

Model 3150 Downflow

Service Manual



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

2325 Cousteau Ct. Vista, CA 92081 ☎ (760) 727-3711 📠 (760) 727-4427
🌐 www.appliedmembranes.com ✉ sales@appliedmembranes.com

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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, 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 125°F (52°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 of the vessel and controller, not the membrane. 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 No. _____

Model No. _____

Water Test _____

Capacity Per Unit _____

Mineral Tank Size _____ Diameter _____ Height _____

Brine Tank Size & Salt Setting per Regeneration _____

Control Valve Specifications

1. Type of Timer

A. 7 Day or 12 Day

B. 1,250 to 21,250 Gallon Meter or
6,250 to 106,250 Gallon Meter or

Other _____

C. Meter Wiring Package

1. System #4 - 1 Tank, 1 Meter, Immediate or Delayed Regeneration

2. System #5 - 2 Tanks, 2 Meters, Interlock

3. System #6 - 2 Tanks, 1 Meter, Series Regeneration

4. System #7 - 2 Tanks, 1 Meter, Alternator

2. Timer Program Settings

A. Backwash _____ Minutes

B. Brine & Slow Rinse _____ Minutes

C. Rapid Rinse _____ Minutes

D. Brine Tank Refill _____ Minutes

3. Drain Line Flow Control _____ gpm

4. Brine Line Flow Controller _____ gpm

5. Injector Size # _____

6. Service Valve Operation Units (SVO)

Size of Service Valve _____

General Commercial Pre-Installation Check List

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

ELECTRICAL FACILITIES: A continuous 115 volt, 60 Hertz current supply is required. (Other voltages available.) Make certain the current supply is always hot and cannot be turned off with another switch.

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

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

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

CAUTION: Water pressure is not to exceed 120 p.s.i., water temperature is not to exceed 100°F, 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. (Maximum 7 feet apart for twin units.)
2. All plumbing should be done in accordance with local plumbing codes. The pipe size for the drain line should be the same size as the drain line flow control connection. Water meters are to be installed on soft water outlets. Twin units with (1) one meter shall be installed on common soft water outlet of units.
3. Make sure that the floor is clean beneath the salt storage tank and that it is level.
4. Place approximately 1" of water above the grid plate (if used) in your salt tank Salt may be placed in the unit at this time.
5. 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.
6. Place the by-pass in service position.
7. Manually index the softener control into "service" position and let water flow into the mineral tank. When water flow stops, close inlet valve, place control in "backwash" position to relieve head of air, then gradually open inlet valve to purge remaining air in tank. Return control to "service" position.
8. Electrical: All electrical connections must be connected according to codes. Use electrical conduit if applicable. Plug into power supply.

3200 Timer Setting Procedure

How To Set Days On Which Water Conditioner Is To Regenerate:

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:

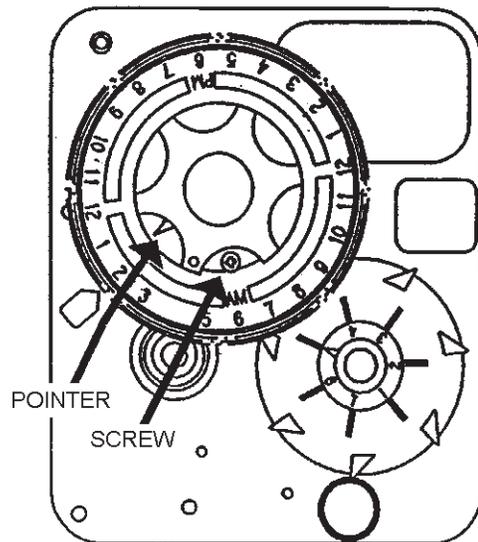
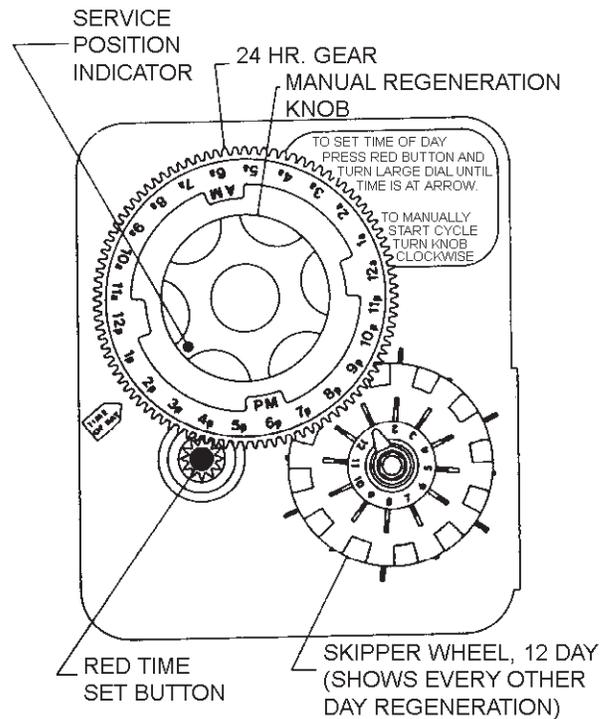
1. Press and hold the red button in to disengage the drive gear.
2. Turn the large gear until the actual time of day is at the time of day pointer.
3. Release the red button to again engage the drive gear.

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

3200 & 3210 Timer Series

Regeneration Cycle Program Setting Procedure

How To Set The Regeneration Cycle Program:

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

3200 & 3210 Series Timers (Figure to Right)

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 the 3200 & 3210 Timers

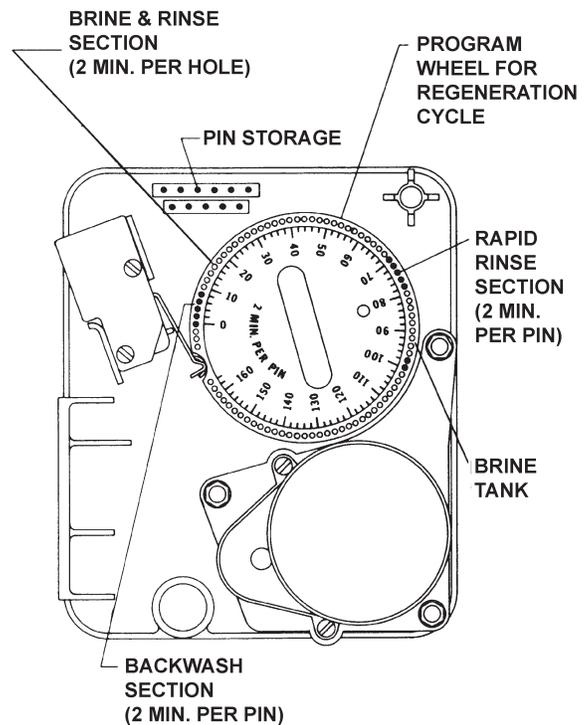
How To Change The Length Of The Backwash Time:

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.



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.

Commercial Demand Regeneration Control Timer Settings

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 denotes remaining gallons exclusive of fixed reserve.

How To Set The Time Of Day:

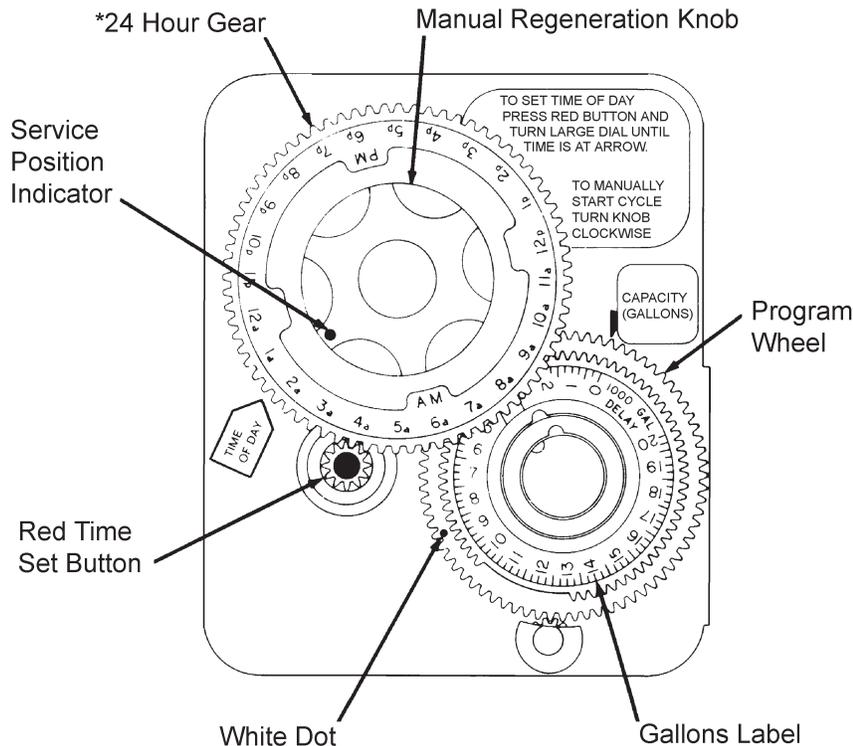
1. Press and hold the red button in to disengage the drive gear.
2. Turn the large gear until the actual time of day is opposite the time of day pointer.
3. Release the red button to again engage the drive gear.

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.
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 for 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.

Immediate Regeneration Timers:

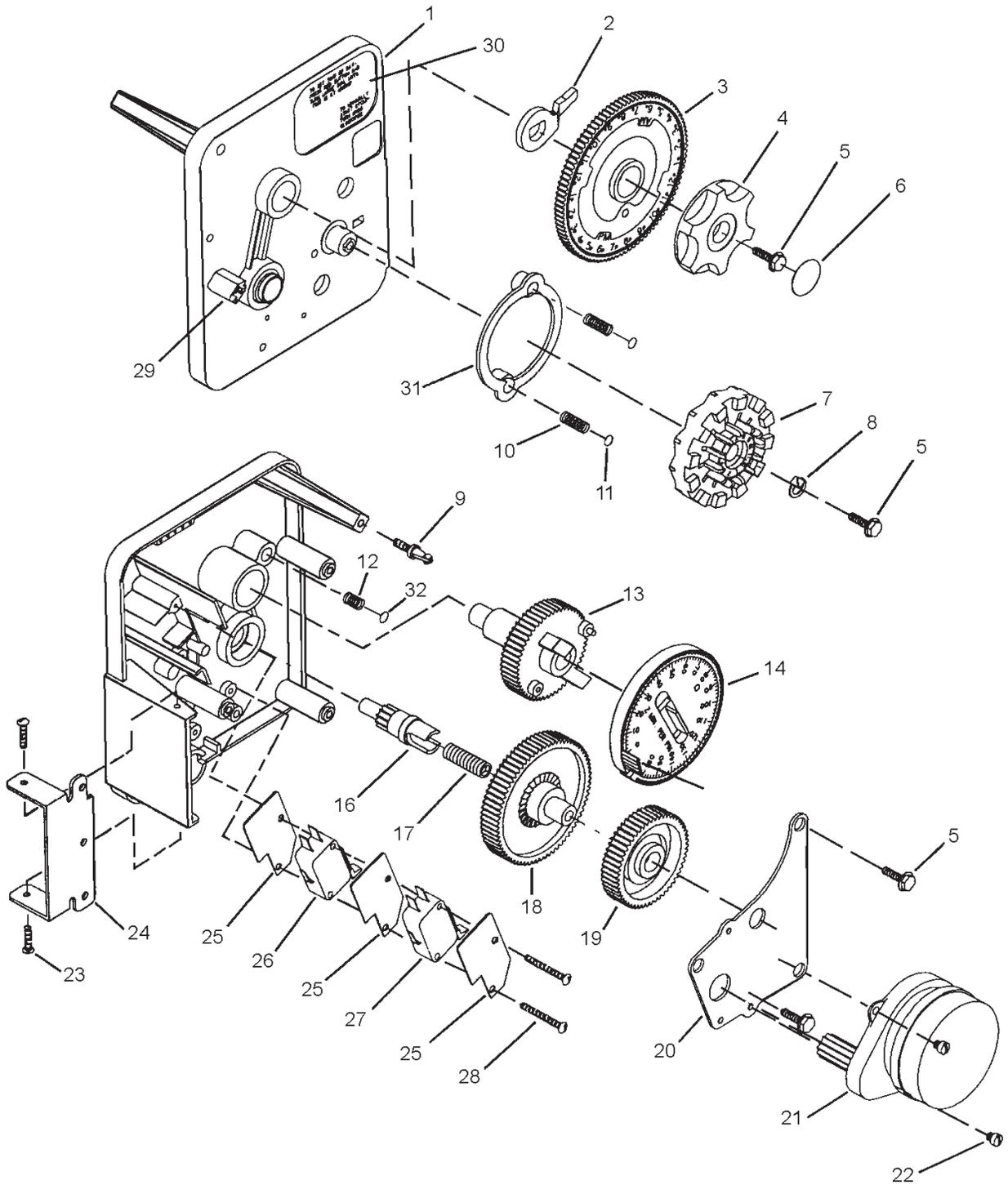
These timers do not have a 24 hour gear. Setting the gallons on the program wheel and manual regeneration procedure are the same as previous instructions.



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.

