

SXT Timer

Supplemental Service Manual



IMPORTANT: Fill in Pertinent Information on Page 3 for Future Reference

Table of Contents

Job Specification Sheet	3
Timer Features	4
Timer Operation.....	6
Master Programming Mode Chart	8
Master Programming Mode	10
User Programming Mode	17
Diagnostic Programming Mode	18
2510 / 2750 / 2850s Timer Assembly	20
9000 / 9100 / 9500 Twin Tank Timer Assembly	21
3/4" Plastic Turbine Meter Assembly	22
3/4" Plastic Paddle Meter Assembly	23
3/4" Brass Paddle Meter Assembly	24
1" Brass Paddle Meter Assembly	25
Inline Plastic Turbine Meter Assembly.....	26
1 1/2" Brass Paddle Meter Assembly	27
3/4", 1" or 1 1/2" Paddle Wheel Meter Cap Assembly	28
2510SXT Wiring Diagram.....	29
2750SXT / 2850SXT Wiring Diagram.....	30
9000SXT / 9100SXT / 9500SXT Wiring Diagram	31
Troubleshooting.....	32
Service Assemblies	33



IMPORTANT PLEASE READ:

- The information, specifications and illustrations in this manual are based on the latest information available at the time of printing. The manufacturer reserves the right to make changes at any time without notice.
- This manual is intended as a guide for service of the valve only. System installation requires information from a number of suppliers not known at the time of manufacture. This product should be installed by a plumbing professional.
- This unit is designed to be installed on potable water systems only.
- This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- If daytime operating pressure exceeds 80 psi (5.5 bar), nighttime pressures may exceed pressure limits. A pressure reducing valve must be installed.
- Do not install the unit where temperatures may drop below 32°F (0°C) or above 110°F (43°C).
- Do not place the unit in direct sunlight. Black units will absorb radiant heat increasing internal temperatures.
- Do not strike the valve or any of the components.
- Warranty of this product extends to manufacturing defects. Misapplication of this product may result in failure to properly condition water, or damage to product.
- A prefilter should be used on installations in which free solids are present.
- In some applications local municipalities treat water with Chloramines. High Chloramine levels may damage valve components.
- Correct and constant voltage must be supplied to the control valve to maintain proper function.

Job Specification Sheet

Job Number: _____

Model Number: _____

Water Hardness: _____ ppm or gpg

Capacity Per Unit: _____

Mineral Tank Size: _____ Diameter: _____ Height: _____

Salt Setting per Regeneration: _____

1. Type of Timer:

- A. 7 Day or 12 Day B. Meter Initiated

2. Downflow: Upflow Upflow Variable

3. Meter Size:

- A. 3/4" Std Range (125 - 2,100 gallon setting)
B. 3/4" Ext Range (625 - 10,625 gallon setting)
C. 1" Std Range (310 - 5,270 gallon setting)
D. 1" Ext Range (1,150 - 26,350 gallon setting)
E. 1-1/2" Std Range (625 - 10,625 gallon setting)
F. 1-1/2" Ext Range (3,125 - 53,125 gallon setting)
G. 2" Std Range (1,250 - 21,250 gallon setting)
H. 2" Ext Range (6,250 - 106,250 gallon setting)
I. 3" Std Range (3,750 - 63,750 gallon setting)
J. 3" Ext Range (18,750 - 318,750 gallon setting)
K. Electronic _____ Pulse Count _____ Meter Size

4. System Type:

- A. System #4: 1 Tank, 1 Meter, Immediate, or Delayed Regeneration
B. System #4: Time Clock
C. System #4: Twin Tank
D. System #5: 2-5 Tanks, 2 Meters, Interlock
E. System #6: 2-5 Tanks, 1 Meter, Series Regeneration
F. System #7: 2-5 Tanks, 1 Meter, Alternating
G. System #9: Electronic Only, 2-4 Tanks, Meter per Valve, Alternating
H. System #14: Electronic Only, 2-4 Tanks, Meter per Valve. Brings units on and offline based on flow.

5. Timer Program Settings:

- A. Backwash: _____ Minutes
B. Brine and Slow Rinse: _____ Minutes
C. Rapid Rinse: _____ Minutes
D. Brine Tank Refill: _____ Minutes
E. Pause Time: _____ Minutes
F. Second Backwash: _____ Minutes

6. Drain Line Flow Control: _____ gpm

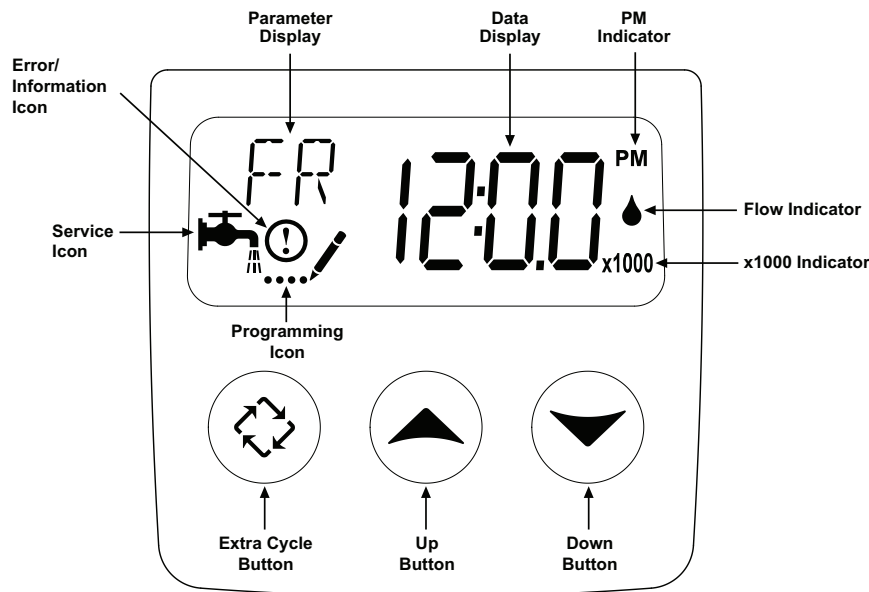
7. Brine Line Flow Controller: _____ gpm

8. Injector Size#: _____

9. Piston Type:

- A. Hard Water Bypass
B. No Hard Water Bypass

Timer Features

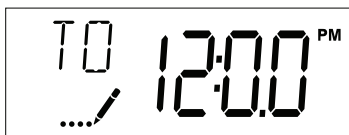


Features of the SXT:

- Power backup that continues to keep time and the passage of days for a minimum of 48 hours in the event of power failure. During a power outage, the control goes into a power-saving mode. It does not monitor water usage during a power failure, but it does store the volume remaining at the time of power failure.
- Settings for both valve (basic system) and control type (method used to trigger a regeneration).
- Day-of-the-Week controls.
- While in service, the display alternates between time of day, volume remaining or days to regeneration, and tank in service (twin tank systems only).
- The Flow Indicator flashes when outlet flow is detected.
- The Service Icon flashes if a regeneration cycle has been queued.
- A Regeneration can be triggered immediately by pressing the Extra Cycle button for five seconds.
- The Parameter Display displays the current Cycle Step (BW, BF, RR, etc) during regeneration, and the data display counts down the time remaining for that cycle step. While the valve is transferring to a new cycle step, the display will flash. The parameter display will identify the destination cycle step (BW, BF, RR, etc) and the data display will read "----". Once the valve reaches the cycle step, the display will stop flashing and the data display will change to the time remaining. During regeneration, the user can force the control to advance to the next cycle step immediately by pressing the extra cycle button.

Setting the Time of Day

1. Press and hold either the Up or Down buttons until the programming icon replaces the service icon and the parameter display reads TD.
2. Adjust the displayed time with the Up and Down buttons.
3. When the desired time is set, press the Extra Cycle button to resume normal operation. The unit will also return to normal operation after 5 seconds if no buttons are pressed.



Queueing a Regeneration

1. Press the Extra Cycle button. The service icon will flash to indicate that a regeneration is queued.
2. To cancel a queued regeneration, press the Extra Cycle button.

Regenerating Immediately

Press and hold the Extra Cycle button for five seconds.

Timer Operation

Meter Immediate Control

A meter immediate control measures water usage and regenerates the system as soon as the calculated system capacity is depleted. The control calculates the system capacity by dividing the unit capacity (typically expressed in grains/unit volume) by the feedwater hardness and subtracting the reserve. Meter Immediate systems generally do not use a reserve volume. However, in twin tank systems with soft-water regeneration, the reserve capacity should be set to the volume of water used during regeneration to prevent hard water break-through. A Meter Immediate control will also start a regeneration cycle at the programmed regeneration time if a number of days equal to the regeneration day override pass before water usage depletes the calculated system capacity.

Meter Delayed Control

A Meter Delayed Control measures water usage and regenerates the system at the programmed regeneration time after the calculated system capacity is depleted. As with Meter Immediate systems, the control calculates the system capacity by dividing the unit capacity by the feedwater hardness and subtracting the reserve. The reserve should be set to insure that the system delivers treated water between the time the system capacity is depleted and the actual regeneration time. A Meter Delayed control will also start a regeneration cycle at the programmed regeneration time if a number of days equal to the regeneration day override pass before water usage depletes the calculated system capacity.

Time Clock Delayed Control

A Time Clock Delayed Control regenerates the system on a timed interval. The control will initiate a regeneration cycle at the programmed regeneration time when the number of days since the last regeneration equals the regeneration day override value.

Day of the Week Control

This control regenerates the system on a weekly schedule. The schedule is defined in Master Programming by setting each day to either "off" or "on." The control will initiate a regeneration cycle on days that have been set to "on" at the specified regeneration time.

Control Operation During Regeneration

During regeneration, the control displays a special regeneration display. In this display, the control shows the current regeneration step number the valve is advancing to, or has reached, and the time remaining in that step. The step number that displays flashes until the valve completes driving to this regeneration step position. Once all regeneration steps are complete the valve returns to service and resumes normal operation.

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 only enters the Program Mode with the valve in service. While in the 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, eliminating the need for battery backup power.

Manually Initiating a Regeneration

1. When timer is in service, press the Extra Cycle button for 5 seconds on the main screen.
2. The timer advances to Regeneration Cycle Step #1 (rapid rinse), and begins programmed time count down.
3. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #2 (backwash).
4. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #3 (brine draw & slow rinse).
5. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #4 (brine refill).
6. Press the Extra Cycle button once more to advance the valve back to in service.

NOTE: If the unit is a filter or upflow, the cycle step order may change.

NOTE: A queued regeneration can be initiated by pressing the Extra Cycle button. To clear a queued regeneration, press the Extra Cycle button again to cancel. If regeneration occurs for any reason prior to the delayed regeneration time, the manual regeneration request shall be cleared.

Control Operation During A Power Failure

The SXT includes integral power backup. In the event of power failure, the control shifts into a power-saving mode. The control stops monitoring water usage, and the display and motor shut down, but it continues to keep track of the time and day for a minimum of 48 hours.

The system configuration settings are stored in a non-volatile memory and are stored indefinitely with or without line power. The Time of Day flashes when there has been a power failure. Press any button to stop the Time of Day from flashing.

If power fails while the unit is in regeneration, the control will save the current valve position before it shuts down. When power is restored, the control will resume the regeneration cycle from the point where power failed. Note that if power fails during a regeneration cycle, the valve will remain in its current position until power is restored. The valve system should include all required safety components to prevent overflows resulting from a power failure during regeneration.

The control will not start a new regeneration cycle without line power. If the valve misses a scheduled regeneration due to a power failure, it will queue a regeneration. Once power is restored, the control will initiate a regeneration cycle the next time that the Time of Day equals the programmed regeneration time. Typically, this means that the valve will regenerate one day after it was originally scheduled. If the treated water output is important and power interruptions are expected, the system should be setup with a sufficient reserve capacity to compensate for regeneration delays.

Master Programming Mode Chart

Master Programming Options			
Abbreviation	Parameter	Option Abbreviation	Options
DF	Display Format	GAL	Gallons
		Ltr	Liters
		Cu	Cubic Meters
VT	Valve Type	St1b	Standard Downflow/Upflow Single Backwash
		St2b	Standard Downflow/Upflow Double Backwash
		Filtr	Filter
		UFbF	Upflow Brine First
		8500	TwinFlo100SXT
		Othr	Other
CT	Control Type	Fd	Meter (Flow) Delayed
		FI	Meter (Flow) Immediate
		tc	Time Clock
		dAY	Day of Week
NT	Number of Tanks	1	Single Tank System
		2	Two Tank System
TS	Tank in Service	U1	Tank 1 in Service
		U2	Tank 2 in Service
C	Unit Capacity		Unit Capacity (Grains)
H	Feedwater Hardness		Hardness of Inlet Water
RS	Reserve Selection	SF	Percentage Safety Factor
		rc	Fixed Reserve Capacity
SF	Safety Factor		Percentage of the system capacity to be used as a reserve
RC	Fixed Reserve Capacity		Fixed volume to be used as a reserve
DO	Day Override		The system's day override setting
RT	Regen Time		The time of day the system will regenerate
BW, BD, RR, BF	Regen Cycle Step Times		The time duration for each regeneration step. Adjustable from OFF and 0-199 minutes. NOTE: If "Othr" is chosen under "Valve Type", then R1, R2, R3, etc, will be displayed instead
D1, D2, D3, D4, D5, D6, & D7	Day of Week Settings		Regeneration setting (On or OFF) for each day of the week on day-of-week systems

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode Chart

Master Programming Options			
CD	Current Day		The Current day of the week
FM	Flow Meter Type	t0.7	3/4" Turbine Meter
		P0.7	3/4" Paddle Wheel Meter
		t1.0	1" Turbine Meter
		P1.0	1" Paddle Wheel Meter
		t1.5	1.5" Turbine Meter
		P1.5	1.5" Paddle Wheel Meter
		Gen	Generic or Other Meter
K	Meter Pulse Setting		Meter pulses per gallon for generic/other flow meter

NOTES:

Some items may not be shown depending on timer configuration.

The timer will discard any changes and exit Master Programming Mode if any button is not pressed for sixty seconds.

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode

When the Master Programming Mode is entered, all available option setting displays may be viewed and set as needed. Depending on current option settings, some parameters cannot be viewed or set.

Setting the Time of Day

1. Press and hold either the Up or Down buttons until the programming icon replaces the service icon and the parameter display reads TD.
2. Adjust the displayed time with the Up and Down buttons.
3. When the desired time is set, press the Extra Cycle button to resume normal operation. The unit will also return to normal operation after 5 seconds if no buttons are pressed.



Entering Master Programming Mode

Set the Time Of Day display to **12:01 P.M.** Press the Extra Cycle button (to exit Setting Time of Day mode). Then press and hold the Up and Down buttons together until the programming icon replaces the service icon and the Display Format screen appears.

Exiting Master Programming Mode

Press the Extra Cycle button to accept the displayed settings and cycle to the next parameter. Press the Extra Cycle button at the last parameter to save all settings and return to normal operation. The control will automatically disregard any programming changes and return to normal operation if it is left in Master Programming mode for 5 minutes without any keypad input.

Resets:

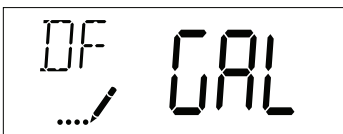
Soft Reset: Press and hold the Extra Cycle and Down buttons for 25 seconds while in normal Service mode. This resets all parameters to the system default values, except the volume remaining in meter immediate or meter delayed systems and days since regeneration in the time clock system.

Master Reset: Hold the Extra Cycle button while powering up the unit. This resets all of the parameters in the unit. Check and verify the choices selected in Master Programming Mode.

1. Display Format (Display Code DF)

This is the first screen that appears when entering Master Programming Mode. The Display Format setting specifies the unit of measure that will be used for volume and how the control will display the Time of Day. This option setting is identified by "DF" in the upper left hand corner of the screen. There are three possible settings:

Display Format Setting	Unit of Volume	Time Display
GAL	U.S. Gallons	12-Hour AM/PM
Ltr	Liters	24-Hour
Cu	Cubic Meters	24-Hour



CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode

2. Valve Type (Display Code VT)

Press the Extra Cycle button. Use this display to set the Valve Type. The Valve Type setting specifies the type of cycle that the valve follows during regeneration. Note that some valve types require that the valve be built with specific subcomponents. Ensure the valve is configured properly before changing the Valve Type setting. This option setting is identified by "VT" in the upper left hand corner of the screen. There are 5 possible settings:

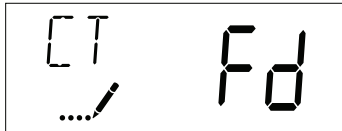
Abbreviation	Parameter
St1b	Standard Downflow/Upflow, Single Backwash
St2b	Standard Downflow/Upflow, Double Backwash
Fltr	Filter
UFbF	Upflow Brine First
8500	TwinFlo 100
Othr	Other



3. Control Type (Display Code CT)

Press the Extra Cycle button. Use this display to set the Control Type. This specifies how the control determines when to trigger a regeneration. For details on how the various options function, refer to the "Timer Operation" section of this service manual. This option setting is identified by "CT" in the upper left hand corner of the screen. There are four possible settings:

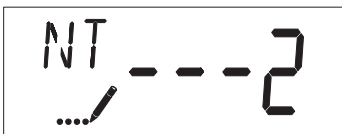
Meter Delayed: Fd
Meter Immediate: FI
Time Clock: tc
Day of Week: dAY



4. Number of Tanks (Display Code NT)

Press the Extra Cycle button. Use this display to set the Number of Tanks in your system. This option setting is identified by "NT" in the upper left hand corner of the screen. There are two possible settings:

Single Tank System: 1
Two-Tank System: 2



CAUTION: Before entering Master Programming, please contact your local professional water dealer.

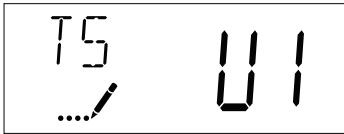
Master Programming Mode

5. Tank in Service (Display Code TS)

Press the Extra Cycle button. Use this display to set whether tank one or tank two is in service. This option setting is identified by "TS" in the upper left hand corner of the screen. This parameter is only available if the number of tanks has been set to 2. There are two possible settings:

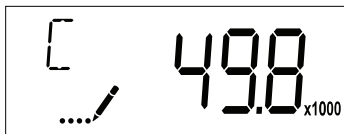
Tank One in Service: U1

Tank Two in Service: U2



6. Unit Capacity (Display Code C)

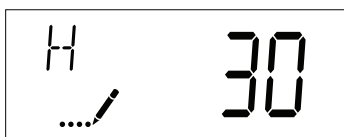
Press the Extra Cycle button. Use this display to set the Unit Capacity. This setting specifies the treatment capacity of the system media. Enter the capacity of the media bed in grains of hardness when configuring a softener system, and in the desired volume capacity when configuring a filter system. This option setting is identified by "C" in the upper left hand corner of the screen. The Unit Capacity parameter is only available if the control type has been set to one of the metered options. Use the Up and Down buttons to adjust the value as needed.



Range: 1-999,900 grain capacity

7. Feedwater Hardness (Display Code H)

Press the Extra Cycle button. Use this display to set the Feedwater Hardness. Enter the feedwater hardness in grains per unit volume for softener systems, or 1 for filter systems. This option setting is identified by "H" in the upper left hand corner of the screen. The feedwater hardness parameter is only available if the control type has been set to one of the metered options. Use the Up and Down buttons to adjust the value as needed.



Range: 4-199 hardness

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode

8. Reserve Selection (Display Code RS)

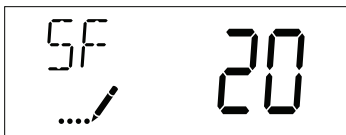
Press the Extra Cycle button. Use this display to set the Safety Factor. Use this display to select the type of reserve to be used in your system. This setting is identified by "RS" in the upper left-hand corner of the screen. The reserve selection parameter is only available if the control type has been set to one of the metered options. There are two possible settings.

FS	Safety Factor
rc	Fixed Reserve Capacity



9. Safety Factor (Display Code SF)

Press the Extra Cycle button. Use this display to set the Safety Factor. This setting specifies what percentage of the system capacity will be held as a reserve. Since this value is expressed as a percentage, any change to the unit capacity or feedwater hardness that changes the calculated system capacity will result in a corresponding change to the reserve volume. This option setting is identified by "SF" in the upper left hand corner of the screen. Use the Up and Down buttons to adjust the value from 0 to 50% as needed.



Range: 0-50%

10. Fixed Reserve Capacity (Display Code RC)

Press the Extra Cycle button. Use this display to set the Reserve Capacity. This setting specifies a fixed volume that will be held as a reserve. The reserve capacity cannot be set to a value greater than one-half of the calculated system capacity. The reserve capacity is a fixed volume and does not change if the unit capacity or feedwater hardness are changed. This option setting is identified by "RC" in the upper left-hand corner of the screen. Use the Up and Down buttons to adjust the value as needed.



Range: 0-half the calculated capacity

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode

11. Day Override (Display Code DO)

Press the Extra Cycle button. Use this display to set the Day Override. This setting specifies the maximum number of days between regeneration cycles. If the system is set to a timer-type control, the day override setting determines how often the system will regenerate. A metered system will regenerate regardless of usage if the days since last regeneration cycle equal the day override setting. Setting the day override value to "OFF" disables this function. This option setting is identified by "DO" in the upper left hand corner of the screen. Use the Up and Down buttons to adjust the value as needed.



Range: Off-99 days

12. Regeneration Time

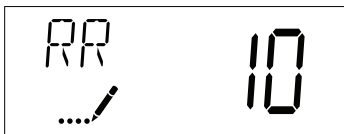
Press the Extra Cycle button. Use this display to set the Regeneration Time. This setting specifies the time of day the control will initiate a delayed, manually queued, or day override triggered regeneration. This option setting is identified by "RT" in the upper left hand corner of the screen. Use the Up and Down buttons to adjust the value as needed.



