

# L-4000E

LIQUID LAUNDRY DISPENSER

INSTALLATION AND OPERATING MANUAL



# PREFACE

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This manual describes how to use L-4000 and L-4000E.

Material in this manual is subject to change without notice. Manual revisions will be made on an as needed basis. Special circumstances involving important design, operation or application information will be released via Technical Service Bulletins.

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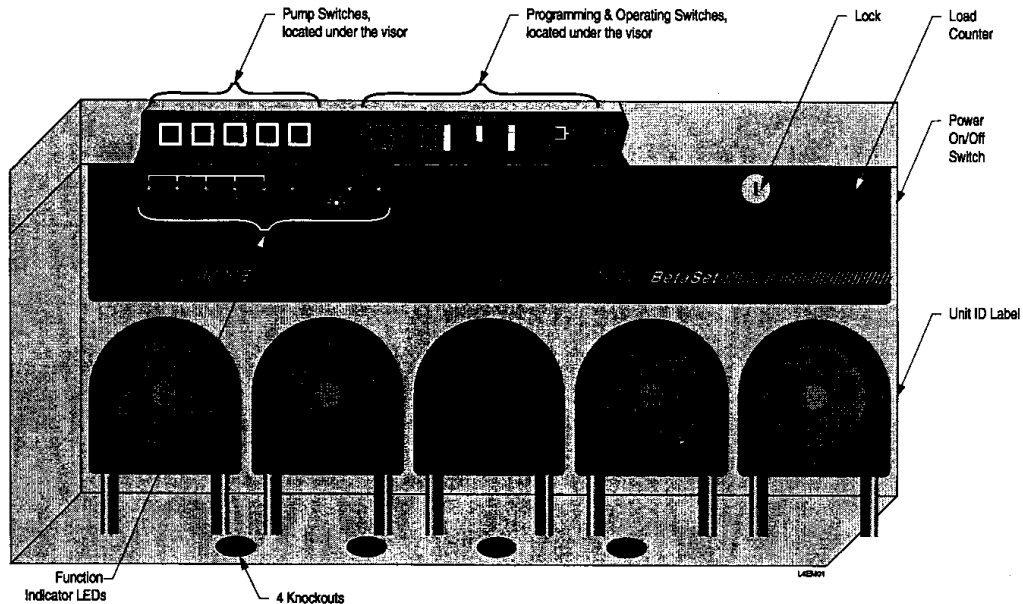
# SPECIFICATIONS

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<b>SIZE</b>	9 ¼H x 18 ½W x 5 ½D in (all models)
<b>WEIGHT</b>	L-4500E (5 pump unit) - 26 lbs L-4400E (4 pump unit) - 24 lbs L-4300E (3 pump unit) - 22 lbs
<b>ENCLOSURE</b>	Type 304 stainless steel
<b>AMBIENT OPERATING TEMPERATURE</b>	36-120° Fahrenheit
<b>ELECTRICAL POWER REQUIREMENTS</b>	115 volts AC (± 10%), 60 Hz - 8 amperes max (with 5 hi-speed motors) 230 volts AC (± 10%), 60 Hz - 4 amperes max (with 5 hi-speed motors) 240 volt, 50 Hz units available for export
<b>FUSES</b>	5 fuses-circuit board mounted (one per motor - motor one fuse also protects circuit board) 250 volt AGC, 2 amp, normal blow (applicable to all models)
<b>TRIGGER SIGNAL INPUT ELECTRICAL REQUIREMENTS</b>	24 to 240 volts AC 50/60 Hz or DC - 5 milli-amps minimum, 20 milli-amps maximum
<b>PUMPS</b>	Peristaltic type (dual roller, self priming, self checking) 106 RPM, shaded pole, constant current AC motors (standard) 25% duty cycle (i.e. 3 min on time requires up to 9 min cooling time) Thermal overload protection (automatic shutoff at 230° Fahrenheit)
	 <i>Contact the factory for information on the availability of hi-speed (200 RPM, 17 ounce per minute) pumps (60 Hz only). Not recommended for use with viscous liquids.</i>
<b>PUMP HYDRAULICS</b>	Vacuum (suction) = 20 inches of mercury (20 in HG) max Pressure (discharge) = 20 pounds per square inch (20 psi) max Standard Pump Displacement = 8.5 ounces (250 milli-liters) per min max  <i>*Displacement specifications based on water (one centipoise)</i>
<b>PUMP OPERATION</b>	<b>Run Time</b> - programmable from one sec to 10 min and 40 sec max <b>Delay Time</b> - programmable from one sec to more than one hour
<b>PROGRAM MEMORY</b>	Approximately 10 years with main power off

# INSTALLATION & SETUP

## EXTERNAL COMPONENTS & CONTROLS



### PUMP SWITCHES

**In Program Mode** - used to program pump run times and pump delay times.

**In Run Mode** - used to manually operate pumps (i.e. priming).

### PROGRAMMING & OPERATING FUNCTION SWITCHES

With middle switch in Program position, use left switch to select desired programming function. Right switch setting does not matter when programming pump times. With middle switch in Run position, use right switch to select desired operating mode. Left switch setting does not matter when in Run Mode. See **Setup & Programming** two, six, and seven for additional information.