3200 Timer Assembly



60304_REVA

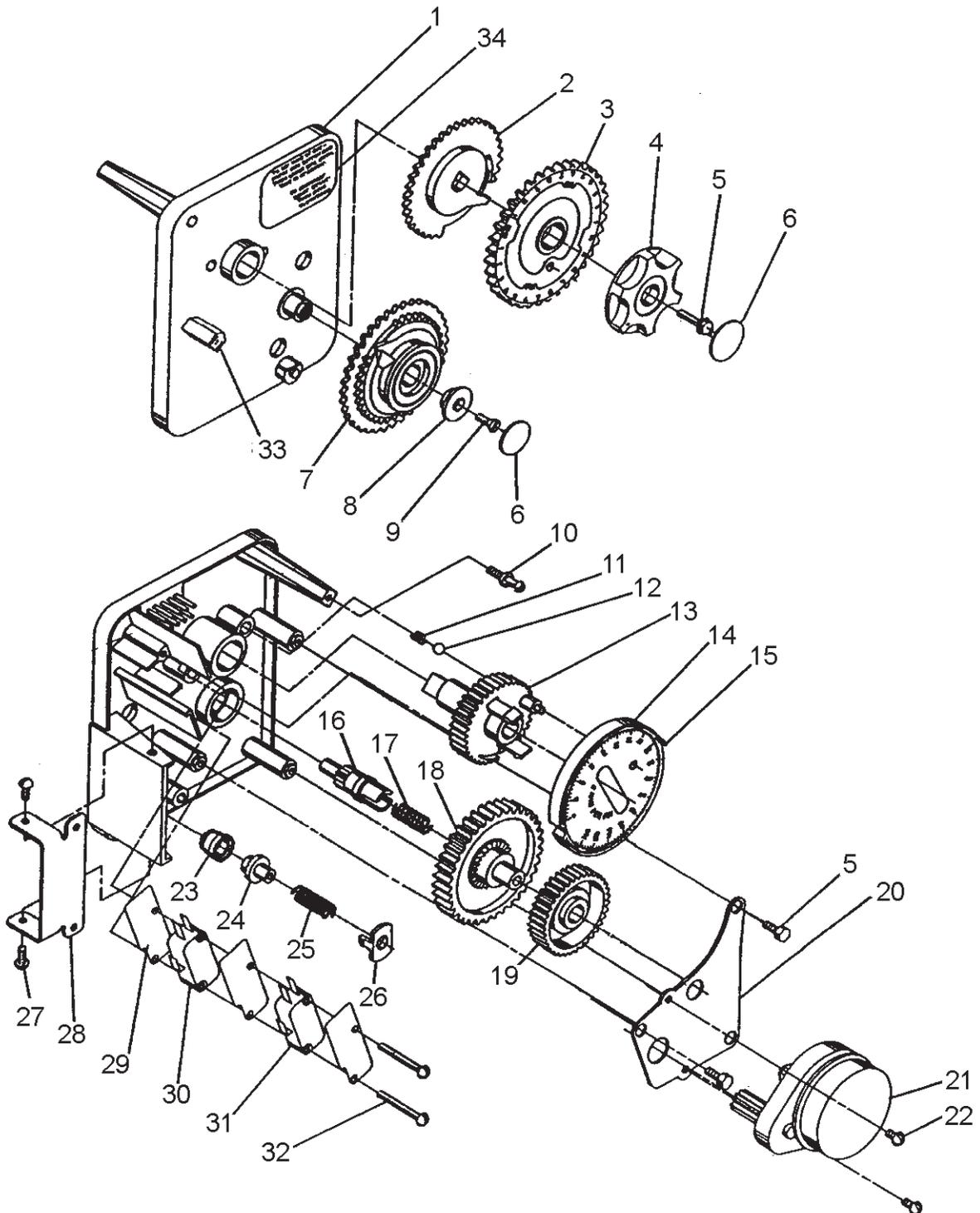
For Service Assembly Numbers, See the Back of this Manual

3200 Timer Assembly

| | | | |
|---------------|---------|---------------|-----------------------------------|
| 1..... | 1..... | 13870..... | Housing, Timer, 3200 |
| 2..... | 1..... | 13011..... | Arm, Cycle Actuator |
| 3..... | 1..... | 40096-24..... | Dial 12AM Regen Assy, Black |
| | | 40096-02..... | Dial 2AM Regen Assy, Black |
| 4..... | 1..... | 13886..... | Knob, 3200 |
| 5..... | 5..... | 13296..... | Screw, Hex Wsh, 6-20 x 1/2 |
| 6..... | 1..... | 11999..... | Label, Button |
| 7..... | 1..... | 14381..... | Skipper Wheel Assy, 12 Day |
| | | 14860..... | Skipper Wheel Assy, 7 Day |
| 8..... | 1..... | 13014..... | Pointer, Regeneration |
| 9..... | 1..... | 14265..... | Clip, Spring |
| 10..... | 2..... | 13311..... | Spring, Detent, Timer |
| 11..... | 2..... | 13300..... | Ball, 1/4" SS |
| 12..... | 1..... | 15424..... | Spring, Detent, Timer |
| 13..... | 1..... | 13911..... | Gear, Main Drive, Timer |
| 14..... | 1..... | 19210..... | Program Wheel Assy, 3200 |
| 15..... | 17..... | 41754..... | Pin, Spring, 1/16 x 5/8 SS, Timer |
| 16..... | 1..... | 13018..... | Pinion, Idler |
| 17..... | 1..... | 13312..... | Spring, Idler Shaft |
| 18..... | 1..... | 13017..... | Gear, Idler |
| 19..... | 1..... | 13164..... | Gear, Drive |
| 20..... | 1..... | 13887..... | Plate, Motor Mounting |
| 21..... | 1..... | 18743-1..... | Motor, 120V, 60Hz 1/30 RPM, 5600 |
| | | 19659-1..... | Motor, 24V, 60 Hz 1/30 RPM |
| 22..... | 2..... | 13278..... | Screw, Phil Hd Mach, 6-32 x 1/8 |
| 23..... | 3..... | 11384..... | Screw, Phil, 6-32 x 1/4 Zinc |
| 24..... | 1..... | 13881..... | Bracket, Hinge Timer |
| 25..... | 3..... | 14087..... | Insulator |
| 26..... | 1..... | 10896..... | Switch, Micro |
| 27..... | 1..... | 15320..... | Switch, Micro, Timer |
| 28..... | 2..... | 11413..... | Screw, Pan Hd Mach, 4-40 x 1 1/8 |
| 29..... | 1..... | 14007..... | Label, Time of Day |
| 30..... | 1..... | 14045..... | Label, Instruction |
| 31..... | 1..... | 13864..... | Ring, Skipper Wheel |
| 32..... | 1..... | 15066..... | Ball, 1/4" Delrin |
| Not Shown ... | 1..... | 13902..... | Harness, 3200 |
| Not Shown ... | 2..... | 40422..... | Nut, Wire, Tan |
| Not Shown ... | 1..... | 15354-01..... | Wire, Ground 4" |

For Service Assembly Numbers, See the Back of this Manual

3210 Timer Assembly



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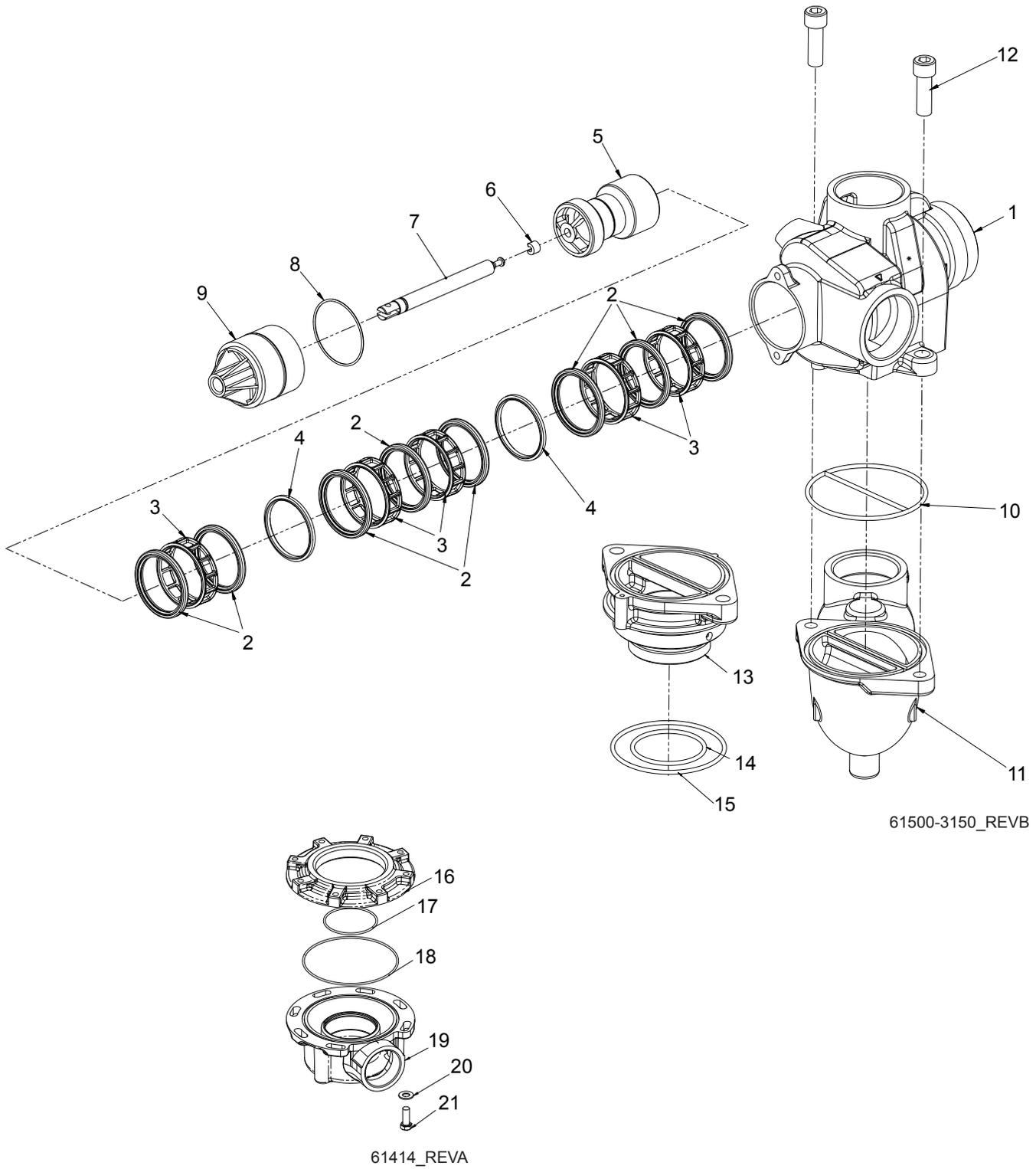
For Service Assembly Numbers, See the Back of this Manual

3210 Timer Assembly Parts List

| Item No. | Quantity | Part No. | Description |
|---------------|----------|---------------|---|
| 1..... | 1..... | 13870..... | Housing, Timer, 3200 |
| 2..... | 1..... | 13802..... | Gear, Cycle Actuator |
| 3..... | 1..... | 40096-24..... | Dial 12AM Regen Assy, Black |
| | | 40096-02..... | Dial 2 AM Regen Assy, Black |
| 5..... | 1..... | 13886..... | Knob, 3200 |
| 6..... | 4..... | 13296..... | Screw, Hex Wsh, 6-20 x 1/2 |
| 7..... | 2..... | 11999..... | Label, Button |
| 8..... | 1..... | 60405-50..... | Program Wheel Assy, w/2" Std Label Set @ 21 |
| 9..... | 1..... | 13806..... | Retainer, Program Wheel |
| 10..... | 1..... | 13748..... | Screw, Flt Hd St, 6-20 x 1/2 |
| 11..... | 1..... | 14265..... | Clip, Spring |
| 12..... | 1..... | 15424..... | Spring, Detent, Timer |
| 13..... | 1..... | 15066..... | Ball, 1/4" Delrin |
| 14..... | 1..... | 13911..... | Gear, Main Drive, Timer |
| 15..... | 1..... | 19210..... | Program Wheel Assy |
| 16..... | 17..... | 41754..... | Pin, Spring, 1/16 x 5/8 SS, Timer |
| 18..... | 1..... | 13018..... | Pinion, Idler |
| 19..... | 1..... | 13312..... | Spring, Idler Shaft |
| 20..... | 1..... | 13017..... | Gear, Idler |
| 21..... | 1..... | 13164..... | Gear, Drive |
| 23..... | 1..... | 13887..... | Plate, Motor Mounting |
| 24..... | 1..... | 18743-1..... | Motor, 120V, 60 Hz 1/30 RPM, 5600 |
| | | 19659-1..... | Motor, 24V, 60 Hz 1/30 RPM |
| 25..... | 2..... | 13278..... | Screw, Phil Hd Mach, 6-32 x 1/8 |
| 26..... | 1..... | 13830..... | Pinion, Program Wheel Drive |
| 27..... | 1..... | 13831..... | Clutch, Drive Pinion |
| 28..... | 1..... | 14276..... | Spring, Meter Clutch |
| 29..... | 1..... | 14253..... | Retainer, Clutch Spring |
| 31..... | 3..... | 11384..... | Screw, Phil, 6-32 x 1/4 |
| 32..... | 1..... | 13881..... | Bracket, Hinge Timer |
| 33..... | 3..... | 14087..... | Insulator |
| 34..... | 1..... | 10896..... | Switch, Micro |
| 35..... | 1..... | 15320..... | Switch, Micro, Timer |
| 36..... | 2..... | 11413..... | Screw, Pan Hd Mach, 4-40 x 1 1/8 |
| 37..... | 1..... | 14007..... | Label, Time of Day |
| 38..... | 1..... | 14045..... | Label, Instruction |
| Not Shown ... | 1..... | 13902..... | Harness, 3200 |
| Not Shown ... | 2..... | 40422..... | Nut, Wire, Tan |
| Not Shown ... | 1..... | 15354-01..... | Wire, Ground, 4" |
| Not Shown ... | 1..... | 15465..... | Caution Label |
| Not Shown ... | 1..... | 14198..... | Capacity Label |

