

INSTALLATION AND OPERATING INSTRUCTIONS  
AND PARTS LIST

# COMMERCIAL WATER FILTERS

1. **WATER PRESSURE**—25 P.S.I. MINIMUM IS REQUIRED. IF PRESSURE IS OVER 100 P.S.I., A PRESSURE REDUCING VALVE SHOULD BE INSTALLED.
2. **DRAIN**—THE UNIT SHOULD BE LOCATED CLOSE TO A DRAIN. THE DRAIN MUST BE CAPABLE OF DISPOSING OF WATER AT THE UNIT BACKWASH RATE UP TO 20 MINUTES.
3. **SPACE REQUIREMENTS**—MAKE SURE ADEQUATE FLOOR SPACE AND HEAD-ROOM IS AVAILABLE. SPACE REQUIREMENTS ARE LISTED ON THE SPECIFICATION SHEET.
4. **ELECTRICAL REQUIREMENTS**—120 VOLT, 60 HZ, 3 AMPS. EXPORT MODEL 240V, 50 HZ, 1.5 AMPS.
5. **MAINTAIN ADEQUATE TEMPERATURE TO PREVENT FREEZING.**

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WATER CONDITIONING

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# BACKWASH FILTER INSTRUCTION MANUAL

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# I WATER TREATMENT MATERIALS

## **FILTER AG (TURBIDITY FILTER)**

This filter material is used for the removal of suspended matter from a water supply. It is a relatively lightweight substance and removes normal suspended solids down to the 20-40 micron range.

The only requirement in its care is periodic backwashing. Backwash at least every third day, or when the pressure drops across the filter has increased 5 P.S.I.

## **ACTIVATED CARBON (TASTE & ODOR FILTER)**

This filter material is used for the removal of chlorine, organic tastes and odors, and other organic matter. It also removes some turbidity. Activated carbon must be replaced when it loses its capacity to remove tastes and odors.

### **CAUTION:**

Because new activated carbon is dry and light weight, it can be backwashed out of the unit accidentally very easily.

Sometimes it is best to soak the carbon for 24 hours before it is backwashed.

If the unit is backwashed to remove dust before the carbon is fully saturated, throttle the inlet valve so that carbon is not lost at the drain.

### **WARNING:**

A chlorine residual is maintained in some water supplies to insure that harmful bacteria have been killed. Activated carbon filters remove chlorine. Dechlorinated water is susceptible to bacteria and algae contamination.

## **FINE FILTER SAND**

This material is used for the removal of the heavier types of sediment from water.

The only requirement in its care is periodic backwashing. Backwash when the pressure drops across the filter has increased by 5 pounds.

## **MULTI-MEDIA**

This multi-layer material is used for the removal of heavy sediment and suspended matter. These units are application when high flow rates are required.

## II INITIAL INSTRUCTIONS: ALL MODELS

1. Check to make sure you have all of the pieces that were shipped:
  - A. Filter tank assembly
  - B. Control valve assembly
  - C. Filter media (see specifications for quantity)
  - D. Gravel (see specifications for quantity)
  - E. Accessory items (if any)
2. Remove filter tank assembly from shipping box or skid.
3. Remove any handhole or manhole covers and inspect interior of tank for debris. Interior should be reasonably clean.
4. Position the tank where it is to be installed.
5. **A. Fiberglass Filter Tanks**  
These units must be loaded with gravel and filter media before being wired or plumbed in. Refer to Page 5.
- B. Steel Filter Tanks**
  - 1½" pipe size models  
By installing the control valve, these models can be plumbed and wired before loading with gravel and filter media, if so desired. Refer to Page 7.
  - 2" pipe size models  
Loading with gravel and filter media can be accomplished at any time before start-up. The control valve does not have to be installed for plumbing. The control valve does have to be installed for wiring. Refer to Page 7.

## MULTI-MEDIA FILTER GENERAL SPECIFICATIONS

Model	Tank Size	Bed Area	Pipes Size	UNDERBED Lbs.	FILTER MEDIA			
					#1 Ft3	#2 Ft3	#3 Ft3	#4 Ft3
FRF 70-MM	13 x 54	0.92	1 1/2	30	1.25	0.75	0.4	0.25
FRF 120-MM	16 x 65	1.4	1 1/2	55	2.0	1.5	7.5	0.4
FRF 150-MM	21 x 62	2.4	1 1/2	140	3.0	2.0	1.0	0.5
FHF 240-MM	24 x 54	3.14	2	150	4.5	3.0	1.5	1.0
FHF 300-MM	30 x 60	4.9	2	250	7.0	5.0	2.5	1.5
FHF 600-MM	36 x 60	7.1	2	300	10.0	7.0	4.0	2.0
FHF 900-MM	42 x 72	9.6	2	500	14.0	9.5	4.5	2.5

## FLOW SPECIFICATIONS

Model	15 GPM/Ft <sup>2</sup>	PSI Loss	Backwash Rate GPM	Width	Depth	Height	Shipping Wt. lbs.
FRF 70-MM	13.8	7	15	18	13	61	335
FRF 120-MM	21.0	8	20	18	15	72	570
FRF 150-MM	36.0	9	35	22	21	69	900
FHF 240-MM	47.1	10	50	24	35	71	1485
FHF 300-MM	73.5	10	75	30	44	81	2285
FHF 600-MM	106.5	10	100	36	50	83	3200
FHF 900-MM	144.0	10	140	42	57	99	4250

\* All dimensions in inches unless otherwise noted.

\* Due to continuous product improvement, specifications subject to change without notice.

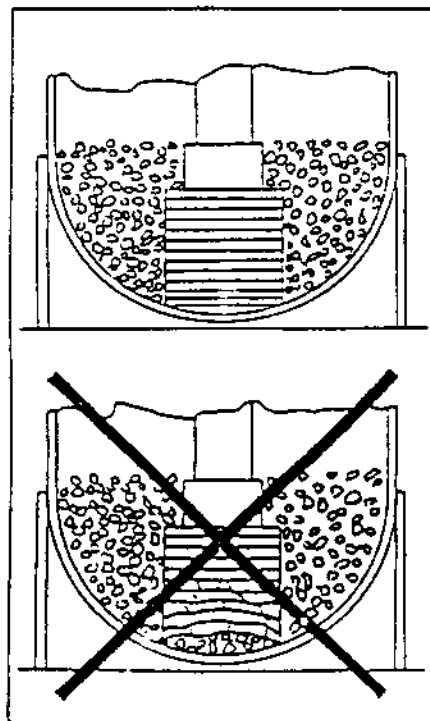
## MULTI-MEDIA FILTER:

### LOADING FIBERGLASS FILTER TANKS

1. Remove the manifold assembly from the tank and remove the protective wrapping from the strainer.
2. Put the manifold assembly back in the tank and put the plastic cap (provided) over the top of the manifold assembly.
3. Fill the tank approximately 1/3 full of water.
4. The following is the proper loading sequence starting with the bottom layer.
  - a) Using the funnel (packed in the gravel carton), pour in the bottom layer of gravel and shake the tank to level.

**CAUTION:** Do not raise the manifold assembly. If gravel is allowed to get under the strainer, the strainer will crush when the tank adaptor is installed.

- b) Pour in the second (8/12 garnet), third (30/40 garnet), and fourth (filter sand) layers of media leveling each layer before the next is loaded.
  - c) Load the top layer of anthracite and fill the tank with water.
  - d) Allow the unit to stand 8-12 hours before backwashing or placing the unit in service. This is to allow the anthracite to absorb water and to prevent it from being washed to drain during the initial backwash.
5. Remove all filter media from the top of the tank, threads, and the plastic cap.
6. Remove the plastic cap. Do not raise manifold assembly



**\*\*7.** Refer to page 6 for instructions to install the manifold assembly and tank adaptor.

GENERAL SPECIFICATIONS								
MODEL	70	120	150	240	300	300	600	900
Tank Type	F.G.*	F.G.*	F.G.*	Steel	Steel	Steel	Steel	Steel
Pipe Size	1½"	1½"	1½"	1½"	1½"	2"	2"	2"
Tank Diameter	13"	16"	21"	24"	30"	30"	36"	42"
Side Sheet	54"	65"	62"	54"	60"	60"	60"	72"
Bed Area Ft. <sup>2</sup>	.92	1.40	2.40	3.14	4.91	4.91	7.07	9.64
Ft <sup>3</sup> Media	2	4	5	8	10	10	20	30
Ft <sup>3</sup> Gravel	.30	.55	2.00	2.50	3.00	3.00	6.50	10.00
Width	18	18	22	24	30	30	36	42
Depth	13	16	21	35	41	44	50	57
Height	61	72	69	71	81	81	83	99

\* F.G. - Fiberglass

FLOW SPECIFICATIONS						
MODEL	FLOW RATES (GPM)			PSI LOSS	BACKWASH RATE-GPM	SHIPPING WT.
	3 GPM/FT. <sup>2</sup>	4 GPM/FT. <sup>2</sup>	5 GPM/FT. <sup>2</sup>			

#### FILTER AG FILTER

70-T	2.8	3.7	4.6	0.8	8	150
120-T	4.2	5.6	7.0	1.2	12	250
150-T	7.2	9.6	12.1	2.3	20	450
240-T	9.4	12.6	15.7	2.7	25	790
300-T	14.7	19.6	24.5	0.8	40	1,100
600-T	21.2	28.3	35.4	1.8	60	1,875
900-T	28.9	38.5	48.1	2.5	90	2,725

#### CARBON FILTER

70-C	2.8	3.7	4.6	0.7	8	155
120-C	4.2	5.6	7.0	1.2	12	255
150-C	7.2	9.6	12.1	2.3	20	460
240-C	9.4	12.6	15.7	2.7	25	800
300-C	14.7	19.6	24.5	1.0	40	1,110
600-C	21.2	28.3	35.4	1.8	60	1,930
900-C	28.8	38.5	48.1	2.7	90	2,820

#### FINE SAND FILTER

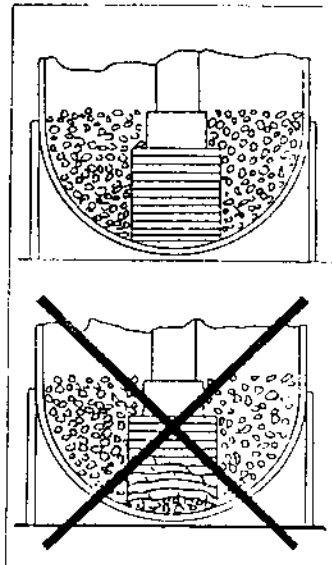
70-S	2.8	3.7	4.6	6.3	10	300
120-S	4.2	5.6	7.0	7.3	15	550
150-S	7.2	9.6	12.1	7.0	30	830
240-S	9.4	12.6	15.7	8.5	35	1,390
300-S	14.7	19.6	24.5	8.1	60	1,850
600-S	21.2	28.3	35.4	8.4	90	3,375
900-S	28.9	38.5	48.1	10.2	115	4,975

## III LOADING FIBERGLASS FILTER TANKS

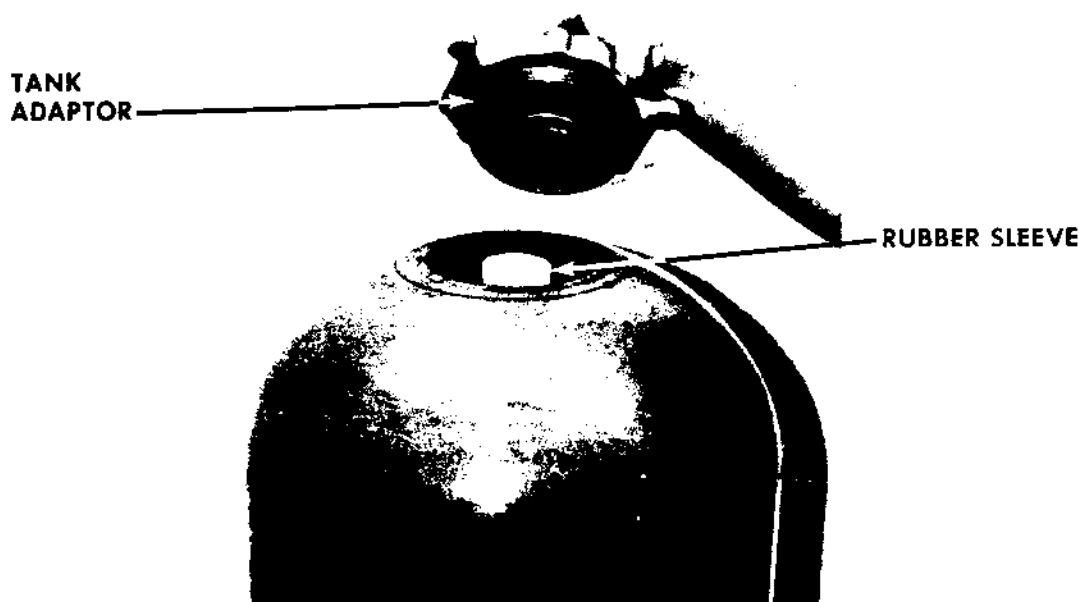
1. Remove the manifold assembly from the tank and remove the protective wrapping from the strainer.
2. Put the manifold assembly back in the tank and put the plastic cap (provided) over the top of the manifold assembly.
3. Using the funnel (packed in the gravel carton) pour in the gravel.

