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LANCASTER[®]

WATER TREATMENT

INSTALLATION, OPERATING AND SERVICE MANUAL

FULLY AUTOMATIC WATER SOFTENER

- 7-LC56-24 7-L56-16 7-L56-24
 7-L56-32 7-L56-45

IRONSOFTE FINE MESH RESIN

- 7-CFES-24 7-FES-24 7-FES-32

Congratulations on purchasing your new **Lancaster Water Softener**. This unit is designed to give you many years of trouble free service. When installed in accordance with the following instructions and if given reasonable care, clear-soft water will be the result. For servicing and future inspection purposes, please file this booklet with your important documents.

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INSTALLATION

Place softener in desired location close to water supply inlet, after pressure tank, and near a source for waste water, (utility sink, floor drain or sewer line). Keep far enough away from walls and other obstructions to allow enough room for servicing the unit. All sillcocks and similar fixtures that will use untreated water must have their pipes connected to the hard water side of the softener. A bypass valve (optional accessory) should be installed so that water will be available if it should be necessary to shut off the pressure in order to service the softener.

The cabinet tank or mineral tank must be reasonably level and solidly in place. Prior to beginning work to the system, make sure that water pressure is shut off at the incoming water supply and that several water spigots are open to prove sufficient venting for drainage of that system.

Arrows are molded into the control valve to show the direction of the flow.

OPTIONAL BYPASS VALVE: The bypass valve easily connects to the control valve body using screws and adapter clips. Install with red handle in the upward position. Press slip end of bypass valve onto in/out connections of valve. Take care not to crimp o-rings. Place into **BYPASS POSITION**. Do not use Vaseline or other unacceptable lubricants on o-rings. A silicone lubricant may be used on black o-rings.

DRAIN LINE: Drain line fitting accommodates 1/2" I.D. flexible poly tube.

It is simplest to run the drain line into a sump pump pit or washing machine drain if possible. If this is not practical, a fitting with a trap must be installed in a sewer line. Place the trap as close to the vent as possible to prevent siphoning of the trap when large amounts of waste water go through the sewer line. **DO NOT** pipe the drain line solidly into the waste line, as this is prohibited by most plumbing codes. The drain line should enter the trap from above so the water will not back up in the drain line if sewer should become plugged up and the trap overflow. The trap should have a short pipe extending from it to prevent splashing when water runs into the trap from drain line.

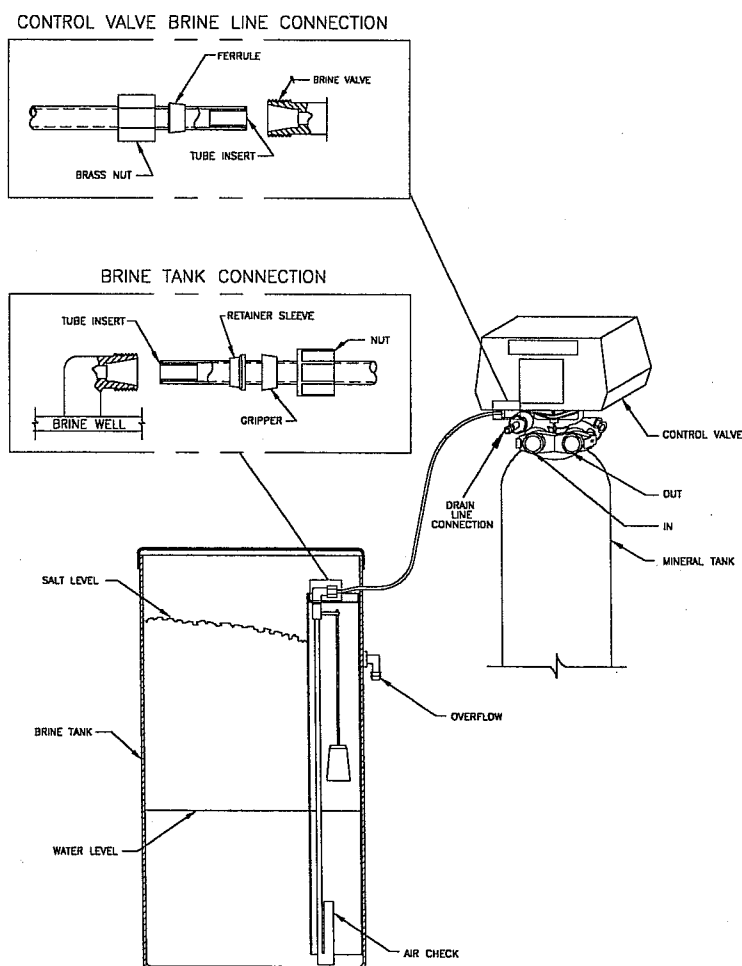
BRINE LINE CONNECTIONS: 3/8" poly tube is shipped inside of the brine tank along with a fittings package.

