

PLUS-TWELVE™ PRESSURELESS STEAM COOKER



Warning

Improper Installation, adjustment, alteration, service, or maintenance can cause property damage, injury, or death. Read the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment.

For Your Safety

Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

MODEL: ST-12 **COVERING:**
Installation
Operation
Service & Parts

INSTALLATION, OPERATION & MAINTENANCE MANUAL



MARKET FORGE
INDUSTRIES INC.

35 Garvey Street Everett MA 02149
Tel: (617) 387-4100 Fax: (617) 387-4456 Fax: (Outside MA) 1-800-227-2659
E-Mail: custserv@mfi.com Website: <http://www.mfii.com>

TABLE OF CONTENTS

PARAGRAPH	PAGE	PARAGRAPH	PAGE
SECTION 1 INTRODUCTION			
1.1 □ Description	1-1	5.4.8 □ Buzzer	5-6
1.2 □ Basic Functioning	1-1	5.4.9 □ Cold Water Condenser Circuit	5-7
1.3 □ Service	1-1	5.4.10 □ Wiring	5-7
SECTION 2 INSTALLATION			
2.1 □ Assembly	2-1	SECTION 6 MAINTENANCE	
2.2 □ Setting in Place	2-1	6.1 □ General	6-1
2.3 □ Mechanical Connections	2-1	6.2 □ Preventive Maintenance	6-1
2.4 □ Water Connections	2-1	6.2.1 □ Cooking Compartment Cleaning	6-1
2.5 □ Installation Check-Out	2-1	6.3 □ Repair & Replacement	6-1
2.5.1 □ Initial Control Settings	2-2	6.3.1 □ Door Latch Tension Adjustment	6-1
2.5.2 □ Cooker Check-Out	2-2	6.3.2 □ Door Handle Tension Adjustment	6-2
2.5.3 □ Shut-Down Procedure	2-2	6.3.3 □ Door Gasket Replacement	6-2
2.6 □ Reversing the Doors	2-2	6.3.4 □ Exterior Panel Removal	6-2
SECTION 3 OPERATION			
3.1 □ Operating Controls & Indicators	3-1	6.3.5 □ Steam & Water Solenoid Valve □ Replacement	6-2
3.2 □ Operating Procedures	3-1	SECTION 7 ILLUSTRATED PARTS LIST	
3.2.1 □ Steam Source Operation	3-1	7.1 □ General	7-1
3.2.2 □ Preheating	3-1	7.2 □ Ordering Information	7-1
3.2.3 □ Cooking	3-1	7.3 □ Index of Illustrated Parts List	7-1
3.2.4 □ Shut-Down Procedure	3-1	7.4 □ Illustrated Parts List	7-2/7-6
3.3 □ Cleaning	3-2	LIST OF TABLES	
3.4 □ Drainage	3-2	TABLE	
3.4.1 □ Cooking Compartment Drainage	3-2	SECTION 3 OPERATION	
3.4.2 □ Drip/Spill Trough Drainage	3-2	3-1 □ Controls & Indicators	3-3
3.5 □ Test Kitchen Bulletin	3-2	SECTION 5 TROUBLE-SHOOTING	
SECTION 4 PRINCIPLES OF OPERATION			
4.1 □ General	4-1	5-1 □ General Trouble-Shooting Guide	5-1
4.2 □ Plumbing Circuits	4-1	5-2 □ Electrically Fault Isolation Guide	5-2
4.2.1 □ Steam Inlet Line	4-1	LIST OF ILLUSTRATIONS	
4.2.2 □ Steam Exhaust & Drain Lines	4-1	FIGURE	
4.2.3 □ Steam Exhaust Condensing System	4-1	SECTION 2 INSTALLATION	
4.3 □ Electrical Circuits	4-2	2-1 □ Typical Door Layout	2-3
4.3.1 □ Control Circuit Components	4-3	SECTION 3 OPERATION	
4.3.1.1 □ 60 Minute Timer	4-3	3-1 □ Controls & Indicators	3-2
4.3.1.2 □ Indicator Lights	4-3	SECTION 4 PRINCIPLES OF OPERATION	
4.3.1.3 □ Buzzer	4-3	4-1 □ Pictorial Diagram - □ Steam & Water Circuits	4-2
4.3.1.4 □ Door Interlock Switch	4-3	SECTION 5 TROUBLE-SHOOTING	
4.3.1.5 □ Thermostatic Switch	4-3	5-1 □ Wiring Diagram, ST -12	5-4
SECTION 5 TROUBLE-SHOOTING			
5.1 □ General	5-1	5-2 □ Schematic Diagram, ST -12	5-7
5.2 □ Trouble-Shooting	5-1	SECTION 7 ILLUSTRATED PARTS LIST	
5.3 □ Electrical Fault Isolation	5-1	7-1 □ Cabinet Assembly	7-3
5.4 □ Electric Trouble-Shooting Procedures	5-1	7-2 □ Door Assembly	7-4
5.4.1 □ Incoming Power	5-2	7-3 □ Control Panel Assembly	7-5
5.4.2 □ Electrical Inspection	5-2	7-4 □ Condenser Assembly	7-6
5.4.3 □ 60 Minute Timer	5-3		
5.4.3.1 □ Timer Contacts	5-3		
5.4.3.2 □ Timer Motor	5-3		
5.4.4 □ Door Interlock Switch	5-6		
5.4.5 □ Steam Solenoid Valves	5-6		
5.4.6 □ Indicator Lights	5-6		
5.4.7 □ Cooking Compartment Thermostat □ Switch	5-6		

SECTION 1 INTRODUCTION

This service and parts manual contains general information, installation instructions, principles of operation, trouble-shooting, and maintenance information for Market Forge ST-12 Pressureless Steam Cooker. Also included is a part list in which each replaceable part is identified and shown in an accompanying exploded view.

1.1 Description

The ST-12 is a pressureless steam cooker consisting of a controlled compartment enclosed in a single cabinet. The compartment is equipped with a separate three-piece door with inner gasket plate isolated from the exterior surface. The door latch design ensures positive sealing of the inner door. Steam delivery and steam-condensing circuits are both electrically controlled. The operating controls are displayed on a single front-mounted panel that includes a timer with an indicator light for the selection of constant steam or 60-minute-long duration cooking.

A separate steam source is required for operation of the Pressureless Cooker and is normally purchased with it, please refer to the respective manual for guidance.

1.2 Basic Functioning

The Model ST-12 compartment is equipped with controls, allowing selection of constant steam or 60-minute timer operation. The cooker becomes operational when it is set to constant steam, or the timer is set at the desired cooking time and the compartment door is closed. The indicator light comes on and the steam solenoid valve opens, allowing steam to flow into the compartment.

When steam flowing inside the compartment has raised the interior temperature to 195°F, the contacts of a thermostatic switch automatically close, completing the circuit to the timer motor and starting the selected cooking time period. At the end of the set interval, timer contacts switch to shut off the cooking operation and sound a signal buzzer. The buzzer is silenced by returning the timer dial to the OFF position.

In the constant steam mode, operation will be continuous. When steam and condensate is emitted from the compartment it is directed through a drain screen inside the compartment into the cooker drain line. A cold water solenoid valve connected into the compartment drain line is automatically actuated by a thermostatic switch in the cooking compartment drain line to condense the steam to water prior to discharge into the drain.

1.3 Service

Required service, both preventive and corrective, is explained in Section 6. Should repairs be required, a network of authorized service agencies is available to assist with prompt service. A current Directory of Authorized Service Agencies may be obtained by contacting:

Product Service Department
Market Forge Industries Inc.
35 Garvey Street Everett MA 02149□
Tel: (617) 387-4100 Fax: (617) 387-4456
Fax: (Outside MA) 1-800-227-2659□
E-Mail: custserv@mfii.com Website: <http://www.mfii.com>

The model and serial number must be referenced when corresponding with Market Forge service personnel. The data plate containing the serial number pertaining to the equipment is located on the top front trim of the cabinet base and also on the top panel of the steamer.