For Service Assembly Numbers, See the Back of this Manual

Control Valve Assembly



For Service Assembly Numbers, See the Back of this Manual

Control Valve Assembly Parts List

| Item No. | Quantity | Part No. | Description |
|----------|----------|---------------|------------------------------------|
| 1..... | 1..... | 15114..... | Valve Body, 3150 |
| 2..... | 8..... | 11720..... | Seal, Piston, 2900/3150 |
| 3..... | 5..... | 10369..... | Spacer, 2", 2900/3150 |
| | | 16141..... | Spacer, Port Ring, HW, 180° |
| 4..... | 2..... | 10368..... | Spacer, Narrow, 3150/3900 |
| | | 10368-01..... | Spacer, Quad Ring, Brass, HW, 180° |
| 5..... | 1..... | 16130..... | Piston, High Backwash |
| | | 19611-01..... | Piston Assy, 3150, NHWBP, O-ring |
| 6..... | 1..... | 14818..... | Ring, Piston Rod, Snap |
| 7..... | 1..... | 15125..... | Rod, Piston, 3150 |
| | | 19708..... | Rod, Piston, 3150 NHWBP |
| 8..... | 1..... | 14922..... | O-ring, -035, Piston |
| 9..... | 1..... | 16398-01..... | End Plug Assy, 3150, White |
| | | 16398-11..... | End Plug Assy, 3150, Black |
| 10..... | 1..... | 15112..... | Seal, 3150 Adapter Base |
| 11..... | 1..... | 17407..... | Adapter, 3150, Sidemount |
| 12..... | 2..... | 40118..... | Screw, Sckt Hd, 1/2 - 13 Unc |

Options

| | | | |
|-------------|--------|---------------|---------------------------------|
| ▲ 13..... | 1..... | 15117-01..... | Adapter, 3150, Machined |
| * ▲ 14..... | 1..... | 15247..... | O-ring, -229 |
| ▲ 15..... | 1..... | 13575..... | O-ring, -240 |
| | | 15210..... | O-ring, -343, Park Tank |
| * ▲ 16..... | 1..... | 19608-20..... | Dispenser, Commercial, 2", 3150 |

Options

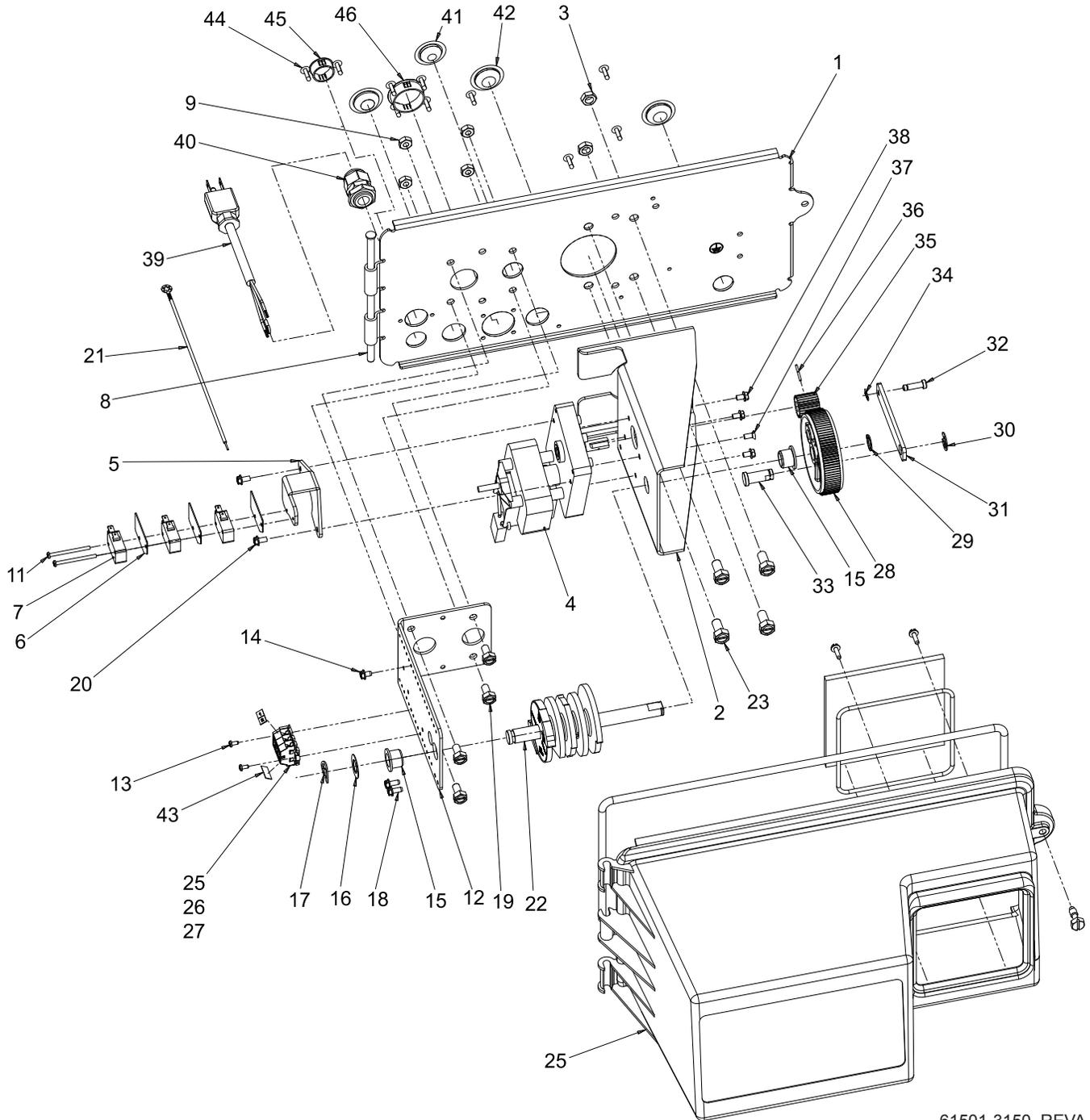
| | | | |
|---------|--------|---------------|---------------------------------------|
| 16..... | 1..... | 40316..... | Adapter, Sidemount |
| 17..... | 1..... | 16804-01..... | O-ring, -150 |
| 18..... | 1..... | 40368..... | O-ring, -160, Sidemount, Flange |
| 19..... | 1..... | 40365..... | Base, 3130/3150, Rotating |
| 20..... | 7..... | 40375..... | Washer, Flat, 3/8, Type A |
| 21..... | 7..... | 19768..... | Screw, Hex Hd, 3/8 - 16 x 1, Cap 18-8 |

* Not used with a fixed sidemount.

▲ Not used with a rotating sidemount.

For Service Assembly Numbers, See the Back of this Manual

Control Drive Assembly



61501-3150_REVA

For Service Assembly Numbers, See the Back of this Manual

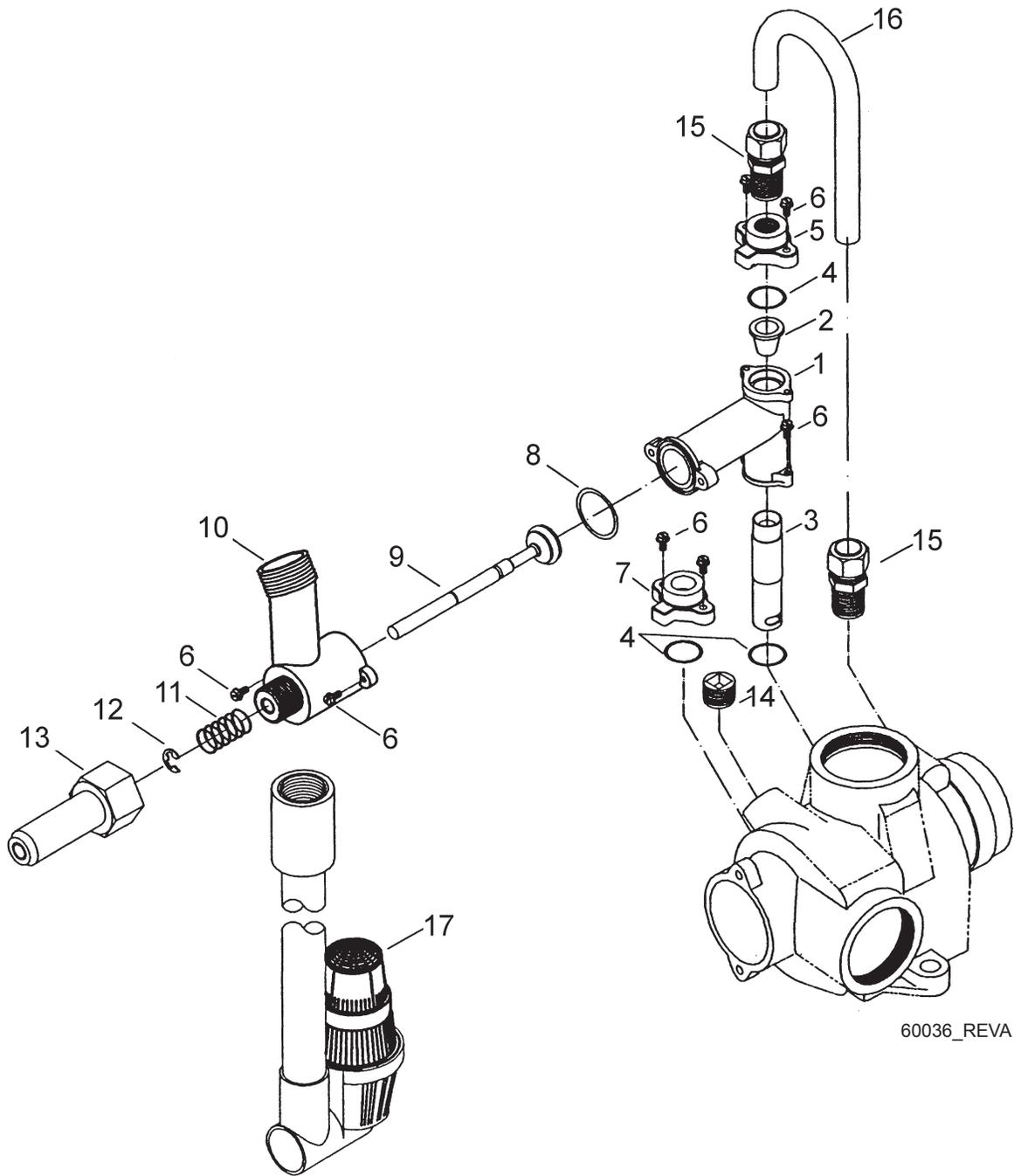
Control Drive Assembly Parts List

| Item No. | Quantity | Part No. | Description |
|-----------|----------|----------|--|
| 1 | 1 | 19304-04 | Backplate, 3150/3900, Upper |
| 2 | 1 | 15120-01 | Bracket, Motor Mtg, 3150/3900 Environmental |
| 3 | 2 | 16346 | Nut, Hex, Jam, 5/16 - 18 |
| 4 | 1 | 40392 | Motor, Drive, 115V, 50/60 Hz, Sp |
| | | 40390 | Motor, Drive, 220V, 50 Hz, Sp, Fam 3 |
| | | 40391 | Motor, Drive, 24V, 50/60 Hz, Sp Fam 3 |
| 5 | 1 | 17797 | Bracket, Switch Mounting, 3150/3900 |
| 6 | 4 | 10302 | Insulator, Limit Switch |
| 7 | 3 | 10218 | Switch, Micro |
| 8 | 1 | 17845-03 | Pin, Hinge, 3150/3900, Env |
| 9 | 4 | 11235 | Nut, Hex, 1/4 -20, Mach Screw, Zinc |
| 10 | 2 | 13365 | Washer, Lock, #4, External |
| 11 | 2 | 40080 | Screw, Rd Hd, 4-40 x 1 1/2" |
| 12 | 1 | 16053 | Bracket, Brine Side |
| 13 | 2 | 40133 | Screw, Pan Hd, 4-40 x 1/4 |
| 14 | 1 | 15226-6 | Terminal Block |
| 15 | 2 | 16052 | Bushing, 3150/3900 |
| 16 | 1 | 16059 | Washer, SS, .88, 3150/3900 |
| 17 | 1 | 16051 | Ring, Retaining, Bowed |
| 18 | 2 | 10300 | Screw, Slot Hex Wsh, 18-8 x 3/8 |
| 19 | 4 | 10231 | Screw, Slot Hex, 1/4 - 20 x 1/2 |
| 20 | 2 | 14202-01 | Screw, Hex Wsh Hd, 8 x 5/16 |
| 21 | 1 | 10475-01 | Wire, Ground |
| 22 | 1 | 16494-03 | Cam Assy, 3150/3900 Signal After Brine Fill |
| | | 16494-05 | Cam Assy, 3150/3900 Upper Signal After Rapid Rinse |
| 23 | 4 | 11224 | Screw, Hex Hd, 5/16 - 18 x 5/8 |
| 24 | 1 | 60240-02 | Cover Assy, 3150/3900 Env, Black |
| 25 | 2 | 41084 | Terminal Block, Segment, Gray |
| 26 | 1 | 41085 | Endplate, Terminal Block, Gray |
| 27 | 1 | 40174 | Terminal Block, Green/Yellow |
| 28 | 1 | 16046 | Gear, Drive |
| 29 | 1 | 16050 | Ring, Retaining |
| 30 | 1 | 11774 | Ring, Retaining |
| 31 | 1 | 16047 | Link, Drive |
| 32 | 1 | 11709 | Pin, Drive Link |
| 33 | 1 | 16048 | Bearing, Drive Link |
| 34 | 1 | 11898 | Clip, 3150/3900 |
| 35 | 1 | 16045 | Pinion, Drive |
| 36 | 1 | 11381 | Pin, Roll, 2900/3900 |
| 37 | 1 | 11080 | Screw, Flt Hd Mach, 8-32 x 3/8 |
| 38 | 3 | 10872 | Screw, Hex Wsh, 8-32 x 17/64 |
| 39 | 1 | 40084-12 | Power Cord, 12' US, Round, 120V |
| 40 | 1 | 17967 | Fitting Assy, Liquid Tight, Blk |
| 41 | 1 | 19691 | Plug, .750 Dia, Recessed, Black |
| 42 | 3 | 19591 | Plug, .8750 Hole, Recessed, Black |
| 43 | 2 | 15250 | Label, Terminal Strip |
| 44 | 10 | 19800 | Plug, .140 Dia, White |
| 45 | 1 | 15806 | Plug, Hole, Heyco #2693 |
| 46 | 1 | 17421 | Plug, 1.20 Hole |
| Not Shown | 1 | 17470 | Cable Guide Assy, 2850/3150 |
| Not Shown | 1 | 19856 | Ring, Retaining |
| Not Shown | 1 | | Timer |
| Not Shown | 1 | 40396 | Harness, Drive, Environmental |
| Not Shown | 1 | 16427-04 | Wire, Lead, 12", White |
| Not Shown | 1 | 40396 | Harness, Drive, Environmental |
| Not Shown | 1 | 14924 | Strain Relief Heyco #1247 |
| Not Shown | 1 | 15513 | Meter Cable, 17.5" |

