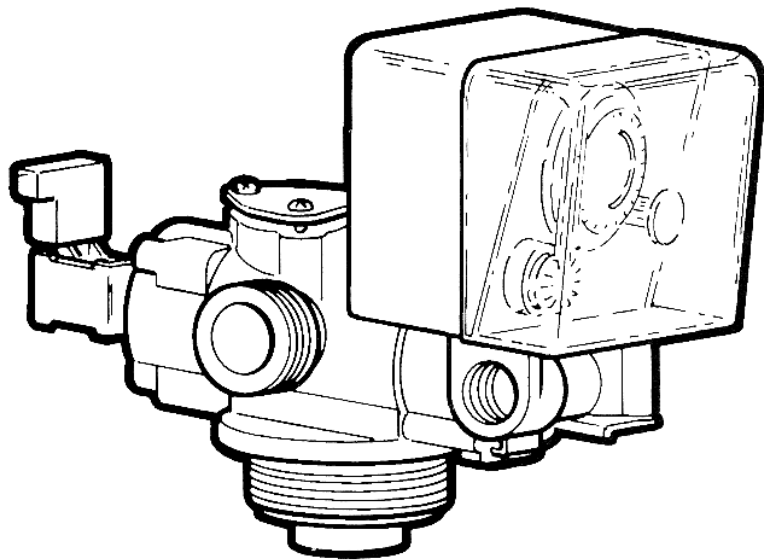
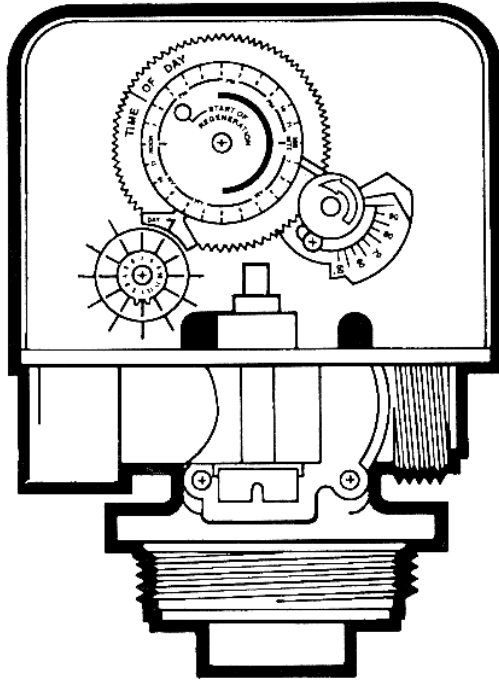




WATER CONDITIONING
CONTROLS

541-008 VALVE



SERVICE MANUAL

Assembly:

1. Cut the top of the distributor tube 1/2 inch below the top of the resin tank threads.
2. Chamfer the top of the tube to prepare it for insertion into the control valve.
3. Verify that the control is equipped with the proper voltage, tank o-ring and injector.
4. Install the control valve onto the distributor tube.
5. Grip the control valve body and turn control into the resin tank.

Installation:

General Information

1. When facing the front of the control the inlet is to the right and the outlet is to the left.
2. The system pressure must be between 20 psi and 120 psi.
3. If the system pressure is greater than 120 psi a pressure reducing valve must be installed.
4. The unit must be installed in accordance with local codes.
5. Do not over tighten connections.

Drain Line Connection

1. The drain line I.D. must be at least 1/2 inch.
2. Teflon tape should be used when installing the drain fitting into the control valve.
3. The drain line must be free of kinks.

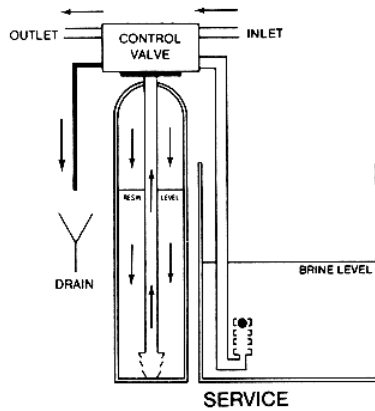
Fitting Kit Connection

1. DO NOT use Teflon tape when connecting the fitting kits to the control valve.
2. If the fitting kit provides a sweat connection, care must be taken to prevent the Noryl nut from melting. Place a wet rag over the copper tube and the Noryl nut prior to heating the tube.
- 3.

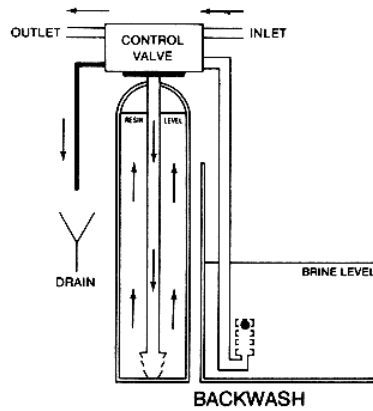
Start Up:

1. Insure that the bypass is secured in the "bypass" position.
2. Verify that the control valve is in the service position.
3. Open all plumbing connections to allow the free flow of water to the unit.
4. Slowly shift the bypass valve to the service position.
5. Allow the water to completely fill the resin tank.
6. Open a tap and allow the water to run until all of the air is removed from the system.
7. Once all of the air is removed, close the tap.
8. Manually advance the control valve to the Backwash position and allow water to flow to drain.
9. Manually return the control valve back to the service position.

