

Installation, Operation and Maintenance Manual

Series PWSTA

Water Softener Systems

PURE WATER

Table of Contents

Job Specifications Sheet	2
General and Commercial Installation Checklist	3
General and Commercial Installation Checklist	5
Regeneration Cycle Program Setting Procedure	8
Time Brine Refill and Meter Setting Procedure	9
9100 Electro Mechanical Timer Assembly	11
9100 Power Head	13
9100 Control Valve Assembly	15
9000/9100/9500 Second Tank Assembly	17
9100 Meter Assembly	18
9100 Bypass Valve	20
2310 Safety Brine Valve	21
Water Conditioner Flow Diagrams	22
Troubleshooting	26
Mechanical Timer Valve Wiring	28
9100 Control Dimensions	29
Meter Flow Data	30
Injector Flow Data	31



Note: Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

Job Specifications Sheet

Job Number _____

Model Number _____

Water Test _____

Capacity Of Unit _____ Max. _____ Per Regeneration

Brine Tank Size _____

Salt Setting Per Regeneration _____

Control Valve Specifications

1. Type of Timer
 - A. 82 minute available regeneration time, 1/15 RPM
 - B. 164 minute available regeneration time, 1/30 RPM
2. Type of Meter

Mechanical Valves (gallon settings)

Meter	Standard Range
3/4"	125–2,125
1"	310–5,270

3. Timer Gallon Setting _____ gal.
4. Regeneration Program Setting
 - A. Backwash _____ min.
 - B. Brine and Slow Rinse _____ min.
 - C. Rapid Rinse _____ min.
 - D. Brine Tank Refill _____ min.
5. Drain Line Flow Control _____ gpm
6. Brine Refill Rate _____ gpm
7. Injector Size _____

General and Commercial Installation Checklist

Water Pressure

A minimum of 25 lbs of water pressure is required for regeneration valve to operate effectively.

Electrical Facilities

An uninterrupted alternating current (A/C) supply is required. Make sure:

- Voltage supply is compatible with unit before installation.
- Current supply is always hot and cannot be turned off with another switch.

Existing Plumbing

Condition of existing plumbing should be free from lime and iron buildup. Replace piping that has heavy lime and/or iron build-up. If piping is clogged with iron, install a separate iron filter unit ahead of the water softener.

Location of Softener and Drain

Locate the softener close to a clean working drain and connect according to local plumbing codes.

Bypass Valves

Always provide for the installation of a bypass valve if unit is not equipped with one.



Caution:

- Do not exceed water pressure of 125psi.
- Do not exceed 110°F water temperature.
- Do not subject unit to freezing conditions.



Caution:

- Do not use with water that is microbiologically unsafe or of unknown quality.
- Test the water periodically to verify that the system is performing satisfactorily.

Equipment Configuration

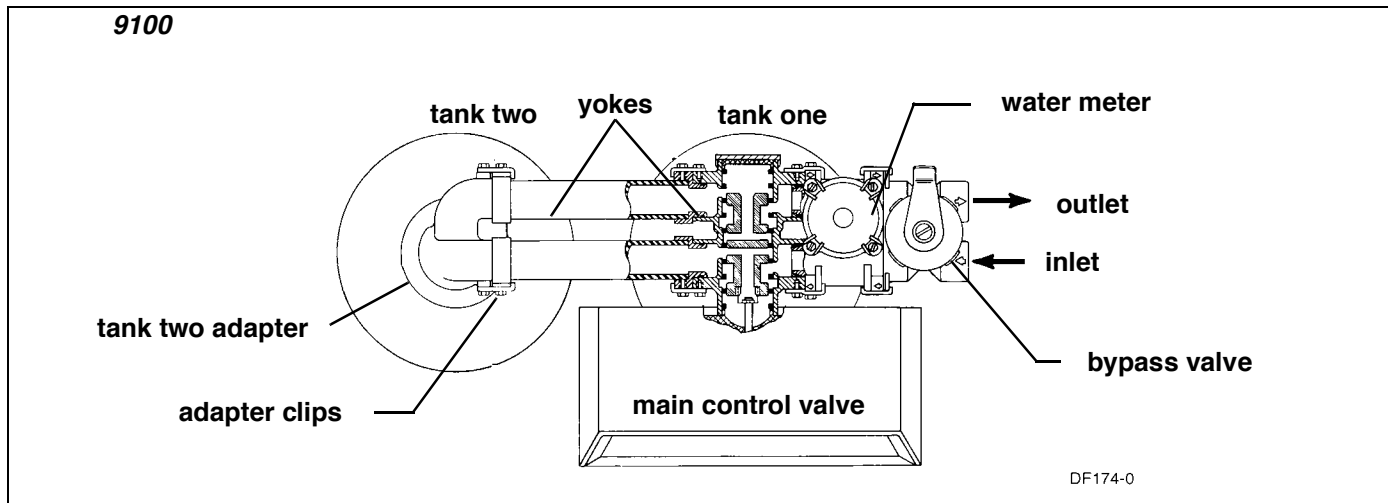


Figure 1: 9100

General and Commercial Installation Checklist

1. Place the softener tanks where you want to install the unit.

NOTE: Be sure the tanks are level and on a firm base.

2. During cold weather it is recommended that the installer warm the valve to room temperature before operating.
3. Perform all plumbing according to local plumbing codes.
 - Use a 1/2" minimum pipe size for the drain.
 - Use a 3/4" drain line for backwash flow rates that exceed 7 gpm or length that exceeds 20' (6 m).
4. Both tanks must be the same height and diameter and filled with equal amounts of media.*
5. The distributor tube must be flush with the top of each tank. Cut if necessary. Use only non-aerosol silicone lubricant.*
6. Lubricate the distributor O-ring seal and tank O-ring seal. Place the main control valve on one tank and the tank adapter on the second tank.*

NOTE: If required, solder copper tubing for tank interconnection before assembling on the main control valve and tank adapter. Maintain a minimum of 1" distance between tanks on final assembly.

7. Solder joints near the drain must be done before connecting the Drain Line Flow Control fitting (DLFC). Leave at least 6" (152 mm) between the DLFC and solder joints when soldering pipes that are connected on the DLFC. Failure to do this could cause interior damage to DLFC.
8. Use only Teflon® tape on the drain fitting.
9. Be sure the floor under the salt storage tank is clean, level, and strong enough to support the system..
10. Place approximately 1" (25 mm) of water above the grid plate. If a grid is not utilized, fill to the top of the air check in the salt tank. Do not add salt to the brine tank at this time.
11. Place the system in Bypass.
 - Turn on the main water supply.
 - Open a cold soft water tap nearby and let water run a few minutes or until the system is free of foreign material (usually solder) resulting from the installation.
12. Place the bypass In Service position and let water flow into the mineral tank.

Electrical

13. Make all electrical connections according to codes. Plug the valve into an approved power source. Do not insert meter cable into the meter yet.
14. Tank one has control valve and tank two has adapter. See Figure 1, page 4.
15. Look on the right side of the control valve, it has indicators showing which position the control valve is in during Regeneration and which tank is In Service.
 - Figure 3, page 6 shows the valve In Service position with tank one supplying conditioned water and tank two on standby.

NOTE: Make sure the meter cable is not inserted in the meter dome. Swing the timer out to expose the program wheel. To swing timer out, grab onto the lower right corner of timer face and pull outward. See Figure 5, page 7.

* Tanks 12" in diameter and smaller are factory loaded with media. Checking media amounts, distributor tube length, lubricating the distributor pilot O-rings, and lubricating the tank seal O-rings on these sized systems is not necessary.

