

HOT WATER SANITIZING UPRIGHT DOOR DISHMACHINE

Manufactured in the United States by:



INSTALLATION & OPERATION MANUAL

FOR ECOLAB MODELS:

ES-2000HT INTL





ES-2000HT INTL

ES-2000HT - Hot water sanitizing, electrically-heated export model dishmachine

Model: _____

Serial No.: _____

Installation Date: _____

Service Rep. Name: _____

Phone No.: _____

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SECTION 1: SPECIFICATION INFORMATION

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SPECIFICATIONS

PERFORMANCE/CAPABILITIES

OPERATING CAPACITY (RACKS/HOUR)

RACKS PER HOUR (NSF RATED)	55
DISHES PER HOUR	1375
GLASSES PER HOUR	1375

OPERATING CYCLE (SECONDS)

WASH TIME	41
RINSE TIME	11
TOTAL CYCLE TIME	62

TANK CAPACITY (GALLONS)

WASH TANK (MINIMUM)	1.25
BOOSTER TANK	6

WASH PUMP CAPACITY

GALLONS PER MINUTE	55
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TEMPERATURES

WASH---°F (MINIMUM)	150
RINSE---°F (MINIMUM)	180

ELECTRICAL REQUIREMENTS

WASH PUMP MOTOR HORSEPOWER 3/4

NOTE: Typical Electrical Circuit is based upon (1) 125% of the full amperage load of the machine and (2) typical fixed-trip circuit breaker sizes as listed in the NEC 2002 Edition. Local codes may require more stringent protection than what is displayed here. Always verify with your electrical service contractor that your circuit protection is adequate and meets all applicable national and local codes. These numbers are provided in this manual simply for reference and may change without notice at any given time.

<u>VOLTS</u>	<u>PH</u>	<u>HZ</u>	<u>RINSE HEATER RATINGS</u>	<u>TOTAL AMPS</u>	<u>TYPICAL ELECTRICAL CIRCUIT</u>
380	3	50	14KW@230V WYE	23	30 AMP

WATER REQUIREMENTS

INLET TEMPERATURE (Minimum)	110°F
WATER LINE SIZE NPT (Minimum)	1/2"
DRAIN LINE SIZE NPT (Minimum)	2"
FLOW PRESSURE P.S.I.	20±5

FRAME DIMENSIONS

WIDTH	25 1/4"
DEPTH	25 1/4"
HEIGHT	66 1/4"
STANDARD TABLE HEIGHT	34"
MAXIMUM CLEARANCE	19"

NOTE: Always refer to the machine data plate for specific electrical and water requirements. The material provided on this page is for reference only and may be subject to change without notice.

SECTION 1: SPECIFICATION INFORMATION

DIMENSIONS

LEGEND

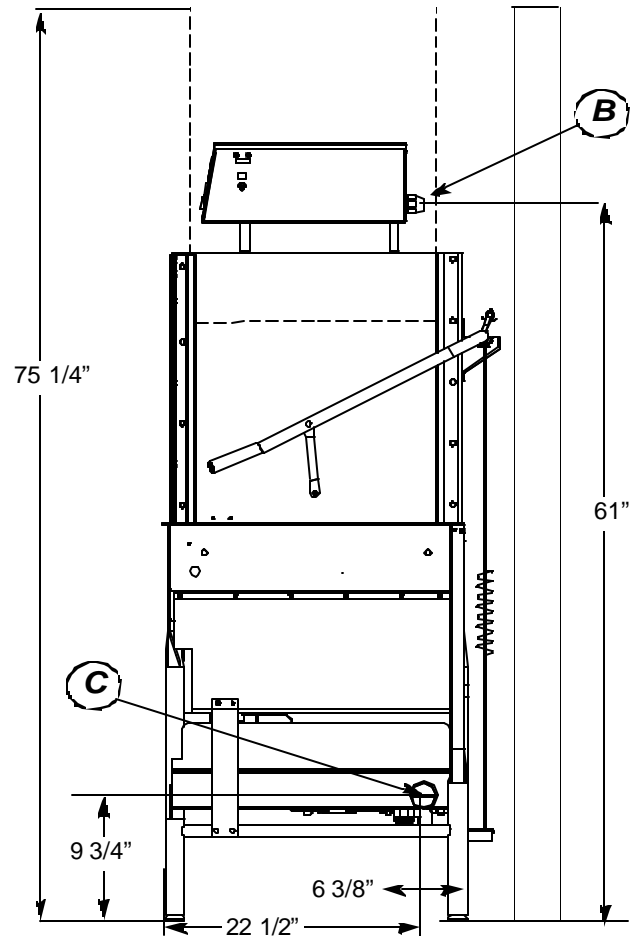
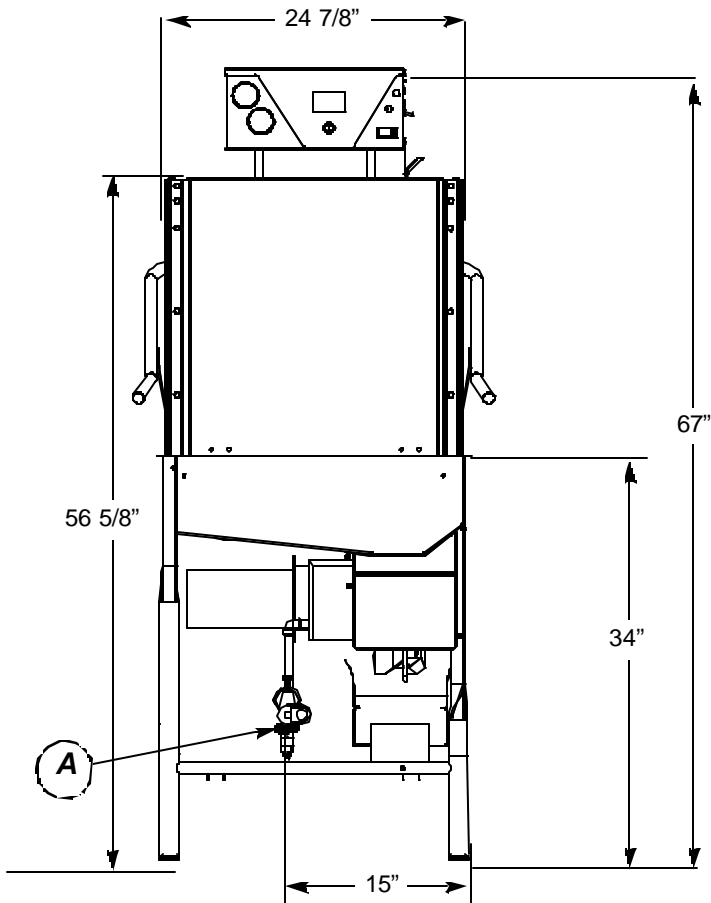
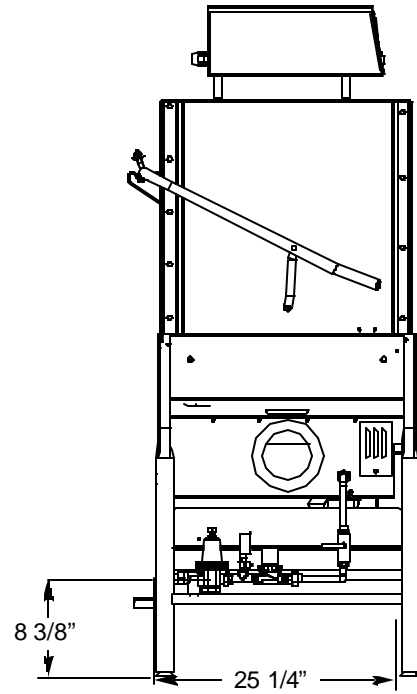
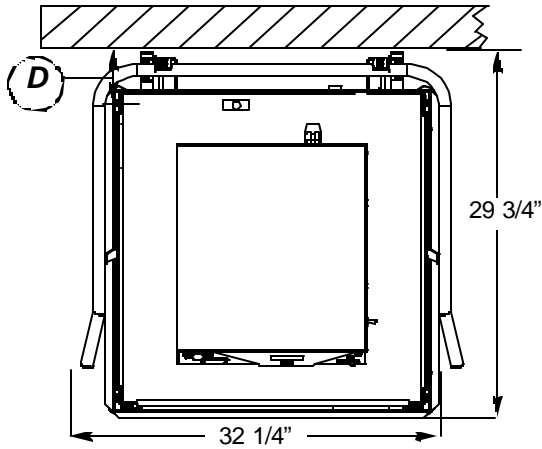
A- WATER INLET (1/2" NPT)

B- ELECTRICAL CONNECTION POINT

C- DRAIN (2" NPT)

D- STANDARD CLEARANCE BETWEEN MACHINE AND WALL (WITH DISHTABLE) IS 4".

NOTE: All vertical dimensions are +/- 1/2" due to adjustable feet.



SECTION 1: SPECIFICATION INFORMATION

TABLE DIMENSIONS

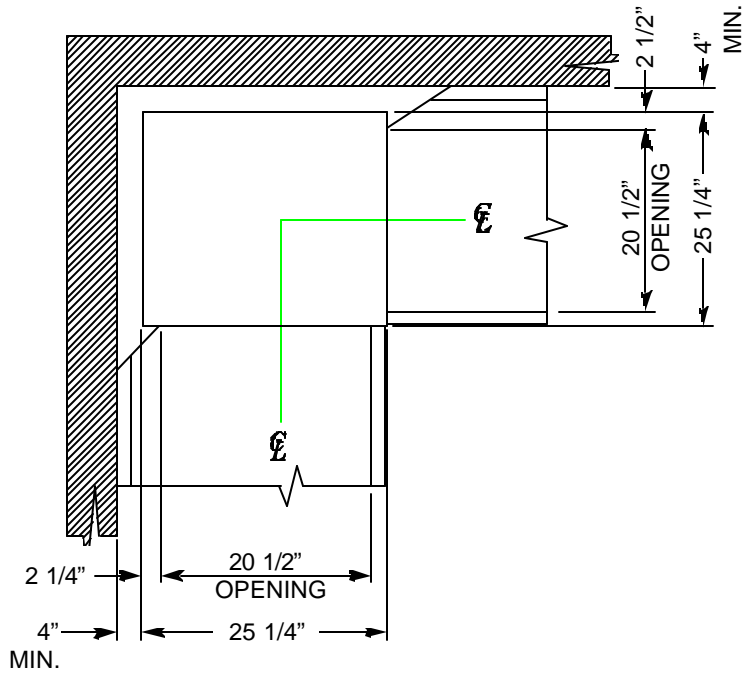


TABLE DIMENSIONS
CORNER INSTALLATION

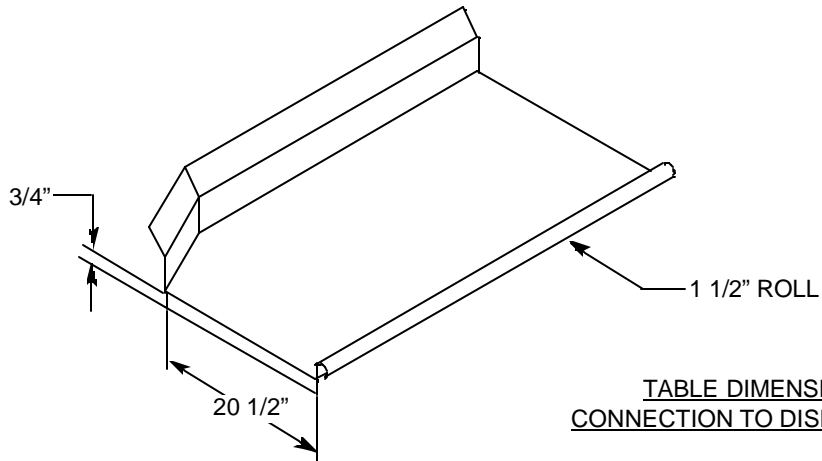


TABLE DIMENSIONS
CONNECTION TO DISHWASHER

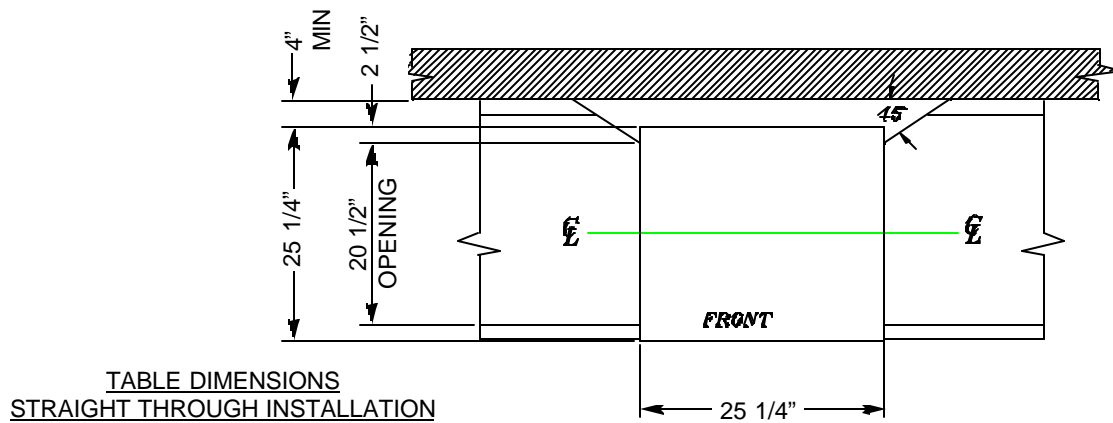


TABLE DIMENSIONS
STRAIGHT THROUGH INSTALLATION

**SECTION 2:
INSTALLATION/OPERATION
INSTRUCTIONS**

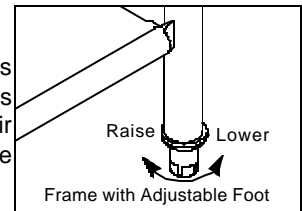
SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS

INSTALLATION INSTRUCTIONS

VISUAL INSPECTION: Before installing the unit, check the container and machine for damage. A damaged container indicates that there may be some damage to the machine. If there is damage to both the container and machine, do not throw away the container. The dishmachine has been inspected and packed at the factory and is expected to arrive to you in new, undamaged condition. However, rough handling by carriers or others may damage the unit while in transit. If this situation occurs, do not return the unit to Ecolab; contact the carrier and ask them to inspect the damage to the unit and to complete an inspection report. You must contact the carrier within 48 hours of receiving the machine.

UNPACKING THE DISHMACHINE: Once the machine has been removed from the container, ensure that there are no missing parts from the machine. This may not be obvious at first. If it is discovered that an item is missing, contact your Ecolab representative immediately to have the missing item shipped to you.

LEVEL THE DISHMACHINE: The dishmachine is designed to operate while being level. This is important to prevent any damage to the machine during operation and to ensure the best results when washing ware. The unit comes with adjustable bullet feet, which can be turned using a pair of channel locks or by hand if the unit can be raised safely. Ensure that the unit is level from side to side and from front to back before making any connections.



PLUMBING THE DISHMACHINE: All plumbing connections must comply with all applicable local, state, and national plumbing codes. The plumber is responsible for flushing the incoming water line prior to connecting it to remove all foreign debris that may get trapped in the valves or cause an obstruction.

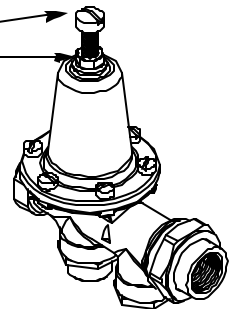
CONNECTING THE DRAIN LINE: The ES-2000HT drain requires a minimum of 2" NPT piping that is pitched at least 1/4" per foot. There must also be an air gap between the machine drain line and the floor sink or drain. If a grease trap is required by code, it should have a flow capacity of 5 gallons per minute.

WATER SUPPLY CONNECTION: Read the section entitled "PLUMBING THE DISHMACHINE" above before proceeding. Install the water supply line (1/2" pipe size minimum) to the dishmachine line strainer using copper pipe. It is recommended that a water shut-off valve be installed between the main supply and the machine to allow access for service. The water supply line must be capable of 20 ± 5 PSI "flow" pressure at the recommended temperature indicated on the data plate.

A water pressure regulating valve (PRV) is included as a standard item on the ES-2000HT. The pressure of the incoming water should be adjusted to 20 ± 5 PSI (flow) by turning the adjustment screw on the top of the PRV (clockwise to increase pressure, counter-clockwise to decrease pressure). This adjustment must only be done while the incoming water fill solenoid valve is open.

Do not confuse static pressure with flow pressure. Static pressure is the line pressure in a "no flow" condition (all valves and services are closed). Flow pressure is the pressure in the fill line when the fill valve is opened during the cycle.

Adjusting screw
Locking nut



Incoming Plumbing Connection

It is also recommended that a shock absorber (not supplied) be installed in the incoming water line. This prevents line hammer (hydraulic shock), induced by the solenoid valve, from causing damage to the equipment.