SECTION 2 INSTALLATION

2.1 Assembly

The Pressureless Cooker is factory-mounted on a cabinet base containing either a steam boiler or direct steam connection controls for the cooker. The assembled unit is shipped bolted to a skid, with cabinet feet in a separate container. Steps required for assembly are as follows:

1. Remove the four bolts that fasten the equipment frame to the skid.
2. Install feet in threaded mounting locations of the cabinet frame.
3. Mount the two pan support racks in brackets and studs inside cooking compartment.
4. Attach panels to lower cabinet. Detailed instructions are enclosed with the panels.
5. Attach the drip trough on studs located on the face of the unit.

2.2 Setting in Place

Level the unit in final location by turning the adjustable feet. Using the cabinet top as a reference, obtain level adjustment left-to-right and front-to-back.

2.3 Mechanical Connections

Since the Pressureless Cooker is interconnected at the factory to the steam boiler or direct steam plumbing, no field connections to the cooker are required. All electrical and plumbing connections are routed to the steam boiler cabinet through the 6-inch-high space between the floor and the bottom edge of the cabinet frame. Connection locations for the cooker mounted on steam boilers of electric, gas, and steam coil utility and direct-connected steam are shown in separate installation instructions for each.

2.4 Water Connections

Before connecting water to this unit, have water supply analyzed to make sure that hardness is no greater than 2.0 grains per gallon and pH level is within the range of 7.0–8.5. Water that fails to meet these standards should be treated by the installation of a water conditioner.

EQUIPMENT FAILURE CAUSED BY INADEQUATE WATER QUALITY IS NOT COVERED UNDER WARRANTY!

CAUTION
PVC or CPVC are not acceptable materials for drains.

2.5 Installation Check-Out

Check-out procedures for the cooker mounted on steam boilers of electric, gas, and steam coil or direct-connected steam are given in separate installation instructions for each. Procedures for the cooker only are included in Subsection 2.5.2.

If the cooker fails to perform as described, consult Table 5-1 of the Trouble-Shooting Guide for corrective action. If difficulty arises with the boiler, reference the separate service and parts manual for that equipment.

Before making this check-out, the operator must be thoroughly familiar with the operating procedures in Section 3 and with the function of each control described in Table 3-1. Reference Figure 3-1 for identification of controls required in the following procedures.

2.5.1 Initial Control Settings

Before beginning the start-up procedures for the cooker, the instruction plate and service manual for the steam boiler must be consulted and all start-up procedures completed to supply 15 PSI steam to the steam inlet line for the cooker.

1. All steam boiler controls are in the operating mode and 15 PSI steam is applied to the cooker inlet plumbing.
2. Cooker timer for the compartment (Figure 3-1) is in the OFF position.
3. Cooker compartment is empty of all information materials, pan supports are mounted in place, and door is open.

2.5.2 Cooker Check-Out

The cooker check-out procedures are as follows:

1. With the door open set timer to about the “4-minute” position. Observe that indicator light is off and steam does not enter compartment.
2. Close cooker compartment door. Observe that indicator light turns on, and steam can be heard rushing into the compartment simultaneously with the door closing.
3. Observe the boiler drain line for passage of steam into the open floor drain. Correct steam condenser operation is evidenced by presence of water flowing from the drain line.
4. Observe cooker operation for several minutes. Operation is correct if timer dials begin to rotate after a short delay period required for preheating. After the delay period plus the “4-minute” initial setting, the timer dials will return to the “0-Minute” position, at which a buzzer sounds. The buzzer is silenced by turning the dial to the OFF position.

SECTION 2 INSTALLATION

2.5.3 Shut-Down Procedure

No shut-down procedure is required for the Pressureless Cooker except to check that the timer dial is in the OFF position and the compartment door are open. Consult the steam boiler instruction plate and complete the shut-down procedures for the boiler.

2.6 Reversing the Doors

The Pressureless Steam Cooker has a reversible cooking compartment door. This section contains instructions for reversing this door.

1. Turn off power to the unit.
2. Open the cooking compartment door
3. Remove the two screws that attach the top hinge to the front of the unit.
4. Slide the door upwards, off the bottom hinge.
5. Remove the two screws that attach the bottom hinge to the front of the units.
6. Remove the right and left side panels by unscrewing the 1 screw on each panel and sliding the panel down.
7. Remove the door interlock assembly by unscrewing the two nuts that hold it in place (assembly is attached to the screws in the top right hinge mounting holes, see fig. 2-1).
8. Remove the four screws in the right side hinge mounting holes and install them in the left side hinge mounting holes (where the hinges were originally mounted).
9. Using the nuts removed in step #6, reinstall the door interlock assembly onto the 2 screws in the lower left hinge mounting holes (see fig. 2-1) with by moving the assembly over the cooking cavity to the other side of the unit. Rotate the door interlock assembly 180° for installation, so that the switch is now facing up.
10. Reinstall the top hinge and screws into the right lower hinge mounting holes. Rotate the hinge 180° for installation, so that the pin which the door rides on is now facing up. The hinge must be rotated because it will now function as the bottom hinge. **DO NOT COMPLETELY TIGHTEN THE HINGE MOUNTING SCREWS YET.** These will be used later for adjusting the door.
11. Remove the door latch assembly from the face of the unit. The 2 nuts mounting the door latch are located behind the face of the unit and must be accessed where the right side panel was removed.
12. Remove the two white hole plugs from the left door latch mounting holes, and insert them into the right door latch mounting holes (where the door latch assembly was originally mounted).
13. Rotate the door latch assembly 180°, and install into the left door latch mounting holes.

NOTE:

Each stud on the latch assembly should have a plastic washer, a spring, a plastic washer and a Nyloc type nut.

14. To adjust the tension of the door latch, tighten both nuts down until the springs are fully compressed, then back each nut off 1 1/2 turn.
15. Rotate the door 180° for mounting.
16. Slide the remaining hinge into the top door bearing.
17. Slide the door and hinge assembly down onto the hinge which you have already mounted to the front of the unit. Use the two screws to mount the top hinge into the right upper hinge mounting holes. **DO NOT COMPLETELY TIGHTEN THE HINGE MOUNTING SCREWS YET.**
18. Slowly push the cooking compartment door closed until it is latched.
19. The cooking compartment door can now be raised, lowered, and/or rotated into position by bumping it with the palm of your hand or by using a small rubber mallet.
20. First, check the alignment at the front of the door by making sure that the striker in the door is centered with the latch mechanism on the front of the unit.
21. Square the door to the unit by raising or lowering the hinge side of the door, keeping the latch centered with the striker.
22. Visually inspect the door. Be sure that the door is square to the unit, the striker is centered with the latch, and the gasket is in contact with the entire lip of the cooking compartment.
23. Gently open the cooking compartment door, taking care not to move it out of position.
24. Tighten all 4 door hinge bracket mounting screws.
25. Close and visually inspect the door again, as described in step 22.
26. Reinstall the left and right side panels, using the screws for each panel.