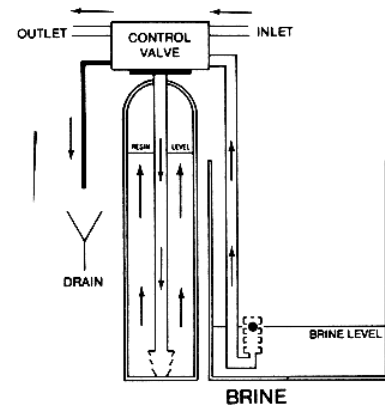
Cycle Flow Diagrams



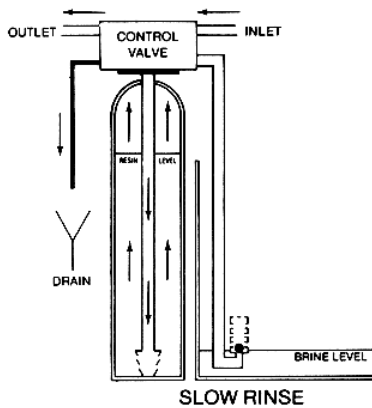
The service cycle position directs untreated water to flow down through the resin bed in the mineral tank and up through the riser tube. The water is conditioned when passing through the resin..



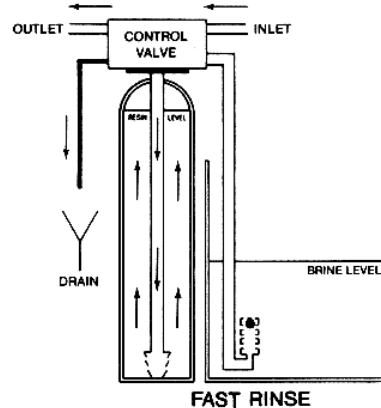
The backwash cycle position directs water to flow down through the riser tube and up through the resin bed and to drain. Foreign material and resin fines are flushed from the mineral tank during this cycle to prepare the resin bed for brining.



In brine draw, concentrated salt brine is drawn from the brine tank and directed to flow down through the riser tube and up through the resin bed to the drain. Brine is drawn until the air check in the brine tank closes.

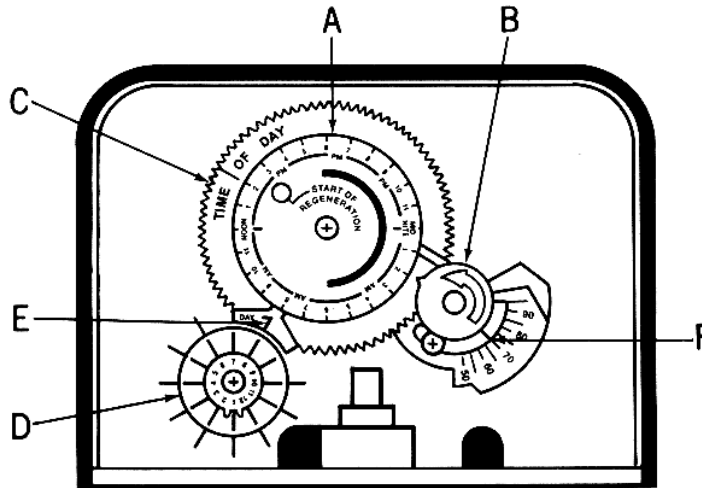


The slow rinse cycle position directs a slow flow of water down through the riser tube and up through the resin bed to drain. This slow flow of water pushes the brine solution through the resin bed



The fast rinse cycle position directs water to flow down through the riser tube and up through the media bed and to drain. Foreign material is flushed from the mineral tank during this cycle.

NOTE: THIS CONTROL VALVE FUNCTIONS WITH A PRESSURIZED BRINE LINE. THE USE OF A SAFETY FLOAT IN CONJUNCTION WITH THE AIR CHECK IS REQUIRED.



Programming

General Information

The control valve is designed to initiate regeneration according to pre-set factory parameters. Following the instructions contained in this section will allow the installer to customize the program for the users exact needs.

The regeneration cycle time is controlled by the time cam located on the front of the timer assembly. The brine & slow rinse cycle can be adjusted from 50 minutes to 95 minutes in 5 minute increments. The backwash and fast rinse cycles are not adjustable.

Factory Default Settings

The following factory default cycle settings are preset into the control valve.

Cycles:

Backwash	11 1/2 minutes
Brine / Slow Rinse	70 Minutes
Fast Rinse	4 1/2 minutes

Set Time of Regeneration

1. Remove the front dust cover from the timer assembly.
2. Rotate the Time of Regeneration plate (A) until the desired time appears in the window. Note A.M. or P.M.

Set Time of Day

1. Remove the front dust cover from the timer assembly.
2. Turn the Timer Knob (B) until the alignment mark located on the Time Of Day Gear (C) points directly to the correct time of day. Note A.M. or P.M.

Set Regeneration Frequency

1. Remove the front dust cover from the timer assembly.
2. Pull all skipper wheel tabs up.
3. Rotate skipper wheel (D) until the number one tab aligns with the DAY mark (E).
4. Starting with the number one tab, push down the tabs to determine the days on which regeneration is required.