### LOCK

Unlock to lift visor and access system controls. With visor up, remove the two screws (top left, top right) to access cabinet interior.

### POWER ON/OFF SWITCH

Controls power to L4000E (not trigger inputs).

### LOAD COUNTER

Optional six digit load counter location. Installation instructions supplied with counter.

**UNIT ID LABEL**

Contains electrical characteristics, model description, and serial number information.

**KNOCKOUTS**

7/8" knockout holes (4) for electrical wiring access. Use approved 1/2" or 3/4" electrical conduit.

**FUNCTION INDICATOR LEDS**

**Pump Trigger Signals**

Respective indicator(s) is on only when a valid electrical signal is applied across the appropriate pair of trigger input terminal screws inside the cabinet.

**Alternate Formula Indicator**

Turned on only when a valid electrical signal is applied across the two Alternate Formula input terminal screws inside the cabinet.

**Bleach Defeat**

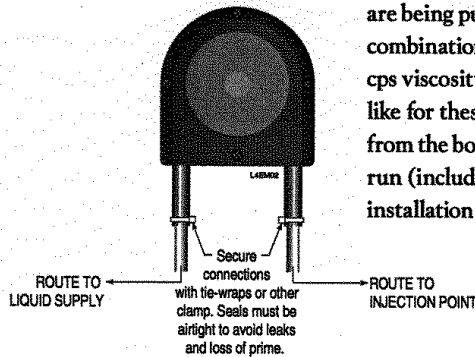
When lit in normal operation, indicates that bleach defeat function is active.  
When in Program Mode, light flashes while programming pump delays.  
Flashing during normal operation indicates that pump(s) have been signaled and the programmed delay time is counting down.

**MOUNTING & INSTALLATION**

1. **Open** the cabinet and mount the unit on a non-vibrating vertical surface using the three keyhole slots on the rear panel of the cabinet. Use appropriate mounting hardware. Mounting hardware and other installation materials are not typically supplied with the unit. A variety of installation kits are available and are sold separately.
2. **Mount** in a serviceable location and only in the horizontal position. Keep away from excessive steam or other moisture. Keep away from extreme heat or cold (36 to 120 degrees Fahrenheit is acceptable).
3. **Locate** the unit and the chemicals as close as possible to the washing machine so suction and discharge supply lines will be as short as possible. The shorter the distances, the less mechanical stress, the longer the pump tube will last.
4. **Route** the plastic supply line (polyflow line) from the chemical pails to the unit and from the unit to the washing machine. Allow enough length to reach the bottom of the liquid supply and to gain adequate access into the washer. Make horizontal runs as straight as possible (no peaks and valleys). Connect the lines to the pumps as detailed below.

**TYPICAL INSTALLATION DESCRIPTION**

Typical installation refers to applications where liquids with physical characteristics similar to water [1 centipoise (cps) - 8.33 pounds per gallon (ppg)]



are being pulled less than 25 feet, pushed less than 25 feet, or most push-pull combinations totaling less than approximately 50 feet. Liquids less than 75 cps viscosity and weighing less than 8.66 ppg are normally considered water-like for these purposes. Typical also assumes that the total vertical lift/rise from the bottom of the liquid reservoir to the highest point in the supply line run (including the injection point) is less than approximately 10 feet. If your installation does not fit or balance\* within the basic criteria described here, contact Beta Technology, Inc. for additional technical information. \*An example of hydraulics balance to improve pump performance would be; using larger supply lines to pump thick, heavy products even for short distances.

L-4000E pump tubes have an inside diameter of approximately 5/32", 1/4" OD (Outside Diameter) polyflow line is recommended for typical installations as it inserts easily into the pump tube and is generally easier to work with. If larger supply line is used (i.e. 3/8" OD.), appropriate adaptor fittings are recommended. Use 1/4" x 1/4" plastic barbed fittings (item N<sup>o</sup> 041912) or other fittings. Insert polyflow lines approximately one inch up into the pump tubes. Vacuum on the suction side and back-pressure on the output side of the pump are the two primary factors that cause mechanical stress on the pump tube (assumes chemical compatibility is appropriate). The lower the stress, the better the pump performs and the better the pump tube life. If long suction or output line runs are necessary or viscous/heavy liquids are pumped, use larger diameter supply lines to reduce the vacuum and pressure.



