

Model 7000

Service Manual



IMPORTANT: Fill in pertinent information on *page 3* for future reference.

Model 7000

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Water Softener Control Valve

Water Pressure

A minimum of 25 psi inlet 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.

	<p>CAUTION</p> <ul style="list-style-type: none">• Minimum water pressure 20 psig.• Maximum water pressure 125 psig.• Minimum water temperature 34° F.• Maximum water temperature 110° F.• Ambient temperature 34° to 122° F (1° to 50° C)• Disconnect all power sources before servicing.• Always operate with cover in place.
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NOTE: This product should be installed by qualified personnel.
Comply with all plumbing codes when installing this product.
Comply with all electrical codes when installing this product.

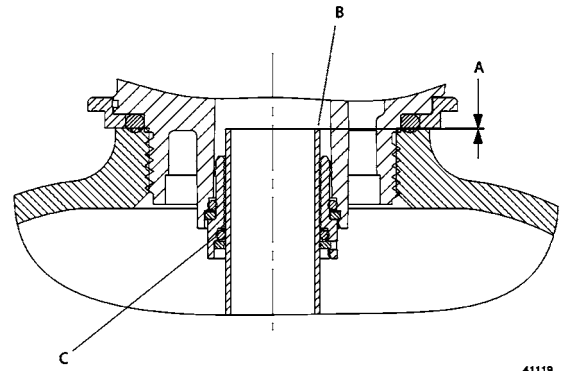
	<p>WARNING</p> <p>The controller MUST be depressurized before removing any quick connection clips for servicing. The connector should be pushed toward the control while removing clips.</p>
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Valve Installation and Start-up Procedures

Installation Instructions

1. Place the softener tank where you want to install the unit.
NOTE: Be sure the tank is level and on a firm, clean base.
2. Perform all plumbing according to local plumbing codes.
3. Cut the 1.05" (32mm) distributor tube flush with the top of the tank (A).
 - Deburr the outside of the tube (B) after cutting.
 - Lubricate the o-ring (C) with non-petroleum based oil.
4. Lubricate the distributor O-ring seal and tank O-ring seal. Use only non-aerosol silicone lubricant.
5. Load media and place the control valve on the tank.
6. All soldering **MUST** be done on any connections requiring soldering prior to connecting the main control valve. The main control valve will be damaged if it is connected at the time of soldering.
7. Apply **Teflon** tape to all threaded fittings.
8. On units with a bypass, place in **Bypass** position.
 - 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. Close the water tap when water runs clean.
9. Make plumbing connections to valve.
10. Plug the valve into an approved power source.
NOTE: Make all electrical connections according to codes.
11. Place the bypass **In Service** position. Cycle the valve to the Backwash position, and let the water flow slowly into the mineral tank until the air is purged from the unit.
12. Add water to the brine tank until the top of the air check is covered. Manually step the valve to the Brine Draw Position, and allow the valve to draw water from the brine tank until it stops.
NOTE: The air check will check at approximately the midpoint of the screened intake area.
13. Manually step the valve to the Brine Refill Position, and allow the valve to return to **In Service** automatically.
14. With the valve **In Service**, check that there is at least 1" of water above the grid in the brine tank, if used.
15. Fill the brine tank with salt.
16. Allow the control to run automatically. Setup is now complete.



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7000 Control Operation and Settings

Display

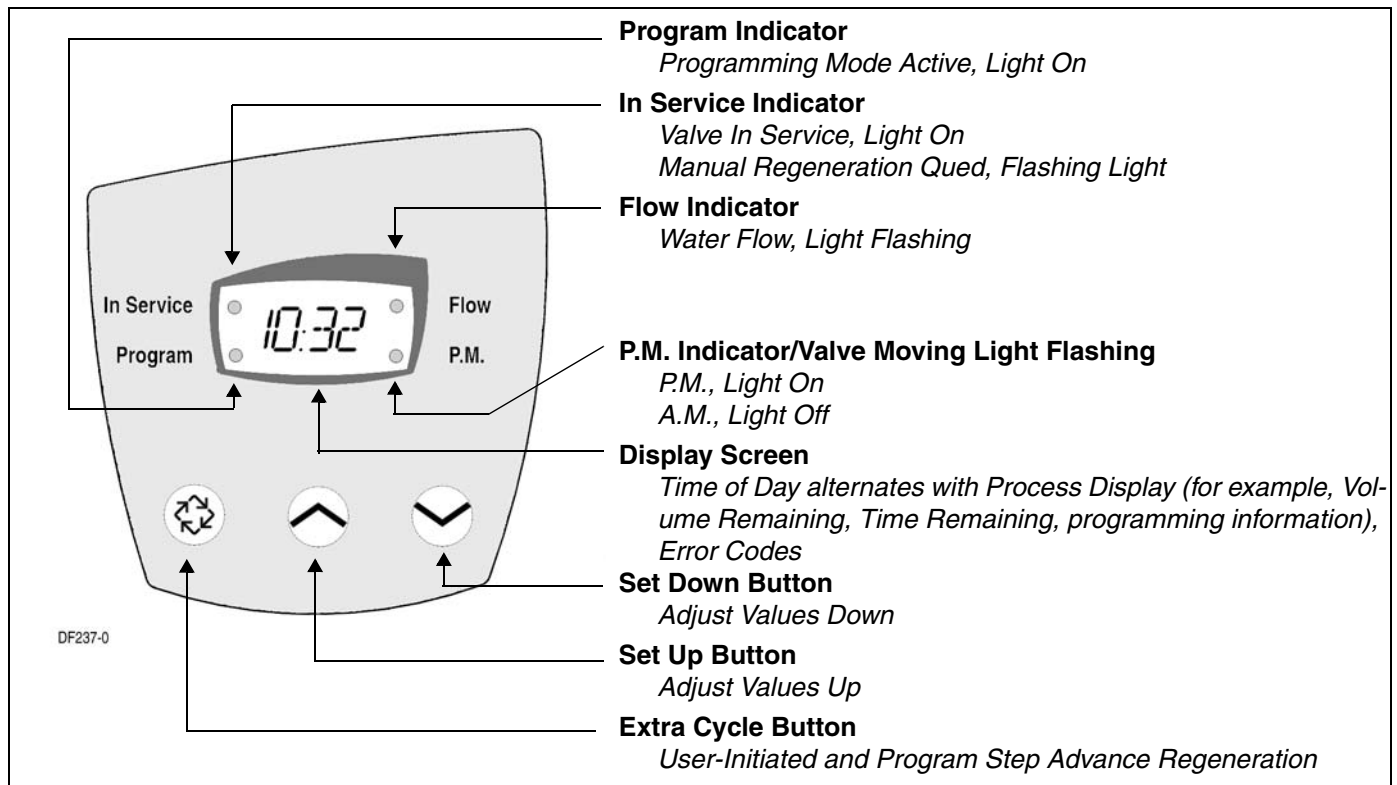


Figure 1: Control Panel and Display

Time Clock Regeneration Valves

In normal operation the Time of Day Display may be viewed at all times. The control operates for a preset number of days between **Regeneration** cycles. When the number of days since the last **Regeneration** reaches the preset number of days, a **Regeneration** cycle initiates at the preset **Regeneration Time**.

NOTE: Program the number of days between **Regeneration** cycles and the **Regeneration** time using the [7000 Control Start-Up Procedures, page 8](#).

Flow Meter Equipped Valves – General

Flow meter equipped valves calculate the volume of water that the system can treat between **Regeneration** cycles based on the system capacity which is preset by the system manufacturer in a Master Programming Mode and the feed water hardness which is programmed in the Start-Up procedure safety factor (Master Mode only).

The remaining system capacity displays in gallons or liters. The display has a range of 0 to 9999 (gallons or liters). If the remaining capacity exceeds 9999 liters when in the Metric Mode, then the display changes to millions of liters and a letter t is displayed as the first digit. The display then has a range of t1.0 (1,000,000) to t1.9 (1,900,000).

Flow Meter Equipped Valves – Immediate Regeneration Mode

The **Time Of Day** display alternates with the **Volume Remaining** display in gallons or liters. The Meter dot flashes in direct relation to the water flow rate through the unit. As treated water is used, the **Volume Remaining** display counts down from a maximum value to zero and initiates a **Regeneration** cycle.

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Flow Meter Equipped Valves – Delayed Regeneration Mode

In Normal operation the **Time Of Day** display alternates with the **Volume Remaining** display. The flow dot flashes in direct relation to the water flow rate through the unit. As treated water is used, the **Volume Remaining** display counts down from a maximum value to zero. If the reserve is reached, a **Regeneration** queues. The display shows all dashes if the entire volume is depleted before the scheduled **Regeneration** time. At the preset **Regeneration Time**, a **Regeneration** cycle initiates.

Control Operation During Regeneration

In **Regeneration** the display shows the **Regeneration** status two ways:

- When the valve advances to the next position, the display flashes the number of that next position followed by three dashes.
- Once the valve reaches a position the display shows that position and number of minutes left in that **Regeneration** step.

NOTE: If the step time exceeds 100, the leading digit flashes.

- Once all **Regeneration** steps are complete, the valve returns to **In Service** and resumes normal operation.

NOTE: Pressing the Extra Cycle Button during a **Regeneration** cycle immediately advances the valve to the next cycle step position and resumes normal step timing.

Control Operation During Programming

The control enters Program Mode with the valve **In Service**. While in Program Mode the control continues to operate normally, monitoring water usage and keeping all displays up to date. Control programming is stored in memory permanently. There is no need for battery backup power.

Control Operation During a Power Failure

During a power failure all control displays and programming are stored for use upon power re-application. An inaccurate or flashing **Time of Day** display indicates that a power outage has occurred. During power failure the control:

- Is fully inoperative and any calls for **Regeneration** are delayed.
- Upon power re-application, resumes normal operation from the point that it was interrupted.
- Does not monitor the volume of water used during a power outage.
- In Delay Regeneration types, the reserve capacity is set to 1/3 the capacity.

Manually Initiating a Regeneration

A **Regeneration** cycle may be initiated manually (referred to as an Extra Regeneration Cycle). There are two options when starting an Extra Regeneration Cycle:

- Press and release the Extra Cycle Button:
 - Flow Meter - Immediate Regeneration controls immediately go into a **Regeneration** cycle.
 - For Time Clock and Flow Meter - Delayed Regeneration controls, the **In Service** dot begins to flash immediately and a **Regeneration** occurs at the pre-programmed **Regeneration** time.



Figure 2: Manually Initiated Regeneration

- Press and hold the Extra Cycle Button for five (5) seconds:
 - For Time Clock and Flow Meter - Delayed Regeneration controls, the control immediately begins the **Regeneration** cycle.

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7000 Control Start-Up Procedures

Set Time of Day

Press the **Set Up** and **Set Down** buttons to set time of day.

- Metric = 24 hour clock
- US = 12 hour clock with PM indicator light



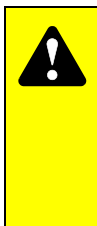
Figure 3: Set Time of Day

Enter Control Programming Mode

- Press and hold both the **Set Up** and **Set Down** buttons for five (5) seconds to enter Programming Mode. When the program mode is entered, the program dot turns on.



Figure 4: Enter Control Programming Mode



CAUTION

Do not set the time of day to 12:01 PM when entering the Start-Up programming mode. Doing so causes the control to enter the Master Programming Mode and alter the factory settings, resulting in a system malfunction.

The **7000** controller performs four (4) basic types of **Regeneration** systems. The type of system is selected by the system manufacturer and set in the Master Programming Mode. Basic systems are:

- **Time Clock**
 - The control operates for a preset number of days between **Regeneration** cycles. On the day that a **Regeneration** cycle is required the system regenerates at the preset Regeneration Time.
- **Meter Immediate**
 - The control regenerates immediately when the remaining capacity (volume of water that can be treated before a **Regeneration** is required) drops to zero (0).
- **Meter Delayed**
 - The control regenerates on the day that the remaining capacity drops to less than the reserve volume. **Regeneration** starts at the preset Regeneration Time.

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Programming a Meter Delayed Regenerated System

1. Feed water hardness (Display Code H).

NOTE: The feed water hardness setting only displays when the system is set to operate as a Meter Immediate or Meter Delayed system type.