Regeneration Cycles

The backwash and fast rinse cycles are non-adjustable. Adjusting the brine & slow rinse cycle can be accessed according to the following procedure. :

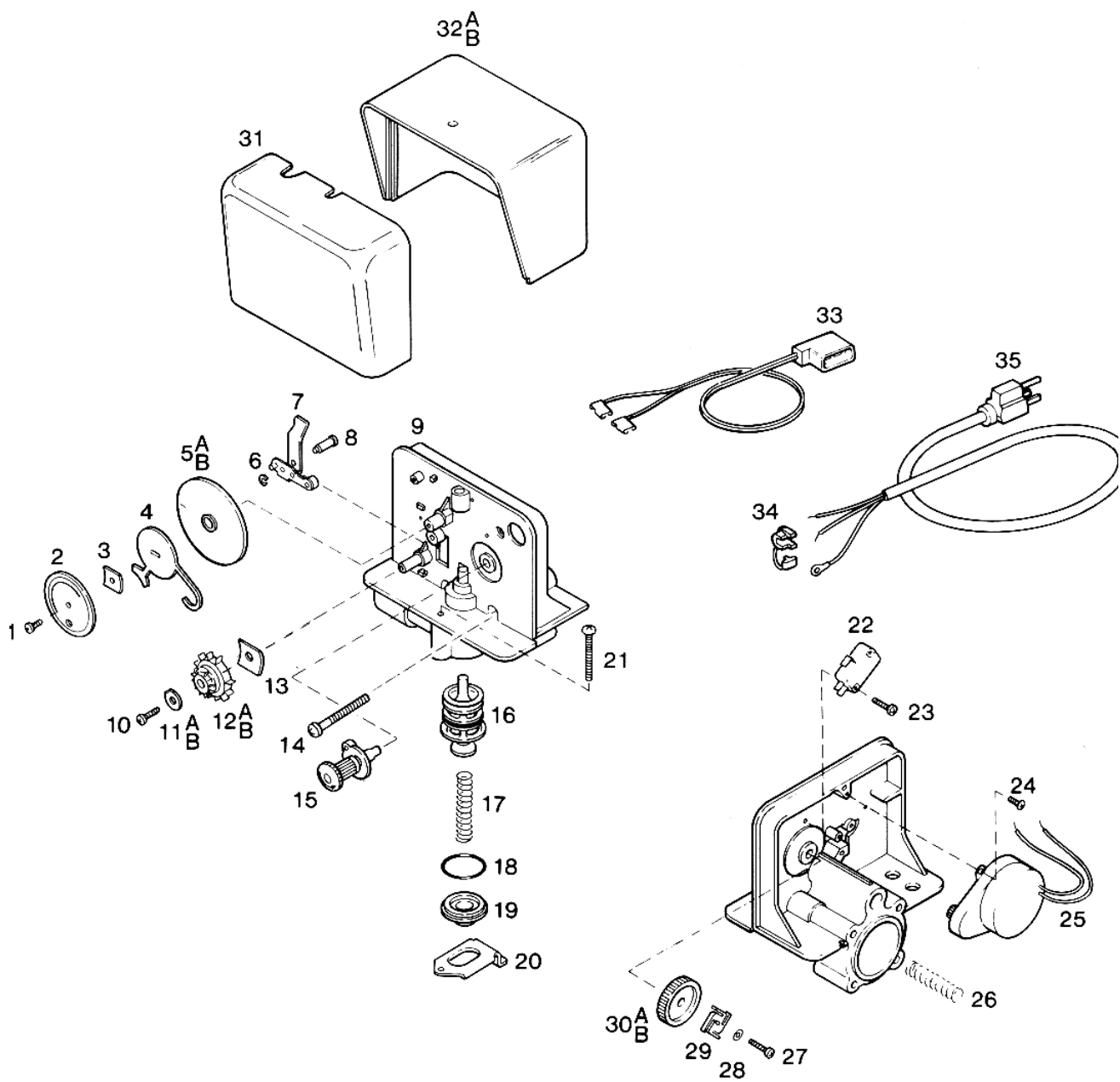
1. Loosen the screw located on top of the timer cover, remove front dust cover from timer assembly.
2. Turn timer knob (B) until set screw on the time cam is visible.
3. Loosen set screw, and using the alignment mark (F) located on the lower cam, move timing cam to the desired length of time.
4. Tighten set screw and install dust cover.

