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# **WaterWorks™**

## **Undersink Reverse Osmosis**

HOME DRINKING WATER SYSTEM  
Model RO 2000

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**Installation**

**Operation**

**Maintenance**

**Repair Parts**

IF YOU HAVE QUESTIONS WHEN  
INSTALLING, OPERATING  
AND MAINTAINING YOUR REVERSE  
OSMOSIS SYSTEM. . .

CALL TOLL FREE  
1-800-86 WATER



System Tested and Certified to  
ANSI/NSF Standard 58. See  
performance data sheet for details.

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## - WARRANTY -

### **FULL WARRANTY ON DELUXE REVERSE OSMOSIS DRINKING WATER SYSTEM (except battery, filter, filter cartridge or membrane)**

For one year from the date of purchase, when this deluxe reverse osmosis drinking water system is installed and maintained in accordance with our instructions, Sears will repair, free of charge, defects in material and workmanship, except for disposable battery, filters, cartridges and membranes.

**TO OBTAIN WARRANTY SERVICE, SIMPLY CONTACT THE NEAREST SEARS SERVICE CENTER THROUGHOUT THE UNITED STATES.** This warranty applies only while this product is in use in the United States.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Sears, Roebuck and Co., D/817 WA, Hoffman Estates, IL 60179

### **SEARS INSTALLATION POLICY**

All installation labor arranged by Sears shall be performed in a neat, workmanlike manner in accordance with generally accepted trade practices. Further, all installations shall comply with all local laws, codes, regulations, and ordinances. Customer shall also be protected, during installation, by insurance relating to Property Damage, Workman's Compensation and Public Liability.

### **SEARS INSTALLATION WARRANTY**

In addition to any warranty extended to you on the WaterWorks merchandise involved, which warranty becomes effective the date the merchandise is installed, should the workmanship of any Sears arranged installation prove faulty within one year, Sears will, upon notice from you, cause such faults to be corrected at no additional cost to you.

## - SAFETY GUIDES -

◆ Read all steps, guides and rules carefully before installing and using your Home Drinking Water System. Follow all steps exactly to correctly install. Reading this book will also help you to get all the benefits from your Home

Drinking Water System.

◆ **DO NOT ATTEMPT TO USE THIS PRODUCT TO MAKE SAFE DRINKING WATER FROM NON-POTABLE WATER SOURCES.**

## - SAFETY GUIDES -

**DO NOT USE THE SYSTEM ON MICROBIOLOGICALLY UNSAFE WATER, OR WATER OF UNKNOWN QUALITY WITHOUT ADEQUATE DISINFECTION BEFORE OR AFTER THE SYSTEM. Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.**

- ◆ CHECK WITH YOUR LOCAL PUBLIC WORKS DEPARTMENT FOR PLUMBING AND SANITATION CODES. YOU MUST FOLLOW THEIR GUIDES AS YOU INSTALL THE SYSTEM. FOLLOW YOUR LOCAL CODES IF THEY DIFFER WITH GUIDES IN THIS MANUAL.
- ◆ The Home Drinking Water System works on water pressure of 40 psi (minimum) to 125 psi (maximum). See the table on page 17. If your

house water pressure is over the maximum, install a pressure reducing valve in the water supply to the Home Drinking Water System.

- ◆ Do not install the Home Drinking Water System outside, or in extreme hot or cold temperatures. Temperature of the water supply to the Home Drinking Water System must be between 40°F (minimum) and 100°F (maximum). See the specification table on page 17. DO NOT INSTALL ON HOT WATER.
- ◆ Read the other limits (pH, hardness, etc.) on page 17 and be sure your water supply conforms. Please read WATER SUPPLY, page 4.

## - WHAT YOUR HOME DRINKING WATER SYSTEM WILL DO -

Your Home Drinking Water System is a REVERSE OSMOSIS (RO) water treating unit. It uses household water pressure to **reverse** a natural physical process called **osmosis**. Water, under pressure, is forced through a semi-permeable membrane where minerals and impurities are screened out and sent down the drain with the waste water. These minerals and impurities are measured as total dissolved solids (TDS).

The system includes replaceable pre and postfilter sediment-carbon cartridges. The prefilter removes sand, dirt, rust particles and other sediments. It also takes chlorine out of the feed water. The postfilter removes any remaining tastes and/or odors just before water is taken from the system faucet. The storage area holds almost 1 gallon of RO product water for your needs.

The undersink system connects to a house COLD water pipe for a water supply. An automatic shutoff valve prevents water waste when the storage area is full and the faucet is closed.

The drinking water system gives you a continuous supply of sparkling clear, delicious water for drink-

ing and cooking. Foods will look better and taste better too. The system eliminates the need to buy bottled water. Instead, it puts high quality water right at your fingertips.

NOTE: A product data sheet is included, and also available from Sears. The data sheet lists what this RO system will remove (or reduce) from the water.

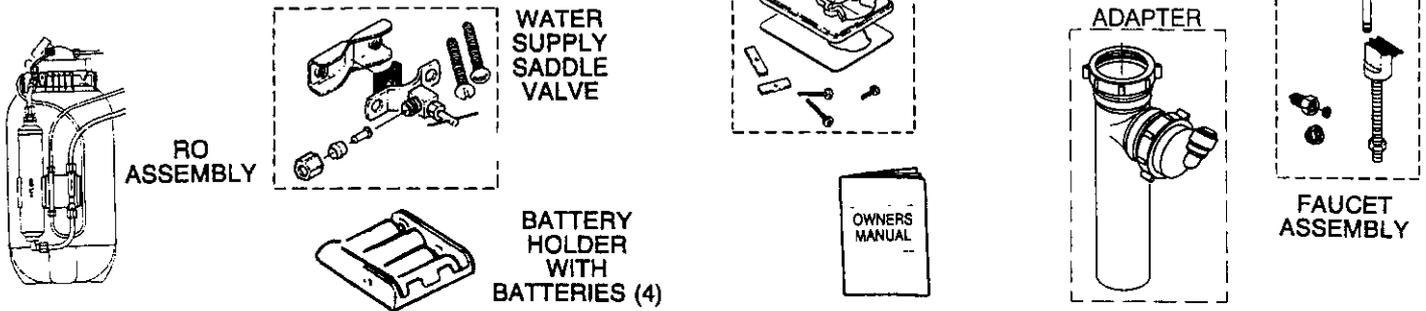
### **ELECTRONIC MONITOR**

The electronic model has 2 water quality sensors, located in the electronic box. Indicator lights on the faucet base work with the sensors, or probes, to show you when water quality is good, and when the system needs servicing.

As you take water from the RO faucet, a flashing green light means the system is giving you high quality RO water. Over a period of time, the RO membrane, prefilter cartridge and postfilter begin to lose efficiency. Flashing amber lights (see pages 12, 13 and 14) tell you when to service the RO membrane and filters.

## - THINGS TO CHECK BEFORE YOU START TO INSTALL -

■ **PARTS IN THE SHIPPING CARTON** — Unpack the carton carefully so needed parts are not discarded by mistake. Included are:



■ **WATER SUPPLY** — The cold water supply to your Home Drinking Water System must be within certain chemical limits (see page 17). If not, it will not make product water as it should, and life of the RO membrane is shortened.

**CAUTION: CHLORINE IN WATER SUPPLY.** The RO membrane is destroyed by chlorine. A pre-

filter carbon cartridge removes chlorine from the water before it enters the RO membrane.

**IMPORTANT: TO KEEP CHLORINE FROM DESTROYING THE RO MEMBRANE, BE SURE TO REPLACE THIS CHLORINE REMOVAL CARTRIDGE AT LEAST EVERY 6 MONTHS, OR 900 GALLONS. (SEE RO CARE GUIDE, PAGE 16.)**

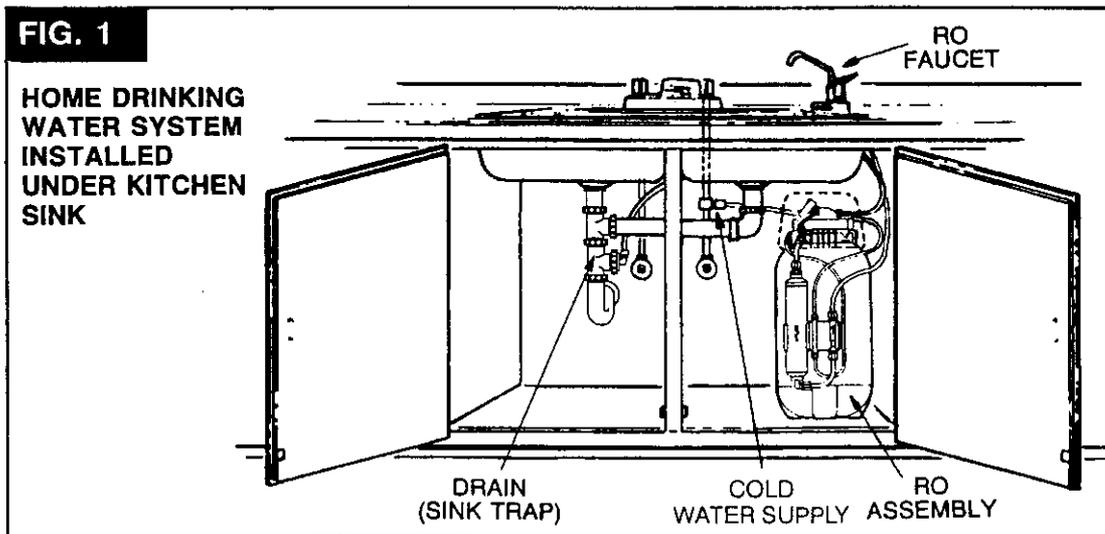
*NOTE: Codes in the state of Massachusetts require installation by a licensed plumber, and do not permit the use of the saddle valve. For installation, use plumbing code 248-CMR of the Commonwealth of Massachusetts.*

■ **WHERE TO MOUNT THE RO ASSEMBLY AND LOCATE THE STORAGE TANK** —

The Home Drinking Water System fits nicely under the kitchen or bathroom sink. However, you can install it where most handy for you. You do need a **COLD** water supply pipe and drain point within 6 feet. Where space is limited, you can lay it on a shelf

or floor. Locate the assembly so you can easily get to it to change filters.