- Press the **Set Up** or **Set Down** buttons to set the amount of feed water hardness in grains/gallon (U.S.) or degrees (metric). The system automatically calculates treated water capacity based on the feed water hardness and the system capacity preset in the Master Programming mode. "Calc" is displayed during calculations.

Example:

Range: 4 – 199 U.S. and metric

- To program 9 grains / gallon (U.S.) or 9 degrees (metric) [**H - 9**]
- Press the **Set Up** and **Set Down** buttons to adjust this value.
- Press the **Extra Cycle** button once to advance to the next step.



Figure 5: Feed Water Hardness

2. Regeneration Time (No display Code)

NOTE: The Regeneration Time setting does not display in Meter Immediate Regeneration Mode since the system regenerates immediately when the available capacity reaches zero (0).

Identify the Regeneration Time display by observing a non-flashing colon between two sets of numbers. Set the desired time of day for **Regeneration** to occur.

Example:

2 o'clock A.M. regeneration time: [2:00] (P.M. Indicator Dot Off)

- Press the **Set Up** and **Set Down** buttons to adjust this value.
- Press the **Extra Cycle** button to exit the programming mode or press and hold the **Set Up** and **Set Down** buttons simultaneously for five (5) seconds to enter the Extended Setup Programming Mode.



Figure 6: Regeneration Time

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3. EXTENDED Programming Mode

Regeneration Cycle Step Programming (Display Code 1 to 6)

Use this feature to program the Regeneration Cycle step times. The Regeneration Cycle Step being programmed appears in the first digit of the display. Each display is used to set the duration time in minutes of that specific step in the regeneration cycle.

Example:

Cycle Step	dF	dFFF	FLtr
1	10 = Backwash	12 = Refill	10 = Backwash
2	60 = Brine Draw	60 = Brine Making	10 = Rapid Rinse
3	5 = 2nd Backwash	10 = Backwash	
4	10 = Rapid Rinse	60 = Brine Draw	
5	12 = Refill	5 = 2nd Backwash	
6		10 = Rapid Rinse	

- Use the **Set Up** and **Set Down** buttons to adjust this value.
- Press the **Extra Cycle** button to advance to the extended diagnostics.

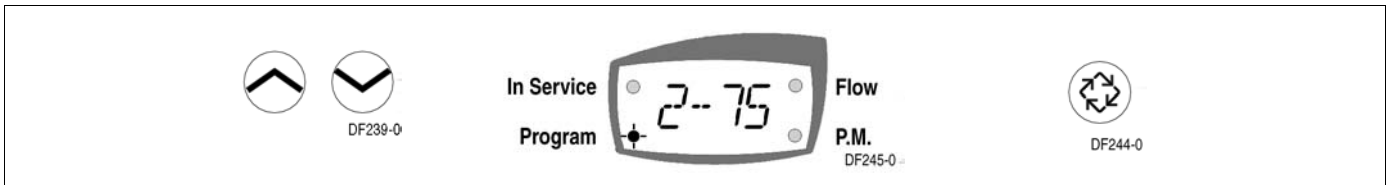


Figure 7: Extended Programming Mode

4. Extended Diagnostics Mode (Viewable Only)

(Dy xx) Display Code xx = days since last **Regeneration**

- Press the **Extra Cycle** button once to advance to the next diagnostics.

(xxxx) No Display code xxxx = volume used since the last **Regeneration**. **(yyyy) No Display code yyyy** Reserve Volume.

- Press the **Extra Cycle** button once to Exit Extended Setup Programming Mode.

Control Programming Complete



Figure 8: Extended Diagnostics Mode

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Programming a Meter Immediate Regenerated System

1. Feed water hardness (Display Code H).

The feed water hardness setting displays only if the system is set to operate as a Meter Immediate or Meter Delayed system type.

- Press the **Set Up** and **Set Down** buttons to set the amount of feed water hardness (grains/gallon or degrees). The system automatically calculates treated water capacity based on the feed water hardness and the system capacity preset in the Master Programming mode.

Example:

Range: 4 – 199 US and Metric

- To program 9 grains / gallon (US) or 9 degrees (Metric) [**H – 9**]
- Press the **Set Up** and **Set Down** buttons to adjust this value.
- Press the **Extra Cycle** button once to Exit Setup Programming Mode or press and hold the Up and Down buttons simultaneously for five (5) seconds to enter the Extended Setup Programming Mode.

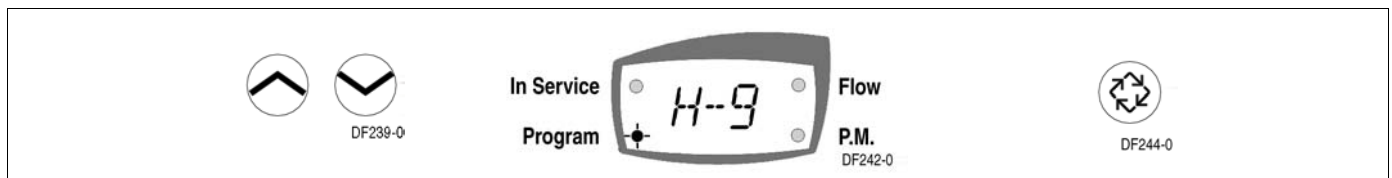


Figure 9: Feed Water Hardness

2. EXTENDED Programming Mode

Regeneration Cycle Step Programming (Display Code 1 – 6)

This Program Step is used to program the Regeneration Cycle step times. The Regeneration Cycle Step being programmed is displayed in the first digit of the display. Each display is used to set the duration time in minutes of that specific step in the **Regeneration** cycle.

Example:

Cycle Step	dF	dFFF	FLtr
1	10 = Backwash	12 = Refill	10 = Backwash
2	60 = Brine Draw	60 = Brine Making	10 = Rapid Rinse
3	5 = 2nd Backwash	10 = Backwash	
4	10 = Rapid Rinse	60 = Brine Draw	
5	12 = Refill	5 = 2nd Backwash	
6		10 = Rapid Rinse	

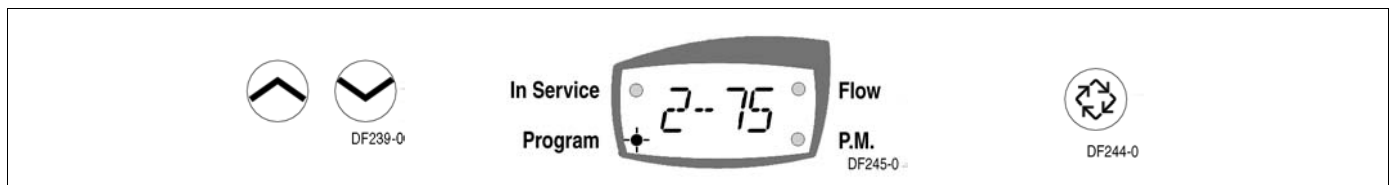


Figure 10: Extended Programming Mode

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3. Extended Diagnostics Mode (Viewable Only)

(Dy xx) Display Code xx = days since last **Regeneration**

— Press the **Extra Cycle** button once to advance to the next diagnostics.

(xxxx) No Display code xxxx = the volume used since the last **Regeneration**

— Press the **Extra Cycle** button once to Exit Extended Setup Programming Mode.

Control Programming Complete



Figure 11: Extended Diagnostics Mode

Programming a Time Clock Regenerated System

1. Regeneration Time (No Display Code)

The Regeneration Time display can be identified by observing a non-flashing colon between two sets of numbers. Set the desired time of day that you want **Regeneration** to occur.

Example:

2 o'clock A.M. regeneration time: [2:00] (P.M. Indicator Dot Off)

— Use the **Set Up** and **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button to proceed to the next step.



Figure 12: Regeneration Time

2. Regeneration Day (Display code A)

Use this display to set the number of days between **Regeneration** cycles. This setting is identified by observing the letter "A" in the first digit. In the Time Clock regeneration mode, the system regenerates at the time set in Step 1 on the programmed number of days.

Example:

Regeneration every 7 days [A -- 7]

— Use the **Set Up** and **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button once to Exit Setup Programming Mode or press and hold the **Set Up** and **Set Down** buttons simultaneously for five (5) seconds to enter the extended setup programming mode.

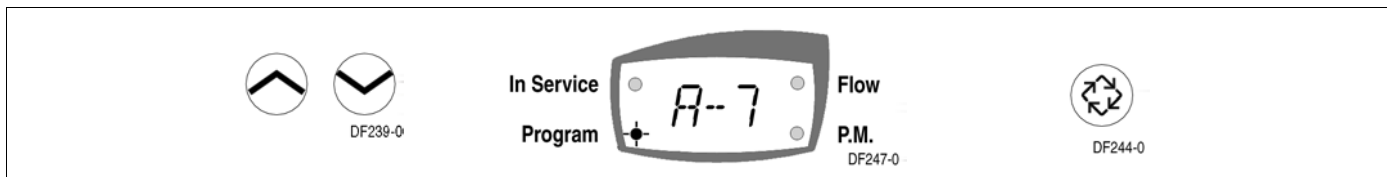


Figure 13: Regeneration Day

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3. Extended Programming Mode

Regeneration Cycle Step Programming (Display Code 1 – 6)

This Program Step is used to program the Regeneration Cycle step times. The Regeneration Cycle Step being programmed is displayed in the first digit of the display. Each display is used to set the duration time in minutes of that specific step in the **Regeneration** cycle.

Example:

Cycle Step	dF	dFFF	FLtr
1	10 = Backwash	12 = Refill	10 = Backwash
2	60 = Brine Draw	60 = Brine Making	10 = Rapid Rinse
3	5 = 2nd Backwash	10 = Backwash	
4	10 = Rapid Rinse	60 = Brine Draw	
5	12 = Refill	5 = 2nd Backwash	
6		10 = Rapid Rinse	

- Use the **Set Up** and **Set Down** buttons to adjust this value.
- Press the **Extra Cycle** button once to proceed to the diagnostics.

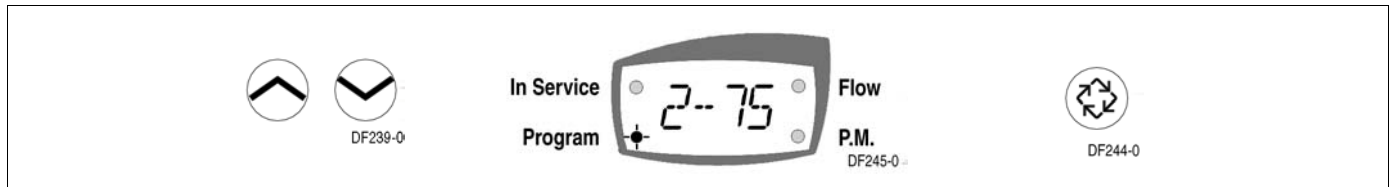


Figure 14: Extended Programming Mode

4. Extended Diagnostics Mode (Viewable Only)

(Dy xx) Display Code xx = days since last Regeneration

- Press the **Extra Cycle** button once to advance to the next diagnostics.
- Press the **Extra Cycle** button once to Exit Extended Setup Programming Mode.

