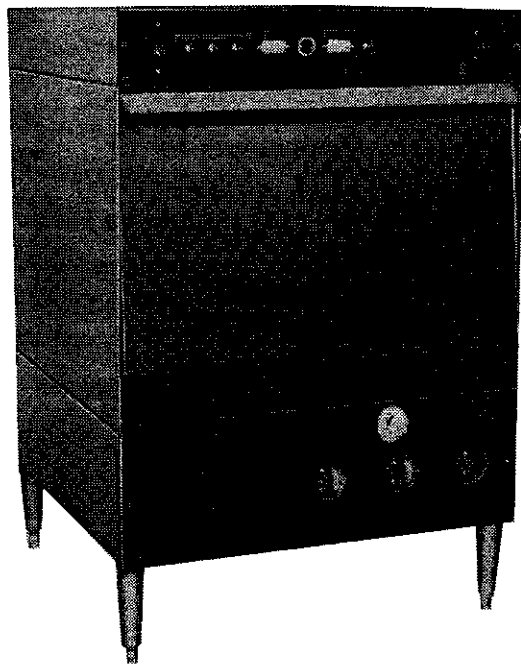




SERVICE & PARTS MANUAL



MODEL L1-C DISHMACHINE

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LI'L MIZER
SERVICE MANUAL

The Li'l Mizer dishwasher represents the latest engineering development in the undercounter dishwashing concept. This operator's manual provides instructions for the tuning and operation of the machine. CMA has attempted to use many of the component parts used in its standard line of dishwashers for the undercounter machine. Each major component part and function will be explained in this section.

SECTION I - Timer Assembly

GENERAL

CAUTION: Never remove control box cover without first turning off the master switch located on the control panel cover.

The timer consists of a group of small, rotary-type cams mounted on one common shaft. The shaft is attached to the gear on one end which is driven by a synchron positive RPM motor. The shaft in the standard timer is driven to make one complete revolution in two minutes.

As the cam shaft turns, the cams operate micro switches that control the various mechanisms on the machine, establishing the sequence of the cycle. By adjustment of certain cams, the time allowed the particular function may be changed. The following outlines the functions of each cam. They are numbers 1 through 7 from left to right.

1st Cam - Left End (Start/Stop)

Operates or controls the current to the synchron motor and the relay that operates the pump motor. When the machine is off, the micro switch roller is laying in the bottom of the cam groove. When the start switch is tripped and held in, it by-passes this micro switch and starts the synchron motor and pump motor. In 3 seconds, the synchron motor has turned the cam shaft far enough for the micro switch roller to ride upon the cam and make contact, which keeps the synchron and pump motors running until the shaft makes a complete turn and the switch roller rides down in to the cam groove which activates the switch and shuts off both motors.

MALFUNCTIONING OF NO. 1 CAM

1. Machine continues to run

- a. Assure start switch is functioning normally (Cam No. 1). The wire arm must travel down into the groove for allowing the switch to function.
- b. Determine if machine cycling stops but pump continues to run. In this case, mercury relay to the pump is defective.
- c. The cam groove is too narrow allowing the master timer train to coast through the stop groove and begin a new cycle. Should the turning momentum of the synchron motor and cam carry a little past "shut off" when the switch roller drops into the cam groove, machine will restart unless adequate space is adjusted in the cam groove to give approximately three seconds from start until cam activates micro switch. See "cam adjustments".
- d. Should micro switch fail to respond when switch roller is in the bottom of the cam groove, proceed as follows to bend wiper arm of micro switch. Insert small screwdriver blade behind wiper arm and up near hinge point at top. Hold another screwdriver against roller arm at hinge point. Push wiper arm back to bend slightly. Care should be taken to assure wiper arm is not bent too far.
- e. If the micro switch is determined to be inoperative, replace switch by removing the small screw which holds it in place on the top of the master timer and replace with a new micro switch.

2nd Cam from Left End (Detergent)

This cam and switch controls the detergent delivery. The amount of detergent delivered is adjusted by changing the cam opening and increasing or decreasing the groove. This switch is normally off and turns on when the wiper rides down into the cam groove.

MALFUNCTIONING CHARACTERISTICS

Same as Sanitizer 5th Cam

3rd Cam from Left End

This cam is set by the factory to control the drain solenoid and cannot be adjusted.

MALFUNCTIONING CHARACTERISTICS

1. Drain solenoid will not operate.
 - a. Assure other factors are O.K. before considering cam switch.
 - b. If all other factors are O.K., consider cam switch the same as 5th cam, paragraph c.
2. Same as 4th cam a & b.

4th Cam from Left End

This cam and switch controls the electro water valve. It is normally closed and turns on when it rides to the bottom of the cam groove. The longer the wiper switch roller rides in the bottom of the cam groove; the longer the water valve is open and the more the water is delivered to the machine. The lower the incoming water pressure, the wider the cam opening must be to get the proper amount of water in the machine. The cam is set in the factory so that the water valve opens about the same time the drain solenoid opens to give the water flushing action desired. To make the gap wider, move the backside of the cam which will have the effect of allowing more water to enter the machine. To reduce water volume, close up the gap by moving the backside of the cam forward. Adjust the cam so the water level is 1 inch over the bottom of the pan or approximately 1 inch up on the bottom spray arm base. (Use the pan weld seam as a reference.)

MALFUNCTIONING CHARACTERISTICS

1. Water will not come into the machine.
 - a. With amp meter check out the proper function of the #4 micro switch to insure that energy is being sent to the coil on the solenoid fill valve.
 - b. If energy is being sent to the fill valve, remove the coil and place a screwdriver bit inside the coil and press the fill switch.

CAUTION:

Do not press the fill switch without a screwdriver bit placed inside the solenoid coil as it will burn it out in seconds. If the electrical energy converts the coil to a magnet, the screwdriver will respond appropriately. Next, remove the drain solenoid cap and inspect the diaphragm to see if a foreign particle has lodged into the bleed hole located in the diaphragm. This will prevent the diaphragm from functioning properly.

2. Water will not shut off.

- a. Assure electrical checks are made before considering the cam switch.
- b. If cam switch is the problem, proceed as under 5th cam, paragraph c.

5th Cam from Left End

The micro switch is normally shut off and only turns on when the roller rides into the cam groove. This occurs two seconds after the drain solenoid closes and then an electric motor pump automatically starts pumping sanitizers into the rinse water.

MALFUNCTIONING CHARACTERISTICS

1. Sanitizer will not feed into machine.

- a. Monitor lower panel where peristaltic pumps are exposed to see if the peristaltic pump is running when the #5 micro switch drops into the groove. If the pump is functioning, check the squeeze tube to see if it is worn out or cracked. If so, replace it.
- b. If the pump is rotating and the tube seems to be intact, take a small strip of shim stock (3/8" strip of a standard calling card will do) and insert it between the peristaltic pump housing and the squeeze tube itself. Many times the shim effort will cause the pump to prime operate normally.
- c. If the chemical pump motor is not operating, use the amp meter to determine if electrical energy is sent to the pump from the #5 micro switch. If so, you can check to see if the pump operates by disconnecting the plugs to see if energy from the #6 cam will turn the pump. If not, the pump may be burned out and should be replaced.
- d. Increase the amount of chlorine delivered by the pump by opening the back side of the #5 groove.

6th Cam from Left End

The micro switch is normally off and only turns on when the roller rides into the cam groove. This occurs at approximately the same time as the sanitizer pump is activated and then an electric motor pump automatically starts pumping rinse additive fluid into the rinse water.

MALFUNCTIONING CHARACTERISTICS

Same as sanitizer #5 cam.

7th Cam from Left End

The 7th cam is used to pause the pump motor just before the drain mode starts. This allows the diverter valve flipper to open for drain without the water pressure resistance.

7TH CAM ADJUSTMENT PROCEDURE

To pause the motor prior to the drain valve opening, adjust the 7th cam to activate two seconds before the 3rd cam. The yellow wire must be on top terminal of 7th cam and brown wire on the middle terminal.

CAM ADJUSTMENT PROCEDURE

All cams are adjustable except the 1st and 3rd cams. However, unless certain special circumstances exist (see each cam heading), do not change the front side of the groove. Only adjust the back side which controls the length of time the electrical function is maintained. Please note that of the seven micro switch functions, the electrical spades are connected to the top and bottom lugs of each micro switch with the exception of the #1 micro switch. This micro switch is connected to the top and middle function which reverses the polarity of the switch and causes it to energize when it walks up out of the groove thus creating a "start/stop" function on the master time chain. Three of the cam functions (#2, 5 and 6) control the three chemical injectors. To increase the amount of chemicals delivered, always move the back side of the groove. The front side is the "start" function of the switch and does not need to be activated once properly set. All the adjustments are at the back side of the cam groove. #1 and #3 cams are factory set and do not require adjustment.

MICRO SWITCH REPLACEMENT (MASTER TIMER ASSEMBLY)

NOTE: Each micro switch has three space lugs. All connect to the top and bottom, except #1 and #7.

1. Turn off master switch.
2. Remove wire from micro switch.
3. While holding top terminal of micro switch with needle nose pliers, lift up and pull out switch.
4. Re-install, reverse removal procedures and add the following:
 - A. Assure all connections are tight; loose connections can cause arcing and damage.
 - B. Run machine through cycle and check chemical delivery and outer level, adjust as required.

SECTION II - Pump Assembly

GENERAL

The pump picks up water from the drain sump and forces it to the spray nozzles with a volume of 68 gallons per minute and a pressure at the nozzles of approximately 7 psi. As the water falls back into the pan after the spray action, it runs down the pan to the sump, through the screen and again to the pump.

The pump is driven by a 115 volt, 1 Hp motor at 3450 RPM.

The impeller is mounted with a right hand thread onto a 5/8" stainless steel shaft. The shaft in turn is coupled to the motor armature shaft. Should a motor change be necessary, see motor replacement.

The water is held in the pump by a bellows type seal, mounted half in the casting and half on the shaft. A porcelain ring in the casting rides on a carbon ring mounted on the shaft to make a good seal.

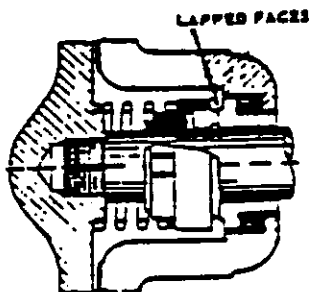
MALFUNCTIONING CHARACTERISTICS

1. Water is leaking around the pump.
 - a. Seal is leaking and needs replacement. When this happens, water comes out around the shaft. See Preventive Maintenance, Section III.
 - b. Gasket and pump are leaking.
 - c. Copper gaskets around bolts are bad and need replacement.
2. Loud howling noise are around the pump.
 - a. Some foreign matter is in the impeller. Disassemble the pump and clean out. See below.
 - b. Sometimes the ball inside of the ball check valve may not be seating properly and will make a high pitch noise which sounds like it is coming from the pump.
3. Pump stops after running a short time.
4. Pump will not start.
5. Pump will not stop.

REPLACEMENT PROCEDURES

1. Removing old seal. Inspecting porcelain.
 - a. Turn off master switch.
 - b. Remove four pump mounting bolts.

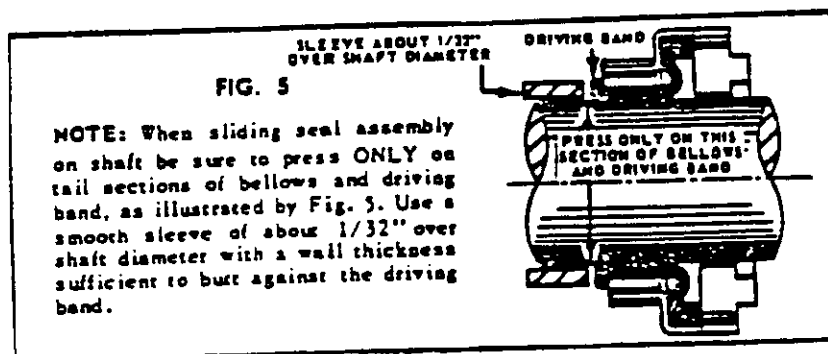
- c. Separate pump housing from seal support casting. Sometimes gasket and flanges stick tightly, requiring wedge to be inserted. Insert at bolt hole position only. If flange should be slightly sprung, bolts will pull together at assembly. Do not mar flange surfaces; otherwise, gasket cannot seal against leaks.
- d. Push motor and seal casting back away from housing and turn so impeller is facing you.
- e. Remove cap from the opposite end of the motor and insert large blade screwdriver in the slot of the motor shaft to keep shaft from turning.
- f. Turn impeller anti-clockwise and unscrew from shaft. It may be necessary to tap a vein of the impeller with a punch and hammer if it will not break loose with turning pressure.
- g. Remove impeller and observe size and position of washer on shaft behind impeller so they may be reinstalled in same position.
- h. Reach in and pull out front part of pump shaft seal. It may be stuck on the shaft and require pressure with a small blade screwdriver.
- i. Remove part of old seal that turns with the impeller and clean assembly with a soft rag.
- j. Inspect porcelain with flashlight for cracks or chips. A crack or chip in the porcelain will cause excessive wear on the graphite. If cracks or chips are observed, replace porcelain ring. Inspect porcelain to make sure that the porcelain and rubber seat cup is not cocked in the casting.