* Specify number of terminals

For Service Assembly Numbers, See the Back of this Manual

1800 Series Brine System Assembly



60036_REVA

For Service Assembly Numbers, See the Back of this Manual

1800 Series Brine System Assembly Parts List

| Item No. | Quantity | Part No. | Description |
|---------------|----------|---------------|---|
| 1..... | 1..... | 16340..... | Body, Injector, 1800 D/F |
| 2..... | 1..... | 15128-xx..... | Injector Nozzle |
| 3..... | 1..... | 15127-xx..... | Injector Throat |
| 4..... | 3..... | 15246..... | O-ring, -116 |
| 5..... | 1..... | 16341-01..... | Cap, Injector, 1800 |
| 6..... | 8..... | 12473..... | Screw, Hex Wsh, 10-24 x 5/8 |
| 7..... | 1..... | 16341-02..... | Plug, Injector, 1800 |
| 8..... | 1..... | 13303-01..... | O-ring, -021, 560CD |
| 9..... | 1..... | 16497-01..... | Stem Assy, 1800, Brine Valve |
| 10..... | 1..... | 18713..... | Brine Valve Body, 1800 |
| 11..... | 1..... | 11772..... | Spring, 3150 Brine Valve |
| 12..... | 1..... | 11774..... | Ring, Retaining |
| 13..... | 1..... | 16498-01..... | Stem Guide Assy, Brine |
| 14..... | 1..... | 16387..... | Plug, Pipe, 1/2" NPT |
| 15..... | 2..... | 18702..... | Fitting, Tube, 1/2 NPT 5/8 |
| 16..... | 1..... | 18703..... | Tube, Brine, 5/8 OD Annealed |
| 17..... | 1..... | 60009-00..... | Air Check, #900, Commercial Less Fittings |
| | | 60009-01..... | Air Check, #900, Commercial, HW Less Fittings |
| Not Shown ... | 1..... | | Flow Control (Specify Flow Rate) |

Option Without Brine Valve

- 1.....16605..... Retainer Plate
- 1.....19860..... Fitting, Brine Valve, 1800

Delete: Items 9 through 16

Injector Throat

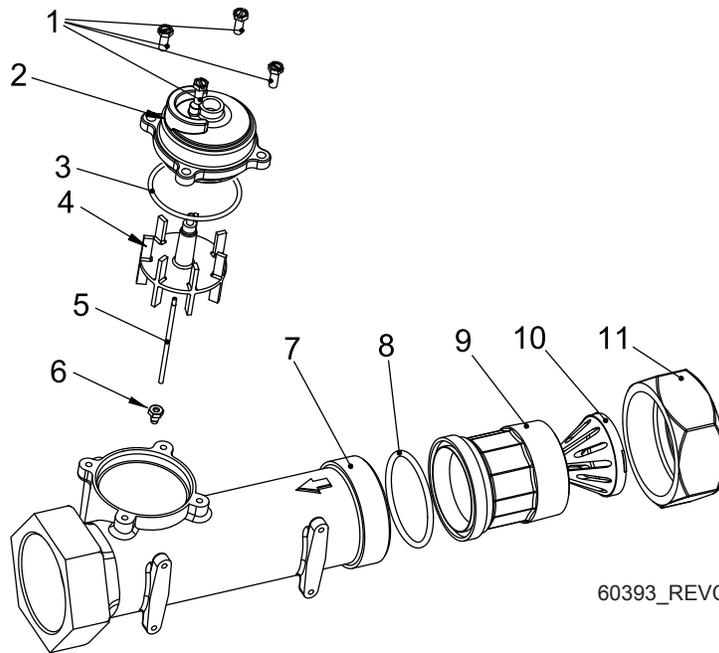
- 15127-04.....#4..... Green
- 15127-05.....#5..... Red
- 15127-06.....#6..... White
- 15127-07.....#7..... Blue
- 15127-08.....#8..... Yellow
- 15127-09.....#9..... Violet
- 15127-10.....#10..... Black

Injector Nozzle

- 15128-04.....#4..... Green
- 15128-05.....#5..... Red
- 15128-06.....#6..... White
- 15128-07.....#7..... Blue
- 15128-08.....#8..... Yellow
- 15128-09.....#9..... Violet
- 15128-10.....#10..... Black

For Service Assembly Numbers, See the Back of this Manual

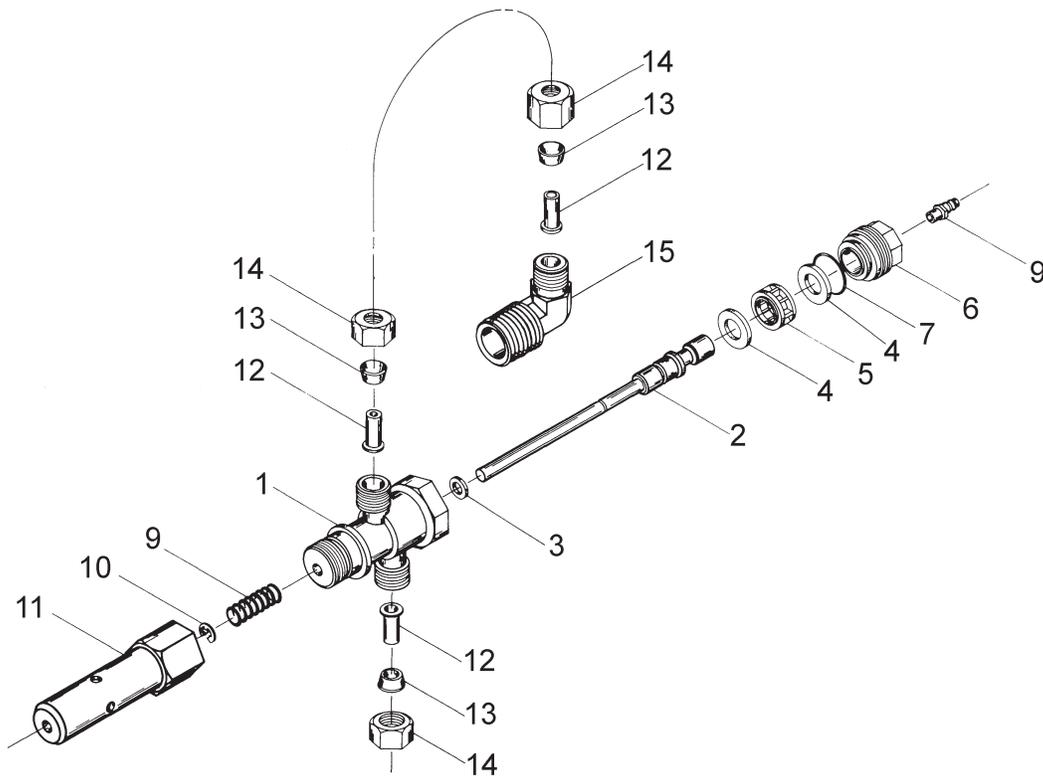
2" Brass Meter Assembly & Parts List



| Item No. | Quantity | Part No. | Description |
|----------|----------|------------|-------------------------------------|
| 1 | 1 | 12112 | Screw, Hex Hd Mach, 10-24 x 1/2 |
| | | 15886 | Screw, Hex Hd, M5 x 12 |
| | | 21716 | Screw, M5 x 16 |
| | | 12473 | Screw, Hex Wsh, 10-24 x 5/8 |
| 2 | 1 | 15803 | Cap, Meter, Brass |
| | | 15803NP | Cap, Meter, NP |
| | | 13822 | Cap, Meter, 5600 |
| 3 | 1 | 13847 | O-ring, -137, Std/560CD, Meter |
| 4 | 1 | 15374-01 | Impeller, 2" Meter |
| | | 15374-11 | Impeller, 2" Meter, HW |
| 5 | 1 | 15432 | Shaft, Impeller, SS |
| 6 | 1 | 15532 | Seat, Impeller Shaft, Hex |
| 7 | 1 | 14456 | Body, Meter, 2" |
| | | 14456-20 | Body, Meter, 2", BSP, Metric |
| | | 14456-20NP | Body, Meter, 2", BSP, Mtrc, NP |
| | | 60627NP | Meter Assy, 2", NP |
| 8 | 1 | 14679 | O-ring, -227, Meter |
| 9 | 1 | 14568 | Fitting, Nipple, 2" |
| | | 14568-10 | Fitting, Nipple, 2", BSP, Brass |
| | | 14568-10NP | Fitting, Nipple, 2", BSP, Brass, NP |
| 10 | 1 | 14680 | Flow Straightener |
| 11 | 1 | 14569 | Nut, 2900 Meter |
| | | 14569NP | Nut, 2900 Meter, NP |

For Service Assembly Numbers, See the Back of this Manual

Service Valve Operator Assembly & Parts List



| Item No. | Quantity | Part No. | Description |
|---------------|----------|---------------|-------------------------------|
| 1..... | 1..... | 15074..... | Body, SVO |
| 2..... | 1..... | 16065..... | Piston & Stem, SVO |
| 3..... | 1..... | 10141..... | O-ring, -010 |
| 4..... | 2..... | 14835..... | Seal, 3150 |
| 5..... | 1..... | 14834..... | Spacer, Softwater Fill |
| 6..... | 1..... | 16509..... | Plug, End, SVO |
| 7..... | 1..... | 12977..... | O-ring, -015 |
| 8..... | 1..... | 15965..... | Fitting, Bias |
| 9..... | 1..... | 10249..... | Spring, Brine Valve |
| 10..... | 1..... | 10250..... | Ring, Retaining |
| 11..... | 1..... | 16498-02..... | Stem Guide Assy, SVO |
| 12..... | 3..... | 10332..... | Fitting, Insert, 3/8 |
| 13..... | 3..... | 10330..... | Fitting, Sleeve, 3/8 Celcon |
| 14..... | 3..... | 10329..... | Fitting, Tube, 3/8 Nut, Brass |
| 15..... | 1..... | 16503..... | Fitting, Elbow, 90 Deg. |
| Not Shown ... | 1..... | 16511..... | Tube, 3150, PVC, SVO |

For Service Assembly Numbers, See the Back of this Manual

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. |

Troubleshooting

| Problem | Cause | Correction |
|-----------------------------------|---|--|
| 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. |
| 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.

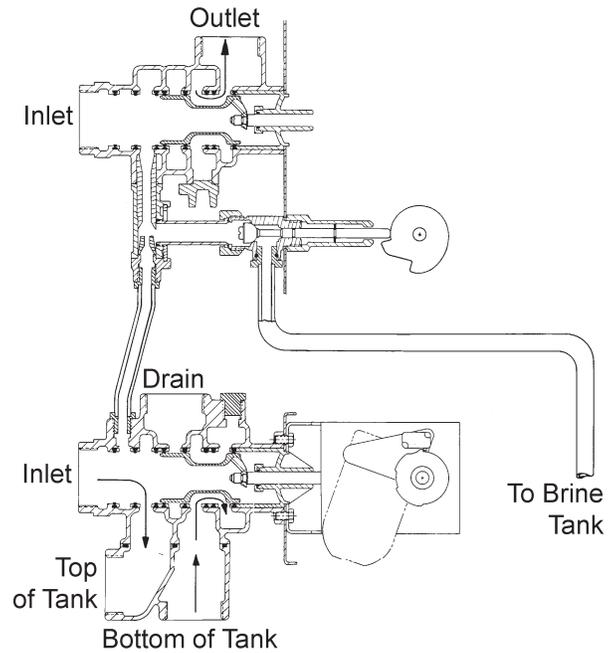
Correction: Pull cable out of meter cover and rotate manually. Program wheel must move without binding and clutch must give positive clicks when program wheel strikes regeneration stop. If it does not, replace timer.

