As clean dishes and other tableware are removed from the conveyor racks, they are sorted by type and stacked onto mobile carts or onto shelving. An air drying space of 24" or more is necessary to ensure proper air drying prior to unloading. Compartment racks containing glasses and cups are removed as units from the rack conveyor dollies and are sent to the tableware storage section for unloading after which the empty racks are returned to the dishwashing machine.

It is recommended that a soak sink be placed near the clean dish removal station. Occasionally, in the case of some egg and casserole dishes, one trip through the machine does not remove all of the food soil. The clean dish operator should inspect the dishes as they are removed from the racks. Any dishes retaining food soil should be placed in the soak sink for 5 to 15 minutes and then given another trip through the machine.

Piggy-back racks of silver should be lifted from the dollies, shaken vigorously (to remove excess water droplets which may cause staining) and then emptied onto a sorting table. Silverware should then be picked up by handlers for sorting into proper containers.

SHUTDOWN PROCEDURE

After the dishwashing machine has been used for several hours under normally heavy dish loads, it should be shut down, drained and given a thorough cleaning. In most eating establishments, this would usually be after each mealtime. Before shutting the machine down, be sure all racks are empty. This includes any racks on the overshelf. Then proceed as follows:

1. Place the mode selector toggle switch to the "OFF" position.
2. In the electrical control cabinet, there is no need to place all manual overload breakers to the "OFF" position.
3. For machines with open or closed steam tank heaters, the steam supply will be shut off automatically when the mode switch is placed in the "OFF" position.
4. Use the handle (red lever) on top of the drive cabinet or the optional under table drive latch rod handle to disengage the drive worm from the dollies.
5. Open all the cabinet doors and latch them in the open position.
6. Open the prewash sink (hommel pot), the power wash tank, power rinse tank (if the machine is so equipped) and final rinse tank lever drain valves. Leave the valves open.

NOTE:

The following steps require the removal of several pieces from the machine for sink cleaning. These pieces can be placed in empty dish racks as they are removed. The racks can then be used to carry them to and from the wash sink for hand washing.

7. Remove all the food soil screens from the power wash tank and power rinse tank (if the machine is so equipped). Deposit any loose food soil in the garbage container and set the screens aside for cleaning.
8. Remove the deep well food soil baskets (or hommel pot basket) from the prewash sink (or hommel pot). Set these (it) aside for cleaning.

CAUTION:

Never empty the food soil screens or baskets by tapping them on the rim of a garbage container. This may bend their edges, in which case they will not fit properly.

9. Remove any loose food soil from the prewash sink (or hommel pot), power wash tank, power rinse tank (if the machine is so equipped) and final rinse tank. Deposit the food soil into the garbage container.
10. Remove the pump inlet screens from pump inlet hole in the final rinse sink. Set them aside for cleaning.
11. Remove all eight spray arms (4 upper and 4 lower) from the manifolds in each of the power wash or power rinse cabinet. Set these aside for cleaning. (8 Upper and 8 Lower) super wash or super rinse cabinet.
12. The dishwasher is now ready to be cleaned.

CLEANING

The most important maintenance operation on a dishwashing machine is a thorough and complete overall cleaning after each period of heavy use. (This is normally after each meal.) A clean machine not only assures that dishes, glassware, and silverware will be properly washed and rinsed, but it is a major contributing factor to long, trouble free operation of the machine.

To clean the dishwashing machine properly, the following steps must be performed. A hot water sink and a hose supplying hot water at 120 degrees F are required.

1. Remove the dishracks from the conveyor train. If some racks were used to hold pieces set aside for cleaning, remove these first.
2. Flush down the conveyor table with a hot water hose. Wipe off any remaining food soil. Move the conveyor train by hand in the normal direction of travel for access to the entire table. The squeegees on the dollies will help clean the table surface. Be sure to clean the dolly wheel tracks.

CAUTION:

Do not spray the drive cabinet. Wipe it clean by hand.

3. Move the conveyor train by hand in the normal direction of travel to position the empty dollies (from which the racks were in step 1 above) inside the cabinets.
4. Thoroughly rinse out the interior of all the cabinets, hoods, sinks, and tanks. Scrub off any build-up of grease, food soil or detergent. Be sure to flush all residues into the tanks and down the drains.
5. At the pot cleaning sink, clean all scrap screens, pump inlet screens, and the two deep-well food soil baskets or hommel pot basket. Use 120 degree F water and scrub with a cleaning agent as required to remove all traces of food soil, grease and detergent. Rinse thoroughly.

CAUTION:

All parts removed from the machine for cleaning must be hand cleaned at a sink. Do not attempt to clean them by sending them through the machine.

6. At the cleaning sink, using the brush supplied (or equivalent) for this purpose, clean the eight spray arms from each of the power wash or power rinse tank (sixteen spray arms from each of the super wash or super rinse tank). Removing the caps from the ends of the spray arms will help in the cleaning process. Be sure the nozzles are clean and completely open. Rinse them thoroughly and replace the caps finger tight.
7. Replace the racks in the dollies. The pieces cleaned at the sink should be placed in the racks to dry and remain there until the machine is ready to be filled and operated.
8. Clean the exterior surfaces around the base and beneath the machine.
9. Leave all the cabinet doors open to allow the cabinet interiors to dry until ready for re-use.

EMERGENCY OPERATION

The dishwashing machine is designed to perform as a completely integrated unit. For maximum effectiveness, all of its operational functions must be in good working order. However, in the case of some malfunctions, the machine can be kept in operation temporarily while awaiting repair services. Emergency measures, which may be employed in these cases, are described below.

NOTE:

Before attempting to operate the machine on an emergency basis, carefully check the troubleshooting guide given in Section 5, Trouble Shooting. Contact the Adamation Service Department immediately for malfunctions which cannot be readily corrected. The procedures below are strictly temporary measures and should be employed only when it is absolutely necessary to keep the machine in service for a limited time.

EMERGENCY OPERATING PROCEDURES

1. The conveyor worm drive fails to operate - First, shut off the manual overload breaker for worm drive. Second, disengage the drive worm from the dollies. Third, propel the conveyor train by hand in its normal direction of travel.
2. The machine operates when the selector toggle switch is in the "MANUAL" position, but not in the "AUTOMATIC" position. Use the "MANUAL" position. To start and stop the machine, depress one of the low voltage push button control switches.
3. The hot water solenoid valve fails in the closed position. (ie: there is no final rinse water.) - Open the final rinse fill valve to obtain the final rinse water. Shut off valve at end of work period. The make-up water will also then continue to be supplied to the power wash tank(approximately 1.5 gallons-per-minute).
4. The cold water solenoid valve fails to operate - Open the prewash fill valve to obtain water. Shut off valve at end of work period.
5. The circulating prewash pump fails to operate - Place the prewash pump's manual overload breaker to the "OFF" position.
6. The prerinse pump fails to operate - Operate the machine without the prerinse function - Place the prerinse pump's manual overload breaker to the "OFF" position.
7. The hot water solenoid valve fails in the open position - The machine will operate normally except that the hot water will not turn off automatically when the machine is stopped. To conserve hot water and rinse additive, station a person at the house hot water shut-off valve and operate it manually as required.

CONVEYOR JAMMING

If the conveyor stops or slows noticeably while the machine is running, or if it fails to start and the drive motor is running, stop the machine immediately. The most likely cause of trouble is a jammed conveyor or drive mechanism. The drive mechanism has a clutch, which will slip when anything jams or blocks the conveyor or becomes lodged in the drive mechanism. This is a protective device, which prevents damage to the machine and the utensils being washed, and personal injuries.

Conveyor jams are generally caused by some part of a utensil being washed projecting from a rack and becoming lodged against some part of the machine. Oversized trays are also sometimes responsible. A rack improperly seated on a dolly can also cause jamming. Another frequent cause is a cloth or towel, which has been dropped on the table and has become bound between a dolly wheel and the wheel track.

When the conveyor jams, do not under any circumstances attempt to pry the jam loose. This can distort the dollies and connecting links and result in other serious damage. Stop the machine and proceed as follows:

1. Disengage the drive worm. (Raise the red handle or pull the optional drive latch Rod handle forward to tilt the drive cabinet away from the conveyor.)

CAUTION:

Always turn the selector toggle switch from the "MANUAL" or "AUTOMATIC" position to the "OFF" position before opening the doors or servicing the drive to prevent accidental starting of the machine.

2. Locate the source of the jam and move the conveyor train backwards by hand to relieve any pressure. Remove the jammed article.
3. Align the drive mechanism with the worm followers and lower the drive cabinet to engage the dollies and latch it in place.
4. Start the machine and resume operation.

SECTION 4 - PRINCIPLES OF OPERATION

GENERAL

The basic CA/CSL-Series dishwashing machine consists of an endless rack conveyor train which automatically carries dishracks from a loading station through four stages of washing and rinsing functions and then to an unloading station (see Figure 1-1). Because the individual requirements of each eating establishment generally differ in some degree from others, in many cases the machine will contain functional stages or auxiliary equipment, which are not considered a part of the basic CA-Series machine. These may include a power scrapper, a power rinse stage, a split rinse function, a longer or differently shaped rack conveyor or a tray conveyor and any one of several auxiliary water heating devices or garbage handling equipment.

In this section, the principles of operation of the basic CA/CSL Series machine are first described. Additional functional stages and auxiliary equipment are discussed separately in Section 7, Illustrated Parts List.

WHAT HAPPENS WHEN A DISH GOES THROUGH THE MACHINE?

The selector toggle switch is in the "AUTOMATIC" position, which is the normal mode of operation for the dishwashing machine (see Section 3, Operation, Automatic Operation). Empty dishracks have been moved up to the loading station and are being filled with soiled tableware. Loading personnel deposit all heavy food soil (garbage) onto the conveyor table (or a garbage spiral or trough if the machine is so equipped) before racking the tableware. When the dishracks at the loading station have been filled with soiled tableware, the operator depresses one of the low voltage push buttons at a control station on the rack conveyor table. All functional stages of the machine now start to operate and the conveyor train moves, carrying the soiled dishes to the prewash cabinet.

As the dishrack with soiled tableware moves into and through the prewash cabinet, it is subjected to a continuous spray of circulated soapy warm water from two spray arms mounted above conveyor train. A third lower arm is optional. This warm water removes any loose food soil from the tableware. The water temperature is maintained at no more than 120 degree F. so as not to bake food soil particles onto the tableware. No detergent is used (or required) for this stage.

The circulated prewash water normally flows to the drain unless the machine is equipped with an optional transfer pump to the trough. After it performs its function, the used water drains through the two perforated deep well food soil baskets (or hommel pot basket) into a deep well sink (or hommel pot). The two deep well food soil baskets (or hommel pot basket) collect(s) all large pieces of food soil which have been washed from the tableware.

The deep well food soil baskets (or hommel pot basket) also collect(s) all of the heavy food soil which has been deposited on the surface of the rack conveyor table by persons loading the dishracks. Squeegees on the underside of some of the dollies in the conveyor train sweep the surface of the table, thus moving any pieces of food soil into the prewash cabinet and into the deep well food soil basket (or hommel pot basket).

After the dishrack passes through the prewash stage, it enters the power wash cabinet. Here it is subjected to a large volume of water at 150 degree F. Detergent is used to remove all remaining food soil and any grease or oily residue from the tableware.

As the dishrack passes through the power wash cabinet, spray arms above and below the rack direct high pressure sprays of wash water on all surfaces of the tableware. This wash water is continuously recirculated in the power wash cabinet. Perforated food soil trays below the rack conveyor collect any pieces of food soil washed from the tableware.

The wash water temperature, pressure and volume together with the time that each piece of tableware must be subjected to the wash spray are stringent standards of the National Sanitation Foundation. Every Adamation dishwashing machine is designed and constructed to meet or exceed these requirements.

The dishrack now enters the power rinse cabinet (CSL1390, CA-2, CA-3, CA-4). This washing stage functions the same as the power wash cabinet except with 160 degrees to 170 degree F water, but no detergent is added.

The dishrack now moves into the prerinse stage. Spray arms above and below the dishrack direct a spray of hot water on all surfaces of the tableware. The prerinse spray removes all detergent and all residual dishwater from the tableware. The prerinse water temperature is approximately 170 degree F. Drying additives used in the final rinse are recirculated.

The dishrack now enters the final rinse stage. Here, spray arms above and below the dishrack direct a spray of water at 180 degree F. and at a flow pressure of 17 PSI (minimum), over all surfaces of the tableware. This spray of high temperature water sanitizes the tableware and preheats it for rapid air drying when it leaves the final rinse cabinet. The volume, temperature and pressure of the final rinse water are also specified by the National Sanitation Foundation. The machine is equipped with a fitting for injecting a rinse agent into the final rinse water. Rinse agents alter the chemical composition of the water to make it flow better and easier. Rinse agents are sometimes called drying agents or drying additives because their use causes the rinse water to drain off of the tableware faster, and in so doing, reduces the time required for air drying. After the dishrack leaves the final rinse cabinet, it now enters the optional super blower to speed up drying before it is finally carried by the conveyor train to the unloading station.

The preceding paragraphs have described what occurs at each functional stage of the dishwashing operation as tableware is carried through the basic CA/CSL-Series machine. The following subsections describe how the circuits and systems operate to perform the dishwashing function of the machine.

WATER CONNECTIONS

The hot and cold water final connections are made by the end user. These valves are equipped for 3/4" input connections. The hot water must be supplied at no less than 180 degree F. and no more than 195 degree F., at a flow pressure of 17 to 20 PSI, as measured at a manifold test point (tee connection) upstream from the hot water solenoid valve. The cold water flow pressure should be no less than 17 PSI. The two shut off valves are kept open at all times except during maintenance of the plumbing lines, fixtures or during a prolonged shutdown.

Both the hot and cold water lines are equipped with solenoid valves, which are operated by the electrical control circuits of the machine. These are two position valves (open or closed), which open only when the machine is in operation (the selector switch is either in the "MANUAL" or the "AUTOMATIC" position). Each solenoid valve is protected from foreign particles by a line strainer at its input connection.

HOT WATER LINES

The hot water solenoid valve is bypassed by a secondary hot water line (solenoid bypass) which is connected to hand operated valves which are used, prior to the machine's operation, to fill the final rinse sink and the power wash or power rinse tank. The final rinse fill valve is connected between the incoming hot water line and the final rinse manifold. The power wash or power rinse fill valve is connected to the line, which supplies the hot water to the power wash or power rinse cabinet.

When both tanks are filled to the level of their overflow standpipes (2.5 gallons in the final rinse sink, 22.5 gallons in the power wash or power rinse tank, or 44 gallons in the super wash or super rinse tank), the fill valves are closed and remain so while the machine is in operation. (In the event that the hot water solenoid valve becomes defective and fails to open, the final rinse fill valve can be used to supply hot water to the final rinse spray arms and make up water for the power wash cabinet on an emergency basis). The solenoid by-pass line also contains a fitting, which may be used to supply the hot water for a detergent dispenser, which is not supplied with the machine.

During operation (the hot water solenoid valve is open), one branch of the hot water circuit supplies 4.8-6.9 (depending on model) gallons-per-minute of 180 degree F. water to the final rinse spray arms. A siphon breaker in the line protects against any reverse flow and a tee connection is provided for injecting the rinse solution to the final rinse water. (This rinse injection device is not supplied with the machine). The spray arms and nozzles of the final rinse section are so designed that, when the correct flow pressure (17 PSI. minimum) is maintained at the hot water manifold of the machine, the required 4.8-6.9 (depending on model) gallons-per-minute of final rinse water will flow through the line. The temperature of the final rinse water is shown on a temperature gauge installed at the final rinse manifold, thus providing true water temperature immediately prior to its entry into the final rinse spray arms. A fitting is also provided at the manifold for installation of a pressure gauge. A second branch of the hot water circuit supplies make-up water to the power wash tank while the machine is operating. This make-up water replaces the wash water that is normally lost from the power wash section during operation. The make-up water enters the power wash cabinet through a flow restrictor. An adjustable valve in the make-up water line regulates the volume of make-up water supplied.

NOTE:

National Sanitation Foundation regulations permit this make-up water to be supplied at a maximum rate of 1.5 gallons-per-minute. In most cases, the volume required will be considerably lower. This depends upon local conditions, but the requirement will normally not exceed 1 gallon-per minute.

COLD WATER LINE

The cold water circuit operates only when the machine is in operation (i.e. the cold water solenoid valve is open). It supplies approximately 2 gallons-per-minute to the prewash tank. An adjustable valve in the line regulates the volume entering the tank. A siphon breaker protects against any backflow into the main water line.

RECOVERY AND RECIRCULATION

NOTE:

The following paragraphs apply only to machine manufactured after January 1, 1991. Machines before that date are equipped with an overflow system requiring baffles and rear mounting standpipes in the final rinse.

All of the hot water used for the prerinse, power rinse, power wash and prewash functions of the machine is obtained by recovering and reusing the 180 degree F. final rinse water. It is first reused for the prerinse and/or power rinse function(s) where its temperature is reduced through normal heat loss. It is then used again for the prewash function. Its temperature is reduced from (140 degree to 110 degree F.) by tempering it with a prewash cold water high pressure spray.

As previously described, the final rinse spray arms located above and below the conveyor deliver a rinse spray of 4.8-6.9 (depending on model) gallons-per-minute at 180 degree F. The final rinse sink, below the conveyor, is sloped to direct all of the used final rinse water into a small (front) 2.5 gallon holding tank. Its outlet is connected through a strainer to a centrifugal pump. This prerinse pump (12.6 gallons-per-minute) pumps the used final rinse water through a riser and into the spray arms of the prerinse section, above and below the conveyor, where, after performing the prerinse function it is returned to the final rinse sink.

The final rinse sink is constructed so that it overflows into power rinse tank (if so equipped) and then to the prewash sink.

POWER WASH PLUMBING

During operation, the dishwater is being continuously recirculated within the power wash cabinet, except for the make-up water, which is supplied to replenish normal losses. The power wash plumbing, therefore, is integral to that section of the machine and is self-contained within it. The power wash tank is filled with 22.5 gallons of 140 degree F. water prior to starting the machine (see Section 4, Principles of Operation, Hot Water Lines). During operation, this water is maintained at 160 degree F. by means of a heater in the wash tank and flows through the pump suction screen in the bottom of the tank into the high volume pump. The water is pumped upward through a riser pipe assembly and two manifolds into eight stationary wash arms, four above and four below the conveyor. After performing the power wash function, the water returns to the wash tank. Optional super wash tank has eight arms above eight below.

The wash arms are individually removable and each wash arm terminates with a 3/4" hand removable cap. A sensing probe in the upper section of the manifold is connected to an external temperature gauge for indicating the temperature of the wash water immediately prior to entering the upper spray arms. The capacity of the power wash tank is maintained at 22.5 gallons by the make-up water supplied during operation and by an overflow standpipe in the tank. An outlet drain in the bottom of the tank is connected to a hand-operated drain valve and is used for emptying the tank to the main machine drain.

DRAIN CIRCUITS

All drain tanks are connected to a common stainless steel drainpipe, which is below and extends the length of the cabinets. The machine drain consists of a 2" pipe, which can be connected at either end to the building's drain. The other end is then fitted with a plug. Hand operated valves are installed in the drain lines from the prewash sink/hommel pot, power wash tank, the power rinse (if so equipped), and the final rinse sink.

PUMPS

The plumbing circuits contain three or more pumps; one for circulating the used final rinse water through the prerinse section, one for circulating the prewash water, one for circulating the wash water within the power wash cabinet and one for circulating the rinse water within the power rinse cabinet (if so equipped). The prerinse and prewash pumps are identical. Both have a capacity of 12.5 gallons-per-minute and both are driven by an integrally mounted 3/4 HP, 3-phase, multi-voltage motors. Both pumps are fitted with mechanical packless seals. The power wash or power rinse pump has a capacity of 255 gallons-per minute and is driven by an integrally mounted 3 HP, 3-phase, multi-voltage motor. It has a non-clogging impeller and is fitted with a mechanical packless seal.

ELECTRICAL CIRCUITS

The electrical circuits of the dishwashing machine supply and control the power to energize all motors, to activate the solenoid operated valves and to operate the electrical immersion or steam coil water heater(s) installed in the power wash or power rinse tank, or the hot water tank circulator, if the machine is so equipped. Provision is also made for the installation of additional circuit elements for equipment options and for accessories such as a garbage disposer or a spiral garbage conveyor. A typical schematic diagram showing all normal power connections for the basic CA-series dishwashing machine is given in the Master Electrical Diagram that has been supplied with your machine.

The dishwashing machine operates from 200/208/240/480 volt, 3-phase, 3-wire, 60/50-cycle electrical service. The power requirements (in amperes) for each installation will depend on the type of wash tank heater supplied with the machine and whether optional or accessory equipment is installed. Incoming electrical power is connected to the machine on a terminal block located at the left rear inside of the transformer box behind the main electrical control cabinet. A disconnect switch must be installed by the user in the incoming line and should be located within sight of the machine. All electrical components of the control and power distribution circuits are contained in the electrical control cabinet. Phase identification is shown in the Master Electrical Diagram that has been supplied with your machine.

NOTE:

The machine can be designed to operate on most 60/50 Hz voltages. Information on these machines can be obtained directly from the Adamation factory.

POWER DISTRIBUTION CIRCUITS

As shown in the Master Electrical Diagram, 3-phase incoming line voltage power is applied to the input terminals of all three-pole magnetic contactors. Each magnetic contactor is operated by a coil, which requires 24-volt power taken from the low voltage control circuit. This coil is operated by the dishwashing machine control circuit, which is connected directly to the incoming power circuit through the mode switch. When the coil of the magnetic contactor is energized, its contacts close and power is supplied to all pumps, motors, the conveyor worm drive motor, the solenoid valves and to options and accessories if the machine is so equipped.

All circuits on the load side of the magnetic contactor contain hand operated manual overload breakers. These manual overload breakers can be used as on/off switches and provide short circuit protection. They also provide over current and over heating protection for the motors.

The hot and cold water solenoid valves are energized through a magnetic relay that is operated by a coil, which required 24-volt power taken from the low voltage control circuit. When all manual overload breakers are in the on position, the dishwashing machine is ready for full operation in either the "MANUAL" or "AUTOMATIC" mode.

If the dishwashing machine is equipped with electric hot water heaters in the power wash or power rinse tank, the power for these heaters is controlled by the magnetic contactor and has low water cut-off protection. Each heater is wired into the load side of a 3-pole manual overload breaker. The selector switch does cut off the control circuit power to the electric tank heaters. The manual overload breakers provide short circuit protection and are energized by the manual/off/auto mode switch. This arrangement enables the heaters to remain in operation and maintain the wash water temperature at the required 160-degree F. temperature when the machine is being operated intermittently.

CAUTION:

The electric hot water heaters must never be turned on, or left on, unless the power wash tank is filled with water. If the machine remains off for 20 minutes, and the power wash tank heaters are not turned off, check the water level of the power wash tank and fill the tank to the overflow standpipe level if required. A low water cutoff switch protects heaters and water should only be added if low water indicator light is on.

When the machine is equipped with a circulating hot water loop in the power wash tank (and a remote hot water boiler) a separate single-phase circuit is provided to operate the circulator in the tank hot water heater plumbing circuit. This circuit is normally connected directly to the two load terminals of the control circuit manual overload breaker, which then acts as an on/off switch for the circulator motor. This arrangement also bypasses the dishwasher control circuit and maintains the power wash dishwater at the required 160-degree F. Temperature for extended shutdown periods.

CONTROL CIRCUIT

The control circuit starts and stops the dishwashing machine by energizing and deenergizing the coil of the magnetic contactor (see Section 4, Principles of Operation, Power Distribution Circuits). When the control circuit mode switch is closed, the connections supply single-phase 24-volt power to the control circuit.

CONTROL CIRCUIT COMPONENTS

The control circuit is shown schematically in the Master Electrical Diagram. It contains the main operating switch for the dishwashing machine (selector switch) and the electrical circuit elements required to start and stop the machine during timed automatic and manual operation. These consist of low voltage push buttons, a latching relay and a timer. A brief description of each follows:

1. Selector Switch - The selector switch is a double-pole, double-throw, three-position switch (manual/off/automatic). When the switch is in the "MANUAL" position, the machine will operate continuously when a low voltage push button is depressed. When the switch is in the "OFF" position, the machine will not start. When the switch is in the "AUTOMATIC" position, the machine will not start until a low voltage push button control station at the conveyor table is depressed. It will then operate for a limited time, depending upon the setting of the timer. It can also be stopped at any time during the operating cycle by depressing a push button. After each operating cycle, the machine will not restart until a push button is again depressed.

2. Latching Relay - The latching relay is an electrically operated double-pole, double-throw switching device which is wired into the control circuits as two single-pole, single-throw, synchronously operated switches. (See Figures 4-1 and 4-2). The switching contacts of the relay are transferred from one set of output contacts to the other each time a 24-volt pulse appears across the relay coil. Thus, if the switching contacts are in the open position (machine off), a 24-volt pulse will switch them to the closed position (machine on). They will remain in the closed position (machine on) until the coil received another 24-volt pulse, which will return them to the open position (machine off).

3. Timer - The machine is equipped with a solid-state 24-volt timer. The timing dipswitches can be set for any interval of operation from 1 second to 1023 seconds. When power is applied, the timer is activated for a period of time, which is determined by the timer setting. At the end of the preset timed interval, a momentary 24-volt pulse crosses the coil of the latching relay and causes it to transfer its contacts to the open (machine off) position. The timer then automatically resets itself to its starting position by returning the internal contacts to their normally closed position. (See Figure 2-1 - Automatic Operation/Timer Adjustment).

CONTROL CIRCUIT CONNECTIONS

The control circuit timer is mounted in a quick disconnect socket. The control circuit relay is mounted to an easily disconnected terminal strip.

MANUAL OPERATION

When the selector switch is placed in the "MANUAL" position, the timer components are bypassed and the machine operates continuously.

AUTOMATIC OPERATION

When the selector switch is placed in the "AUTOMATIC" position, the machine will only operate when it is energized by a low voltage push button. The neutral side of the incoming 24-volt, single-phase line is permanently connected to the latching relay and to one connection of the timer motor. At this point the machine is not operating and all of the components are in the open (machine off) position.

A low voltage push button at one of the control stations at the conveyor table is depressed and the following sequence of events occur. (A simplified electrical diagram showing the low voltage push button system is shown in Figure 4-3).

1. The low voltage push button closes momentarily. This places a short 24-volt pulse across the coil terminals of the latching relay.

2. The latching relay switching contacts throw from the normally off to the normally on position, closing the circuits.

3. 24-volts are placed across the coil of the magnetic contactor. The machine starts to operate.

4. The latching relay applies 24-volts to the timer through the normally closed contacts of the timer switch. The timer starts to operate.

5. The timer operates a preset time, transferring its common connection from the normally closed to the normally open position.

6. A 24-volt pulse appears across the coil terminals of the latching relay and transfers it switching contacts back to the normally off position.

7. The 24-volt power is removed from the line, the coil of the magnetic contactor is de-energized and the machine stops.

8. The 24-volt power is removed from the timer, which resets itself to its original position. The timer switch returns to the normally closed position.

9. The machine will then remain stopped until a low voltage push button is again depressed or the selector switch is placed in the manual position.

CONVEYOR SYSTEM

The conveyor system consists of a horizontal table on which a train of dollies is driven by a conveyor worm drive mechanism. The purpose of the conveyor system is to carry the dish racks automatically from the loading station through the prewash, power wash, power rinse (if so equipped), final rinse, and super blower (if so equipped) cabinets to the unloading station and thence back to the loading station (see Figure 1-1). When the machine is operating, the conveyor system carries the dish racks through the cabinets at a rate, which assures that all tableware will be cleaned and rinsed in accordance with National Sanitation Foundation standards.

CONVEYOR TABLE

The conveyor table is a horizontal, stainless steel, watertight table which is supported by vertical cross-braced leg assemblies. The table is so formed that the dolly tracks are an integral part of the table. Outside of the cabinets, the space between the tracks is a flat, watertight recessed surface, which is pitched slightly toward the prewash cabinet so that all liquids spilled upon it will drain into the prewash sink (or disposer or hommel pot if the machine is so equipped).

The conveyor table does not extend through the power wash cabinet. The dolly tracks through the power wash cabinet consist of two stainless steel angles, which carry the conveyor train through the cabinet between the upper and lower power wash spray arms.

CONVEYOR TRAIN

The conveyor train consists of a number of interconnected dollies, which are driven continuously around the track of the conveyor table. (See Section 7, Illustrated Parts List, Figure 7-1). The dollies are connected to each other by means of connecting links, which maintain the correct spacing between the dollies. Each dolly is fitted with four stainless steel, self-cleaning, ball-bearing, conical wheels which engage the track angles in the sides of the conveyor table above the horizontal surface of the table. The clearance between the underside of the dollies and the horizontal surface of the table is such that heavy food soil (garbage) can be deposited (between the dollies) directly upon the horizontal surface of the conveyor table and between the dolly tracks without interfering with the operation of the conveyor train. A certain number of dollies in the conveyor train are equipped with squeegees which sweep the recessed flat surface of the conveyor table between the tracks, thus moving all accumulated food soil to the deep food soil baskets in the prewash sink (or to the disposer or hommel pot if the machine is so equipped).

The dollies are designed to hold 20" x 20" combination (combo) dish racks, special racks for oversized trays and other types of dish racks.

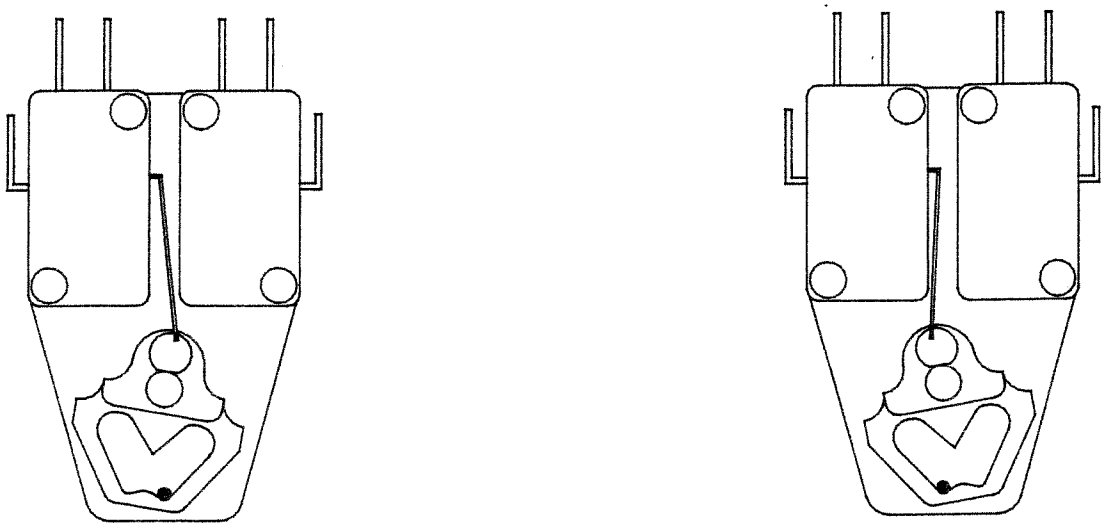
CONVEYOR OUTSIDE WORM DRIVE

The CA/CSL Series dishwashing machine is equipped with an outside worm drive mechanism. (See Section 7, Illustrated Parts List, Figure 7-2). This outside drive mechanism propels the conveyor train by means of a rotating worm which engages successive worm followers which are mounted on the dollies. The outside drive mechanism is contained within a drive cabinet, which is mounted on the inboard side along a straight section of the conveyor table. The mechanism consists a gear motor, a clutch, a sprocket driven chain and a drive worm.

Outside drive dollies are equipped with two worm followers, which are mounted on the side of the dolly frame, which faces the inboard side of the conveyor table. The outside drive cabinet is so aligned that the drive worm engages the worm followers on the dollies for its entire length. As each dolly moves up to the outside drive cabinet, its leading worm follower will engage the rotating drive worm. The lagging worm follower of the preceding dolly will still be engaged. The rotation other worm drive the dollies and thus the entire conveyor train around the track. By the time the lagging worm follower of the preceding dolly has moved past the worm, the leading worm follower of the next dolly will have become engaged. Thus, two worm followers will always be driven along the worm at all times.

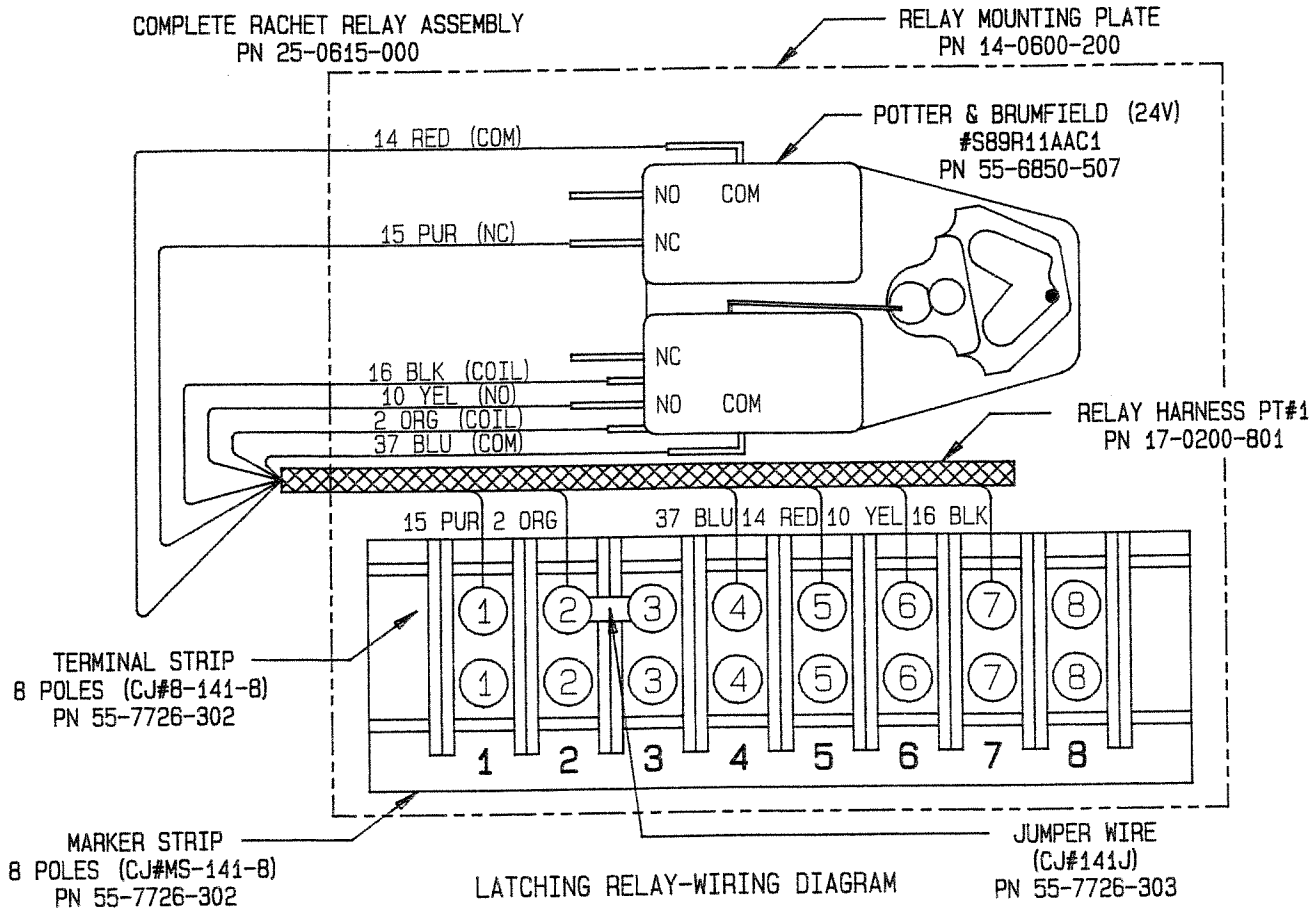
For correct operation, the teeth of all worm followers must engage the worm to a depth of approximately one-half inch into the worm channel through the full length of travel of the worm. Too deep an engagement will cause excessive friction and wear. This means that the dollies must travel along a plane that is parallel with the centerline of the worm.

The entire drive mechanism pivots on a hinge pin. A handle mounted on top of the drive cabinet or the optional under table drive latch handle can be released to tilt the cabinet away from the conveyor train, thus disengaging the drive worm from the dolly worm followers. This handle also locks the cabinet into its operating position (down). A clutch in the outside drive is strictly a protective device. It is initially factory adjusted to slip when the conveyor train becomes jammed or encounters excessive interference.



