# INSTALLATION MANUAL

# For softeners with **DELUXE** valve

designed for plumbing up to 1 inch

# Caution:

Read and Follow
All Safety Rules and
Operating Instructions
Before First Use of
This Product.

If you have questions when installing, operating or maintaining your softener, and when setting the timer, call this toll-free number...

1-800-426-9345

(M - F, 7 am - 8 pm, CST)

For repair or replacement parts, call this toll-free number...

1-800-366-7278

www.KenmoreWater.com

SAVE THIS MANUAL





# **UltraSoft Water Softeners**

- ◆ Safety Guides
- ◆ Unpacking
- ♦ Where To Install
- ◆ How To Install
- ◆ Pressure Testing

Use the plastic bag and tie provided, to hang manuals nearby the softener for future reference.

Sears, Roebuck and Co., Hoffman Estates, IL 60179 USA

# INTRODUCTION

This manual gives you the steps needed to install your new Kenmore Water Softener. To better understand how the water softener is installed, and to know what you will need, please read this entire manual before beginning.

After you have installed the water softener, the included owner's manual tells you how to start, program, operate and maintain it. The owners manual also has the product warranty, and a listing of repair parts available from Sears.

Your Kenmore Water Softener will remove hardness minerals (measured in grains per gallon...gpg) and some clear water iron (measured in parts per million...ppm) from water. See the specifications, in your owners manual, for the maximum limits of hardness and iron removal. A water softener will not improve other water problems such as acidity, tastes and odors, or iron other than clear water iron. It will not purify contaminated water, or make other unsafe water safe to drink.

Sears sells a complete line of water treating equipment to correct various water problems. To be sure you have the proper type and size equipment, you must have your water tested. Your Sears store can give you water test results for hardness, iron and acidity, and tell you what equipment you need. Simply take at least a 4 oz. sample of your water to Sears, and they will test it while you wait. If you need help to get your water tested, or if you have other questions about your water, ask at your Sears store, or call the Kenmore Water Line ...1-800-426-9345.

# TABLE OF CONTENTS

# TABLE OF CONTENTS

SE	CTION 1 BEFORE INSTALLING CHECKS & TESTS	PAGE NO.
A.	Safety Guides	1-1
В.	Unpacking The Water Softener	1-2
C.	Water System Tests	1-3
SE	CTION 2 PLAN YOUR INSTALLATION	
A.	Where To Install The Water Softener	2-1
В.	Tools, Pipe and Fittings, Other Materials Needed	2-2, 2-3
C.	Typical Soldered Copper (or CPVC) In and Out Pipes	2-4
D.	Typical Threaded In and Out Pipes To Softener	2-5
SE	CTION 3 STEP BY STEP GUIDES TO INSTALL	
A.	Assemble Inlet-Outlet Adaptors, or Plastic Bypass Valve	3-1, 3-2
B.	Installing 3-Valve Bypass	3-3
C.	Locate and Connect Water Softener	3-4
D.	Connect Valve and Salt Tank Drain Hoses	3-5, 3-6
E.	Pressure Test - Check for Leaks	3-7
F.	Grounding - Connect to Electrical Power	3-8, 3-9

RESTART THE WATER HEATER

3-9

# A. SAFETY GUIDES

▲ Read all steps, guides and rules carefully before installing and using your new water softener. Follow all steps exactly to correctly install. Failure to follow them could cause personal injury or property damage. Reading this book will also help you to get all of the benefits from your water softener.

▲ Your water softener will remove hardness minerals and "clear water" iron\* from water, up to the limits shown on the specifications page in your owner's manual. It will not remove other types of iron, acids, tastes and odors, etc. It will not purify polluted water or make it safe to drink.

▲ Check with your local public works department for plumbing, electric and sanitation codes. You must follow their guides as you install your softener.

▲ Use only LEAD-FREE SOLDER AND FLUX, as required by federal and state codes, when installing soldered copper plumbing.

▲ Protect the softener and piping from freezing. Damage from freezing voids the softener warranty. See how to protect from freezing in your owner's manual.

# **⚠** CAUTIONS

PLEASE READ AND COMPLY WITH THE FOLLOWING **GUIDES TO PREVENT DAMAGE TO THE SOFTENER** OR OTHER PROPERTY, PERSONAL INJURY, OR POS-SIBLE FATAL SHOCK.

▲ THIS SOFTENER WORKS ON 24 VOLTS ONLY. BE SURE TO USE ONLY THE TRANSFORMER INCLUDED. AND PLUG IT INTO A NOMINAL 120V, 60 CYCLE HOUSEHOLD OUTLET THAT IS GROUNDED AND PROPERLY PROTECTED BY AN OVERCURRENT DE-VICE SUCH AS A CIRCUIT BREAKER OR FUSE. IF TRANSFORMER IS REPLACED, USE ONLY THE AU-THORIZED SERVICE, CLASS II, 24 VOLT, 10 VA TRANSFORMER.