PLUMBING CHECK: Slowly turn on the water supply to the machine after connecting the incoming fill line and the drain line. Check for leaks and repair as required. Leaks must be repaired prior to placing the machine in operation.

SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS

ELECTRICAL INSTALLATION INSTRUCTIONS

ELECTRICAL POWER CONNECTION: Electrical and grounding connections must comply with the applicable portions of the National Electrical Code ANSI/NFPA 70 (latest edition) and/or other electrical codes.

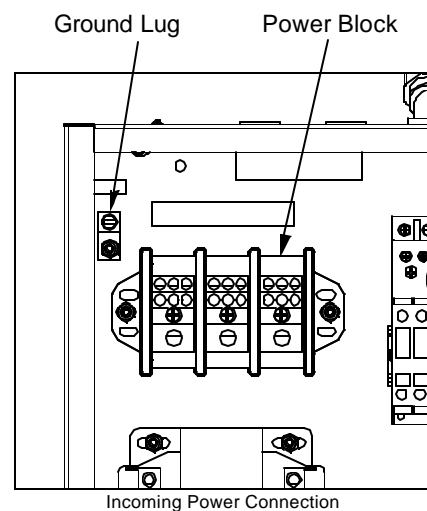
Disconnect electrical power supply and lockout the disconnect switch to indicate that you are working on the circuit.

The dishmachine data plate is located on the right side front of the machine. Refer to the data plate machine voltage, total amperage load and serial number.

To install the incoming power lines, open the lower control box by removing the control box lid. Install 3/4" conduit into the pre-punched holes in the back of the control box. Route power wires and connect to power block and grounding lug. Install the service wires (L1, L2 & L3 (Where applicable)) to the appropriate terminals as they are marked on the terminal block. Install the grounding wire into the lug provided.

It is recommended that "DE-OX" or another similar anti-oxidation agent be used on all power connections.

VOLTAGE CHECK: Apply power to the dishmachine. **Note: Do not turn the machine on.** Check the incoming power at the terminal block and ensure it corresponds to the voltage listed on the data plate. If not, contact a qualified service agency to examine the problem. Do not run the dishmachine if the voltage is too high or low. Shut off the service breaker and mark it as being for the dishmachine. Advise all personnel of any problems and of the location of the service breaker. Replace the control box cover and tighten the screws.



SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS

OPERATING INSTRUCTIONS

OPERATIONAL START-UP & CHECK: Before proceeding with start-up, verify the following:

1. Open the doors and verify that the pump intake strainer is correctly installed in the sump.
2. Check that the upper and lower rinse arms are securely screwed into their receptacles.
3. Check that the plugs are securely screwed into the ends of both wash arms and the rinse arms.
4. Check that the wash arms are securely screwed into the stationary bases and that they rotate freely.
5. Verify that the drain stopper is correctly installed at the drain seat.

QUICK START GUIDE: After the initial installation of the machine:

1. Insert chemical feeder pump stiffeners into appropriate containers.
2. Turn on machine.

POWER UP: To energize electrically, proceed as follows:

- A. Turn on electrical power supply at the circuit breaker.
- B. Check voltage at incoming terminals L1, L2 & L3. The voltage measured at these points should match data plate voltage.
- C. If voltages are in required range, close the control box cover.



3. Before enabling the booster heater, the booster heater tank must first be filled with water.

TO FILL BOOSTER HEATER WITH WATER:

4. Press and hold the manual fill switch on the right side of the control box until you hear water being sprayed from the rinse arms, indicating that the rinse tank is filled with water.

TO ENABLE THE BOOSTER HEATER:

5. Connect the orange/white wire in the control box from the heater contactor to the orange/white wire on terminal board 2.



NOTE: Ensure the orange/white wires at the heater contactor are connected properly. They have been purposely disconnected at the factory to avoid damage to the heater element when there is no water in the booster tank.

6. Run a few machine cycles to verify the correct operation of the machine.

Check for water leaks.

Verify that the rinse temperature is between 180°F and 195°F for the entire rinse sequence. If it is not, before adjusting the rinse thermostat, verify that the incoming water temperature is 110°F minimum and that the incoming water flow pressure is 20 ± 5 psi (measured during the rinse sequence). Adjust the pressure regulating valve as necessary to achieve 20 ± 5 psi.

TO FILL WASH TUB: To Fill Wash Tub depress the "On -Off" switch to the "On" position. Depress and hold Fill Switch until you see water draining out from the bottom of the machine. Open door for 3 seconds and close, this will start machine cycle. Allow machine to complete one cycle, and then check for proper water level.

Note: Water must be in the sump while the machine is running to avoid running the pump dry and causing damage to the pump seal.

If the water level is not at the level noted above it will require adjustment. Check to ensure that the recommended water pres-

SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS

OPERATING INSTRUCTIONS (CONTINUED)

sure is being supplied to the machine (20 ±5 PSI is required). If the water pressure is correct then the fill valve control will need adjustment. Use the following steps to adjust the timer.

- A. Open control box cover
- B. Locate the electronic timer.
- C. Refer to the next page for adjustment to the electronic timer.

NOTE: The machine must run a complete cycle to drain and fill. If the machine is not allowed to drain, the water will build up inside the tub. After the initial fill, the rinse water for the current cycle will become the wash water for the next cycle.

The dishmachine is now ready to proceed with the washing of dishes.

PREPARING DISHES: Preparation of the ware will help ensure good results and less re-washes. If not done properly the dishes will not be clean and will reduce the efficiency of the dishmachine.

The following steps should be followed to ensure good results:

- A. Remove all scraps and gross soil into a garbage can.
- B. Separate and pre-soak silverware.
- C. Separate and pre-soak the egg and casserole dishes.
- D. Scrape all ware with a brush or spatula.
- E. Flush cups, bowls and glasses with running water.
- F. Prewash dishware by soaking or spraying with a pre-rinse hose.
- G. Place dishes and cups in dish rack. Cups should be upside down (so they don't hold water).
- H. Place glasses and flatware in their respective racks. Scatter flatware loosely in rack. Glasses should be placed upside down in a properly sized rack. For optimal results, flatware should be washed twice, the first being horizontal, the second in a special rack to hold flatware vertical.

DAILY MACHINE PREPARATION: Before proceeding with start-up, verify the following:

- A. Open door and verify that the sump strainer is in place in the sump.
- B. Verify that the drain stopper is in position.
- C. Check that the plugs are securely screwed into the ends of all wash arms.
- D. Check that the wash arms are securely screwed into the stationary bases and rotate freely.
- E. Check levels in all chemical containers and replace if empty.
- F. For initial fill, close doors then depress the "FILL" switch to the "FILL" position.

WASHING A RACK OF WARE:

- A. Open doors, place a full rack into the machine, and close doors. Unit will start automatically.
- B. After cycle is completed open doors and remove rack.
- C. Place another full rack into the dishmachine, and close doors.
- D. Dishmachine will repeat cycle.

SHUT DOWN AND CLEANING:

- A. At the end of mealtime, move the "OFF/ON" switch to the "OFF" position.
- B. Open doors and manually remove drain stopper to drain the unit.
- C. Remove and clean upper and lower wash arms.
- D. Remove and clean the sump strainer.

SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS

TIMER PROGRAMMING INSTRUCTIONS FOR (FOR INSTALLATION TECHNICIAN ONLY)

To access the programming mode, the machine must be ON, and idle (between cycles).

On the timer board, press and hold both the MOVE and ENTER buttons on the timer board simultaneously for two seconds.

The PROGRAM light will illuminate.

Once in the programming mode, the MOVE button is used to scroll between the programming categories and the ENTER button is used to select the category.

Press the MOVE button to move the blinking light between FILL, RINSE AID, DETERGENT or SANITIZER.

Press the ENTER button for the chosen category.

The PROGRAM light will illuminate.

To change the value of a parameter, use the MOVE button to illuminate the light next to the time option (time is in seconds). In the time categories, each second in use will light up. To deselect the option, press ENTER and the light will go off, press ENTER again and it will illuminate. Once you have set your time category, press the MOVE button to the ACCEPT option and press ENTER. This will save the changed parameters.

Once you press the ENTER button when the ACCEPT option is illuminated, you will exit the programming mode. To change any other values, you will have to return to the programming mode. To revert back to a previous setting, you must return to that option and change the parameter back to the previous setting.

Once in the programming mode, if there have been no keypad inputs for approximately 2 minutes, the system will automatically exit out of the programming mode. Any changes to parameters will be saved when the programming mode is automatically exited.

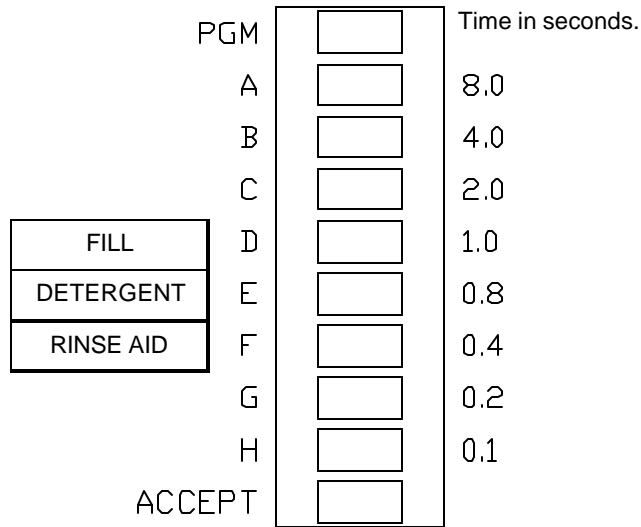
The wash and drain settings are not adjustable.

All time adjustments are in seconds. Refer to the chart on the next page for the adjustable outputs.

SECTION 2: INSTALLATION/OPERATION INSTRUCTIONS
TIMER PROGRAMMING INSTRUCTIONS FOR (FOR INSTALLATION TECHNICIAN ONLY)

Please note that options A, B, C, G and H are not adjustable outputs.

Timer Programming Board



SECTION 3: PREVENTATIVE MAINTENANCE

SECTION 3: PREVENTATIVE MAINTENANCE

PREVENTATIVE MAINTENANCE

The dishmachines covered in this manual are designed to operate with a minimum of interaction with the operator. However, this does not mean that some items will not wear out in time.

There are many things that operators can do to prevent catastrophic damage to the dishmachine. One of the major causes of component failure has to do with prescrapping procedures. A dishmachine is not a garbage disposal; any large pieces of material that are put into the machine shall remain in the machine until they are either broken up (after spreading out on your ware!) or physically removed. Strainers are installed to help catch debris, but they do no good if they are clogged. Have operators regularly inspect the pan strainers to ensure (1) that they are free of soil and debris and (2) they are laying flat in the tub.

When cleaning out strainers, do NOT beat them on waste cans. The strainers are made of metal and can be forgiving; but once severe damage is done, it is next to impossible for the strainer to work in the way it was designed to. Wipe out strainers with a rag and rinse under a faucet if necessary. For stubborn debris, a toothpick should be able to dislodge any obstructions from the perforations. Always ensure that strainers are placed back in the machine before operation and that they lay flat in the tub.

You may wish to contact your Ecolab representative in order to learn more about how your water hardness will effect the performance of your machine. Hard water makes dishmachines work harder and decreases efficiency.

Again, it is important to remind operators that trying to perform corrective maintenance on the dishmachine could lead to larger problems or even cause harm to the operator. If a problem is discovered; secure the dishmachine using proper shut down procedures as listed in this manual and contact your Ecolab representative.

Some problems, however, may have nothing to do with the machine itself and no amount of preventative maintenance is going to help. A common problem has to do with temperatures being too low. Verify that the water temperatures coming to your dishmachine match the requirements listed on the machine data plate. There can be a variety of reasons why your water temperature could be too low and you should discuss it with your Ecolab representative to determine what can be done.

By following the operating and cleaning instructions in this manual, you should get the most efficient results from your machine. As a reminder, here are some steps to take to ensure that you are using the dishmachine the way it was designed to work:

1. Ensure that the water temperatures match those listed on the machine data plate.
2. Ensure that all strainers are in place before operating the machine.
3. Ensure that all wash and/or rinse arms are secure in the machine before operating.
4. Ensure that drains are closed/sealed before operating.
5. Remove as much soil from dishes by hand as possible before loading into racks.
6. Do not overfill racks.
7. Ensure that glasses are placed upside down in the rack.
8. Ensure that all chemicals being injected to machine have been verified as being at the correct concentrations.
9. Clean out the machine at the end of every workday as per the instructions in the manual.
10. Always contact your Ecolab representative whenever a serious problem arises.
11. Follow all safety procedures, whether listed in this manual or put forth by local, state or national codes/regulations.

SECTION 4: TROUBLESHOOTING

SECTION 4: TROUBLESHOOTING

COMMON PROBLEMS



This trouble-shooting guide will help identify failed components. Before replacing a component that has been identified as faulty, double-check the wiring to and from the component, to ensure that the problem is not first caused by a loose or open connection.

Inspection, testing and repair of electrical equipment should be performed only by qualified service personnel. Certain procedures in this section require electrical tests or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power, attach test equipment and reapply power to test. When replacing electrical parts, disconnect power at source circuit breaker.

Problem: Machine will not turn on.

1. No power to dishmachine.
 - a. Check that service disconnect supplying power to the machine is ON.
 - b. Measure voltage at terminal block in lower control box. If no voltage exists, or the voltage does not match the voltage indicated on the machine's data plate, seek the assistance of a qualified electrician.



Rinse booster tank must be filled with water before the heater is enabled to prevent damage to the heater element.

Problem: The temperature of the rinse water is too low, or the wash is being extended too often (when this feature is enabled).

1. Incoming water pressure and/or temperature are not within required specifications. Check the temperature of the incoming water. It must be 110°F minimum. Check the flow pressure of the incoming water (observe the indication on the pressure gauge on the incoming water line when the incoming water solenoid valve is open). The pressure must be between 15 and 25 psi.
2. Rinse tank temperature setting is too low, or heater element has been disabled. It should typically be set at approximately 185°F, depending on the operating parameters at the particular installation. Confirm that the heater element has been enabled.
3. The rinse tank heating element is faulty. Using a clamp-type amp probe, measure the amperage through each coil of the heater element wires. The amperage should be approximately equal through each coil. If not, replace the heater element. An alternate method of checking the heater element is to first disconnect power to the machine, and then disconnect all wires at the heater element. Measure the resistance of each coil of the heater element. The resistance measurements should be approximately equal through each coil.

Problem: Machine will not fill or rinse.

1. The incoming water line is blocked, preventing water from entering the machine. Check and, if necessary, clean the Y-strainer on the incoming water line.
2. The incoming water solenoid valve is faulty. Replace solenoid valve.

Problem: Wash pump motor will not run.

1. The wash pump motor is faulty. If you hear the contactor engage when you try to manually run the pump and the pump does not run, the pump motor is faulty and must be replaced. The motor contains integral thermal overload protection devices. If the motor becomes hot from excessive loads, these devices open the electrical circuit within the motor and prevent the motor from running. Before replacing the motor, allow it to cool so that the overload devices can reset themselves, and then re-test the motor. If the motor still does not run, replace the motor.

Problem: Machine runs with the doors open.

1. Door switch is faulty. Disconnect the door switch leads and check for continuity between the two leads when the doors are open. If continuity, replace door switch.

Problem: Machine will not drain. Drain mechanism does not move up or down.

1. Loose wire connection. Verify that all wire connections are tight.
2. Drain hole may be obstructed. Remove the obstruction.
3. Drain rod bent or binding. Repair the rod, or replace as necessary.

SECTION 4: TROUBLESHOOTING

COMMON PROBLEMS

5. Faulty timer. After wash when drain should occur check voltage between blue/red and red wires. If no voltage check wires and connectors for continuity, if okay, replace timer.

Problem: Machine fills continuously, either when machine is off or on.

1. Faulty water solenoid valve.
 - a. First check that valve is installed correctly relative to flow direction (there is an arrow on the valve body which indicates the direction of flow).
 - b. Valve is stuck in open position or damage has occurred to the diaphragm within the valve. Replace valve.

Problem: Dishmachine will not run with power switch in the "ON" position.

1. Check secondary voltage on control transformer. If no voltage, check voltage to primary. Voltage "yes" replace transformer if no check circuit breaker for continuity if open reset. If it cannot be reset replace it.
2. Check power switch. With switch on, check for voltage between WHITE and RED wires. If no voltage, replace switch.
3. Check door switch. With the door open, check for voltage between the GREY and RED wires. If no voltage, replace the door switch.
4. Check timer for blinking light on light bar. If there is no light, check voltage to J1-9 and J1-10. If there is no voltage check wires and connector for continuity, if okay replace timer.

Problem: Dishmachine will not cycle with power switch in the "ON" position, works only in Delime Mode.

1. Check timer for blinking light on light bar. If there is no light, check voltage to J1-9 and J1-10. If there is no voltage check wires and connector for continuity, if okay replace timer.

Problem: Dishmachine cycles continuously.