The RO System weighs about 40 lbs. when full of water. Set it on the floor or other solid surface that will hold this weight.



## - THINGS TO CHECK BEFORE YOU START TO INSTALL -

**REMOTE LOCATION** — You can install the RO assembly or water supply saddle valve in another place away from the RO faucet (please see page 20).

■ **REPLACING ANOTHER RO SYSTEM** — We suggest you remove all parts of another RO system, and use everything included with your new RO system.

## - TOOLS AND MATERIALS YOU WILL NEED -

- 9/16" open end, or adjustable wrench
- standard pliers, and larger adjustable jaw pliers or pipe wrench
- slotted and Phillips head screwdrivers
- plumbers putty
- pipe joint compound (thread seal) or Teflon tape, approved for use on potable water supplies
- hand or battery powered drill with 1/8" bit (if needed for the cold water supply valve, page 6)

- electric drill and bits, if hole is needed for the RO faucet, page 7

**CAUTION: TO AVOID DAMAGING A SINK BEYOND REPAIR, CONSULT A QUALIFIED PLUMBER OR INSTALLER FOR GUIDES BEFORE DRILLING HOLES IN PORCELAIN OR STAINLESS STEEL**

## - 5 STEPS TO INSTALL THE SYSTEM -

**STEP 1 - INSTALL THE COLD WATER SUPPLY SADDLE VALVE, PAGE 6.**

**STEP 2 - INSTALL THE DRAIN ADAPTER, PAGES 6 AND 7.**

Note: Running the drain tubing directly to a floor drain, sump, standpipe, laundry tub, etc., as shown on page 20, is preferred. However, if that is not possible or practical, the included drain adapter installs in the sink drain pipe, always **above** or ahead of the p-trap. **Be sure to comply with your local plumbing codes.** Other drain pipe fittings, in addition to the adapter, may be needed.

**STEP 3 - INSTALL THE FAUCET, PAGES 7-9.**

- A - PREPARE MOUNTING HOLE**
- B - ASSEMBLE FAUCET**
- C - FASTEN FAUCET IN PLACE**

**STEP 4 - MAKE ELECTRICAL, AND REMAINING TUBING CONNECTIONS.**

**STEP 5 - SANITIZING, PRESSURE TESTING, PLACING IN "SERVICE".**

# - HOW TO INSTALL YOUR HOME DRINKING WATER SYSTEM -

## STEP 1 — INSTALL THE COLD WATER SUPPLY SADDLE VALVE (FIG. 2)

■ Install this valve on the COLD water pipe to the kitchen sink (FIG. 2).

■ This valve has a cutting pin and will make its own hole in copper or plastic pipe. To install on iron pipe, you have to drill a 1/8" diameter hole for the cutting pin.

**DANGER (IF DRILLING PIPE): TO PROTECT YOURSELF FROM SERIOUS INJURY OR FATAL SHOCK, USE A HAND OR BATTERY POWERED DRILL ONLY TO MAKE THE HOLE. DO NOT USE AN ELECTRIC DRILL.**

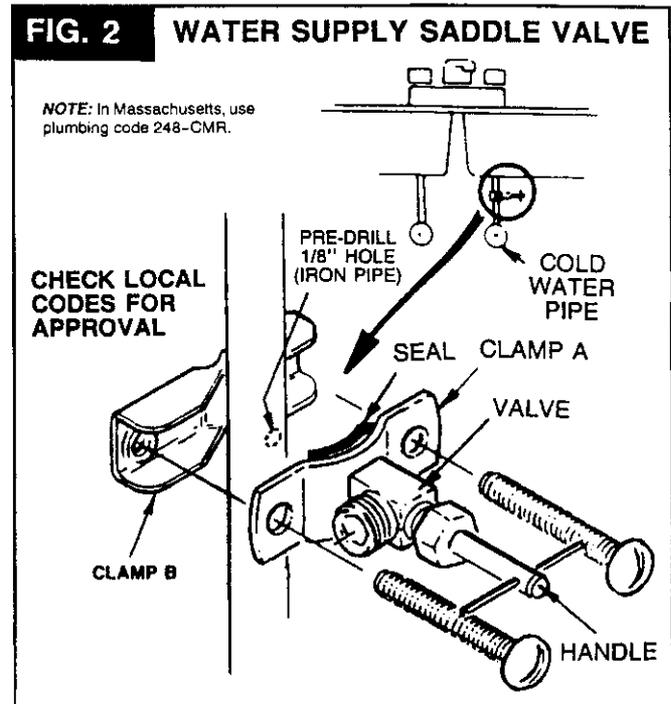
■ USE THE FOLLOWING GUIDES TO INSTALL:

1. Close the house main water supply valve. Open a high and low faucet in the house to drain water from the pipes.

2. Looking at FIG. 2, if not already done, turn the valve into clamp A and tighten. Turn the valve handle all the way out.

NOTE: If you have to drill a 1/8" diameter hole, hold the valve with clamp A up to the pipe and mark the spot to drill. **BEFORE DRILLING, READ THE DANGER NOTE ABOVE.**

3. Place the seal on the inside of clamp A as shown. Locate clamp A (turn handle in to align pin if pre-drilled hole) and clamp B on the pipe. Fasten in place using 2 screws. Tighten each screw evenly,



but do not overtighten and crush the pipe.

4. Turn the valve handle inward to make a hole in the copper or plastic pipe.

**DO NOT TURN ON THE WATER SUPPLY AT THIS TIME.**

**NOTE: BE SURE THE VALVE HANDLE PACKING NUT IS TIGHT.**

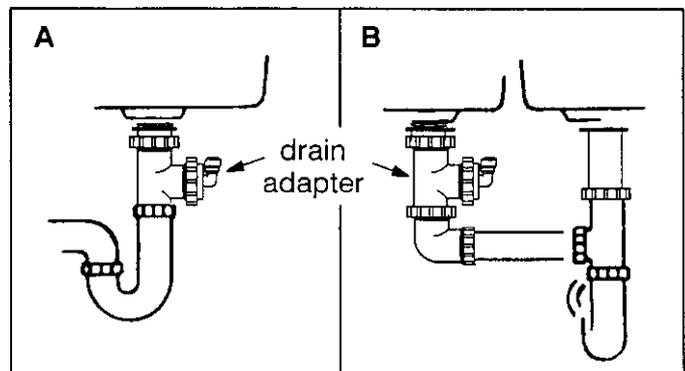
## STEP 2 — INSTALL THE DRAIN ADAPTER

■ Before beginning, be sure to read the note on page 5.

■ The drain adapter fits 1-1/2" sink drain pipe.

■ The adapter installs directly onto the sink tail-piece as typically shown in fig. A and B.

■ Locate so drain tubing from the faucet (FIG. 7, page 10) makes a straight run to the adapter, **without dips, loops, low spots or kinks.**



*continued on page 7*

# – HOW TO INSTALL YOUR HOME DRINKING WATER SYSTEM –

## INSTALL THE DRAIN ADAPTER

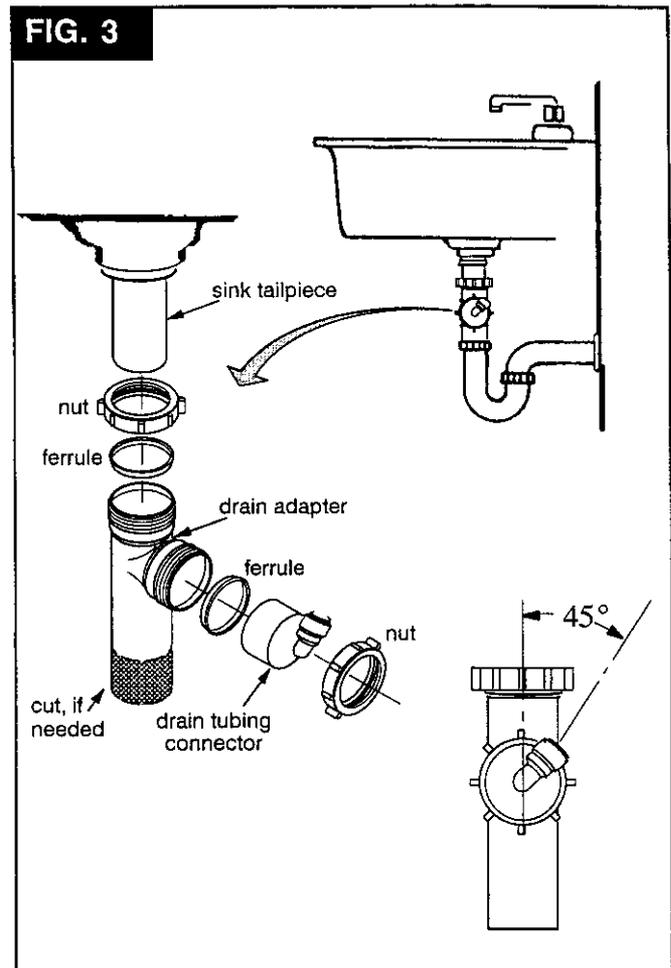
■ Use FIG. 3 and the following guides.

