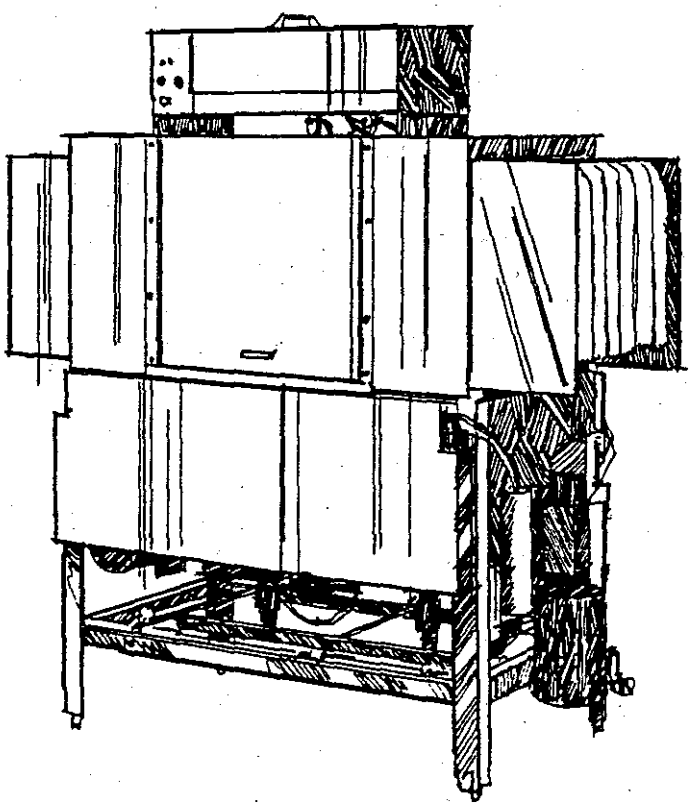
CMA DISHMACHINES

SERVICE MANUAL



Model M-1

CHEMICAL METHODS ASSOCIATES
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SPECIFICATIONS

WATER CONSUMPTION	1.2 per rack 216 gallons per hour
OPERATING CYCLE	
Pre-wash time	20 seconds
Power wash time	20 seconds
Rinse time	20 seconds
Total cycle	60 seconds/one minute
CONVEYOR SPEED	5 ft./minimum
OPERATING CAPACITY	3 trays per minute/180 racks per hour (NSF rated)
HOLDING TANK CAPACITY	13.5 gallons
PUMP CAPACITY	
Pre-wash/wash/rinse	73 gallons per minute each pump
WATER REQUIREMENTS	
Inlet temp	140 degrees Fahrenheit
Water inlet IPS	3/4"
Drain size IPS	2"
Flow pressure	20 psi
WASH PUMP MOTORS (3)	1 Horsepower @ 208/230, 2.5/2.5
HEATERS	
Coil heaters (4)	1500 watts each/6kw at 4 (2500 watts available)
DIMENSIONS	
Depth	25"
Width	44"
Height	52-3/4", 75-1/2" extended

DIMENSIONS

Standard table height	34" adjust to 35"
Maximum clearance for dishes	19"
Standard racks	19-3/4" x 19-3/4"

SHIPPING WEIGHT

Approximate Basic Model	**750 pounds**

ELECTRICAL RATING

Volts	208/220
Phase	1
Load Amps	50

Requires clean 60 amp circuit

Specifications subject to change without notice

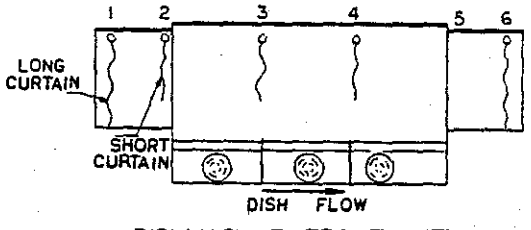
PREPARATION FOR INSTALLATION

When you receive your new Moving Mizer, complete the assembly by installing the curtain rods and two buffer sections which are shipped inside the machine. After the shipping crate has been removed from the machine, remove the left and right stainless steel buffer sections and bolt them in place with the nuts and bolts provided. The buffer with the extra curtain clamps mounts onto the dirty end of the machine.

All of the spray arms should be inserted and locked in place over each of the three wash tank compartments. Make sure that the end plugs are in place.

There are a total of five curtains used in the Moving Mizer; two are long and three short. Two of the long curtains have shorter rods than any of the other curtains. The short rods hold the long curtains at the entrance and exit of the machine.

If the dish flow was from left to right, the proper sequence for the placement of the curtains would be long curtain, short rod, in the first station; short curtain, short rod, in the second station; short curtain, long rod, third station; short curtain, long rod, fourth station; short rod, long curtain, sixth station. The only curtain change to reverse the flow of dishes is that the short curtain #2 changed to #5. The sketch below lists the stations 1 through 6. In this case, it represents a flow to left to right. Reverse the sequence for right to left dishmachine.



DISHMACHINE FRONT VIEW

The Moving Mizer is designed to give maximum cleaning in 44 inches. It represents the cleaning power of machines twice its width. The curtains incorporated in the machine minimize transfer from tank to tank during the wash and sanitizing procedures.

Energy costs for running the moving Mizer have been greatly reduced by the introduction of stage washing which incorporates activation of the wash tank and rinse tanks only when the rack is in place over each of the three compartments. This design allows the heavy food soil to be removed in the first station which provides a relatively clean dish before it reaches the wash stage in the center tank.

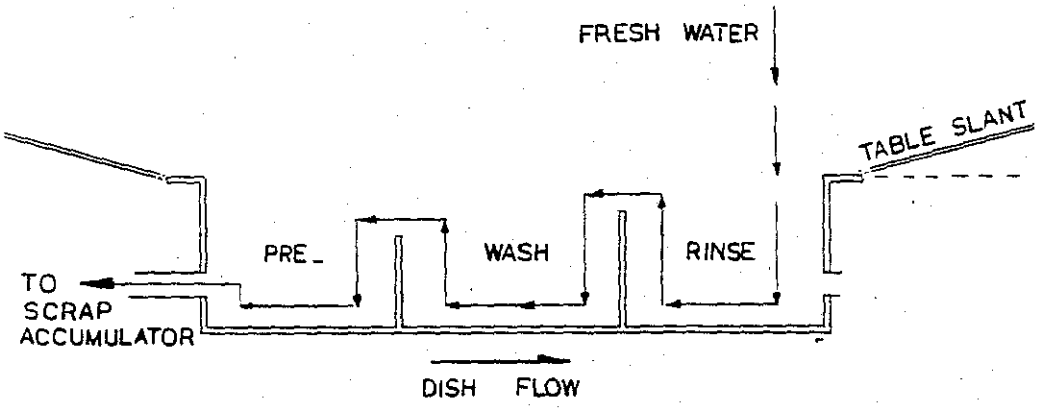
INSTALLATION NOTES

1. Tables must slant into machine (for 28" of Table we recommend a drop of at lease 3/4" in table height).

2. Tray rail is not to be moved up or down. Any change will alter the position of the Tilt Switch in relation to the dish rack or the dish rack in relation to the conveyor dogs.

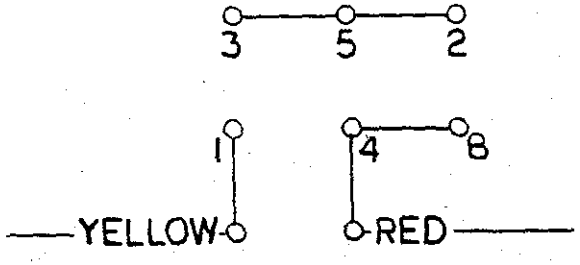
3. Use wide angle 90 degree plumbing for scrap trap (to avoid debris from blocking the scrap trap drain). This could result in flooding the machine.

The scrap accumulator is plumbed to the two inch exit on the entrance side (or dirty dish side) of the machine. The machine is designed to deliver 1.2 gallons of fresh rinse water which carries from the rinse and power wash tanks, into the pre-wash tank and then exits out into the scrap accumulator. SEE DIAGRAM.

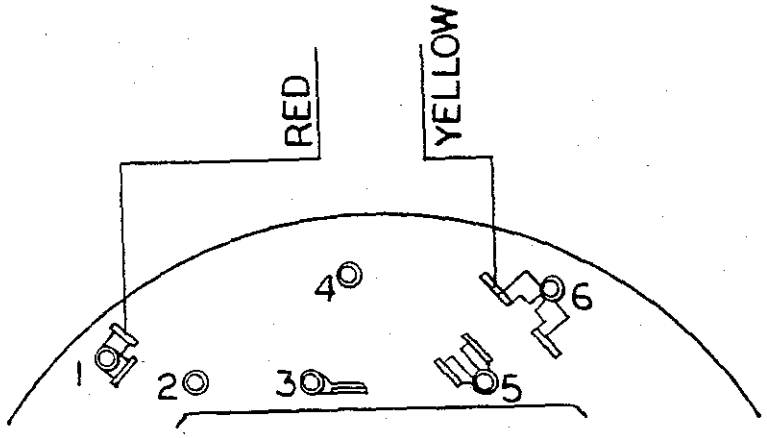


4. Observed rotation of the Conveyor Cam.

   - If rotation is clockwise as you are looking at the machine from the front, that is correct.
   - If it is counter clockwise, the movement of the rocker arm will unscrew the cam bearing.
   - To correct: rewire motor by changing #5 and #8 wires.

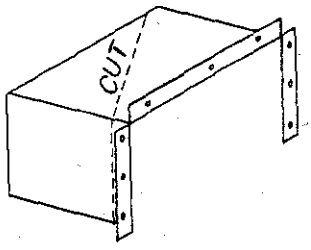


5. Water pump motors should be wired as such:



6. Incoming wire for the M-1 should be at least an 8 gauge wire for both L1 and L2.

7. If tables enter conveyor machine at a 90 degree angle and buffer or splash shield cannot be used, modify shield by cutting on a diagonal. It will provide some protection from splash.

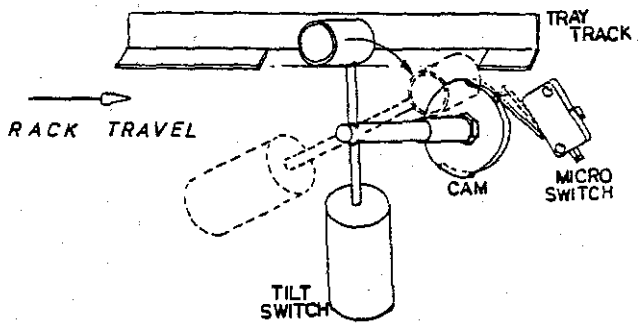


8. Make sure that all racks used will press lever switch down far enough to activate. If they <u>DO NOT,</u> adjust so they will. Half-racks must be put in two at a time.

9. No Quick Drains should be installed on tables before or after machine. They must be plumbed back into machines or welded over and capped off.

10. The diagram below should be viewed as though looking at from the inside of the machine. The diagram indicates proper tilt switch adjustment. Adjust cam to activate micro switch, when trip switch is level with tray track.

NOTE: If not adjusted properly, pump motor will turn off and on several times when dish rack releases tilt switch and it rocks back and forth.



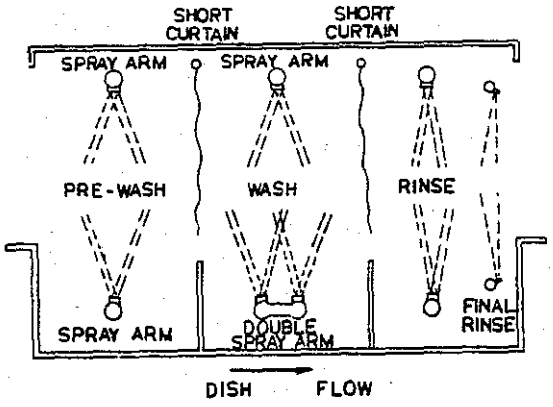
TRIP SWITCH ARRANGEMENT

11. The water inlet is attached to the inlet line on the top of the machine with a three-quarter inch, 140 degree hot water supply. NOTE: make sure that the primary heater is set to deliver 140 degrees to the machine. If unsure, turn down the booster heater to 140 degrees and leave it on line. Be sure the water source is 3/4" inlet all the wat from water heater or water softener. No 1/2" restrictions.

12. Set Pressure Regulator while machine is in FINAL RINSE CYCLE; correct pressure is 20 psi, (+ or - 2 lbs.) VERY IMPORTANT.

13. The diagram below shows the proper spray arm alignment to prevent tank to tank contamination and excessive spray reflecting out of machine.

SPRAY ARMS DESIGN



14. Mixing Chamber

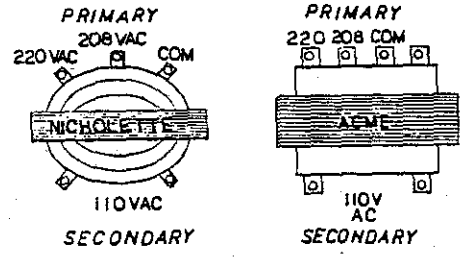
CAUTION: Check valves should be installed parallel to the machine where chemicals will not leak onto stainless.

ELECTRICAL POWER REQUIREMENTS

STEP DOWN TRANSFORMER

M-1's are wired from the factory to accept 220 voltage. If you install an M-1 in 208 voltage installation, the 220 leg of the step down transformer must be changed to the middle position which is the 208 leg. This will give you the proper 110 voltage which runs all the controls of the machines. If you have not made this conversion on existing 208 installations, you may be supplying the 110 voltage circuits with low voltage resulting in component failure. The diagram below is a top view of the step down transformer.

The electrical circuit required to run the Moving Mizer is a clean 60 amp, 208/220 single phase line. If a three-phase Delta system is involved, the wild leg should be disconnected and the two, clean 110 volt legs wired to the top and bottom screw terminals on the terminal block.



If any particular function is out of operation on the machine, select the fuse which controls the functions and check it using a conductivity test to determine if the fuse is blown. It is then a matter of tracing the circuitry back on the function with the conductivity meter to find out where the problem exists.

M-1 MOVING MIZER HEATERS

The heating elements used on the Moving Mizer are four in number. One element is located in the prewash, two in the wash, and one in the final rinse. A 1-1/2" socket is used to install or replace the elements. They should be approximately 20 to 25 ft/lbs.

The heaters are wired 208/220 single phase voltage. Each heater is rated at 1500 watts and has an amp draw of 7.2. This reading can be gained by testing with an amp probe (tester) around any one of the two wires going to the heater element. If this reading is not observed, the heater will not be operating.

The heaters are controlled by the thermostat, and probe bulkheads located in each of the three tanks. Two things will happen: if there is low temperature, the thermostat will allow a signal to be sent to the heater mercury relays. If there is ever low water in any tank, probe bulkhead will shut off the signal to the heater mercury relays through the low level relay.

The thermostat and probe bulkheads are wired in series, or in other words, a loop. A line of power comes to the thermostat, then the line continues from there to the probes and so on until it returns to the control box where the line supplies power to the heater mercury relays. Please refer to wire diagram on "heater controls."

SAFETY TIPS FOR M-1 MOVING MIZER

DANGER — Always turn off circuit breaker at wall when working on dishmachine. (Remember it is 220 voltage.) Even with machine switched off there is a live connection coming to the switch so switch off circuit breaker.

CAUTION — Do not get in path of conveyor rocker arm and the conveyor moving bar. Do not reach into rocker arm area without first making sure the dishmachine is turned off at the circuit breaker.

