PROGRAMMING THE 460TC

Plug the wall-mount transformer into a functioning electrical outlet that is not controlled by a switch. Plug the transformer into the transformer plug receptacle on the control.

Open the access door by pushing the raised tab on the door toward the left while pulling the tab out (Figure 5).

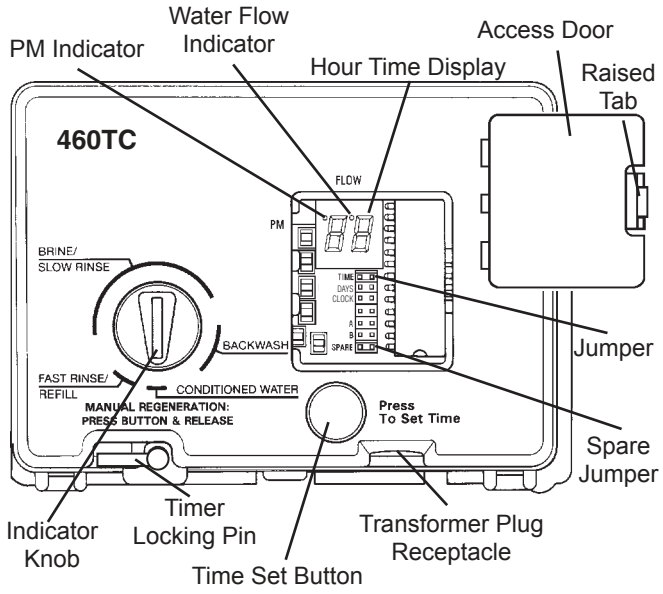

Figure 5

Time of Day Setting

With the jumper on the set of pins next to the word **TIME** (Figure 6), set the time of day to the closest hour by pressing the black **TIME SET** button. PM hours are indicated by a light next to the letters **PM** on the display window.

NOTE: The use of a small needle-nose pliers will aid in moving the jumper.

NOTE: The unit is factory set to regenerate at 2:00 a.m. If you prefer to have the unit regenerate at an earlier or later time, simply set the current time of day accordingly (e.g., to have the unit regenerate at 4:00 a.m.—two hours later—set the clock two hours earlier than the actual time of day).

NOTE: The Timer Locking Pin should always be horizontal (Figure 5) during operation.

Days Setting

Move the jumper to the set of pins next to the word **DAYS** (Figure 7). Press the black **TIME SET** button until the desired number of days between regeneration is displayed. The range is from 1 to 30 days.

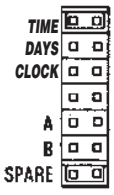

Figure 6

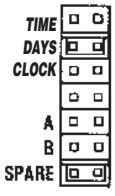

Figure 7

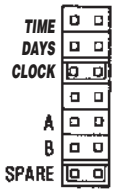

Figure 8

Clock Setting

Move the jumper to the set of pins next to the word **CLOCK** (Figure 8). Press the black **TIME SET** button until the desired clock setting is displayed. The clock range is 0 to 1. Select 0 for the standard AM/PM clock or select 1 for a 24 hour clock.

Return the jumper to the top set of pins next to the word **TIME** and replace the access door. The jumper must NOT be left on any pins other than the top pair next to the word **TIME**. Otherwise, the unit may show a blank display.

NOTE: A spare jumper is located on the bottom set of pins.

Memory Retention

During a power outage, all of the data in the microprocessor's memory is stored in a special electronic chip called NOVRAM, Nonvolatile Random Access Memory. This data includes the time of day, water usage amounts, and the number of days since the last regeneration. The NOVRAM will maintain the data in its memory. When power is restored, the NOVRAM returns the data to the microprocessor and operation resumes as if an outage never occurred.

The time of day will be late by the length of the power outage. Most power outages are less than one minute in duration. Therefore, it may be months or years before the time display would require resetting. If an outage of one or more hours occurs, the time of day should be reset. No other reprogramming is necessary.

ADJUSTMENT OF BRINE CONTROL 460i/460TC

The amount of salt placed into the regenerant storage tank has nothing to do with the amount of salt used during the regeneration cycle. Water will dissolve and absorb salt only until it becomes saturated. A given amount of brine (salt saturated water) contains a specific amount of salt.

The salt dial controls the amount of brine used during the regeneration cycle, e.g., when set at 15 lbs. (6.8 Kg), the amount of brine the conditioner will use for each cycle will contain 15 lbs. (6.8 kg) of salt. Never let the amount of salt in the brine tank be less than the amount required for the next regeneration.