2. If porcelain is not at right angles to the impeller shaft, it will cause the bellows to flex with every revolution of the impeller shaft. Pump seal bellow will last only a short time under these conditions. Inspect porcelain and rubber seat cup to make certain that both pieces are all the way to the bottom of the cavity in casting. If the porcelain does not bottom in the casting, this will cause excessive wear on the graphite by too much tension. If porcelain is grooved, which is unlikely due to its hardness, replace.

3. Installing Type 21 Seal. Seal replacements are normally completed in the shop on the bench. The following procedure should be carefully followed:

- a. Remove old graphite from Seal Head.
- b. Remove old bellows from Seal Head.
- c. Install new bellows and graphite exactly as in old seal.
- d. Seal will be destroyed on installation if impeller shaft, in space where seal slides into work position, is full of gum and other deposits. Clean shaft from porcelain to threads with steel wool, SOS pad or very fine emery paper. (Give the seal a smooth, clean, well-lubricated surface to slide on). This is important.
- e. Place thread protector over threaded portion of impeller shaft. Thread protector is necessary to prevent the cutting of the bellows on shoulder of impeller shaft. Thread protectors are available from the home office.
- f. It is most important that the bellow and the impeller shaft be lubricated so that bellows will slide on shaft without wrinkling or distorting and turn the graphite, therefore, it is necessary to use the correct lubricant. Do not use oil or silicone fluid as they may attack the bellows chemically. The spring cannot drive the bellows and graphite. Dip assembled portion of the pump seal, seal head in a soap solution. As pictured below, use sleeve to push seal head into running position.



NOTE: A machined sleeve for pressing the seal head into position which acts as a "thread protector" is available from the home office.

- g. Placing spring in position and install impeller.
4. Check the pump for proper pressure. Due to long seal life, the impeller may become clogged with broken pieces of glass, prune seeds and toothpicks as the machine operator may run the machine without strainer screen in place.
- a. When you have pump apart, inspect impeller for clogging. This is important. Use an old ice pick bent in a curve to fit curvature of volutes of impeller. It is impossible to observe stoppage of cavity by sight.

Delivery of pump may be checked without taking pump apart to manually inspect impeller. This is done with a pressure gauge.

Equipment required to check pump delivery:

A pressure test kit assembly is available from CMA headquarters. It consists of a pressure gauge connected to a tubing which is fastened to an end plug assembly. To run a pressure test simply remove one of the end plugs and screw in the adaptor end of the test kit assembly, hold the pressure gauge in your hand and close the doors and activate the dishwasher. The machine should run at 7# (without chemicals). Detergents, depending on temperature, will cause the pressure to drop due to aeration of suds. Therefore, all pressure tests should be run with clear water.

Pressure LESS than 7 psi will mean one of the following is affecting pump pressure:

- (1) NOT ENOUGH WATER
 - (2) IMPELLER STOPPED
 - (3) EXCESSIVE WEAR ON SPRAY JETS
- b. If not enough water is in machine, gauge will fluctuate wildly, dropping as low as three (3) psi, then increasing momentarily to 5 - 7 psi.
 - c. If impeller is plugged with trash, increasing or decreasing water level will not affect reading on pressure gauge. The hand on the gauge will remain steady. The gauge reading will be less than the 7 psi depending on the degree of stoppage.

- d. If the spray arms have been used for a long time, the holes in the jets will wear allowing more water to flow through each jet, thus reducing pressure. The machine will take more water and thus more chemicals.
- e. The spray arm jets are designed to produce a fan-shaped pattern of water and each jet has a definite area to cover. As the holes wear round in shape, you get a round stream of water from each jet and a very poor spray pattern.

SECTION III - Vacuum Breaker Valve

GENERAL

The vacuum breaker valve is a standard plumbing code requirement for any unit that is hooked to a portable water line and generates waste water in its operation. It must be installed above the highest point where wash or waste water could be at any time.

The vacuum breaker valve prevents waste water in the unit from being sucked into the water line should an occasion arise wherein the main water supply line should develop a vacuum.

The vacuum breaker valve has a poppet float inside which, through gravity, rides in the "down" position when no water pressure is on the valve. In this position, it opens the line so that air can be drawn in through the sides of the cover.

By this means, no vacuum is developed on the line to the wash water and wash water could not enter the water line.

If water pressure is applied, the poppet floats up immediately and closes the opening to the cover preventing waste from coming out of the air holes.

MALFUNCTIONING CHARACTERISTICS

1. Water leaks out air vent holes or around cover when pressure is applied:
 - a. Poppet gasket eroded, needs replacing
 - b. Poppet float corroded, needs deliming or replacement
 - c. Cover gasket bad, replace
 - d. Low water pressure

REPLACEMENT PROCEDURES

1. Poppet gasket

- a. Remove two small nuts on top of cap. Lift cap off and unscrew brass nut with crescent wrench. If hard to release, use wrench also on lower part to prevent damage to plumbing.
- b. Lift poppet float out and inspect float and gasket.
- c. If poppet is deformed in any way, replace entire assembly and gasket.
- d. Inspect cover gasket and assure it is in good condition. They crack very easily and replace if needed. Be sure all of the old one is removed and surface on body and cover are clean.
- e. Install poppet on cover pin and screw cover in place.
- f. Check under water pressure by operating fill switch several times to assure no leaks.

UST

SECTION IV - Water Solenoid Valve 1/2" J.E.

GENERAL

The valve is an electro-magnetic type that includes a design feature that is made to close the valve slowly so that a surge or pounding action in the water is eliminated. As the 115 volt current is applied to the coil it draws the metal plunger into the coil, releasing the water pressure on the back side of the diaphragm and the water pressure from the line pushes the diaphragm up and the water enters the line to the pump. When the current going to the coil is shut off, the plunger again seats on the orifice of the diaphragm and waste is slowly trapped on the back side of the diaphragm and slowly the diaphragm closes to shut off the waste flow to the pump.

MALFUNCTIONING CHARACTERISTICS

1. Water will not shut off.
 - a. Diaphragm is defective, needs replacement.
 - b. Rubber in end of plunger is bad. Replace plunger.
2. Valve does not shut off smoothly and quietly, allows water to surge or pound.

3. Valve does not operate.

- a. Check current supply to coil. If supply is okay, coil is defective. Replace coil.
- b. Plunger stuck in down position. Determine reason and replace if needed.

NOTE: Should the water pressure be greater than 60#, it is suggested that a water pressure regulator be installed to prolong the life of the internal parts of the valve.

REPLACEMENT PROCEDURES (Plunger and Diaphragm)

1. Remove screw on top of solenoid coil with screwdriver, and remove coil as a unit.
2. Shut off water with gate valve.
3. Remove solenoid cap with large channel lock pliers. A small amount of water will drain out when cap is removed.
4. Plunger rides in hollow stainless steel tube in the center of the cap with spring part up so small rubber in other end of plunger can seat on the small metal orifice in the center of the diaphragm. Inspect this small rubber in the plunger end. If it is protruding and would not make a good seat, entire plunger must be replaced.
5. The diaphragm kit provides a new rubber ring which should be installed with a new diaphragm to assure good water seal.
6. Wet rubber ring and press in place with fingers. Assure it is down in groove around entire valve.
7. Install new diaphragm with small orifice in center extending up.
8. Put plunger in cap with spring to top side and screw cap on housing.
9. Reverse balance of disassembling procedure.
10. Assure cap does not leak and valve operates smoothly.

SECTION V - Water Flow Control Valve (3 1/2 gallon)

(Not provide with machine)

GENERAL

This valve is installed in the hot water supply line directly ahead of the solenoid water valve and has several functions as follows:

1. It is designed to maintain a flow of 3 1/2 gallons of water per minute to the machine regardless of water flow pressure fluctuations.
2. Where self pump and well water systems are encountered, often times you will find the pressures will sometimes be so low, not enough water comes into the machine during the fill cycle therefore, very poor dishwashing results. The water flow valve is rarely used, as most fluctuating pressure can be compensated for with the #4 cam. (Fill Flush)

Under these conditions, you may set the fill cam for this low pressure but have entirely too much water at the high pressure point. This same condition can be found in an old restaurant water system that is all stopped up such that the flow pressure is low to start with, but when someone flushes a toilet or turns on a faucet someplace, the pressure goes very low.

To handle this problem, consider the following:

- a. Install a 3 1/2 gallon per minute flow control valve. This unit acts as a compensator and will hold the flow to 3 1/2 gallons per minute, regardless of the pressure in the incoming line.
3. Adjust water valve cam to give proper water level. This means the valve will be held open longer.
4. In most cases, when this is done, it is necessary to change the timer to a 2 1/2 minute cycle to give more time for the water to get into the machine. In this case, the maximum opening of the water control cam would be needed.
5. Cam setting for water valve:

With the flow control in place, the cam should be opened considerably to provide the proper water level. Also, the right hand cam should be moved ahead so the water valve opens sooner to allow purging and flushing of the machine a little faster.

6. Maintenance and Malfunctioning

It is presently considered that the only problem that may arise is a buildup of mineral deposits within the orifices in the valve center section. This would be indicated by a reduction of the water level during the cycle. If hard water is used, check for deposits in six months, otherwise every twelve months.

7. Removal of Mineral Deposits

Assure manual water valve is turned off. The valve may be taken apart by unscrewing the seat from the body and using some instrument carefully to remove the deposited minerals.

SECTION VI - Ball Check Valve

GENERAL

The ball check valve is designed to prevent water from being drawn through the vacuum breaker and introduced into the pump while the pump is running. It is, in fact, a one-way check valve. When water is introduced through the vacuum breaker, it overcomes the relief valve, sends water into the pump assembly to purge soiled water from the manifold system. If the spring-loaded poppet seat (depending on design of the bracket) fails, a common symptom is a rapid drop of pressure in the rinse arm. This is especially true if the pressure seems good for 4 or 5 seconds and suddenly drops off to 2 or 3#.

MALFUNCTIONING CHARACTERISTICS

1. Loss of manifold wash pressure
 - a. The spring has failed, allowing air to enter the pump. Replace spring.
2. Excessive foaming action is apparent during washing cycle.
 - a. Ball is defective and not seating properly. Clean mineral deposits from around area ball seats. Check spring. Replace valve.

SECTION VII - Counter, Tray

A standard digit counter is installed inside timer box assembly. Each time the cam shaft makes one revolution, the counter adds on to the total recorded. The total figure on the counter indicates the total number of cycles the machine has run. The difference between service periods indicates the number of trays run during the period.

MALFUNCTIONING CHARACTERISTICS

1. Counter does not register.
 - a. Counter is wired to the detergent micro switch cam (#2). If counter is not functioning, check detergent cam to see that micro switch operates properly. If it is not, replace switch. If it is, check wire. If wire is secure, change counter.

REPLACEMENT PROCEDURE

1. Remove two small mounting screws from inside of timer box.
2. Replace by reversing procedure.
3. Record reading of old counter and advise office, noting change made.

SECTION VIII - Mercury Relay

To increase the service life of the manual start switch and the cam micro switch, the starting load of the pump motor is controlled by an electro magnetic solenoid type switch which is called a relay. Many relays are made such that large silver-plated points are drawn together by the magnetic coil to make the circuit and start the device. When these points come together due to the current load, they will arc. The points are silver-plated to reduce this arc and burning that is normal for this type of action. However, after many operations, the silver burns through and the points become defective and cause trouble. To reduce this problem as much as possible, we have incorporated a relay that uses mercury in a vacuum tube to make and break the pump motor circuit. Mercury operating in a vacuum does not have a tendency to burn or deteriorate.