Control Programming Complete



Figure 15: Extended Diagnostics Mode

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Water Conditioner Flow Diagrams

In Service Position

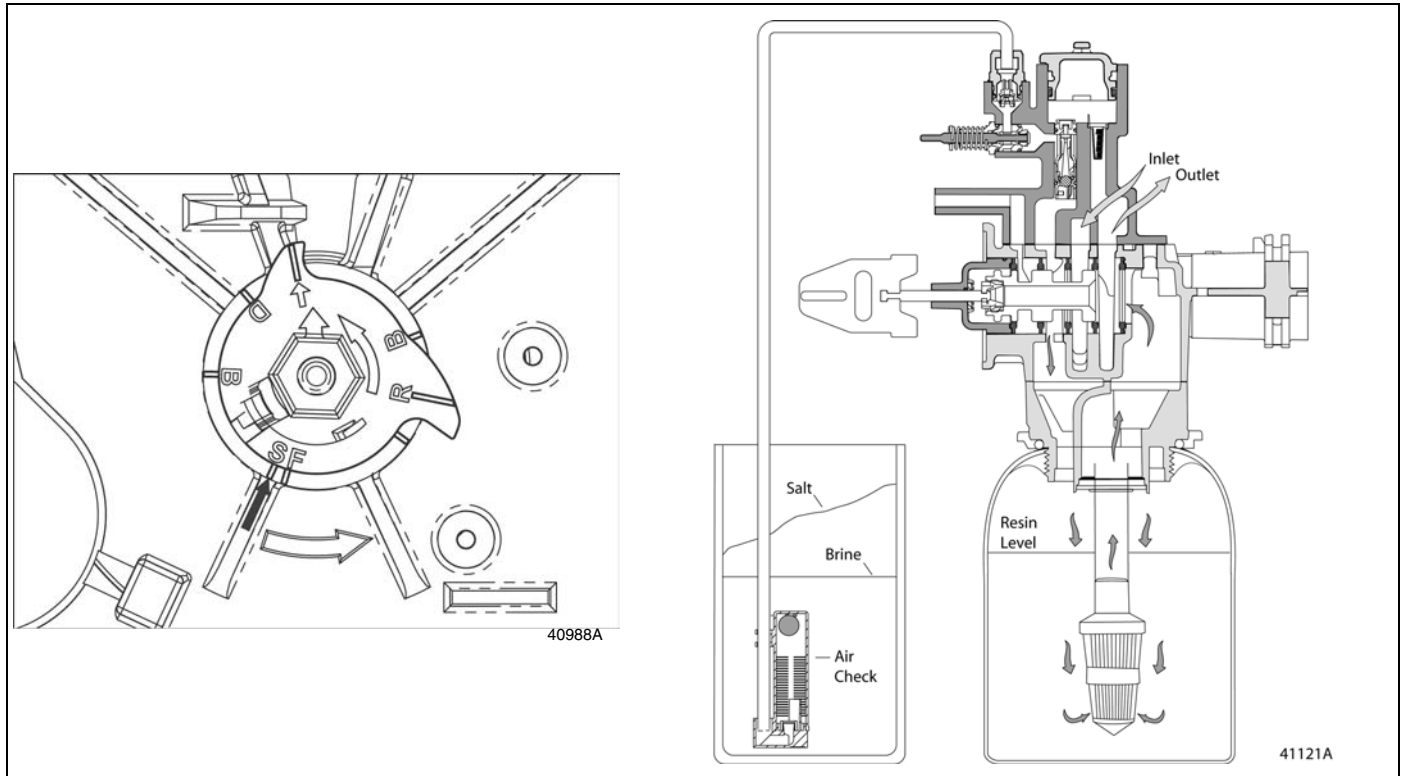


Figure 16: In Service Position

Backwash Position

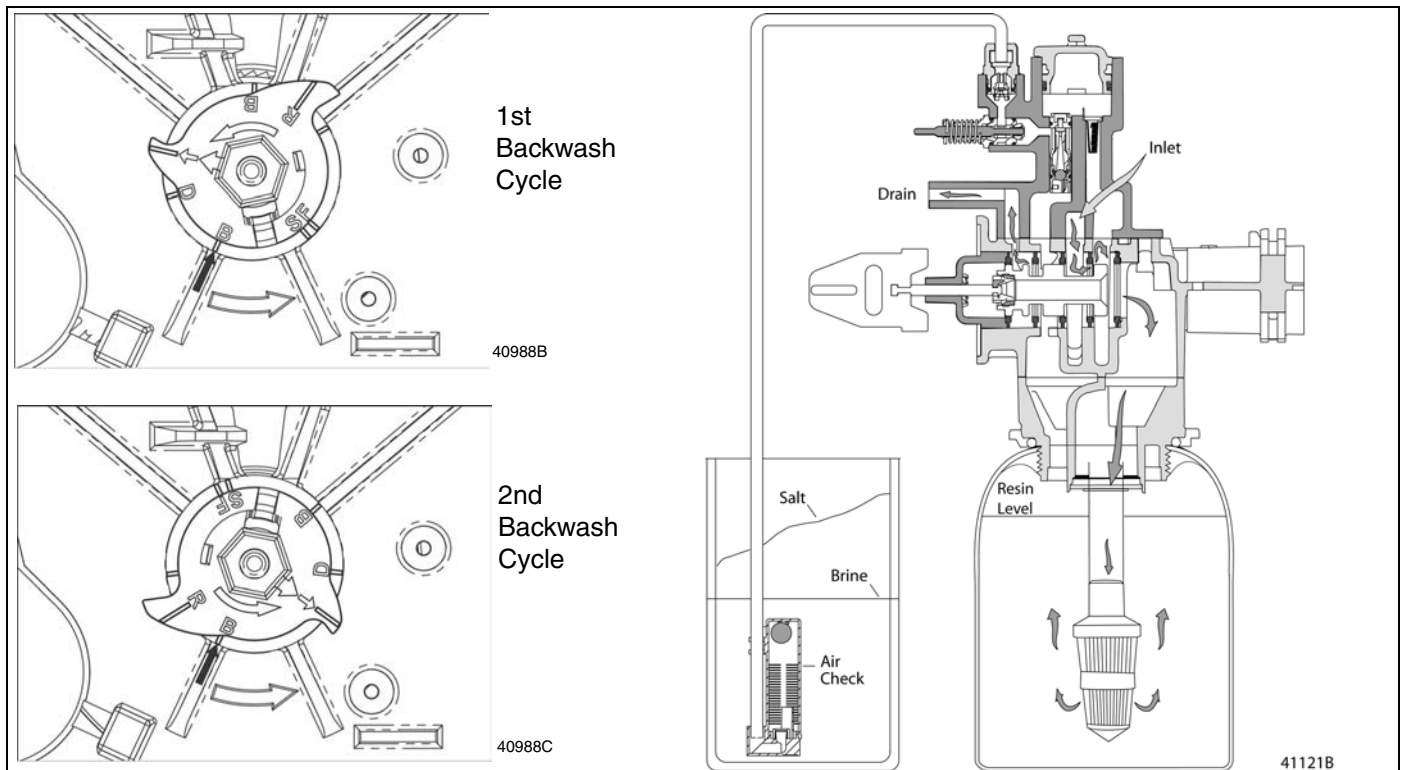


Figure 17: Backwash Position

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Water Conditioner Flow Diagrams

Brine Position

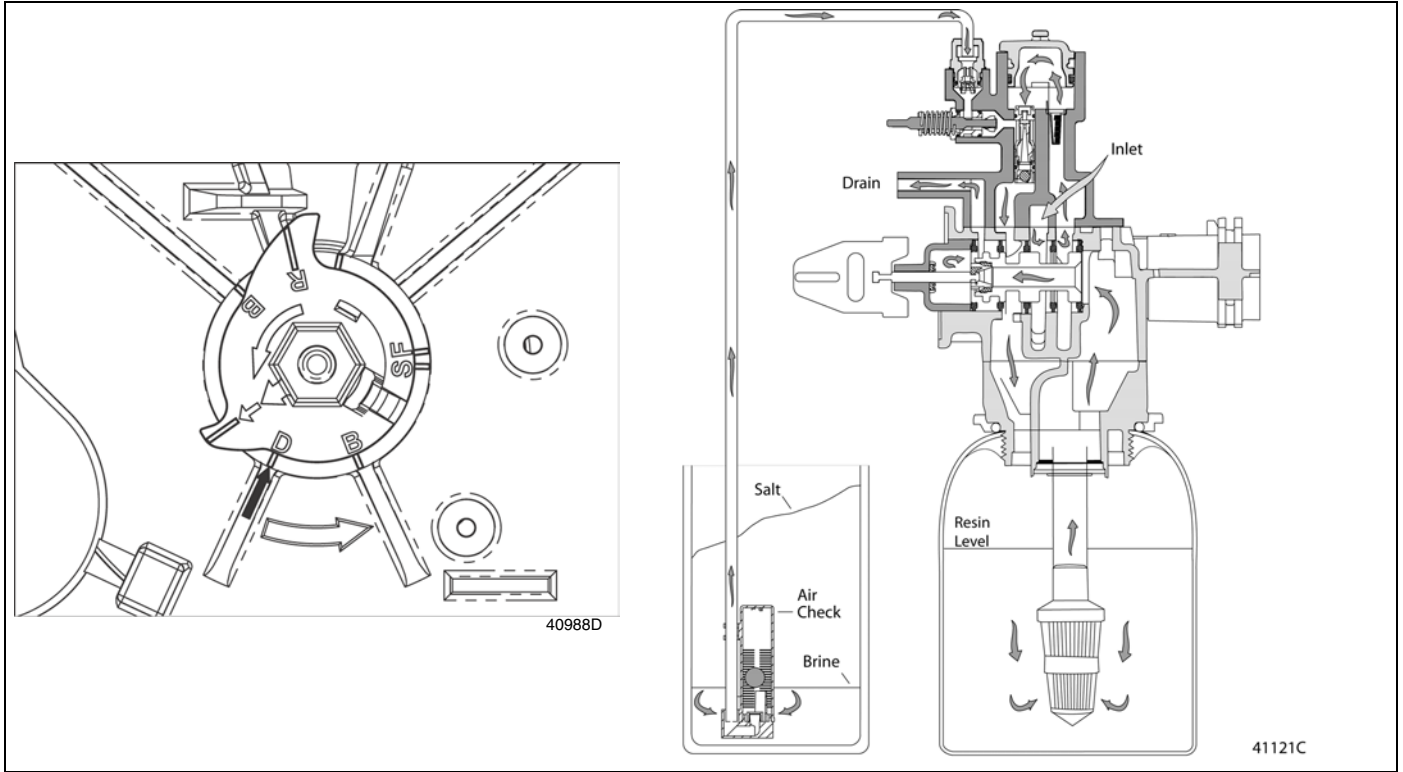


Figure 18: Brine Position

Slow Rinse Position

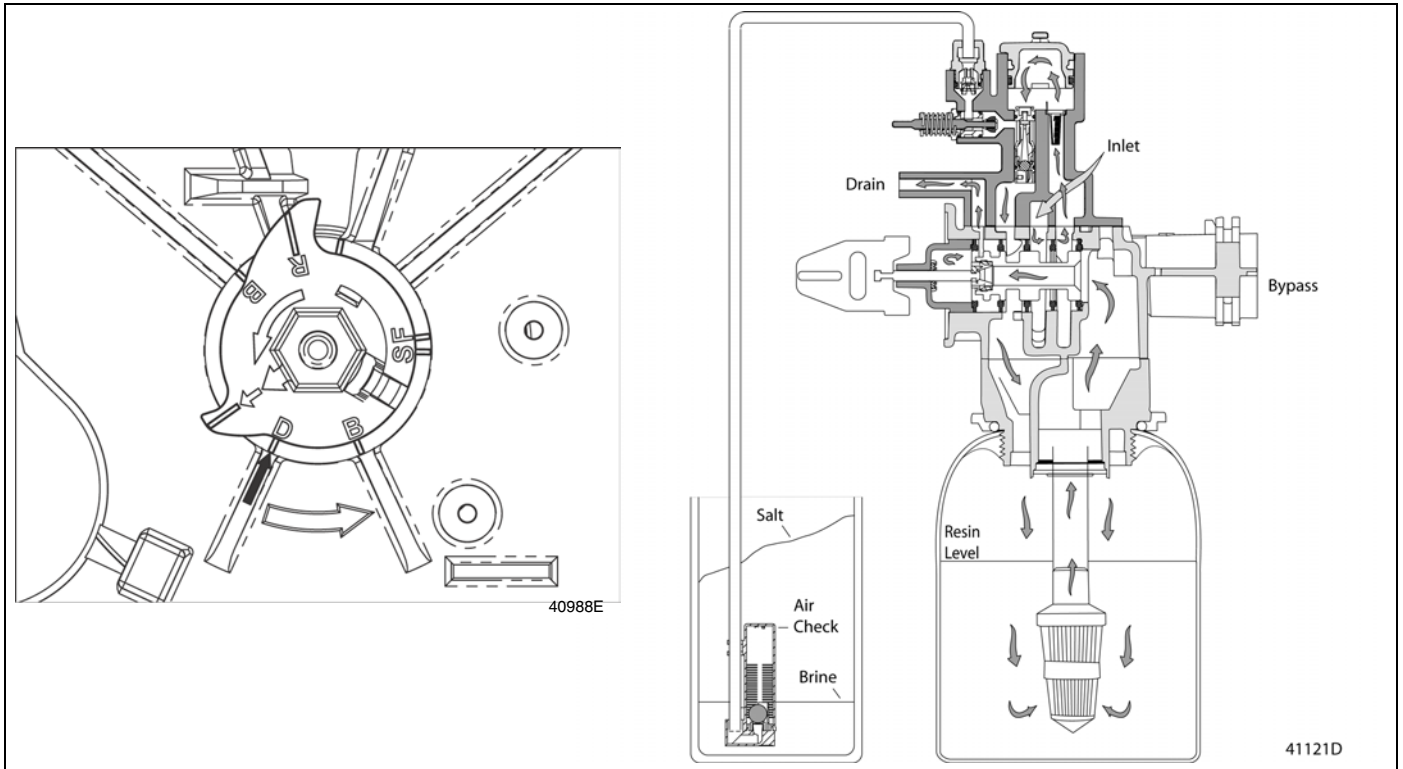


Figure 19: Slow Rinse Position

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Water Conditioner Flow Diagrams