Note: Consult a plumber if you are not familiar with plumbing procedures.

1. Use a ferrule and nut to assemble the drain tubing connector to the drain adapter. Turn the connector to about 45° from the 12:00 position, as shown (to 10:00 or 2:00 position). Tighten the nut securely.
2. Carefully disassemble the sink drain pipe and clean the tailpiece to assure a leak-tight fit.
3. Install the drain adapter onto the sink tailpiece, using a ferrule and nut. Snug the nut, but do not tighten.

Note: If needed, to make fit, you can cut to shorten the unthreaded end of the adapter. **Do not cut too short** so the adapter will make a leak-tight seal with the connecting fitting.

4. Assemble the p-trap to the drain adapter, and other drain pipe fittings as required (check codes) to complete the drain run.
5. Tighten all connections.



## STEP 3 — PREPARE MOUNTING HOLE, ASSEMBLE FAUCET AND INSTALL

### A. PREPARE MOUNTING HOLE.

1. Pick 1 of the following places for the faucet where it will fit flat against the surface. Be sure you have room underneath for the tubing connections (FIG. 7, page 10).

... in a hole already in the sink (enlarge to 1-1/4" diameter if needed) to use for an extra faucet or spray.

... drill a hole (1-1/4" diameter) in the sink top.

CAUTION: TO AVOID DAMAGING A SINK

BEYOND REPAIR, CONSULT A QUALIFIED PLUMBER OR INSTALLER FOR GUIDES BEFORE DRILLING HOLES IN PORCELAIN OR STAINLESS STEEL.

... drill a hole (1-1/4" diameter) in the countertop next to the sink.

2. Drill the mounting hole.

3. Place plumbers putty around the edge of the hole to prevent water leakage around the faucet base.

# - HOW TO INSTALL YOUR HOME DRINKING WATER SYSTEM -

## ASSEMBLE FAUCET AND INSTALL - continued

### B. ASSEMBLE FAUCET (FIG. 4)

1. Remove the hex nut, and all other parts shown in the dotted line box, FIG. 4.

2. Insert the faucet stud through the top gasket and faucet base. Then, replace the hex nut and tighten. **DO NOT OVERTIGHTEN AND BREAK THE FAUCET BASE.**

NOTE: The faucet *may* include some small parts that are not used.

3. Wet the o-rings (2) on the faucet spout. Push the spout into the faucet body until it bottoms in the cavity.

### C. FASTEN FAUCET IN PLACE

1. Looking at FIG. 5A, locate the faucet support and gasket over the sink or countertop mounting hole.

NOTE: First, breakout small button and save for use in step 10.

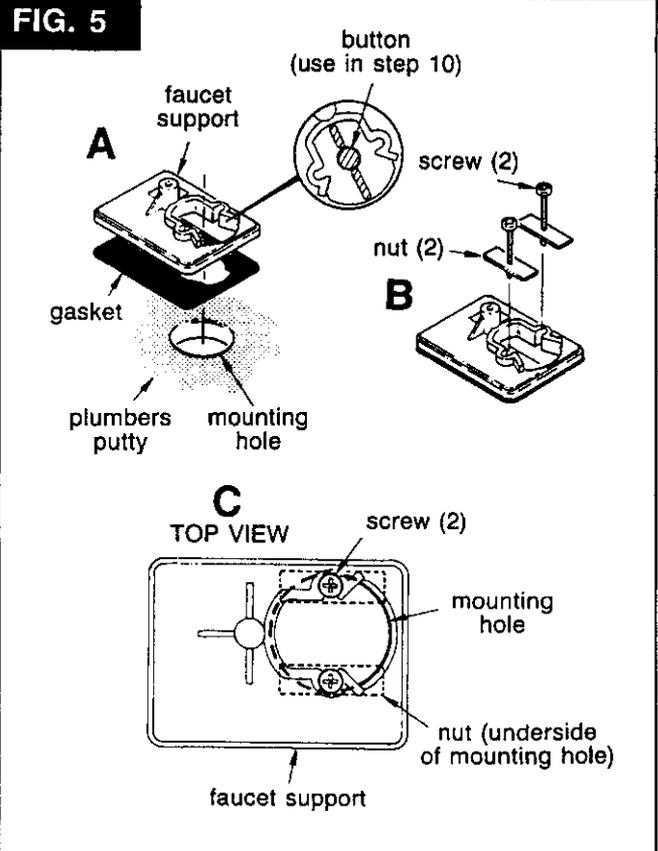
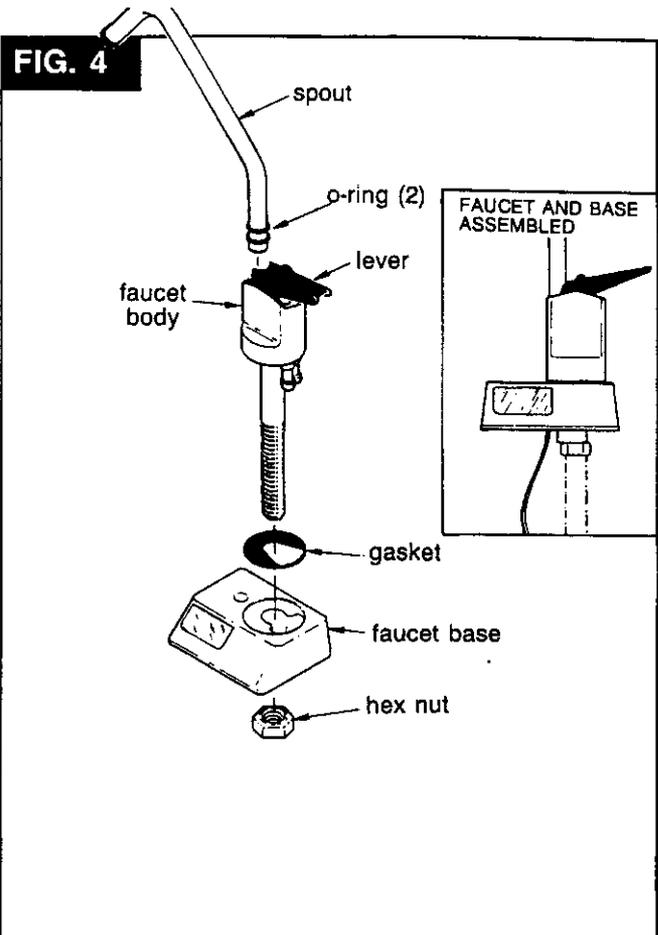
2. Turn the special nuts (FIG. 5B) a few turns onto the 1-3/8" long screws.

3. Place a screw into a notch in the faucet support, with the nut on the underside of the mounting hole (FIG. 5C). Use a finger to hold the nut and tighten the screw until snug. In the same manner, install the second screw and nut. **BE SURE THE SUPPORT IS POSITIONED CORRECTLY, THEN TIGHTEN BOTH SCREWS EVENLY UNTIL THE SUPPORT IS HELD FIRMLY IN PLACE.**

4. As shown in FIG. 6, insert the washer into the tubing adaptor. Turn the adaptor onto the faucet stud, and tighten.

5. Move the RO assembly into installation position under the sink, or other desired location. Route the 2 lengths of tubing, marked "FAUCET", and "1/4" BARB ON FAUCET", from the bottom, upward through the mounting hole and faucet support (FIG. 6).