When the 110 volt current is supplied from the start switch or the cam switch to the relay coil, a magnetic field is developed in the coil which draws the metal core, which is floating on the mercury in the ceramic center tube, downward. As the core is drawn downward, the mercury in the tube is displaced and caused to move up in the tube and make contact with the exposed wire terminal in the tube. The mercury then acts as a conductor of the current and the pump motor starts. It will continue to operate until the current to the coil of the relay is cut off and the core returns to the up position, allowing the mercury to also again change position and break contact with the wire terminal and the motor stops.

MALFUNCTIONING CHARACTERISTICS

1. Pump will not stop running.
 - a. Tap coil lightly with wood end of screwdriver. If motor immediately shuts off, the center core of mercury relay is sticking in the down position. Relay should be changed.
 - b. If the motor does not stop from the action in "a" above, use an amp meter to determine if the #1 micro switch deactivates as the wiper arm drops down into the #1 cam groove. If the #1 micro switch does not disrupt current to the mercury relay coil, it is defective and should be replaced.
 - c. If "b" does not correct trouble and the leads going to the coil around the mercury relay check out with an amp meter as not being active, you can assume the mercury relay is shorting out or stuck and should be replaced.
2. Pump will not start.
 - a. Check all electrical wires to the #1 micro relay switch and mercury relay contacts. Using an amp meter, check to see if energy is being transmitted through the #1 switch to the mercury relay coil. If not, the #1 micro switch is defective and should be replaced.
 - b. If energy is being transmitted to the mercury relay coil, using the handle of a screwdriver, tap side of mercury relay column to see if it will start. If it dies, it is sticking and should be changed. Using the amp meter, check the current on the lead wires coming from the top of the mercury relay to see if they have been energized. If they have, trace them to the pump. If energy is going to the pump starting coils and it fails to operate, the pump is defective and should be changed.

REPLACEMENT PROCEDURE

1. Shut off master switch.
2. Disconnect coil wires at ground terminal block and cam terminal block.
3. Disconnect motor wire and cam terminal block wire.
4. Remove screws holding aluminum mounting bracket to control box and remove entire bracket relay.
5. Reverse removal procedure and check for operation. Assure all connections are tight. Loose connections cause arcing and heating.

SECTION IX - Motor, Pump

The motor is a capacitor type, 1 Hp and turns 3450 RPM. It develops a 10 amp load at starting and operates on 115 volt, 60 cycle AC current. It is equipped with an internal thermal overlay switch that automatically kicks out if the motor overheats. Monitor the air vents to see if they are clear of dust and debris. This allows air to circulate over the motor to properly cool it.

The bearings are sealed and do not need lubrication. A ball thrust bearing is on the pump end and a sleeve on the other.

MALFUNCTIONING CHARACTERISTICS

1. Motor will not start.
 - a. If motor is hot to the touch, apparently the safety switch has kicked out. Safety switch will kick in automatically when motor cools. Clean out vent holes with motor stopped. Be sure and turn off the master switch prior to cleaning the vent veins.

REPLACEMENT PROCEDURES

1. Turn off master switch.
2. Remove lower panel.
3. Remove two nuts holding chemical pumps in place. Then remove complete chem pumps with bracket and set to the side.
4. Remove large brass nut on suction side of pump.
5. Disconnect pump flush line on front of pump cover.
6. Loosen pump discharge hose clamp by reaching into motor compartment through the right side of the machine and from the front, using a screwdriver or hand ratchet with 5/16 socket.
7. Remove bolts holding motor hold bracket to machine base.
8. Remove motor as a complete assembly from machine.
9. Remove bolts, etc.
10. Separate pump mount from pump cover, being careful not to scar joining surfaces.
11. Remove gasket.
12. Replace gasket.
13. Install replacement unit.

SECTION X - Diverter Valve Drain Assembly

When diverter valve is energized, the drain port opens and the spray manifold port closes, allowing machine to drain. If valve fails, check if energy is being transmitted through motor. If motor checks out okay, then check motor shaft and valve shaft connection. Valve shaft front must not be subject to mechanical pressure or force, otherwise shaft connection will separate.

MALFUNCTIONING PROCEDURES (Plunger and diaphragm)

1. Turn off master switch.
 - a. Remove two wires connected to motor.
 - b. Remove clamps on all three ports of valve.
 - c. Remove valve from machine.

SECTION XI - Start Side of Rocker

The start switch is of a special design and is a momentary contact type which is normally open. The rocker switch is designed to prevent over-stress by the operator in that the plastic housing of the rocker bar bottoms out against the base of the switch. It is designed to keep water and foreign materials from entering the contact chamber. The start load on the contacts is small thus reducing exposure to burning the contact points, causing deterioration of the switch.

MALFUNCTIONING CHARACTERISTICS

1. Machine will not stop running.
 - a. Turn on master switch and using an amp probe, determine if the start function sends energy to the #1 micro switch. Push the rocker switch to the opposite position to monitor if the fill function is functioning. If you determine that the switch is not working, replace.
2. Machine will not start.
 - a. Insure the master switch is on. Check the circuit breaker panel to the dishwasher to determine if the circuit breaker is blown.
 - b. Using an amp meter, trace the current through the switch to see if it is functioning. If not, replace.

REPLACEMENT PROCEDURES

1. Turn off master switch.
2. Disconnect spade lugs from the inside of the switch and remove screws holding switch in place.
3. To re-install, screw a new rocker switch in place. Connect the spade lugs to the proper terminals and test for proper function.

SECTION XII - Line or Master Switch

This is a toggle type, double pole switch. It is used to cut off both the ground and hot wires coming from the wall outlet. The dual pull switch allows the operator to turn off both sides of the circuit.

MALFUNCTIONING CHARACTERISTICS

1. Machine will not start
 - a. Check the panel box to insure that the circuit breaker has not been tripped.
 - b. Using an amp meter, determine if the current is supplied to the master switch. If not, check for a bad circuit breaker. (This may involve calling in an electrician.)
 - c. Turn master switch on and trace with an amp probe to confirm that current is passing through the switch.

REPLACEMENT PROCEDURES

1. Turn off breaker.
2. Remove control panel cover.
3. Remove master switch by removing the screws.
4. Disconnect wires. Note which wires are fastened to each terminal. Replace switch and control panel cover.

SECTION XIII - Fill Side of Rocker Switch

MALFUNCTIONING CHARACTERISTICS

1. Water will not come into machine when fill button is tripped.
 - a. Turn off master switch and check action of the rocker switch. It should retain its spring-loaded center position.
 - b. Turn the master switch on and using an amp probe, check to see if it sends electrical energy to the #4 micro switch which, in turn, controls the J.E. 1/2" fill solenoid valve.

SECTION XV - Spray Arm Assembly

The spray arms are made of round stainless steel tubes with stainless steel jets welded in place. The jets sit straight up and are spaced to give coverage of all dish surfaces as the arms swing around. On each spray arm there are two spray jets that are angled. These spray jets are angled to propel or push the spray arm at the rate of 60 rpm. In the event one of these jets is clogged, the spray arm may not turn.

Removable plugs are provided at each end of the spray arm. Each plug can be removed by two methods:

1. Using a pair of pliers or wrench
2. The slot is designed to be used with the back of a butter knife, screwdriver or on the lip of the tables attached to the dishwasher.

MALFUNCTIONING CHARACTERISTICS

1. Spray arm not turning.
 - a. Remove arm and inspect for clogged jets.
 - b. Inspect spray arm bearing for wear or damage.
2. Dishes not getting clean.
 - a. Follow procedures for "1" above.
3. Dishes not getting rinsed.
 - a. Follow procedure for "1" above.
4. After many years of use, the eye inside diameter of the spray jets sometimes wear and become larger. Using the pressure test assembly, monitor the pressure available at the end of the spray arm. If it drops below 5#, the spray arm assembly should be changed.

NOTE: Do not check pressure with chemicals in the wash or rinse solution. Pressure checks should be handled only with clear water.

REPLACEMENT PROCEDURES

1. Spray arms: With fingers, turn round spray bearing washer to the right (has backward thread to prevent bearing from unscrewing itself).
2. Install.

Reverse procedure.

SECTION XVI - Bearing, Spray Arm

The spray arm bearing has a course thread that enters spray base and a fine thread that enters spray arm hub. The white plastic washer that is on the course side of the bearing is to prevent the bearing from locking onto the spray base.

MALFUNCTIONING CHARACTERISTICS

1. Spray arms will not turn.
 - a. Remove arm and inspect ball bearings to make sure they are free of debris.
 - b. Check to see if ball bearings are spinning freely. If not, they may be worn.

SECTION XVII - Chemical Pumps

Peristaltic pumps are used to dispense chemicals. One rotation of the roller across the squeeze tube dispenses approximately 1cc of liquid chemical into the sump. A prime switch has been provided with each chemical pump to enable the serviceman to prime the pump system. To prime the peristaltic pumps, locate three toggle switches on the control panel, then open the door of the machine to observe the three chemical discharge bulkheads located inside the wash cavity. Push and hold the toggle switch labeled for each peristaltic pump to the "on" position. When primed, one can observe the dispensing of the chemicals into the sump. Count the "pulses" of each discharge to ensure smooth uninterrupted delivery.

Through the front of the lower panel, the rotation of each chemical pump can be observed and counted. This allows the serviceman to accurately adjust the amount of chemical delivered from each pump through its on/off mode. The Li'l Mizer uses minimum water, about 1 1/2 gallons. Normal setting for chemical pumps will be 3-5 pulses per sanitizer. Check rinse water at end of cycle with appropriate field test kit for proper ppm of chlorine to ensure compliance with health code requirements. After setting the chemical and fill cams, run the machine through a complete cycle.

SECTION XVII - Operation of Machine

"Don't feed me garbage!" The undercounter Li'l Mizer dishwasher is unique in its field. It has all the features of a standard, commercial size dishwasher with many interchangeable parts used in its big "cousin" manufactured by Chemical Methods. The major source of potential problems will be faulty pre-scrapping. This dishwasher drains itself by pumping the soiled water out of the machine during the middle of the cycle through the drain valve. The machine is equipped with a removable drain screen. It is very important that the machine is not run without the drain screen in place in that debris can easily get down into the pump impeller or hang up the drain valve, creating a trouble call.

It is important that the operator be thoroughly trained in the importance of pre-scraping the dishes and emphasize to the operator that he cannot operate the dishwasher without the drain screen in place. If he does, it may require a time consuming trouble call to remove the pump and check the impeller for debris. Standard racking procedures for tableware should be followed. It is important that the machine should be installed only where hot, soft water is provided by the customer.

Operating control. The machine is equipped with a power light (red), two rocker control switches, and a running light (green). The rocker control switches are labeled "drain" and "fill/start" (Illustration II). The fill switch is used to fill the machine for the first cycle. After that, the machine will automatically fill, drain, purge and dispense chemicals during a normal cycle. The machine should be filled one inch over the entire bottom of the pan (use the pan weld seam as a reference). By listening to the normal pumping sound of the motor, the serviceman can determine if there is insufficient water in the machine, as you will hear a hesitation in the normal washing rhythm created by the pump sucking air due to water starvation. Cam #4 is used to adjust the amount of water automatically fed into the machine. At the end of the day when the machine is to be shut down, the operator should first press the drain switch which activates the main pump motor and at the same time opens the drain solenoid valve which allows the water to be pumped out of the machine. Once the water has been pumped out, the strainer should be removed and cleaned out and made ready for the next day's operation.

Over-filling "a problem". The #4 cam controls the amount of water delivered to the machine during each cycle. If the account has widely varying water pressure during the day, it may be necessary to install a pressure regulator to control the flow. Remember, the drain time is set at the factory; therefore, it is the water "quantity" which is adjustable.

To start the machine. The start switch is depressed once the sump has been filled. This switch has to be held in place for approximately 3 seconds for the automatic run mode to activate. The running light (green) on the front of the machine is tied into the cam train and will tell the operator when the machine is in cycle. It shuts off at the end of each cycle. To minimize maintenance calls relating to results, insist that the customer provide hot, soft water. The Li'l Mizer is unlike any other standard, commercial dishwasher and trouble calls with regard to "clean dishes" will be all but eliminated if careful attention is paid to this recommendation.

SECTION XVIII - Preparation and Installation Guidelines

I. The dishwasher is shipped from the factory in a double wall corrugated box. The guidelines are listed in a step-by-step procedure for your reference.