Reason: Meter is not measuring flow.

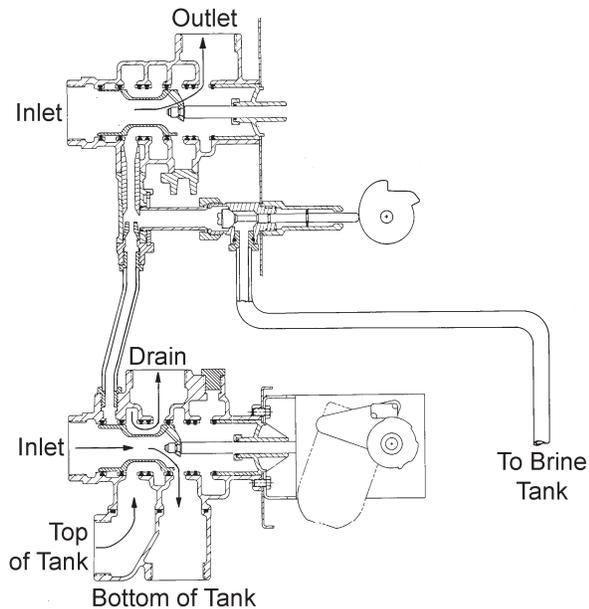
Correction: Check meter with meter checker.

Water Conditioner Flow Diagrams

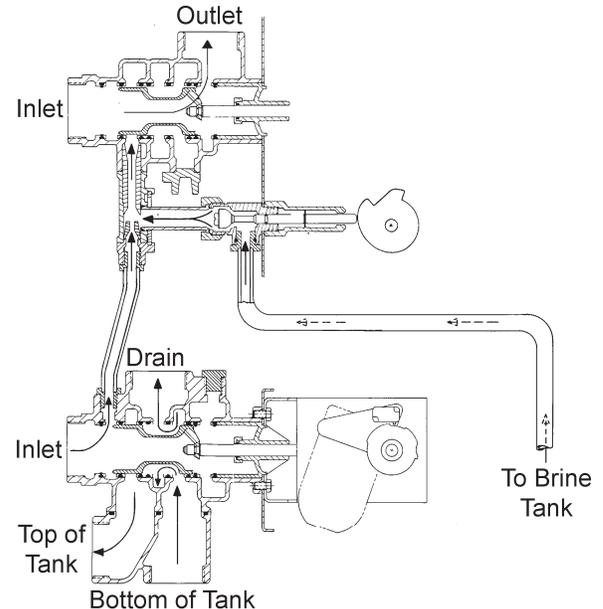
1 Service Position



2 Backwash Position

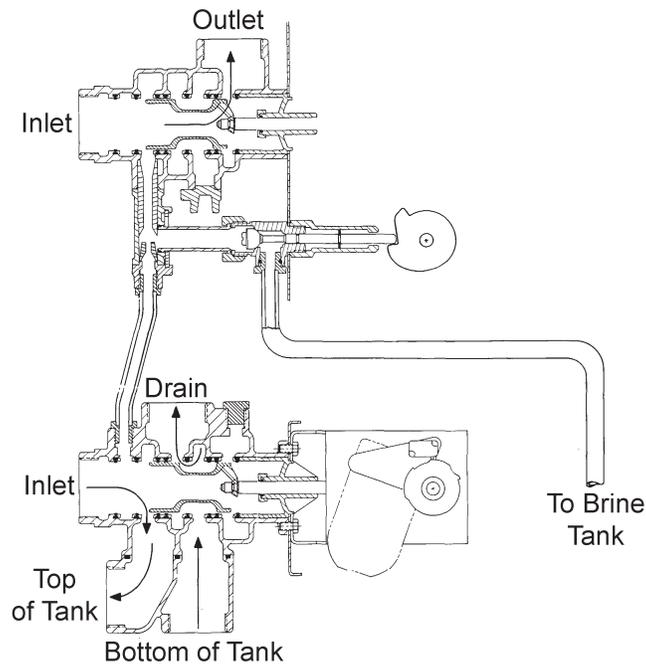


3 Brine and Slow Rinse Position

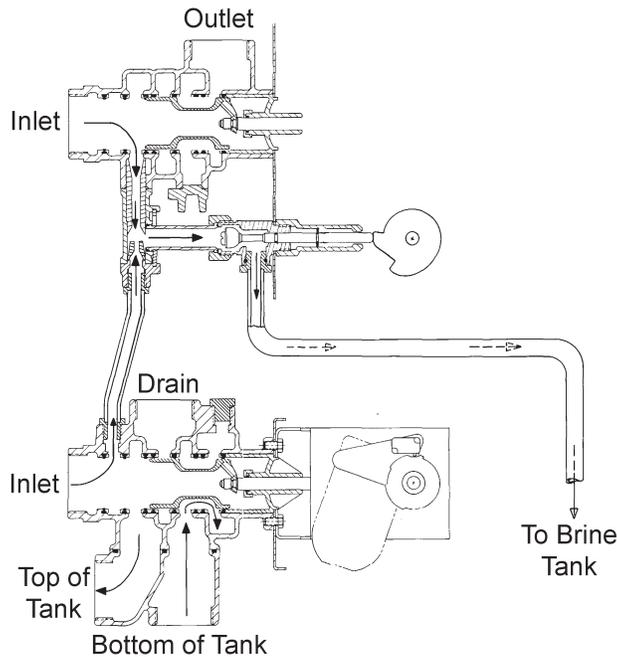


Water Conditioner Flow Diagrams

4 Rapid Rinse Position

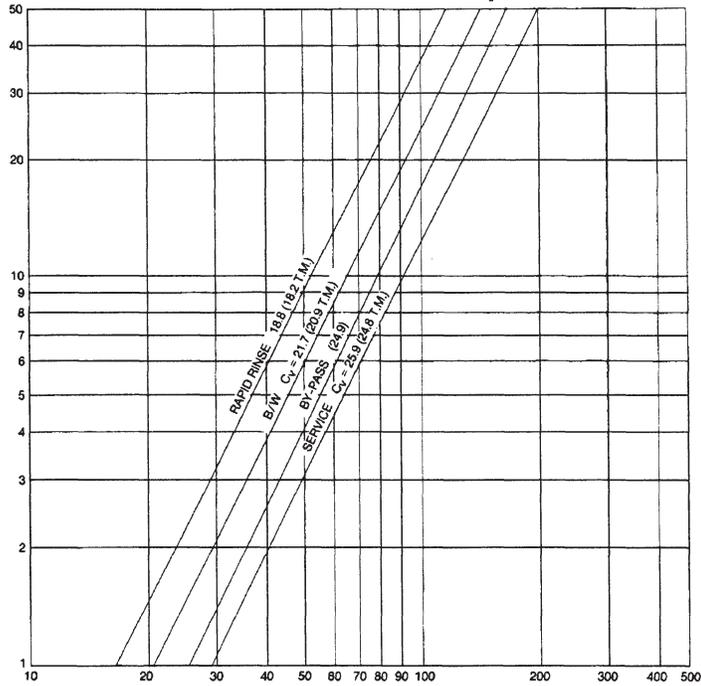


5 Brine Tank Refill Position

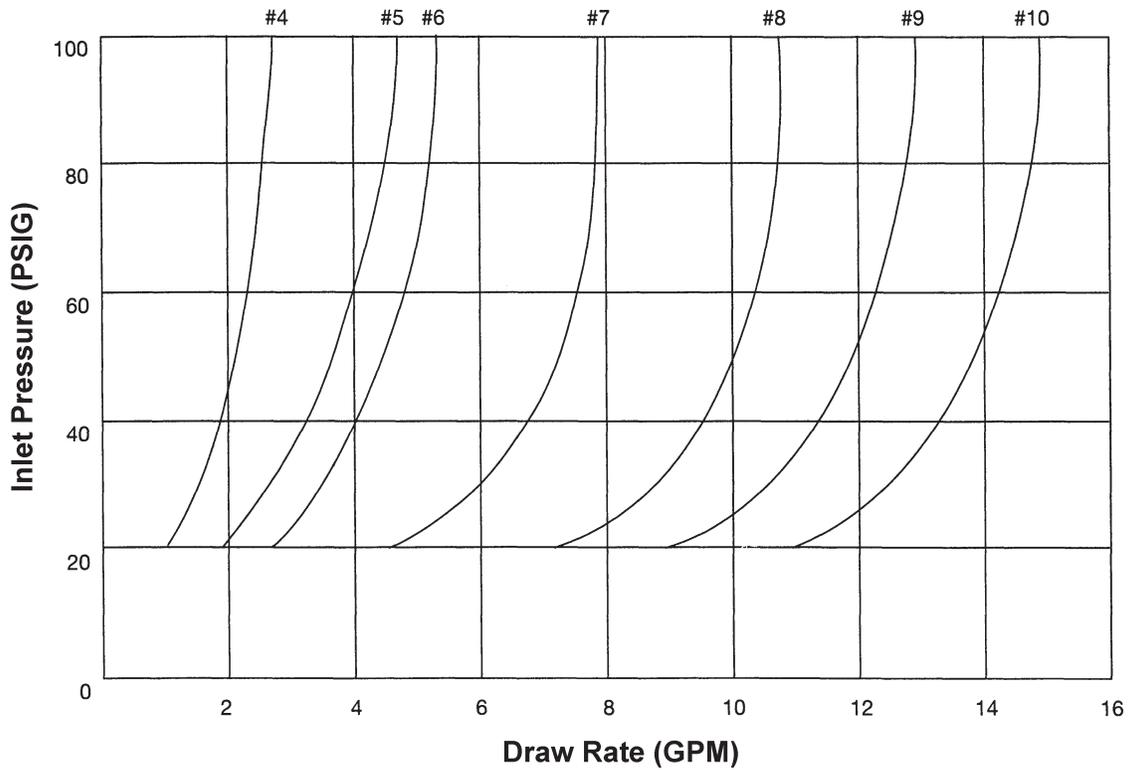


Flow Data & Injector Draw Rates

3150 Valve Side Mount & Top Mount



3150 on Empty Tank



Typical Timer Settings

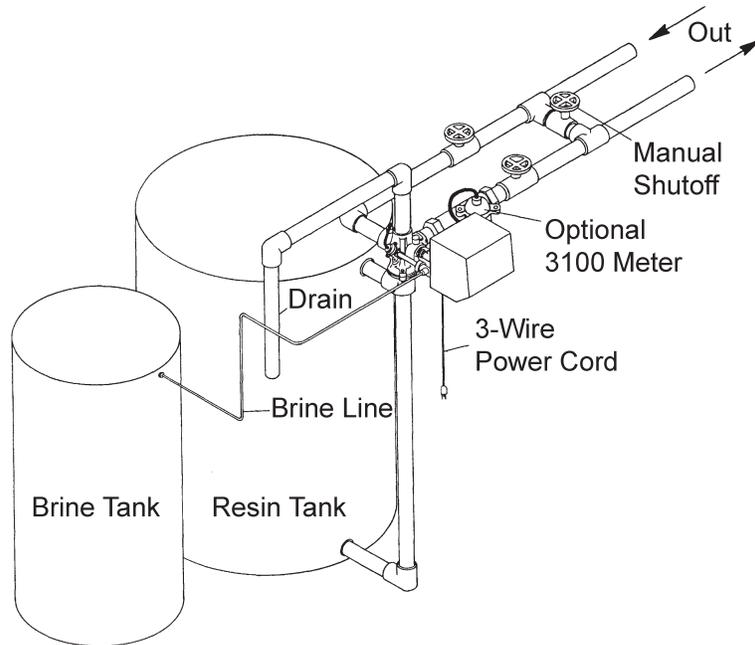
| Tank Dia. Volume of Resin | B/W Rate-GPM | B/W Time Min. | 1800 Inj. Size | Brine and Slow Rinse Time-Minutes | | | | | | | | | Fast Rinse Time | Brine Refill Rate GPM | Brine Tank Refill Time-Minutes | | |
|------------------------------|--------------|---------------|----------------|-----------------------------------|--------|--------|---------------------------|--------|--------|---------------------------|--------|--------|-----------------|-----------------------|--------------------------------|---------------------------|---------------------------|
| | | | | @ 6# Per Ft ³ | | | @ 10# Per Ft ³ | | | @ 15# Per Ft ³ | | | | | @ 6# Per Ft ³ | @ 10# Per Ft ³ | @ 15# Per Ft ³ |
| | | | | 35 PSI | 60 PSI | 90 PSI | 35 PSI | 60 PSI | 90 PSI | 35 PSI | 60 PSI | 90 PSI | | | | | |
| 24" 10 Ft ³ | 15 | 10 | 4 | 42 | 30 | 26 | 68 | 50 | 46 | 102 | 76 | 64 | 10 | 2 | 6 | 16 | 26 |
| 30" 15 Ft ³ | 25 | 10 | 5 | 36 | 26 | 24 | 62 | 42 | 40 | 96 | 68 | 64 | 10 | 5 | 6 | 10 | 16 |
| 36" 20 Ft ³ | 35 | 10 | 6 | 34 | 28 | 28 | 58 | 48 | 48 | 84 | 68 | 68 | 10 | 5 | 8 | 14 | 20 |
| 42" 30 Ft ³ | 50 | 10 | 7 | 36 | 26 | 26 | 58 | 44 | 44 | 92 | 70 | 70 | 10 | 10 | 6 | 10 | 16 |
| 48" 42 Ft ³ | 70 | 10 | 8 | 34 | 34 | 34 | 56 | 56 | 56 | 76 | 76 | 76 | 10 | 15 | 6 | 10 | 14 |
| 54" 55 Ft ³ | 80 | 10 | 9 | 40 | 34 | 34 | 60 | 50 | 50 | 90 | 76 | 76 | 10 | 15 | 8 | 12 | 18 |
| 60" 70 Ft ³ | 100 | 10 | 10 | 46 | 36 | 34 | 68 | 54 | 52 | 102 | 80 | 78 | 10 | 20 | 8 | 12 | 18 |

