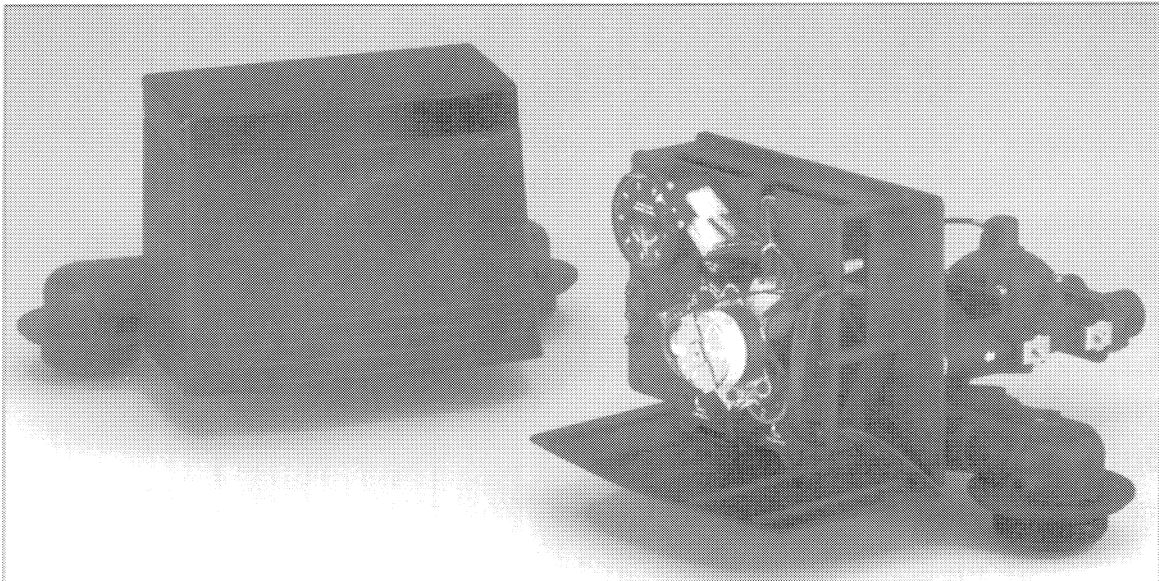


MODEL 8500 ECONOMINDER

Downflow Brining

Service Manual



IMPORTANT: Fill in pertinent information on page 2 for future reference.

MODEL 8500 ECONOMINDER

Job Specification Sheet

* JOB NO. _____

* METER MODEL NO. _____

* PIPE SIZE INLET TO SOFTENER _____

OUTLET TO FEED LINES _____

* ESTIMATED OR MEASURED FLOW RATE MIN. _____ gpm

* ESTIMATED OR MEASURED FLOW RATE MAX. _____ gpm

* 8500 CONTROL VALVE SPECIFICATIONS

1) Type of Meter

A) 3/8" meter *Std. range 50 to 850 gal. setting
*Ext. range 250 to 4,250 gal. setting

B) 3/4" meter *Std. range 125 to 2,100 gal. setting
*Ext. range 625 to 10,500 gal. setting

2) Meter Gallon Setting

3) Regeneration Program Settings (see page 5)

A) Rinse _____ min.

B) Backwash _____ min.

C) Brine & Slow Rinse _____ min.

D) Brine Tank Refill _____ min.

4) Drain Line Flow Control _____ gpm

5) Brine Refill Rate _____ gpm

6) Injector Size _____

MODEL 8500 ECONOMINDER

General Residential Installation Checklist

WATER PRESSURE: A minimum of 25 pounds of water pressure is required for regeneration valve to operate effectively.

ELECTRICAL FACILITIES: A continuous 110 volt, 60 Hertz current supply is required. Make certain the current supply is always on and cannot be turned off with another switch.

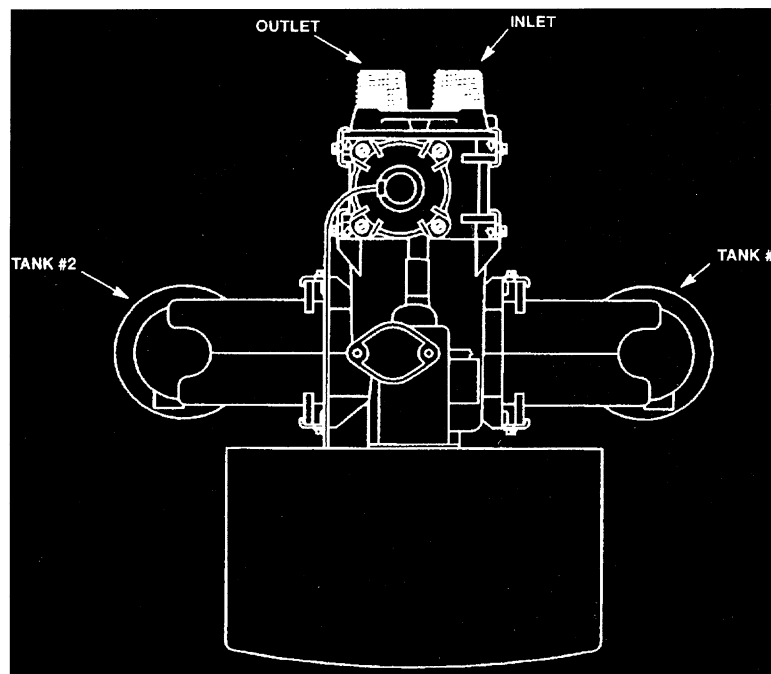
EXISTING PLUMBING: Condition of existing plumbing should be free from lime and iron buildup. Piping that is built up heavily with lime and/or iron should be replaced. If piping is clogged with iron, a separate iron filter unit should be installed ahead of the water softener.

LOCATION OF SOFTENER AND DRAIN: The softener should be located close to a drain.

BY-PASS VALVES: Always provide for the installation of a by-pass valve.

CAUTION: Water pressure is not to exceed 120 p.s.i., water temperature is not to exceed 110° F. and the unit cannot be subjected to freezing conditions.

Installation and Start-Up Procedures



1. Place the softener tanks where you want to install the unit, making sure the tanks are level and on a firm base.
2. All plumbing should be done in accordance with local plumbing codes. The pipe size for the drain line should be minimum 1/2". Overhead drains exceeding 4' above unit require 3/4" drain line.
3. Both tanks must be the same height and diameter and filled with equal amounts of media. The 1" distributor tube (1.050 O.D.) should be cut flush with top of each tank.
4. Lubricate the distributor o-ring seal and tank "o" ring seal with silicone lubricant. Place the adapters on tanks.
5. Install valve between tank adapters, noting position of number one and two tanks. Be sure adapter clips are seated firmly against valve.
6. Solder joints near the drain must be done prior to connecting the Drain Line Flow Control fitting. Leave at least 6" between the DLFC and solder joints when soldering. Failure to do this could cause damage to the drain module.
7. Teflon tape is the only sealant to be used on the drain fitting.

MODEL 8500 ECONOMINDER

General Residential Installation Checklist Continued

8. Make sure that the floor is clean beneath the salt storage tank and that it is level.
9. Place approximately 1" of water above the grid plate (if used) in your salt tank. Salt may be placed in the unit at this time.
10. On units with a by-pass, place in by-pass position. Turn on the main water supply. Open a cold soft water tap nearby and let run a few minutes or until the system is free from foreign material (usually solder) that may have resulted from the installation.
11. Place the by-pass in service position and let water flow into the mineral tanks. When water flow stops, open a cold water tap nearby and let water run until air is purged from the tank in service.
12. Electrical: All electrical connections must be connected according to codes. Plug unit into electrical outlet.
13. The control valve has indicators which tell you which position the control valve is in during regeneration and which tank is IN SERVICE. Fig. 1 indicates that tank #1 is supplying conditioned water. (Tank #2 is on standby or being regenerated).

ROTATE PINNED PROGRAM WHEEL COUNTERCLOCKWISE TO START A MANUAL CYCLE OR TO SELECT CYCLE POSITIONS.

14. Rotate program wheel to start the off-line tank rinse. Let water run until all air is purged from this tank. Rotate program wheel until the second set of pins actuate the control switch. The drive will now transfer the tanks and begin the backwash cycle on the tank that was in service. NOTE: You must wait until the control stops at the backwash position before advancing the program wheel further even though the homing circuit is locked in once the control reaches the rinse position. If advanced too fast, the control will not move to the next cycle and also will not be in sync with the program wheel. To correct an out of sync condition, rotate the program wheel to its home position and allow the control to return to the stand-by position.

With all the air backwashed out, cycle the program wheel to the brine position and brine tank refill. You must wait for the control drive motor to position itself in each cycle and stop before advancing on to the next position.

Once back in the stand-by position, repeat the above cycles. The tanks will switch again, and you will backwash the air head out of the other tank.

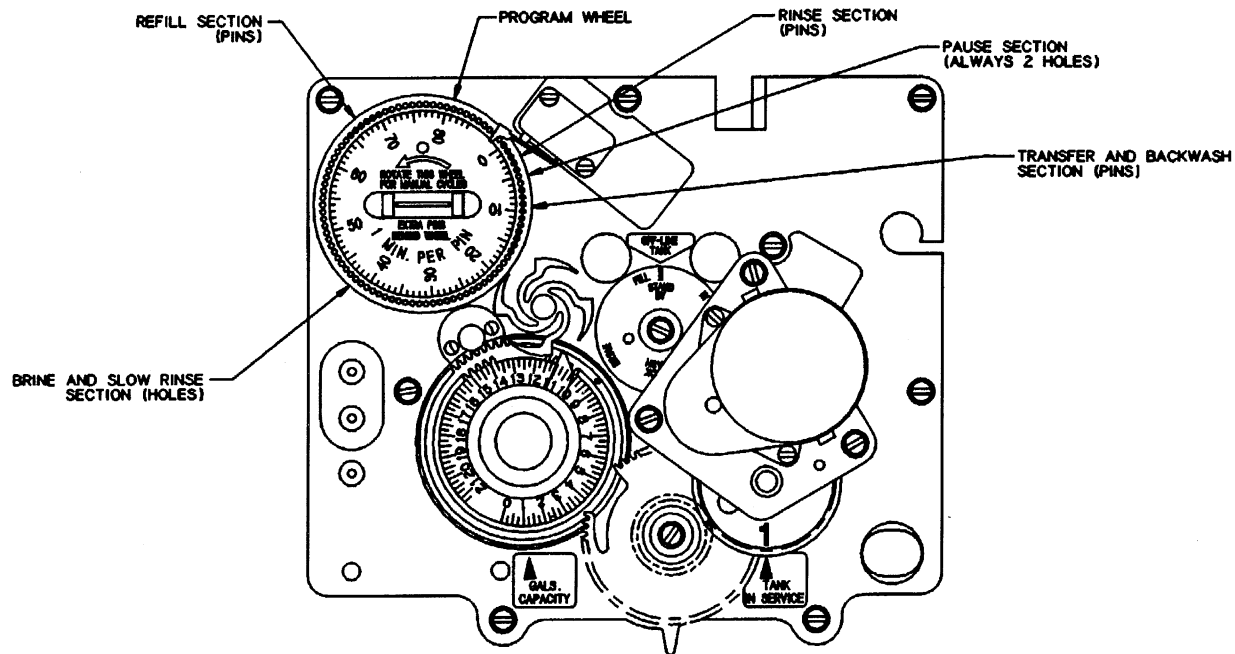


Fig. 1

MODEL 8500 ECONOMINDER

Regeneration Cycle Program Setting Procedure

HOW TO SET THE REGENERATION CYCLE PROGRAM:

The regeneration cycle program on your water conditioner has been factory preset, however, portions of the cycle or program may be lengthened or shortened in time to suit local conditions.