Step 1: Unwrap the machine and check for the following component parts:

- a. Drain Screen: This is normally shipped inside the wash cavity of the machine.
- b. Tube stiffeners: (Tube stiffeners have been prepared at the factory and must be used to prevent the feed tubes from curling inside the chemical pail and sucking air.) Push the chemical feed tubes through the tube stiffeners until the end of the colored tube extends through the bottom of the tube stiffener. The bottom end is cut on an angle to prevent the peristaltic pump from sucking against the bottom surface of the pail. To prevent the tube from being inadvertently pulled up through the tube stiffener, push the chemical feed tube out beyond the bottom of the tube stiffener and with a match, melt the end and flair it against a table knife. When the plastic cools down, the enlarged flair will not allow the tube to be pulled up through the tube stiffener and accomplish the desired effect. Tube stiffeners with chemical lines attached can be found tied to the plumbing on the back of the machine.

Step 2: Open up the door and locate bag. The bag contains the following components:

Cam Adjustment Wrench

II. HOOKING UP THE DETERGENT FEEDERS: (The detergent feeders have been prepared at the factory.) Remove the lower panel and install the peristaltic squeeze tubes using the following steps:

Step 1: Using the peristaltic squeeze tube, rotate the rotor arm as you push the peristaltic tube in place. The rotor arm rotates in a clockwise rotation. The tube should be installed so that approximately one inch extends from the suction and discharge side of the peristaltic rotor housing.

Step 2: Using a screw driver, place the cover plate over the peristaltic housing. NOTE: Do not over-tighten the screws as they may bind the peristaltic motor.

Step 3: Locate the detergent lead system. The number two cam from the left should energize the detergent feeder. The wire leads are white/blue. The number five cam should energize the sanitizer feeder; leads white/green. The third chemical feeder is energized from the number six cam; leads are white/purple. NOTE: The leads have bullet connectors.

Step 4: Connect the chemical suction lines to pump. NOTE: Right side of pump is discharge; left is side suction. The peristaltic pumps rotate clockwise; therefore, as the rotors roll across the squeeze tube, liquid material is forced through the tube into the injector system. Use the spring clips to fasten the pickup and discharge lines to the squeeze tube.

III. DRAIN SCREEN ASSEMBLY: The drain screen assembly must be in place during operation. It has been designed to perform two basic functions:

1. Strain water that is circulating through spray arms and pump assembly.
2. A basket to catch broken glass, or heavy solids that may plug impeller.

IV. ACTIVATING MACHINE: The petcock is in the open position to prevent freezing residual water in route.

Step 1: Close the 1/8" petcock located at the bottom side of the main pump motor. Hold the fill button until the water level is approximately 1" over the surface of the tank.

Step 2: Once the water is filled to the proper level, press the rocker switch to RUN position for 3 seconds. The machine will automatically be in its cycle.

Step 3: Next, observe the detergent peristaltic pump. It should begin to run approximately four to five seconds into the cycle. The amount of product delivered by each cam is controlled by changing the opening in each cam. When the micro switch rides down into the cam, the peristaltic pump motor begins to rotate. It will continue to rotate until it rides up out of the groove. Therefore, to extend the amount of product delivered to the machine, open the groove; to reduce the amount of product delivered to the machine, close the groove. Cams are slip fit. A cam adjustment wrench is provided, but the cam can be adjusted with a small screwdriver or the edge of a table knife. Normally, do not change the start function of the cam; do all of the adjustments from the back side. This procedure is spelled out in depth in the service manual. It is recommended that some type of W.D. 40, X-seize 2000 be used on the lubricating pads built into the peristaltic pumps. It will double the service life of the peristaltic squeeze tubes by reducing their wear from friction. The motors on the new peristaltic pumps may be stalled by excessive tightening of the cover plate screws. If a peristaltic pump does not turn when the micro switch is activated, loosen screws on cover plate. Should pump still not turn, with your thumb and forefinger, turn the pump rotor in a clockwise direction.

Step 4: The Water Line, (see 4th cam instructions).

The machine is equipped with 1/2" standard gate valve (back right lower corner). A hot water line should be plumbed to this point.

Drain

On the discharge side of the diverter valve, we have provided a 1" barb fitting. If code approves, connect a good commercial grade hose to this fitting and secure with clamp. If code does not approve, remove barb fitting and adapt to code. NOTE: Floor drain type installations overflow kit is available. Contact CMA.

Electrical

A clean 20 amp 110 volt 60 Hz circuit should be used to supply electrical energy to the Li'l Mizer dishwasher. Check the local electrical code to determine if hard wire or plug-in cord is required. The electrical connection is made at the master switch located in the front left side of the machine.

The control monitor is attached to the frame with a hinge and the panel held in place with two screws in the front corners of the machine. In the event heavy maintenance is required, this is a feature designed specifically for service accessibility.

Step 5: Dishmachine Legs

- a. As an option, 6" legs can be ordered from CMA's Order Department.

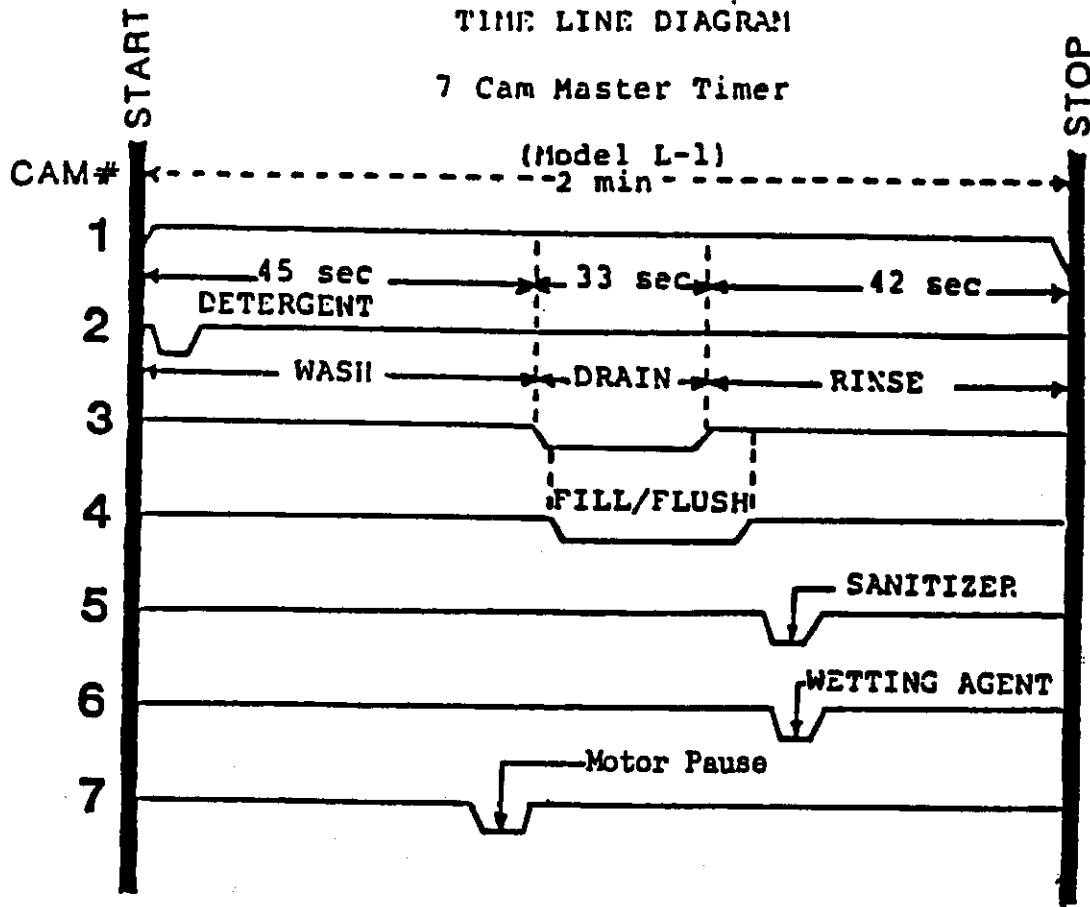
Technical personnel are available at any time at Chemical Methods Headquarters should you, as an installer, have any questions. The telephone number during regular working hours is (714) 898-8781 or (213) 598-0901. If you are installing in the evening and have an emergency, you can contact Chemical Methods personnel by dialing (714) 891-8290, leaving your number, and your call will be returned by on-call service personnel.

Chemical Methods' machines are designed to require minimum maintenance and prolong life. We are here to serve you.

ILLUSTRATION 1

TIME LINE DIAGRAM

7 Cam Master Timer



- (#1 cam) Start and stops main pump motor
- (#2 cam) Detergent pump
- (#3 cam) Fix drain
- (#4 cam) Fill and flush controls water level
- (#5 cam) Chemical sanitizer pump
- (#6 cam) Wetting agent pump
- (#7 cam) Motor Pause

ILLUSTRATION II

**Li'l Mizer
(undercounter)
OPERATOR CONTROLS**

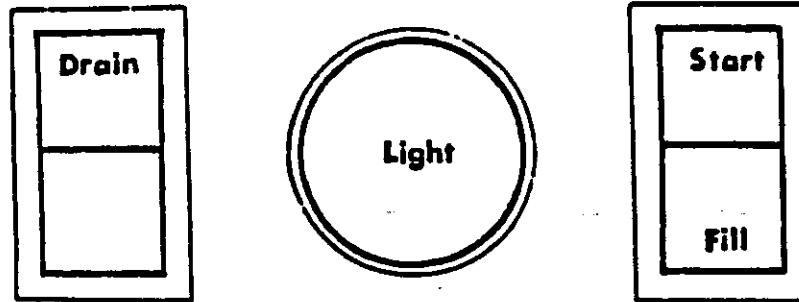
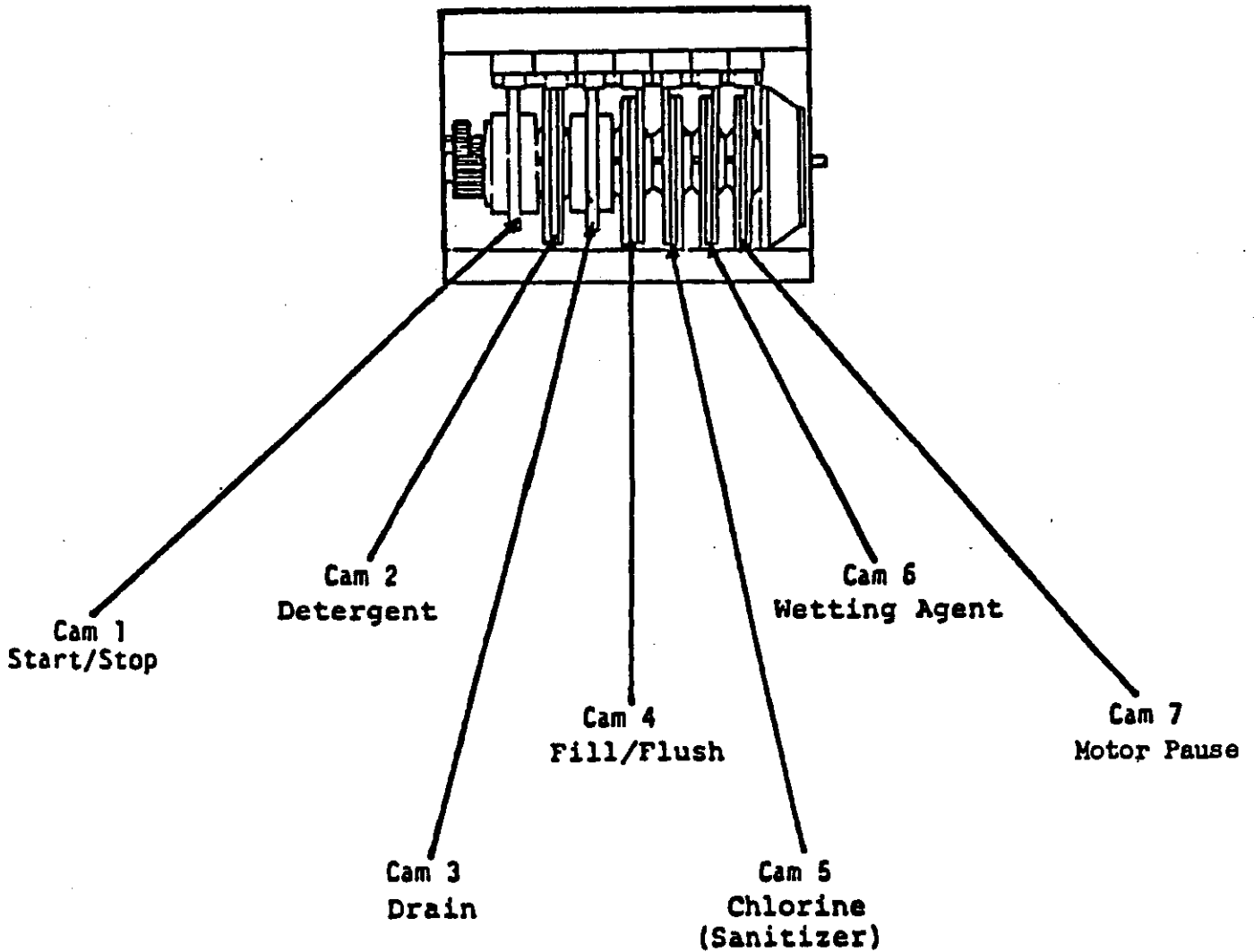
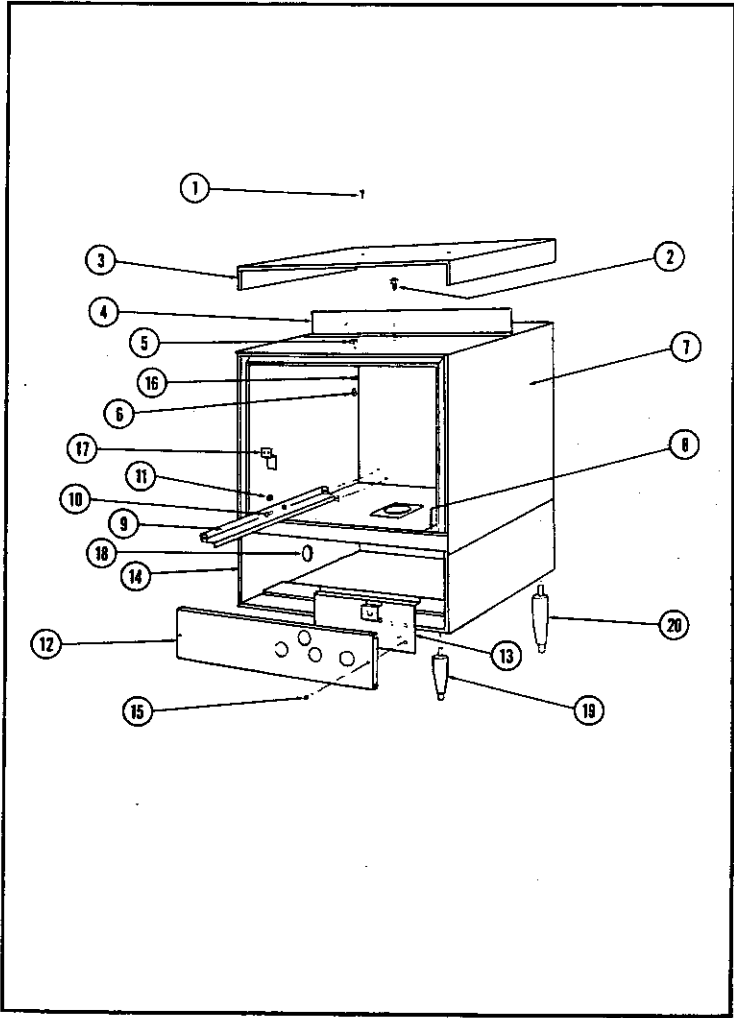