▲ Unplug the transformer right away if the power cable should become damaged or frayed. Make repairs, or replace the transformer, before plugging back into the power outlet.

▲ Always unplug the softener from electrical power before removing outer valve covers.

<sup>\*</sup> Capacity to remove clear water iron was tested in the field by the manufacturer.

# SECTION 1 BEFORE INSTALLING CHECKS & TESTS

# **B. UNPACKING THE WATER SOFTENER**

Directions for unpacking the softener are on the top of the shipping carton. This manual, and the owner's manual, were in the small parts bag. You will need the small parts to install the softener. Keep them in the bag until you are ready to use them so you don't lose any parts. Remove all other cardboard pieces, foam packings, tapes, etc. from the softener and discard.

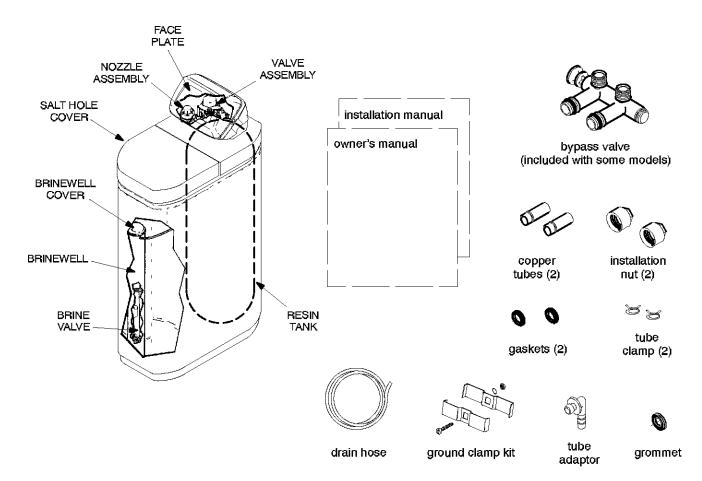
Check the softener for shipping damage. If you find damage, report it to your Sears store.

Use care when handling the softener. DO NOT turn upside-down. DO NOT drop, or set on sharp objects that could make a hole in the bottom. The water softener is heavy and to avoid damage, or personal injury, do not try to lift it or move more than necessary. See page 3-4, when you are ready to move it into installation position.

# FIG. 1

# PARTS DESCRIPTIONS

# **SMALL PARTS**



# BEFORE INSTALLING CHECKS & TESTS

# C. WATER SYSTEM TESTS

Has your water supply had a chemical analysis? Please see page A on the inside of the front cover.

CHECK YOUR WATER PRESSURE — For your softener to work right, a water pressure of no lower than 20 pounds per square inch (psi) is needed in the house water pipes. The highest pressure allowed in the water pipes is 125 psi. If pressure is over 125 psi, buy and install a pressure reducing valve in the water inlet pipe to the softener.

#### Note:

If water pressure during the day is 100 psi or more, pressure during the night may go over 125 psi. Adding a pressure reducing valve may reduce the flow.

If you have a well water system, look at the pressure gauge to find the water pressure. Call your local water department if you have city water. They will tell you what the water pressure is where you live.

CHECK YOUR WATER FLOW RATE — A water flow of at least 3 gallons per minute is needed. A

lower flow will keep your softener from working as well as it should. To make an easy check of your flow rate, do the following. You will need a one gallon container (can, jar, pail, etc.).

- Fully open two cold water faucets close to the point water enters the house.
- 2. With both faucets open, fill the gallon container at one faucet while looking at a watch or clock to see how many seconds it takes.
- Empty the container and go to the second faucet (be sure BOTH faucets are still on). Fill the gallon container at the second faucet and see how many seconds it takes.
- Turn off both faucets. Now add the number of seconds it took to fill the container at both faucets.
- A total of 90 seconds, or less, means the system flow rate is good.

FOR FUTURE REFERENCE, ENTER RESULTS OF YOUR WATER SYSTEM TESTS IN THE "FACTS AND FIGURES TO KEEP" TABLE IN YOUR OWNERS MANUAL.