*For best pump performance and pump tube life, keep vacuum under 10 inches of mercury (10 in. HG). Do not exceed 20 in. HG.*

*For best pump performance and pump tube life, keep pressure under eight pounds per square inch (8 psi). Do not exceed 20 psi.*

A variety of straight CPVC pipe and plastic snap-in type supply line drum guides are available for both 1/4" and 3/8" supply lines. Drum guides must be used to keep the supply line rigid to the bottom of the liquid supply. Drum guides are not included with the unit.

Terminate and secure the output lines from the pumps so that the chemicals will be safely and completely injected into the washer drum. Access is typically available via the washer's powder chemical supply bin(s) plumbing. Some washers provide specific connection locations and methods.

Use pump delays, or program washer chemical flush valves to be on longer than pump run times to ensure that all chemical is flushed down.

If a vertical drop to the injection point causes excessive dripping after the pump stops, making a loop in the supply line immediately before the injection point will help control this.

**Viscosity reference liquids at 70 degrees Fahrenheit**

Water = 1 cps

Hydraulic oil = 43.2 cps

SAE 10 oil = 110 cps

SAE 20 oil = 220 cps

SAE 30 oil = 440 cps

SAE 50 oil = 880 cps

SAE 60 oil = 1080 cps

Molasses = 10,800 cps

**ELECTRICAL CONNECTIONS**



*Install in compliance with all applicable electrical codes.  
Refer electrical installation and servicing to qualified personnel only.*

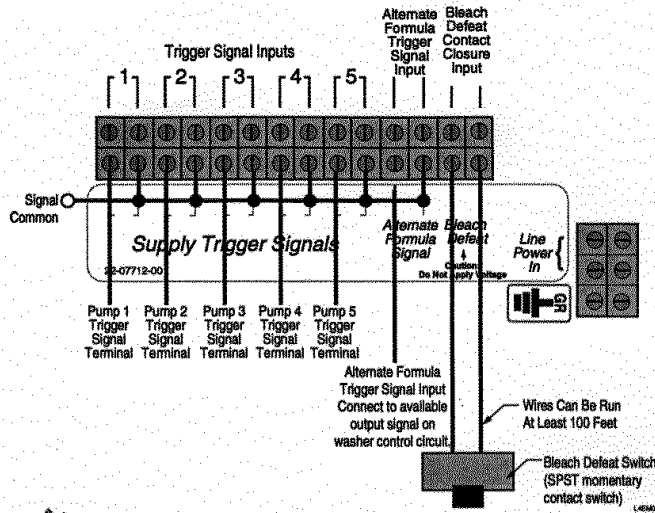
**MAIN POWER WIRING**

- A. Open the pump cabinet to access the wiring terminals. Electrical access knockout holes are on the bottom of the unit.
- B. Connect an appropriate power source and ground to the power input and ground terminals inside the cabinet on the right side. Refer to the Specifications section and the unit identification plate for electrical requirements. A complete wiring diagram is located in the back of the manual.

**TRIGGER SIGNAL WIRING**

- A. Refer to the Interface Wiring Diagram manual for detailed wiring information on over fifty specific washer models. In addition, see **Washing Machine Manufacturer Listing** for a listing of washing machine manufacturers.
- B. Refer to the Specifications section and the unit identification plate for signal input electrical requirements. The signal inputs are optically isolated and independent of each other. Separate signal sources (i.e. signaling pumps from more than one washer) and different voltages may be connected to each trigger signal input if desired. The reference wiring diagrams below show generic wiring connections for a common multiple (six) signal circuit and an independent three signal circuit. Bleach Defeat switch and Alternate Formula signal wiring (manually switched and control signal methods both shown) are also shown.
- C. If Direct Current (DC) signals are used, the right side screw of each pair of signal input terminals is the negative input and the left screw is the positive input (Bleach Defeat input is not applicable - contact closure only).

## PUMP SIGNALS WITH COMMON / REMOTE BLEACH DEFEAT

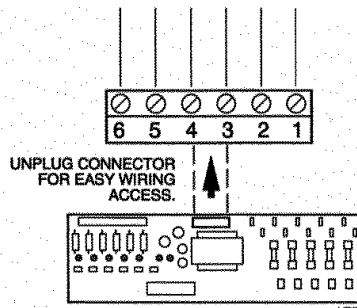


For bleach defeat switch, make contact closure connection only. Do not apply any electrical source to these two terminals.

Make connections to washer control circuitry wires or terminals designated as chemical supply signals. Use a normally open, momentary action push-button or toggle type switch only. Mount the switch in a location easily accessible to the machine operator (i.e. front panel of washer).

## MAIN CIRCUIT BOARD CONNECTOR

The following wiring connection must be used or pumps may not run.

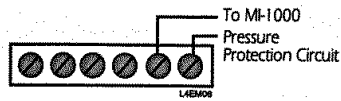


## Stand Alone L-4000E



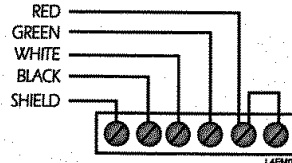
Pins 1 and 2 are jumper wired from the factory. This wire must be in place for L-4000E pump operation.