13. Regeneration Cycle Step Times

Press the Extra Cycle button. Use this display to set the Regeneration Cycle Step Times. The different regeneration cycles are listed in sequence based on the valve type selected for the system, and are identified by an abbreviation in the upper left-hand corner of the screen. The abbreviations used are listed below. If the system has been configured with the "OTHER" valve type, the regeneration cycles will be identified as R1, R2, R3, R4, R5, and R6. Each cycle step time can be set from 0 to 199 minutes, or "OFF." Setting a cycle step to "OFF" will disable all of the following steps. Setting a cycle step time to 0 will cause the control to skip that step during regeneration, but keeps the following steps available. Use the Up and Down buttons to adjust the value as needed. Press the Extra Cycle button to accept the current setting and move to the next parameter.

Cycle Step	Abbreviation
BD	Brine Draw
BF	Brine Fill
BW	Backwash
RR	Rapid Rinse
SV	Service



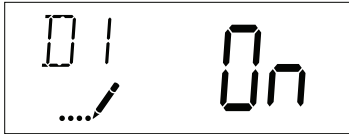
Range: 0-199 minutes

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode

14. Day of Week Settings

Press the Extra Cycle button. Use this display to set the regeneration schedule for a system configured as a Day of Week control. The different days of the week are identified as D1, D2, D3, D4, D5, D6, and D7 in the upper left-hand corner of the display. Set the value to "ON" to schedule a regeneration or "OFF" to skip regeneration for each day. Use the Up and Down buttons to adjust the setting as needed. Press the Extra Cycle button to accept the setting and move to the next day. Note that the control requires at least one day to be set to "ON." If all 7 days are set to "OFF", the unit will return to Day One until one or more days are set to "ON."



15. Current Day (Display Code CD)

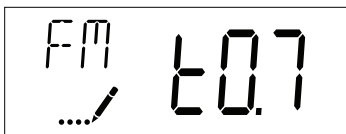
Press the Extra Cycle button. Use this display to set the current day on systems that have been configured as Day of Week controls. This setting is identified by "CD" in the upper left-hand corner of the screen. Use the Up and Down buttons to select from Day 1 through Day 7.



16. Flow Meter Type (Display Code FM)

Press the Extra Cycle button. Use this display to set the type of flow meter connected to the control. This option setting is identified by "FM" in the upper left-hand corner of the screen. Use the Up and Down buttons to select one of the 7 available settings.

t0.7	Fleck 3/4" Turbine Meter
P0.7	Fleck 3/4" Paddle Wheel Meter
t1.0	Fleck 1" Turbine Meter
P1.0	Fleck 1" Paddle Wheel Meter
t1.5	Fleck 1 1/2" Turbine Meter
P1.5	Fleck 1 1/2" Paddle Wheel Meter
GEn	Generic/Other Meter



CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode

17. Meter Pulse Setting (Display Code K)

Press the Extra Cycle button. Use this display to specify the meter pulse setting for a non-standard flow meter. This option setting is identified by "K" in the upper left-hand corner of the screen. Use the Up and Down buttons to enter the meter constant in pulses per unit volume.



18. Press the Extra Cycle button to save all settings and exit Master Programming Mode.

User Programming Mode

User Programming Mode Options		
Abbreviation	Parameter	Description
DO	Day Override	The timer's day override setting
RT	Regeneration Time	The time of day that the system will regenerate (meter delayed, timeclock, and day-of-week systems)
H	Feed Water Hardness	The hardness of the inlet water - used to calculate system capacity for metered systems
RC	Reserve Capacity	The fixed reserve capacity
CD	Current Day	The current day of week

NOTES:

Some items may not be shown depending on timer configuration.

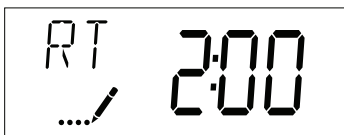
The timer will discard any changes and exit User Mode if any button is not pressed for sixty seconds.

User Programming Mode Steps

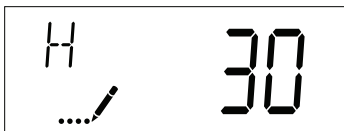
1. Press the Up and Down buttons for five seconds while in service, and the time of day is NOT set to 12:01 PM.
2. Use this display to adjust the Day Override. This option setting is identified by "DO" in the upper left hand corner of the screen.



3. Press the Extra Cycle button. Use this display to adjust the Regeneration Time. This option setting is identified by "RT" in the upper left hand corner of the screen.



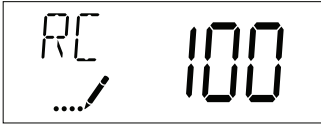
4. Press the Extra Cycle button. Use this display to adjust the Feed Water Hardness. This option setting is identified by "FH" in the upper left hand corner of the screen.



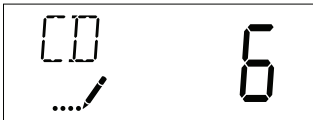
Range: 4-199 hardness

User Programming Mode

5. Press the Extra Cycle button. Use this display to adjust the Fixed Reserve Capacity. This option setting is identified by "RC" in the upper left-hand Corner of the screen.



6. Press the Extra Cycle button. Use this display to set the Current Day of the Week. This option setting is identified by "CD" in the upper left hand corner of the screen.



7. Press the Extra Cycle button to end User Programming Mode.

Diagnostic Programming Mode

Diagnostic Programming Mode Options		
Abbreviation	Parameter	Description
FR	Flow Rate	Displays the current outlet flow rate
PF	Peak Flow Rate	Displays the highest flow rate measured since the last regeneration
HR	Hours in Service	Displays the total hours that the unit has been in service
VU	Volume Used	Displays the total volume of water treated by the unit
RC	Reserve Capacity	Displays the system's reserve capacity calculated from the system capacity, feedwater hardness, and safety factor
SV	Software Version	Displays the software version installed on the controller

NOTES:

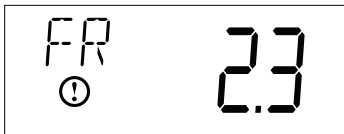
Some items may not be shown depending on timer configuration.

The timer will exit Diagnostic Mode after 60 seconds if no buttons are pressed.

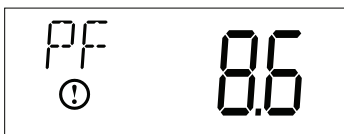
Press the Extra Cycle button to exit Diagnostic Mode at any time.

Diagnostic Programming Mode Steps

1. Press the Up and Extra Cycle buttons for five seconds while in service.
2. Use this display to view the current Flow Rate. This option setting is identified by "FR" in the upper left hand corner of the screen.



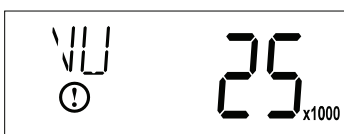
3. Press the Up button. Use this display to view the Peak Flow Rate since the last regeneration cycle. This option setting is identified by "PF" in the upper left hand corner of the screen.



4. Press the Up button. Use this display to view the Hours in Service since the last regeneration cycle. This option setting is identified by "HR" in the upper left hand corner of the screen.



5. Press the Up button. Use this display to view the Volume Used since the last regeneration cycle. This option setting is identified by "VU" in the upper left hand corner of the screen.

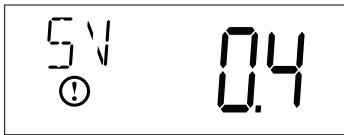


Diagnostic Programming Mode

6. Press the Up button. Use this display to view the Reserve Capacity. This option setting is identified by "RC" in the upper left hand corner of the screen.

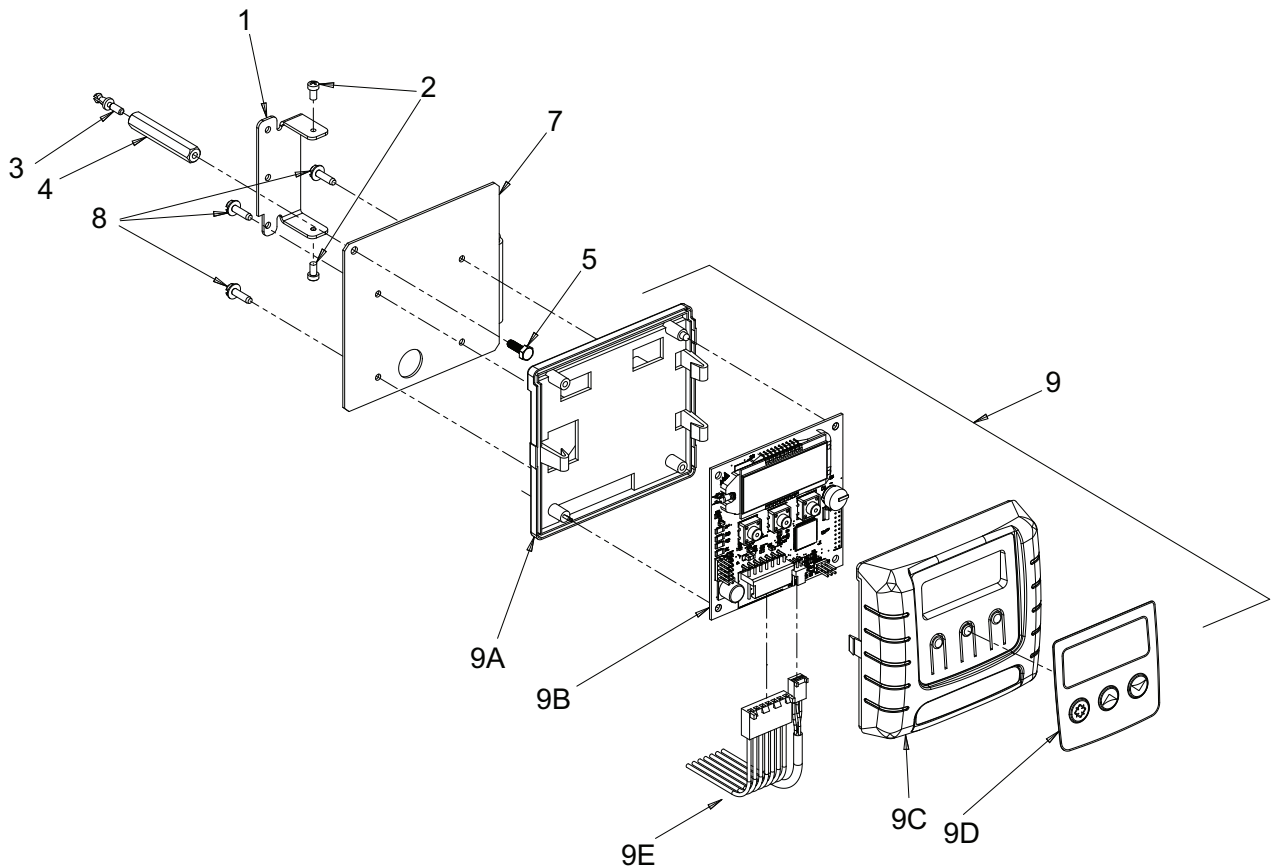


7. Press the Up button. Use this display to view the Software Version. This option setting is identified by "SV" in the upper left hand corner of the screen.



8. Press the Extra Cycle button to end Diagnostic Programming Mode.

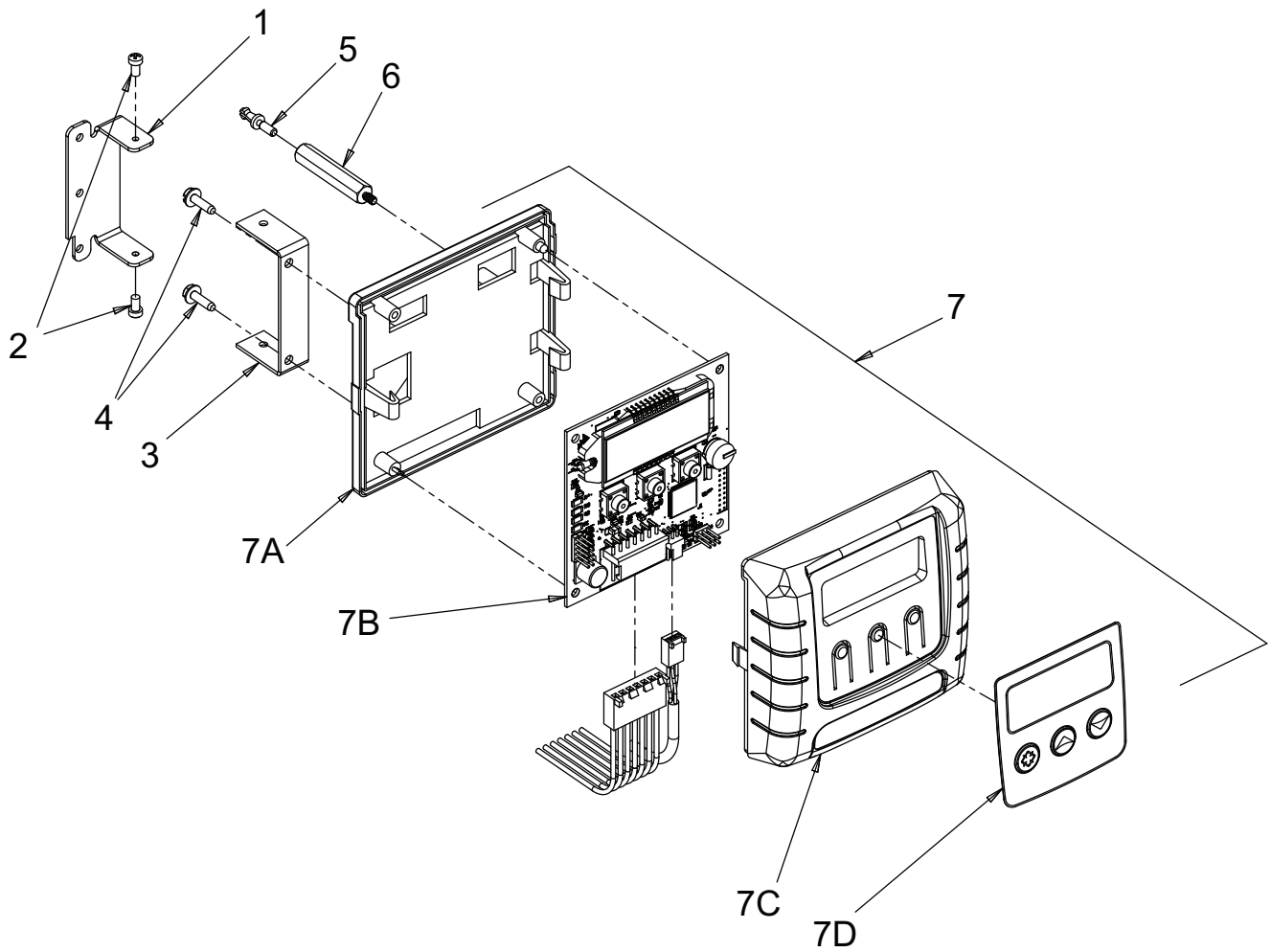
2510 / 2750 / 2850s Timer Assembly



Item No.	Quantity	Part No.	Description
1	1	13881	Bracket, Hinge Timer
3	1	14265	Clip, Spring
4	1	27172	Stand-off, Timer, 2510SXT, 2750SXT
5	1	21363	Screw, Hex HD, M4 X 12 MM
7	1	27168	Bracket, Timer, 2510SE/2750SXT
8	3	13296	Screw, Hex Washer, 6-20 X 1/2
9	1	42778	Timer, SXT, 2510/2750, DF
9A	1	19889	Housing, Circuit Board
9B	1	42196	Circuit Board, SXT
9C	1	42635-01	Cover, Front, SXT, Square
9D	1	42637	Label, Display, SXT
9E	1	42864	Wire Harness, SXT

For Assembly Numbers, See the Back of this Manual

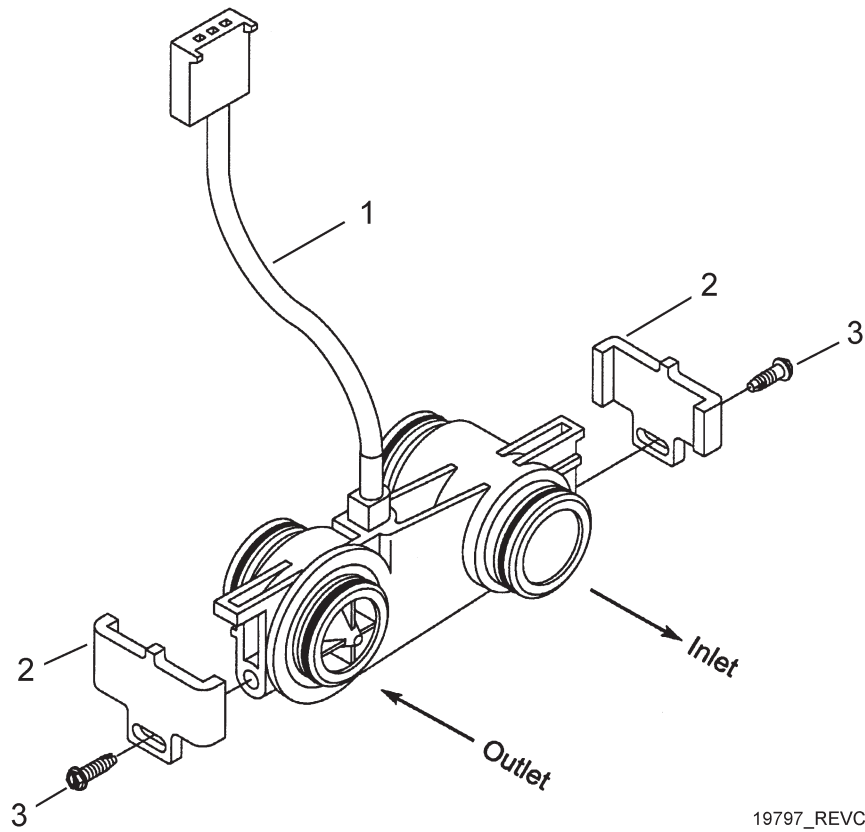
9000/9100/9500 Twin Tank Timer Assembly



Item No.	Quantity	Part No.	Description
1.....	1.....	13881.....	Bracket, Hinge Timer
2.....	2.....	11384.....	Screw, Phillips, 6-32 X 1/4
3.....	1.....	42732.....	Bracket, Timer, 9000SXT
4.....	2.....	13296.....	Screw, Hex Washer Hd, 6-20 X 1/2
5.....	1.....	14265.....	Clip, Spring
6.....	1.....	42733.....	Stand-off, Timer, 9000SXT
7.....	1.....	42777.....	Timer, SXT, D/F, 9000/9100/9500
7A.....	1.....	19889.....	Housing, Circuit Board
7B.....	1.....	42196.....	Circuit Board, SXT
7C.....	1.....	42635-01.....	Cover, Front, SXT, Square
7D.....	1.....	42637.....	Label, Display, SXT

For Assembly Numbers, See the Back of this Manual

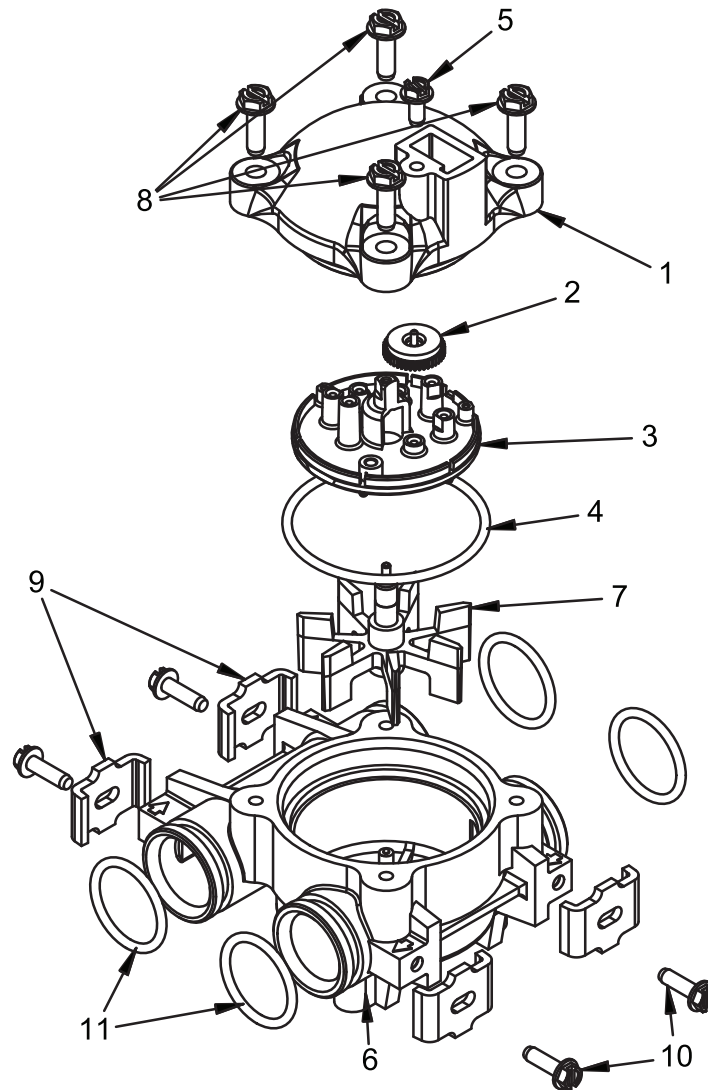
3/4" Plastic Turbine Meter Assembly



Item No.	Quantity	Part No.	Description
1.....	1.....	19791-01.....	Meter Cable Assy, Turbine/SXT
2.....	2.....	19569.....	Clip, Flow Meter
3.....	2.....	13314.....	Screw, Slot Ind Hex, 8-18 x .60