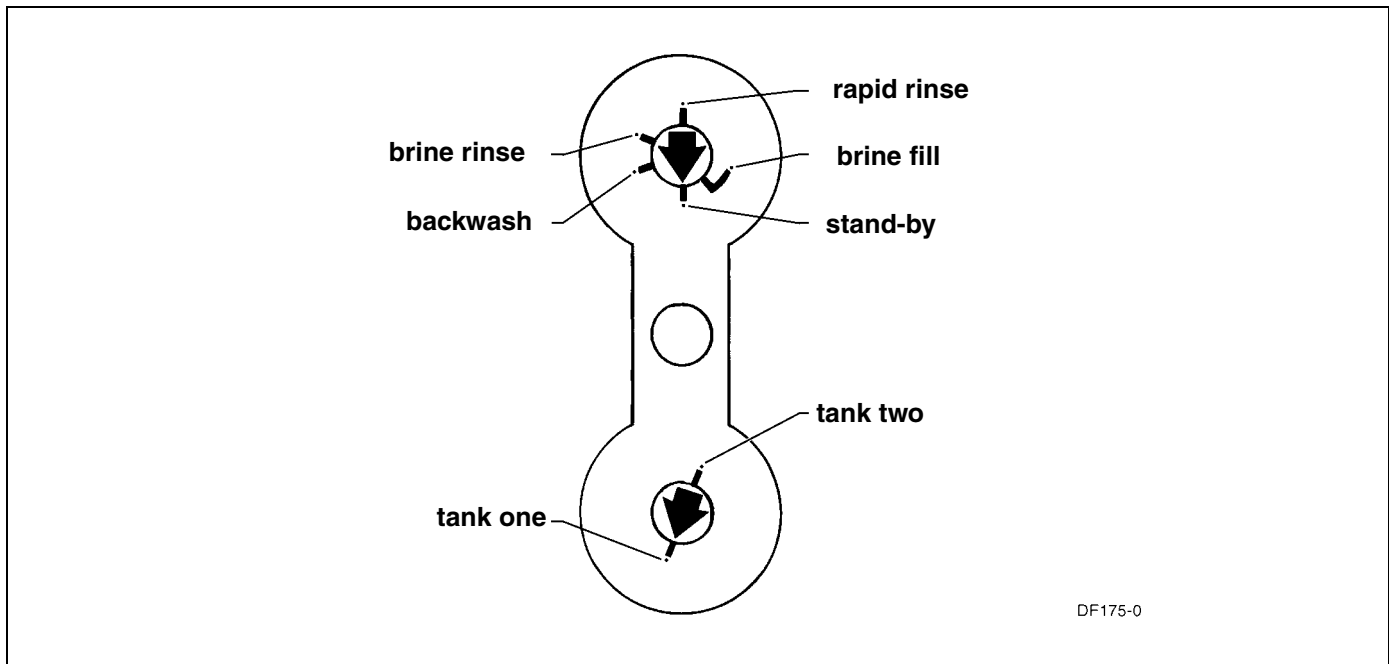


Figure 3: Control Valve Position Indicators

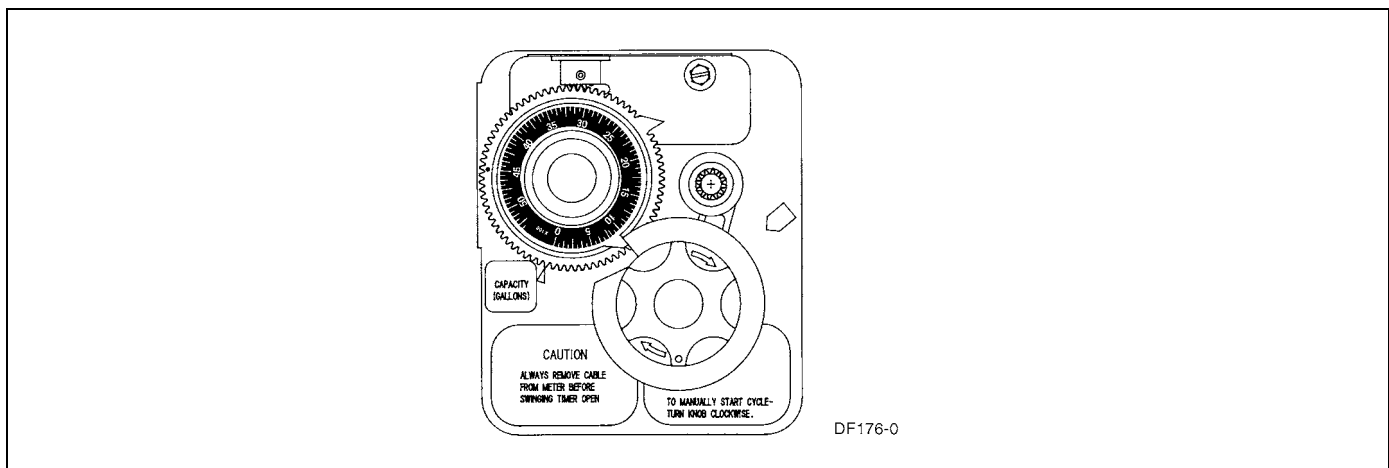


Figure 4: Timer

16. Cycle timer into backwash position. Turn manual knob so that the micro switch rides on the first set of pins.
 - In this position the tank's switch (lower piston) and the control valve moves to the backwash position (upper piston).
 - Wait until the positioning of upper and lower pistons stops before advancing the timer further. If advanced too fast the control will not home into the In Service position (it will not advance to any other position). To correct this, rotate the manual knob back to In Service and start again into backwash.
- NOTE: Once valve positions itself into the backwash cycle, the homing circuit locks in. Then unplug the system. Allow the system to remain in the backwash position until air no longer flows from the drain line.**
17. Plug the unit back in with all the air backwashed, slowly cycle the timer to the brine position; rapid rinse; and brine tank refill. Wait for the control drive motor to position itself in each cycle and stop, before advancing on to the next position.
18. Once back in the In Service position, cycle the control valve again into the backwash position. The tanks switch again, and air head backwashes out of the other tank. Once the system reaches the backwash position unplug it again. Allow the system to remain in the backwash position until all air is purged from the system. When all air is gone no air will come out of the drain line. Then plug the unit back in. Proceed to regeneration cycle program setting procedure. Cycle the control back to the In Service position. **Leave the timer in the open position. DO NOT insert meter cable yet.**

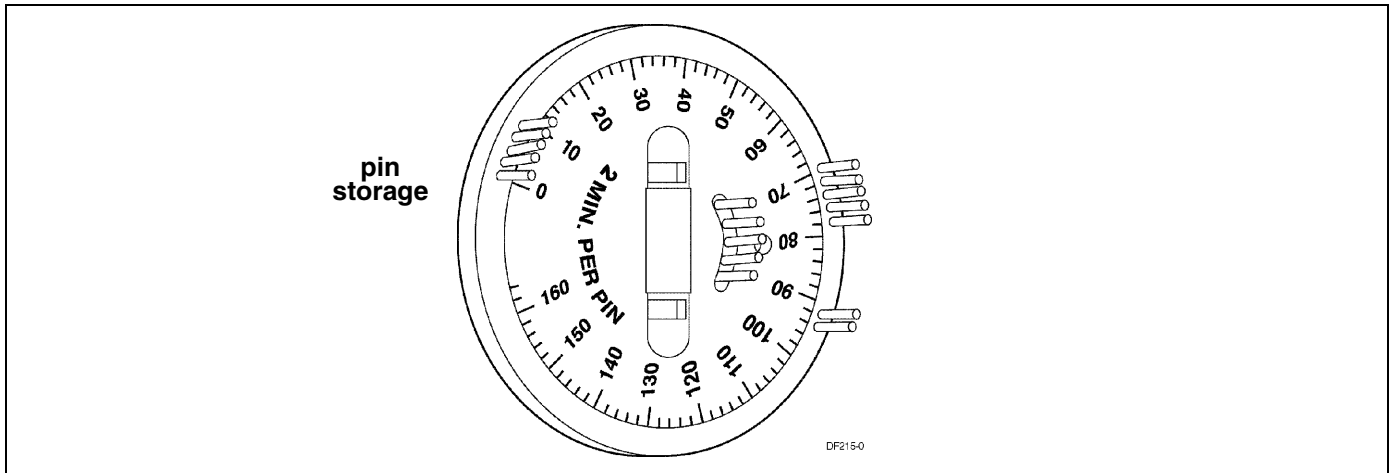


Figure 5: Program Wheel

NOTE: Two motors are available:
1/15 RPM has 82 minute **Regeneration Time**.
1/30 RPM has 164 minute **Regeneration Time**.

Regeneration Cycle Program Setting Procedure

Setting the Regeneration Cycle Program

The **Regeneration** cycle program on the water conditioner is preset at the factory. However, portions of the cycle or program time may be lengthened or shortened for local conditions or system design.

1. Expose cycle program wheel by grasping timer in lower right hand corner and pulling. This releases snap retainer and swings timer to the left

NOTE: Meter cable *must* be removed from meter dome before opening timer.

2. Remove the program wheel by grasping program wheel and squeezing protruding lugs towards center. Lift program wheel off timer.

— Switch arms may require movement to facilitate removal.

3. Return timer to closed position by engaging snap retainer in back plate.

— Make certain all electrical wires locate above snap retainer post.

Changing Length of the Backwash Time

The program wheel in *Figure 5* is **In Service** position. Looking at the numbered side of the program wheel, the group of pins starting at zero determines the length of time the unit backwashes.

Example: If there are six pins in this section, the time of backwash is 12 minutes (2 minutes per pin). To change the length of backwash time, add or remove pins as required.

— The number of pins multiplied by two equals minutes of backwash.

Changing 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 a unit will brine and rinse (2 minutes per hole).

To change the length of brine and rinse time, add or remove pins in the rapid rinse group of pins to increase or decrease the number of holes in the brine and rinse section.

— The number of holes multiplied by two equals minutes of brine and rinse.

Changing Length Of Rapid Rinse

The second group of pins on the program wheel determines the length of time the water conditioner rapid rinses (2 minutes per pin). To change the length of rapid rinse time, add or remove pins at the higher numbered end of this section as required.

— The number of pins multiplied by two equals minutes of rapid rinse.

NOTE: Program wheels with 0–82 minute cycle times, use one minute per pin or hole to set **Regeneration** times. The layout of pins and holes on the program wheel follow the same procedure as on this page.

Changing Length of Brine Tank Refill Time

The second group of holes on the program wheel determines the length of time the water conditioner refills the brine tank (2 minutes per hole).

To change the length of refill time, move the two pins at the end of the second group of holes as required.

The **Regeneration** cycle is complete when the two pin set at end of the brine tank refill section trips the outer micro-switch. The program wheel, however, continues to rotate until the inner micro-switch drops into the notch on the program wheel.

Time Brine Refill and Meter Setting Procedure

Programming

1. The control valve is set at the factory for backwash; brine and slow rinse; rapid rinse and brine tank fill times. Change any of these times by repositioning the pins and holes or adding more pins.

NOTE: Two speed timer motors are available

1/15 RPM has 82 minute **Regeneration Time** and each pin or hole equals one minute.

1/30 RPM has 164 minute **Regeneration Time** and each pin or hole equals two minutes.

2. The control valve has a separate brine tank fill cycle.

— Calculate the desired salt setting using the brine line flow control rate of refill (in gpm) multiplied by the timer setting. Then, using one gallon of fresh water dissolving approximately 3 lbs salt, calculate the refill time.

Example: A desired 30 lbs salt setting:

The unit has a 1.0 gpm refill rate so a 10 gallon fill is required.

$$10 \text{ gallons} \times 3 \text{ lbs/gals} = 30 \text{ lbs salt}$$

Set the timer refill section at 10 minutes.

$$10 \text{ minutes} \times 1.0 \text{ gpm} = 10 \text{ gallon fill}$$

NOTE: There must always be two pins at the end of a refill time to stop the fill cycle.

With the **Regeneration** times set, place timer back to its original position, making sure the lower right hand corner snaps back into the backplate and the meter cable slides through the backplate and does not bind.

3. Setting the gallon wheel.

Knowing the amount of resin in each tank and the salt setting per **Regeneration**, calculate the gallons available, using the following capacities as a guide:

$$\frac{(\text{capacity per ft}^3 \times \text{ft}^3 \text{ of resin per tank})}{\text{compensated hardness of H}_2\text{O}} = \text{gallons available}$$

NOTE: Based on tank size:

More resin increases capacity, less resin decreases capacity.

More salt increases capacity, less salt decreases capacity.

Example:

tank diameter	=	16"
compensated hardness	=	35 grains per gal (tested sample)
ft ³ resin (based on flow rate)	=	4
lbs of salt	=	8
capacity per ft ³	=	24,000

$$\frac{(24,000 \times 4 \text{ ft}^3 \text{ of resin per tank})}{35 \text{ grains}} = 2740 \text{ gallons available before regeneration}$$

DO NOT SET THIS FIGURE - GO TO STEP 4

- Because the control valve regenerates with soft water from the other tank, subtract the water used for **Regeneration**. Take each **Regeneration** cycle and calculate the water used.

Example: Unit is set for a 16" diameter tank with 4 ft³ of resin and salted at 8 lbs. per ft³, 7 gpm backwash, #3 injector, 1.0 gpm brine refill, and 60 psi and timer set for *10 min. backwash, 60 min. brine and rinse, 10 min. rapid rinse, 10 min. brine tank fill.*

$$\begin{aligned} \text{Backwash} & 10 \text{ minutes} \times 7.0 \text{ gpm} = 70.0 \text{ gallons} \\ \text{Brine and Rinse} & 60 \text{ minutes} \times 1.0 \text{ gpm} = 60.0 \text{ gallons} \\ \text{Rapid Rinse} & 10 \text{ minutes} \times 7.0 \text{ gpm} = 70.0 \text{ gallons} \\ \text{Brine Tank Fill} & 10 \text{ minutes} \times 1.0 \text{ gpm} = 10.0 \text{ gallons} \\ \text{Total Regeneration Water} & = 210.0 \text{ gallons} \end{aligned}$$

With the 2740 gallons available calculated in Step 3, subtract the **Regeneration** water used from the total water available.

$$\begin{array}{rcl} 2740 \text{ gallons available} & - & 210 \text{ gallons used} = 2530 \text{ gallons} \\ & & \text{(in Regeneration, Step 4)} \end{array}$$

4. Set meter wheel at approximately 2530 gallons. Lift the inner dial of the meter program wheel so that you can rotate it freely. Position the white dot opposite the 2530 gallon setting.

NOTE: There is a slight delay between the time the meter zeros out and the cycle starts. Units using the:

1/15 RPM motor, 82 minute **Regeneration Time** has a *9 minute delay*

1/30 RPM motor, 180 minute **Regeneration Time** has an *18 minute delay*.

This delay period is not critical on residential equipment. However, take this factor into consideration for commercial applications by subtracting continuous flows for 9 minutes or 18 minutes from water available.