To change the regeneration cycle program, the program wheel must be removed. Grasp program wheel and squeeze protruding lugs towards center, lift program wheel off timer. (Switch arms may require movement to facilitate removal.)

HOW TO CHANGE THE LENGTH OF THE RINSE TIME:

The program wheel as shown in FIG. 1 is in the stand-by position. As you look at the numbered side of the program wheel, the group of pins starting at zero determines the length of time your control will rinse the off-line tank.

FOR EXAMPLE: If there are five pins in this section, the time of rinse will be 5 minutes. To change the length of rinse time, add or remove pins as required. The number of pins equals the rinse time in minutes.

PAUSE POSITION - Always 2 holes.

HOW TO CHANGE THE LENGTH OF BACKWASH TIME:

The group of pins after the pause section determines the length of time your control will backwash. The first two pins are required for the transfer cycle and the remaining pins will time the backwash cycle.

FOR EXAMPLE: If there are 10 pins in this section the time of backwash will be 8 minutes ($10-2 = 8$). To change the length of backwash time add or remove pins at the higher numbered end of the pin group.

HOW TO CHANGE THE LENGTH OF BRINE AND RINSE TIME:

The group of holes between the last pin in the backwash section and the second group of pins determines the length of time that your control will brine and rinse.

To change the length of brine and rinse time, move the refill group of pins to give more or fewer holes in the brine and rinse section. Number of holes equals brine and rinse time in minutes.

HOW TO CHANGE THE LENGTH OF BRINE TANK REFILL TIME:

The third group of pins on the program wheel determines the length of time that your control will refill the brine tank.

To change the length of refill time, add or remove pins at the higher numbered end of this group of pins.

The regeneration cycle is complete when the outer micro-switch drops off of the last pin in the brine tank refill section. The program wheel, however, will continue to rotate until the inner micro-switch drops into the notch on the program wheel. See page 6 for salt setting calculations, and page 7 for general timer settings.

MODEL 8500 ECONOMINDER

Time Brine Refill & Meter Setting Procedure

PROGRAMMING

1. Your control valve has been factory set for rinse; backwash; brine and slow rinse; and brine tank fill times. See the control valve specification sheet (pg.7). Any of these times can be changed by revising the pins and holes sequence (see pg. 5).
2. The 8500 Control has a separate brine tank fill cycle. Your desired salt setting must be calculated, using the blue (.25 gpm) or black (.5 gpm) or red (1.0 gpm) rate of refill (in gpm) times your timer setting. Then using one gallon of fresh water dissolving approximately 3 lbs. salt, calculate your refill time.

ie: A desired 9 lb. salt setting: The unit has a .5 gpm refill rate, we will need a 3 gallon fill. (9 lb. salt ÷ 3 lb./gal = 3 gal.)
The timer refill section would have to be set at 6 minutes. (3 gal. ÷ .5 gpm = 6 min.)

3. Setting the gallon wheel

Knowing the amount of resin you have in each tank and your salt setting per regeneration, calculate the gallons available, using the following capacities as a guide:

One Cubic Foot of Resin Salt Setting at Capacity per Regeneration

15 lb.	30,000 grains
10 lb.	27,000 grains
8 lb.	24,000 grains
6 lb.	20,000 grains

$$\text{Gallons available} = \frac{\text{Capacity per Regeneration.}}{\text{Compensated Hardness of H}_2\text{O}}$$

ie: 24 grain water; each tank having 1 cubic foot of resin and salted at 8 lb. of salt, yielding a usable 24,000 grain capacity: $\frac{24,000 \text{ gr. capacity}}{24 \text{ gr. water}} = 1,000$ gallons available.

4. Since the 8500 Valve regenerates with soft water from the other tank, you must subtract the water used for regeneration. Take each of your regeneration cycles and calculate the water used. (Use the injector Slow Rinse rate chart supplied, see pg. 7).

ie: Unit is set up for a 9" tank having 2.0 gpm backwash, #0 injector, .5 gpm refill, timer set up for 5 min. rinse, 8 min. backwash, 50 min. brine and rinse, 7 min. brine tank fill.

A. Rinse - 5 mins. x 2.0 gpm =	10.0 gallons
B. Backwash - 8 mins. x 2.0 gpm =	16.0 gallons
C. Brine and Rinse - 50 mins. x .39 gpm = (See injector chart slow rinse flow, pg. 7)	19.5 gallons
D. Brine Tank Fill - 7mins. x .5 gpm =	3.5 gallons
Total Regeneration Water =	48.5 gallons

If we have 1000 gallons available from Step 3, we want to subtract the regeneration water used from the total water available.

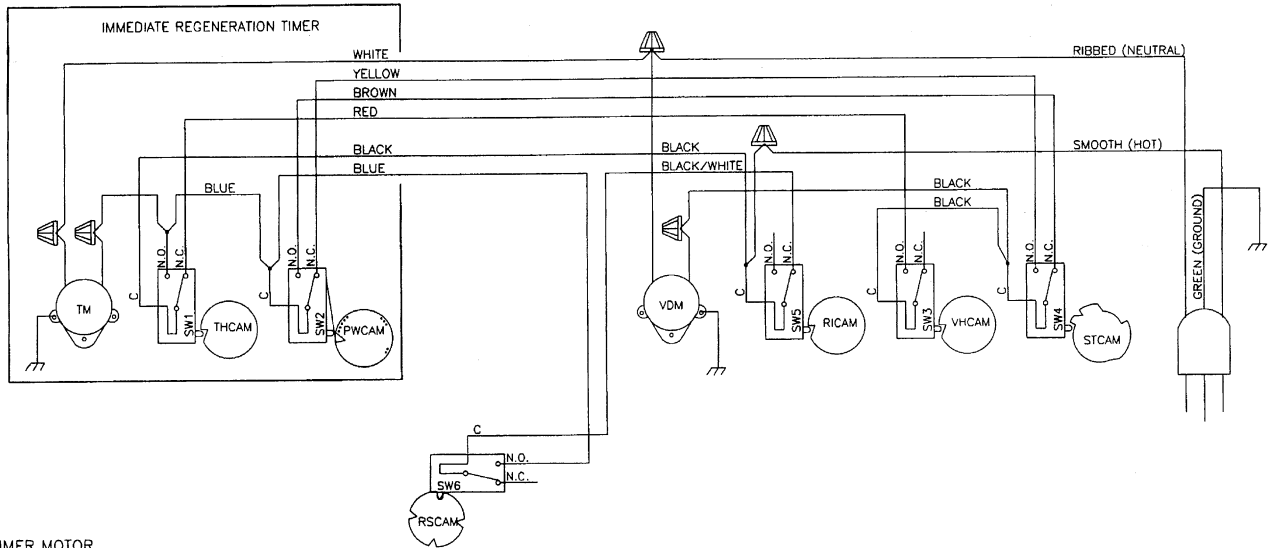
1000 gallons available - 50 gallons used = 950 gallons setting.

5. **NOW** set Meter wheel at 950 gallons. Lift the inner dial of the meter program wheel so that you can rotate it freely. Position the white dot at the 950 gallon setting (see Fig.1).
6. Check Bypass.
7. Check to be sure meter cable is properly installed.

MODEL 8500 ECONOMINDER

2 Tank Wiring & Control Information

Control Wiring Diagram



- TM – TIMER MOTOR
- VDM – VALVE DRIVE MOTOR
- SW1 – TIMER HOMING SWITCH
- SW2 – TIMER PROGRAM SWITCH
- SW3 – VALVE HOMING SWITCH
- SW4 – VALVE PROGRAM SWITCH
- SW5 – REGEN INTERLOCK SWITCH
- SW6 – REGEN SIGNAL SWITCH
- THCAM – TIMER HOMING CAM
- PWCAM – PROGRAM WHEEL CAM
- VHCAM – VALVE HOMING CAM
- STCAM – VALVE STEP CAM
- RICAM – REGEN INTERLOCK CAM
- RSCAM – REGEN SIGNAL CAM

CONTROL INFORMATION

Tank Dia.	Resin Load	Injector	Inj. Color	Draw / Slow Rinse Rate (GPM)*	BLFC**	DLFC***	Timer Settings****	Total Capacity
6"	.35 Cu Ft	#000	Brown	.1 gpm / .24 gpm	.25 gpm	.8 gpm	5-8-50-5	9,450 Grains
7"	.56 Cu Ft	#00	Violet	.2 gpm / .26 gpm	.25 gpm	1.2 gpm	5-8-50-8	15,120 Grains
8"	.8 Cu Ft	#00	Violet	.2 gpm / .26 gpm	.25 gpm	1.5 gpm	5-8-50-11	21,600 Grains
9"	1.0 Cu Ft	#0	Red	.25 gpm / .39 gpm	.5 gpm	2.0 gpm	5-8-50-7	27,000 Grains
10"	1.25	#1	White	.35 gpm / .62 gpm	.5 gpm	2.4 gpm	5-8-50-9	33,750 Grains

* All listed flows at 60 PSI and will vary at different pressures.