Rapid Rinse Position

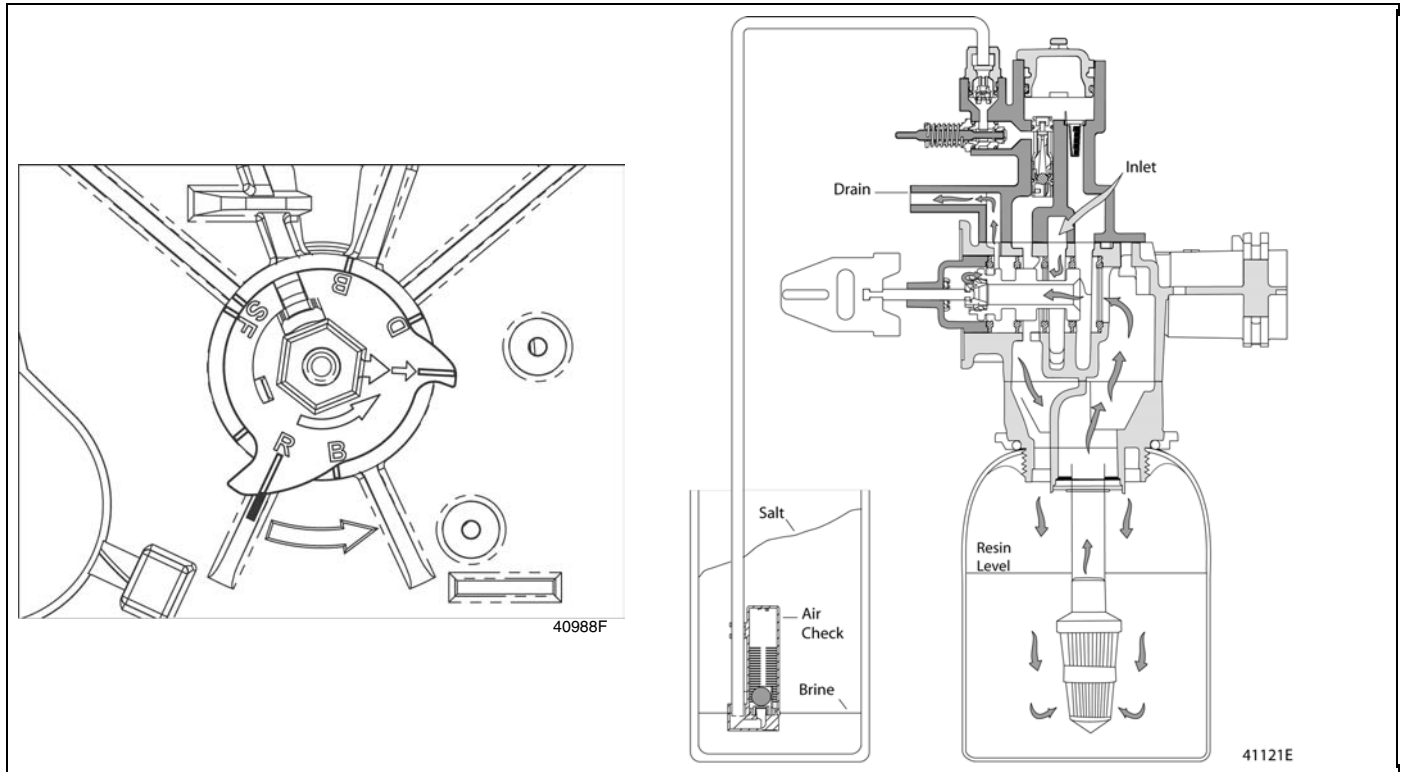


Figure 20: Rapid Rinse Position

Brine Tank Refill Position

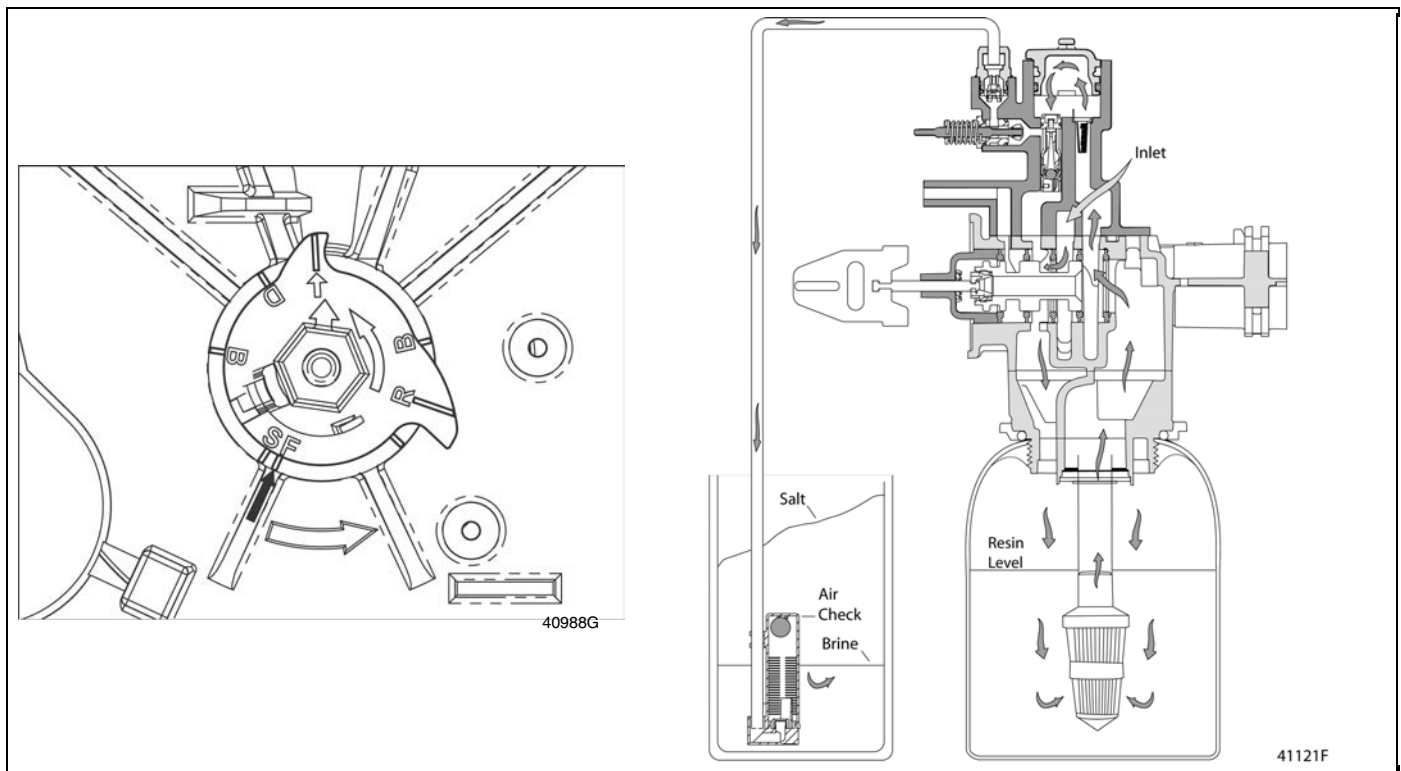


Figure 21: Brine Tank Refill Position

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Notes:

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Power Head

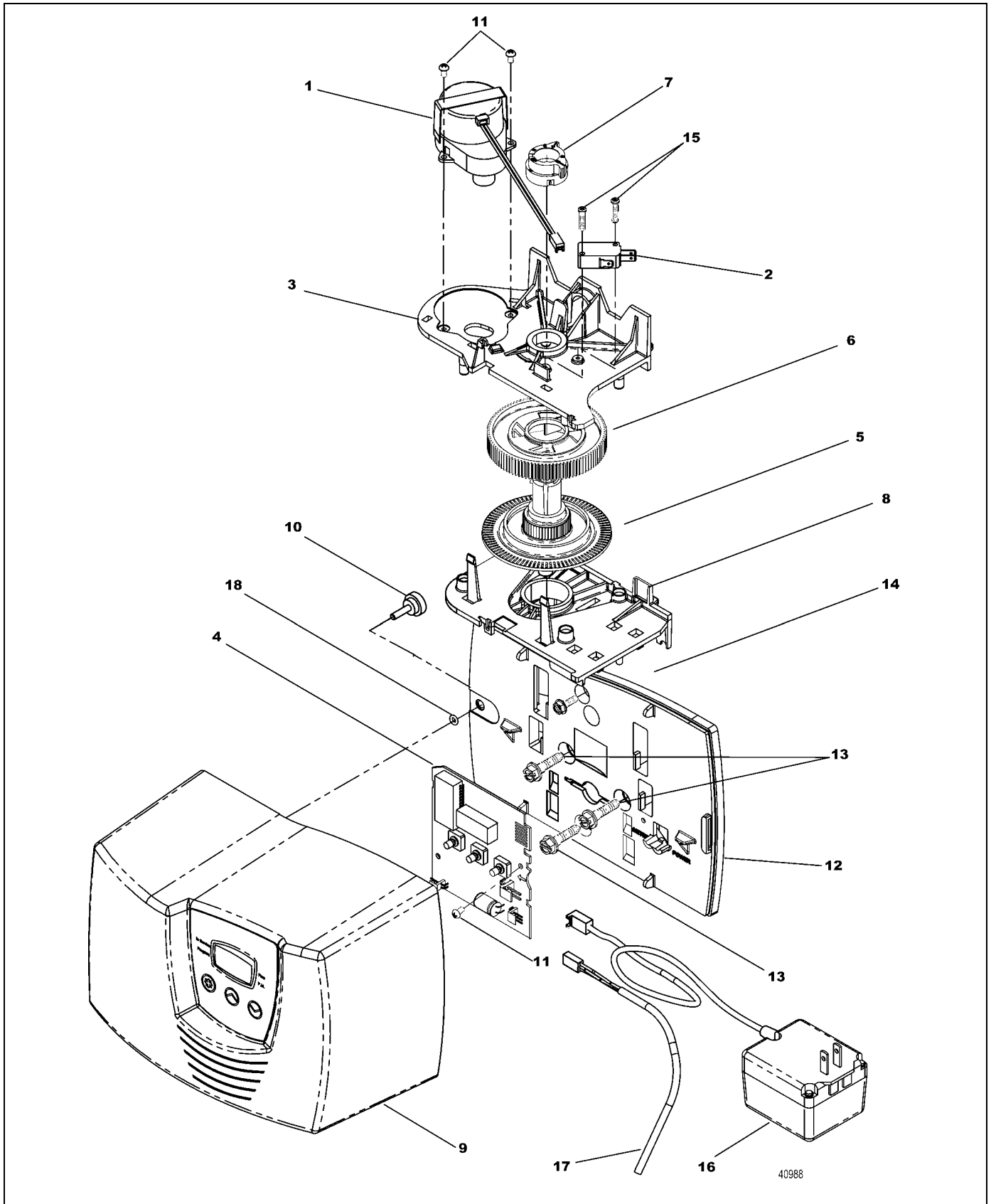


Figure 22: Power Head

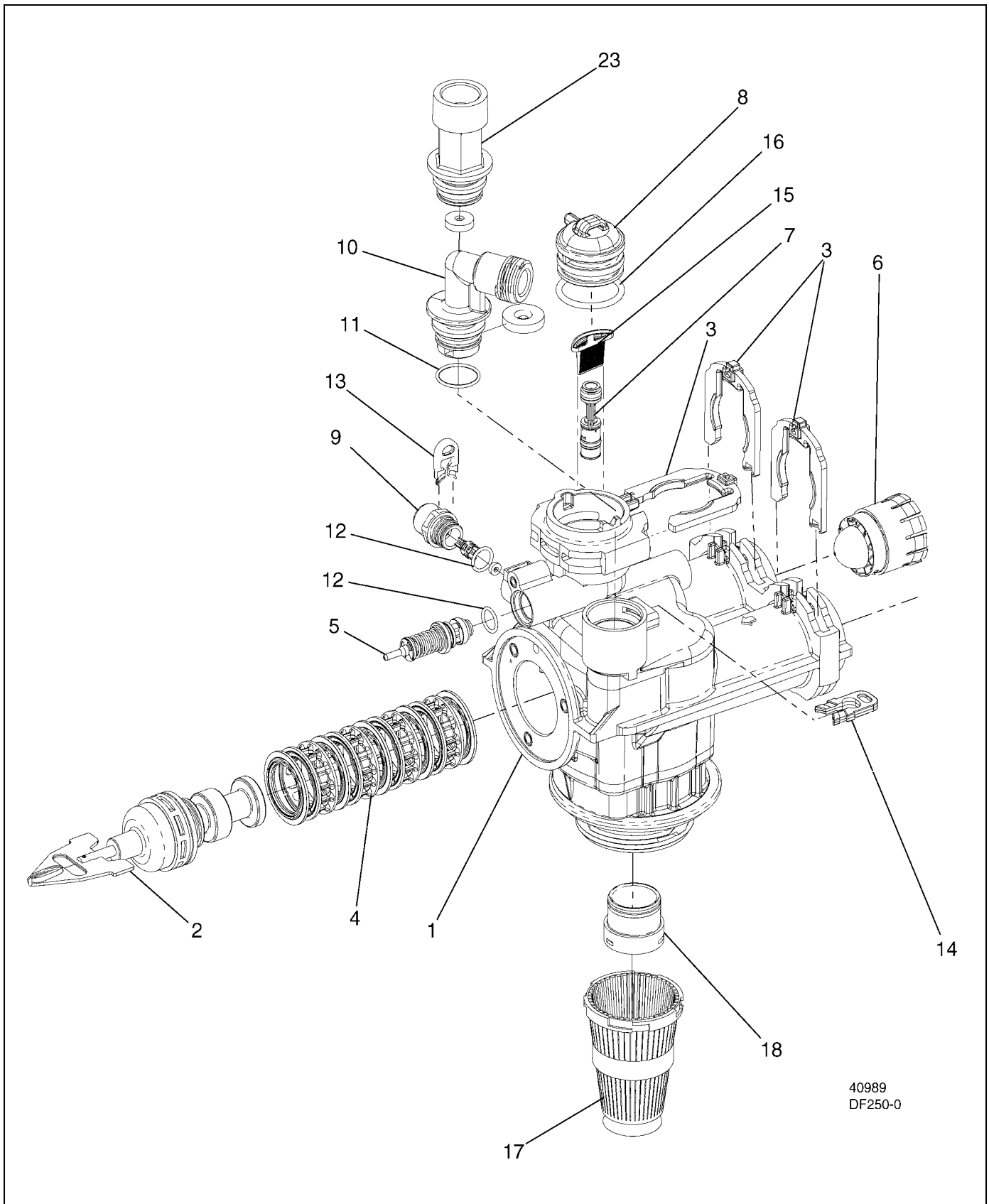
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Power Head Parts List

<i>Item Number</i>	<i>No. Req'd</i>	<i>Part Number</i>	<i>Description</i>
1	1	40968	motor
2	1	10218	optional auxiliary switch
3	1	40978	plate, upper support
4	1	61460	circuit board
5	1	40702	shaft, encoder
6	1	40703	gear, main drive
7	1	40704	cam, brine, down flow
		40977	cam, aux. switch/filter
8	1	40979	plate, lower support
9	1	61430	cover asm
10	1	19367	screw, thumb
11	3	13602	screw, 6-32x.312"
12	1	40980	backplate
13	3	40967	screw, 1/4-20x1.0"
14	1	15727	screw, 10-24x1/2"
15	2	11805	screw, 4-40x5/8"
16	1	40981	transformer, US 24V, 9.6VA
17	1	19791-01	meter cable assembly, turbine
18	1	41122	o-ring

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Valve Assembly



40989
DF250-0

Figure 23: Valve Assembly

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Valve Assembly Parts List

Item Number	No. Req'd	Part Number	Description																																	
1	1	61050	valve body assembly																																	
2	1	61452-10	piston assembly, 7000 softener, D/F 35 GPM																																	
		61453-10	piston assembly, 7000 softener, D/F 28 GPM																																	
		61452-20	piston assembly, 7000 , filter																																	
3	3	40576	clip, H, plastic																																	
4	1	61438	seal and spacer kit																																	
5	1	60016-01	brine valve, 7000																																	
6	1	40577	turbine meter assembly																																	
7	1	61XXX	injector assemblies																																	
			<table border="0"> <thead> <tr> <th>Part Number</th> <th>Injector Number</th> </tr> </thead> <tbody> <tr> <td>61454-000</td> <td>#000</td> </tr> <tr> <td>61454-00</td> <td>#00</td> </tr> <tr> <td>61454-0</td> <td>#0</td> </tr> <tr> <td>61454-1</td> <td>#1</td> </tr> <tr> <td>61454-2</td> <td>#2</td> </tr> <tr> <td>61454-3</td> <td>#3</td> </tr> <tr> <td>61454-4</td> <td>#4</td> </tr> <tr> <td>61454-5</td> <td>#5</td> </tr> </tbody> </table>	Part Number	Injector Number	61454-000	#000	61454-00	#00	61454-0	#0	61454-1	#1	61454-2	#2	61454-3	#3	61454-4	#4	61454-5	#5															
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8	1	40556	cap, injector																																	
9	1	61XXX	BLFC assemblies																																	
			<table border="0"> <thead> <tr> <th>Part Number</th> <th>BLFC Size</th> <th>GPM</th> </tr> </thead> <tbody> <tr> <td>61450-12</td> <td>3/8"</td> <td>0.125</td> </tr> <tr> <td>61450-25</td> <td>3/8"</td> <td>0.25</td> </tr> <tr> <td>61450-50</td> <td>3/8"</td> <td>0.50</td> </tr> <tr> <td>61450-100</td> <td>3/8"</td> <td>1.0</td> </tr> <tr> <td>61451-12</td> <td>1/2"</td> <td>0.125</td> </tr> <tr> <td>61451-25</td> <td>1/2"</td> <td>0.25</td> </tr> <tr> <td>61451-50</td> <td>1/2"</td> <td>0.50</td> </tr> <tr> <td>61451-100</td> <td>1/2"</td> <td>1.0</td> </tr> </tbody> </table>	Part Number	BLFC Size	GPM	61450-12	3/8"	0.125	61450-25	3/8"	0.25	61450-50	3/8"	0.50	61450-100	3/8"	1.0	61451-12	1/2"	0.125	61451-25	1/2"	0.25	61451-50	1/2"	0.50	61451-100	1/2"	1.0						
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61450-12	3/8"	0.125																																		
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61451-100	1/2"	1.0																																		
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			<table border="0"> <thead> <tr> <th>Part Number</th> <th>DLFC Size</th> <th>GPM</th> </tr> </thead> <tbody> <tr> <td>61455-17</td> <td>3/4"</td> <td>1.7</td> </tr> <tr> <td>61455-20</td> <td>3/4"</td> <td>2.0</td> </tr> <tr> <td>61455-24</td> <td>3/4"</td> <td>2.4</td> </tr> <tr> <td>61455-30</td> <td>3/4"</td> <td>3.0</td> </tr> <tr> <td>61455-35</td> <td>3/4"</td> <td>3.5</td> </tr> <tr> <td>61455-40</td> <td>3/4"</td> <td>4.0</td> </tr> <tr> <td>61455-45</td> <td>3/4"</td> <td>4.5</td> </tr> <tr> <td>61455-50</td> <td>3/4"</td> <td>5.0</td> </tr> <tr> <td>61455-60</td> <td>3/4"</td> <td>6.0</td> </tr> <tr> <td>61455-70</td> <td>3/4"</td> <td>7.0</td> </tr> </tbody> </table>	Part Number	DLFC Size	GPM	61455-17	3/4"	1.7	61455-20	3/4"	2.0	61455-24	3/4"	2.4	61455-30	3/4"	3.0	61455-35	3/4"	3.5	61455-40	3/4"	4.0	61455-45	3/4"	4.5	61455-50	3/4"	5.0	61455-60	3/4"	6.0	61455-70	3/4"	7.0
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61455-70	3/4"	7.0																																		
11	1	13303-01	o-ring, -021																																	
12	2	13302-01	o-ring, 014																																	
13	1	40946	clip, brine retaining																																	
14	1	40945	clip, drain retaining																																	
15	1	40950	screen, injector																																	
16	1	40951	o-ring, -220																																	
17	1	18280	collector, top, 1"x.011, gray																																	
18	1	61419	kit, 1.05" dist. adapter																																	
23	1	61xxx	DLFC kits																																	
			<table border="0"> <thead> <tr> <th>Part Number</th> <th>DLFC Size</th> <th>GPM</th> </tr> </thead> <tbody> <tr> <td>61456-8.0</td> <td>1"</td> <td>8.0</td> </tr> <tr> <td>61456-9.0</td> <td>1"</td> <td>9.0</td> </tr> <tr> <td>61456-10</td> <td>1"</td> <td>10.0</td> </tr> <tr> <td>61456-12</td> <td>1"</td> <td>12.0</td> </tr> <tr> <td>61456-15</td> <td>1"</td> <td>15.0</td> </tr> <tr> <td>61456-20</td> <td>1"</td> <td>20.0</td> </tr> <tr> <td>61456-25</td> <td>1"</td> <td>25.0</td> </tr> <tr> <td>61456-30</td> <td>1"</td> <td>30.0</td> </tr> </tbody> </table>	Part Number	DLFC Size	GPM	61456-8.0	1"	8.0	61456-9.0	1"	9.0	61456-10	1"	10.0	61456-12	1"	12.0	61456-15	1"	15.0	61456-20	1"	20.0	61456-25	1"	25.0	61456-30	1"	30.0						
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61456-25	1"	25.0																																		
61456-30	1"	30.0																																		
Not Shown		12763-10	stuffer tool assembly																																	