**L4000E with MI-1000 (Water Flushed Delivery Option)**



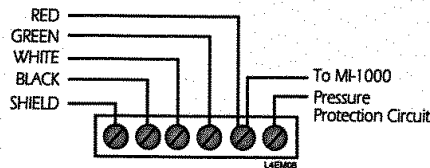
Remove jumper wire. Pins 1 and 2 must be connected to MI-1000 pressure protection circuit. One pressure protection wire per pin.

**L-4000E with RS-1000 (Remote Formula Selector Option)**



Pins 6, 5, 4, 3 and 2 must be connected to RS-1000 shield, black, white, green and red wires respectively.

**L-4000E with MI-1000 and RS-1000**

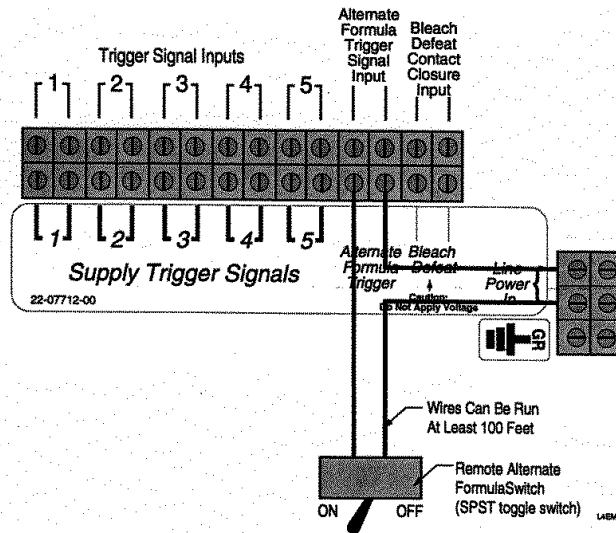


Follow the wiring for both the L4000E with MI-1000 and L-4000E with RS-1000. Note that pin 2 should have two wire connections; one leg of MI-1000 pressure protection circuit and red wire from RS-1000.



All L-4000E production units before 1/1/98 have 5 pin connectors and cannot be used with the MI-1000. However, they may be used with the RS-1000.

**PUMP SIGNALS IN PAIRS / REMOTE ALTERNATE FORMULA SELECT SWITCH**

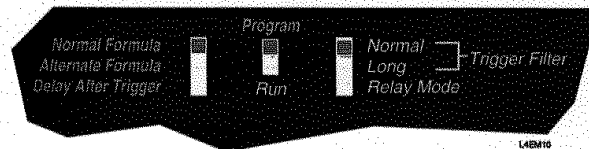


Make connections to washer control circuitry wires or terminals designated as chemical supply signals. Use a properly rated on/off locking toggle switch only. Mount the switch in a location easily accessible to the machine operator (i.e. front panel of washer). Connect the two signal inputs to an appropriate power source.

## SETUP & PROGRAMMING

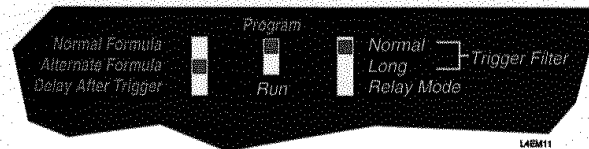
### TO PROGRAM

#### Normal Formula Pump Times



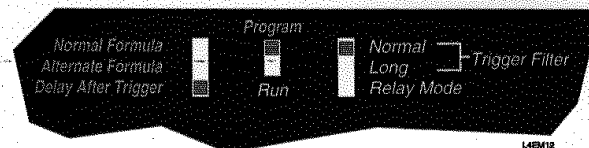
1. Prime pumps.
2. Set switches as shown above.
3. Press pump switch until pump starts. Let pump run until correct amount of liquid is measured, or desired pumping time is reached.
4. Press pump switch again to stop pump. Run time is automatically stored, replacing the previously programmed time.
5. Set middle switch to Run position for normal operation or continue programming.

#### Alternate Formula Pump Times



1. Prime pumps.
2. Set switches as shown above.
3. Repeat steps three, four, and five as above.

#### Pump Delay Times



1. Set switches as shown above. Long signal filter may be used if applicable.
2. Run washer through a cycle. As the cycle advances, the pump(s) trigger signal indicator light(s) will light up indicating that the signal is present (the signaled pump(s) will not run). The Bleach Defeat light will begin

to flash (after the selected signal filter time has passed), indicating that the delay programming has started for the signaled pump(s).

3. Wait until the point during the cycle that you want the signaled pump(s) to operate and press the appropriate pump switch(es).
4. The pump(s) will run. Let the pump(s) run for two or three seconds and then press the pump switch(es) again. The pump(s) will stop and the delay time is stored. Bleach Defeat light stops flashing when the last signaled pump is programmed.
5. Maximum delay time is more than one hour.