5. Insert meter cable into meter.
6. Check bypass.
7. Plug in unit.

9100 Electro Mechanical Timer Assembly

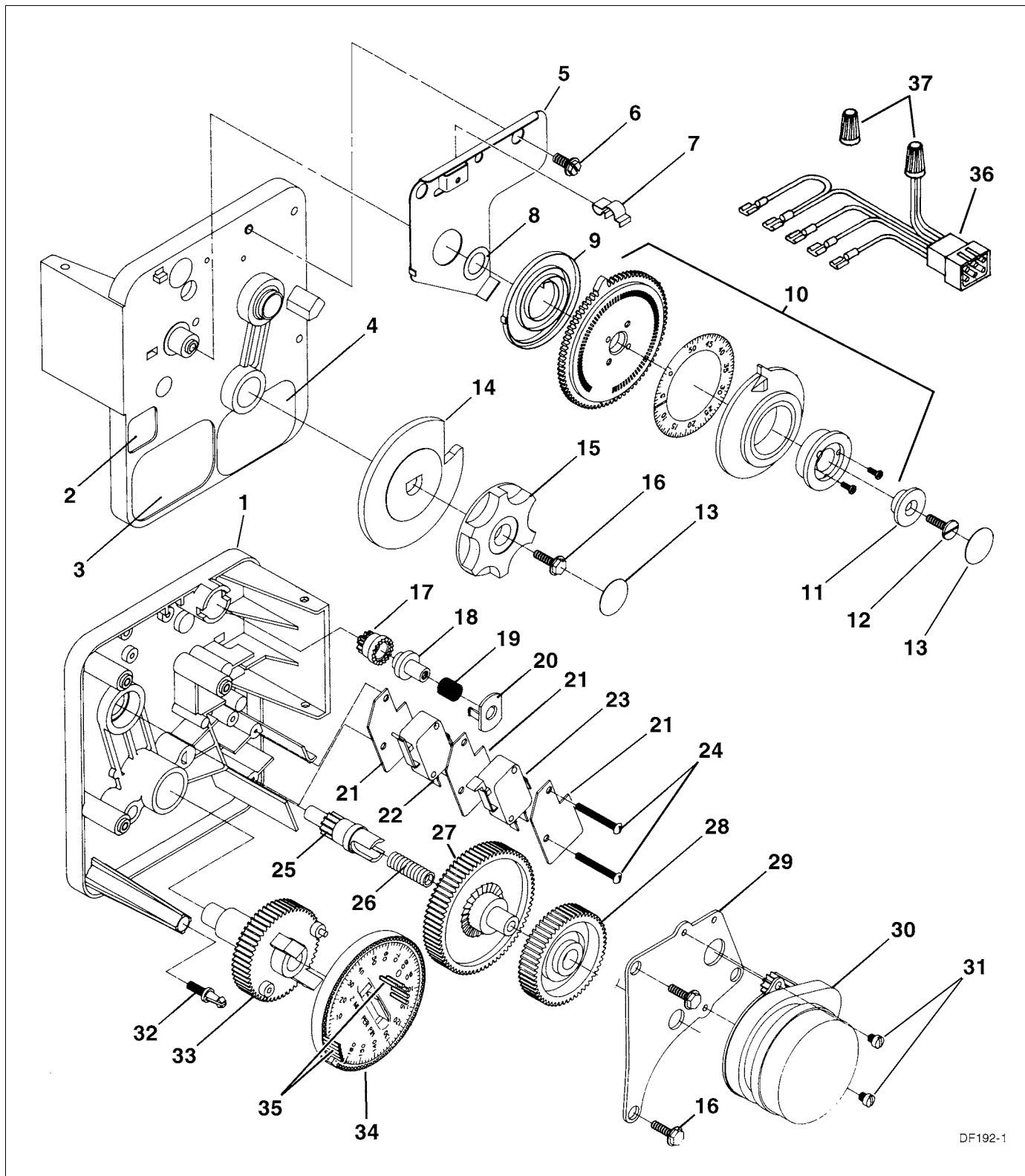
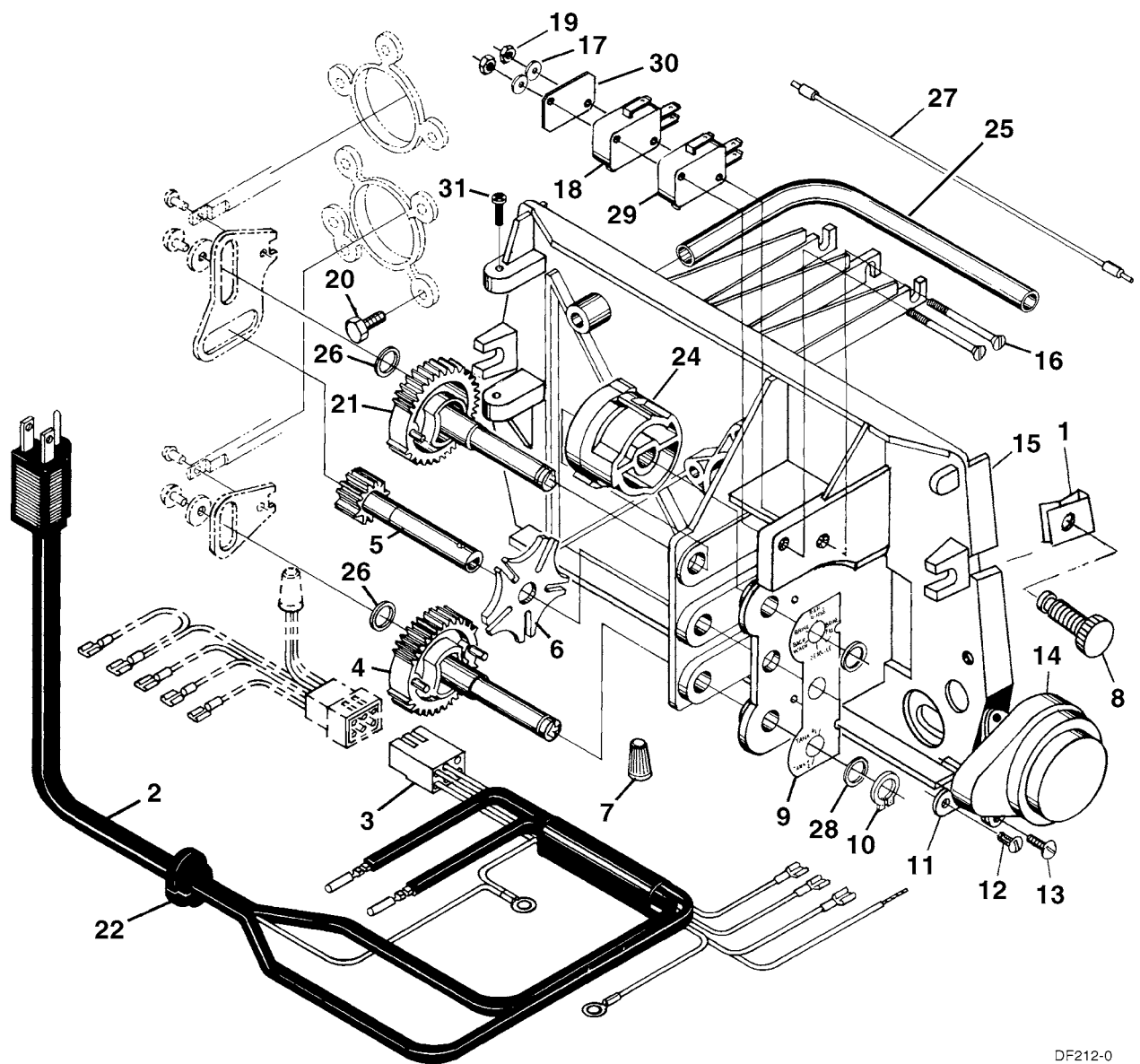


Figure 21

9100 Electro Mechanical Timer Assembly

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	13870-03	timer housing assembly.
2	1	17870	label, capacity gallons
3	1	15465	label, Caution
4	1	16930	label, Instruction
5	1	15227	actuator plate
6	1	10300	screw, hex washer #8
7	1	17513	spring clip
8	1	15407	washer, plain #4
9	1	15228	spring
10	1	16270-10	gallon wheel assembly 3/4" standard range meter
		16270-50	gallon wheel assembly 3/4" extended range meter
		16270-30	gallon wheel assembly 1" standard range meter
		16270-40	gallon wheel assembly 1" extended range meter
11	1	13806	program wheel retainer
12	1	13748	screw, flathead #6-20
13	2	11999	button decal
14	1	15223	cycle actuator gear
15	1	13886-01	knob
16	4	13296	screw, hex washer #6-20
17	1	17724	drive pinion
18	1	17723	drive pinion clutch
19	1	14276	spring, meter clutch
20	1	14253	retainer
21	3	14087	insulator
22	1	15314	switch
23	1	15320	switch
24	2	11413	screw, pan head #4-40
25	1	13018	idler shaft
26	1	18563	spring, idler shaft
27	1	13017	idler gear
28	1	13164	drive gear
29	1	13887	motor mounting plate
30	1	18743	motor, 120V 60 Hz. -1/30 RPM
		18824	motor, 220V 50 Hz. -1/30 RPM
		19170	motor, 120V 60 Hz. -1/15 RPM
		18825	motor, 220V 50 Hz. -1/15 RPM
31	2	13278	screw, #6-32
32	1	14265	spring clip
33	1	15055	main drive gear
34	1	19210-02	program wheel, 90 minute
		19210-05	program wheel, 180 minute
35	23	15493	roll pin
36	1	15203	harness
37	2	12681	wire nut
38	1	60320-02	auxiliary timer switch kit (not shown)

9100 Electro Power Head



DF212-0

Figure 22

9100 Power Head

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	2	18728	nut, clip #8-32
2	1	11838	power cord, 6' U.S. 120V
		11839	power cord, 12' U.S.120V
		11545-01	power cord, 5' European 220V
		14678	power cord, 6' U.S. 220V
		19303-01	power cord, Australian 8' 220V
		19674	transformer, U.S., 110V to 24V
		25651	transformer, European, 220V to 24V
3	1	15202	wire harness, mechanical
		14822	wire harness auxiliary drive switch
4	1	15134	drive gear assembly, lower
5	1	15135	drive gear assembly
6	1	14896	geneva wheel
7	2	40422	wire connector
8	2	19367	cover screw
9	1	15175	position decal
10	2	14917	retaining ring
11	1	15199	ground plate
12	1	14430	screw, hex washer #6
13	2	19160	screw, motor mounting
14	1	18737	drive motor, 24V, 50/60 Hz (red wires)
	1	18738	drive motor, 120V, 60 Hz (black wires)
	1	18739	drive motor, 220V, 50 Hz (yellow wires)
15	1	15131	backplate, mechanical and SE
16	2	15172	screw, flat head #4-40
17	2	10340	washer, lock #4
18		10218	micro switch (homing)
19	1	10339	nut, micro switch
20	1	15331	screw, valve mounting
21	2	15133	drive gear assembly, upper
22	1	13547	strain relief
23	1	15810	retaining ring, drive gear
24	1	15132	triple cam (9000/9100)
25	1	15638	cable guide (9000/9100)
26	2	15372	washer, thrust
27	1	15216	meter cable, 15.25", 1" meter, mechanical
		15425	meter cable, 13.25", 3/4" meter, mechanical
28	2	15692	spacer
29	1	16433	micro switch (program)
30	1	10302	insulator
31	2	15173	screw
Not Shown			
32	1	60232-110	cover, black
	1	60232-112	cover, black - left window
33	1	60320-09	optional auxiliary drive switch (9000/9100)