** B.L.F.C. (Brine Line Flow Control) Refill rate for filling the brine tank.

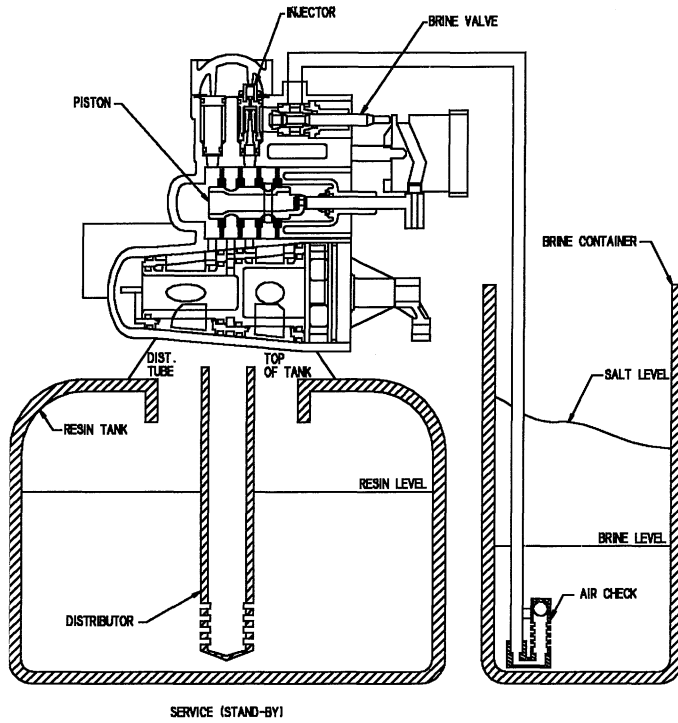
*** D.L.F.C. (Drain Line Flow Control) All flows calculated at 4.5 GPM Per SQ FT of bed area.

**** Timer settings are Pre Rinse, Backwash, Brine Draw / Slow rinse, Brine tank refill calculated at 10 lbs per cu. ft.

The above chart to only be used as a guide. Water Conditions and resin loads may vary. Always consult OEM for details.

MODEL 8500 ECONOMINDER

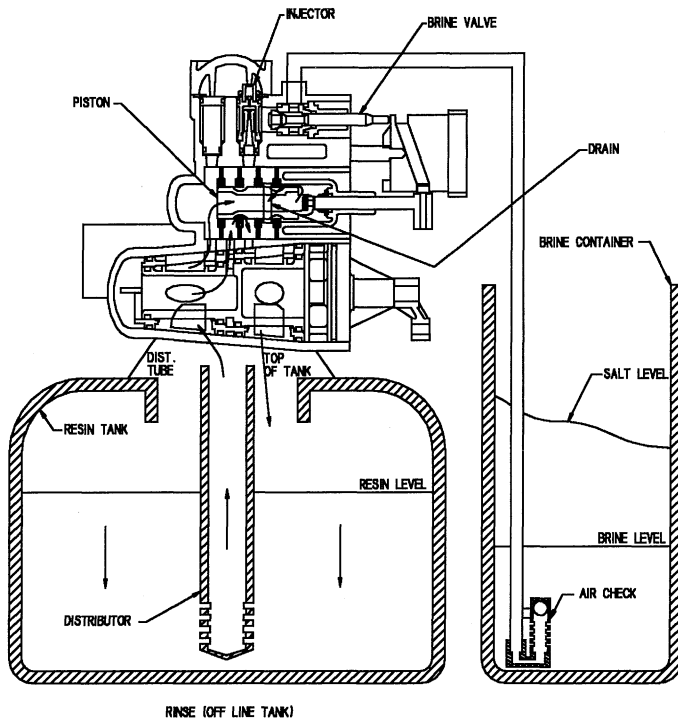
Water Conditioner Flow Diagrams (downflow brining)



SERVICE POSITION

Hard water enters the control at the valve inlet, flows thru the rotor and down thru the mineral in the service tank. Conditioned water enters the bottom distributor, flows up thru the center tube, thru the rotor, out the valve outlet and thru the meter.

The other tank is on stand-by.



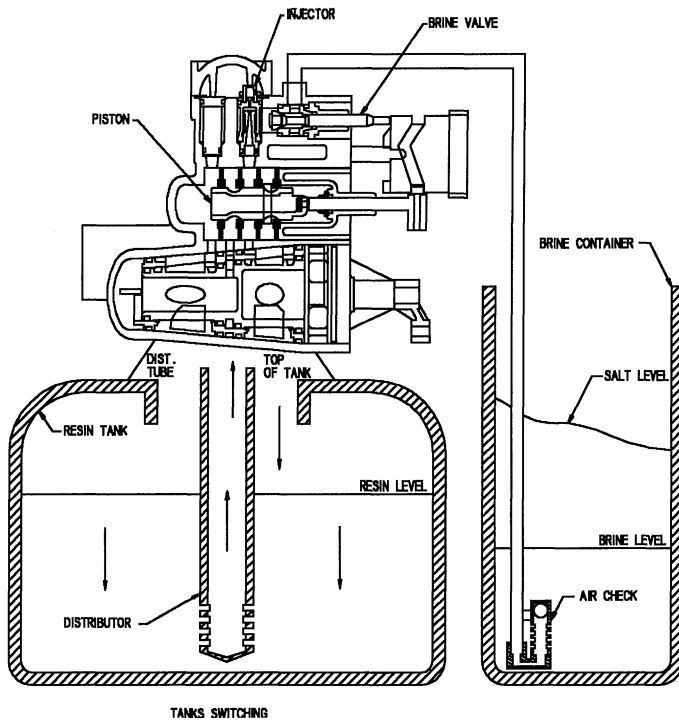
RINSE OFF-LINE TANK POSITION

(Regeneration Cycle Step #1)

Conditioned water enters the rotor, flows up to the piston, around the piston groove, around the rotor, down thru the mineral, up the center tube, around the rotor, thru the piston and out the drain.

MODEL 8500 ECONOMINDER

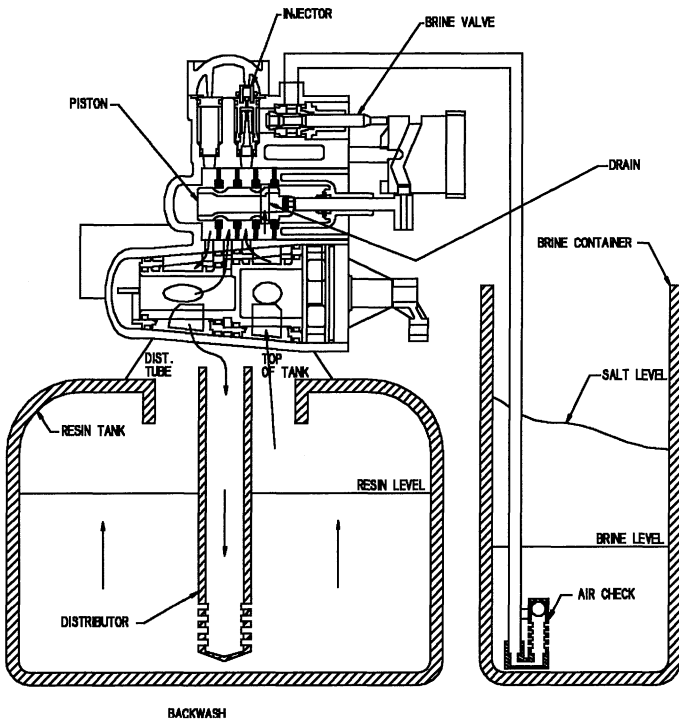
Water Conditioner Flow Diagrams (downflow brining) Continued



TANKS SWITCHING POSITION

(Regeneration Cycle Step #2)

Hard water enters the control at the valve inlet, flows thru the rotor and down thru the mineral in both tanks. Conditioned water enters the bottom distributors, flows up the center tube, thru the rotor, out the valve outlet and thru the meter.



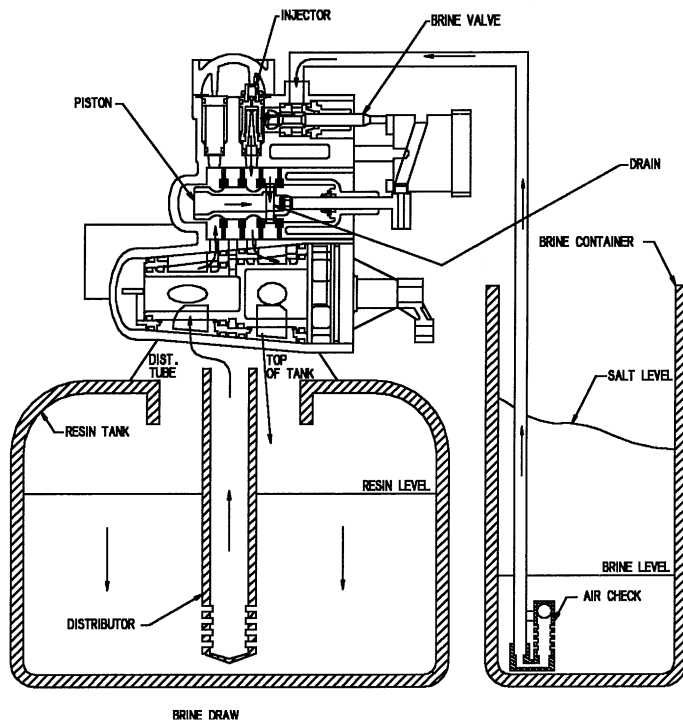
BACKWASH POSITION

(Regeneration Cycle Step #3)

Conditioned water enters the rotor, flows up to the piston, around the piston groove, around the rotor, down the center tube, up thru the mineral, around the rotor, around the piston groove and out the drain.

MODEL 8500 ECONOMINDER

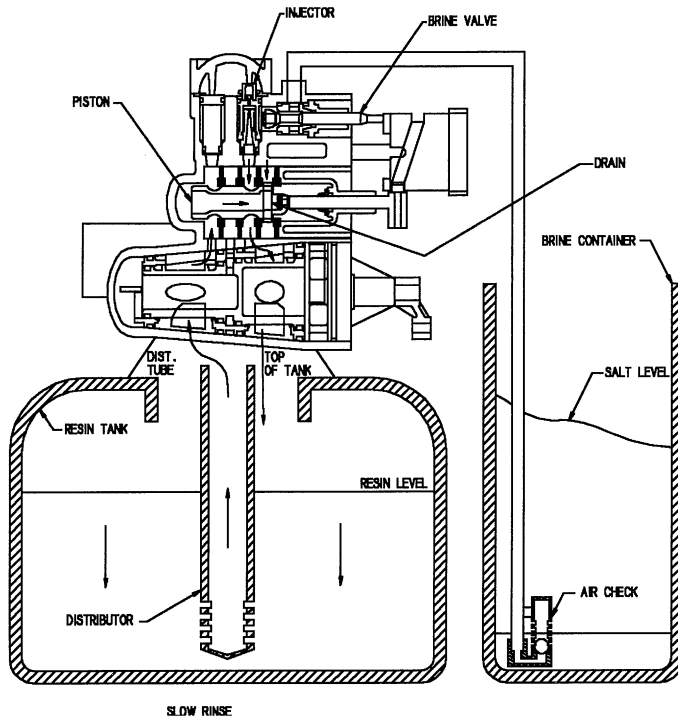
Water Conditioner Flow Diagrams (downflow brining) Continued



BRINE DRAW POSITION

(Regeneration Cycle Step #4)

Conditioned water from the valve outlet flows into the injector section, thru the nozzle and throat to draw brine from the brine tank. Brine flows around the piston, around the rotor, down thru the mineral, up the center tube, around the rotor, thru the piston and out the drain.