MAKE CONNECTION TO BRINE TANK: Loosen nut on brine tank connection. Push the tube insert into the provided 3/8" poly tube. Push the poly tube and insert into the nut until it is fully seated into the fitting. Do not use pipe dope or any other sealant on threads. Teflon tape is not needed on the threads. Tighten nut securely to create a pressure tight connection. Pliers or crescent wrench may be used. The nut, gripper and retainer sleeve is a three piece assembly that can come apart if removed from the elbow body. Parts must be reassembled exactly as shown to function properly. If the nut is completely removed from the body, slip the nut, plastic gripper and retainer sleeve on to the tube then tighten on to the fitting.

MAKE CONNECTION TO CONTROL VALVE: Slide brass nut onto 3/8" poly tube. Slide ferrule onto poly tube **as shown in diagram**. Install tube insert. Press fully into brine valve fitting. Tighten brass nut.

BRINE TANK OVERFLOW PRECAUTION: Attach a 1/2" poly tube (not provided) to the barbed fitting on the outside of the tank. This poly tube should be piped to drain to allow brine to discharge to drain in the event of an overflow condition.

SANITIZING: (This is to be done after placing unit into service - see next page.) Use 2 oz. of 5¼% household chlorine bleach for each cubic foot of resin. Pour bleach directly into the brine well of the softener. Manually index the softener to the **REGEN** position. Allow system to complete the regeneration automatically. Check for other local and state codes which may also specify sanitation methods.



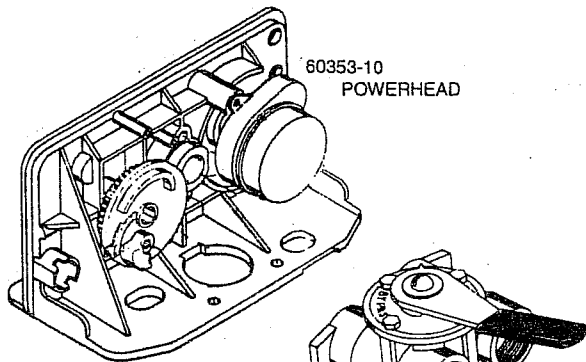
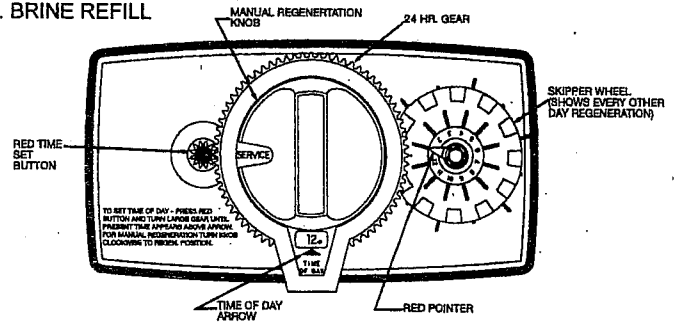
PLACING UNIT INTO SERVICE:

1. Manually index the softener control into the **BACKWASH** position. Slowly open bypass valve and allow water to flow into the resin tank. When the water flows steadily to drain without the presence of air, index control to **IN SERVICE** position.

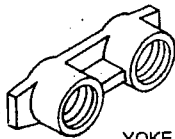
NOTE: the various regeneration positions may be dialed manually by turning the knob on the front of the control clockwise until the indicator shows that the softener is in the desired position. **VARIOUS REGENERATION POSITIONS ARE:**

- | | | | |
|-------------|--------------|------------------|-----------------|
| 1. IN SERV. | 3. RINSE | 5. BRINE + RINSE | 7. SETTLE RINSE |
| 2. REGEN. | 4. BACK WASH | 6. RAPID RINSE | 8. BRINE REFILL |

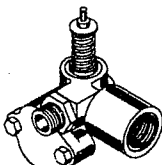
2. Set regeneration intervals. To set days that regeneration is to occur, slide tabs on skipper wheel outward to expose trip fingers. Each tab represents one day. The finger at the red pointer represents tonight. Moving clockwise from red pointer, extend or retract fingers to obtain desired regeneration schedule.
3. Add 1-1/2 gallons of water to the brine tank.
4. Plug in the electrical cord and look in the sight hole in the back of the motor to see that it is running.
5. Set the correct time of day.
6. Manually advance the control to the beginning of the brine refill position and allow the control to return to the service position automatically.
7. Fill the brine tank with salt. Maintain salt level above water level. We recommend Solar Salt.
8. Make sure bypass valve(s) is in the service position.



BY-PASS VALVE
No. 60041-1"
No. 60040-3/4"



YOKE
NO. 13398 - BRASS 1"
NO. 13708 - BRASS 3/4"



INJECTOR/DRAIN MODULE ASSY.
NO.60084-0121, #1 INJ., .25 BLFC, 1.5 DLFC
NO.60084-0122, #1 INJ., .50 BLFC, 1.5 DLFC
NO.60084-0141, #1 INJ., .25 BLFC, 2.4 DLFC
NO.60084-0142, #1 INJ., .50 BLFC, 2.4 DLFC



NO. 60032
BRINE VALVE ASSY.