**CAUTION:** Do not raise the manifold assembly. If gravel is allowed to get under the strainer, the strainer will crush when the tank adapter is installed.

4. Pour in the filter media.
5. If the filter will be stored up within a few days, fill the tank with water at this time.
6. Remove all filter media from the top of the tank, threads and the plastic cap.
7. Remove the plastic cap. Do not raise manifold assembly.



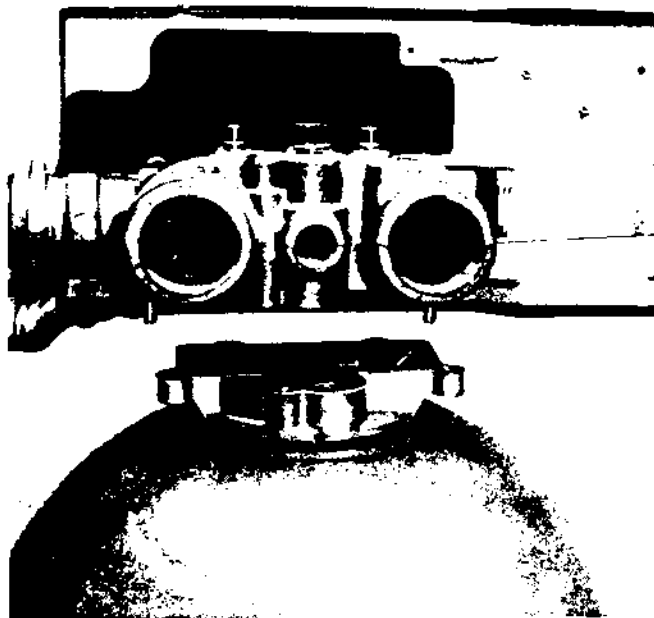
8. Apply an o-ring lubricant to the black rubber sleeve that accepts the manifold assembly, the bevel on top of the tank and the top 1" of the manifold assembly.



9. Position the tank adapter in the top opening of the tank with the manifold assembly in the rubber sleeve. Thread the tank adapter into the tank until the adapter bottoms on the tank.

## IV INSTALLING THE CONTROL VALVE ON FIBERGLASS FILTER TANKS

1. Remove the control valve from the carton.
2. Position the valve gasket on the tank adapter.
3. Put two (2) of the allen head screws through the control valve screw holes to use in lining up the gasket and holes. Start these screws into the tank adapter. Make sure the gasket is in place.
4. Install the three (3) other allen head screws and tighten evenly.
5. If an external flow control is used (above 10 gpm backwash rate) install the  $\frac{3}{4}$ " nipple,  $\frac{3}{4}$ " x 1" reducer and the 1" flow control out of the drain casting on the end of the valve.





# V LOADING STEEL FILTER TANKS

## A. FILTER AG, ACTIVATED CARBON FILTER, FINE SAND FILTER:

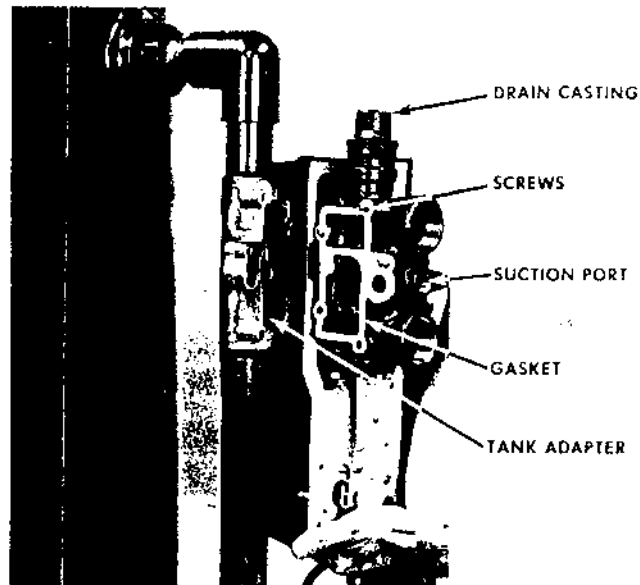
1. Remove covers from top and side openings of tank if they are not already off.
2. Slowly pour the gravel through the top opening of the tank. Be careful not to damage the distributor assembly in the bottom of the tank.
3. Level the gravel through the side opening. The distributors should be covered. To facilitate leveling, fill with water to the surface of the gravel. Level off any high spots.
4. Replace the hand hole cover. Carefully center the gasket and make sure no gravel is lodged between the gasket and the tank.
5. Pour the filter media through the top opening of the tank. Leveling is not required.
6. Set the top cover on loosely.

## B. MULTI-MEDIA FILTER:

1. Remove the top access cover and fill the tank approximately 1/4 full of water.
2. Slowly pour the 1/4 x 1/8 gravel through the top opening of the tank. Care is to be taken not to damage the distributor assembly in the bottom of the tank.
3. Drain the tank until the water level is below the side access cover of the tank and remove the cover. Level the gravel making sure the entire distribution system is covered.
4. Replace the side cover. Carefully center the gasket and make sure no gravel is lodged between the gasket and the tank. Then add each layer of media one at a time. After each layer is added, the tank should be filled with water and the unit backwashed for approximately five minutes. Procedure for backwashing is described in part ten "filter start up". The above backwashing procedure will level each media layer.
5. Load the top layers of anthracite and fill the tank with water. Allow the anthracite to soak for 8-10 hours before backwashing and being placed in service. This is to prevent the anthracite from being backwashed to drain.
6. After soaking, replace the top cover and the unit is now ready for startup.

## VI INSTALLING THE CONTROL VALVE 1½" PIPE SIZE STEEL TANK UNITS

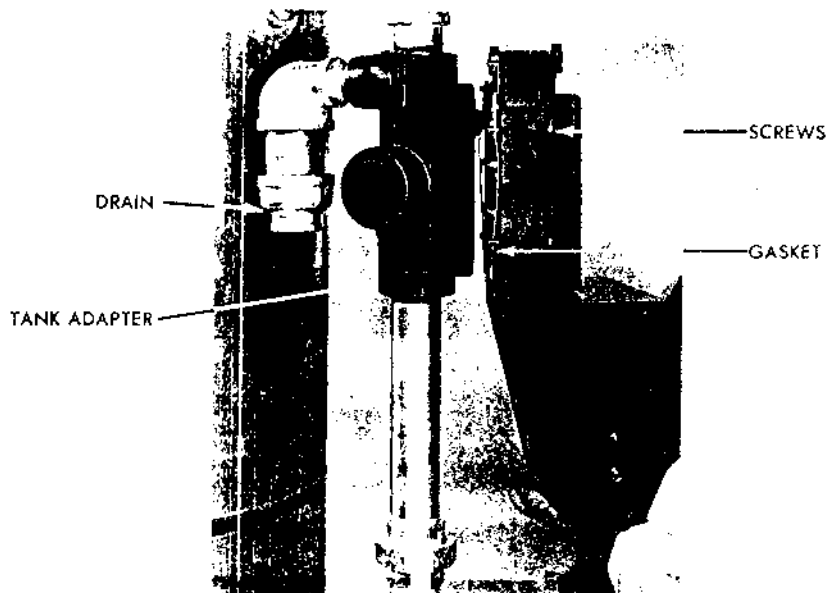
1. Remove the control valve from the carton.
2. Remove the gasket and five (5) allen head screws from the small box inside the valve carton. The shut-off valve and reducer bushing for the suction port are also in this small box.
3. Remove the protective shipping plate from the tank adapter on the face piping of the filter tank. Discard the plate and the screws holding the plate.
4. Put two (2) of the allen head screws through the control valve screw holes and hang the gasket on the screws.
5. Position the control valve on the tank adapter and start the two (2) screws. Make sure the gasket is in place.



6. Install the three (3) other allen head screws and tighten all five (5) evenly.
7. Install the external flow control fittings into the drain casting on the end of the valve. These fittings are packed either in the small box or wrapped separately.

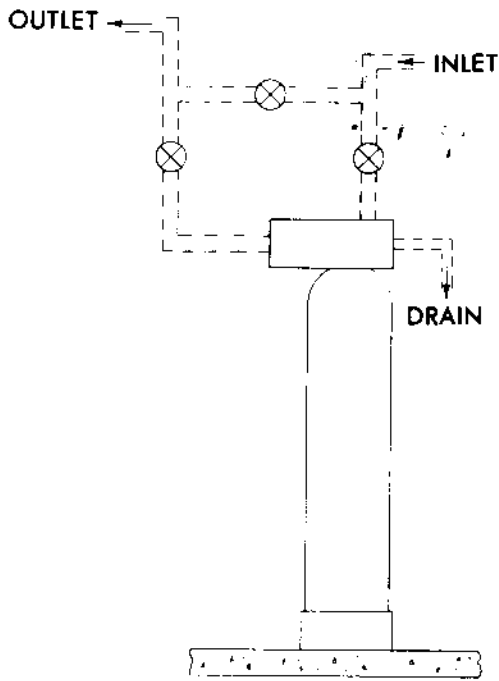
## VII INSTALLING THE CONTROL VALVE 2" PIPE SIZE STEEL TANK UNITS

1. Remove the control valve from the carton being careful not to damage the machined bottom of the valve.
2. Remove the protective shipping plate from the tank adapter on the face piping of the filter tank. Discard the plate and the screws holding the plate.
3. Place gasket on machined surface of valve using two (2) screws through valve to hold gasket in position.
4. Position the valve body on the tank adapter and start the two (2) screws.