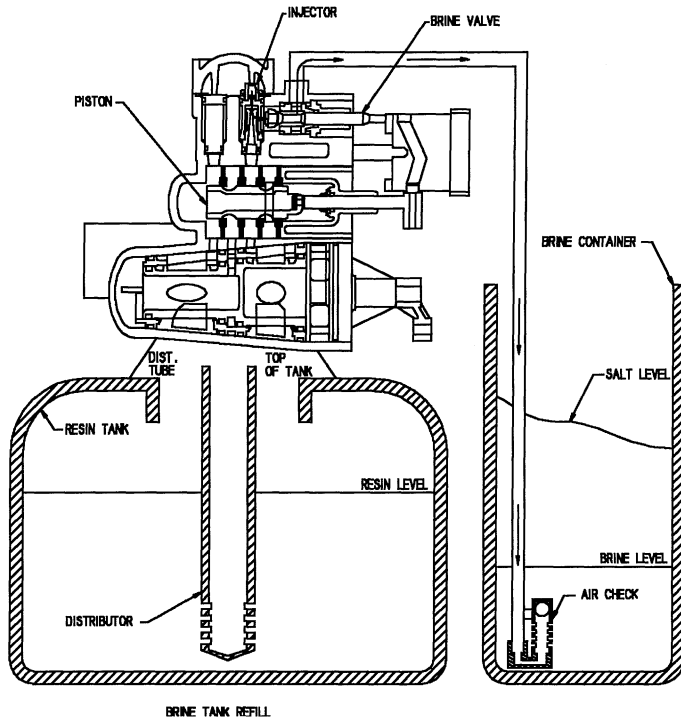
SLOW RINSE POSITION

(Regeneration Cycle Step #5)

Conditioned water from the valve outlet flows into the injector section, thru the nozzle and throat, around the piston, around the rotor, down thru the mineral, up the center tube, around the rotor, thru the piston and out the drain.

MODEL 8500 ECONOMINDER

Water Conditioner Flow Diagrams (downflow brining) Continued



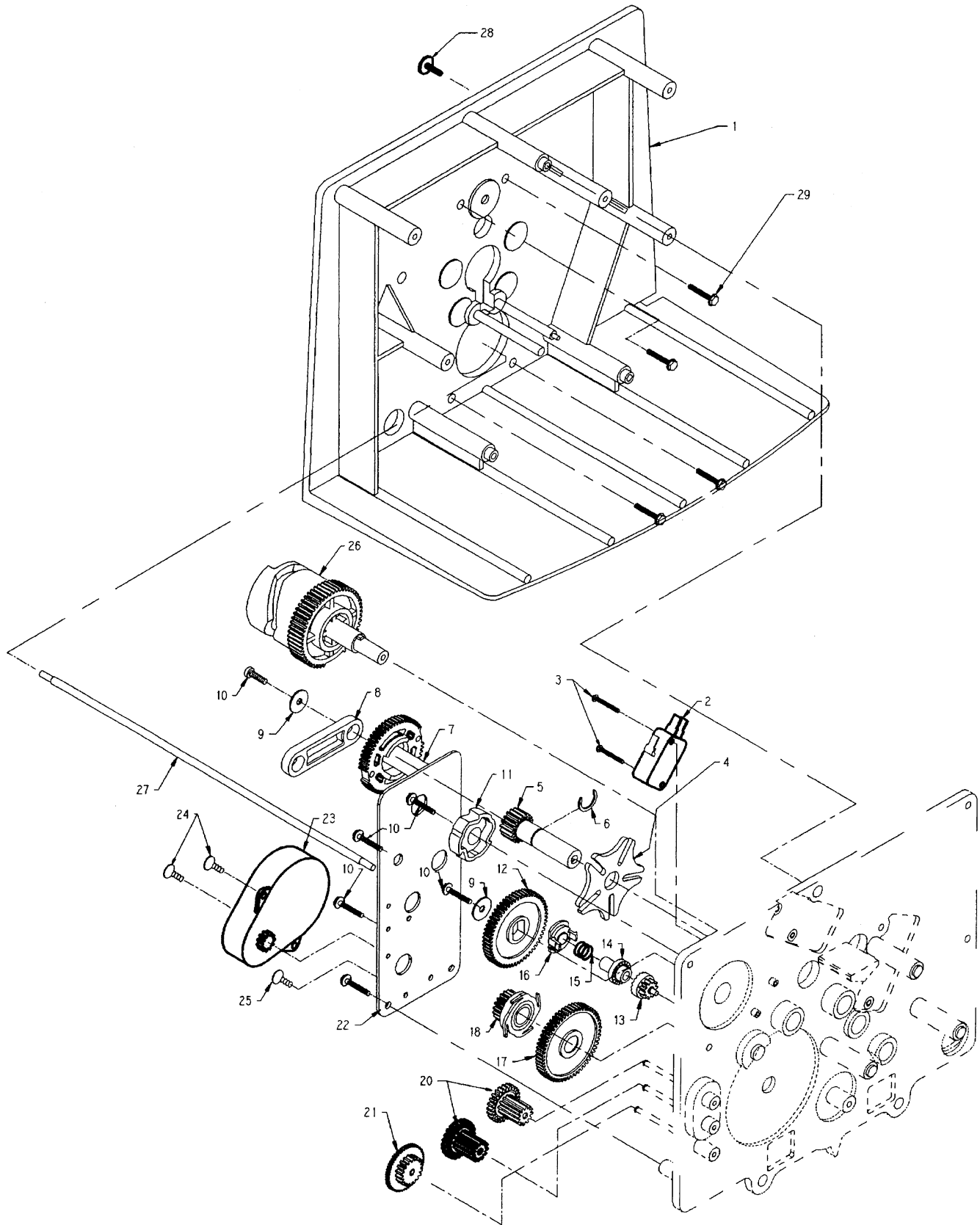
BRINE TANK REFILL

(Regeneration Cycle Step #6)

Conditioned water from the valve outlet flows into the injector section, thru the nozzle, thru the brine line flow control, thru the brine valve and into the brine tank. The second tank is now on stand-by until the service tank is depleted.

MODEL 8500 ECONOMINDER

Drive Assembly



MODEL 8500 ECONOMINDER

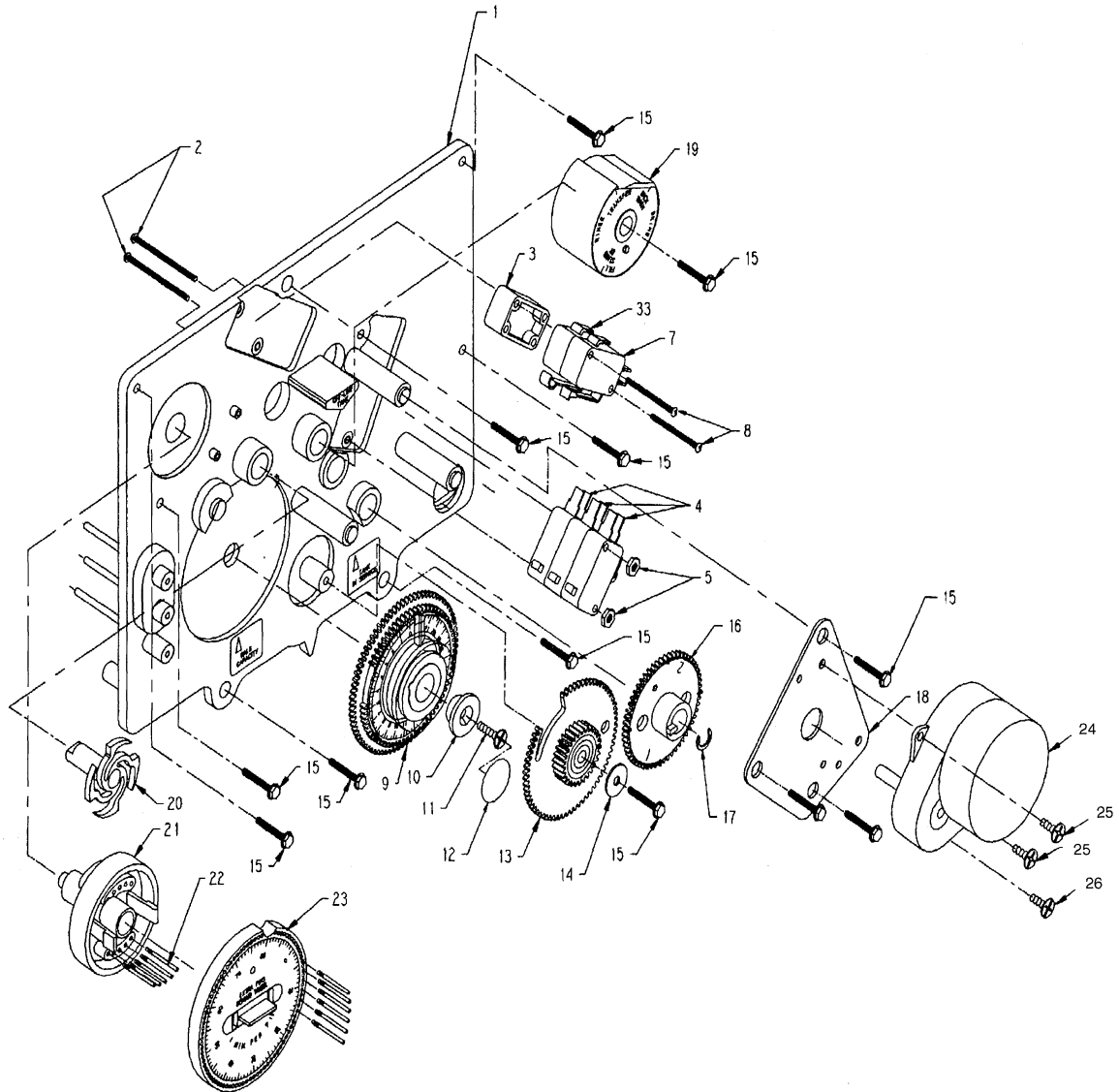
Drive Assembly

PARTS LIST

Item No.	Part No.	Quantity	Description
1	18798-01	1	Backplate
2	19722	1	Switch
3	19849	2	Screw 4 x 5/8" Pan Hd.
4	14896	1	Geneva Disk
5	18796	1	Pinion
6	15810	1	Retaining Ring
7	19062	1	Gear and Pin Assembly
8	18785	1	Link, Transfer
9	13363	2	Washer
10	13296	6	Screw, 6x1/2" Hex.Hd.
11	18793	1	Cam. Cycle Start
12	18791	1	Gear, 57 T.
13	13830	1	Pinion, Prog. Wheel Drive
14	13831	1	Clutch, Prog. Wheel Drive
15	14276	1	Spring
16	14253	1	Retainer, Clutch Spring
17	18789	1	Gear, 54 T.
18	18788	1	Pinion, 19 T.
19	19023	1	Cover (Not Shown)
20	17169	2	Gear, 24/12
21	17167	1	Gear 55/18
22	18806	1	Plate, Timer Motor Mtg.
23	17181	1	Motor, 120V/60HZ
	17733	1	Motor, 24V/60HZ
	18705	1	Motor, 240V/50HZ
	19357	1	Motor, 24V/50HZ
24	11384	2	Screw, 6 x 1/4" Fill. Hd.
25	14430	1	Screw, 6 x 1/4" Hex. Hd.
26	19061	1	Gear and Cam Assembly
27	14968	1	Meter Cable, 10-1/2" Long
28	19367	1	Screw, 8 x 1/2"
29	12473	4	Screw, 10 x 5/8"