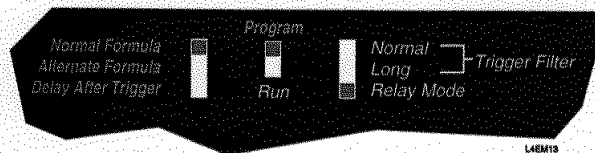


*The front panel control switches are recessed. Use a small screwdriver, etc. to operate switches.*

### TO PRIME PUMPS

1. With middle switch in Run position and right switch in Relay position, press and hold pump switch. The pump will run as long as the switch is pressed. Release switch to stop pump.
2. Run the pump until the liquid is pulled up into the pump or through the pump to the injection point (depending on where pump displacement programming measurements are to be taken).

### TO OPERATE In Relay Mode

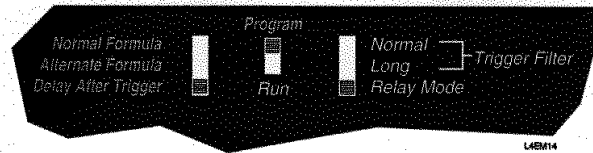


1. Set switches as shown above. Pump(s) will run for the duration of signal.

### In Timed Modes (Norm/Alternate)

1. Set middle switch to Run position (left switch position does not matter).
2. Set the right switch to the Normal or Long Signal Filter position as applicable.
3. Pumps will run for the programmed time after a valid signal is received and programmed delay (if applicable) time has passed. Operation of the middle pump also depends on the status of the Bleach Defeat function.

## TO CLEAR PUMP DELAYS



1. Set switches as shown below.
2. Press the pump(s) switch until the pump(s) begin to run. Wait for approximately two seconds and press the switch(es). The pump(s) will stop and the delay(s) is cleared to zero time.

## SETUP - NOTES

1. Specified electrical power source allows all pumps to be operated simultaneously in any mode.
2. The five pump trigger signal indicator lights and the Alternate Formula indicator light will turn on when valid signals are present even if the unit main power is off. This is useful for verifying correct signaling from the washer without running the pumps or triggering delays.
3. Factory installed jumper wires connect the common side terminals (right screw) of all five pump signal inputs. Re-configure as and if applicable.
4. Due to pump hydraulics factors, displacement measurements taken directly at the output of the pump can be much greater than measurements taken at the end of the output supply line.

## PROGRAMMING - NOTES

1. After programming pump run times or delay times, repeating the procedure will erase the previous time and store the new time.
2. In Relay Mode operation, the Normal Signal Filter is in effect. The pump(s) will continue to operate for three seconds after the signal stops. Plan pump signal programming accordingly.
3. Programmed pump delays are in effect whether the pumps are operated in the Normal mode or the Alternate Formula mode.
4. Use caution when programming and using pump delays especially in applications where pumps are signaled during one sub-cycle but delayed until a later sub-cycle (i.e. signaling the bleach pump during a wash cycle but delaying the injection until the first rinse cycle). Make sure that water fill and drain times are consistent and that sub-cycle time changes and total wash cycle time changes due to differences in wash cycle selections are compatible with any pump delay programming.
5. Using the Long Signal Filter where short delays (under 17 seconds) are desired or needed is acceptable and saves programming time.

# SYSTEM OPERATION

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1. To manually operate a pump for the Normal Formula time press the pump control switch until the pump begins to run. The pump will stop when the programmed run time elapses. To manually operate a pump for the Alternate Formula time (i.e. for checking displacement), the Alternate Formula signal must be on at the time the pump switch is pressed.
2. When using the Alternate Formula feature, the Alternate Formula signal must be applied previous to and be present at the time an incoming pump signal is received in order for the pump to operate for the alternate run time. The Alternate Formula trigger signal does not need to remain on once the pump(s) signal is received even if pump delays are programmed.
3. An equal amount of time is required (either three or 17 seconds depending on filter setting) to disqualify a previous trigger signal before another signal can be received. Subsequent signals sent during the disqualification period will be ignored.
4. If the Bleach Defeat function is selected in error, press the Bleach Defeat switch again to turn the function off. If the pump has already been signaled and a delay time is counting down, pressing the switch again will not turn the function off. The bleach defeat function is operational in the Relay Mode.

# MAINTENANCE

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## ROUTINE MAINTENANCE

### GENERAL CLEANING

Keep the unit wiped clean of any residual chemical buildup that might corrode the stainless steel cabinet.

### PUMP TUBE REPLACEMENT SCHEDULE

Due to the many variables involved (i.e. chemical compatibility, quantity of product pumped, hydraulics factors) we cannot specify a set time to replace the pump tubes. Pump tube displacement drops as the tube wears. Check displacement regularly. Establish a routine replacement schedule based on the performance of the original tubes. Replace pump tubes at regularly scheduled intervals to reduce service calls and to ensure accurate product displacement. Do not let pump tubes wear to the point where they will tear and allow chemicals to saturate the pump housing.