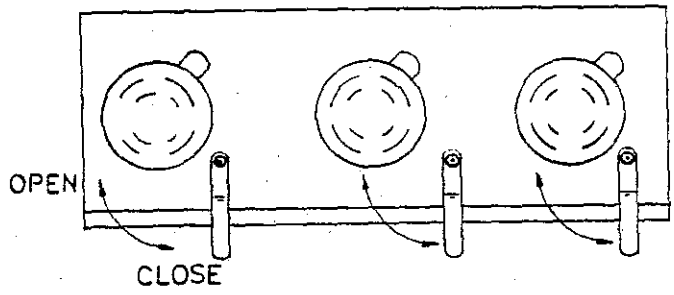
CAUTION — Do not open front door when machine is in operation.

CAUTION — Avoid water spraying on electrical control box on top of the dishmachine. When cleaning, do not spray water directly on to motors.

CAUTION — When cleaning final rinse arms that are plugged, exercise caution when removing. The final rinse arms are under pressure and filled with chemicals.

OPERATION INSTRUCTIONS FOR THE M-1 MOVING MIZER

A. Make sure the drains are closed (handle turned all the way down).



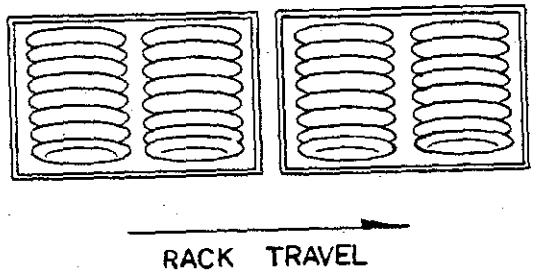
B. Turn on master switch on side of control box. Green power light will indicate the machine is energized. Push fill switch and hold for 3 seconds. The 2.5 min. timer will be activated and the machine will begin to receive water and detergent.

C. Make sure water temperature is between 140 - 150 degrees. Tank heaters will only hold temperature between wash cycles.

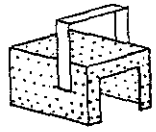
D. IMPORTANT

Placement of dishes in rack:

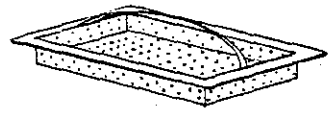
Make sure dishes are placed correctly. If they become dislodged, they could interfere with lever tilt switch and interrupt the operation of the machine.



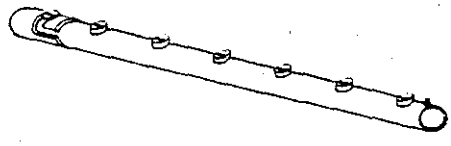
E. At the end of the day and after heavy periods of accumulation, clean stainer trays. There are six trays inside the machine. Also, remove seven spray arms and clean them out. There are suction screens over each pump inlet at the bottom of the water tanks. Remove these and clean, then take caution in returning to holding tracks in tanks.



SUCTION SCREEN



STRAINER TRAY

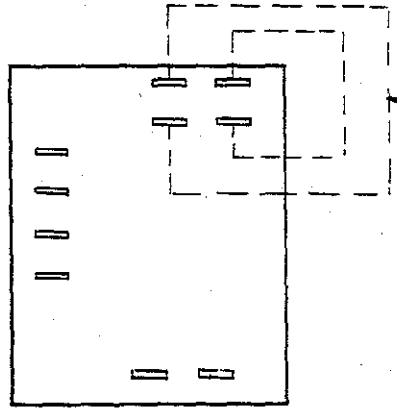


SPRAY ARM

When water becomes heavily soiled, drain tanks and refill machine.

F. Check chemical buckets. Make sure there is adequate supply of detergent, rinse aid, and sanitizer. Also check that pick-up line is inserted into correct bucket.

NOTE: Priming Sanitizer and Rinse Motors



VARI SPEED CONTROL UNIT

TO BEGIN OPERATION

The Moving Mizer is designed to automatically fill and chemically charge prior to the operation in the morning.

CAUTION:

Do not operate the machine without the tank full. The rocker switch located on the front of the control panel is depressed for a count of three seconds. The switch activates the three-minute timer which fills from the number two cam (counting from the left), this switch controls the fill solenoid valve thus introducing fresh water to enter the wash tanks.

If the water pressure is low, it may be necessary to rewire micro switch for 360 degree operation. Relocate black wire on 2nd micro switch (3 min. timer) from the bottom terminal to the middle terminal. Once water is observed flowing out of the overflow into the top of the scrap accumulator, the machine is fully charged and ready for operation.

The number one cam (3 minute timer) automatically dispenses detergent into the middle wash tank during the fill cycle. The amount of detergent is adjustable to control the level of detergent strength.

The wetting agent and sanitizing agents are not injected during the initial fill stage. They are injected into the final rinse make-up water when the tilt switch is activated in the final rinse tank.

CHEMICAL DISPENSING: 20 Second Timer

The number one cam, counting from the left, dispenses detergent. It activates every 20 seconds which is the period of time necessary for a rack of dishes to exit each wash station. The detergent pump will operate one time during each 20 second period. The amount of chemical is adjusted by using the standard adjustment procedure on the cam (cam wrench). The switch which sends energy to the detergent pump is activated by the final rinse tilt switch.

The sanitizing pump operates when the fresh water enters the machine during final rinse. The water is treated at 50 ppm. The Moving Mizer is adjusted with the pressure regulator to 20 pounds pressure, + or - 2 lbs. This allows 1.2 gallons of water to enter the machine each time a rack is washed.

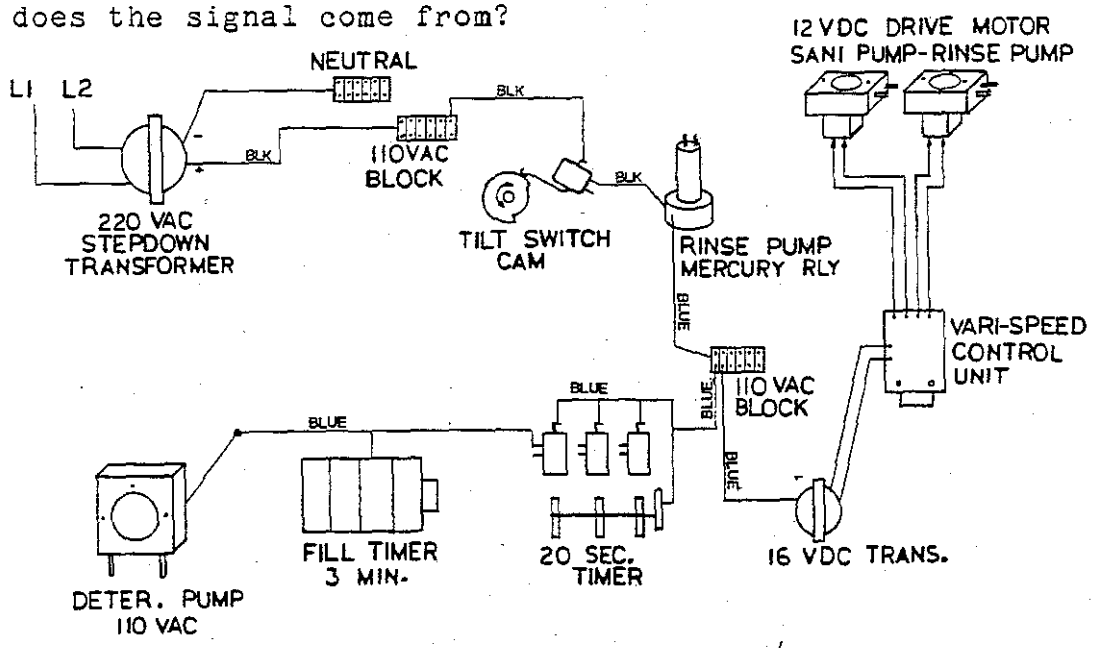
The Moving Mizer is also approved for final recirculation sanitizing. The number three cam on the 20 second timer is used to dispense sanitizer only in the recirculation mode.

It is recommended the 5-1/2% chemical solution be standardized to allow uniform dispensing of the sanitizing solution into the flow of rinse water as the machine operates. At this level, maximum shelf life is available.

CHEMICAL ADJUSTMENTS AND INFORMATION FOR THE M-1

The detergent pump is controlled and activated by the 20 second timer. The cam that operates the micro-switch for the detergent can be adjusted from 0-12 cc's per 20 second cycle. This is accomplished by using the micro-switch for normally "on" and normally "off" positions. The power is applied to the top of the switch through the top blade. If the blue wire which comes from the peri pump is placed on the bottom blade, then power will be sent whenever the cam is in the low position. If the wire is placed on the middle cam, then power will be sent whenever the cam is on the high side.

Where does the signal come from?



ELECT. SOURCE 220 V, SINGLE Ø, 60 HZ

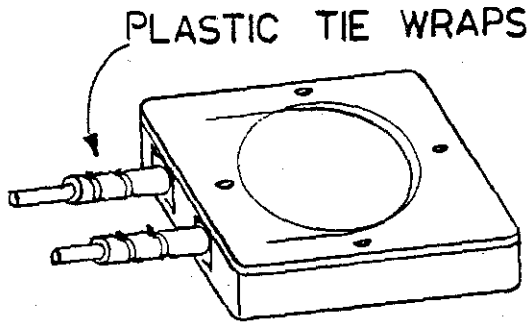
The varispeed transformer and controller receives its signal from the 110 volt terminal block also. The speed of each 12 volt pump motor can be controlled individually with a range of 1 to 19 rpm, this will provide a maximum of approximately 12 cc's per cycle for each of the pumps.

The rinse and sani are pumped against pressure as they are injected into the final rinse manifold. This is a problem area for two reasons:

1) The peri pump must be able to overcome the 20 psi present in the manifold of the final rinse.

2) The stress on the squeeze tube is 3 times that of a pump that simply drops the chemical in the tank.

For these two reasons it is important to always inspect and replace the squeeze tube for the rinse and sani chemicals. Also, the pinch of the 3 roller pump is more severe than the 2 roller pump and has a tendency to pull the tube chemical line around if they are not secured adequately. We recommend that two plastic tie wraps be used at each end of the squeeze tube.



Normal operations should use chemical settings at:

8 cc's of Detergent - (Premium Grade)

6 cc's of Sani at 6% Chlorine

4 cc's of Rinse

REGULAR SERVICE AND MAINTENANCE CHECK LIST

1. Upon entering the facility, make a preliminary check of the flatware and glasses, especially stemware. This will give you a quick indication of how the machine is functioning.

2. Go to the M-1, turn off the power switch on the side of the control box. Open the door and check the interior condition of the machine.

   a. The stainless on the inside of the machine should be clean and shiney, no dull look or buildup of white lime scale.

   b. Check the condition of the scrap trays for excessive garbage. Make sure the dishmen are cleaning the machine, explain proper cleaning procedures.

   c. Open the drains and check to make sure they are all working properly.

3. Once the machine has drained, remove both end curtains from the scrap and rinse and remove all the scrap trays from the machine. A. Check all spray arms and jets - clean and explain cleaning procedures to dishmen. B. Check the pump screen cover inside each tank, check the drain openings making sure they are free and clear of debris. C. Check the float switches, or probe bulkheads making sure they are attached and moving up and down freely. D. Check the heater elements. They should be black with no splits, breaks, or cracks.

4. Close the drains, turn the power on and fill the machine.

   a. While the machine is filling, check the liquid detergent to make sure that it is pumping into the machine. You can do this by opening the door and observing detergent coming out of the 1/4" tubing.

   b. Check fill vacuum breaker for leaks.

   c. This is a time to check the water hardness. Check the water at the fill while it is coming into the machine.

   d. Using a curtain bar or something long, turn on the final rinse so the conveyor and the pressure rinse starts and observe the spray pattern of the final rinse jets. It is easier to see while the pressure is lower. If you have any clogged rinse jets, clean them using a bent paper clip.

5. Check the heaters to see if they are working. They are wired in series, either they all work, or none. If the temperature is below 140 degrees, check the voltage through the lower contactor on the mercury relay switches. You should get a reading.

Once the fill cycle has been completed, check the water level in all three tanks. The 2-1/2 minute timer should be sufficient at 5 to 10 psi fill to fill the first two tanks completely, and the scrap tank to at least 1/2 to 3/4 full.

6. With the machine full, replace all of the scrap trays into the proper position.

7. Place a rack into the machine, and observe the spray pattern of the scrap, the wash, and the final rinse.

   a. Check the titration of the wash tank at this point.

   b. While the rack is in the final rinse, check the chlorine for fifty parts per million in the final rinse.

   c. Observe final rinse vacuum breaker for leaks.

8. Run a stemware or glass rack through the machine at this point and check the results on the glassware. A. Observe the check valves for the rinse and sanitizer. Make sure they are not leaking or building up chlorine crystals. If they are clean, leave them alone. B. Check the condition of the chemical tubing from the peri pump to the check valves. C. Check the peri pump squeeze tubes to make sure they are tight, pumping product properly and not leaking within the peri pump. There should be no moisture within the peri pump itself. D. Observe the final rinse pressure at 20 psi +2. Adjust if necessary.

9. Check the condition of the chemical tubing coming from the detergent rinse and sani buckets, up to the machine.

10. With the machine stopped, check the roller cam bearing on the conveyor. You should be able to move the outer cover of that roller cam bearing with your finger. Also, keep it well greased so that outer covering does not freeze up.

11. Check the conveyor arm. Make sure the arms are running smoothly.

12. Run two or three racks through the machine. Check the scrap overflow. While the racks are running through the machine, take a quick look under the machine to check for any drips or leaks coming from the machine or motor to make sure a pump seal is not leaking.

13. Using an all-purpose cleaner or stainless steel polish, clean up the outside of the machine to keep it looking nice.

14. Once this is all done, fill out a service report and take your results to the manager.

This is a quick, preliminary check of the machine that should be done at least once a month on a regular scheduled service call with a serviceman or a scheduled appointment with a salesman going in. All of this checking does not require much in the way of tools. About the only extra item you need is a chlorine test kit or a detergent test kit. The above can be accomplished in 10-15 minutes.

TECHNICAL TIPS

SPECIAL TOOLS NEEDED IN SERVICING THE M-1 CONVEYOR:

Electrical Test Equipment

1. Voltage/ohms tester
2. Amp probe

Hand Tools

1. Small snap ring pliers
2. 1-1/2" socket and ratchet
3. Mechanical fingers (flexible or rigid)
4. Thermometer
5. Allen wrench
6. 3/4" deep socket and wrench

TEST TO RUN

Conveyor Control Unit The conveyor control unit is defective, you would read a ground signal at the conveyor mercury relay all the time or no ground signal at the conveyor mercury relay all the time.

Heater Circuit There are two heaters on each heater mercury relay. If both heater elements were operating on the heater circuit, you would have an amp draw of approximately 14 amps when you test the wire leading from the heater mercury relay. If you have a reading of only 7 amps, you know one heater is not operating. Both must be operating to achieve results.

Drain System If a drain on the water tank will not close completely and the machine will not fill, look inside the machine and into the drain. Observe any obstacle that my be blocking the ball valve from closing all the way such as a spoon or fork.

Tilt Switch If a tilt switch becomes loose and inoperative, it will be necessary to remove it by taking the snap ring from the shaft after the cam has been taken off. Then the tilt switch can be pulled from the inside after which the bearing and brass sleeve can be tightened or replace.

Elect All controls in the M-1 conveyor are operated with 110 voltage. The power supply to the four motors and four heater elements are 208/220 voltage single phase.

Thermostat If it becomes necessary to adjust the thermostat, it can be done by loosening the small set screw to the side of the center rod. The center rod can then be turned with a screw driver. Left or counter-clockwise is temperature increase about 30 degrees F. per 1/4 turn and temperature decrease is to the right or clockwise.

Best results are obtained if line water temperature at machine is 150 degrees F. The machine is designed to recover temperature lost during operation but not to be considered a source of heating water,

If all test have been made and all components are satisfactory, a solution (if an answer still has not been found), may be a loose connection or poorly crimped wire. This will keep full power from reaching the motor or heater.

When testing for voltage in the M-1 conveyor, start at the power block and follow down to the end (defective item). When you lose a voltage reading, you have found your problem.