MODEL 8500 ECONOMINDER

Drive Assembly Continued



MODEL 8500 ECONOMINDER

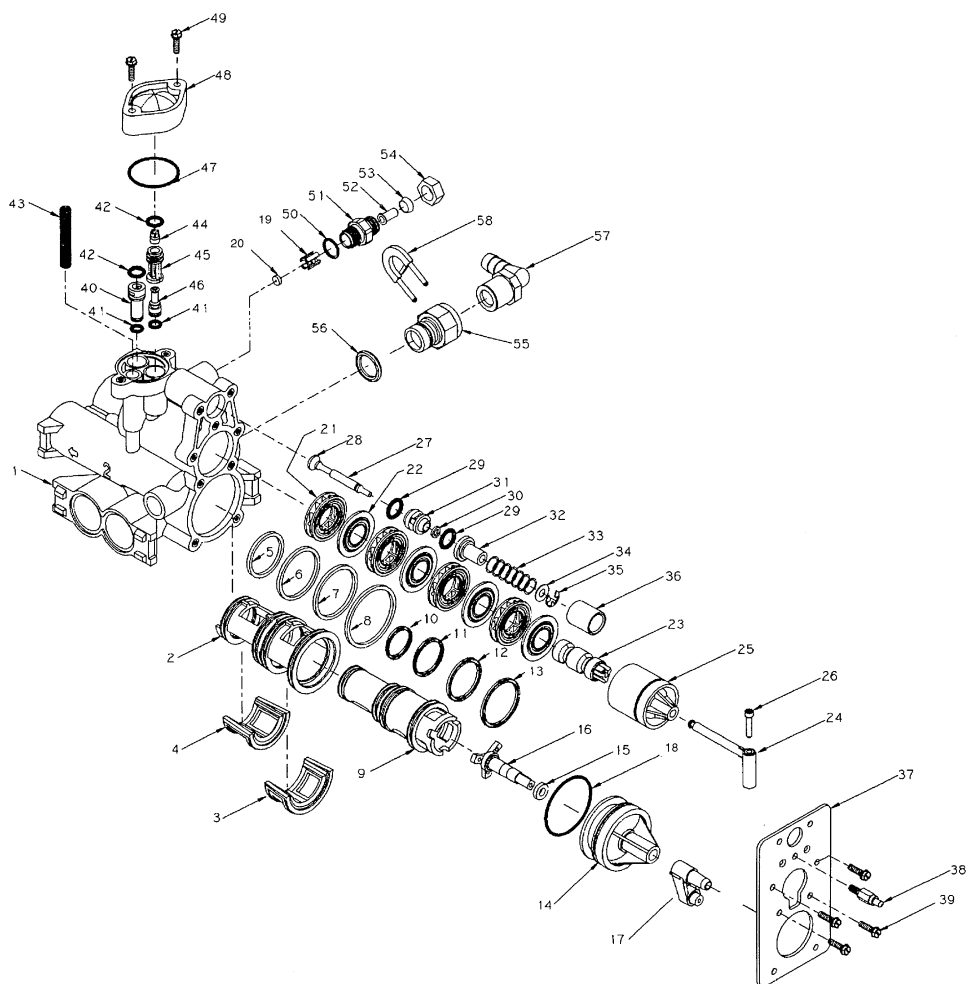
Drive Assembly Continued

PARTS LIST

Item No.	Part No.	Quantity	Description
1	19351	1	Center Plate Assembly
2	19111	2	Screw, 4 x 1-1/2" Fl. Hd.
3	18803	1	Spacer
4	10218	3	Switch
5	10339	2	Nut, 4-40
6	15354-02	1	Ground Wire (Not Shown)
7	15320	1	Switch
8	12624	2	Screw, 4-40 x 1-1/2"
9	14039-01	1	Program Wheel Assembly
10	13806	1	Retainer, Program Wheel
11	13748	1	Screw, 6 x 1/2" Fl. Hd.
12	11999	1	Button Decal
13	18802	1	Gear, Reset
14	13363	1	Washer
15	13296	13	Screw, 6 x 1/2" Hex. Hd.
16	19354	1	Gear and Label Assembly
17	15810	1	Retaining Ring
18	18807	1	Plate, Drive Motor Mtg.
19	19353	1	Cam and Label Assembly
20	18792	1	Cam, Cycle Start
21	18787	1	Shaft, Program Wheel
22	15493	31	Roll Pin
23	19355	1	Prog. Wheel and Label
24	18897	1	Motor, 120V/60HZ
	18898	1	Motor, 24V/60HZ
	18899	1	Motor, 240V/50HZ
	19046	1	Motor, 24V/50HZ
25	11384	2	Screw, 6 x 1/4" Fill. Hd.
26	14430	1	Screw, 6 x 1/4" Hex. Hd.
27	11842	1	Power Cord (Not Shown)
28	13547	1	Strain Relief (Not Shown)
29	12681	3	Wire Nut (Not Shown)
30	18612	2	Wire Nut-Blue (Not Shown)
31	19633	1	Wire Harness (Not Shown)
32	19356	1	Leadwire (Not Shown)
33	10896	1	Switch

MODEL 8500 ECONOMINDER

Control Valve Assembly



PARTS LIST

Item No.	Part No.	Quantity	Description
1	18770-01	1	Valve Body, Machined
2	18783	1	Cage
3	19004	1	Seal, Molded Inlet
4	19005	1	Seal, Molded Outlet
5	19054	1	Seal, O-Ring, -124
6	19055	1	Seal, O-Ring, -128
7	19056	1	Seal, O-Ring, -129
8	19057	1	Seal, O-Ring, -133
9	18782	1	Rotor
10	18874	1	Seal, Q-Ring, -118
11	18875	1	Seal, Q-Ring, -121
12	18876	1	Seal, Q-Ring, -123

MODEL 8500 ECONOMINDER

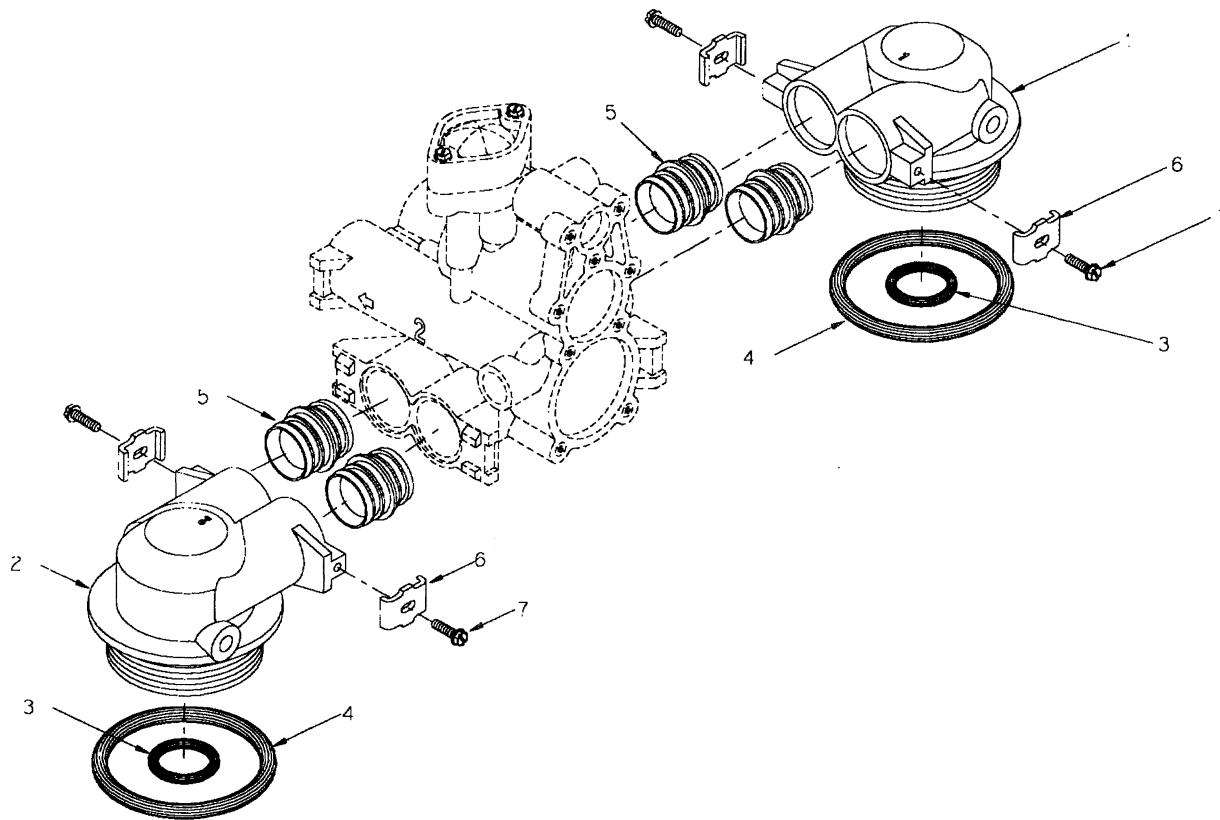
Control Valve Assembly

PARTS LIST (Continued)