6. Using the brass tubing nut, fasten the 3/8" tubing (marked "FAUCET") to the tubing adaptor and



## - HOW TO INSTALL YOUR HOME DRINKING WATER SYSTEM -

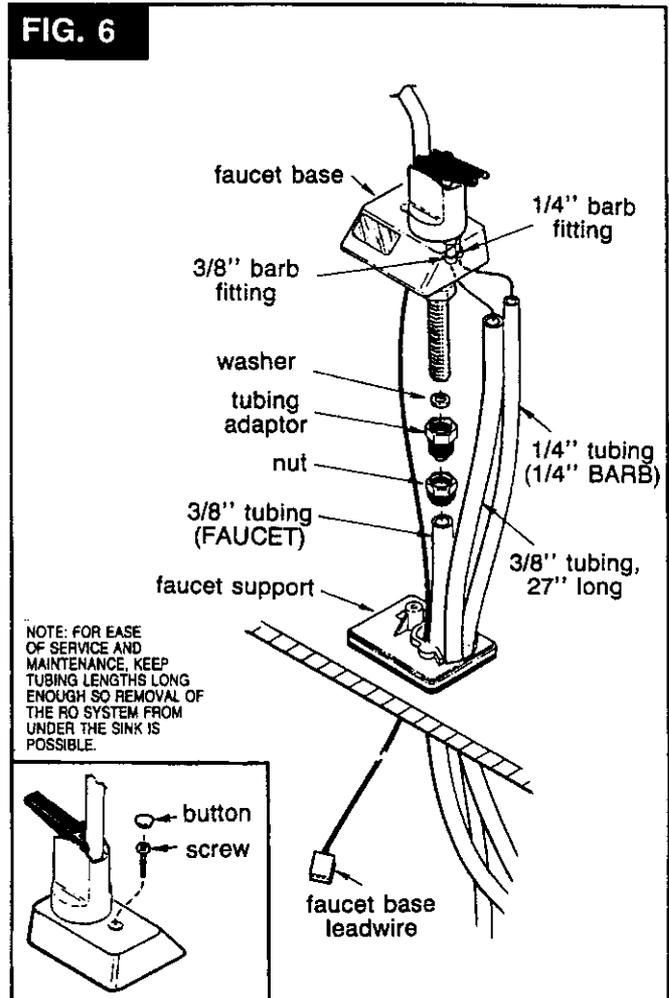
tighten the nut. **NOTE:** Cut tubing as needed for neat appearance, but keep long enough to allow easy service of the RO system.

7. If needed, cut the 1/4" tubing (marked "1/4" BARB ON FAUCET") to length. Then, push the end all the way onto the 1/4" barb fitting on the faucet.

8. Take the 27" long separate piece of 3/8" tubing and pass 1 end down through the faucet support. Push the other end all the way onto the 3/8" barb fitting on the faucet.

9. Feed the faucet base leadwire down through the faucet support.

10. Lower the faucet and base down onto the faucet support, carefully working the tubing and leadwire through the support. Use the 5/8" long screw to fasten base and support together. Insert the button, removed from the support in step 1, into the hole to cover the screw.



### STEP 4 — MAKE ELECTRICAL, AND REMAINING TUBING CONNECTIONS

#### A. INSTALL BATTERY PACK IN ELECTRONIC BOX.

1. Looking at FIG. 7, page 10, remove the rubber retainer holding the electronic box and postfilter in the holder.

2. Pull the electronic box from the holder and remove the back cover.

3. Fasten the battery pack (BE SURE BATTERIES ARE INSTALLED CORRECTLY, AS SHOWN ON THE BATTERY HOLDER) and electronic box con-

nectors together. Place the battery pack inside the electronic box and install the back cover.

4. Reinsert the electronic box and postfilter into the holder bracket.

5. Replace the rubber retainer around the holder.

*continued on next page*

# - HOW TO INSTALL YOUR HOME DRINKING WATER SYSTEM -

## MAKE REMAINING RO CONNECTIONS - continued

### B. CONNECT TUBING, FAUCET TO DRAIN TUBING CONNECTOR

Looking at FIG. 7 and page 16, run the 3/8" x 27" tubing from the RO faucet, to the connector at the adapter you installed in the sink drain pipe. Cut this tubing as needed to route in as **straight of a run as possible without dips, loops, low spots or kinks**. Be sure the end of the tubing is cut square, then push the end into the connector until it stops (about 11/16"). Pull on the tubing to be sure it is held securely.

### C. CONNECT TUBING TO WATER SUPPLY

Use the tubing insert, ferrule and nut, at the water supply saddle valve, to fasten the remaining 1/4" tubing (marked "WATER SUPPLY"). Tighten the nut with a wrench.

D. Fasten the faucet base and electronic box lead-wire connectors together, routing where dry, and out of the way.

## STEP 5 — SANITIZING, PRESSURE TESTING, PLACING IN "SERVICE"

A. DO THE SANITIZING PROCEDURES, PAGE 15. THEN, CONTINUE WITH STEP B.

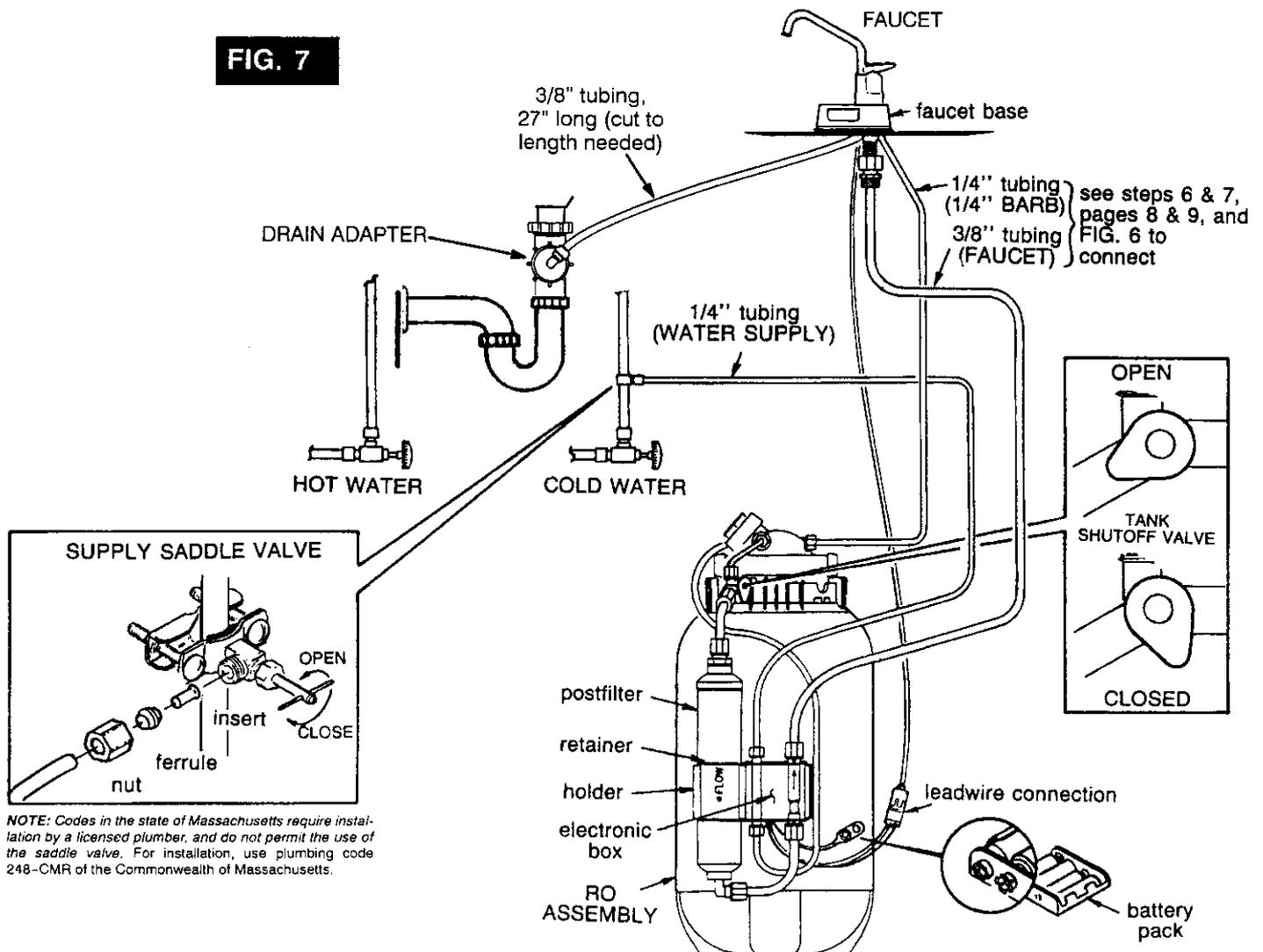
B. Double check all tubing connections to be sure they are tightened.

C. Open the house main water supply valve and the supply saddle valve (turn handle fully out). Open the tank shutoff valve . . . see below.

D. In about 4 hours, pressure will start to build in

*continued on next page*

**FIG. 7**



NOTE: Codes in the state of Massachusetts require installation by a licensed plumber, and do not permit the use of the saddle valve. For installation, use plumbing code 248-CMR of the Commonwealth of Massachusetts.

## - HOW TO INSTALL YOUR HOME DRINKING WATER SYSTEM -

the RO system. At that time, carefully check all fittings and tubing connections for any water leaks. Correct leaks if any are found.

### E. IMPORTANT PURGING INSTRUCTIONS:

The RO cartridge contains a food grade preservative that you should clean from it before using the system. The preservative will give product water an unpleasant taste and odor.

1. After the storage bladder has filled (takes about 4 hours), open the system faucet until the bladder is empty.

2. Allow the bladder to fill again for about 4 hours, then open the faucet and empty. After 4 purgings, the system is ready to make product water for your use.