ILLUSTRATION III





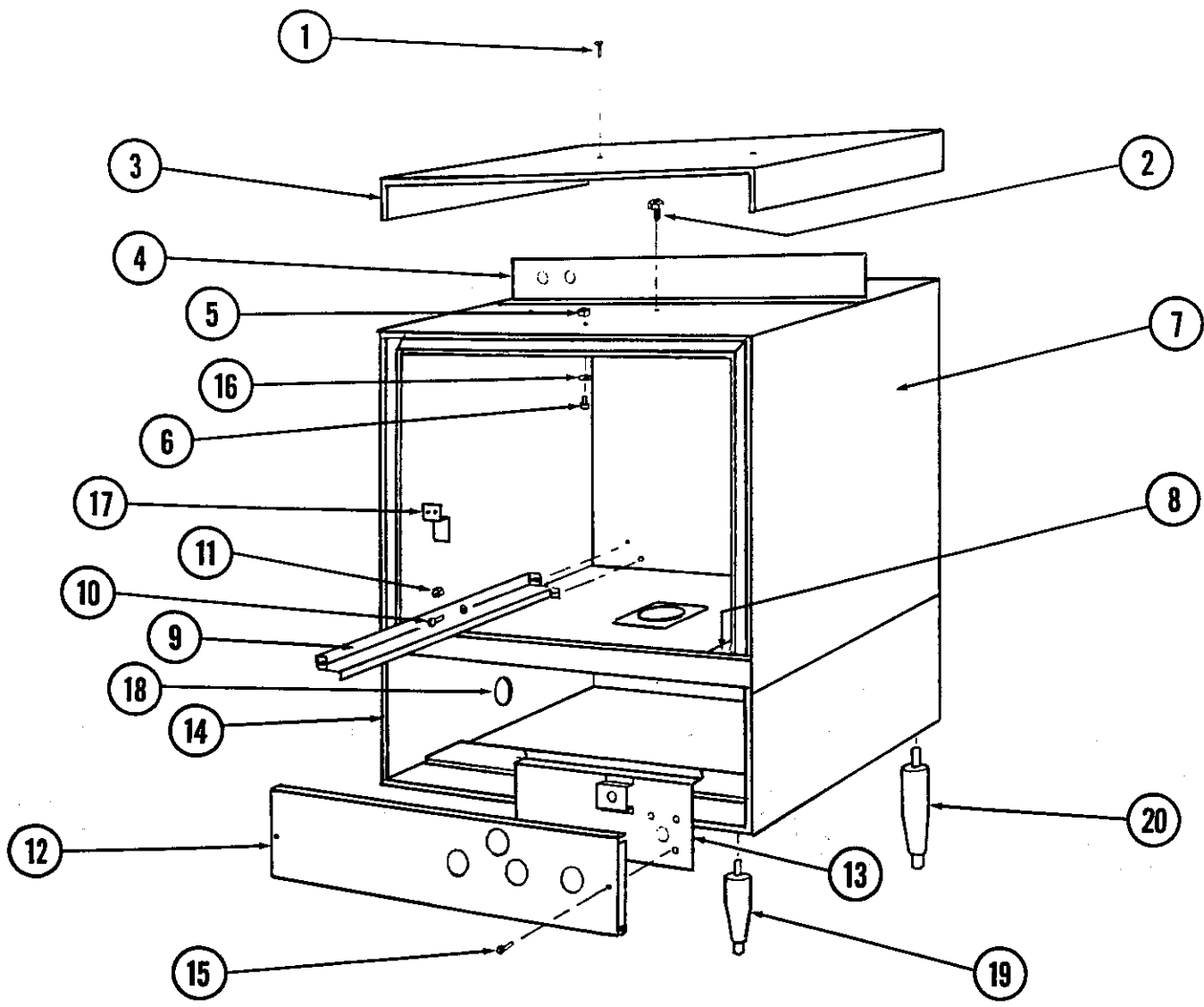
SECTION XVIII



EXPLODED VIEW



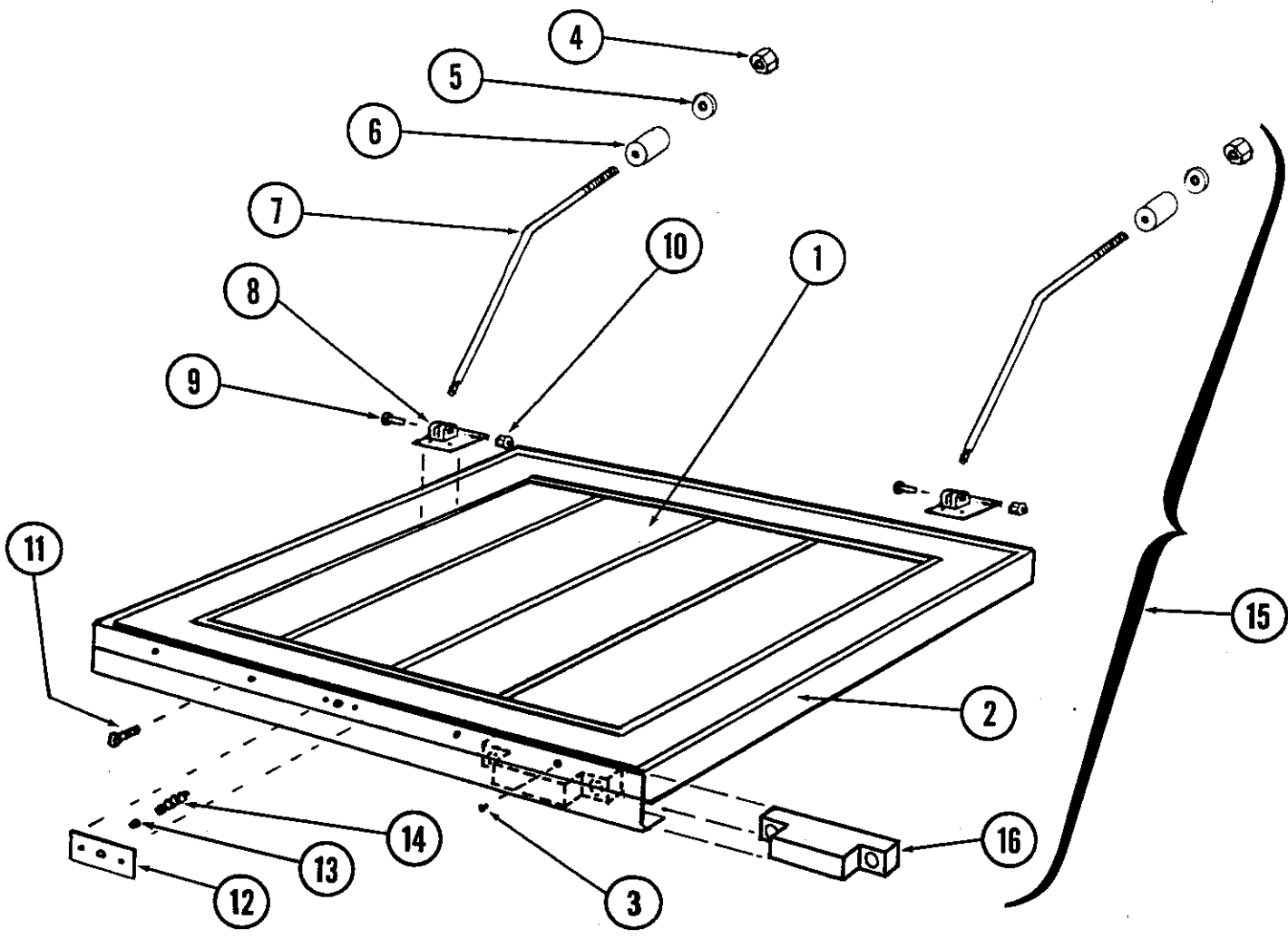
CABINET SYSTEM ASSEMBLY



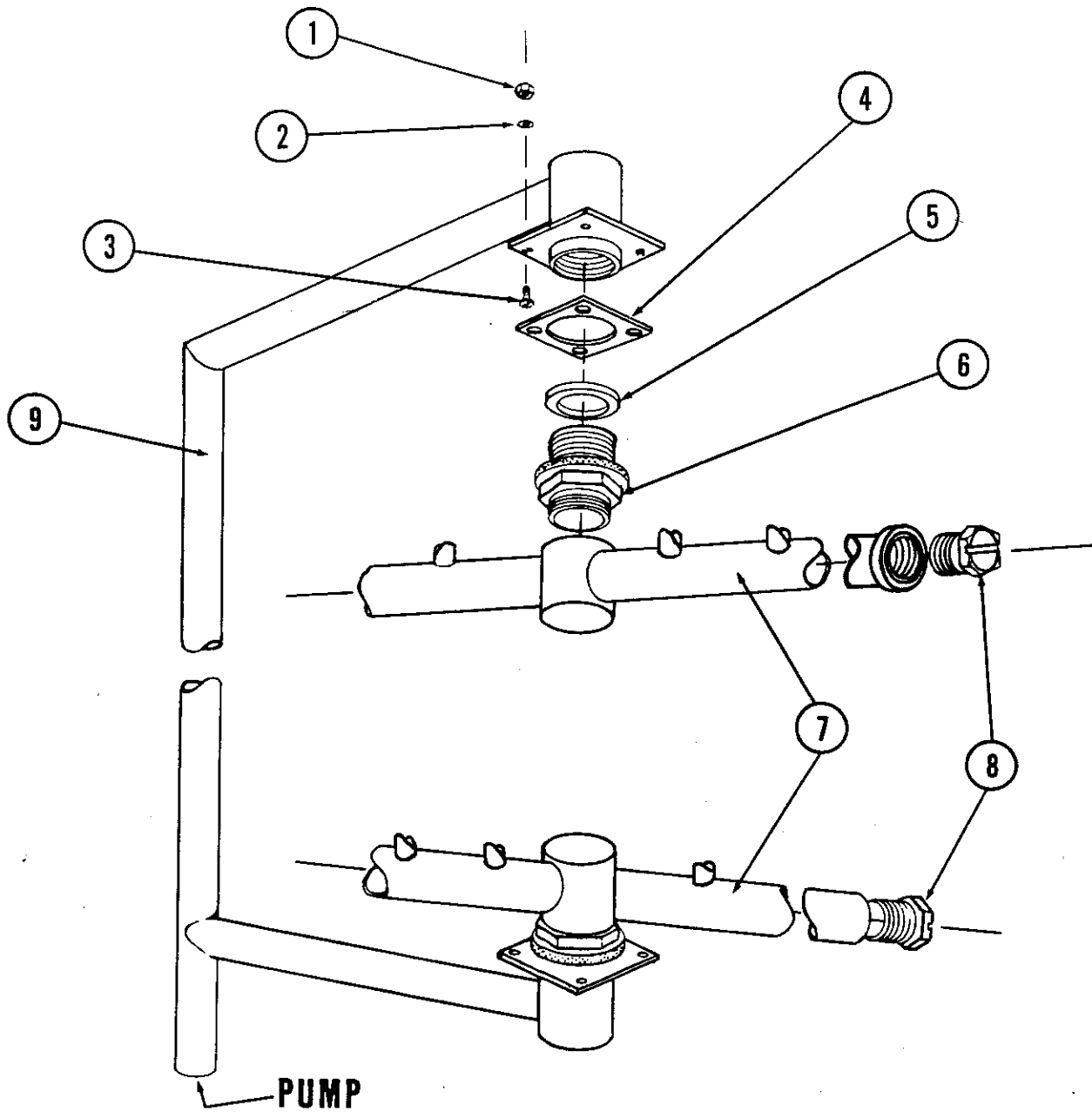
ITEM NO.	NO. REQ'D	DESCRIPTION
1	4	P/N 00911.00, 8 - 32x1/2" Panhead Screw
2	4	P/N 00940.50, 10 - 32x3/4" Panhead Screw
3	1	P/N 04903.00, L-1C Stainless Steel Top
4	2	P/N 04905.00, L-1C Stainless Steel Back Panel
5	1	P/N 00912.00, 1/4" - 20 Lock Nut
6	1	P/N 00929.10, 1/4" - 20x3/4" Catch Head Bolt
7	1	P/N 04901.00, L-1C Stainless Steel Body
8	1	P/N 04911.00, L-1C Tray Track (RH)
9	1	P/N 04912.00, L-1C Tray Track (LH)
10	2	P/N 00941.00, 10 - 32x5/8" Panhead Screw

ITEM NO.	NO. REQ'D	DESCRIPTION
11	2	P/N 00912.00, 1/4" - 20 Nylon Lock Nut
12	1	P/N 04915.00, L-1C Front Peri Pump Panel
13	1	P/N 04914.00, L-1C Peri Pump Mount
14	1	P/N 04902.00, L-1C Stainless Steel Stand
15	2	P/N 03800.00, 10 - 32x1" Panhead Screw