Final Rinse Arms Recommend keeping extra rinse arms on service trucks, in case of hard water clogging, soak clogged arms in a delimer back at shop.

SERVICE CHECK LIST

1. Inspect Chemical Dispensing Units

   A. Peri-pumps
   B. Squeeze tubes
   C. Chemical line (tubing)
   D. Check valves
      Make sure that the product is being dispensed.

2. Inspect Tilt Switch

   A. Is tight (no leaks)
   B. Does arm move freely?
   C. Is micro switch properly positioned?

3. Check overflow drain. Is it clear of debris?

4. Check primary drain.

5. Inspect probe bulkheads.

6. Inspect heater elements.

7. Remove any debris from tanks.

8. Inspect conveyor dogs. Do they move freely?

9. Inspect curtain for proper placement and wear.

10. Fill machine and check for leaks.

11. Check for proper water level.

12. Check incoming water temp. Should be 140-150.

13. Test pH in wash tank.

14. Run a flight of racks. Make sure heater comes on. Check results and ppm available chlorines.

15. Grease Cam Bearing.

Suggested Truck Parts

Description	Part No.
1. Final Rinse Spray Arm	13304.00
2. 3 Min Timer Motor	00504.00
3. 25 Amp Fuse	13403.00
4. Peri Pump (19 rpm) DCV	13406.80
5. Timer (20 sec.)	13418.00
6. Trip Switch	13408.50
7. Lock Rings (important)	13411.00
8. Micro Switch	00411.00
9. Immersion Heater	13417.00
10. Cam Bearing	13507.00
11. Chemical Check Valve	13657.00
12. Contactor Switch	13457.00
13. Conveyor Control Unit	13461.00
14. Low Level Relay Switch	13476.10
15. Probe Bulkhead	13477.00
16. Variable Speed Control Board	13406.81
17. 16 VAC Signal Transformer	13471.00
18. 20 Second Timer Motor	13418.50

The attached list is recommended for the initial inventory of parts which are unique to the Moving Mizer and not in standard distributor inventory.

INITIAL PARTS INVENTORY

QUANTITY	PART NO.	PART DESCRIPTION
1	13304.00	FINAL SPRAY ARM
1	13016.00	THERMOSTAT
1	00200.10	1 HP PUMP MOTOR ASSY.
1	03222.05	IMPELLER 3-7/8
1	04306.00	PUMP MOTOR MOUNT GASKET
1	13303.70	SPRAY ARM
2	13305.60	SPRAY ARM END CAP
1	00433.00	MASTER SWITCH (30 AMP)
1	00510.00	TIMER (3 MIN.)
5	13403.00	FUSE (25 AMP)
1	00416.00	PERISTALTIC PUMP (50 RPM)
1	13418.00	5IM34 (20 SECONDS)
1	13408.50	TRIP SWITCH
2	13411.00	LOCK RINGS/TILT SWITCH
3	13417.00	IMMERSION HEATER (1500 WATT)
1	13423.00	TRANSFORMER
1	13570.00	MOTOR CONVEYOR DRIVE ASSY.
1	13507.50	CAM BEARING
2	13657.00	CHEMICAL INLET CH. VALVE
1	13457.00	CONTACT SWITCH
1	13461.00	CONVEYOR CONTROL UNIT
2	13477.00	PROBE BULKHEAD
1	13471.00	16VAC SIGNAL TRANSFORMER
1	13406.81	VARI-SPEED CONTROL BOARD
1	13406.80	12 VDC PERI PUMP (19 RPM)
5	13515.00	CONVEYOR DOG
1	13476.10	LOW LEVEL RELAY

TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
Pre-wash/power wash motor inoperative	Tilt switch micro switch defective or not adjusted	Replace defective motor
	Bad motor or capasator	"
	Fuse	
	Mercury Relay	Replace
Heaters No heat	Fuse burned	Replace fuse (check again after installed)
	Defective element	Replace element
	Inoperable continuity relay/probe	Replace relay/probe
	Defective mercury relay	Replace relay
	Thermostat not adjusted	Adjust, turn left for higher temp, 1/4 turn=30 deg. F.
	Burned or loose wire	Follow back on wires and replace
Low heat during operation	Low incoming water temp (should be at least 150 deg. F.)	Turn up supply or booster heat. Insulate pipe. Check for cold water mixing.
	Incoming water being deflected out of machine.	Correct placement of ware on rack. Correct curtain placement. Correct table slant into machine. Check alignment of spray arms.

Trouble Shooting (Cont.)

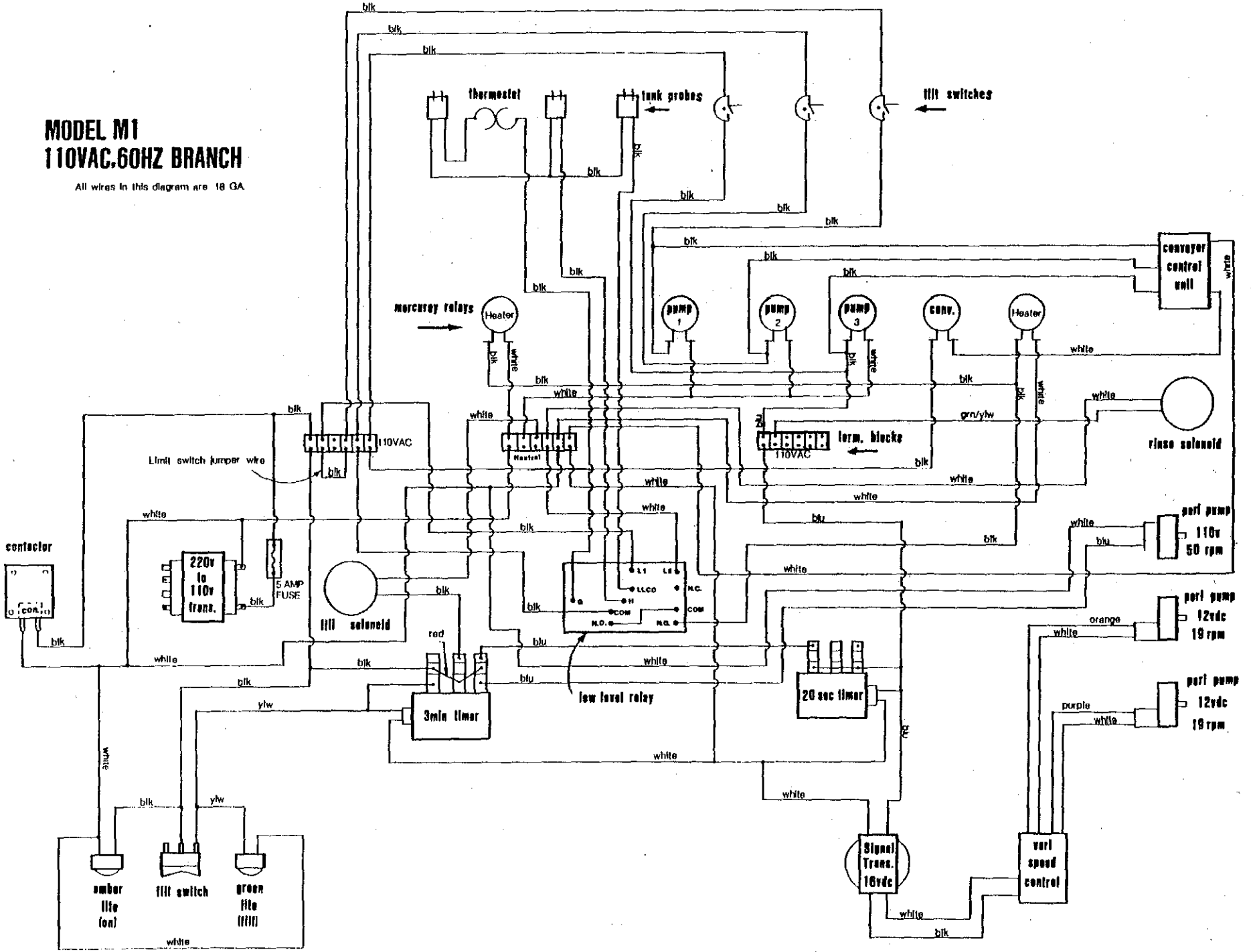
PROBLEM	CAUSE	SOLUTION
	Water washing out of machine.	Slant tables into dishmachine.
	Limed up rinse spray tips	De-lime machine - clean out rinse spray tips with a piece of wire.
Low spray arm pressure (approx.) 8 psi)	Low water, clogged	Check above causes. Check inlet hole for debris (tooth picks, straws, hot air balloons)
Low water level	Water washing out of machine	Slant tables into dishmachine
	Limed up final rinse tips	Delime machine-clean out rinse with a piece of wire. Delime final rinse system. Connect rinse pump pick up line to delimer container, activate final rinse tilt switch. Chemical will be drawn up to mixing chamber and flush system.
CAUTION: MUST DRAIN TANKS AND DISCONNECT SANITIZER CHEMICAL PUMP.		
High water level	Not draining out of machine.	Clear opening to trap.
Machine will not operate (power supply is coming into control box).	Defective on/off switch or contactor	Replace
	Limit switch activated or defective	Remove rack activating switch, replace switch.
Water pump motor runs continuously	Tilt switch lever stuck "on" position.	Remove and clean Make sure it is free moving.

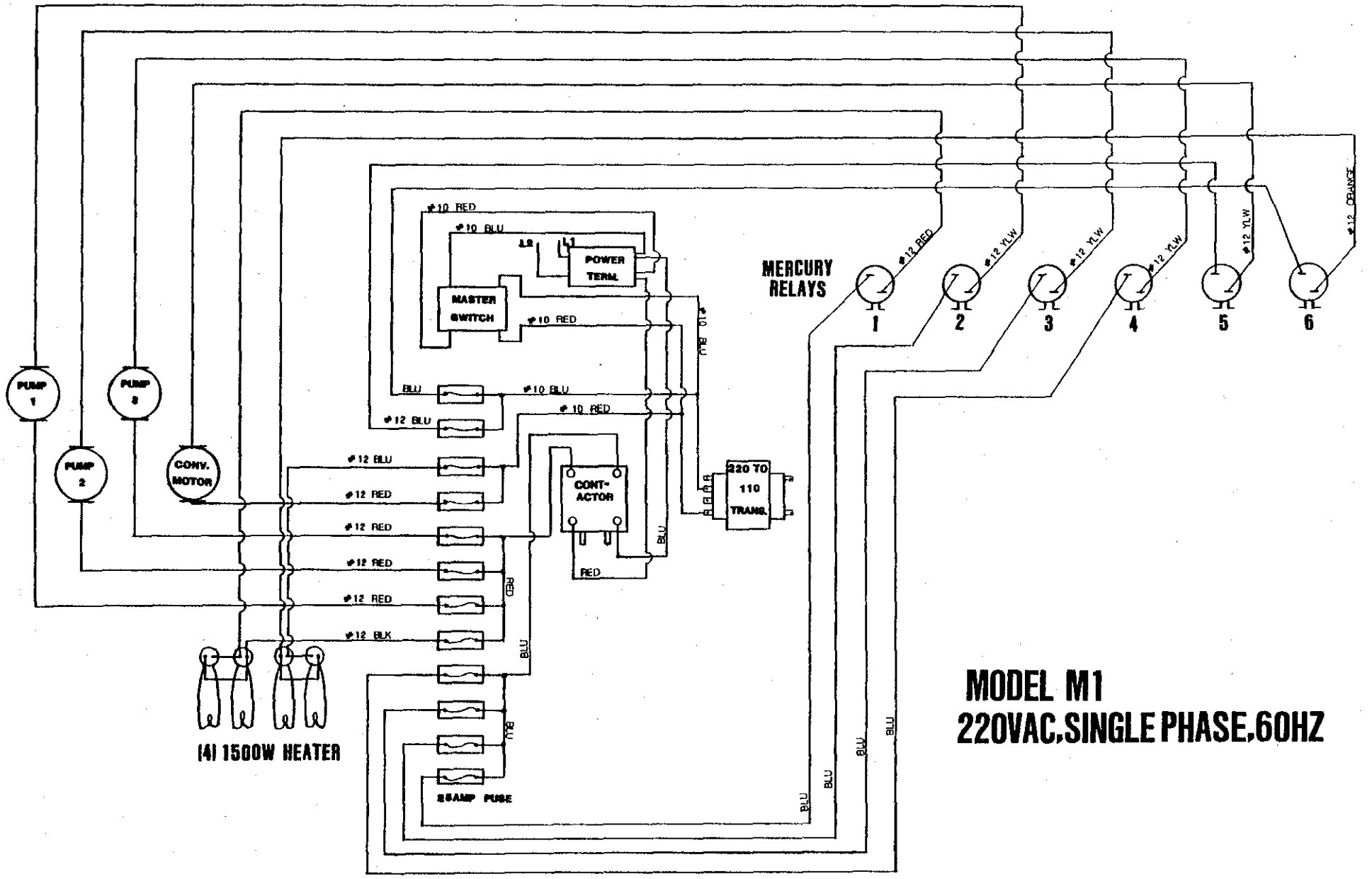
PROBLEM	CAUSE	SOLUTION
	Tilt switch micro switch not adjusted properly.	Adjust
	Bad Mercury Relay	Replace
Racks stay in machine and will not exit.	Broken, bent racks. Rack rail alignment	Replace, adjust 1/8" above tank top lip or table height.
	Rack rides on conveyor dogs. Dogs too high or low.	Free dog movement, alignment. Dogs need to be 1/2" higher than table.
Low or no pressure in final rinse spray	Defective solenoid valve	Replace water solenoid kit.
	Final rinse pressure below 20 psi.	Adjust regulator Increase pipe size to machine.
	Plugged jets	Remove and clean
Rinse water runs	Rinse/tilt switch stuck "on". Tilt switch cam adjusted properly.	Remove, clean, make free moving. Adjust.
	Defective water solenoid kit.	Replace
Detergent will not add during fill	Wired incorrectly	Chick wire diagram.
	Bad micro switch on 2.5 min.	Replace.
No water added	Same as above	Same as above
Chemicals not injecting:	No chlorine	
	Supply has emptied	Replace with new supply.
	Chemical line cut, burned or leaking.	Restore
	chlorine pump not operating	Check wiring diagram or replace pump.

PROBLEM	CAUSE	SOLUTION
	Not priming chemical	Squeeze tube/pump housing clearance.
No rinse	Same as above	Same as above.
	20 second timer inoperative	Replace
No detergent	Same as all above.	Same as all above.