1. Dishmachine is in Delime Mode. Put the NORMAL/DELIME switch in the "NORMAL" position.

Problem: Dishmachine will not fill, though other functions work.

1. Y-strainer on incoming water line plugged or clogged. Remove strainer and clean out.
2. Water supply valve(s) turned off. Turn the valve(s) on.
3. Faulty solenoid valve diaphragm. Replace diaphragm, clean foreign material out of valve body and orifices.
4. Faulty solenoid coil. If the coil has voltage, replace the coil.
5. Faulty timer. During fill, measure the voltage between the BLUE and RED wires. If it reads 120 volts, timer is okay. If there is no voltage check wires and connector for continuity, if okay replace timer.

Problem: Dishmachine fills continuously, even without power applied to the machine.

1. Solenoid valve dirty or faulty. Clean valve or replace faulty parts as required.

Problem: Dishmachine fills continuously, only when power is supplied to the machine.

1. Faulty fill switch. Check continuity of fill switch, if closed replace.
2. Faulty timer, check voltage between J3-5 and RED wire if always reads voltage replace timer.

Problem: The wash motor does not run, other functions work.

1. Loose wire connection to timer or contactor. Tighten wires as required.
2. Faulty wash relay. Check the voltage at the relay coil between the YELLOW and RED wires. If you read 120 volts and contacts do not pull in, then the coil is faulty. Replace the wash relay.
3. Faulty timer. During wash check voltage between yellow and red wires. If no voltage check wires and connectors for continuity, if okay, replace timer.

SECTION 4: TROUBLESHOOTING

COMMON PROBLEMS

Problem: Wash motor runs continuously.

1. NORMAL/DELIME switch is in "DELIME" position. Place the switch in the "NORMAL" position.
2. Wash relay welded closed. Turn the machine off. If the wash relay doesn't release, replace contactor.
3. Faulty timer, check voltage between J3-2 and RED wire if always reads voltage replace timer.

Problem: Low wash water pressure.

1. Water level is too low. Increase the fill time, or decrease the drain time, and verify that incoming water pressure is 20A5 PSI.
2. Sump strainer clogged. Clean and re-install.
3. Obstruction in either the wash pump housing or the wash manifold. Disassemble and clear obstruction.
4. Clogged wash arm nozzles. Remove the wash arms, clean the nozzles, then re-install.

Problem: Dishmachine keeps tripping the service breaker.

1. The power supply may be shorting to ground. Check for loose wires or burned connections.
2. Pump impeller jammed. Clear the impeller.
3. Wash motor faulty. Check the motor voltage and amperage draw. If amperage draw is over 12 amps, replace the motor.
4. Heater faulty. Check amp draw on wires to element, if readings are not balanced, replace element.

Problem: Dishmachine will not hold water.

1. Faulty drain ball. Replace as necessary.
2. Drain hole may be obstructed. Remove the obstruction.
3. Drain rod bent or binding. Repair the rod, or replace as necessary.

Problem: Chemical pump(s) not feeding.

1. Push prime switch on dispenser. If pumps run check timer, if they don't run check pump motors for continuity, if open replace
2. Faulty timer. During fill, measure the voltage between the ORANGE/BLACK and RED wires and BLACK/YELLOW and RED wires. If it reads 120 volts, timer is okay. If there is no voltage check wires and connector for continuity, if okay replace timer.

SECTION 5: SERVICE PROCEDURES

SECTION 5: SERVICE PROCEDURES

RINSE SOLENOID VALVE REPAIR PARTS KIT

These dishmachines are equipped with electrical solenoid valves to allow for automatic fill and rinse. These valves are designed to specific tolerances and design aspects that must be met in order to function properly.

Ecolab offers repair kits for replacing some of the wear items associated with solenoid valves which will allow you to save money in that replacement of these parts can take place *without* removing the solenoid valve from the plumbing assembly.

The instructions provided here are for maintenance personnel only. Unauthorized persons should not attempt any of the steps contained in these instructions.

Warning: many of the instructions and steps within this document require the use of tools. Only authorized personnel should ever perform any maintenance procedure on the dishmachine!

PREPARATION

1. Power must be secured to the unit at the service breaker. Tag or lock out the service breaker to prevent accidental or unauthorized energizing of the machine.

2. Ensure that incoming water to the machine is secured either by use of a shut-off valve or disconnecting the incoming water line.

TOOLS REQUIRED

The following tools will be needed to perform this maintenance evolution:

1. Small flathead screwdriver
2. Medium flathead screwdriver
2. Needle nose pliers
3. 5/16" nutdriver
4. Channel locks
5. 12" pipe wrench

TIME REQUIRED

It is estimated that it will take (1) person twenty minutes to perform this task, not including all of the items indicated in the section entitled "PREPARATION".

IMPORTANT NOTES

1. Read these instructions thoroughly before attempting this maintenance evolution. Become familiar with the parts and what actions need to be taken. This will save time in the long run!

2. The procedures demonstrated in this manual are shown being performed on an ES-4400 rack conveyor dish-machine. The actual maintenance steps, however, apply to any Parker style solenoid valve found on a Ecolab dish-machine.

STEPS

1. Remove the top screw with the 5/16" nutdriver. Remove the screw and the data plate and set to the side.



Removing the top screw

2. With the top screw and data plate removed, grasp the solenoid coil and gently pull up. The coil should slide up, allowing you to remove it from the valve bonnet. If you are wanting to replace the coil, continue on with Step 3. If you are wanting to replace some of the internal components of the valve, proceed to step 12.

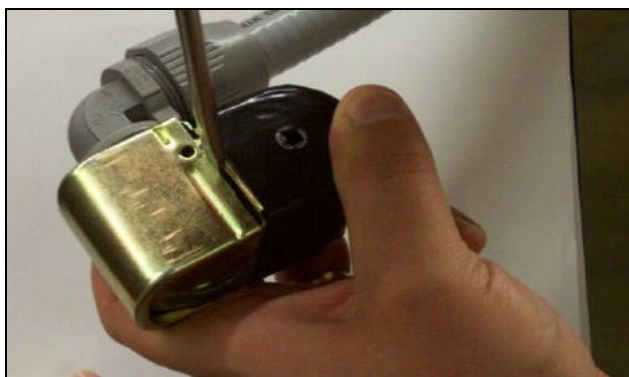


Removing the coil

3. **NOTE:** Replacing the solenoid coil requires working with the wiring of your machine. It is important that all wiring maintenance be performed by qualified personnel. Always verify the wiring steps presented in this instruction with the schematic that shipped with the unit. A current schematic can also be found in the unit's installation manual. Before beginning any step that involves working with wiring, ensure that the steps located in the section entitled "Preparation" have been performed. Power must be secured to the machine at the service breaker. Failure to do so could result in severe injury to maintenance personnel.

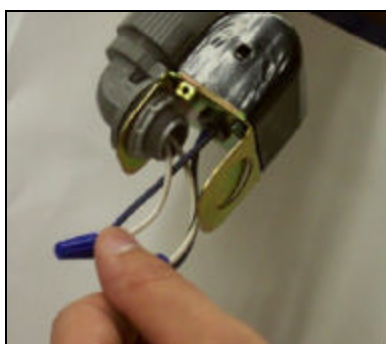
SECTION 5: SERVICE PROCEDURES

RINSE SOLENOID VALVE REPAIR PARTS KIT (CONTINUED)



Prying open the coil wire cover

4. When replacing the coil, ensure that when removing the coil wire cover that care is taken not to damage the wires inside. Using the medium flathead screwdriver, gently use it to open the cover enough to where it could be pulled off.



Straightening the wires

5. Once the coil wire cover has been removed and set to the side, take the internal wires and pull them out straight.



Removing the wire nuts

6. Remove the wire nuts from the wires and separate them.



Loosening the conduit nut

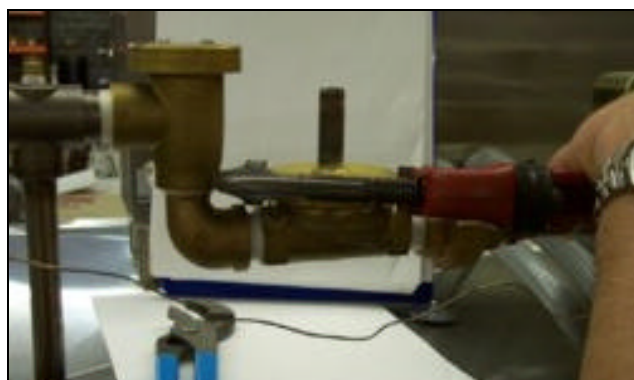
7. Using a pair of channel locks, gently loosen the conduit retaining ring for the conduit nut. Once it is loosened, use your fingers to unscrew and remove it.

8. Pull the conduit away and discard the bad coil. Take the new coil and attach the conduit, reinstall & tighten the conduit nut, and pull the wires through so that you will be able to wire the valve back up.

9. Reconnect the wires from the conduit to the wires from the solenoid as they had been connected previously. Ensure that the wire nuts are on tight.

10. Slide the coil wire cover back on, taking care not to damage the wires.

11. If you are done performing maintenance on the valve, continue on to step 23. Otherwise, please go on to step 12.L



Loosening the valve bonnet

12. To remove the valve bonnet, grasp it with the jaws of the pipe wrench and turn to the left. **Note:** on some models you may have to remove the valve in order to perform this and any further steps. Be careful not to damage the plumbing assembly. Only use the pipe wrench enough to where you can spin the valve bonnet off with your hand.

SECTION 5: SERVICE PROCEDURES

RINSE SOLENOID VALVE REPAIR PARTS KIT (CONTINUED)



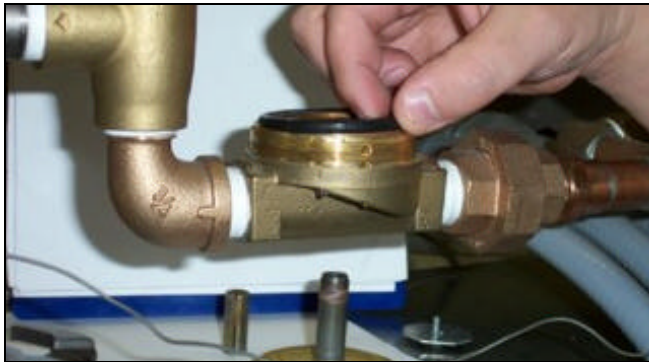
Removing the valve bonnet

13. Slowly remove the valve bonnet. **Note:** The spring for the plunger is located directly under the bonnet and may come free if you are not careful. Remove the plunger, spring and valve bonnet and place to the side.



Removing the diaphragm

17. Remove the diaphragm retainer and then the diaphragm itself. Many problems associated with a solenoid valve can be traced to a clogged pilot port in the diaphragm.

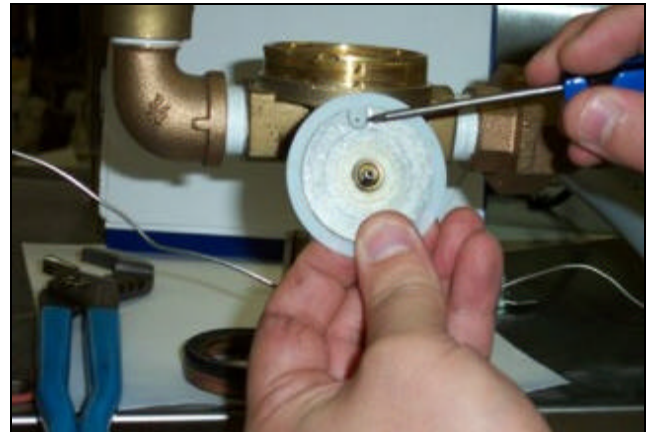


Removing the O-ring

14. Remove the O-ring and inspect it. If it has any tears or cuts or excessive flat spaces, it should be replaced.

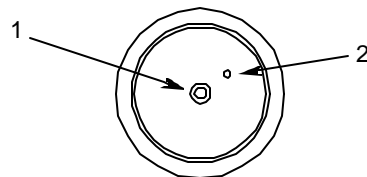
15. Examine the threads for the valve bonnet. Check them for scoring or signs of damage. Take a cloth and clean them out to remove any foreign particles that might get lodged in the threads and cause a leak. Severely damaged threads should not be repaired; instead it is recommended that the entire valve should be replaced. These instructions do not provide information on replacing the solenoid valve.

16. **Note:** Even though an O-ring may not appear damaged, it is a good idea to go ahead and replace it if you have a new one. This will help ensure that your valve remains leak-free in the future!



Pointing out the extension hole

18. As indicated in the photo above, the extension hole can become clogged. If it is difficult to clean out, you can use a heated straight pin to push through the hole. The center hole, the pilot port, must also be clear. If the diaphragm is torn or bent in any way, it must be replaced.



Diaphragm showing (1) pilot port and (2) extension hole

SECTION 5: SERVICE PROCEDURES

RINSE SOLENOID VALVE REPAIR PARTS KIT (CONTINUED)



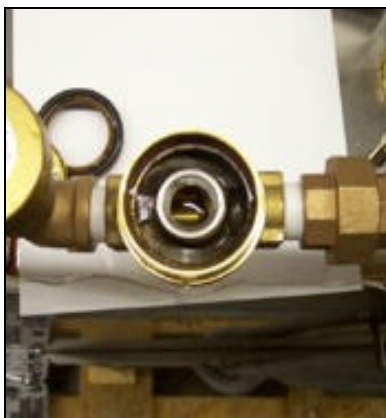
Removing the screen retainer

19. Using the small flathead screwdriver, lift out the screen retainer. Verify that the holes in it are free of clogs and debris.



Removing the mesh strainer screen

20. Again using the small flathead screwdriver, carefully remove the mesh screen from inside the valve body. The screen should be taken and rinsed out to remove any debris fouling it.



View inside the solenoid valve body

21. With the mesh screen removed, look down into the valve and verify it is not clogged. Remove any foreign objects from the valve body that would obstruct flow.

22. Reassemble the valve, reversing the steps needed to take it apart. Replace defective replacement parts with new parts from ordered kits. Ensure that components are sufficiently tightened to prevent leakage.

AFTER MAINTENANCE ACTIONS

Reconnect the incoming water (if disconnected) and turn on. Then restore power to the unit. Run the unit for at least 10 minutes to ensure there are no leaks. If any problems arise please contact your Ecolab representative.

SPECIAL PARTS

Repair kit includes: Plunger, Spring, O-ring, and Diaphragm.

Solenoid Valve Plunger Kit

Includes plunger and spring

Part number 06401-003-07-40

Solenoid Valve Diaphragm Kit

Includes diaphragm and o-ring

Part number 06401-003-07-41 (1/2" NPT)

Part number 06401-003-07-42 (3/4" NPT)

Solenoid Valve 110 Volt Coil and Housing

Part number 06401-003-07-43

Solenoid Valve 230 Volt Coil and Housing

Part number 06401-003-07-43

Complete Solenoid Valve

Part number 04810-100-12-18 (1/2", 110 Volt)

Part number 04810-100-09-18 (1/2", 230 Volt)

Part number 04810-100-53-00 (3/4", 110 Volt)

Part number 04810-100-03-18 (3/4", 230 Volt)

SECTION 5: SERVICE PROCEDURES

VACUUM BREAKER REPAIR PARTS KIT

These dishmachines are equipped with vacuum breakers to serve as back-flow prevention devices. ASSE requirements specify what type of back-flow prevention is necessary on dishmachines. Vacuum breakers, unlike air gaps, have certain parts that have specific tolerances and design aspects that must be met in order to function properly.

Ecolab offers repair kits for replacing some of the wear items associated with vacuum breakers which will allow you to save money in that replacement of these parts can take place *without* removing the vacuum breaker from the plumbing assembly.

The instructions provided here are for maintenance personnel only. Unauthorized persons should not attempt any of the steps contained in these instructions.

Warning: many of the instructions and steps within this document require the use of tools. Only authorized personnel should ever perform any maintenance procedure on the dishmachine!

PREPARATION

1. Power must be secured to the unit at the service breaker. Tag or lock out the service breaker to prevent accidental or unauthorized energizing of the machine.

2. Ensure that incoming water to the machine is secured either by use of a shut-off valve or disconnecting the incoming water line.

TOOLS REQUIRED

The following tools will be needed to perform this maintenance evolution:

1. Small flathead screwdriver
2. Needle nose pliers

TIME REQUIRED

It is estimated that it will take (1) person twenty minutes to perform this task, not including all of the items indicated in the section entitled "PREPARATION".

IMPORTANT NOTES

1. Read these instructions thoroughly before attempting this maintenance evolution. Become familiar with the parts and what actions need to be taken. This will save time in the long run!

STEPS

1. **Note:** These instructions only apply to vacuum breakers (1/2" NPT and 3/4" NPT) as pictured below. The repair kits indicated in these instructions will only work on those style of back-flow preventers. If you have a machine with a different style of vacuum breaker, contact your Ecolab representative about replacement components.



Vacuum breaker

2. **Note:** Even though the photos in these instructions show a vacuum breaker that has been removed from the plumbing assembly, these maintenance steps could be performed with it installed so long as the requirements in the section entitled "PREPARATION" have been met.