Item No.	Part No.	Quantity	Description
13	18877	1	Seal, Q-Ring, -126
14	18781	1	End Plug, Rotor
15	14926	1	Seal, Q-Ring, -012
16	18776-01	1	Shaft, Rotor Drive
17	18784	1	Crank, Transfer
18	15820	1	Seal, O-Ring -134
19	13245	1	Retainer, BLFC Button
20	60022-xx	1	BLFC Button, Specify Size
21	18871	4	Spacer, Regeneration
22	18870	4	Seal, Regeneration
23	19667	1	Piston, Regeneration
24	18779	1	Piston Rod
25	19237	1	End Plug Assembly
26	18808	1	Pin, Drive Roller
27	14925	1	Brine Valve Stem
28	12626	1	Seat, Brine Valve
29	13302	2	Seal, O-Ring, -014
30	12550	1	Seal, Q-Ring, -009
31	13167	1	Spacer, Brine Valve
32	13165	1	Cap, Brine Valve
33	11973	1	Spring, Brine Valve
34	16098	1	Washer, Nylon
35	11981-01	1	Retaining Ring
36	18786	1	Spacer, Brine Valve
37	18777	1	Plate, Retainer
38	18809	1	Pin, Cam Bearing
39	12112	4	Screw, 10 x 1/2"
40	18276	1	Plug, Injector
41	10141	2	Seal, O-Ring, -010
42	13771	2	Seal, O-Ring, -012
43	18810	1	Screen, Injector
44	18273	1	Vortex Generator
45	18274-XXX	1	Injector Nozzle - Specify Size, See Page 7
46	18275-XXX	1	Injector Throat - Specify Size, See Page 7
47	15243	1	Seal, O-Ring, -028
48	18774	1	Cover, Injector
49	17063	2	Screw, 10 x 1"
50	12977	1	Seal, O-Ring, -015
51	13244	1	Adapter, BLFC
52	10332	1	Insert, 3/8"
53	10330	1	Sleeve, 3/8", Delrin
54	10329	1	Nut, 3/8" Tube Fitting
55	11385-01	1	Flow Control Hsg., Plastic
56	11183	1	Seal, O-Ring, -017
57	12338	1	Hose Barb
58	18312	1	Retainer, DLFC

MODEL 8500 ECONOMINDER

Tank Adapter Assembly

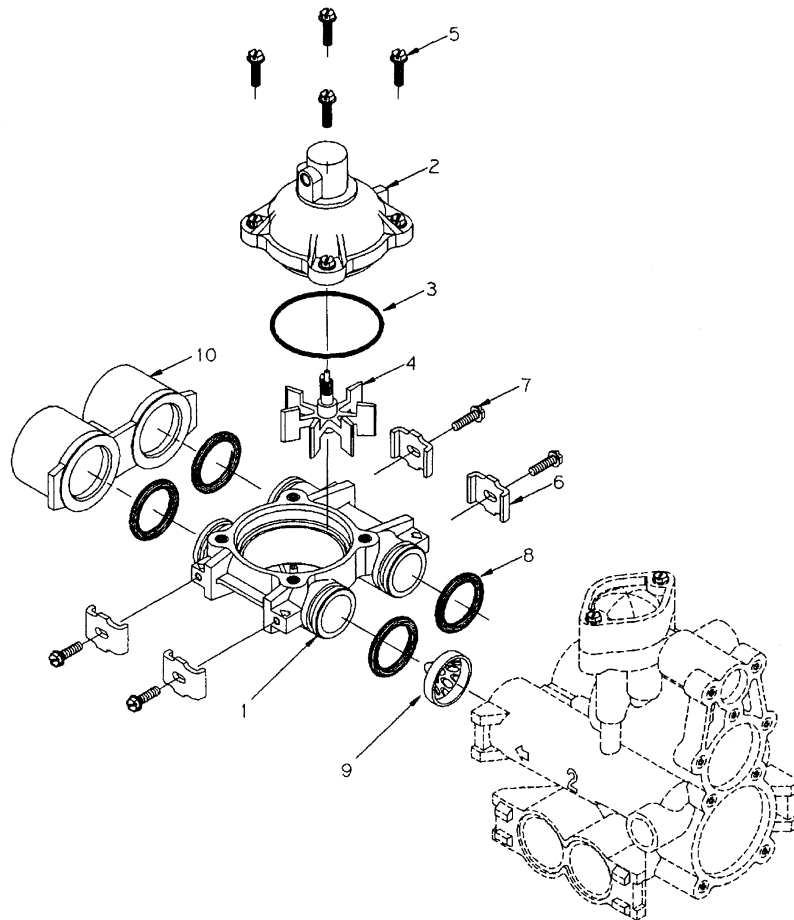


PARTS LIST

Item No.	Part No.	Quantity	Description
1	19242-01	1	Adapter Assembly, Tank 1, 6"-8" Tanks
	19242-03	1	Adapter Assembly, Tank 1, 9"-10" Tanks
2	19242-02	1	Adapter Assembly, Tank 2, 6"-8" Tanks
	19242-04	1	Adapter Assembly, Tank 2, 9"-10" Tanks
3	13304	2	Seal, O-Ring, -121
4	18303	2	Seal, O-Ring, -336
5	15078-01	4	Adapter Coupling
6	13255	4	Clip, Mounting
7	13314	4	Screw, 8 x 5/8"

MODEL 8500 ECONOMINDER

Meter Assembly

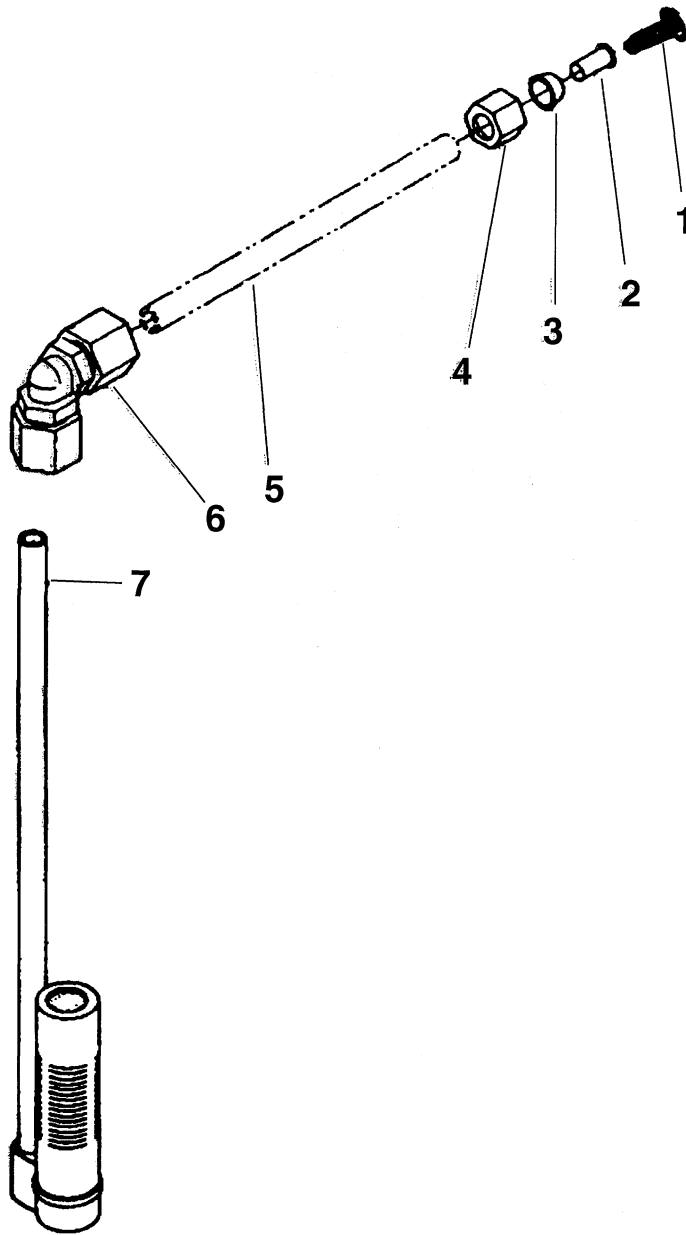


PARTS LIST

Item No.	Part No.	Quantity	Description
1	13821	1	Meter Body, 3/4 In.
	16983	1	Meter Body, 3/8 In.
2	15452	1	Meter Cover Assembly, Rt. Angle, Standard
	15659	1	Meter Cover Assembly, Rt. Angle, Ext. Range
3	13847	1	Seal, O-Ring, -137
4	13509	1	Impeller
5	12473	4	Screw, 10 x 5/8"
6	13255	4	Clip, Mounting
7	13314	4	Screw, 8 x 5/8"
8	13305	4	Seal, O-Ring, -119
9	14613	1	Flow Straightener
10	13708	1	Yoke, Brass, 3/4" NPT
	13398	1	Yoke, Brass, 1" NPT
	18706-02	1	Yoke, Plastic, 3/4" NPT
	18706	1	Yoke, Plastic, 1 " NPT

MODEL 8500 ECONOMINDER

Air Check



PARTS LIST

Item No.	Part No.	Quantity	Description
1	12767	1	Brine Line Screen
2	10332	1	Tube Insert 3/8"
3	10330	1	Ferrule 3/8"
4	10329	1	Tube Nut 3/8"
5	Not Supplied	1	Brine Line Tube (3/8" Flexible Tube)
6	12794	1	90° Elbow - 3/8" T to 3/8" T
7	60002	1	#500 Air Check Assembly

MODEL 8500 ECONOMINDER

Service Instructions

PROBLEM	CAUSE	CORRECTION
1. Softener Fails To Regenerate.	A. Electrical Service To Unit Has Been Interrupted.	A. Assure Permanent Electrical Service (Check Fuse, Plug, Pull Chain or Switch).
	B. Timer Is Defective.	B. Repair Timer.
2. Hard Water.	A. By-Pass Valve is Open.	A. Close By-Pass Valve.
	B. No Salt in Brine Tank.	B. Add Salt To Brine Tank and Maintain Salt Level Above Water Level.
	C. Injector Screen Plugged.	C. Clean Injector Screen.
	D. Insufficient Water Flowing into Brine Tank.	D. Check Brine Tank Fill Time And Clean Brine Line Flow Control If Plugged.
	E. Hot Water Tank Hardness.	E. Repeated Flushings Of The Hot Water Tank is Required.
	F. Leak At Distributor Tube.	F. Make Sure Distributor Tube Is Not Cracked. Check "O" Ring And Tube Pilot.
	G. Internal Valve Leak.	G. Replace Seals and Spacers And/Or Piston.
3. Unit Used Too Much Salt.	A. Improper Salt Setting.	A. Check Salt Usage and Salt Setting.
	B. Excessive Water in Brine Tank.	B. See Problem No. 7.
4. Loss Of Water Pressure.	A. Iron Buildup In Line To Water Conditioner.	A. Clean Line To Water Conditioner.
	B. Iron Buildup in Water Conditioner.	B. Clean Control and Add Mineral Cleaner To Mineral Bed. Increase Backwash Time And/Or Reduce Gallon Setting.
	C. Inlet of Control Plugged Due to Foreign Material Broken Loose From Pipes By Recent Work Done On Plumbing System.	C. Remove Piston and Clean Control.
5. Loss of Mineral Through Drain Line.	A. Air in Water System.	A. Assure That Well System Has Proper Air Eliminator Control. Check For Dry Well Condition.
6. Iron In Conditioned Water.	A. Fouled Mineral Bed.	A. Check Backwash, Brine Draw And Brine Tank Fill. Reduce Gallon Setting.
7. Excessive water In Brine Tank.	A. Plugged Drain Line Flow Control.	A. Clean Flow Control.
	B. Plugged Injector System.	B. Clean Injector and Screen.
	C. Timer Not Cycling.	C. Replace Timer.
	D. Foreign Material In Brine Valve.	D. Replace Brine Valve Seat And Clean Valve.
	E. Foreign Material In Brine Line Flow Control.	E. Clean Brine Line Flow Control.
	F. Power Loss During Brine Fill.	F. Check Power Source.