## - HOW YOUR HOME DRINKING WATER SYSTEM WORKS -

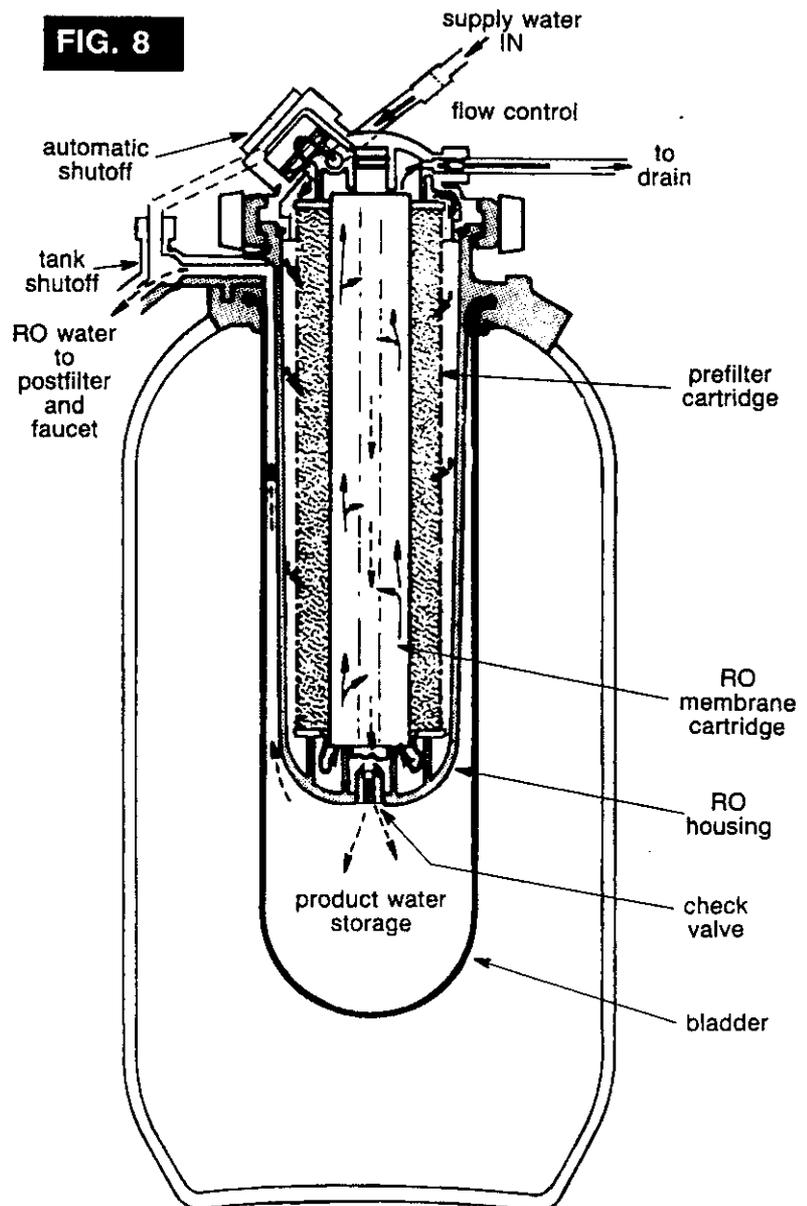
Water from the cold supply pipe saddle valve is directed through 1/4" tubing, to the electronic box. Here, the total dissolved solids (TDS) content, of the supply water, is measured. Water flow continues to the RO prefilter.

**PREFILTER** - The prefilter is a replaceable sediment-activated carbon cartridge. It removes sand, silt, dirt, other sediments, and up to 2 parts per million (ppm) chlorine from the supply water. **CHLORINE WILL DESTROY THE RO MEMBRANE. . . SEE PAGES 4 AND 13.** Filtered, clean, chlorine-free water flows from the prefilter and to the RO membrane.

**RO MEMBRANE CARTRIDGE** - The RO cartridge, located inside of the prefilter, is a tightly-wound, semi-permeable membrane. Semi-permeable means water will work through the membrane, but first, dissolved solids and organic matter are screened out and flushed to the drain. The screened, high quality product water goes to the storage area, or to the postfilter if the RO faucet is open.

**POSTFILTER** - After leaving the storage area, but before going to the faucet, product water goes through the postfilter. The postfilter is also a sediment-carbon type filter. It removes any remaining tastes, odors or sediments from the product

*continued on next page*



## - HOW YOUR HOME DRINKING WATER SYSTEM WORKS -

### POSTFILTER - continued

water. High quality drinking water flows from the postfilter and to the faucet.

NOTE: Before going to the faucet, product water passes through the electronic box and remaining TDS is measured by a sensor.

**FAUCET** - The sinktop or countertop faucet dispenses the drinking water. It has a hand operated, spring loaded lever to keep the faucet closed and to prevent waste. You can keep the faucet open by pushing upward on the lever and locking it against the spout. To meet plumbing codes, an air-gap is built into the faucet drain water tubes. The air-gap prevents a back siphon of drain water.

**MONITOR** - When the faucet is opened, lights on the faucet base show how the RO system is working.

- **FLASHING GREEN** - The RO system is giving you high quality product water.

NOTE: The green light may stop flashing when the supply of RO water is nearly gone, and flow from the faucet decreases. This is a normal condition.

- **FLASHING AMBER "FILT"** - The prefilter cartridge and postfilter need replacing. Also replace the control box batteries . . . see page 14. This

light comes on after 6 months, or after 900 gallons of product water use.

- **FLASHING AMBER "RO"** - The RO membrane cartridge needs replacing. (BE SURE TO REPLACE BATTERIES . . . SEE ABOVE, TO ASSURE PROPER "RO" LIGHT OPERATION.) The RO light comes on when the RO membrane no longer removes at least 75% of the TDS from the water supply.

NOTE: Disregard the "RO" light when it flashes for a few seconds at a time.

**AUTOMATIC SHUTOFF** - When the storage area has filled with product water, and the RO faucet is closed, the automatic shutoff is forced closed. Water flow through the system is stopped before it can enter the RO module, preventing continued flow to the drain. The shutoff remains closed, and water is saved, until the faucet is opened again.

**CHECK VALVE** - A check valve (FIG. 8) is built into the product water outlet of the RO housing. The check valve prevents a backward flow of product water, from the storage area, to the membrane. A backward flow could rupture the RO membrane.

**FLOW CONTROL** - The flow control (FIG. 9) keeps flow through the RO cartridge at the needed rate for high quality product water. A cone shaped screen fits over the flow control to help prevent plugging with drain water sediments.

## - CARE OF YOUR HOME DRINKING WATER SYSTEM -

To keep your Home Drinking Water System working and making high quality water, you must make sure supply water is always within the limits shown on page 17. This gives you the longest life from the PREFILTER CARTRIDGE, RO MEMBRANE CARTRIDGE, and POSTFILTER. Each of these will wear out in time and need replacing.

**CAUTION: BEFORE WORKING ON THE SYSTEM, DO THE FOLLOWING TO RELIEVE WATER PRESSURE IN THE RO TANK.**

- 1a. Turn off the water supply to the RO (turn the supply saddle valve all the way inward...FIG. 7).
- b. Open the product water faucet and keep open until water flow stops.
- c. Using a 2 gallon (minimum) container to catch

the water, disconnect the postfilter and empty the storage bladder.

2. Looking at FIG. 9, or page 18, remove the protective cap and depress the relief valve stem, allowing air to ENTER the tank (do not block valve passage). Release the valve stem AFTER flow from the shutoff valve slows to a slight drip. Replace the protective cap.

CAUTION: This valve is for vacuum relief only. DO NOT attempt to pressurize the tank.

3. Reconnect the postfilter.

## - CARE OF YOUR HOME DRINKING WATER SYSTEM -

**PREFILTER CARTRIDGE** - You must replace the prefilter cartridge often to protect the RO membrane from being destroyed by chlorine, and/or from plugging with sediments from the water supply. If you have chlorine in the water, replace the cartridge at least every 6 months. If the prefilter cartridge plugs with sediments, water flow into the RO system drops, slowing the making of quality RO water. The RO membrane may also begin to plug with sediments. If this happens, you may not get enough RO water for your needs.

**NOTE:** The amber "FILT" light on the faucet base will begin to flash after 6 months or 900 gallons of product water use to tell you the filter cartridge needs replacing.

**POSTFILTER** - Always replace the postfilter at the same time you replace the prefilter cartridge. The postfilter gives the product water a final filtering of any tastes and/or odors that may remain.

### TO REPLACE THE POSTFILTER

**CAUTION: BE SURE TO RELIEVE PRESSURE, STEPS 1, 2 AND 3, BOTTOM OF PAGE 12.**

1. Disconnect tubing at both ends (Fig. 9).
2. Pull the filter from the holder and remove fittings from both ends.
3. Observing the flow arrow, on new filter, turn the fittings (use Teflon tape) into both ends. The elbow fitting installs at the bottom end, or outlet.
4. Replace filter into the holder and reconnect the tubing at both ends.