MODEL M1
110VAC,60HZ BRANCH

All wires in this diagram are 18 GA

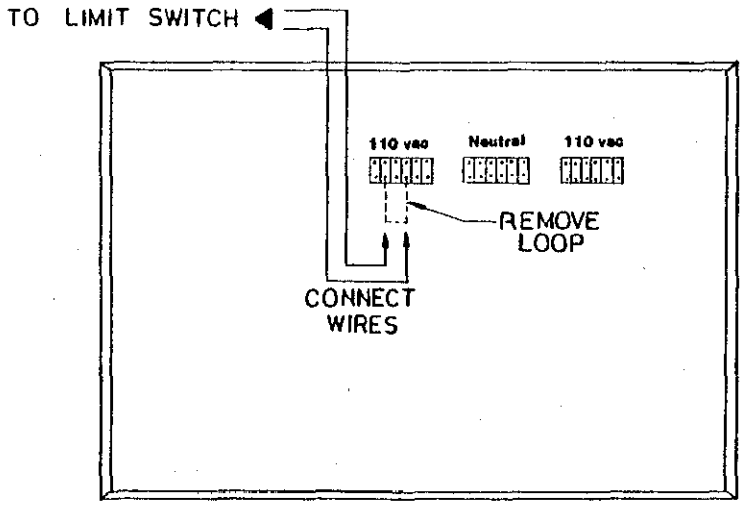




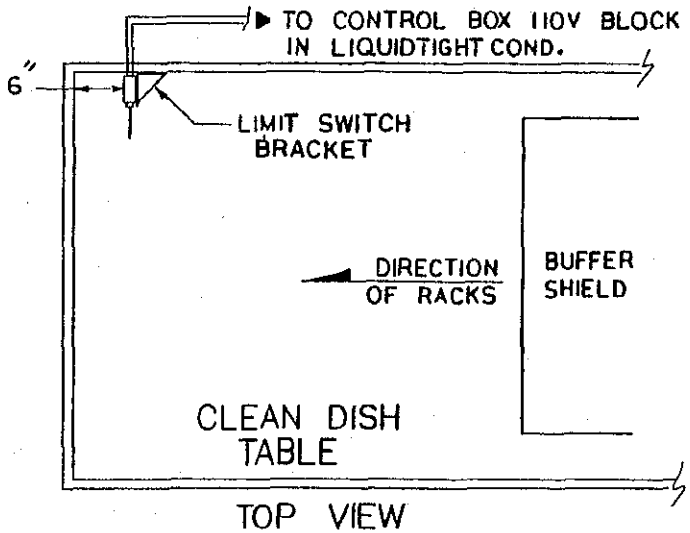
MODEL M1
220VAC,SINGLE PHASE,60HZ

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

LIMIT SWITCH
COVER PLATE REMOVED



CONTROL BOX
(TOP VIEW)



TOP VIEW

TOLERANCES UNLESS OTHERWISE SPECIFIED		
FRACTIONS	DEC	ANGLES
±	±	±

APPROVALS	DATE
DRAWN	
CHECKED	

CHEMICAL METHODS ASSOCIATES, INC.
World Leaders in Low Temperature Warewashing
12700 Knott Ave., Garden Grove, CA 92641

MOVING MIZER LIMIT SWITCH INSTALLATION

SCALE	SIZE	DRAWING NO.
NONE	B	13464.10

DO NOT SCALE DRAWING | SHEET

M-1 MOVING MIZER INSTRUCTIONS

CUSTOMER NOTICE

TEN TIPS TO SAVE THE $25.00 SERVICE CHARGE

IF A SERVICE CALL IS INITIATED BY THE LESSEE OF THIS EQUIPMENT AND IT IS SUBSEQUENTLY DETERMINED THAT THE PROBLEM DOES NOT RELATE TO PART FAILURE OR OUT OF CHEMICALS, THERE WILL BE A MINIMUM $25.00 SERVICE CHARGE FOR SERVICEMAN TO RESPOND.

1. CIRCUIT BREAKER FOUND IN "OFF" POSITION.
2. CLOGGED DRAINS (AT ANY POINT IN DRAIN LINE - IT IS NOT A GARBAGE DISPOSAL).
3. LACK OF SOFT WATER (CHECK SALT LEVEL IN BRINE TANK).
4. LACK OF HOT WATER DUE TO VALVES SHUT OFF OR INCORRECT THERMOSTAT SETTINGS.
5. FAILURE OF EQUIPMENT UNRELATED TO MACHINE.
6. ABUSE TO EQUIPMENT OR FAILURE TO PERFORM MINIMUM CLEANING REQUIREMENTS AS OUTLINED AT TIME OF INSTALLATION.

   A. RINSE ARM TIPS CLEAN AND FREE OF DEBRIS
   B. STRAINER TRAYS CLEAN AND FREE OF DEBRIS
   C. WATER TANK DRAIN AND PICK UP OPENINGS CLEAN AND FREE OF DEBRIS.

7. NO WATER PRESSURE IN SPRAY ARMS DUE TO END CAPS MISSING CAUSED BY OPERATOR NEGLECT.

8. LEVER SWITCHES BLOCKED OR HELD FROM FREE MOVEMENT DUE TO LODGED UTENSIL OR DISH.

9. LINES TO CHEMICAL BUCKETS FOUND IN WRONG CONTAINERS OR EMPTY. (NOTE) LINES TO BUCKETS ARE COLOR CODED.

10. LESSOR'S SERVICE RESPONSIBILITY SHALL BE LIMITED TO ITS INITIAL ORIENTATION, DELIVERY OF CHEMICALS, ADJUSTMENT OF CHEMICAL INJECTION SYSTEM, AND REPLACEMENT OF PARTS FOUND TO BE WORN OR DEFECTIVE.

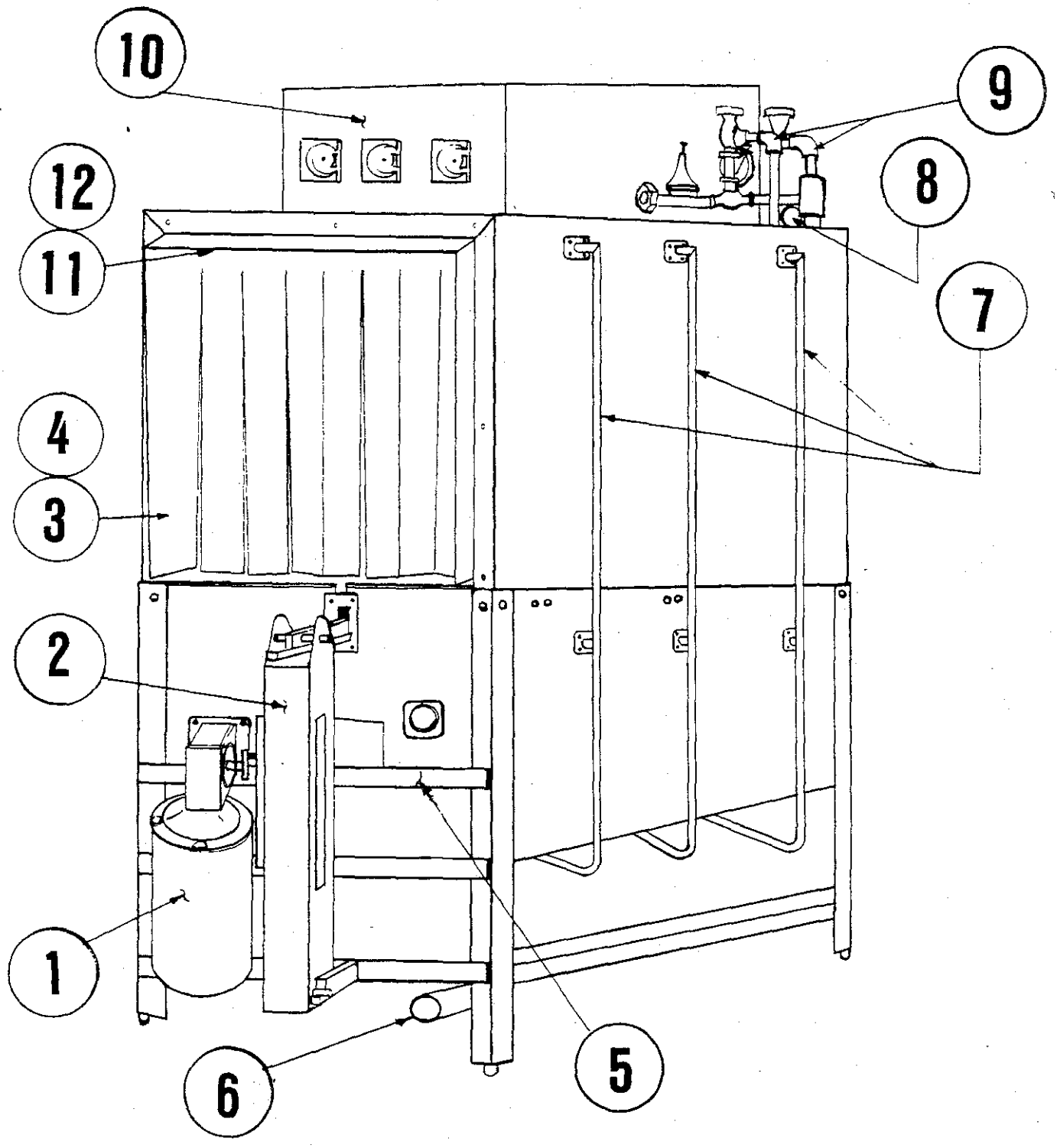
SECTION II

EXPLODED VIEW

CHEMICAL METHODS ASSOCIATES

A S.C. Johnson COMPANY

MODEL M1 DISHMACHINE



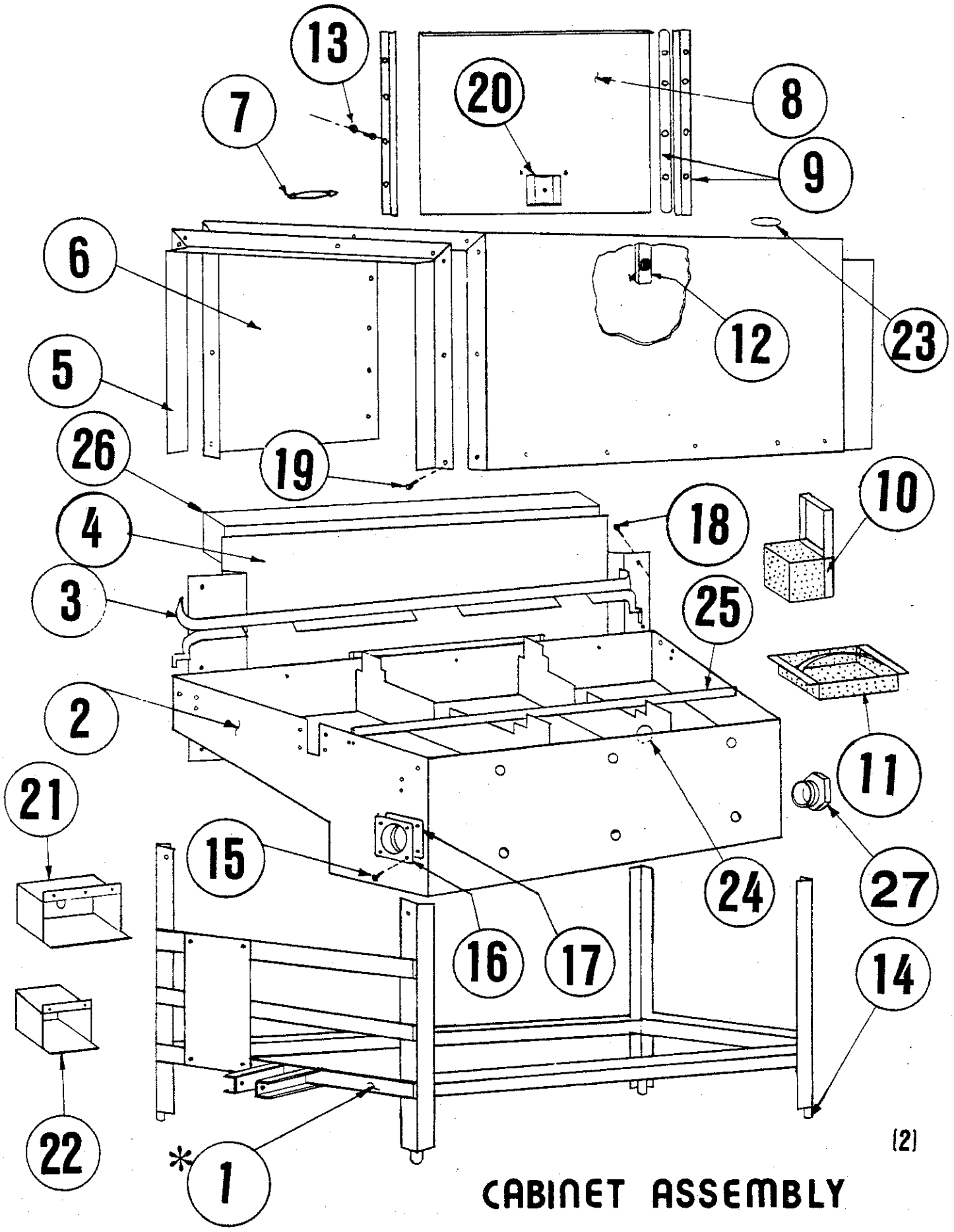
PARTS MANUAL

JULY 92

CHEMICAL METHODS ASSOCIATES

MODEL M1 DISHMACHINE

Ref. No.	No. Req,d	Description
1	1	P/N 13501.00 Conveyor Motor 1/3 HP 60 Hz
2	1	13508.00 Rocker Arm
3	2	13703.10 Curtain (Long)
4	3	13702.00 Curtain (Short)
5	1	13903.00 Stand
6	1	13001.00 Drain Manifold
7	3	13301.00 M-1 Manifold
8	1	13605.00 Pressure Gage (30 psi)
9	1	08600.16 Water inlet System
10	1	13904.00 Control Box
11	2	13705.10 Curtain Rod (Long)
11	3	13705.00 Curtain Rod (Short)
12	10	725.50 Curtain Clip



(2)

CABINET ASSEMBLY

CHEMICAL METHODS ASSOCIATES

CABINET SYSTEM
ASSEMBLY

Ref. No.	No. Req,d	Description
1	1	P/N 13903.10 Stand V.A.
2	1	13902.00 Pan (Tank)
3	1	13906.50 Tray Track (Front)
3	1	13906.00 Tray Track (Back)
4	1	13912.00 Splash Shield
5	2	13901.00 Wrapper Shield
6	1	13900.00 Wrapper
7	1	00535.00 Door Handle
8	1	13907.00 Door
9	2	01554.00 Door Guide
9	2	13706.00 Door Guide Gasket
10	3	13933.00 Pump Strainer Basket
11	6	13910.00 Strainer Basket
12	1	13701.00 Open Door Latch
12	1	13915.00 Open Door Latch Bracket
13	32	00912.00 1/4-20 Nylon Lock Nut
14	4	01310.00 Bullet Foot
15	24	00906.00 1/4-20X1/2" Hex Head Bolt
16	2	01307.00 Scrap Trap Flange Nut Square
17	2	01308.00 Scrap Trap Flange Nut Gasket
18	4	00906.00 1/4-20X1/2" Hex Head Bolt
19	26	00905.00 1/4-20X1/2" Trusshead Bolt
20	1	01552.00 Door Stop