SECTION 2 INSTALLATION

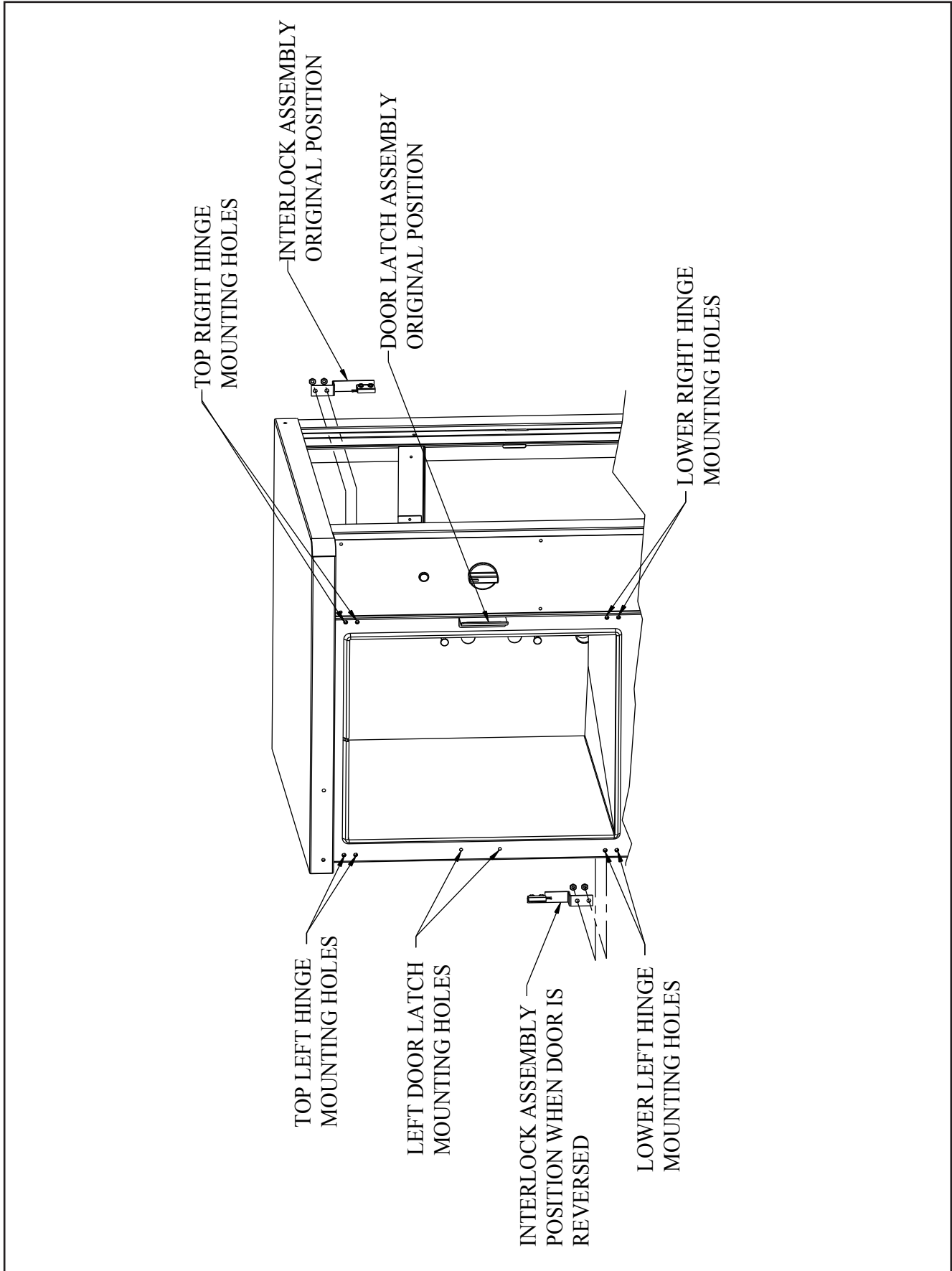


Figure 2-1 Typical Door Layout

SECTION 3 OPERATION

3.1 Operating Controls and Indicators

The controls and indicators required to operate the Pressureless Steam Cooker are listed in Table 3-1, together with a short functional description of each. Figure 3-1 shows the physical location of each control and indicator.

3.2 Operating Procedures

The ST-12 Pressureless Steam Cooker defrosts frozen foods and cooks fresh and defrosted foods. The cooking compartment permits selection of continuous (constant steam) cooking or timed (0–60 minutes) cooking. Instructions for operation are included in this section. Consult Test Kitchen Bulletin for detailed cooking information.

3.2.1 Steam Source Operation

The Pressureless Cooker is supplied mounted on a cabinet containing either a steam boiler or controls for direct-connected steam. Manual controls are accessed by opening the cabinet door. The start-up procedure for the steam source is completed once before each daily operating period of the cooker. (For steam boilers, see instruction plate.)

3.2.2 Preheating

Before each initial operation of the cooker, and at any other time when the cooking compartment is cold, a 1-minute preheating period is required. To preheat the cooker, put steam source into operation and proceed as follows:

1. Close cooking compartment door.
2. Set 60-Minute Timer Dial (1) to “4-minute” setting.

NOTE:

Total elapsed preheating time equals the timer setting plus a short delay period needed to active a thermostatic switch included in the controls.

3. Turn off buzzer, which sounds to indicate cooking is complete, by setting the Timer Dial (1) to OFF position.

3.2.3 Cooking

Before loading the cooker, be sure compartment is hot. See Subsection 3.2.2 for preheating instructions.

1. Slide pans of food into cooking compartment pan supports.
2. Close cooking compartment door.

3. Set timer cooking time:
 - a. constant steam—for continuous cooking
 - b. 60-minute timer—for timed cooking.
4. Set appropriate timer to the required cooking time (see pages 3.3 to 3.6).
5. Turn off buzzer, which sounds to indicate cooking is complete, by setting timer dial (1) to the OFF position.
6. Open door slightly at first letting most of the steam out of the compartment and then fully open the door.
7. Unload by sliding pans of food from pan supports, taking care to avoid hitting compartment opening.

3.2.4 Shut-Down Procedure

No shut-down procedure is required for the cooker except to check the timer dial (1) are in the OFF position and that the compartment door is open. When all cooking has been completed for the day, the steam source must be shut off. (For steam boilers, see instruction plate.)

CAUTION

When the unit is not in use, leave the cooking compartment door slightly ajar to prolong the life of the door gasket.

3.3 Cleaning

After each period of daily operation (more frequently as required to maintain cleanliness), the cooker should be thoroughly cleaned by completing the following steps:

1. Remove left, right & center pan supports, and drain screen by lifting up and off mounting studs. Wash with a mild detergent. Rinse and set aside for reassembly.
2. Wash cooking compartment interior using a mild detergent and water. Rinse and dry thoroughly.
3. Replace pan supports, and drain screen in compartment and leave door slightly ajar.

3.4 Drainage

3.4.1 Cooking Compartment Drainage

The bottom of the cooking compartment is angled slightly toward the rear of the unit. This assures that any condensate build-up or spills will be directed toward the drain hole, which is located at the rear bottom center of the cooking compartment. Any liquid exiting the cooking compartment runs down the cooking compartment drain tube and into the drain line.

SECTION 3 OPERATION

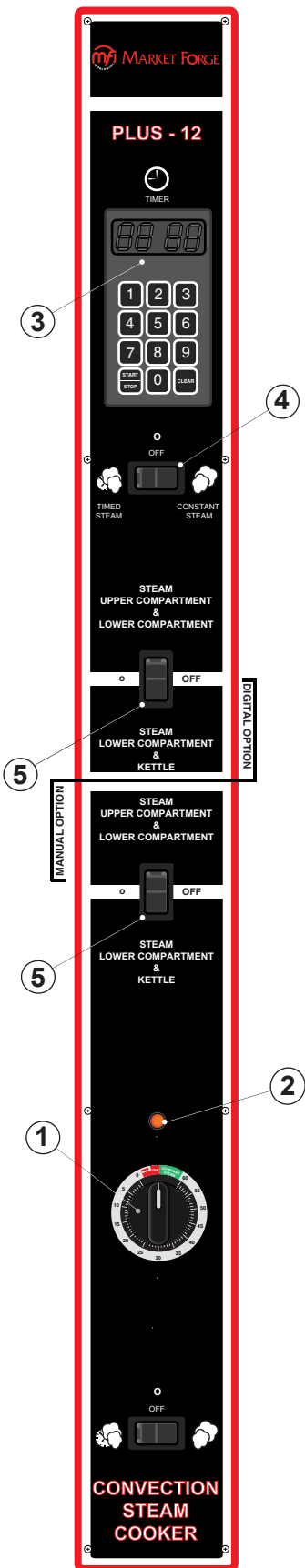


Figure 3-1 Controls & Indicators

3.4.2 Drip/Spill Trough Drainage

The ST-12 Pressureless Steam Cooker has a drip/spill trough below the cooking compartment door. It will catch any condensate gathering on the front of the unit when the door is opened.