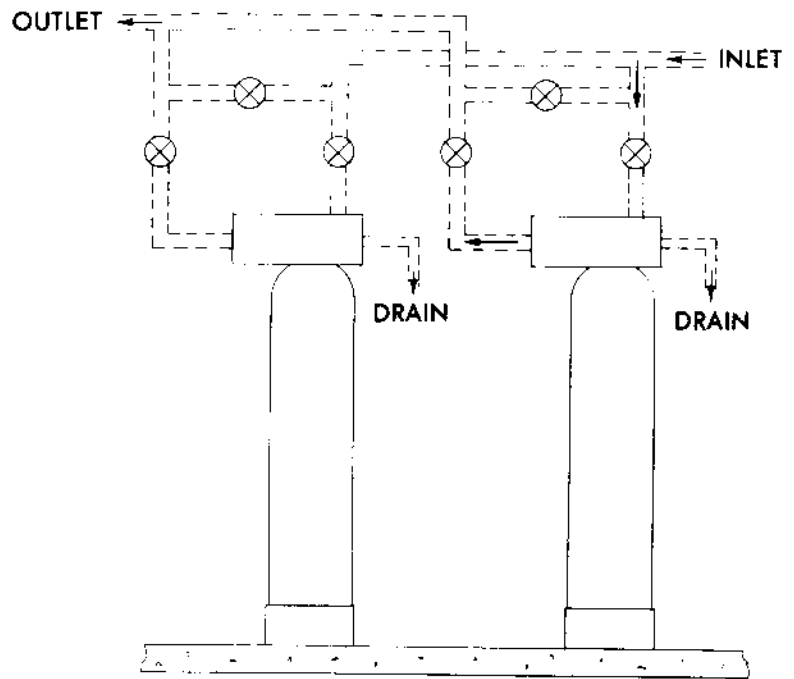


5. Install the eight (8) remaining allen head screws and tighten evenly.

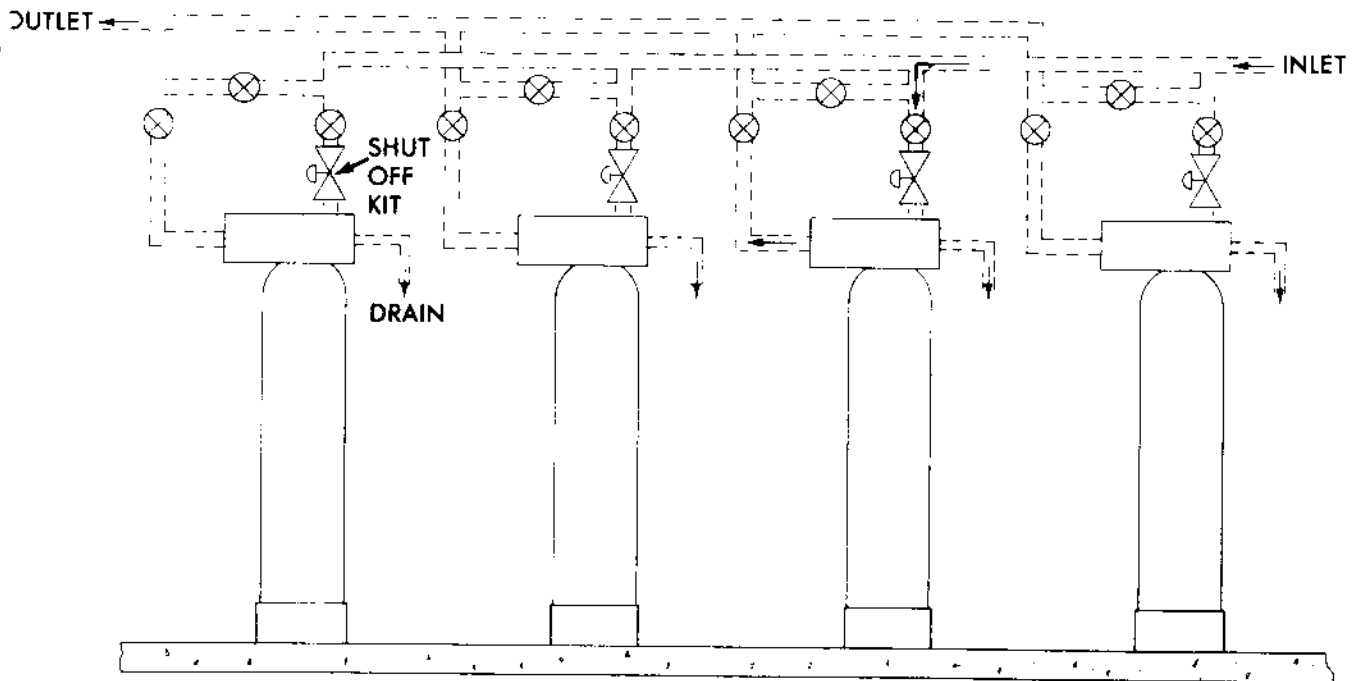
# TYPICAL PIPING DIAGRAMS FIBERGLASS TANK MODELS



**SINGLE UNIT  
FIGURE 1**



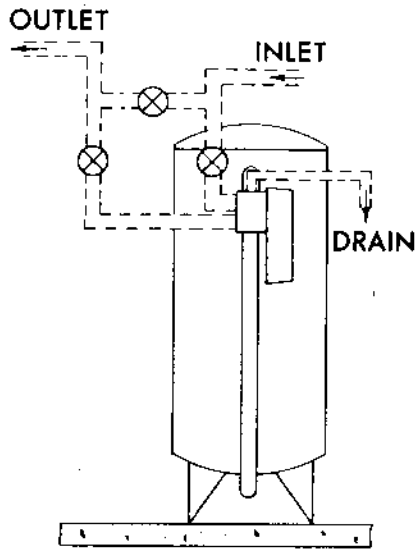
**TWIN UNITS  
FIGURE 2**



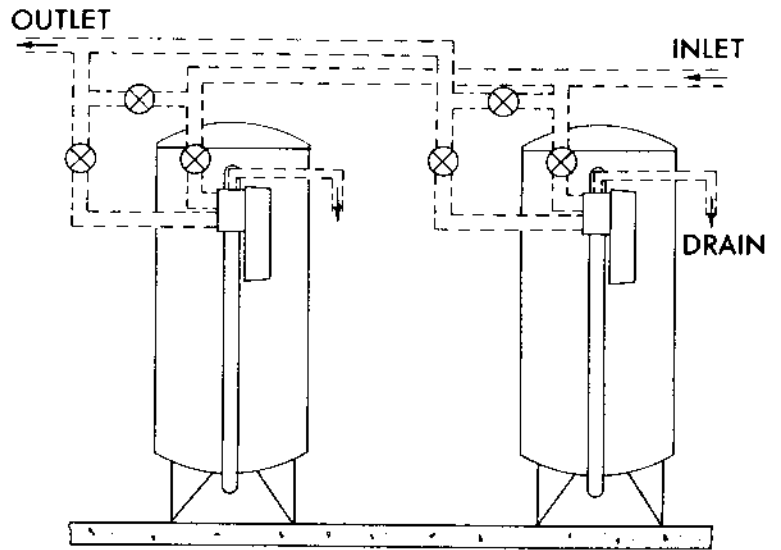
**MULTIPLE FILTER SYSTEM  
FIGURE 3**

**NOTE:** In order to insure equal water distribution, it is necessary that all units have identical plumbing arrangements between inlet manifold and valve, and between outlet manifold and valve.

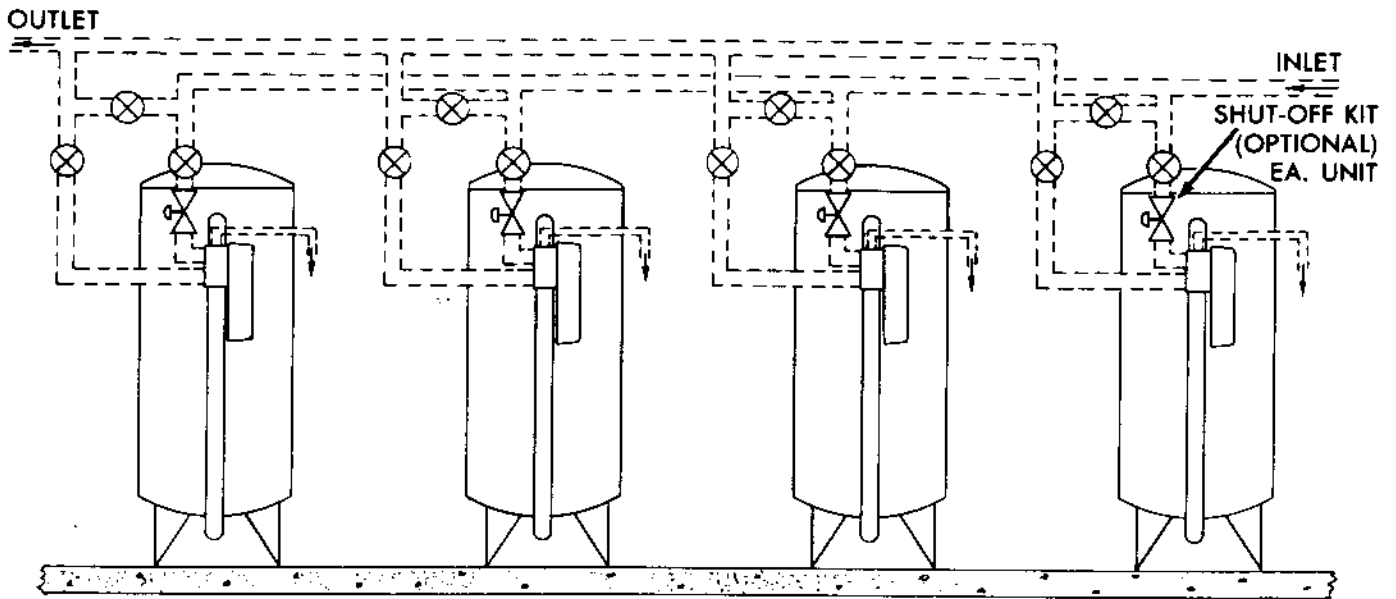
# TYPICAL PIPING ARRANGEMENTS FOR 1 1/2" PIPE SIZE STEEL TANK MODELS