Refer to the salt setting table, Table 1, for proper salt settings. To set the salt dial, insert a screwdriver into the pointer knob (Figure 9) and move the pointer to the proper setting.

NOTE: To convert the salt settings from English to Metric, divide by 2.2.

Example: 12 pound = 5.5 kg of salt.
2.2

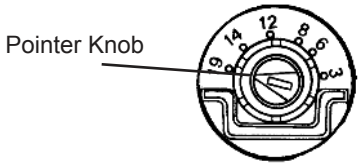

Figure 9

Table 1 - Suggested Salt Dial Settings (Pounds of Salt) for Various Size Softeners

Capacity Setting Kilograins	Resin Bed Volume							
	.5 ft^3	.75 ft^3	1.0 ft^3	1.25 ft^3	1.5 ft^3	1.75 ft^3	2.0 ft^3	2.5 ft^3
12	4.5	-	-	-	-	-	-	-
16	9.	5	-	-	-	-	-	-
20	-	8.5	6	-	-	-	-	-
24	-	14	8.5	7	-	-	-	-
30	-	-	15	11	9	-	-	-
32	-	-	18.5	12.5	10	9	-	-
35	-	-	-	16	12	10	9	-
40	-	-	-	11.5*	17	14	12	-
48	-	-	-	-	14*	10.5*	17	13
60	-	-	-	-	-	-	15*	10.5*

*This setting requires use of “XS” (Extra Salt) cam and doubles the amount of the setting.

SPLICING THE LOW VOLTAGE TRANSFORMER CORD

If it is necessary to extend the length of the transformer cord, an optional 15-foot (4.6-m) extension is available, or the cord may be spliced as follows:

Strip insulation from wire 5/16 inch from wire end.

Insert stripped wire into barrel of connector and crimp. For best results, crimp twice per wire as shown in Figure 10.

Splice connectors or extension wire are not supplied. They are available at hardware or electrical stores.

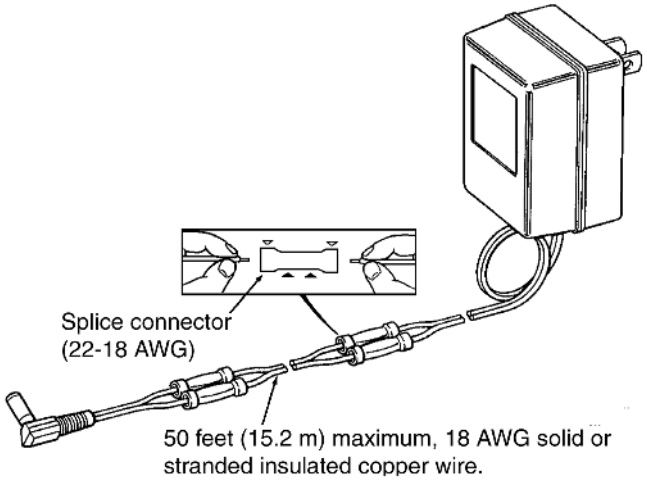

Figure 10

TROUBLESHOOTING

Your water conditioning system is designed and manufactured for efficient, low maintenance service. However, if problems do occur, this section provides a list of possible causes and solutions. You can solve some problems yourself, such as low salt in the salt storage tank or a blown household fuse. However, some problems require installer or dealer assistance.

IMPORTANT: Service procedures that require the water pressure to be removed from the system are marked with a !. To remove water pressure from the system, put the bypass valve or three-valve bypass into the bypass position and open the backwash drain valve (the sixth valve back from the control) with a screwdriver. Restore system water pressure when the service work is completed.