TABLE 3-1

CONTROLS & INDICATORS

(See Figure 3-1)

REF. NUMBER	DESCRIPTION	FUNCTION
1 □	Timer/Constant Steam □	Controls cooking up to 60 Minutes or uses constant operation.
2 □	Indicator Light □	Indicates cooker is in operation.
3 □	Digital Timer □	Control cooking up to 99 minutes or constant.
4	Mode Switch	Constant Steam/Timer

SECTION 3 OPERATION

TEST KITCHEN BULLETIN

Model ST-12 Pressureless Cooker Facts On Parade

3.5 TEST KITCHEN BULLETIN

1. Frozen vegetables should always be cooked in perforated 12" x 20" x 2 1/2" (1/1 65mm) pans.
2. Frozen entrees should be underlined with a perforated pan for best results. If they are defrosted first, the heating time will be decreased.
3. Fresh foods may also be cooked in this unit. Vegetables and other foods where the stock is not to be retained should be cooked in perforated 12" x 20" x 2 1/2" (1/1 65mm) pans for the most nutritious results.
4. There is a thermostatic time delay built into this unit which adapts the unit to the proper cooking time. This means that the total time will usually be longer than the time setting.
5. There is a safety interlock switch on the door which shuts off the steam each time the door is opened if the unit is in the cooking cycle.
6. Compartments may be filled and timer set simultaneously.
7. Sheet pans will fit in compartment with the center rack removed.
8. All foods, except cakes and pastry, can be cooked in a steam cooking unit.
9. Steam cooked meals have greater nutritional value since they retain most of their vitamins and minerals.
10. Because foods are cooked faster by the higher temperatures of steam cooking, they can be prepared closer to serving time, insuring maximum freshness.
11. Steam cooked foods have a higher percent yield more portions per dollar spent.
12. Food may be served from the same pan in which it is steam cooked, thus reducing food breakage since there is no extra handling or transferring of food from cooking pans to serving pans. It also reduces pot washing tasks.
13. Some important advantages of steam cooking are labor saving, reduced operating costs, space saving, and the lifting of heavy stock pots is eliminated.
14. Rice and spaghetti products, if thoroughly wet at the start of the cooking process, are very easily prepared.
15. Food such as potatoes, poultry, seafood, and some meats may be blanched in the steam cooker, thus reducing the total cooking time and grease absorption.
16. Fuel is used only when the steam cooking unit is in operation.
17. The steam cooker will loosen foods burned on pans making washing easier.
18. Solid pans are recommended when liquid is to be retained and perforated pans when the liquid is not to be retained.
19. Eggs may be cooked out of the shell if they are to be chopped which eliminates peeling after steaming.
20. The steam cooker can be opened during the cooking period to add or remove items. If any time is lost, an adjustment may be made on the timer.
21. Steam cooking information, including recommended pan size and type, weight per pan, cooking times and pan yields are given on the following pages of this manual.

SECTION 3 OPERATION

The ST-12 Pressureless Cooker is a one compartment unit. The compartment holds twelve 12" x 20" x 2 1/2" or six 12" x 20" x 4" pans. This unit enables the cook to prepare foods close to the time of service. The cooking times given are timer settings and should be set in a preheated compartment. There is a thermostatic time delay in the compartment that adjusts the total time depending on the temperature and amount of the food. Therefore the total time will be greater than the timer setting. At the end of the timer cooking cycle the buzzer will sound, steam will stop flowing and the food can be removed.

FROZEN VEGETABLES

ITEM	Approx. Frozen Weight Per Pan	Recommended 12" x 20" (1/1) Perforated Pan	Number of Pans	Timer Settings in Minutes	Approx. Number Cooked Servings Per Pan
Asparagus Spears	7 1/2 lbs. (3.4 kg)	2 1/2" (65mm)	12	12-15	30 3 oz. (85 g)
Beans, Green Regular	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	10-15	25 3 oz. (85g)
Beans, Green French Cut	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	5-7	25 3 oz. (85 g)
Beans, Lima	7 1/2 lbs. (3.4 kg)	2 1/2" (65mm)	12	12-15	30 3 oz. (85 g)
Broccoli	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	4-6	25 3 oz. (85 g)
Brussel Sprouts	7 1/2 lbs. (2.7 kg)	2 1/2" (65mm)	12	10-15	30 3 oz. (85 g)
Carrots	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	10-15	25 3 oz. (85 g)
Cauliflower	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	7-12	25 3 oz. (85 g)
Corn-Cut	7 1/2 lbs. (3.4 kg)	2 1/2" (65mm)	12	8-12	30 3 oz. (85 g)
Mixed Vegetables	7 1/2 lbs. (3.4 kg)	2 1/2" (65mm)	12	8-12	30 3 oz. (85 g)
Peas (Loose)	7 1/2 lbs. (3.4kg)	2 1/2" (65mm)	12	3-5	30 3 oz. (85 g)
Spinach	9 lbs. (4kg)	2 1/2" (65mm)	12	Must be defrosted	30 4 oz. (115 g)
Squash	12 lbs. (5.4 kg)	2 1/2" (65mm)	12	Must be defrosted	50 3 oz. (85 g)

FROZEN PREPARED ENTREES

ITEM	Weight Per Pan	Recommended 12" x 20" (1/1) Perforated Pan	Number of Pans	Timer Settings in Minutes	Approx. Number Cooked Servings Per Pan
Lobster Tails 6-8 oz. (170-255 g)	7-8 lbs. (3.2-3.6 kg)	2 1/2" (65mm)	12	15-25	15 6 oz. (170 g)
Shrimp, C.D.P.	16-20 lbs. (7-9 kg)	2 1/2" (65mm)	12	8-11	75 3 oz. (85g)
Shrimp Green	16-20 lbs. (7-9 kg)	2 1/2" (65mm)	12	11-15	50 3 oz. (85 g)
Bulk Pack Frozen	3 1/2-4 lbs. (1.6-1.8 kg)	2 1/2" (65mm)	12	35-45	10 6 oz. (170 g)
Bulk Pack Defrosted	3 1/2-4 lbs. (1.6-1.8 kg)	2 1/2" (65mm)	12	25-35	10 6 oz. (170 g)

VEGETABLES (CANNED)

ITEM	Weight Per Pan	Recommended 12" x 20" (1/1) Perforated Pan	Number of Pans	Timer Settings in Minutes	Approx. Number Cooked Servings Per Pan
Canned Vegetables	7 lbs. (3.2 kg)	2 1/2" (65mm)	12	5-10	25-30 3oz. (85 g)

SECTION 3 OPERATION

PRESSURELESS STEAM COOKING TIMER SETTINGS & PORTIONS

VEGETABLES

ITEM	Approx. Frozen Weight Per Pan	Recommended 12" x 20" (1/1) Perforated Pan	Number of Pans	Timer Settings in Minutes	Approx. Number Cooked Servings Per Pan
Beans, Snap Green or Waxed	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	18-22	25-30 3 oz. (85 g)
Beets (50mm) 2"	7 1/2 lbs. (3.4 kg)	2 1/2" (65mm)	12	40-50	30-35 3 oz. (85g)
Broccoli 1/2-3/4" (12-20mm) Stalks	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	14-18	25-30 3 oz. (85 g)
Carrots Sliced	9 lbs. (4 kg)	2 1/2" (65mm)	12	18-21	35-40 3 oz. (85 g)
Cauliflower, Trimmed 1 1/2-2" (38-50 mm)	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	12-16	30-35 3 oz. (85 g)
Corn on Cob Husked	1 doz.	2 1/2" (65mm)	12	10-15	12
Cabbage Head 1/4-1/6 Cored	5 lbs. (2.25 kg)	2 1/2" (65mm)	12	14-18	15-20 4 oz. (115 g)
Onions (50 mm) 2"	6 lbs. (2.7 kg)	2 1/2" (65mm)	12	20-25	25-30 4 oz. (115 g)
Peas, Shelled	5 lbs. (2.25 kg)	2 1/2" (65mm)	12	5-6	25-30 3 oz. (85 g)
Potatoes, French Fry Cut	10 lbs. (4.5 kg)	2 1/2" (65mm)	12	18-21	50 3 oz. (85 g)
Potatoes, Regular Cut, 3" (75 mm)	10 lbs. (4.5 kg)	2 1/2" (65mm)	12	35-40	50 3 oz. (85 g)
Spinach, Cleaned Cut	3 lbs. (1.4 kg)	2 1/2" (65mm)	12	3-5	10-12 3 3/4 oz. (105 g)
Squash, Summer, Sliced 1" thick (25 mm)	7 lbs. (3.2 kg)	2 1/2" (65mm)	12	7-10	30-35 3 oz. (85 g)
Squash, Winter Peeled	9 lbs. (4 kg)	2 1/2" (65mm)	12	10-15	25-30 3 oz. (85 g)
Diced Turnip	5 lbs. (2.25 kg)	2 1/2" (65mm)	12	28-32	20-25 4 oz. (115 g)