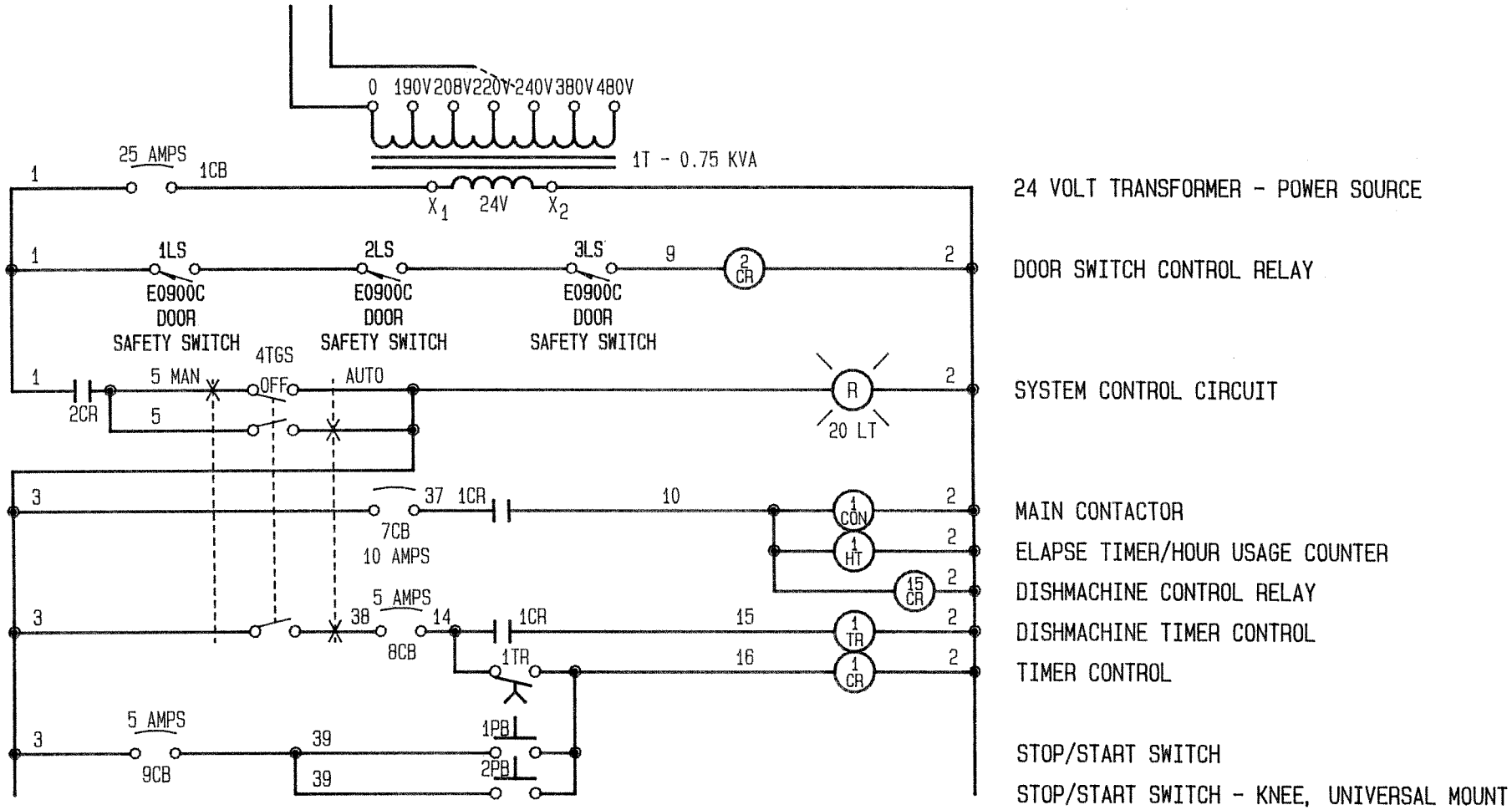
LATCHING RELAY

FIGURE 4-1



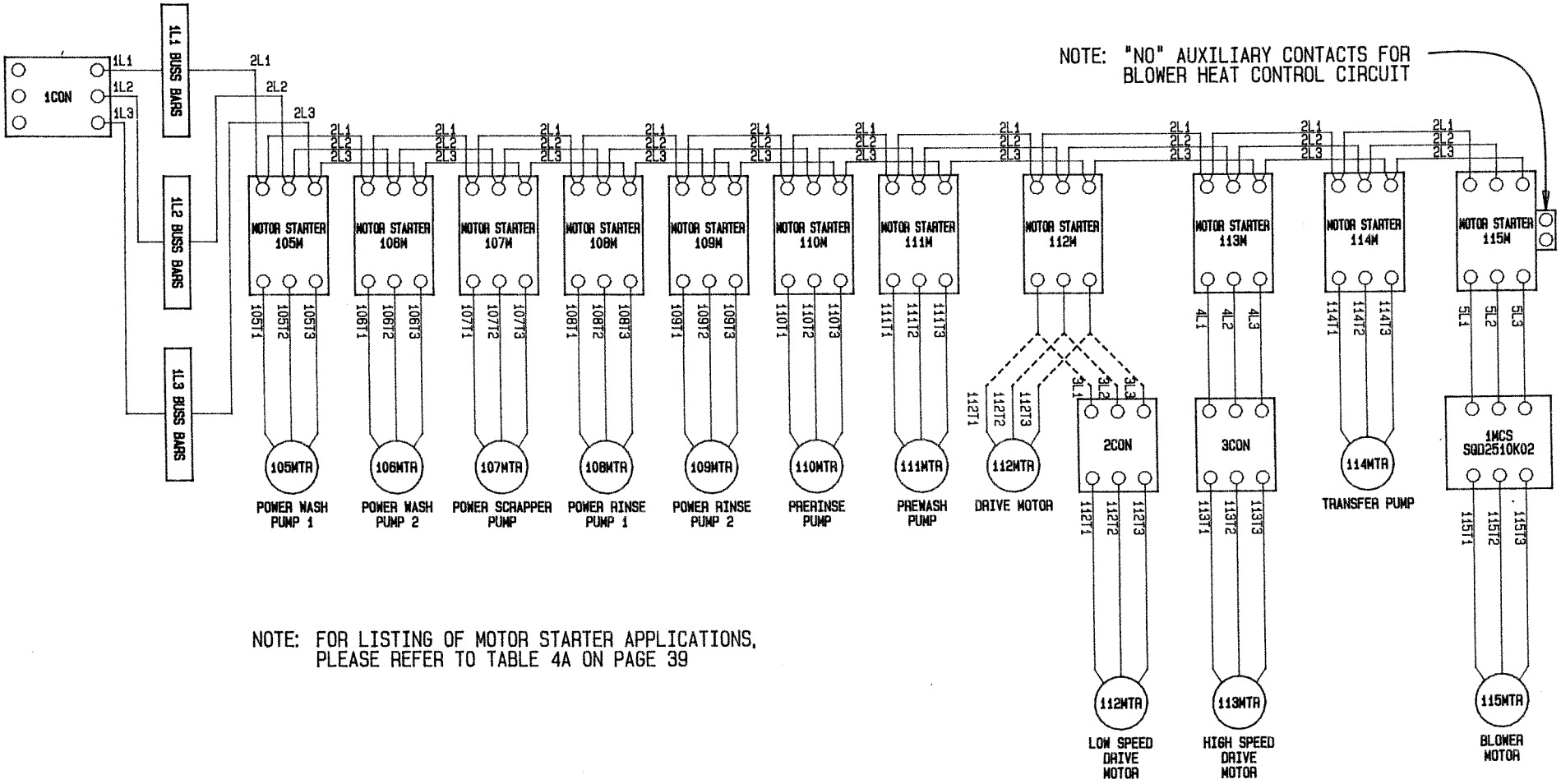
LATCHING RELAY-WIRING DIAGRAM

FIGURE 4-2



24 VOLTS CONTROL CIRCUIT
LOW VOLTAGE PUSH BUTTON START/STOP SWITCH(ES) - ELECTRICAL WIRING DIAGRAM

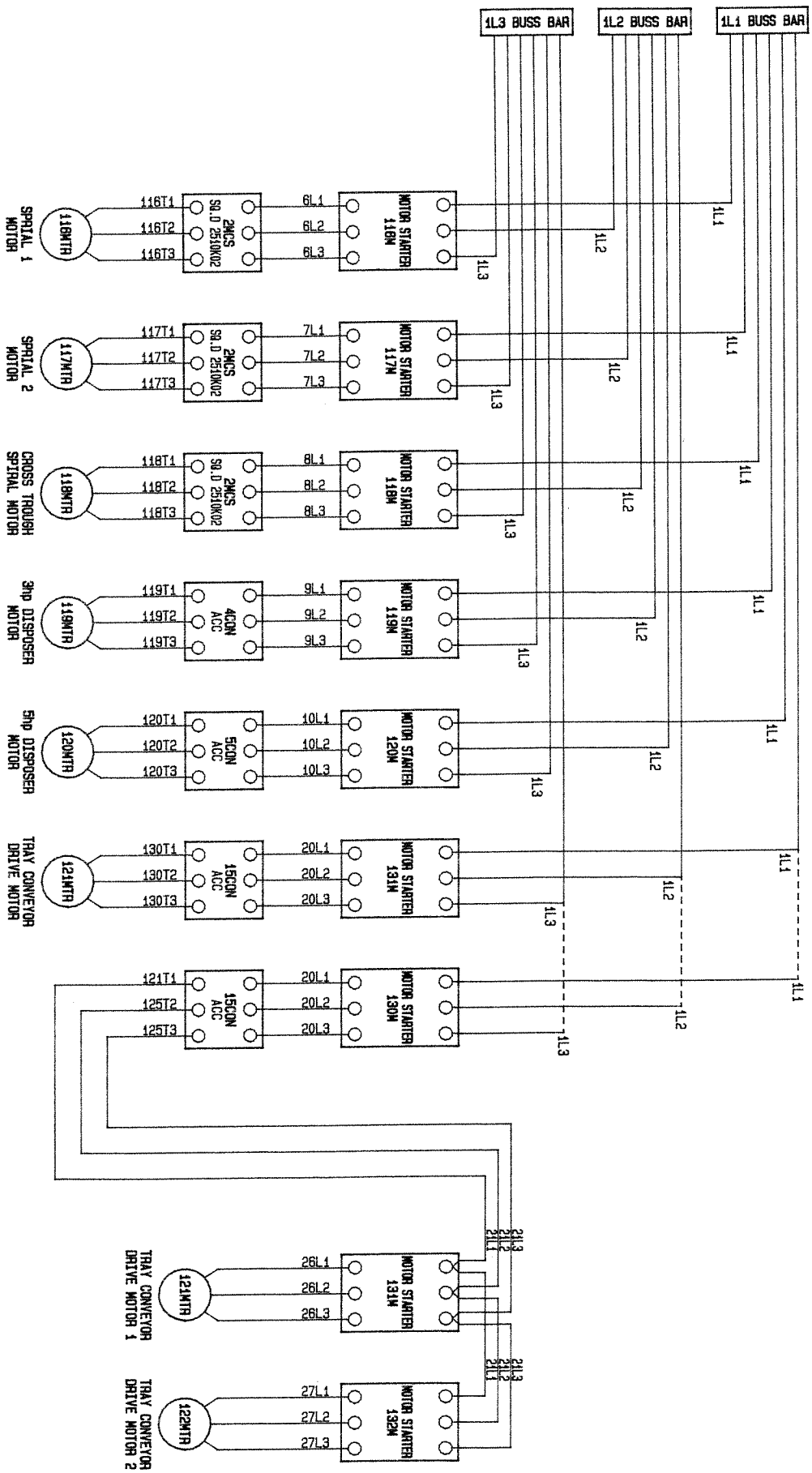
FIGURE 4-3



NOTE: FOR LISTING OF MOTOR STARTER APPLICATIONS, PLEASE REFER TO TABLE 4A ON PAGE 39

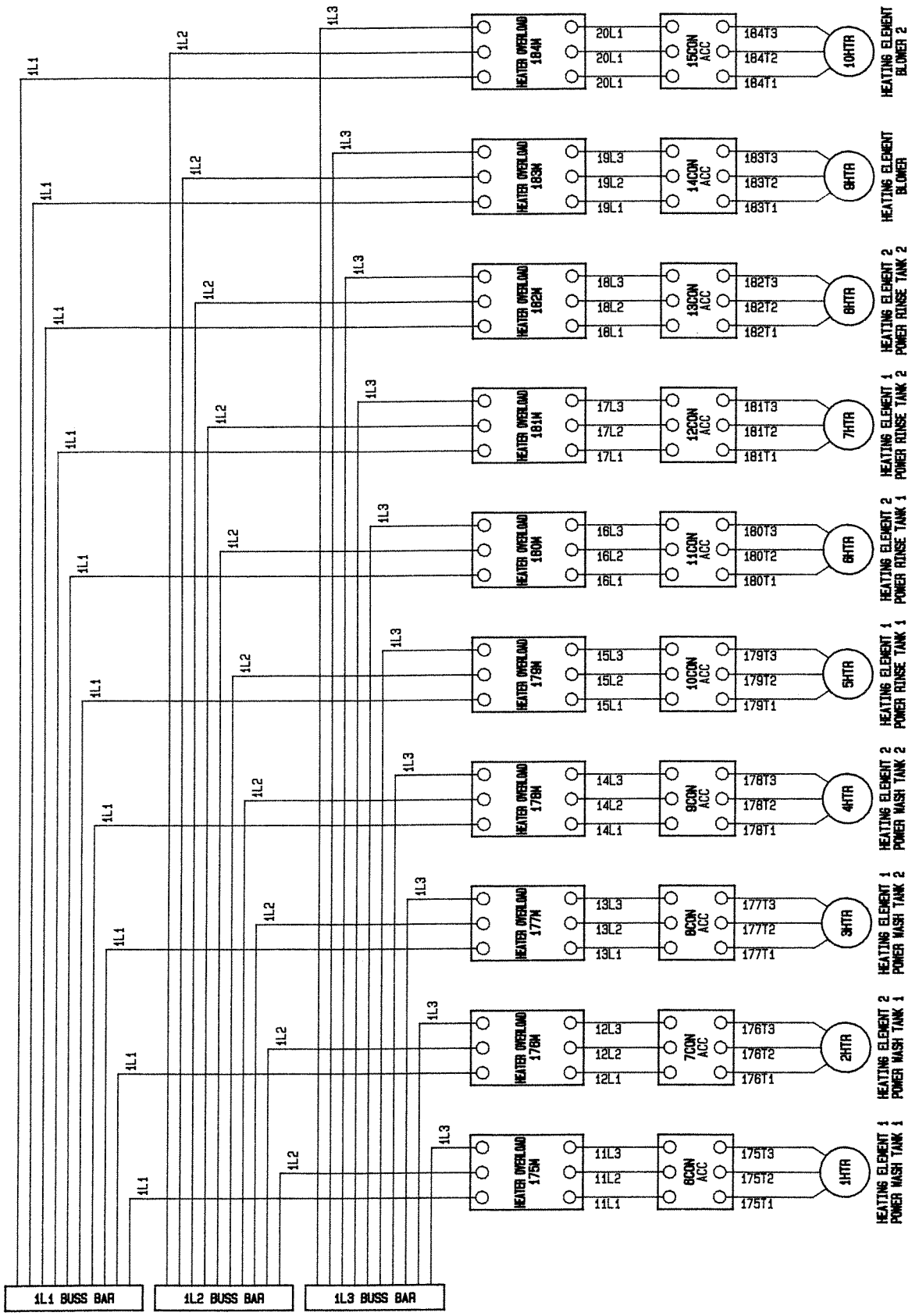
DISHMACHINE LINE VOLTAGE MASTER WIRING DIAGRAM
(PART 1 of 4)

FIGURE 4-4



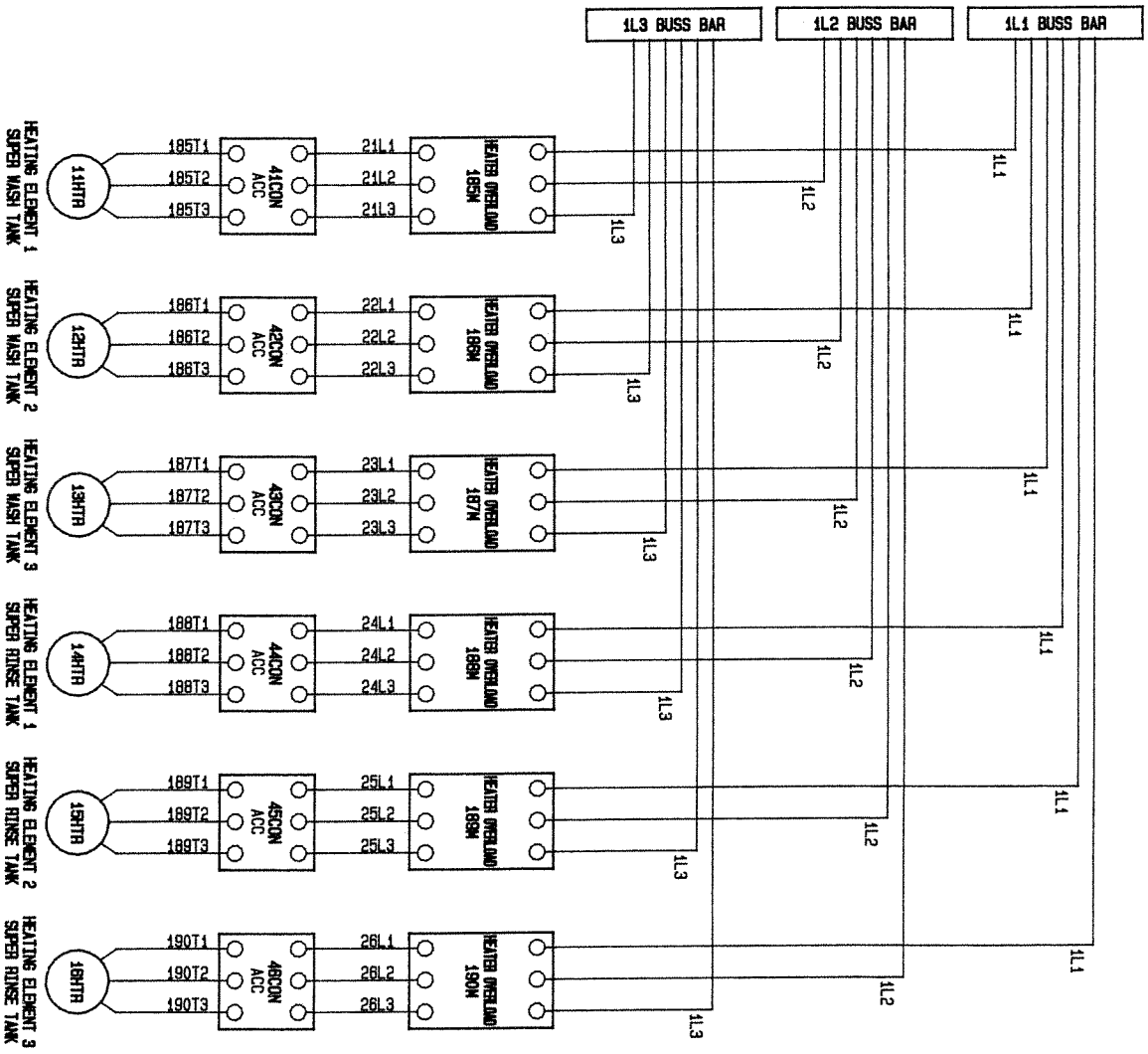
NOTE: FOR LISTING OF MOTOR STARTER APPLICATIONS, PLEASE REFER TO TABLE 4A ON PAGE 39

DISHMACHINE LINE VOLTAGE MASTER WIRING DIAGRAM
(PART 2 of 4)
FIGURE 4-5



DISHMACHINE LINE VOLTAGE MASTER WIRING DIAGRAM
(PART 3 of 4)

FIGURE 4-6



DISHMACHINE LINE VOLTAGE MASTER WIRING DIAGRAM
(PART 4 of 4)
FIGURE 4-7

			208/230 VOLTS 60Hz 3PH		460/480 VOLTS 60Hz 3PH	
REF. MOTOR#	MOTOR	hp	AMPS	MSP# - RANGE	AMPS	MSP# - RANGE
105MTR TO 109MTR	STD POWER WASH/RINSE (TEFC)	3.00	9.1/8.2	GV2M14 6.0/10.0	4.1/3.9	GV2M10 4.0/6.3
105MTR TO 109MTR	STD POWER WASH/RINSE (ODP)	3.00	9.9/9.0	GV2M14 6.0/10.0	4.5/4.3	GV2M10 4.0/6.3
105MTR TO 109MTR	HI PRSSR PWR WSH/RNS (ODP)	7.50	21.0/19.0	GV2M21 17.0/23.0	9.5/9.1	GV2M14 6.0/10.0
110MTR	PRE FINAL RINSE	0.75	2.6/2.4	GV2M08 2.5/4.0	1.2/1.2	GV2M06 1.0/1.6
111MTR	CIRCULATING PREWASH	1.00	3.2/3.0	GV2M08 2.5/4.0	1.5/1.4	GV2M06 1.0/1.6
111MTR	CIRCULATING PREWASH W/3 ARMS	1.50	4.5/4.2	GV2M10 4.0/6.3	2.1/2.0	GV2M07 1.6/2.5
112MTR/113MTR	WORM DRIVE	0.25	1.2/1.2	GV2M06 1.0/1.6	0.6/0.6	GV2M05 0.6/1.0
114MTR	PREWASH TRANSFER	0.75	2.6/2.4	GV2M08 2.5/4.0	1.2/1.2	GV2M06 1.0/1.6
115MTR	*SUPER BLOWER	3.00	8.6/7.8	GV2M14 6.0/10.0	3.9/3.7	GV2M08 2.5/4.0
115MTR	*SUPER BLOWER CONVERSION	5.00	13.4/13.2	GV2M16 9.0/14.0	6.6/6.3	GV2M14 6.0/10.0
116MTR TO 118MTR	SPIRAL	0.25	1.2/1.2	GV2M06 1.0/1.6	0.6/0.6	GV2M05 0.6/1.0
119MTR	DISPOSER (3hp INSINKERATOR)	3.00	6.0/7.4	GV2M14 6.0/10.0	3.7/3.7	GV2M08 2.5/4.0
120MTR	DISPOSER (5hp INSINKERATOR)	5.00	8.6/8.8	GV2M14 6.0/10.0	4.4/4.4	GV2M10 4.0/6.3
121MTR/122MTR	CONVEYOR (MAIN AND AUXILARY)	0.75	2.9/2.6	GV2M08 2.5/4.0	1.3/1.5	GV2M06 1.0/1.6

TABLE 4A
DISHMACHINE MOTOR STARTER APPLICATIONS

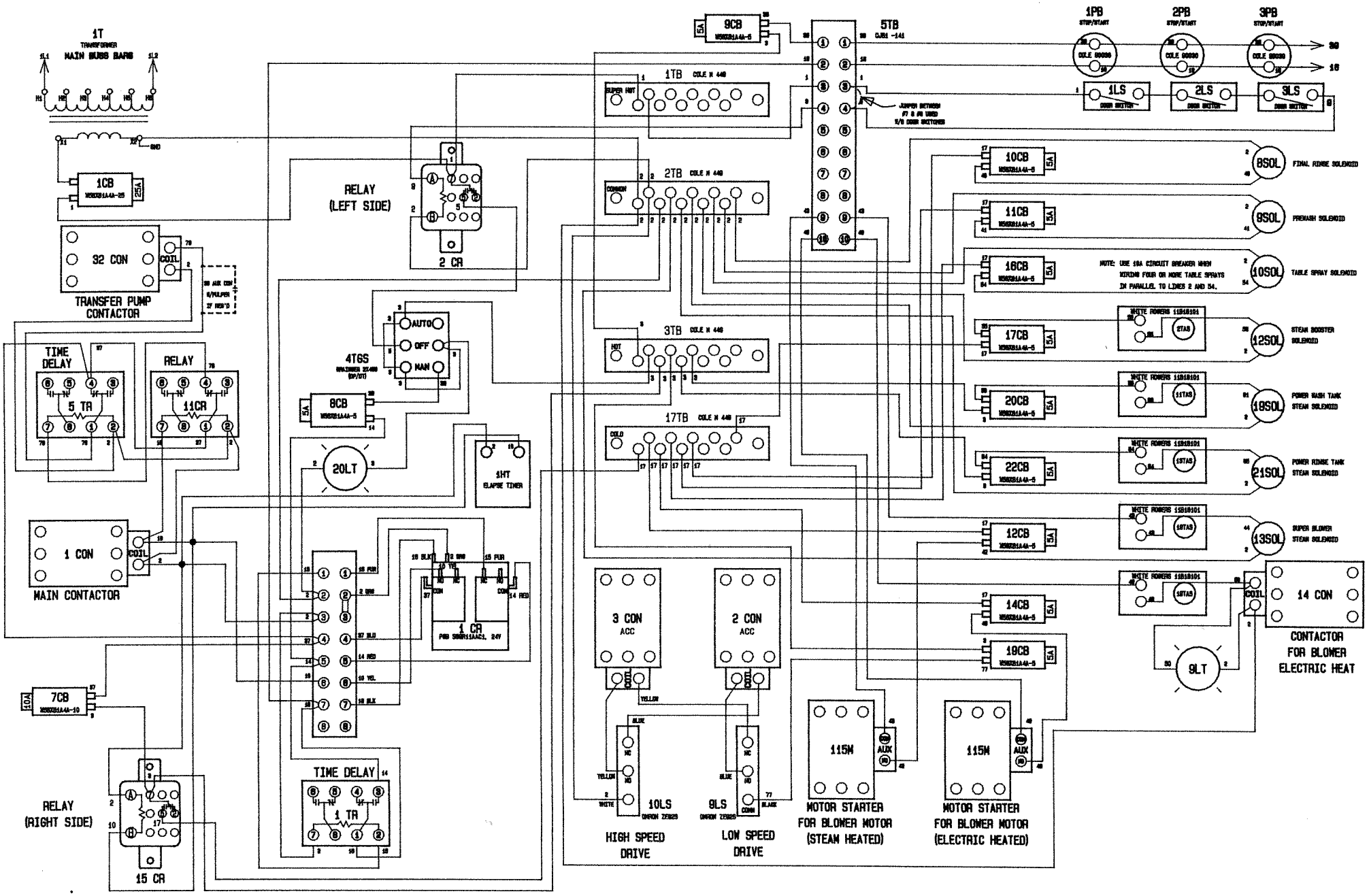
			230/240 VOLTS 60Hz 3PH		460/480 VOLTS 60Hz 3PH	
REF. HEATER#	HEATING ELEMENT	DERATED kW	AMPS	MSP# - RANGE	AMPS	MSP# - RANGE
1HTR TO 8HTR	12kW HEATERS (WASH/RINSE)	11/12	27.6/28.8	MG24544-UP TO 40	13.8/14.4	GV2M20 13.0/18.0
9HTR/10HTR	7.9kW HEATERS (BLOWER)	7.3/7.9	18.2/19.0	GV2M21 17.0/23.0	9.1/9.5	GV2M14 6.0/10.0
11HTR TO 16HTR	12kW HEATERS (WASH/RINSE)	11/12	27.6/28.8	MG24544-UP TO 40	13.8/14.4	GV2M20 13.0/18.0

TABLE 4B (230/240 VOLTS)
DISHMACHINE OVERLOAD FOR HEATING ELEMENT APPLICATIONS

			208 VOLTS 60Hz 3PH	
REF. HEATER#	HEATING ELEMENT	DERATED kW	AMPS	MSP# - RANGE
1HTR TO 8HTR	12kW HEATERS (WASH/RINSE)	9.0	25.0	MG24544-UP TO 40
9HTR/10HTR	7.9kW HEATERS (BLOWER)	5.9	16.5	GV2M20 13.0/18.0
11HTR TO 16HTR	12kW HEATERS (WASH/RINSE)	9.0	25.0	MG24544-UP TO 40

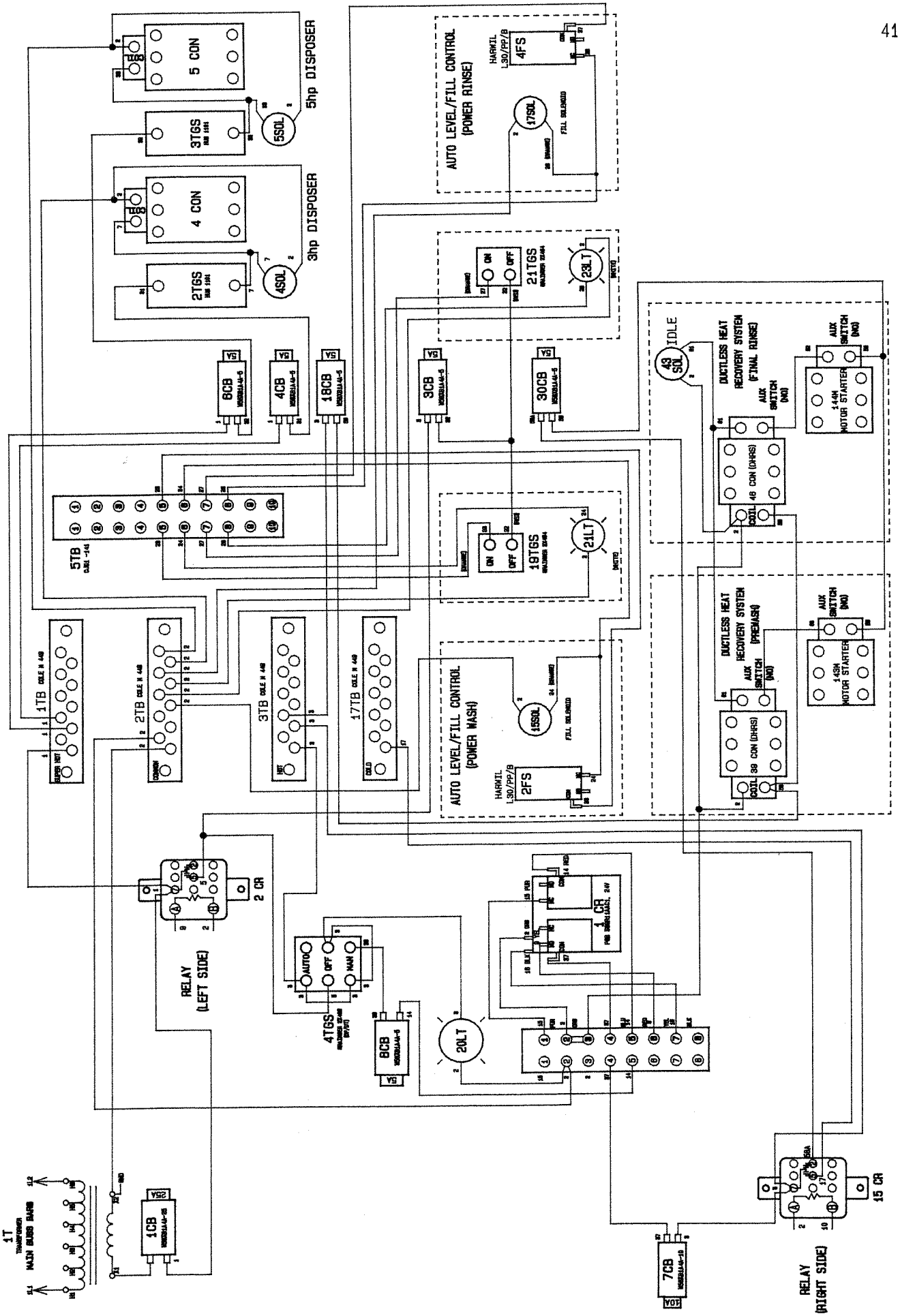
TABLE 4C (208 VOLTS)
DISHMACHINE OVERLOAD FOR HEATING ELEMENT APPLICATIONS

*NOTE: MOTOR STARTER FOR SUPER BLOWER REQUIRES AN AUXILIARY CONTACT#GV2AN11

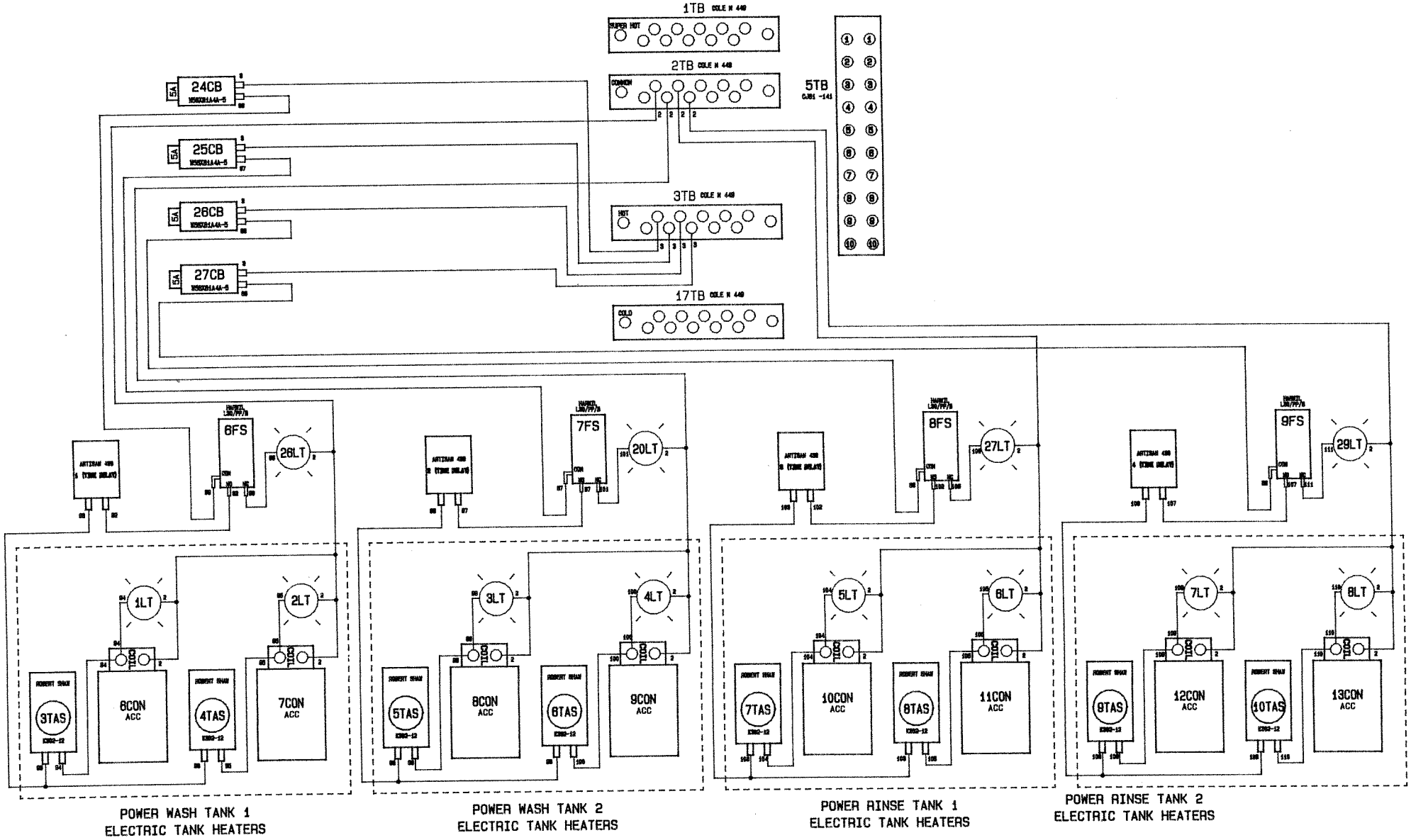


DISHMACHINE LOW VOLTAGE CONTROL CIRCUIT MASTER WIRING DIAGRAM
(PART 1 of 4)

FIGURE 4-8

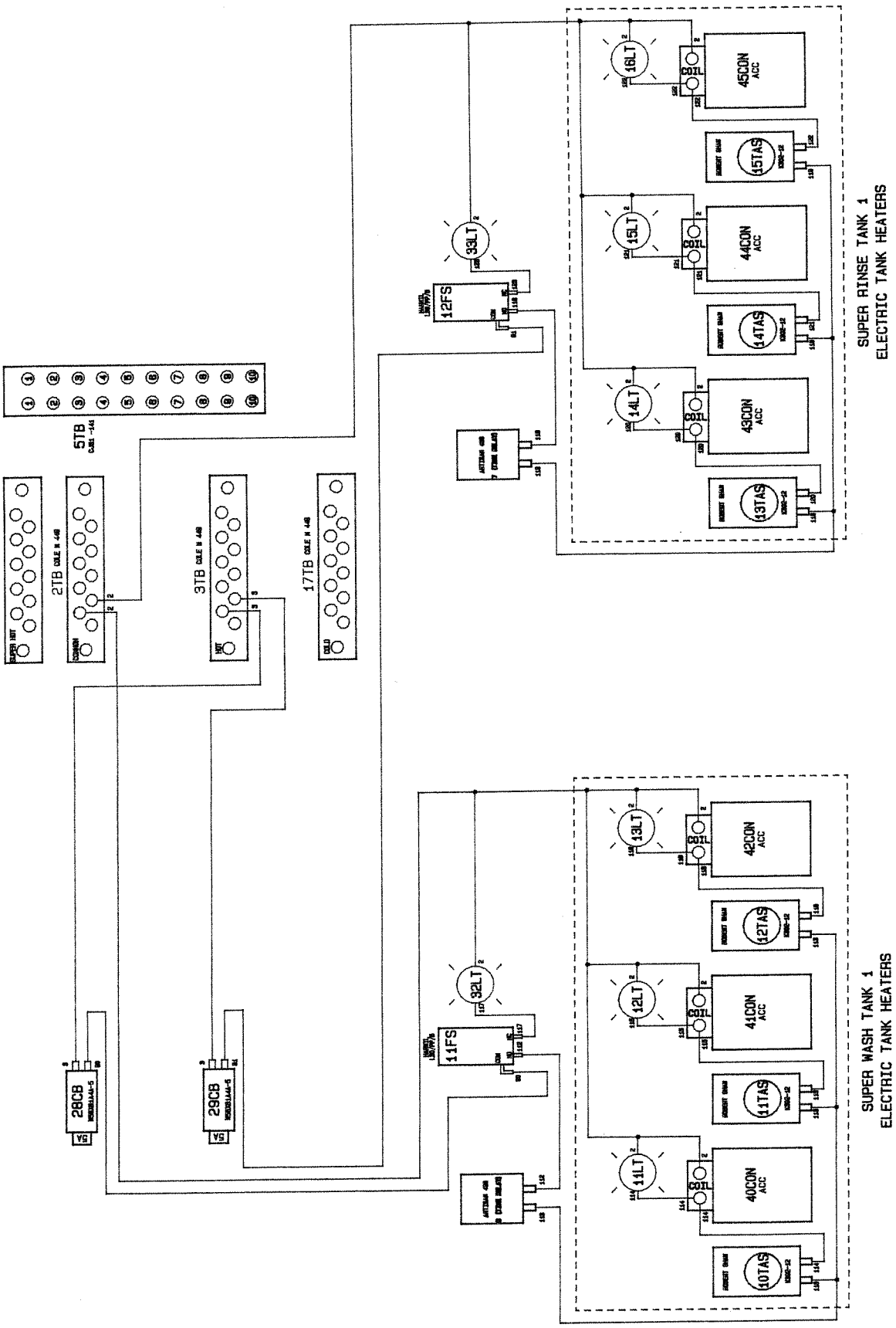


DISHMACHINE LOW VOLTAGE CONTROL CIRCUIT MASTER WIRING DIAGRAM
(PART 2 of 4)
FIGURE 4-9

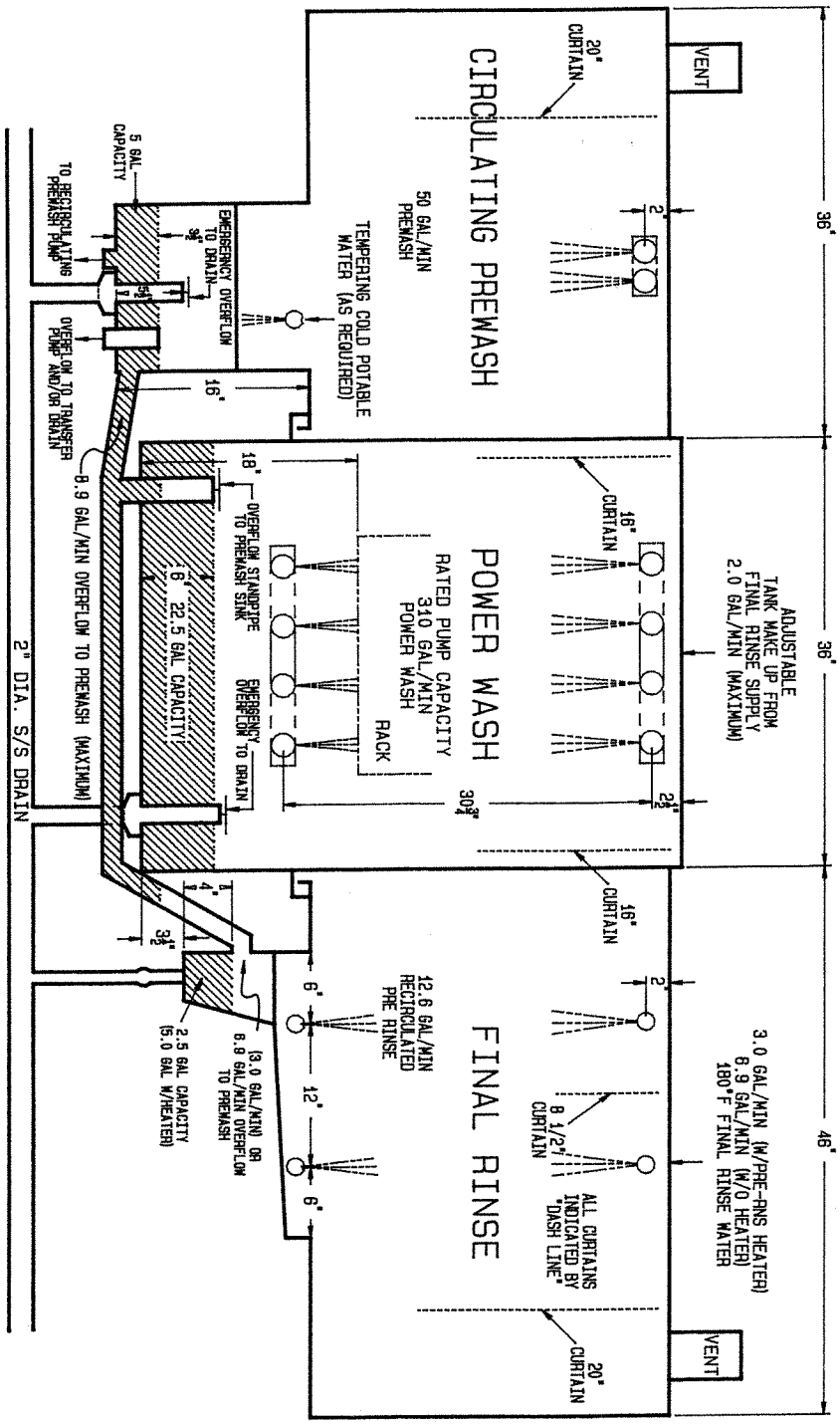


DISHMACHINE LOW VOLTAGE CONTROL CIRCUIT MASTER WIRING DIAGRAM
(PART 3 of 4)