Model 7000

Bypass Assembly

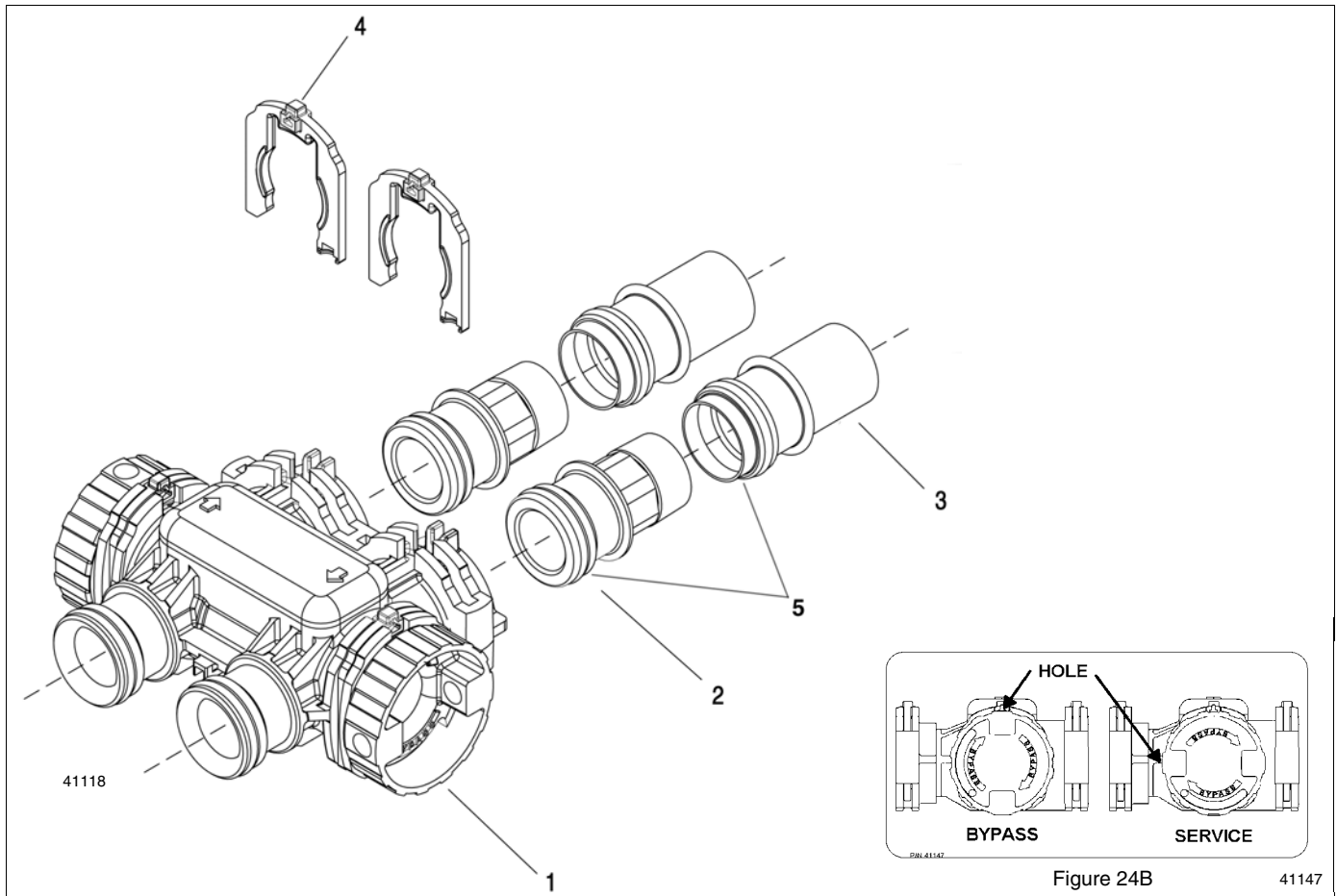
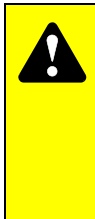


Figure 24: 7000 Bypass Assembly

Figure 24B

41147



IMPORTANT

To bypass the valve, turn bypass knob on both sides of the valve to bypass position. (See [Figure 24B.](#))

When returning to service, put the inlet into service before the outlet.

Item Number	No. Req'd	Part Number	Description
1	1	40569	7000 bypass assembly
2	1	40563	connector, 1" NPT
		40563-10	connector, 1" BSP
		40565	connector, 1-1/4" NPT
		40565-10	connector, 1-1/4" BSP
3	1	40953	connector, 1-1/4" sweat, copper
4	2	40576	clip, H, plastic
5	1	40951	o-ring
Not Shown	1	61462	7000 valve bypass service kit (includes all internal parts for 7000 bypass assembly— bypass body not included)

Model 7000

2310 Safety Brine Valve

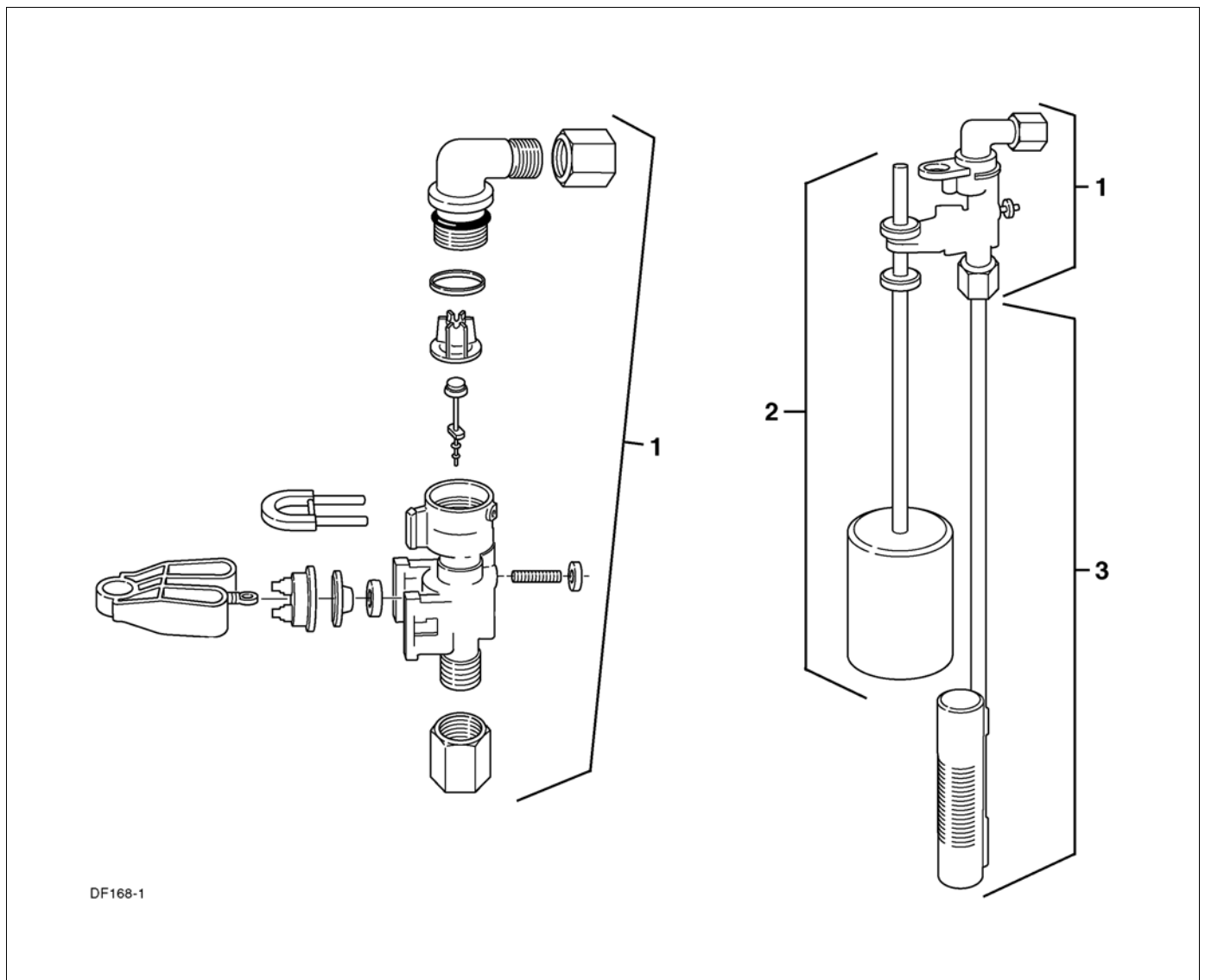


Figure 25: 2310 Safety Brine Valve

<i>Item Number</i>	<i>No. Req'd</i>	<i>Part Number</i>	<i>Description</i>
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

Model 7000

Troubleshooting

Error Codes

NOTE: Error Codes appear on the **In Service** display.

There are three possible error codes.:

Error Code	Probable Cause	Recover and Resetting
(Err 0)	Drive motor is stalled	Unplug the unit from the power source. When power is restored to the unit, the Err _ display code clears. If the condition causing the error has not been resolved the Err _ code reappears in the four digit display. Do not attempt to troubleshoot this problem any further. Contact the installer for service.
(Err 1)	Drive motor is running continuously	
(Err 2)	There have been more than 99 days since the last Regeneration	Regeneration must occur for the unit to recover, the display to clear and the valve to function normally. Contact the installer for service.



WARNING

The controller **MUST** be depressurized before removing any quick connection clips for servicing. The connector should be pushed toward the control while removing clips.

General 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. B. Replace seals and spacers and/or piston.

Model 7000

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 treated 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.

Model 7000

Removing Gear Box Assembly

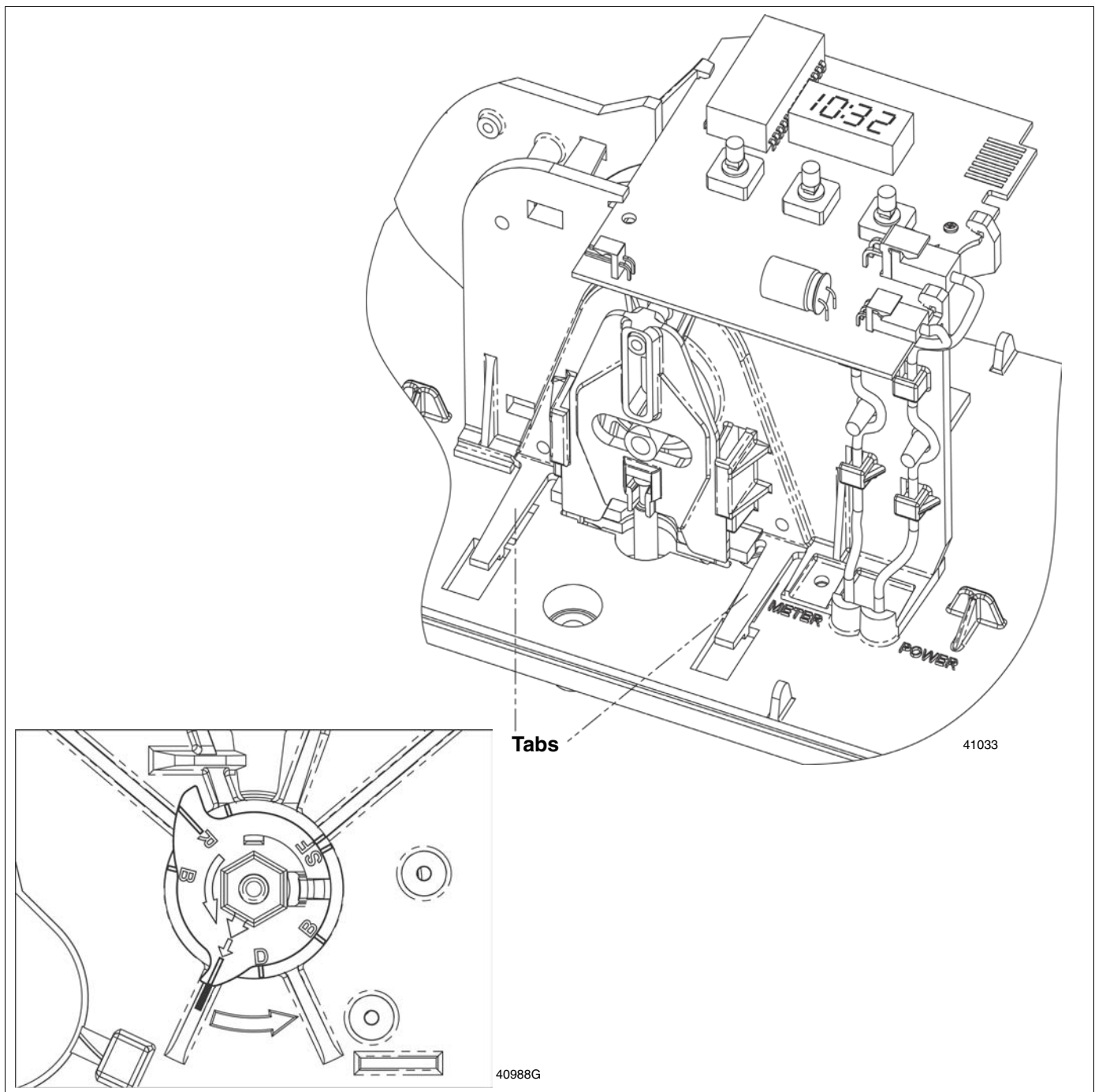


Figure 26: Removing the Gear Box Assembly

1. Unplug the power source.
2. With 3/8" nut driver, turn the cycle cam counter-clockwise to the position shown in [Figure 26](#) above.
3. Slightly pull the two tabs outward and push the gearbox slightly upward to remove.
4. When returning valve to service after powerhead disassembly, manually step valve through regeneration using the extra cycle button until valve is in service.