MEAT, POULTRY & FISH

ITEM	Weight Per Pan	Recommended 12" x 20" (1/1) Perforated Pan	Number of Pans	Timer Settings in Minutes	Approx. Number Cooked Servings Per Pan
Chicken Cut-up	8 lbs (3.6 kg)	2 1/2" (65mm)	2	20-30	15-20 2 oz. Protein (55 g)
Chicken, 4 lbs. Whole	3 each	4" (100 mm)	6	45-50	25-30 2 oz. Protein (55 g)
Fowl, 5lbs. or more Whole	2 each	4" (100 mm)	6	50-60	20-25 2 oz. Protein (55 g)
Fish, Fillets	3 lbs (1.4 kg)	2 1/2" (65mm)	12	10-15	12-15 2 oz. (55 g)
Frankforts	5 lbs (2.3 kg)	2 1/2" (65mm)	12	3-5	35-40 2 oz. (55 g)
Hamburgers 3 oz. (85 g)	5 lbs (2.3 kg)	2 1/2" (65mm)	12	18-22	20-25 2 oz. Protein (55 g)
Meatballs 1 oz. (30 g)*	6 lbs (2.7 kg)	2 1/2" (65mm)	12	20-25	20-25 2 oz Protein (55 g)

SECTION 3 OPERATION

PRESSURELESS STEAM COOKING TIMER SETTINGS & PORTIONS

MEAT, POULTRY & FISH CONTINUED

ITEM	Approx. Frozen Weight Per Pan	Recommended 12" x 20" (1/1) Perforated Pan	Number of Pans	Timer Settings in Minutes	Approx. Number Cooked Servings Per Pan
Meatloaf*	15 lbs (6.8 kg)	2 1/2" (65mm)	12	40-50	50-60 2 oz. Protein (55 g)
Pork Chops, 4 oz. Loin Bone (115 g)	6 lbs (2.7 kg)	2 1/2" (65mm)	12	25-30	24 2 oz. Protein (55 g)
Sausage 1 1/2 oz. (45 g)	6 lbs (2.7 kg)	2 1/2" (65mm)	12	18-21	18-20 2oz. (55 g)
Turkey On Carcass	20-22 lbs (9-10 kg)	2 1/2" (65mm)	2	2-2 1/2 hrs.	50-60 2 oz. Protein (55 g)
TurkeyOff Carcass	10-12 lbs (4.5-5 kg)	2 1/2" (65mm)	12	1-1 1/4hrs.	55-65 2 oz. Protein (55 g)

MISCELLANEOUS

ITEM	Weight Per Pan	Recommended 12" x 20" (1/1) Perforated Pan	Number of Pans	Timer Settings in Minutes	Approx. Number Cooked Servings Per Pan
Eggs In Shell	3 dozen	2 1/2" (65mm)	12 <input type="checkbox"/>	9-11	36 -1 egg each
Eggs Out of Shell	4 dozen	2 1/2" (65mm)	12 <input type="checkbox"/>	6-8	48 - 1 egg each
Rice — Bulletin 16 gives direction	4 lbs. (1.8 kg)	2 1/2" (65mm)	12 <input type="checkbox"/>	18-22	60-65 3oz. (85 g)
Spaghetti — Bulletin 13 gives direction	3 lbs. (1.4 kg)	4" (100mm)	6	18-22	40-45 4oz. (115 g)

SECTION 4 PRINCIPLES OF OPERATION

4.1 General

The ST-12 Pressureless Steam Cooker consists of one cooking compartment in a single cabinet assembly. The compartment is fitted with an independent electrically controlled steam circuit and spring-loaded, self-sealing door with a slam action latch. The compartment can be used for either constant steam or 60-minute timing. The principles of operation in this section include an explanation of steam, steam condensing, and electrical circuits and their functioning.

4.2 Plumbing Circuits

The plumbing circuit consists of the piping, steam solenoid valve, steam jet-pipe, drain, and cold water condenser required to provide controlled steam application to the cooking compartments. A simplified diagram of this circuit is shown in Figure 4-1.

NOTE:

Figure 4-1 is strictly a pictorial schematic diagram and is not intended to show the actual configuration of the plumbing. All components are shown in correct relationship with each other. However, the diagram does not show their actual locations or position within the cooker.

As shown in the diagram, steam inlet and exhaust connections are connected at the factory directly into a steam boiler or direct-connected steam plumbing enclosed within the base cabinet on which the cooker is mounted. The boiler (or direct-connected steam control system) is equipped to supply constant, regulated steam at 14–15 PSI. Steam exhaust, having been reduced to water by the cold water condenser, is directed into the boiler (or direct-connected steam control) drain system.

Steam inlet lines for the compartment are equipped with a normally closed solenoid valve operated by the electrical control circuit. The inlet valve is opened whenever the compartment control circuit is activated by use of the 60-minute timer.

4.2.1 Steam Inlet Line

A steam supply line is plumbed from the boiler output (or direct-connected steam control) to a 1/2-inch barb fitting connected to the input sides of the steam inlet solenoid valve. When a cooking compartment is not in use, the valve for the compartment remains closed to prevent steam from entering. During operation, the appropriate inlet solenoid valve is opened by activation of the control circuit.

Steam is projected onto the surface of pans of food loaded into the compartment by an orifice located inside the compartment. Steam continues to flow through the compartment in this manner until the control circuit closes the solenoid valve.

4.2.2 Steam Exhaust and Drain Lines

Perforated strainers at the drain line opening inside the compartment allow only steam, condensation, and liquid cooking drainage to enter. Prior to discharge into the boiler drain system, steam is converted to water by the cold water condensing system for the compartment.

4.2.3 Steam Exhaust Condensing System

The steam condensing system consists of a, two-position, normally closed cold water solenoid valve, with outlet sides connected into the exhaust plumbing for each cooking compartment. A spray nozzle directs cold water about the inside of the drain lines to increase cold water contact with exhausted steam. Valve inlet side is connected remote from the supply line of the steam boiler (or direct-connected steam plumbing). The valve responds to a thermostatic switch located inside the compartment. When the timer starts the cold water solenoids will energize.

4.3 Electrical Circuits

The electrical circuits of the cooker control the power to activate timer motors and energize solenoid-operated valves and circuits, which in turn control application of steam to the cooking compartment and condensation of steam from the exhaust line. The cooker operates on 120V, 2 amp, 60Hz electrical service connected to all circuits from the circuits of the steam boiler (or direct-connected steam controls) contained within the cabinet on which the cooker is mounted. Power is supplied to the control circuit at all times when the shut-off device (Circuit Breaker) for the unit (installed by an certified Electrician) is in the ON position.

4.3.1 Control Circuit Components

A brief description of the electrical circuit elements follows.

4.3.1.1 60 Minute Timer/Constant Steam

The timer contains a 120-volt AC synchronous motor that drives a timing dial through a gear reduction and clutch mechanism. The timer dial is manually set for any interval of operation from 0 to 60 minutes or constant steam as read on the calibrated dial face. The manual rotation of the dial moves the common element (1) of the timer switch from the neutral (OFF) position to contact (3), which connects with the steam inlet solenoid valve operating circuit.

The cooker is placed into automatic operation with the setting of the timer dial. Its timing cycle, however, is automatically delayed by a thermostatic switch, which assures operating temperature is achieved before the timer motor begins to “time out.”