**SINGLE UNIT  
FIGURE 4**

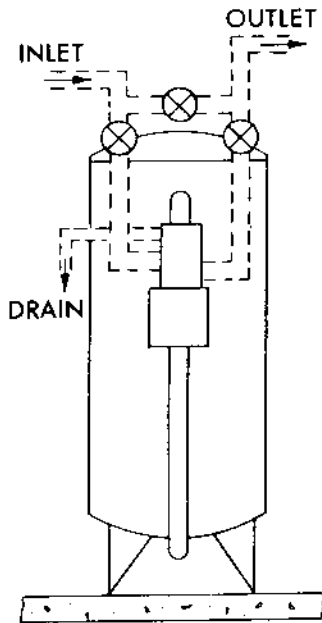


**TWIN UNITS  
FIGURE 5**

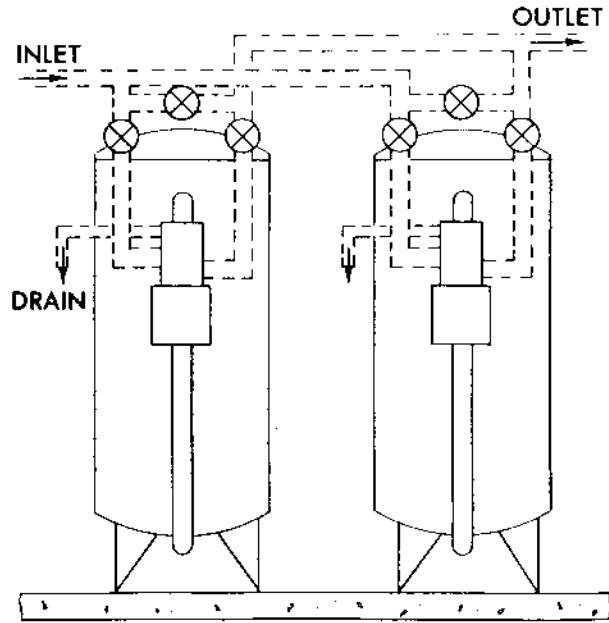


**MULTIPLE UNITS  
FIGURE 6**

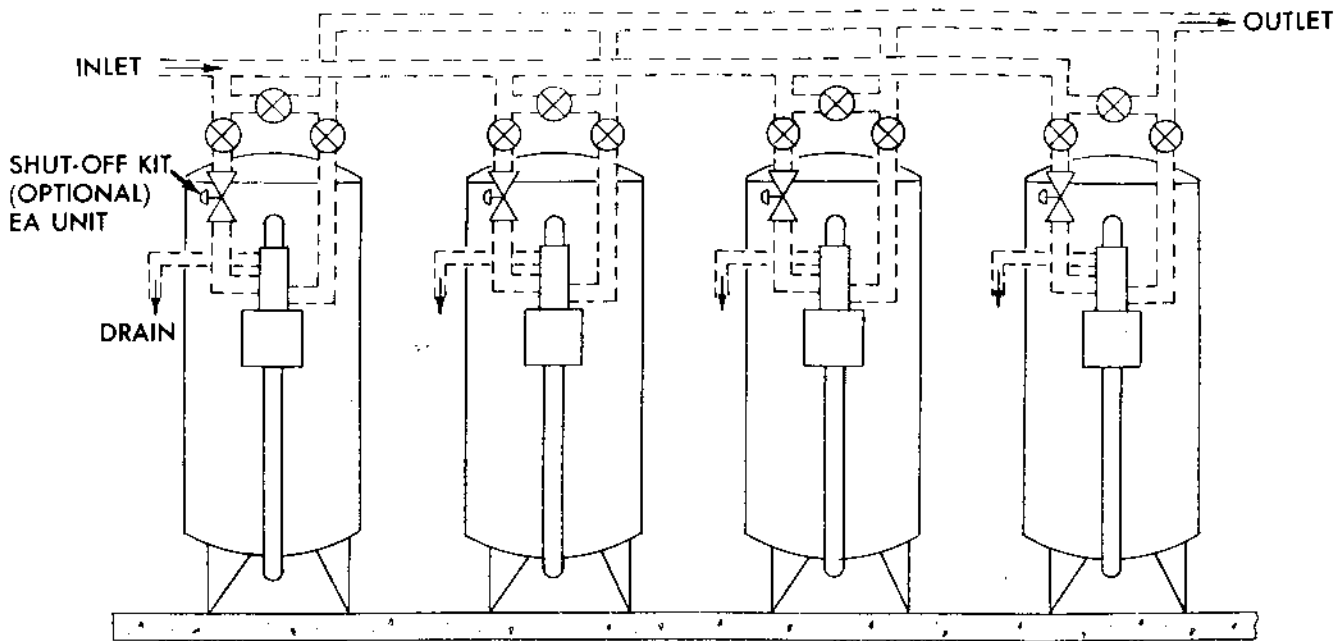
# TYPICAL PIPING DIAGRAMS 2" STEEL TANK MODELS



**SINGLE UNIT  
FIGURE 7**

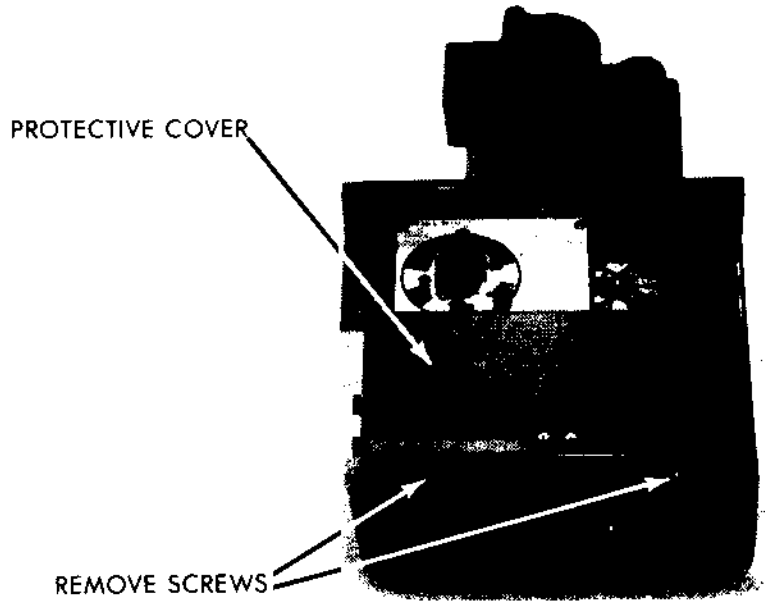


**TWIN UNITS  
FIGURE 8**

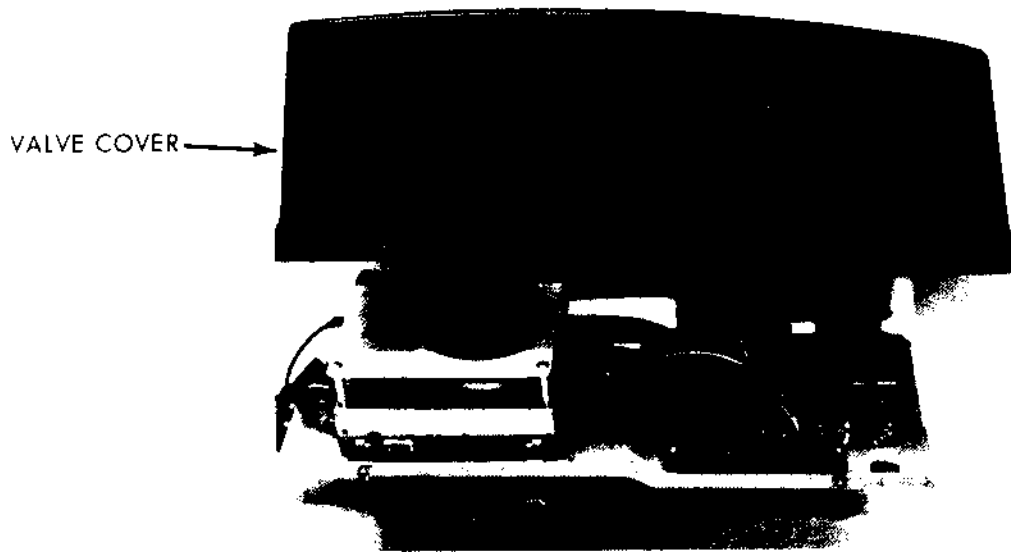


**MULTIPLE FILTER SYSTEM  
FIGURE 9**

**NOTE:** In order to insure equal water distribution, it is necessary that all units have identical plumbing arrangements between inlet manifold and valve, and between manifold and valve.



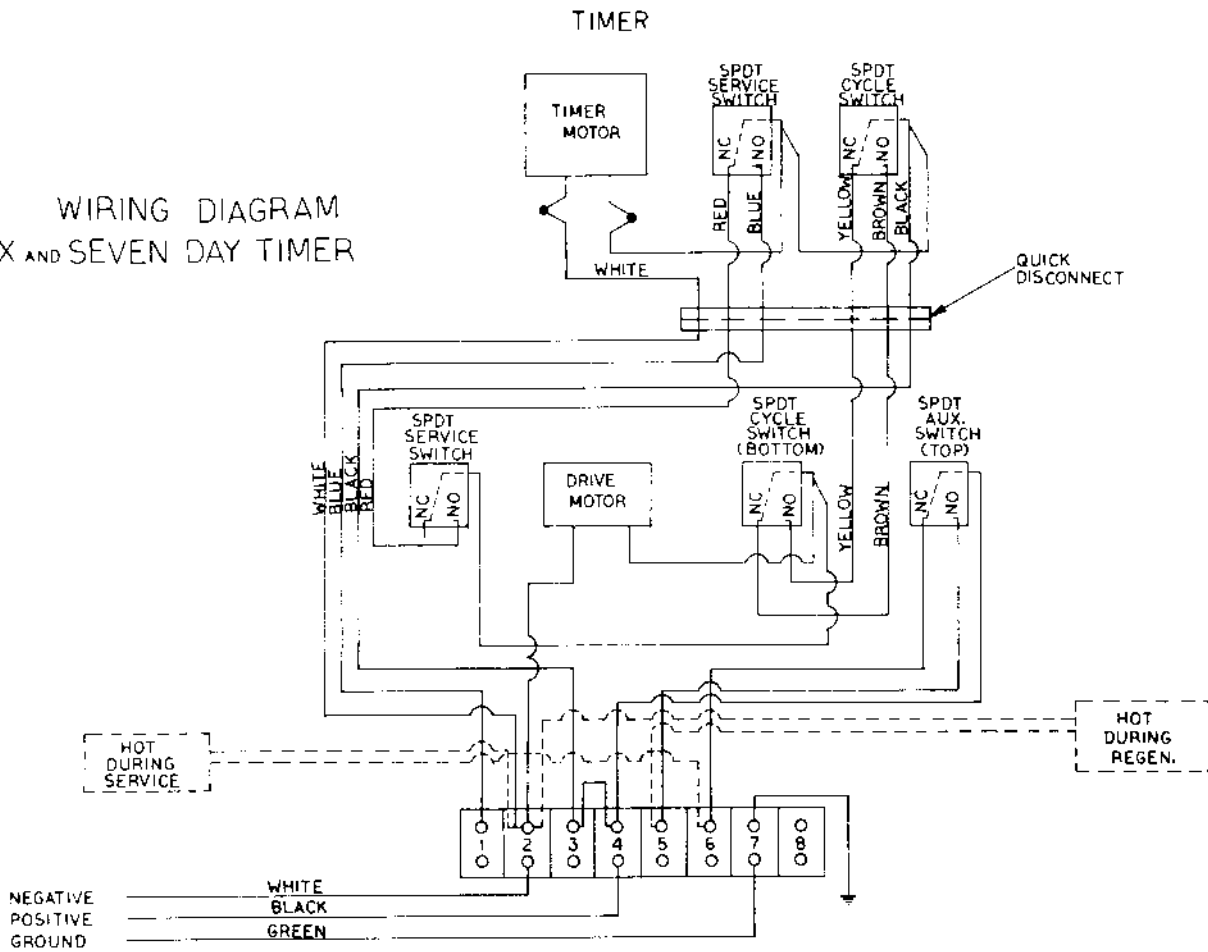
**FIGURE 10**



**FIGURE 11**

# WIRING: ALL UNITS

## WIRING DIAGRAM SIX AND SEVEN DAY TIMER



STANDARD: 120 VOLT 60 Hz. 3 A.  
OPTIONAL: 240 VOLT 50 Hz. 1.5 A.

1. Make necessary electrical connections to the power source.
  - A. 2" control valves must have the protective cover removed for access to the terminal block (Figure 10).
  - B. 1½" control valves must have the valve cover removed for access to the terminal block (Figure 11).

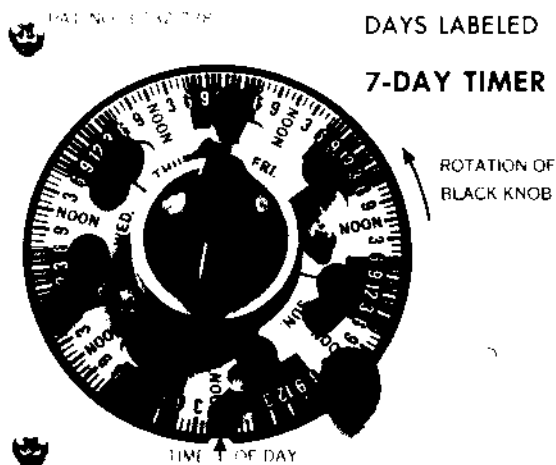


FIGURE 12

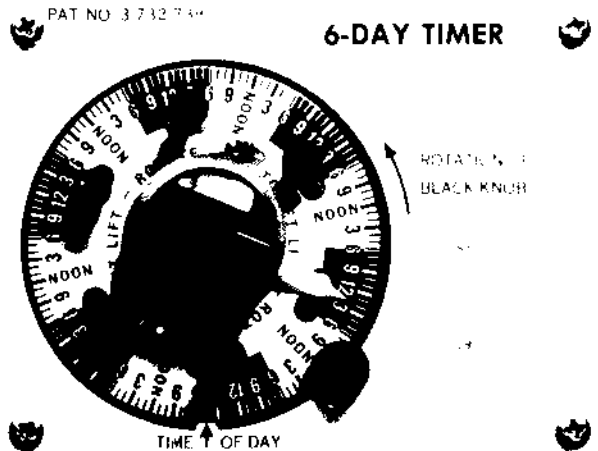


FIGURE 13

2. For servicing, a remote on/off switch is recommended.

**CAUTION: The installation must conform to all state and local electrical codes.**

# MODEL 3200 TIMER

## 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:

Press and hold the red button in to disengage the drive gear. Turn the large gear until the actual time of day is at the time of day pointer.