### TO REPLACE THE PREFILTER CARTRIDGE

**CAUTION: BE SURE TO RELIEVE PRESSURE, STEPS 1, 2 AND 3, BOTTOM OF PAGE 12.**

**IMPORTANT: BE SURE YOUR HANDS ARE CLEAN BEFORE WORKING ON RO SYSTEM INTERNAL PARTS.**

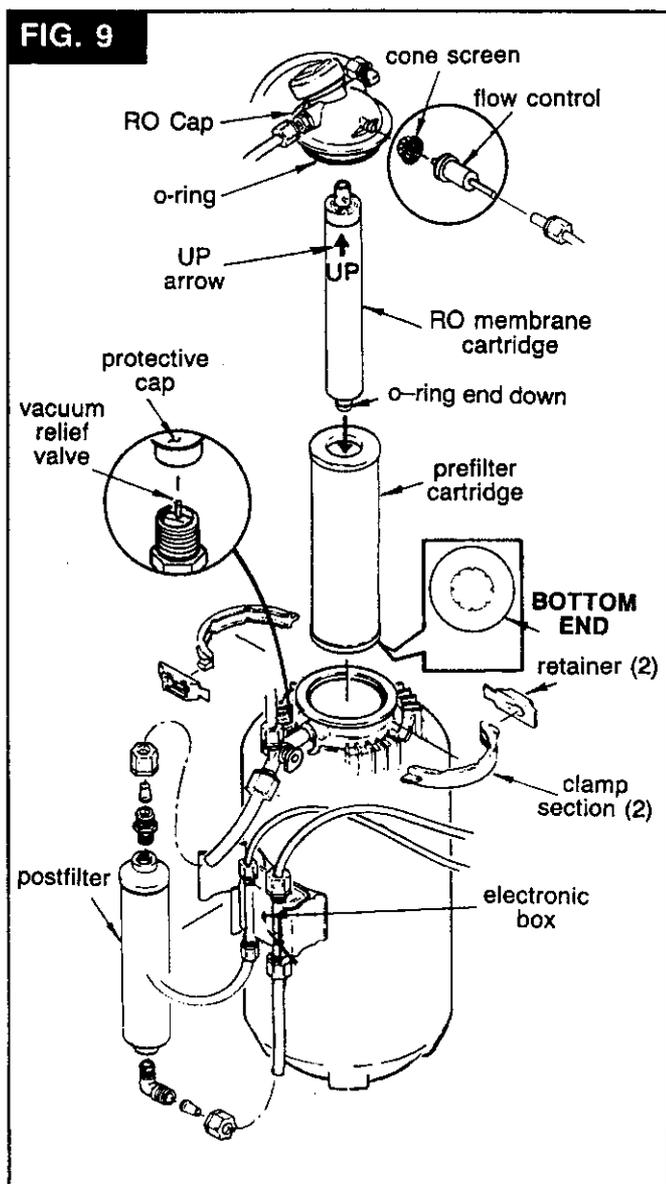
1. Remove the clamp retainers and clamp sections (Fig. 9).
2. Separate the cap from the RO housing (no need to disconnect tubing) and set aside.

**NOTE: If the cap o-ring seal remained in the RO housing, replace it on the cap.**

3. Lift the RO cartridge and prefilter cartridge from the housing, then separate and dispose of the prefilter cartridge.
4. Dump water remaining in the RO housing.
5. Slide the RO cartridge **INTO THE TOP END** of the new prefilter cartridge, as shown in FIG. 9, then place into the RO housing.

**NOTE: Be sure the bottom end of the prefilter is at the bottom, and the up arrow (▲) on the RO cartridge points upward (o-ring seal end downward).**

6. Be sure the cap o-ring has lubrication (silicone grease). Then, push into position and install clamp sections and retainers.
7. Replace the electronic box batteries . . . see page 14.



## - CARE OF YOUR HOME DRINKING WATER SYSTEM -

**RO MEMBRANE CARTRIDGE** - The useful life of the membrane cartridge depends mostly on the pH (see page 17) of your supply water. The lower the pH, the longer the membrane will last. For example, if the feed water has a pH of about 7.0, the cartridge may last for over 1 year; but if the pH is high, cartridge life may be shortened. The high pH weakens the membrane and makes pin hole leaks.

**NOTE:** The amber "RO" light on the faucet base will begin to flash when RO water quality drops so less than 75% of the TDS are removed from the supply water.

This reverse osmosis system contains a replaceable treatment component critical for effective removal of total dissolved solids. The water should be tested periodically to verify that the system is performing satisfactorily.

### TO REPLACE THE RO CARTRIDGE

1. Refer to page 13 and follow instructions under "To Replace the Prefilter Cartridge".
2. Remove and replace the flow control and screen (see steps on this page).
3. Turn on the water supply and **PURGE THE RO CARTRIDGE . . . SEE PAGE 11.**

**BATTERIES IN ELECTRONIC BOX** - Always replace the batteries (4, "AA" alkaline) in the electronic control box after installing a new prefilter cartridge and postfilter. Good batteries assure proper operation of the indicator lights. Removing the batteries also resets the 6 month or 900 gallon period for monitoring the filter cartridges. See FIG. 7 on page 10.

**FLOW CONTROL** - A clean flow control is a must for the RO membrane to make high quality product water. The flow control keeps water flow through the membrane at the right rate to get the best quality product water. If the control becomes plugged, so water can't get through, it will only take a short time

for the RO membrane to become useless. A small, cone-shaped screen is positioned over the flow control (FIG. 9) to help keep the flow control clean.

Every time you work on the RO system, check the flow control and screen to make sure they are clean.

### TO REPLACE FLOW CONTROL AND SCREEN

**CAUTIONS:** To install the screen, place the cone end into the RO cap. Then carefully push it in using 1/4" tubing as a tool. Do not force in farther after you feel resistance. Visually check to be sure it is properly positioned.

When installing the flow control, tighten the nut by hand, then another 1/4 to 1/2 turn with a pliers. **DO NOT OVERTIGHTEN AND DISTORT OR CRUSH THE TUBING AND FLOW CONTROL.**

### SERVICING THE BLADDER

If the bladder should require inspection and replacement, use the following guides. Refer to the parts illustration on page 18.

**CAUTION: BE SURE TO RELIEVE PRESSURE, STEPS 1, 2 AND 3, BOTTOM OF PAGE 12.**

1. Remove the vacuum relief valve (use 7/16" socket).
2. Rotate the tank shutoff valve 90° and pull from the RO housing.
3. Apply downward pressure on the RO cap while rotating counterclockwise 90°.

**NOTE:** If the cap turns in the RO housing, first do steps 1 and 2 under "To Replace the Prefilter Cartridge", page 13.

4. Lift the RO housing out of the liner assembly and **PLACE WHERE CLEAN AND SANITARY.**
5. Remove the bladder.

**NOTE:** BE SURE THE INNER SURFACE OF THE REPLACEMENT BLADDER, AND THE OUTER SURFACE OF THE RO HOUSING ARE CLEAN. USE DISH SOAP AND HOT WATER TO CLEAN AND RINSE.

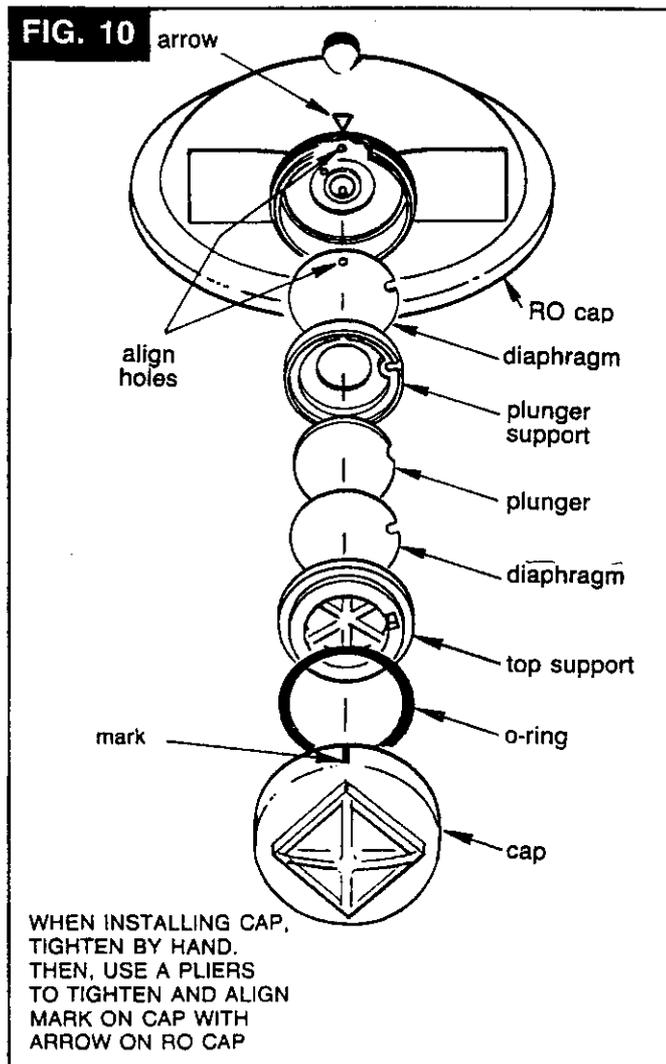
6. Install the bladder into the liner assembly. Wet the top bead of the bladder with water, or apply a light coating of silicone grease.