- Cont. -

CHEMICAL METHODS ASSOCIATES

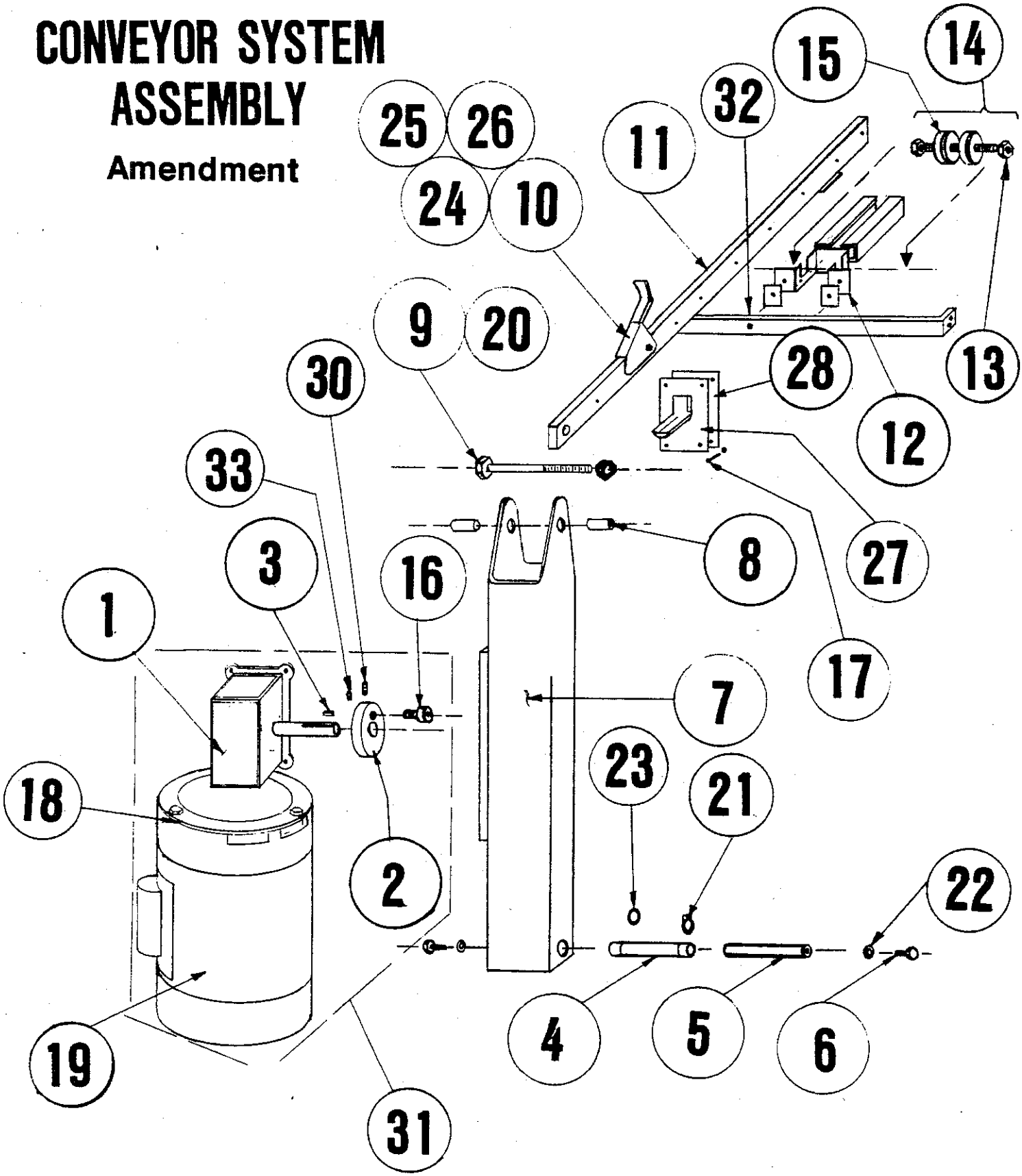
CABINET SYSTEM
ASSEMBLY

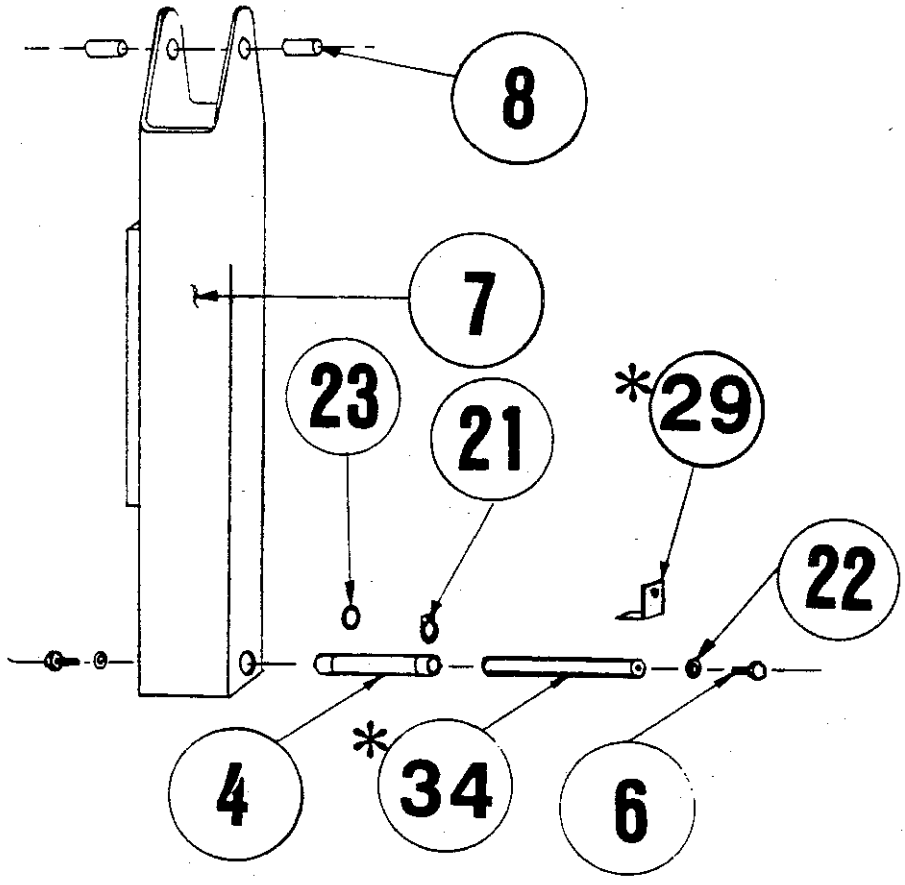
Ref. No.	No. Req,d	Description
21	2	P/N 13927.00 Junction Box (8")
22	1	13926.00 Junction Box (5")
23	4	01513.00 Hole Stopper
24	1	13934.00 Tank Divider Plug
25	1	13922.00 Center Support Rail
26	1	13905.00 Panel (M1)
27	1	13625.00 2" PVC Plug

* Use P/N 13903.00 Stand, For Models Built Before Jan. 1991.

CONVEYOR SYSTEM ASSEMBLY

Amendment

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6

CHEMICAL METHODS ASSOCIATES

CONVEYOR SYSTEM

ASSEMBLY

Ref. No.	No. Req,d	Description
1	1	P/N 13504.00 Gear Reducer
2	1	13505.10 Cam (Narrow)
3	1	13505.20 Keyway (Cam)
4	1	13509.51 Rocker Arm Shaft Bearing
5	1	13510.10 Bearing Shaft VA.
6	2	00906.00 1/4"-20X1/2" Hex Head Bolt
7	1	13508.00 Rocker Arm
8	2	13513.00 Rocker Arm Spacer
9	1	13808.00 1/2-13X3-1/2" Hex Head Bolt
10	9	13515.00 Conveyor Dog (13515.15 shaved)
11	1	13514.00 **Conveyor Bar**
12	1	13521.20 **Conveyor Bar Bearing Bracket**
13	2	00913.00 5/16"-18 SS Nut
14	1	13521.00 **Conveyor Bar Bearing Assy.**
15	1	13521.10 **Conveyor Bar Bearing**
16	1	13507.50 Cam Bearing
17	4	00906.00 1/4"-20X1/2 Hex Bolt And Nut
18	1	13522.00 Reducer Motor Gasket
19	1	13501.00 Conveyor Motor 1/3 HP
20	1	13809.00 1/2-13 Nylon insert Lock Nut
21	2	13509.52 7/8" I.D. Ext. Lock Ring
22	2	00925.00 5/16" SS Washer
23	2	13509.53 7/8" I.D. Brass Washer
24	9	13818.00 3/8"-16X1 3/4" Hex Bolt
25	9	13806.00 Nylon insert Lock Nut (3/8"-16)
26	18	13520.00 Conveyor Dog Bearing

-Cont.-

CONVEYOR SYSTEM

ASSEMBLY

CHEMICAL METHODS ASSOCIATES

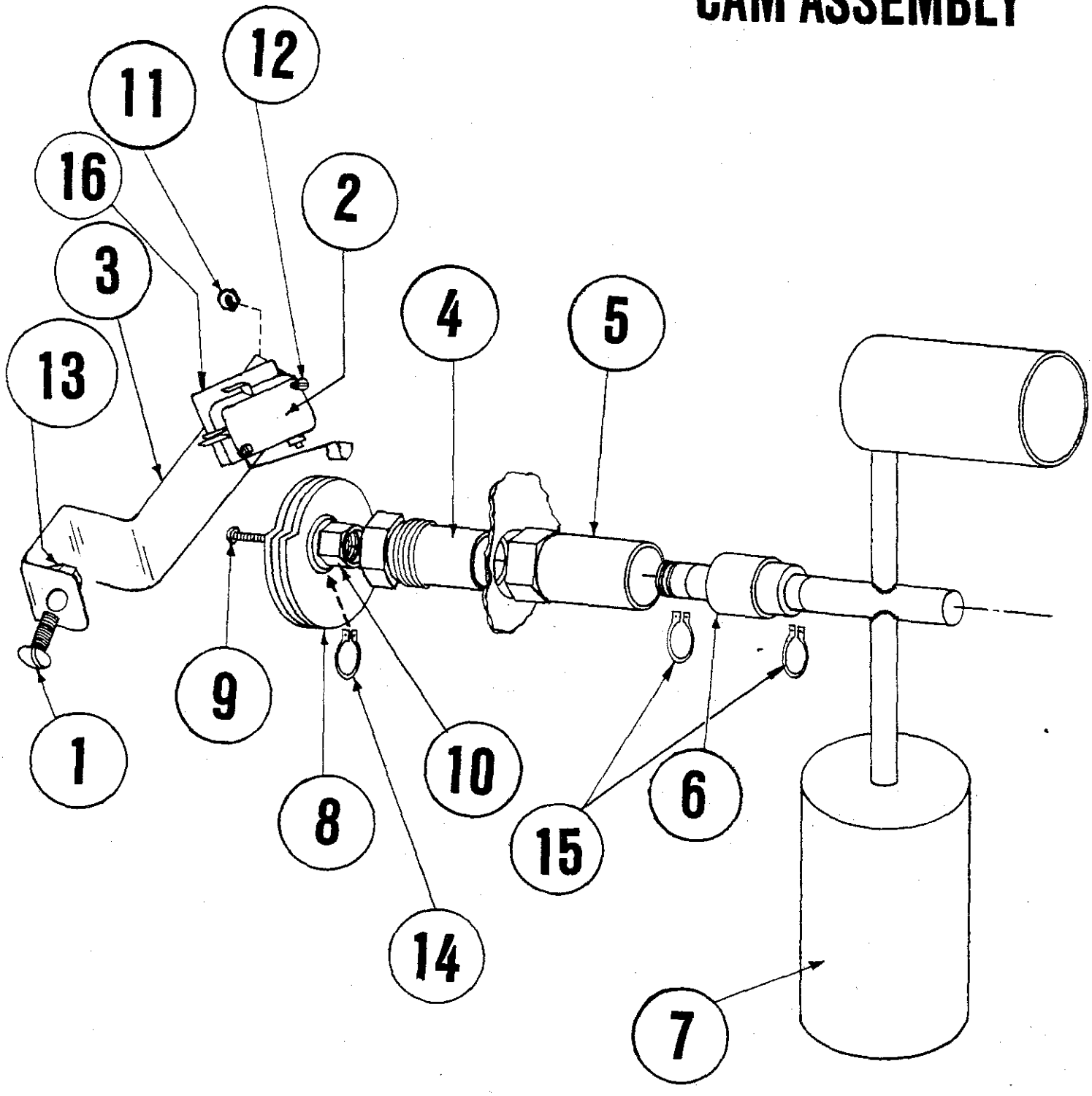
-CONT.-

Ref. No.	No. Req,d	Description
27	1	P/N 13913.00 Drip Chute
28	1	13542.00 Drip Chute Gasket
*29	2	13558.00 Hold Down Bracket
30	1	1381600 5/16"-18X1/2" Allen Screw
31	1Assy.	13570.00 Motor Conveyor Drive Assy.
32	1	13955.00 Conveyor Bar Anchor Support
33	1	00935.00 1/4"-20X1/4" Allen Screw.
*34	1	13510.00 Bearing Shaft

* Parts Used On Models Built Before Jan. 1991.

NOTE: For Conveyor Bar Conversion Kit And Installation Instructions, See Back Pages.

TRIP SWITCH CAM ASSEMBLY



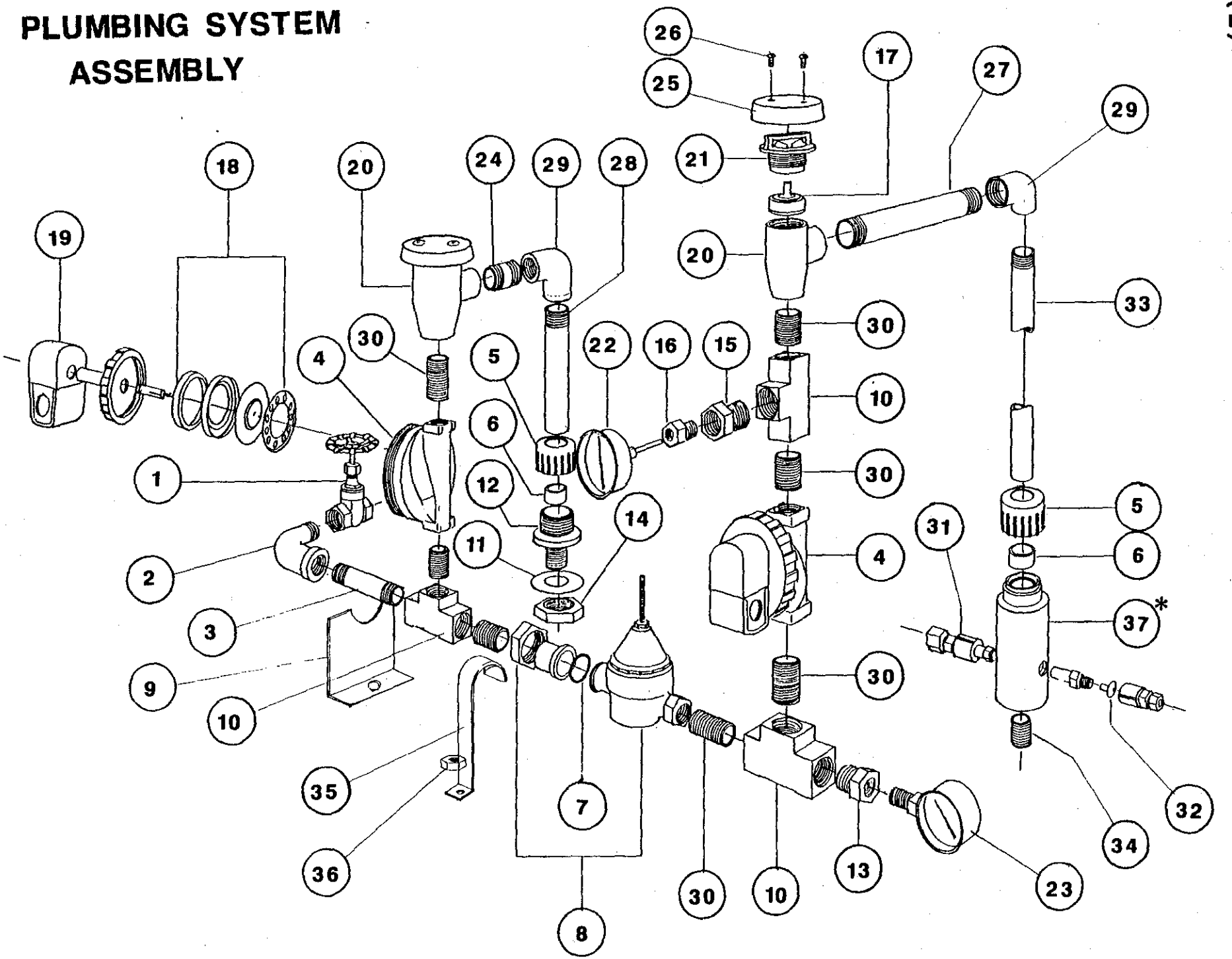
CHEMICAL METHODS ASSOCIATES

TRIP SWITCH CAM ASSEMBLY

Ref. No.	No. Req,d	Description
1	3	P/N 00905.00 1/4-20X1/2 Trusshead Bolt
2	3	00411.00 Microswitch
3	3	13414.00 Microswitch Bracket
4	3	13435.00 Bearing Nut
5	3	13455.00 Switch Sleeve Brass
6	3	13424.50 Bearing
7	3	13408.50 Trip Switch
8	3	01115.15 Cam
9	3	13825.00 8-32X1 Pan Head Screw
10	3	13409.51 Shaft Extender
11	6	13826.50 4-40 Hex Nut
12	6	13826.00 4-40X5/8 Pan Head Screw
13	3	00912.00 1/4" Nylon Lock Nut
14	6	13411.50 Lock Ring
15	6	13411.00 Lock Ring
16	3	13418.10 Spacer

NOTE: For Switch Cam Assy. Conversin Kit , See Back Pages.