3. Remove the top cap by gripping firmly and turning to the left. The cap should come off after a few turns.



Removing the cap

4. Set the cap to the side.

5. Using the needle nose pliers, gently lift out the plunger and set to the side. Examine the brass seating surface inside the vacuum breaker. The plunger is required to sit flat on this surface so it must be free of defects, imperfections and the like. If there is debris, remove it. If it is chipped or cracked then the vacuum breaker must be replaced. Failure to do so may result in the vacuum breaker not working according to its design and could result in damage to the dishmachine.

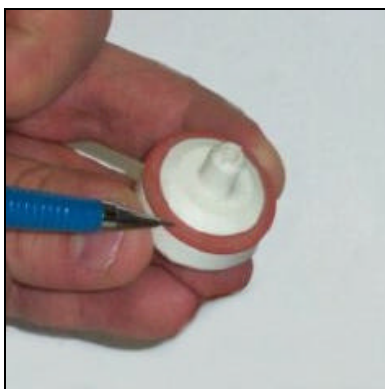
SECTION 5: SERVICE PROCEDURES

VACUUM BREAKER REPAIR PARTS KIT (CONTINUED)



Removing the plunger

6. Your repair kit comes with a new plunger. Examine the old one and ensure that the mating surface is not damaged or cut. Also inspect the rubber seal on the top of the plunger to ensure it is in good condition and not torn.



Examining the seal ring on the plunger



Examining the plunger seating surface

7. If any of these conditions are present, replace the old plunger with the new one from your kit. Verify that the new plunger is also free from defects. If it is not, contact your Ecolab representative immediately.

8. The plunger should drop into the vacuum breaker and seat. Ensure it is not flipped upside down (the orange seal ring should be up towards the top of the vacuum breaker).

9. Pick up the cap and examine it. With a soft towel, remove any grit, grime or debris that may have gotten caught in the threads of both the cap retainer or the vacuum breaker body. There is an O-ring that should be present on the cap retainer as well. Regardless of the condition of the plunger, this O-ring should be replaced once the cap is removed. Using a small flathead screwdriver, remove the old O-ring.



Replacing the O-ring

10. With the new O-ring in place, screw the cap back on the vacuum breaker body. The cap needs to only be hand tight (snug).

AFTER MAINTENANCE ACTIONS

1. Reconnect the incoming water (if disconnected) and turn on. Then restore power to the unit. Run the unit for at least 10 minutes to ensure there are no leaks. If any problems arise please contact your Ecolab representative.

SPECIAL PARTS

To order the kit with components and instructions:

Components of 1/2" Repair Kit
06401-003-06-23

Components of 3/4" Repair Kit
06401-003-06-24

SECTION 6: PARTS SECTION

SECTION 6: PARTS SECTION

STANDARD PARTS

HARDWARE- Stainless Steel

Description	Jackson No.
SCREW 4-40X1/4"	05305-002-32-38
SCREW 4-40X3/8"	N/A
SCREW 4-40X1/2"	N/A
SCREW 4-40X3/4"	N/A
SCREW 4-40 X 1"	N/A
SCREW 6-32X3/8"	N/A
SCREW 6-32X1/2"	N/A
SCREW 6-32X3/4"	05305-011-37-05
SCREW 6-32X1-1/2"	N/A
SCREW 8-32X3/8"	05305-172-02-00
SCREW 8-32X1/2"	05305-172-07-00
SCREW 8-32X5/8"	N/A
SCREW 8-32X3/4"	05305-172-06-00
SCREW 10-32X3/8"	05305-173-12-00
SCREW 10-32X1/2"	N/A
SCREW 10-32X3/4"	05305-011-62-17
SCREW 10-32X1"	N/A
SCREW 10-32X1-1/2"	N/A
SCREW 10-24X3/8"	05305-173-03-00
SCREW 10-24X1/2"	N/A
SCREW 10-24X3/4"	N/A
SCREW 10-24X1"	N/A
SCREW 10-24X6"	N/A
SCREW SOCKET 1/4-20X3/8"	N/A
SCREW 1/4-20X1/2"	05305-274-02-00
SCREW 1/4-20X5/8"	05305-274-24-00
SCREW 1/4-20X3/4"	05305-274-04-00
SCREW 1/4-20X1-1/2"	05305-274-23-00
SCREW 1/4-20X2-1/2"	05305-274-13-00
SCREW 3/8-16X3/4"	05306-011-71-60
SCREW 3/8-16X1-1/4"	05305-276-10-00
SCREW SOCKET 3/8-16X1-1/2"	N/A
SCREW 3/8-16X1-3/4"	05306-011-36-94
NUT HEX 4-40	N/A
NUT HEX 6-32	N/A
NUT HEX 8-32	N/A
NUT HEX 10-32	N/A
NUT HEX 10-24	N/A
NUT HEX 1/4-20	005310-274-01-00
NUT HEX 5/16-18	05310-275-01-00
NUT HEX 3/8-16	05310-276-01-00
NUT LOCK 4-40	N/A
NUT LOCK 6-32	05310-373-03-00
NUT LOCK 8-32	05310-272-02-00
NUT LOCK 10-32	05310-373-02-00
NUT LOCK 10-24	05310-373-01-00
NUT LOCK 1/4-20	05310-374-01-00

SECTION 6: PARTS SECTION

STANDARD PARTS (CONTINUED)

NUT LOCK 5/16-18	N/A
NUT LOCK 3/8-16	05310-011-72-55
WASHER FLAT 1/4	05311-002-78-93
WASHER FLAT 5/16	05311-175-01-00
WASHER FLAT 3/8	05311-176-01-00
WASHER LOCK #8	05311-272-01-00
WASHER LOCK #10	N/A
WASHER LOCK 1/4	05311-274-01-00
WASHER LOCK 5/16	05311-275-01-00
WASHER LOCK 3/8	05311-276-01-00
WASHER LOCK 1/2	05311-011-71-93
WASHER BEV 3/8 SQUARE	05311-011-35-36
PIN COTTER 1/16X1/2"	05315-011-68-56
PIN COTTER 3/32X3/4"	05315-207-01-00
PIN COTTER 1/8X3/4"	05315-011-60-09
PIN COTTER 1/8X1-1/2"	05315-002-05-86
PIN COTTER 3/16X1-3/4"	N/A
HAIR PIN	05315-002-15-39

HARDWARE MISC.

CABLE TIE 7"	05975-602-05-16
CABLE TIE 15" 100PK	N/A
CABLE TIE W/SCREW HOLE	N/A
GREASE SILICONE 3OZ TUBE	N/A
SILICONE CAULK WHITE 3OZ TUBE	N/A
TEFLON TAPE ROLL	N/A
ELECTRICAL TAPE	N/A
ENDCAP, DOOR HANDLE	05340-011-35-00
DOOR GUIDE, PLASTIC, 23 1/2" Long	05700-111-33-59

ELECTRICAL

CONDUIT 1/2"	05975-111-46-57
NUT, CONDUIT 1/2"	N/A
CONNECTOR, CONDUIT 1/2"	05975-011-45-13
ELBOW, 90DEG, CONDUIT 1/2"	05975-111-01-00
ELBOW 45DEG, CONDUIT 1/2"	05975-011-45-23
PLUG, PLASTIC 1/2"	N/A
PLUG, METAL 1/2"	N/A
PLUG, RUBBER 1/2"	N/A
PLUG, METAL 1-1/2"	N/A
HANGER, CONDUIT METAL	N/A
TERMINAL FEMALE 1/4" W/PIGGY BACK	N/A
TERMINAL FEMALE 1/4" 14-8GA	N/A
TERMINAL FEMALE 1/4" 16-14GA	N/A
TERMINAL FEMALE 1/4" 22-18GA	N/A
CONNECTOR BUTT SPLICE 16-14GA	N/A
CONNECTOR BUTT SPLICE 22-18GA	N/A
TERMINAL SPADE #8HOLE 16-14GA	N/A
TERMINAL SPADE #8HOLE 22-16GA	N/A
TERMINAL SPADE #10HOLE 14-16GA	N/A

SECTION 6: PARTS SECTION

STANDARD PARTS (CONTINUED)

TERMINAL SPADE .25HOLE 12-10GA	N/A
TERMINAL SPADE .25HOLE 16-14GA	N/A
TERMINAL EYELET #8HOLE 16-14GA	N/A
TERMINAL EYELET #10HOLE 16-14GA	N/A
WIRE NUT 18-12GA	N/A
WIRE NUT 14-10GA CRIMP	N/A

PLUMBING

THERMOMETER, SCREW-IN, ES2000/4000	06685-111-35-30
THERMOMETER, 96"LEAD, CONVEYOR	06685-111-68-49
GAUGE PRESSURE 0-30PSI, BOTTOM MOUNT	06685-011-64-29
GAUGE PRESSURE 0-100PSI, BOTTOM MOUNT	06685-111-88-34
GAUGE PRESSURE 0-100PSI, BACK MOUNT	06685-011-48-32
WASH ARM PRESSURE TEST KIT	N/A
NEEDLE VALVE, 1/4" PIPE	N/A
VALVE BALL 1/2"PIPE	N/A
VALVE GLOBE 1/2"PIPE	04820-100-15-00
VALVE BALL 3/4"PIPE	N/A
REGULATOR WATER 1/4"PIPE, 180F	04820-011-69-05
REGULATOR WATER 1/2"PIPE, 140F	04820-100-04-07
REGULATOR WATER 3/4"PIPE, 180F	04820-100-01-06
REPAIR KIT 3/4" WATER REGULATOR	N/A
STRAINER Y 1/2" PIPE	04730-217-01-10
STRAINER Y 3/4" PIPE	04730-717-02-06
SCREEN, COARSE 3/4"	N/A
SCREEN, FINE 3/4"	N/A

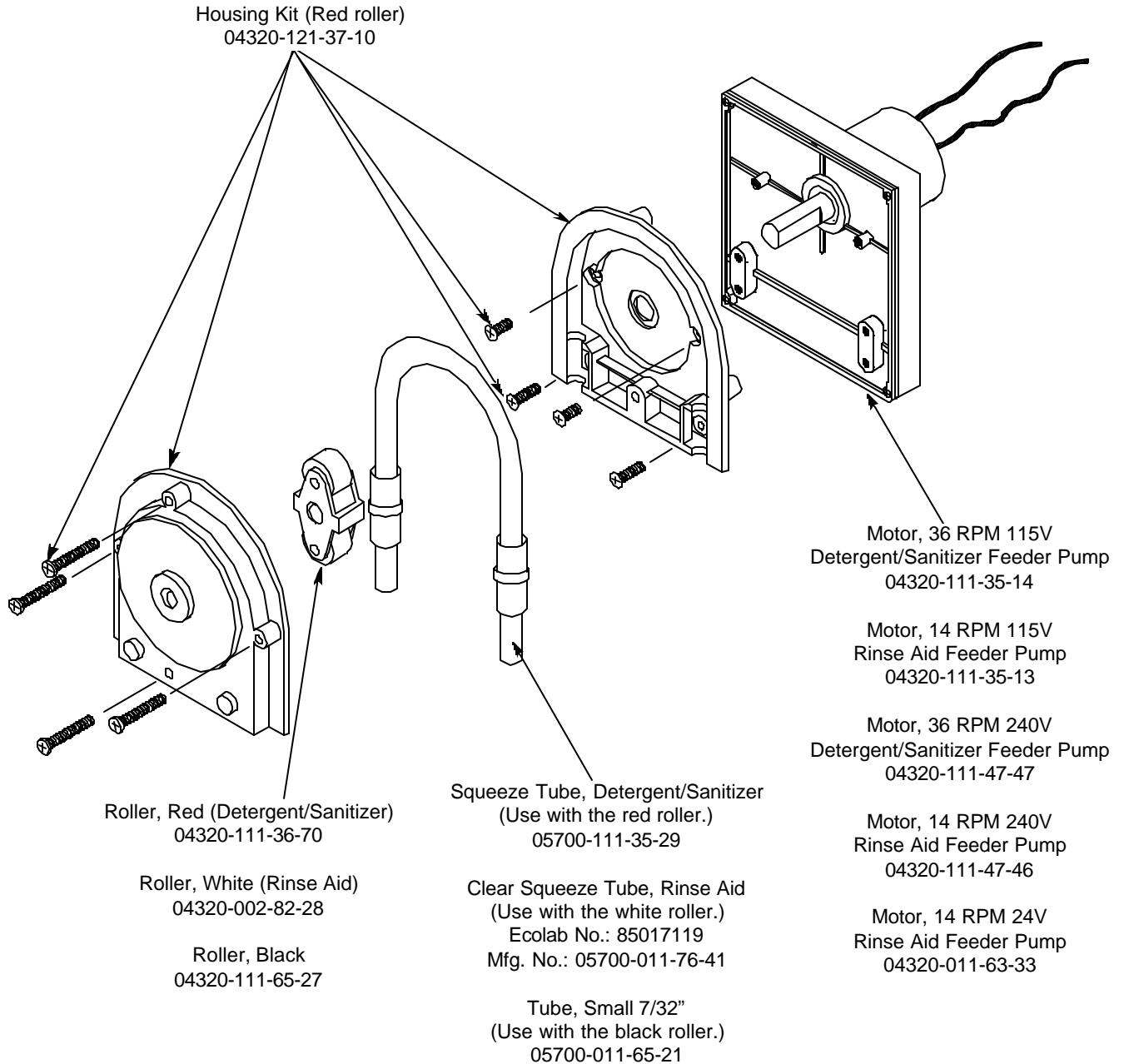
TUBING

TUBING 1/4" CLEAR	05700-011-37-12
TUBING 1/4" RED	05700-011-37-14
TUBING 1/4" BLUE	05700-011-37-16
COPPER TUBE 1/4" 50 FT	N/A
COPPER TUBE 3/8" 25 FT	N/A
COPPER TUBE 1/2" 50 FT	N/A

TUBING MISC.

WASH TANK CONNECTOR, 45DEG 1/2" HOSE	04730-002-69-80
WASH TANK CONNECTOR, 18DEG 5/8" HOSE	04820-111-51-14
WASH TANK CONNECTOR, 45DEG 5/8" HOSE	04730-011-45-21
CHECK VALVE, ELBOW, RINSE LINE	N/A
RINSE INJECTOR CHECK VALVE KIT	N/A
PICK-UP TUBE STIFFENER	05700-002-66-49
CLAMP, HOSE 7/32-5/8"	05700-000-35-06
CLAMP, HOSE 5/16-7/8"	04730-011-36-05
CLAMP, HOSE 11/16-1.5"	N/A
CLAMP, HOSE 7/8-2.75"	04730-719-01-37
CLAMP, HOSE 4.75-6.5"	04730-011-34-90