SECTION 4 PRINCIPLES OF OPERATION

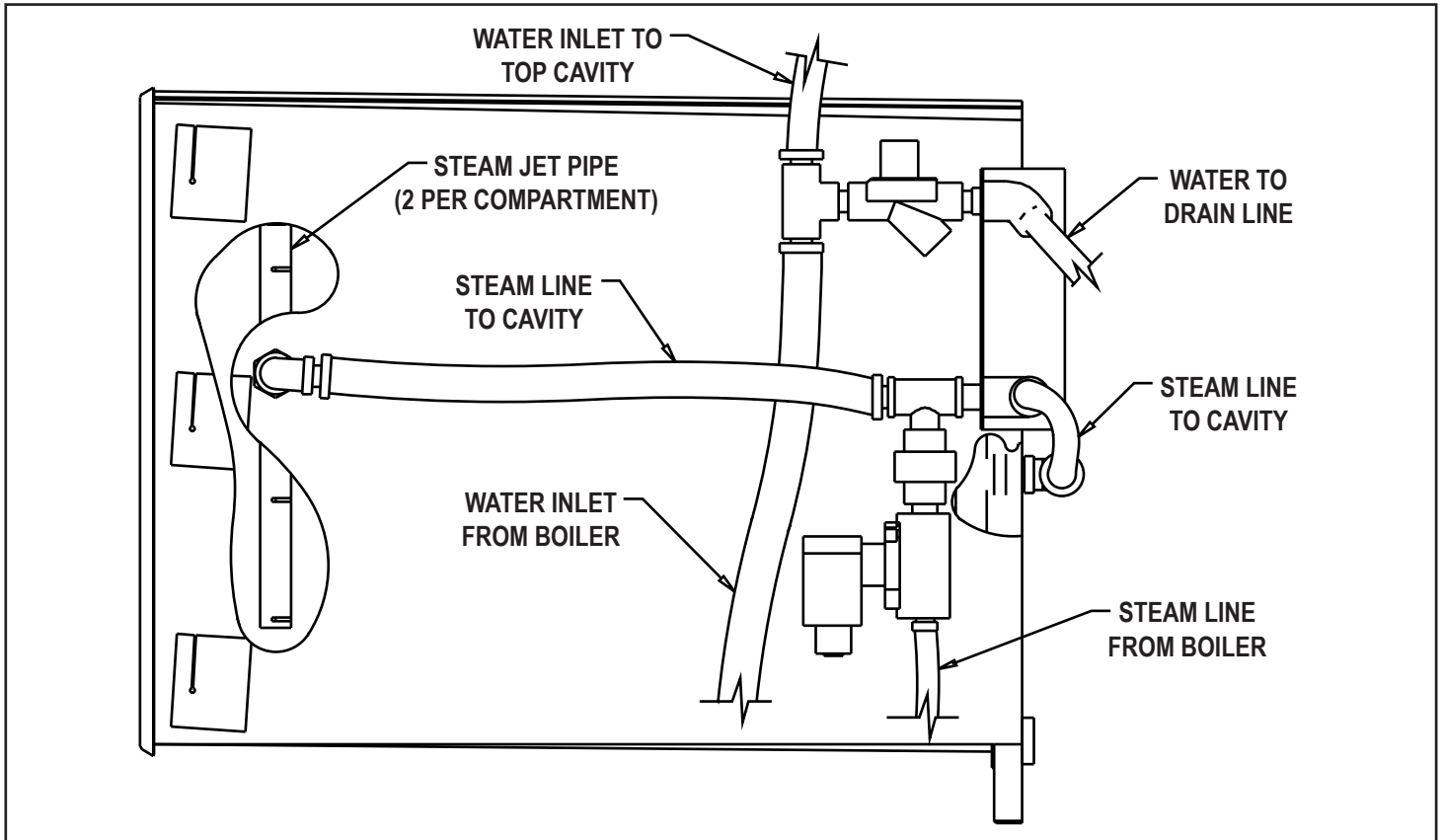


Figure 4-1 Pictorial Diagram, Steam & Water Circuits (Model ST-20 Shown Here)

When the timer motor has operated for the preset duration, the common element is transferred to contact (4), returning the inlet solenoid valve to the closed position and energizing the buzzer. Contact to the buzzer circuit remains closed until the dial is manually turned to the OFF position, returning the common element (1) of the timer switch to the neutral position.

4.3.1.2 Indicator Lights

An indicator light is included for the compartment. The light remains on (red) at all times when the coinciding timer dial is set and the door interlock switch is closed. The light turns off at the end of the timed cooking duration or when the set time has elapsed.

4.3.1.3 Buzzer

The buzzer is an alarm device that operates by oscillation of a striker against the core of an electromagnet. When the 60-minute timer dials reach the "0-Minute" position, the buzzer coil is energized to sound the buzzer. Movement of the timer dial to the OFF position opens the contact to the buzzer coil to shut it off.

4.3.1.4 Door Interlock Switch

The interlock switch is a single-pole proximity switch with normally open contacts. The switch is operated by the nor-

mally open contacts. The switch is operated by the proximity of a magnet within the door. When the door is open, the switch contacts remain in the open position. When the door is closed and securely latched in place, the magnet is near the switch to close the contacts. Connected between the operating contact (3) of the timers and the steam inlet solenoid valve, the door switch acts as a protective device to interrupt valve operation unless the door is closed.

4.3.1.5 Thermostatic Switch

The thermostatically operated switch is a two-position, normally open switch mounted on the cooking compartment. The switch functions to activate the cold water solenoid valves of the steam condensing system and to delay timer motor operation until the compartment temperature reaches 195°F, thus assuring that cooking temperature exists throughout the timed duration.

4.3.1.6 Digital Timers (Optional)

The timer controls the steam to the cavity by either a constant steam setting or a used defined timer that will be programmed by the user into the timer

SECTION 5 TROUBLE-SHOOTING

5.1 General

The information in this section is intended to assist both the operator and service personnel in locating the general source of problems that may occur with the cooker. Before following any of the procedures given in this section, the operator should be thoroughly familiar with the operating instructions and the function of all controls that are described in Section 3. If the problem cannot be readily corrected, the operator should contact the nearest Market Forge service agency for assistance.

5.2 Trouble-Shooting Guides

A trouble-shooting guide for use by service personnel is given in Table 5-1.

5.3 Electrical Fault Isolation

Correction of an electrical failure first requires isolation of the fault to a single circuit or component. In most cases, the nature of the failure and its effect upon the operation of the cooker will be sufficient to narrow it down to one or more circuit elements. Table 5-2 is provided as a guide for isolating electrical faults.

5.4 Electrical Trouble-Shooting Procedures

Before performing the trouble-shooting procedures in this section, the serviceman must be familiar with the function of all controls as described in Section 3 as well as with the Principles of Operation described in Section 4.

TABLE 5-1 GENERAL TROUBLE-SHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	REMEDY
1. INDICATOR LIGHT FAILS TO LIGHT WITH TIMER SET.	<ul style="list-style-type: none"> a. Power to Cooker OFF. b. Door Interlock Switch contacts not closed. c. Door Interlock Switch faulty. d. Indicator Light burned out. e. Faulty Timer contacts. f. Faulty Wiring. 	<ul style="list-style-type: none"> a. Locate External Circuit Breaker for incoming power & place in ON position. b. Shut cooker door to close switch contacts, Check alignment of door with switch. c. Replace Switch (see subsection 5.4.4). d. Replace Light. e. Replace Timer (see subsection 5.4.3). f. Inspect condition of wire & tightness of all connections, Correct as needed.
2. STEAM FAILS TO ENTER COOKING COMPARTMENT WITH INDICATOR LIGHT ON.	<ul style="list-style-type: none"> a. Faulty Steam Solenoid Valve. b. Faulty Wiring. 	<ul style="list-style-type: none"> a. Replace Valve (see subsection 5.4.5). b. Inspect condition of wire & tightness of all connections, Correct as needed.
3. STEAM ENTERS COMPARTMENT CONTINUOUSLY. TIMER DIAL NOT TURNING.	<ul style="list-style-type: none"> a. Constant Steam Position. b. Faulty Thermostatic Switch. c. Faulty Timer Motor. d. Faulty Steam Solenoid Valve. e. Faulty Wiring. 	<ul style="list-style-type: none"> a. Move knob to timing location. b. Replace Switch (see subsection 5.4.7). c. Replace Timer (see subsection 5.4.3). d. Replace Valve (see subsection 5.4.5). e. Inspect condition of wire & tightness of all connections, Correct as needed.
4. STEAM CONTINUES TO FLOW INTO COMPARTMENT AND/OR BUZZER FAILS TO SOUND AT END OF TIMER SETTING.	<ul style="list-style-type: none"> a. Timer Contacts Faulty. b. Buzzer Faulty. c. Faulty Wiring. 	<ul style="list-style-type: none"> a. Replace Timer (see subsection 5.4.3). b. Replace Buzzer (see subsection 5.4.8). c. Inspect condition of wire & tightness of all connections, Correct as needed.
5. STEAM FLOWS CONTINUOUSLY FROM BOILER (OR DIRECT CONNECTED STEAM CONTROL) DRAIN LINE WITH COOKER IN OPERATION.	<ul style="list-style-type: none"> a. Cold water not connected. b. Faulty Thermostat. c. Faulty Cold water. d. Faulty Wiring. 	<ul style="list-style-type: none"> a. Turn on external shut-off valve. b. Replace Thermostat (see subsection 5.4.7). c. Replace Valve. d. Inspect condition of wire & tightness of all connections, Correct as needed.