Release the red button to again engage the drive gear.

### How To Manually Regenerate Your Water Conditioner At Any Time:

Turn the manual regeneration knob clockwise.

This slight movement of the manual regeneration knob engages the program wheel and starts the regeneration program.

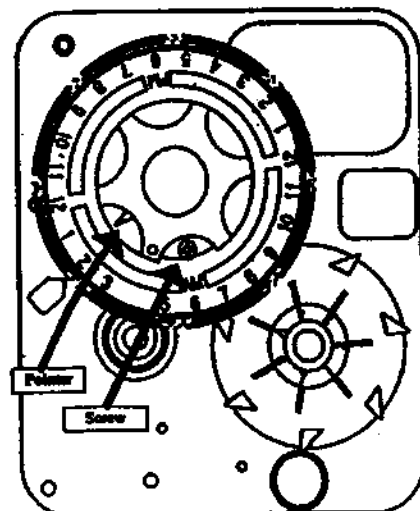
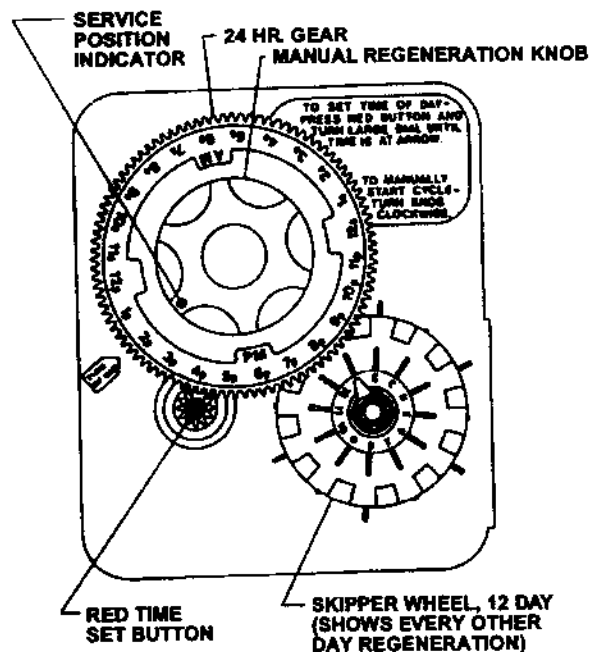
The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing.

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.

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.**



# MODEL 3200 TIMER

## *regeneration cycle program setting procedure*

*(brine tank refill separate from rapid rinse - stf) Black drive cam and brine valve cam*

### How To Set Regeneration Cycle Program:

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

To expose cycle program wheel, grasp timer in upper left-hand corner and pull, releasing snap retainer and swinging timer to the right.

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

### How To Change The Length Of The 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 a zero determines the length of time your unit will backwash.

**FOR 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. (Note: Do not add pins before "0" minutes designation.)

### How To Change The Length of Brine and Rinse Time:

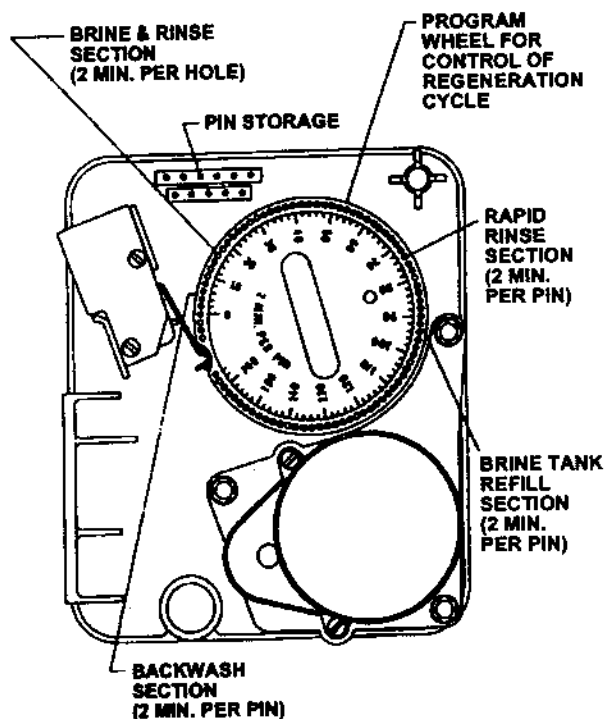
The group of holes between the last pin in the backwash section and the second group of pins determines the length of time that your unit will brine and rinse. (2 min. per hole.)

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:

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.)

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:

The second group of holes on the program wheel determines the length of time that your water conditioner will refill the brine tank. (2 min. per hole.)

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

The regeneration cycle is complete when the outer micro-switch is tripped by the two pin set at end of the brine tank refill section. The program wheel, however, will continue to rotate until the inner micro-switch drops into the notch on the program wheel.

Return timer to closed position engaging snap retainer in back plate. make certain all electrical wires locate above snap retainer post.

## IMPORTANT!

**SALT LEVEL MUST ALWAYS BE ABOVE WATER LEVEL IN BRINE TANK.**

# MODEL 3200 TIMER

## *regeneration cycle program setting procedure*

### *(rapid rinse) White drive cam and brine valve cam*

#### **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.

The expose cycle program wheel, grasp timer in upper left-hand corner and pull, releasing snap retainer and swinging timer to the right.

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

#### **How To Change The Length Of The Backwash Time:**

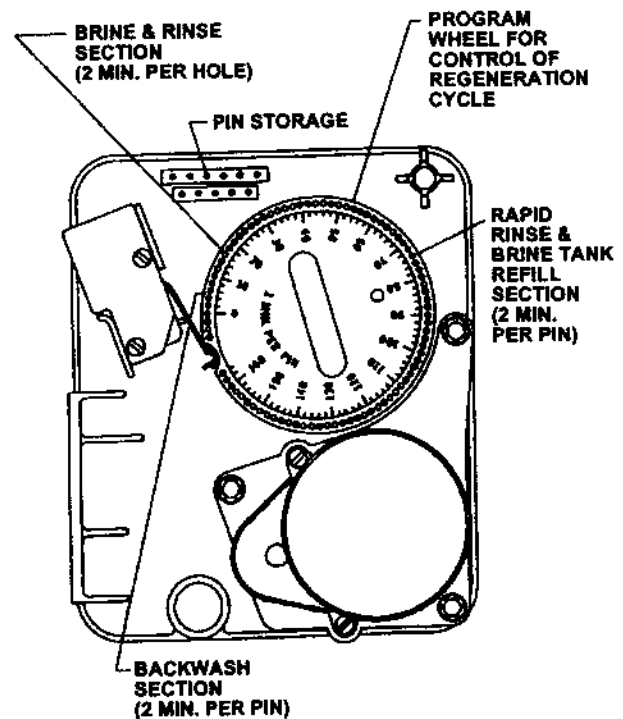
The program wheel as shown in the drawing is in the service position. As you look at the numbered side of the program wheel, the group of pins starting at zero determines the length of time your unit will backwash.

**FOR 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. (**Note: Do not add pins before "0" minutes designation**)

#### **How To Change The Length of Brine and Rinse Time:**

The group of holes between the last pin in the backwash section and the second group of pins determines the length of time that your unit will brine and rinse. (2 min. per hole.)

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 And Brine Tank Fill Time:**

The second group of pins on the program wheel determines the length of time that your water conditioner will rapid rinse and brine tank fill. (2 min. per hole.)

To change the length of rapid rinse and brine tank fill 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 and brine tank fill time in minutes.

The regeneration cycle is complete when the outer micro-switch drops off the last pin in the rapid rinse and brine tank fill group of pins. The program wheel, however, will continue to rotate until the inner micro-switch drops into the notch on the program wheel.

Return timer to closed position engaging snap retainer in back plate. Make certain all electrical wires located above snap retainer post.

### **IMPORTANT!**

**SALT LEVEL MUST ALWAYS BE ABOVE WATER LEVEL IN BRINE TANK.**

# VIII RECOMMENDED FILTER CYCLE TIMES

Backwashing is a very important process in any filtration system. Backwashing is accomplished by reversing the flow of water through the mineral bed. The upward flow of water washes out to the drain the debris the filter has collected. Backwashing also prevents the filter bed from becoming packed & channeled. Normal backwash time is approximately 20 minutes. Extremely dirty water may require the backwash time to be increased.

Slow Rinse is used only because of the electrical operation of the control valve. The cycle is available because it is needed in other types of water treatment equipment.

Fast Rinse is required for two reasons. First to purge fine sediment from the filter bed and, second, to settle the sediment in the freeboard water. Normally, Fast Rinse time is 8-10 minutes.

In a Multiple Filter System where the filters are backwashed with clean filtered water, the Fast Rinse time may be reduced to 2-3 minutes.

## 1. Single and twin filter systems.

The timer can be used as it comes from the factory, the cycle times are as follows:

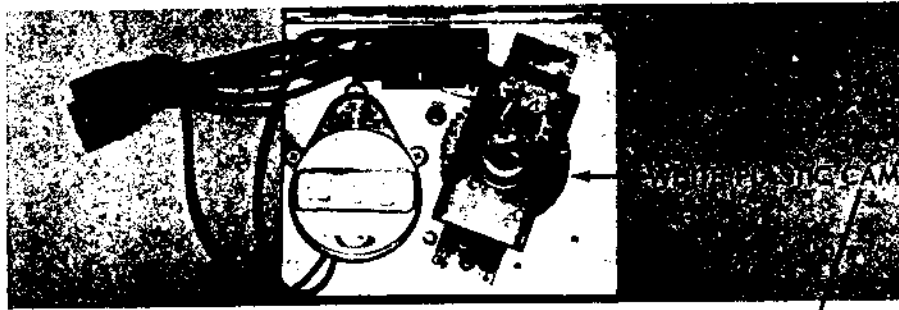
### A. 6-day timer (standard)

- Backwash — 18 minutes
- Slow Rinse — 3 minutes
- Fast Rinse — 8 minutes

### B. 7-day and AR timers (optional)

- Backwash — 22 minutes
- Slow Rinse — 3 minutes
- Fast Rinse — 10 minutes

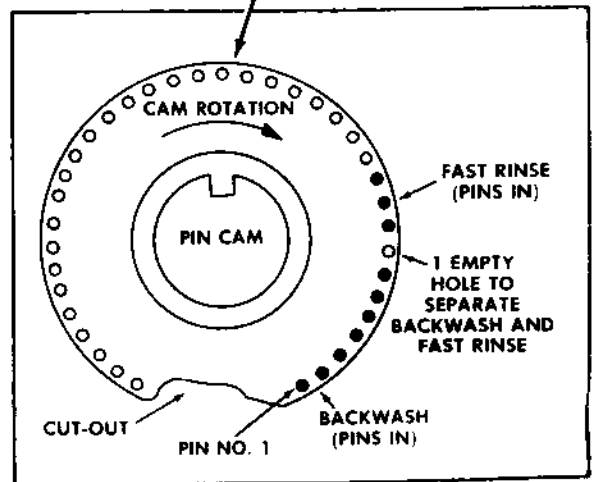
## 2. In multiple filter systems, the Fast Rinse time may be reduced to 2-3 minutes. To adjust this, refer to the section on setting cycle times.



REAR VIEW OF TIMER  
FIGURE 14

## PIN TIME CHART

BACKWASH OR FAST RINSE		
No. of PINS IN	6-Day Timers Mins.	ARC & 7-Day Timers Mins.
1	3	4
2	5	7
3	8	10
4	11	13
5	13	16
6	16	19
7	19	21
8	21	24
9	24	27
10	27	30
11	29	33
12	32	36



PIN CAM  
FIGURE 15

# IX SETTING CYCLE TIMES

1. Disconnect the electrical power.
2. Lift up the small black timer knob and rotate the large black timer knob counter-clockwise until the white line on the knob is pointing directly away from the time of day arrow.
3. You must be able to gain access to the white plastic cam on the back of the timer.
  - A. 1½" pipe size control valves.