9100 Control Valve Assembly

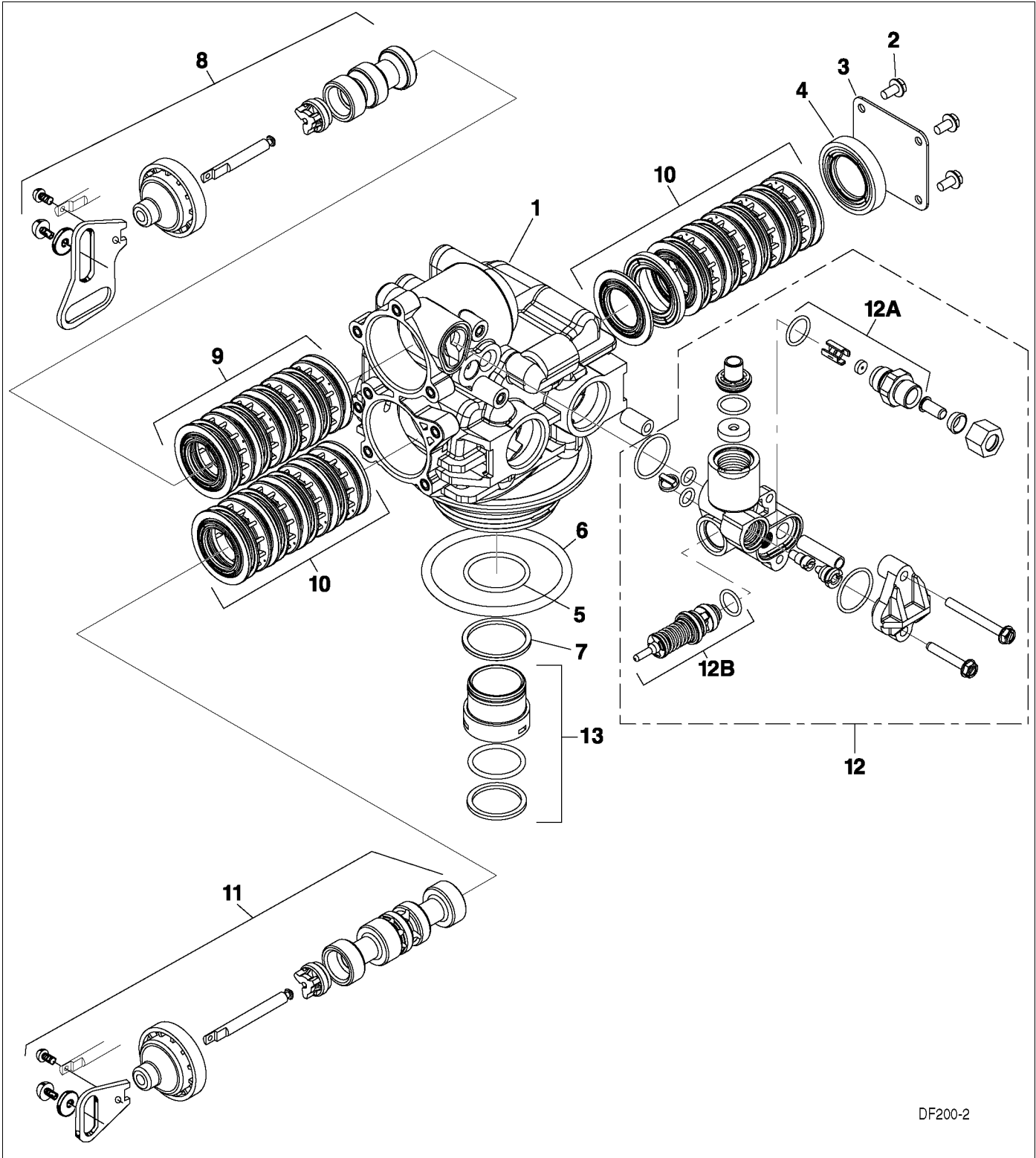


Figure 24

9100 Control Valve Assembly

<i>Item</i>	<i>Quantity</i>	<i>Part Number</i>	<i>Description</i>							
1	1	40688	valve body assembly							
2	4	15137	screw, hex washer #10-24 x 3/8"							
3	1	14906	end plate							
4	1	14928	end plug							
5	1	19054	O-ring, 124							
6	1	18303	O-ring, 336							
7	1	40538	retainer, 32mm							
8	1	60400	piston top assembly							
9	1	60125	seal and spacer kit, top							
	1	60125-20	seal and spacer kit, top (559PE)							
10	1	60421	seal and spacer kit, bottom							
	1	60421-20	seal and spacer kit, bottom (559PE)							
11	1	60401	piston assembly, bottom							
12	1	60385-XXXX	injector assembly <i>(see following chart for dash numbers)</i>							
				<i>injector</i>	<i>number</i>	<i>DLFC</i>	<i>number</i>	<i>BLFC</i>	<i>number</i>	
				red #0	00	Blank	0	Blank	0	
				white #1	01	1.2	1	0.25	1	
				blue #2	02	1.5	2	0.50	2	
				yellow #3	03	2.0	3	1.00	3	
				green #4	04	2.4	4			
						3.0	5			
						3.5	6			
						4.0	7			
						5.0	8			
						7.0	9			
12A	1	60022-12	brine line flow control assembly, 0.125 gpm							
		60022-25	brine line flow control assembly, 0.250 gpm							
		60022-50	brine line flow control assembly, 0.500 gpm							
		60022-100	brine line flow control assembly, 1.00 gpm							
12B	1	60350	brine valve assembly							
13	1	61419	distributor adapter kit, 1.05"							
<i>Not Shown</i>										
14		12763	seal and space stuffer tool							
15		13061	spacer puller tool							
16		13759	DLFC retainer tool							

9100 Second Tank Assembly

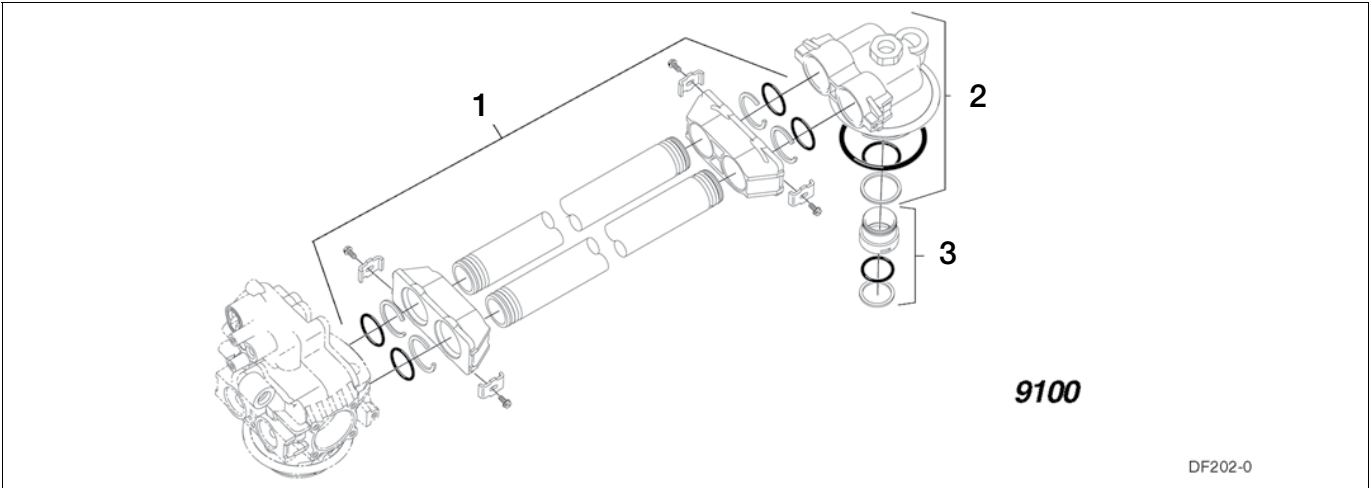


Figure 29

9100 Second Tank Assembly

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	60425-12	plastic tube assembly, 9100, up to 12" tanks
		60425-16	plastic tube assembly, 9100, up to 16" tanks
2	1	14865	second tank adapter assembly, 9100
3	1	61419	distributors adapter kit, 9100, 1.05"

9100 Meter Assembly

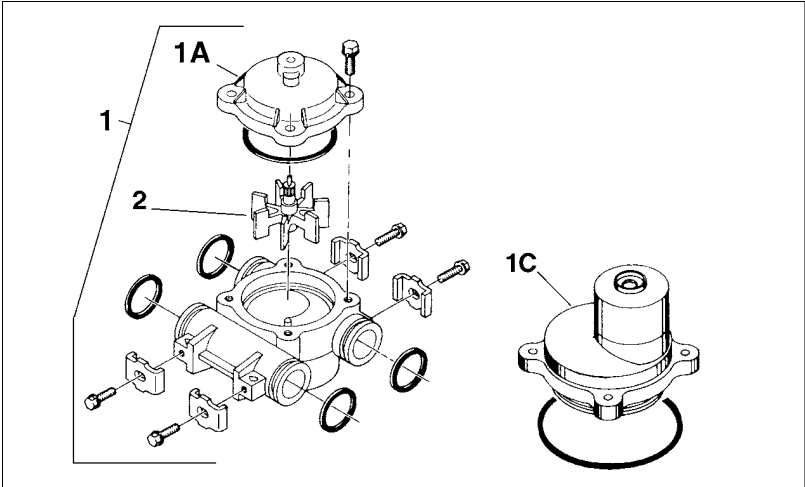
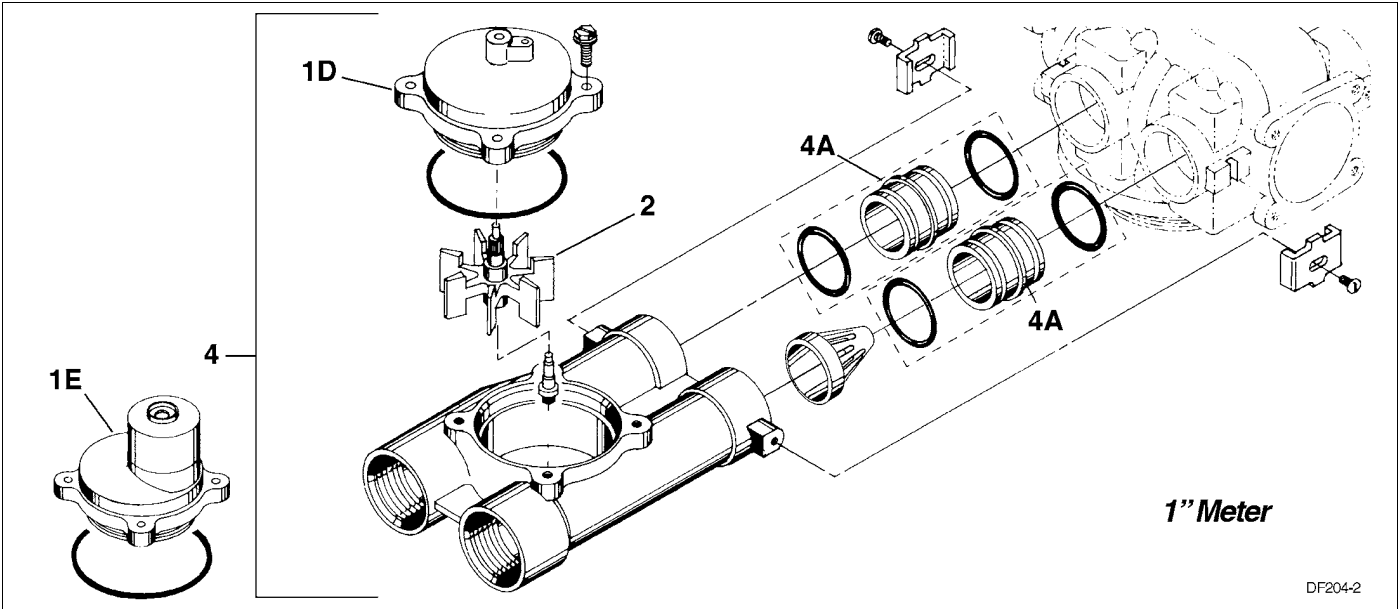


Figure 31



DF204-2

9100 Meter Assembly

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	60086	3/4" meter assembly, standard range
		60087	3/4" meter assembly, extended range
1A	1	14038	meter cap assembly, standard range
1C		15150	meter cap assembly, extended range
1D	1	15218	meter cap assembly, brass standard range
		15218NP	meter cap assembly, brass nickel-plated standard range
1E		15237	meter cap assembly, brass extended range
		15237NP	meter cap assembly, brass nickel-plated extended range
2	1	13509	impeller
		13509-01	impeller, hot water
4	1	60389	1" meter assembly, standard range
		60389NP	1" meter assembly, standard range
		60390	1" meter assembly, extended range
		60390NP	1" meter assembly, extended range, nickel-plated
		60612	1" meter assembly, standard range, hot water
4A	1	15078	1" adapter coupling
Not Shown			
7		60460	meter checker kit, standard range
8		60461	meter checker kit, extended range