FIGURE 4-10

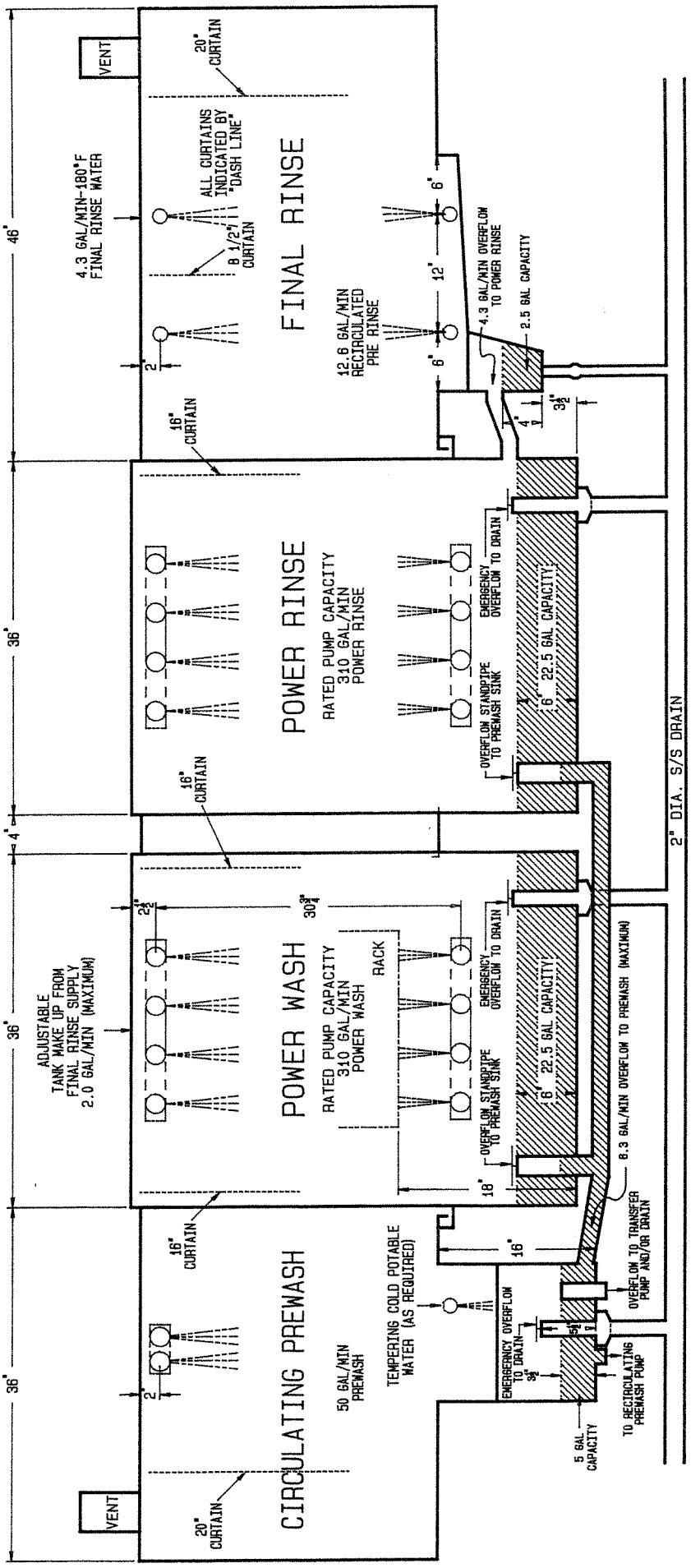


DISHMACHINE LOW VOLTAGE CONTROL CIRCUIT MASTER WIRING DIAGRAM
(PART 4 of 4)
FIGURE 4-11



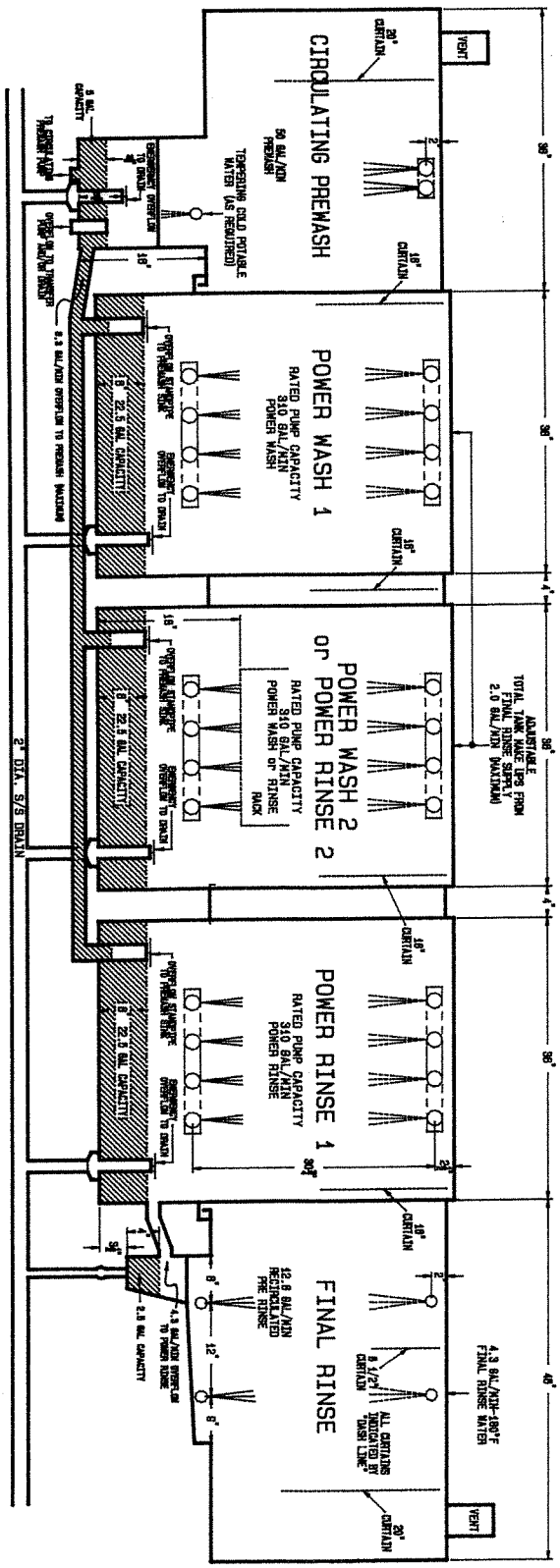
SCHEMATIC DIAGRAM OF WATER FLOW FOR CA-1
ADAMATION DISHMACHINE

FIGURE 4-12



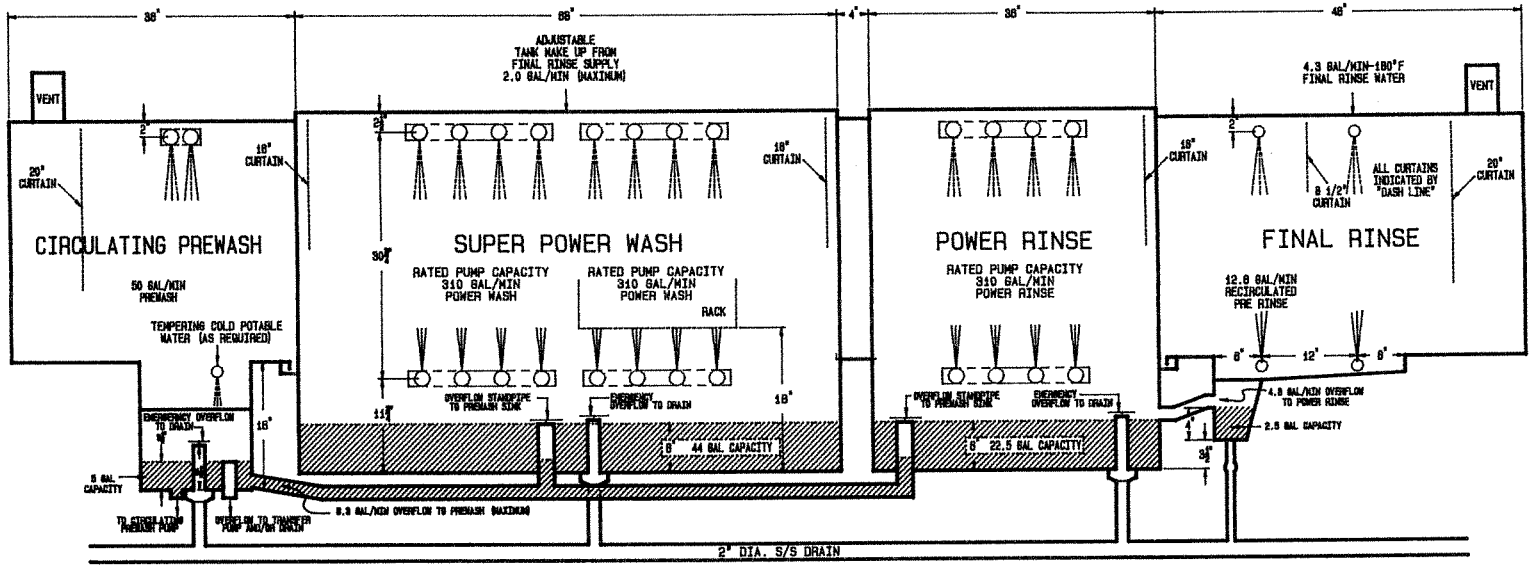
SCHEMATIC DIAGRAM OF WATER FLOW FOR CA-2
ADAMATION DISHMACHINE

FIGURE 4-13



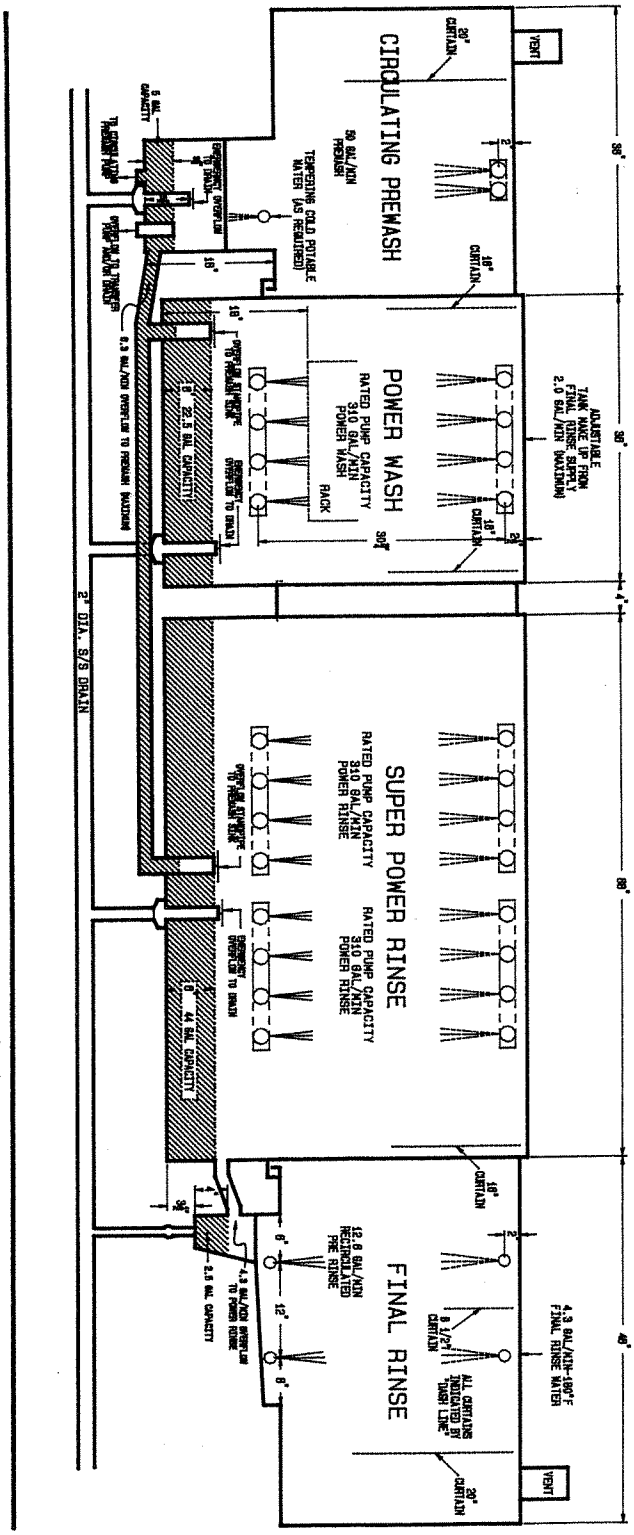
SCHEMATIC DIAGRAM OF WATER FLOW FOR CA-3
ADAMATION DISHMACHINE

FIGURE 4-14



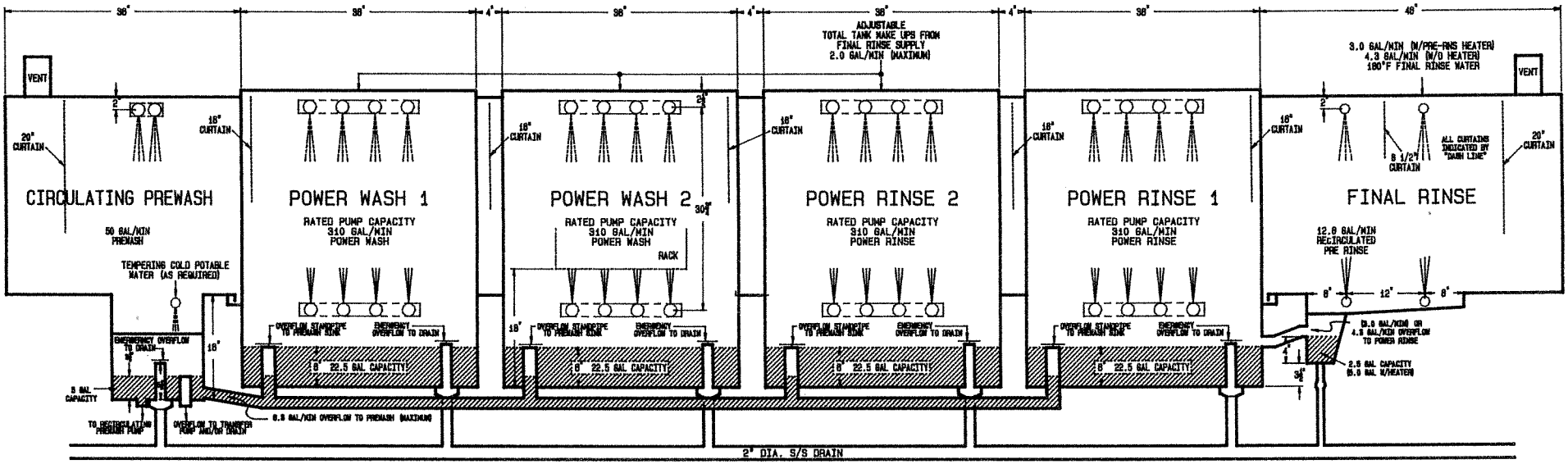
SCHEMATIC DIAGRAM OF WATER FLOW FOR CA-3(SW)
ADAMATION DISHMACHINE

FIGURE 4-15



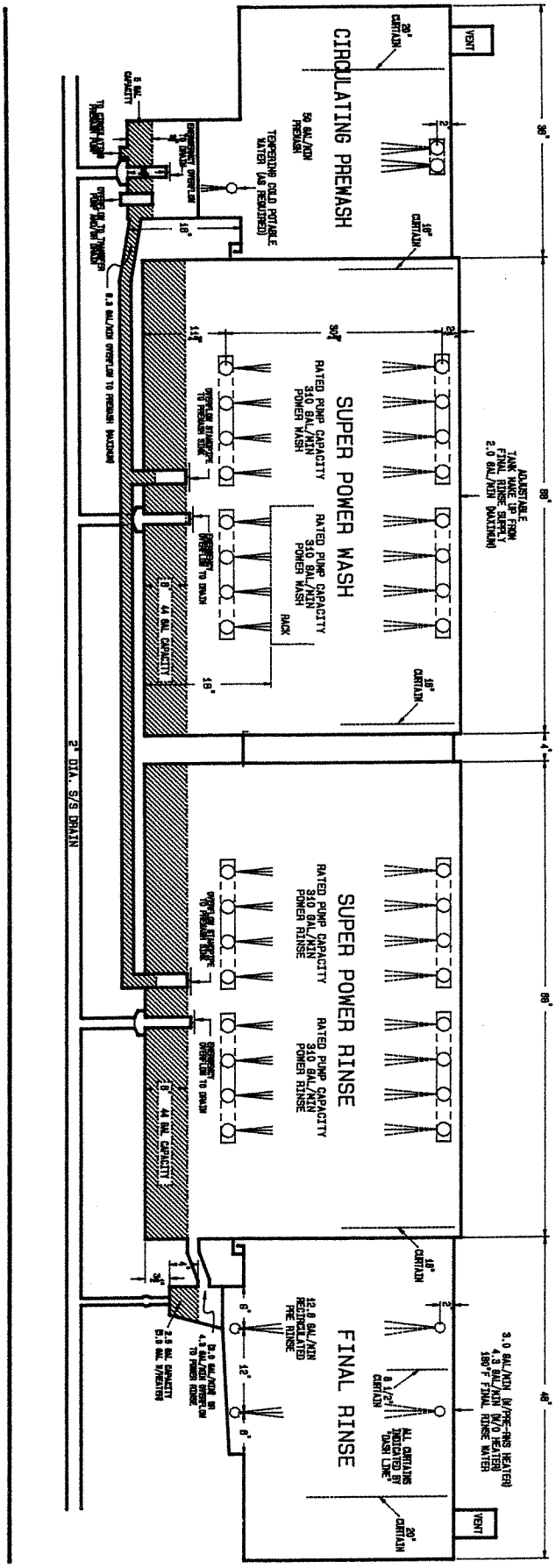
SCHEMATIC DIAGRAM OF WATER FLOW FOR CA-3 (SR)
ADAMATION DISHMACHINE

FIGURE 4-16



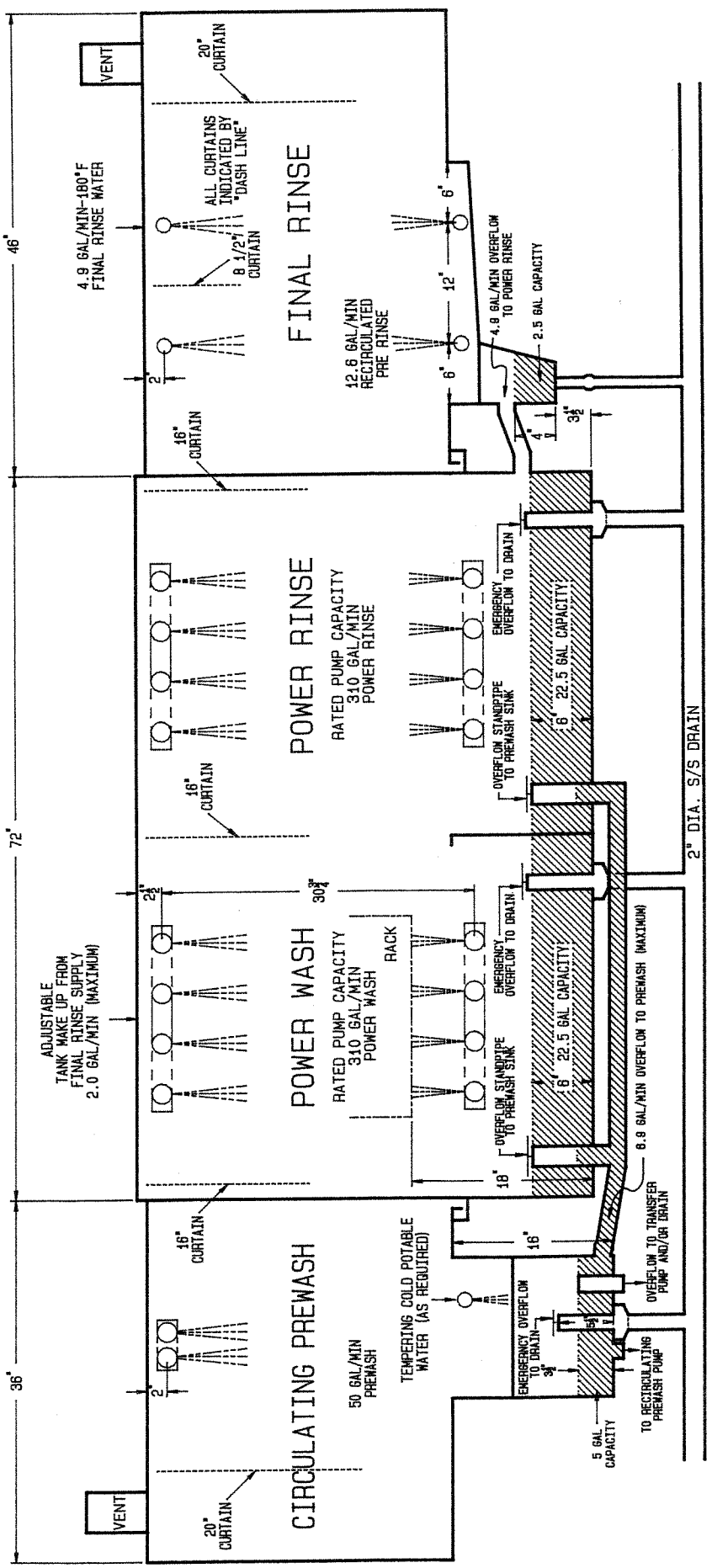
SCHEMATIC DIAGRAM OF WATER FLOW FOR CA-4
ADAMATION DISHMACHINE

FIGURE 4-17



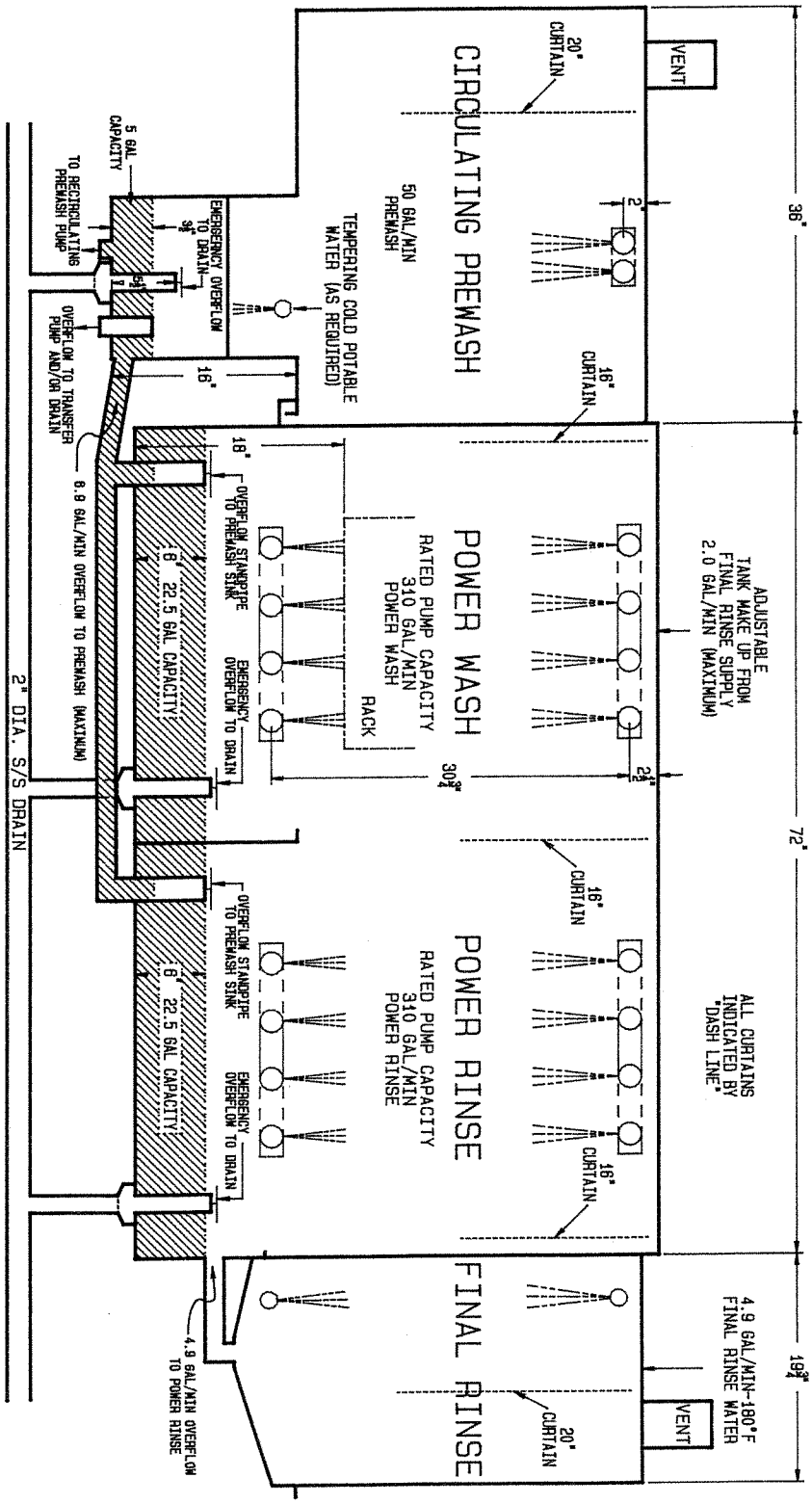
SCHEMATIC DIAGRAM OF WATER FLOW FOR CA-4(SW/SR)
ADAMATION DISHMACHINE

FIGURE 4-18



SCHEMATIC DIAGRAM OF WATER FLOW FOR CSL-1390
ADAMATION DISHMACHINE

FIGURE 4-19



SCHEMATIC DIAGRAM OF WATER FLOW FOR CSL-1390 WITHOUT PRE-RINSE ADAMATION DISHMACHINE

FIGURE 4-20

SECTION 5 - TROUBLE SHOOTING

GENERAL

The information in this section is intended to assist both the operator of the machine and qualified service personnel to locate the general source of a problem. Many times it will result in an immediate repair by the operator. If the problem cannot be readily corrected, the operator should immediately contact the Adamation Service Department or the nearest Adamation Sales Office. Before following any of the procedures given in this section, the operator should be thoroughly familiar with the operating instruction and the function of all controls, which are given in Section 3, Operation, and Page 14.

THE POWER WASH OR POWER RINSE TANK WILL NOT FILL WITH WATER

1. Check to be sure that the house hot water shut-off valve is open.
2. Check to be sure that the wash or rinse tank's lever drain valve is closed. (See Figure 3-1)
3. Check to be sure that the fill valve is open.

THE FINAL RINSE TANK WILL NOT FILL WITH WATER

1. Check to be sure that the house hot water shut-off valve is open.
2. Check to be sure that the rinse tank's lever drain valve is closed.

THERE IS NO FINAL RINSE WATER WHEN THE MACHINE IS ON

1. Check to be sure that the hot water shut-off valve is open.
2. Check the hot water solenoid valve. If it is faulty, replace it.

NOTE:

If the solenoid fails in the closed position, the machine can be operated on an emergency basis by using the final rinse fill valve.

3. Check the 24-volts contact points on the main solenoid relay. If it is defective, it must be replaced.

THE FINAL RINSE WATER TEMPERATURE IS BELOW 180 DEGREE FARENHEIT

1. Check the water temperature of the input water to the hot water shut-off valve to see if it is below 180 degree F. If it is, increase the input water temperature.
2. Check to be sure that the thermometer is working correctly. If it is not, replace it.

THE DISHMACHINE WILL NOT START

1.Check the power input to the machine to be sure that it is working.
2.Check the incoming power line for a blown fuse or a tripped circuit breaker.
3. Check to be sure that all the manual overload breakers in the electrical control cabinet are on. (Be sure that all the tanks are filled with water).
4. Check the mode selector switch. It should either be in the "MANUAL" or "AUTOMATIC" position. If the machine still does not start, check the switch for defects.
5. If any of the 24-volt low voltage circuit breakers continues to trip, call a service person.

THE LOW VOLTAGE PUSH BUTTONS WILL NOT START THE MACHINE WHEN THE SELECTOR SWITCH IS ON "AUTOMATIC" (THE MACHINE DOES START IN THE "MANUAL" MODE)

1. There is a malfunction in the push button system. Call a service person.
2. There is a malfunction in the control circuits.

NOTE:

The machine can be operated in the manual mode until it is repaired without doing any damage. If system failed when ratchet relay was in off position, relay must be manually rocked to on position by service technician. Machine may then be shut off by placing mode switch in "OFF" position at appropriate time.

A MOTOR OR PUMP FAILS TO START

1. Check to be sure that the related manual overload breaker in the electrical control cabinet is in the on position. If it is off, turn the breaker on after it has cooled down.

NOTE:

If the conveyor drive or any part of the drive system fails, the conveyl"or can be pushed by hand on an emergency basis until the necessary repairs can be made.

2. Check the incoming power line for a blown fuse or a tripped circuit breaker.

THE CONVEYOR TRAIN STOPS OR FAILS TO START WHILE THE DRIVE MOTOR IS RUNNING

1. Check to be sure that the conveyor or drive chain is not jammed.
2. Check the clutch for defects.
3. Check to be sure that the drive chain is not broken.
4. Check to be sure that the worm followers on the dollies are being properly engaged by the drive worm. (Make sure that the latch on the drive worm is operating correctly in the down position).
5. If machine is equipped with more than one drive, check to make sure that the unused drive is totally disengaged.

THE POWER WASH WATER TEMPERATURE IS BELOW 140 DEGREE FARENHEIT

A. **FOR STEAM HEATED POWER WASH TANKS:**

1. Check to be sure that the house steam valve is open.
2. Check to be sure that return valve is open (closed steam only).
3. Check to be sure that the thermostat setting is not set too low.
4. Check to be sure that the steam pressure is not too low.

B. **FOR ELECTRICALLY HEATED WASH TANKS:**

1. Check to be sure that the related manual overload breaker located in the electrical control cabinet is in the on position.
2. Check to be sure that the thermostat controlled relay(s) on the heater are open and set correctly.
3. Check to be sure that the heater is not faulty.
4. If the low water cut off light is on, check the water level in the tank.

C. **FOR BOTH STEAM AND ELECTRICALLY HEATED WASH TANKS:**

1. Check the thermometer for defects.
2. Check the spray arms in the prewash cabinet to be sure they are positioned correctly.
3. Check the steam exhaust vents on the prewash cabinet and/or the final rinse cabinet to be sure they are not open too far.
4. Check to be sure that the prewash and/or final rinse spray curtains are not hanging on the outboard side of the vent opening(s).

THE POWER WASH TANK IS LOSING WATER

1. Check to be sure that the wash tank's lever drain valve is closed (Figure 3-1).
2. Check to be sure that the spray arms are properly in place. If they are not, they are probably shoving water out of the cabinet. Also check to make sure that all spray arm caps are on.
3. Check to be sure that the make-up water is entering the tank. If not, open the wash tank make-up adjustment valve (Figure 3-1).
4. Check to see how objects with large flat surfaces (such as trays) are being loaded. These items should be loaded in the rack parallel to the conveyor's direction of travel and spaced one rack full every fourth or fifth dolly.

THE FINAL RINSE TANK IS LOSING WATER

1. Check to make sure that the rinse tank's lever drain valve is closed (Figure 3-1).
2. Check to make sure that the rinse water pressure is adequate.
3. Check to make sure that all the prerinse spray arm nozzles are in place properly. (If they are not, they are probably shoving water out of the cabinet).

THE POWER WASH/POWER RINSE TANK OVERFLOWS AT THE DOOR OPENING

1. Check the scrap screens for debris. If they are full, clean them and then replace them.
2. Check both overflow standpipes for clogs. If clogged, clear the obstruction and put the standpipe back in place.
3. Check to be sure that the drain line is not clogged. If it is, clean it out.

THERE IS NO PREWASH SPRAY OR THE SPRAY IS INADEQUATE

1. Check to see if the circulating prewash pump is operating. If not, check to be sure that the related manual overload breaker located in the electrical control cabinet is in the on position.
2. Check the prewash pump inlet to be sure that it is not clogged.
3. Check the prewash spray arms to be sure that they are not clogged. If they are, remove the end caps from the arms and place the arms back into their original position inside the machine. Close the door and operate the machine normally for five to ten seconds. Then stop the machine and replace the end caps. If the arms are still clogged, call a service person.
4. Check that sink or Hommel Pot drain is not open.

THE FINAL RINSE TANK OVERFLOWS AT THE DOOR OPENING

1. Check the scrap screen for debris. If it is full, clean it and then replace it.
2. Check the overflow for clogs. If clogged, clear the obstruction.
3. Check to be sure that the drain line is not clogged. If it is, clean it out.

THE PREWASH TANK OVERFLOWS AT THE DOOR OPENING

1. Check to be sure that the drain screen or overflow is not clogged. If it is clogged, clean it out.
2. Check the deep well food soil baskets for debris. If they are full, empty and then clean the baskets.
3. On machines equipped with optional Hommel Pot, check to be sure that discharge chute is not blocked with debris. If it is blocked, clear out obstruction.

THERE IS NO PRERINSE SPRAY OR THE SPRAY IS INADEQUATE

1. Check to see if the prerinse pump is operating. If not, check to be sure that the related manual overload breaker located in the electrical control cabinet is in the on position.
2. Check the pump intake screen in the rinse tank to be sure that it is not clogged. It is located in the front section bottom of the final rinse tank.
3. Check the prerinse spray arms to be sure that they are not clogged. If they are, remove the end caps from the arms and place the arms back into their original position inside the machine. Close the door and operate the machine normal for five to ten seconds. Then stop the machine and replace the end caps. If the arms are still clogged, call a service person.
4. Check to be sure the rinse tank's drain valve is closed.
5. Check to see if the rinse tank's drain valve is leaking. If it is, it must be replaced (Figure 3-1).

THERE IS NO POWER WASH/POWER RINSE SPRAY OR THE SPRAY IS INADEQUATE

1. Check to see if the power wash/rinse pump is operating. If not, check to be sure that the related manual overload breaker located in the electrical control cabinet is in the on position.
2. Check the pump intake screen to be sure that it is not clogged. It is located on the bottom of the tank.
3. Check the power wash/rinse spray arms to be sure that they are not clogged. If they are, remove the end caps from the arms and place the arms back into their original position inside the machine. Close the door and operate the machine normally for five to ten seconds. Then stop the machine and replace the end caps. If the arms are still clogged, call a service person.
4. If there is no water in the wash/rinse tank refer to Section 5, Trouble Shooting, The Power Wash Tank Is Losing Water, Page 55.

THE CONVEYOR TRAIN WILL NOT RUN

1. The conveyor manual breaker switch is off. Turn the switch on.
2. There is a foreign object jamming the train. Remove the object.
3. The clutch is slipping. Call a service person.
4. The low voltage control circuit breaker is tripped. Push the reset button.
5. Other. Call a service person.

ELECTRICAL FAULT ISOLATION

The first step toward correcting an electrical failure is to isolate the fault to a single electrical circuit or component. In most cases the nature of the failure and its effect upon the operation of the dishwashing machine will be sufficient to isolate it to one or more circuit elements. This section is provided as a guide for isolating electrical faults to circuits or components.

ELECTRICAL TROUBLE SHOOTING PROCEDURES

All electrical trouble shooting procedures, which follow require access to components and terminals within the electrical control cabinet. Before starting any trouble shooting procedures, remove the cabinet front and the manual overload breaker molding from the cabinet (Refer to Pages 35-43 for wiring diagrams).

WARNING:

Use extreme care when working on components inside the electrical control cabinet. When power is supplied to the dishwashing machine, exposed terminals in the cabinet may carry 208 to 480 volts.

Before performing the trouble shooting procedures in this section, the service person must be completely familiar with the function of all controls as described in Section 3 and with the Principles of Operation as described in Section 4. Except where otherwise indicated, all operating controls (including manual overload breakers) must be in the off position before starting any trouble shooting procedure.

ELECTRICAL INSPECTION

The first step in any electrical trouble shooting procedure is a thorough physical inspection of all wiring connections. If after a thorough inspection the electrical problem has not been solved, continue reading until you find the correct heading for your particular problem.

THE MACHINE WILL NOT OPERATE IN EITHER THE "MANUAL" OR "AUTOMATIC" MODE

1. Check to be sure that the incoming power is on.
2. Check to be sure that all 24V control circuit breakers are on, pushed in.
3. Check the magnetic contactors.
4. Check to be sure that the selector toggle switch is on.
5. Check the wiring.

THE MACHINE OPERATES IN THE "MANUAL" MODE BUT NOT IN THE "AUTOMATIC" MODE

1. Check to be sure that all 24V control circuit breakers are on, pushed in.
2. Check the low voltage push button system.
3. Check the wiring.

THE MACHINE OPERATES IN THE "AUTOMATIC" MODE BUT NOT IN THE "MANUAL" MODE

1. Check to be sure that the selector toggle switch is properly positioned.
2. Check the wiring.
3. Check low voltage push button system.

THE MACHINE OPERATES IN THE "AUTOMATIC" MODE BUT DOES NOT STOP AUTOMATICALLY

1. Check the timer.
2. Check the latching relay.

NOTE:

To determine which element is at fault, start the machine in the automatic mode and then depress a low voltage push button while the machine is running. If the machine stops, the fault is in the timer. If the machine continues to run, the fault is in the latching relay or in the control circuit wiring.

THE POWER WASH PUMP MOTOR HUMS, BUT DOES NOT TURN

1. Check the incoming power supply.
2. Reset the manual overload breaker.

NOTE:

This is usually the result of a blown fuse or a burned out contact in one phase of the three-phase line.

THE POWER WASH PUMP FAILS TO OPERATE YET ALL OTHER PUMPS AND THE CONVEYOR DRIVE ARE OPERATING

1. Check the power wash pump motor.
2. Check the power wash pump's manual overload breaker.
3. Check the wiring.

THE PRERINSE PUMP FAILS TO OPERATE YET ALL OTHER PUMPS AND THE CONVEYOR DRIVE ARE OPERATING

1. Check the prerinse pump motor.
2. Check the prerinse pump's manual overload breaker.
3. Check the wiring.

THE PREWASH PUMP FAILS TO OPERATE YET ALL OTHER PUMPS AND THE CONVEYOR DRIVE ARE OPERATING

1. Check the prewash pump motor.
2. Check the prewash pump's manual overload breaker.
3. Check the wiring.

THE COLD WATER SOLENOID VALVE FAILS TO OPERATE

1. Check the solenoid valve (coil).
2. Check the wiring.
3. Check to make sure the incoming cold water is on.

THE CONVEYOR DRIVE MOTOR FAILS TO OPERATE YET ALL OTHER PUMPS ARE OPERATING

1. Check the conveyor drive motor.
2. Check the conveyor drive's manual overload breaker.
3. Check the wiring.

THE HOT WATER SOLENOID VALVE FAILS TO OPERATE

1. Check the solenoid valve (coil).
2. Check the wiring.
3. Check to make sure the incoming hot water is on.

WARNING:

Before checking connections and wiring, be absolutely sure that input power is removed from the machine, that the selector toggle switch is in the off position and that all manual overload breakers are in the off position.