16	3	P/N 00926.00, 5/16" Stainless Steel Washer
17	2	P/N 04910.00, L-1C Splash Shield
18	1	P/N 41052.00, Hole Plug (1.25")
19	4	P/N 01146.50, 4" Leg *
20	4	P/N 01146.00, 6" Leg *

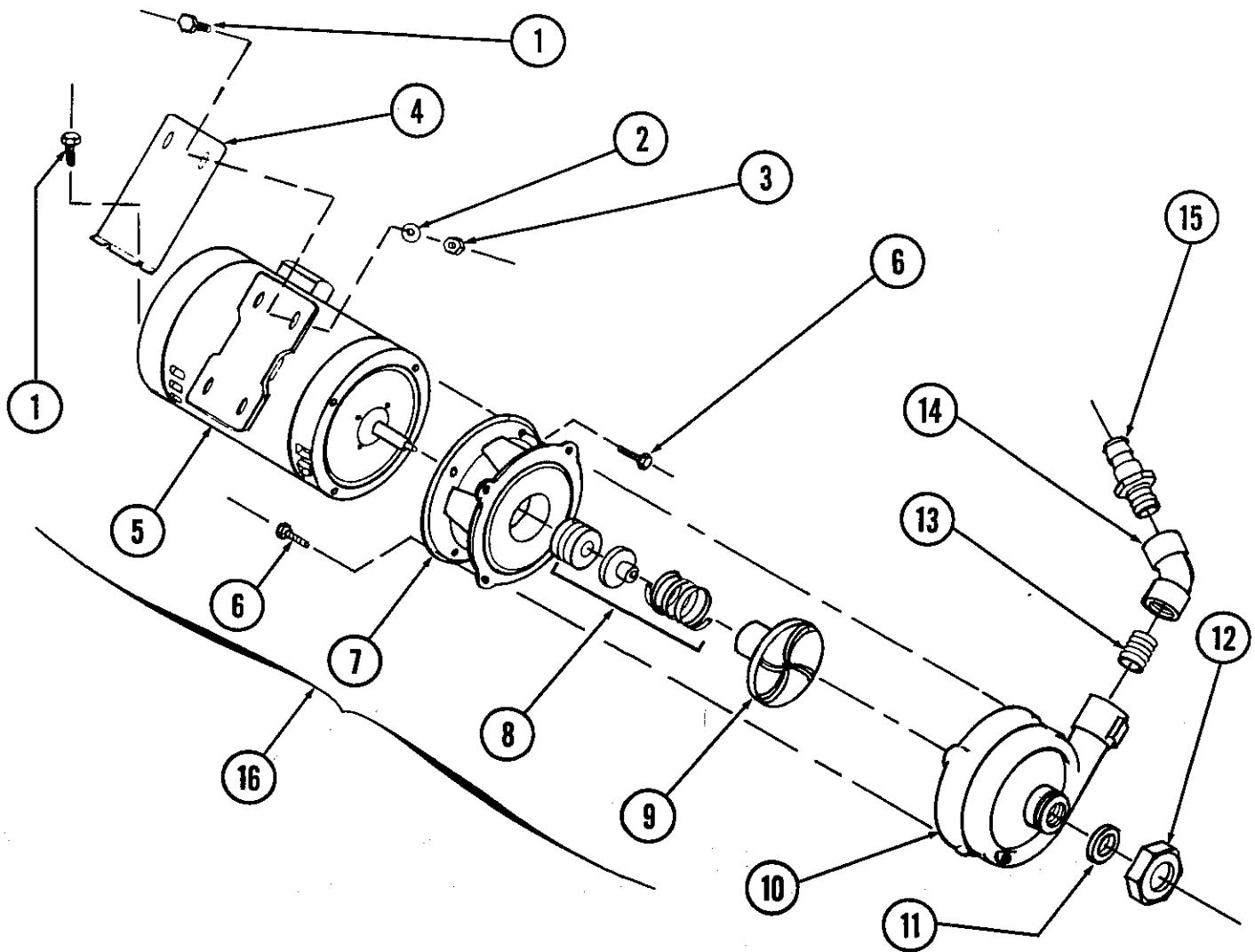
* Optional Parts



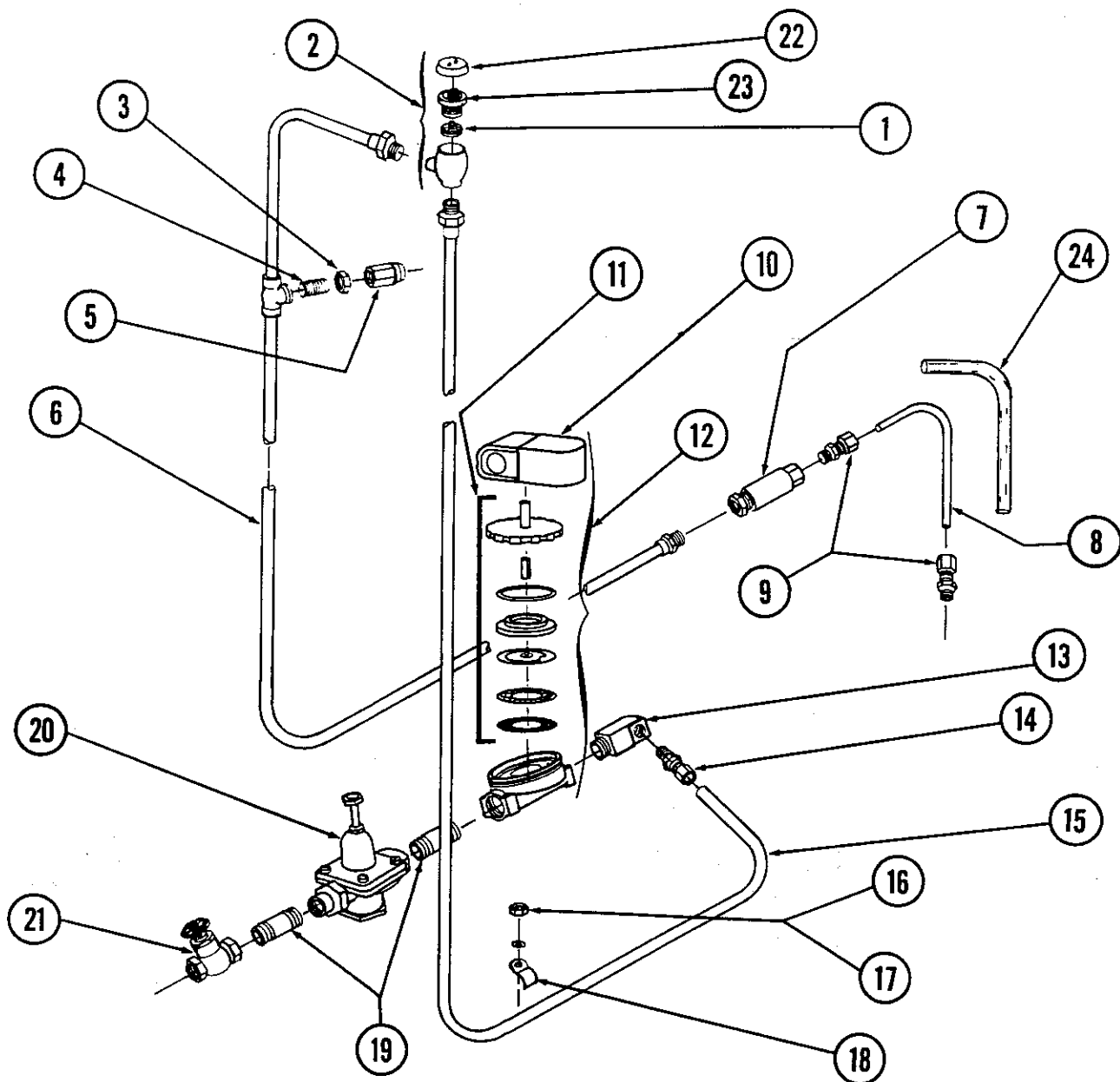
ITEM NO.	NO. REQ'D	DESCRIPTION
1	1	P/N 04906.00, L-1C Door Inner Panel w/Hinge
2	1	P/N 04906.50, L-1C Door Outer Panel
3	4	P/N 00930.00, Pop Rivet
4	2	P/N 13805.00, 5/16" - 18 Lock Nut
5	2	P/N 00925.00, 5/16" Brass Washer
6	2	P/N 04517.15, Door Stop (Silicone) Parallel
7	2	P/N 04918.10, Door Support Rod Angled
8	1	P/N 04916.00, Door Clevis
9	2	P/N 13825.00, #8 - 32x1" Pan Head Screw
10	2	P/N 00927.00, #8 - 32 Lock Nut
11	4	P/N 13826.00, #4 - 40x5/8" Pan Head Screw
12	1	P/N 04510.00, L-1C Door Catch Plate
13	1	P/N 04511.00, L-1C Catch Hemi-Ball SS
14	1	P/N 04512.00, L-1C Catch Ball Spring
15	1	P/N 04509.10, Complete Door
16	1	P/N 00558.30, Magnetic Reed Magnet