Disconnect plastic quick connect in wiring from timer. Flip timer up and remove it from motor plate.
  - B. 2" pipe size control valves.

Disconnect plastic quick connect in wiring from timer. Remove the two (2) screws holding the timer onto control valve box. Remove timer.
4. The pins in the cam are now visible (Figure 14).

Counter-clockwise from the cutout on the cam the first set of pins is the backwash time, the space (no pins) is the slow rinse time (2 holes required) and the second set of pins is the fast rinse time.
5.
  - A. To reduce fast rinse time for multiple filters, pull the two (2) pins from the second set (farthest from the cutout) all the way out.
  - B. If additional backwash time is required, increase the number of pins in the first group according to the pin time chart. Be sure to maintain two empty holes between the two groups of pins.

**NOTE:** 10 additional pins — order Kit No. 720070.

# X FILTER STARTUP

1.
  - A. Steel Tank Filters  
Remove top cover and open the inlet valve only enough to allow the filter to slowly fill with water. When full, close inlet valve and replace the cover.
  - B. Fiberglass Tank Filters.  
If the tank was filled with water before the control valve was bolted on, go to Step 2. If not, the tank must be filled very slowly. Turn on the power to the filter. Advance the control valve to the backwash position and slightly open the inlet valve. Allow the tank to fill until air is not coming out the drain. Open the inlet valve completely, except activated carbon (See Page 3) Proceed to Step 5.
2. Turn on the electrical power to the filter.
3. Advance the control valve to the backwash position.
4. Partially open the inlet valve. When the water runs to the drain free of air, open the inlet valve completely.
5. Allow the unit to backwash for five (5) minutes, or until the water running to the drain is as clear as the raw water.
6. Again, lift the small black knob on the timer and rotate the large black timer knob counter-clockwise until the black knob points to the blue "service indicator." The control valve plunger should be all the way in.
7. If the installation consists of multiple filters, follow the above procedure for each filter.

# XI TIME CONTROL SETTING

- TO SET TIME OF REGENERATION, pull out (about 1/4") all regeneration pins until snug. Loosen screws "B".
 

**6 DAY TIMERS:** Rotate time dial "A" so that the "pointer" (pin #1) points to the time on dial "A" when the unit should begin to regenerate. Tighten screws "B".

**7 DAY TIMERS:** Rotate time dial "A" so that the center line of any regeneration pin lines up with the time on dial "A" when the unit should begin to regenerate. Tighten screws "B".

Regeneration time can be scheduled between 12:00 a.m. and 6:00 a.m. If daytime regeneration is desired set timer (12) hours ahead (clockwise).
- TO SET REGENERATION SCHEDULE for desired regeneration frequency, set pins as follows:
 

**6 DAY TIMERS**

**Every Day:** Push pins 2, 3, 4, 5 and 6 all the way down.

**Every 2nd Day:** Push pins 3 and 5 down, pull pins 2, 4 and 6 up until snug.

**Every 3rd Day:** Push pin 4 down, pull pins 2, 3, 5 and 6 up until snug.

**Every 6th Day:** Pull pins 2, 3, 4, 5 and 6 up until snug.

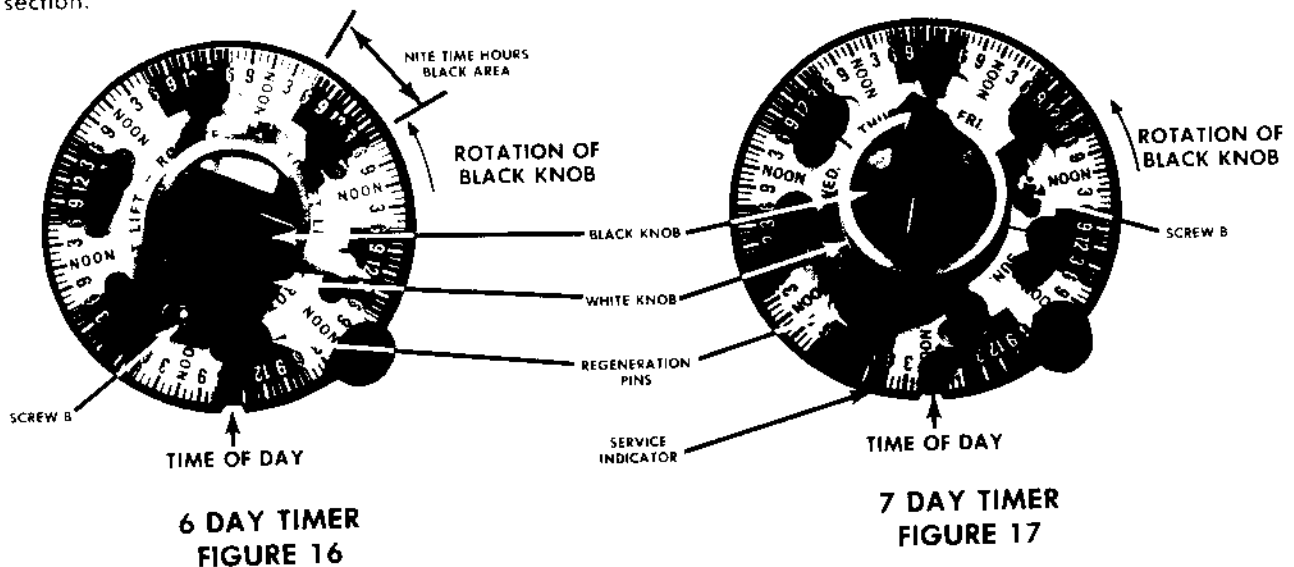
**NOTE:** Pin No. 1 is always down.

**7 DAY TIMERS**

Push pins in until snug for days of the week when regeneration is desired. Pull pins out until snug for days of the week when regeneration should be skipped.
- TO SET TIME OF DAY
 

**6 DAY TIMERS:** Lift white knob and rotate clockwise until the correct time is opposite time of day arrow.

**7 DAY TIMERS:** Lift white knob and rotate clockwise until the area of time dial "A" corresponding to the day of the week (today) is opposite the time of day arrow. Then rotate the white knob slightly until the correct time is opposite the time of day arrow.
- After the adjustments are completed, make sure the valve is in the Service Position. Refer to Electrical Final Check section.



# XII ELECTRICAL - FINAL CHECK

- Turn on the power to the unit.
- Lift the small black timer knob and slowly rotate the large black timer knob COUNTER-CLOCKWISE until the drive motor begins to move the plunger. The valve will stop in the backwash position. The plunger will be fully extended. **NOTE:** The small knob must be lifted for steps 3, 4, and 5.
- Further rotate the large black timer knob COUNTER-CLOCKWISE until the drive motor begins to operate. The next position is slow rinse.

4. Again rotate the large black timer knob COUNTER-CLOCKWISE until drive motor begins to operate. The valve will stop in the fast rinse position.
5. Rotate the large black timer knob COUNTER-CLOCKWISE until the line on the knob points at service indicator. See Figure 16 or 17.
6. Check the timer settings:
  - A. Time of regeneration.
  - B. Time of day.
  - C. Regeneration frequency.

## XIII SERVICE HINTS

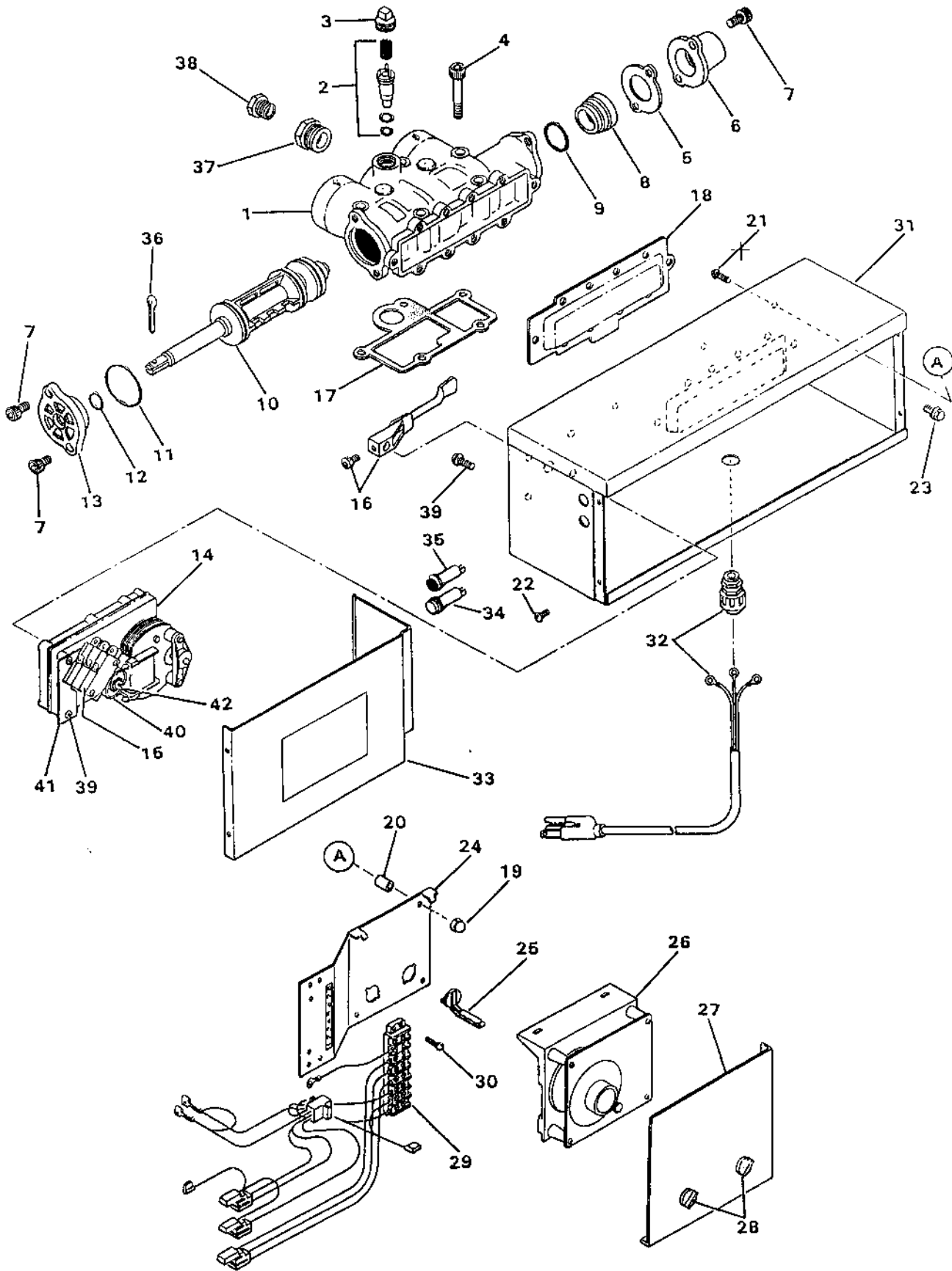
1. **TO MANUALLY START EXTRA REGENERATION CYCLE** rotate "Black Knob" counter-clockwise to stop. This will start an extra regeneration cycle to make up for excessive water usage. Regeneration cycle will start in approximately ten (10) minutes. Regularly scheduled regenerations will not be affected.
 

**NOTE: SERVICE POSITION INDICATOR:** When arrow on Black Knob points at the blue strip, the filter is in the service position. See Page 24 for service position of valve. When Black Knob points to the red strip, filter is in regeneration and water is automatically by-passing filter unless a shut-off kit is installed.
2. **UNIT WILL NOT REGENERATE AUTOMATICALLY.**
  - A. Is there power to the unit? Is the power cord plugged in? Is there a remote switch in the line shut off?
  - B. Is the timer motor running? If the timer motor is running, the small driven gear on the timer motor will be turning. If not, replace the timer motor.
  - C. Red regeneration drive gear not engaged. Check red gear behind push button on timer for proper alignment.
  - D. Valve motor micro switch not opening or closing. Adjust micro switch stack.
  - E. Valve motor micro switch burned out. Replace micro switch.
  - F. Timer micro switch not opening or closing. Adjust micro switch.
  - G. Timer micro switch burned out. Replace micro switch.
3. **MINERAL TO SERVICE**
  - A. **(Side Mount Tanks) Distributor missing in tank bottom**—Remove the plug at the bottom of the mineral tank. If mineral and gravel are present, a distributor is out of place. Remove the mineral and gravel from the tank and replace distributor.
 