SECTION 6: PARTS SECTION
CHEMICAL FEEDER PUMP ASSEMBLY

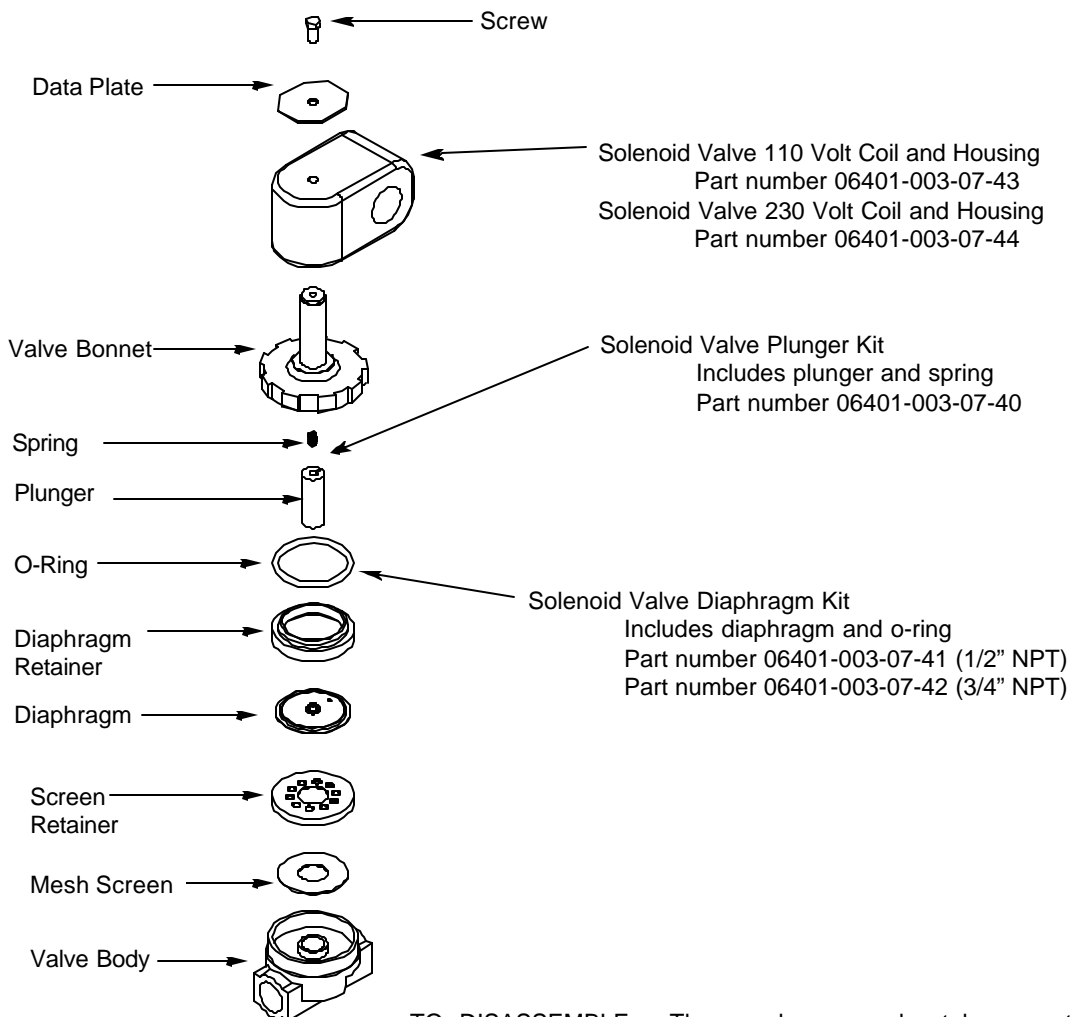


3/8" Sight Tube

05700-111-35-33

SECTION 6: PARTS SECTION

SOLENOID VALVE

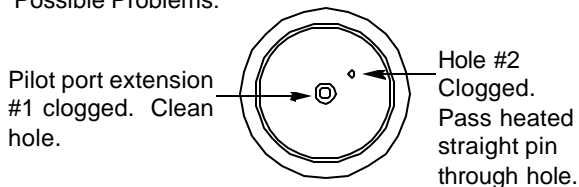


Complete Solenoid Valve
 Part number 04810-100-12-18 (1/2", 110 Volt)
 Part number 04810-100-09-18 (1/2", 230 Volt)
 Part number 04810-100-53-00 (3/4", 110 Volt)
 Part number 04810-100-03-18 (3/4", 230 Volt)

TO DISASSEMBLE - These valves may be taken apart by unscrewing the bonnet and the enclosing tube assembly from the valve body assembly. After unscrewing, carefully lift off the bonnet and enclosing tube assembly. Don't drop the plunger. The o-ring seal and diaphragm cartridge can now be lifted out. Be careful not to damage the machined faces while the valve is apart.

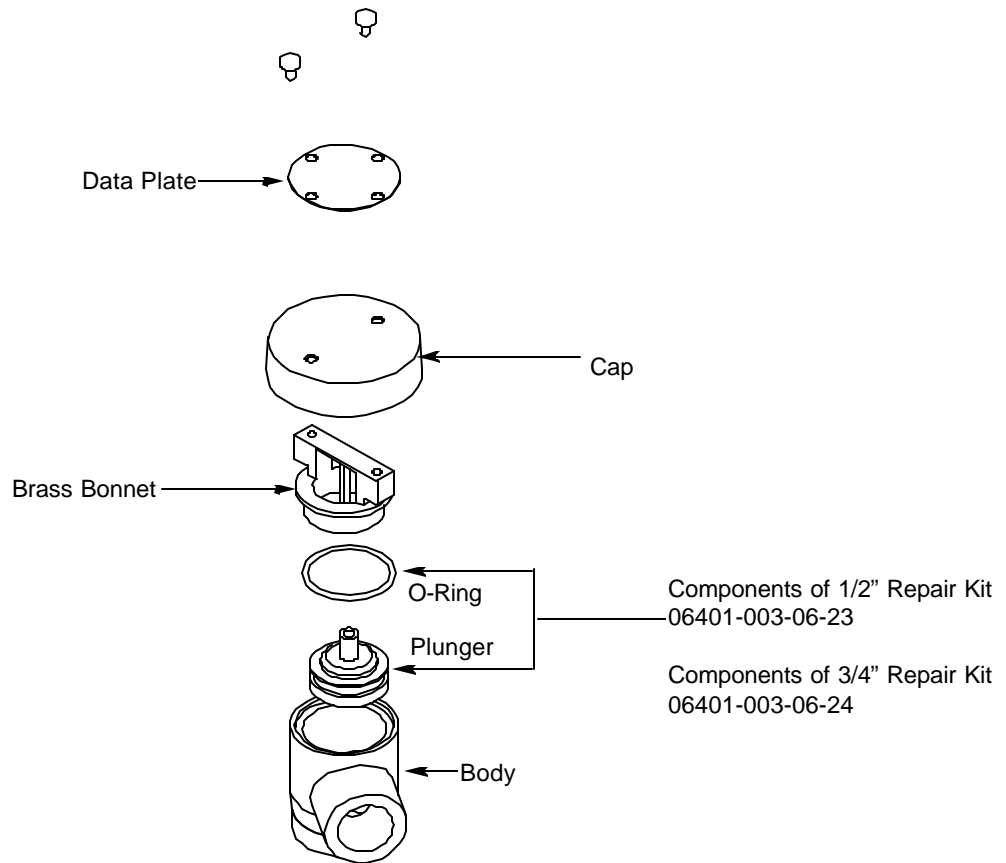
TO REASSEMBLE - Place the diaphragm cartridge in the body with the pilot port extension UP. Hold the plunger with the synthetic seat against the pilot port. Make sure the o-ring is in place, then lower the bonnet and enclosing tube assembly over the plunger. Screw the bonnet assembly snugly down on the body assembly.

Possible Problems:



SECTION 6: PARTS SECTION

VACUUM BREAKER REPAIR PARTS KITS



1/2" Complete Vacuum Breaker Assembly
04820-003-06-13

3/4" Complete Vacuum Breaker Assembly
04820-002-53-77

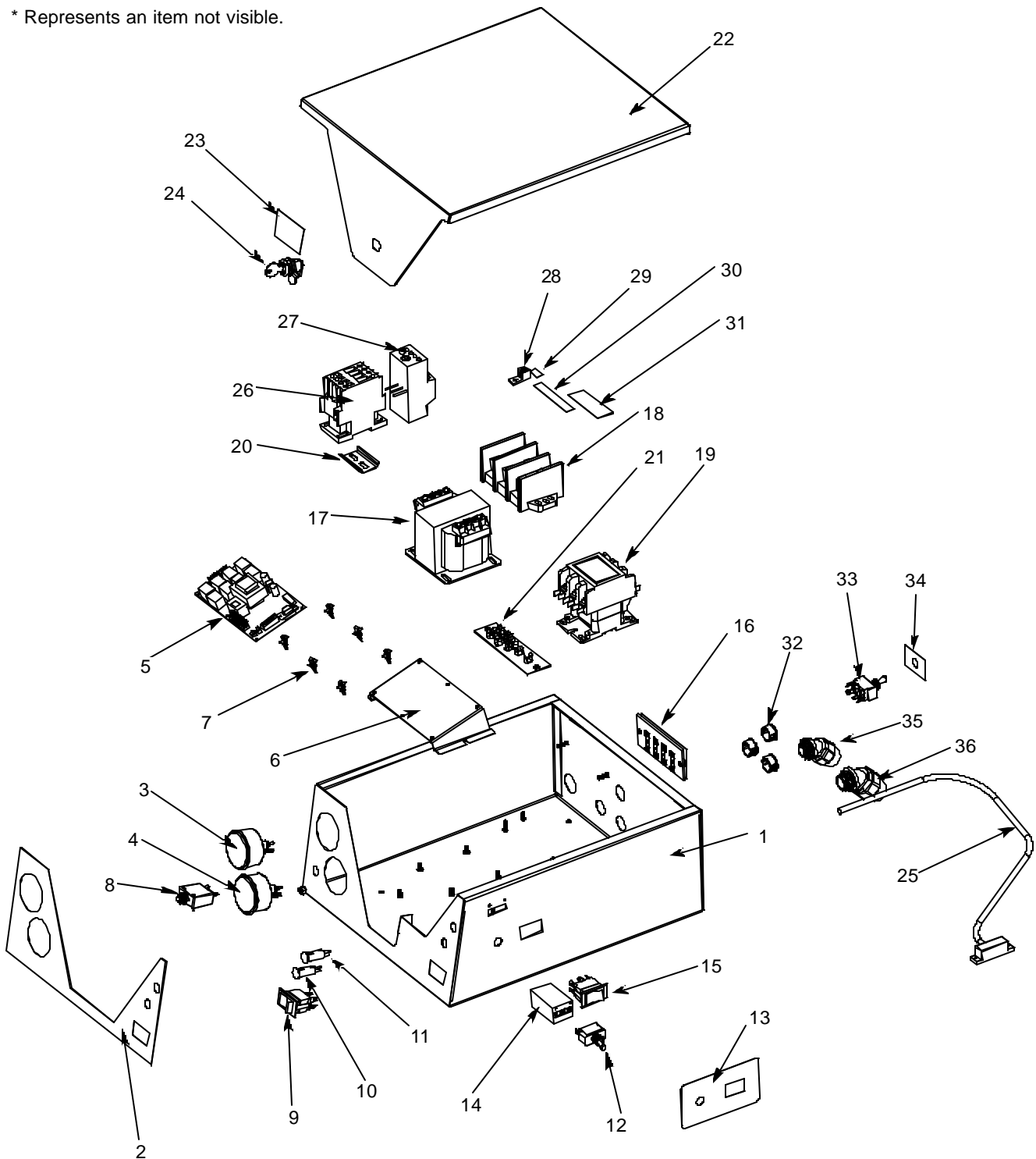
1/4" Complete Vacuum Breaker Assembly
04810-011-51-62

3/8" Complete Vacuum Breaker Assembly
04820-002-75-73

SECTION 6: PARTS SECTION

CONTROL BOX ASSEMBLY

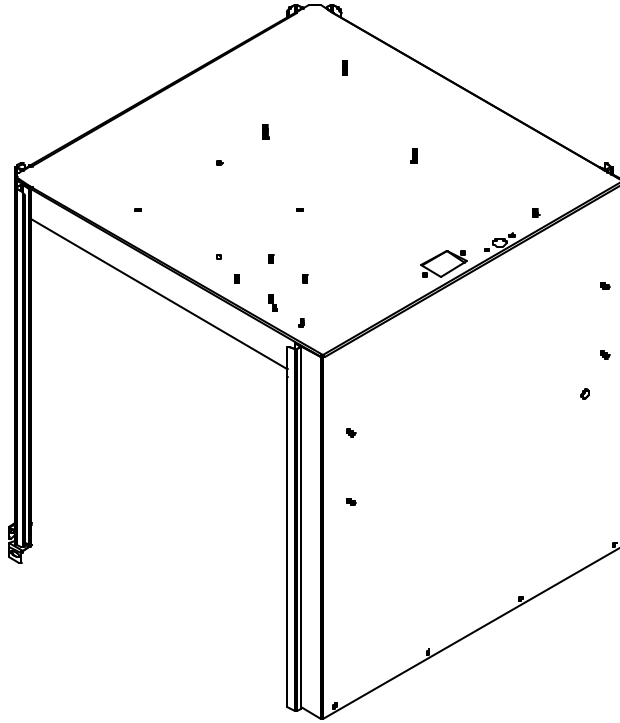
* Represents an item not visible.



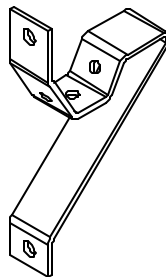
SECTION 6: PARTS SECTION
UPPER CONTROL BOX ASSEMBLY CONTINUED

ITEM	QTY	DESCRIPTION	Mfg. No.
1	1	Control Box Weldment	05700-003-24-24
2	1	Control Box Decal	09905-003-24-35
3	1	Thermometer, Rinse	06685-111-68-49
	1	Decal, 180 Min. Rinse Thermometer	09905-002-97-62
4	1	Thermometer, Wash	06685-111-68-48
	1	Decal, 150 Min. Wash Thermometer	09905-003-00-69
5	1	Timer, Universal	05945-003-07-48
6	1	Timer Mounting Bracket	05700-003-02-08
7	6	Holder, Keystone	05940-002-21-87
8	1	Circuit Breaker	05925-011-68-34
9	1	Switch, ON/FILL - OFF/DRAIN	05930-011-49-55
10	1	Light, Green	05945-111-44-43
11	1	Light, Red, 115V	05945-111-44-45
12	1	Switch	05930-111-38-21
13	1	Decal, Cycle/Manual Fill	09905-003-23-40
14	1	Cycle Counter	05990-111-35-38
	4	Screw, 4-40 x 1/4" Phillips Pan Head	05305-002-32-38
15	1	Switch	05930-301-49-00
16	1	Terminal Board	05940-021-89-41
17	1	Transformer	05950-011-75-59
18	1	Terminal Block, 3 Pole	05940-011-48-27
19	1	Contactora, Heater	05945-002-24-70
20	1	Din Rail, 2"	05700-002-36-09
21	1	Terminal Board	05940-002-78-97
	2	Locknut, 10-24 with Nylon Insert	05310-373-01-00
22	1	Cover, Electrical Control Box	05700-003-12-74
	2	Cotter Pin, 3/32" x 3/4" Long	05315-207-01-00
23	1	Decal, Warning-Disconnect Power	09905-100-75-93
24	1	Lock, Control Box	05340-102-01-00
25	1	Reed Switch	05930-002-36-80
26	1	Contactora, Wash Motor	05945-111-68-38
27	1	Overload, 1 - 1.5	05945-111-68-39
28	1	Ground Lug	05940-200-76-00
29	1	Decal, Ground	09905-011-86-66
30	1	Decal, L1 L2 L3	09905-101-12-66
31	1	Decal, Copper Conductors	09905-011-47-35
32	3	Plug, Heyco	05975-011-47-81
33	1	Switch	05930-301-21-18
34	1	Decal, Manual/Delime Switch	09905-011-74-61
35	1	Fitting, 3/4" 45 Deg Plastic	05975-011-47-74
Other parts not shown:			
	4	Leg, Control Box	05700-011-33-71
	4	Screw, 1/4"-20 x 2-3/4" Hex Head	05305-274-13-00
	17	Locknut, 10-24 S/S Hex with Nylon Insert	05310-373-01-00

SECTION 6: PARTS SECTION
HOOD ASSEMBLY & ASSOCIATED PARTS



Hood Weldment
05700-003-24-20



Cantilever Arm Support Bracket
05700-031-88-00

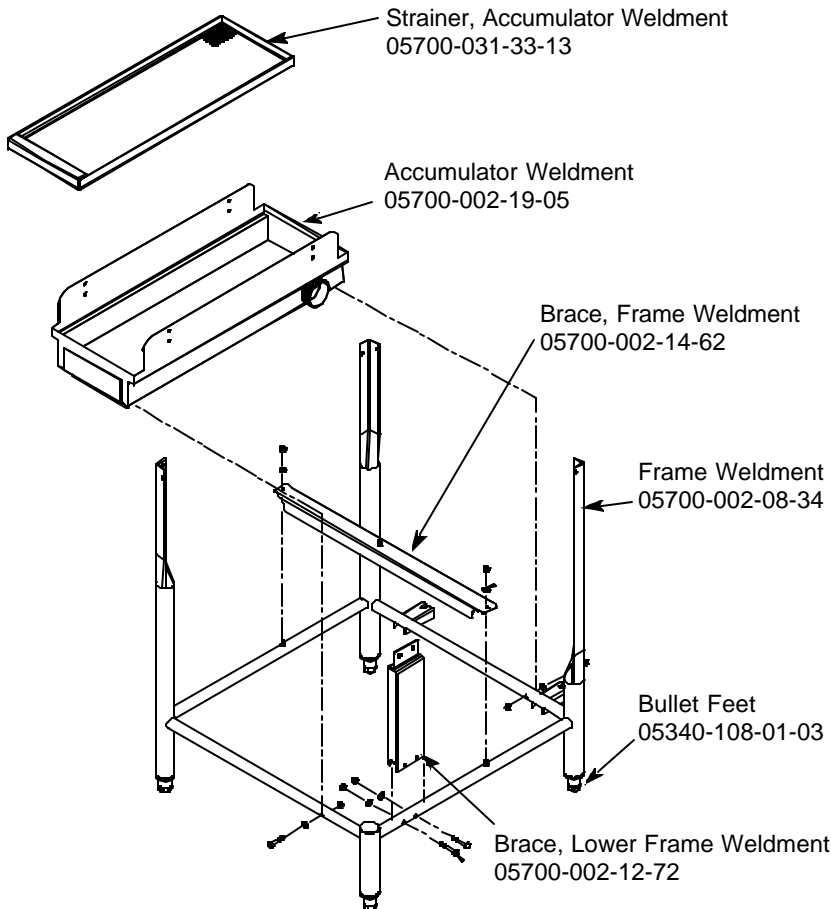
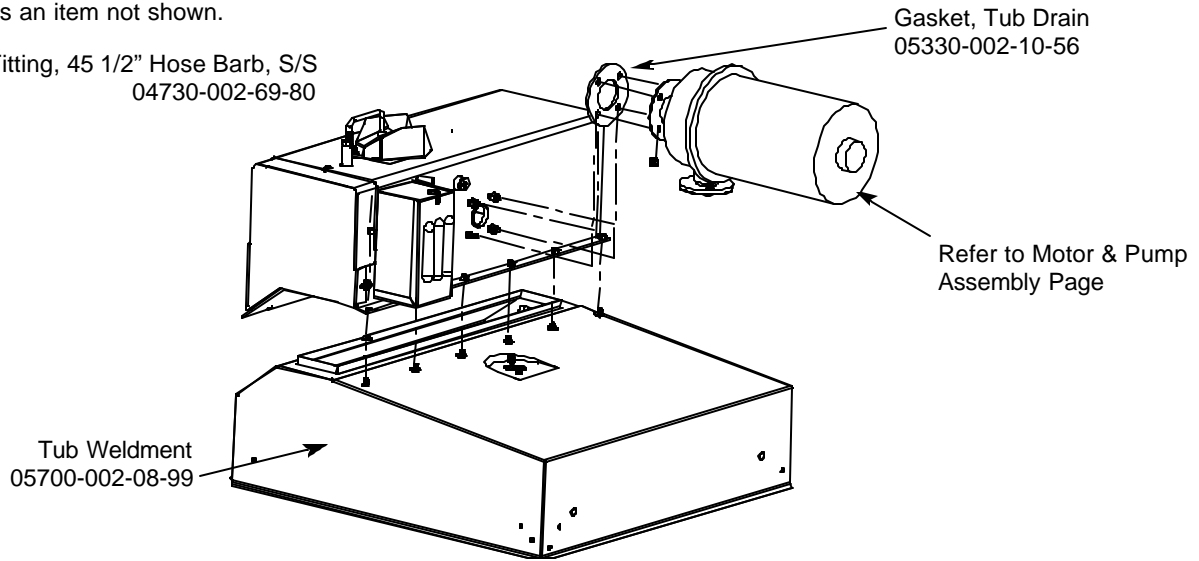
Wear Button, 1/2" Dia.
3 per Bracket
05700-011-88-01

SECTION 6: PARTS SECTION

TUB & FRAME ASSEMBLIES

* Represents an item not shown.