MODEL 8500 ECONOMINDER

Service Instructions Continued

PROBLEM	CAUSE	CORRECTION
8. Softener Fails To Draw Brine.	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.	A. Clean Drain Line Flow Control. B. Clean Injector. C. Clean Screen. D. Increase Line Pressure To 25 P.S.I. Min. E. Change Seals, Spacers and Rotor/Piston Assembly.
9. Control Cycles Continuously.	A. Broken Or Shorted Switch.	A. Determine If Switches are Faulty Replace Them, or Replace Complete Power Head.
10. Drain Flows Continuously.	A. Valve Is Not Programming Correctly. B. Foreign Material in Control. C. Internal Control Leak.	A. Check Timer Program and Positioning of Control. Replace Power Head Assembly If Not Positioning Properly. B. Remove Power Head Assembly And Inspect Bore, Remove Foreign Material and Check Control In Various Regeneration Positions. C. Replace Seals and Piston/Rotor Assembly.

General Service Hints

Problem: Softener Delivers Hard Water.

Cause could be that . . . Reserve Capacity Has Been Exceeded.

Correction: Check salt dosage requirements and reset program wheel to provide additional reserve.

Cause could be that . . . Program Wheel Is Not Rotating With Meter Output.

Correction: Pull cable out of meter cover and rotate manually. Program wheel must move without binding and cycle actuator must start the cycle before the clutch releases.

Cause could be that . . . Meter Is Not Measuring Flow.

Correction: Check output by observing rotation of small gear on front of timer (Note—program wheel must not be against regeneration stop for this check). Each tooth is approximately 25 gallons on 3/4" installations. If not performing properly, replace meter.

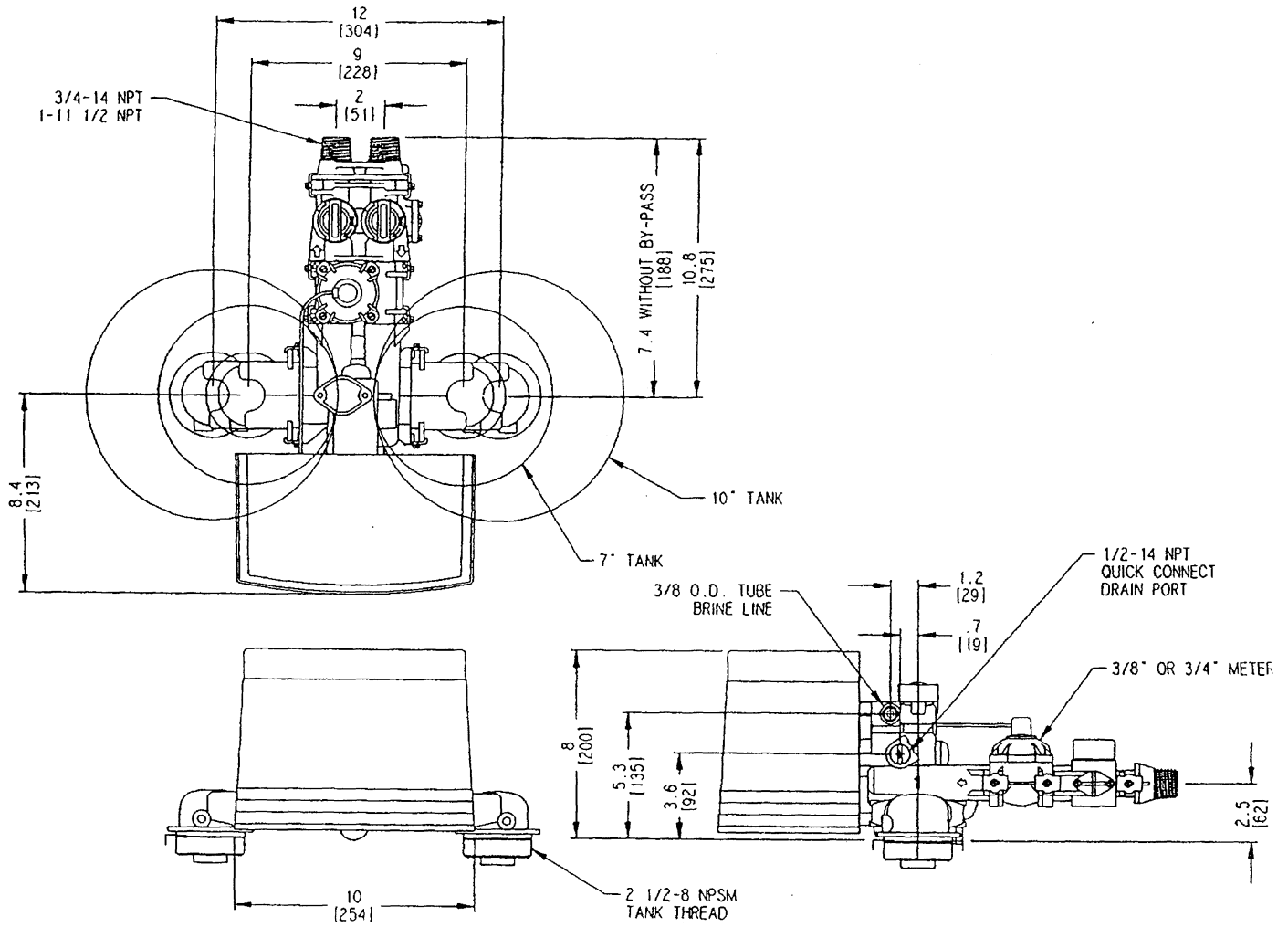
Cause could be that . . . The Program Wheel Is Beyond Start Cam.

Correction:

1. If power failed during regeneration; reset program wheel and cycle manually.
2. If exceeding system capacity before regeneration was completed; either a) increase system capacity or b) restrict flow rates.
3. If defective timer; Repair timer.

MODEL 8500 ECONOMINDER

Control Dimensions



MODEL 8500 ECONOMINDER

Service Assemblies

PARTS LIST

Quantity	Part No.	Description
	60022-25	BLFC .25 GPM
	60022-50	BLFC .50 GPM
	60022-100	BLFC 1.0 GPM
		For Illustration, See Page 16
1	12094	Flow Washer .25 GPM
	12095	Flow Washer .50 GPM
	12097	Flow Washer 1.0 GPM
1	12977	O-Ring, -015
1	13244	Adapter, BLFC
1	13245	Retainer, BLFC Button
	60049	By-Pass, Plastic
		For Illustration, See Page 16
1	18272-000	1610 Injector Assy., 000, Brown
1	18272-00	1610 Injector Assy., 00, Violet
1	18272-0	1610 Injector Assy., 0, Red
1	18272-1	1610 Injector Assy., 1, White
	60350	Brine Valve Assy., 8500 (9000)
		For Illustration, See Page 16
1	11973	Spring, Brine Valve
1	11981	Retaining Ring
1	16095	Washer, Plain #10 Nylon
1	12550	Quad Ring, -009
1	12626	Seat, Brine Valve
1	13165	Cap, Brine Valve
1	13167	Spacer, Brine Valve
2	13302	O-Ring, -014
1	14925	Brine Valve Stem, 9000
	60088-0	3/4" Meter, Standard Range, Rt. Angle
	60089-0	3/4" Meter, Extended Range, Rt. Angle
		For Illustration and Parts List, See Page 19
	60112	Piston Assy, 8500 Downflow
		For Illustration, See Page 16
1	19237	End Plug, White Assy.
1	19667	Piston
1	18779	Piston Rod

MODEL 8500 ECONOMINDER

Service Assemblies Continued

PARTS LIST (Continued)

Quantity	Part No.	Description
	60148	Seal & Spacer Kit, 8500 - Upper For Illustration, See Page 16
4	18870	Seal
4	18871	Spacer
	61300-00	8500 Powerhead Assembly
	-01	See "Parts Price List"
	-03	
		DLFC, Flow Washers
	12085	Flow Washer, 1.2 GPM
	12086	Flow Washer, 1.5 GPM
	12087	Flow Washer, 2.0 GPM
	12088	Flow Washer, 2.4 GPM
	60147	Cage And Rotor Kit For Illustration, See Page 16
1	18783	Cage
1	19004	Cage Assy., Molded, Inlet
1	19005	Cage Assy., Molded, Outlet
1	19054	Cage Assy., O-Ring, -124
1	19055	Cage Assy., O-Ring, -128
1	19056	Cage Assy., O-Ring, -129
1	19057	Cage Assy., O-Ring, -133
1	18782	Rotor
1	18874	Seal, Q-Ring, -118
1	18875	Seal, Q-Ring, -121
1	18876	Seal, Q-Ring, -123
1	18877	Seal, Q-Ring, -126

MODEL 8500 ECONOMINDER

Service Instructions

A. REMOVE/INSTALL DRIVE PANEL:

1. Cycle control to put tank 2 in SERVICE and regeneration cam in the BRINE position. Unplug electrical cord from outlet. Unplug meter cable at meter dome.
2. Remove 8 screws securing drive panel to backplate, then pull panel away. All components are mounted to this panel.
3. To replace drive panel be certain that drive link is resting on alignment pin (tank 2 position) and cam is in BRINE position. Rotate crank arm to its lowermost position, see fig. 3. Feed meter cable thru hole in backplate and position drive panel on backplate. Align with post pilots and link as necessary.
4. Replace 8 screws, plug in meter cable.
5. Plug electrical cord into outlet and cycle control to the STAND BY position.