GRAINS OF HARDNESS TO BE REMOVED DAILY

| Grains Hardness | Number of Persons in Family | | | | | |
|-----------------|-----------------------------|------|------|------|-------|-------|
| | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | 600 | 900 | 1200 | 1500 | 1800 | 2100 |
| 8 | 800 | 1200 | 1600 | 2000 | 2400 | 2800 |
| 10 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 |
| 12 | 1200 | 1800 | 2400 | 3000 | 3600 | 4200 |
| 14 | 1400 | 2100 | 2800 | 3500 | 4200 | 4900 |
| 16 | 1600 | 2400 | 3200 | 4000 | 4800 | 5600 |
| 18 | 1800 | 2700 | 3600 | 4500 | 5400 | 6300 |
| 20 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 |
| 22 | 2200 | 3300 | 4400 | 5500 | 6600 | 7700 |
| 25 | 2500 | 3750 | 5000 | 6250 | 7500 | 8750 |
| 30 | 3000 | 4500 | 6000 | 7750 | 9000 | 14000 |
| 35 | 3500 | 5250 | 7000 | 9000 | 10400 | 15750 |

INSTRUCTIONS FOR SELECTING REGENERATION INTERVAL

To choose the proper regeneration interval, first check the specification table to determine the total grains hardness per day to be removed. The industry figures 50 gallons of water per person per day will be used. An automatic washer is figured as a person. Frequent regeneration is beneficial, particularly when larger amounts of iron are involved.

Example: Family of 4 at 50 gallons each with 13 grains hardness.
 $200 \times 13 = 2600$ grains per day to be removed.
 $2600 \times 6 = 15600$ grains to be removed by 6 day cycle.
 $2600 \times 12 = 31200$ grains to be removed by 12 day cycle.

To obtain maximum efficiency per pound of salt, the softener should be set to regenerate at an interval that will utilize the full capacity of the mineral. If 5 parts per million or more of iron are present, it is recommended that the softener be regenerated at least once every 4 days.