9100 Bypass Valve

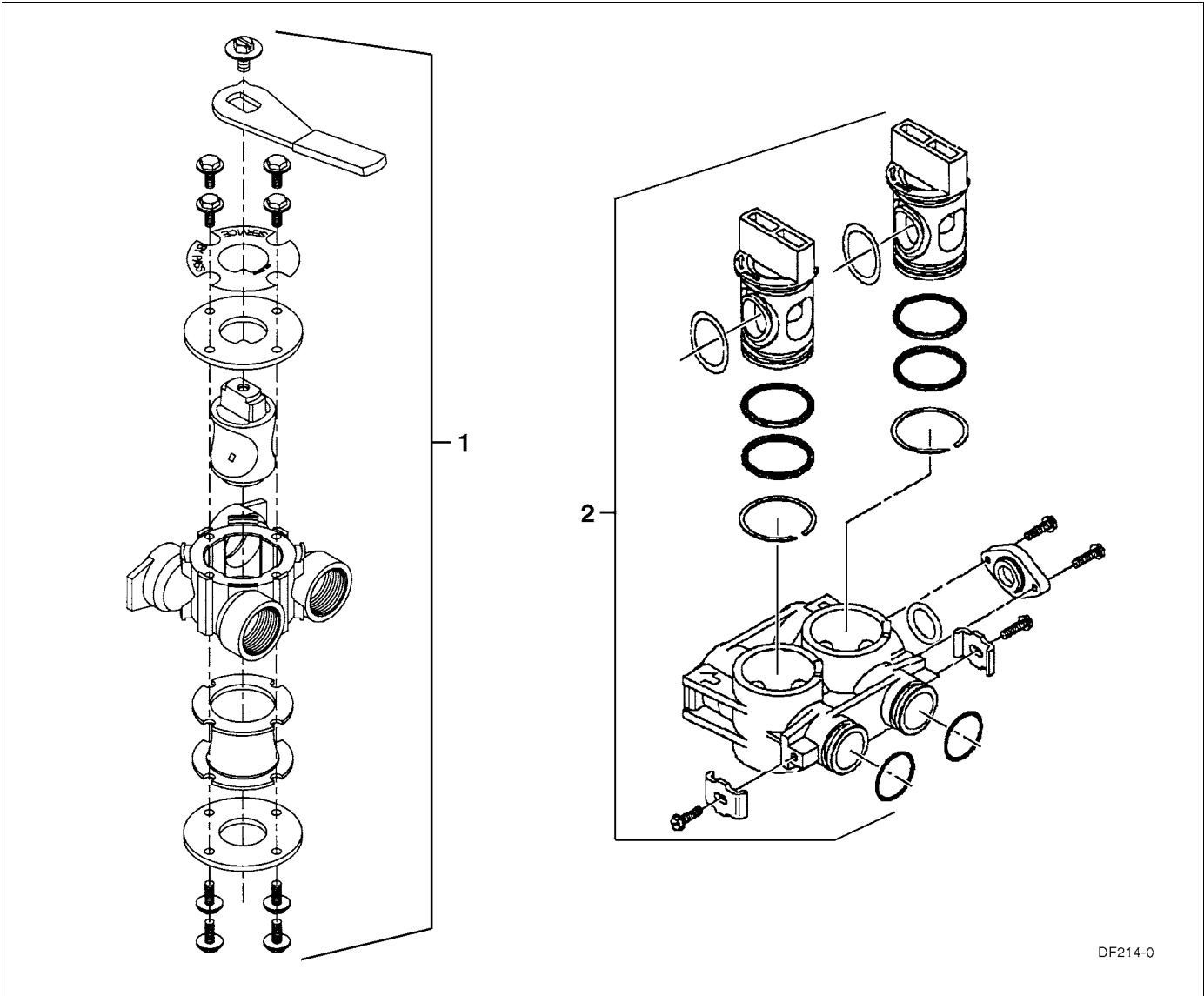


Figure 34

Item	Quantity	Part Number	Description
1	1	60040SS	3/4" bypass valve NPT
		60040-10	3/4" bypass valve BSP
		60041SS	1" bypass valve NPT
		60041-10	1" bypass valve BSP
2	1	60049	plastic bypass valve
Not Shown			
3		40157	plastic bypass T-handle wrench

2310 Safety Brine Valve

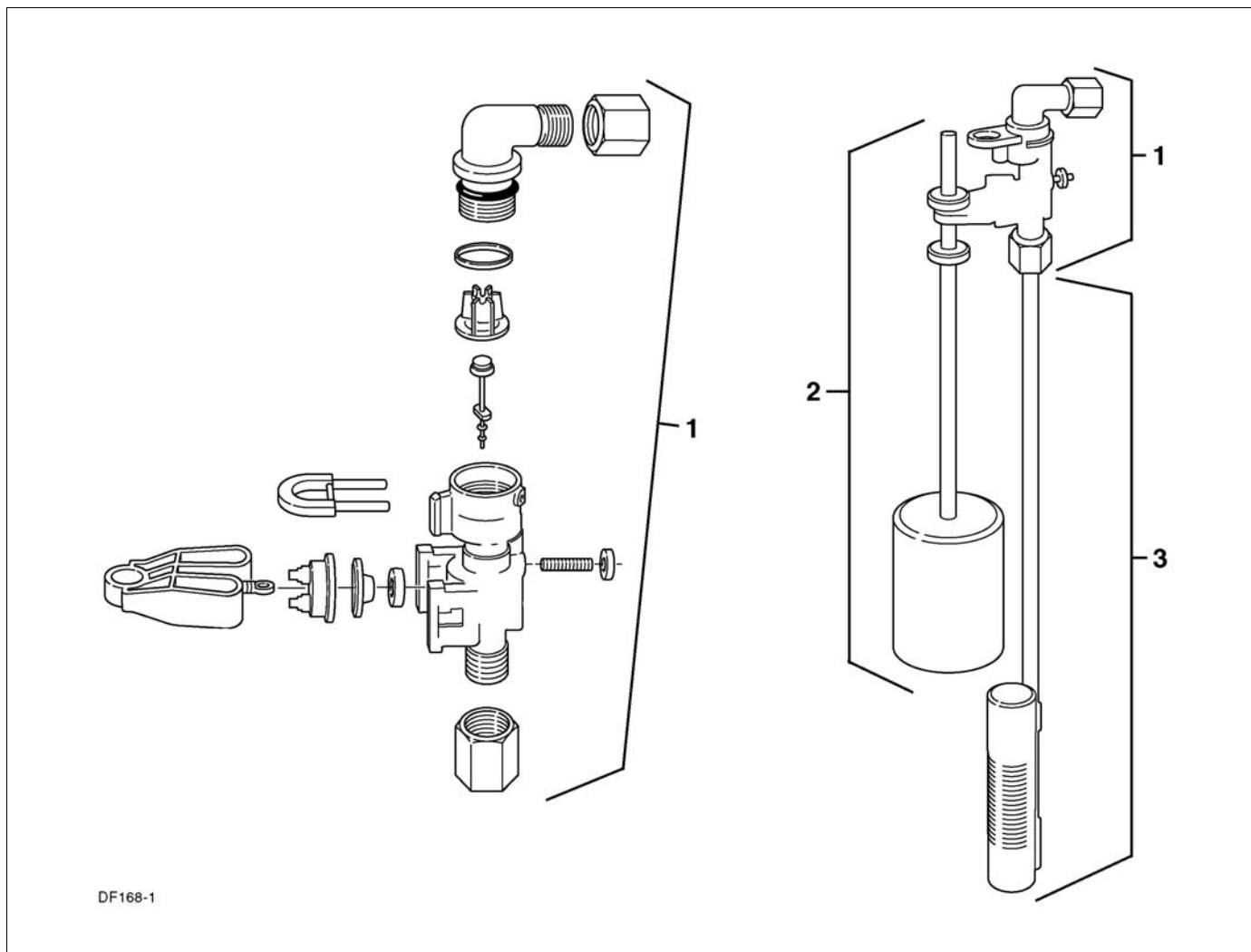


Figure 35

Item	Quantity	Part Number	Description
1	1	60014	2310 safety brine valve
2	1	60068	2310 float assembly
		60026-30	float assembly red/white (float fill)
3	1	60002	#500 air check