ITEM NO.	NO. REQ'D	DESCRIPTION
1	8	P/N 00912.00, 1/4" - 20 Nylon Lock Nut
2	16	P/N 00924.00, 1/4" SS Washer
3	8	P/N 00929.00, 1/4" - 20x3/4" Trusshead Bolt
4	2	P/N 04306.00, Square Manifold Gasket
5	2	P/N 04305.10, Polyethalene Gasket
6	2	P/N 04303.00, L-1C Spray Arm Bearing
7	2	P/N 00304.03, Spray Arm
8	4	P/N 00308.50, Spray Arm End Plug
9	1	P/N 04301.00, L-1C Spray Manifold



ITEM NO.	NO. REQ'D	DESCRIPTION
1	4	P/N 00908.00, 5/16" - 18x5/8" SS Hexhead Bolt
2	4	P/N 00926.00, 5/16" SS Washer
3	2	P/N 00913.00, 5/16" - 18 Hex Nut
4	1	P/N 04909.00, L-1C Motor Mount
5	1	P/N 00201.00, Water Pump Motor 1 HP
6	8	P/N 00921.00, 3/8" - 16x3/4" Hex Bolt
7	1	P/N 03224.00, Pump Base (Mount)
8	1	P/N 00206.00, Pump Seal Kit
9	1	P/N 03222.05, Impeller L-1M
10	1	P/N 04206.00, Pump Cover
11	1	P/N 00208.00, Slip Joint Nut Gasket
12	1	P/N 04204.00, L-1C Compression Nut 2.5"
13	1	P/N 04602.00, 1" Close Nipple PVC
14	1	P/N 04601.00, 45 Degree Elbow FIP x FIP PVC
15	1	P/N 50302.06, 1" MIP x 1" Barb PVC
16	1	P/N 00200.10, Includes Items 5, 6, 7, 8, and 9

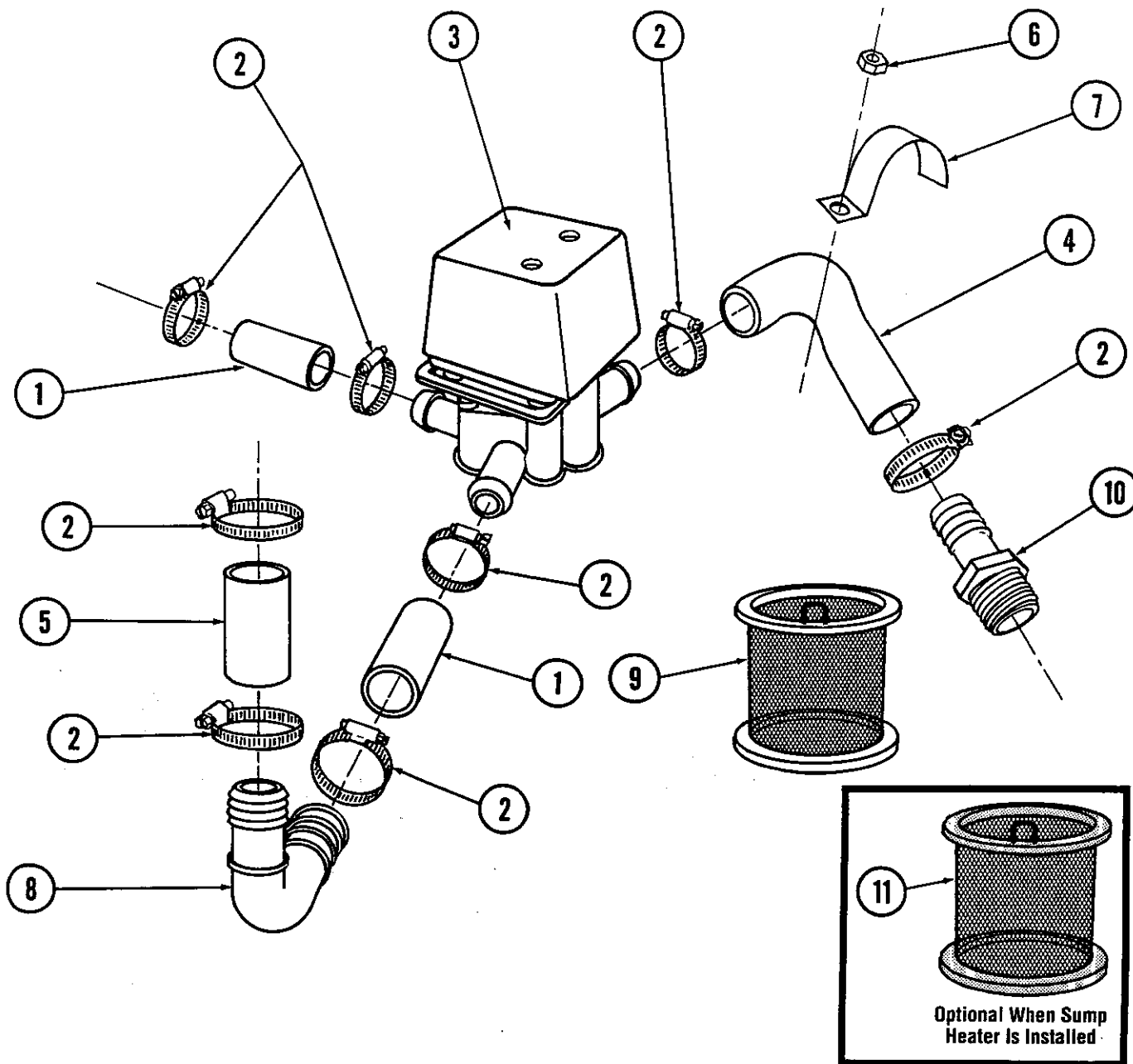


ITEM NO.	NO. REQ'D	DESCRIPTION
1	1	P/N 03623.00, 1/2" Vac. Brkr Repair Kit - WATTS
2	1	P/N 03624.00, 1/2" Vacuum Breaker - WATTS
3	1	P/N 00721.00, 1/2" Jamb Nut
4	1	P/N 03614.00, 1/2" Brass (Close) Nipple
5	1	P/N 00748.50, 1/2" Shrub Head
6	1	P/N 04605.00, L-1C "U" Tube
7	1	P/N 00715.00, Ball Check Valve
8	1	P/N 05012.40, 1/2" CU Ref. Tubing
9	2	P/N 00724.00, 1/2" Comp x 1/2" MIP Coupling
10	1	P/N 00738.10, Water Solenoid Coil J/E
11	1	P/N 00707.00, 1/2" Water Solenoid Repair Kit J/E
12	1	P/N 03603.10, 1/2" Water Solenoid Valve J/E

ITEM NO.	NO. REQ'D	DESCRIPTION
13	1	P/N 00745.00, 1/2" 90 Degree Street Elbow
14	1	P/N 00760.00, 5/8" Comp. x 1/2" MIP Adapter
15	1	P/N 04606.00, L-1C "L" Tube
16	1	P/N 00915.00, 1/4" - 20 Hex Nut
17	1	P/N 00924.00, 1/4" Stainless Steel Washer
18	1	P/N 00725.50, 1/2" Plumbing Strap
19	2	P/N 03602.50, 1/2" "Y" Strainer - Optional
20	1	P/N 03602.00, 1/2" Tee Strainer - Optional
21	1	P/N 03600.00, 1/2" Gate Valve
22	1	P/N 00739.50, Vacuum Breaker Cap SS
23	1	P/N 03624.25, Vacuum Breaker Bonnet Bras
24	1	P/N 04603.40, 5/8" I.D. x 7/8" O.D. Tubing



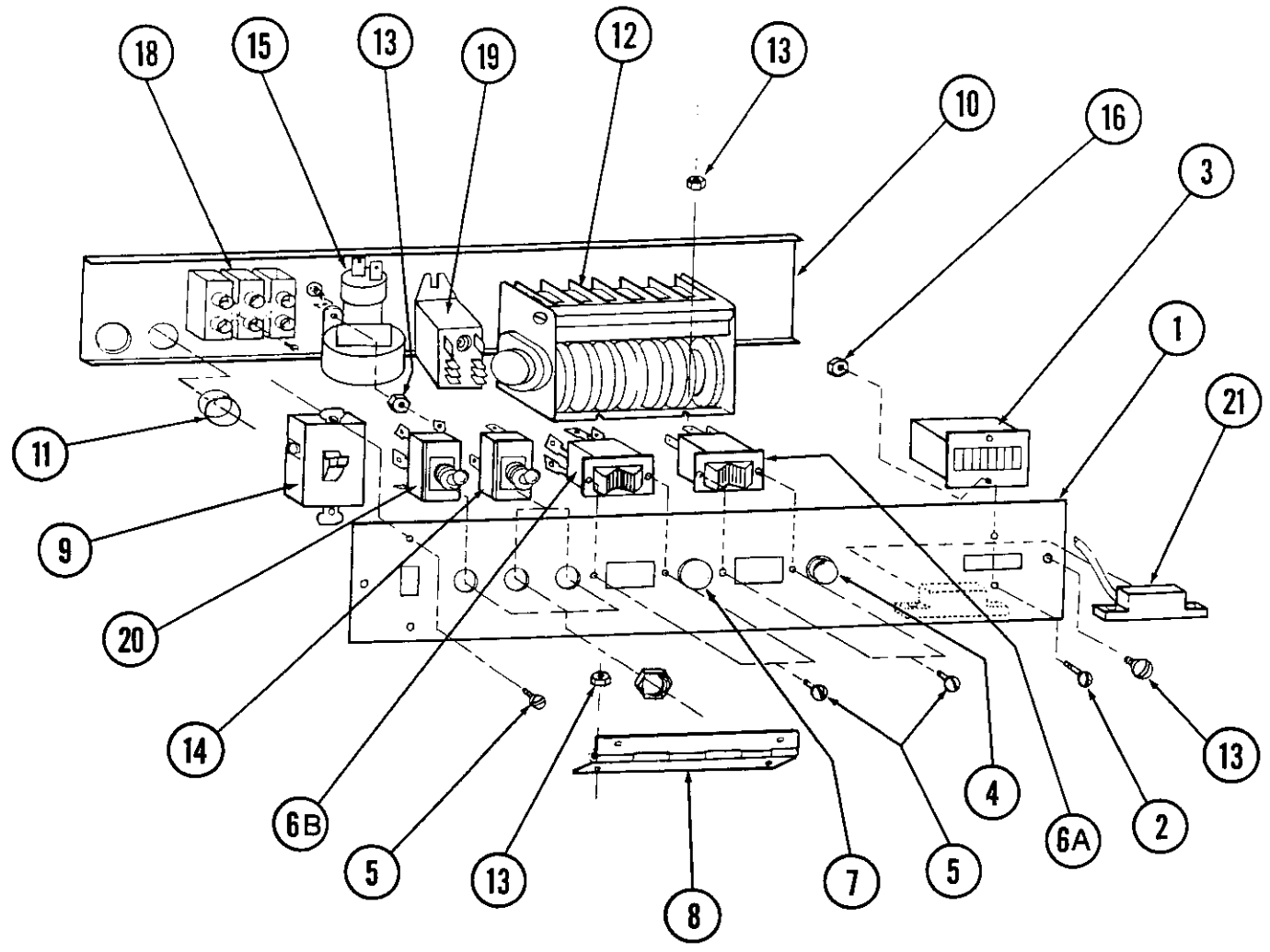
DRAIN SYSTEM ASSEMBLY



ITEM NO.	NO. REQ'D	DESCRIPTION
1	2	P/N 04105.00, Pump Hose 3.7"
2	8	P/N 03101.00, 1" Hose Clamp #16
3	1	P/N 04103.00, L-1C Drain Valve**
4	1	P/N 03108.51, 1" Goose Neck Drain Hose
5	1	P/N 04104.00, Drain Hose 4.0"
6	1	P/N 00915.00, 1/4" - 20 Hex Nut
7	1	P/N 13304.52, Short Support Bracket
8	1	P/N 04106.00, 1" 90 Degree Barb x Barb Elbow
9	1	P/N 04107.00, Drain Screen Assembly L-1C
10	1	P/N 50302.06, 1" MIP x 1" Barb PVC
11	1	P/N 04110.00, L-1C Drain Screen SS (Optional)