With Model 2350 Safety Brine Valve

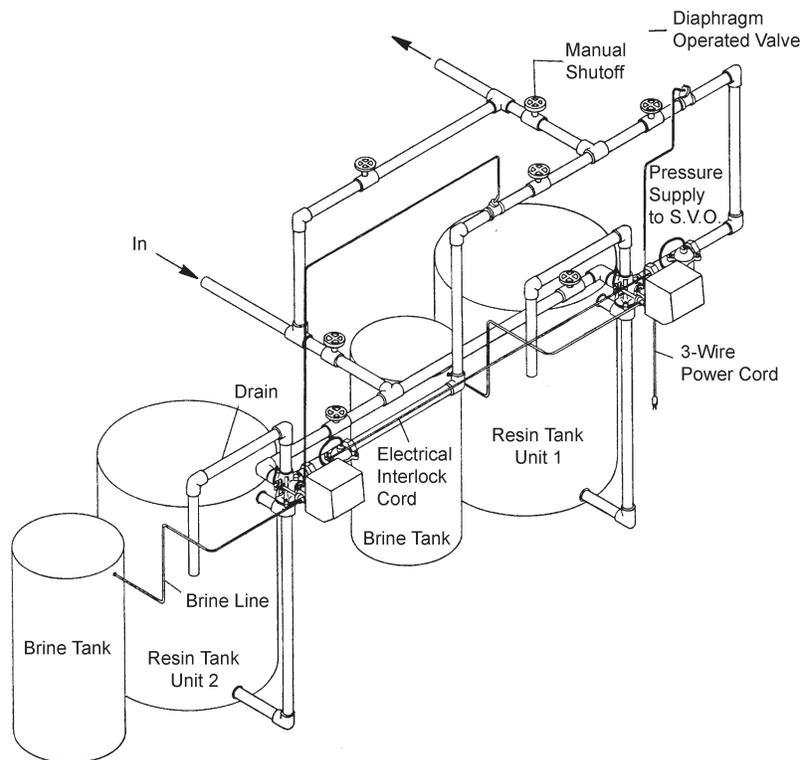
| | | | | | | | | | | | | | | | | | |
|---------------------------|-----|----|----|----|----|----|----|----|----|-----|----|----|----|----|----|----|----|
| 48" 42 Ft ³ | 70 | 10 | 8 | 34 | 34 | 34 | 56 | 56 | 56 | 76 | 76 | 76 | 10 | 10 | 9 | 16 | 22 |
| 54" 55 Ft ³ | 80 | 10 | 9 | 40 | 34 | 34 | 60 | 50 | 50 | 90 | 76 | 76 | 10 | 10 | 12 | 18 | 28 |
| 60" 70 Ft ³ | 100 | 10 | 10 | 46 | 36 | 34 | 68 | 54 | 52 | 102 | 80 | 78 | 10 | 10 | 16 | 24 | 36 |

Installation Drawings

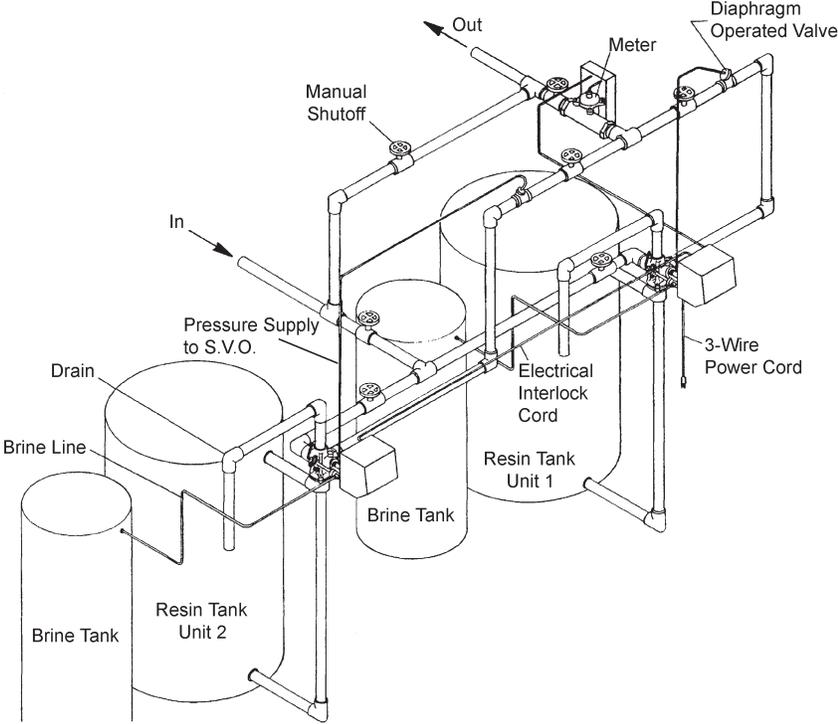
System #4 - Typical Single Tank Installation with Optional Meter



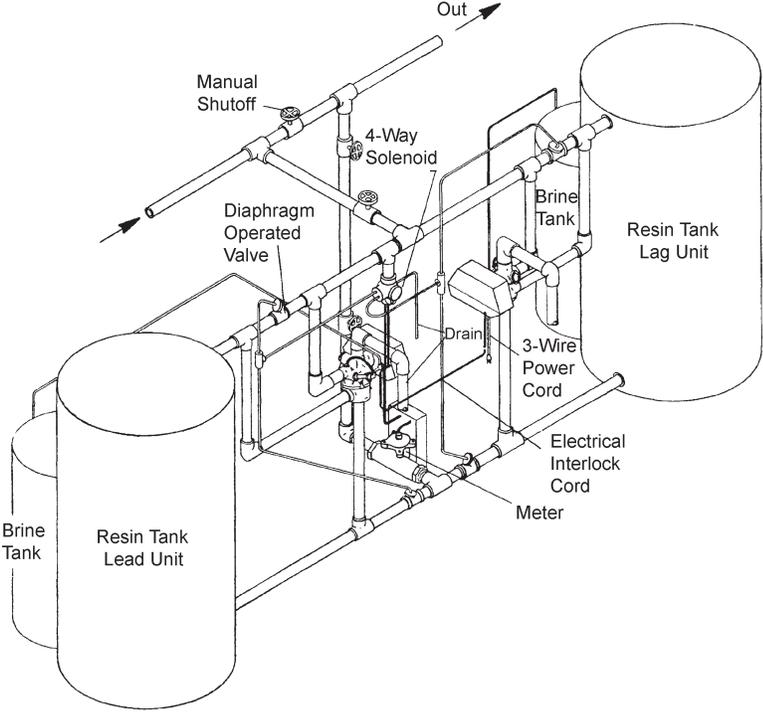
System #5 - Interlock - Typical Twin Tank Installation with Optional Meter Interlock and No Hard Water Bypass



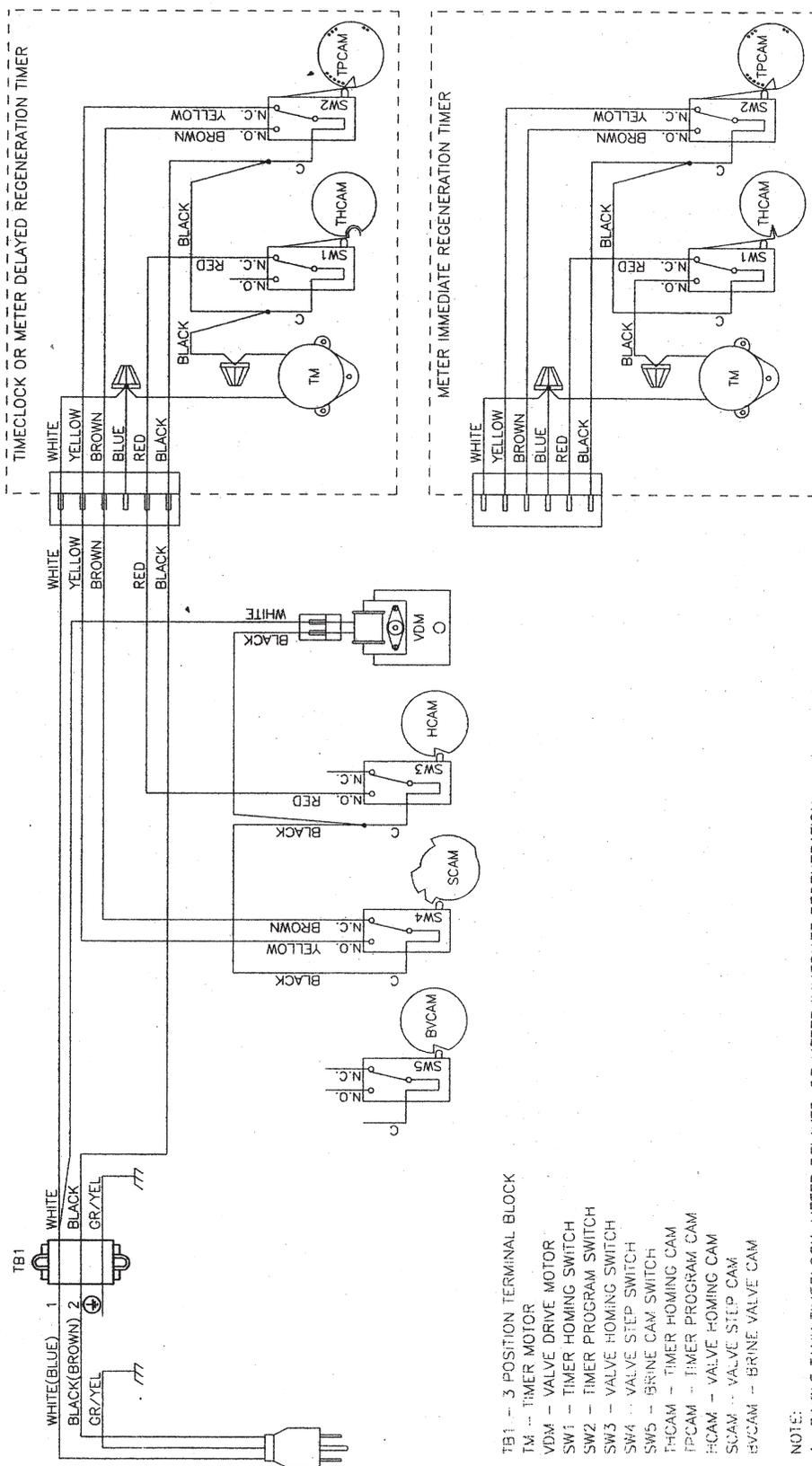
System #6 - Twin Series Regeneration Installation with a Remote Meter



System #7 - Twin Alternator Installation with a Remote Meter



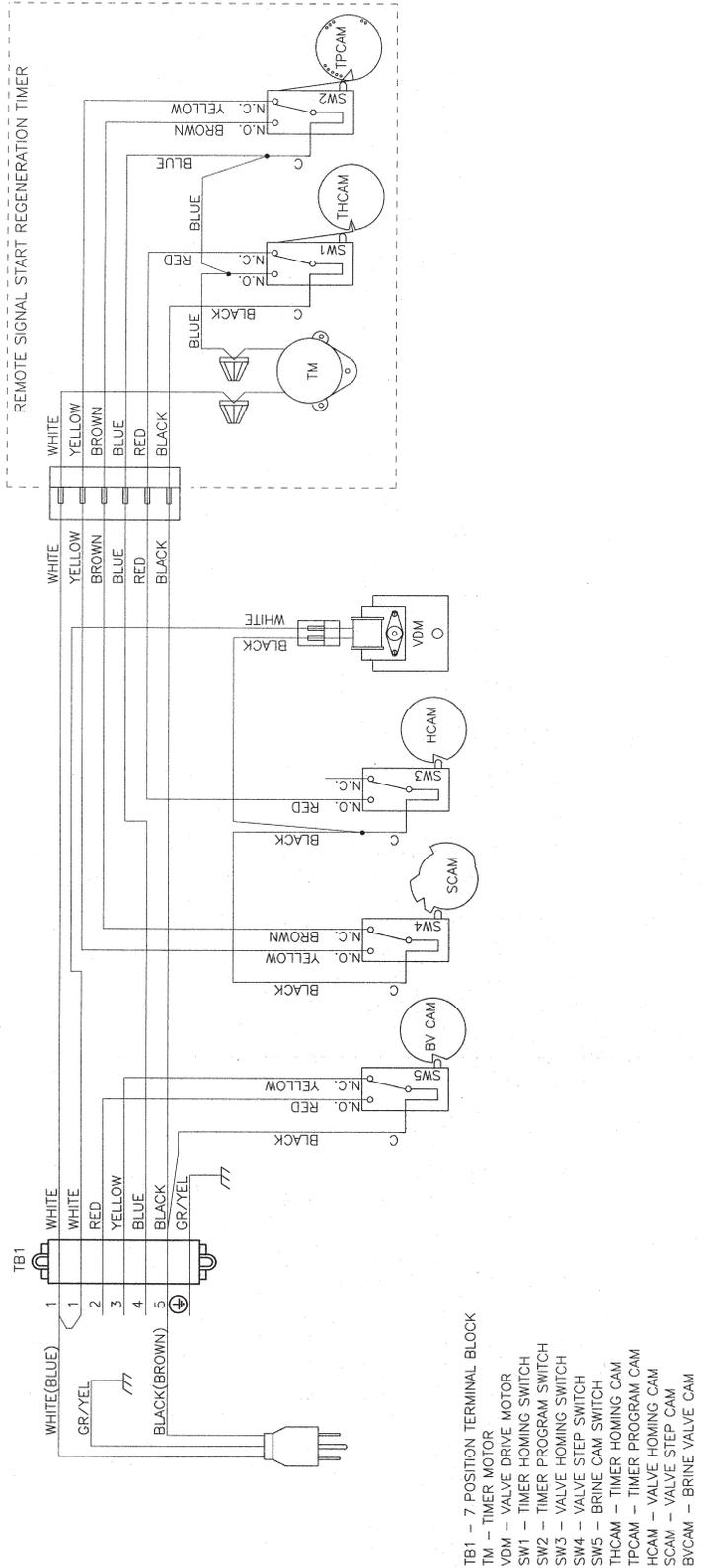
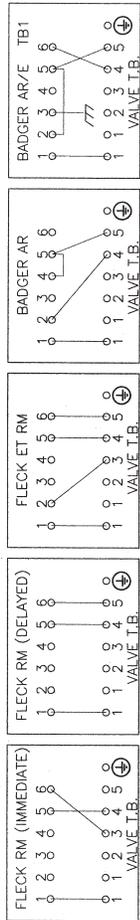
System #4 Immediate/Delayed Regeneration Valve Wiring