For Assembly Numbers, See the Back of this Manual

Meter Assembly

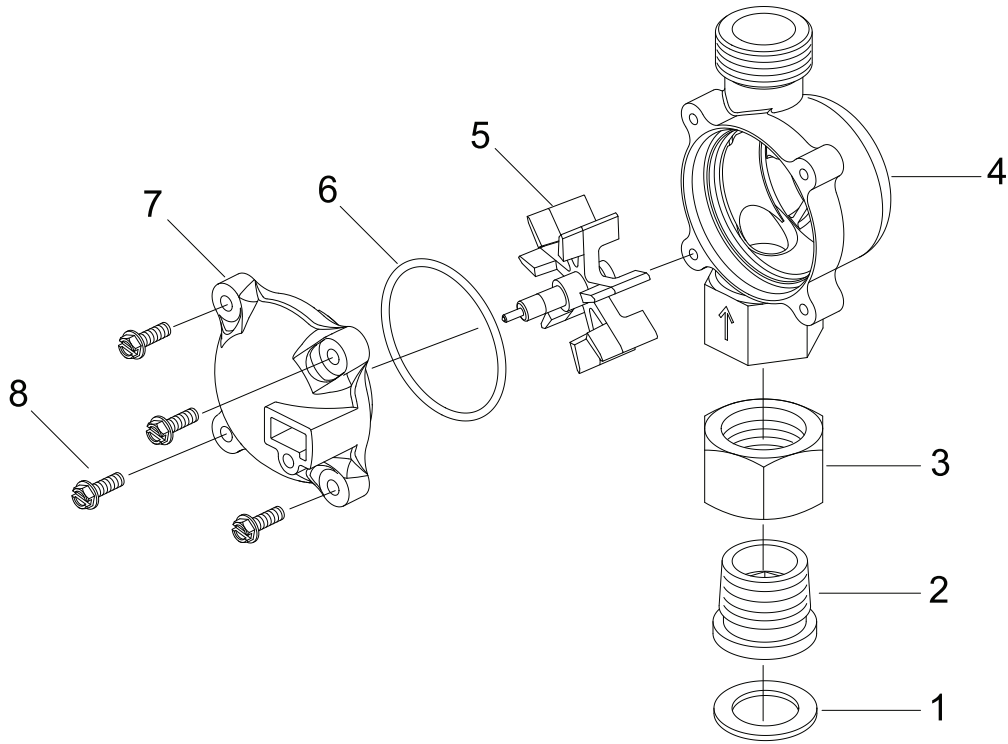


60086_REV D_60086-50

Item No.	Quantity	Part No.	Description
1.....	1	13874	Body, Meter, 5600
2.....	1	14715	Gear Assy, Electronic Meter Cap
3.....	1	41055	Plate, Intermediate
4.....	1	13847	O-ring, -137, Std, Meter
5.....	5	17798	Screw, Slot Hex Washer Head
6.....	1	13821	Body, Meter, 5600
7.....	1	13509	Impeller, Meter
8.....	4	12473	Screw, Hex Wsh, 10-24 x 5/8
9.....	4	13255	Clip, Mounting
10.....	1	13314	Screw, Slot Ind Hex, 8-18 x .60
11.....	1	13305	O-ring, -119
12.....	1	14613	Flow Straightener

For Assembly Numbers, See the Back of this Manual

3/4" Brass Paddle Meter Assembly

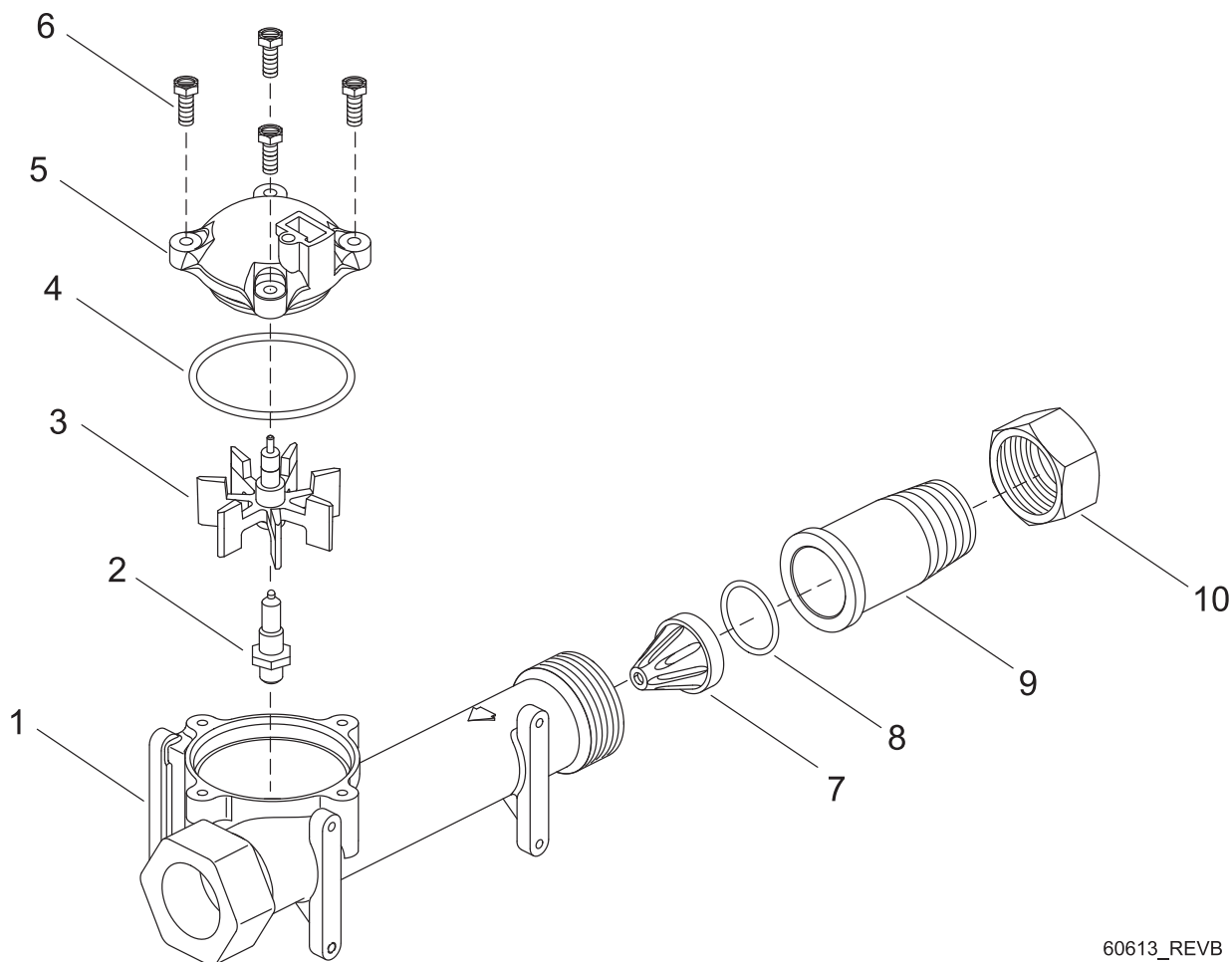


60618_REVA

Item No.	Quantity	Part No.	Description
1.....	1	11206	Gasket, Fitting
2.....	1	13942	Retainer, Nut
3.....	1	11207	Nut, Special, Quick Connect
4.....	1	13906	Body, Meter, 3/4"
5.....	1	13509	Impeller, Meter
		13509-01	Impeller, Celcon
6.....	1	13847	O-ring, -137 Std/560CD, Meter
7.....	1	14716	Meter Cap Assy, ET/NT
8.....	1	12473	Screw, Hex Wsh, 10-24 x 5/8
Not Shown		19121-08	Meter Cable Assy, NT, 35" w/Connector
		19121-09	Meter Cable Assy, NT, 99.5" w/Connector
		19121-10	Meter Cable Assy, NT, 303.5" w/Connector

For Assembly Numbers, See the Back of this Manual

1" Brass Paddle Meter Assembly

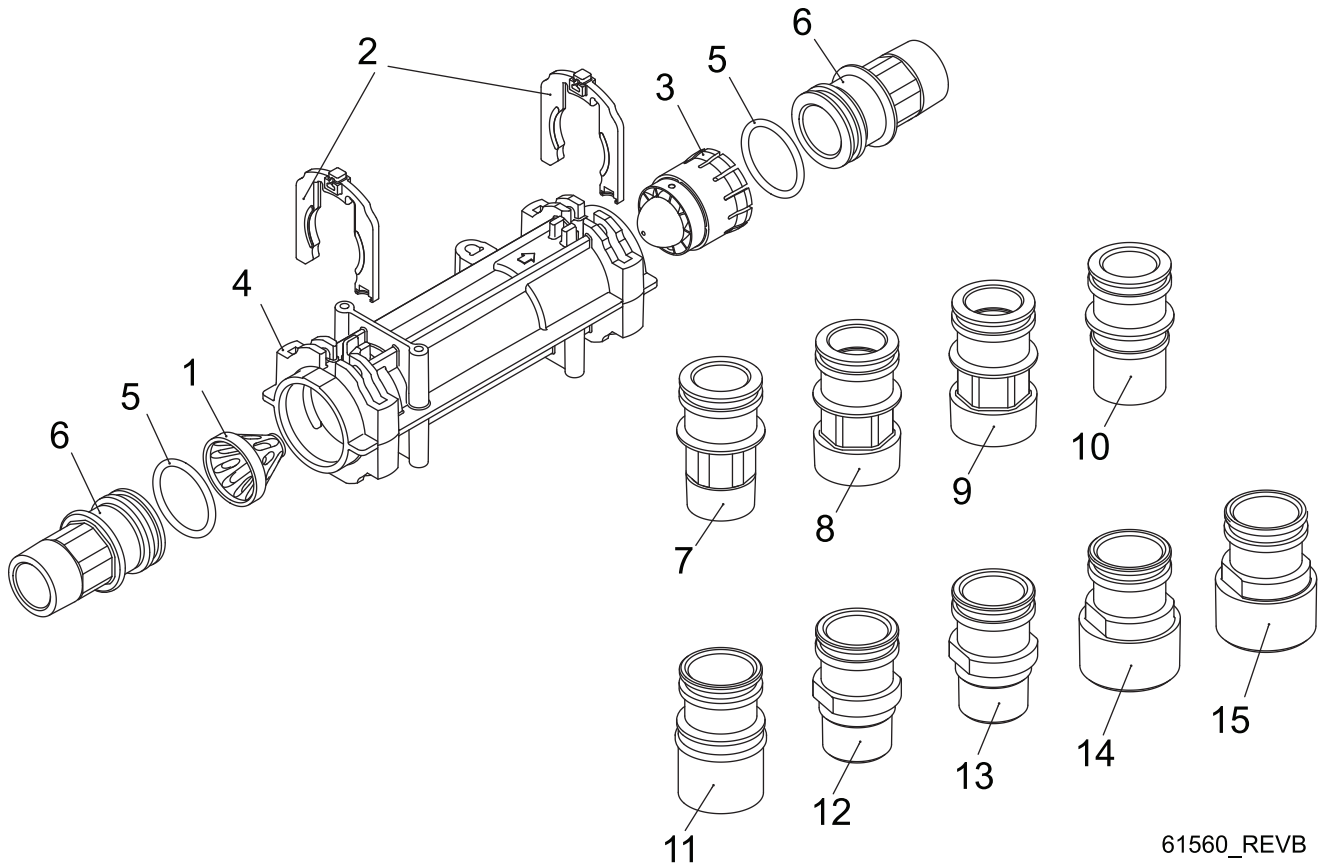


60613_REVB

Item No.	Quantity	Part No.	Description
1.....	1	14959	Body, Meter, 2750
2.....	1	13882	Post, Meter Impeller
3.....	1	13509	Impeller, Meter
4.....	1	13847	O-ring, -137, Std/560CD, Meter
5.....	1	14716	Meter Cap Assy, ET/NT
6.....	4	12112	Screw, Hex Hd Mach, 10-24 x 1/2
7.....	1	14960	Flow Straightener, 1"
8.....	1	13287	O-ring, -123
9.....	1	14961	Fitting, 1" Quick Connect
10.....	1	14962	Nut, 1" Meter, Quick Connect

For Assembly Numbers, See the Back of this Manual

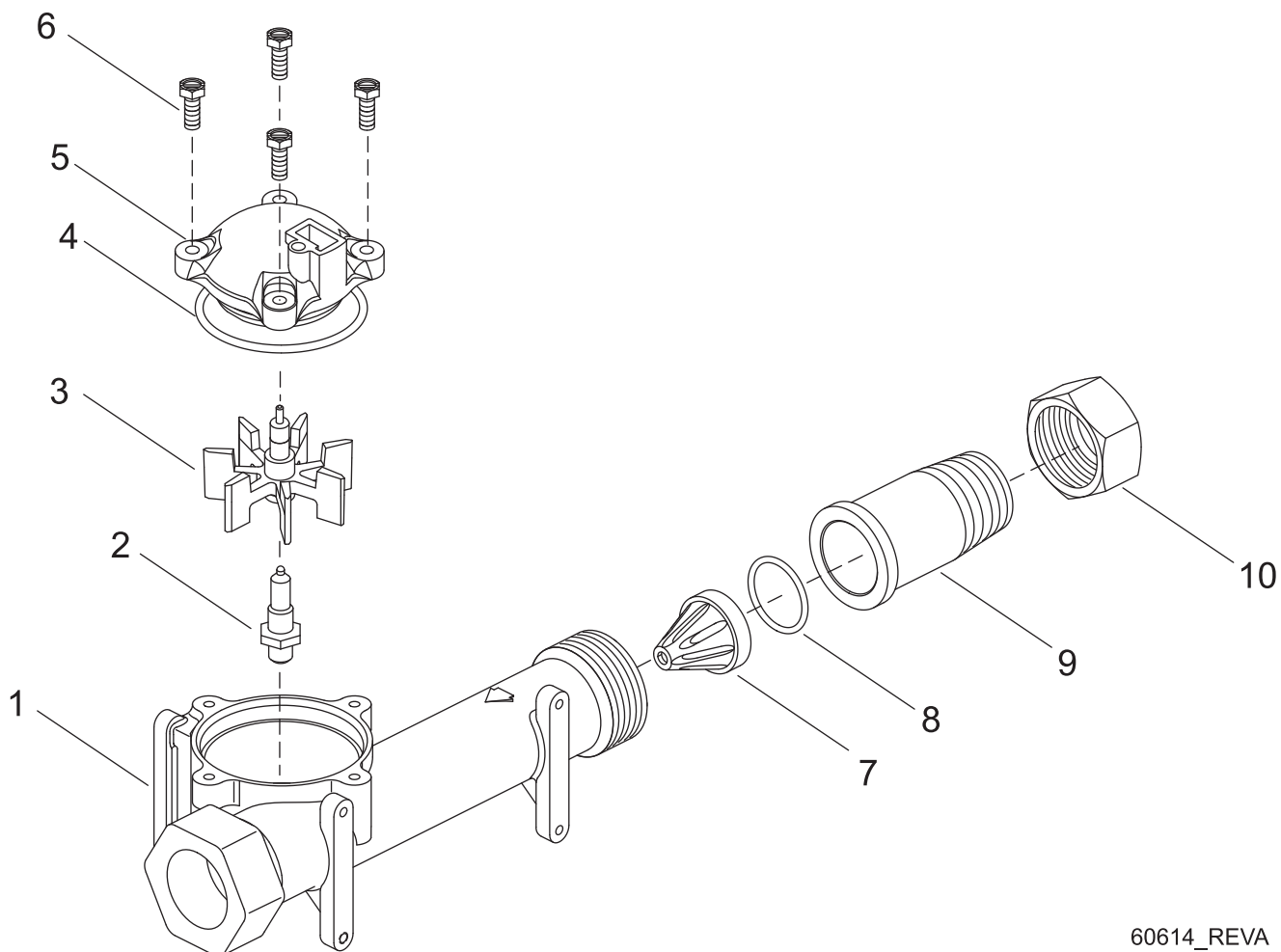
Inline Plastic Turbine Meter Assembly



Item No.	Quantity	Part No.	Description
1	1	17542	Flow Straightener
2	2	40576	Clip, H, Plastic, 7000
3	1	40577	Turbine Meter Assy, 7000
4	1	41555	Body, Remote Meter
5	2	40951	O-ring, -220
6	2	40563	Connector, 1" NPT, 7000
7	2	40563-10	Connector, 1" BSP, 7000
8	2	40565	Connector, 1-1/4" NPT, 7000
9	2	40565-10	Connector, 1-1/4" BSP, 7000
10	2	41242	Connector, 1" & 1-1/4" Sweat
11	2	41243	Connector, 1-1/4 & 1-1/2" Sweat
12	2	41596	Connector, Brass, 1" NPT
13	2	41596-10	Connector, Brass, 1" BSP
14	2	41597	Connector, Brass, 1-1/2" NPT
15	2	41597-10	Connector, Brass, 1-1/2" BSP

For Assembly Numbers, See the Back of this Manual

1-1/2" Brass Paddle Meter Assembly

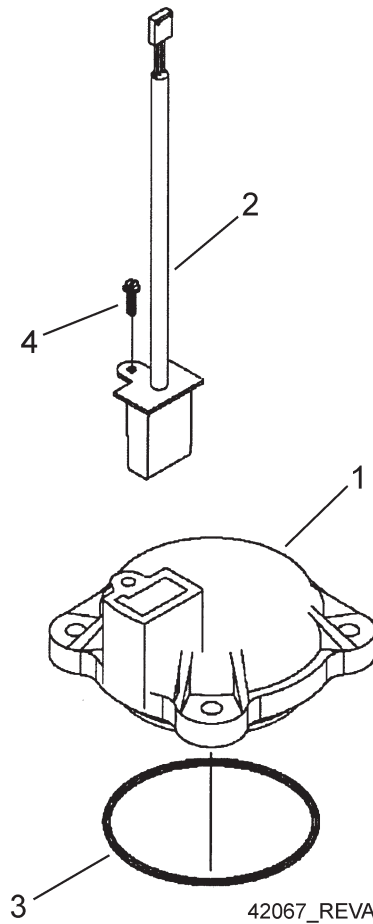


60614_REVA

Item No.	Quantity	Part No.	Description
1.....	1.....	17569.....	Body, Meter, 2850/9500
2.....	1.....	13882.....	Post, Meter Impeller
3.....	1.....	13509.....	Impeller, Meter
4.....	1.....	13847.....	O-ring, -137, Std/560CD, Meter
5.....	1.....	14716.....	Meter Cap Assy, NT
6.....	4.....	12112.....	Screw, Hex Hd Mach, 10-24 x 1/2
7.....	1.....	17542.....	Flow Straightener, 1-1/2"
8.....	1.....	12733.....	O-ring, -132
9.....	1.....	17544.....	Fitting, 1-1/2" Quick Connect
10.....	1.....	17543.....	Nut, 1-1/2", Quick Connect

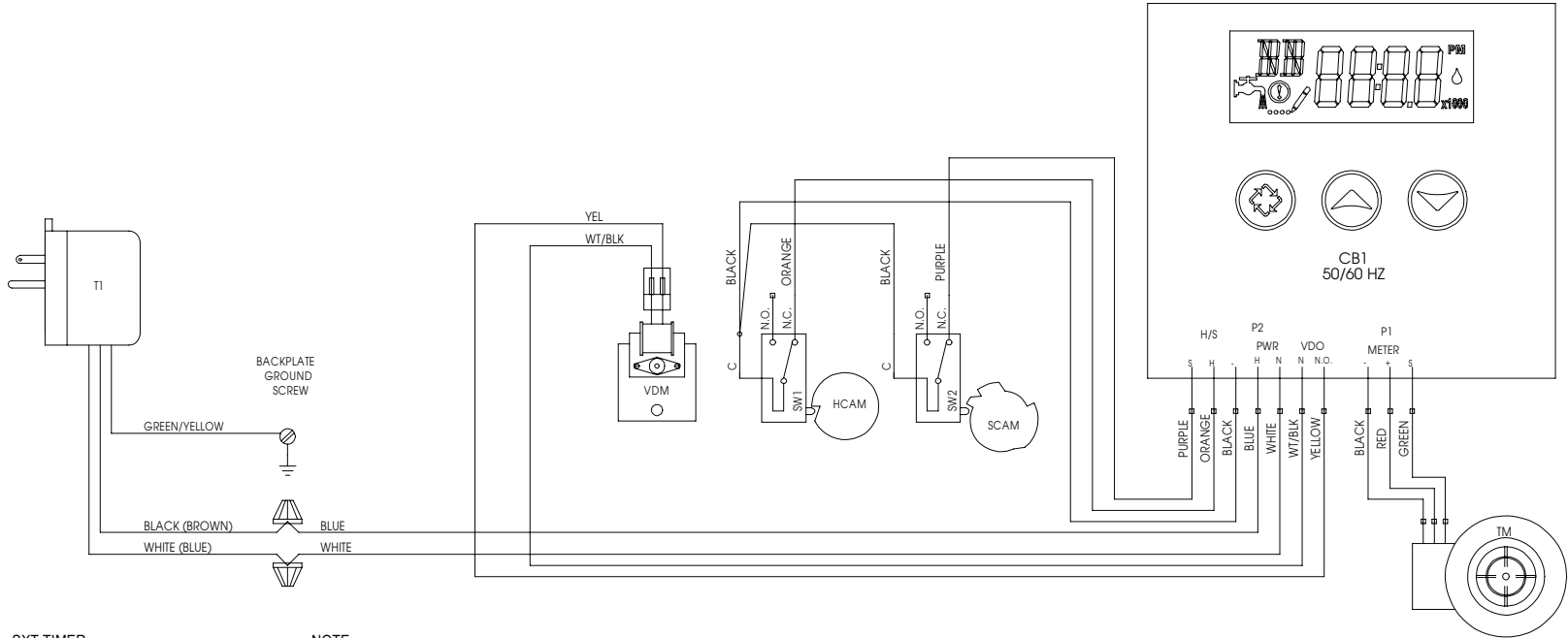
For Assembly Numbers, See the Back of this Manual

3/4", 1" or 1-1/2" Paddle Wheel Meter Cap Assembly



Item No.	Quantity	Part No.	Description
1.....	1	14716.....	Meter Cap Assy, NT
2.....	1	19121-01.....	Meter Cable Assy, SXT, Paddle 6700XTR
3.....	1	13847	O-ring, -137, Std/560CD, Meter
4.....	1	17798.....	Screw, Slot Hex Wsh Hd