Water Conditioner Flow Diagrams

In Service Position

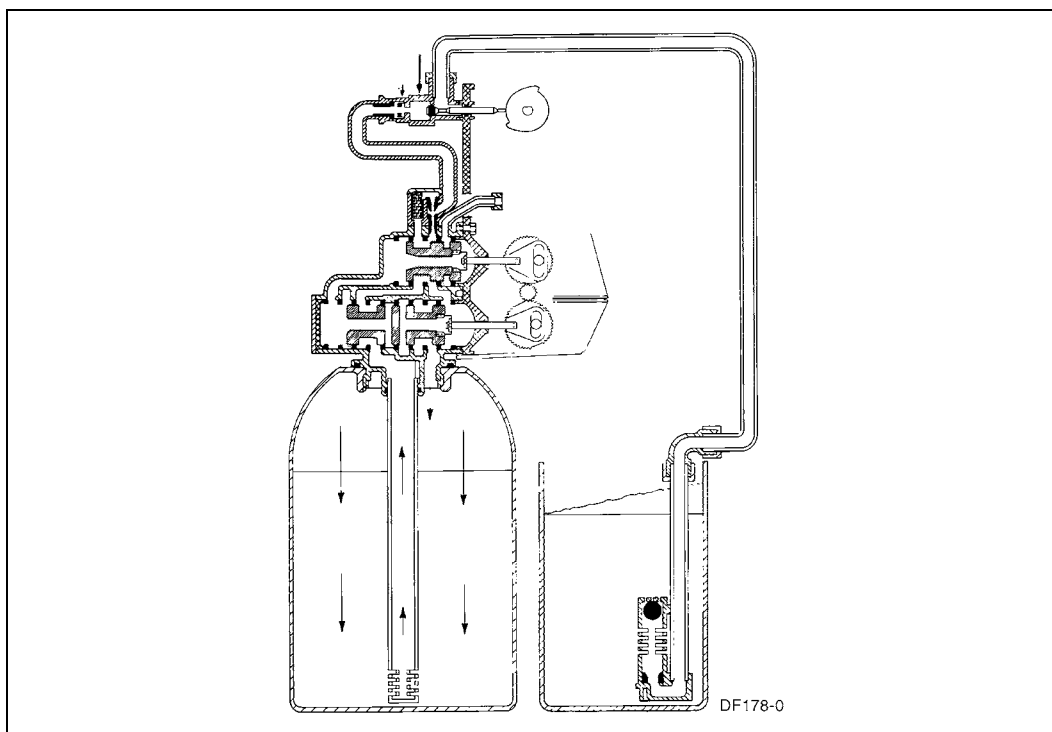


Figure 38: In Service Position

Tanks Switching

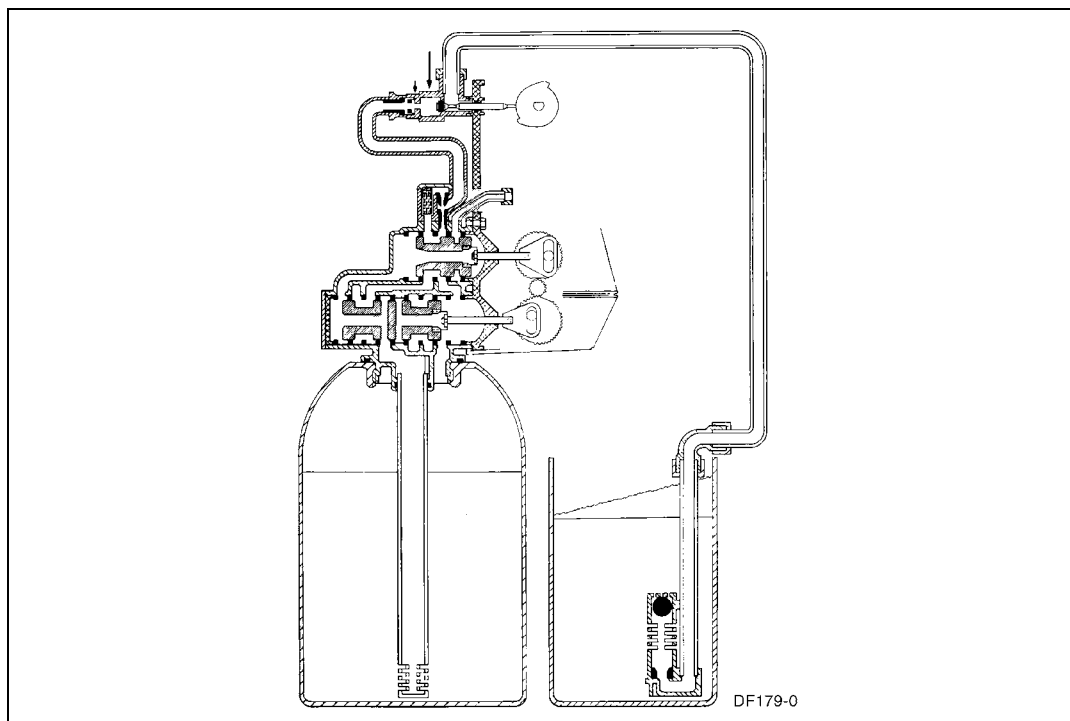


Figure 39: Tanks Switching, Meter Initiated Regeneration

Backwash

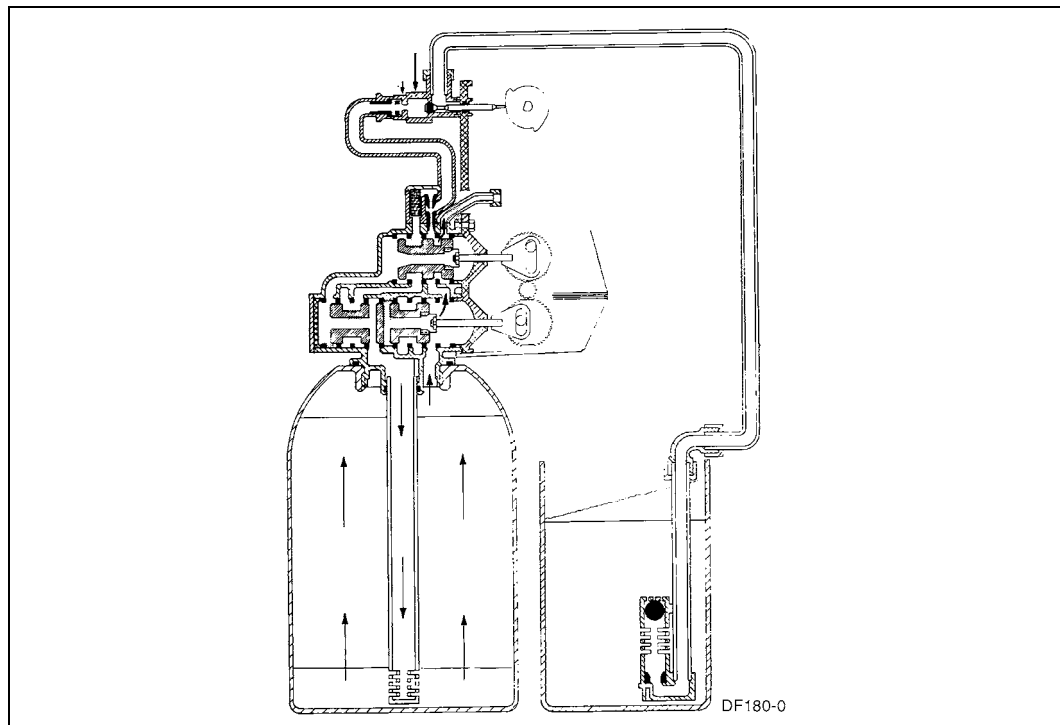


Figure 40: Backwash Position

Brine Draw

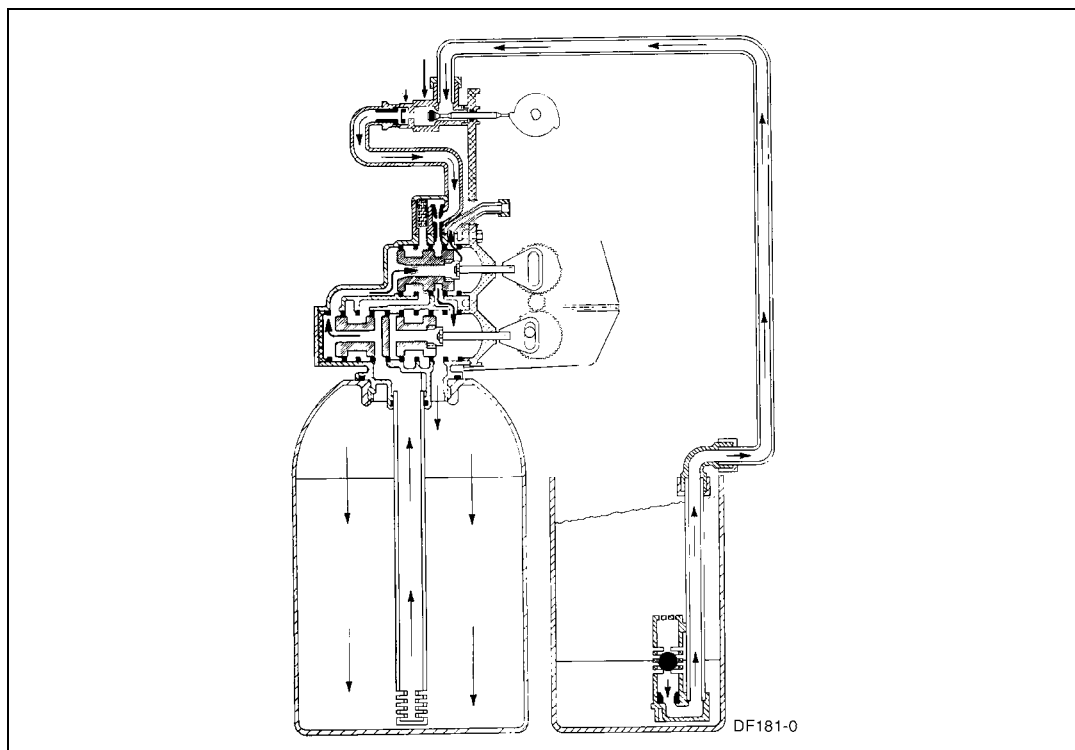


Figure 41: Brine Draw

Slow Rinse

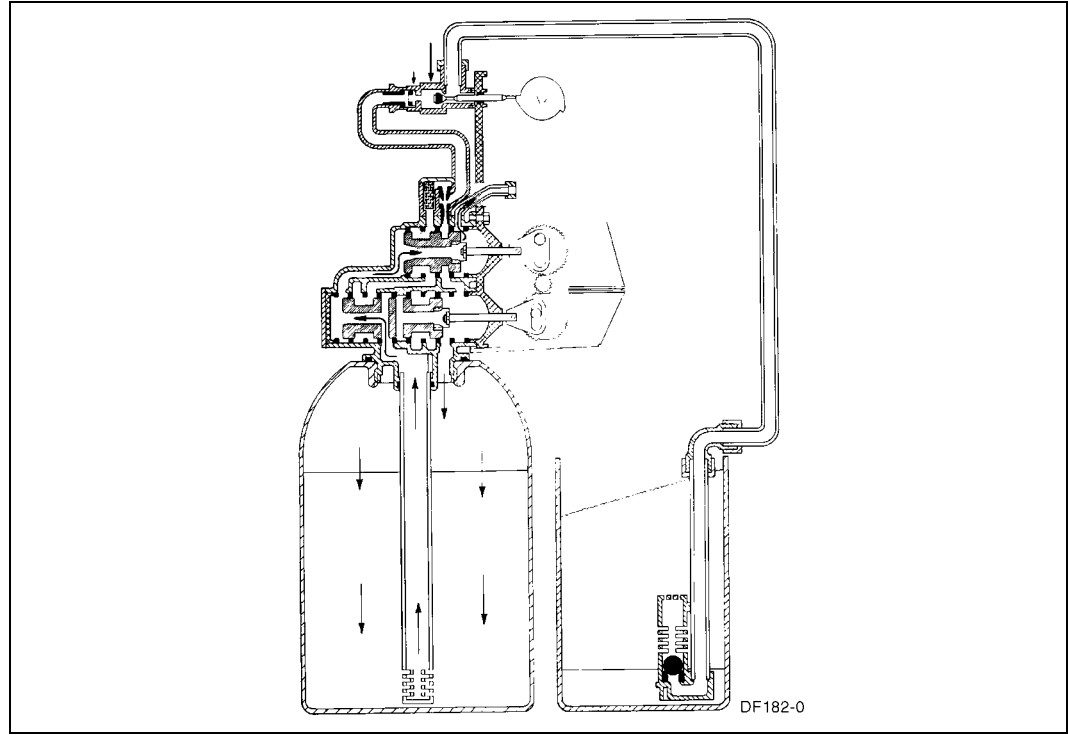


Figure 42: Slow Rinse

Rapid Rinse

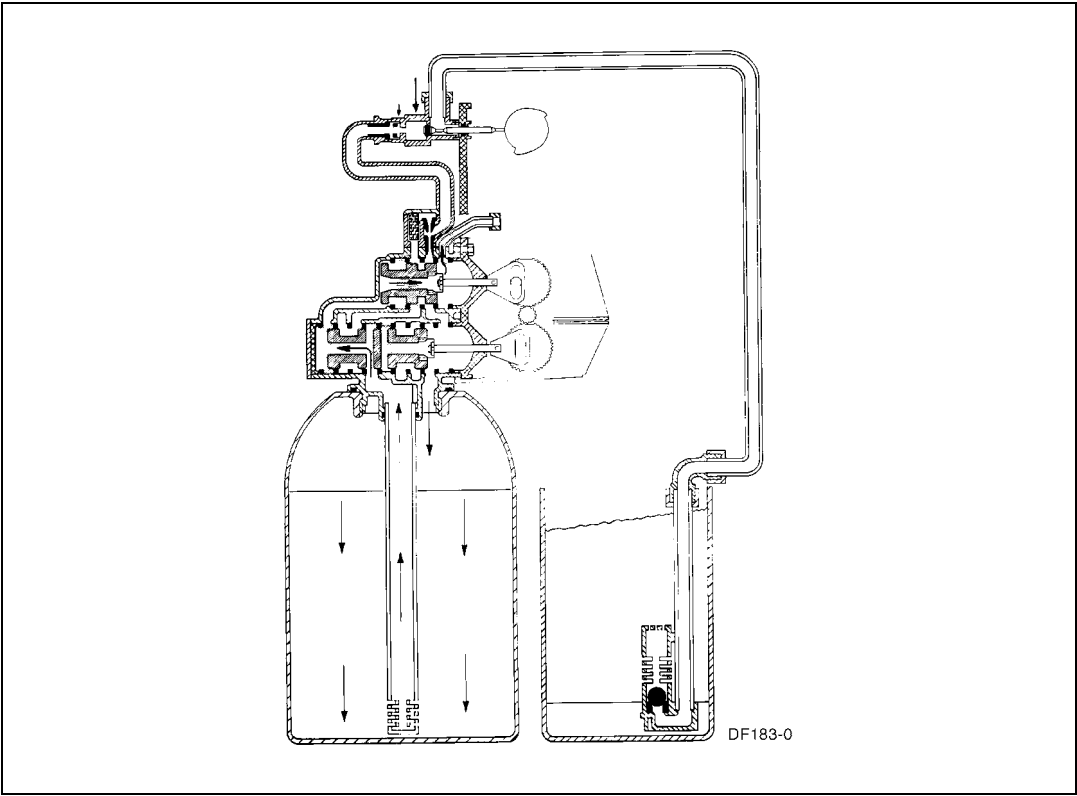


Figure 43: Rapid Rinse

Brine Tank Fill Position

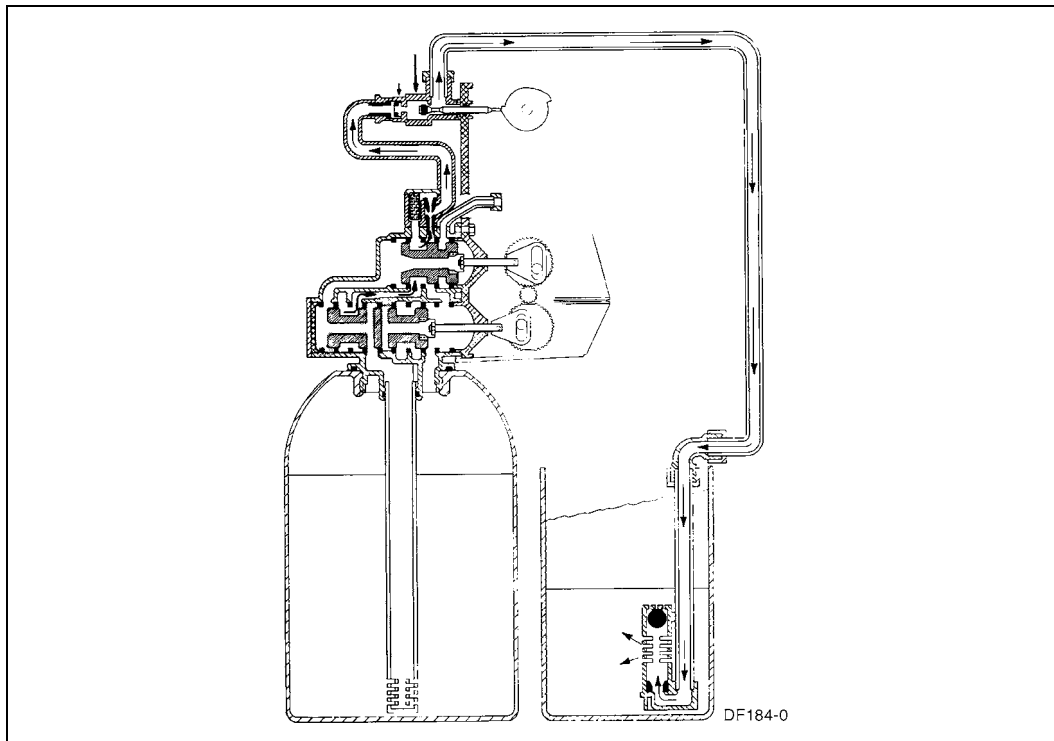


Figure 44: Brine Tank Fill Position

In Service, Tanks Switched

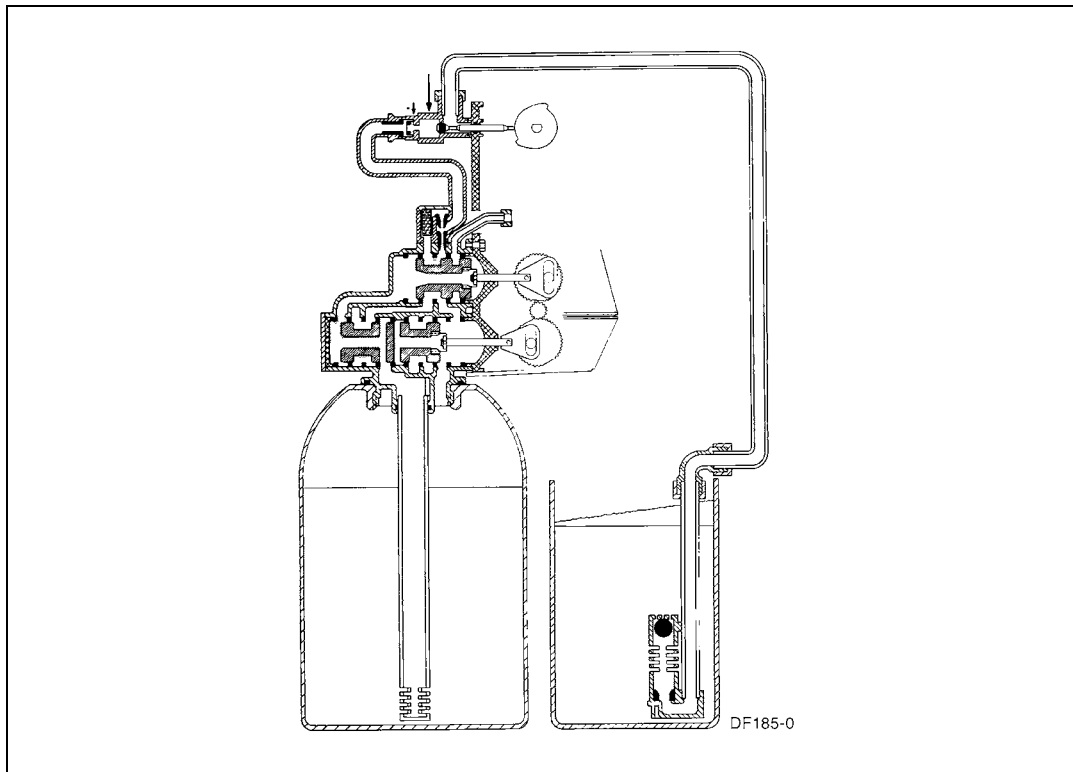


Figure 45: In Service, Tanks Switched

Troubleshooting

PROBLEM	CAUSE	CORRECTION
1. Softener fails to regenerate.	A. Electrical service to unit has been interrupted. B. Timer is defective.	A. Assure permanent electrical service (check fuse, plug, pull chain or switch). B. Replace timer.
2. Hard water.	A. Bypass valve is open. B. No salt in brine tank. C. Injector screen plugged. D. Insufficient water flowing into brine tank. E. Hot water tank hardness. F. Leak at distributor tube. G. Internal valve leak.	A. Close bypass valve. B. Add Salt to brine tank and maintain salt level above water level. C. Clean injector screen. D. Check brine tank fill time and clean brine line flow control if plugged. E. Repeated flushing of the hot water tank is required. F. Make sure distributor tube is not cracked. Check O-Ring and tube pilot. D. Replace seals and spacers and/or piston.
3. Unit used too much salt.	A. Improper salt setting. B. Excessive water in brine tank.	A. Check salt usage and salt setting. B. See Problem No. 7.
4. Loss of water pressure.	A. Iron buildup in line to water conditioner. B. Iron buildup in water conditioner. C. Inlet of control plugged due to foreign material broken loose from pipe by recent work done on plumbing system.	A. Clean line to water conditioner. B. Clean control and add mineral cleaner to mineral bed. Increase frequency of regeneration and/or backwash time. C. Remove pistons and clean control.