*Bulkhead Fitting, 45 1/2" Hose Barb, S/S
04730-002-69-80



Plug, Rear Corner
05700-002-25-01

Plug, Front Corner
05700-002-25-00

Hose, 3/8" I.D. x 5/8" O.D. x 14" Long
05700-002-04-40

Clamp, Mini 7/16" - 25/32"
04730-011-36-05

Elbow, 90° 3/8" x 1/8"
04730-002-18-96

SECTION 6: PARTS SECTION

MOTOR & PUMP ASSEMBLY

Complete Pump & Motor Assembly
06105-003-23-01

Pump Only Assembly
(Area indicated within box, Casing is included)
05700-002-79-52

Motor Only
06105-003-25-21

Pump Casing
05700-002-85-02

Shim Kit
05700-002-82-58

Case Capscrew
05305-002-81-88

Mechanical Seal
05330-002-34-22

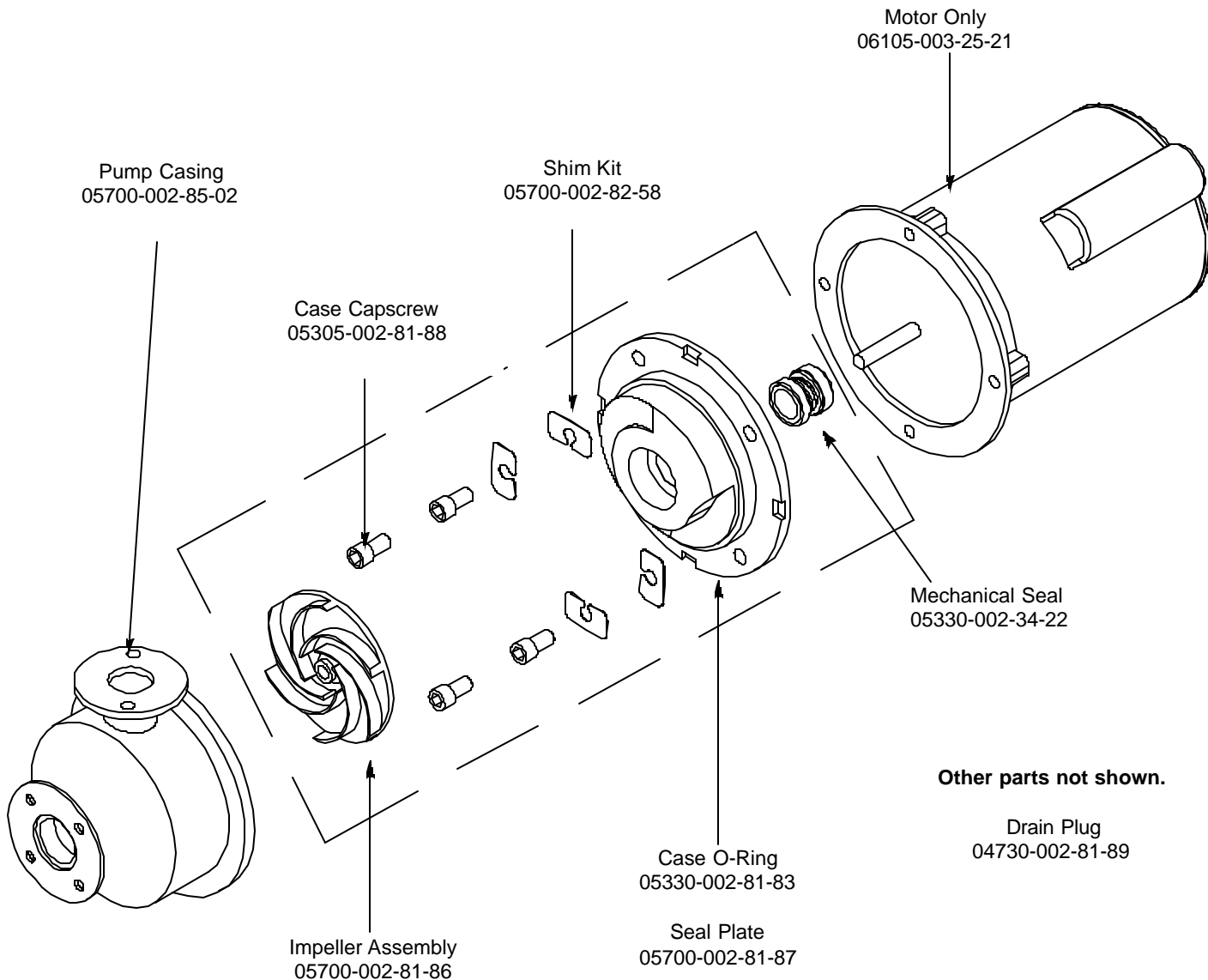
Other parts not shown.

Drain Plug
04730-002-81-89

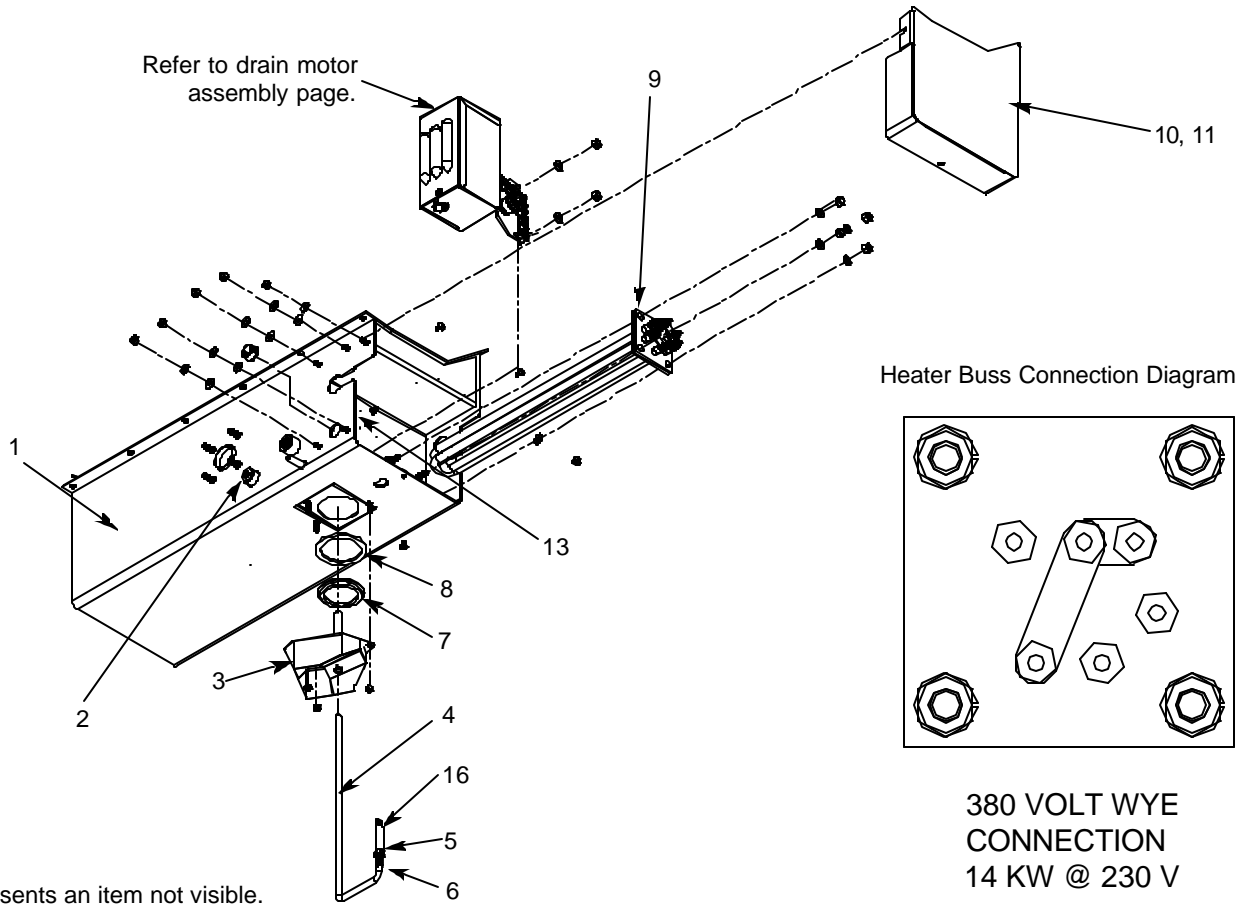
Case O-Ring
05330-002-81-83

Seal Plate
05700-002-81-87

Impeller Assembly
05700-002-81-86



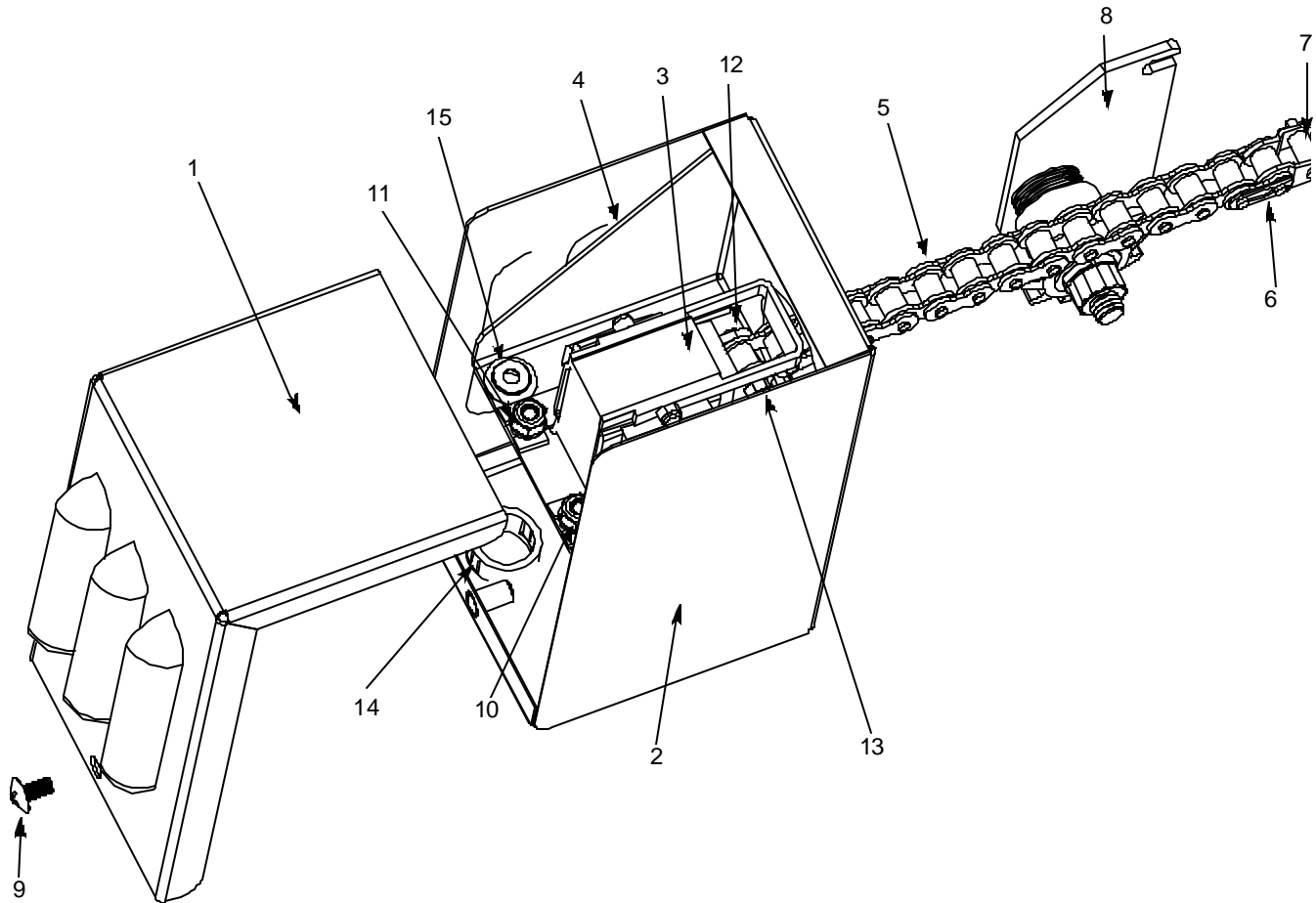
SECTION 6: PARTS SECTION
BOOSTER TANK ASSEMBLY



* Represents an item not visible.