18669_REV C

System #4 Remote Signal Start Valve Wiring

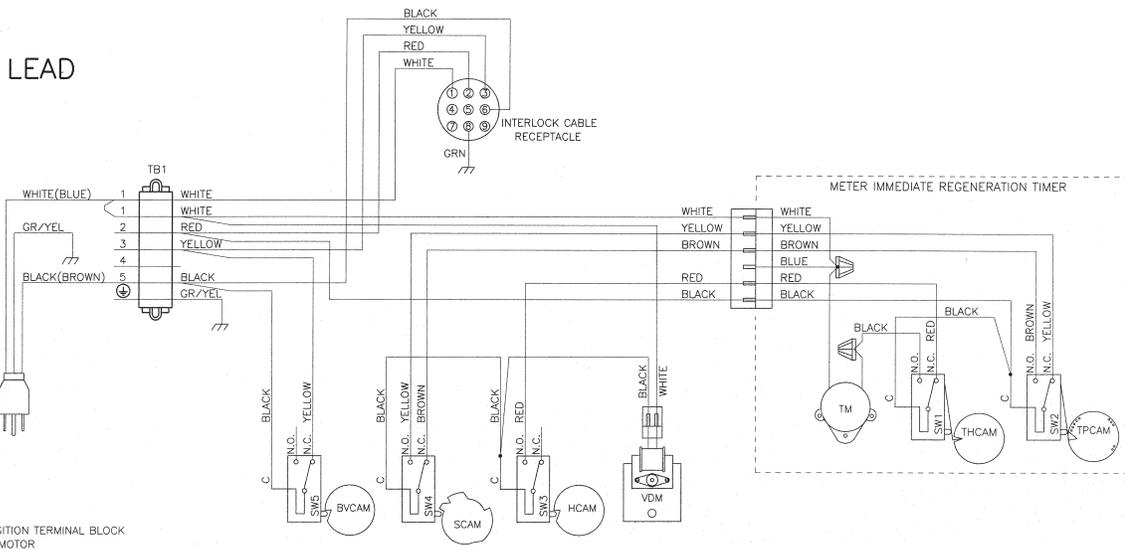
REMOTE METER WIRING



- NOTE:
1. SINGLE TANK REMOTE METER INITIATED DELAYED, OR IMMEDIATE REGENERATION.
 2. VALVE SHOWN IN SERVICE POSITION.

40500_REV/B

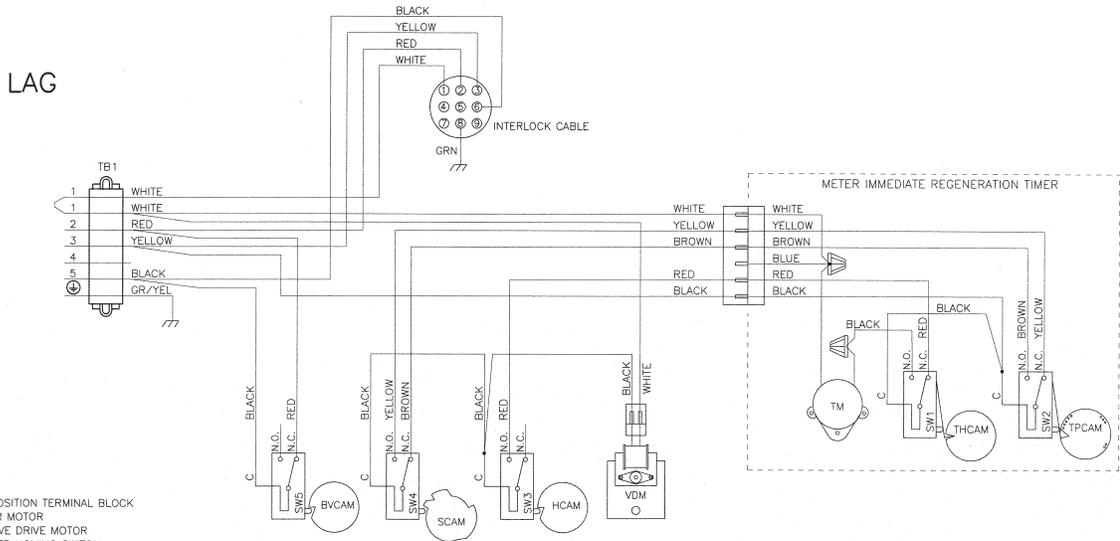
System #5 Duplex Valve Wiring



TB1 - 7 POSITION TERMINAL BLOCK
 TM - TIMER MOTOR
 VDM - VALVE DRIVE MOTOR
 SW1 - TIMER HOMING SWITCH
 SW2 - TIMER PROGRAM SWITCH
 SW3 - VALVE HOMING SWITCH
 SW4 - VALVE STEP SWITCH
 SW5 - BRINE CAM SWITCH
 THCAM - TIMER HOMING CAM
 TPCAM - TIMER PROGRAM CAM
 HCAM - VALVE HOMING CAM
 SCAM - VALVE STEP CAM
 BVCAM - BRINE VALVE CAM

NOTE:
 1. TWO TANK INTERLOCKED, INDIVIDUAL METER, IMMEDIATE REGENERATION.
 2. BOTH TANKS NORMALLY IN SERVICE.
 3. ONLY ONE TANK IN REGENERATION THE OTHER REMAINS IN SERVICE.
 4. VALVE SHOWN IN SERVICE.

18690-01_REVD



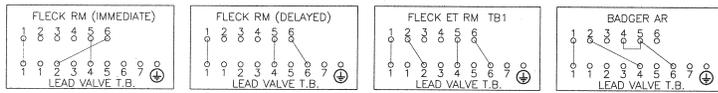
TB1 - 7 POSITION TERMINAL BLOCK
 TM - TIMER MOTOR
 VDM - VALVE DRIVE MOTOR
 SW1 - TIMER HOMING SWITCH
 SW2 - TIMER PROGRAM SWITCH
 SW3 - VALVE HOMING SWITCH
 SW4 - VALVE STEP SWITCH
 SW5 - BRINE CAM SWITCH
 THCAM - TIMER HOMING CAM
 TPCAM - TIMER PROGRAM CAM
 HCAM - VALVE HOMING CAM
 SCAM - VALVE STEP CAM
 BVCAM - BRINE VALVE CAM

NOTE:
 1. TWO TANK INTERLOCKED, INDIVIDUAL METER, IMMEDIATE REGENERATION.
 2. BOTH TANKS NORMALLY IN SERVICE.
 3. ONLY ONE TANK IN REGENERATION THE OTHER REMAINS IN SERVICE.
 4. VALVE SHOWN IN SERVICE.