Check all wiring connections by hand to assure that both ends of all connection points are firmly and tightly secured. Use a screwdriver to tighten the connection points if necessary. Visually inspect all the connection points for evidence of rust, corrosion or other high interference material. If there appears to be the slightest evidence of this condition, separate the leads from the connection points and clean them both with fine sandpaper (0000 is recommended). Be sure that all the terminal connections are clean (shiny), that they fit together tightly and securely and that no contaminating material (food particles, moisture, dirt or dust etc.) is present around or between the terminal connections.

TROUBLE SHOOTING SEQUENCE

Electrical trouble shooting procedures in this section are arranged, as nearly as possible, to follow the normal sequence of electrical events through the dishwashing machine.

In most cases, the correct operation of any single electrical component will depend upon its inputs, which in turn depend upon the correct operation of the preceding component or the wiring and connections between the two.

Section 5, Trouble Shooting, Electrical Fault Isolation, Page 56 isolates the electrical problems to a single electrical component or to a group of components. Using the information in this section, it should not be necessary to perform all component trouble shooting procedures, but to check only that component (or group of components) suspected of being at fault. To use a simple example: if the machine operates in the "AUTOMATIC" mode but not in the "MANUAL" mode, then the incoming power, the control circuits manual overload breaker and the magnetic contactor cannot be faulty (other wise the machine would not operate at all). The fault almost always has to be in the selector toggle switch or in the wiring between the selector toggle switch and the magnetic contactor. In this case, it is not necessary to check out any other components. The service person, using this section and the wiring and schematic diagrams, will recognize many other similar (but somewhat more complicated) situations.

INCOMING POWER

Before trouble shooting any of the electrical parts or assemblies of the dishwashing machine, always verify that the power is being supplied to the machine and that the power input is at the correct rating for the machine. This is normally 60-cycle, 3 phase, 3 wire, at 208 to 480 volts. The current requirements (amperes) will vary depending upon the type of wash tank heaters installed and whether auxiliary equipment is wired into the electrical circuits.

NOTE:

Each installation must have a main disconnect switch or other similar device installed between the building's power source and the dishwashing machine. Check that this switch is closed and that no fuses are blown. In cases where the entire machine fails to operate, or where the machine only operates partially (the power wash pump motor hums, some single phase motors operate and some do not, one solenoid valve operates and the other does not) the trouble can often be traced to a fault in the incoming power lines.

If the electrical elements in the power line to the machine are in good working condition (including splices between the building's power source and the machine) and it appears that the machine is being supplied with power at the proper rating, proceed as follows:

1. Check that all manual overload breakers in the electrical control cabinet are off.
2. Turn on the building's power to the machine.
3. Using an A-C voltmeter, measure the phase-to-phase voltage across all three-line terminals of the magnetic contactor. Each pair of lines must read 208 to 480 volts. If not, the wiring between the building's power source and the magnetic contactor is defective. If the voltage at the line terminals of the magnetic contactor is correct and the machine will not operate, the fault lies within the electrical circuits of the dishwashing machine.

24 VOLTS CONTROL CIRCUIT OVERLOAD BREAKERS

The only malfunction which could result from a defective main 25 amp control circuit overload breaker is total inoperability; i.e. the machine will not operate in either the "MANUAL" or "AUTOMATIC" mode. To check the main 25 amp control circuit overload breaker proceed as follows:

1. Turn on the building's power to the machine.
2. Check the 25-amp control circuit overload breaker to see if it has tripped. If tripped, push button in and proceed. All other manual overload breakers should be off.
3. Measure the voltage across the ground (line #2) and the load terminal of the main 25-amp circuit overload breaker. The meter should read 24 volts. If not, check the wiring between the overload breaker and the transformer. If it checks out, the overload breaker is defective and must be replaced.

Each branch control circuit is protected by a 5-amp circuit breaker. If a branch circuit is not functioning, check to see if the corresponding 5-amp circuit breaker located in 24V junction panel on the rear of the power wash cabinet has tripped. Reset circuit breaker (if tripped) by pushing in button. The circuit should operate. If not, refer to the low voltage control circuit master wiring diagrams (Figures 4-8 to 4-11) to locate faulty wiring and/or component(s).

MAGNETIC CONTACTOR

A defective magnetic contactor can cause the following malfunctions:

1. The dishwashing machine will not operate in either the "MANUAL" or "AUTOMATIC" mode.

2. The machine operates only partially (ie: the power wash pump motor hums). If this occurs and 208 to 480 volts power is present at all three line terminals of the magnetic contactor (as measured in Section 5, Trouble Shooting, Incoming Power, Page 60, Step 3). The fault is usually a burned out set of contacts in one circuit in the magnetic contactor or defective wiring between one of the contactor load terminals and an overload breaker bus bar.

Before checking the magnetic contactor for a complete operational failure of the machine, be sure to check the incoming power as described in Section 5 Trouble Shooting, Incoming Power, Page 59 and the 24 volts control circuit overload breakers as described above. Then proceed as follows:

1. Check all 24V control circuit overload breakers located on the side of the main electrical control panel and in the 24V junction panel on the rear of the power wash cabinet to ensure that none has tripped. All other manual overload breakers should be in the off position. The contactor should energize.
2. With an A-C voltmeter, measure the phase-to-phase voltage across all three-load terminals of the magnetic contactor. The meter should read 208 to 480 volts. The fault could be an open coil or burned out contacts.

NOTE:

If the voltage is present at two of the three load terminals, the fault is most likely burned out contacts in the open phase. However, it is also possible for all three sets of contacts to burn out simultaneously.

3. Turn off the building's power to the machine.
4. Check the magnetic contactors by removing the nameplate cover and examining them visually.
5. To check the coil, remove the two leads. Measure the D-C resistance between the terminals from which the leads were removed. The meter should read approximately 1000 ohms. If the coil resistance is substantially above or below this figure (plus or minus 20 percent), the coil is defective and must be replaced.
6. Replace the leads, if necessary.

THE SELECTOR TOGGLE SWITCH

A defective selector toggle switch may be the cause of failure of the machine to operate in both the manual and automatic modes, or failure to operate in one mode only. To check the selector toggle switch, proceed as follows:

1. Check that all manual overload breakers are in the off position.
2. Turn off the building's power to the machine.
3. Connect an ohmmeter between the middle terminal and either one of the outer terminals.
4. Operate the ohmmeter switch to obtain a reading of zero ohms on the meter when the switch is in either the "MANUAL" or "AUTOMATIC" position. If a zero reading cannot be obtained, the switch is defective. A zero reading will be obtained in only one switch position, not both, if the switch is not faulty.
5. Move one ohmmeter lead from the outer terminal used in Step 4 to another outer terminal.
6. Repeat Step 5. A zero reading should now be obtained for an alternate switch position. If not, the switch is defective and must be replaced.

NOTE:

If the machine still fails to operate in both the "MANUAL" and "AUTOMATIC" mode and the incoming power, the main 25 amp control circuit overload breaker, the magnetic contactor and the selector toggle switch are all in good operating condition, the trouble lies in the wiring within the control circuit or between the control circuit and the magnetic contactor.

7. Remove the ohmmeter and replace all six leads on the selector toggle switch terminals.

THE LOW VOLTAGE PUSH BUTTON

A defective low voltage push button will prevent the machine from starting. Before checking the button itself, carefully check the terminals, boots and all connectors between the push buttons and the low voltage terminal strip in the main electrical control panel.

POSSIBLE LOW VOLTAGE PUSH BUTTON SYSTEM PROBLEMS

1. If a button is stuck or defective, check the connectors.
2. If certain buttons do not work, check the continuity between the terminals of each button. The buttons are normally open.

THE LATCHING RELAY

A defective latching relay can result in the machine failing to start when the selector toggle switch is in the "AUTOMATIC" or "MANUAL" position or failing to stop when the machine is running in the automatic mode. Before checking for a faulty latching relay, be certain that the selector toggle switch and the low voltage push buttons are all operating properly. First check the relay coil as follows:

1. Check that the building's power to the machine is off and that all manual overload breakers are in the off position.
2. Disconnect the coil leads from the latching relay assembly terminal strip (Leads are black and orange).
3. Using an ohmmeter, measure the D-C resistance between the two leads removed in Step 2. (Black and orange leads). The meter should read 900 ohms, plus or minus 20 percent. If not, coil is defective and the entire latching relay must be replaced.
4. If the coil is not defective, replace the coil leads and check the contracts of the relay as described in the following paragraphs.

The latching relay has two stable positions (See Figure 4-2). When the machine is in the automatic or manual mode of operation, the contacts, which supply power to the magnetic contactor and timer, are closed and the dishwashing machine operates ("machine on"). In the second position, both sets of contacts are open, ("machine off") and the machine stops. To check the contact of the relay, proceed as follows:

1. Separate the connectors between the control circuit harness and the magnetic contactor.
2. Manually place the latching plate of the relay in the "machine on" position.
3. Using an ohmmeter, measure the D-C resistance between the relay terminal strip. In both cases the resistance must be zero ohms. If not, the relay is defective and must be replaced.

4. Manually place the latching plate of the relay in the "machine off" position. Repeat Step 3. In both cases the meter must read infinity, otherwise the relay is defective.
5. With machine on, if small indexing lever on relay is stuck in up position with the spring compressed instead of dead center middle, check for shorted push button switch.

NOTE:

Before replacing a relay, carefully check the wiring connections between the relay terminal strip and the relay connector pins. Also check the permanent jumper of the relay terminal strip.

6. Reconnect the wires removed in step one.

THE TIMER

A defective timer will result in the machine not stopping automatically when the mode of operation. If the machine fails to stop automatically, but can be stopped by pushing a low voltage push button at a conveyor control station, the fault is in a defective or loose timer socket or in its wiring. When this occurs, stop the machine with a low voltage push button and place the selector switch to the "OFF" position. Remove the cabinet front from the electrical control cabinet and proceed as follows:

WARNING:

Use extreme care while working on the time in the electrical control cabinet. Many terminals carry 208 to 480 volts.

1. Turn on the building's power to the machine and place the control circuit overload breaker and conveyor worm drive manual overload breaker (labeled "single drive", "low speed drive", or "high speed drive") to the on position. All other manual overload breakers should be off.
2. Turn off the hot water shutoff valve.
3. Depress one of the low voltage push buttons at a conveyor control station. The conveyor should start. If the conveyor does not shut off after the preset time, the timer is defective.
4. Remove the timer from the socket. The low voltage push buttons should now start and stop the machine when it is in the automatic mode.
5. The timer is a sealed unit and must be replaced as such if it is found to be defective (Adamation Part Number 55-7900-156).

NOTE:

In rare cases, due to vibration, dust, dirt or some other contaminating material getting into the timer socket, the timer may not operate. This is unusual but it can occur. If the timer stops once in a very great while, it is not significant, except as a nuisance situation. If the timer stops twice in a cycle, it nearly always indicates a faulty timer socket.

THE CONTROL CIRCUIT WIRING

All of the electrical elements of the control circuit (selector toggle switch, low voltage push buttons, latching relay and timer) are connected to each other (and to the power control circuits of the machine) through a harness. This cable harness is connected, through mating connectors, to a harness, which is connected to the control circuit manual overload breaker and magnetic contactor. If all of the electrical elements in the control circuit are operating correctly (and the incoming power, control circuit manual overload breaker and magnetic contactor have been checked as described above) and the machine still fails to operate in either the manual or the automatic mode (or both), the fault probably lies in the harness wiring.

The control circuit harness can be disconnected from its mating harness to the power circuits by disconnecting the spade clips. The inputs to the control circuits are identified at the terminal strip connection. The Master Electrical Diagram is a wiring diagram, which shows all terminals at this connection and all interconnections within the control circuits. All numbered terminals are identified and all leads are color-coded. Harness connections within the control circuits can be easily removed. Using an ohmmeter, it is a simple matter to verify wiring continuity between the connections shown on the Master Electrical Wiring Diagram. This is usually best done by stages. Do not remove all harness connections prior to starting, but only the ones required for each continuity check. As each lead is replaced, check it for evidence of corrosion and clean it if necessary. Be sure that all leads are firmly and tightly attached so as to provide good electrical connections.

Wiring connections between the other half of the connector, the control circuit overload breaker and magnetic contactor can be similarly checked for continuity by using the wiring connections shown in The Master Electrical Diagram (Figures 4-4 to 4-11).

THE MANUAL OVERLOAD BREAKERS

If a manual overload breaker trips and continues to trip after being reset, first check whether the breaker itself is defective. To do this, remove the load from the breaker, place the breaker in the on position and apply power to the circuit. If the manual overload breaker trips with no load connected to it or will not reset it is defective and must be replaced.

If it has been determined that the manual overload breaker is not defective and it trips and continues to trip after being reset, the fault is probably a short circuit on the load side of the manual overload breaker or a bound up pump motor combination. Check for bare, crossed or loose wiring and check all pumps for binding. If the wiring is not defective and the motor turns freely, the fault is usually in the manual overload breaker and must then be replaced. A single-phase condition will also cause the breaker to trip. Check all three high voltage feeds to machine.

If any motor fails to operate and the associated manual overload breaker does not trip, check the voltage at the motor. If the voltage is 208 to 480 volts on all phases, the fault is in the motor. If not, the fault is on associated manual overload breaker, which must be replaced.

NOTE:

All electric pump motors contain external thermal overload devices. When a motor stops, the cause may be an overheated motor. In this case, the overload device must be normally reset when the motor cools down. If the motor again stops, investigate the cause of the overheating. Check the ventilating openings (breathers) of the motor. The fault may also not be in the motor itself but in some local environmental condition, such as the proximity of the motor to a source of excessive heat, (i.e. steam pipes).

SECTION 6 - MAINTENANCE

GENERAL

This section contains both preventive and corrective maintenance information. Preventive maintenance may be performed by qualified full time maintenance personnel at the establishment in which the dishwashing machine is installed. However, corrective maintenance must be performed only by Adamation trained service personnel. Personnel should never attempt to make repairs or replacements to the machine. In order to perform its task properly, the dishwashing machine depends upon the correct operating relationship of all of its parts and assemblies. These must be kept in good working order and if service is required, it must always be performed by Adamation trained personnel who fully understand the overall machine.

Before attempting to perform any of the procedures given in this section, maintenance personnel must be thoroughly familiar with the operating procedures given in Section 3 and the Principles of Operation in Section 4. Operating instructions will not be repeated in this section unless operation for maintenance purposes differs from the procedures given in Section 3.

SERVICE CONTRACTS

Adamation service contracts are available within a radius of 75 miles of Adamation owned offices. If a service contract is desired, or for complete information as to its scope, the machine owner should contact the sales representative from whom the machine was purchased. The salesperson or the Adamation service representative will explain services provided in the current contract.

PREVENTIVE MAINTENANCE

The single most important preventive maintenance operation on the dishwasher is the cleaning procedure after each period of heavy use described in Section 3, Operation, Cleaning, page 21. Additional preventive maintenance operations are given in this section. In establishments such as Universities, Hospitals, large hotels and military installations, which employ full time maintenance personnel, the tasks described below can be assigned to them. For other installations, tasks requiring mechanical or electrical experience should be performed only by Adamation trained service personnel.

This section sets forth certain minimum preventive maintenance procedures which must be performed periodically to assure continued trouble free operation of the dishwashing machine. A considerable amount of costly and time-consuming machine servicing can be avoided by adhering to an effective preventive maintenance schedule. This schedule is contained in the following paragraphs.

DAILY

1. Cleaning - All the external parts of the machine and the area around it. Wipe all the grime or other soil from the motors, pumps, etc. (Do not use water to clean the motors). Clean beneath the cabinets and the conveyor table.

NOTE:

The conditions under which most dishwashing machines are used (high humidity, large amounts of water being used, food soil, garbage, other types of food waste products being handled in the vicinity of the machine and the like) make cleanliness in and around the machine a very essential part of its operational capability. This is important!

WEEKLY

1. Electrical Inspection - With all incoming power removed from the machine (and all manual overload breakers off) inspect all the exposed wiring for chafing, insulation damage or other visible defects. Check all the accessible wiring connections for tightness. Look for signs of corrosion at the cable and the wiring connections. Check the motor pump combination assemblies for both wiring and for mechanical tightness.

2. Plumbing Inspection - Place the entire machine in operation. Inspect all the pumps, valves (both hand and solenoid operated), water connections (unions, tee's, etc.) and piping into the tanks and cabinets for signs of leakage. Inspect overflow system for blockage. Check for missing, bent, or blocked pump intake and scrap screens, clean or replace as required. Inspect all gauges for proper readings while machine is running.
3. Cleaning The Spray Arms - Remove the end caps from the spray arms in the prewash cabinet. Close the cabinet door and operate the machine normally for five to ten second. Stop the machine and replace the end caps (finger tight--do not use a wrench). Repeat the procedure for the prewash, prerinse, and the final rinse arms and replace.

NOTE:

If the nozzles in the spray arms appear to be clogged or defective, call a service person. Do not attempt to perform preventive maintenance operations on the nozzles.

4. Grease Trap - If the house plumbing system is equipped with a grease trap, inspect and clean the trap.
5. Worm Drive - Remove the chain guard cover on left hand side of drive cabinet housing. Inspect chain for slippage or jumping of chain on sprocket and adjust as required. Inspect condition of bearings. Lubricate the drive chain with light machine oil. Inspect latch assembly for proper engagement of drive worm to dolly drive blocks.
6. Dolly Train - Inspect dolly frames for squareness. Inspect connecting links for straightness and that the bolts or cotter pins are secure and in place. Inspect for torn or missing table squeegees. Inspect dolly wheels for saran wrap and the like wrapped around its wheel bearing. Ensure drive blocks are tight, not worn, and engage to drive worm properly.
7. Mechanical - Inspect all doors for free movement; support hooks are in place, not bent, and operation of door safety switches. Check for missing or improperly located curtains.

MONTHLY

1. Motor Ventilating Openings - Clean thoroughly. (Clogged motor ventilating openings-breathers-will not only contributes to reduced motor life, but in certain cases, can be the cause of nuisance type machine service calls).
2. Line Strainers - First be sure that both shut-off valves are closed and that the water lines are drained. Then remove the strainer screens and clean or replace them as required.
3. Worm Drive - Visually inspect jackshaft, "Lovejoy" coupling, and motor interlock. Grease flange bearings as required.

NOTE:

The frequency which line strainers must be cleaned or replaced depends upon the mineral content of the local water. Start doing it monthly, then vary the time interval based on experience.

DELIMING

Inspect the cabinet interiors and tanks periodically for accumulation of lime deposits. When this occurs, the owner or operator should have a representative of his detergent supplier delime the machine. The frequency of deliming depends upon the mineral content of the water supplied to the machine.

REPAIR AND REPLACEMENT

In the event that the dishwashing machine or any of its functional parts fails to operate, and the fault cannot be corrected by following the trouble shooting instructions in Section 5, the owner or operator should immediately contact the nearest Adamation office for repair service.

NOTE:

Accessories such as garbage disposers, hot water boosters, water boilers and the like may be supplied and installed with the dishwashing machine. Except for steam powered hot water boosters, service on major accessories not manufactured by Adamation must be performed by trained representatives of the original manufacturer.

Section 7 of this manual contains a listing of all replaceable parts and associated exploded views of the entire dishwasher and its accessories. In most cases, disassembly procedures will be obvious to a trained service person from the exploded views. In this section disassembly and assembly instructions will be given only when the procedure is not readily apparent to a trained service person by referring to the applicable exploded view in Section 7.

SPECIAL TOOLS

The following special tools may be purchased to facilitate servicing of Adamation machines.

1. A seal installation tool. (1" wash seal)- Adamation Part No. 17-1301-400.
2. A pump seal extractor (1") - Adamation Part No. 17-1300-500.
3. An inside heater nut wrench - Adamation Part No. 19-1200-300.
4. A Disposer Unjamming Wrench, 2, 3 and 5 H.P. - Adamation Part No. 19-1200-1027-1/2-10 H.P. - Adamation Part No. 19-1200-400 (supplied with machine when equipped with a disposer).

POWER PUMP SYSTEM

An exploded view of the power pump system is shown in Figure 7-7. All pump parts are replaceable and it can be disassembled as shown in the exploded view.

The part most likely to require replacement in this system is the shaft seal (6), which can be replaced without removing the pump and motor assembly from the machine or breaking any plumbing connections. When the seal is replaced, also replace the "O" Ring (7). Drain the power wash tank and the pump casing and proceed as follows (the number shown in parenthesis after each part name is the index number for that part shown in Figure 7-7).

1. Remove the eight hex head screws (15) and remove the pump impeller cover (14) from the pump housing (8).
2. Remove the hex head screw (13), the stainless steel impeller screw washer (12) and the impeller gasket (11) from the end of the impeller shaft.
3. Pull the impeller (10) off of the impeller shaft. The key (3) may come off the shaft with the impeller. If it does not, remove it.

NOTE:

If the impeller does not pull off easily, use a wheel puller. In this case, replace the hex head screw (13) in the impeller shaft (without replacing the washers (12 and 11) to protect the internal screw threads in the impeller shaft. Remove the impeller (10).

4. Slide the "O" Ring (7) off of the shaft and discard it.
5. Lubricate the shaft with light machine oil.
6. Using the pump seal extractor (Adamation Part No. 17-1300-500), pull the shaft seal (6) off of the shaft. Place the ends of the extractor legs against the seal, squeeze the legs together so that the ends are inside the lips of the metal seal casing, push inward to depress the seal and then let the extractor arms spring outward to engage the lips of the seal casing. Withdraw the seal.
7. Clean the shaft, inspect it and thoroughly clean the shaft seal cavity. Oil the shaft and the shaft seal cavity with a light machine oil.
8. Lubricate the new shaft seal and the rubber base inside and out with a light machine oil.
9. Slide the new shaft seal on the shaft so that the internal rubber ring is toward the impeller (10). Slide the shaft seal all the way in. Be sure that the bottom of the seal goes all the way into the pump cavity and is seated properly. Tap the seal lightly around the perimeter of its metal casing to insure proper seating. This is best done with a special piece of plastic tubing. (Adamation Part No. 17-1301-400). Do not use metal! Observe the proper seating of the seal through the pump inlet.
10. Install a new "O" Ring.
11. Replace the key (3) on the impeller shaft, cover the motor shaft with anti-seize high temperature. Replace the impeller (10), the impeller gasket (11), the stainless steel impeller screw washer (12) and the hex head screw (13), in that order.
12. Check the impeller (10) for freedom of rotation. The impeller sleeve is designed so that when the shaft seal is properly seated and the impeller is fully tightened, the seal will not be collapsed to the proper position and the impeller will rotate freely. If it does not rotate freely, recheck the seal for proper seating.
13. Replace the end plate (14).

POWER WASH/POWER RINSE PUMP MOTOR

The power wash pump motor bearings are replaceable. Otherwise, a faulty motor should be replaced as a unit.

To remove the motor, disassemble the power wash pump as shown in Figure 7-7. (It may be necessary to break the pump plumbing connections.) Then remove the motor from the pump intake housing (4) and from the mounting plate. To replace the bearings, disassemble the motor as shown in Figure 7-7. When reassembling the pump and motor assembly a new shaft seal (6) and a new "O" Ring (7) should be installed as described in Section 6, Maintenance, Power Pump System.

PRERINSE AND PREWASH TRANSFER PUMP AND MOTOR COMBINATION

These are identical assemblies, which are shown exploded in Figures 7-6. All of the systems parts are replaceable and can be removed by breaking the two plumbing connections to the pump casing, removing the entire assembly from its mounting and disassembling the system as shown in the exploded view. The unit must be disassembled to separate the motor from the pump if either the motor or the pump needs to be replaced individually.

SOLENOID VALVES

Solenoid valves are available in 1/2", 3/4" and 1" NPT. These valves may be used either for water or steam applications. Exploded views are shown in Figure 7-8. All parts are not replaceable, but the valve can be disassembled for cleaning as shown in the exploded views. When replacing a defective coil, it is not necessary to disassemble the entire valve. Simply remove red cap, push coil down and then pry at tab to slide off nameplate/retainer. Make sure that the replacement solenoid coil is stamped for 24 Volts/60 Hertz operation.

HAND OPERATED BALL VALVES

The several types of hand-operated ball valves are shown exploded views in the various plumbing assemblies where they are used. Individual parts are not replaceable. Handles may be purchased individually.

PLUMBING ASSEMBLIES

All of the pipefittings, connectors, risers, manifolds, spray arms, nozzles and associated plumbing hardware, which provide water connections to the various cabinets and drain connections from the tanks are separately replaceable. For disassembly and replacement of any part of this type, refer to the applicable exploded view in Section 7 and its associated parts list.

GASKETS

All piping, risers, thermostat tubes and the like which pass through the cabinet walls or the tanks are gasketed to prevent leakage. Whenever the seal is broken during repair operations, or when there is evidence of leakage, the gasket must be replaced. Never reinstall a used gasket. All gaskets are shown in the applicable exploded views in Section 7, and their removal and replacement is obvious. When replacing a gasket, clean all the metal surfaces thoroughly and use a sealing compound.

DRIVE MECHANISM

The front, rear, and side views of the entire drive mechanism are shown in Figure 7-2. All parts shown are replaceable and the mechanism can be disassembled and repaired as required. The gear motor is not repairable and must be replaced as a unit.

WORM/DRIVE ALIGNMENT

After making repairs or replacements to the drive mechanism, it may be necessary to readjust the drive cabinet so that the drive worm engages the worm followers on the dollies correctly. For correct operation, three important tolerances must be maintained.

1. The worm followers on the dollies should clear the leading and trailing edges of the drive cabinet by approximately one-half of an inch.
2. The teeth of the worm followers should engage the worm, through its entire length, to a depth of approximately 1/2" - 5/8".
3. All worm follower must engage the worm freely and smoothly when the drive cabinet is latched in its operating position (locked down) and the cabinet must be firmly (locked down) secured in this position.

NOTE:

The worm followers teeth must never bottom on the hub of the drive worm and must never hang up on the leading or trailing edges of the drive cabinet. When all three conditions above are met, the worm followers (and dollies to which they are attached) will travel parallel to the center axis of the drive worm.

To adjust the position of the drive worm (18 or 19, Figure 7-2), with respect to the worm followers (3 or 4, Figure 7-1) on the dollies, loosen the six mounting bolts on the underside of the conveyor table. The slotted holes in the mounting bracket permit the entire drive cabinet (and thus the worm) to be moved toward or away from the conveyor table, and to be skewed somewhat to obtain parallelism between the worm and the worm followers. When the worm is correctly aligned, retighten the six mounting bolts securely.

If it is not possible to obtain the correct engagement of the drive worm and worm followers using the above method, the drive cabinet may be tilted up or down. Since the cabinet pivots on the mounting bracket, adjusting its tilt will move the drive worm toward or away from the worm followers. Before changing the tilt position of the cabinet, loosen the two hex nuts (49) and lock washers (51) in the cabinet latching linkage and adjust up or down as required to extend the length of the latching linkage somewhat. Now readjust the latch assembly by loosening the nut (28) and removing screw (27). Turn the latch rod (21) counterclockwise to tighten and clock-wise to loosen the latch assembly. Place the screw (27) and test the latch before replacing the nut (28). When adjusted properly, the latch will seat firmly with no vibration or rocking. Once adjusted properly, replace the nut (28).

DRIVE CHAIN ADJUSTMENT

To tighten or loosen the drive chain (12 & 13, Figure 7-2) slightly loosen the six hex head mounting screws (30-33) which secure the gear motor and drive assembly to the inside of the cabinet (1). The slotted mounting holes in the motor and bearing mounting plate (6) permit the gear motor (11) and the drive clutch (9) to be adjusted for the proper drive chain (12 & 13) tension. Check the tension by rotation the chain through the full 360 degrees on the larger sprocket. The proper tension between the two sprockets is achieved when 1/4"-3/8" is in the chain (12 & 13).

CAUTION:

After making any adjustments which affect the position of the clutch sprocket (10) or the worm sprocket (14), and before operating the drive mechanism, be sure that the clutch sprocket and the worm sprocket are lined up perfectly with each other and that the clutch sprocket is not cocked or skewed. Both of the sprockets and the drive chain must rotate in the same vertical plane. Imperfect alignment will cause rapid wear of the sprocket teeth.

DRIVE CLUTCH ADJUSTMENT

The drive clutch (9, Figure 7-2) is strictly a protective device which was adjusted when the machine was manufactured so as to slip when any obstruction slowed or stopped the conveyor train, thus preventing possible damage to the dollies, connecting links and/or the drive mechanism. Except after repairs to the clutch itself, or after replacing the gear motor (in which case the clutch must be removed), it is unlikely that the clutch slippage is due to improper tension. After any other repairs to the drive mechanism, if the clutch slips, look for the trouble elsewhere. Never replace or adjust the clutch until it has been positively established that it is set too lightly. Note that the clutch is preset at the factory and should not be altered except by a qualified factory authorized service agent. To check the drive clutch tension, proceed as follows:

1. Station a person at a curved outside edge of the conveyor table. (Not on a straight section).
2. Engage the drive mechanism and start the conveyor. The correct clutch tension is when the conveyor train moves freely but the person at the table can stop it (causing the clutch to slip) by exerting "comfortable" hand pressure against a dolly as it travels around the curved section of the track.

DOLLIES

An exploded view of a dolly assembly is shown in Figure 7-1. All of the parts shown can be replaced and the dolly can be disassembled to the extent shown. All dollies have two worm followers mounted on the side.

In addition to replacing those removable parts, the dolly frame and some of the parts can be straightened if they become bent or out of square. Bent connecting links can also be straightened. A dolly/linkage jig plate is included with each warewashing system.

LOW VOLTAGE PUSH BUTTONS AND WIRES

All low voltage push buttons and wires are replaceable. Additionally, a broken switch or connector can be repaired temporarily by cutting the wire so that both ends can then be joined by a temporary butt splice.

CAUTION:

Cut off all incoming power to the machine before removing the cabinet front and manual overload breaker molding. When these panels are removed, the line connections to the magnetic contactor are exposed. These connections carry 208 to 480 volts. There is no switch on the dishwashing machine to break this circuit. It must be turned off at the building's incoming power service to the dishwashing machine.

MAGNETIC CONTACTOR

The magnetic contactor cannot be repaired. A defective magnetic contactor must be replaced as a unit.

MANUAL OVERLOAD BREAKERS

Your Master Electrical Wiring Diagram shows the location of all manual overload breakers in the electrical control cabinet. Some of the manual overload breakers shown will be installed only in machines with electric tank heaters, and machines, which have accessory equipment such as a disposer. Those identified by the conveyor drive, power wash, prerinse and prewash are common to all CA/CSL Series dishwashing machines currently made.

Manual overload breakers are not repairable. When replacing a defective manual overload breaker, be certain that the replacement has the same electrical current rating as the one being replaced. Manual overload breakers are protective devices only in the sense that they provide short circuit, single phase and overload or overheating protection. The electrical circuits of the dishwashing machine have been designed so that each breaker offers maximum single phase and short circuit protection for the components in its circuit. The correct electrical current rating for each manual overload breaker is adjustable and noted on the master electrical drawing.

All of the manual overload breakers are mounted in the same manner. These breakers have three input wiring connections and are mounted directly on to a DIN rail. The only wiring connections are from the output of the breaker to the load.

The control circuit breakers are connected to wiring harnesses. These connections must be removed for replacement. Remove the defective breaker and replace it with a new unit of the same rating.

CONTROL CIRCUIT

Access to the control circuit can be obtained by removing the cabinet front from the electrical control cabinet.

An exploded view of the control circuit is shown in Figure 7-4. It can be disassembled to the extent shown. The latching relay and the selector toggle switch are non-repairable. The timer can be repaired only to the extent of replacing its socket.

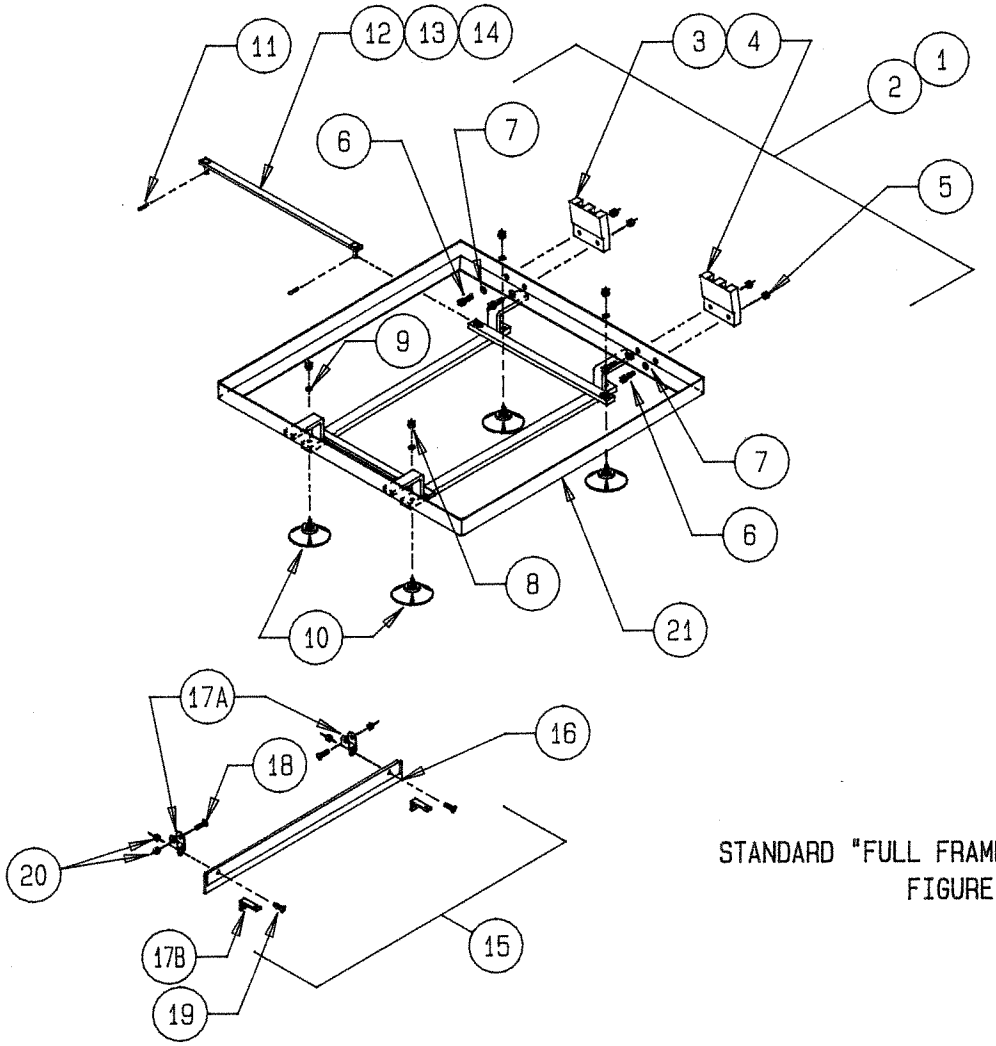
SECTION 7 - ILLUSTRATED PARTS LIST

GENERAL

This section contains a complete listing of all replaceable parts of the basic CA/CSL Series dishwashing machine and the accessory equipment, which is used with the machine. For the purpose of parts identification, the basic CA/CSL Series machine is broken down into functional assemblies. Each assembly is shown in an exploded view, which is keyed to the accompanying parts list. Exploded views are also provided for most of the accessory equipment parts lists.

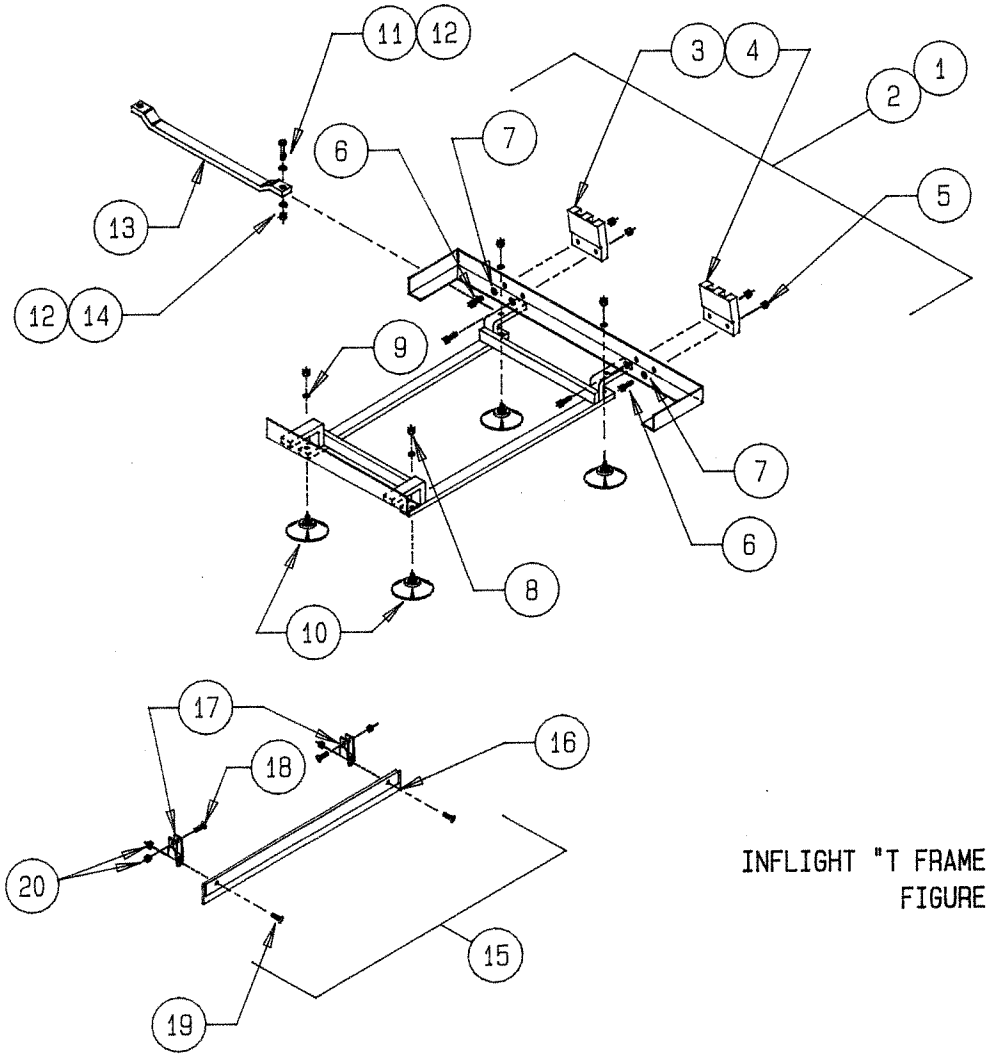
Each parts list contains the Adamation part number, a description of each part, and the number of times the part is used in the assembly shown in the accompanying exploded view. When a part of subassembly is purchased by Adamation and used without modification, the name and part number of the original manufacturer is also given in the description column.

The order should contain the Adamation part number(s), the parts description(s), the quantity required and the model and serial number of the machine (from the machine nameplate) for which the part(s) are/is being ordered. Note that "NPN" means that no Adamation part number as been assigned.