### HOW TO LUBRICATE AND REPLACE TUBES

1. Remove the 4 bolts that secure the front pump housing to the rear pump housing. The front housing may then be easily removed by hand.
2. Remove the old tube and clean the inside of both housing halves to remove any residue.
3. Apply a light coating (a finger tip dose is fine) of lubricant to a new piece of tubing before inserting it into the pump housing. Only the portion (inside radius) of the tubing that will make contact with the rollers needs to be lubricated. Occasional lubrication during the expected life of the tube may help extend tubing life.
4. Carefully insert the new tube so that it fits tightly against the rear pump housing half. To ensure proper tube placement, rotate the roller assembly once or twice while holding the tube in place. Then, press the front housing against the rear housing so that the bolt holes mate up and screw in the 4 bolts. Only 6 to 8 inch pounds of torque are required to tighten the pump housing. Overtightening may cause the pump housing to crack.



#### *Lubrication Note*

*Use vaseline to lubricate Silicone and Viton tubes. Use a silicone lubricant such as Dow Corning 111 to lubricate Nordel and BetaTube tubes. C-FLEX tubes do not require lubrication. Too large an application of lubricant or using an incompatible lubricant may cause premature squeeze tube wear.*

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**TROUBLESHOOTING**

*Complete wiring diagrams are located in the back of the manual.*

**1. NO POWER**

- A. Is correct voltage measured across the two internal power terminals?
- B. Is power switch on?
- C. Check unit functions to make sure that a burned out Power light is not the only problem.
- D. Remove the protective shield that covers the circuit board and check fuse #1 (leftmost). Replace circuit board if properly rated fuses blow repeatedly.

**2. PROPERLY RATED FUSES BLOW REPEATEDLY**

- A. Is pump roller assembly jammed or other physical pump problem?
- B. Replace board if fuse(s) blow with respective motor(s) leads unplugged from board.
- C. Replace shorted motor if fuse does not blow when motor is unplugged.

**3. PUMP WILL NOT OPERATE (MANUALLY OR WHEN TRIGGERED)**

- A. Is electrical power source providing specified current? Standard 115 volt motors draw 1.2 amperes each. Standard 230 volt motors draw .6 amperes each. Add 30% draw for high speed motors. Inadequate current source will cause the microprocessor to reset allowing no pumps to run.
- B. Are pins 1 and 2 of the main circuit board connector jumpered (except when used with MI-1000)?
- C. Is roller assembly loose on motor shaft?
- D. Is fuse blown?
- E. Is pump overheated? If so, let pumps cool before operating.

**4. PUMP RUNS CONTINUOUSLY WITHOUT BEING SIGNALLED (OR MANUALLY ACTIVATED)**

- A. Replace circuit board.

**5. UNIT WILL NOT ACCEPT RUN OR DELAY TIME PROGRAMMING**

- A. Are the front panel slide switches dirty or oxidized? Spray a small amount of switch contact cleaner into the open body of each switch and move switches back and forth.
- B. Replace the circuit board.

**6. UNIT ACCEPTS PROGRAMMING BUT WILL NOT OPERATE IN RUN MODE**

- A. Replace the circuit board after confirming Run/Program switch operation.

**7. PUMP SIGNAL INDICATORS WILL NOT LIGHT**

- A. Are washer signal wires connected properly?
- B. Is washer timer, card control, or computer program supposed to be sending a signal?
- C. If applicable, are the washer chemical flush water solenoids operating as per normal?
- D. Replace the board if a valid electrical signal (measured across the respective pair of trigger terminals) does not cause the indicator to light up as long as the signal is present.

**8. PUMP SIGNAL INDICATORS LIGHT WHEN SIGNALLED BUT PUMP DOES NOT OPERATE**

- A. Are pump delays programmed (indicated by flashing Bleach Defeat light)?
- B. Is the signal time greater than the selected Signal Filter time?
- C. Is the unit in the Run mode?
- D. Consult Section 3 (Pump Will Not Run) to make sure that the pump is okay.
- E. Replace the circuit board.

**9. PUMP SIGNAL INDICATORS LIGHT AT THE WRONG TIME**

Our signal inputs are designed to draw minimal current from the washer circuitry so as to not effect the operation of the washer control circuitry. This low current signal receiving capability may cause some susceptibility to AC coupling or other electrical phenomenon when connected to some washers (i.e. Wascomat W series machines). Disabling the washer signal source load (i.e. the softener water flush solenoid on Wascomat W series machines) will often eliminate the AC coupling. Extreme cases may require using isolation relays so that the relays are signaled from washer and another electrical source is switched through the relay contacts to the respective L-4000E signal input terminals. Symptoms include but are not limited to:

- A. All or some signal indicators are on even if the washer is not operating.
- B. All or some signals come on at the start of the cycle and stay on throughout the cycle.
- C. Additional signal indicators light up when other signals are sent from the washer (i.e. softener signal comes on when detergent pump is signaled).
- D. Signal indicators repeatedly come on when washer is performing certain functions (i.e. filling, draining, extracting, auto-balancing).