PLUMBING SYSTEM ASSEMBLY



PLUMBING SYSTEM

ASSEMBLY

CHEMICAL METHODS ASSOCIATES

Ref. No.	No.Req,d	Description
1	1	P/N 00700.00 3/4" Gate Valve
2	1	00704.00 3/4" 90 Deg. Street Elbow
3	1	00781.00 3/4"x3-1/2" Nipple
4	2	00705.00 3/4" Water Solenoid J/E
5	2	13656.30 3/4"Compression Cap CPVC
6	2	13656.20 3/4" Compression Gasket
7	1	00703.00 Pressure Regulator 'O' Ring
8	1	136020O 3/4" Pressure Regulator
9	2	0152500 Plumbing Support Bracket
10	3	00716.50 3/4X3/4X3/4 FXFXF Brass TEE
11	2	0075200 Antifoam valve Diaphragm
12	1	13652.00 Coller Insert Water Inlet
13	1	00769.00 3/4"X1/4" Brass Bushing
14	1	13606.00 3/4" Jamb Nut Brass
15	1	00741.00 3/4"X1/2" Bushing
16	1	13604.00 1/2"x1/4" Bushing
17	2	00735.00 WATTS 3/4" Vac. Brkr (Repair Kit)
18	2	00706.00 3/4" Solenoid Repair Kit J.E.
19	2	00738.10 J/E Solenoid Coil
20	2	00710.50 WATTS 3/4" Vacuum Breaker
21	2	00735.60 3/4"Bonnet Brass
22	1	00120.00 Thermometer
23	1	13605.00 Pressure Gauge
24	1	13635.50 3/4"X2" Nipple CPVC
25	2	00739.50 Vacuum Breaker Cap SS
26	4	00421.51 6-32X1/4" Panhead Screw
27	1	13639.20 3/4"X4-1/2" Nipple PVC
28	1	13656.15 3/4"X8" Inlet Tube PVC
29	2	13624.00 3/4" 90 Deg. FXF CPVC ELL
30	7	00701.00 3/4"X1-1/2" Nipple

CHEMICAL METHODS ASSOCIATES

PLUMBING SYSTEM

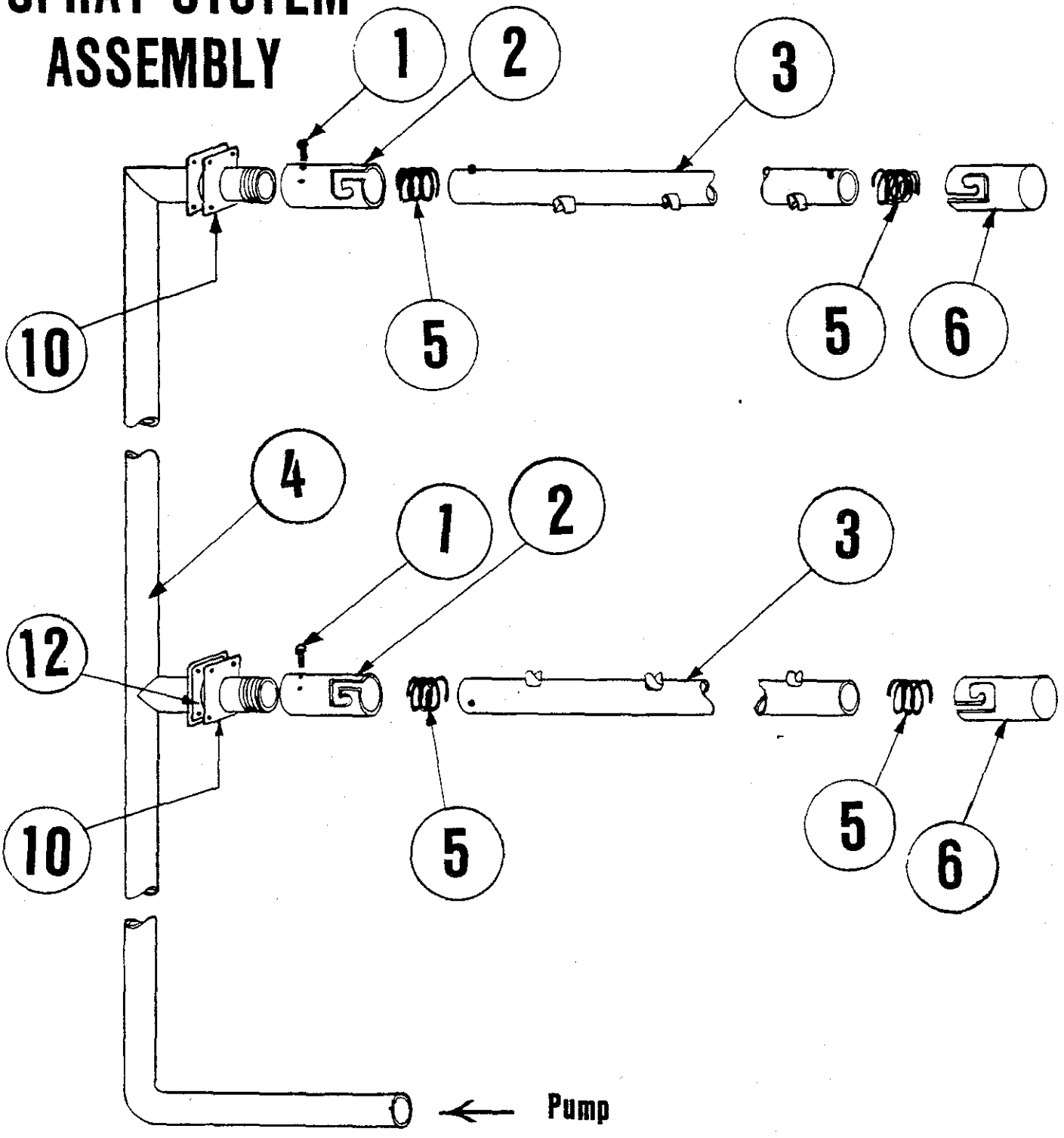
ASSEMBLY

-Cont-

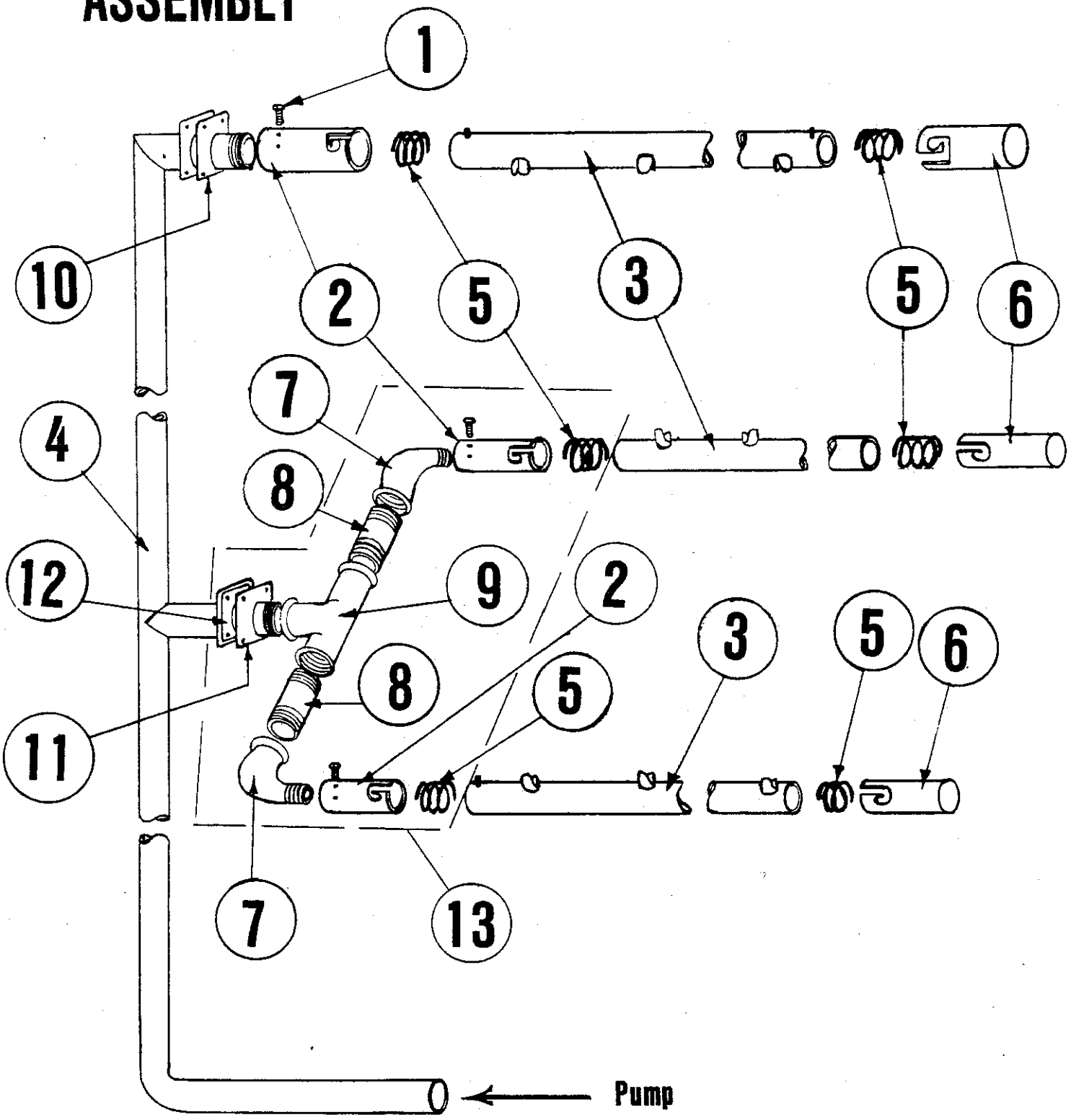
Ref. No.	No. Req,d	Description
31	2	P/N 13657.00 Check Valve
32	2	13657.40 Duck bill Chem. Check Valve
33	1	13656.17 3/4"X9-3/4" Inlet Tube PVC
34	1	13629.00 1/2" Close Nipple SS
35	1	13304.53 Long Support Brkt
36	2	00915.00 1/4"-20 SS Nut
37	1	13669.00 Mixing Chamber Body
*	-	13656.00 Mixing Chamber Assy.

* P/N 13656.00 Includes Items: 37,33,6 And 5.