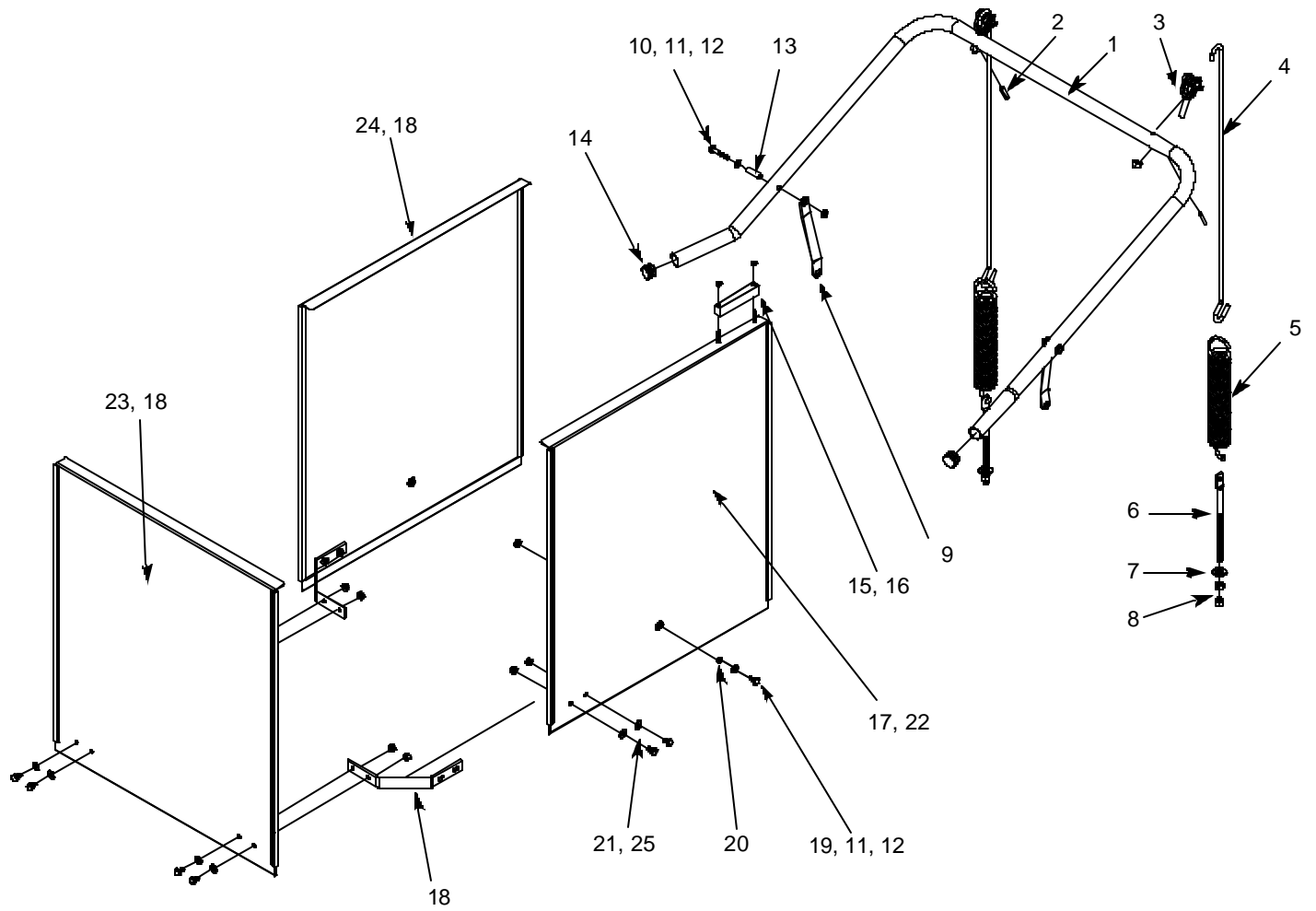
ITEM	QTY	DESCRIPTION	Mfg. No.
1	1	Booster Tank Weldment	05700-002-38-84
2	1	Thermostat Probe Adapter	05700-002-29-75
	1	Temperature Probe	06680-002-16-80
	1	Fitting, 1/4" Imperial Brass	05310-924-02-05
3	1	Spillway	05700-031-37-86
	1	Drain Link Assembly	05700-002-38-24
4	1	Drain Link	05700-002-09-24
5	1	Drain Link Connector	05700-002-38-10
6	1	Hex Nut, 5/16"-18	05310-275-01-00
7	1	Drain Seat Insert	05700-021-34-38
8	1	Drain Seat Gasket	05700-111-34-52
9	1	Heater Element, 14 KW 208 Volt	04540-002-48-99
9	1	Heater Element, 14 KW 240 Volt	04540-002-49-00
	1	Heater Gasket	05330-011-47-79
10	1	Heater Cover Weldment	05700-002-08-45
11	1	Heater Cover Gasket	05700-002-52-57
12	1	Pin, Hairpin Cotter	05315-002-15-39
13	1	Thermostat, Rinse	05930-003-06-48

SECTION 6: PARTS SECTION
DRAIN MOTOR ASSEMBLY



ITEM	QTY	DESCRIPTION	Mfg. No.
1	1	Cover, Drain Motor Box	05700-002-47-83
2	1	Box, Drain Motor Assembly	05700-002-87-43
3	1	Drain Solenoid	04810-200-11-00
4	1	Weldment, Bracket Drain Solenoid	05700-002-87-44
5	1	Chain, Drain, Seven Links	05700-002-87-55
6	1	Chain, Connector Link	03020-002-87-56
7	1	Spacer, Chain	05700-002-87-48
8	1	Chain Sprocket Bracket Assembly	05700-002-87-46
9	1	Screw, 10-32 x 3/8" Phillips Truss Head	05305-173-12-00
10	4	Locknut, 10-24 Hex with Nylon Insert	05310-373-01-00
11	4	Washer, Flat, S/S #10	05311-173-02-00
12	1	Screw, 6-32 x 7/8" Phillips Round Head	05305-171-10-00
13	1	Locknut, 6-32 Hex with Nylon Insert	05310-373-03-00
14	2	Bushing, Snap	05975-210-03-00
15	1	Grommet, Rubber	05325-011-46-73
16	1	Drain Link (Shown on previous page.)	05700-002-09-24

SECTION 6: PARTS SECTION
CANTILEVER ARM/DOOR ASSEMBLIES

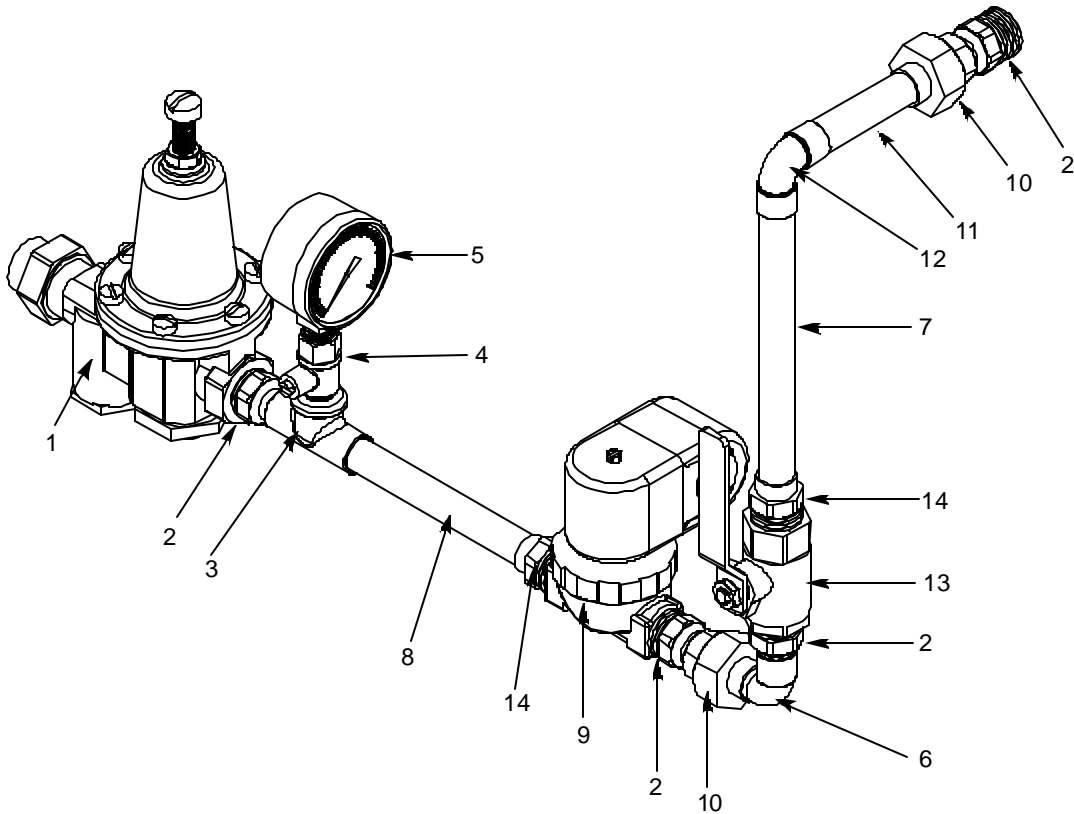


SECTION 6: PARTS SECTION
CANTILEVER ARM/DOOR ASSEMBLIES (CONTINUED)

ITEM	QTY	DESCRIPTION	Mfg. No.
	1	Complete Cantilever Arm Assembly (Items 1-14)	05700-002-79-18
1	1	Arm, Cantilever	05700-031-50-67
2	1	Spring Pin, 1/4" Dia. x 1 1/8" Long	05315-407-06-00
3	2	Yoke Assembly	05700-000-75-77
4	2	Rod, Spring	05700-001-28-18
5	2	Spring, Cantilever	05340-109-02-00
6	2	Bolt, Hanger Eye 3/8"-16	05306-956-05-00
7	2	Washer, Impeller 3/8" I.D. x 7/8" O.D.	05311-176-02-00
8	4	Nut, 3/8"-16 S/S Hex	05310-276-01-00
9	2	Cantilever Arm Connector	05700-011-90-99
10	2	Screw, 1/4"-20 x 1 1/2" Long S/S	05305-274-23-00
11	2	Washer, 1/4" ID S/S	05311-174-01-00
12	2	Locknut, 1/4"-20 S/S Hex with Nylon Insert, Low Profile	05310-374-02-00
13	2	Sleeve, Cantilever Arm	05700-000-85-69
14	2	Plug, Cantilever Arm	05340-011-35-00
15	1	Magnet, Reed Switch	05930-002-68-53
16	2	Locknut, 8-32 S/S Hex with Nylon Insert	05310-272-02-00
17	1	Right Door Weldment with Studs	05700-002-22-25
	1	Door Assembly, Right Side with Door Guides	05700-003-05-35
17	1	Right Door Weldment with Studs (Vapor Vent Mode)	05700-002-75-93
18	6	Door, Guides	05700-111-33-59
19	2	Screw, 1/4"-20 x 1/2" Long S/S	05305-274-02-00
20	2	Spacer, PB Bolt	05700-000-29-40
21	4	Locknut, 1/4"-20 S/S Hex with Nylon Insert	05310-374-01-00
22	2	Door Connector Bracket	05700-021-33-39
23	1	Door Only, Front	05700-002-20-09
	1	Door Assembly, Front with Door Guides	05700-003-05-36
24	1	Door Only, Left Side	05700-002-20-08
	1	Door Assembly, Left Side with Door Guides	05700-003-05-37
25*	2	Bracket, Cantilever Arm Support	05700-031-88-00
26*	6	Wear Button, 1/2" Dia. UHMW	05700-011-88-01

* Represents an item not shown.

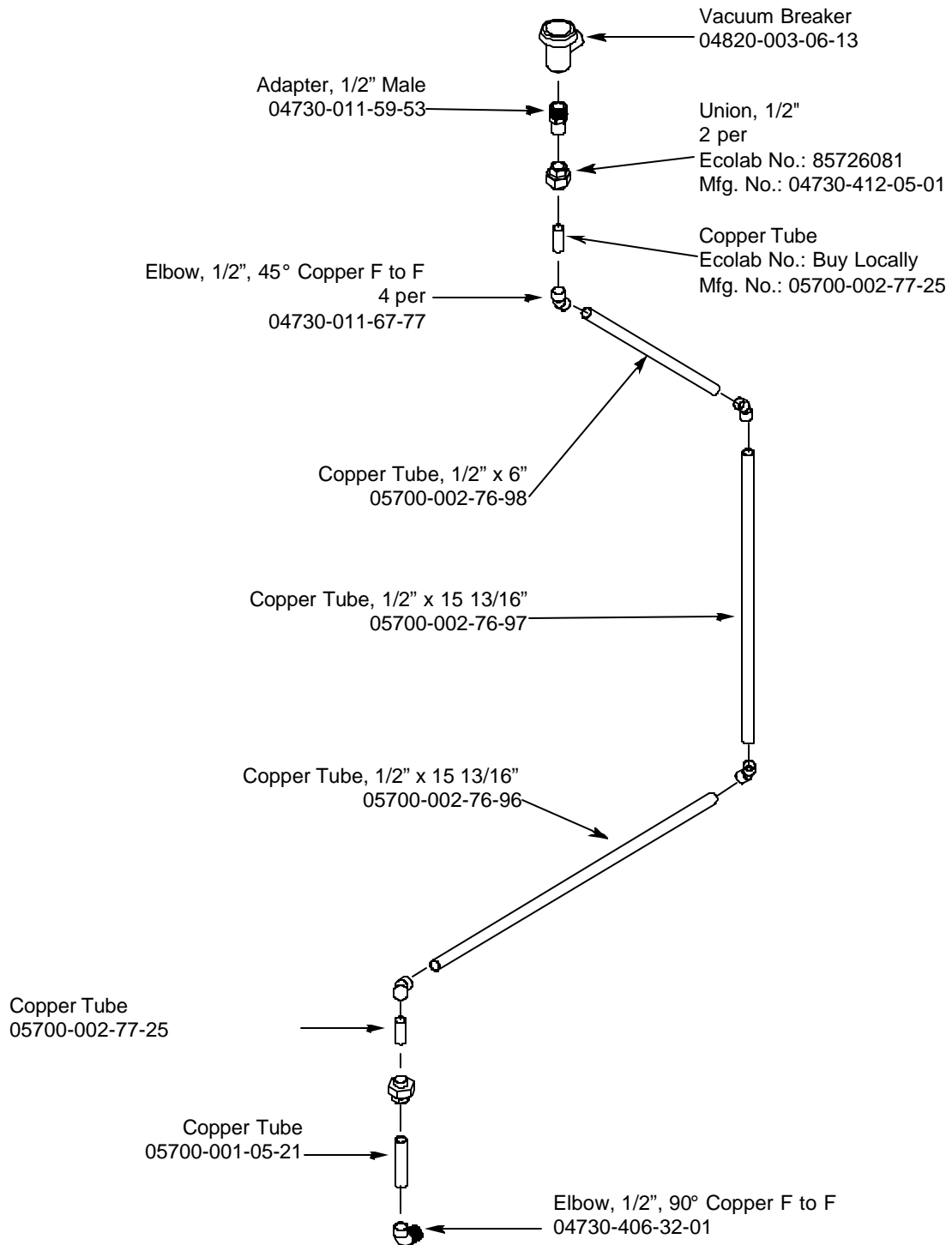
SECTION 6: PARTS SECTION
INCOMING PLUMBING ASSEMBLY



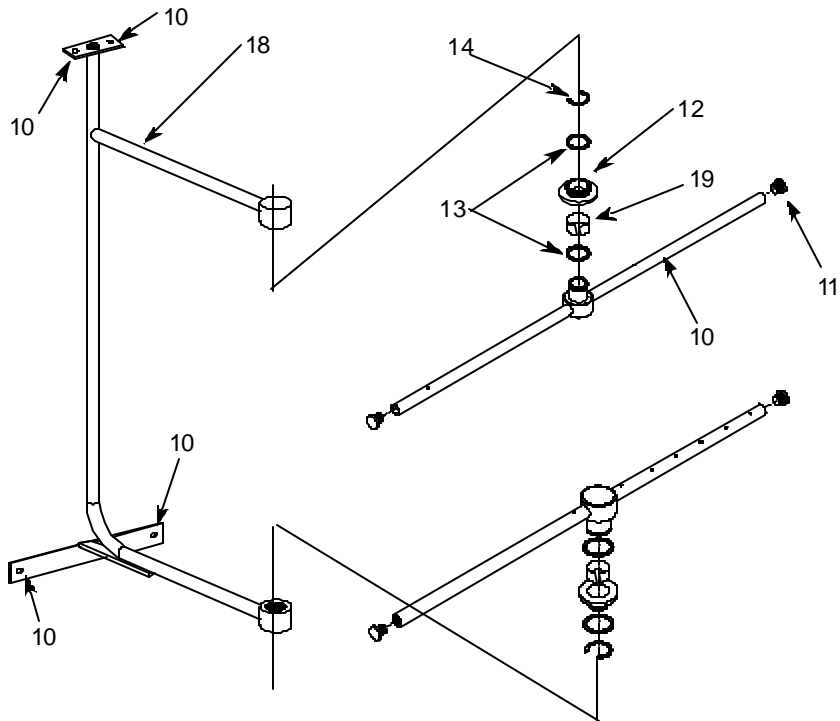
ITEM	QTY	DESCRIPTION	Mfg. No.
1	1	Regulator, 1/2"	04820-100-04-07
2	4	Adapter, FTG x Male , 1/2" Copper	04730-011-59-53
3	1	Tee, 1/2" C x 1/2" C x 1/4", FNPT, Brass	04730-411-25-01
4	1	Ball Valve, Test Cock, 1/4", Brass	04810-011-72-67
5	1	Pressure Gauge, 0-100 PSI	06685-111-88-34
	1	Decal, 15-25 PSI	09905-002-97-94
6	1	Elbow, 1/2" C to FTG, 90°	04730-406-31-01
7	1	Copper Tube, 1/2" x 6 1/2"	05700-002-60-71
8	1	Copper Tube, 1/2" x 5 1/8"	05700-003-23-47
9	1	Solenoid Valve, 1/2", 110 Volt	04810-100-12-18
10	2	Union, 1/2" C to C	04730-412-05-01
11	2	Copper Tube, 1/2" x 3"	05700-001-05-21
12	1	Elbow, 1/2" C to C, 90°	04730-406-01-01
13	1	Valve, Ball	04820-100-15-00
14	3	Adapter, CU x Male, 1/2" Copper	04730-401-03-01