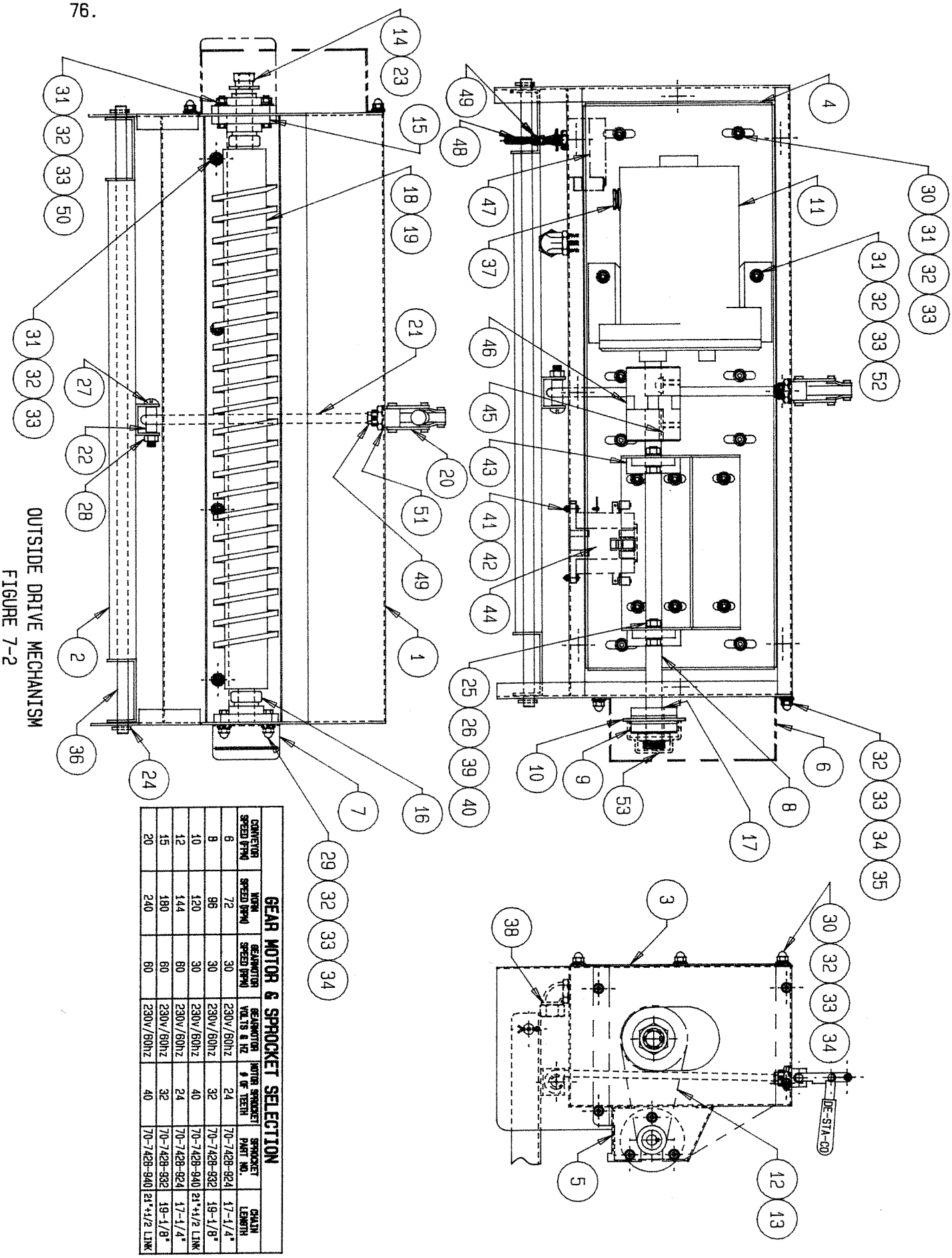
STANDARD "FULL FRAME" CONVEYOR DOLLY
FIGURE 7-1

INDEX NO.	PART NUMBER	PARTS LIST-----STANDARD "FULL FRAME" CONVEYOR DOLLY	QNTY PER ASSMLY
1	32-0353-900	DOLLY ASSY, 20" X 20", W/BLOCKS, CLOCKWISE, W/WHEELS	1
2	32-0356-600	DOLLY ASSY, 20" X 20", W/BLOCKS, COUNTERCLOCKWISE, W/WHEELS	1
3	21-0210-001	FOLLOWER BLOCK, WORM, CLOCKWISE	2
4	21-0210-002	FOLLOWER BLOCK, WORM, COUNTERCLOCKWISE	2
5	10-1904-420	NUT, JAM, S/S, 1/4-20	4
6	10-1105-420	SCREW, HEX HEAD, S/S, 1/4-20 X 5/8" LONG	4
7	10-1801-420	WASHER, LOCK, S/S, 1/4" DIA.	4
8	10-1904-524	NUT, HEXNUT, S/S, 5/16-24, JAM	4
9	10-1801-518	WASHER, LOCK, S/S, 5/16"	4
10	22-0377-000	WHEEL, DOLLY	4
11	10-8108-116	PIN, COTTER, S/S, 1/16" X 1"	2
12	22-0313-705	LINKAGE, CONNECTING, 12" LONG	AS REQ'D
13	22-0313-708	LINKAGE, CONNECTING, 13" LONG	AS REQ'D
14	22-0313-710	LINKAGE, CONNECTING, 14" LONG	AS REQ'D
15	22-0411-800	SQUEEGEE ASSY. (20" X 20" DOLLY)	1
16	22-0411-806	SQUEEGEE, WITHOUT BRACKETS	1
17A	11-0943-500	BRACKET, SQUEEGEE, 16 GAUGE	2
17B	11-0414-500	BRACKET, SQUEEGEE, ANGLE (BOOMERANG APPLICATION ONLY)	AS REQ'D
18	10-1008-832	SCREW, PAN HEAD, S/S, 8/32-1"	2
19	10-1006-832	SCREW, PAN HEAD, S/S, 8/32-3/4"	2
20	10-1901-832	NUT, FLEX, S/S 8/32 DIA.	4
21	32-3356-780	CARRIAGE, DOLLY, 20" X 20" WITHOUT FOLLOWERS	1



INFLIGHT "T FRAME" CONVEYOR DOLLY
FIGURE 7-1a

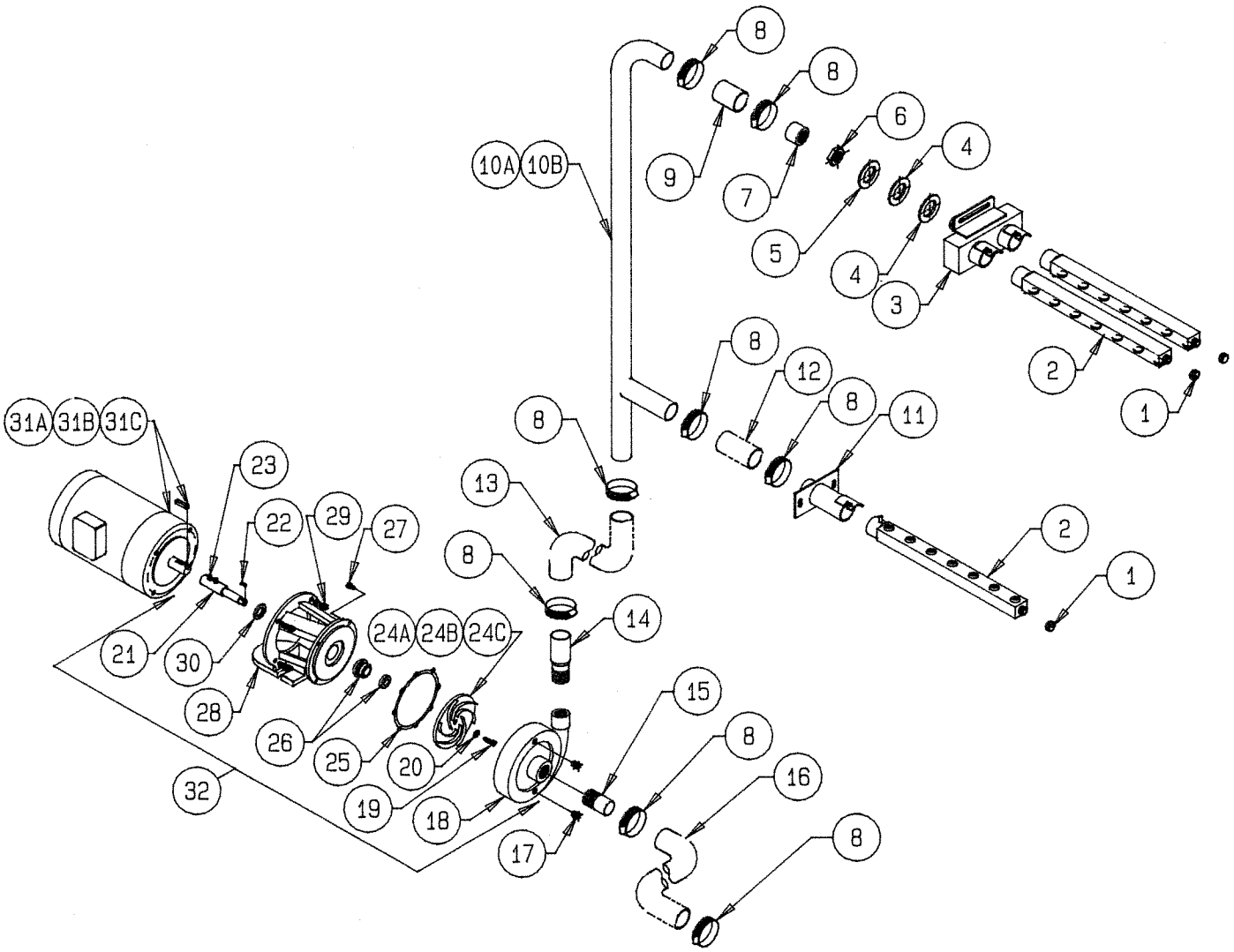
INDEX NO.	PART NUMBER	PARTS LIST-----INFLIGHT "T FRAME" CONVEYOR DOLLY	QNTY PER ASSMLY
1	42-3320-680	"T" DOLLY ASSY, 20" X 20", W/BLOCKS&WHEELS-SPECIFY ROTATION	1
2	42-3320-690	"T" DOLLY ASSY, 20" X 20", W/O BLOCKS AND WHEELS	1
3	21-0210-001	FOLLOWER BLOCK, WORM, CLOCKWISE	2
4	21-0210-002	FOLLOWER BLOCK, WORM, COUNTERCLOCKWISE	2
5	10-1904-420	NUT, JAM, S/S, 1/4-20	4
6	10-1105-420	SCREW, HEX HEAD, S/S, 1/4-20 X 5/8" LONG	4
7	10-1801-420	WASHERS, LOCK, S/S, 1/4" DIA.	4
8	10-1904-524	NUT, HEXNUT, S/S, 5/16-24, JAM	4
9	10-1801-518	WASHER, LOCK, S/S, 5/16"	4
10	22-0377-000	WHEEL, DOLLY	4
11	10-2004-006	BOLT, SHOULDER, S/S, 1/4 X 3/4 WITH 10-24 THREAD	1
12	10-1800-420	WASHER, FLAT, S/S, 1/4"	2
13	42-3321-081	LINKAGE, CONNECTING, 12" LONG, WITH SLOTS, CLOSED COUPLED	1
14	10-2903-024	NUT, HEXNUT, S/S, 10-24, ELASTIC STOP	1
15	22-0411-800	SQUEEGEE ASSY. (20" X 20" DOLLY)	1
16	22-0411-806	SQUEEGEE, WITHOUT BRACKETS	1
17	11-0943-502	BRACKET, SQUEEGEE, 16 GAUGE, CLOSE COUPLED DOLLY	2
18	10-1008-832	SCREW, PAN HEAD, S/S, 8/32-1"	2
19	10-1006-832	SCREW, PAN HEAD, S/S, 8/32-3/4"	2
20	10-1901-832	NUT, FLEX, S/S, 8/32 DIA.	4



OUTSIDE DRIVE MECHANISM
FIGURE 7-2

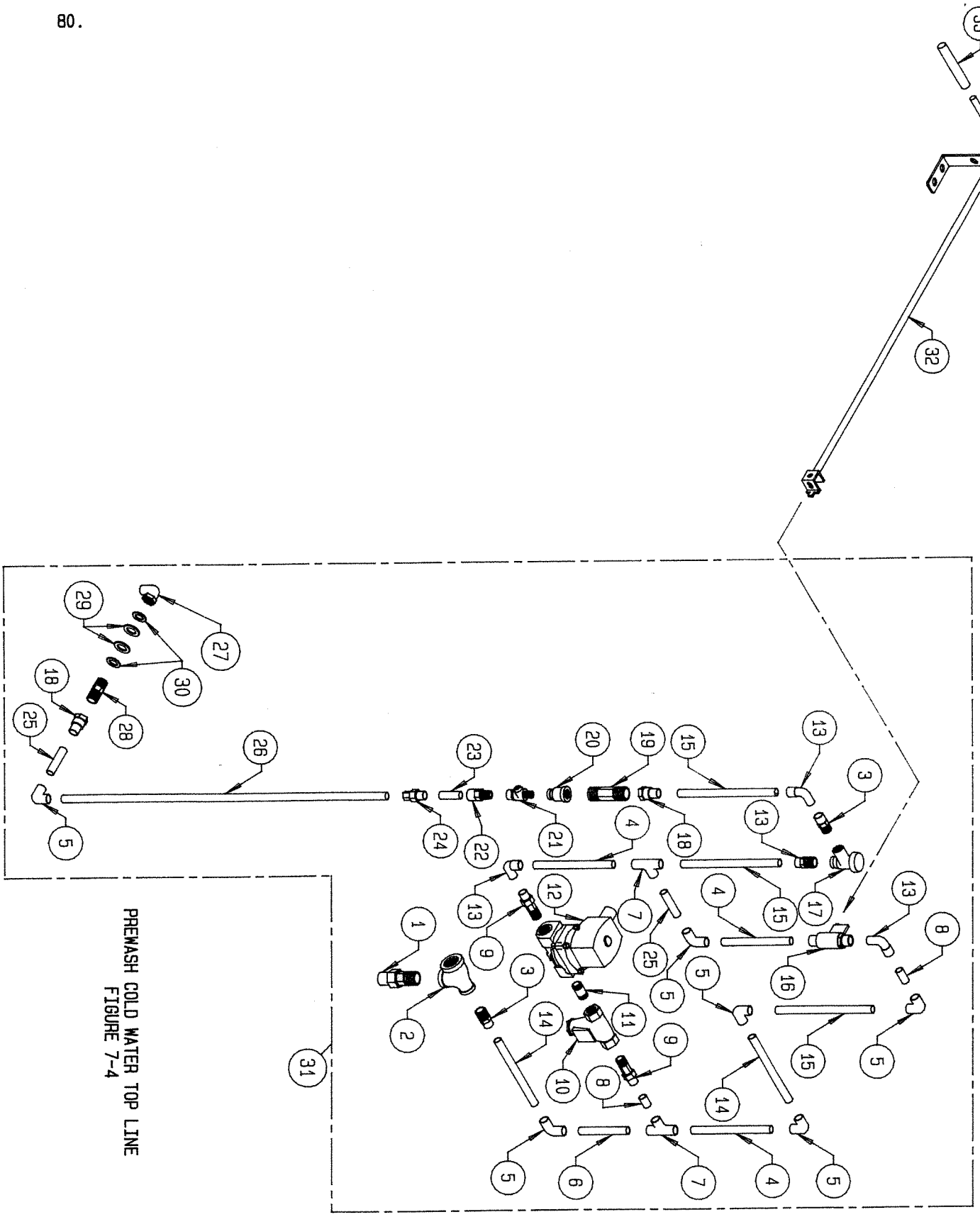
GEAR MOTOR & SPROCKET SELECTION						
CONVEYOR SPEED (FPM)	MOTOR SPEED (RPM)	GEARMOTOR SPEED (RPM)	GEARMOTOR VOLTS & HZ	MOTOR SPROCKET # OF TEETH	SPROCKET PART NO.	CHAIN LENGTH
6	72	30	230v/60hz	24	70-7428-924	17-1/4"
8	96	30	230v/60hz	32	70-7428-932	19-1/8"
10	120	30	230v/60hz	40	70-7428-940	21"+1/2 LINK
12	144	60	230v/60hz	24	70-7428-924	17-1/4"
15	180	60	230v/60hz	32	70-7428-932	19-1/8"
20	240	60	230v/60hz	40	70-7428-940	21"+1/2 LINK

INDEX NO.	PART NUMBER	PARTS LIST-----OUTSIDE DRIVE MECHANISM	QNTY PER ASSMLY
1	98-0007-009	*CABINET, DRIVE, S/S *NOTE: AVAILABLE AS A	1
2	98-0007-009	*FRAME, DRIVE CABINET MOUNTING, S/S COMPLETE SHEET	1
3	98-0007-009	*COVER, CABINET REAR, S/S METAL KIT ONLY	1
4	98-0007-009	*BACK PAN, MOTOR AND BEARING MOUNTING, S/S	1
5	98-0007-009	*DRIP PAN, WORM, S/S	1
6	98-0007-009	*COVER, CHAIN GUARD, S/S (FOR COVER ONLY: P/N 42-0246-500)	1
7	11-0211-400	GUIDE, WORM, FOLLOWER, S/S	1
8	11-0219-100	SHAFT, JACK, OUTSIDE DRIVE	1
9	70-1050-015	CLUTCH, DALTON #35, ADJUSTABLE, 3/4" BORE	1
10	SEE CHART	SPROCKET, MOTOR DRIVE	1
11	55-5004-034	MOTOR, VW, 1/4 HP, 30 RPM (FOR 60 RPM MTR: P/N 55-5004-908)	1
12	70-0900-035	CHAIN, BLACK, #35, PER INCH (FOR HALF LINK: P/N 70-0905-035)	SEE CHART
13	70-0905-135	LINK, MASTER CONNECTING, BLACK, #35	1
14	19-3102-600	SPROCKET, #35, 10T, 1/2" BORE, (OSD WORM)	1
15	19-2500-100	BEARING, FLANGE, 3/4" BORE, NYLON, OUTSIDE DRIVE	3
16	70-0480-053	BEARING, THRUST, 3/4", OUTSIDE DRIVE	2
17	19-2100-301	KEY, 3/16" X 5/32" X 1" LONG	1
18	22-0243-300	WORM, CLOCKWISE, OUTSIDE DRIVE	1
19	22-0243-400	WORM, COUNTERCLOCKWISE, OUTSIDE DRIVE	1
20	19-2300-600	CLAMP, DE-STA-CO	1
21	11-0217-602	ROD, LATCH, FOR OSD W/JACK SHAFT, S/S	1
22	19-2500-300	SLEEVE, LATCH ROD, 1/2" O.D. X 1-3/16" LONG, S/S	1
23	70-4050-020	KEY, WOODRUFF, #5, 1/8" X 5/8" FOR 10 TOOTH SPROCKET	1
24	10-8108-018	PIN, COTTER, 1/8" X 1", S/S	2
25	10-1900-316	NUT, HEX, 3/8-16, S/S	4
26	10-1801-316	WASHERS, LOCK, 3/8", S/S	4
27	10-1216-316	SCREW, ROUND, 3/8-16 X 2" LONG	1
28	10-2903-316	NUT, ELASTIC STOP, 3/8-16, S/S	1
29	10-1108-420	SCREW, HEX, 1/4-20 X 1" LONG, S/S	3
30	60-7500-002	STUD, 1/4-20 X 1/2" LONG	22
31	10-1900-420	NUT, HEX, 1/4-20, S/S	26
32	10-1800-420	WASHERS, FLAT, 1/4", S/S	40
33	10-1801-420	WASHERS, LOCK, 1/4", S/S	40
34	10-1906-420	NUT, ACORN, 1/4-20, S/S	15
35	60-7500-001	STUD, 1/4-20 X 3/8" LONG	8
36	11-0209-100	ROD, HINGE, S/S, OUTSIDE DRIVE	1
37	55-2816-004	NIPPLE, CHASE, 1/2"	1
38	55-2003-502	CONNECTOR, SEALTITE, 1/2", 90 DEGREES	1
39	10-1110-316	SCREW, HEX, 3/8-16 X 1-1/4" LONG	4
40	10-1800-316	WASHERS, FLAT, 3/8", S/S	4
41	10-1003-832	SCREW, PAN, 8-32 X 3/8" LONG (FOR DUAL DRIVES ONLY)	2
42	10-1900-832	NUT, HEX, 8/32, S/S (FOR DUAL DRIVES ONLY)	2
43	70-0455-207	BEARING, FLANGE, 2 HOLE, FB260X, 3/4"	2
44	55-1050-323	CONTACTOR, 40A, 24V COIL (FOR DUAL DRIVES ONLY)	1
45	19-2100-204	KEY, 3/16" X 3/16" X 1-1/2" LONG	1
46	70-0800-001	COUPLING, JAW TYPE, 3/4", LOVE JOY #L100 W/URATHENE INSERT	1
47	55-7400-160	SWITCH, LIMIT, OMRON, #ZEQ2S (FOR DUAL DRIVES ONLY)	1
48	12-0243-502	SCREW, ADJUSTING ACTUATOR (FOR DUAL DRIVES ONLY)	1
49	10-1900-518	NUT, HEX, 5/16-18, S/S (FOR DUAL DRIVES ONLY)	2
50	10-1110-420	SCREW, HEX, 1/4-20 X 1-1/4" LONG	3
51	10-2801-110	WASHERS, LOCK, 3/4", S/S	1
52	60-7500-003	STUD, 1/4-20 X 3/4" LONG	2
53	42-0246-800	BOOT, DALTON CLUTCH, PLASTISOL	1



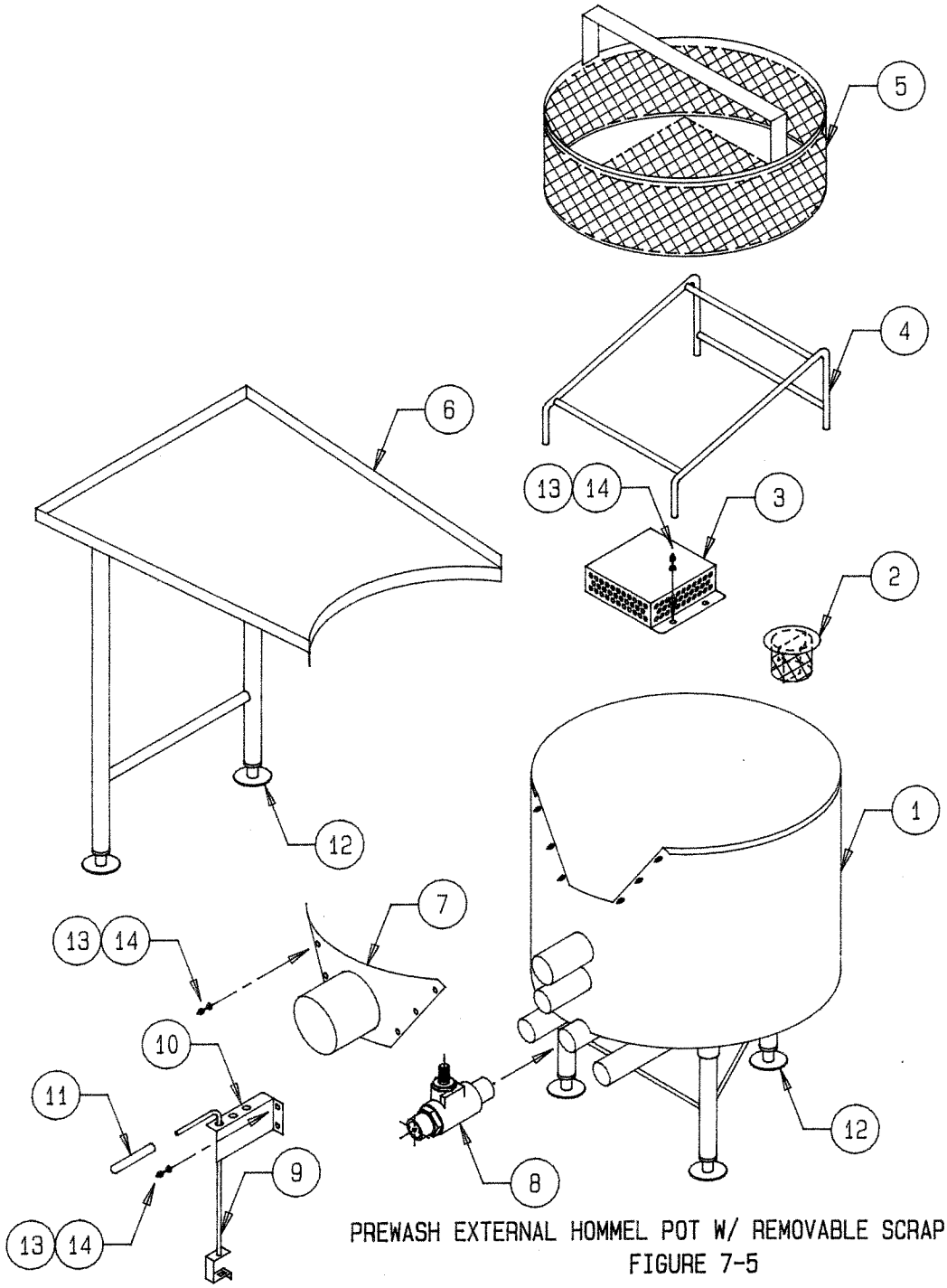
CIRCULATING PREWASH SYSTEM
FIGURE 7-3

INDEX NO.	PART NUMBER	PARTS LIST-----CIRCULATING PREWASH SYSTEM	QNTY PER ASSMLY
1	75-0830-606	CAP, 3/4" NPT, PLATED	3
2	42-0655-700	WASH TUBE, HIGH PRESSURE, WITHOUT CAP	3
3	32-0651-500	MANIFOLD, UPPER CIRCULATING PREWASH-TWO WASH TUBES	1
4	19-4201-038	GASKET, 1-3/8" I.D. X 2-1/2" O.D. X 1/16" THICK, FIBER	2
5	19-1501-500	WASHER, FLAT, 1-1/4" I.D. X 2-3/4" O.D., S/S	1
6	60-5502-107	NUT, LOCK, 1" NPT	1
7	75-1130-007	COUPLING, HALF, 1" NPT, S/S	1
8	70-1000-528	CLAMP, HOSE, 1-1/16" TO 2", S/S	8
9	42-0655-604	HOSE, SUPER FLEX MARINE, 1-5/8" O.D. X 3" LONG (CUT TO 2")	1
10A	42-0662-501	RISER, PREWASH, 1-5/8" O.D. X .065" WALL, S/S	1
10B	42-0662-502	RISER, PREWASH, 1-5/8" O.D. X .065" WALL, W/LOWER "T", S/S	1
11	22-0644-303	MANIFOLD, LOWER CIRCULATING PREWASH-SINGLE WASH TUBE	1
12	42-0655-604	HOSE, SUPER FLEX MARINE, 1-5/8" O.D. X 3" LONG	1
13	65-7112-080	HOSE, SUPER FLEX MARINE, 1-5/8" O.D. (SPECIFY LENGTH)	1
14	12-0982-100	NIPPLE, TRANSFER PUMP, 1" NPT X 1-5/8" O.D. TUBING	1
15	19-4301-900	NIPPLE, MODIFIED, 1-1/4" NPT X 2" LONG	1
16	65-7112-080	HOSE, SUPER FLEX MARINE, 1-5/8" O.D. (SPECIFY LENGTH)	1
17	75-6205-001	PLUG, SQUARE HEAD, 1/8" NPT, GALVANIZED	2
18	55-6302-002	VOLUTE, PRICE PUMP CD100	1
19	55-6301-910	*BOLT, IMPELLER LOCK	1
20	55-6301-910	*WASHER, IMPELLER *NOTE: AVAILABLE AS	1
21	55-6301-910	*SHAFT, PRICE PUMP CD100 A COMPLETE	1
22	55-6301-910	*KEY, IMPELLER, PRICE PUMP CD100 SHAFT KIT ONLY	1
23	55-6301-910	*SCREW, SHAFT SET, PRICE PUMP CD100	1
24A	55-6301-124	IMPELLER, PRICE PUMP CD100, 60Hz, 1 hp, 4-3/16" DIA.	1
24B	55-6301-122	IMPELLER, PRICE PUMP CD100, 60/50 Hz, 1.5/1 hp, 4-3/8" DIA.	1
24C	55-6301-123	IMPELLER, PRICE PUMP CD100, 50Hz, 1-1/2 hp, 4-15/16" DIA.	1
25	55-6301-605	GASKET, PRICE PUMP CD100, FIBER	1
26	55-6301-305	SEAL, PRICE PUMP CD100, #447	1
27	10-1105-420	BOLT, HEX, PUMP HOUSING, 1/4-20 X 5/8" LONG	4
28	55-6302-001	HOUSING, SHAFT, SEAL, AND GASKET FOR PRICE PUMP CD100	1
29	10-1110-316	BOLT, HEX, PUMP MOUNTING, 3/8-16 X 1-1/4" LONG	4
30	N.P.N.	WASHER, SLINGER, PRICE PUMP CD100	1
31A	55-5012-014	MOTOR WITH KEY, 1 hp, (SPECIFY VOLTAGE), 60Hz, 3PH	1
31B	55-5014-010	MOTOR WITH KEY, 1.5/1 hp, (SPECIFY VOLTAGE), 60/50 Hz, 3PH	1
31C	55-5015-002	MOTOR WITH KEY, 2/1.5 hp, (SPECIFY VOLTAGE), 60/50 Hz, 3PH	1
32	55-6301-085	KIT, PRICE PUMP CD100-WITHOUT IMPLELLER (INDEX#24)	1
--	55-6300-015	COMPLETE MOTOR/PUMP ASSEMBLY, 3PH, 1 hp, 4-3/16" DIA. IMPELLER (SPECIFY VOLTAGE AND Hz)	AS REQ'D
--	55-6300-017	COMPLETE MOTOR/PUMP ASSEMBLY, 3PH, 1-1/2 hp, 4-3/8" DIA. IMPELLER (SPECIFY VOLTAGE AND Hz)	AS REQ'D



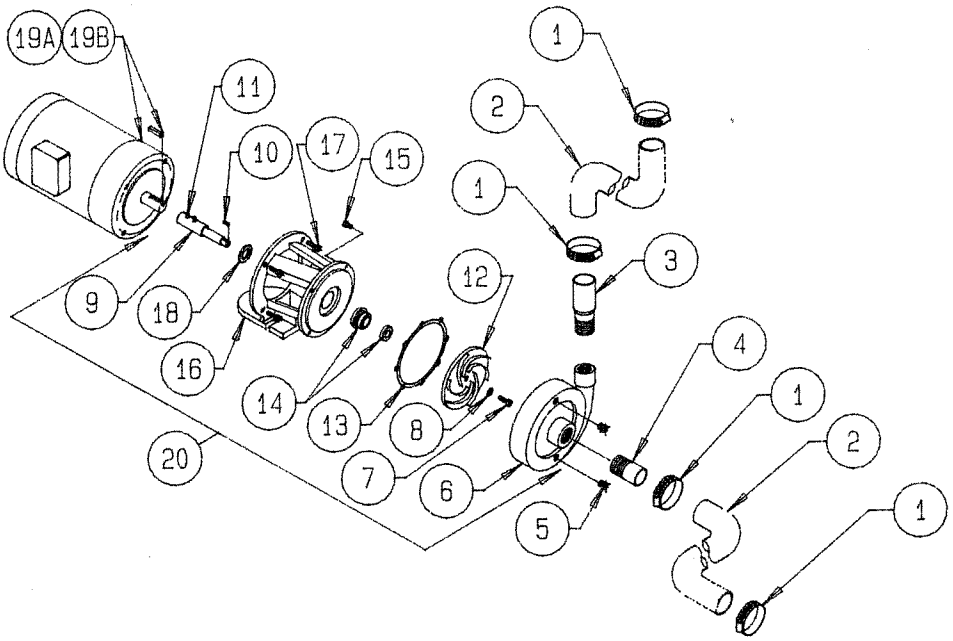
PREWASH COLD WATER TOP LINE
FIGURE 7-4

INDEX NO.	PART NUMBER	PARTS LIST-----PREWASH COLD WATER LINE	QNTY PER ASSMLY
1	75-8201-100	UNION, 3/4" C X M, BRASS	1
2	75-7601-351	TEE, 1" F X 1/2" F X 3/4" F, BRASS	1
3	75-0026-016	ADAPTER, 1/2" C X M, WROT	3
4	65-4922-004	TUBING, 1/2" X 5" LONG, COPPER	3
5	75-1602-042	ELBOW, 1/2" C X C - 90°, WROT	6
6	65-4922-004	TUBING, 1/2" X 3-1/2" LONG, COPPER	1
7	75-7602-070	TEE, 1/2" C X C X C, WROT	2
8	65-4922-004	TUBING, 1/2" X 1-1/8" LONG, COPPER	2
9	75-8201-060	UNION, 1/2" C X M, BRASS	2
10	75-7500-521	STRAINER, WATTS #27, 1/2" NPT, BRASS	1
11	75-5101-080	NIPPLE, 1/2" NPT X 1-1/2" LONG, BRASS	1
12	55-7300-550	SOLENOID, ASCO #8220G3, 1/2" NPT, 24V	1
	55-7301-550	KIT, REPAIR, ASCO, #8220G SERIES, 1/2" NPT	AS REQ'D
	55-7301-560	COIL, ASCO, #8220G SERIES, 24V	AS REQ'D
13	75-1702-004	ELBOW, STREET, 1/2" C X 90°, WROT	3
14	65-4922-004	TUBING, 1/2" X 6" LONG, COPPER	2
15	65-4922-004	TUBING, 1/2" X 7" LONG, COPPER	3
16	75-8515-001	VALVE, BALL, WATTS, 1/2" C X C, BRASS	1
17	75-7550-115	BREAKER, SYPHON, WATTS, 1/2" NPT, BRASS	1
18	75-0026-015	ADAPTER, 1/2" C X F, BRASS	2
19	75-8506-006	VALVE, FLOW, 1/2" M X M (4.8 GPM), BRASS	1
20	75-1141-004	COUPLING, REDUCER, 1/2" F X 1/4" F, BRASS	1
21	75-8504-561	VALVE, CHECK, WATTS #1/4 AB-5, 1/4" M X F, BRONZ	1
22	75-0026-010	ADAPTER, 1/2" C X 1/4" M, WROT	1
23	65-4922-004	TUBING, 1/2" X 1-1/4" LONG, COPPER	1
24	75-8202-004	UNION, 1/2" C X C, BRONZ	1
25	65-4922-004	TUBING, 1/2" X 2" LONG, COPPER	3
26	65-4922-004	TUBING, 1/2" X 21-1/4" LONG, COPPER	1
27	75-1601-040	ELBOW, 1/2" C X F, 90°, BRASS	1
28	75-5151-004	NIPPLE, HEX, 1/2" NPT, BRASS	1
29	19-4200-500	GASKET, RINSE ARM, 7/8" I.D.	2
30	19-1500-200	WASHER, FLAT, 7/8" I.D., S/S	2
31	42-0658-300	COMPLETE COLD WATER TOP LINE ASSEMBLY	-
32	42-0659-701	VALVE HANDLE (25" LONG) KIT WITH BRACKET	1
33	31-0620-402	COVER, FILL VALVE HANDLE, PLASTISOL	1



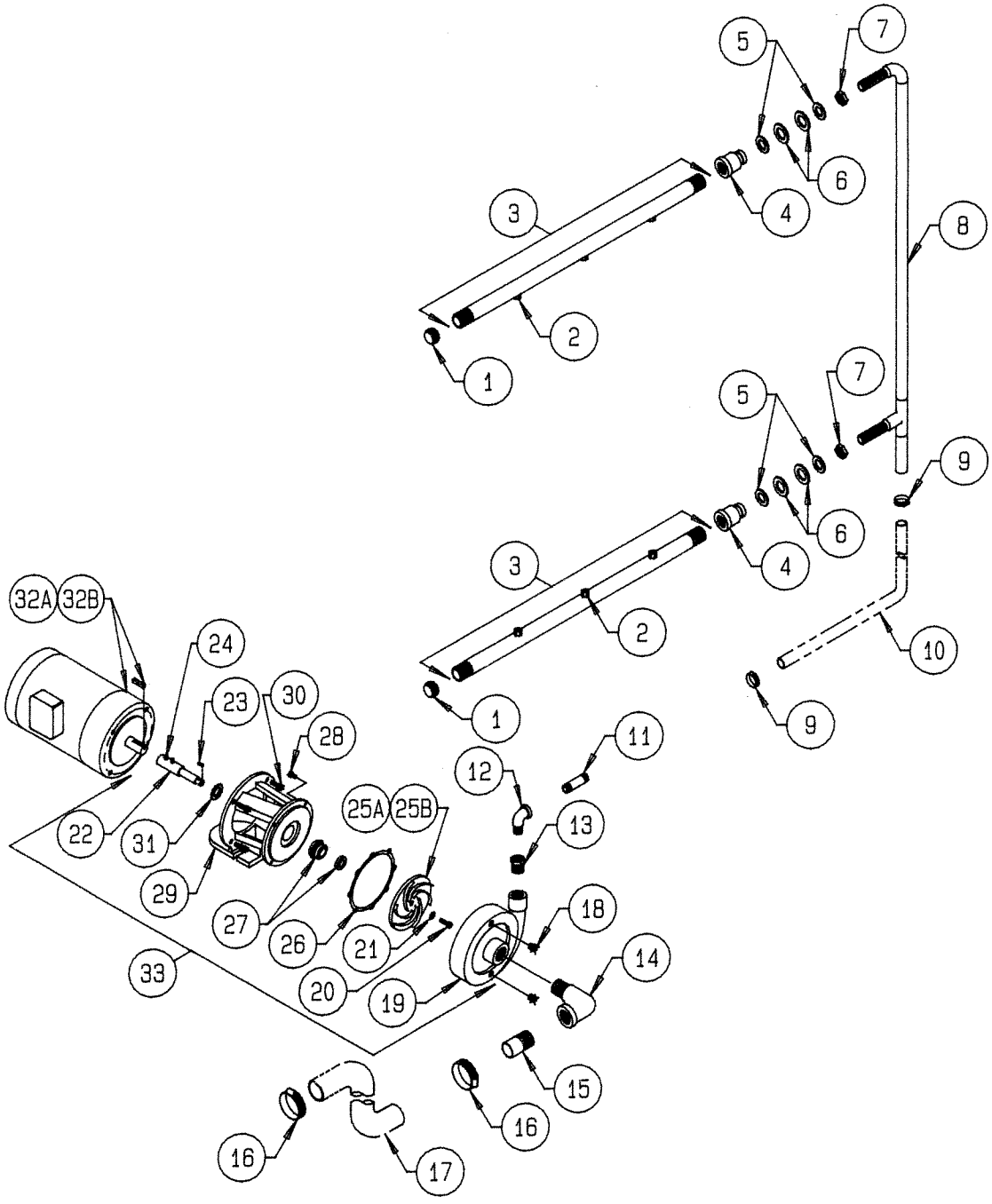
PREWASH EXTERNAL HOMMEL POT W/ REMOVABLE SCRAP BASKET
FIGURE 7-5

INDEX NO.	PART NUMBER	PARTS LIST-----PREWASH EXTERNAL HOMMEL POT	QNTY PER ASSMLY
1	42-0657-700	POT, HOMMEL, RECIRCULATING, WIDE MOUTH	1
2	42-0660-100	COVER, ANTI-SWIRL, OUTLET TO TRNSFR PUMP/OVERFLOW TO DRAIN	1
3	42-0664-000	SCREEN, RECIRCULATING PUMP, HMML PT W/ 2" OVERFLOW TO DRAIN	1
4	42-0992-400	SUPPORT, HOMMEL POT SCRAP BASKET	1
5	32-0903-200	BASKET, SCRAP, HOMMEL POT	1
6	32-0977-700	DRAIN BOARD, HOMMEL POT	OPTIONAL
7	42-0662-400	ADAPTER, WIDE MOUTH TO 4" OD (FOR REMOTE HOMMEL POT)	AS REQ'D
8	75-8515-005	VALVE, BALL, WATTS, 1-1/2" C X C	1
9	N.P.N.	HANDLE, DRAIN VALVE (SUPPLY DISHMACHINE S/N WHEN ORDERING)	1
10	N.P.N.	BRACKET, DRAIN VALVE HANDLE	1
11	42-0657-720	COVER, DRAIN VALVE HANDLE, PLASTISOL	1
12	70-2300-503	FOOT, ADJUSTABLE, FLANGED, 1-5/8" OD	AS REQ'D
13	10-1801-420	WASHER, LOCK, 1/4"	AS REQ'D
14	10-1906-420	NUT, ACORN, 1/4-20	AS REQ'D