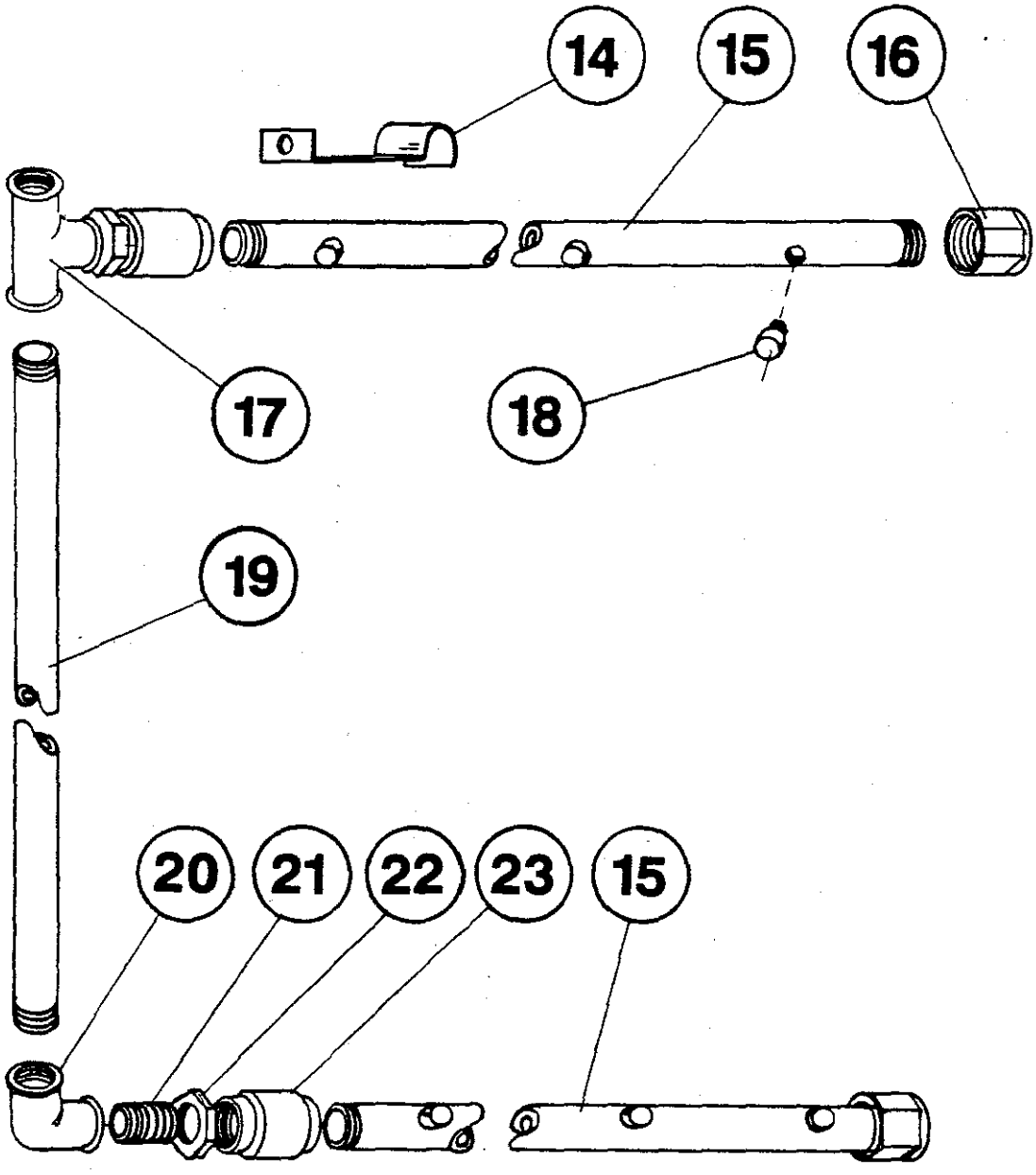
SPRAY SYSTEM ASSEMBLY



SPRAY SYSTEM ASSEMBLY



FINAL RINSE ARM

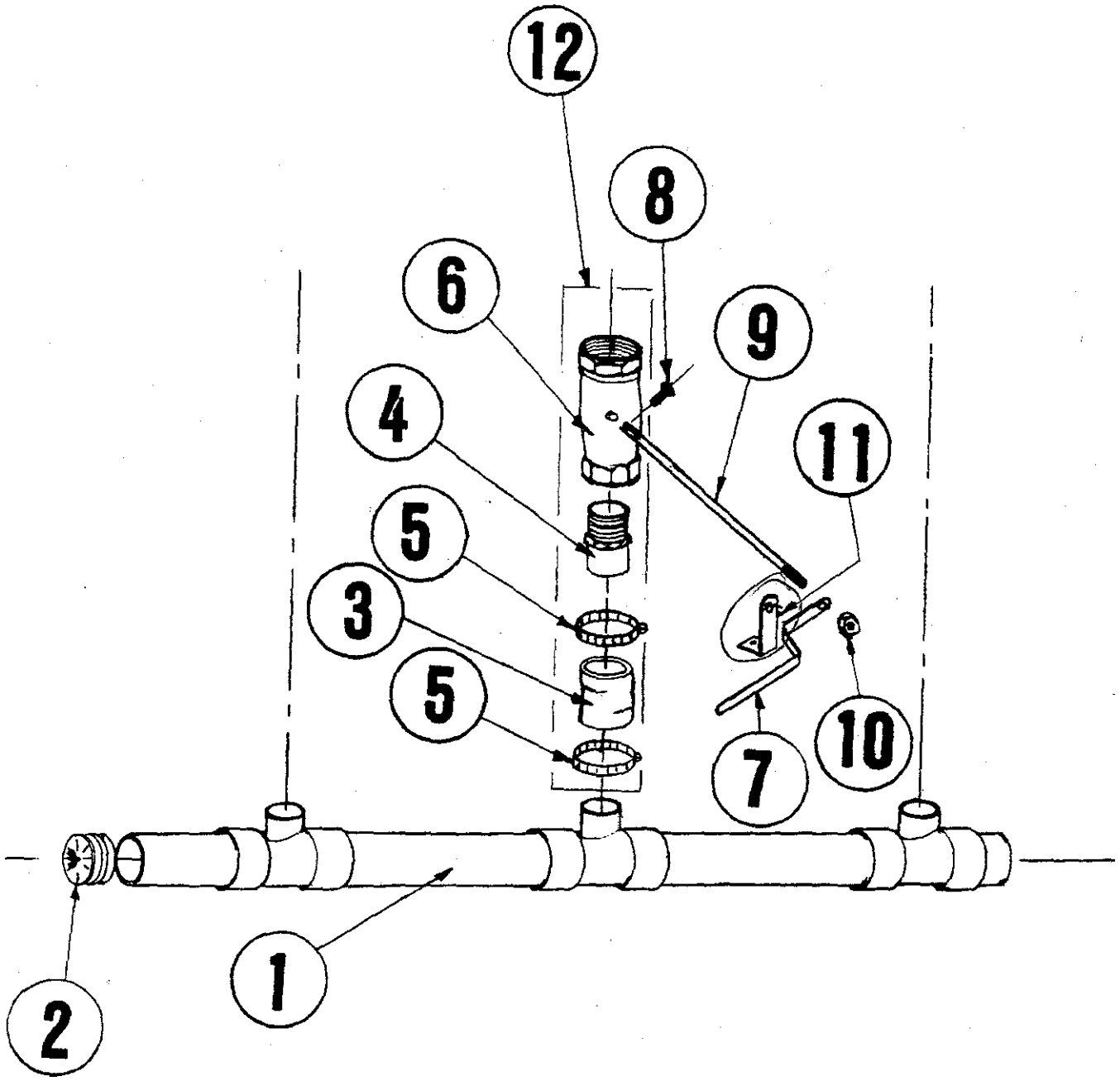


CHEMICAL METHODS ASSOCIATES

SPRAY SYSTEM ASSEMBLY

Ref. No.	No. Req,d	Description
1	14	P/N 00906.00 1/4"-20 x 1/2" Hexhead Bolt
2	7	13306.20 Spary Arm Extender S. S.
3	7	13303.70 Spray Arm
4	3	13301.00 M-1 Manifold
5	14	13306.55 Spray Arm Extension Spring
6	7	13305.60 Spray Arm End Cap (W/Spring)
7	2	00704.50 3/4" Street Elbow (Plated)
8	2	00701.50 3/4"X1-1/2" Nipple(Plated)
9	1	00716.51 TEE 3/4" FXFXF (Plated)
10	5	13306.51 Spray Arm Adapter (Long)
11	1	13306.50 Spray Arm Adapter (Short)
12	12	04306.00 SQ. Manifold Gasket
13	1Assy.	13327.00 Double Spray Arm Socket Assy.
14	2	13304.53 Long Support Brkt
15	2	13304.00 Final Rinse Spray Arm
16	2	13310.00 1/2" Brass Cap
17	1	00743.00 1/2" Tee FXFXF (Plated)
18	8	13304.50 Spray Tip CPVC
19	1	13307.50 Final Rinse Down Tube CPVC
20	1	41030.00 1/2" 90 Deg. ELL FXF (Plated)
21	2	13629.00 1/2" Close Nipple
22	4	00721.00 1/2" Jamb Nut Brass
23	2	13618.51 1/2" Coupling CPVC

DRAIN SYSTEM ASSEMBLY

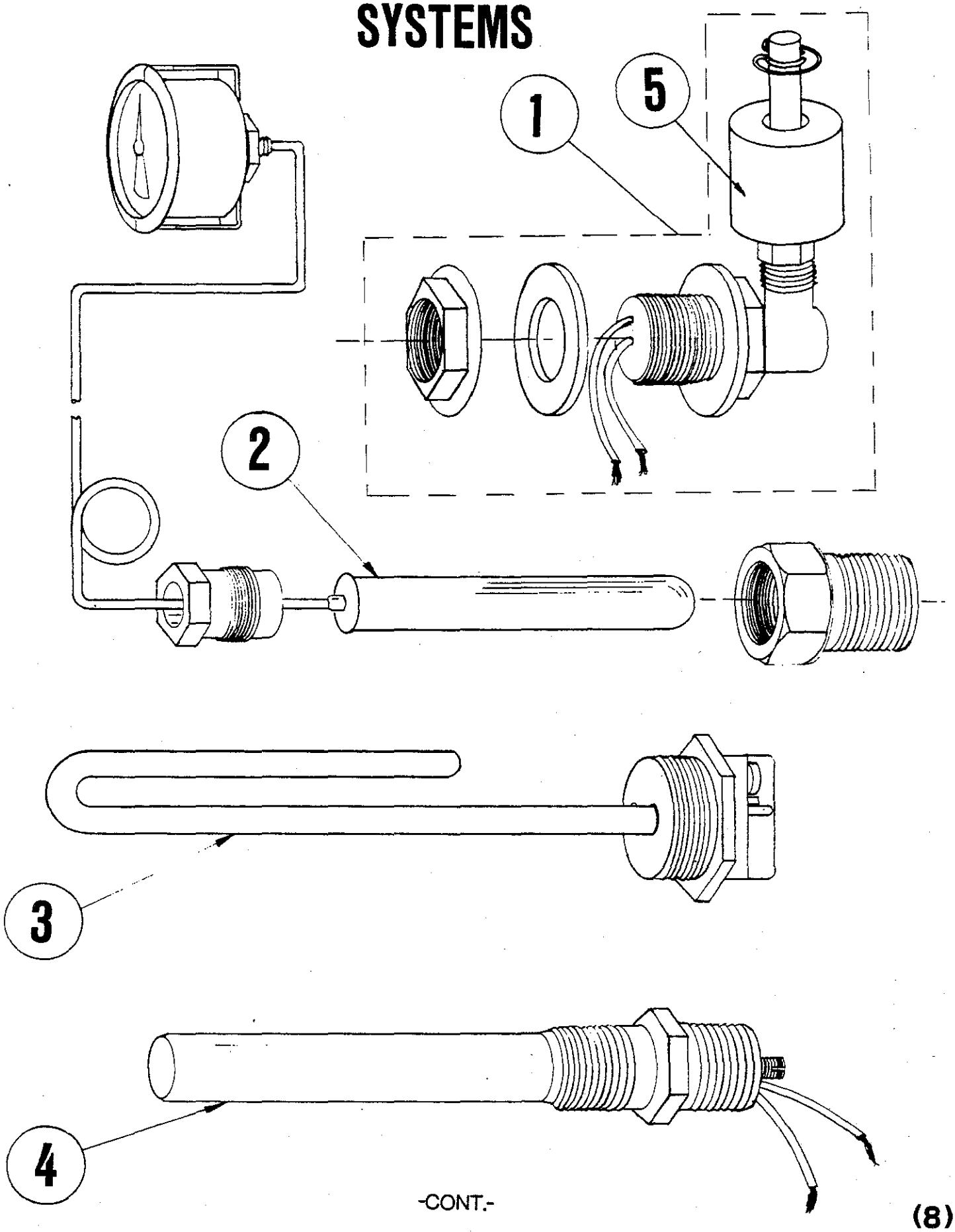


CHEMICAL METHODS ASSOCIATES

DRAIN SYSTEM
ASSEMBLY

Ref. No.	No. Req,d	Description
1	1	P/N 13001.00 Drain Manifold
2	1	13024.00 Dymanite Plug
3	3	13020.20 Hose Drain Manifold
4	3	00766.50 1-1/2 C X Mip Adapter
5	6	50109.00 Hose Clamp #28 S.S.
6	3	13002.00 1-1/2" Ball Valve
7	3	13010.52 Valve Handle
8	3	00941.00 10-32X5/8 Pan Head Screw
9	3	13010.50 Extension Rod
10	3	13010.51 3/8-20 S.S. Hex Nut
11	3	13923.50 Drain HNDL EXT. Support
12	3Assy.	13026.00 1 1/2" Ball Valve Assy.

WATER CONTROL SYSTEMS



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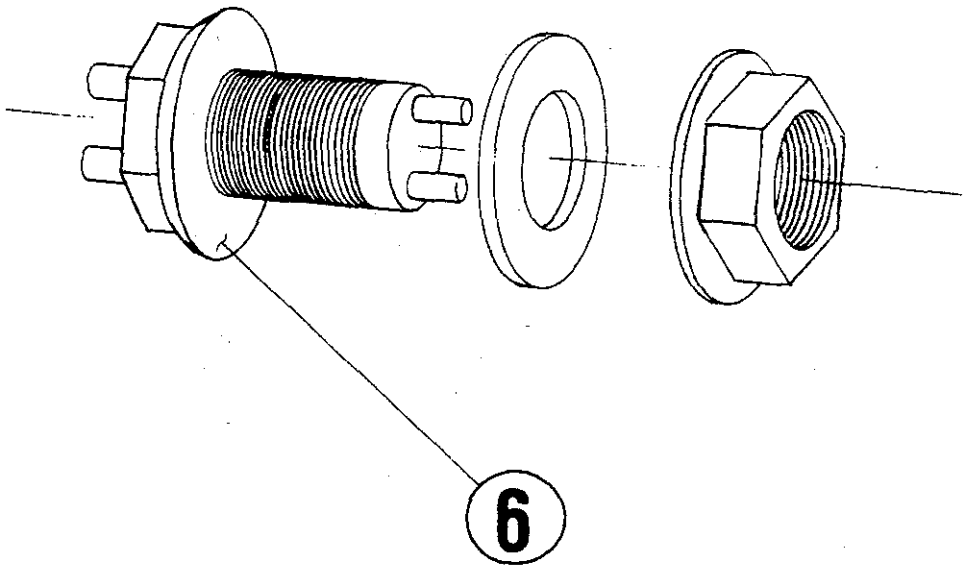
WATER CONTROL SYSTEMS

Amendment



CHEMICAL METHODS ASSOCIATES

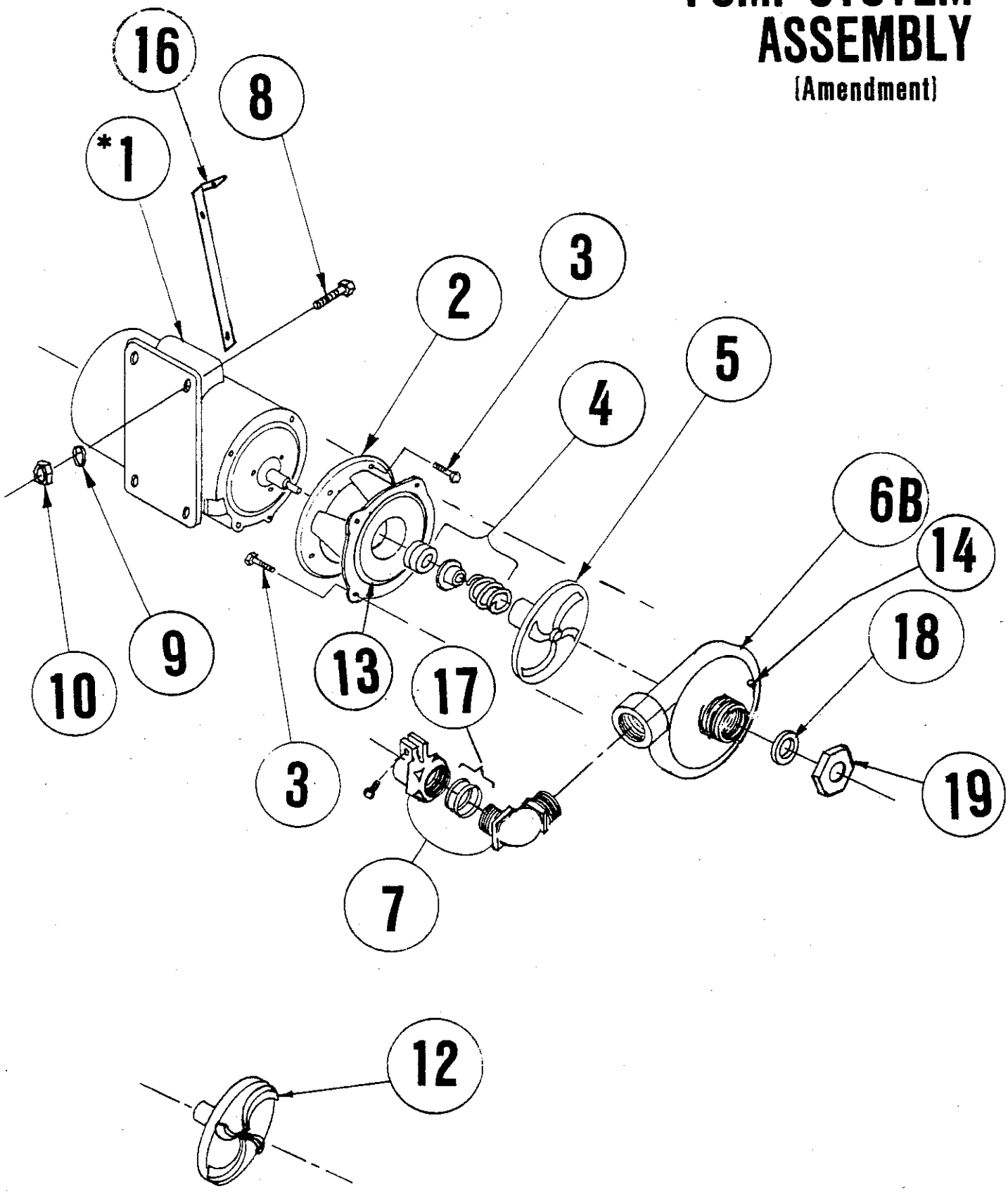
Water Control Systems

Ref. No.	No. Req,d	Description
1	3	P/N 13466.50 Low Level Switch Assy.
2	3	03202.00 Thermometer
3	4	13417.00 immersion Heater (1500w)
4	1	13016.00 Thermostat
5	3	13466.00 Float Switch
* 6	3	13477.00 Low Level Bulkhead Probe