# A. WHERE TO INSTALL THE WATER SOFTENER

# SECTION A

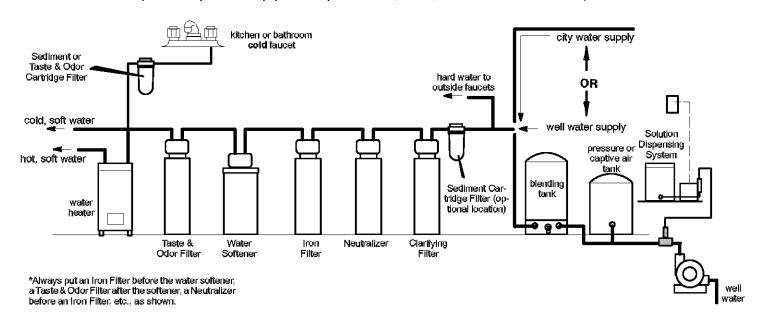
Think of the following points as you choose a place to put your softener. (see FIG. 2).

- Place as close as possible to the pressure tank (well water) or water meter (city water).
- Place as close as possible to a water drain such as a floor drain, laundry tub, sump or standpipe.
  - Connect to the house main water pipe BEFORE THE WATER HEATER. Temperature of water going through the softener must not be more than 120°F (49°C). Hot water will damage inner softener parts. To reduce the risk of hot water backup, piping between the softener and water heater should be as long of a run as possible.
- Keep outside faucets on hard water to save soft water and salt.

- Do not install in a place where the softener could freeze. Damage caused by freezing voids the warranty by Sears, Roebuck and Co.
- Put the softener in a place water damage is least likely to occur if it develops a leak. Sears or the manufacturer will not repair or pay for water damage.
- A grounded, 120V electrical outlet, to plug the transformer into is needed within 10 feet of the softener (the softener has a 10 foot power cable).

  Be sure the outlet and transformer are in an inside place, to protect from wet weather. So the softener always has electrical power, use a continuously "live" outlet, that cannot be accidentally switched off.
- When installing in an outside location, you must take the steps necessary to assure the softener, installation plumbing, and wiring, are as well protected from the elements, contamination, vandalism, etc., as when installed indoors.
- Keep the softener out of direct sunlight. The sun's heat can melt plastic parts.

# FIG. 2 THE PROPER ORDER TO INSTALL WATER TREATING EQUIPMENT (Shows sequence of equipment only. — Seldom, if ever, would all items be needed\*.)



# SECTION 2

# PLAN YOUR INSTALLATION

# B. TOOLS, PIPE AND FITTINGS, OTHER MATERIALS NEEDED

You must first decide how to run in and out pipes to the softener. Look at your house main water pipe at the point you will connect the softener. Is the pipe soldered copper, glued plastic, or threaded galvanized or brass? What is the pipe size? What kind of pipe and fittings is it easiest for you to work with, and what tools do you have?

Now look at the common plans for in and out piping on page 2-4 (soldered copper) and 2-5 (threaded). Select the drawing best for you and use it as a guide to plan what materials you will need. As you plan your in and out piping, keep in mind the following check list. Then get all the materials you will need before you start.

# Notes:

Use page 2-3 to make a plan drawing for your specific installation.

Some models include a plastic bypass valve, a length of *valve* drain garden hose, and a length of *overflow* drain hose for the salt storage tank.

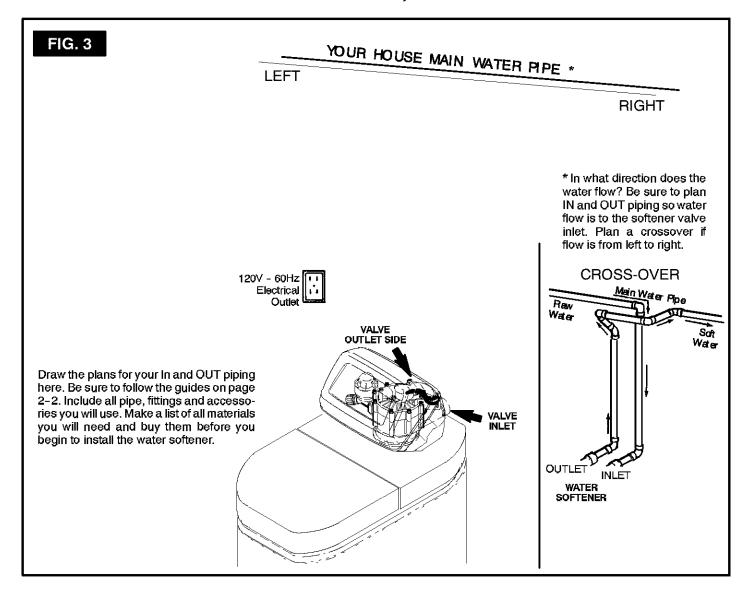
- ✓ In and out fittings included with the softener are 3/4" (nominal) copper sweat tubes. You should maintain the same, or larger, pipe size as the water supply pipe, up to the softener inlet and outlet.
- Use copper, brass, galvanized or CPVC plastic pipe and fittings for the in and out pipes. Be sure to check local codes.
- If you do plumb with threaded or CPVC in and out pipes, buy the needed adaptors and solder to the inlet and outlet copper tubes provided.
- Copper and galvanized pipe corrode fast when connected together. Use pipe and fittings of the same material.