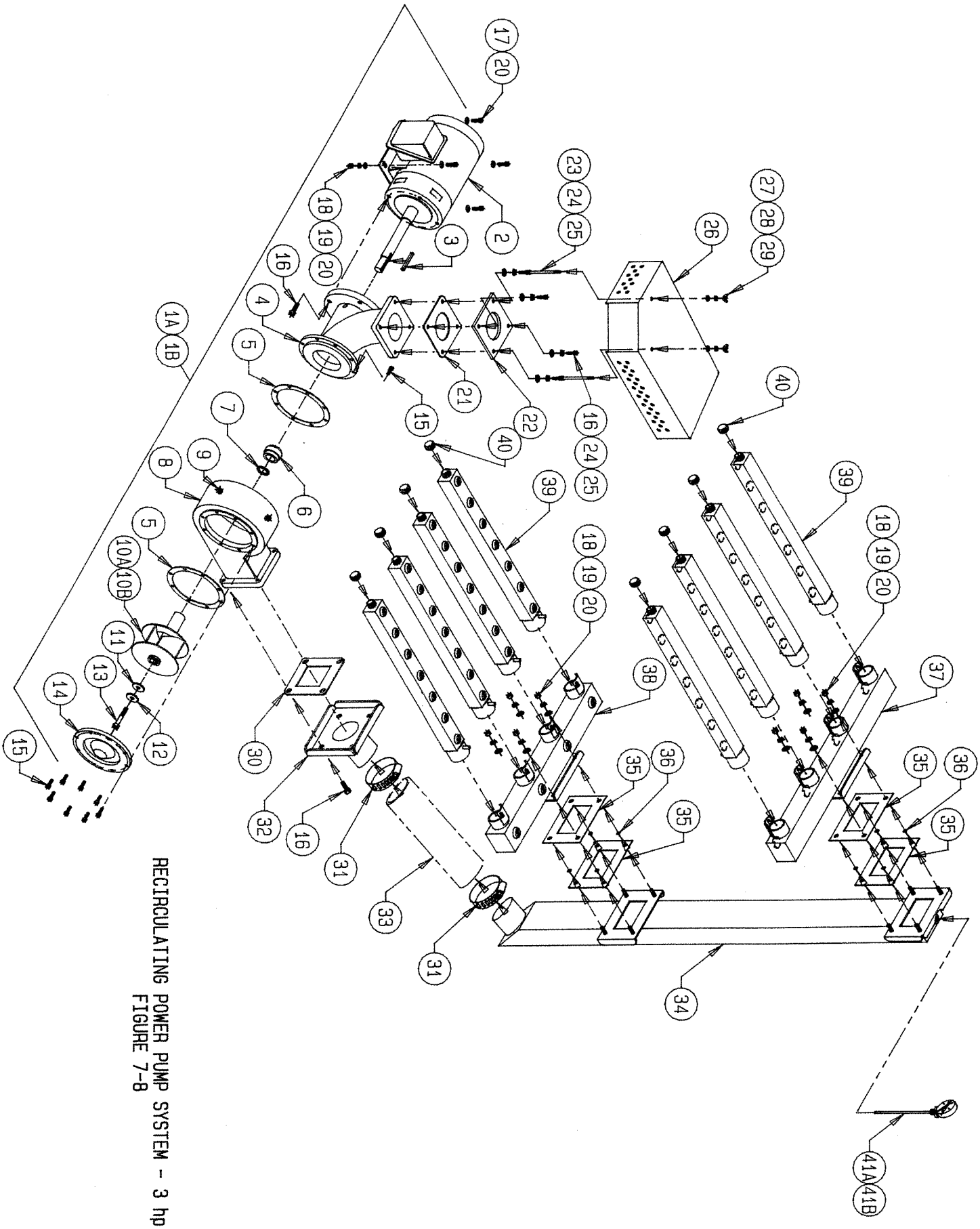
PREWASH TRANSFER PUMP SYSTEM
FIGURE 7-6

INDEX NO.	PART NUMBER	PARTS LIST-----PREWASH TRNSFER PUMP SYSTEM	QNTY PER ASSMLY
1	70-1000-528	CLAMP, HOSE, 1-1/16" TO 2", S/S	4
2	65-7112-080	HOSE, SUPER FLEX, 1-5/8" I.D. (SPECIFY LENGTH)	2
3	12-0982-100	NIPPLE, TRANSFER PUMP, 1" NPT X 1-5/8" O.D. TUBING	1
4	19-4301-900	NIPPLE, MODIFIED, 1-1/4" NPT X 2" LONG, B.I.	1
5	75-6205-001	PLUG, SQUARE HEAD, 1/8" NPT, GALVANIZED	2
6	19-4302-000	VOLUTE, PRICE PUMP CD100, MODIFIED	1
7	55-6301-910	*BOLT, IMPELLER LOCK *NOTE: AVAILABLE AS	1
8	55-6301-910	*WASHER, IMPELLER A COMPLETE	1
9	55-6301-910	*SHAFT, PRICE PUMP CD100 SHAFT KIT ONLY	1
10	55-6301-910	*KEY, IMPELLER, PRICE PUMP CD100	1
11	55-6301-910	*SCREW, SHAFT SET, PRICE PUMP CD100	2
12	42-0505-800	IMPELLER, PRICE PUMP CD100, 3/4 hp, 3 3/4" DIA., MODIFIED	1
13	55-6301-605	GASKET, PRICE PUMP CD100, FIBER	1
14	55-6301-305	SEAL, PRICE PUMP CD100, #447	1
15	10-1105-420	BOLT, HEX, PUMP HOUSING, 1/4-20 X 5/8" LONG	4
16	55-6302-001	HOUSING, SHAFT, SEAL, AND GASKET FOR PRICE PUMP CD100	1
17	10-1110-316	BOLT, HEX, PUMP MOUNTING, 3/8-16 X 1-1/4" LONG	4
18	N.P.N.	WASHER, SLINGER, PRICE PUMP CD100	1
19A	55-5010-015	MOTOR WITH KEY, 3/4 hp, (SPECIFY VOLTAGE), 60Hz, 3PH	1
19B	55-5012-014	MOTOR WITH KEY, 3/4 hp, (SPECIFY VOLTAGE), 50Hz, 3PH	1
20	55-6300-018	KIT, PRICE PUMP CD100, MODIFIED-WITHOUT IMPLELLER (INDEX#12)	1
--	55-6300-016	COMPLETE MOTOR/PUMP ASSEMBLY, 3PH, 3/4 hp, 3-3/4" DIA., MODIFIED IMPELLER (SPECIFY VOLTAGE AND Hz)	AS REQ'D



PRE-FINAL RINSE PUMP SYSTEM
FIGURE 7-7

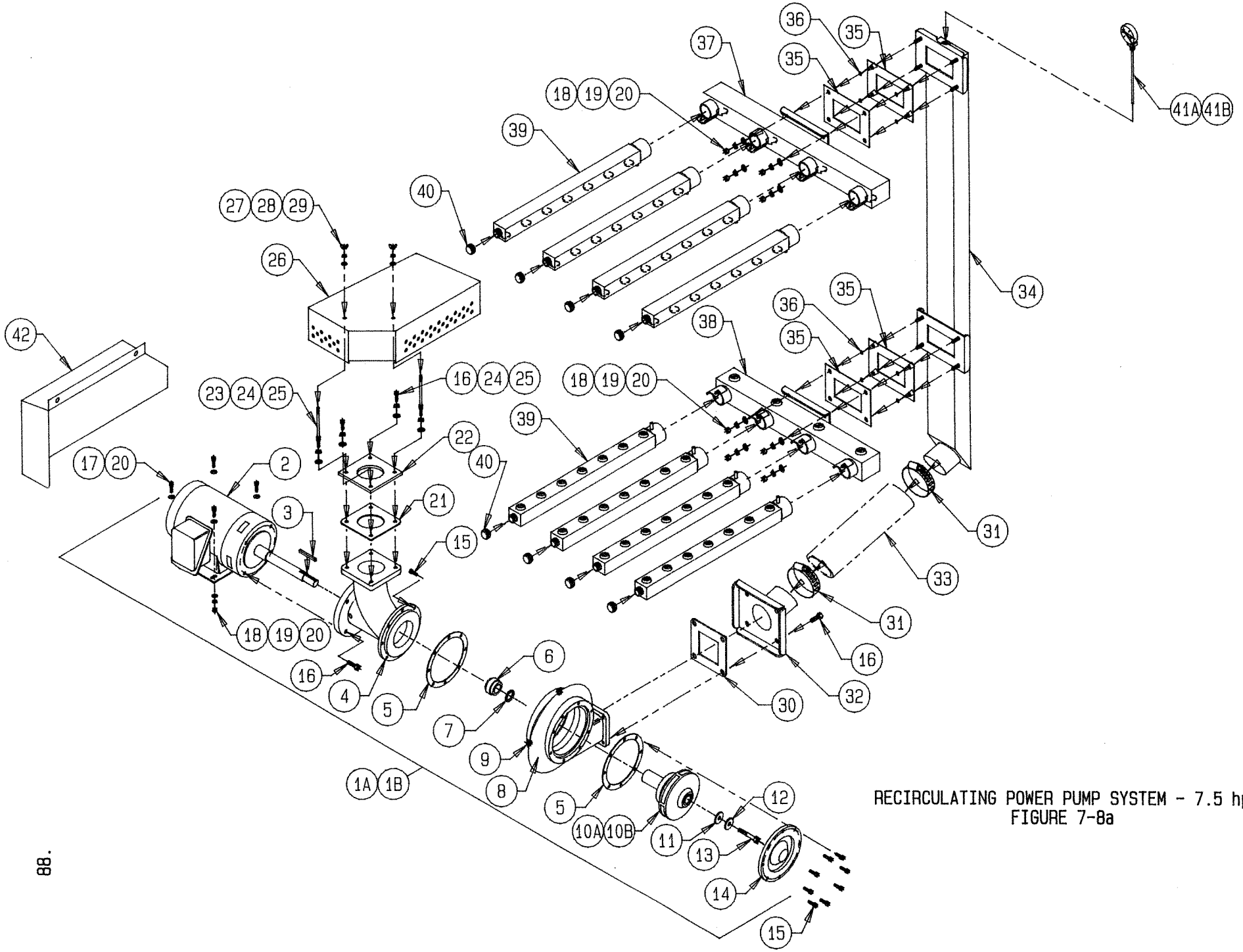
INDEX NO.	PART NUMBER	PARTS LIST-----PRE-FINAL RINSE PUMP SYSTEM	QNTY PER ASSMLY
1	75-0830-606	CAP, 3/4" NPT, PLATED	2
2	75-5400-700	NOZZLE, VEE JET, 1/8" NPT X 65/30	6
3	22-0652-200	SPRAY PIPE ARM, PRERINSE, 3/4" NPT X 3 NOZZLES	2
4	75-1141-007	COUPLING, REDUCING, 3/4" F X 1/2" F	2
5	19-1500-200	WASHER, FLAT, 7/8" I.D., S/S	4
6	19-4200-500	GASKET, RINSE ARM, 7/8" I.D.	4
7	60-5502-104	NUT, LOCK, 1/2" NPT, S/S	2
8	22-0655-400	PIPE, PRERINSE RISER, 1" O.D., S/S	1
9	70-1000-527	CLAMP, HOSE, 11/16" TO 1-1/2, S/S	2
10	65-7112-070	HOSE, GAS, 1" I.D. (SPECIFY LENGTH)	1
11	75-5100-200	NIPPLE, 3/4" NPT X 2" LONG, B.I.	1
12	75-1700-006	ELBOW, 3/4" F X M X 90° STREET, B.I.	1
13	75-0750-135	BUSHING, 1" M X 3/4" F, B.I.	1
14	75-1705-009	ELBOW, 1-1/4" M X F X 90° STREET, GALVANIZED	1
15	19-4301-900	NIPPLE, MODIFIED, 1-1/4" NPT X 2" LONG, B.I.	1
16	70-1000-528	CLAMP, HOSE, 1-1/16" TO 2", S/S	2
17	65-7112-080	HOSE, SUPER FLEX, 1-5/8" I.D. (SPECIFY LENGTH)	2
18	75-6205-001	PLUG, SQUARE HEAD, 1/8" NPT, GALVANIZED	2
19	55-6302-002	VOLUTE, PRICE PUMP CD100	1
20	55-6301-910	*BOLT, IMPELLER LOCK *NOTE: AVAILABLE AS	1
21	55-6301-910	*WASHER, IMPELLER A COMPLETE	1
22	55-6301-910	*SHAFT, PRICE PUMP CD100 SHAFT KIT ONLY	1
23	55-6301-910	*KEY, IMPELLER, PRICE PUMP CD100	1
24	55-6301-910	*SCREW, SHAFT SET, PRICE PUMP CD100	2
25A	55-6301-120	IMPELLER, PRICE PUMP CD100, 60Hz, 3/4 hp, 3 3/4" DIA.	1
25B	55-6301-124	IMPELLER, PRICE PUMP CD100, 50Hz, 3/4 hp, 4-3/16" DIA.	1
26	55-6301-605	GASKET, PRICE PUMP CD100, FIBER	1
27	55-6301-305	SEAL, PRICE PUMP CD100, #447	1
28	10-1105-420	BOLT, HEX, PUMP HOUSING, 1/4-20 X 5/8" LONG	4
29	55-6302-001	HOUSING, SHAFT, SEAL, AND GASKET FOR PRICE PUMP CD100	1
30	10-1110-316	BOLT, HEX, PUMP MOUNTING, 3/8-16 X 1-1/4" LONG	4
31	N.P.N.	WASHER, SLINGER, PRICE PUMP CD100	1
32A	55-5012-010	MOTOR WITH KEY, 3/4 hp, (SPECIFY VOLTAGE), 60Hz, 3PH	1
32B	55-5012-014	MOTOR WITH KEY, 3/4 hp, (SPECIFY VOLTAGE), 50Hz, 3PH	1
33	55-6301-085	KIT, PRICE PUMP CD100-WITHOUT IMPLELLER (INDEX#25)	1
--	55-6300-016	COMPLETE MOTOR/PUMP ASSEMBLY, 3PH, 3/4 hp, IMPELLER (SPECIFY VOLTAGE AND Hz)	AS REQ'D



RECIRCULATING POWER PUMP SYSTEM - 3 hp
FIGURE 7-8

INDEX NO.	PART NUMBER	PARTS LIST-----RECIRCULATING POWER PUMP SYSTEM - 3 hp	QNTY PER ASSMLY
1A	42-0506-700	PUMP, WASH, ASSY, 3 hp, COUNTERCLOCKWISE, TEFC (SHOWN) *	1
1B	42-0506-600	PUMP, WASH, ASSY, 3 hp, CLOCKWISE, TEFC (NOT SHOWN) *	1
2	55-5016-037	MOTOR, WASH PUMP, 3 hp, (208/230/460V), 3PH, TEFC *	1
3	19-2100-208	KEY, 3/16" X 3/16" X 2-1/2" LONG, S/S	1
4	31-0500-200	HOUSING, PUMP INTAKE, 3 hp	1
5	19-4204-100	GASKET, PUMP INTAKE	2
6	75-7050-020	SEAL, WASH PUMP, 1" DIA. (COMES WITH "O" RING-INDEX#7)	1
7	75-7020-520	RING, "O", PUMP SEAL	1
	17-1301-400	TOOL, PUMP SEAL INSTALLER (NOT SHOWN)	AS REQ'D
8	31-0500-100	HOUSING, PUMP DISCHARGE, 3 hp	1
9	75-6200-002	PLUG, DRAIN, 1/4" NPT	3
10A	42-0506-500	IMPELLER, WASH PUMP, 3 hp, CCW WITH CURVED VANES (SHOWN)	1
10B	42-0506-400	IMPELLER, WASH PUMP, 3 hp, CW WITH CURVED VANES (NOT SHOWN)	1
11	19-4201-100	GASKET, IMPELLER, 1-3/8" OD X 3/8" ID	1
12	19-1500-300	WASHER, IMPELLER SCREW, 1-3/8" OD X 3/8" ID	1
13	10-5116-316	SCREW, HEX HEAD, 3/8-16 X 2" LONG WITH NYLOK, S/S	1
14	21-0501-000	COVER, PUMP CASTING	1
15	10-1107-420	SCREW, HEX HEAD, 1/4-20 X 7/8" LONG, STEEL	16
16	10-1108-316	SCREW, HEX HEAD, 3/8-16 X 1" LONG, S/S	10
17	10-1110-518	SCREW, HEX HEAD, 5/16-18 X 1-1/4" LONG, S/S	4
18	10-1900-518	NUT, HEX HEAD, 5/16-18, S/S	12
19	10-1801-518	WASHER, LOCK, 5/16", S/S	12
20	10-1800-518	WASHER, FLAT, 5/16", S/S	16
21	19-4200-100	GASKET, PUMP INTAKE TO CABINET, 4" X 4" X 3/16", RED RUBBER	1
22	11-0612-200	FLANGE, PUMP INTAKE STIFFENER, S/S	1
23	11-0621-300	BOLT, MODIFIED, PUMP INTAKE SCREEN	2
24	10-1801-316	WASHER, LOCK, 3/8", S/S	4
25	10-1800-316	WASHER, FLAT, 3/8", S/S	4
26	42-0655-900	SCREEN, PUMP INTAKE	1
27	10-1905-420	NUT, WING, 1/4-20, S/S	2
28	10-1801-420	WASHER, LOCK, 1/4", S/S	2
29	10-1800-420	WASHER, FLAT, 1/4", S/S	2
30	19-4200-900	GASKET, PUMP DISCHARGE TO RISER, 3-1/2" SQUARE, RED RUBBER	1
31	70-1000-533	CLAMP, #44, 2-1/2", S/S	2
32	42-1608-502	ADAPTER, PUMP DISCHARGE TO RISER, S/S (PART OF KIT-INDEX#34)	1
33	42-0660-412	HOSE, WONDERFLEX, 2-1/2" IDx15-1/2" LG (PART OF KIT-INDEX#34)	1
34	42-0660-400	RISER PIPE ASSEMBLY, S/S (INCLUDES INDEX#32 AND #33)	1
35	19-4200-700	GASKET, RISER TO CABINET, 4" X 5", RED RUBBER	4
36	75-7050-529	RING, "O", 1/4" ID X 1/16" THICK	8
37	42-0654-300	MANIFOLD, UPPER WASH ARMS, S/S	1
38	42-0657-600	MANIFOLD, LOWER WASH ARMS, S/S	1
39	42-0655-700	WASH ARMS, HIGH PRESSURE, S/S	8
40	75-0830-606	CAP, WASH ARM, 3/4" NPT, PLATED	8
41A	70-2475-007	THERMOMETER, 3" DIAMETER, 20-240 DEGREES	1
41B	70-2475-010	THERMOMETER, 5" DIAMETER (LARGE), 20-240 DEGREES	1

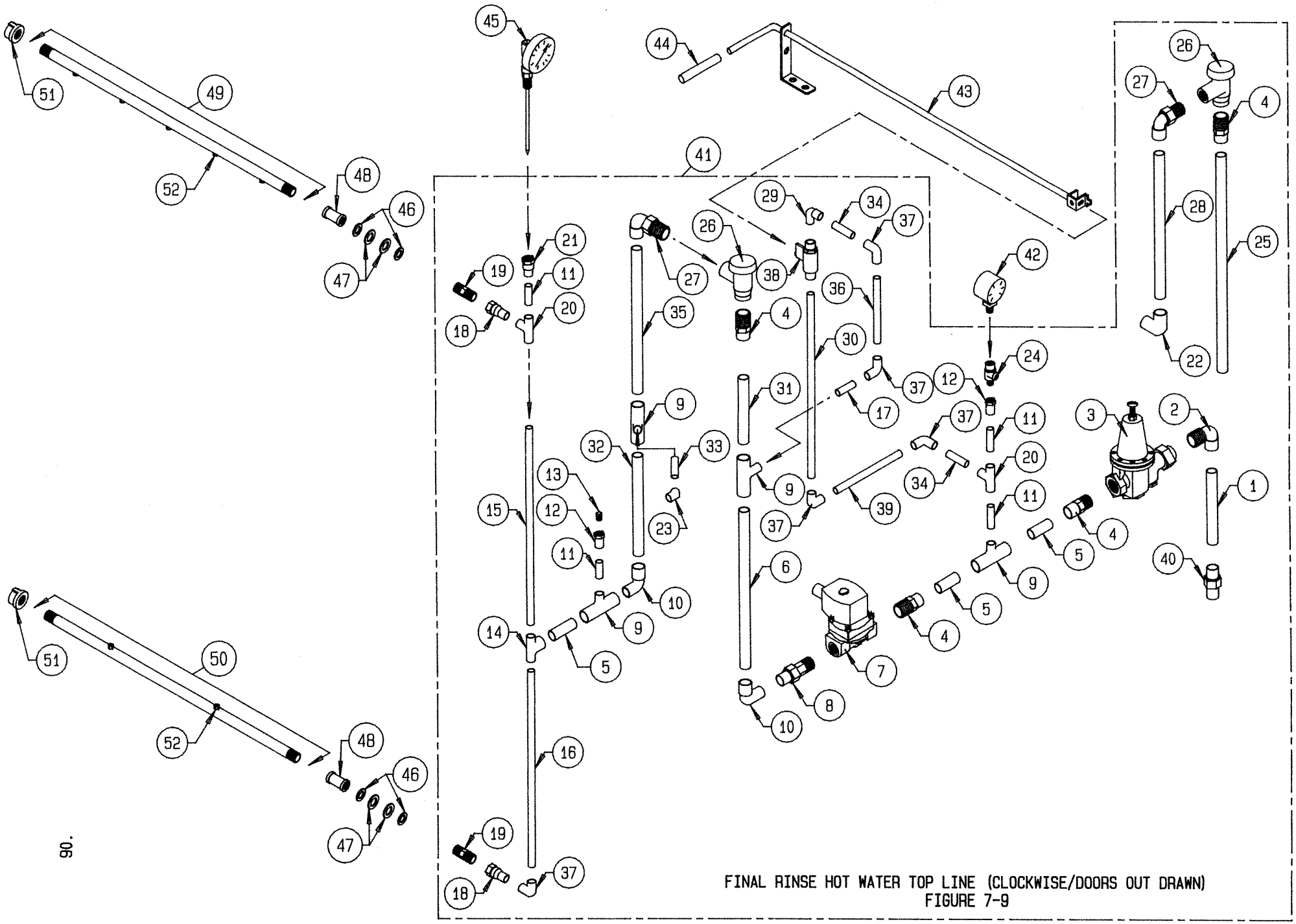
* CUSTOMER TO VERIFY VOLTAGE AND HERTZ



RECIRCULATING POWER PUMP SYSTEM - 7.5 hp
FIGURE 7-8a

INDEX NO.	PART NUMBER	PARTS LIST-----RECIRCULATING POWER PUMP SYSTEM - 7.5 hp	QNTY PER ASSMLY
1A	32-0505-303	PUMP, WASH, ASSY, 7.5 hp, COUNTERCLOCKWISE, ODP (SHOWN) *	1
1B	32-0505-302	PUMP, WASH, ASSY, 7.5 hp, CLOCKWISE, ODP (NOT SHOWN) *	1
2	55-5016-075	MOTOR, WASH PUMP, 7.5 hp, (208/230/460V), 3PH, ODP *	1
3	19-2100-208	KEY, 3/16" X 3/16" X 2-1/2" LONG, S/S	1
4	42-2307-301	HOUSING, PUMP INTAKE, 7.5 hp	1
5	19-4204-100	GASKET, PUMP INTAKE	2
6	75-7050-020	SEAL, WASH PUMP, 1" DIA. (COMES WITH "O" RING-INDEX#7)	1
7	75-7020-520	RING, "O", PUMP SEAL	1
	17-1301-400	TOOL, PUMP SEAL INSTALLER (NOT SHOWN)	AS REQ'D
8	42-2307-401	HOUSING, PUMP DISCHARGE, 7.5 hp	1
9	75-6200-002	PLUG, DRAIN, 1/4" NPT	3
10A	42-2308-200	IMPELLER, WASH PUMP, 7.5 hp, CCW WITH CURVED VANES (SHOWN)	1
10B	42-2308-300	IMPELLER, WASH PUMP, 7.5 hp, CW WITH CURVED VANES (NOT SHOWN)	1
11	19-4201-100	GASKET, IMPELLER, 1-3/8" OD X 3/8" ID	1
12	19-1500-300	WASHER, IMPELLER SCREW, 1-3/8" OD X 3/8" ID	1
13	10-5116-316	SCREW, HEX HEAD, 3/8-16 X 2" LONG WITH NYLOK, S/S	1
14	21-0501-000	COVER, PUMP CASTING	1
15	10-1107-420	SCREW, HEX HEAD, 1/4-20 X 7/8" LONG, STEEL	16
16	10-1108-316	SCREW, HEX HEAD, 3/8-16 X 1" LONG, S/S	10
17	10-1110-518	SCREW, HEX HEAD, 5/16-18 X 1-1/4" LONG, S/S	4
18	10-1900-518	NUT, HEX HEAD, 5/16-18, S/S	12
19	10-1801-518	WASHER, LOCK, 5/16", S/S	12
20	10-1800-518	WASHER, FLAT, 5/16", S/S	16
21	19-4200-100	GASKET, PUMP INTAKE TO CABINET, 4" X 4" X 3/16", RED RUBBER	1
22	11-0612-200	FLANGE, PUMP INTAKE STIFFENER, S/S	1
23	11-0621-300	BOLT, MODIFIED, PUMP INTAKE SCREEN	2
24	10-1801-316	WASHER, LOCK, 3/8", S/S	4
25	10-1800-316	WASHER, FLAT, 3/8", S/S	4
26	42-0655-900	SCREEN, PUMP INTAKE	1
27	10-1905-420	NUT, WING, 1/4-20, S/S	2
28	10-1801-420	WASHER, LOCK, 1/4", S/S	2
29	10-1800-420	WASHER, FLAT, 1/4", S/S	2
30	19-4200-900	GASKET, PUMP DISCHARGE TO RISER, 3-1/2" SQUARE, RED RUBBER	1
31	70-1000-533	CLAMP, #44, 2-1/2", S/S	2
32	42-1608-502	ADAPTER, PUMP DISCHARGE TO RISER, S/S (PART OF KIT-INDEX#34)	1
33	42-0660-412	HOSE, WONDERFLEX, 2-1/2" IDx15-1/2" LG (PART OF KIT-INDEX#34)	1
34	42-0660-400	RISER PIPE ASSEMBLY, S/S (INCLUDES INDEX#32 AND #33)	1
35	19-4200-700	GASKET, RISER TO CABINET, 4" X 5", RED RUBBER	4
36	75-7050-529	RING, "O", 1/4" ID X 1/16" THICK	8
37	42-0654-300	MANIFOLD, UPPER WASH ARMS, S/S	1
38	42-0657-600	MANIFOLD, LOWER WASH ARMS, S/S	1
39	42-0655-700	WASH ARMS, HIGH PRESSURE, S/S	8
40	75-0830-606	CAP, WASH ARM, 3/4" NPT, PLATED	8
41A	70-2475-007	THERMOMETER, 3" DIAMETER, 20-240 DEGREES	1
41B	70-2475-010	THERMOMETER, 5" DIAMETER (LARGE), 20-240 DEGREES	1
42	42-0445-900	COVER, 7.5 hp ODP MOTOR	1

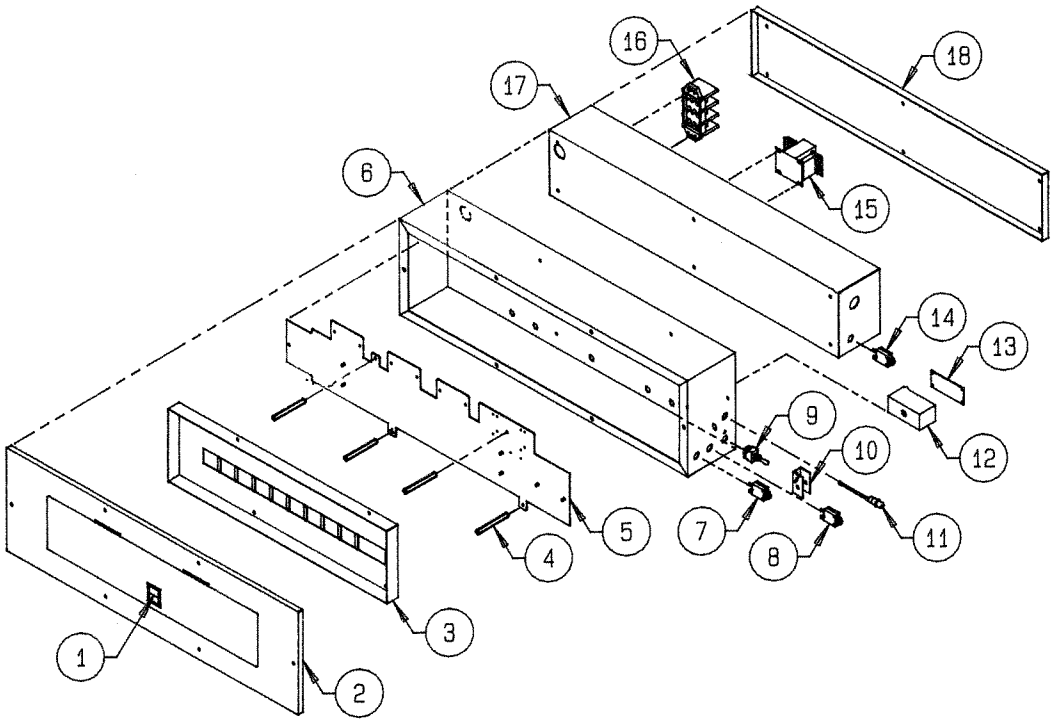
* CUSTOMER TO VERIFY VOLTAGE AND HERTZ



FINAL RINSE HOT WATER TOP LINE (CLOCKWISE/DOORS OUT DRAWN)
FIGURE 7-9

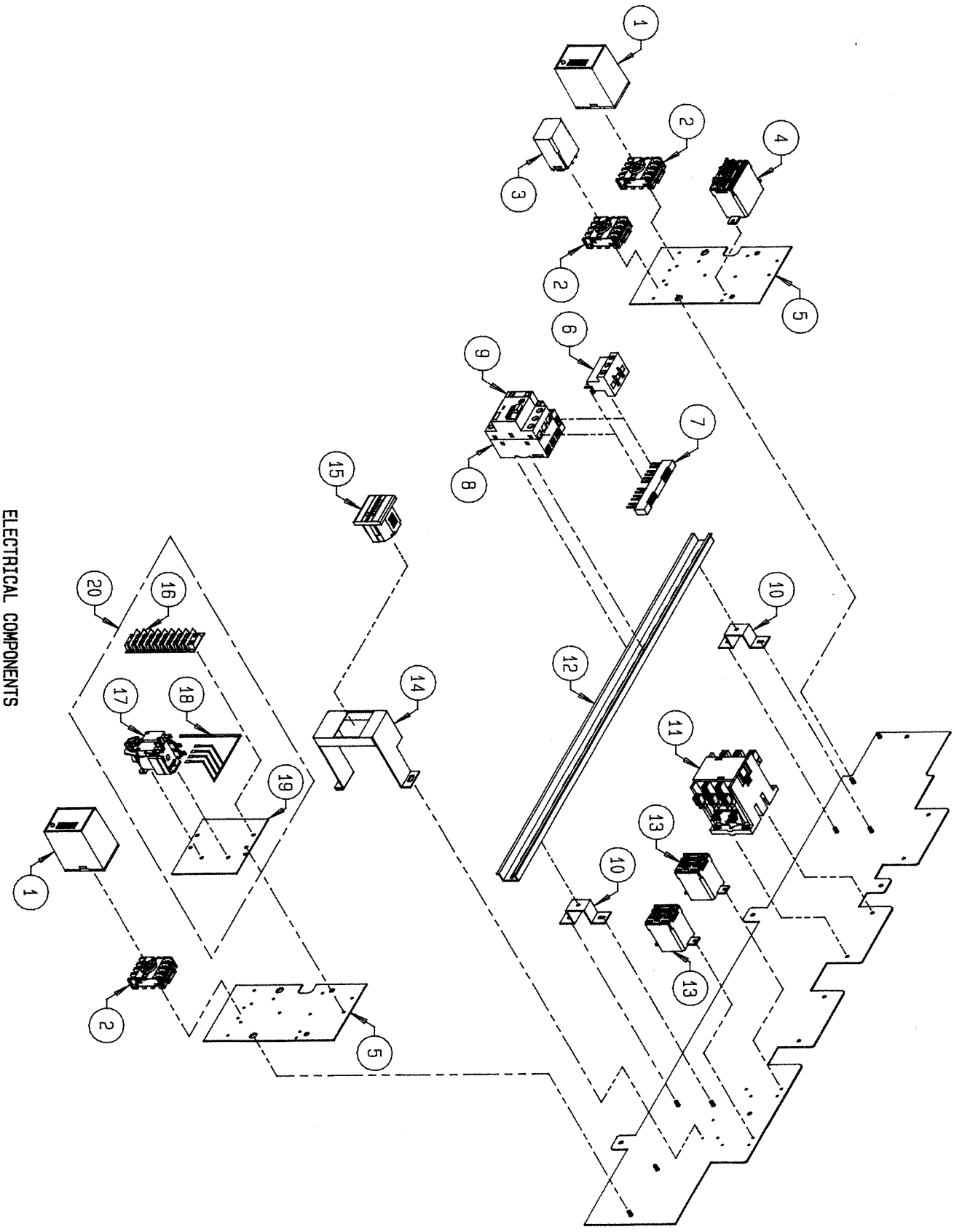
INDEX NO.	PART NUMBER	PARTS LIST-----FINAL RINSE HOT WATER TOP LINE (PAGE 1 of 2)	QNTY PER ASSMLY
1	65-4922-006	TUBING, 3/4" X 5" LONG, COPPER	1
2	75-1601-061	ELBOW, 3/4" C X M, 90°, WROT	1
3	75-6876-140	VALVE, REDUCING, WATER, 3/4"NPT, BRONZ	1
4	75-0026-041	ADAPTER, 3/4" C X M, WROT	4
5	65-4922-006	TUBING, 3/4" X 1-3/4" LONG, COPPER	3
6	65-4922-006	TUBING, 3/4" X 10-7/8" LONG, COPPER	1
7	55-7300-551	SOLENOID, ASCO #8220G5, 3/4" NPT, 24V	1
	55-7301-551	KIT, REPAIR, ASCO, #8220G SERIES, 3/4" NPT	AS REQ'D
	55-7301-560	COIL, ASCO, #8220G SERIES, 24V	AS REQ'D
8	75-8201-100	UNION, 3/4" C X M, BRASS	1
9	75-7602-150	TEE, 3/4" C X 3/4" C X 1/2" C, WROT	4
10	75-1702-006	ELBOW, STREET, 3/4" C, 90°, WROT	2
11	65-4922-004	TUBING, 1/2" X 1-1/2" LONG, COPPER	4
12	75-0026-011	ADAPTER, 1/2" C X 1/4" F, WROT	2
13	75-6201-002	PLUG, SQUARE HEAD, 1/4" NPT, BRASS	1
14	75-7602-080	TEE, 1/2" C X 1/2" C X 3/4" C	1
15	65-4922-004	TUBING, 1/2" X 13-5/8" LONG, COPPER	1
16	65-4922-004	TUBING, 1/2" X 14-1/2" LONG, COPPER	1
		TUBING, 1/2" X 15-1/4" LONG (W/DOGHOUSE FNL RNS), COPPER	AS REQ'D
17	65-4922-004	TUBING, 1/2" X 2" LONG, COPPER	1
18	75-0026-000	EXTENSION, 1/2" F X 1/2" C STREET	2
19	75-5151-004	NIPPLE, HEX, 1/2" NPT, BRASS	2
20	75-7602-070	TEE, 1/2" C X C X C, WROT	2
21	75-0026-015	ADAPTER, 1/2" C X F, BRASS	1
22	75-1602-062	ELBOW, 3/4" C X C - 90°, WROT	1
23	75-1632-042	ELBOW, 1/2" C X C - 45°, WROT	1
24	75-8520-020	VALVE, BALL, TEST COCK, WATTS #TC2, BRASS	1
25	65-4922-006	TUBING, 3/4" X 50" LONG, COPPER	1
		TUBING, 3/4" X 58" LONG (WITH ELECTRIC BOOSTER), COPPER	AS REQ'D
26	75-7550-210	BREAKER, SYPHON, WATTS, 3/4" NPT, BRASS	2
27	75-1741-061	UNION ELBOW, 3/4" C X M X 90°, BRASS	2
28	65-4922-006	TUBING, 3/4" X 10" LONG, COPPER	1
29	75-1702-004	ELBOW, STREET, 1/2" C X 90°, WROT	1
30	65-4922-004	TUBING, 1/2" X 13-1/4" LONG, COPPER	1
31	65-4922-006	TUBING, 3/4" X 4" LONG, COPPER	1
32	65-4922-006	TUBING, 3/4" X 6-7/8" LONG, COPPER	1
33	65-4922-004	TUBING, 1/2" X 2-3/8" LONG, COPPER	1
34	65-4922-004	TUBING, 1/2" X 2-5/8" LONG, COPPER	2
35	65-4922-006	TUBING, 3/4" X 10" LONG, COPPER	1
36	65-4922-004	TUBING, 1/2" X 6" LONG, COPPER	1
37	75-1602-042	ELBOW, 1/2" C X C - 90°, WROT	5
38	75-8515-001	VALVE, BALL, WATTS, 1/2" C X C, BRASS	1
39	65-4922-004	TUBING, 1/2" X 4-7/8" LONG, COPPER	1
40	75-8202-006	UNION, 3/4" C X C, BRONZ	1
41	42-0658-500	COMPLETE HOT WATER TOP LINE ASSEMBLY (LESS SPRAY PIPES)	-
42	70-2470-615	GAUGE, PRESSURE, 2" STEEL CASE, 0-60 psi	1
43	42-0659-702	VALVE HANDLE (24" LONG) KIT WITH BRACKET	1
44	31-0620-402	COVER, FILL VALVE HANDLE, PLASTISOL	1

INDEX NO.	PART NUMBER	PARTS LIST-----FINAL RINSE HOT WATER TOP LINE (PAGE 2 of 2)	QNTY PER ASSMLY
45	70-2475-007	THERMOMETER, FINAL RINSE (STD 3" DIAL), 20-240 °F	1
	70-2475-010	THERMOMETER, FINAL RINSE (LARGE 5" DIAL), 20-240 °F	AS REQ'D
46	19-1500-200	WASHER, FLAT, 7/8" I.D., S/S	4
47	19-4200-500	GASKET, RINSE ARM, 7/8" I.D.	4
48	75-1101-004	COUPLING, 1/2" F X F, BRASS	2
49	22-0640-501	SPRAY PIPE ARM, UPPER, 1/2" NPT X 5 NOZZLES (SHOWN)	1
	22-0640-300	SPRAY PIPE ARM, UPPER, 1/2" NPT X 6 NOZZLES (CA-1)	AS REQ'D
	42-0664-300	SPRAY PIPE ARM, UPPER, 1/2" NPT X 4 NOZZLES (FOR 3 GPM F.R.)	AS REQ'D
50	22-0640-502	SPRAY PIPE ARM, LOWER, 1/2" NPT X 2 NOZZLES (SHOWN)	1
	22-0640-300	SPRAY PIPE ARM, LOWER, 1/2" NPT X 6 NOZZLES (CA-1)	AS REQ'D
	42-0664-300	SPRAY PIPE ARM, LOWER, 1/2" NPT X 4 NOZZLES (FOR 3 GPM F.R.)	AS REQ'D
51	75-0830-604	CAP, 1/2" NPT, PLATED	2
52	75-5400-701	NOZZLE, VEE JET, 1/8" NPT X 10/80 (SHOWN)	AS REQ'D
	N.P.N.	NOZZLE, K-2 FLOODJET, 1/8" NPT (FOR 3 GPM F.R.)	AS REQ'D