ELECTROMECHANICAL POWER HEAD PARTS LIST

<u>ITEM</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1.	15-76	Screw	1
2.	529-309	Time Dial	1
3.	525-303	Spring Washer, (Small)	1
4.	52-308	Locating Dial	1
5A.	529-232-1	Gear, Time of Day (12 Day)	1
5B.	529-232-2	Gear, Time of Day (7 Day)	1
6.	19-3	C-clip	1
7.	529-218	Actuator	1
8.	529-212	Spindle, Actuator	1
9.	529-333-1	Housing, Power Head	1
10.	15-185-10	Screw, Day Selector Wheel	1
11A.	525-274-1	Washer, Day Indicator (12 Day)	1
11B.	525-274-2	Washer, Day Indicator (7 Day)	1
12A.	525-241-2	Day Selector Wheel (12 Day)	1
12B.	525-241-4	Day Selector Wheel (7 Day)	1
13.	525-205	Spring Washer, (Large)	1
14.	15-87	Screw, Head Mount	4
15.	529-239-1	Cycle Cam & Knob Assembly	1
16.	529-219-3	Drain Plunger Assembly	1
17.	401-7	Return Spring, Drain Plunger	1
18.	185-0221-1	O-ring, Plunger Cap	1
19.	529-286	Plunger Cap	1
20.	529-280	Retainer, Drain Plunger	1
21.	15-92-2	Screw, Retainer	1
22.	525-279-4	Switch & Terminal Assembly	1
23.	15-185-10	Screw, Switch	2
24.	15-76	Screw, Timer Motor	2
25.	30-77-_*	Timer Motor	1
26.	516-221	Return Spring, Main Diaphragm	1
27.	15-185-10	Screw, Ratchet	1
28.	14-11	Washer, Ratchet	1
29.	525-260	Ratchet	1
30A.	525-254-2	Gear, Ratchet (12 Day)	1
30B.	525-254-5	Gear, Ratchet (7 Day)	1
31.	529-234-_*	Front Cover	1
32A.	529-220-1	Rear Cover (Gray)	1
32B.	529-220-2	Rear Cover (White)	1
33.	529-290-14BK	Solenoid Cord	1
34.	28-8-28	Strain Relief	1
35.	28-142-2	Power Cord (120 Volt)	1