- ALWAYS install a bypass valve or valves. Either use the Sears special valve (included with some models and available at your local Sears store), or 3 shut-off valves (see pages 2-4 and 3-3). Bypass valves let you turn off water to the softener if needed for repairs, but still have water in the house pipes.
- ✓ Drain tubing (3/8 in. inside diameter), is needed for the valve and salt tank drains. See step 1 and 2 on page 3-5 and 3-6. Some models include a length of drain tubing, or you can buy tubing at most Sears stores.

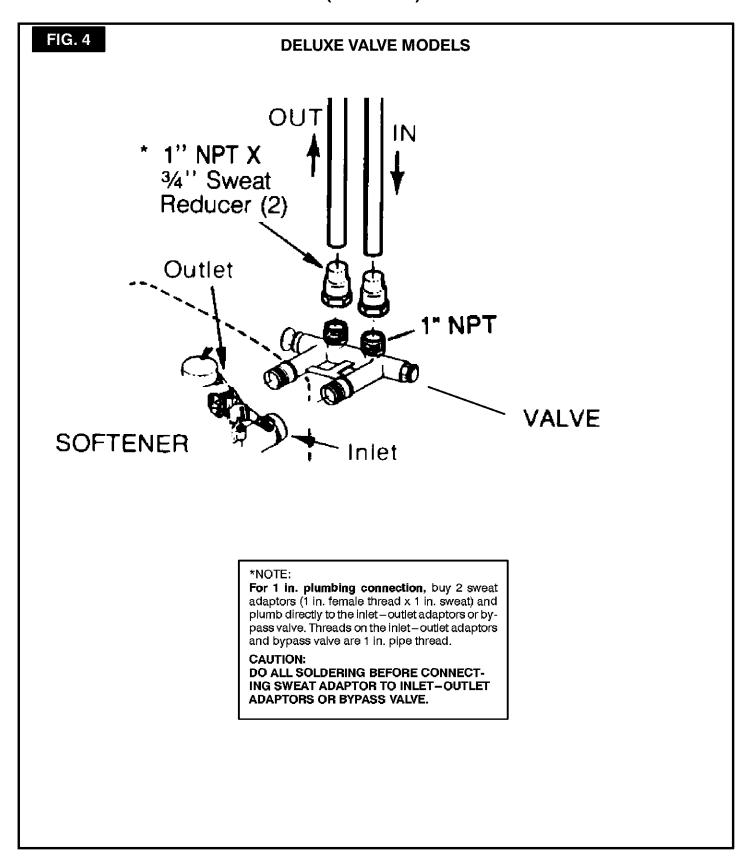
If a rigid valve drain is needed to comply with plumbing codes, you can buy the parts needed (see page 3-5) to change the softener to a 1/2 in. minimum copper tubing drain.

- TOOLS NEEDED:—Common and cross point (Phillips) screw drivers, slip joint pliers and a tape measure or rule. ALSO...
- ...for SOLDERED COPPER tubing cutter, propane torch, solid-core LEAD-FREE solder, paste flux, emery cloth, sandpaper or steel wool.
- ...for THREADED PIPE hacksaw or pipe cutter, pipe wrenches, pipe threading tool, pipe joint compound approved for use on potable water.
- ...for CPVC PLASTIC hacksaw, adjustable wrench, solvent cement approved for use on potable water, primer.

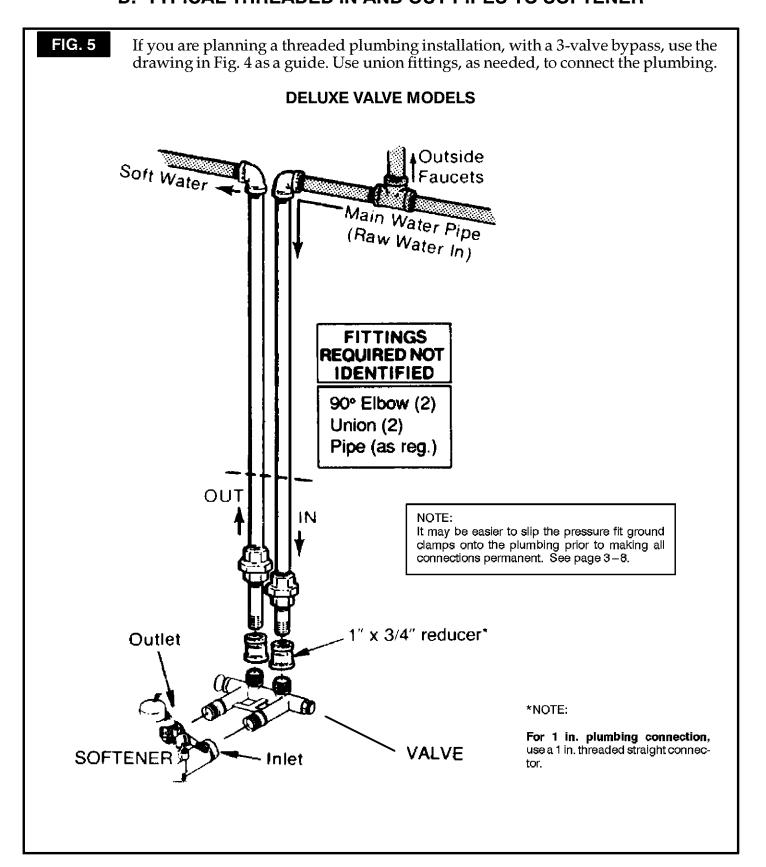
# **B. PIPE AND FITTINGS, PLAN DRAWING**