SECTION 5 TROUBLE-SHOOTING

The electrical trouble-shooting procedures that follow require access to components and terminals of the electrical control panel shown in Figure 7-3. Electrical controls are reached by removing screws that fasten the control panel to the frame. The panel may be pulled forward for testing while interconnected to the cooker circuits or disconnected at the pin connection for complete removal and repair.

5.4.1 Incoming Power

Before trouble-shooting any of the electrical parts or assemblies, verify that power is being supplied to the cooker. Incoming power is connected at the boiler (or direct-connected steam) control box located in the base cabinet. With power connected to the cooker, an AC voltmeter is used to measure 120 volts across L1 and L2. If 120 volts is present, and the cooker will not operate, the fault lies within the electrical circuits of the cooker.

5.4.2 Electrical Inspection

The first step in any electrical trouble-shooting procedure is a thorough physical inspection of all wiring connections. To access electrical components, remove the control panel as explained in Subsection 6.3.4.

Warning

Before removing control panel or checking connections and wiring, be sure that the circuit breaker for incoming power is OFF. When power is supplied, all exposed terminals of the control panel carry 120 volts.

Check all wiring connections by hand to assure that both ends of all connection points are tightly secured. Use a screwdriver to tighten connection points. If necessary, visually inspect all quick-disconnect terminals for evidence of corrosion. Terminals in this condition should be separated, cleaned with emery cloth until shiny, and tightly reconnected.

5.4.3 60-Minute Timer

5.4.3.1 Timer Contacts

Defective timer contacts will result in failure of either cooker compartment to operate. When this occurs, remove the control panel (see Subsection 6.3.4), and proceed as follows:

1. Turn off power to the cooker at external circuit breaker.
2. Disconnect all five wires from timer terminals (see Figure 5-1).
3. Connect an ohmmeter between terminals 1 and 3.
4. Rotate timer dial beyond the "0-Minute" point (any setting) to obtain a reading of zero ohms on the ohmmeter. If zero ohm reading cannot be obtained,

timer contacts are defective and the timer must be replaced.

5. Move ohmmeter leads to terminals 1 and 4.
6. Rotate timer dial to "0-Minute" position (an audible click indicates correct position). If zero ohm reading cannot be obtained, the timer is defective and must be replaced.
7. Remove ohmmeter and replace all five leads on timer terminals as shown in Figure 5-1.

5.4.3.2 Timer Motor

A defective timer motor will cause continuous operation in the Time mode, with the timer dial failing to return to the "0-Minute" position. Since thermostatic switch failure can cause the same symptom, fault must first be isolated to the timer by testing the thermostat (see Subsection 5.4.8). To confirm timer motor condition, proceed as follows:

1. Carefully check motor wire leads and tighten loose connections.

WARNING

Use care while working with control panel. Terminals carry 120 volts.

2. Turn on power to the cooker.
3. Set timer dial (any setting beyond "0-minute"). If operation is correct, the motor fails to operate, it is defective and the entire timer must be replaced.
4. Shut off power to the cooker.

5.4.4 Door Interlock Switch

Malfunction of the cooker door interlock switch prevents timer indicator lights from turning on and steam solenoid from opening when the timer dial is set. If steam does not enter the compartment and the indicator light fails to turn on with the door latch securely engaged, the fault may be in the door interlock switch. Proceed as follows:

1. Turn off power to the cooker.
2. Disconnect wires to the door switch terminals (see Figure 5-1).
3. Connect an ohmmeter between the terminals of the switch.
4. Actuate the switch by closing the cooking compartment door. If a zero reading cannot be obtained, the switch is defective and must be replaced.
5. Remove the ohmmeter and replace the leads on switch terminals (see Figure 5-1).

SECTION 5 TROUBLE-SHOOTING

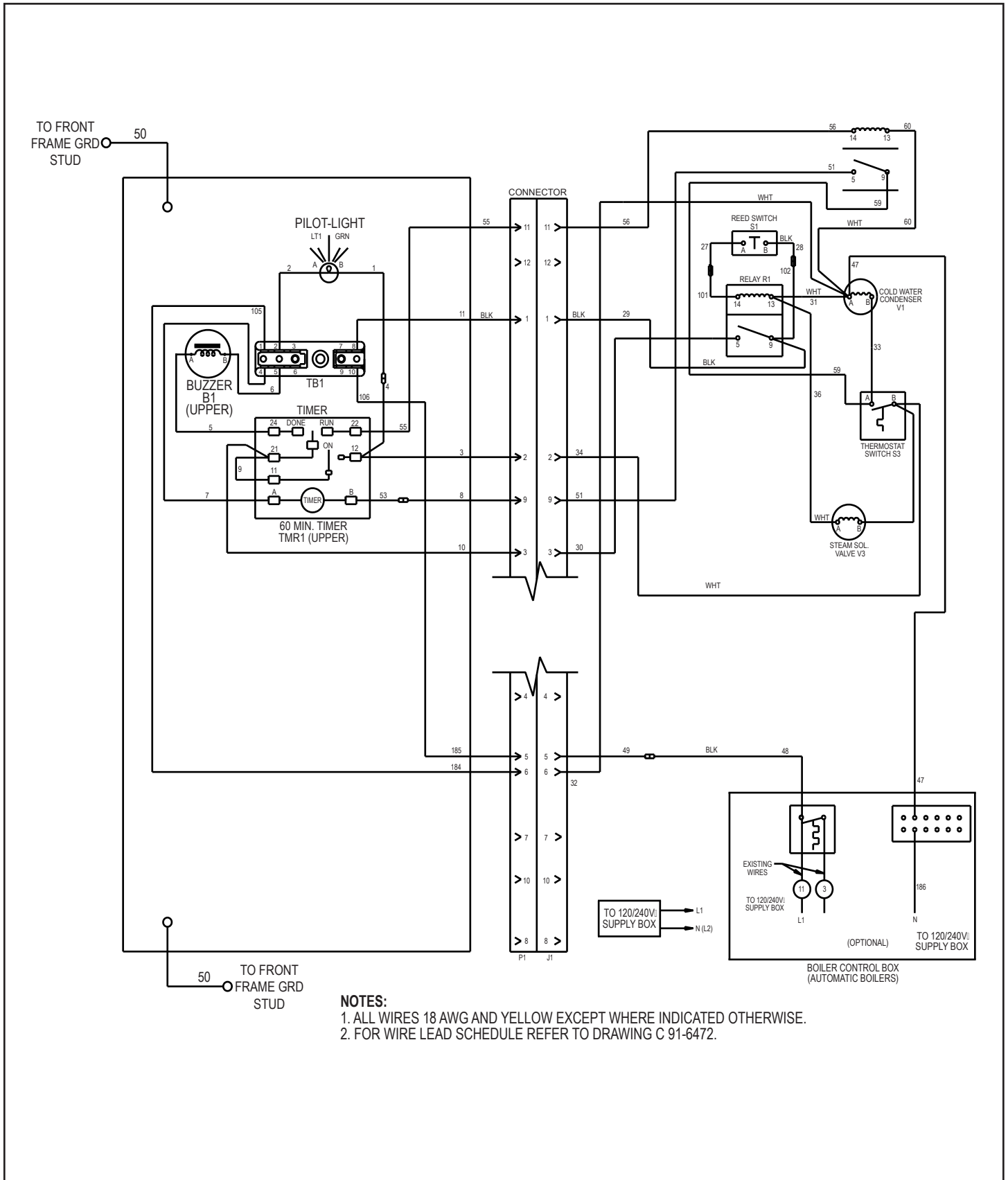


Figure 5-1 Wiring Diagram Mechanical Controls, Model ST-12

SECTION 5 TROUBLE-SHOOTING

NOT AVAILABLE AT THIS TIME

Figure 5-1 Wiring Diagram Digital Controls, Model ST-12 (NOT AVAILABLE AT THIS TIME)

SECTION 5 TROUBLE-SHOOTING

5.4.5 Steam Solenoid Valve

When either inlet solenoid valve fails to operate, the fault may be a defective coil. A defective coil is found using an AC volt-meter to check the voltage at the coil wire terminals, with the cooker compartment operating in either constant steam or 60-minute timer mode. If voltage of 120 volts is present and the coil fails to open the valves, the fault is in the valve coil. Defective valve coils are not separately replaceable, requiring complete valve replacement.