**10. PUMPS WILL NOT OPERATE FOR ALTERNATE FORMULA TIME**

- A. Is a valid electrical signal applied at the time the pump(s) are signaled?
- B. Is switch operating properly and are the switch wires okay?

- C. Is Alternate Formula signal input working? See section 7D.
- D. Replace the board.

### 11. BLEACH DEFEAT FUNCTION WILL NOT OPERATE

- A. Is the switch operating properly and are the switch wires okay?
- B. Is 5 volts DC measured across the two terminals?
- C. Does the input respond to a direct short (jumper wire) across the two Bleach Defeat terminals?
- D. Replace the circuit board.



*It is possible that the Bleach Defeat feature may be working and that only the indicator is burned out. Make sure this is not the case.*

### 12. PUMP DOES NOT PULL LIQUID PROPERLY:

- A. Is too much vacuum being created (i.e. suction lines too small, product too far away, product too viscous, vertical lift too high)? This is easily recognized by the fact that the tubing will completely flatten out (collapse) inside the pump housing when the pump starts to run.
- B. Is the supply line in the chemical drum sucking up against the side or bottom of the drum?
- C. Is there a crimp in the intake supply line?
- D. Is the pump tube worn out or is roller and pump tube combination configuration wrong?

### 13. PUMP WILL NOT HOLD PRIME

- A. Is there an air leak somewhere along the input supply run (i.e. properly sealed supply line/pump tube connection)?
- B. Is the pump tube worn out or is roller and pump tube combination configuration wrong?

## ACCESSORIES & SPARE PARTS

The items listed in this section provide you with quick reference numbers for some of the major parts and accessories. A complete exploded assembly drawing and parts list is located in the back of the manual. To order a part from the drawings, identify the part by bubble number and refer to the phone numbers on the Preface page.

### AVAILABLE PUMP TUBES

L-4000E series units are factory equipped with Silicone or BetaTube pump tubes unless otherwise specified. Other tube materials are available for chemical compatibility purposes. Refer to Technical Service Bulletin 86-1012 (published in November 1986) for detailed information on chemical compatibility.

DESCRIPTION	ITEM N°
Printed Circuit Board, L-4000E, 115 VAC	035872
Printed Circuit Board, L-4000E Latch, 115 VAC	097376
Printed Circuit Board, L-4000E, 230 VAC	035873
Printed Circuit Board, L-4000E Latch, 230 VAC	097377
Power Switch	042574
Fuse, 2 Amp	042882
Pump Housing, Front, 8 oz	059967
Pump Housing, Rear, 8 oz	091084
Pump Motor, 115 VAC, 100 RPM	018051
Pump motor, 230 VAC, 106 rpm	018053
Pump Roller Assembly, 8 oz	051189
Tubing, .188 ID, BetaTube	022028
Tubing, .188 ID, Silicone	026913
Trigger cable, 10 conductor, 22 ga, 50 ft	018036
Power cord, 18 ga, 12 ft	033136
Tubing, 3/8 OD x 100'	033110

#### TECHNICAL ASSISTANCE

If you require additional technical information, contact our Technical Support Department. Refer to the Preface page for telephone numbers.

#### RETURNING EQUIPMENT FOR REPAIR

If you need to send an item back to be repaired, you must call or write to obtain a Return Authorization Number (RA) before sending it back. Our Repair Department will provide you with a return number. Please write the RA number on the outside of the box before sending it back. It is also very helpful to our repair department if you include a note inside the box explaining the nature of the problem. Failure to obtain an authorization number before sending an item in for repair or replacement may delay the return of your equipment.

# APPENDIX

## A. WASHING MACHINE MANUFACTURER LISTING

This section is provided in case you require more information or assistance in order to connect your L4000E unit to a specific washing machine model. Most often, the information you need will be available on a schematic in the washing machine manufacturers user documentation. If you need assistance, you are certainly welcome to call Beta Technology, Inc. or you can call the washer manufacturer directly. Regardless of whom you call, please have the Model number and Serial number of the specific machine before calling.