* Indicate Voltage

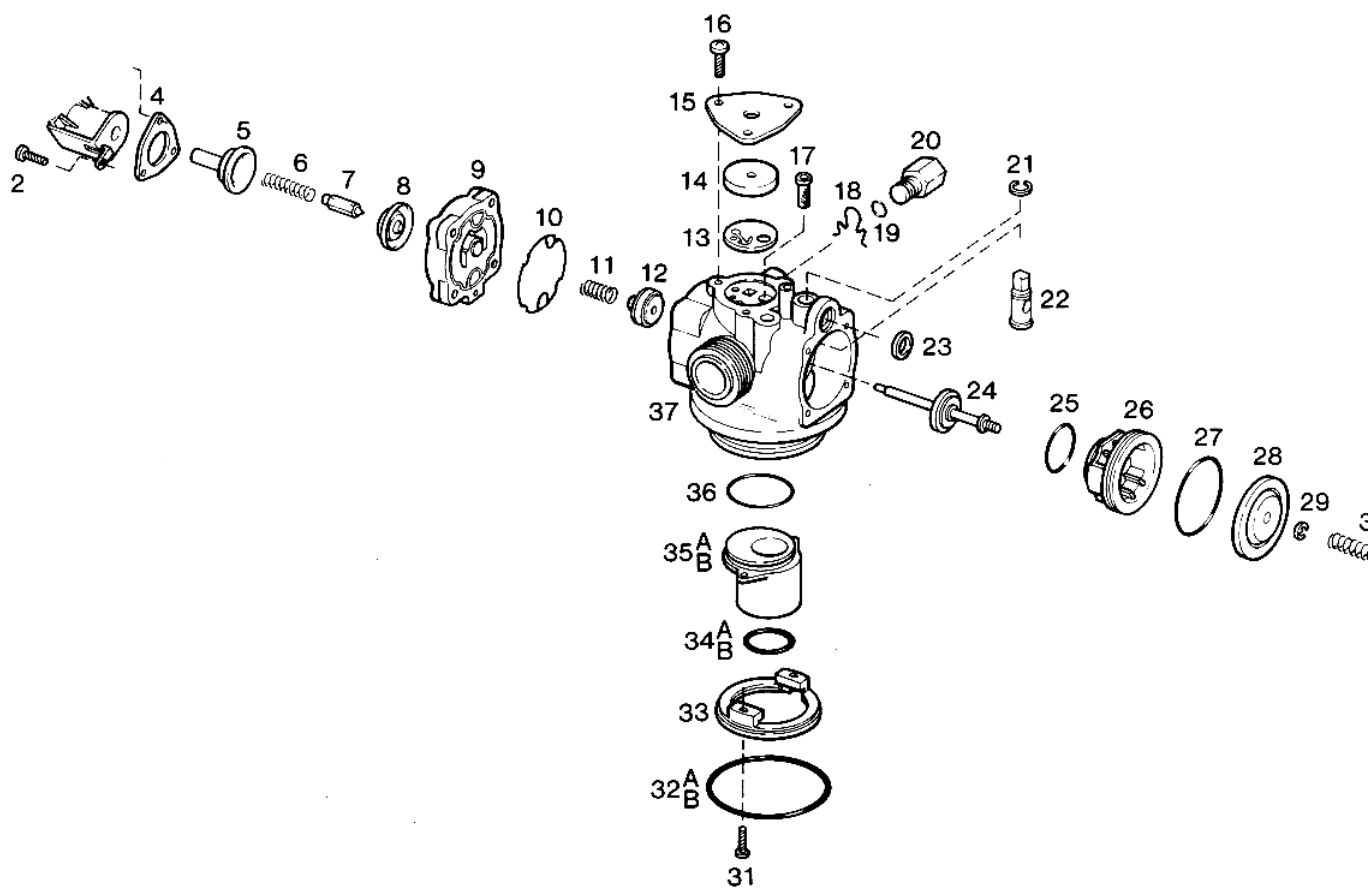
** Indicate Opaque or Clear



VALVE BODY PARTS LIST

<u>ITEM</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1.	15-88	Screw, Backcap	4
2.	15-90	Screw, Solenoid Mount	3
3.	413-134-___ *	Solenoid Coil (Specify Voltage)	1
4.	413-60	Spacer	1
5.	413-58	Guide	1
6.	413-62	Spring, Plunger	1
7.	413-61	Plunger, Solenoid	1
8.	413-59	Diaphragm, Solenoid	1
9.	541-208-2	Backcap, 5 Cycle Fast Rinse	1
10.	541-206	Seal, Backcap	1
11.	541-239	Return Spring, Check Disc	1
12.	541-246	Check Disc	1
13.	541-325	Gasket, Injector	1
14.	428-__	Injector (Specify Size)	1
15.	541-221	Cover Plate, Injector	1
16.	15-89	Screw, Injector Mount	3
17.	413-13	Filter Screen, Injector	1
18.	541-254	Spring Clip	1
19.	186-111-N	O-Ring, Brine Fitting	1
20.	541-250-1	Brine Fitting	1
21.	19-19	C-Clip, Backwash Flow Adjuster	1
22.	541-243	Backwash Flow Adjuster w/o-rings	1
23.	529-244	Gasket, Cross Over Port	1
24.	541-244	Body Stem Assembly	1
25.	185-024-1	O-Ring (Small), Seat Insert	1
26.	541-204	Seat Insert	1
27.	185-028-12	O-Ring (Large), Seat Insert	1
28.	541-256	Main Diaphragm	1
29.	19-3	C-Clip, Main Diaphragm	1
30.	516-221	Return Spring, Main Diaphragm	1
31.	19-90	Screw, Adapter Ring	2
32A.	185-231-1	O-Ring, Structural Tank	1
32B.	186-105	O-Ring, Park Tank	1
33.	541-232	Adapter Ring	1
34A.	185-211-1	O-Ring, 13/16" Riser Adapter	1
34B.	185-214-1	O-Ring, 1.050" Riser Adapter	1
35A.	541-205	13/16" Riser Adapter	1
35B.	541-218	1.050" Riser Adapter	1
36.	185-029-1	O-Ring(Outside), Riser Adapter	1
37.	541-257-1	Valve Body & Seal	1

* - Indicate Voltage



Troubleshooting Guide:

Symptom / Cause	Solution
1. Unit Fails To Regenerate	
A. Faulty electrical circuit.	A. Verify electrical service (fuse, circuit breaker, light switch, pull chain, power cord).
B. Defective clock motor.	B. Replace the clock motor. Follow the procedure outlined in the Parts Replacement section of this manual
C. Low inlet pressure.	C. Verify that the service inlet pressure is a minimum of 20 psi.
D. Drain line is restricted.	D. Insure that the drain line is free of kinks. Cycle the control to backwash and verify flow rate.
E. All skipper tabs in the "out" position.	E. Push desired number of skipper tabs to the "in" position.
F. The brine injector is plugged.	F. Clean or replace the injector.
G. Main diaphragm is torn.	G. Replace the diaphragm.
H. Timer Knob out of alignment with Time Gear.	H. Realign the Knob and Gear. Follow the procedure outlined in the Parts Replacement section of this manual.
I. Defective solenoid coil.	I. Test or replace the solenoid coil.
2. Hard Water To Service	
A. The bypass valve is open or faulty.	A. Close the bypass valve.
B. No salt in the storage tank.	B. Add salt.
C. Not enough water in the storage tank.	C. Verify that the safety float is properly set.
D. Unit fails to draw brine.	D. See Symptom/Cause #6.
E. Excessive water usage.	E. Check regeneration frequency.
F. Unit not regenerating.	F. See Symptom/Cause #1.
G. Loss of resin.	G. See Symptom/Cause #4.
H. Change in raw water hardness.	H. Test the water hardness.
I. Leak at the distributor tube.	I. Verify that the distributor tube is seated correctly and is not cracked.
3. Excessive Salt Usage	
A. Excessive water in storage tank.	A. Verify that the safety float is properly set.
B. Unit regenerating too frequently.	B. Check regeneration frequency.
C. Faulty safety float.	C. Replace the safety float.
4. Loss Of Resin	
A. Faulty air check in storage tank.	A. Clean or replace the air check.
B. Leak at the distributor tube.	B. Verify that the distributor tube is seated correctly and is not cracked.
C. Backwash flow improperly adjusted.	C. Verify the backwash flow.
5. Salt Water To Service	
A. Brine/Slow Rinse cycle time set too short.	A. Verify the cycle time.
B. Excessive water in the storage tank.	B. Verify that the safety float is adjusted correctly and operating properly.
C. Brine injector undersized.	C. Verify proper injector selection.