ELECTRICAL SYSTEM ASSEMBLY

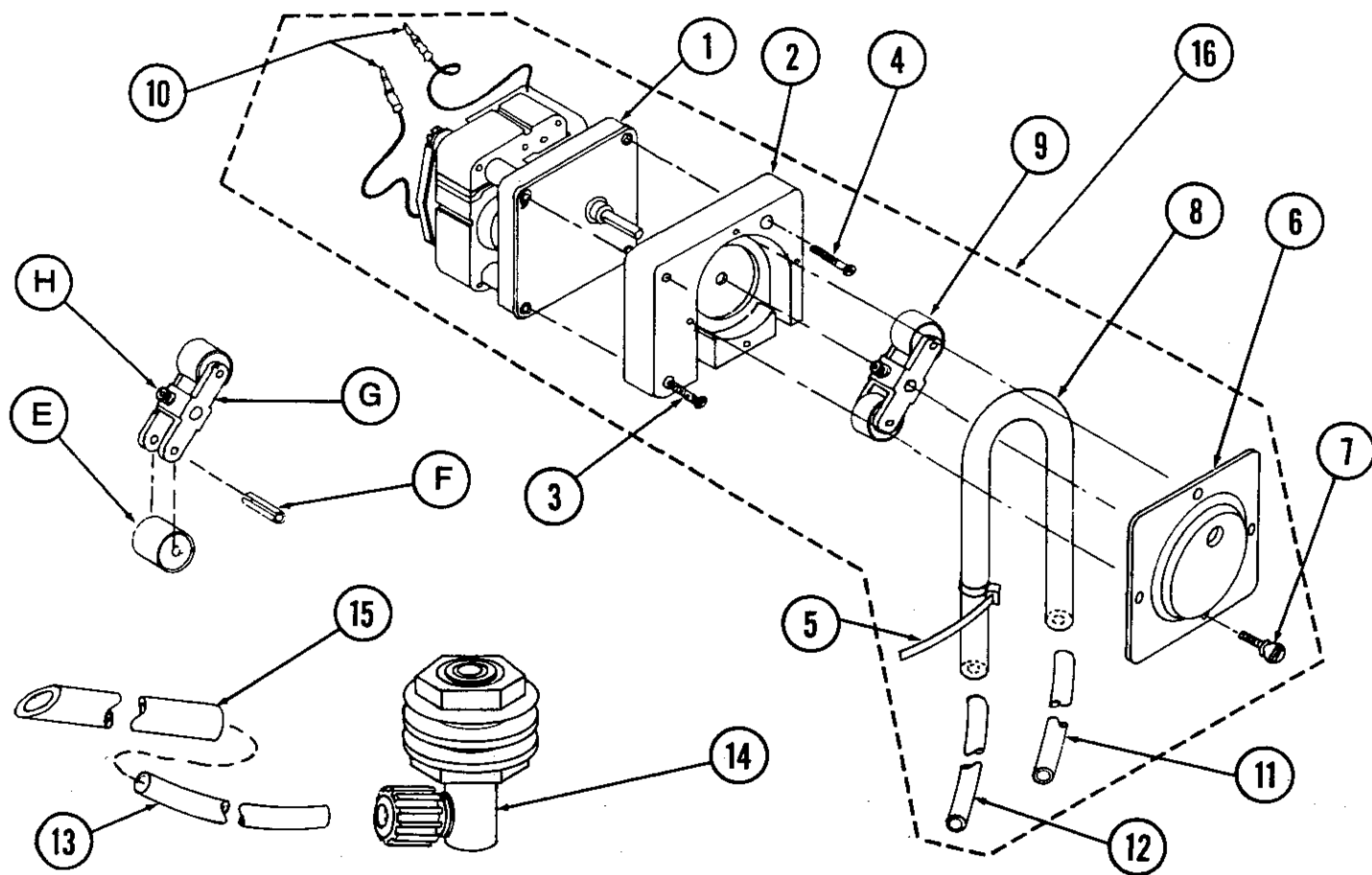


ITEM NO.	NO. REQ'D	DESCRIPTION
1	1	P/N 04904.00, L-1C SS Top Panel
2	2	P/N 00907.00, 6 - 32x1/2" Panhead Screw
3	1	P/N 03408.50, Counter
4	1	P/N 00406.00, Control Box Light (120/60) 1/2" D
5	6	P/N 00421.51, 6 - 32x1/4" Panhead Screw
6A	1	P/N 00421.50, Start/Fill Switch 3 Pole
6B	1	P/N 03405.50, Drain/Fill Switch 6 Pole
7	1	P/N 00476.00, Running Light Green 120V, 1" Dia.
8	1	P/N 04908.00, L-1C Front Panel Hinge
9	1	P/N 00433.10, Master Switch 20 Amp
10	2	P/N 04905.00, L-1C SS Back Panel
11	2	P/N 00437.00, Snap Bushing

ITEM NO.	NO. REQ'D	DESCRIPTION
12	1	P/N 00408.80, Timer
13	7	P/N 00927.00, 8 - 32 Nylon Hex Nut
14	3	P/N 03410.00, Primer Switch
15	1	P/N 00404.00, Mercury Relay (Single)
16	2	P/N 00916.00, 6 - 32 PM Nut
17	2	P/N 00940.50, 10 - 32x3/8" Panhead Screw
18	1	P/N 00454.10, 3 Pole Terminal Block
19	1	P/N 00631.00, Ice Cube Relay
20	1	P/N 00475.00, Toggle Switch DPDT 15 Amp
21	1	P/N 00558.00, Magnetic Reed Switch
*	1	P/N 04414.00, L-1C Wiring Harness



PERISTALTIC PUMP ASSEMBLY

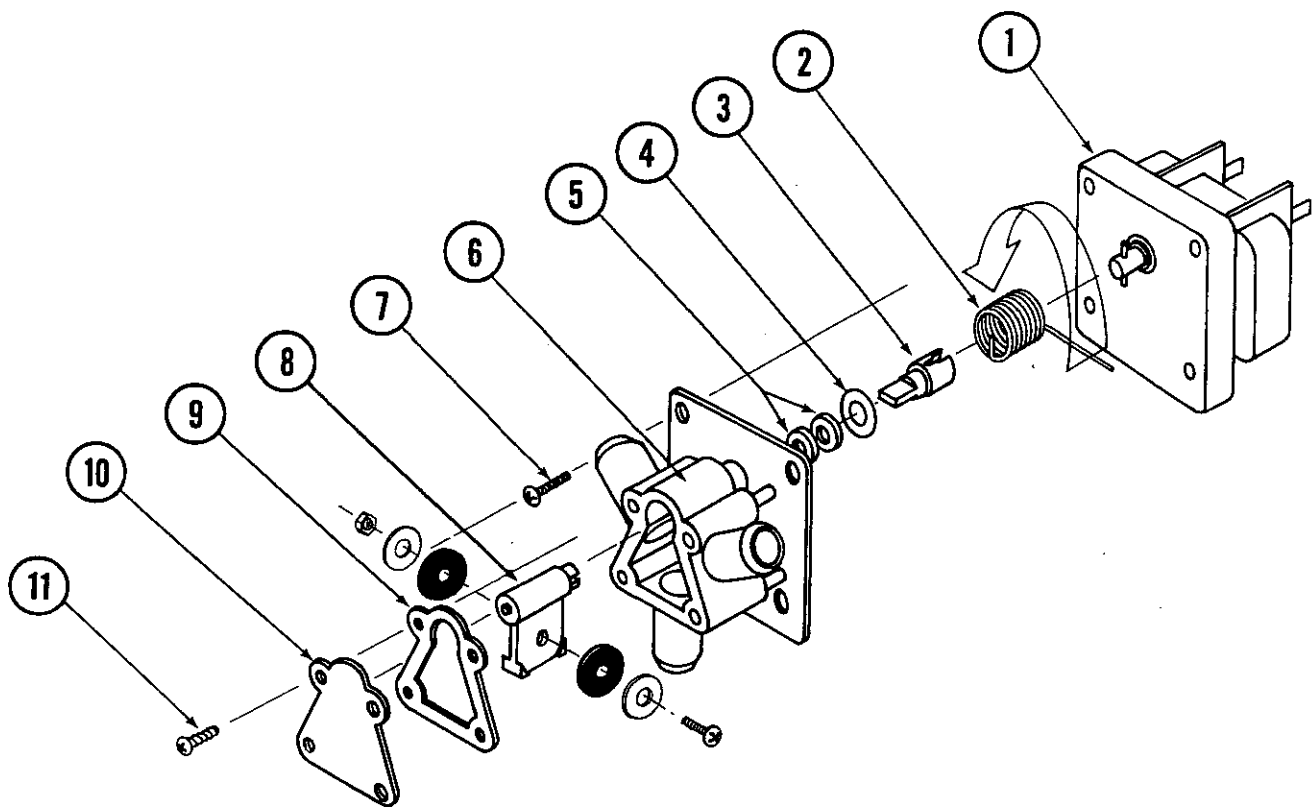


ITEM NO.	NO. REQ'D	DESCRIPTION
1	3	P/N 00416.00, Peristaltic Pump Motor
2	3	P/N 00417.00, Peristaltic Pump Block
3	6	P/N 00919.00, 10 - 32x1-1/2" Pan Head Screw
4	3	P/N 00918.00, 10 - 32x1-1/2" Fillister HD Screw
5	6	P/N 00932.00, Twist Tie - Large
6	3	P/N 00418.00, Peristaltic Pump Block Cover
7	12	P/N 00973.00, 8 - 32x1/2" Thumb Screw
8	3	P/N 00435.00, Squeeze Tube
9	3	P/N 00419.00, Peristaltic Rotor Assembly
E	6	P/N 00423.00, Rotor Bearing

ITEM NO.	NO. REQ'D	DESCRIPTION
F	6	P/N 00422.00, Rotor Bearing Pin
G	3	P/N 00424.00, Rotor Bearing Carriage
H	3	P/N 00935.00, 1/4" - 20x1/4" Allen Screw
10	6	P/N 00448.00, Barrel Connector (Male)
11	AR	P/N 00425.51, Chemical Tubing (Blue)
12	AR	P/N 00425.53, Chemical Tubing (Red)
13	AR	P/N 00425.54, Chemical Tubing (White)
14	3	P/N 03415.00, Chemical Tube Bulkhead
15	3	P/N 00443.00, Tube Stiffener
16	1	P/N 00415.00, Complete Peristaltic Pump



L-1C DRAIN VALVE



ITEM NO.	NO. REQ'D	DESCRIPTION
1	1	P/N 04103.21, L-1X Drain Motor 115V, 60Hz
2	1	P/N 04103.14, L-1X Drain Valve Spring
3	1	P/N 04103.20, L-1X Drain Valve Drive Pin
4	1	P/N 04103.19, L-1X Drain Valve Washer (Thin)
5	1	P/N 04103.17, L-1X Drain Seal Washer
6	1	P/N 04103.12, L-1X Drain Valve Housing
7	4	P/N 00941.00, #10-32x5/8" Pan Head Screw
8	1	P/N 04103.16, L-1X Hinge/Seal
9	1	P/N 04103.15, L-1X Drain Housing Gasket
10	1	P/N 04103.13, L-1X Drain Valve Housing Cover
11	4	P/N 04103.18, L-1X #8x5/8" Self Threading Screw

L-1C DRAIN VALVE REPAIR INSTRUCTIONS

P/N 04103.00 Depend-O-Drain

- Turn the main power switch to "OFF" position.
- Remove the orange and white leads to the valve motor.
- Remove the valve assembly by loosening three hose clamps closest to the valve body. (Drain goose neck bracket may have to be removed.)
- To replace broken valve spring or bad drain hinge/seal, the valve should be disassembled as shown above.
- Replace the defective part(s) and set up the assembly as shown.
- Hold the hinge/seal (8), valve housing (6), seal washer (5), thin washer (4), drive pin (3), and valve spring (2) together in the shown sequence and make sure the hinge/seal fits all the way inside the valve housing with the drive pin narrow tip inside the hinge/seal slot and the spring's upper tip inside the drive pin gap.
- Turn the motor shaft pin to match the drive pin gap. Push the whole assembly down until the motor shaft pin is inside the drive pin gap. Housing plate and motor mounting plate screw holes must match. (Valve spring tail **must** be at shown position.) Holding the assembly at this position, turn the spring tail approximately 160° counter-clockwise and lift the housing plate just enough to pass the spring tail under the two bossed points on the housing plate.
- Put the four pan head screws (7) back on and secure the housing on the motor.
- Mount the housing gasket and cover plate back on and secure with self-threading screws (11).
- Install the valve back on the machine and test it for proper function.