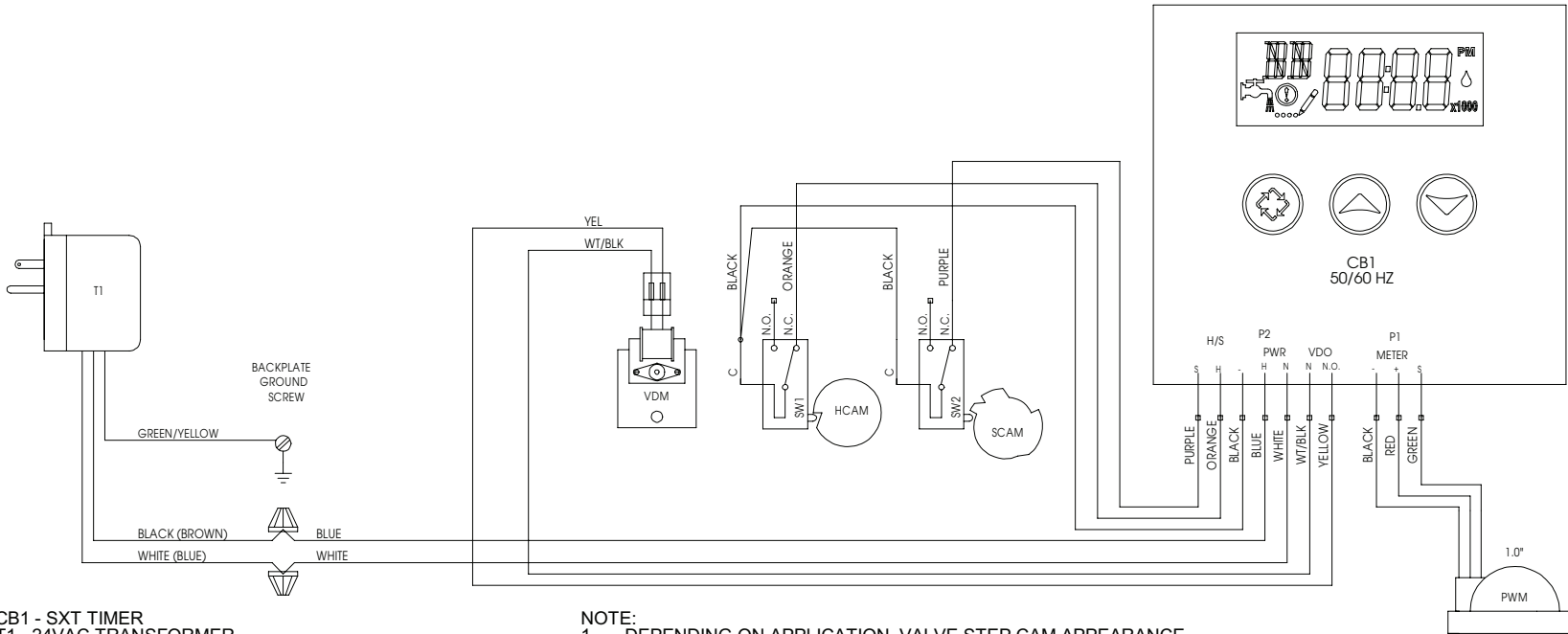
For Assembly Numbers, See the Back of this Manual



CB1 - SXT TIMER
 T1 - 24VAC TRANSFORMER
 K1 - 24VAC VALVE DRIVE RELAY
 TM - 3/4" TURBINE FLOW METER (OPTIONAL)
 VDM - VALVE DRIVE MOTOR
 SW1 - VALVE HOMING SWITCH
 SW2 - VALVE STEP SWITCH
 HCAM - VALVE HOMING CAM
 SCAM - VALVE STEP CAM

NOTE:
 1. DEPENDING ON APPLICATION, VALVE STEP CAM APPEARANCE WILL VARY.
 2. REGARDLESS OF CAM TYPE USED, WIRING TO SWITCHES SW1 AND SW2 WILL REMAIN AS SHOWN.
 3. VALVE SHOWN IN SERVICE POSITION.

2750SXT / 2850SXT Wiring Diagram

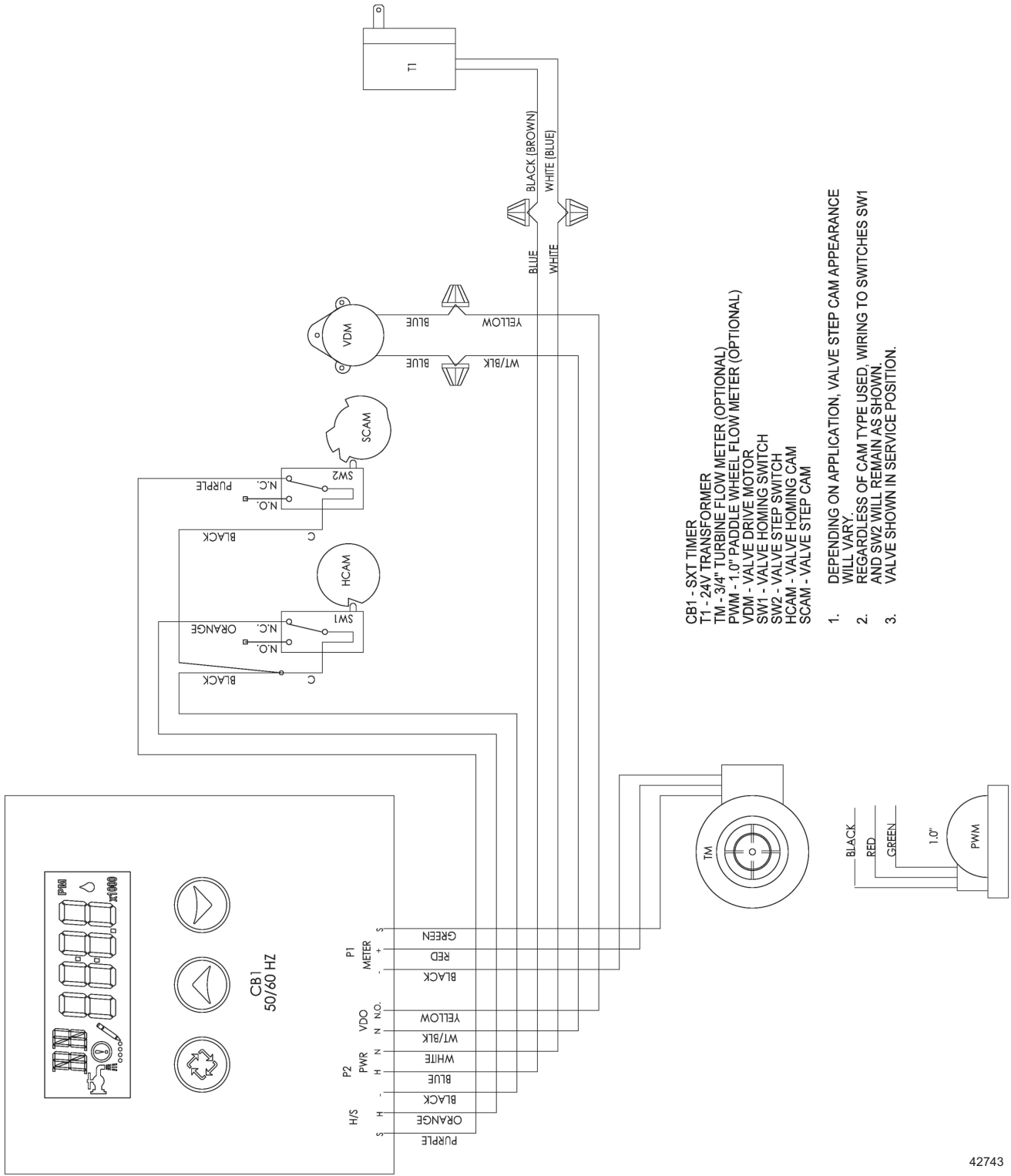


CB1 - SXT TIMER
 T1 - 24VAC TRANSFORMER
 K1 - 24VAC VALVE DRIVE RELAY
 PWM - 1.0" OR 1.5" PADDLE WHEEL FLOW METER (OPTIONAL)
 VDM - VALVE DRIVE MOTOR
 SW1 - VALVE HOMING SWITCH
 SW2 - VALVE STEP SWITCH
 HCAM - VALVE HOMING CAM
 SCAM - VALVE STEP CAM

NOTE:
 1. DEPENDING ON APPLICATION, VALVE STEP CAM APPEARANCE WILL VARY.
 2. REGARDLESS OF CAM TYPE USED, WIRING TO SWITCHES SW1 AND SW2 WILL REMAIN AS SHOWN.
 3. VALVE SHOWN IN SERVICE POSITION.

42742

9000SXT / 9100SXT / 9500SXT Wiring Diagram



42743

Error Codes

Note: Error codes appear on the In Service display.

Error Code	Error Type	Cause	Reset and Recovery
0	Cam Sense Error	The valve drive took longer than 6 minutes to advance to the next regeneration position.	Unplug the unit and examine the powerhead. Verify that all cam switches are connected to the circuit board and functioning properly. Verify that the motor and drive train components are in good condition and assembled properly. Check the valve and verify that the piston travels freely. Replace/reassemble the various components as necessary. Plug the unit back in and observe its behavior. The unit should cycle to the next valve position and stop. If the error re-occurs, unplug the unit and contact technical support.
1	Cycle Step Error	The control experienced an unexpected cycle input	Unplug the unit and examine the powerhead. Verify that all cam switches are connected to the circuit board and functioning properly. Enter Master Programming mode and verify that the valve type and system type are set correctly with regard to the unit itself. Step the unit through a manual regeneration and verify that it functions correctly. If the error re-occurs unplug the unit and contact technical support.
2	Regen Failure	The system has not regenerated for more than 99 days (or 7 days if the Control Type has been set to Day-of-Week).	Perform a Manual Regeneration to reset the error code. If the system is metered, verify that it is measuring flow by running service water and watching for the flow indicator on the display. If the unit does not measure flow, verify that the meter cable is connected properly and that the meter is functioning properly. Enter Master Programming mode and verify that the unit is configured properly. As appropriate for the valve configuration, check that the correct system capacity has been selected, that the day override is set properly, and that the meter is identified correctly. If the unit is configured as a Day-of-Week system, verify that at least one day is set ON. Correct the settings as necessary.
3	Memory Error	Control board memory failure.	Perform a Master Reset and reconfigure the system via Master Programming mode. After reconfiguring the system, set the valve through a manual regeneration. If the error re-occurs, unplug the unit and contact technical support.
2	There have been more than 99 days since the last		Regeneration must occur for the unit to recover, the display to clear and the valve to function normally. [7 - - 5]: To recover from [Err2], the user must initiate a regeneration or set at least one individual day to 1.

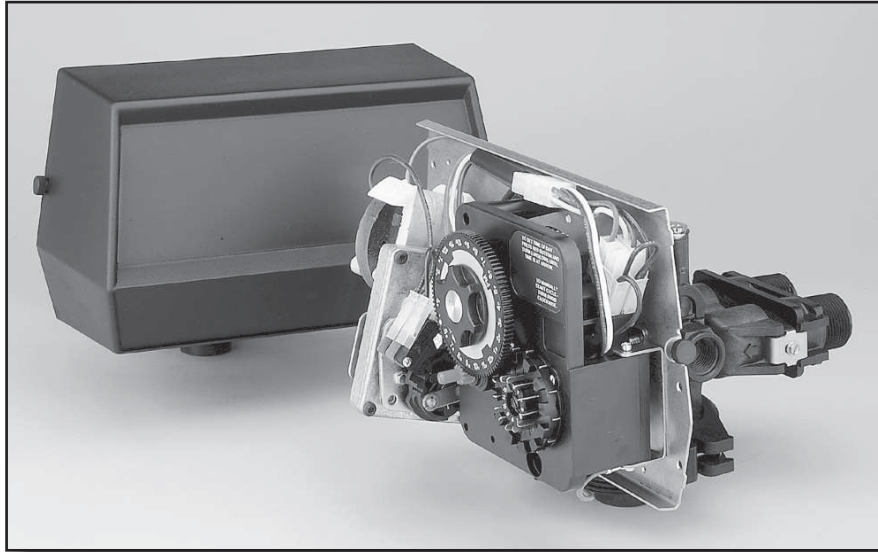
Service Assemblies

Meter:

60086-50 Meter Assy, 3/4", Electronic 2510/6600/6700
60613 Meter Assy, 2750 Electronic 1"
60613-20 Meter Assy, 2750, Electronic 1" BSP/Metric
60613NP Meter Assy, 2750, Electronic 1" Nickel Plated
60614 Meter Assy, 2850/9500, Electronic 1-1/2" Meter
60614NP Meter Assy, 2850/9500, Electronic 1-1/2" Meter, NP
60618 Meter Assy, Electronic, 3/4"
60619-20 Meter Assy, 1-1/2" Electronic BSP/Metric
60626 Meter Assy, Turbine, Electronic 3/4" wit Clips and Screws
60626-01 Meter Assy, Turbine, 3/4" w/Clips, Screws, Mtr/Cable
61560-01 Meter Assy, In-Line, w/1" NPT Plastic Connector
61560-02 Meter Assy, In-Line, w/1" BSP Plastic Connector
61560-07 Meter Assy, In-Line, w/1" NPT Brass Connector
61560-08 Meter Assy, In-Line, w/1" BSP Brass Connector
61560-05 Meter Assy, In-Line, w/1" I.D. & 1-1/4" O.D. Sweat Connector
61560-09 Meter Assy, In-Line, w/ 1-1/2" NPT Brass Connector
61560-10 Meter Assy, In-Line, w/ 1-1/2" BSP Brass Connector

Model 2510 & 2510 Econominder

Service Manual



IMPORTANT: Fill in Pertinent Information on Page 3 for Future Reference

Table of Contents

Job Specification Sheet.....	3
Installation Instructions.....	4
Start-Up Instructions.....	5
3200 Timer Setting Procedure.....	6
3210 Timer Settings.....	7
3200 & 3210 Timer Series.....	8
3200 Timer Assembly.....	10
3210 Timer Assembly.....	12
Powerhead Assembly.....	14
Powerhead Assembly (Environmental).....	16
Manual Powerhead Assembly.....	18
Control Valve Assembly.....	20
Softener & Filter Conversion Kits.....	22
Meter Assembly.....	23
1600 Brine System Assembly.....	24
1650 Brine System Assembly.....	25
Bypass Valve Assembly (Plastic).....	26
Bypass Valve Assembly (Metal).....	27
2300 Safety Brine Valve.....	28
2310 Safety Brine Valve.....	29
Service Instructions.....	30
Seal & Spacer Replacement.....	31
Troubleshooting.....	33
Flow Data & Injector Draw Rates.....	35
Wiring Diagram.....	36
Service Assemblies.....	37



IMPORTANT PLEASE READ:

- The information, specifications and illustrations in this manual are based on the latest information available at the time of printing. The manufacturer reserves the right to make changes at any time without notice.
- This manual is intended as a guide for service of the valve only. System installation requires information from a number of suppliers not known at the time of manufacture. This product should be installed by a plumbing professional.
- This unit is designed to be installed on potable water systems only.
- This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- If daytime operating pressure exceeds 80 psi (5.5 bar), nighttime pressures may exceed pressure limits. A pressure reducing valve must be installed.
- Do not install the unit where temperatures may drop below 32°F (0°C) or above 110°F (43°C).
- Do not place the unit in direct sunlight. Black units will absorb radiant heat increasing internal temperatures.
- Do not strike the valve or any of the components.
- Warranty of this product extends to manufacturing defects. Misapplication of this product may result in failure to properly condition water, or damage to product.
- A prefilter should be used on installations in which free solids are present.
- In some applications local municipalities treat water with Chloramines. High Chloramine levels may damage valve components.
- Correct and constant voltage must be supplied to the control valve to maintain proper function.

Job Specification Sheet

Job Number: _____

Model Number: _____

Water Hardness: _____ ppm or gpg

Capacity Per Unit: _____

Mineral Tank Size: _____ Diameter: _____ Height: _____

Salt Setting per Regeneration: _____

1. Type of Timer:

- A. 7 Day or 12 Day B. Meter Initiated

2. Downflow: Upflow Upflow Variable

3. Meter Size:

- A. 3/4" Std Range (125 - 2,100 gallon setting)
B. 3/4" Ext Range (625 - 10,625 gallon setting)
C. 1" Std Range (310 - 5,270 gallon setting)
D. 1" Ext Range (1,150 - 26,350 gallon setting)
E. 1-1/2" Std Range (625 - 10,625 gallon setting)
F. 1-1/2" Ext Range (3,125 - 53,125 gallon setting)
G. 2" Std Range (1,250 - 21,250 gallon setting)
H. 2" Ext Range (6,250 - 106,250 gallon setting)
I. 3" Std Range (3,750 - 63,750 gallon setting)
J. 3" Ext Range (18,750 - 318,750 gallon setting)
K. Electronic _____ Pulse Count _____ Meter Size

4. System Type:

- A. System #4: 1 Tank, 1 Meter, Immediate, or Delayed Regeneration
B. System #4: Time Clock
C. System #4: Twin Tank
D. System #5: 2-5 Tanks, 2 Meters, Interlock
E. System #6: 2-5 Tanks, 1 Meter, Series Regeneration
F. System #7: 2-5 Tanks, 1 Meter, Alternating
G. System #9: Electronic Only, 2-4 Tanks, Meter per Valve, Alternating
H. System #14: Electronic Only, 2-4 Tanks, Meter per Valve. Brings units on and offline based on flow.

5. Timer Program Settings:

- A. Backwash: _____ Minutes
B. Brine and Slow Rinse: _____ Minutes
C. Rapid Rinse: _____ Minutes
D. Brine Tank Refill: _____ Minutes
E. Pause Time: _____ Minutes
F. Second Backwash: _____ Minutes

6. Drain Line Flow Control: _____ gpm

7. Brine Line Flow Controller: _____ gpm

8. Injector Size#: _____

9. Piston Type:

- A. Hard Water Bypass
B. No Hard Water Bypass

Installation Instructions

WATER PRESSURE: A minimum of 20 pounds of water pressure (1.3 bar) is required for regeneration valve to operate effectively.

ELECTRICAL FACILITIES: An uninterrupted alternating current (A/C) supply is required. Note: Other voltages are available. Please make sure your voltage supply is compatible with your unit before installation.

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.

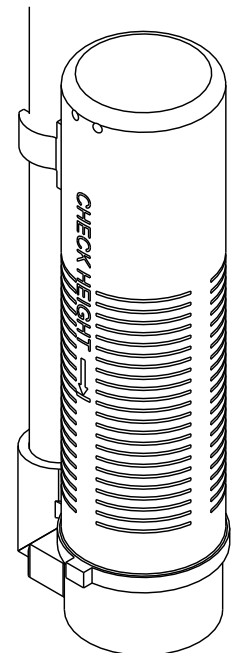
LOCATION OF SOFTENER AND DRAIN: The softener should be located close to a drain to prevent air breaks and back flow.

BY-PASS VALVES: Always provide for the installation of a by-pass valve if unit is not equipped with one.

CAUTION: Water pressure is not to exceed 125 psi (8.6 bar), water temperature is not to exceed 110°F (43°C), and the unit cannot be subjected to freezing conditions.

Installation Instructions

1. Place the softener tank where you want to install the unit making sure the unit is level and on a firm base.
2. During cold weather, the installer should warm the valve to room temperature before operating.
3. All plumbing should be done in accordance with local plumbing codes. The pipe size for residential drain line should be a minimum of 1/2" (13 mm). Backwash flow rates in excess of 7 gpm (26 Lpm) or length in excess of 20' (6 m) require 3/4" (19 mm) drain line. Commercial drain lines should be the same size as the drain line flow control.
4. Refer to the dimensional drawing for cutting height of the distributor tube. If there is no dimensional drawing, cut the distributor tube flush with the top of the tank.
5. Lubricate the distributor O-ring seal and tank O-ring seal. Place the main control valve on tank. Note: Only use silicone lubricant.
6. Solder joints near the drain must be done prior to connecting the Drain Line Flow Control fitting (DLFC). Leave at least 6" (15 cm) between the DLFC and solder joints when soldering pipes that are connected on the DLFC. Failure to do this could cause interior damage to the DLFC.
7. Teflon tape is the only sealant to be used on the drain fitting. The drain from twin tank units may be run through a common line.
8. Make sure that the floor is clean beneath the salt storage tank and that it is level.
9. 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 (Figure 1) in the salt tank. Do not add salt to the brine tank 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. Once clean, close the water tap.
11. Slowly place the by-pass in service position and let water flow into the mineral tank. When water flow stops, slowly open a cold water tap nearby and let run until the air is purged from the unit.
12. Plug unit into an electrical outlet. Note: All electrical connections must be connected according to local codes. Be certain the outlet is uninterrupted.



60002-34REVC

Figure 1 Residential Air Check Valve

	<p>CAUTION</p> <ul style="list-style-type: none">• Do not exceed 125 psi water pressure• Do not exceed 110°F (43°C) water temperature• Do not subject unit to freezing conditions
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Start-Up Instructions

The water softener should be installed with the inlet, outlet, and drain connections made in accordance with the manufacturer's recommendations, and to meet applicable plumbing codes.

1. Turn the manual regeneration knob slowly in a clockwise direction until the program micro switch lifts on top of the first set of pins. Allow the drive motor to move the piston to the first regeneration step and stop. Each time the program switch position changes, the valve will advance to the next regeneration step. Always allow the motor to stop before moving to the next set of pins or spaces.

NOTE: For electronic valves, please refer to the manual regeneration part of the timer operation section. If the valve came with a separate electronic timer service manual, refer to the timer operation section of the electronic timer service manual.

2. Position the valve to backwash. Ensure the drain line flow remains steady for 10 minutes or until the water runs clear (see above).
3. Position the valve to the brine / slow rinse position. Ensure the unit is drawing water from the brine tank (this step may need to be repeated).
4. Position the valve to the rapid rinse position. Check the drain line flow, and run for 5 minutes or until the water runs clear.
5. Position the valve to the start of the brine tank fill cycle. Ensure water goes into the brine tank at the desired rate. The brine valve drive cam will hold the valve in this position to fill the brine tank for the first regeneration.
6. Replace control box cover.
7. Put salt in the brine tank.