Symptom / Cause	Solution
6. Control Fails To Draw Brine A. Brine injector is plugged. B. Filter screen plugged. C. Loose brine line connection. D. Drain line is restricted. E. Low inlet pressure. F. Main diaphragm is torn. G. Solenoid plunger stuck open.	A. Clean or replace the injector. Follow the procedure detailed in the Parts Replacement section of this manual. B. Clean or replace screen. C. Verify that all the brine line connections are tight. D. Insure that the drain line is not kinked or plugged. E. Verify that the service inlet pressure is a minimum of 20 psi. F. Replace diaphragm. G. Clean or replace the solenoid plunger assembly. Follow the procedure detailed in the Parts Replacement section of this manual.
7. Continuous Flow To Drain A. Drain plunger stuck open. B. Clock motor stalled.	A. Clean or replace the drain plunger assembly. Follow the procedure detailed in the Parts Replacement section of this manual. B. Replace the clock motor. Follow the procedure detailed in the Parts Replacement section of this manual.
8. Loss Of Water Pressure A. Iron build up in mineral tank. B. Lower distributor basket crushed.	A. Increase the salt dosage or regenerate more frequently. B. Replace the basket and verify that the distributor is cut 1/2 inch below the top of the tank threads.

Parts Replacement:

General Information

Familiarize yourself with the parts replacement procedures and component parts thoroughly before attempting any repair.

Insure that the unit is in the bypass position and relieve the system pressure before attempting any repair procedure.

WARNING! Disconnect all electrical power to the unit before attempting any repair procedure.

Required Tools

The following tools are required to perform routine maintenance on this control valve.

Phillips Screwdriver
Needle Nose Pliers
Adjustable Wrench
Small Standard Screwdriver

Timer Assembly Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.
4. Relieve the system pressure by using a screwdriver to press down on the drain plunger opening the drain line.
5. Disconnect the solenoid cable from the solenoid coil.
6. Remove the four (4) head mounting screws.
7. Lift the timer assembly away from the valve body.
8. Follow these steps in reverse to re-install the timer assembly.

Note: Prior to re-installment insure the main return spring is located over the main diaphragm.

Timer Motor Replacement

1. Disconnect all electrical power to the control.
2. Remove both the front dust cover and rear timer cover.

3. Disconnect the two (2) wire nuts from the timer motor leads.
4. Remove the two (2) motor mount screws.
5. Lift the motor away from the timer assembly.
6. Follow these steps in reverse to re-install the timer motor.

Main Diaphragm Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.
4. Relieve the system pressure by using a screwdriver to press down on the drain plunger opening the drain line.
5. Disconnect the solenoid cable from the solenoid coil.
6. Remove the four (4) head mounting screws.
7. Lift the timer assembly away from the valve body.
8. Remove the c-clip from the center of the diaphragm.
9. Lift the diaphragm away from the body stem assembly.
10. Follow these steps in reverse to re-install the main diaphragm.

Note: Prior to re-installment insure the main return spring is centered over the main diaphragm.

Drain Plunger Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.
4. Relieve the system pressure by using a screwdriver to press down on the drain plunger opening the drain line.
5. Remove the retainer screw located below the "Time Of Day" gear.
6. Lift the retainer down and away from the timer assembly.
7. Press down on the drain plunger to remove it from the valve body.
8. Inspect the plunger o-rings and center cup for wear.
9. Clean out the plunger orifice in valve body.

10. Use a Dow 111 Silicone based lubricant to lightly lubricate the plunger o-rings and the valve body orifice.
11. Follow these steps in reverse to re-install drain plunger.

Injector and Filter Screen Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.
4. Relieve the system pressure by using a screwdriver to press down on the drain plunger opening the drain line.
5. Remove the three (3) screws from the triangular cover plate.
6. Lift away the cover plate.
7. Remove the injector from valve body and separate the gasket from the injector.
8. Inspect the injector cavities for blockage.
9. Remove the filter screen from the valve body and inspect the screen for dirt. Replace if necessary.
10. Follow these steps in reverse to re-install the injector and filter screen.

Note: Prior to re-installing the injector gasket, insure that the gasket side marked "OUT" is facing the injector.

Riser Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Relieve the system pressure.
4. Disconnect the unit from the bypass connections.
5. Remove the unit from the resin tank.
6. Turn out the upper distributor basket from the unit adapter ring.
7. Remove the two (2) adapter hold down screws, and lift away the adapter ring.
8. Separate the riser assembly from the valve body.
9. Clean the riser o-rings and wipe out the valve body cavity.
10. Use a Dow 111 Silicone based lubricant to lightly lubricate the riser o-rings and the valve body cavity.
11. Follow these steps in reverse to re-install the riser assembly.

Check Disc Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Relieve the system pressure.
4. Disconnect the solenoid cable from the solenoid coil.
5. Remove the four (4) screws from the backcap.
6. Place a hand under the backcap and remove the backcap. The check disc return spring will fall into your hand.
7. Remove the check disc from the back of the body stem assembly.
8. Inspect the rubber seal on the check disc for wear. Clean or replace if necessary.
9. Re-install the check disc on the body stem assembly.
10. Place a small amount of Dow 111 Silicone based lubricant on the back cap center post.
11. Insure that the back cap gasket is properly seated in backcap.
12. Install the check disc return spring onto the center post.
13. Align the mark on top of the back cap with the mark on the valve body and carefully direct the open end of the return spring onto the center post of the check disc.
14. Install the four (4) back cap screws.
15. Pressurize the system and check for leaks.