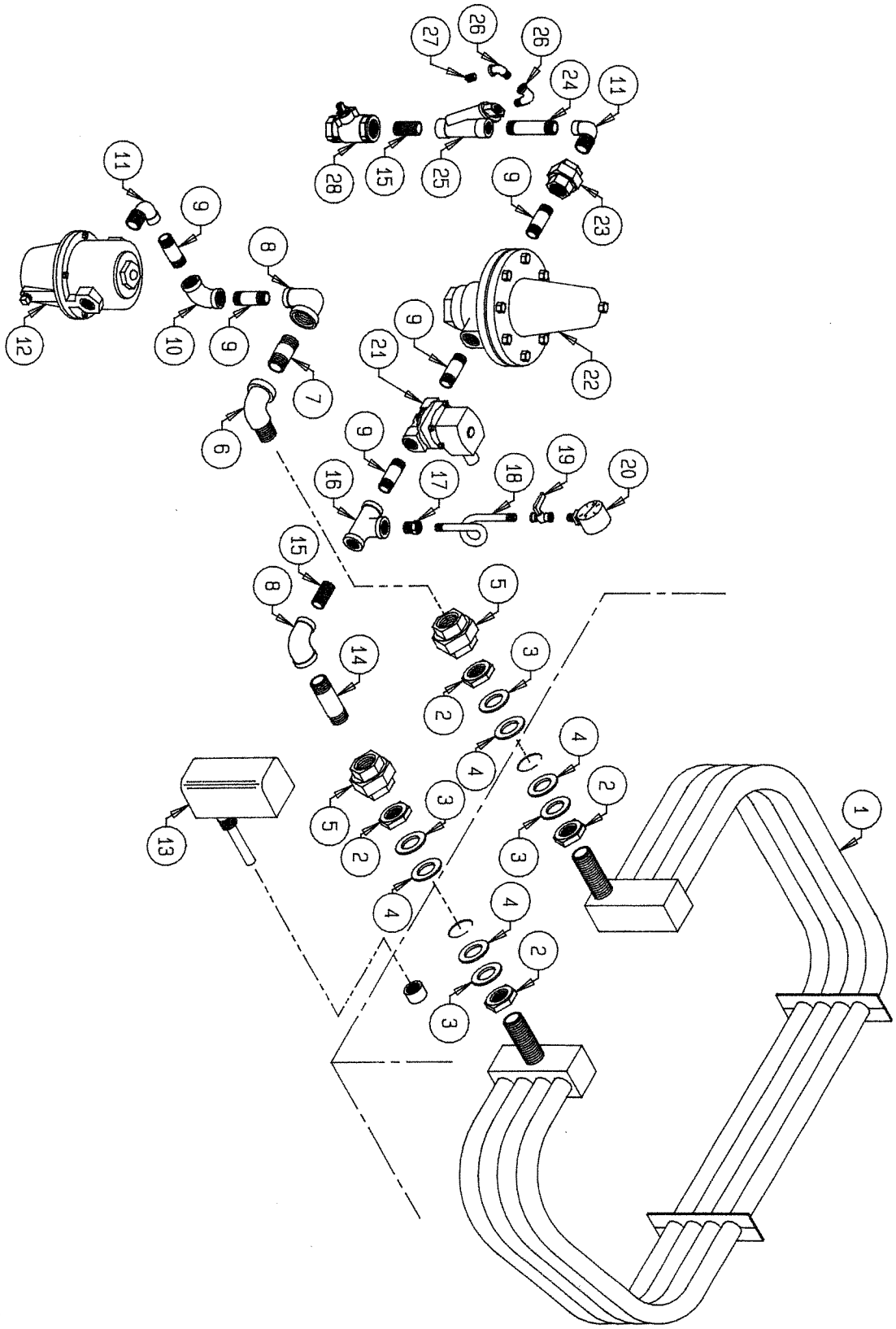
ELECTRICAL CONTROL CABINET
FIGURE 7-10

INDEX NO.	PART NUMBER	PARTS LIST-----ELECTRICAL CONTROL CABINET	QNTY PER ASSMLY
1	70-4450-022	LATCH, ELECTRICAL PANEL, BRUSHED CHROME	1
2	98-0005-009	COVER, ELECTRICAL PANEL, FRONT (PART OF ELEC. CABINET KIT)	1
3	98-0005-009	MOLDING PANEL, MOTOR STARTERS (PART OF ELEC. CABINET KIT)	1
4	14-0527-000	SUPPORT, MOLDING PANEL, TYPE 4, 3-3/4"	4
5	98-0005-009	MOUNTING PLATE, MOTOR STARTERS (PART OF ELEC. CABINET KIT)	1
6	98-0005-009	CABINET, ELECTRICAL CONTROL (PART OF ELEC. CABINET KIT)	1
7	55-0970-002	BREAKER, CONTROL CIRCUIT, 24V, 5 AMPS	1
8	55-0970-005	BREAKER, CONTROL CIRCUIT, 24V, 10 AMPS	1
9	55-7400-304	SWITCH, TOGGLE, DPDT, GRAINGER #2X469	1
10	14-0502-500	GUARD, TOGGLE SWITCH, ELECTRICAL PANEL	1
11	55-2860-802	LIGHT, PILOT, RED, 28V	1
12	55-0600-046	BOX, ELECTRIC, 2" X 4", RACO #270L	1
13	55-1100-006	COVER, ELECTRIC BOX, 2" X 4"	1
14	55-0970-004	BREAKER, CONTROL CIRCUIT, 24V, 25 AMPS	1
15	55-7950-402	TRANSFORMER, DELTA #T8480, PRI: 190V-480V, SEC: 24V, 750VA	1
16	55-7726-106	TERMINAL BLOCK, MARATHON #1403401, 175 AMPS/POLE	1
	55-7726-108	TERMINAL BLOCK, MARATHON #1433553, 335 AMPS/POLE	AS REQ'D
17	98-0005-009	HOUSING, TERM. BLCK/TRANSFORMER (PART OF ELEC. CABINET KIT)	1
18	98-0005-009	COVER, TERM. BLCK/TRNSFRMR HSNG (PART OF ELEC. CABINET KIT)	1



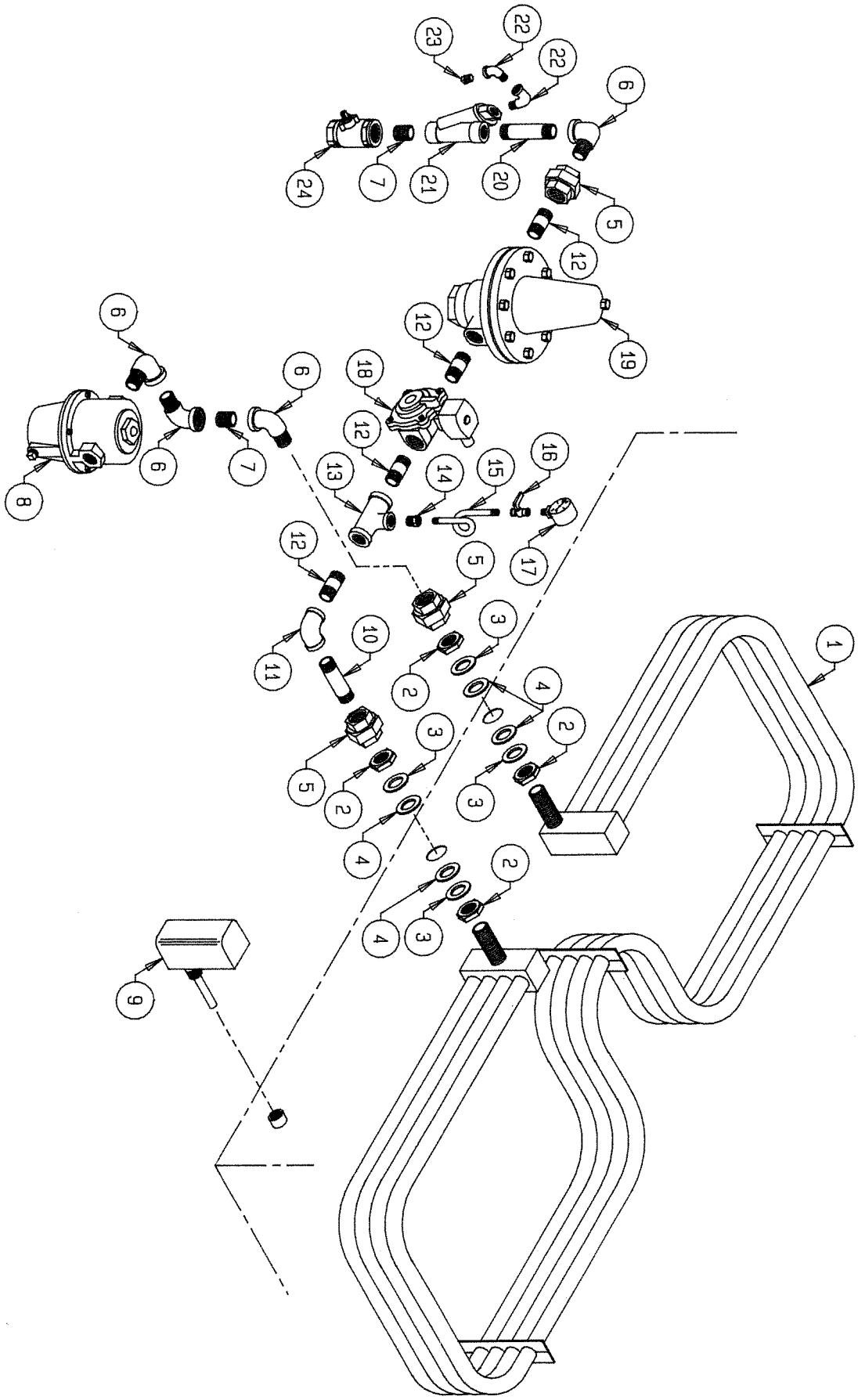
ELECTRICAL COMPONENTS
FIGURE 7-10a

INDEX NO.	PART NUMBER	PARTS LIST-----ELECTRICAL COMPONENTS	QNTY PER ASSMLY
1	55-7900-156	TIMER RELAY, PLUG IN. 24V (1 FOR TRANSFER PUMP OPTION)	2
2	55-7000-006	SOCKET, 8 PINS, PLUG IN (2 FOR TRANSFER PUMP OPTION)	3
3	55-6850-602	CONTROL RELAY, PLUG IN, 24V (FOR TRANSFER PUMP OPTION)	1
4	55-6850-520	RELAY, 3 POLES, 30 AMP, 24V (FOR TRANSFER PUMP OPTION)	1
5	NPN	PLATE, MOUNTING (PART OF ELEC. CABINET KIT #98-0005-009)	2
6	55-7382-520	FEEDER, TOP FEED, TERMINAL BLOCK, FOR GV2 MOTOR STARTERS	AS REQ'D
7	55-7382-530	BUSS BAR, FOR TWO(2) GV2 MOTOR STARTERS (AS SHOWN)	AS REQ'D
	55-7382-535	BUSS BAR, FOR THREE(3) GV2 MOTOR STARTERS (NOT SHOWN)	AS REQ'D
	55-7382-540	BUSS BAR, FOR FOUR(4) GV2 MOTOR STARTERS (NOT SHOWN)	AS REQ'D
	55-7382-545	BUSS BAR, FOR FIVE(5) GV2 MOTOR STARTERS (NOT SHOWN)	AS REQ'D
8	55-7381-799	STARTER, MOTOR PROTECTOR, #GV2M05 (0.6 - 1.0 A)	AS REQ'D
	55-7381-800	STARTER, MOTOR PROTECTOR, #GV2M06 (1.0 - 1.6 A)	AS REQ'D
	55-7381-801	STARTER, MOTOR PROTECTOR, #GV2M07 (1.6 - 2.5 A)	AS REQ'D
	55-7381-802	STARTER, MOTOR PROTECTOR, #GV2M08 (2.5 - 4.0 A)	AS REQ'D
	55-7381-803	STARTER, MOTOR PROTECTOR, #GV2M10 (4.0 - 6.3 A)	AS REQ'D
	55-7381-804	STARTER, MOTOR PROTECTOR, #GV2M14 (6.0 - 10.0 A)	AS REQ'D
	55-7381-805	STARTER, MOTOR PROTECTOR, #GV2M16 (9.0 - 14.0 A)	AS REQ'D
	55-7381-806	STARTER, MOTOR PROTECTOR, #GV2M20 (13.0 - 18.0 A)	AS REQ'D
	55-7381-807	STARTER, MOTOR PROTECTOR, #GV2M22 (20.0 - 25.0 A)	AS REQ'D
	55-7381-808	STARTER, MOTOR PROTECTOR, #GV2M32 (24.0 - 32.0 A)	AS REQ'D
	55-7382-510	KIT, TAMPER, FOR GV2 MOTOR STARTERS	AS REQ'D
9	55-7382-500	CONTACTS, AUXILIARY #GV2AN11, FOR GV2 MOTOR STARTERS	AS REQ'D
10	55-7382-400	STANDOFF, 1" FOR DIN RAIL	2
11	55-1050-323	CONTACTOR, 40 AMP, 24V	AS REQ'D
	55-1050-324	CONTACTOR, 40 AMP, 24V, WITH AUXILIARY CONTACTS	AS REQ'D
12	55-7382-440	DIN RAIL, 23-3/4" LONG (PRICE PER FOOT)	2 FT
13	55-6850-530	RELAY, 1 POLE, 30 AMP, 24V	2
14	25-0411-400	BRACKET, PANEL, ELAPSED HOUR METER	1
15	55-7901-101	METER, ELAPSED HOUR, 24V	1
16	55-7726-301	STRIP, TERMINAL, 8 STATIONS (SEE REF. ITEM #20)	AS REQ'D
17	55-6850-507	RELAY, RATCHET, 24V (SEE REF. ITEM #20)	AS REQ'D
18	17-0200-801	HARNESS, RATCHET RELAY ASSEMBLY (SEE REF. ITEM #20)	AS REQ'D
19	14-0600-200	BASE PLATE, RATCHET RELAY ASSEMBLY (SEE REF. ITEM #20)	AS REQ'D
20	25-0615-000	ASSEMBLY, RATCHET RELAY (INCLUDES ITEMS #16, 17, 18, AND 19)	1



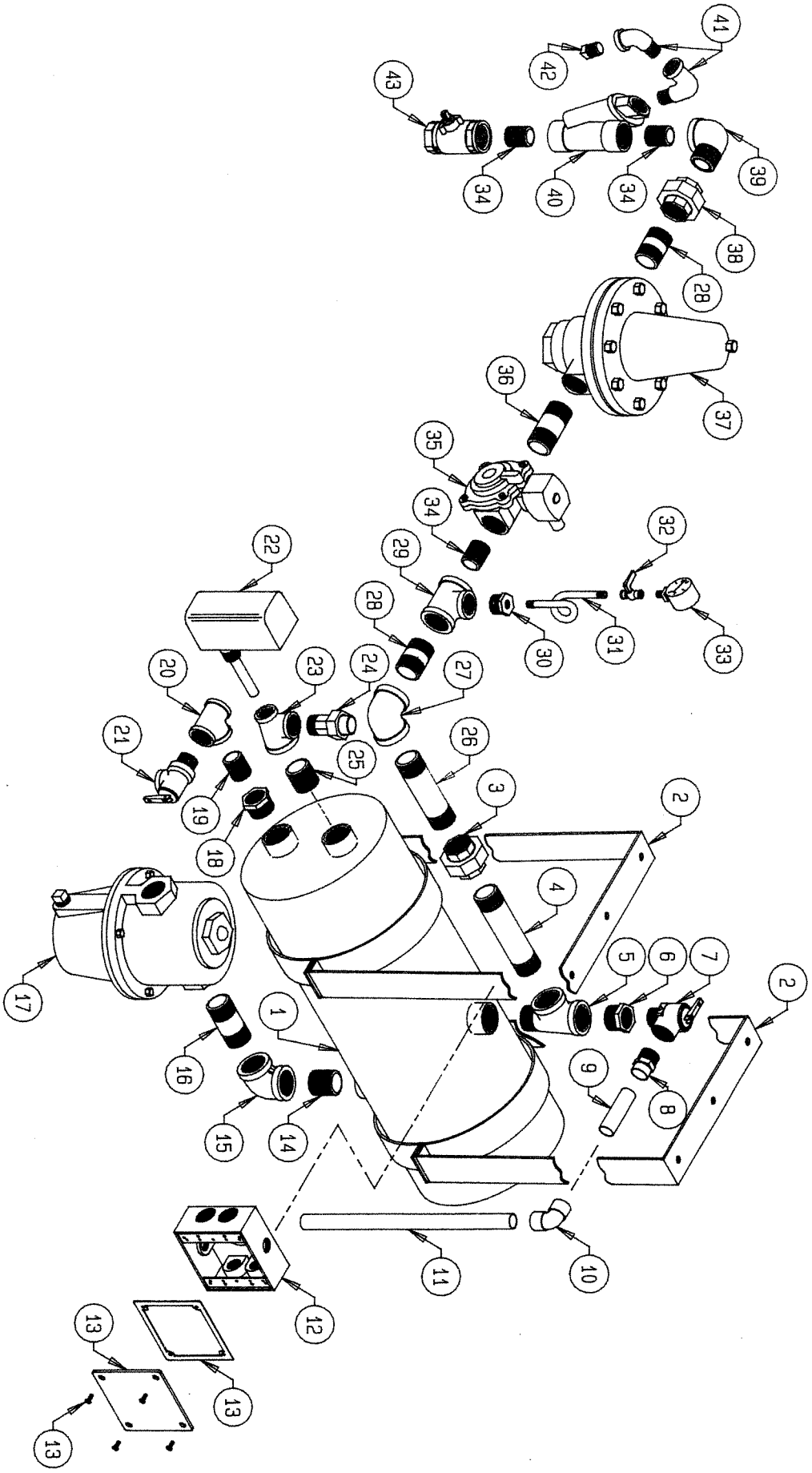
CLOSED STEAM TANK HEAT COMPONENTS - REGULAR CABINET
FIGURE 7-11

INDEX NO.	PART NUMBER	PARTS LIST-----CLOSED STEAM TANK HEAT COMPONENTS (REGULAR CABINET)	QNTY PER ASSMLY
1	32-0710-800	COIL, STEAM, 1" NIPPLES	1
2	60-5502-107	LOCKNUT, HEX, 1", S/S	4
3	19-1501-500	WASHER, 1-3/8" I.D. X 2-1/2" O.D., S/S	4
4	19-4201-038	GASKET, 1-3/8" I.D. X 2-1/2" O.D., FIBER	4
5	75-8200-007	UNION, 1" F X F, B.I.	2
6	75-1700-007	ELBOW, 1" F X M, 90°, B.I.	1
7	75-5100-265	NIPPLE, 1" X 2" LONG, B.I.	1
8	75-1690-080	ELBOW, 1" F X 3/4" F, 90°, B.I.	2
9	75-5100-200	NIPPLE, 3/4" X 2" LONG, B.I.	5
10	75-1600-006	ELBOW, 3/4" F X F, 90°, B.I.	1
11	75-1700-006	ELBOW, 3/4" F X M, 90°, B.I.	2
12	75-7800-011	TRAP, STEAM, 3/4" F X F	1
13	55-7750-050	THERMOSTAT, 4" LONG PROBE, WHITE ROGERS #11B18-101	1
14	75-5100-267	NIPPLE, 1" X 3" LONG, B.I.	1
15	75-5130-006	NIPPLE, 3/4" X CLOSE, B.I.	2
16	75-7600-006	TEE, 3/4" F X F X F, B.I.	1
17	75-0750-030	BUSHING, 3/4" M X 1/4" F, B.I.	1
18	75-7800-100	PIG TAIL, 1/4", SHORT	1
19	75-8520-010	VALVE, PETCOCK, 1/4" F X F, POLISHED BRASS	1
20	70-2470-615	GAUGE, PRESSURE, 1/4", 2" DIA. STEEL CASE, 0-60 psi	1
21	55-7300-551	SOLENOID, ASCO #8220G5, 3/4" NPT, 24V	1
	55-7301-551	KIT, REPAIR, ASCO, #8220G SERIES, 3/4" NPT	AS REQ'D
	55-7301-560	COIL, ASCO, #8220G SERIES, 24V	AS REQ'D
22	75-6875-040	REGULATOR, PRESSURE, STEAM, 3/4"	1
23	75-8200-006	UNION, 3/4" F X F, B.I.	1
24	75-5100-210	NIPPLE, 3/4" X 3" LONG, B.I.	1
25	75-7500-051	STRAINER, LINE, "Y', 3/4" F X F	1
26	75-1700-004	ELBOW, 1/2" F X M, 90°, B.I.	2
27	75-6200-004	PLUG, SQUARE HEAD, 1/2", B.I.	1
28	75-8522-025	VALVE, BALL, 3/4" F X F	1
--	42-0658-100	COMPLETE 3/4" STEAM PLUMBING MANIFOLD (LESS INDEX#1-4 & 13)	-



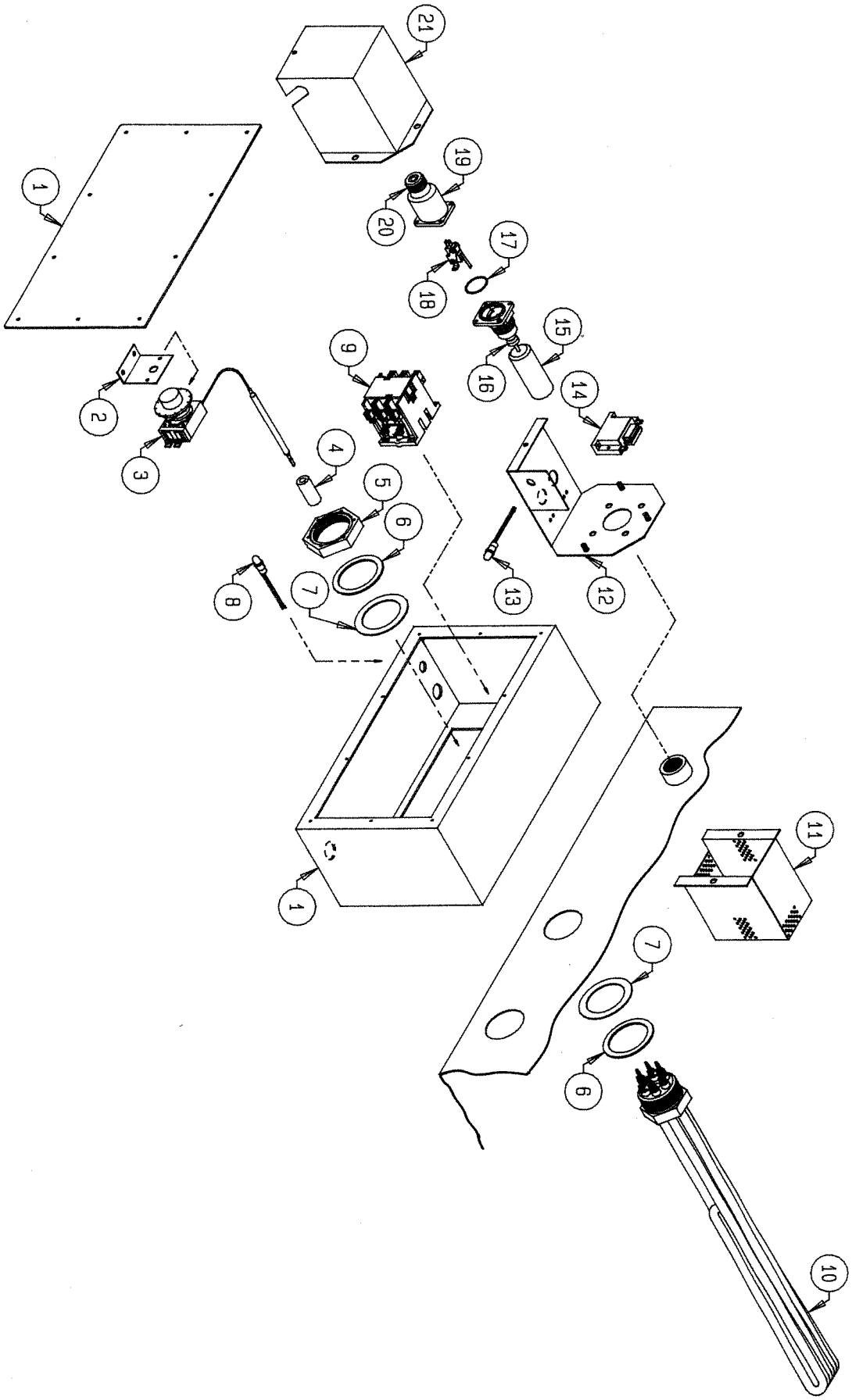
CLOSED STEAM TANK HEAT COMPONENTS - SUPER CABINET
FIGURE 7-12

INDEX NO.	PART NUMBER	PARTS LIST-----CLOSED STEAM TANK HEAT COMPONENTS (SUPER CABINET)	QNTY PER ASSMLY
1	42-0711-600	COIL, STEAM, SUPER CABINET, 1" NIPPLES	1
2	60-5502-107	LOCKNUT, HEX, 1", S/S	4
3	19-1501-500	WASHER, 1-3/8" I.D. X 2-1/2" O.D., S/S	4
4	19-4201-038	GASKET, 1-3/8" I.D. X 2-1/2" O.D., FIBER	4
5	75-8200-007	UNION, 1" F X F, B.I.	3
6	75-1700-007	ELBOW, 1" F X M, 90°, B.I.	4
7	75-5130-008	NIPPLE, 1" X CLOSE, B.I.	2
8	75-7800-012	TRAP, STEAM, 1" F X F	1
9	55-7750-050	THERMOSTAT, 4" LONG PROBE, WHITE ROGERS #11B18-101	1
10	75-5100-268	NIPPLE, 1" X 3-1/2" LONG, B.I.	1
11	75-1600-007	ELBOW, 1" F X F, 90°, B.I.	1
12	75-5100-265	NIPPLE, 1" X 2" LONG, B.I.	4
13	75-7600-032	TEE, 1" F X 1" F X 3/4" F, B.I.	1
14	75-0750-030	BUSHING, 3/4" M X 1/4" F, B.I.	1
15	75-7800-100	PIG TAIL, 1/4", SHORT	1
16	75-8520-010	VALVE, PETCOCK, 1/4" F X F, POLISHED BRASS	1
17	70-2470-615	GAUGE, PRESSURE, 1/4", 2" DIA. STEEL CASE, 0-60 psi	1
18	55-7300-552	SOLENOID, ASCO #8220G7, 1" NPT, 24V	1
	55-7301-552	KIT, REPAIR, ASCO, #8220G SERIES, 1" NPT	AS REQ'D
	55-7301-560	COIL, ASCO, #8220G SERIES, 24V	AS REQ'D
19	75-6875-070	REGULATOR, PRESSURE, STEAM, 1"	1
20	75-5100-270	NIPPLE, 1" X 4" LONG, B.I.	1
21	75-7500-101	STRAINER, LINE, "Y", 1" F X F	1
22	75-1700-006	ELBOW, 3/4" F X M, 90°, B.I.	2
23	75-6200-006	PLUG, SQUARE HEAD, 3/4", B.I.	1
24	75-8522-031	VALVE, BALL, 1" F X F	1
--	42-0658-000	COMPLETE 1" STEAM PLUMBING MANIFOLD (LESS INDEX#1-4 & 9)	-



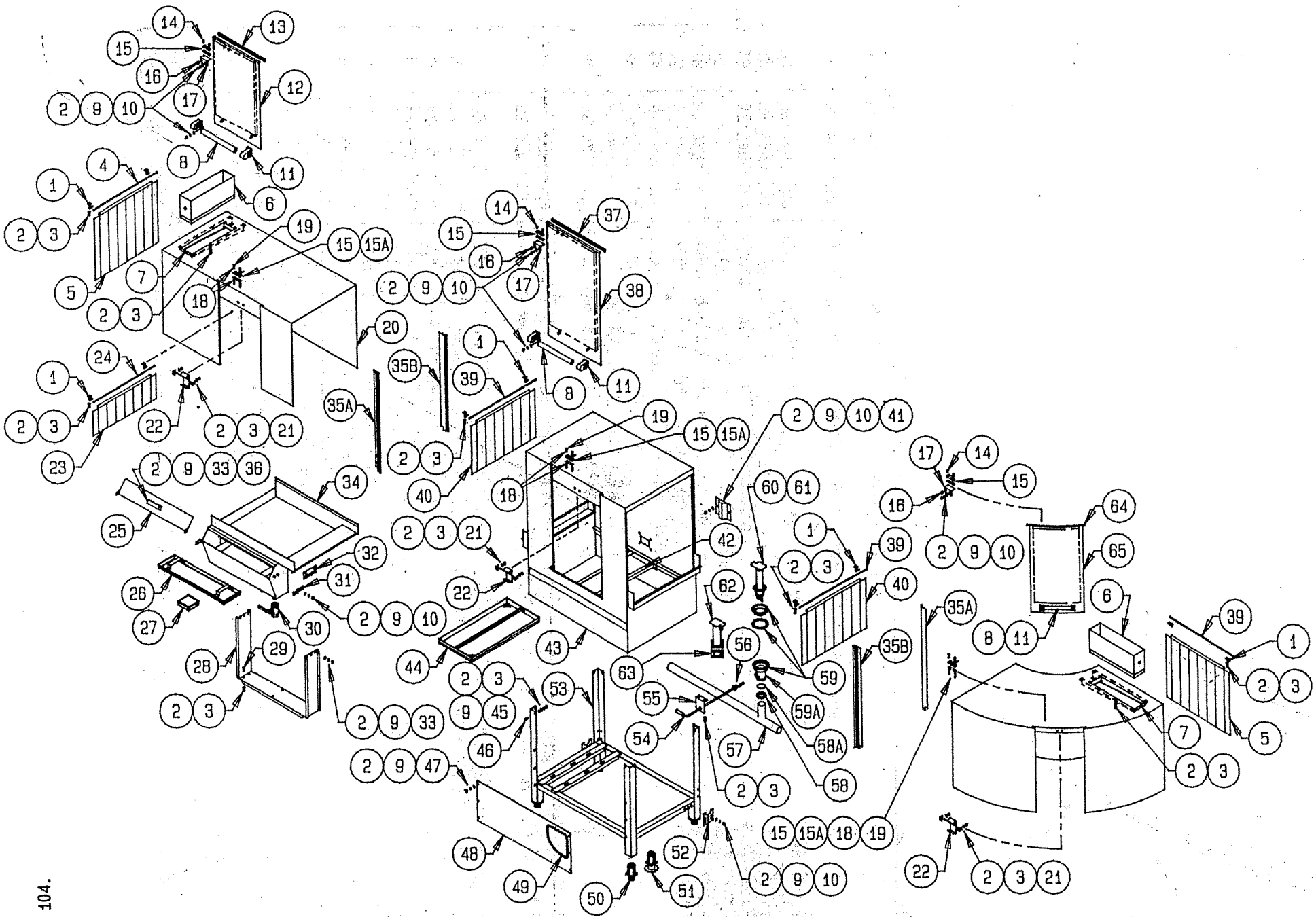
CLOSED STEAM HOT WATER BOOSTER
FIGURE 7-13

INDEX NO.	PART NUMBER	PARTS LIST-----CLOSED STEAM HOT WATER BOOSTER	QNTY PER ASSMLY
1	22-0710-600	HEAT EXCHANGER, STEAM BOOSTER, PLATISOL COATED	1
2	22-0710-900	LEG ASSEMBLY FOR STEAM BOOSTER HEAT EXCHANGER	1
3	75-8200-007	UNION, 1" F X F, B.I.	1
4	75-5100-276	NIPPLE, 1" X 6" LONG, B.I.	1
5	75-7600-010	TEE, 1" F X 1" M X 1" F, B.I.	1
6	75-0750-135	BUSHING, 1" M X 3/4" F, B.I.	1
7	75-8526-051	RELIEF VALVE, 3/4" M X 3/4" F X STEAM, BRASS	1
8	75-0026-041	ADAPTER, 3/4" M X 3/4" C, COPPER	1
9	65-4922-006	COPPER TUBING, 3/4" X 3" LONG	1
10	75-1602-062	ELBOW, 3/4" C X C X 90°	1
11	65-4922-006	COPPER TUBING, 3/4" X 14" LONG	1
12	55-0600-045	BOX, ELECTRIC, WATERTIGHT, 4" X 4"	1
13	55-1100-025	COVER WITH GASKET AND SCREWS(4), WATERTIGHT, 4" X 4"	1
	55-2003-302	SEALTIGHT CONNECTOR, 1/2" X 45° (NOT SHOWN)	2
	65-1000-204	SEALTIGHT, 1/2" X 20" LONG, CONNECTS #12 TO #22 (NOT SHOWN)	1
14	75-5130-008	NIPPLE, 1" X CLOSE, B.I.	1
15	75-1600-007	ELBOW, 1" F X F, 90°, B.I.	1
16	75-5100-267	NIPPLE, 1" X 3" LONG, B.I.	1
17	75-7800-012	TRAP, STEAM, 1" F X F	1
18	75-0751-150	BUSHING, 1" M X 3/4" F, BRASS	1
19	75-5131-006	NIPPLE, 3/4" X CLOSE, BRASS	1
20	75-7601-280	TEE, 3/4" F X 3/4" F X 3/4" F, BRASS	1
21	75-8526-015	RELIEF VALVE, 3/4" M X 3/4" F X WATER, BRASS	1
22	55-7750-050	THERMOSTAT, 4" LONG PROBE, WHITE ROGERS #11B18-101	1
23	75-7601-351	TEE, 1" F X 1/2" F X 3/4" F, BRASS	1
24	75-8201-100	UNION, 3/4" C X 3/4" M, BRASS	1
25	75-5131-007	NIPPLE, 1" X CLOSE, BRASS	1
26	75-5100-250	NIPPLE, 1" X 5" LONG, B.I.	1
27	75-1600-007	ELBOW, 1" F X F, 90°, B.I.	1
28	75-5100-265	NIPPLE, 1" X 2" LONG, B.I.	2
29	75-7600-032	TEE, 1" F X 1" F X 3/4" F, B.I.	1
30	75-0750-030	BUSHING, 3/4" M X 1/4" F, B.I.	1
31	75-7800-100	PIG TAIL, 1/4", SHORT	1
32	75-8520-010	VALVE, PETCOCK, 1/4" F X F, POLISHED BRASS	1
33	70-2470-615	GAUGE, PRESSURE, 1/4", 2" DIA. STEEL CASE, 0-60 psi	1
34	75-5130-008	NIPPLE, 1" X CLOSE, B.I.	3
35	55-7300-552	SOLENOID, ASCO #8220G7, 1" NPT, 24V	1
	55-7301-552	KIT, REPAIR, ASCO, #8220G SERIES, 1" NPT	AS REQ'D
	55-7301-560	COIL, ASCO, #8220G SERIES, 24V	AS REQ'D
36	75-5100-267	NIPPLE, 1" X 3" LONG, B.I.	1
37	75-6875-070	REGULATOR, PRESSURE, STEAM, 1"	1
38	75-8200-007	UNION, 1" F X F, B.I.	1
39	75-1700-007	ELBOW, 1" F X M, 90°, B.I.	1
40	75-7500-101	STRAINER, LINE, "Y', 1" F X F	1
41	75-1700-006	ELBOW, 3/4" F X M, 90°, B.I.	2
42	75-6200-006	PLUG, SQUARE HEAD, 3/4", B.I.	1
43	75-8522-031	VALVE, BALL, 1" F X F	1
--	42-0659-100	CLOSED STEAM BOOSTER ASSEMBLY (INDEX#1-25)	-
--	42-0659-000	MANIFOLD STEAM PLUMBING PART "A" FOR BOOSTER (INDEX#26-43)	-