NOTE: Do not use granulated or rock salt.

3200 Timer Setting Procedure

How To Set Days On Which Water Conditioner Is To Regenerate (Figure 2):

Rotate the skipper wheel until the number "1" is at the red pointer. Set the days that regeneration is to occur by sliding tabs on the skipper wheel outward to expose trip fingers. Each tab is one day. Finger at red pointer is tonight. Moving clockwise from the red pointer, extend or retract fingers to obtain the desired regeneration schedule.

How To Set The Time Of Day:

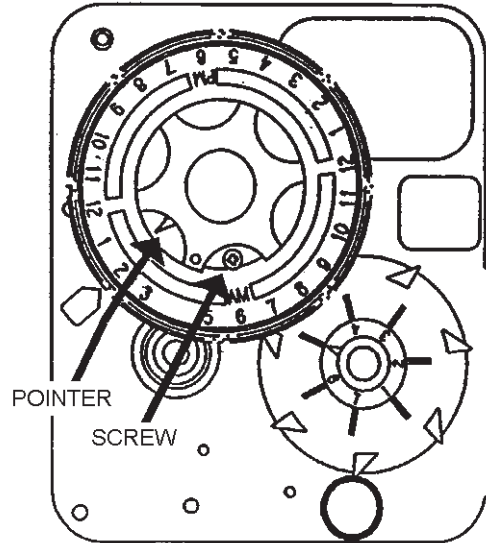
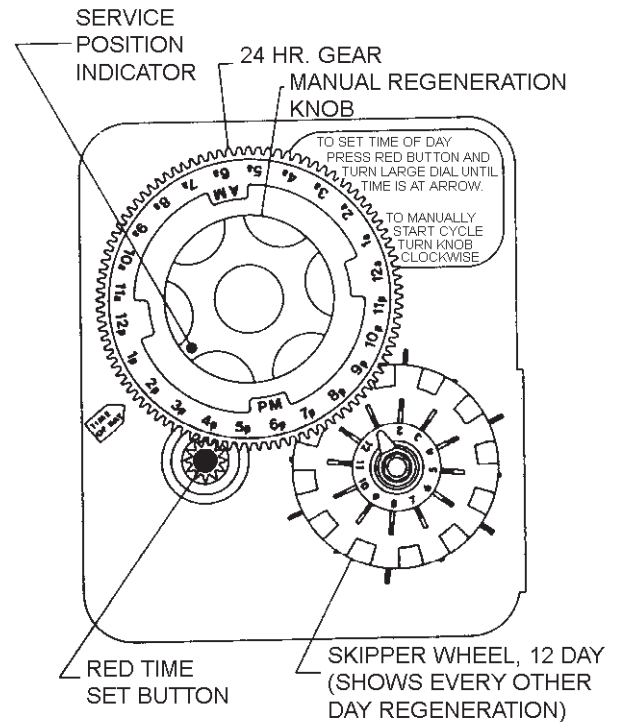
1. Press and hold the red button in to disengage the drive gear.
2. Turn the large gear until the actual time of day is at the time of day pointer.
3. Release the red button to again engage the drive gear.

How To Manually Regenerate Your Water Conditioner At Any Time:

1. Turn the manual regeneration knob clockwise.
2. This slight movement of the manual regeneration knob engages the program wheel and starts the regeneration program.
3. The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing.
4. Even though it takes three hours for this center knob to complete one revolution, the regeneration cycle of your unit might be set only one half of this time.
5. In any event, conditioned water may be drawn after rinse water stops flowing from the water conditioner drain line.

How to Adjust Regeneration Time:

1. Disconnect the power source.
2. Locate the three screws behind the manual regeneration knob by pushing the red button in and rotating the 24 hour dial until each screw appears in the cut out portion of the manual regeneration knob.
3. Loosen each screw slightly to release the pressure on the time plate from the 24 hour gear.
4. Locate the regeneration time pointer on the inside of the 24 hour dial in the cut out.
5. Turn the time plate so the desired regeneration time aligns next to the raised arrow.
6. Push the red button in and rotate the 24 hour dial. Tighten each of the three screws.
7. Push the red button and locate the pointer one more time to ensure the desired regeneration time is correct.
8. Reset the time of day and restore power to the unit.



3200 ADJUSTABLE REGENERATION TIMER

IMPORTANT!
SALT LEVEL MUST ALWAYS BE ABOVE
WATER LEVEL IN BRINE TANK

Figure 2

61502_3200REVA

Typical Programming Procedure

Calculate the gallon capacity of the system, subtract the necessary reserve requirement and set the gallons available opposite the small white dot on the program wheel gear.

NOTE: Drawing shows 8,750 gallon setting. The capacity (gallons) arrow (15) shows zero gallons remaining. The unit will regenerate tonight at the set regeneration time.

How To Set The Time Of Day:

1. Press and hold the red button in to disengage the drive gear.
2. Turn the large gear until the actual time of day is opposite the time of day pointer.
3. Release the red button to again engage the drive gear.

How To Manually Regenerate Your Water Conditioner At Any Time:

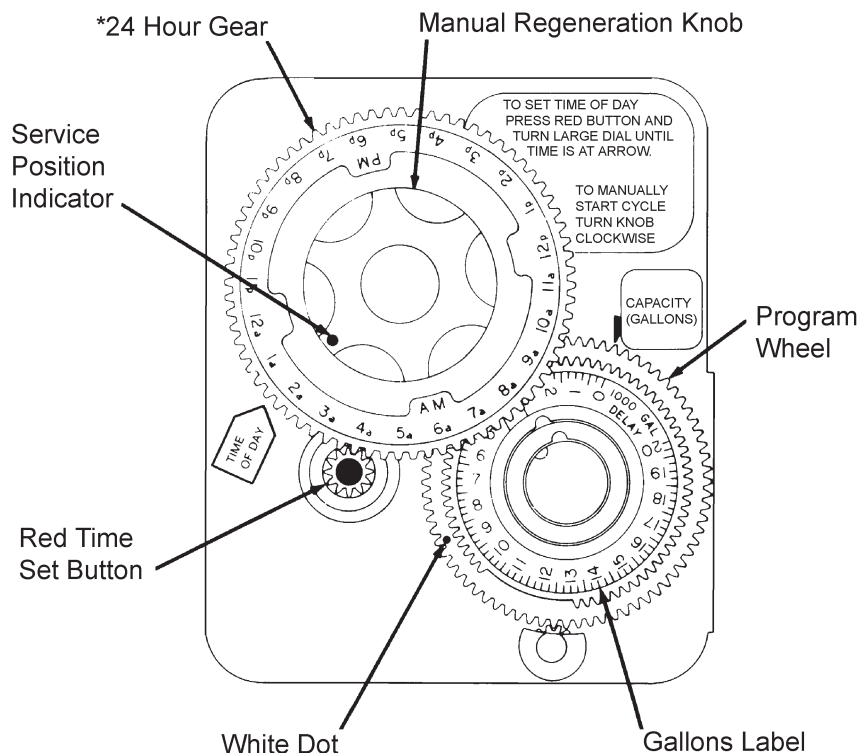
1. Turn the manual regeneration knob clockwise.
2. This slight movement of the manual regeneration knob engages the program wheel and starts the regeneration program.

The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing.

3. Even though it takes three hours for this center knob to complete one revolution, the regeneration cycle of your unit might be set for only one half of this time.
4. In any event, conditioned water may be drawn after rinse water stops flowing from the water conditioner drain line.

Immediate Regeneration Timers:

These timers do not have a 24 hour gear. Setting the gallons on the program wheel and manual regeneration procedure are the same as previous instructions. The timer will regenerate as soon as the capacity gallons reaches zero.



NOTE:

The program wheel to the left may be different than the program wheel on the product.

NOTE:

To set meter capacity rotate manual knob one - 360° revolution to set gallonage.

*Immediate regeneration timers do not have a 24-hour gear. No time of day can be set.

61502_3200REVA

Figure 3

3200 & 3210 Timer Series

Regeneration Cycle Program Setting Procedure (Downflow)

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.

3200 & 3210 Series Timers (Figure 4)

1. To expose cycle program wheel, grasp timer in upper left-hand corner and pull, releasing snap retainer and swinging timer to the right.
2. To change the regeneration cycle program, the program wheel must be removed. Grasp program wheel and squeeze protruding lugs toward center, lift program wheel off timer. Switch arms may require movement to facilitate removal.
3. Return timer to closed position engaging snap retainer in back plate. Make certain all electrical wires locate above snap retainer post.

Timer Setting Procedure for 3200 & 3210 Timer

How To Change The Length Of The Backwash Time:

The program wheel as shown in the drawing is in the service 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 unit will backwash.

EXAMPLE: If there are six pins in this section, the time of backwash will be 12 min. (2 min. per pin). To change the length of backwash time, add or remove pins as required. The number of pins times two equals the backwash time in minutes.

How To Change The Length Of Brine And Rinse Time:

1. 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 unit will brine and rinse (2 min. per hole).
2. To change the length of brine and rinse time, move the rapid rinse group of pins to give more or fewer holes in the brine and rinse section. Number of holes times two equals brine and rinse time in minutes.

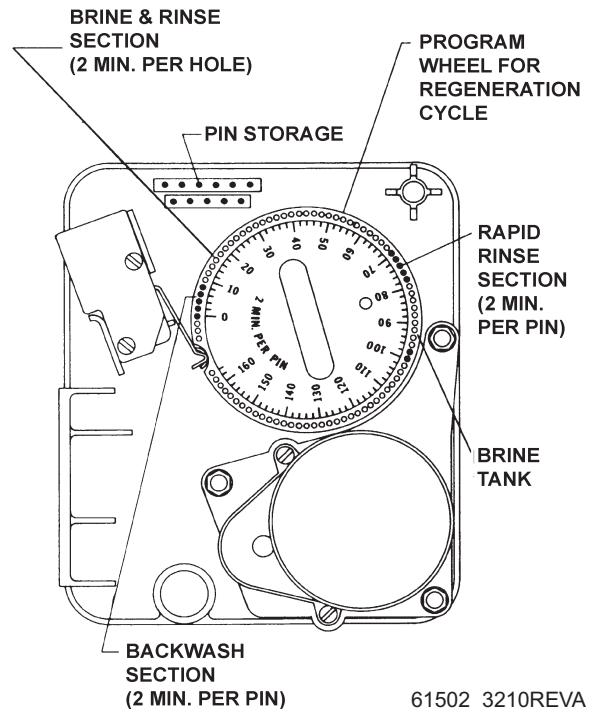


Figure 4

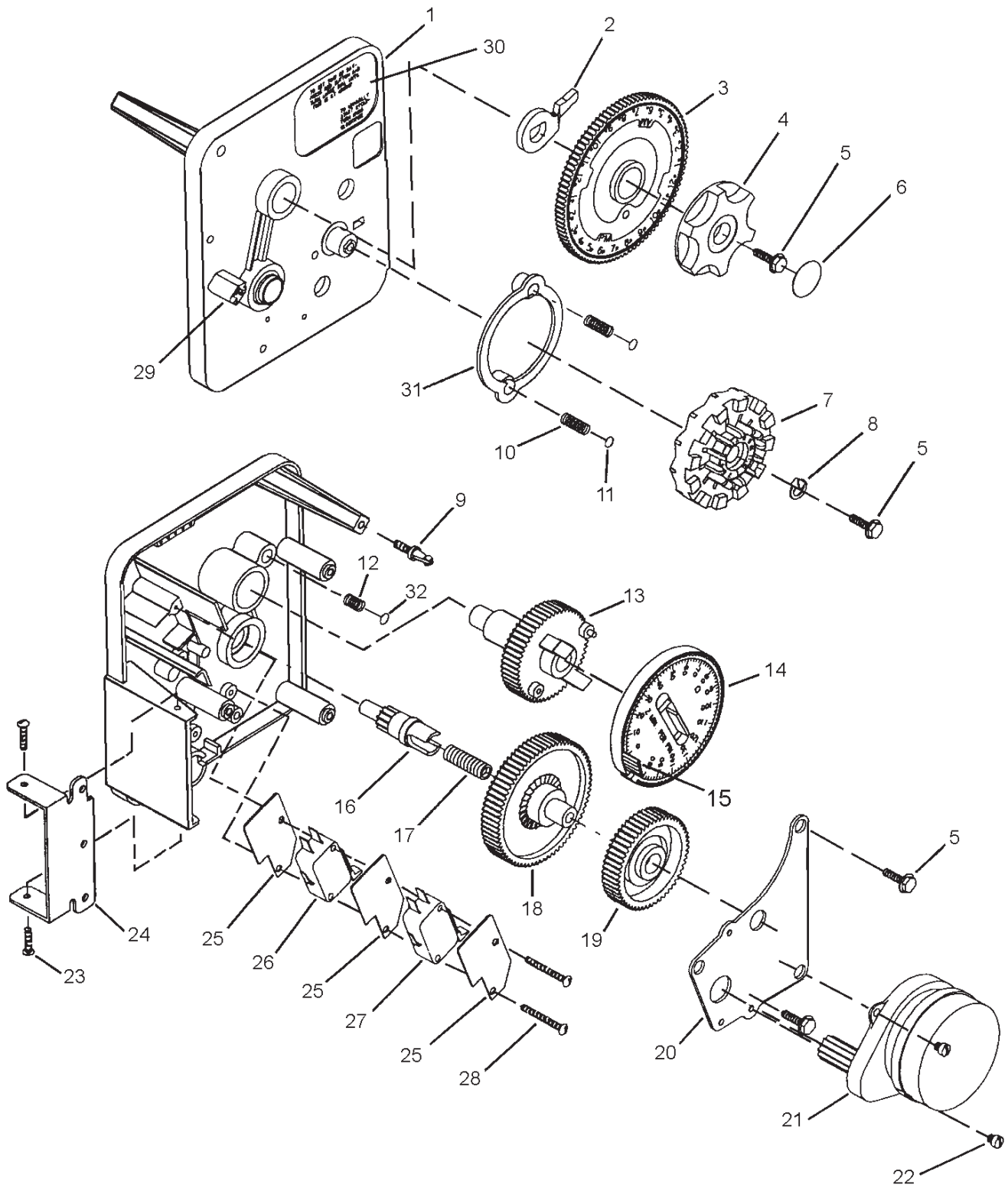
How To Change The Length Of Rapid Rinse:

1. The second group of pins on the program wheel determines the length of time that your water conditioner will rapid rinse (2 min. per pin).
2. 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 times two equals the rapid rinse time in minutes.

How To Change The Length Of Brine Tank Refill Time:

1. The second group of holes in the program wheel determines the length of time that your water conditioner will refill the brine tank (2 min. per hole).
2. To change the length of refill time, move the two pins at the end of the second group of holes as required.
3. The regeneration cycle is complete when the outer microswitch is tripped by the two pin set at end of the brine tank refill section.
4. The program wheel, however, will continue to rotate until the inner micro-switch drops into the notch on the program wheel.

3200 Timer Assembly



61502-3200_REVA

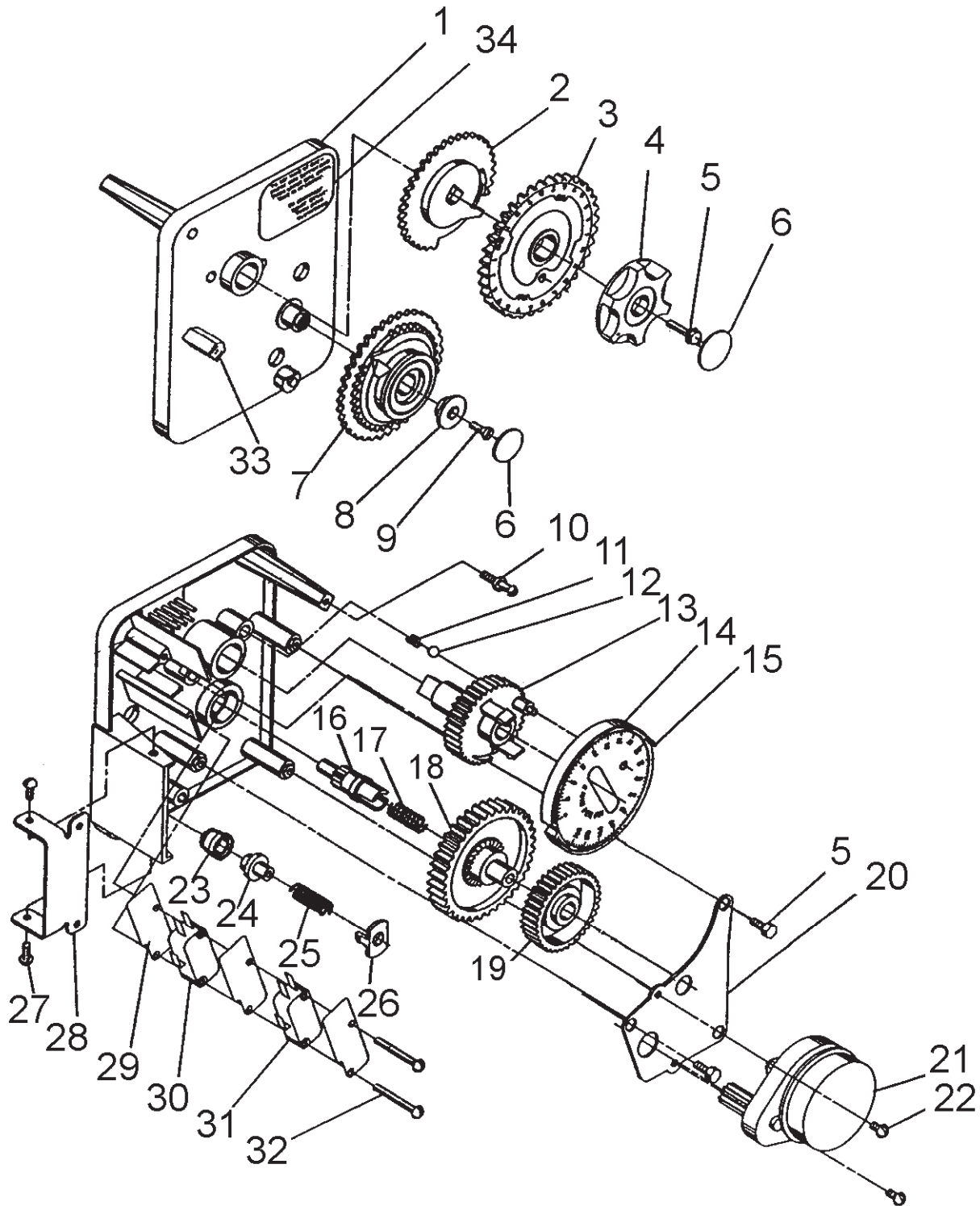
For Service Assembly Numbers, See the Back of this Manual

3200 Timer Assembly

Item No.	Quantity	Part No.	Description
1	1	13870	Housing, Timer, 3200
2	1	14265	Clip, Spring
3	3	14087	Insulator
4	1	10896	Switch, Micro
5	1	15320	Switch, Micro, Timer
6	2	11413	Screw, Pan Hd Mach, 4-40 x 1-1/8
7	1	13886	Knob, 3200
8	5	13296	Screw, Hex Wsh, 6-20 x 1/2
9	1	11999	Label, Button
10	1	13018	Pinion, Idler
11	1	13312	Spring, Idler Shaft
12	1	13017	Gear, Idler
13	1	13164	Gear, Drive
14	1	13887	Plate, Motor Mounting
15	1	18743-1	Motor, 120V, 60Hz, 1/30 RPM, 5600
		19659-1	Motor, 24V, 60Hz, 1/30 RPM
16	2	13278	Screw, Slt'd Fillister Hd 6-32 x .156
17	1	15424	Spring, Detent, Timer
18	1	15066	Ball, 1/4", Delrin
19	1	15465	Label, Caution
20	1	19210	Program Wheel Assy
21	1	13911	Gear, Main Driver, Timer
22	17	41754	Pin, Spring, 1/16 x 5/8 SS, Timer
23	1	13011	Arm, Cycle Actuator
24	1	13864	Ring, Skipper Wheel
25	2	13311	Spring, Detent, Timer
26	2	13300	Ball, 1/4", SS
27	1	14381	Skipper Wheel Assy, 12 Day
		14860	Skipper Wheel Assy, 7 Day
28	1	13014	Pointer, Regeneration
29	1	40096-24	Dial, 12 AM Regen Assy, Black
		40096-02	Dial, 2 AM Regen Assy, Black
30	1	13881	Bracket, Hinger Timer
31	2	11384	Screw, Phil, 6-32 x 1/4 Zinc
32	1	13902	Harness, 3200
33	2	40422	Nut, Wire, Tan
34	1	15354-01	Wire, Ground, 4"
35	1	14007	Label, Time of Day