## - CARE OF YOUR HOME DRINKING WATER SYSTEM -

7. Install the RO housing, push downward and rotate 90° clockwise to lock in place.
8. Replace the tank shutoff valve and rotate 90° to lock.
9. Using the o-ring seal, replace the vacuum relief valve.
10. **DO THE SANITIZING AND PURGING PROCEDURES, PAGE 10.**

### **AUTOMATIC SHUTOFF SERVICE**

If the shutoff assembly, on the RO cap, requires service, reassemble parts exactly as shown in FIG. 10. Be sure to align indicated marks to properly torque cap to RO cap.



### **SANITIZING THE RO SYSTEM**

Sanitizing is recommended upon installation of the RO system, and after servicing inner parts of the RO housing, and cap. IT IS IMPORTANT FOR THE SERVICE PERSON TO HAVE CLEAN HANDS WHILE HANDLING INNER PARTS OF THE SYSTEM.

1. BE SURE WATER SUPPLY TO THE RO IS TURNED OFF, AND THE RO FAUCET IS OPEN.
2. Remove the clamp retainers and clamp sections, Fig. 9, page 13.
3. Lift the cap from the RO housing (no need to disconnect tubing) and move aside.

**NOTE: IF THE CAP O-RING SEAL REMAINED IN THE RO HOUSING, REPLACE IT ON THE CAP.**

4. Remove the RO cartridge and prefilter cartridge from the RO housing. If needed, flush housing with fresh, clean water.

5. Fill the RO housing, with fresh water, to about 1 inch from the top. Add 1.0 oz. of chlorine (ordinary 5.25% household bleach . . . Hilex, Clorox, etc.) and mix in the water. DO NOT ADD CHLORINE FIRST. Concentrated, it will attack plastics.

6. Replace the cap, with o-ring, and install the retaining clamps.

7. Connect the RO faucet product water tubing directly to the tank shutoff valve, isolating the carbon postfilter.

8. Open the tank shutoff valve, and the water supply to the RO. Open the RO faucet, locking the lever upward, against the spout.

9. Allow water to circulate through the system until the bleach odor is gone.

10. Turn off the water supply to the RO. Close the RO faucet after water flow stops.

11. Reconnect the postfilter (replace used filter) to the RO system, Fig. 9, page 13.

- 12 a. Do steps 2 and 3.

- b. Replace the RO cartridge and prefilter cartridge (BE SURE YOUR HANDS ARE CLEAN).

- c. Do step 6.

- d. Turn to page 10 and do the pressure testing and purging steps B through E.

# - CARE OF YOUR HOME DRINKING WATER SYSTEM -

## RO CARE GUIDE

### MODEL RO 2000 WITH MONITOR

**IMPORTANT: BEFORE DOING THE FOLLOWING MAINTENANCE, BE SURE TO RELIEVE PRESSURE AND ALLOW AIR TO ENTER THE TANK, STEPS 1, 2 AND 3, PAGE 12.**

**1.** Replace the prefilter cartridge and postfilter when the amber "FILT" light begins to flash while taking product water from the RO faucet. Clean or replace the flow control and screen, and replace the batteries in the electronic control box.

**2.** Replace the RO membrane cartridge when the amber "RO" light begins to flash while taking product water from the RO faucet. Clean or replace the flow control and screen.

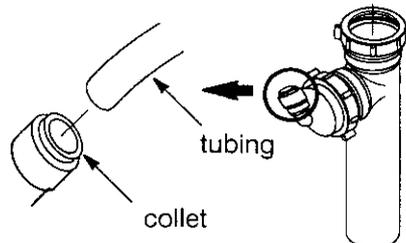
**NOTES:** **a.** If slow making of product water occurs before an amber light begins to flash, replace the prefilter cartridge. If production rate does not improve, then replace the postfilter and RO membrane. **b.** If product water flow from the RO faucet is slow, do the steps referred to in the IMPORTANT note above.

## OTHER TROUBLESHOOTING

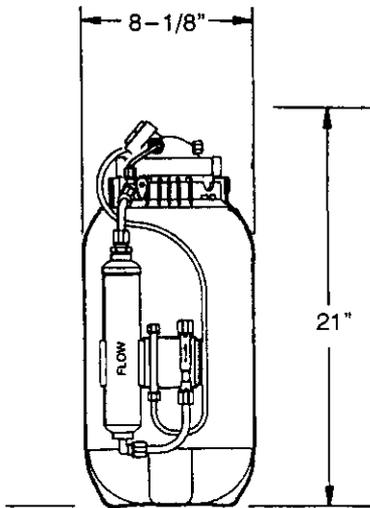
PROBLEM	CAUSE	CORRECTION
<i>Chlorine taste and/or odor in the RO product water</i>	The ppm of chlorine in your water supply exceeds maximum limits, and has destroyed the RO membrane.	If the water supply contains more than 2.0 ppm of chlorine, additional filtering of the water supply to the RO is needed. Correct this condition before doing maintenance on the RO system.
	The prefilter is no longer removing chlorine from the water supply.	Replace the RO membrane cartridge, flow control, screen, prefilter, postfilter, and batteries in the electronic box.
<i>Other taste and/or odor</i>	Postfilter expended.	Replace the postfilter. If taste and odor persists, replace the prefilter, RO membrane cartridge, flow control, screen, and batteries in the electronic box.
	RO membrane cartridge expended.	
	Contamination in product water storage.	Use sanitizing procedures. Then replace the postfilter.
<i>High total dissolved solids (TDS) in product water</i>	Water supply to the RO system not within specifications.	Increase water pressure, precondition the water, etc., as needed to conform before doing maintenance on the RO system.
	RO membrane cartridge expended.	Replace the RO membrane cartridge, flow control, screen, prefilter, postfilter, and batteries in the electronic box.
<i>Slow product water flow from the RO faucet</i>	Vacuum created in storage area for product water.	Open the vacuum relief valve and allow the tank to fill with air. See page 12.
<i>Water leaking from faucet air-gap hole</i>	Drain side of faucet airgap (3/8" tubing) plugged, restricted, or incorrectly connected to drain point.	Inspect and eliminate restriction or plug. Refer to installation instructions for proper drain connection.
<i>Indicator lights, on faucet base, not working</i>	Faucet base leadwire not connected to electronic box leadwire.	Connect
	Battery pack not connected to electronic box.	
	Batteries installed incorrectly, or expended.	Observe orientation markings on the holder and install correctly. Replace batteries if old.
	Leadwires or connectors damaged.	Inspect and repair or replace as needed.

**Tubing Connection at Drain Adapter:** Cut the end of the tubing square and push into the fitting as far as possible (11/16"). Pull on the tubing to be sure it is held firmly in place.

**To Disconnect Tubing:** Push the tubing inward to depress the fitting collet. Hold the collet in while pulling the tubing out.



## - DIMENSIONS / SPECIFICATIONS -



Supply water pressure limits.....	40-125 PSI
Supply water temperature limits.....	40-100°F
Maximum total dissolved solids (TDS).....	2000 PPM
Maximum water hardness @ 6.9 pH.....	10 GPG
Maximum iron, manganese, hyd. sulfide.....	0
Chlorine in supply water (SEE PAGE 4).....	Max. 2.0 PPM <sup>1</sup>
Supply water pH limits.....	4-10 pH
Product (quality) water, 24 hrs.*.....	11 gals.
Waste water per gal. product water, 24 hrs.*.....	3 gals.
Percent rejection of TDS, minimum (new membrane)*.....	90%
Storage capacity.....	.1 gal.
Product water vending flow.....	1/2 GPM

**METRIC**  
280-860 kPa  
5-40°C

41.6 liters  
11.4 liters

3.8 liters  
1.9 liters/min.

\*Supply water at 55 psi and 77°F with 750 parts per million sodium chloride. Quality water production, amount of waste water and percent rejection all vary with changes in pressure, temperature and total dissolved solids. See the charts below for additional production and rejection rates.

<sup>1</sup> Up to 2.0 ppm removed by the RO prefilter cartridge.

NOTE: This product is tested and complies with Water Quality Association Standards.

You can use the following charts to determine RO performance for your specific water pressure and total dissolved solids content. The results are from tests conducted on the RO membrane using a 9" long flow control at a 25% product water recovery rate.