5. Loss of mineral through drain line.	A. Air in water system. B. Drain line flow control too large.	A. Assure that well system has proper air eliminator control. Check for dry well condition. B. Check to ensure drain line flow control is sized properly for your mineral tank.
6. Iron in conditioned water.	A. Fouled mineral bed.	A. Check backwash, brine draw and brine tank fill. Increase frequency of regeneration.
7. Excessive water in brine tank.	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. F. Power loss during brine fill.	A. Check flow control. B. Clean injector and screen. C. Replace timer. D. Replace brine valve seat and clean valve. E. Clean brine line flow control. F. Check power source.

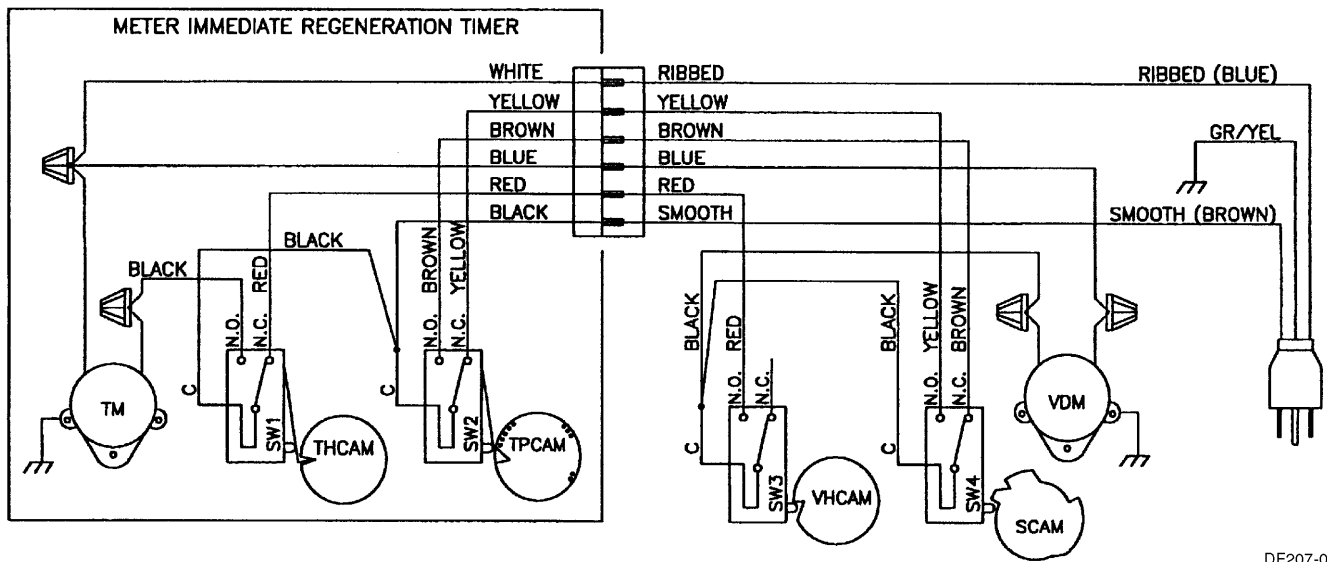
PROBLEM	CAUSE	CORRECTION
8. Softener fails to draw brine.	A. Drain line flow control is plugged. B. Injector is plugged. C. Injector screen plugged. D. Line pressure is too low. E. Internal Control Leak	A. Clean drain line flow control. B. Clean injector. C. Clean screen. D. Increase line pressure to 25 psi min. E. Change seals, spacers and piston assembly.
9. Control cycles continuously.	A. Broken or shorted switch.	A. Determine if switch or timer is faulty and replace it, 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 assembly.

General Service Hints

Problem: Softener delivers hard water

PROBLEM	CAUSE	CORRECTION
Softener delivers hard water.	Reserve capacity has been exceeded. Program wheel is not rotating with meter output. Meter is not measuring flow.	Check salt dosage requirements and reset program wheel to provide additional reserve. 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. 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 75 gallons on 1-1/2" installations. If not performing properly, replace meter.