For Service Assembly Numbers, See the Back of this Manual

3210 Timer Assembly



61502-3210_REVA

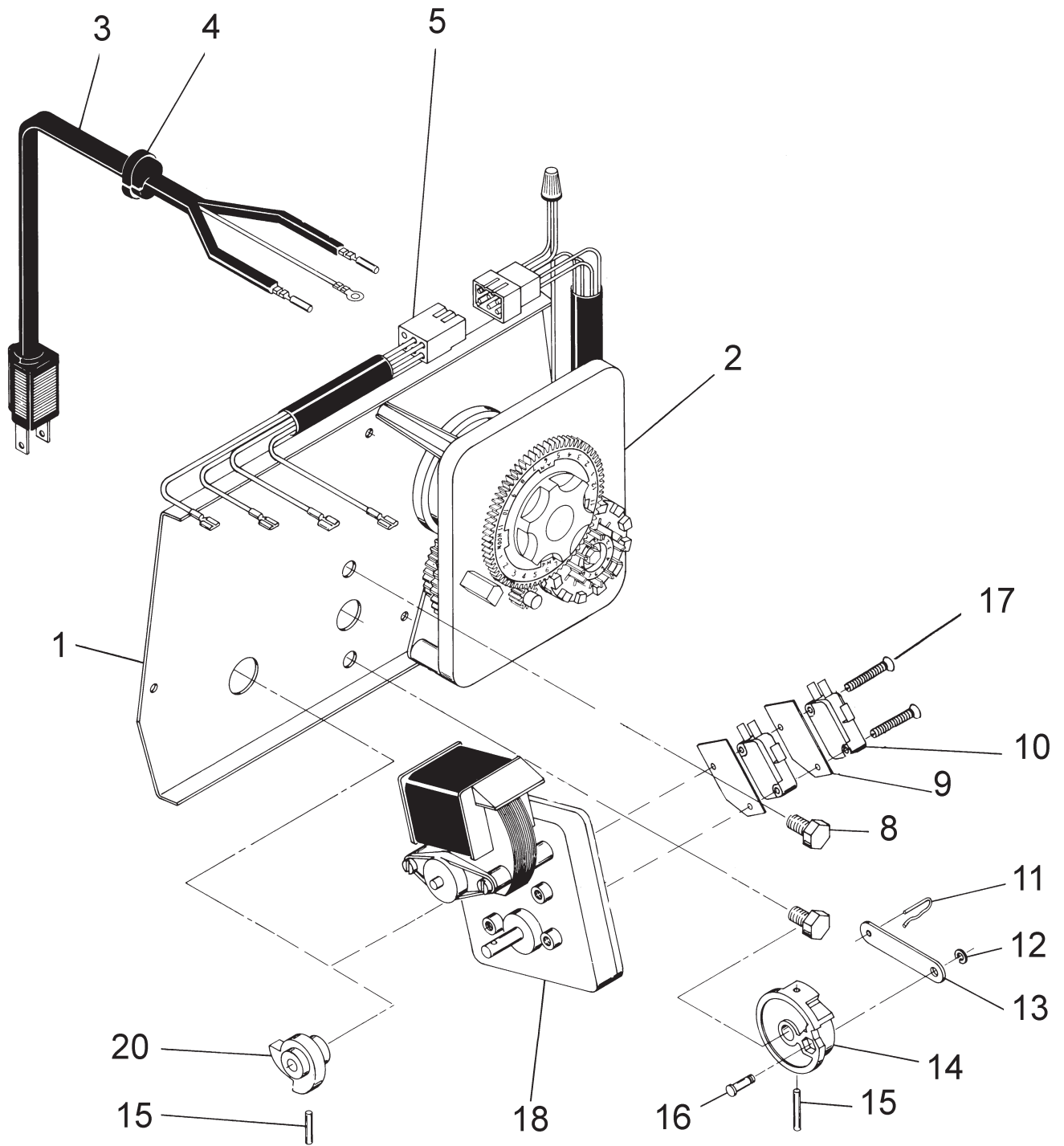
For Service Assembly Numbers, See the Back of this Manual

3210 Timer Assembly

Item No.	Quantity	Part No.	Description
1	1	13870	Housing, Timer, 3200
2	1	13802	Gear, Cycle Actuator
3	1	40096-02	Dial, 2 AM Regen Assy, Black
4	1	13886	Knob, 3200
5	4	13296	Screw, Hex Wsh, 6-20 x 1/2
6	2	11999	Label, Button
7	1	60405-15	Program Wheel, w/34" Std Label, w/People Label Set @21
8	1	13806	Retainer, Program Wheel
9	1	13748	Screw, Flat Head St, 6-20 x 1/2
10	1	14265	Clip, Spring
11	1	15424	Spring, Detent, Timer
12	1	15066	Ball, 1/4" Delrin
13	1	13018	Pinion, Idler
14	1	13312	Spring, Idler Shaft
15	1	13017	Gear, Idler
16	1	13164	Gear, Drive
17	1	13887	Plate, Motor Mounting
18	1	18743-1	Motor, 120V, 60Hz 1/30 RPM, 5600
19	1	13278	Screw, Fillister Hd, 6-32 x .156
20	1	13830	Pinion, Program Wheel Drive
21	1	13831	Clutch, Drive Pinion
22	1	14276	Spring, Meter, Clutch
23	1	14253	Retainer, Clutch Spring
24	3	11384	Screw, Phil, 6-32 x 1/4
25	1	13881	Bracket, Hinge Timer
26	3	14087	Insulator
27	1	10896	Switch, Micro
28	1	15320	Switch, Micro, Timer
29	2	11413	Screw, Pan Hd Mach, 4-40 x 1-1/8
30	1	14198	Label, Indicator
31	1	15465	Label, Caution
32	1	14007	Label, Time of Day
33	1	14045	Label, Instruction
34	1	13902	Harness, 3200
35	2	40422	Nut, Wire, Tan
36	1	15354-01	Wire, Ground, 4"
37	1	19210	Program Wheel Assy
38	17	41754	Pin, Spring, 1/16 x 5/8 SS Timer
39	1	13911	Gear, Main Drive, Timer
40	1	15354-01	Wire, Ground 4"

For Service Assembly Numbers, See the Back of this Manual

Powerhead Assembly (Designer)



61501_2510REVB

For Service Assembly Numbers, See the Back of this Manual

Powerhead Assembly (Designer)

Item No.	Quantity	Part No.	Description
1	1	40264	Backplate, SS/SVO, W-T-Screws
2	1		3200, Timer 7 or 12 Day
3	1	11838	Power Cord
4	1	13547	Strain Relief
5	1	40400	Harness, Drive, Designer/Environmental
8	2	10231	Screw, Drive Mounting
9	2	10302	Insulator
10	2	10218	Switch
11	1	10909	Connecting Link Pin
12	1	10250	Retaining Ring
13	1	10621	Connecting Link
14	1	12576	Drive Cam, STF (Black)
	1	12102	Drive Cam, RR (White)
15	2	10338	Roll Pin
16	1	13366	Drive Bearing
17	2	14923	Screw, Switch Mounting
18	1	41543*	Motor, Drive, 115V, 50/60Hz
		42579**	Motor, Drive, 24VAC/VDC, 50/60Hz
		41545*	Motor, Drive, 230V, 50/60Hz
20	1	12777	Brine Valve Cam, STF (Black)
	1	10815	Brine Valve Cam, RR (White)

Not Shown:

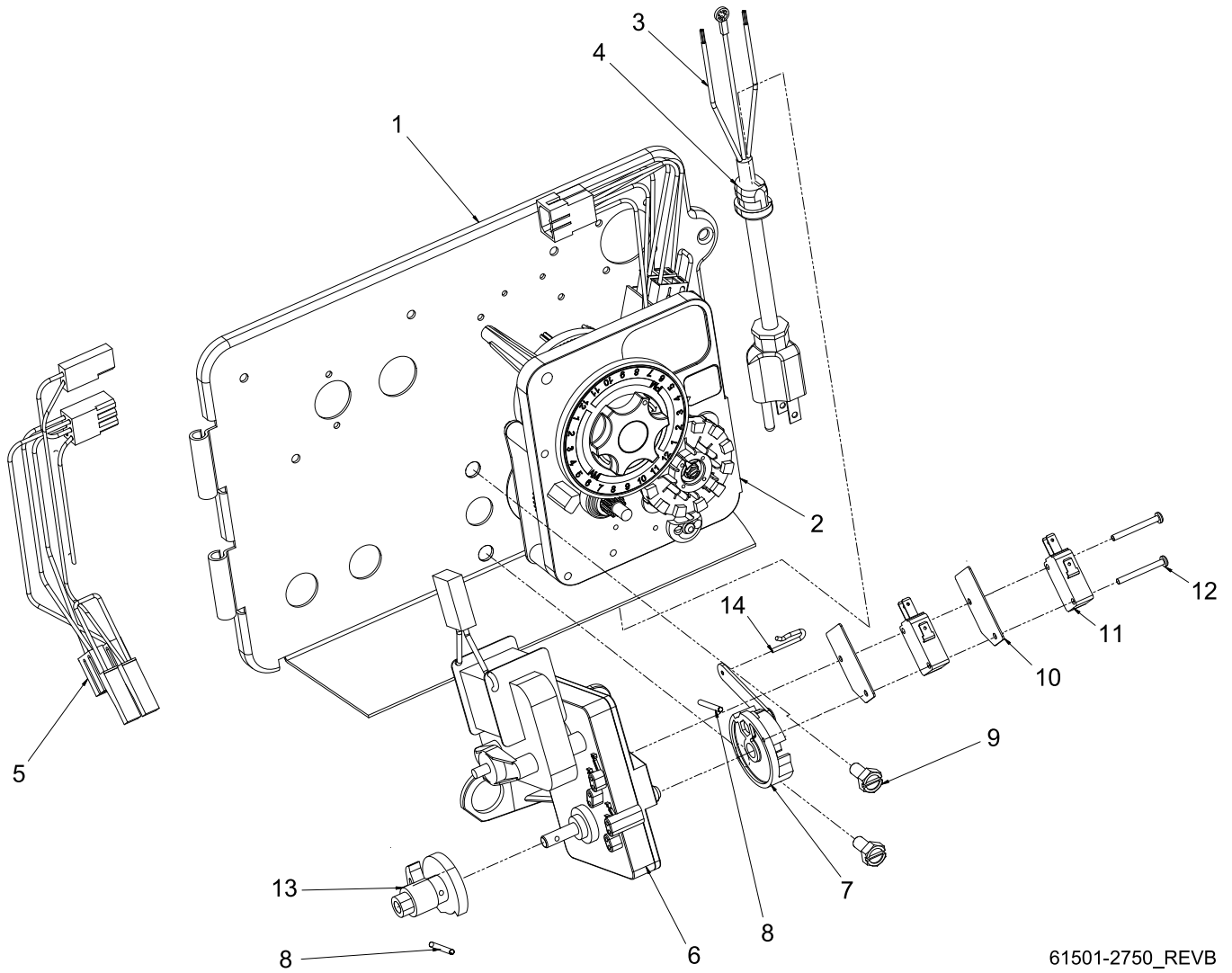
	2	10300	Screw, Timer Mounting
	1	13741	Hole Plug
	1	17904	Hole Plug
	2	19367	Screw, Thumb
	1	15441	Meter Cable Guide Assy (Econominder Only)
	1	15495	Meter Cable, 13.87" (Econominder Only)
	1	60232-110	Cover, Designer, 1 Pc, Black

* Bracket is integrated into the motor.

** Bracket is integrated into motor. Picture may not reflect component.

For Service Assembly Numbers, See the Back of this Manual

Powerhead Assembly (Environmental)



61501-2750_REVB

For Service Assembly Numbers, See the Back of this Manual

Powerhead Assembly (Environmental)

Item No.	Quantity	Part No.	Description
1	1	18697-15	Backplate, Hinged, 2900
2	1		Timer: - 3200 7 Day - 3200 12 Day - 3210 Meter
3	1	11839	Power Cord, 12' Fleck
4	1	13547	Strain Relief, Flat Cord
5	1	40400	Harness, Drive, Designer/Environmental
6	1	41543*	Motor, Drive, 115V, 50/60 Hz
		42579**	Motor,
		41545*	Motor,
7	1	60160-15	Drive Cam Assy, STF, Blue, 2900
8	2	10338	Pin, Roll, 8/32 x 7/8
9	2	10231	Screw, Slot Hex, 1/4 - 20 x 1/2
10	2	10302	Insulator, Limit Switch
11	2	10218	Switch, Micro
12	2	14923	Screw, Pan Hd Mach, 4-40 x 1
13	2	12777	Cam, Shut-Off Valve
14	1	10909	Pin, Link

Not Shown:

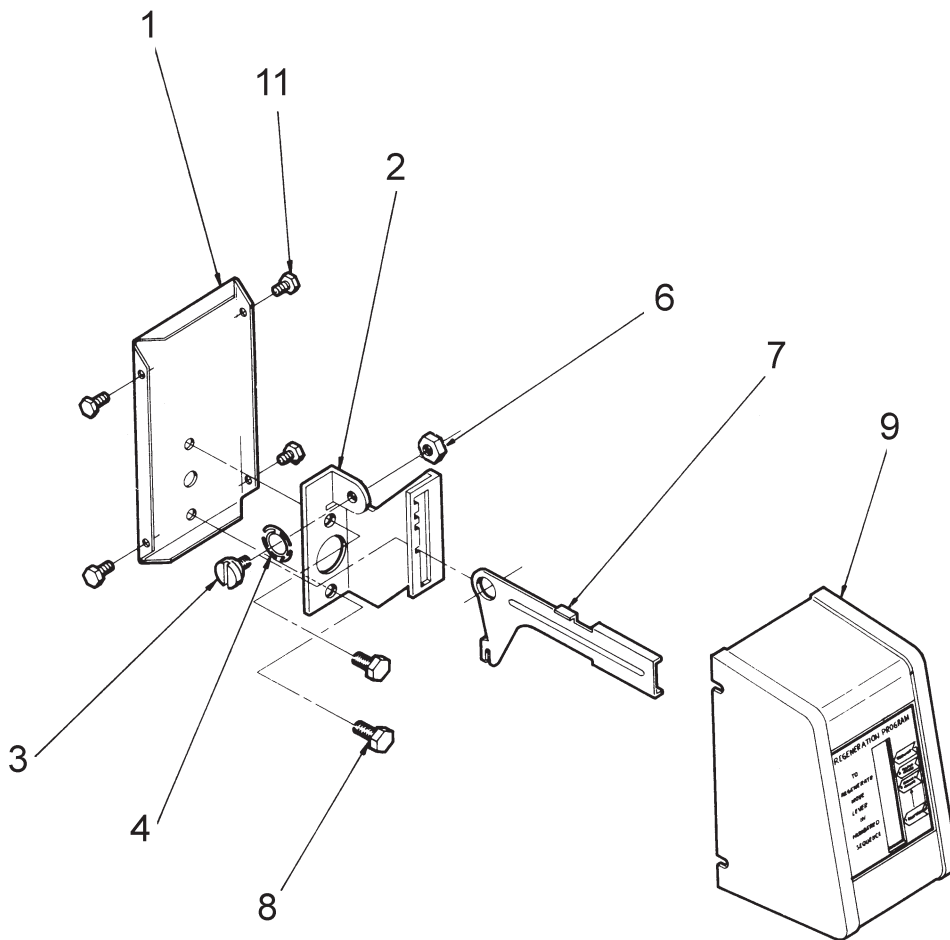
1	15441	Cable Guide Assy, 2750, 2510
1	15495	Meter Cable, 13.87"
1	13741	Plug, 3/4", Knock-Out
1	15806	Plug, Hole, Heyco #2693
1	16493	Plug, Hole, Heyco
1	17421	Plug, 1.20 Hole Heyco #2733
2	19691	Plug, .750 Dia, Recessed, Black
7	19800	Plug, .140 Dia, White
4	19801	Plug, .190 Dia, White
2	10300	Screw, Slot Hex Wsh, 8-18 x 3/8
1	10872	Screw, Hex Wsh, 8-32 x 17/64
1	60219-02	Cover Assy, Environmental, Black w/Clear Window

* Bracket is integrated into the motor.

** Bracket is integrated into motor. Picture may not reflect component.

For Service Assembly Numbers, See the Back of this Manual

Manual Powerhead Assembly



60409REVA

Item No.	Quantity	Part No.	Description
1	1	12593	Backplate, Manual
2	1	12592	Bracket, Lever Position
3	1	12596	Screw, Spec Mach, 1/4 - 20 x 1/2
4	1	12707	Washer, Spring
6	1	11235	Nut, Hex, 1/4 - 20, Mach Screw, Zinc
7	1	12594	Lever, Valve Position
8	2	10231	Screw, Slot Hex, 1/4 - 20 x 1/2 18-8 SS
9	1	60224-32	Cover Assy, Manual, Filter
	1	60224-33	Cover Assy, Manual, Softener
11	4	10300	Screw, Slot Hex Wsh, 8-18 x 3/8 Type "B" RC44-47

Not Shown:

	1	10909	Pin, Link
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For Service Assembly Numbers, See the Back of this Manual

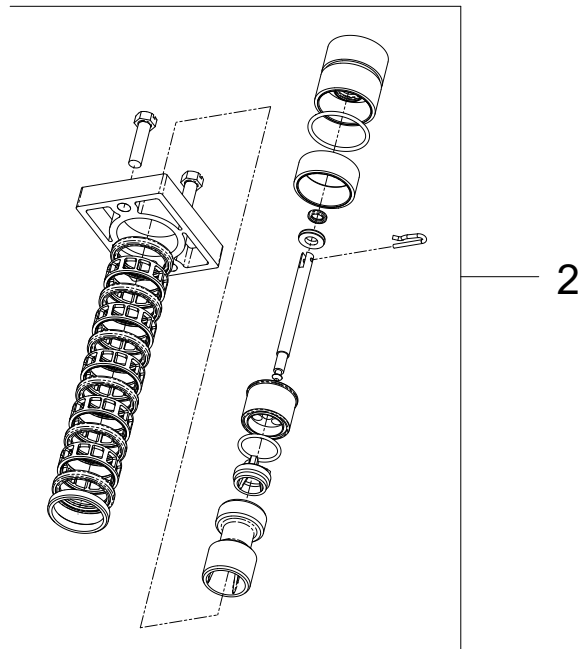
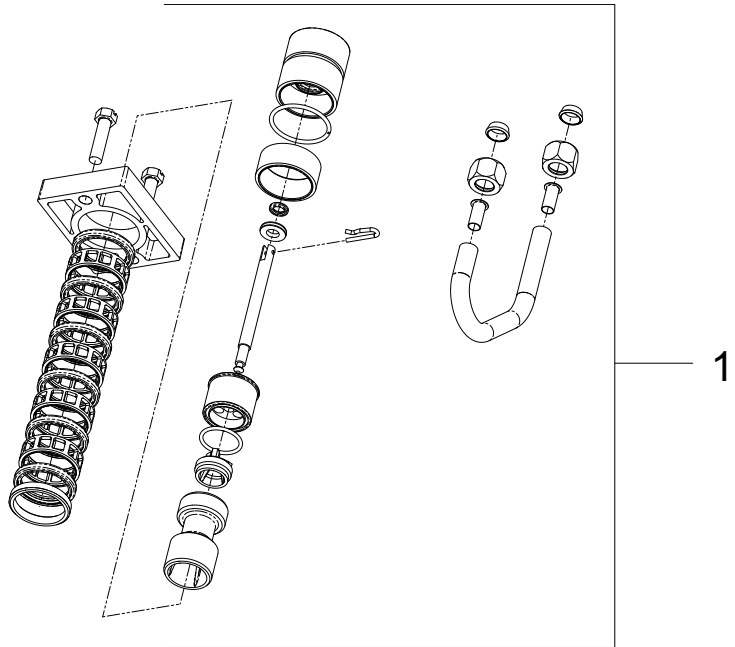
Control Valve Assembly

Item No.	Quantity	Part No.	Description
1	1	19328	Valve Body, 2510
2	1	11385-01	Housing, Flow Control, Plastic
3	1	11183	O-ring, -017
4	1	12408	Washer, Flow, 7.0 GPM
5	1	18312	Retainer, Drain
6	1	19322	Adapter Base, 2510
7	1	19936	Seal, 2510, Base
8	1	19899	Clamp, Female, 2510
9	1	19900	Clamp, Male, 2510
10	1	40000	Pin, Hinge, Clamp
11	1	19998	Pivot, Clamp, 2510
12	1	40057	Screw, Comb Hd, 114-20, 2"
13	1	19197	Ring, Slip
14	1	18303	O-ring, -336
15	1	13030	Retainer, Dist Tube, O-ring
16	1	13304	O-ring, -121
17	1	17776	Body, Injector, 1600
18	1	10328	Fitting, Elbow, 90 Deg.
19	1	16221	Disperser, Air
20	1	10227	Screen, Injector
21	1	10229	Gasket, Injector Cap, 1600
22	1	11893	Cap, Injector, SS
23	2	10692	Screw, Slot Hex Hd, 10-24x
24	1	14805	Gasket, Injector Body, 1600/1700
25	1	12338	Fitting, Elbow, 90 Deg.
26	1	61670-00	Piston Assy w/Seal & Spacer Kit 2510 Piston
27	1	61670-01	Piston Assy w/Seal & Spacer Kit 2510 Piston NHWBP
28	1	10757	Spacer, End
29	1	12973-3	Nozzle, Injector, #3, PVC
30	1	12974-3	Throat, Injector, #3, PVC

NOTE: For optimal seal life, the use of lubricants is not recommended.

For Service Assembly Numbers, See the Back of this Manual

Softener & Filter Conversion Kits

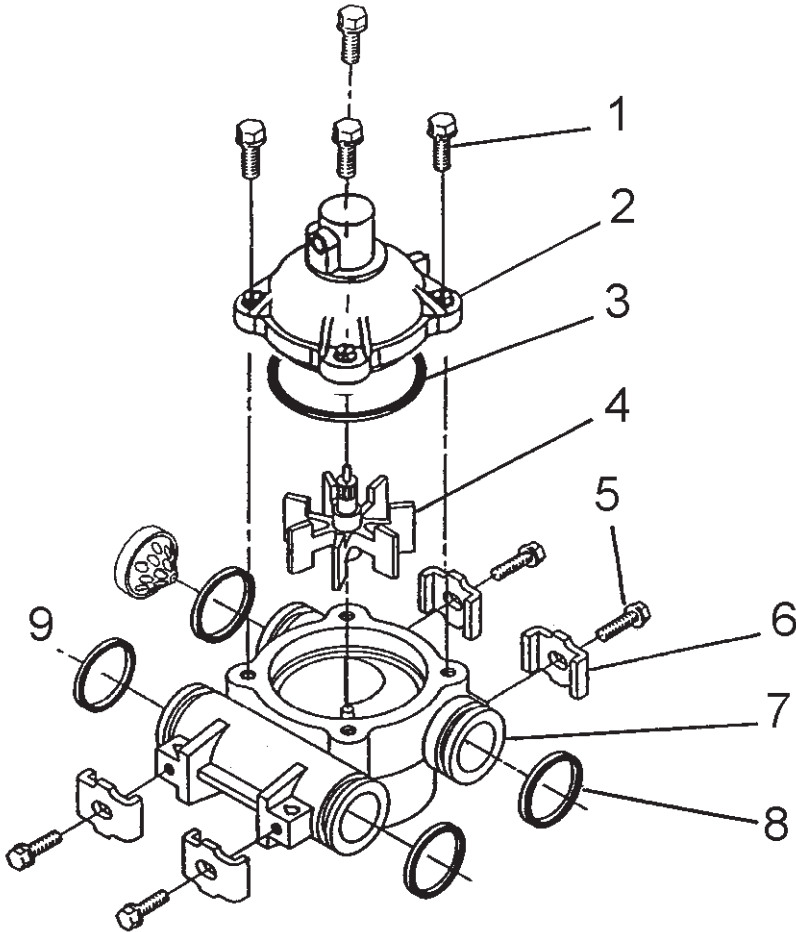


61671REVC

Item No.	Part No.	Description
1	61671-01	Piston Conversion w/Seal & Spacer 2510 NHWBP 1600
2	61671-00	Piston Kit w/Seal & Spacer 2510 NHWBP Filter

NOTE: For optimal seal life, the use of lubricants is not recommended.