Body Stem Assembly Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.
4. Relieve the system pressure by using a screwdriver to press down on the drain plunger to the open drain line.
5. Disconnect the solenoid cable from the solenoid coil.
6. Remove the four (4) head mounting screws.
7. Lift the timer assembly away from the valve body.
8. Remove the c-clip from the center of the diaphragm.
9. Lift the diaphragm away from the body stem assembly.

10. Remove the seat assembly.
 11. Lift out the body stem assembly.
 12. Inspect the center check disc rubber seal for wear. Clean or replace if necessary.
 13. Re-install the body stem assembly.
 14. Lightly lubricate the seat assembly o-rings with a Dow 111 Silicone based lubricant.
 15. Re-install the seat assembly, insure that one of the two (2) flats is facing towards the top of the valve body.
 16. Re-install main diaphragm and timer assembly.
 17. It is now necessary to re-install the rear check disc. Refer to check disc Replacement procedure.
7. Remove the three (2) remaining screws which hold down the solenoid plunger retainer.
 8. Place a hand under the plunger retainer while lifting away the retainer assembly.
 9. Verify that the plunger moves back and forth against the return spring without sticking. Clean or replace if necessary.
 10. Separate the solenoid diaphragm from the valve body. Verify that the diaphragm cavity in the valve body is free of debris.
 11. Inspect the diaphragm for rips or tears. The diaphragm should have a hole in the center and a smaller "pin" hole off center.
 12. Follow these steps in reverse to re-install the solenoid assembly.

Backwash Adjustment Valve Replacement

1. Place the bypass valve into the "bypass" position.
2. Relieve the system pressure. Remove the four (4) head mounting screws.
4. Lift the timer assembly away from the valve body.
5. Remove the c-clip from the center of the diaphragm.
6. Lift the diaphragm away from the body stem assembly.
7. Remove the seat assembly.
8. Disconnect the large c-clip located on top of the backwash adjustment valve.
9. Press the backwash adjustment valve down and out through the valve body assembly.
10. Inspect the o-rings on the valve for wear. Clean or replace the valve assembly if necessary.
11. Lightly lubricate the o-rings with a Dow 111 Silicone based lubricant.
12. Follow these steps in reverse to re-install the backwash adjustment valve.

Solenoid Assembly Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Relieve the system pressure.
4. Disconnect the solenoid cable from the solenoid coil.
5. Remove the one (1) solenoid mounting screw.
6. Lift away the solenoid coil. Test coil and replace if necessary.

Units of Hardness:

1 French Degree	= 10 mg CaCO ₃ (Calcium Carbonate) per liter of water
1 German Degree	= 10 mg CaO (Calcium Oxide) per liter of water
1 Clark Degree	= 1 grain CaCO ₃ (Calcium Carbonate) per Imperial Gallon of water
1 grain/US Gallon	= 1 grain CaCO ₃ (Calcium Carbonate) per U.S. Gallon of Water
1 New US & UK unit	= 1 mg CaCO ₃ (Calcium Carbonate) per 1000 grams of water
1 Russian Degree	= 1 mg Ca (Calcium) per liter of water
1 part per million (ppm)	= 1 mg CaCO ₃ (Calcium Carbonate) per 1000 grams of water
1 grain/US Gallon	= 17.1 ppm

	French (°F)	German (°G)	Clark (°C)	Grain (GPG)	US/UK	Russian (°R)	ppm
1 French Degree	1.00	0.560	0.70	0.583	10.0	4.0	10.0
1 German Degree	1.78	1.000	1.25	1.040	17.8	7.2	17.8
1 Clark Degree	1.43	0.800	1.00	0.833	14.3	5.7	14.3
1 grain/US Gallon	1.71	0.958	1.20	1.000	17.1	6.8	17.1
1 New US & UK Unit	0.10	0.056	0.07	0.058	1.0	0.4	1.0
1 Russian Degree	0.25	0.140	0.18	0.150	2.5	1.0	2.5
1 part per million	0.10	0.056	0.07	0.058	1.0	0.4	1.0

Conversion Information:

Length:

1 mile	= 1609 m
1 yd	= 0.9144 m
1 ft	= 0.308 m
1 in	= 25.4 mm
1 mil	= 0.0254 mm

1 km	= 0.621 miles
1 m	= 1.093 yd
1 m	= 3.28 ft
1 cm	= 0.3937 in
1 mm	= 39.37 mil

Area:

1 yd ²	= 0.8361 m ²
1 ft ²	= 0.0929 m ²
1 in ²	= 6.45 cm ²

1 m ²	= 1.196 yd ²
1 m ²	= 10.764 ft ²

Temperature:

$$1 \text{ Degree Celcius} = ((^{\circ}\text{F}-32)*5)/9$$

$$1 \text{ Degree Farenheit} = ((9*^{\circ}\text{C})/5)+32$$

Volume:

1 ft ³	= 28.318 liters
1 liter	= 0.03532 ft ³
1 Gal. US	= 3.785 liters
1 liter	= 0.2642 Gal. US

Pressure:

1 psi	= 6894.76 Pa
1 psi	= 0.06895 bar
1 psi	= 51.715 mm Hg

1 Pa	= .000145 psi
1 bar	= 14.504 psi
1 mm Hg	= 0.0193 psi

Velocity:

1 US Gal/min.	= 3.785 liters/min.
1 US Gal/min.	= 227.1 liters/hr
1 US Gal/min.	= 0.227 m ³ /hr

1 m ³ /hr	= 4.403 US Gal/min.
1 liter/hr	= 0.0044 US Gal/min.