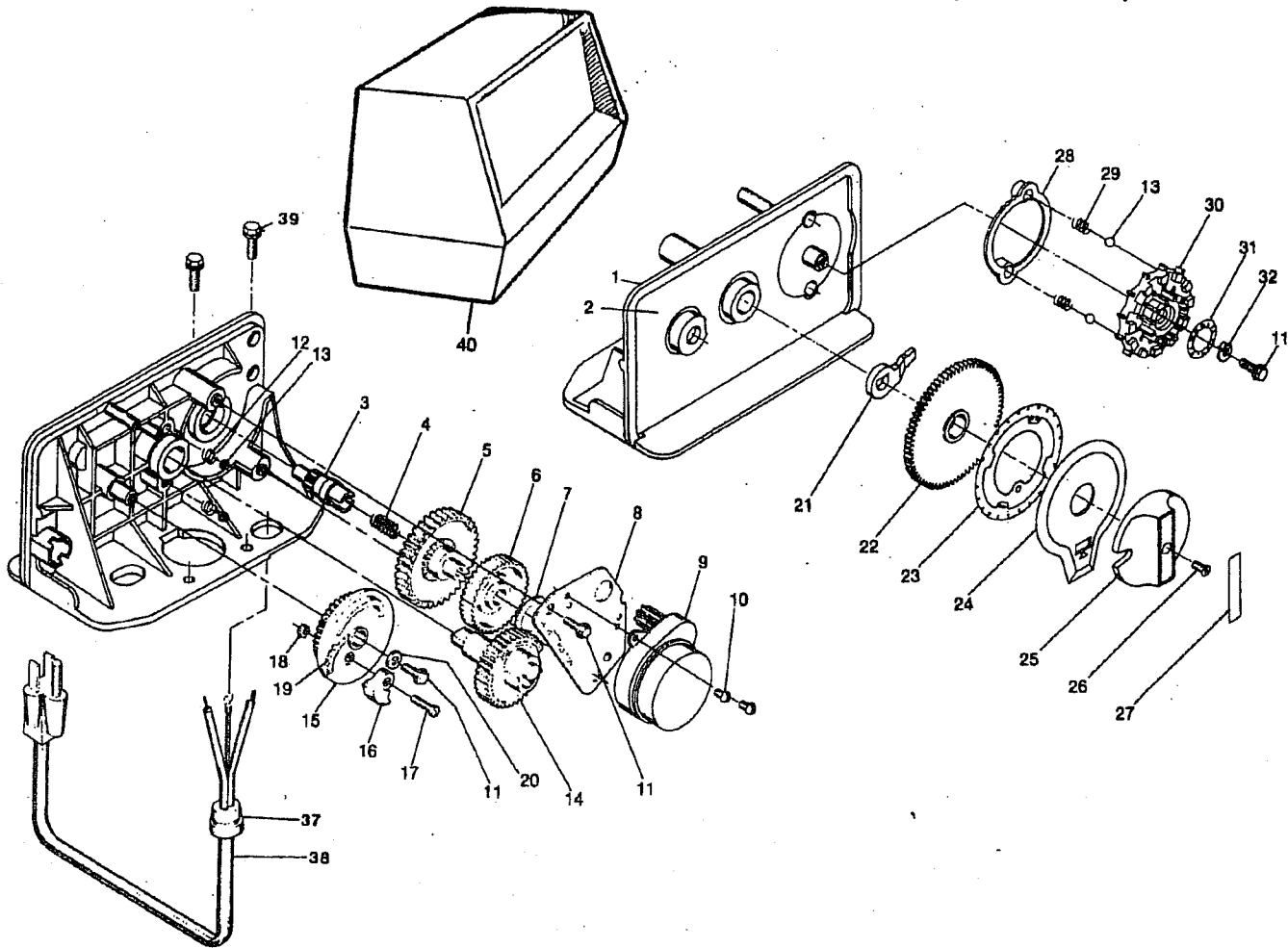
FULLY AUTOMATIC WATER SOFTENERS

| Model No. | L56-16 | L56-24 | L56-32 | L56-45 | LC56-24 |
|-------------|--------|--------|---------|---------|---------|
| Tank Size | 7 x 44 | 8 x 44 | 10 x 44 | 10 x 47 | 10 x 35 |
| Salt - Lbs. | 8 | 12 | 15 | 22 | 12 |
| Capacity | 16,000 | 24,000 | 32,000 | 45,000 | 24,000 |

"IRONSOF" FINE MESH RESIN UNITS

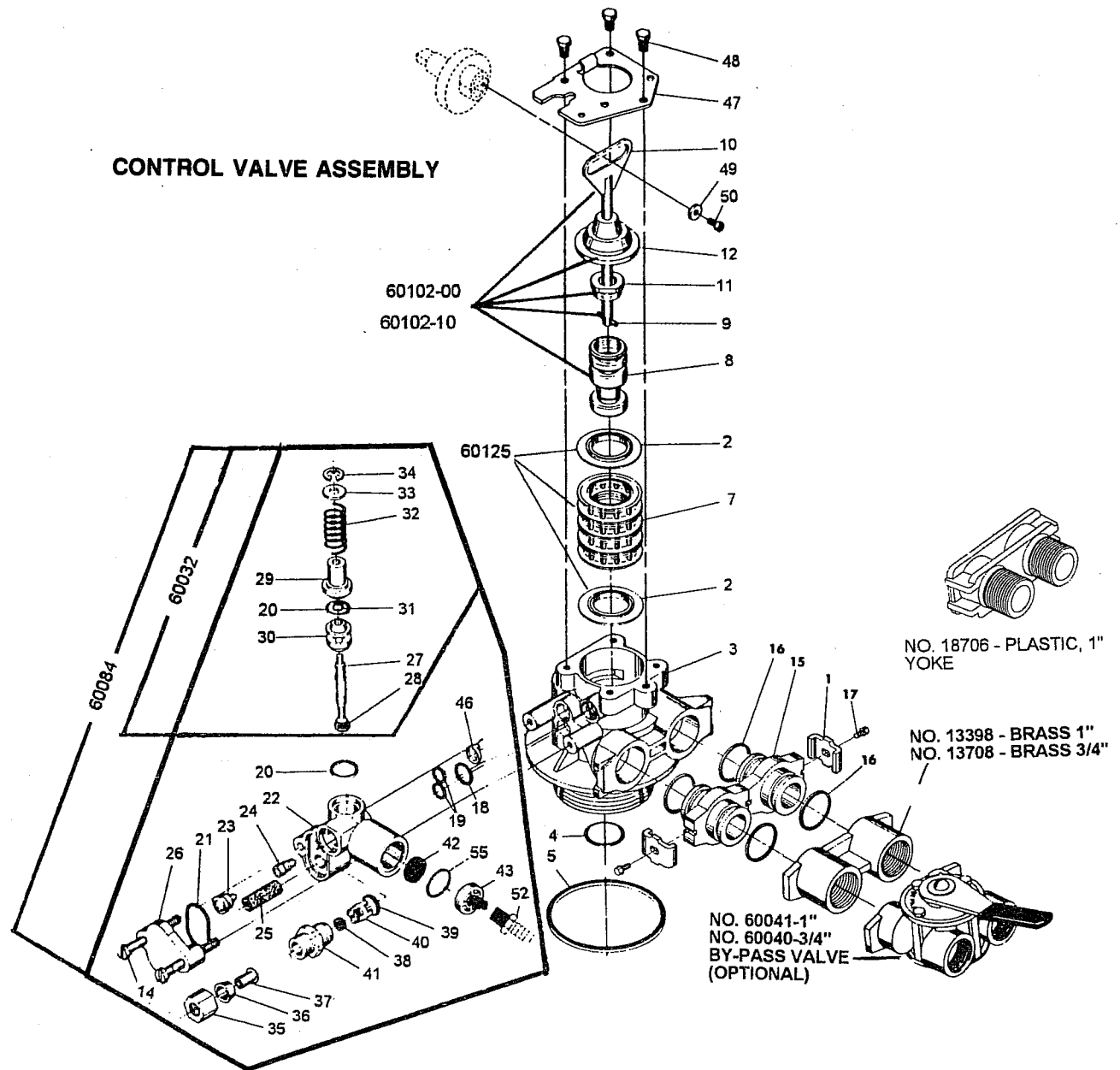
| Model No. | FES-24 | FES-32 | FES-45 | CFES-24 |
|-------------|--------|---------|---------|---------|
| Tank Size | 8 x 44 | 10 x 47 | 12 x 48 | 10 x 35 |
| Salt - Lbs. | 12 | 15 | 22 | 12 |
| Capacity | 24,000 | 32,000 | 45,000 | 24,000 |