# C. TYPICAL SOLDERED COPPER (OR CPVC) IN AND OUT PIPES TO SOFTENER

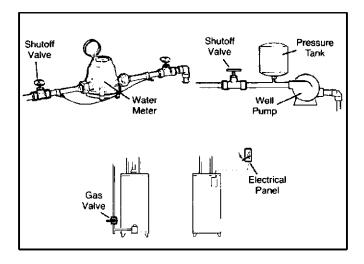


# D. TYPICAL THREADED IN AND OUT PIPES TO SOFTENER



# A. ASSEMBLE INLET-OUTLET ADAPTORS, OR PLASTIC BYPASS VALVE

- Close the shut-off valve on the house main water pipe, near the water meter or pressure tank, to turn off the water.
- Shut off the gas or electric supply to the water heater.
- Open the highest and lowest water faucets in your house to let water drain from the pipes. Close faucets after water has drained.
- If not already done, remove all cardboard or plastic packing pieces from inside the softener. Set the parts bag where you can easily see it, and get to parts as you need them.



INSTALL SEARS BYPASS VALVE AND / OR THE INLET OUTLET COPPER TUBES (FIG. 4, 5 AND 6). All needed parts are in the parts

# Note:

If you will not install the bypass valve because you will have a 3-valve bypass, skip step b, but do steps a and c.

- Visually check and remove any foreign materials from the valve inlet and outlet ports (FIG. 6). Carefully remove the two large plastic clips (you will use them). Check to be sure the turbine and turbine support are firmly in place. (Fig. 6)
- BYPASS VALVE: If not already done, put a light coating of silicone grease on the o-ring seals and slide onto the bypass valve. Push the bypass valve into the softener valve as far as it will go. Snap the 2 large holding clips into place, from the top down as shown. (Fig. 7)
  - **CAUTION...Be** sure the clips snap firmly into place so the bypass valve will not pull out. (Fig. 7)

#### GO TO PAGE 3-4.

- **INLET AND OUTLET COPPER TUBES:** If not already done, put a light coating of silicone grease on the o-ring seals and slide onto the copper tubes. Place the tubes into the valve inlet and outlet ports, or bypass valve ports, as far as they will go. Both tubes are the same and fit either port. Tighten the installation nuts holding the copper tubes. (Fig. 7)
  - $\triangle$  CAUTION...Be sure the clips snap firmly into place so the tubes will not pull out. (Fig. 7)

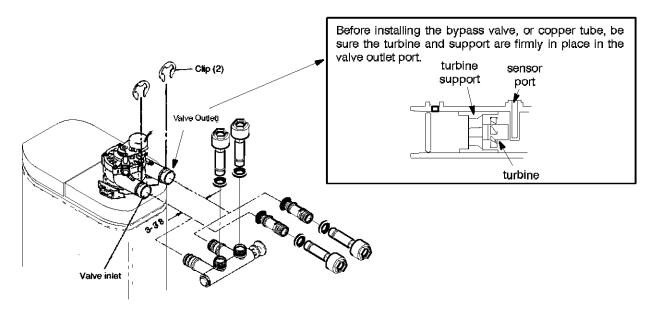
GO TO PAGE 3-3.