Meter Assembly

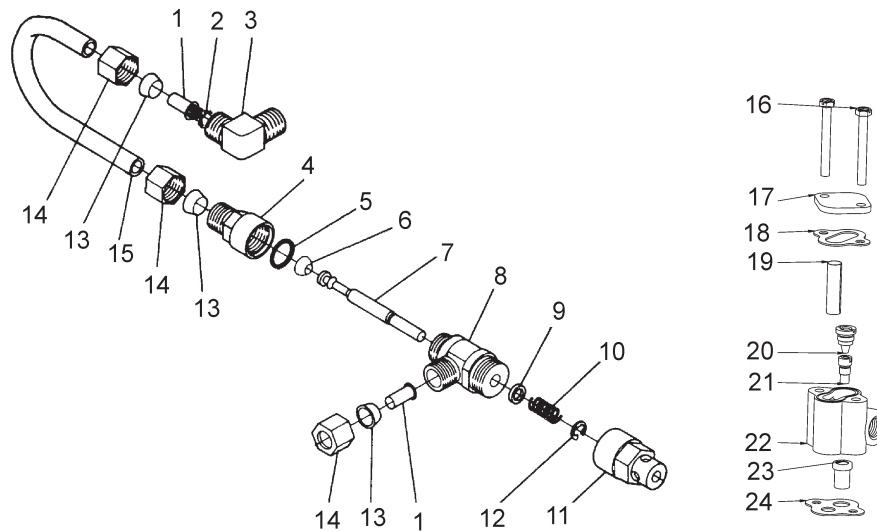


60088

Item No.	Quantity	Part No.	Description
1	4	12473	Screw - Meter Cover Assembly
2	1	15659	Meter Cover Assy. - Ext., Rt. Angle (Not Shown)
	1	15452	Meter Cap Assy, 3/4" to 2", Std, Rt Ang/90, Plastic Paddle
3	1	13847	O-ring - Meter Cover Assembly
4	1	13509	Impeller
5	4	13314	Screw - Adapter Clip
6	4	13255	Adapter Clip
7	1	13821	Meter Body
8	4	13305	O-ring - Meter Body
9	1	14613	Flow Straightener

For Service Assembly Numbers, See the Back of this Manual

1600 Brine System Assembly



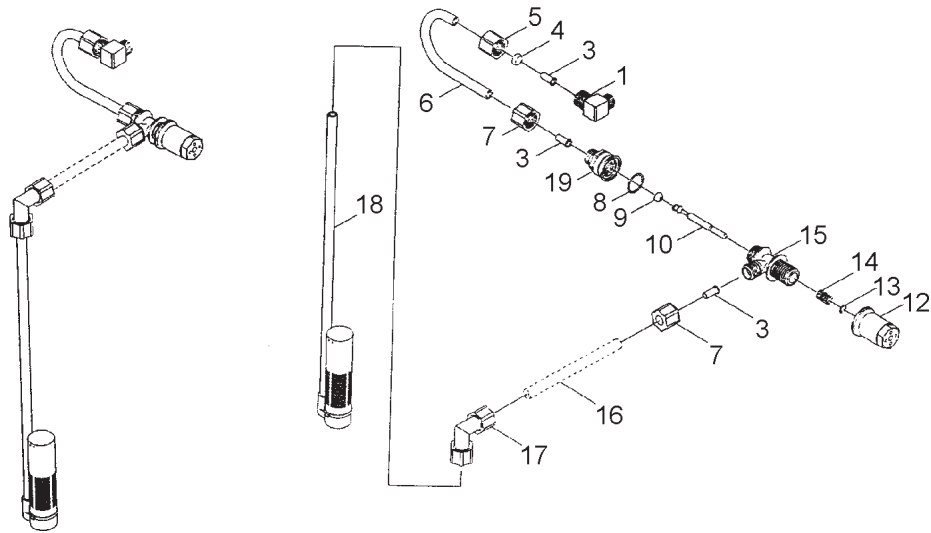
60029REV C

Item No.	Quantity	Part No.	Description
1	2	10332	Fitting, Insert, 3/8
2	1	12767	Screen, Brine
3	1	10328	Fitting, Elbow, 90 Deg. 1/4 PT x 3/8 Tube
4	1	60020-25	BLFC, .25 GPM, 1600
4	1	60020-50	BLFC, .50 GPM, 1600
4	1	60020-100	BLFC, 1.0 GPM, 1600
5	1	11982	O-ring, -016
6	1	12626	Seat, Brine Valve
7	1	12552	Brine Valve Stem, 1600
8	1	12748	Brine Valve Body Assy, 1600 w/Quad Ring
9	1	12550	Quad Ring, -009
10	1	10249	Spring, Brine Valve
11	1	11749	Guide, Brine Valve Stem
12	1	10250	Ring, Retaining
13	3	10330	Fitting, Sleeve, 3/8 Celcon
14	3	10329	Fitting, Tube, 3/8 Nut, Brass
15	1	16508-01	Tube, Brine Valve, 2850/1600
	1	12774	Tube, Brine Valve, 1500
	1	40027	Tube, Brine Valve, 2510
	1	15221	Tube, Brine Valve, 2750
	1	42184	Tube, Brine Valve, 2850s
	1	41683*	Tube, Brine Valve, UF, 1600/1650
16	2	10692	Screw, Slot Hex Hd, 10 - 24X 18-8 SS
17	1	11893	Cap, Injector, SS
18	1	10229	Gasket, Injector Cap, 1600
19	1	10227	Screen, Injector
20	1	10913	Nozzle, Injector
21	1	10914	Throat, Injector
22	1	17776	Body, Injector, 1600
	1	17776-02*	Body, Injector, 1600 Upflow
23	1	16221	Dispenser, Air
24	1	14805	Gasket, Injector Body, 1600/1700

*Upflow Only

For Service Assembly Numbers, See the Back of this Manual

1650 Brine System



60011

Item No.	Quantity	Part No.	Description
60011 Brine Valve Assembly, Includes Items 3-15 (Less BLFC 60010-)			
1	1	10328	Elbow, 90 1/4 NPT x 3/8
3	3	10332	Insert, 3/8
4	1	10330	Sleeve, 3/8 Nut Brine
5	1	10329	Tube Fitting, 3/8 Nut Brine
6	1	40027	Tube, Brine Valve
7	2	19625	Assy., GFN Nut
8	1	16924	O-ring
9	1	12626	Seat, Brine Valve
10	1	12552	Brine Valve Stem, 1600
12	1	17906	Guide, Brine Valve Stem
13	1	10250	Retaining Ring
14	1	10249	Spring, Brine Valve
15	1	17884	Brine Valve Body Assy., Plastic
17	1	12794	Elbow, 3/8 Tube Poly, White
18	1	60002	#500 Air Check
19	1	60010-xx	BLFC Assy.

60010-25 BLFC Assy. (Parts)

1	1	17907	Housing
1	1	12128	25 GPM Label
1	1	12094	25 Flow Washer
1	1	12098	Retainer

60010-50 BLFC Assy. (Parts)

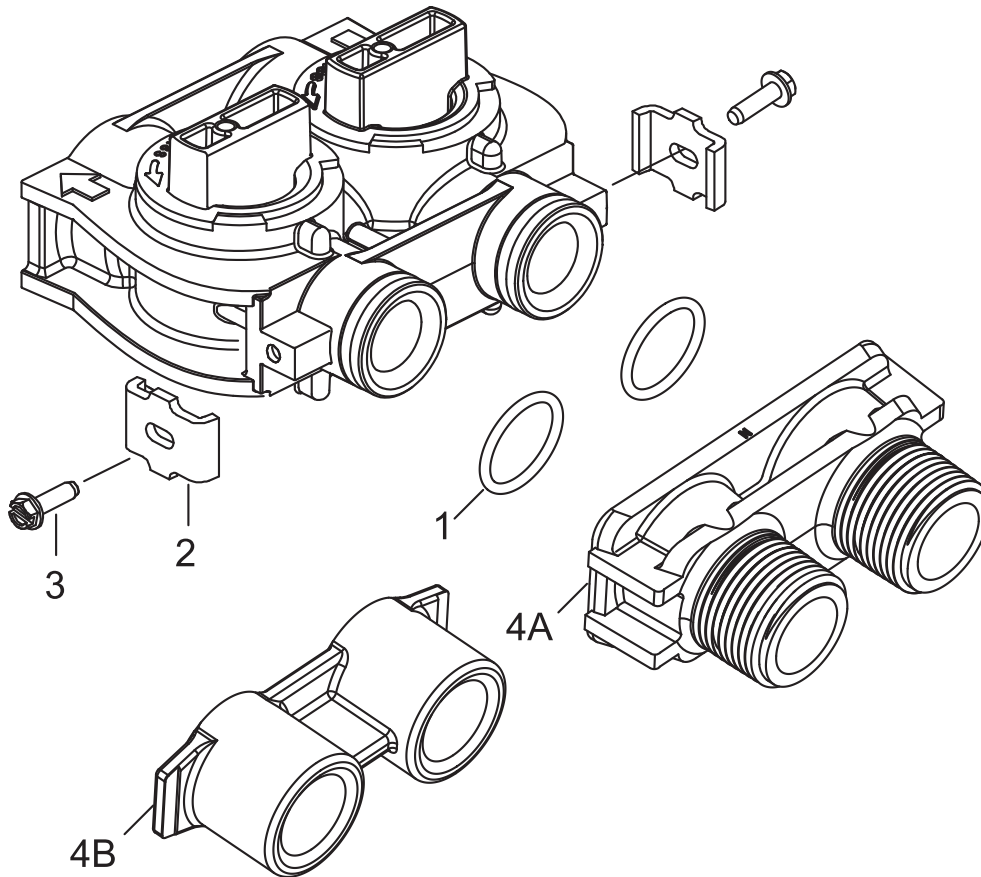
1	1	17907	Housing
1	1	10759	50 GPM Label
1	1	12095	50 Flow Washer
1	1	12098	Retainer

60010-100 BLFC Assy. (Parts)

1	1	17907	Housing
1	1	10760	1.0 GPM Label
1	1	12097	1.0 Flow Washer
1	1	12098	Retainer

For Service Assembly Numbers, See the Back of this Manual

Bypass Valve Assembly (Plastic)

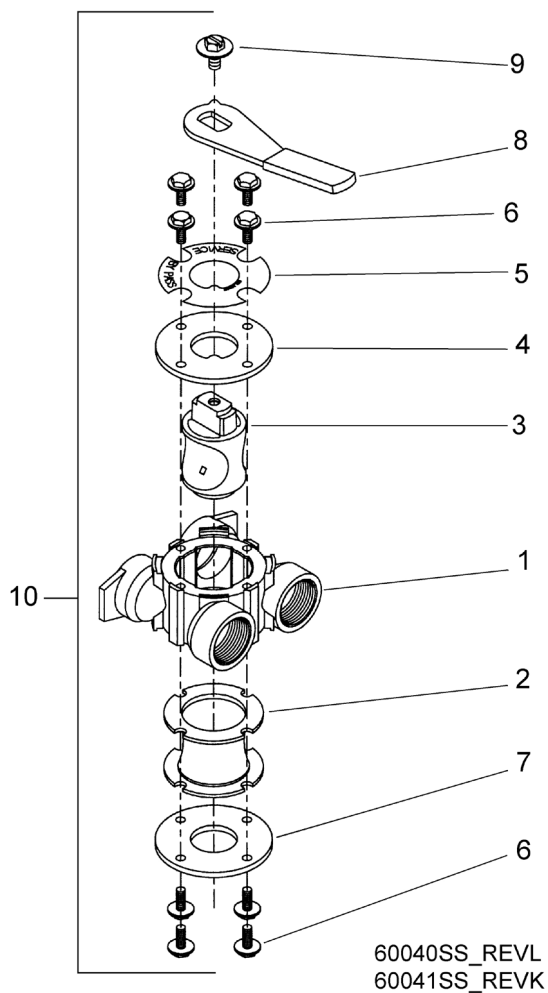


60049REVD

Item No.	Quantity	Part No.	Description
1	2	13305	O-ring, -119
2	2	13255	Clip, Mounting
3	2	13314	Screw, Slot Ind Hex, 8-18 x .60
4A	1	18706	Yoke, 1", NPT, Plastic
		18706-02	Yoke, 3/4", NPT, Plastic
4B	1	13708-40	Yoke, 1", Sweat
		13708-45	Yoke, 3/4", Sweat
		19275	Yoke, Angle 90 Deg, 3/4", NPT
		19275-45	Yoke, Angle 90 Deg, 3/4" Sweat
		19620-01	Yoke Assy, 3/4", R/Angle, 90 Deg w/O-rings, Clips & Screws
		40636	Yoke, 1 1/4", NPT
		40636-49	Yoke, 1 1/4", Sweat
		41027-01	Yoke, 3/4", NPT, Cast, Machined
		41026-01	Yoke, 1", NPT, Cast, Machined, SS

For Service Assembly Numbers, See the Back of this Manual

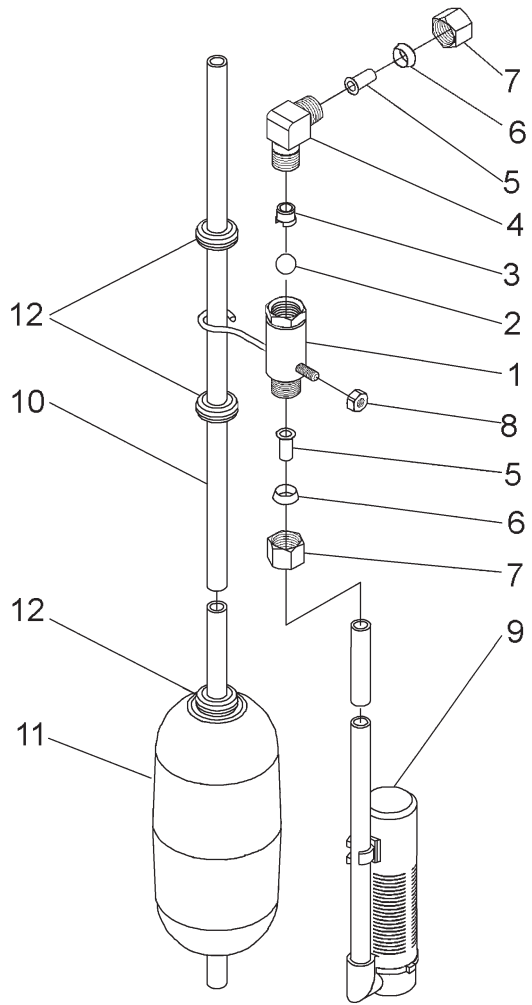
Bypass Valve Assembly (Metal)



Item No.	Quantity	Part No.	Description
1	1	40614	Bypass Body, 3/4"
		40634	Bypass Body, 1", SS
2	1	14105	Seal, Bypass, 560CD
3	1	11972	Plug, Bypass
4	1	11978	Side Cover
5	1	13604-01	Label
6	8	15727	Screw
7	1	11986	Side Cover
8	1	11979	Lever, Bypass
9	1	11989	Screw, Hex Head, 1/4-14
10	1	60040SS	Bypass Valve, 5600, 3/4" NPT Blk Grip Lever, SS
		60041SS	Bypass Valve, 5600, 1" NPT Blk Grip Lever, SS

For Service Assembly Numbers, See the Back of this Manual

2300 Safety Brine Valve

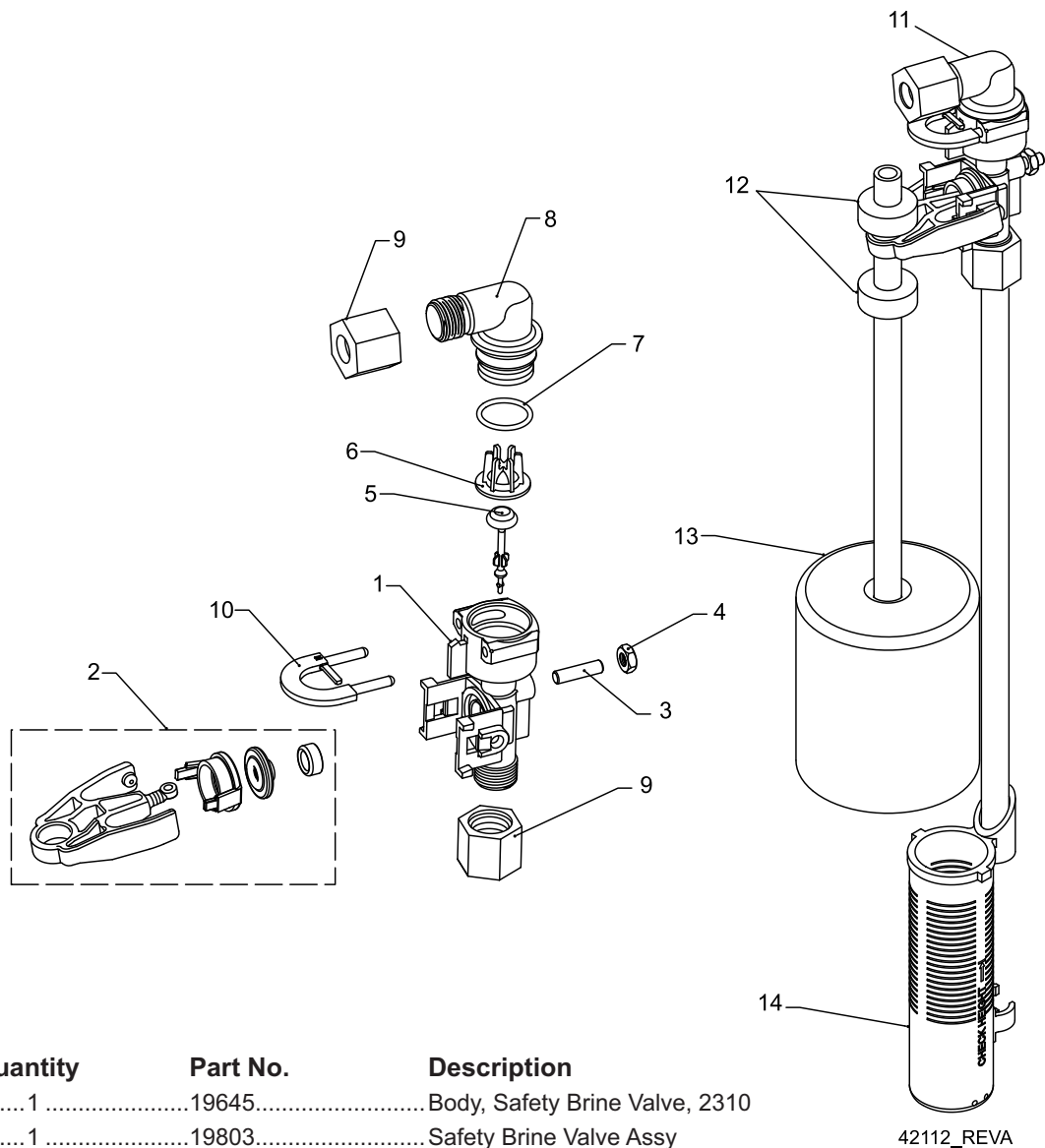


60027REVA

Item No.	Quantity	Part No.	Description
1	1	60027-00	Safety Brine Valve, 2300, Less Elbow
2	1	10138	Ball, 3/8", Brass
3	1	11566	Ball Stop, Slow Fill
4	1	10328	Fitting, Elbow, 90 Deg. 1/4 NPT x 3/8 Tube
5	1	10332	Fitting, Insert, 3/8
6	1	10330	Fitting, Sleeve, 3/8 Celcon
7	1	10329	Fitting, Tube, 3/8 Nut, Brass
8	1	10186	Nut, Hex, 10-32
9	1	60002-34	Air Check, #500, 34" Long
		60003-34	Air Check, #500, HW, 34" Tube
10	1	10149	Rod, Float
11	1	10700	Float Assy, White
12	3	10150	Grommet, .30 Dia