NO. 60353-10 POWER HEAD ASSEMBLY
(LESS COVER)



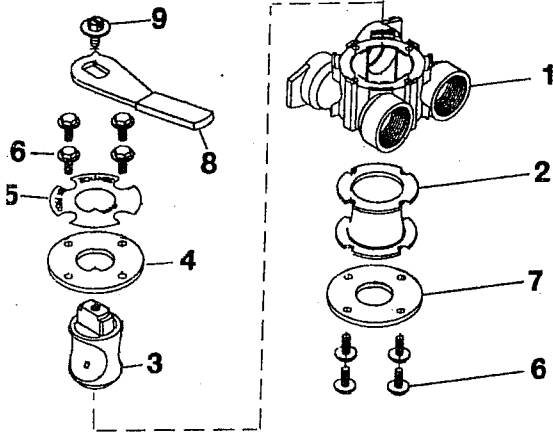
| Item No. | Qty. | Part No. | Description |
|----------|------|----------|-------------------------|
| 1 | 1 | 15494 | Drive Panel |
| 2 | 1 | 14331 | Front Label |
| 3 | 1 | 13018 | Idler Pinion |
| 4 | 1 | 13312 | Idler Spring |
| 5 | 1 | 13017 | Idler Gear |
| 6 | 1 | 13164 | Drive Gear |
| 7 | 1 | 13299 | Curved Washer |
| 8 | 1 | 13175 | Motor Mounting Plate |
| 9 | 1 | 18743 | Motor - 110 V. 1/30 RPM |
| 10 | 3 | 11384 | Screw |
| 11 | 3 | 13296 | Screw |
| 12 | 2 | 14457 | Spring |
| 13 | 2 | 13300 | Ball |
| 14 | 1 | 13170 | Main Gear & Shaft |
| 15 | 1 | 13168 | Brine Cam Assy. |
| 16 | 1 | 13169 | Time Fill Cam |
| 17 | 1 | 11980 | Screw - Time Fill Cam |
| 18 | 1 | 11081 | Nut - Time Fill Cam |

| Item No. | Qty. | Part No. | Description |
|----------|------|----------|------------------------------|
| 19 | 1 | 13489 | Label - "Lbs of Salt - 6-36" |
| 20 | 1 | 12037 | Washer |
| 21 | 1 | 13011 | Cycle Actuator Arm |
| 22 | 1 | 13009 | 24 Hour Gear Assy. |
| 23 | 1 | 13959 | 24 Hour Label |
| 24 | 1 | 14176 | Valve Position Dial |
| 25 | 1 | 14177 | Knob |
| 26 | 1 | 15151 | Screw - Knob |
| 27 | 1 | 14207 | Knob Label |
| 28 | 1 | 13864 | Skipper Wheel Ring |
| 29 | 2 | 13311 | Spring |
| 30 | 1 | 14381 | Skipper Wheel Assy. |
| 31 | 1 | 13429 | Skipper Wheel Label |
| 32 | 1 | 13014 | Regeneration Pointer |
| 37 | 1 | 13547 | Strain Relief |
| 38 | 1 | 11842 | Electrical Cord |
| 39 | 2 | 12473 | Screw-Drive Mounting |
| 40 | 1 | 60226 | Black Cover |