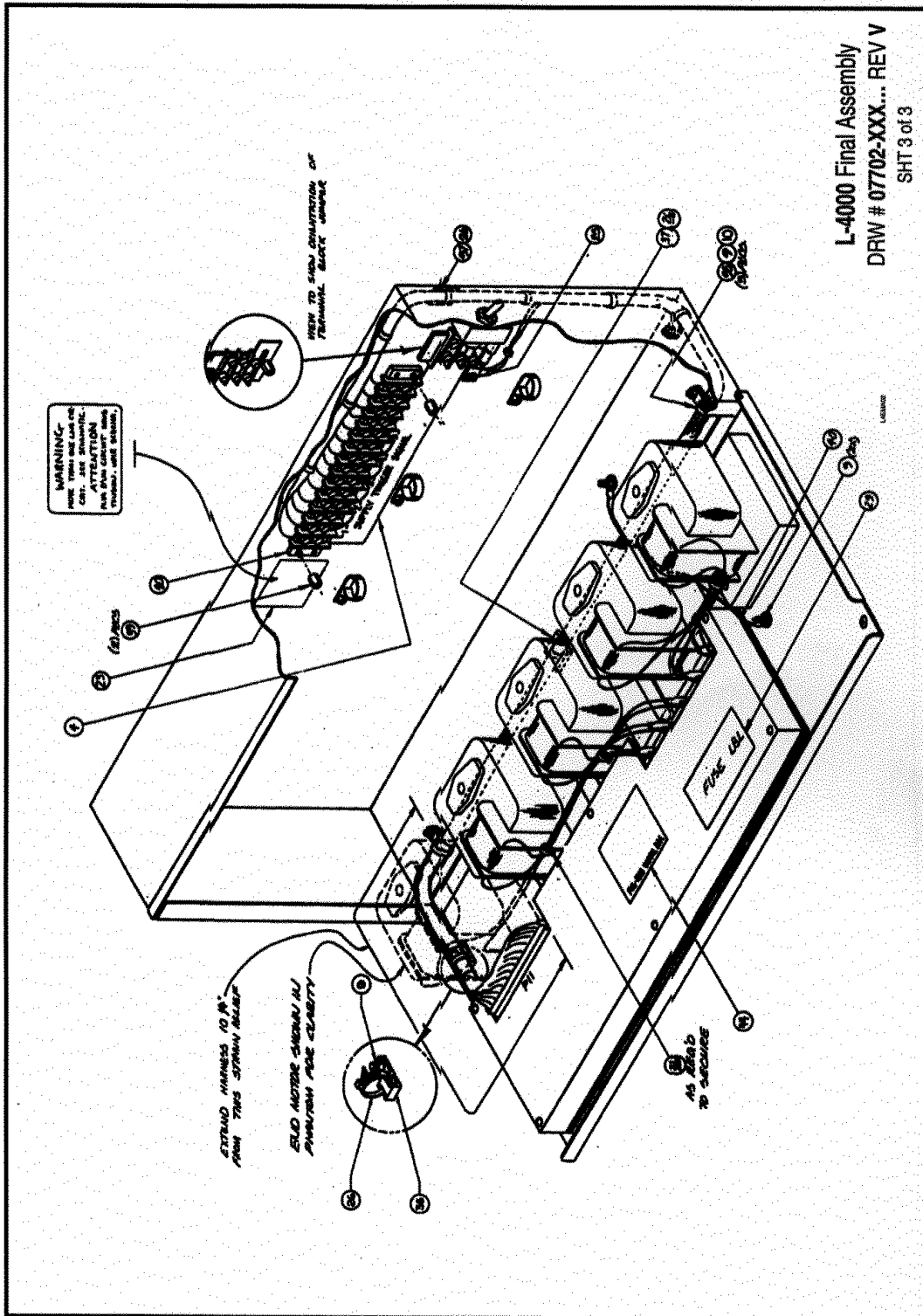
Information for some of the full washer control manufacturers is also included.

COMPANY	LOCATION	TELEPHONE
American Laundry Machinery Inc. (also handles Huebsch washers)	Cincinnati, Ohio	513-731-5500
Automatic Control Systems, Inc.	North Easton, Mass.	617-238-1002
G.A. Braun Incorporated	Syracuse, N.Y.	315-475-3123
Cook Machinery Company	Dallas, Texas	800-526-2665
Dexter Company (The)	Fairfield, Iowa	515-472-5131
Edro Corporation (The)	East Berlin, Conn.	203-828-0311
Dyna-Wash Washers		
Ellis Corporation	Chicago, Illinois	312-772-6744
Girbau, U.S.A.	Philadelphia, Pa.	215-289-3435
Henrici Incorporated	Canton, Mass.	617-828-2400
Intraspec, Inc.	Bogota, N.J.	201-487-3113
Ipsos U.S.A.	Long Island City, N.Y.	718-898-5822
Maytag	Cleveland, Tennessee	615-472-3333
Pellerin Milnor Corporation	Kenner, Louisiana	504-467-9591
Primus	Gloucester, Mass.	508-281-6080
Speed Queen	Ripon, Wisconsin	414-748-3121
UniMac Company, Inc. (Uniwash/UniMat washers)	Marianna, Florida	904-526-3405
Washex Machinery Corp	Wichita Falls, Texas	817-855-3990
Wascomat	Inwood, New York	516-371-0700

## B. DRAWINGS & DIAGRAMS

On the following pages.





L-4000 Final Assembly  
DRW # 07702-XXX... REV V  
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