For Service Assembly Numbers, See the Back of this Manual

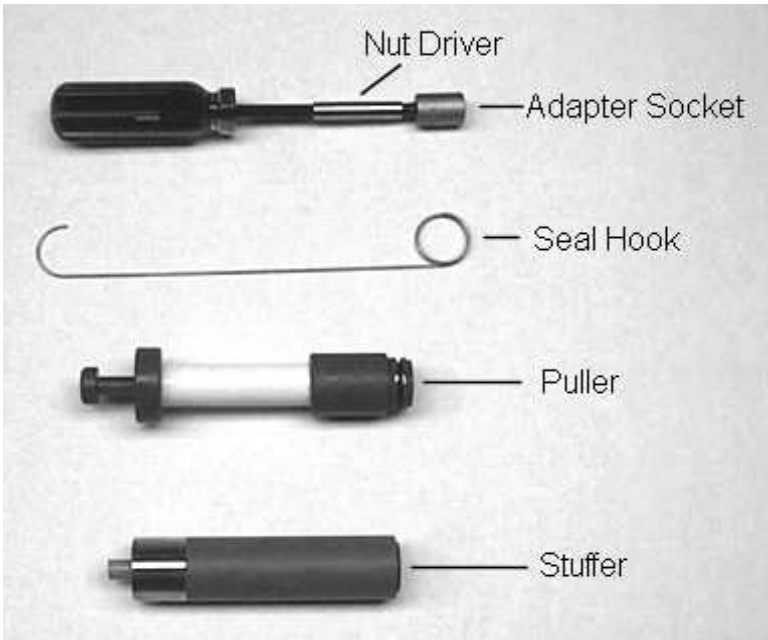
2310 Safety Brine Valve



Item No.	Quantity	Part No.	Description
1.....	1	19645.....	Body, Safety Brine Valve, 2310
2.....	1	19803.....	Safety Brine Valve Assy
3.....	1	19804.....	Screw, Sckt Hd, Set, 10-24 x .75
4.....	1	19805.....	Nut, Hex, 10-24, Nylon Black
5.....	1	19652-01	Poppet Assy, SBV w/O-ring
6.....	1	19649.....	Flow Dispenser
7.....	1	11183.....	O-ring, -017
8.....	1	19647.....	Elbow, Safety Brine Valve
9.....	2	19625.....	Nut Assy, 3/8" Plastic
10.....	1	18312.....	Retainer, Drain
11.....	1	60014.....	Safety Brine Valve Assy, 2310
12.....	2	10150.....	Grommet, .30 Dia
13.....	1	60068-30	Float Assy, 2310, w/30" Rod
14.....	1	60002-34	Air Check, #500, 34" Long

For Service Assembly Numbers, See the Back of this Manual

Service Instructions



Tools Used in the Seal and Spacer Replacement

Description	Part No.
Nut Driver	12664
Socket Adapter	16906
Socket 7/16"	12665
Seal Hook	12874
Puller	13061
Stuffer	11098

Seal & Spacer Replacement

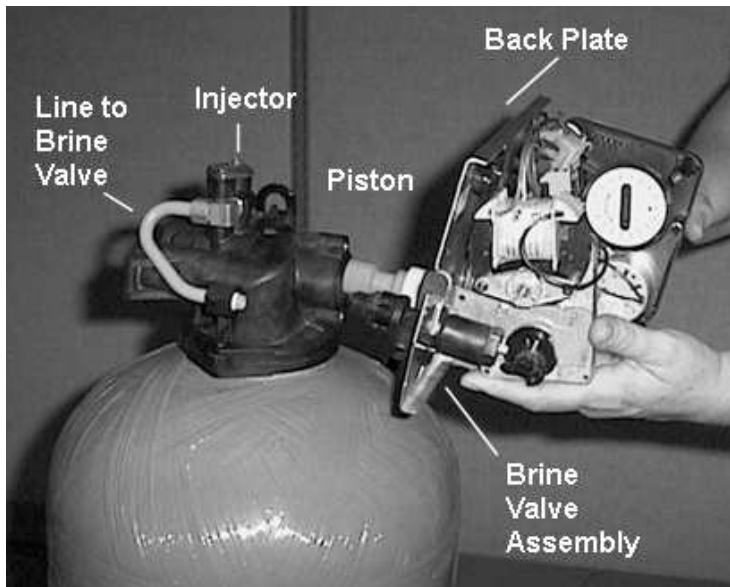


Figure 5

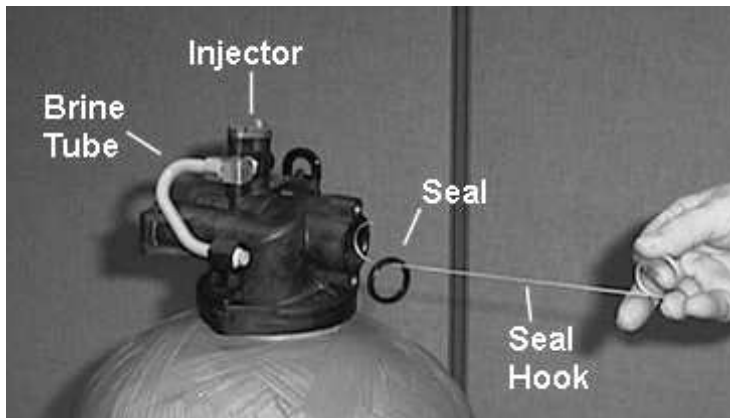


Figure 6

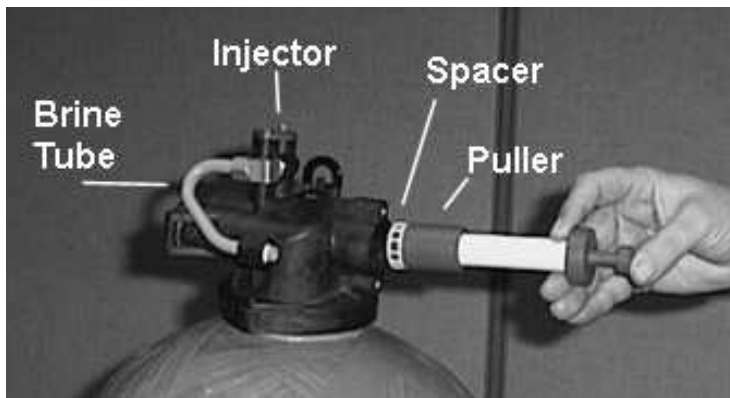


Figure 7

1. Turn off water supply to valve. Next, cycle valve to backwash position, then to service. Now remove electrical plug from outlet.
2. Remove control box cover.
3. Disconnect the brine line from the injector housing to the brine valve (if your unit has timed brine tank fill).
4. Remove the two capscrews that hold the back plate to the valve.
5. Grasp the back plate on both sides and slowly pull end plug and piston assembly out of the valve body (see Figure 5) and lay aside.
6. Remove the seal first using the wire hook with the finger loop (see Figure 6).
7. The spacer tool (use only for removing the spacers) has three retractable pins, retained by a rubber ring, at one end; they are retracted or pushed out by pulling or pushing the center button the opposite end.
8. Insert the pin end of the spacer tool into the valve body with the pins retracted (button pulled back). Push the tool tight against the spacer and push the button in (see Figure 7). When the button is pushed in, the pins are pushed out to engage the 1/4 dia. holes in the spacer. Remove the tool from the valve body. The spacer will be on the end. Pull the center button back, the pins will be retracted and the spacer can be removed from the spacer tool.

Seal & Spacer Replacement

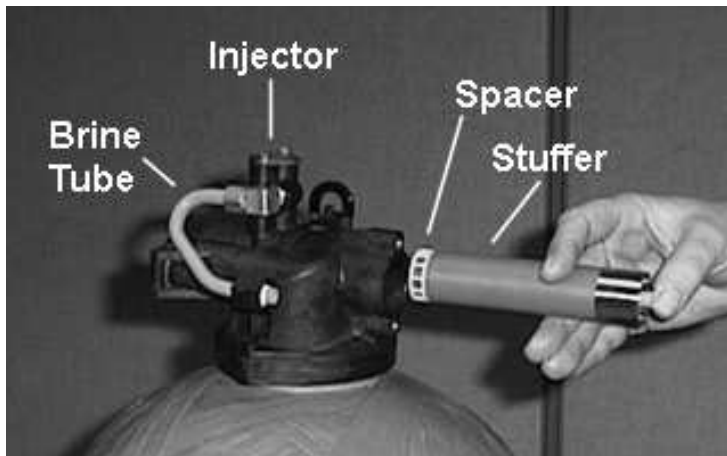


Figure 8

9. Alternately remove the remaining seals and spacers in accordance with steps No. 6 and 8.
10. The last or end spacer does not have any holes for the pins of the spacer tool to engage, therefore if the end spacer does not come out on the first try, try again using the wire hook with the finger loop.
11. To replace seals, spacers and end ring, use special tool with the brass sleeve on one end. This is a double-purpose tool (see Figure 8). The male end acts as a pilot to hold the spacers as they are pushed into the valve body and the brass female end is used to insert the seals into the valve body.
12. To restuff a valve body, first take the end ring (the plastic or brass ring without holes), then with your thumb press the button on the brass sleeve end, the large dia. inner portion is now exposed (see Figure 8). Place the end ring on this pilot with the lip on the end ring facing the tool, and push the tool into the valve body bore until it bottoms. While the tool is in the valve body, take a seal and press it into the inside diameter of the exposed brass female end.
13. Remove the tool, turn it end for end and insert it into the valve body bore. While holding the large dia. of the tool, slide it all the way into the valve body bore until it bottoms, then push the center button to push the seal of the tool and leave it in place in the valve body.
14. Remove the tool from the valve body and push the center on the brass female end to expose the pilot on the opposite end. Place a spacer on this end and insert the spacer and tool into the valve.

Troubleshooting

Problem	Cause	Correction
1. Water conditioner 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. Replace timer.
	C. Power failure.	C. Reset time of day.
2. Hard water.	A. By-pass valve is open.	A. Close by-pass valve.
	B. No salt is 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 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 frequency of regeneration.
	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.
	B. Improperly sized drain line flow control.	B. Check for proper drain rate.
6. Iron in conditioned water.	A. Fouled mineral bed.	A. Check backwash, brine draw, and brine tank fill. Increase frequency of regeneration. Increase backwash time.
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.

Troubleshooting

Problem	Cause	Correction
8. Softener fails to draw brine.	A. Drain line flow control is plugged.	A. Clean drain line flow control.
	B. Injector is plugged.	B. Clean injector
	C. Injector screen plugged.	C. Clean screen.
	D. Line pressure is too low.	D. Increase line pressure to 20 P.S.I.
	E. Internal control leak	E. Change seals, spacers, and piston assembly.
	F. Service adapter did not cycle.	F. Check drive motor and switches.
9. Control cycles continuously.	A. Misadjusted, 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.	A. Check timer program and positioning of control. Replace power head assembly if not positioning properly.
	B. Foreign material in control.	B. Remove power head assembly and inspect bore. Remove foreign material and check control in various regeneration positions.
	C. Internal control leak.	C. Replace seals and piston assembly.

General Service Hints For Meter Control

Problem: Softener delivers hard water

Reason: Reserve capacity has been exceeded.

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

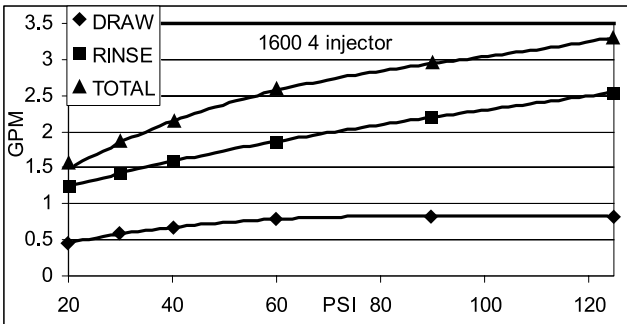
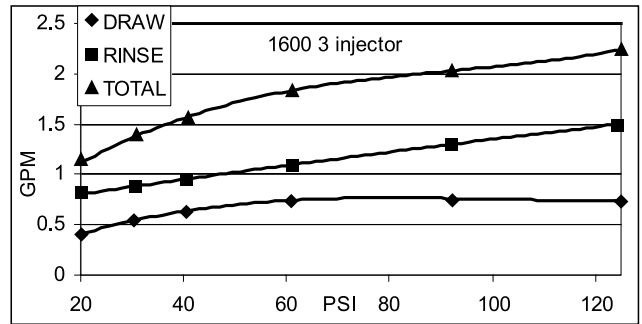
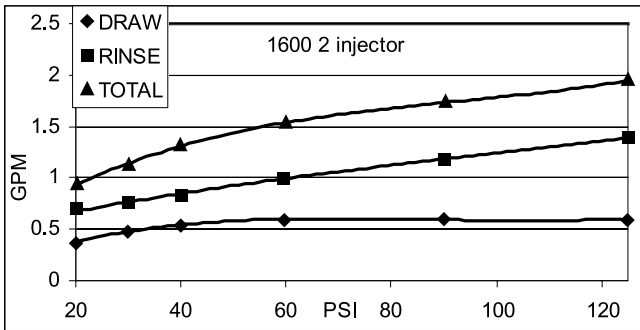
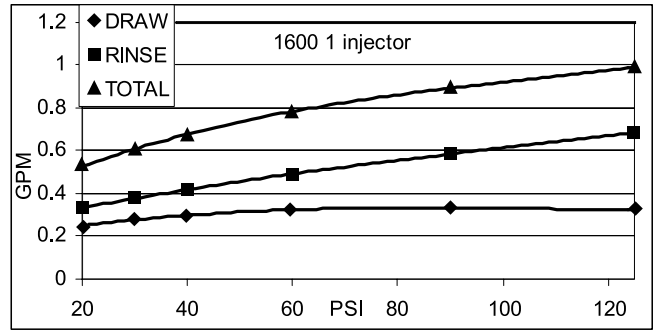
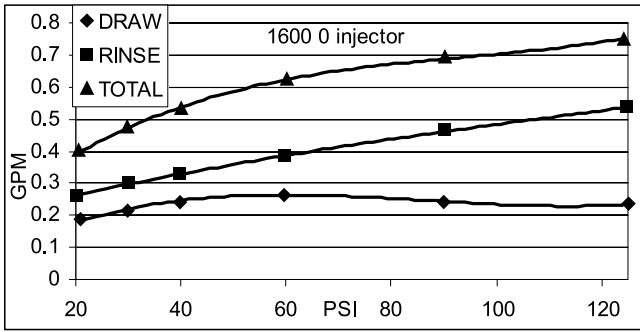
Reason: Program wheel is not rotating with meter output.

Correction: Pull cable out of meter cover and rotate manually. Program wheel must move without binding and clutch must give positive clicks when program wheel strikes regeneration stop. If it does not, replace timer.

Reason: Meter is not measuring flow.

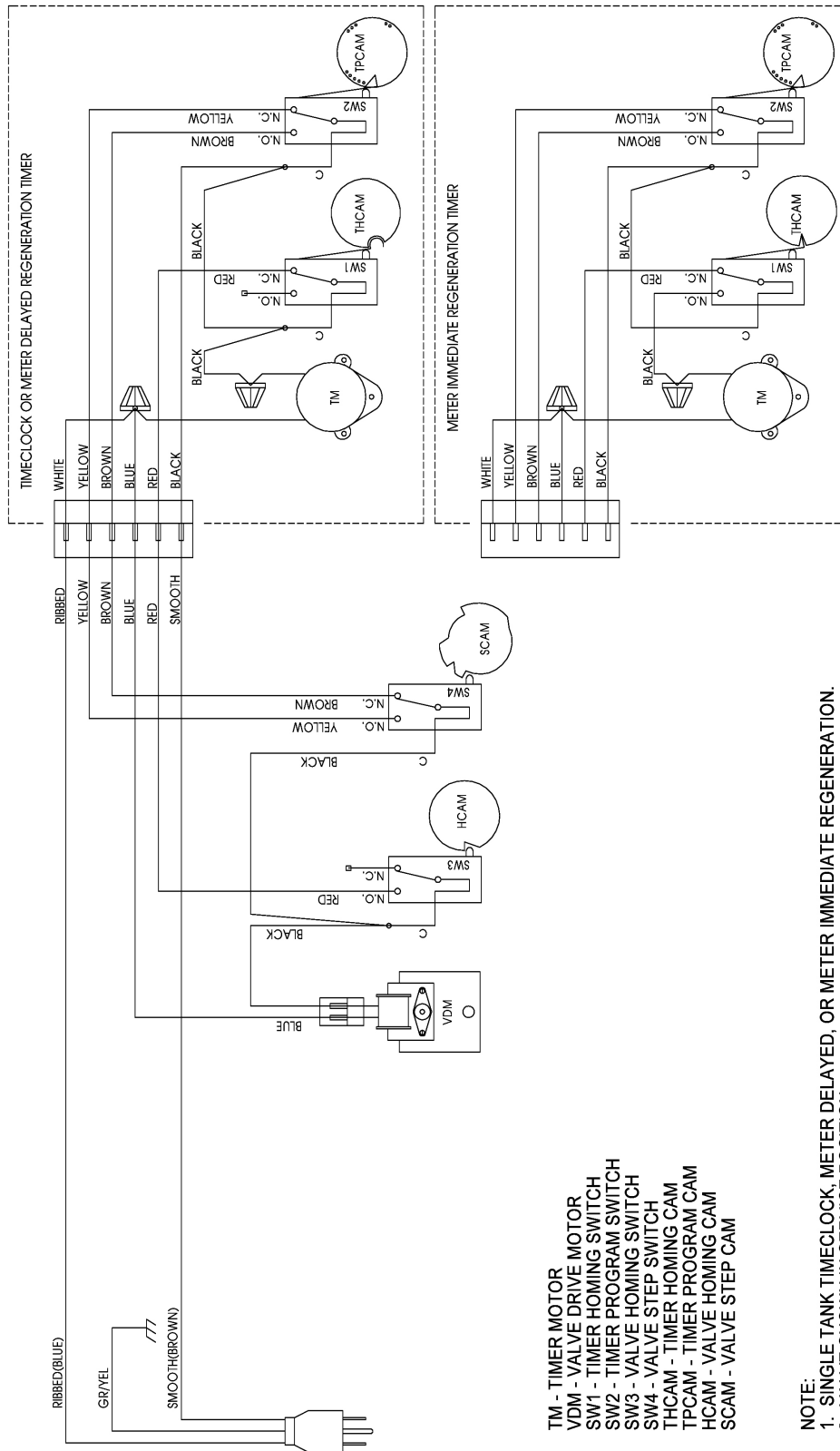
Correction: Check meter with meter checker.

Flow Data & Injector Draw Rates



TR20391_REVA

Wiring Diagram



24 Hour Gear

40096-02Dial 2AM Regen Assy, Black
40096-24Dial 12AM Regen Assy, Black
60519-02Gear Assy, 3200, 24 Hour 2 Times/Day
60519-03Gear Assy, 3200, 24 Hour 3 Times/Day
60519-04Gear Assy, 3200, 24 Hour 4 Times/Day
60519-06Gear Assy, 3200, 24 Hour (12:00) 6 Times/Day

Brine Line Flow Controls (BLFC)

60010-25BLFC, 1650, .25 GPM, Plastic
60010-50BLFC, 1650, .50 GPM, Plastic
60010-100BLFC, 1650, 1.0 GPM, Plastic

Brine Valves

60011-010.....Brine Valve, 1650, Short Stem, .25 GPM, Less Tube
60011-030.....Brine Valve, 1650, Short Stem, 1.0 GPM, Less Tube

Bypasses

60049.....Bypass Plastic Assy
60040SS.....Bypass Valve, 5600, 3/4" NPT
60041SS.....Bypass Valve, 5600, 1" NPT

Cam

60160-15Drive Cam Assy, STF, Blue

Clamp

60503.....Clamp Ring Assembly, 2510

Coupling

60510.....Adapter Coupling Assy, 5600

Drain Line Flow Controls

60705-00DLFC, Plastic, Blank
60705-06DLFC, Plastic, .60 GPM
60705-08DLFC, Plastic, .80 GPM
60705-10DLFC, Plastic, 1.0 GPM
60705-12DLFC, Plastic, 1.2 GPM
60705-13DLFC, Plastic, 1.3 GPM
60705-15DLFC, Plastic, 1.5 GPM
60705-17DLFC, Plastic, 1.7 GPM
60705-20DLFC, Plastic, 2.0 GPM
60705-24DLFC, Plastic, 2.4 GPM
60705-30DLFC, Plastic, 3.0 GPM
60705-35DLFC, Plastic, 3.5 GPM
60705-40DLFC, Plastic, 4.0 GPM
60705-45DLFC, Plastic, 4.5 GPM
60705-50DLFC, Plastic, 5.0 GPM
60705-60DLFC, Plastic, 6.0 GPM
60705-70DLFC, Plastic, 7.0 GPM
60706-8.0DLFC, QC x 3/4" F, 8.0 GPM
60706-9.0DLFC, QC x 3/4" F, 9.0 GPM
60706-12DLFC, QC x 3/4" F, 12.0 GPM
60706-15DLFC, QC x 3/4" F, 15.0 GPM

Drives

60050-21Drive Assy, 2750, STF, 120V Softener

Injectors

60480-XX.....1600 Injector Assy

Meters

60088-180Meter Assy, 3/4" Dual Port, Slip Std, Rt Ang/180
.....Plastic Paddle w/clps
60089-180Meter Assy, 3/4" Dual Port, Slip Ext, Rt Ang/180
.....Plastic Paddle w/clps

Pistons

61670-00Piston Assy w/Seal&Spacer Kit 2510 Piston
61670-01Piston Assy w/Seal&Spacer Kit 2510
.....Piston NHWBP
61671-00Piston Conversion w/Seal&Spacr 2510
.....NHWBP Filter
61671-01Piston Conversion w/Seal&Spacr 2510
.....NHWBP 1600

Program Wheels

60405-10Program Wheel w/3/4" Std Label Set @ 21
60405-15Program Wheel w/3/4" Std Label
.....w/People Label Set @ 21

Safety Brine (2300)

60028-30Float Assy, 2300, 30", White
60027-FFA....Safety Brine Valve Body, 2300,
.....Fitting Facing Arm
60027-FFS....Safety Brine Valve Body,
.....Fitting Facing Stud

Sales & Service Aids

40097.....Literature, 2510, S/Manual
40729.....Literature, 2510, Spec Sheet

Skipper Wheels

14860.....Skipper Wheel Assy, 7 Day
14381.....Skipper Wheel Assy, 12 Day

Yokes

13708-40Yoke, 1", Sweat
13708-45Yoke, 3/4", Sweat
18706.....Yoke, 1", NPT, Plastic
18706-02Yoke, 3/4", NPT, Plastic
19275.....Yoke, Angle 90 Deg. 3/4", NPT
19275-45Yoke, Angle 90 Deg., 3/4 Sweat
19620-01Yoke Assy, 3/4", R/Angle, 90 Deg w/O-rings,
.....Clips, and Screws
40636.....Yoke, 1 1/4", NPT
40636-49Yoke, 1 1/4", Sweat
41026-01Yoke, 1", NPT, SS
41027-01Yoke, 3/4", NPT, Cast, Machd

Notes