Problem	Cause	Solution
Clock does not display time of day.	Transformer cord unplugged.	Connect power.
	No electric power at outlet.	Repair outlet or use working outlet.
	Defective transformer.	Replace transformer.
	Defective circuit board.	Replace timer.
Clock does not display correct time of day.	Outlet operated by switch.	Use outlet not controlled by switch.
	Incorrect voltage or frequency (Hz).	Replace timer with one of correct voltage and frequency (Hz).
	Power outages.	Reset clock.
Time display continues to advance.	Defective time set switch.	Replace timer.
Time display shows something other than time of day.	Electrical interference.	Disconnect power to unit. Restore power and reset time of day display.
	Defective circuit board.	Replace timer.
No water flow display when water is flowing.	Bypass valve in bypass.	Shift bypass valve to not-in-bypass position.
	Meter probe disconnected or not fully connected to meter housing.	Fully insert probe into meter housing.
	Restricted meter turbine rotation due to foreign matter in meter.	**!**Remove meter housing, free up turbine and flush with clean water. Do not disassemble turbine from meter housing. Turbine shouls spin freely. If not replace meter.**!**
	Defective meter probe.	Replace timer.
	Defective circuit board.	Replace timer.
Control regenerates at wrong time of day.	Power outages.	Reset clock to correct time of day.
	Clock set incorrectly.	Reset clock to correct time of day.
Timer stalled in regeneration cycle.	Motor dead.	Replace timer.
	Motor runs backwards.	Replace timer.
	No electric power at outlet.	Repair outlet or use working outlet.
	Broken gear.	Replace timer.
	Defective switch.	Replace timer.
	Air leak in brine connections.	Check all junction points and make appropriate corrections.
	Binding of camshaft.	Remove foreign object obstruction from valve discs or camshaft.
	Water pressure greater than 125 psi during regeneration.	**!**Install pressure regulator.**!**
	Defective circuit board.	Replace timer.
Continuous regeneration. Camshaft does not stop at the end of regeneration.	Broken switch activator on gear.	Replace timer.
	Defective switch.	Replace timer.

Problem	Cause	Solution
Control will not regenerate automatically or when button is pressed	Electric cord unplugged.	Connect power.
	No electric power at outlet.	Repair outlet or use working outlet.
	Defective motor.	Replace timer.
	Broken gear.	Replace timer.
	Binding in gear train.	Replace timer.
	Defective switch.	Replace timer.
Control will not regenerate automatically but will regenerate when button is pressed.	If water flow display is not operative, refer to "No water flow display when water is flowing".	Same as "No water flow display when water is flowing".
	Defective circuit board.	Replace timer.
	Incorrect hardness and capacity settings.	Set to correct values. See Programming section.
Run out of soft water between regenerations.	Improper regeneration.	Repeat regeneration, making certain that correct salt dosage is used.
	Fouled softener resin.	Use resin cleaner. (The use of resin cleaners in an unvented enclosure is not recommended)
	Incorrect salt setting.	Set salt control to proper level. See Salt Setting chart.
	Incorrect hardness or capacity settings.	Set to correct values. See Programming section.
	Water hardness has increased.	Set hardness to new value. See Programming section.
	Restricted meter turbine rotation due to foreign material in meter housing.	**!** Remove meter housing, free up turbine and flush with clean water. DO NOT DISASSEMBLE TURBINE FROM METER HOUSING. Turbine should spin freely; if not, replace meter. **!**
	Excessive water usage below 1/5 gallon per minute.	**!**Repair leaky plumbing and/or fixtures. **!**

DISINFECTION OF WATER CONDITIONERS

The materials of construction of the modern water conditioner will not support bacterial growth nor will these materials contaminate a water supply. However, the normal conditions existing during shipping, storage and installation indicate the advisability of disinfecting a conditioner after installation, before the conditioner is used to treat potable water. In addition, during normal use, a conditioner may become fouled with organic matter, or in some cases, with bacteria from the water supply.

Thus every conditioner should be disinfected after installation. Some will require periodic disinfection during their normal life, and in a few cases disinfection with every regeneration would be recommended.

Depending upon the conditions of use, the style of conditioner, the type of ion exchange, and the disinfectant available, a choice can be made among the following methods.

Sodium or Calcium Hypochlorite

Application

These materials are satisfactory for use with polystyrene resins, synthetic gel zeolite, greens and bentonites.

5.25% Sodium Hypochlorite

These solutions are available under trade names such as Clorox, Linco, Bo Peep, White Sail and Eagle Brand Bleach. If stronger solutions are used, such as those sold for commercial laundries, adjust the dosage accordingly.

1. Dosage
   A. Polystyrene resin; 1.2 fluid ounce per cubic foot.
   B. Non-resinous exchanger; 0.8 fluid ounce per cubic foot.
2. Brine tank conditioners
   A. Backwash the conditioner, and add the required amount of hypochlorite solution to the brine well of the brine tank. (The brine tank should have water in it to permit the solution to be carried into the conditioner.)
   B. Proceed with the normal regeneration.

Calcium Hypochlorite

Calcium hypochlorite, 70% available chlorine, is available in several forms including tablets and granules. These solid materials may be used directly, without dissolving before use.

1. Dosage
   A. 2 grams (approximately 0.1 ounce) per cubic foot.
2. Brine tank conditioners
   A. Backwash the conditioner and add the required amount of hypochlorite to the brine well of the brine tank. (The brine tank should have water in it to permit the chlorine solution to be carried into the conditioner.)
   B. Proceed with the normal regeneration.