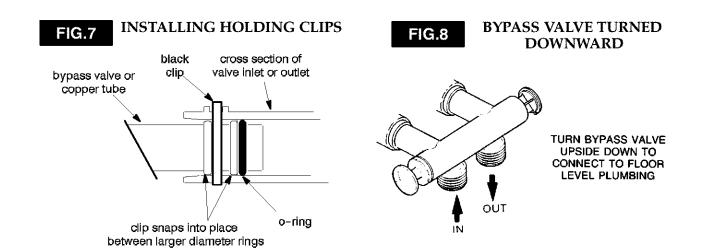
# STEP BY STEP GUIDES TO INSTALL

# A. ASSEMBLE INLET-OUTLET ADAPTORS, OR PLASTIC BYPASS VALVE

# **DELUXE VALVE MODELS**

FIG.6 INSTALLING BYPASS VALVE, and / or INLET and OUTLET COPPER TUBES





# **B. INSTALL 3-VALVE BYPASS**

- 1. INSTALLING 3 VALVE BYPASS AND PIPES (FIG. 9)
- Cut the house main water pipe where you will connect the softener. Loosely put together pipe, fittings, and the 3 valves. Place valve(s) within easy reach.

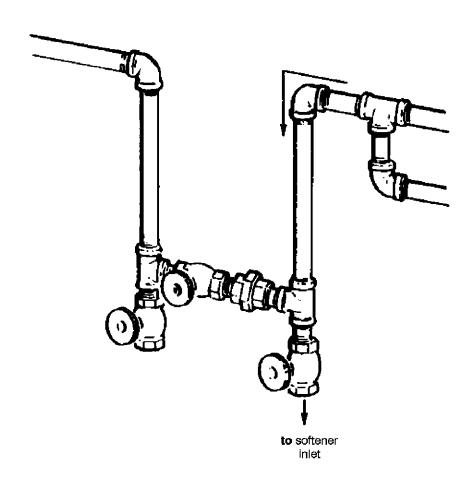
### **IMPORTANT:**

When looking at the front of the softener, the inlet is on the right side. If water in your house main water pipe runs from left to right, be sure to use a "cross-over" as shown on page 2-3.

b When all pipe, fittings and valves make a good fit together, tighten all threaded joints (use joint compound on outside threads), or solder all sweat joints.



3 - VALVE BYPASS (threaded plumbing shown)



# SECTION 3 STEP BY STEP GUIDES TO INSTALL

# C. LOCATE WATER SOFTENER, AND CONNECT PIPES

# MOVE THE SOFTENER INTO PLACE

Move the softener into place, onto a level and smooth surface. If needed, put a piece of 3/4" plywood, at least 17" x 20", under the tank. Then put spacers under the plywood to level the softener. Do not put shims or spacers directly under the tank, without the plywood. The weight of the softener, when full of salt and water, may cause the tank to puncture or break at the shim or spacer.

To move the softener, grip under the ridge on the salt tank sidewall and carefully rock back and forth, into position.

**CONNECT THE SOFTENER** (Refer to your plan drawing on page 2-3, and to page 2-4 or 2-5. Read the IMPORTANT note on page 3-3. Then, measure, cut (thread if needed) and put all pipe and fittings together up to the main water pipe, or to the bypass valve(s) you installed on page 3-3.

# Notes:

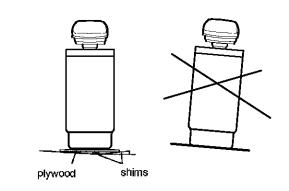
- Include adaptors, reducers, union fittings, etc., as needed.
- Cut pipe lengths exact for correct aligning, and to prevent stress on the softener valve.
- Use pipe joint compound or Teflon tape on outside pipe threads.
- When all piping fits together...
- ...solder all sweat fittings.
- ...prime and cement all CPVC joints.
- ...tighten all threaded joints.

# (AUTIONS:

▲ Never solder fittings while connected to nonmetallic parts. Wait until soldered pipe has cooled before connection (see fig. 11).

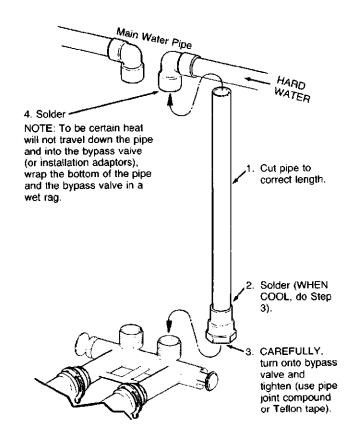
▲ Be careful when putting pipe fittings together. Do not cross thread, and do not overtighten.

### MOVE SOFTENER INTO PLACE **FIG.10**



# FIG.11

# TYPICAL SOLDERING CONNECTIONS



# SECTION 3 STEP BY STEP GUIDES TO INSTALL

# D. CONNECT VALVE AND SALT TANK DRAINS

# CONNECT THE VALVE DRAIN HOSE

Take a length of 3/8" inside diameter drain tubing and attach one end to the drain fitting (FIG. 12). Use a tube clamp to hold it in place. Put the other end of the tubing over a floor drain, into a laundry tub, standpipe, or other suitable drain. Check your local codes.