Distributors should be checked immediately before the gravel is installed. **USE CAUTION** to avoid collapsing the distributors with wrenches and pliers.
  - B. **Unit installed backward**—Check plumbing and make sure the unit is properly installed. The inlet port on the control valve is marked with an arrow pointing into the valve.
  - C. **(Top Mount Tanks) If the distributor is crushed when the mineral tank is loaded**, gravel and/or mineral may enter the soft water pipes. (See Page 5). Remove the control valve. Remove the tank adaptor.
4. **CONTROL VALVE BINDS AND WILL NOT COMPLETE CYCLE**

Sand and hot water backup will damage piston seals and may cause piston to bind. If sand is present, water should be pre-filtered. Prevent hot water back-up with a check valve on the heater inlet. **NOTE:** Check local plumbing codes first.
5. **LEAK TO DRAIN**
  - A. Check plunger positioning. See Page 24, Service Position.
  - B. Check drain shut-off washer located in upper cap. (1 1/2" control valve only).
  - C. Check drain shut-off sealing surface in upper cap. (2" control valve only).
6. **INSUFFICIENT SERVICE FLOW RATE (Units equipped with optional by-pass shut-off kits).**
  - A. **Motorized valve not closing**—The valve must seal when closed. Dirt, rust, scale, etc. may prevent the valve from closing. Disassemble and clean. With control valve in the Service Position, disconnect any tubing connection. No water should flow out of the solenoid valve.
  - B. **Diaphragm valve not opening fully**—Build up of scale on diaphragm shaft. Clean shaft with fine emory paper.
  - C. **Vent port in the side of the diaphragm plugged**—Clean port with a fine wire or nail.

# RF Top Mount Valve Repair Parts and List

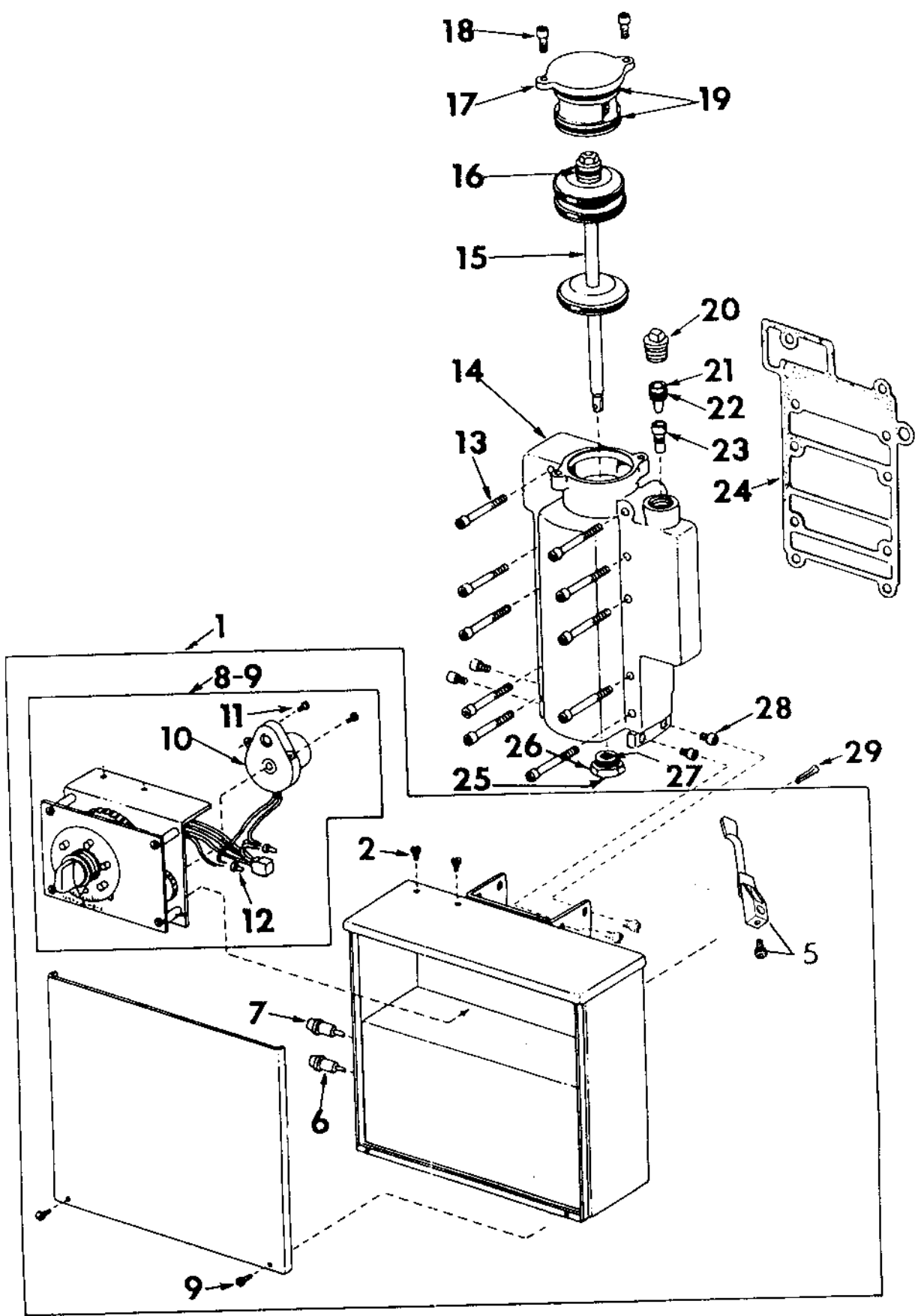


# RF Top Mount Valve Repair Parts and List

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	340032	Valve Body NPT	12	400051-11	O-Ring (Included w/Item 13)
	340035	Valve Body BSPP	13	507135	Lower Cap Assembly
2	—	Throat and Nozzle Assembly	14	507244	110-120 Volt/60 Hz
	507121	#53 x #28 (Models used on 45, 70, 100, 120) Top and Side Mount, Green		507245	240 Volt/50 Hz
	507122	#45 x #22 (Models used on 150, 180) Side Mount, Orange	15	320124	Micro Switches (3 req'd.) Included w/items 14
	507123	#39 x #16 (Models used on 200, 225, 240) White	16	507239	Drive Link
	507124	#36 x #10 (Models used on 300) Red	17	400626	Gasket
	507125	#31 x #7 (Models used on 450) Gold	18	400625	Gasket
	507126	#29 x 1 5/64 (Models used on 600) Dark Blue	19	300905	Nylon Nut
	507127	#27 x 1/4 (Models used on 750) Brown	20	300906	Nylon Spacer
	507129	#50 x #22 (Models used on 150) Top Mount, Yellow	21	400238	Screw
3	420225	1/2" Pipe Plug	22	400738	Screw (4 req'd.)
4	400166	Cap Screws (5 req'd.)	23	400128	Screw (10 req'd.)
5	300853	Upper Cap Gasket	24	300876	Timer Mounting Plate
6	720300	Flow Pkg. 3 gpm NPT	25	300138	Timer Lock
	720301	Flow Pkg. 3 gpm BSPP	26	—	Timer Assembly
	720302	Flow Pkg. 4 gpm NPT		607076	6 Day 120 Volt
	720303	Flow Pkg. 4 gpm BSPP		607131	6 Day 240 Volt
	720304	Flow Pkg. 5 gpm NPT		607084	7 Day 120 Volt
	720305	Flow Pkg. 5 gpm BSPP		607102	7 Day 240 Volt
	720306	Flow Pkg. 6 gpm NPT	27	300875	ARC 120 Volt
	720307	Flow Pkg. 6 gpm BSPP	28	300867	ARC 240 Volt
	720308	Flow Pkg. 10 gpm NPT	29	—	Timer Cover
	720309	Flow Pkg. 10 gpm BSPP		507877	Pawl Latch (2 req'd.)
	720310	Flow Pkg. 15 gpm NPT		507878	Wire Harness
	720311	Flow Pkg. 15 gpm BSPP		507878	120 Volt
	720312	Flow Pkg. 25 gpm NPT	30	400202	240 Volt
	720313	Flow Pkg. 25 gpm BSPP	31	300870	Self-Tapping Screw (2 req'd.)
	720322	Flow Pkg. 35 gpm NPT	32	720268	Mounting Box
7	400165	Cap Screw	33	300874	Power Cord Kit
8	300851	Drain Shut-Off	34	300645	Motor Cover
9	400085	O-Ring	35	300644	Service Light
10	507888	Piston (Ref. page 32 for Kits)	36	400504	Regeneration Light
11	400205	O-Ring	37	420201	Cotter Pin
			38	420531	Hex Bushing 1/2" x 3/8"
			39	86109	Male Connector 3/8" Tube to 1/4" NPT
			40	320203	Screw (6 req'd.)
			41	300745-1	Cam
			42	400229	Switch Bracket
					Screw



# VALVE ASSEMBLY COMPLETE WITH TIMER



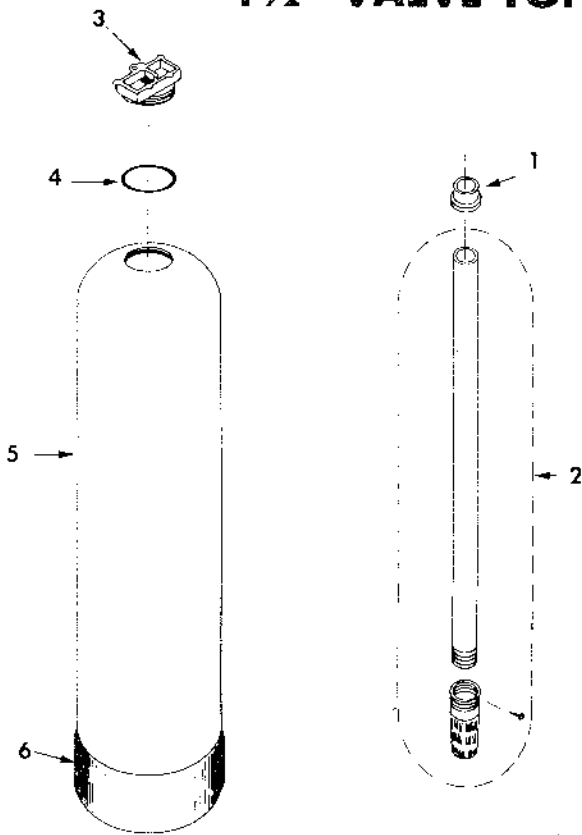
**REPAIR PARTS LIST**  
**VALVE ASSY. COMP. W/TIMER**

For Model	Timer	Part No. 110 V.-60 Cy.	Part No. 220 V.-50 Cy.
150	6 Day	807144	—
180	7 Day	807162	807176
220, 225	6 Day	807145	—
240	7 Day	807163	807177
300	6 Day	807146	—
450	7 Day	807164	807178
600	6 Day	807147	—
	7 Day	807165	807179
750	6 Day	807148	—
	7 Day	807166	807180
900	6 Day	807149	—
	7 Day	807167	807181