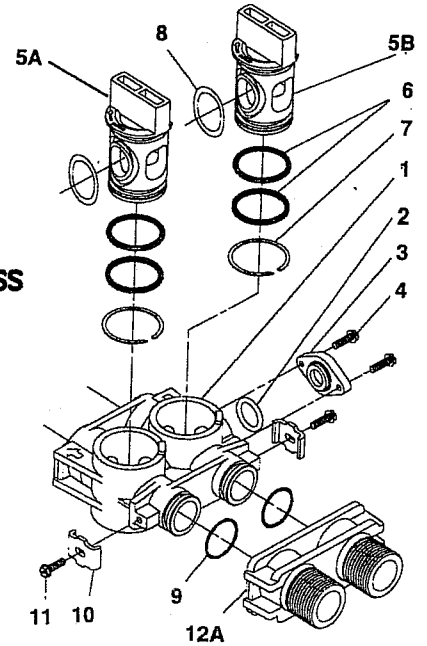
| Item No. | Qty. | Part No. | Description | Item No. | Qty. | Part No. | Description | Item No. | Qty. | Part No. | Description |
|----------|------|----------|-----------------------|----------|------|----------|--------------------|----------|-------|-----------------------------|-----------------------|
| 1 | 2 | 13255 | Adapter Clips | 20 | 2 | 13302 | O-Ring | 39 | 1 | 12977 | O-Ring |
| 2 | 5 | 13242 | Seals | 21 | 1 | 13303 | O-Ring | 40 | 1 | 13245 | Retainer |
| 3 | 1 | 61400-12 | Valve Body Assy. - 1" | 22 | 1 | 13163 | Injector Body | 41 | 1 | 13244 | B.L.F.C. Fitting |
| 4 | 1 | 13304 | O-Ring | 23 | 1 | 10913 | Injector Nozzle | 42 | 1 | 12085 | 1.2 GPM Button - CFES |
| 5 | 1 | 12281 | O-Ring | 24 | 1 | 10914 | Injector Throat | 1 | 12086 | 1.5 GPM Button - L56-16-24 | |
| 7 | 4 | 14241 | Spacer | 25 | 1 | 10227 | Injector Screen | 1 | 12089 | 2.4 GPM Button - L56-32, 45 | |
| 8 | 1 | 13247 | Piston - L56 | 26 | 1 | 13166 | Injector Cover | 43 | 1 | 13173 | Retainer |
| 1 | 1 | 13852 | Piston - FES | 27 | 1 | 13172 | Brine Valve Stem | 46 | 1 | 13497 | Air Dispenser |
| 9 | 1 | 10696 | Piston Pin | 28 | 1 | 12626 | Brine Valve Seat | 47 | 1 | 13546 | End Plug Retainer |
| 10 | 1 | 13001 | Piston Rod Assy. | 29 | 1 | 13165 | Brine Valve Cap | 48 | 3 | 12112 | Screws |
| 11 | 1 | 12953 | Piston Retainer | 30 | 1 | 13167 | Brine Valve Spacer | 49 | 1 | 13363 | Washer |
| 12 | 1 | 13446 | End Plug Assy. - L56 | 31 | 1 | 12550 | Quad Ring | 50 | 1 | 13296 | Screw |
| 1 | 1 | 13446-10 | End Plug Assy. - FES | 32 | 1 | 11973 | Spring | 52 | 1 | 13308 | Drain Line Fitting |
| 14 | 2 | 13315 | Screw | 33 | 1 | 16098 | Washer | 55 | 1 | 15348 | O-Ring |
| 15 | 2 | 19228 | Adapter Coupling | 34 | 1 | 11981 | Retaining Ring | | | 60032 | Brine Valve Assy. |
| 16 | 4 | 13305 | O-Ring | 35 | 1 | 10329 | Fitting Nut | | | 60084 | Injector/Drain Assy. |
| 17 | 4 | 13314 | Screw | 36 | 1 | 10330 | Ferrule | | | 60102-00 | Piston Assy. - L56 |
| 18 | 1 | 12638 | O-Ring | 37 | 1 | 10332 | Tube Insert | | | 60102-10 | Piston Assy. - FES |
| 19 | 2 | 13301 | O-Ring | 38 | 1 | 12095 | Button - .50 GPM | | | 60125 | Seal Kit |

NO. 60041 BY-PASS VALVE ASSEMBLY 1"
NO. 60040 BY-PASS VALVE ASSEMBLY 3/4"