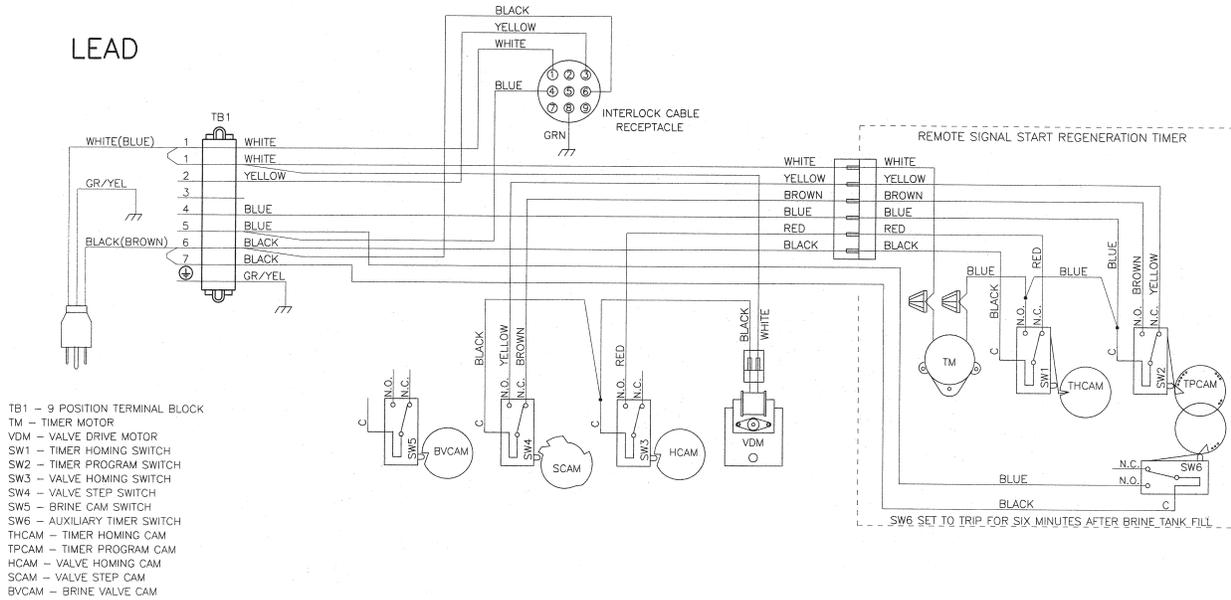
18690-02_REVD

System #6 Duplex Valve Wiring

REMOTE METER WIRING

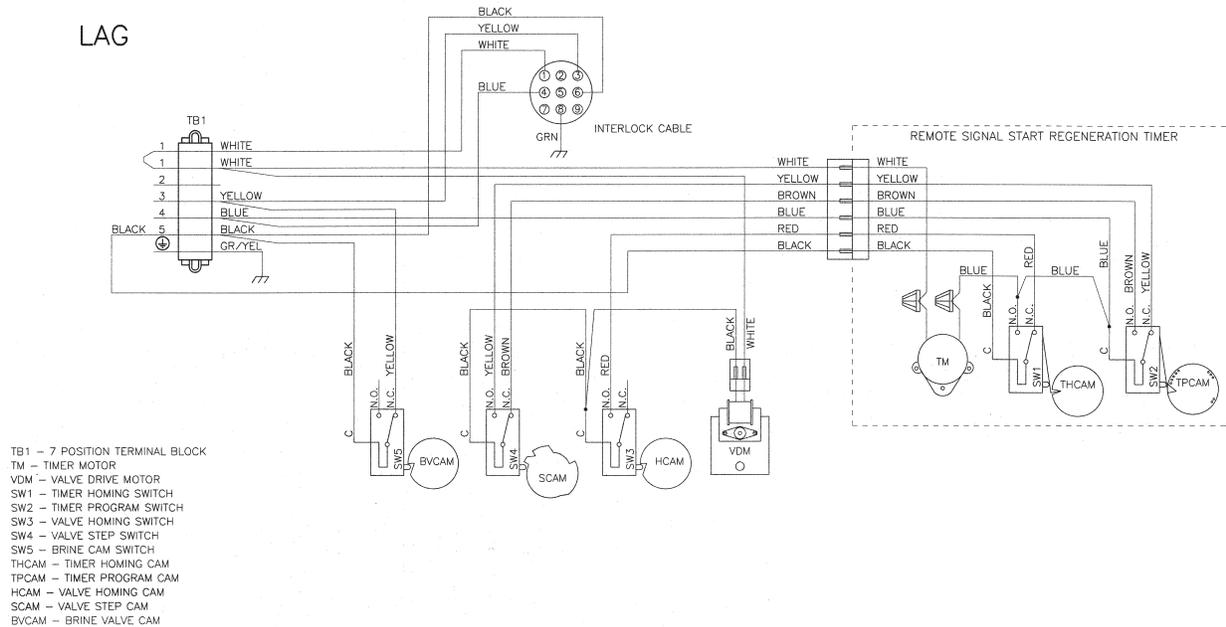


LEAD



18671-01_REV D

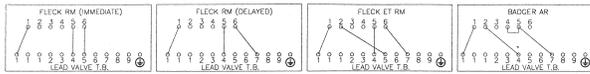
LAG



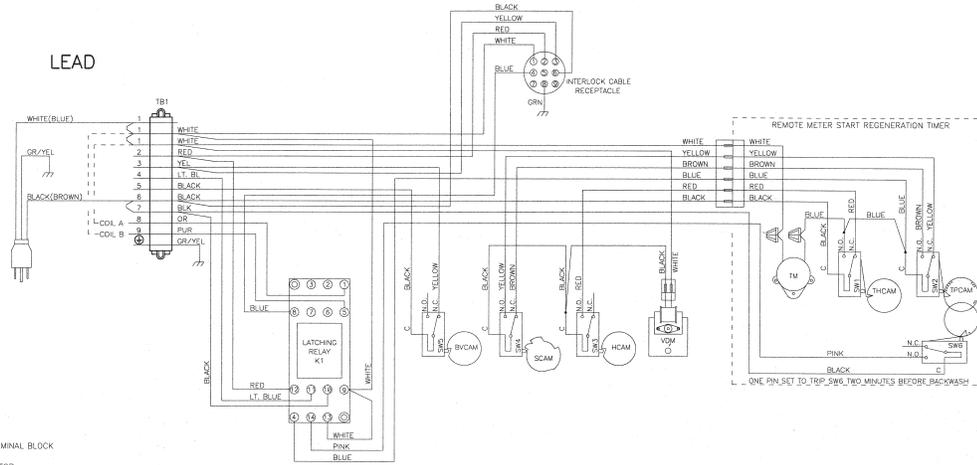
18671-02_REV D

System #7 Duplex 24V / 120V 3-Way Valve Wiring

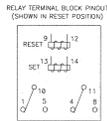
REMOTE METER WIRING



LEAD



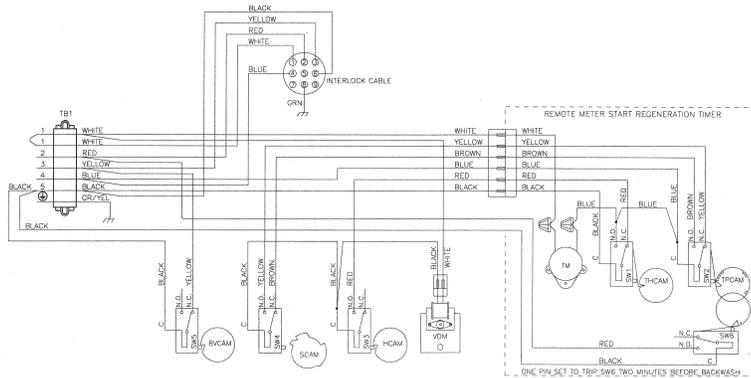
- TB1 - 12 POSITION TERMINAL BLOCK
- TM - TIMER MOTOR
- VDM - VALVE DRIVE MOTOR
- K1 - DUAL COIL LATCHING RELAY
 - 24V P/N 17815
 - 120V P/N 15887
- SW1 - TIMER HOMING SWITCH
- SW2 - TIMER PROGRAM SWITCH
- SW3 - VALVE HOMING SWITCH
- SW4 - VALVE STEP SWITCH
- SW5 - BRINE CAM SWITCH
- SW6 - TIMER AUXILIARY SWITCH
- THCAM - TIMER HOMING CAM
- TPCAM - TIMER PROGRAM CAM
- HCAM - VALVE HOMING CAM
- SCAM - VALVE STEP CAM
- BVCAM - BRINE VALVE CAM



- NOTE:
1. TWO TANK SINGLE REMOTE METER ALTERNATING REGENERATION. ONLY ONE TANK IN SERVICE THE OTHER IN REGENERATION OR STANDBY.
 2. SYSTEM WIRED FOR 3-WAY SOLENOID OUTPUT.
 - COIL A CLOSSES THE DIAPHRAGM VALVES OF LEAD UNIT.
 - COIL B CLOSSES THE DIAPHRAGM VALVES OF LEAD UNIT.
 3. VALVE SHOWN IN SERVICE POSITION.

40503-01_REV B

LAG



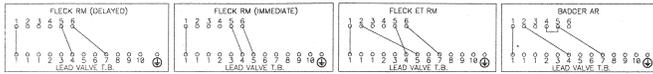
- TB1 - 7 POSITION TERMINAL BLOCK
- TM - TIMER MOTOR
- VDM - VALVE DRIVE MOTOR
- SW1 - TIMER HOMING SWITCH
- SW2 - TIMER PROGRAM SWITCH
- SW3 - VALVE HOMING SWITCH
- SW4 - VALVE STEP SWITCH
- SW5 - BRINE CAM SWITCH
- SW6 - TIMER AUXILIARY SWITCH
- THCAM - TIMER HOMING CAM
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- SCAM - VALVE STEP CAM
- BVCAM - BRINE VALVE CAM

- NOTE:
1. TWO TANK SINGLE REMOTE METER ALTERNATING REGENERATION. ONLY ONE TANK IN SERVICE THE OTHER IN REGENERATION OR STANDBY.
 2. SYSTEM WIRED FOR 3-WAY SOLENOID OUTPUT.
 - COIL A CLOSSES THE DIAPHRAGM VALVES OF LEAD UNIT.
 - COIL B CLOSSES THE DIAPHRAGM VALVES OF LEAD UNIT.
 3. VALVE SHOWN IN SERVICE POSITION.

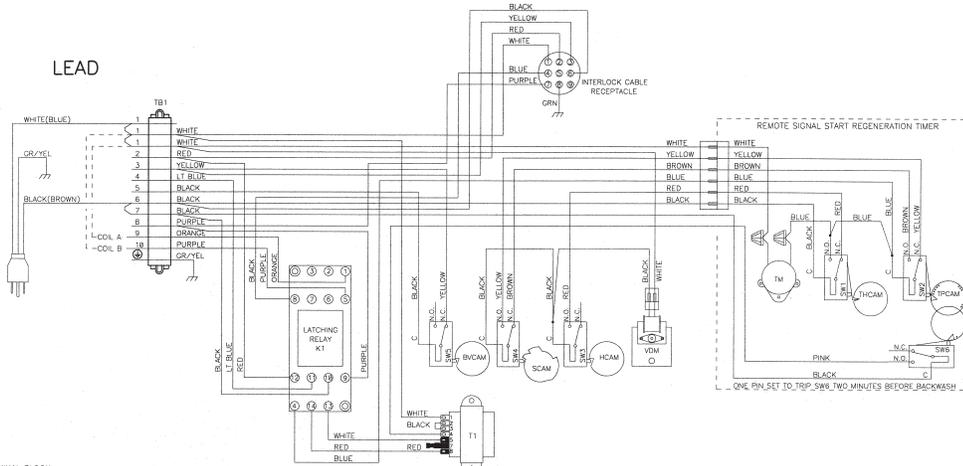
40503-02_REV B

System #7 Duplex 230V 3-Way Valve Wiring

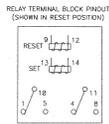
REMOTE METER WIRING



LEAD



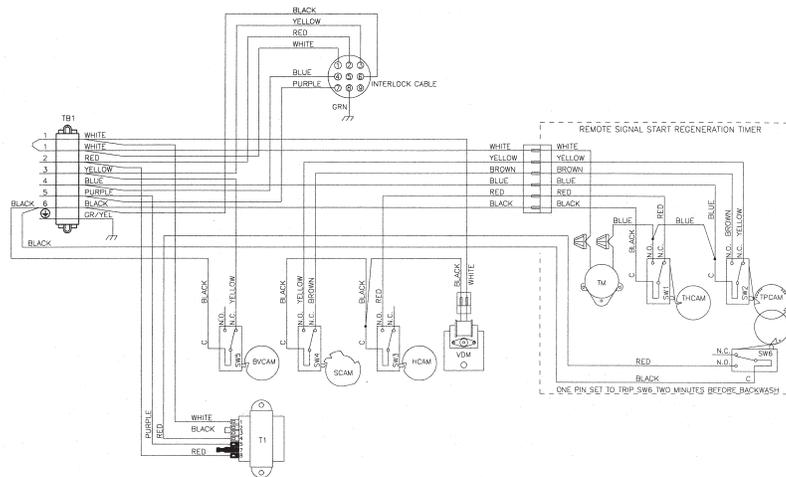
- TB1 - 13 POSITION TERMINAL BLOCK
 TM - TIMER MOTOR
 VDM - VALVE DRIVE MOTOR
 T1 - 230V/120V DUAL COIL LATCHING RELAY P/N 16887
 T1 - 230V/120V TRANSFORMER P/N 40112
 SW1 - TIMER HOMING SWITCH
 SW2 - TIMER PROGRAM SWITCH
 SW3 - VALVE HOMING SWITCH
 SW4 - VALVE STEP SWITCH
 SW5 - BRINE CAM SWITCH
 SW6 - TIMER AUXILIARY SWITCH
 THCAM - TIMER HOMING CAM
 TPCAM - TIMER PROGRAM CAM
 HCAM - VALVE HOMING CAM
 SCAM - VALVE STEP CAM
 BVCAM - BRINE VALVE CAM



- NOTE:
 1. TWO TANK SINGLE REMOTE METER ALTERNATING REGENERATION.
 ONLY ONE TANK IN SERVICE THE OTHER IN REGENERATION OR STANDBY.
 2. SYSTEM WIRED FOR 3-WAY SOLENOID OUTPUT.
 COIL A CLOSES THE DIAPHRAGM VALVES OF LEAD UNIT.
 COIL B CLOSES THE DIAPHRAGM VALVES OF LEAD UNIT.
 3. VALVE SHOWN IN SERVICE POSITION.

40504-01_REVB

LAG



- TB1 - 8 POSITION TERMINAL BLOCK
 TM - TIMER MOTOR
 T1 - 230V/120V TRANSFORMER P/N 40112
 VDM - VALVE DRIVE MOTOR
 SW1 - TIMER HOMING SWITCH
 SW2 - TIMER PROGRAM SWITCH
 SW3 - VALVE HOMING SWITCH
 SW4 - VALVE STEP SWITCH
 SW5 - BRINE CAM SWITCH
 SW6 - TIMER AUXILIARY SWITCH
 THCAM - TIMER HOMING CAM
 TPCAM - TIMER PROGRAM CAM
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 SCAM - VALVE STEP CAM
 BVCAM - BRINE VALVE CAM

- NOTE:
 1. TWO TANK SINGLE REMOTE METER ALTERNATING REGENERATION.
 ONLY ONE TANK IN SERVICE THE OTHER IN REGENERATION OR STANDBY.
 2. SYSTEM WIRED FOR 3-WAY SOLENOID OUTPUT.
 COIL A CLOSES THE DIAPHRAGM VALVES OF LEAD UNIT.
 COIL B CLOSES THE DIAPHRAGM VALVES OF LEAD UNIT.
 3. VALVE SHOWN IN SERVICE POSITION.

40504-02_REVB

Service Assemblies

60036-02 Brine Valve, 1800, Design 3

- 1..... 11772.....Spring, 3150 Brine Valve
- 1..... 11774.....Ring, Retaining
- 1..... 18713Brine Valve Body, 1800
- 1..... 16497-01Stem Assy, 1800 Brine Valve
New Style
- 1..... 16498-01Stem Guide Assy, Brine

60277-xx1800 Injector Assembly

- 4..... 12473Screw, Hex Wsh, 10-24 x 5/8
- 1..... 15127Injector Throat Assy
- 1..... 15128-xxInjector Nozzle - Specify Size
- 2..... 15246O-ring, -116
- 1..... 16340Body, Injector, 1800, D/F
- 1..... 16341-01Cap, Injector, 1800

60106-00Piston Assy, 3900/3150 Std

- 1..... 14818Ring, Piston Rod, Snap
- 1..... 14922O-ring, -035, Piston
- 1..... 16130Piston, High Backwash
- 1..... 15125Rod, Piston, 3150
- 1..... 16398-01End Plug Assy, 3150, White

60113-01Piston Assy, 3150, NHWBP, D-Flow Conversion/Replacement

- 1..... 16398-01End Plug Assy, 3150, White
- 1..... 19611-01Piston Assy, 3150, NHWBP, O-ring
- 1..... 19708Rod, Piston, 3150 NHWBP
- 1..... 14818Ring, Piston Rod, Snap

60131Seal & Spacer Kit 2930/3130/3150

- 2..... 10368Spacer, Narrow, 3150/3900
- 5..... 10369Spacer, 2", 2900/3150
- 8..... 11720.....Seal, Piston, 2900/3150

60057-01Drive Assy, 3150, 120V, B/Fill 3900 Upper Sys #5 or Sys # 7

- 4..... 10302Insulator, Limit Switch
- 3..... 10872Screw, Hex Wsh, 8-32 x 17/64
- 1..... 11080.....Screw, Flt Hd Mach, 8-32 x 3/8
- 3..... 10218Switch, Micro
- 2..... 12660Nut, Hex, 10-24 SS
- 2..... 17567Screw, Hex Wsh Hd, 8 x 1/2
- 1..... 15120Bracket, Motor Mtg, 3150/3900
- 1..... 40392Motor, Drive, 115V, 50/60 Hz SP1
- 1..... 16052Bushing, 3150/3900
- 1..... 17797Bracket, Switch Mounting 3150/3900
- 2..... 12624Screw, Phil Pan, 40 x 1 1/2

60150-3150 ...SVO Assy, 3150

60393Meter Assy, 2900, 2" Std

60394Meter Assy, 2900, 2" Ext

Side Mount Adapter

- 61414.....Adapter, Assy, Sdmnt, 3130/3150
Rotating
- 61414NP.....Adapter Assy, Sdmnt, 3130/3150
Nickel Plated Rotating
- 61414-20Adapter Assy, Sdmnt
- 61414-20NPAdapter Assy, Sdmnt