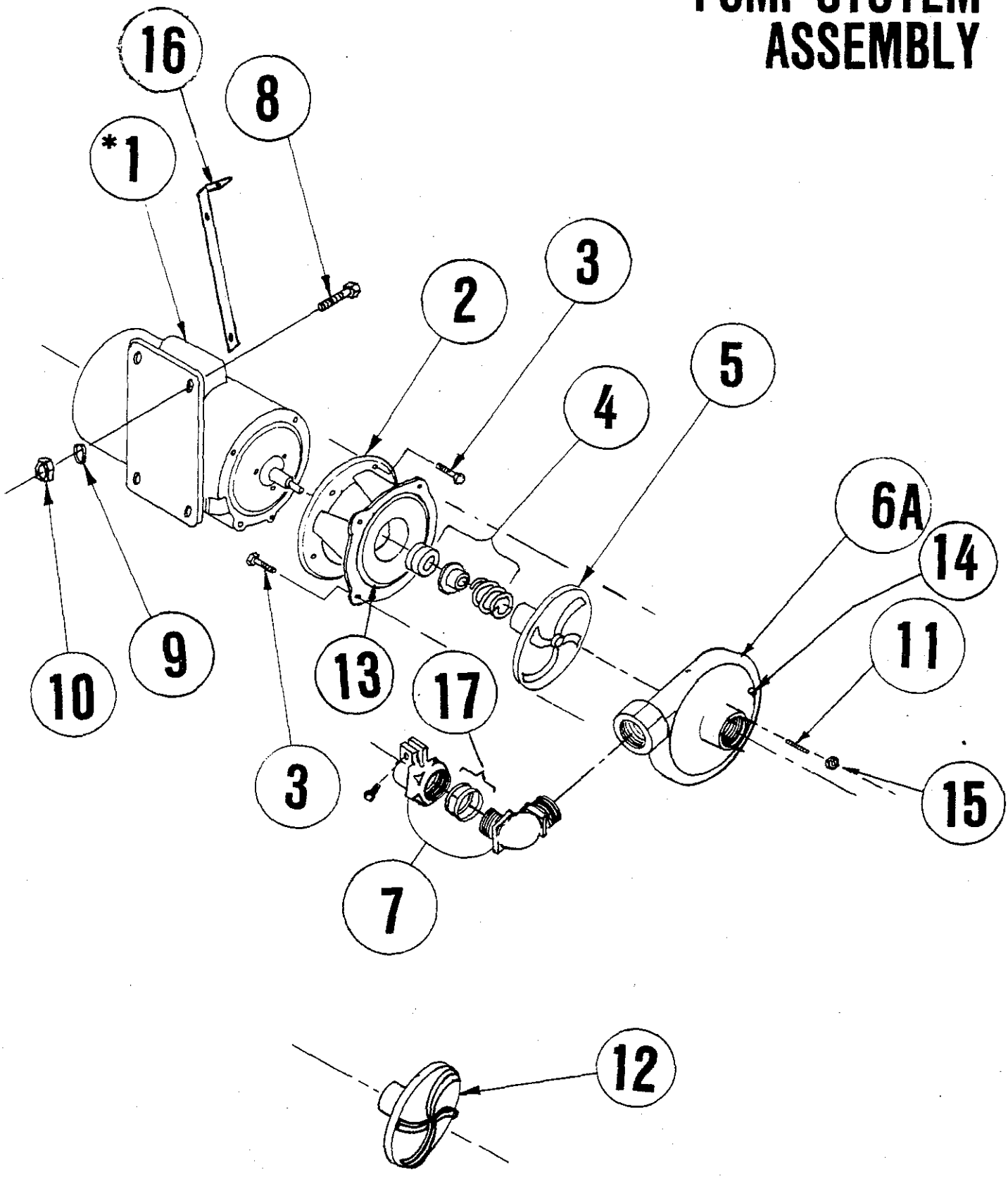
* Used in Models Manufactured After Dec. 1987 .

PUMP SYSTEM ASSEMBLY

(Amendment)



PUMP SYSTEM ASSEMBLY



CHEMICAL METHODS ASSOCIATES

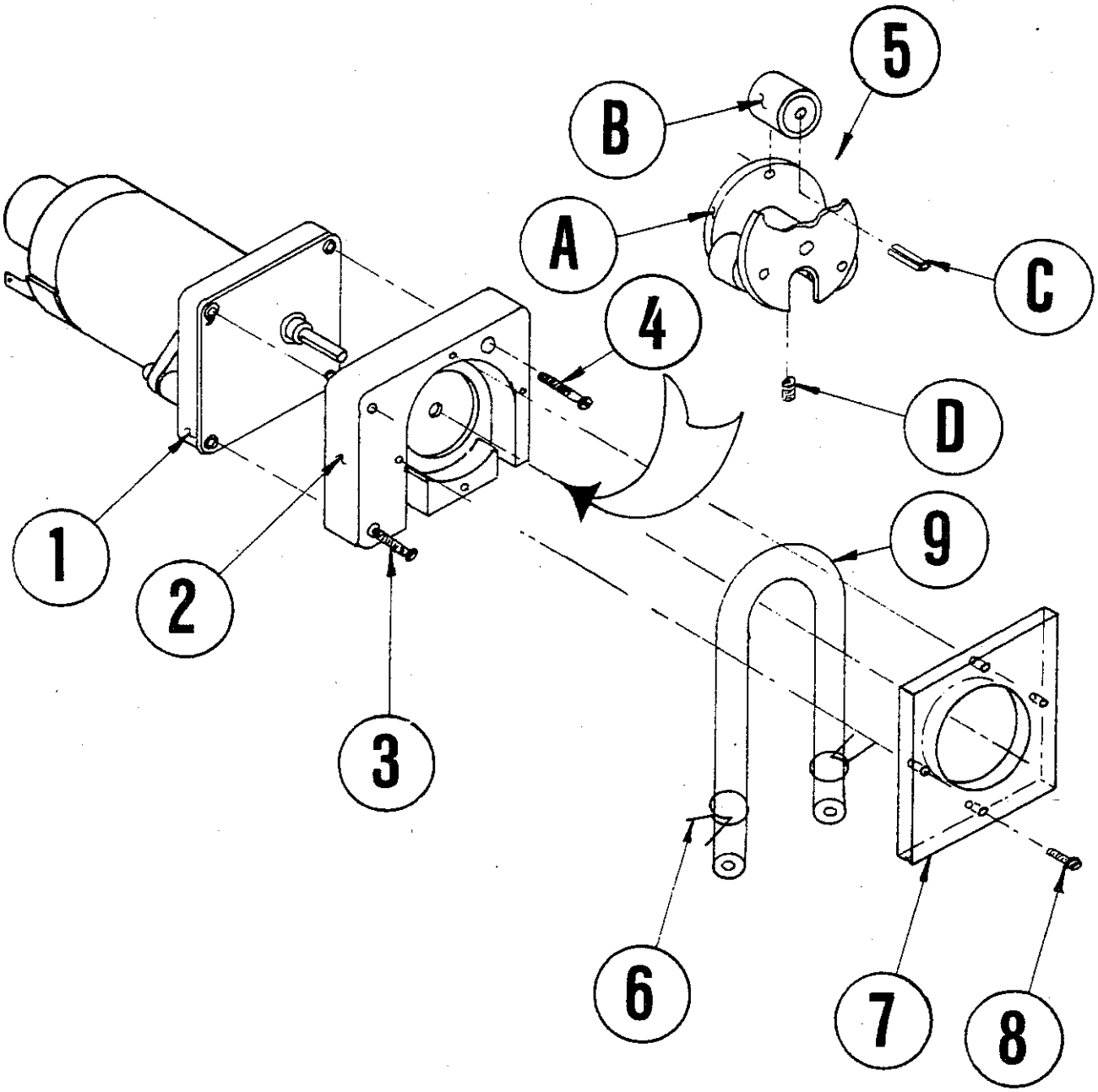
PUMP SYSTEM

ASSEMBLY

Ref. No.	No.Req,d	Description
1	3	P/N 00201.00 Water Pump Motor 1HP
2	3	03224.00 Pump Base (Mount)
3	24	00921.00 3/8-16X3/4" Hex Head Bolt
4	3	00206.00 Pump Seal Kit
5	1	13202.50 Impeller (Final Rinse)
6a	3	03223.00 Pump Cover
7	3	00213.00 1" Ford Adaptor MIPXPJ Tube
8	3	00906.00 1/4"-20X1/2" Hex Head Bolt
9	3	00924.00 1/4" Stainless Steel Washer
10	3	00912.00 1/4"-20 Nylon insert Lock Nut
11	12	13811.00 1/4"-20X1" Stud SS
12	2	03222.05 impeller
13	3	03226.00 Pump "O" Ring Gasket
14	3	00238.00 3/8" Male Plug
15	12	00912.00 1/4"-20 Nylon insert Lock Nut
16	3	13916.00 Motor Support Bracket
17	3	00225.00 1" Compression Gasket
18	3	00208.00 Slip Joint Nut Gasket
19	3	04204.00 Compression Nut 25"
6 b	3	04206.00 Pump Cover (threaded)
*	3Assy.	00200.10 Universal Pump Motor Assy.

* P/N 00200.10 Includes Items 1,2,3,4,12 and 13

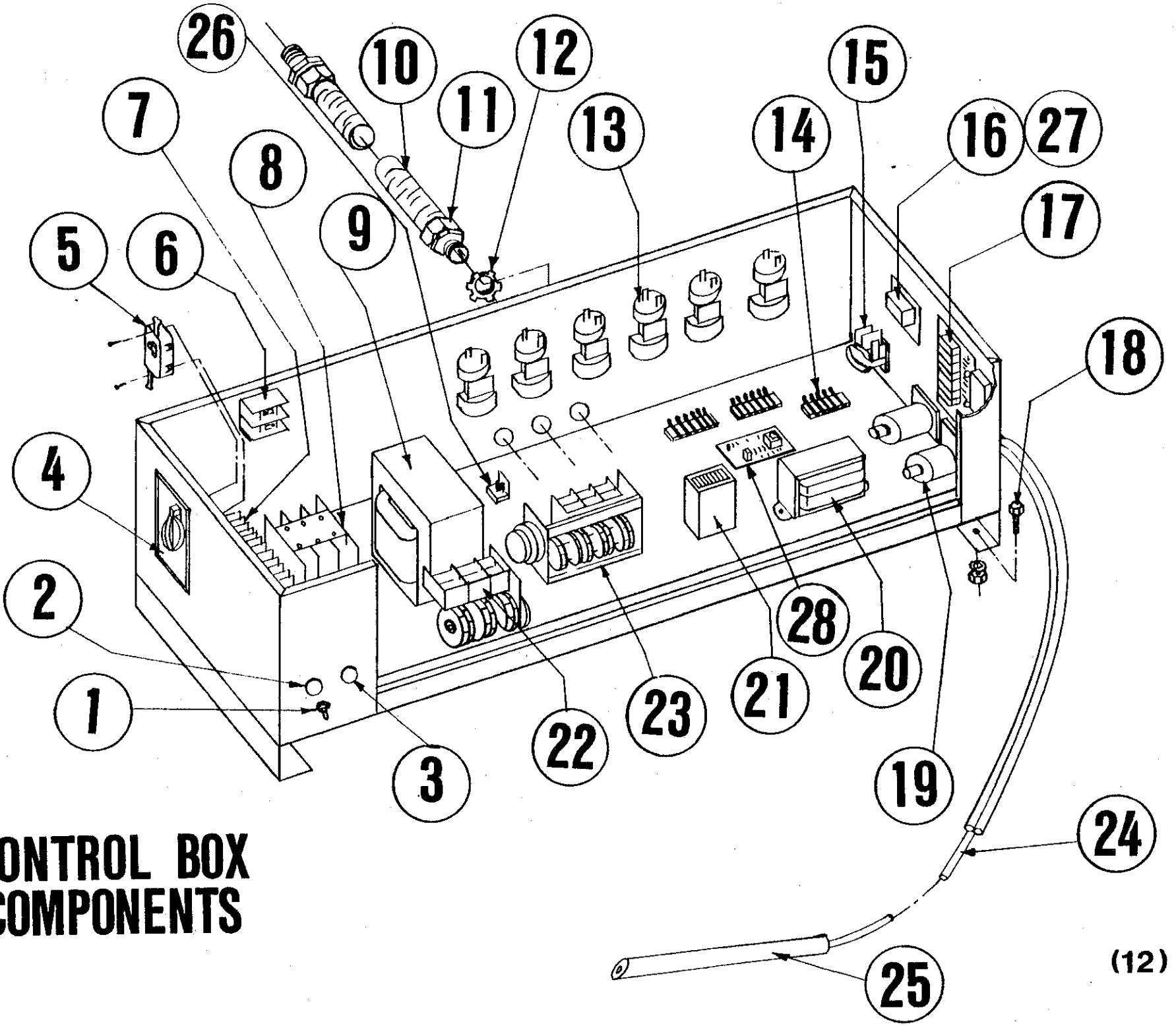
PERISTALTIC PUMP ASSEMBLY
P/N 13405.80



PERISTALTIC PUMP
ASSEMBLY

CHEMICAL METHODS ASSOCIATES

ITEM NO.	NO. REQ'D	DESCRIPTION
1	1	P/N 00416.00, Peristaltic Pump Motor (50rpm)
2	1	P/N 00417.00,Peristaltic Pump Block
3	2	P/N 00919.00, 10-32 x 1-1/2" Pan Head Scr
4	1	P/N 00918.00, 10-32 x 1-1/2" Fillister Head Scr
5 (optional)	1	P/N 00419.50, 3 Bearing Rotor Assembly
A	1	P/N 00424.50, Rotor Bearing Carriage
B	3	P/N 00423.00, Rotor Bearing
C	3	P/N 00422.00, Rotor Bearing Pin
D	1	P/N 00935.00, 10-32 x 1/4" Set Scr
6	2	P/N 00931.00 Twist Tye - Small
7	1	P/N 00418.00, Peristaltic Pump Block Cover
8	4	P/N 00911.00, 8-32 x 1/2" Pan Head Scr
9	1	P/N 00435.00, Squeeze Tube
10	1	P/N 00419.00, 2 Bearing Rotor Assembly
E	2	P/N 00423.00, Rotor Bearing
F	2	P/N 00422.00, Rotor Bearing Pin
G	1	P/N 00424.00, Rotor Bearing Carriage
H	1	P/N 00935.00, 1/4" 20x1/4" Set Scr
11	2	P/N 00448.00, Barrel Connector (male)



* CONTROL BOX COMPONENTS

CHEMICAL METHODS ASSOCIATES

CONTROL BOX COMPONENTS

Ref. No.	No. Req,d	Description
1	1	P/N 00405.00 Start/Fill Switch Toggle INSL
2	1	00478.00 1" Running Light Yellow 125 VAC
3	1	00476.00 1" Running Light Green 120VAC
4	1	00432.00 Bell Box Cover
5	1	00433.00 Master Switch
6	1	13426.00 Power Terminal Block (DIST)
6	1	13426.50 Control Box Ground Block
7	13	13420.00 Fuse Block
7	1	13420.50 Fuse End Block
7	12	1340350 Fuse (25 AMP)
8	1	13457.00 Contact Switch
9	1	13423.00 Transformer
10	AR	00400.00 3/8" Sealtite Conduit
11	AR	00401.00 ST-38 Connector
12	AR	00403,10 BL-50 Tiger Grip Nut
13	6	00404.00 Mercury Relay (Single)
14	3	13404.00 6 Position Terminal Block
15	1	00415.00 Peristaltic Pump Assy.
16	1	13461.00 Conveyor Control Unit
16	1	13461.50 Conveyor Control Switch Mount
17	1	13406.81 Peristaltic Pump Control Unit
18	4	00906.00 1/4-20X 1/2" Hex Head Bolt
19	2	13405.80 Peri-Pump Motor Assy. (DC)
20	1	13471.00 Transformer 110VAC-16VAC
21	Optional	03408.50 Counter 110VAC

- CONT. -

CONTROL BOX
COMPONENTS

CHEMICAL METHODS ASSOCIATES

Ref. No.	No. Req,d	Description
22	1	P/N 13418.00 Timer (20 Second)
23	1	13428.00 2-1/2 Min. Timer (4CAM)
24	1	00459.04 Chem. Discharge Tube Set
24	1	00459.04 Chem. Suction Tube Set
25	3	00443.00 Tube Stiffner
26	1	13403.10 Fuse (5AMP)
26	1	13420.00 Fuse Block
27	1	13462.00 Conveyor Control Unit Fuse (3AMP)
28	1	13476.10 Low Level Relay

* **P/N 13904.50 Control Box Cover**