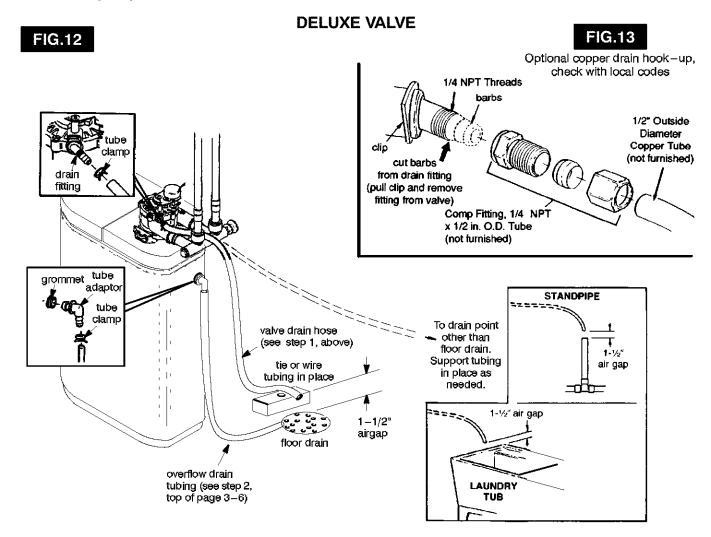
 $\triangle$  Leave an air gap of about 1-1/2" between the end of the hose and the drain. This gap is needed so you don't get a back-flow of sewer water into the softener. Do not put the end of the hose into the drain or connect without the air gap.

Place and support the hose so it does not kink or have sharp bends. So water pressure does not cause the hose to "whip", tie or wire it in place. Do not pinch the hose shut. The softener will not work if this drain hose is pinched, plugged, closed or restricted in any way.

▲ Keep the hose lower than the drain fitting. (In some homes, to get to a drain you must raise the hose and run it over-head. If you need an overhead drain, do not raise the hose more than 8' above the floor. A copper drain tube is best to use.)

**COPPER DRAIN TUBE:** The plumbing codes where you live may say that you must use a copper valve drain tube. A copper tube is also best to use for an over-head drain. Use a copper drain tube if the softener is installed outside, or in the sunlight. Heat from the sun makes many kinds of rubber or plastic hose to soften, flatten and close up.

To adapt a copper drain tube to the softener, buy a compression fitting (1/4 in. female pipe threads x)1/2 in. O.D. tube) and tubing from your local hardware store.



# SECTION 3

# STEP BY STEP GUIDES TO INSTALL

# D. CONNECT VALVE AND SALT TANK DRAINS

- 2. CONNECT SALT TANK OVERFLOW TUBING
- a Take the rubber grommet, tube adaptor and tube clamp (FIG. 12) that are in the parts bag.
- **b** Push the grommet into the hole in the salt tank wall so half is inside and half is outside.
- c Push the bigger end of the tube adaptor into the grommet.
- d Push one end of a length of 3/8" I.D. tubing onto the tube adaptor, using the tube clamp to hold it in place. Put the other end of the tubing over the floor drain.

# Important:

- The salt tank overflow is for safety only. If the salt tank should overfill with water, the overflow tubing carries it to the drain.
- Over-fill water must run downward through the tubing. Do not raise the tubing higher than the grommet and tube adaptor (FIG. 12).
- **Do not** connect to the valve drain hose you installed in step 1. Both drains must have a separate hose or tube.

# STEP BY STEP GUIDES TO INSTALL

# E. PRESSURE TEST / CHECK FOR LEAKS

# (A) CAUTION:

To avoid water or air pressure damage to softener inner parts, and to flush pipe chips or other residue from the water pipes, be sure to do the following steps exactly as instructed.

Look at the picture in FIG. 15 showing your kind of bypass valve(s).

- Fully open two cold, soft water faucets nearby the softener.
- Place bypass valve(s) in "bypass" position. On a single valve, slide the stem inward to bypass. On a 3-valve system, close the inlet and outlet valves and open the bypass valve.
- Fully open the house main water pipe shutoff valve (closed in step 1, page 3-1). Observe steady water flow from both open faucets.
- Place bypass valve(s) in "service", **EXACTLY** as follows: Keep soft water faucets open.
- SINGLE BYPASS VALVE: SLOWLY, slide pull the valve stem outward toward service, pausing several times to allow the softener to pressurize slowly.
- 3-VALVE BYPASS: Fully close the bypass valve and open the outlet valve. SLOWLY, open the inlet valve, pausing several times to allow the softener to pressurize slowly.
- After about three minutes, open a hot water faucet for about one minute, or until all air is expelled, then close.
- Close both cold water faucets.
- Check your plumbing work for leaks and fix right away if any are found. Be sure to observe previous caution notes.