Weight:

1 lb.	= 0.4536 kg
1 kg	= 2.2046 lb.

UNIT INSTALLATION INSTRUCTIONS

- ✓ Position unit(s) in proposed installation location assuring level footings and clearances.
- ✓ Install bypass valves on units, and check that control heads are secured on tanks and brine valve connections are tight. On air injected iron filters it is advised that the internal transport screen be removed prior to installation.
- ✓ Plumb Inlet, outlet as designated on unit, and drains in accordance to local codes. Teflon thread tape or approved pipe dope should be used on drain connections. Threads on inlet and outlet unions should be left clean.

IMPORTANT: Do not solder to inlet and outlet pigtails while they are connected to control heads. Permanent damage to seal surfaces or unit nuts may result voiding your warranty.

- ✓ On typical installations, units are installed after water meters on municipal supplies and after pumps and pressure reservoirs on rural supplies. They usually proceed the domestic water

heaters. Filter units most often proceed softeners.

- ✓ Drains should discharge at or above floor level not to exceed 10 feet (3m) above the discharge connection. All drain connections should comply with local codes and proper methods for cross connection and backflow prevention.

CAUTION: Never connect drain lines directly to any waste drain without an approved air gap.

- ✓ When drains discharge below floor level a proper vacuum break should be used above the floor level
- ✓ It is recommended that the safety drain located on the side of the brine be connected with a 1/2 inch hose, to a drain a minimum of 1 foot below the connection. The line should not be allowed to rise above the connection to the tank at any point.

CAUTION: Do not connect this drain to the unit drain. Flooding may result.

START-UP PROCEDURE

- ✓ Move all bypass valves to the bypass position.
- ✓ Close all outlets in the water system to prepare for pressure test.
- ✓ Allow a small amount of water to run into system and listen for any leaks.
- ✓ Repair any leaks at this point.
- ✓ Fully pressurise system and inspect for leaks again. Effect repairs were required.
- ✓ Run water at an outlet that has no obstructions or strainer to remove any foreign matter left from the installation. Proceed with the following steps for each unit:
- ✓ Apply power to control and move to the backwash (cycle #1).
- ✓ Slowly move the bypass toward the service position until water begins to fill the unit.
- ✓ When water begins to flow from the drain line the bypass can be moved completely into the service position.
- ✓ The backwash should be allowed to run for the entire cycle time to clear the unit.

- ✓ On softeners the brine cycle should be checked for proper vacuum by placing enough water in the tank to cover the top of the brine platform in the bottom of the tank. Initiate a brine cycle and note the time it takes to draw 1 inch of water. This time should not exceed 6 minutes.
- ✓ On softeners check that water is being sent back to the brine tank for brine refill-
- ✓ When all units have been commissioned do a final leak check.

INSTALLATION

Minimum Site Requirements For Proper Operation:

- ✓ .Supply Water Pressure: 20 psi (140 KPa) min. 120 psi max.
- ✓ .Supply Water Temperature: 120 oF (48°C) max. Prevent from freezing!
- ✓ .Supply Water Flow Rate: See flow rate table
- ✓ .Electrical Supply: 120 V. A. C. (±10%) 60 Hz. 0.6 A. continuous power

Existing Plumbing:

- ✓ .Plumbing that has been exposed to source water contaminants may be responsible for down stream recontamination of the treated water.

Waste Drain:

- ✓ .An approved drain must be available for waste water disposal capable of handling the requirements on the unit.

PRE-INSTALLATION CHECK LIST

At Your Shop:

- ✓ .Open and inspect unit(s) for damage and necessary fittings.
- ✓ .Report damage to your carrier within 48 hours.
- ✓ .Report shortages to manufacturer immediately.

At The Site

- ✓ .Identify all plumbing connections, electrical outlets, and drain connections that will be involved in the installation and determine their suitability.

NOTE: Individual drain runs are considered more acceptable than teeing lines together.

- ✓ .Confirm that electrical supply is continuous and not connected to sources of electrical noise such as large inductive loads, radio transmitters etc.
- ✓ .Check the proposed flow path of water from the safety overflows on brine tanks and potassium tanks to assure that acceptable damage will occur in the event of an overflow. Relocation or re-routing may be necessary.
- ✓ .Make certain that plumbing, electrical, and drain lines are and will not interfere with the operation and access to existing structures such as switches, breaker panels, water valves, doorways, etc.
- ✓ .Allow 10-15 feet (3-5 m) of non insulated pipe between softener outlet and water heater inlet. If this is not possible installation of a check valve is recommended

.NOTE: HOT WATER MAY SEVERELY DAMAGE THIS EQUIPMENT AND VOIDS THE WARRANTY.