Model 7000

Inserting Circuit Board

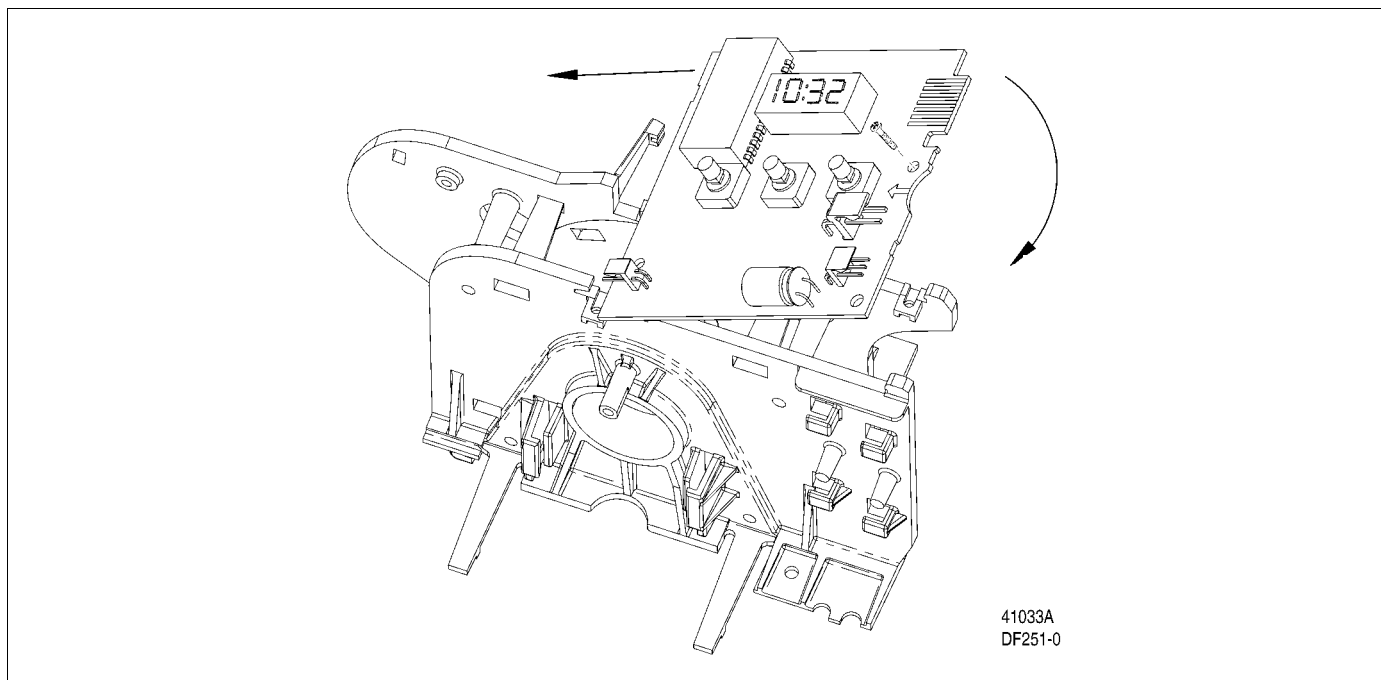


Figure 27: Aligning Circuit Board Notches

1. To insert the circuit board, align the notches on the left side of the board with the flexible finger on the power head. Apply pressure to the left while rotating the board back.

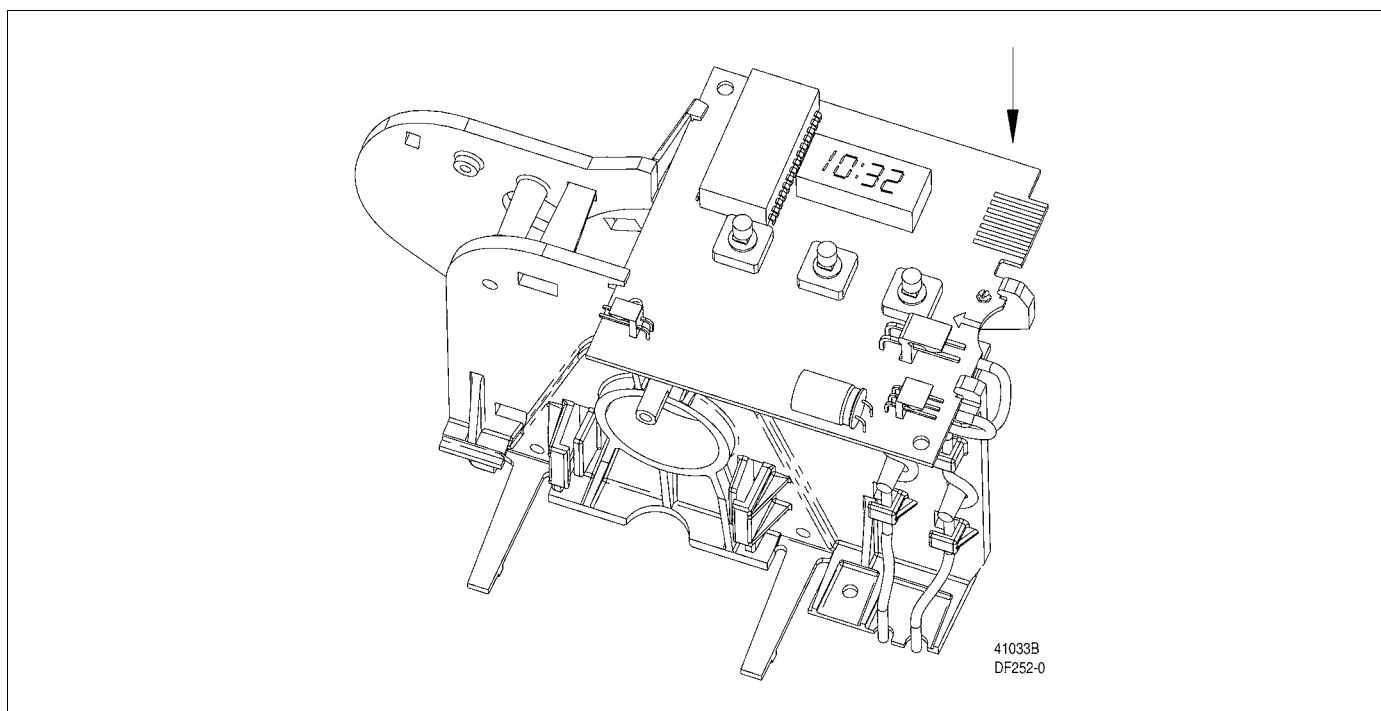


Figure 28: Snapping Circuit Board Into Place

2. When all the way down, snap the circuit board into place under the notches on the right.

Model 7000

Connecting Circuit Board

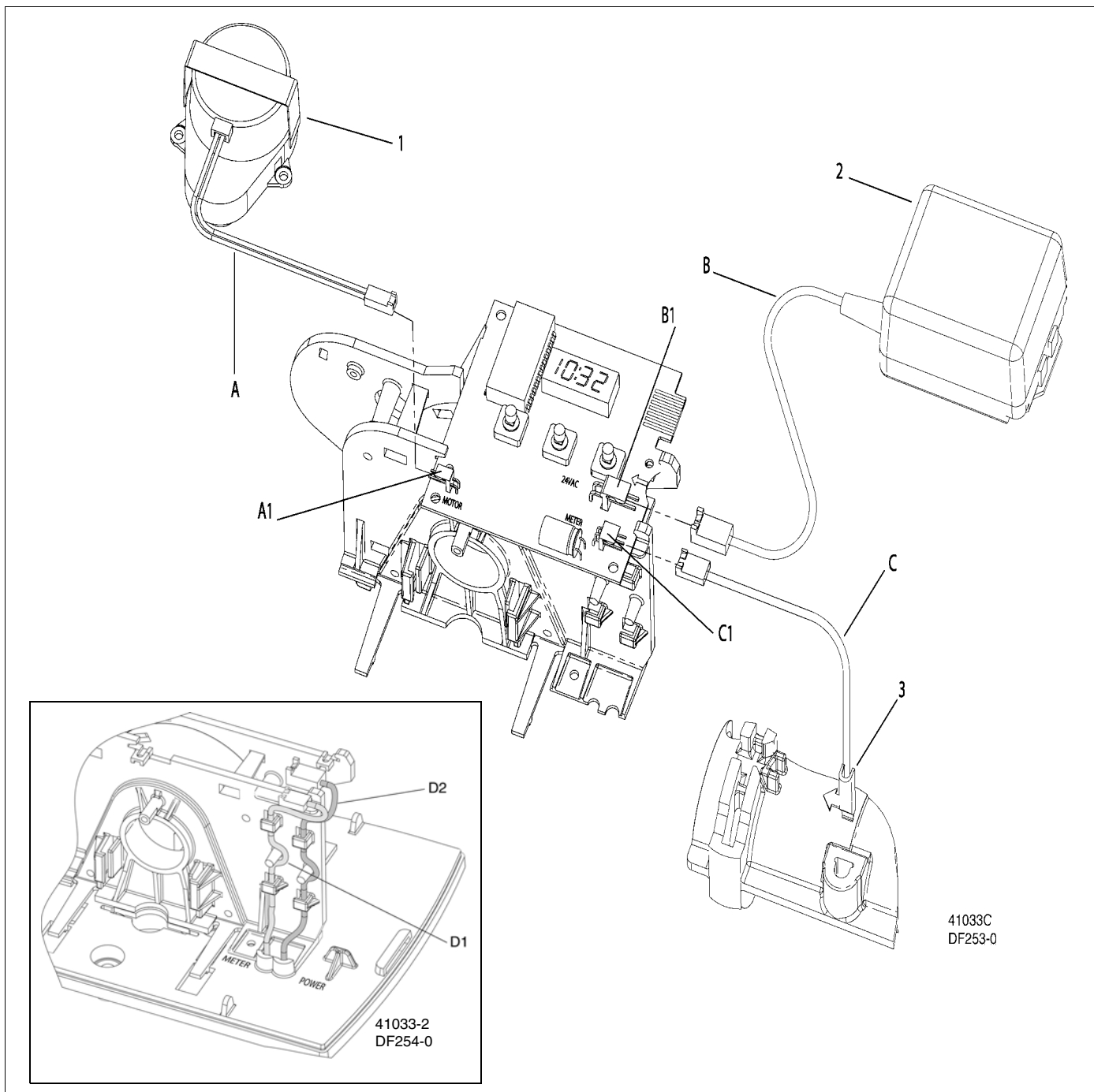


Figure 29: Connecting the Circuit Board

After the circuit board is installed:

1. Connect the motor wires (A) to the motor connector (A1) on board.
2. Connect the transformer cable (B) to the transformer connector (B1) on board.
3. Connect the meter cable (C) to the meter cable connector (C1) on board.
4. Connect the valve end to the opening on the valve body.
5. Thread meter cable (D1) and power wire (D2) along path shown in [Figure 29](#).