SECTION 6: PARTS SECTION

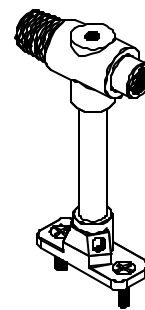
OUTLET PLUMBING ASSEMBLY



SECTION 6: PARTS SECTION
WASH & RINSE ARM/MANIFOLD ASSEMBLIES

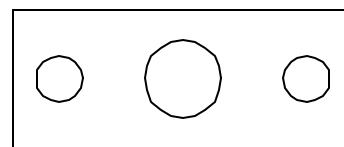


DETAIL "A"
FINAL RINSE ARMS & MANIFOLD

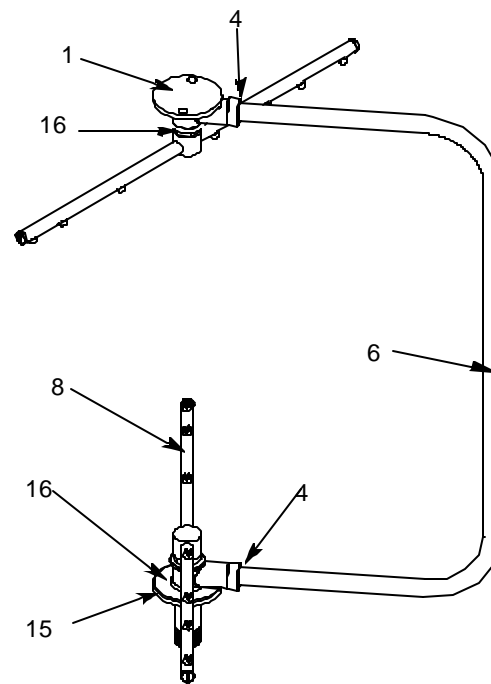
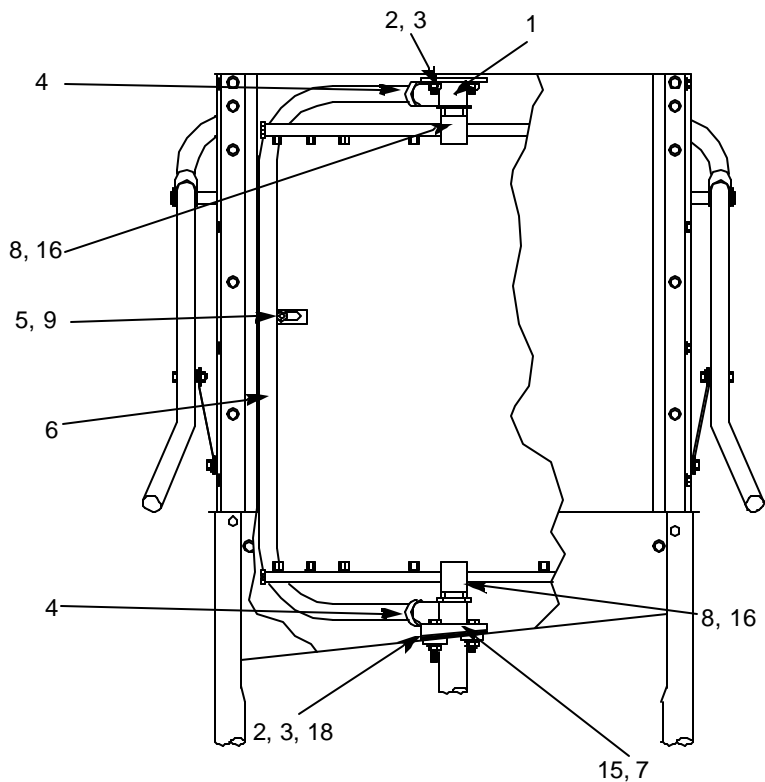


Rinse Injector Weldment
 1 per machine
 05700-002-31-30

Plug, 1/8" NPT, Brass
 3 per Rinse Injector
 04730-209-07-37



Rinse Injector Gasket
 05330-111-42-81



DETAIL "B"
WASH ARMS & MANIFOLD

SECTION 6: PARTS SECTION

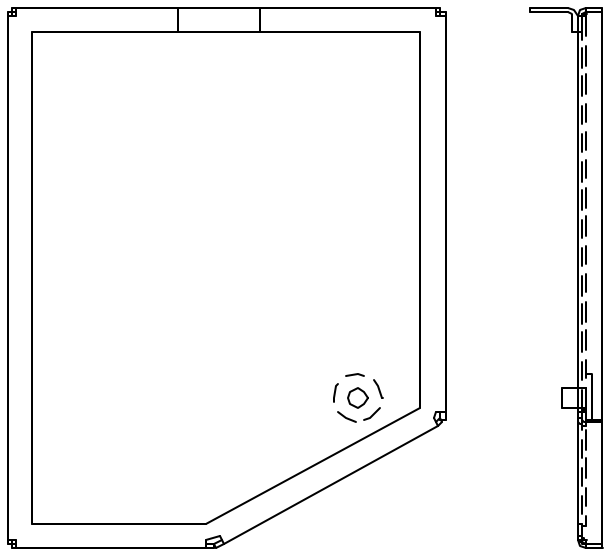
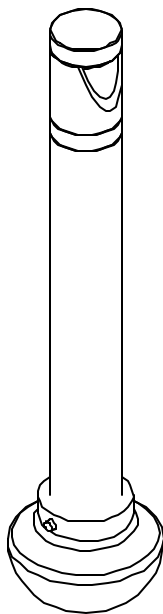
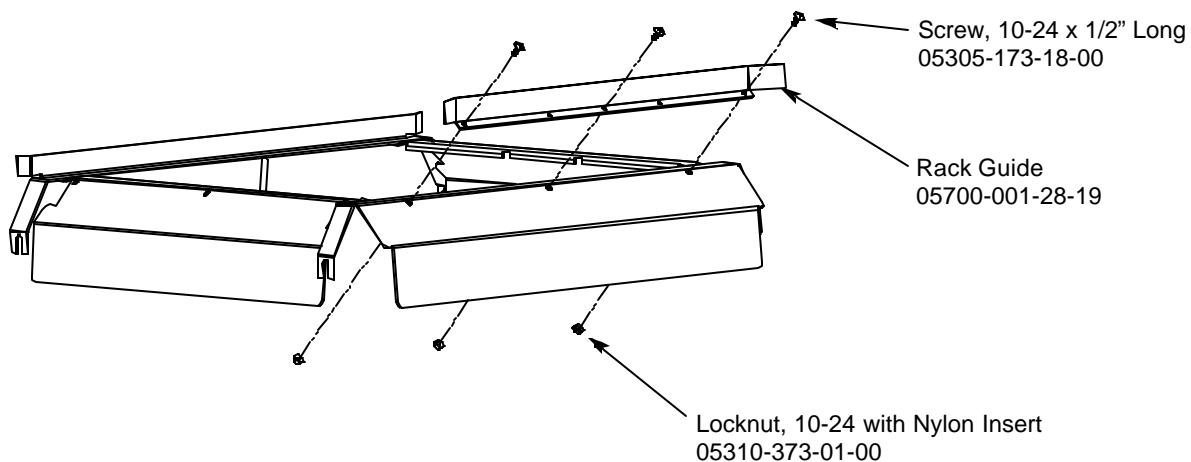
WASH & RINSE ARM/MANIFOLD ASSEMBLIES (CONTINUED)

ITEM	QTY	DESCRIPTION	Mfg. No.
1	1	Upper Manifold	05700-031-34-82
2	4	Nut, 3/8"-16 S/S Hex	05310-276-01-00
3	4	Lockwasher, 3/8"	05311-276-01-00
4	2	O-Ring	05330-111-35-15
5	1	Positioning Bracket, Manifold Tube	05700-011-34-63
6	1	Tube, Wash Manifold	05700-002-08-32
7	2	Gasket, Manifold	05700-111-35-03
8	2	Wash Arm	05700-021-63-42
9	5	Locknut, 1/4"-20 S/S Hex with Nylon Insert	05310-374-01-00
	2	Rinse Arm Complete Assembly	05700-031-73-54
10	1	Rinse Arm	05700-031-73-53
11	2	Rinse Arm Plug	04730-609-04-00
12	1	Bushing, Rinse Head	05700-021-33-84
13	2	Washer, Nylon	05330-011-42-10
14	1	Retaining Ring	05340-112-01-11
15	1	Lower Wash Manifold	05700-021-63-73
16	2	Bearing Assembly	05700-021-35-97
17	1	Rinse Manifold Assembly	05700-021-47-61
18	2	Bolt, 3/8"-16 x 1" S/S	05305-276-03-00
19	2	Bearing, Rinse Head	03120-002-72-24
20*	2	Wash Arm End Cap	05700-011-35-92
21*	1	Nut, P/P For 1/8" Tubing	04730-011-59-45
22*	1	Fitting, Outlet Elbow	04820-111-51-18
23*	1	Check Valve	04820-111-51-14
24*	1	Fitting, 1/4" Imperial Brass	05310-924-02-05
25*	1	Thermostat Probe Adapter	05700-002-29-75

SECTION 6: PARTS SECTION

INNER TUB COMPONENTS

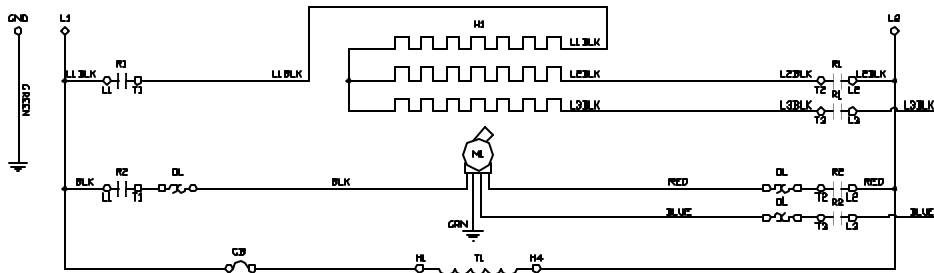
Rack Assembly
05700-002-01-01



SECTION 7: ELECTRICAL SCHEMATCS

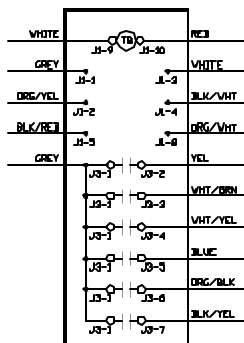
SECTION 7: ELECTRICAL SCHEMATICS

ES-2000HT, INTL (380 VOLT, 50HZ, THREE PHASE)



LEGEND

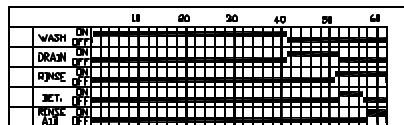
- H1 HEATER
- M1 WASH PUMP MOTOR
- J3 DRAIN SOLENOID
- M3 DETERGENT PUMP MOTOR*
- M4 RINSE AID PUMP MOTOR*
- R1 HEATER CONTACTOR
- R2 WASH MOTOR CONTACTOR
- DL WASH MOTOR OVERLOAD
- E1 POWER LIGHT
- E2 CYCLE LIGHT
- TI CONTROL TRANSFORMER
- S1 POWER SWITCH
- S2 CYCLE SELECTOR SWITCH
- S3 DOOR SWITCH
- S4 DELINE SWITCH
- S5 DETERGENT PRIME SWITCH*
- S6 RINSE AID PRIME SWITCH*
- S7 MANUAL FILL SWITCH
- CB CIRCUIT BREAKER
- FS FILL SOLENOID
- TS HEATER THERMOSTAT
- TB TIMER BOARD
- CT CYCLE COUNTER



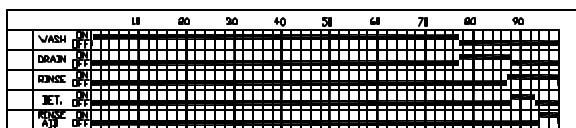
PROGRAM 19

* REMOTE DISPENSER

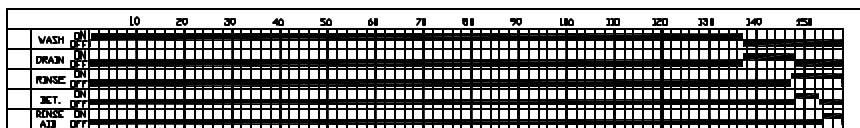
TIMING CHART LIGHT CYCLE



TIMING CHART MEDIUM CYCLE



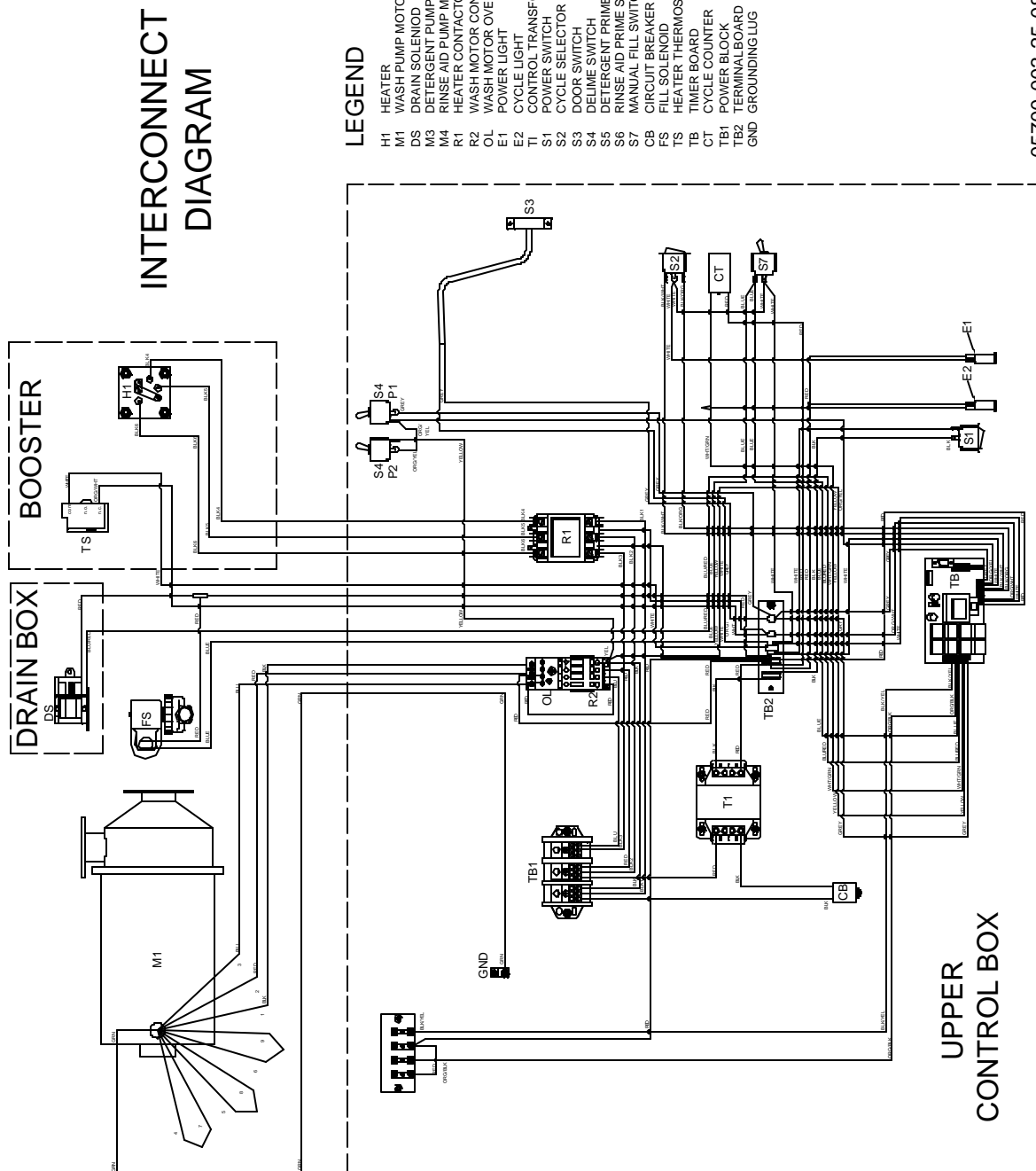
TIMING CHART HEAVY CYCLE



9905-003-23-54

SECTION 7: ELECTRICAL SCHEMATICS

INTERCONNECT DIAGRAM



INTERCONNECT
DIAGRAM

LEGEND

- H1 HEATER
- M1 WASH PUMP MOTOR
- DS DRAIN SOLENOID
- M3 DETERGENT PUMP MOTOR*
- M4 RINSE AID PUMP MOTOR*
- R1 HEATER CONTACTOR
- R2 WASH MOTOR CONTACTOR
- OL WASH MOTOR OVERLOAD
- E1 POWER LIGHT
- E2 CYCLE LIGHT
- T1 CONTROL TRANSFORMER
- S1 POWER SWITCH
- S2 CYCLE SELECTOR SWITCH
- S3 DOOR SWITCH
- S4 DELIME SWITCH
- S5 DETERGENT PRIME SWITCH*
- S6 RINSE AID PRIME SWITCH*
- S7 MANUAL FILL SWITCH
- CB CIRCUIT BREAKER
- FS FILL SOLENOID
- TS HEATER THERMOSTAT
- TB TIMER BOARD
- CT CYCLE COUNTER
- TB1 POWER BLOCK
- TB2 TERMINAL BOARD
- GND GROUNDING LUG

05700-003-25-08

SECTION 7: ELECTRICAL SCHEMATICS

LABEL DIAGRAM