**PRODUCT WATER GALLONS PER DAY**  
(PRODUCT WATER OUTLET OPEN)

**PERCENT REJECTION OF TDS**  
(PRODUCT WATER OUTLET CLOSED)

FEED WATER PRESSURE TO RO (PSI)	PRODUCT WATER GALLONS PER DAY (PRODUCT WATER OUTLET OPEN)						PERCENT REJECTION OF TDS (PRODUCT WATER OUTLET CLOSED)						
	300	500	750	1000	2000	3000	300	500	750	1000	2000	3000	
120	39.5	36	33	29	24	19	120	98.3	97.8	97.2	96.4	94.8	93.5
110	36.5	33	30	26	21.5	17	110	98.3	97.7	97.1	96.3	94.5	92.8
100	33.5	30	27	23	19	14.5	100	98.2	97.6	97	96.1	94.2	92.1
90	30	27	24	20	16	12	90	98.2	97.5	96.8	95.8	93.8	91.2
80	27	24	21	17	13.5	9.5	80	98.1	97.4	96.6	95.5	93.1	90
70	23.5	21	18	14	10.5	7	70	98	97.3	96.4	95	92.1	87.9
60	20.5	17.5	15	11	WATER PRESSURES TOO LOW AT THIS TDS		60	97.8	97	96	94.3	WATER PRESSURES TOO LOW AT THIS TDS	
50	16.5	14.5	11.5	8.5			50	97.5	97	95.2	93		
40	13	11	8.5	5.5			40	96.7	95.5	93.9	90.5		
	300	500	750	1000	2000	3000		300	500	750	1000	2000	3000
	<b>TOTAL DISSOLVED SOLIDS (TDS)</b>						<b>TOTAL DISSOLVED SOLIDS (TDS)</b>						



## - REPAIR PARTS -

### WaterWorks™ HOME DRINKING WATER SYSTEM Undersink Reverse Osmosis MODEL RO 2000

KEY NO.	PART NUMBER	DESCRIPTION OF PART	KEY NO.	PART NUMBER	DESCRIPTION OF PART
1	7205465	Faucet	27	7167764	Flow Control
2	1260600	Washer	28	7095030	Cone Screen
3	7207734	Adaptor (Includes key nos. 2 & 4)	29	---	---
4	9043201	Nut, 3/8" Tubing	30	7115610	O-ring Seal, 3-1/8" x 3-3/8" O.D.
5	7192230	Drain Adapter	31	7110466	RO Cap
6	9003204	Nut, 1/4" Tubing (6)	32	7113846	Support, Plunger
7	7131331	Tubing Insert, 1/4" (5)	33	7113838	Plunger
8	7124986	Elbow, 1/4" NPT x 1/4" Tubing	34	7124677	Top Support
9	7114509	Tank Shutoff Valve	35	7116755	O-ring Seal, 1-3/16" x 1-3/8" O.D.
10	7116763	O-ring Seal, 7/16" x 5/8" O.D.	36	7131721	Cap
11	7131349	Tubing Insert, 3/8" (5)	37	7125932	Diaphragm Kit <input type="checkbox"/>
12	9003203	Nut, 3/8" Tubing (5)	38	42-34704	RO Electronics Assembly
13	7011272	Saddle Valve (water supply)	39	0900156	Screw, #6-32 x 5/8"
14	7087485	Connector, 1/4" NPT x 3/8" Tubing	40	7214032	Faucet Base (Includes key nos. 39, 41, 42, 43, 46 and 47)
15	42-34709	(a) Post Carbon Filter } replacement (b) Pre Carbon Filter } package has 1 of each	41	0900713	Screw, #6-32 x 1-3/8" (2)
16	9004502	Elbow, 1/4" NPT x 3/8" Tubing	42	7115262	Faucet Support <input type="checkbox"/>
17	7128702	Filter Holder	43	7115725	Nut (2)
18	7118414	Liner Assembly	44	7115822	Battery Holder <input type="checkbox"/>
19	0900044	O-ring Seal, 5/16" x 7/16" O.D.	45	7170880	Electronic Box
20	7140869	Vacuum Relief Valve	46	7090771	Gasket
21	7109910	Bladder	47	7051206	Gasket
22	7121954	Ball-Check Kit	◆	7126506	Cable Extender, 15' - optional (extends connection between faucet base and electronic box)
23	7155018	RO Housing	◆	7157280	Tubing, 3/8" x 20'
24	7176292	Clamp Section (2)	◆	7161823	Tubing, 1/4" x 20'
25	7088033	Clamp Retainer (2)	◆	7214105	Owner's Manual
26	42-34706	RO Membrane Cartridge (Includes key nos. 27 & 28)			

Place the diaphragm with the small hole into the RO cap first. Locate the small hole over the vent hole in the cap, at the 12:00 position (see page 13).

Includes the button that covers screw, key no. 39.

Purchase batteries locally (4 req'd., "AA" alkaline)

## - REMOTE INSTALLATION LOCATION -

### INSTALLING RO ASSEMBLY, AND/OR SUPPLY SADDLE VALVE IN REMOTE LOCATION

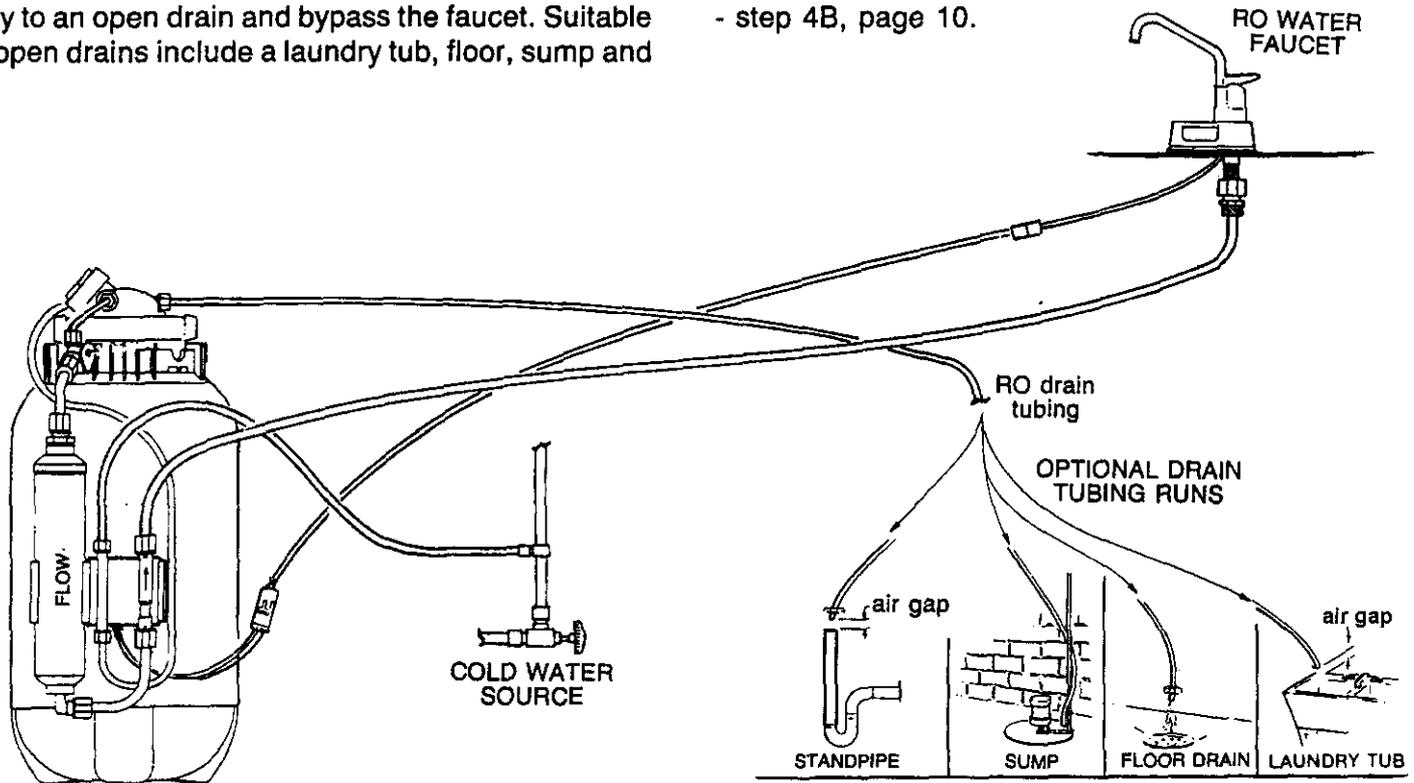
Longer lengths of tubing are available from Sears (see page 19) for installing the RO assembly, and/or water supply saddle valve away from the RO faucet. Examples: In the basement, under the kitchen or bathroom sink. In a closet or room nearby the kitchen or bathroom.

You can run the RO assembly drain tubing directly to an open drain and bypass the faucet. Suitable open drains include a laundry tub, floor, sump and

stand pipe drains. It is very important to keep the end of the RO drain tubing at least 1-1/2" above the drain point. This provides an air gap to prevent a back-siphon of sewer water.

Omit the following steps:

- all of step 2, pages 6 and 7.
- steps C7 and C8, page 9.
- step 4B, page 10.



When ordering parts, always provide the following information:

- ◆ Product Type: **WaterWorks™ Undersink Reverse Osmosis Drinking Water System**
- ◆ Model: *RO 2000*
- ◆ Part Number: *from page 19*
- ◆ Part Description: *from page 19*

**For the repair or replacement parts you need**

Call 7 am – 7 pm, 7 days a week

**1 – 800 – 366 – PART**

(1 – 800 – 366 – 7278)