Model 7000

Dimensions

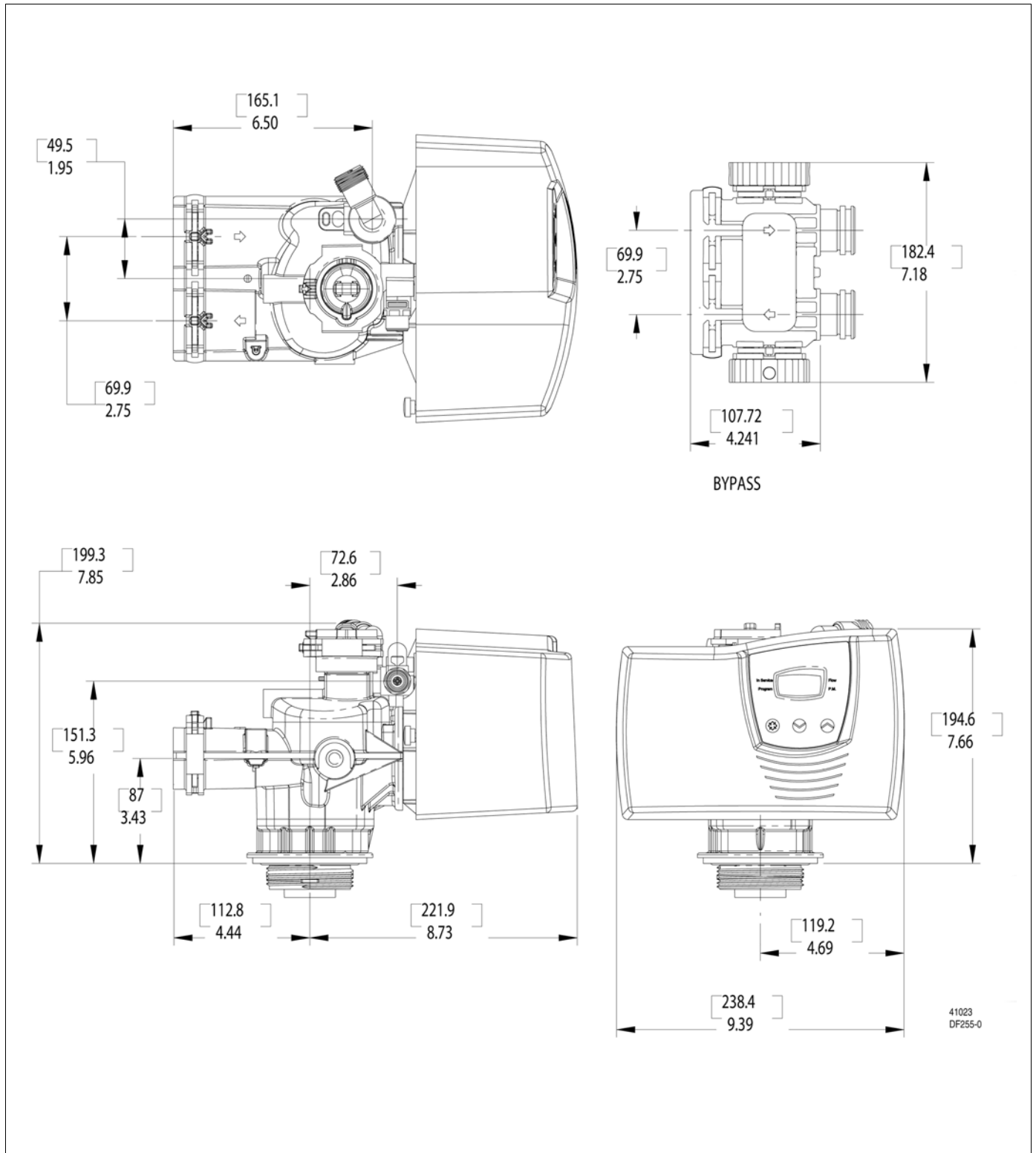


Figure 30: Dimensions

Model 7000

Meter Flow Data

7000

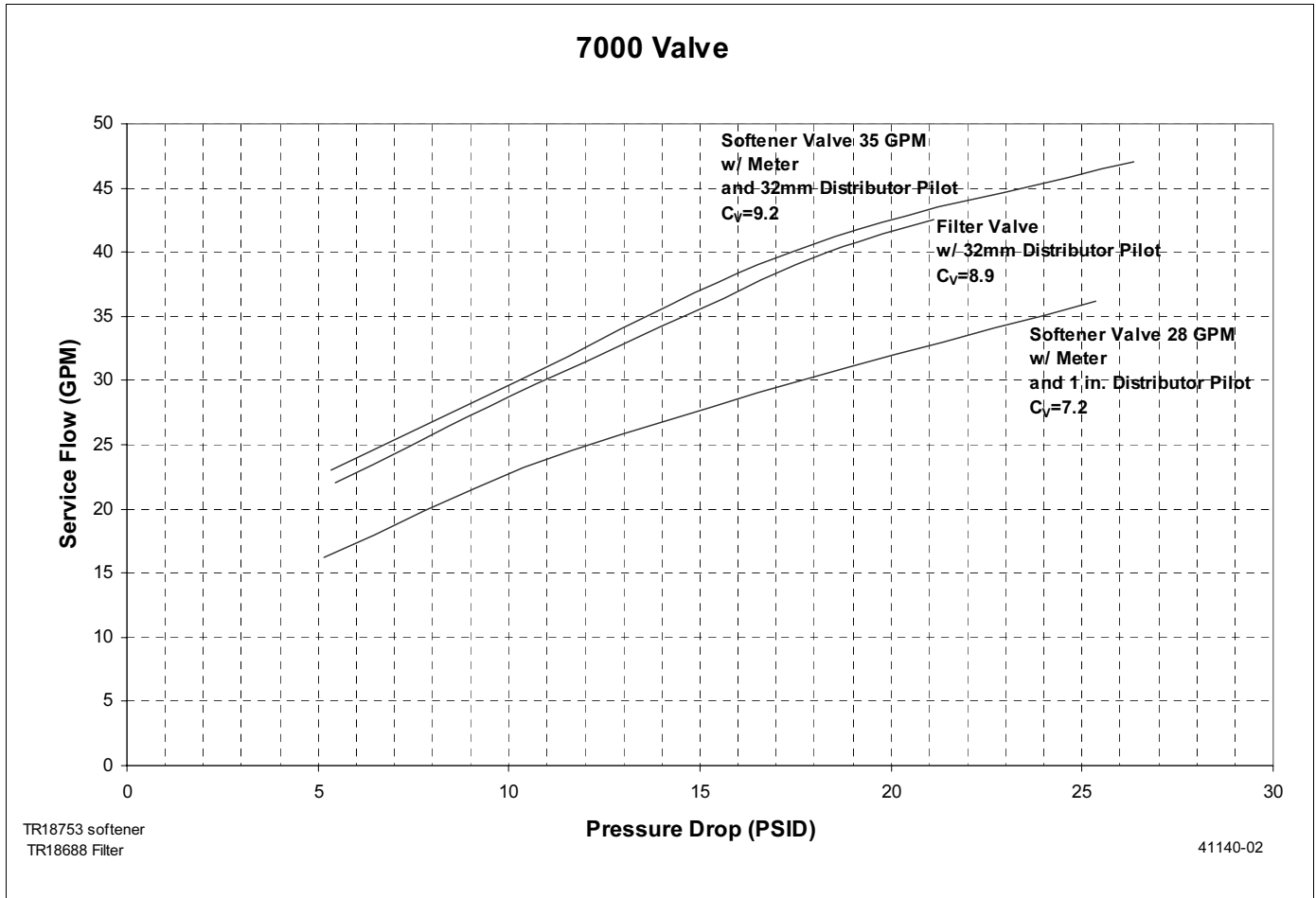
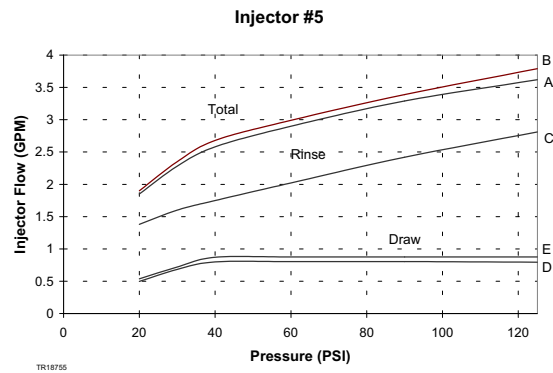
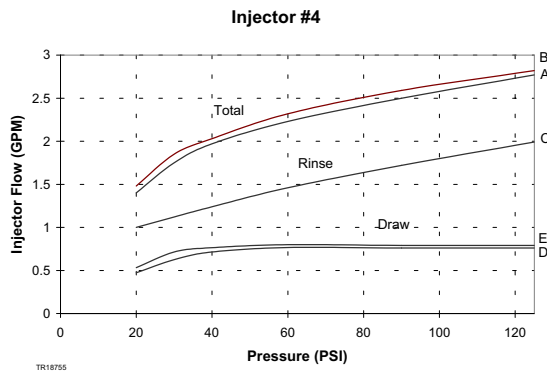
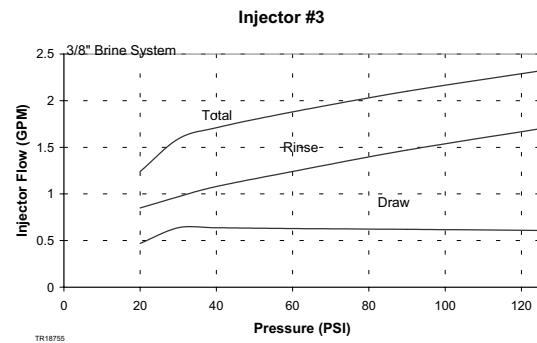
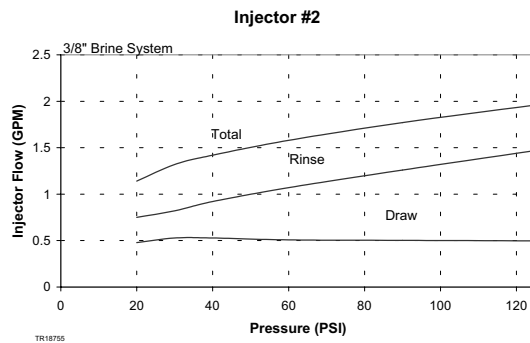
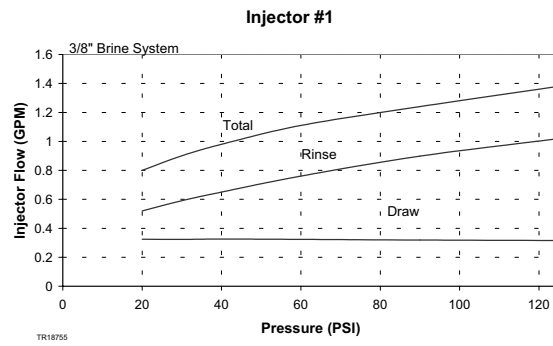
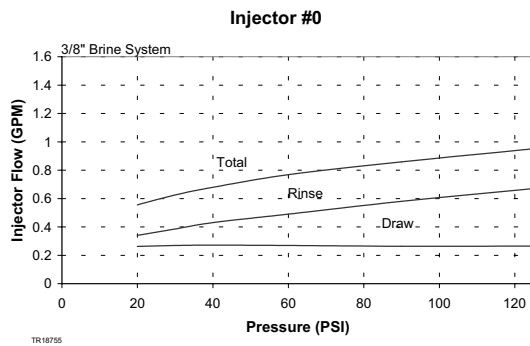
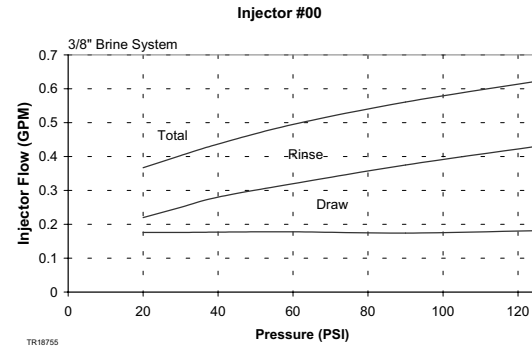
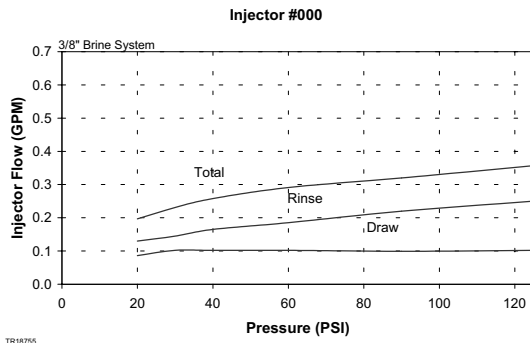


Figure 31: 7000 Flow Data

Model 7000

Injector Flow Data 7000



- A) Total Flow, 3/8" Brine System
- B) Total Flow, 1/2" Brine Line
- C) Rinse
- D) Brine Draw, 3/8" Brine System
- E) Brine Draw, 1/2" Brine Line

Note: All data taken with 2310 Safety Brine Valve and 500 Air Check

Figure 32: 7000 Injectors