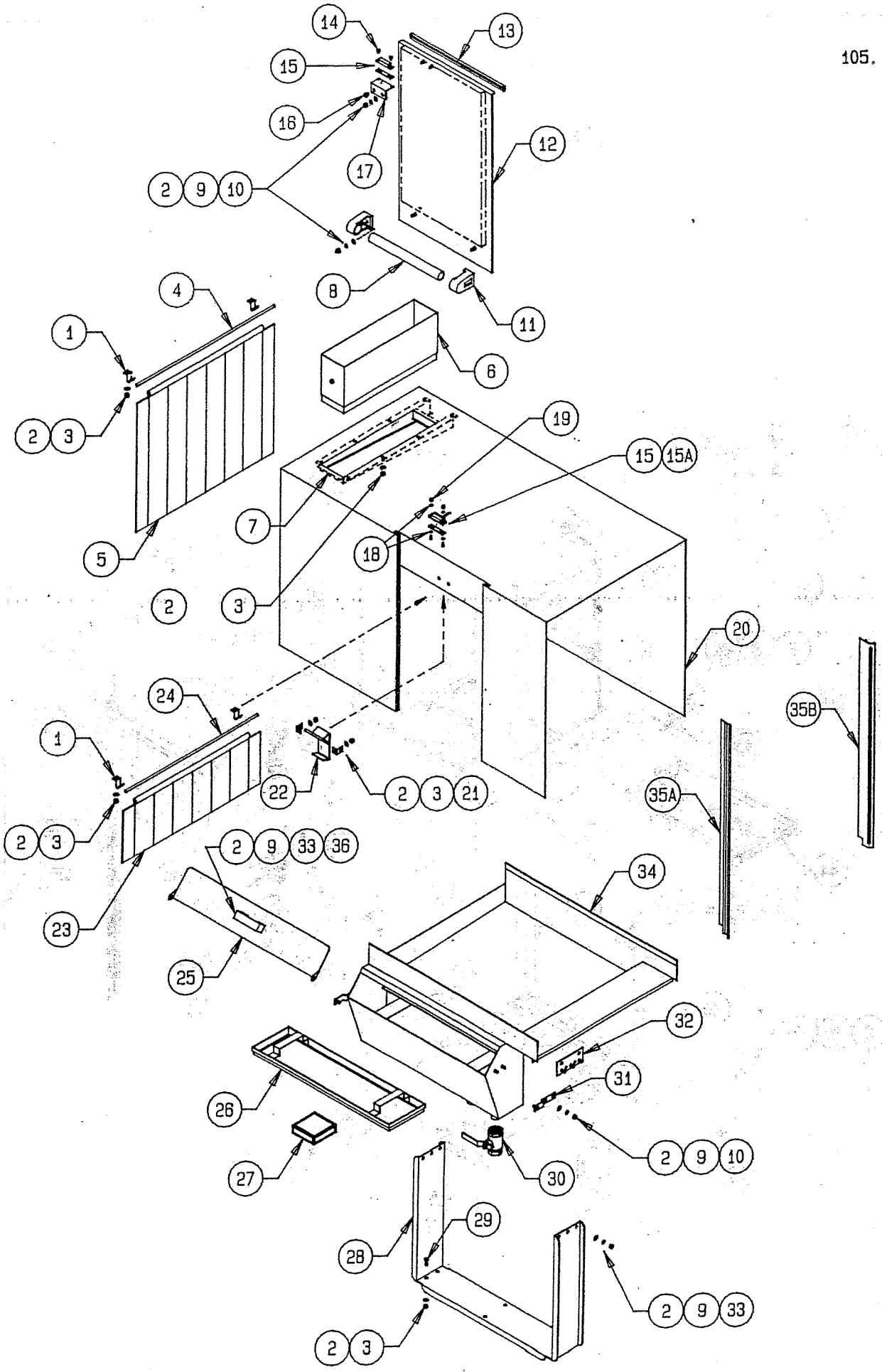


ELECTRIC IMMERSION TANK HEAT WITH LOW WATER CUT-OFF COMPONENTS
FIGURE 7-14

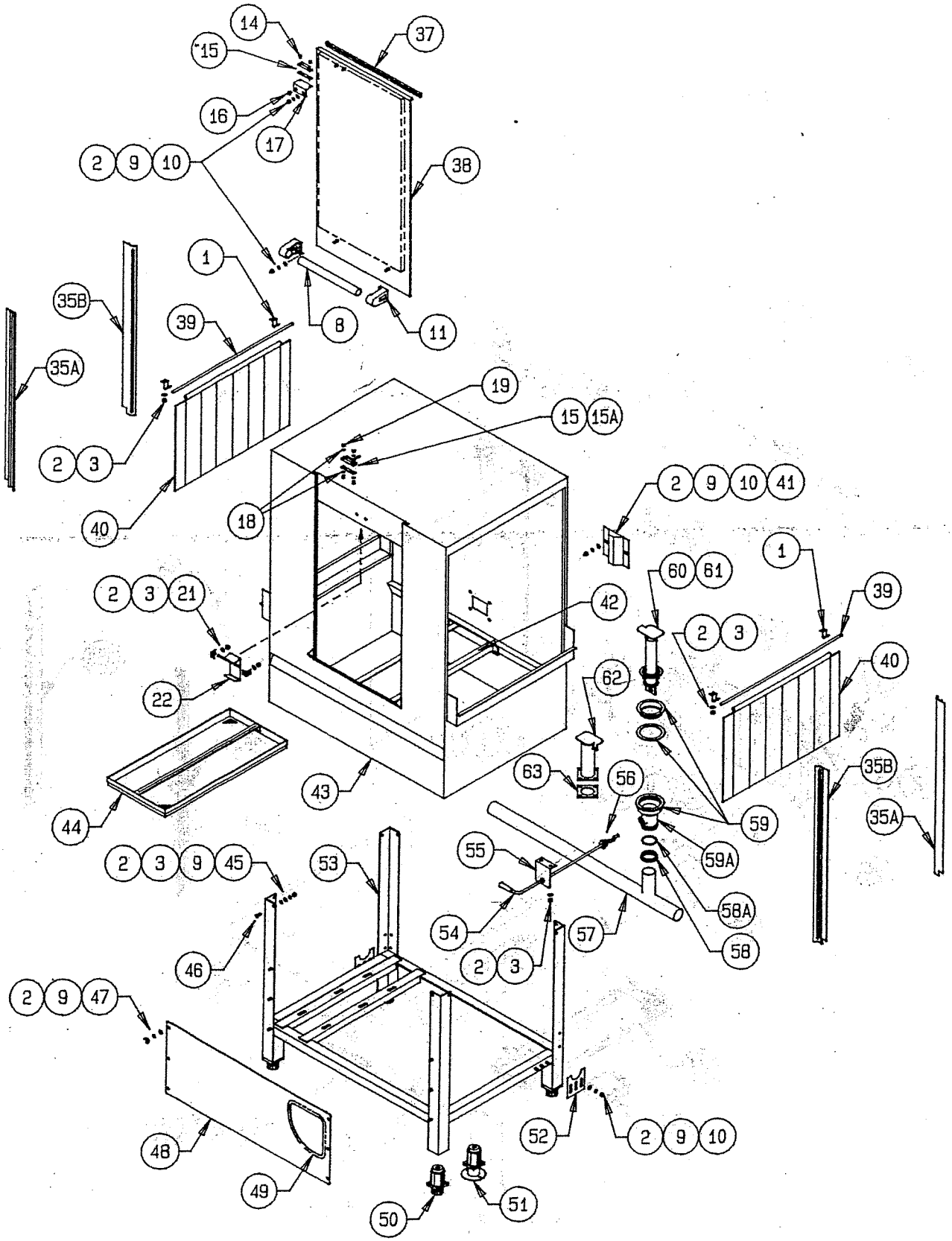
INDEX NO.	PART NUMBER	PARTS LIST-----ELECTRIC IMMERSION TANK HEAT WITH LOW WATER CUT-OFF COMPONENTS	QNTY PER ASSMLY
1	45-0544-400	BOX WITH COVER FOR 2 OR 3 HEATER ELEMENTS	1
	25-0409-355	BOX WITH COVER FOR SINGLE HEATER ELEMENT (NOT SHOWN)	AS REQ'D
2	11-0938-600	BRACKET, THERMOSTAT, ELECTRIC HEATER, S/S	2 or 3
3	55-2860-922	THERMOSTAT, WITH DIAL, 60-250°F	2 or 3
4	14-0601-800	INSULATOR, HEATER THERMOSTAT	2 or 3
5	60-5502-016	NUT, LOCK, HEATER MOUNTING, GALVANIZED, 2"	2 or 3
6	19-1500-900	WASHER, FLAT, ELECTRIC HEATER, S/S	4 or 6
7	19-4201-700	GASKET, ELECTRIC HEATER, 2-3/8" ID X 3-1/4" OD, FIBER	4 or 6
8	55-2860-802	LIGHT, PILOT, RED, 24V	2 or 3
9	55-1050-323	CONTACTOR, MAGNETIC, 40A, 24V	2 or 3
10	55-2860-774	ELEMENT, HEATER, 12kW@240V/60/3 (DERATES TO 9kW@208V/60/3)	AS REQ'D
	55-2860-775	ELEMENT, HEATER, 12kW@480V/60/3 (DERATES TO 11kW@460V/60/3)	AS REQ'D
--	55-2859-704	KIT-12kW@240V HTR ASS'Y W/SINGLE BOX&24V CNTRLS (INDEX#1-10)	AS REQ'D
--	55-2859-754	KIT-12kW@480V HTR ASS'Y W/SINGLE BOX&24V CNTRLS (INDEX#1-10)	AS REQ'D
11	35-0410-755	KIT, LOW WATER CUT-OFF, PART 1 OF 3	1
12	35-0410-755	KIT, LOW WATER CUT-OFF, PART 2 OF 3	1
13	55-2860-802	LIGHT, PILOT, RED, 24V	1
14	55-7900-700	TIMER, UNIVERSAL, ARTISAN #438USA	1
15	55-7402-001	FLOAT ONLY, HARWIL FLOAT SWITCH	AS REQ'D
16	55-7402-004	BOOT, RUBBER, HARWIL FLOAT SWITCH	AS REQ'D
17	N.P.N.	GASKET, "O" RING, HARWIL FLOAT SWITCH	AS REQ'D
18	55-7400-177	SWITCH, MICRO, HARWIL #10399-22	AS REQ'D
19	55-7402-002	COVER, HARWIL FLOAT SWITCH	AS REQ'D
20	55-7402-003	NUT, STRAIN RELIEF, WITH GASKET, HARWIL FLOAT SWITCH	AS REQ'D
--	55-7400-755	COMPLETE SWITCH, WATER LEVEL, HARWIL (INDEX#15-20)	1
21	35-0410-755	KIT, LOW WATER CUT-OFF, PART 3 OF 3	1



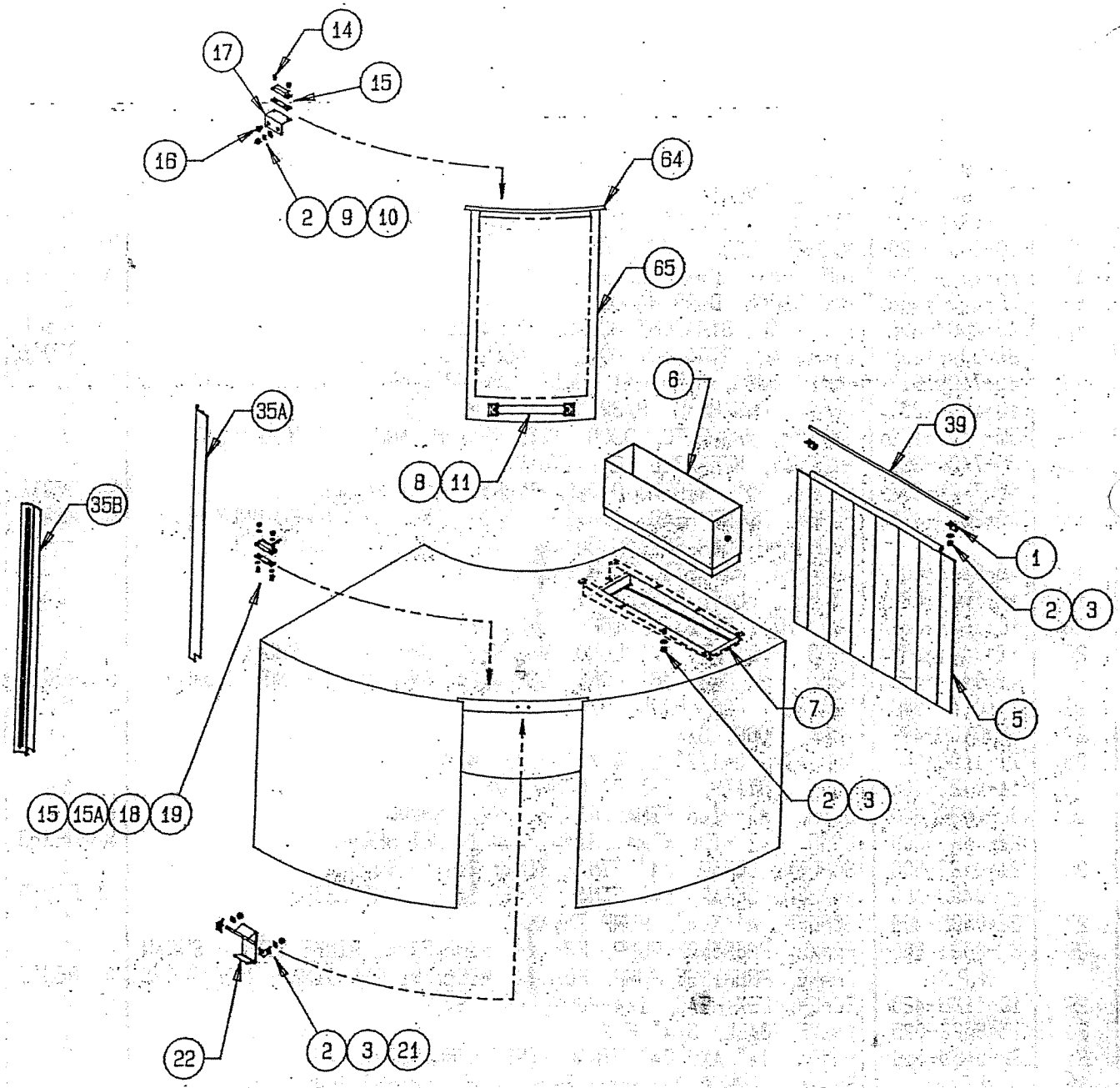
CA CABINET & 90" PREWASH HOOD & 46" FINAL RINSE HOOD W/24" SINK (CW-DOORS OUT)
FIGURE 7-15



46" FINAL RINSE HOOD W/24" SINK (CW-DOORS OUT)
FIGURE 7-15A



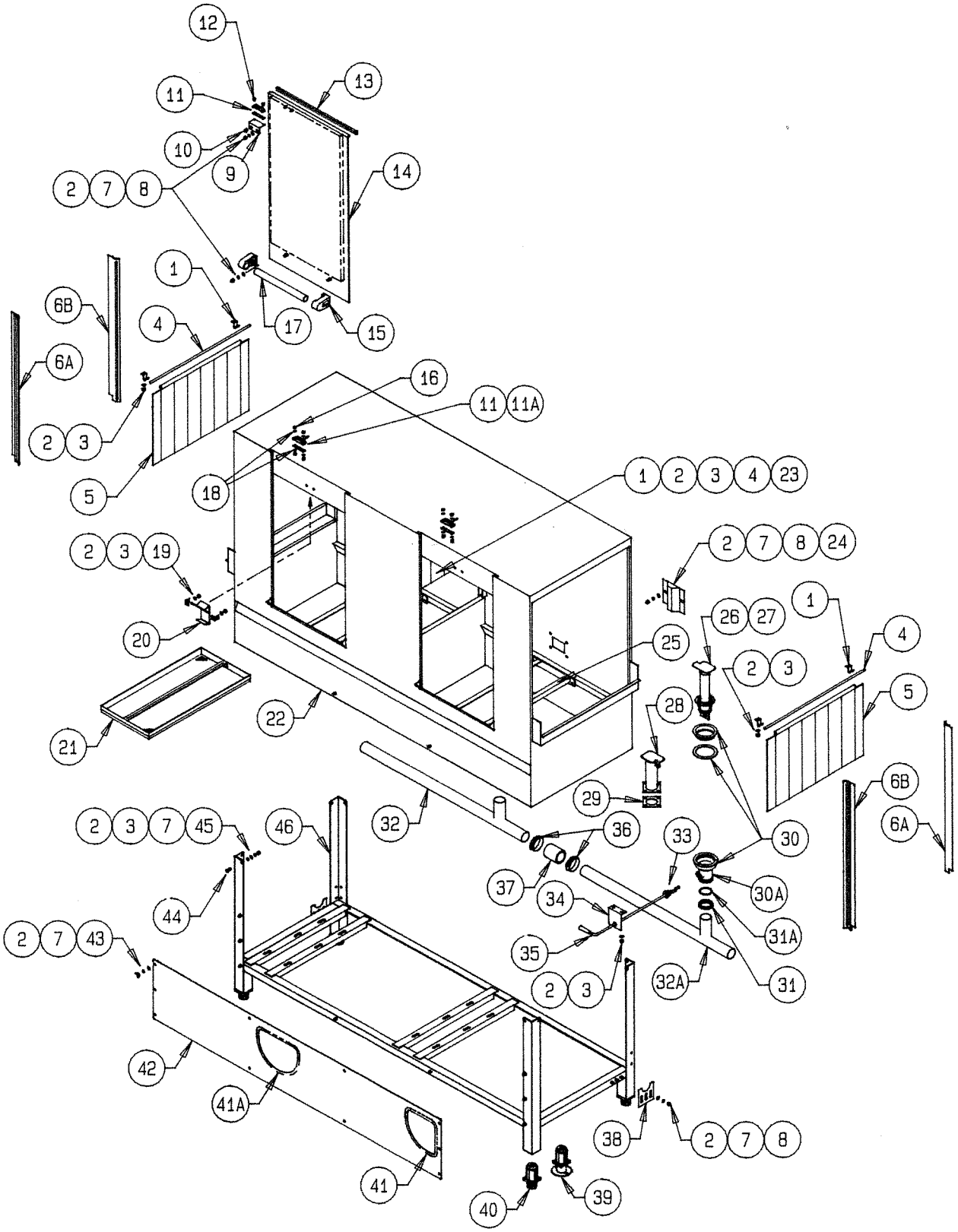
CA CABINET
FIGURE 7-15B



90" PREWASH HOOD (CW-DOORS OUT)

INDEX NO.	PART NUMBER	PARTS LIST——CA CABINET & 90° PREWASH HOOD & 46" FNL RNS HOOD W/24" SNK (CW/DOORS OUT - PAGE 1 of 2)	QNTY PER ASSMLY
1	11-0413-502	HOOK, CURTAIN, WITH HOLE, S/S	10
2	10-1800-420	WASHER, FLAT, 1/4", S/S	AS REQ'D
3	10-2903-420	NUT, HEX, ELASTIC STOP, 1/4-20, S/S	AS REQ'D
4	11-0405-300	ROD, CURTAIN, 23-5/8" LONG, S/S	1
5	70-1150-004	CURTAIN, 20" LONG X 23-1/2" WIDE	2
6	32-0923-900	COWL, VENT, WITH DAMPER, 4" X 16", S/S	2
	32-0923-902	DAMPER ONLY, FOR 4" X 16" VENT COWL, INSIDE PARTS, S/S	AS REQ'D
7	22-0941-700	GUTTER, VENT, 4" X 16", S/S	2
8	42-1316-012	TUBING, 1-13/16" O.D. X 12" LONG, S/S	3
9	10-1801-420	WASHER, LOCK, 1/4", S/S	AS REQ'D
10	10-1906-420	NUT, HEX, ACORN, 1/4-20, S/S	AS REQ'D
11	70-3000-084	END PIECE, DOOR HANDLE	6
12	42-0984-900	DOOR, ALL STRAIGHT HOODS, NON-INSULATED	AS REQ'D
	98-5000-106	DOOR, ALL STRAIGHT HOODS, INSULATED	AS REQ'D
13	65-7109-017	SEAL, DOOR, STRAIGHT HOODS, 16-3/8" LONG	1
14	10-1005-832	SCREW, PAN HEAD, 8/32 X 5/8" LONG, S/S	6
15	55-7400-170	SWITCH, MAGNETIC, DOOR, WITH SPACERS AND 6 FT WIRE LEAD	3
15A	55-7400-350	RACEWAY, WIREMOLD #C1 (IVORY)	3
	55-7400-352	ELBOW, 90°, WIREMOLD #C8 (IVORY) - NOT SHOWN	AS REQ'D
16	10-2003-420	SCREW, ROUND HEAD, 1/4-20 X 3/8" LONG, S/S (USED ONLY WHEN MOUNTING DOOR SWITCH BRACKET TO INSULATED DOOR PANEL)	AS REQ'D
17	45-0412-600	BRACKET, MAGNETIC DOOR SWITCH, S/S	3
18	10-1800-832	WASHER, FLAT, 8/32, S/S	12
19	10-1903-832	NUT, HEX, ELASTIC STOP, 8/32, S/S	6
20	42-0440-655	HOOD, FNL RNS, 46" LONG, USE W/24" SNK (CW) - SHOWN	1
	42-0440-755	HOOD, FNL RNS, 46" LONG, USE W/24" SNK (CCW) - NOT SHOWN	AS REQ'D
21	11-0117-800	BRACKET, DOOR HOOK, S/S	6
22	22-0126-407	HOOK, DOOR, S/S	3
23	70-1150-009	CURTAIN, 8-1/2" LONG X 23-1/2" WIDE	1
24	11-0422-100	ROD, CURTAIN, 22-5/8" LONG, S/S	1
25	32-0439-800	DOOR, 24" WIDE FINAL RINSE SINK - SHOWN	1
	22-0405-300	DOOR, 14" WIDE FINAL RINSE SINK - NOT SHOWN	AS REQ'D
26	21-0422-600	SCREEN, SCRAP, 24" FINAL RINSE SINK - SHOWN	1
	22-0403-300	SCREEN, SCRAP, 14" FINAL RINSE SINK - NOT SHOWN	AS REQ'D
27	22-0405-400	SCREEN, 4" X 4", PUMP INTAKE	1
28	32-0821-800	FRAME, PRERINSE PUMP, FOR 24" WIDE FINAL RINSE SINK - SHOWN	1
	N.P.N.	FRAME, PRERINSE PUMP, FOR 14" WIDE FNL RNS SINK - NOT SHOWN	AS REQ'D
29	10-1106-420	SCREW, HEX HEAD, 1/4-20 X 3/4", S/S	4
30	75-8522-025	VALVE, BALL, 3/4" F X F	1
31	32-0439-600	HINGE, 14" AND 24" FINAL RINSE SINK DOOR, S/S	2
32	N.P.N.	BRACKET, PRERINSE PUMP FRAME (REF. B2M-33-1040), S/S	2
33	10-1900-420	NUT, HEX, 1/4-20, S/S	AS REQ'D
34	42-0134-255	SINK, FINAL RINSE, 24" STRAIGHT (CW) - SHOWN	1
	42-0134-355	SINK, FINAL RINSE, 24" STRAIGHT (CCW) - NOT SHOWN	AS REQ'D
35A	31-0122-204	SLIP, CABINET, HIGH HOOD, S/S, LH	2
35B	31-0122-203	SLIP, CABINET, HIGH HOOD, S/S, RH	2
36	11-0421-400	HANDLE, PLASTISOL COATED	1
37	65-7109-016	SEAL, DOOR, CABINETS, 19-1/4" LONG	1

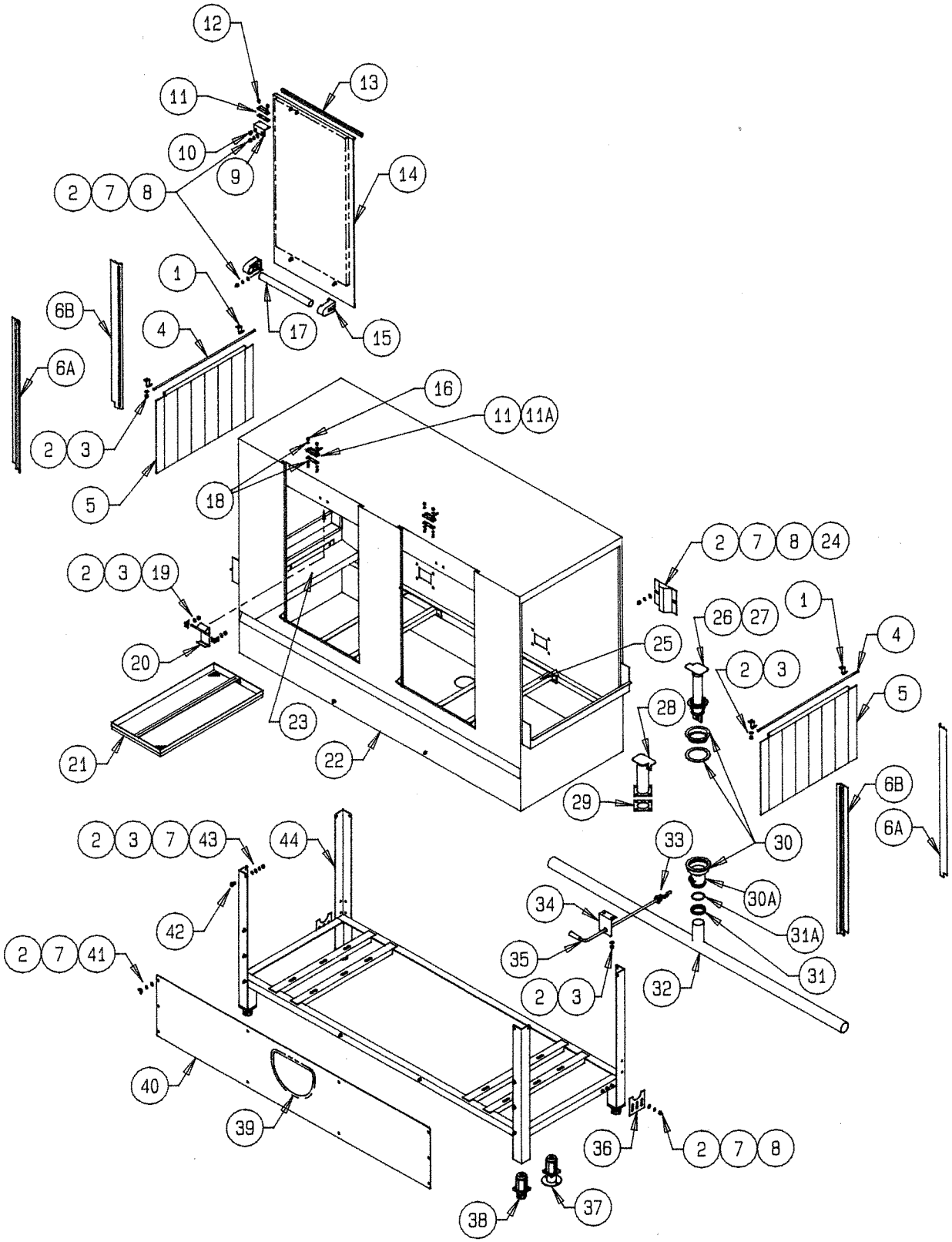
INDEX NO.	PART NUMBER	PARTS LIST-----CA CABINET & 90° PREWASH HOOD & 46" FNL RNS HOOD W/24" SNK (CW/DOORS OUT - PAGE 2 of 2)	QNTY PER ASSMLY
38	42-0442-700	DOOR, ALL CABINETS, NON-INSULATED	AS REQ'D
	98-5000-107	DOOR, ALL CABINETS, INSULATED	AS REQ'D
39	11-0421-900	ROD, CURTAIN, 24-5/8" LONG, S/S	3
40	70-1150-005	CURTAIN, 16" LONG X 23-1/2" WIDE	2
41	42-0660-000	COVER, FILL & MAKE-UP LINES	1
42	41-0137-300	SUPPORT, SCRAP SCREEN, CA CABINET	1
43	98-5000-001	CA CABINET, LESS ASSEMBLY, SHEET METAL ONLY	1
44	42-0440-300	SCREEN, SCRAP, POWER WASH/RINSE	3
45	60-8850-156	WASHER, NYLITE, 1/4"	8
46	10-1005-420	SCREW, PAN HEAD, 1/4-20 X 5/8" LONG, S/S	8
47	10-1905-420	NUT, WING, 1/4-20, S/S	6
48	21-0414-602	PANEL, MOTOR, CA CAB., REAR CLOSED STEAM HEAT - SHOWN	AS REQ'D
	21-0414-603	PANEL, MOTOR, CA CAB., FRONT CLOSED STEAM HEAT - NOT SHOWN	AS REQ'D
	21-0414-601	PANEL, MOTOR, CA CAB., FRONT ELECTRIC HEAT - NOT SHOWN	AS REQ'D
49	65-7109-010	CHANNEL, "U", BLACK RUBBER, PER FOOT	2 FT
50	70-2300-100	FOOT, POP-IN, CA CABINET, 2" SQUARE	4
51	70-2300-099	FOOT, POP-IN FLANGED, 2" SQUARE WITH MOUNTING HOLES	AS REQ'D
52	22-0984-500	SUPPORT, CABINET DRAIN LINE	2
53	22-0816-755	KIT, ANGLE IRON, CA CABINET BASE	1
54	75-1476-011	HANDLE, KLEIN LEVER DRAIN, 17-1/4" LONG, S/S, INCLEDES #56)	1
55	11-0128-900	SUPPORT, CLIP, LEVER ACTION, KLEIN DRAIN VALVE	1
56	75-7050-505	GASKET, SMALL "O" RING FOR KLEIN LEVER DRAIN HANDLE	AS REQ'D
	75-7050-508	GASKET, LARGE "O" RING FOR KLEIN LEVER DRAIN HANDLE	AS REQ'D
57	42-0655-400	MANIFOLD, CA 1 MAIN CABINET DRAIN, S/S	1
58	60-5502-258	NUT, SLIP, 2" FOR TAIL PIECE	1
58A	75-7050-526	RING, "O", FOR 2" TAIL PIECE/SLIP NUT	1
59	75-1475-020	DRAIN, KLEIN LEVER, WITH LOCK RING AND GASKET	AS REQ'D
59A	75-1476-004	DRAIN, KLEIN LEVER, BODY ONLY	AS REQ'D
60	32-0652-001	STANDPIPE, OVERFLOW, KLEIN LVR DRAIN, W/SCRN & FLIP TOP LID	AS REQ'D
61	75-7050-521	RING, "O", FOR KLEIN LEVER DRAIN STANDPIPE, RUBBER	AS REQ'D
***	32-0629-600	ASSEMBLY, KLEIN LEVER DRAIN W/HANDLE & OVERFLOW STANDPIPE (INCLUDES ITEMS# 54, 59, 60, & 61)	1
62	32-0651-301	STANDPIPE, OVERFLOW, 2" O.D. X 6" HIGH	1
63	19-4201-500	GASKET, STANDPIPE, RUBBER	1
64	65-7109-018	SEAL, DOOR, CURVED HOOD, 17-3/8" LONG	1
65	42-0910-690	DOOR, ALL CURVED HOODS, NON-INSULATED (REF. D2M-9-1069)	AS REQ'D
	98-5000-120	DOOR, ALL CURVED HOODS, INSULATED (D2M-9-1069/TP#17UU-L)	AS REQ'D



CSL 1390 CABINET
FIGURE 7-16

INDEX NO.	PART NUMBER	PARTS LIST-----CSL 1390 CABINET - PAGE 1 OF 2	QNTY PER ASSMLY
1	11-0413-502	HOOK, CURTAIN, WITH HOLE, S/S	6
2	10-1800-420	WASHER, FLAT, 1/4", S/S	AS REQ'D
3	10-2903-420	NUT, HEX, ELASTIC STOP, 1/4-20, S/S	AS REQ'D
4	11-0421-900	ROD, CURTAIN, 24-5/8" LONG, S/S	3
5	70-1150-005	CURTAIN, 16" LONG X 23-1/2" WIDE	2
6A	31-0122-204	SLIP, CABINET, HIGH HOOD, S/S, LH	2
6B	31-0122-203	SLIP, CABINET, HIGH HOOD, S/S, RH	2
7	10-1801-420	WASHER, LOCK, 1/4", S/S	AS REQ'D
8	10-1906-420	NUT, HEX, ACORN, 1/4-20, S/S	AS REQ'D
9	45-0412-600	BRACKET, MAGNETIC DOOR SWITCH, S/S	2
10	10-2003-420	SCREW, ROUND HEAD, 1/4-20 X 3/8" LONG, S/S (USED ONLY WHEN MOUNTING DOOR SWITCH BRACKET TO INSULATED DOOR PANEL)	AS REQ'D ---
11	55-7400-170	SWITCH, MAGNETIC, DOOR, WITH SPACERS AND 6 FT WIRE LEAD	2
11A	55-7400-350	RACEWAY, WIREMOLD #C1 (IVORY)	2
	55-7400-352	ELBOW, 90°, WIREMOLD #C8 (IVORY) - NOT SHOWN	AS REQ'D
12	10-1005-832	SCREW, PAN HEAD, 8/32 X 5/8" LONG, S/S	4
13	65-7109-016	SEAL, DOOR, CABINETS, 19-1/4" LONG	2
14	42-0442-700	DOOR, ALL CABINETS, NON-INSULATED	AS REQ'D
	98-5000-107	DOOR, ALL CABINETS, INSULATED	AS REQ'D
15	70-3000-084	END PIECE, DOOR HANDLE	4
16	10-1903-832	NUT, HEX, ELASTIC STOP, 8/32, S/S	4
17	42-1316-012	TUBING, 1-13/16" O.D. X 12" LONG, S/S	2
18	10-1800-832	WASHER, FLAT, 8/32, S/S	8
19	11-0117-800	BRACKET, DOOR HOOK, S/S	4
20	22-0126-407	HOOK, DOOR, S/S	2
21	42-0440-300	SCREEN, SCRAP, POWER WASH/RINSE	6
22	98-5000-002	CSL 1390 CABINET, LESS ASSEMBLY, SHEET METAL ONLY	1
23	70-1150-004	CURTAIN, 20" LONG X 23-1/2" WIDE	1
24	42-0660-000	COVER, FILL & MAKE-UP LINES	2
25	41-0137-300	SUPPORT, SCRAP SCREEN, CA CABINET	2
26	32-0652-001	STANDPIPE, OVERFLOW, KLEIN LVR DRAIN, W/SCRN & FLIP TOP LID	AS REQ'D
27	75-7050-521	RING, "O", FOR KLEIN LEVER DRAIN STANDPIPE, RUBBER	AS REQ'D
***	32-0629-600	ASSEMBLY, KLEIN LEVER DRAIN W/HANDLE & OVERFLOW STANDPIPE (INCLUDES ITEMS# 26, 27, 30, & 35)	2 ---
28	32-0651-301	STANDPIPE, OVERFLOW, 2" O.D. X 6" HIGH	2
29	19-4201-500	GASKET, STANDPIPE, RUBBER	2
30	75-1475-020	DRAIN, KLEIN LEVER, WITH LOCK RING AND GASKET	AS REQ'D
30A	75-1476-004	DRAIN, KLEIN LEVER, BODY ONLY	AS REQ'D
31	60-5502-258	NUT, SLIP, 2" FOR TAIL PIECE	2
31A	75-7050-526	RING, "O", FOR 2" TAIL PIECE/SLIP NUT	2
32	42-0655-400	MANIFOLD, CA1 MAIN CABINET DRAIN, S/S	1
32A	42-0655-400	MANIFOLD, CA1 MAIN CABINET DRAIN, S/S (MODIFIED, 3" SHORTER)	1
33	75-7050-505	GASKET, SMALL "O" RING FOR KLEIN LEVER DRAIN HANDLE	AS REQ'D
	75-7050-508	GASKET, LARGE "O" RING FOR KLEIN LEVER DRAIN HANDLE	AS REQ'D
34	11-0128-900	SUPPORT, CLIP, LEVER ACTION, KLEIN DRAIN VALVE	2
35	75-1476-011	HANDLE, KLEIN LEVER DRAIN, 17-1/4" LONG, S/S (INCLUDES #33)	2

INDEX NO.	PART NUMBER	PARTS LIST-----CSL 1390 CABINET - PAGE 2 OF 2	QNTY PER ASSMLY
36	70-1000-530	CLAMP, HOSE, #32, 1-9/16" TO 2-1/2" DIA., S/S	2
37	42-0655-603	COUPLING, HOSE, 2" ID X 3" LONG, RUBBER	1
38	22-0984-500	SUPPORT, CABINET DRAIN LINE	2
39	70-2300-099	FOOT, POP-IN FLANGED, 2" SQUARE WITH MOUNTING HOLES	AS REQ'D
40	70-2300-100	FOOT, POP-IN, CA CABINET, 2" SQUARE	4
41	65-7109-010	CHANNEL, "U", BLACK RUBBER, PER FOOT	2 FT
	65-0990-081	ADHESIVE, CONTACT, 3M #1357, PER PINT	AS REQ'D
41A	65-7109-010	CHANNEL, "U", BLACK RUBBER, PER FOOT	3 FT
	65-0990-081	ADHESIVE, CONTACT, 3M #1357, PER PINT	AS REQ'D
42	31-0424-800	PANEL, MOTOR, CSL1390 CABINET (PLEASE SPECIFY TYPE OF TANK HEAT: CLOSED STEAM REAR, AS SHOWN, OR ELECTRIC FRONT)	1
43	10-1905-420	NUT, WING, 1/4-20, S/S	10
44	10-1005-420	SCREW, PAN HEAD, 1/4-20 X 5/8" LONG, S/S	8
45	60-8850-156	WASHER, NYLITE, 1/4"	8
46	32-0819-755	KIT, ANGLE IRON, CSL 1390 CABINET BASE	1



SUPER CABINET
FIGURE 7-17

INDEX NO.	PART NUMBER	PARTS LIST-----SUPER CABINET - PAGE 1 OF 2	QNTY PER ASSMLY
1	11-0413-502	HOOK, CURTAIN, WITH HOLE, S/S	4
2	10-1800-420	WASHER, FLAT, 1/4", S/S	AS REQ'D
3	10-2903-420	NUT, HEX, ELASTIC STOP, 1/4-20, S/S	AS REQ'D
4	11-0421-900	ROD, CURTAIN, 24-5/8" LONG, S/S	2
5	70-1150-005	CURTAIN, 16" LONG X 23-1/2" WIDE	2
6A	31-0122-204	SLIP, CABINET, HIGH HOOD, S/S, LH	2
6B	31-0122-203	SLIP, CABINET, HIGH HOOD, S/S, RH	2
7	10-1801-420	WASHER, LOCK, 1/4", S/S	AS REQ'D
8	10-1906-420	NUT, HEX, ACORN, 1/4-20, S/S	AS REQ'D
9	45-0412-600	BRACKET, MAGNETIC DOOR SWITCH, S/S	2
10	10-2003-420	SCREW, ROUND HEAD, 1/4-20 X 3/8" LONG, S/S (USED ONLY WHEN MOUNTING DOOR SWITCH BRACKET TO INSULATED DOOR PANEL)	AS REQ'D ---
11	55-7400-170	SWITCH, MAGNETIC, DOOR, WITH SPACERS AND 6 FT WIRE LEAD	2
11A	55-7400-350	RACEWAY, WIREMOLD #C1 (IVORY)	2
	55-7400-352	ELBOW, 90°, WIREMOLD #C8 (IVORY) - NOT SHOWN	AS REQ'D
12	10-1005-832	SCREW, PAN HEAD, 8/32 X 5/8" LONG, S/S	4
13	65-7109-016	SEAL, DOOR, CABINETS, 19-1/4" LONG	2
14	42-0442-700	DOOR, ALL CABINETS, NON-INSULATED	AS REQ'D
	98-5000-107	DOOR, ALL CABINETS, INSULATED	AS REQ'D
15	70-3000-084	END PIECE, DOOR HANDLE	4
16	10-1903-832	NUT, HEX, ELASTIC STOP, 8/32, S/S	4
17	42-1316-012	TUBING, 1-13/16" O.D. X 12" LONG, S/S	2
18	10-1800-832	WASHER, FLAT, 8/32, S/S	8
19	11-0117-800	BRACKET, DOOR HOOK, S/S	4
20	22-0126-407	HOOK, DOOR, S/S	2
21	42-0440-300	SCREEN, SCRAP, POWER WASH/RINSE	5
22	98-5000-003	SUPER CABINET, LESS ASSEMBLY, SHEET METAL ONLY	1
23	N.P.N.	FILLER PIECE, SCRAP SCREEN, S/S (REF. TP#24E)	2
24	42-0660-000	COVER, FILL & MAKE-UP LINES	2
25	41-0137-300	SUPPORT, SCRAP SCREEN, CA CABINET	2
26	32-0652-001	STANDPIPE, OVERFLOW, KLEIN LVR DRAIN, W/SCRN & FLIP TOP LID	AS REQ'D
27	75-7050-521	RING, "O", FOR KLEIN LEVER DRAIN STANDPIPE, RUBBER	AS REQ'D
***	32-0629-600	ASSEMBLY, KLEIN LEVER DRAIN W/HANDLE & OVERFLOW STANDPIPE (INCLUDES ITEMS# 26, 27, 30, & 35)	1 ---
28	32-0651-301	STANDPIPE, OVERFLOW, 2" O.D. X 6" HIGH	1
29	19-4201-500	GASKET, STANDPIPE, RUBBER	1
30	75-1475-020	DRAIN, KLEIN LEVER, WITH LOCK RING AND GASKET	AS REQ'D
30A	75-1476-004	DRAIN, KLEIN LEVER, BODY ONLY	AS REQ'D
31	60-5502-258	NUT, SLIP, 2" FOR TAIL PIECE	1
31A	75-7050-526	RING, "O", FOR 2" TAIL PIECE/SLIP NUT	1
32	42-0655-300	MANIFOLD, SUPER CABINET DRAIN, S/S	1
33	75-7050-505	GASKET, SMALL "O" RING FOR KLEIN LEVER DRAIN HANDLE	AS REQ'D
	75-7050-508	GASKET, LARGE "O" RING FOR KLEIN LEVER DRAIN HANDLE	AS REQ'D
34	11-0128-900	SUPPORT, CLIP, LEVER ACTION, KLEIN DRAIN VALVE	2
35	75-1476-011	HANDLE, KLEIN LEVER DRAIN, 17-1/4" LONG, S/S (INCLUDES #33)	2
36	22-0984-500	SUPPORT, CABINET DRAIN LINE	2

INDEX NO.	PART NUMBER	PARTS LIST-----SUPER CABINET - PAGE 2 OF 2	QNTY PER ASSMLY
37	70-2300-099	FOOT, POP-IN FLANGED, 2" SQUARE WITH MOUNTING HOLES	AS REQ'D
38	70-2300-100	FOOT, POP-IN, CA CABINET, 2" SQUARE	4
39	65-7109-010	CHANNEL, "U", BLACK RUBBER, PER FOOT	3 FT
	65-0990-081	ADHESIVE, CONTACT, 3M #1357, PER PINT	AS REQ'D
40	31-0425-100	PANEL, MOTOR, SUPER CABINET (PLEASE SPECIFY TYPE OF TANK HEAT: CLOSED STEAM REAR, AS SHOWN, OR ELECTRIC FRONT)	1
41	10-1905-420	NUT, WING, 1/4-20, S/S	10
42	10-1005-420	SCREW, PAN HEAD, 1/4-20 X 5/8" LONG, S/S	8
43	60-8850-156	WASHER, NYLITE, 1/4"	8
44	32-0821-655	KIT, ANGLE IRON, SUPER CABINET BASE	1