Mechanical Timer Valve Wiring



TM - TIMER MOTOR

VDM - VALVE DRIVE MOTOR

SW1 - TIMER HOMING SWITCH

SW2 - TIMER PROGRAM SWITCH

SW3 - VALVE HOMING SWITCH

SW4 - VALVE PROGRAM SWITCH

THCAM - TIMER HOMING CAM

TPCAM - TIMER PROGRAM CAM

Figure 46

9100 Control Dimensions

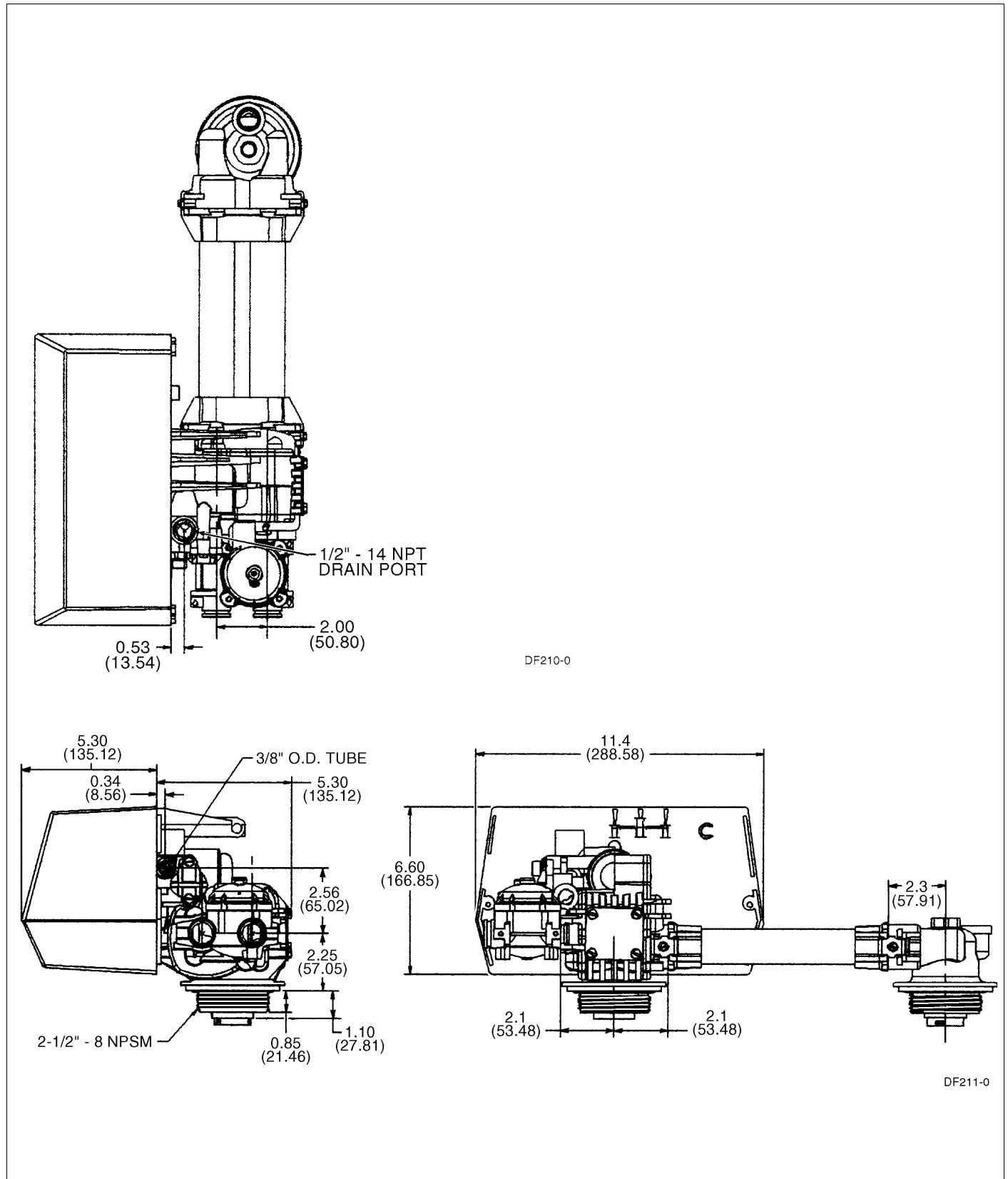


Figure 50

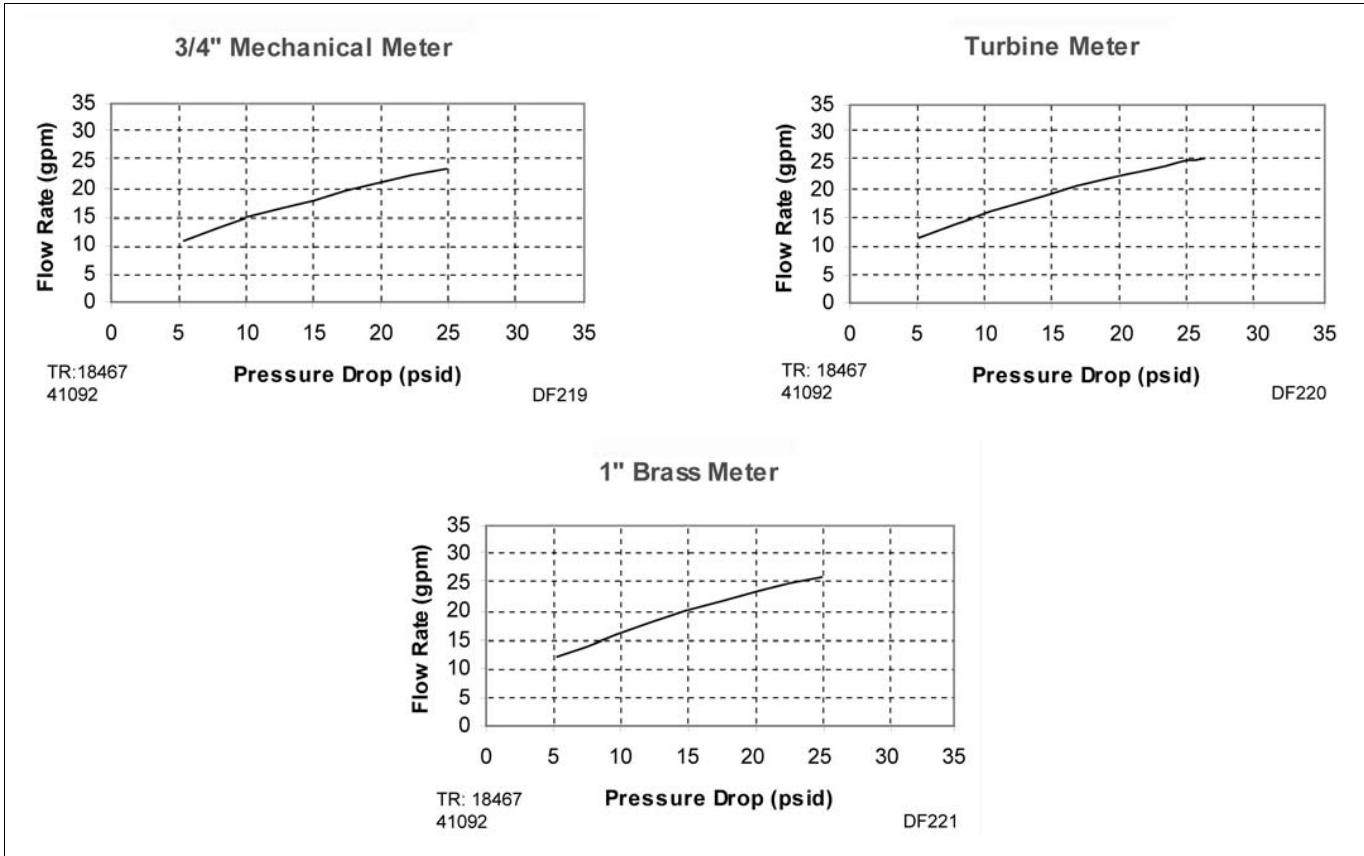


Figure 53: 9100 Meter Flow Data

Injector Flow Data

9100

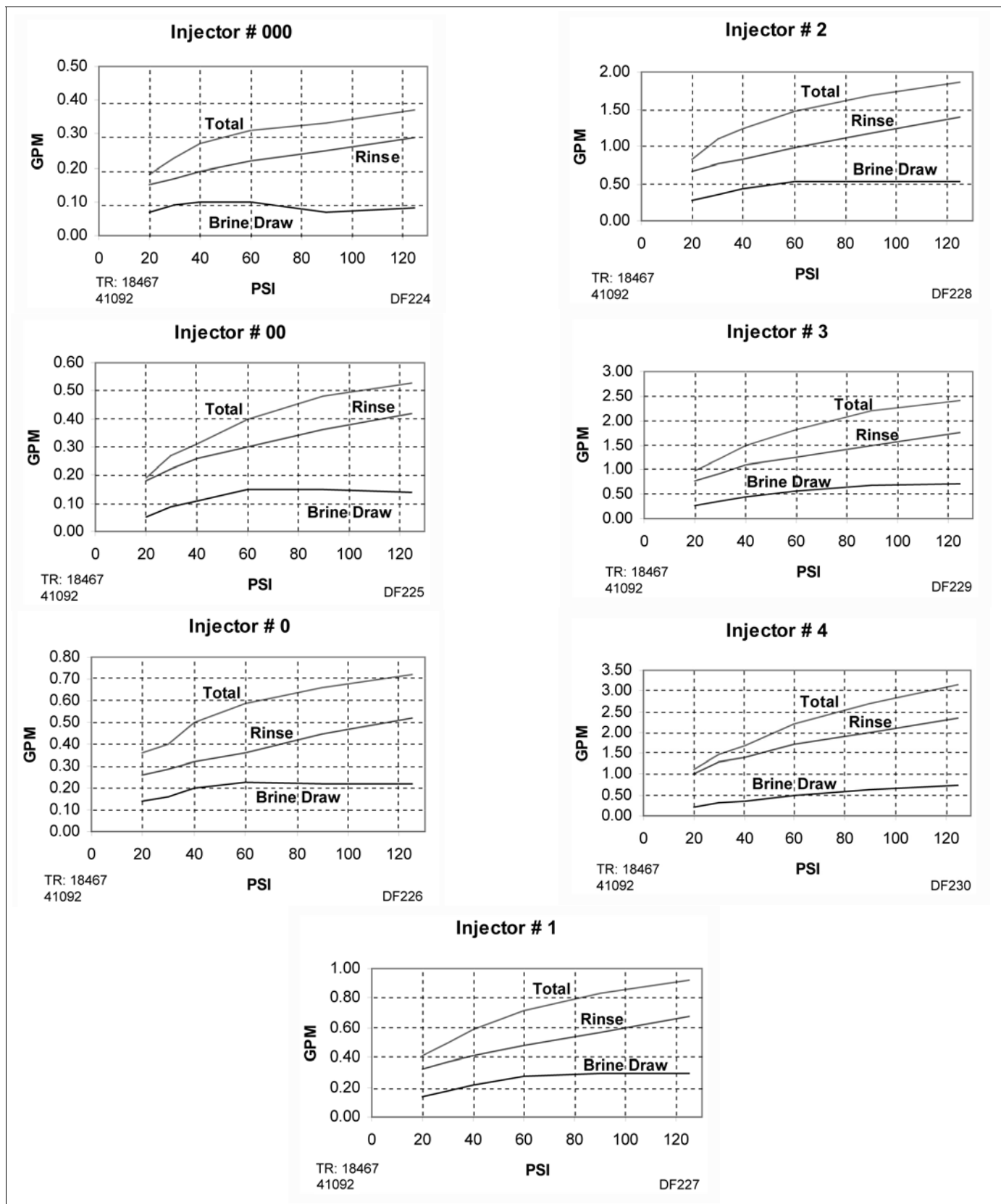


Figure 55: 9000/9100—1600 Series Injectors

CALIFORNIA PROPOSITION 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. (California law requires this warning to be given to customers in the State of California.)

For more information: www.watts.com/prop65

LIMITED WARRANTY: Certain Watts Pure Water products come with a limited warranty from Watts Regulator Co. Other products may have no warranty or are covered by the original manufacturer's warranty only. For specific product warranty information, please visit www.watts.com or the published literature that comes with your product. Any remedies stated in such warranties are exclusive and are the only remedies for breach of warranty. **EXCEPT FOR THE APPLICABLE PRODUCT WARRANTY, IF ANY, WATTS MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, WATTS HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND IN NO EVENT SHALL WATTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR PROPERTY DAMAGE, REGARDLESS OF WHETHER IT WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES.**



A Watts Water Technologies Company

USA: Tel. (800) 224-1299 • www.watts.com

Canada: Tel. (888) 208-8927 • www.watts.ca