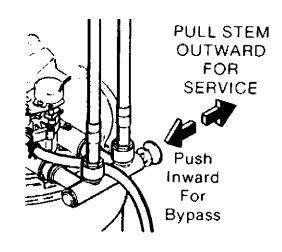
# HOUSE MAIN WATER **FIG.14** SHUTOFF VALVES Shutoff Valve Shutoff Pressure Mater Valve Meter Tank

# **FIG.15**

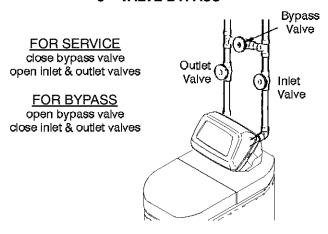
Bypass valve(s) should always remain in soft water **service** position. Position in *bypass* only if needed for softener repairs.

Pump

#### SINGLE BYPASS



### 3 - VALVE BYPASS



# F. GROUNDING / CONNECT TO ELECTRICAL POWER

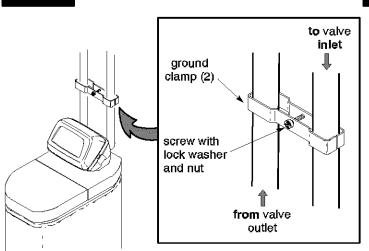
# 1. INSTALL GROUNDING WIRE BETWEEN THE SOFTENER IN AND OUT PIPES

The house cold water pipe (iron or copper) is often used to ground all electrical outlets in the home. Outlets are grounded to protect you from shock when you touch any electric appliance plugged into the outlet. If you installed the single bypass valve (FIG. 15), the cold water pipe ground is broken.

To restore the ground, take the ground clamp kit that is on the cardboard liner. Install across the inlet and outlet copper tubes as shown in FIG. 16. Be sure good contact is made between the pipe and the clamps.

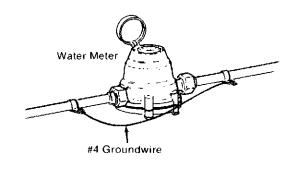
**FIG.16** 

# **COLD WATER PIPE GROUNDING**



**FIG.17** 

# WATER METER JUMPER WIRE



# Important:

Be sure the cold water pipe has direct metal to metal contact all the way to the ground. Plastic, rubber or other electrically insulating parts such as hoses, fittings, washers or gaskets can break the direct metal to metal contact. Also check the water meter (city water) or the well pump. Install #4 copper jumper wires, clamped tightly on both ends, across insulated parts (FIG. 17).

# 2. ELECTRICAL POWER OUTLET FOR YOUR SOFTENER

The softener works on 24 volt, 60 Hz electric power. The included transformer changes standard 120 volt AC house power to 24 volts. You must plug the transformer into a grounded, 120 volt outlet only. Be sure the outlet is always "live" so someone cannot turn it off by mistake.

#### Note:

The included transformer is made for *inside use only*. Be sure the electrical outlet you plug the transformer into is inside, to protect from weather (see page 2-1).

# SECTION 3

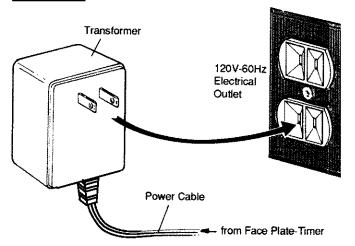
# SECTION 3 STEP BY STEP GUIDES TO INSTALL

# F. GROUNDING / CONNECT TO ELECTRICAL POWER

3. PLUG IN THE TRANSFORMER

Plug the transformer into the electrical outlet.

FIG. 18 CONNECTING TRANSFORMER



After installing your water softener, replace the covers. For the UltraSoft 100, first position the main cover on the softener. Then, set the salt hole cover into the main cover, and lower closed. For the UltraSoft 200, angle the covers so the main cover clips onto the back first, then bring down in front and clip on the 2 tabs inside the rim of the salt hole and lower the salt cover closed.

# RESTART THE WATER HEATER

# TURN ON THE GAS (OR ELECTRIC) SUPPLY TO THE WATER HEATER AND LIGHT THE PILOT

Your new Sears softener is now softening the water for your household needs. However, your WATER HEATER is filled with hard water. To have fully soft water right away, you can drain the water heater so it refills with soft water. If you don't drain the water heater, it will take a few days before you have fully soft water.

To drain the water heater, open a hot water faucet and let it run until the water runs cold. Then close the faucet.

# YOUR PLUMBING AND ELECTRICAL WORK IS COMPLETE.

Now go to your owner's manual and do the softener start-up steps...setting the timer, adding salt to the storage tank, sanitizing, etc.

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