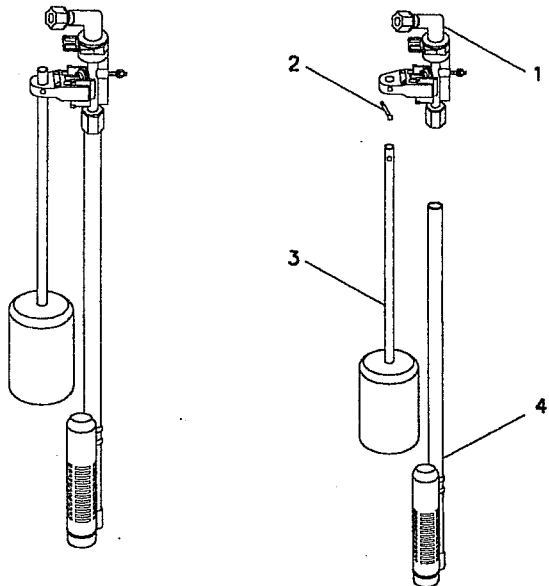


| Item No. | Quantity | Part No. | Description |
|----------|----------|----------|------------------------------|
| 1 | 1 | 13399 | Valve Body 1" NPT |
| | 1 | 17290 | Valve Body 3/4" NPT |
| 2 | 1 | 11726 | By Pass Seal |
| 3 | 1 | 11972 | By Pass Plug |
| 4 | 1 | 11978 | Side Cover |
| 5 | 1 | 13604 | Valve Label |
| 6 | 8 | 15727 | 10-24 x 1/2" Machine Screw |
| 7 | 1 | 11986 | Side Cover |
| 8 | 1 | 11979 | Valve Lever |
| 9 | 1 | 11989 | 1/4"-14 x 1/2" Machine Screw |

NO.60049 PLASTIC BY-PASS



| Item No. | Quantity | Part No. | Description |
|----------|----------|----------|-------------------------------|
| 1 | 1 | 19723 | By-pass Valve Body, Plastic |
| 2 | 1 | 11183 | O-Ring |
| 3 | 1 | 19724 | Cap, Bypass |
| 4 | 2 | 17512 | #6-24x3 Screw |
| 5a | 1 | 17820 | Plug, By-pass, Inlet (White) |
| 5b | 1 | 17820-01 | Plug, By-pass, Outlet (White) |
| 6 | 4 | 18661 | O-Ring |
| 7 | 2 | 18662 | Retaining Ring |
| 8 | 2 | 18660 | O-Ring |
| 9 | 2 | 13305 | O-Ring |
| 10 | 2 | 13255 | Mounting Clip |
| 11 | 2 | 13314 | #8-18x5/8 Screw |
| 12a | 1 | 18706 | Yoke, Plastic, 1" NPT |
| | 1 | 18706-02 | Yoke, Plastic, 3/4" NPT |



NO. 4740 BRINE VALVE

4740 Brine Valve Assembly

| Item No. | Quantity | Part No. | Description |
|----------|----------|-------------|-------------------------|
| 1 | 1 | H4600 | 3/8" Safety Brine Valve |
| 2 | 1 | 10151 | Pin |
| 3 | 1 | H4640-32 | Float Assembly |
| 4 | 1 | H4500-30.50 | Air Check Assembly |

SERVICE INSTRUCTIONS

TO REPLACE BRINE VALVE, INJECTORS, AND SCREEN: Unplug electrical cord from outlet. Turn off water supply to softener. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Disconnect brine tube and drain line connections at the injector body. Remove the two injector body mounting screws. The injector and brine module can now be removed from the control valve. Remove and discard valve body O-Rings.

TO REPLACE BRINE VALVE: Pull brine valve from injector body, also remove & discard O-Ring at bottom of brine valve hole. Apply silicone lubricant to new O-Ring and reinstall at bottom of brine valve hole. Apply silicone lubricant to O-Ring on new valve assembly and press into brine valve hole, shoulder on bushing should be flush with injector body.

TO REPLACE INJECTORS AND SCREEN: Remove injector cap and screen, discard O-Ring. Unscrew injector nozzle and throat from injector body. Screw in new injector throat and nozzle, be sure they are seated tightly. Install a new screen. Apply silicone lubricant to new O-Ring and install around oval extension on injector cap.

Apply silicone lubricant to the three new O-Rings and install over three bosses on injector body. Insert screws with washers through injector cap and injector. Place this assembly through hole in timer housing and into mating holes in the valve body. Tighten screws. Reconnect brine tube and drain line. Return bypass or inlet valving to normal service position. Water pressure should now be applied to the softener. Check for leaks at all seal areas. Check drain seal with the control in the backwash position. Plug electrical cord into outlet. Set time of day and cycle the control valve manually to assure proper function. Make sure the control valve is returned to the service position. Make sure there is enough brine in the brine tank. Rotate program wheel counter-clockwise until it stops at regeneration position. Start regeneration cycle manually if water is hard.

TO REPLACE TIMER (POWER HEAD ASSEMBLY): Unplug electrical cord from outlet. Turn off water supply to softener. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Remove screw and washer at drive yoke. Remove timer mounting screws. The entire timer assembly will now lift off easily. Put new timer on top of valve. Be sure drive pin on main gear engages slot in drive yoke (rotate control knob if necessary). Replace timer mounting screws. Replace screw and washer at drive yoke. Return bypass or inlet valving to normal service position. Water pressure should now be applied to the softener. Plug electrical cord into outlet. Set time of day. Cycle the control valve manually to assure proper function. Make sure the control valve is returned to the service position. Make sure there is enough brine in the brine tank. Rotate program wheel counter-clockwise until it stops at regeneration position. Start regeneration cycle manually if water is hard.