**TIMER-DRIVE MOTOR ASSEMBLY**

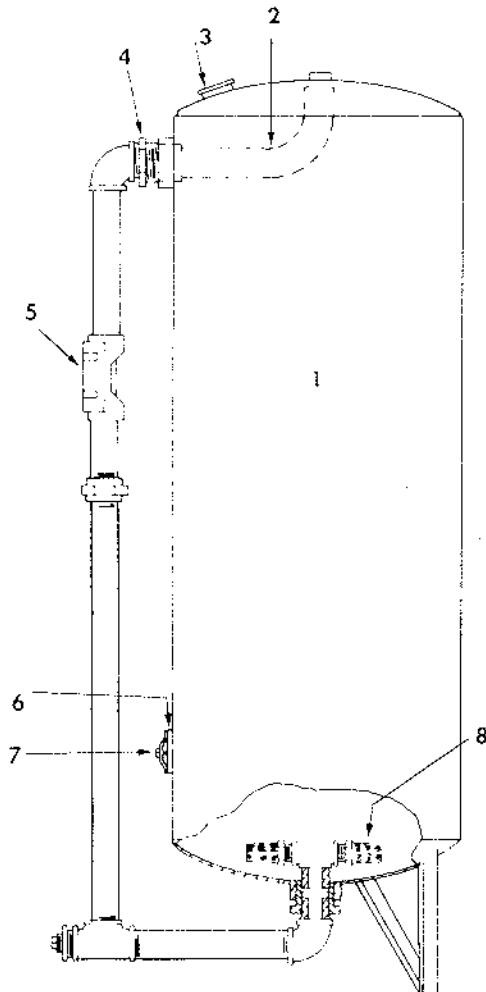
Ref. No.	Part No. 110V-60 Cy.	Description	Part No. 220V-50 Cy.
1	607068	Timer & Drive Motor Assembly 6 Day	—
1	607069	Timer & Drive Motor Assembly 7 Day	607103
2	400173	Screw — 6-32 x 3/8" Lg. (2 Req.)	
5	507240	Drive Link Assembly	
6	300608	Pilot Light (Service)	300645
7	300607	Pilot Light (Regeneration)	300644
8	607076	Timer Assembly 6 Day (6/7 RPM)	607131
	607064	Timer Assembly 7 Day (1 RPM)	607102
9	607065	Timer Assembly A.R.C. Operation	
10	300556	Timer Motor 6 Day	300593
	300594	Timer Motor 7 Day	300610
11	400158	Screw 4-40 x 3/16" (2 Req.)	
12	300082	Wire Terminal (2 Req.)	
13	400166	Mach. Screw 5/16 - 18 x 2 3/4" Lg. (10 Req.)	
14	320099	Valve Body	
15	507223	Piston Assembly (w/No.16) - OLD NO. 507049	
16	400078	"O" Ring	
17	320108	Drain Casting	
18	400165	Mach. Screw 5/16 x 5/8" Lg. (2 Req.)	
19	402006	"O" Ring (2 Req.)	
20	420227	Pipe Plug 3/4 NPT Brass	
21	320040	Nozzle #45 (For 20" x 54" Tank)	
	320041	Nozzle #39 (For 24" x 54" Tank)	
	320043	Nozzle #31 (For 30" x 60" Tank)	
	320044	Nozzle #29 (For 36" x 60" Tank)	
	320045	Nozzle #27 (For 36" x 72" Tank)	
	320046	Nozzle #22 (For 42" x 72" Tank)	
22	400050	"O" Ring	
23	320048	Throat #22 (For 20" x 54" Tank)	
	320049	Throat #16 (For 24" x 54" Tank)	
	320051	Throat #7 (For 30" x 60" Tank)	
	320052	Throat 15/64" (For 36" x 60" Tank)	
	320053	Throat 1/4" (For 36" x 72" Tank)	
	320054	Throat 17/64" (For 42" x 72" Tank)	
24	400623	Gasket	
25	340003	1 1/4" Valve Cap, Back	
26	400060	"O" Ring	
27	400077	"O" Ring	
28	400150	Capscrew 5/16-18 x 3/8" Lg. (4 Req.)	
29	400504	Cotter Pin	

## 1½" VALVE TOP MOUNT FILTER TANKS



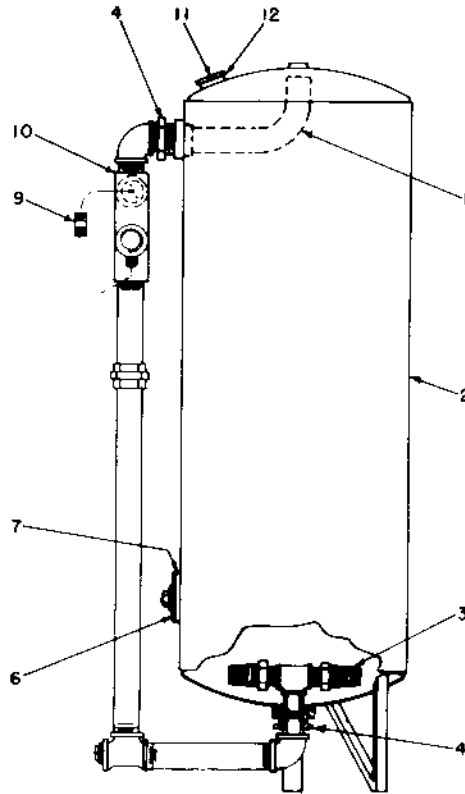
REF. NO.	PART NO.	DESCRIPTION
1	300740	Rubber Sleeve
2	703008	Manifold Assembly (Mod. 70)
	703006	Manifold Assembly (Mod. 120)
	703025	Manifold Assembly (Mod. 150)
	703045	Manifold Assembly (Mod. 240)
3	340033	Tank Adapter
4	400079	"O"-Ring
5	100046	Mineral Tank (13" x 54")
	100087	Mineral Tank (16" x 65")
	100089	Mineral Tank (21" x 65")

## 1½" VALVE SIDE MOUNT FILTER TANKS



REF. NO.	PART NO.	DESCRIPTION
1	—	Mineral Tank - Side Mount
	100124	24" x 54"
	100126	30" x 60"
2	100349	Distributor Pipe
3	100095	Cap Assembly
*	100096	Cap Shell
*	100105	Seal Plate
*	100106	Retaining Ring (2 Required)
*	400121	Screw
*	400074	"O"-Ring
4	—	Bushing - Dbl. Tap
	410409	2½" x 1½" (2 Required)
		24" Dia. Tanks
	410422	3" x 1½" (2 Required)
		30" Dia. Tanks
5	340034	Side Mount Adapter
6	400614	Gasket - (4 x 6) Hand Hole
	400615	Gasket (11 x 15) Man Hole
7	100113	Hand Hole Cover (4 x 6)
	100114	Man Hole Cover (11 x 16)
8	703023	Bottom Strainer Assembly
		24" Dia. (2 Required)
		30" Dia. (4 Required)

## 2" VALVE FILTER TANKS



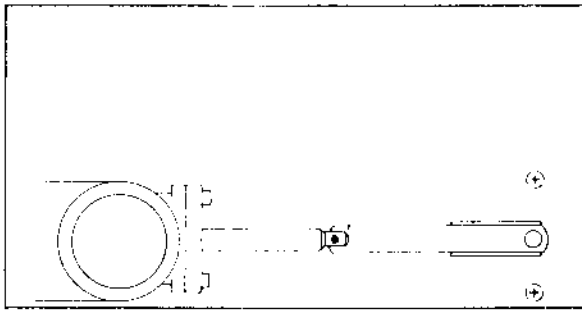
### REPAIR PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
1	—	
	100350	2" x 90° PVC Short (5½')
	100351	2" x 90° PVC Long (14½')
	100348	2½" x 90° PVC
2	—	Mineral Tank Side Mount
	100126	30" x 60"
	100127	36" x 60"
	100129	42" x 72"
3	703023	Bottom Strainer Assembly
		30" Thru 36" Dia. (4 Required) 42" Dia. (6 Required)
4	—	Bushing DBL Tap
	410420	3" x 2"
	410425	3½" x 2"
6	100113	Hand Hole Cover Comp. (4 . 6)
	100114	Manhole Cover Comp. (11 x 16)
7	400614	Gasket (4 x 6) Hand Hole
	400615	Gasket (11 x 15) Man Hole

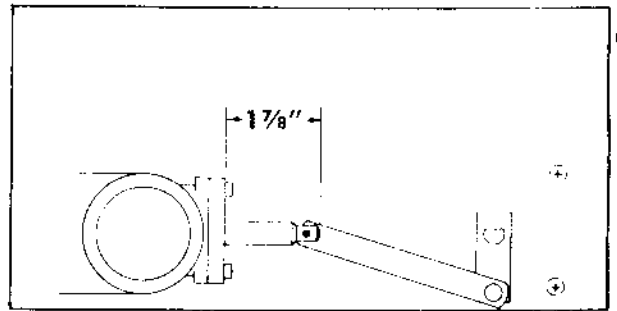
REF. NO.	PART NO.	DESCRIPTION
8	—	Flow Control
	320164	60 GPM (Mod. 300 S & I)
	320164	60 GPM (Mod. 600 T & C)
	320148	90 GPM (Mod. 600 S & I)
	320148	90 GPM (Mod. 900 T & C)
9	—	Side Mount Adaptor
	320128	2" NPT
	320130	2" BSP
10	100095	Cap Assembly
*	100096	Cap Shell
*	100105	Seal Plate
*	100106	Retaining Ring (2 Required)
*	400121	Screw
*	400074	"O"-Ring

\* Not Shown.

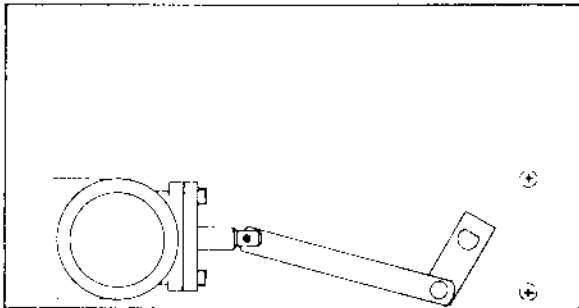
# 1 1/2" CONTROL VALVE PISTON POSITION DIAGRAMS



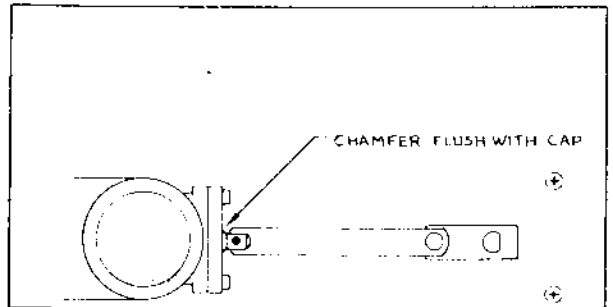
**1 BACKWASH POSITION**



**2 BRINE AND SLOW RINSE POSITION**

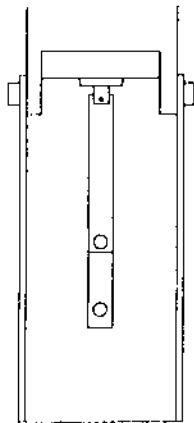


**3 FAST RINSE POSITION**

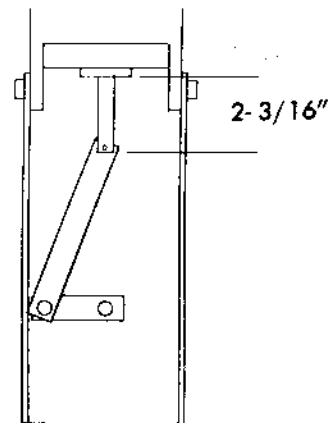


**4 SERVICE POSITION**

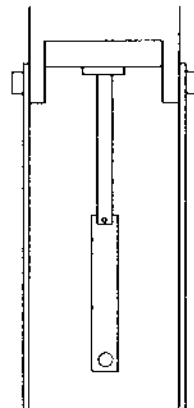
# 2" CONTROL VALVE PISTON POSITION DIAGRAM



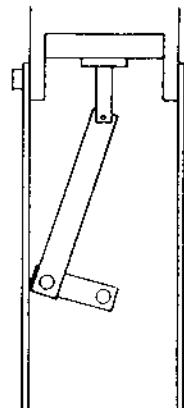
**SERVICE POSITION**



**SLOW RINSE POSITION**



**BACKWASH POSITION**



**FAST RINSE POSITION**