B. REMOVE/INSTALL POWERHEAD:

1. Cycle control to put tank 2 in SERVICE and regeneration cam in the BRINE position. Unplug electrical cord from outlet. Unplug meter cable at meter dome.
2. Remove 4 screws securing power head to valve body, then pull power head away.
3. To replace powerhead be certain that drive link is resting on alignment pin (tank 2 position) and cam is in BRINE position. Rotate crank arm to its lowermost position, see fig. 3. Place powerhead on valve body, align link and crank as necessary.
4. Replace 4 screws, plug in meter cable.
5. Plug electrical cord into outlet and cycle control to the STAND BY position.

C. REMOVE/INSTALL MOTOR:

1. Unplug electrical cord from outlet.
2. Remove 2 wire nuts securing motor leads to electrical wires.
3. Remove 2 screws securing motor to motor plate and pull motor out of drive gear.
4. Install new motor into drive gear, if mounting holes do not line up, lift motor slightly and rotate clockwise until holes line up. Push motor against plate and install 2 screws.
5. Reconnect motor leads to electrical wires with wire nuts.
6. Plug electrical cord into outlet.

D. REMOVE/INSTALL ROTOR AND CAGE:

1. Turn off water supply to conditioner:
 - a. If conditioner has a "three valve" by-pass system, first open the valve in the by-pass line, then close the valves at the inlet and outlet.
 - b. If the conditioner has an integral by-pass valve, put it in the by-pass position.
 - c. If there is only a shut-off valve, close it.
2. Follow steps B1 and B2.
3. Pull crank arm from rotor drive shaft. Remove 4 screws and 1 pilot pin from valve body and remove retainer plate.
4. Grasp a rib on rotor end plug with pliers and pull out of valve body.
5. Insert a screwdriver under rotor flange (see fig. 1) and pry rotor from cage. Pull rotor straight out of cage.
6. Insert cage puller tool, p/n 19640, into cage, (see fig. 2) insert screwdriver thru hole in puller and pry cage from valve body. Use care as inlet and outlet seals may fall from cage as it is removed from valve body.
7. To install cage and rotor, replace and lubricate 4 rotor seals, use care to assure that seals are not twisted. Replace and lubricate 4 cage seals. Install rotor into cage with rotor ports facing the large openings in the cage, slight back and forth rotation of rotor will assist in seating the rotor properly in the cage.

MODEL 8500 ECONOMINDER

Service Instructions

8. Replace and lubricate inlet and outlet seals, keep seals facing up until cage is inside valve body then rotate approximately 180° to properly position cage in valve body.
 9. Replace and lubricate both seals in the end plug. Place rotor drive shaft into mating slots in rotor. Note, there is only one correct position. Do not force drive legs into rotor slots.
 10. Push end plug over rotor shaft and rotate until cage pins pick up slots in the end plug, continue to push end plug and cage into valve body until end plug is flush with valve face. There are internal keys in valve that only allow cage to be in the one proper position and slight rotation of end plug may be necessary to obtain this position.
 11. Replace retainer plate and secure with 4 screws and 1 pilot pin. Place crank arm on rotor shaft and rotate to its lowermost position. Note, rotate rotor crank only in the area indicated in fig. 3, rotation outside of this area may damage the inlet and outlet seals.
 12. To replace powerhead, be certain that drive link is resting on alignment pin (tank 2 position) and cam is in BRINE position. Place powerhead on valve body, align link and crank as necessary. Replace 4 screws. Plug in meter cable.
 13. Return by-pass or inlet valving to the normal service position. Water pressure should now be applied to the conditioner and any by-pass line shut off.
 14. Plug electrical cord into outlet and cycle control to the STAND BY position. Check for leaks at all seal areas.
 15. Check for proper operation of valve.
- E. REMOVE/INSTALL REGENERATION PISTON, SEALS, AND SPACERS:
1. Follow steps D1 thru D3.
 2. Grasp piston rod and pull end plug and piston straight out of valve.
 3. Remove all seals and spacers (4 of each).
 4. Inspect seals and piston for damage, replace as necessary.
 5. Install spacers and lubricated seals alternately, starting with a spacer.
 6. Apply lubricant to piston and install into seal/spacer stack.
 7. Follow steps D11 thru D15.
- F. REMOVE/INSTALL BRINE VALVE:
1. Follow steps D1 thru D3.
 2. Grasp brine valve stem with pliers and pull out of valve body, save the white spacer.
 3. Remove and replace "O" ring at bottom of brine valve hole.
 4. Apply lubricant to "O" ring on new brine valve assembly and press into valve body. Install white spacer over brine valve, top of spacer should be flush with valve face.
 5. Follow steps D11 thru D15.
- G. REMOVE/INSTALL INJECTOR SYSTEM:
1. Follow step D1.
 2. Cycle control to RINSE position to relieve pressure in valve. Unplug electrical cord from outlet.
 3. Remove 2 screws securing injector cover. Remove cover and discard "O" ring seal. Pry injector nozzle and throat assembly from valve body with screwdriver.
 4. Push in new injector nozzle and throat assembly. Make certain they are seated properly in the valve body. Clean or replace the screen.
 5. Install new lubricated "O" ring seal and replace cover and screws, tighten securely.
 6. Follow steps D13 thru D15.

MODEL 8500 ECONOMINDER

Service Instructions

H. REMOVE/INSTALL CONTROL VALVE:

1. Follow steps G1 and G2.
2. Remove 2 screws and clips on side of valve body at either tank adapter.
3. Pull tank and adapter away from valve body.
4. Temporarily support valve body and repeat steps 2 and 3 for remaining tank.
5. Remove 2 clips and screws at yoke or by-pass.
6. Pull valve and meter away from plumbing connections.
7. Lubricate seals on meter and install new valve and meter into yoke or by-pass. Attach with clips and screws, being certain clips are seated firmly against meter body.
8. Apply new lubricated seals to couplings and install in valve body.
9. Push tank and adapter into valve body and attach with clips and screws, being certain clips are seated firmly against adapter.
10. Repeat steps 8 and 9 for remaining tank
11. Follow steps D13 thru D15.

I. REMOVE/INSTALL METER:

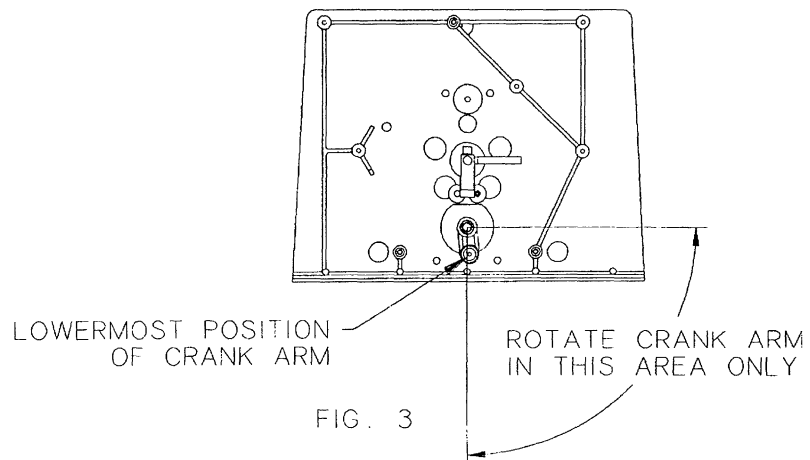
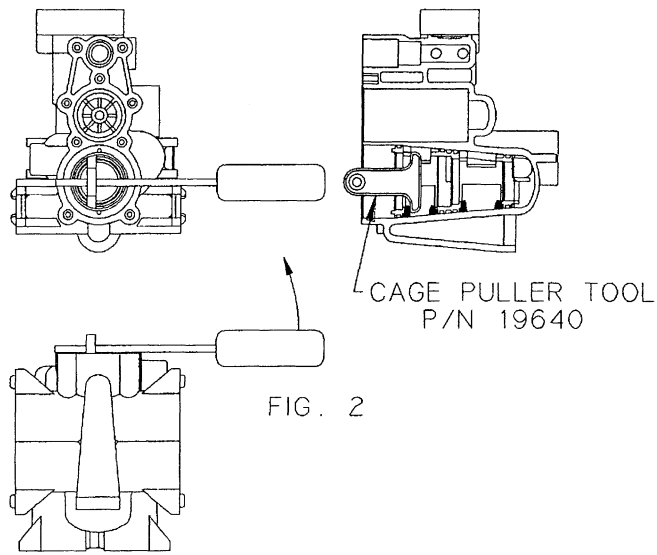
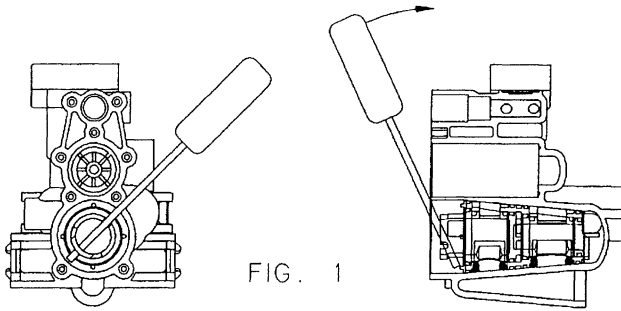
1. Follow steps H1 thru H6.
2. Remove 2 clips and screws securing meter to valve body. Unplug meter cable at meter dome. Pull meter out of valve body.
3. Lubricate seals on new meter and install in valve body. Attach with clips and screws being certain clips are seated firmly against meter body.
4. Plug meter cable into meter dome.
5. Lubricate seals on meter and install into yoke or by-pass. Attach with clips and screws, being certain clips are seated firmly against meter body.
6. Follow steps H8 thru H11.

J. REMOVE/INSTALL METER COVER AND/OR IMPELLER:

1. Follow steps G1 and G2.
2. Unplug meter cable from meter dome. Remove 4 screws securing cover to meter body.
3. Lift cover off of meter body, discard "O" ring.
4. Remove and inspect impeller for gear or spindle damage, replace if necessary.
5. Apply lubricant to new "O" ring and assemble to the smallest diameter on meter cover.
6. Assemble new cover to meter body. Be certain impeller enters freely into cover. Press firmly on cover and rotate if necessary to assist in assembly. Be certain meter output faces towards tank 2.
7. Replace 4 screws and tighten securely. Plug meter cable into meter dome.
8. Follow steps D13 thru D15.

MODEL 8500 ECONOMINDER

Service Instructions



MODEL 8500 ECONOMINDER

Notes

MODEL 8500 ECONOMINDER

Notes