TO REPLACE PISTON ASSEMBLY: Unplug electrical cord from outlet. Turn off water supply to softener. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Remove screw and washer at drive yoke. Remove timer mounting screws. The entire timer assembly will now lift off easily. Remove end plug retainer plate. Pull upward on end of piston yoke until assembly is out of valve. Inspect the inside of the valve to make sure that all spacers and seals are in place, and that there is no foreign matter that would interfere with the valve operation. Take new piston assembly as furnished and push piston into valve by means of the end plug. Twist yoke carefully in a clockwise direction to properly align it with drive gear. Replace end plug retainer plate. Place timer on top of valve. Be sure drive pin on main gear engages slot in drive yoke (rotate control knob if necessary). Replace timer mounting screws. Replace screw and washer at drive yoke. Return bypass or inlet valving to normal service position. Water pressure should now be applied to the softener. Plug electrical cord into outlet. Set time of day. Cycle the control valve manually to assure proper function. Make sure the control valve is returned to the service position. Make sure there is enough brine in the brine tank. Rotate program wheel counter-clockwise until it stops at regeneration position. Start regeneration cycle manually if water is hard.

TO REPLACE SEALS AND SPACERS: Unplug electrical cord from outlet. Turn off water supply to conditioner. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Remove screw and washer at drive yoke. Remove timer mounting screws. The entire timer assembly will now lift off easily. Remove end plug retainer plate. Pull upward on end of piston rod yoke until assembly is out of valve. Remove and replace seals and spacers with fingers.

TROUBLESHOOTING PROCEDURES

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|-------------------------------------|---|---|
| 1. Softener fails to regenerate. | <ul style="list-style-type: none"> a. Electrical service to unit has been interrupted. b. Timer is defective. c. Power failure. | <ul style="list-style-type: none"> a. Assure permanent electrical service. b. Replace timer. c. Reset time of day. |
| 2. Softener delivers hard water. | <ul style="list-style-type: none"> a. By-pass valve is open. b. No salt in brine tank. c. Injectors or screen plugged. d. Insufficient water flowing into brine tank. e. Hot water tank hardness. f. Leak at distributor tube. g. Internal valve leak. h. Reserve Capacity has been exceeded. | <ul style="list-style-type: none"> a. Close by-pass valve. b. Maintain salt level above water level. c. Clean or replace injectors and screen. d. Check fill time and clean brine line plug if clogged. e. Empty hot water tank. f. Make sure distributor tube is not cracked. Check O-Ring and tube pilot. g. Replace seals and spacer and/or piston. h. Check Salt dosage requirements and reset program wheel to provide additional reserve. |
| 3. Unit uses too much salt. | <ul style="list-style-type: none"> a. Improper salt setting. b. Excessive water in brine tank. | <ul style="list-style-type: none"> a. Check salt usage and salt setting. b. See problem no. 7. |
| 4. Loss of water pressure. | <ul style="list-style-type: none"> a. Iron buildup in line to water conditioner. b. Iron buildup in water conditioner. c. Inlet of control plugged by foreign material. | <ul style="list-style-type: none"> a. Clean line to water conditioner. b. Clean control, increase frequency of regeneration and use a resin cleaner. c. Remove piston and clean control. |
| 5. Loss of resin out of drain line. | <ul style="list-style-type: none"> a. Air in water system. | <ul style="list-style-type: none"> a. Assure that well system has proper air eliminator control. Check for dry well condition. |
| 6. Iron in conditioned water. | <ul style="list-style-type: none"> a. Fouled resin bed. | <ul style="list-style-type: none"> a. Check backwash, brine draw and brine tank fill. Increase frequency of regeneration and use a resin cleaner. |
| 7. Excessive water in brine tank. | <ul style="list-style-type: none"> a. Plugged drain line flow control. b. Plugged injector system. c. Timer not cycling. d. Foreign material in brine valve. e. Foreign material in brine line flow control. | <ul style="list-style-type: none"> a. Clean flow control. b. Clean injector and replace screen. c. Replace timer. d. Clean or replace brine valve. e. Clean brine line flow control. |
| 8. Softener fails to draw brine. | <ul style="list-style-type: none"> a. Drain line flow control is plugged. b. Injector is plugged. c. Injector screen plugged. d. Line pressure is too low. e. Internal control leak. | <ul style="list-style-type: none"> a. Clean drain line flow control. b. Clean or replace injectors. c. Replace screen. d. Increase line pressure to at least 20 psi. e. Change seals and spacers and/or piston assy. |
| 9. Control cycles continuously. | <ul style="list-style-type: none"> a. Faulty timer mechanism | <ul style="list-style-type: none"> a. Replace timer. |
| 10. Drain flows continuously. | <ul style="list-style-type: none"> a. Foreign material in control. b. Internal control leak. c. Control valve jammed in brine or backwash position. d. Timer motor stopped or jammed. | <ul style="list-style-type: none"> a. Advance control through various regeneration positions. Remove foreign material in control. b. Replace seals and/or piston assy. c. Replace piston, seals and spacers. d. Replace timer. |

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