5.4.6 Indicator Lights

If the cooker compartment functions correctly, with the single exception that the indicator light fails to light during operation, the fault is a defective indicator light. A "burned out" or defective light is verified by using an AC volt-meter at the leads, with input power on the selector switch in the correct position for that timer, the timer set, and the door latches closed. If 120 volts is present, the fault is in the indicator light and requires replacement. If 120 volts is not present, the fault is in the wiring or control components (selector switch, timer, or door switch).

5.4.7 Cooking Compartment Thermostatic Switch

A thermostatic switch included in the circuit for the timer motor delays timer operation until steam flowing into the compartment satisfies the temperature-actuated switch device. If a timer motor fails to operate within about one minute after the indicator light comes on (with cooker compartment empty), the cause may be a defective thermostatic switch. To test the switch, proceed as follows:

1. Disconnect the two wires connected to the thermostatic switch terminals.
2. Connect an ohmmeter between the two terminals of the switch.
3. Place the cooker into operation and observe ohmmeter dial. Within one minute of operation, the switch contacts close automatically to register a zero ohm reading on the dial. If a zero ohm reading is not obtained, the switch is defective.
4. Shut off cooker, disconnect ohmmeter leads, and replace wires on switch terminals.

5.4.8 Buzzer

If the buzzer does not sound at the termination of the operator-selected timer setting (timer dial returned to "0-Minute" position), the fault may be a defective buzzer. Buzzer operation is verified using an AC volt-meter at the

buzzer coil connections with input power on and selector switch and coinciding timer dial set at the "0-Minute" position. If voltage is 120 volts, the fault is in the buzzer, which must be replaced. If 120 volts is not present, the fault is in the wiring or control components (timer or selector switch).

5.4.9 Cold Water Condenser Circuit

If during cooker operation steam exits from the drain line opening (located in lower boiler compartment) and the condensing system fails to operate, as evidenced by repeated discharge of water from the drain line, the condensing circuit is malfunctioning. The failure can be caused by a defective condenser thermostat or cold water solenoid coil, or by wiring failure. To test condenser thermostat, refer to Subsection 5.4.8.

If the condenser thermostat functions correctly, but either of the cold water solenoid valves fails to operate, the cause might be a faulty valve coil. A defective coil is found using an AC volt-meter to check the voltage at the coil wire terminals with the cooker compartment in operation. If voltage of 120 volts is present and the valve fails to open, the fault is in the valve coil. Defective valve coils are separately replaceable.

5.4.10 Wiring

All of the electrical components of the cooker (timers, indicator lights, etc.) are connected to each other by wiring shown in Figure 5-1. If all of the electrical components are operating correctly (and the incoming power has been checked), but the cooker fails to operate, the fault lies in the wiring.

Figure 5-1 is a diagram that shows all terminals and interconnections within the electrical circuits. All numbered terminals are identified and all leads number-coded as shown. Connections can be easily removed. Figure 5-2 shows the same information schematically and is an aid in isolating circuits for testing.

Using an ohmmeter, wiring continuity between the connections shown on the wiring diagram (Figure 5-1) is readily verified. This is best done in stages, removing only those wires required for each continuity check. As each lead is replaced, it should be checked for evidence of corrosion, and cleaned if necessary. All leads must be tightly attached so as to provide a good electrical connection.

SECTION 6 MAINTENANCE

6.1 General

This section contains both preventive and corrective maintenance information. Preventive maintenance may be performed by maintenance personnel at the establishment in which the cooker is installed. It is recommended that user personnel never attempt to make repairs or replacements to the equipment without the assistance of authorized service. Assistance in service methods or a current Directory of Authorized Agencies may be obtained from Market Forge (see Subsection 1.3).

6.2 Preventive Maintenance

A good preventive maintenance program begins with the daily cleaning procedure described in Subsection 3.3. Additional preventive maintenance operations are presented in this section. In establishments that employ full-time maintenance personnel, the tasks described can be assigned to them. For other installations, tasks requiring mechanical or electrical experience should be performed by an authorized service agency.

The following paragraphs set forth minimum preventive maintenance procedures that must be completed periodically to assure continued trouble-free operation of the cooker.

CAUTION

Under no circumstances should hardware (or parts) be replaced with a different length, size, or type other than as specified in the parts list. The hardware used in the cooker has been selected or designed specifically for its application, and the use of other hardware may damage the equipment and will void any warranty.

6.2.1 Cooking Compartment Cleaning

A daily cleaning of the cooking compartment and pan supports is required. See Subsection 3.3 for details.

6.3 Repair & Replacement

Section 7 of this manual contains a listing of all replaceable parts and associated exploded views of the ST-12 Cooker. In most cases, disassembly procedures will be obvious from the exploded views. Instructions follow for procedures that are not readily apparent.

6.3.1 Door Latch Tension Adjustment

CAUTION

Shut off main electrical power to unit.

Procedure:

1. Open the cooking compartment door.

2. Remove the control panel by removing the eight mounting screws and disconnecting the wire plug and restraining wire.
3. Tighten both nuts down until the springs are fully compressed.
4. Back each nut off 1/2 turn.
5. Remount the control panel, reconnecting wire plug and restraining wire.

6.3.2 Door Handle Tension Adjustment

Procedure:

1. Open the cooking compartment door.
2. Remove the six screws and washers from the top edge and bottom edge of the door.
3. Remove the inner door gasket mounting plate assembly from the outer door. Do not disassemble these three components—remove them as an assembly.
4. Tighten both nuts down until the springs on the outer door are fully compressed.
5. Back each nut off 1/2 turn.
6. Remount the inner door gasket mounting plate assembly by assembling the six screws and washers.

6.3.3 Door Gasket Replacement

The cooking compartment door gaskets are made of a silicone-type rubber material that is very durable but subject to wear during normal operation. Should the gasket leak, readjust the door gasket to the unit or replace it.

Procedure—Replace Gasket:

1. Open the cooking compartment door.
2. Remove the six screws on the outside of the door, and remove the inner door assembly.
3. Remove the eight nuts from the door gasket mounting plate on the inside of the inner door assembly.
4. Remove the door gasket mounting plate and the door gasket.
5. Install the new door gasket (see Figure 7-2 for part number) to the mounting plate.
6. Reassemble the mounting plate with gasket to the inside of the inner door assembly using the eight nuts.

SECTION 6 MAINTENANCE

7. Reassemble the inner door assembly using the six screws on the outside of the door.

NOTE:

Remember that the lip on the door gasket mounting plate must fit into the channel on the inside edge of the gasket to insure a proper seal.

Procedure—To Adjust Gasket to Unit:

To prevent steam leaks around the door, adjust the gasket tension to cavity. Adjust the gasket by loosening the six screws on top and bottom of door, move inner door plate in or out, left side or right side, and tighten the six screws.

6.3.4 Exterior Panel Removal

WARNING

To prevent hazard in servicing the cooker, be certain that the steam supply boiler is shut down, the cold water shut-off valve is closed, and the electrical disconnect circuit breaker for the cooker/boiler unit is off before removing side panels.

Access to all internal plumbing and electrical assemblies is from the right side and right front. The left-side panel is removed by removing the bottom screw and pushing up on the panel until the lower lip disengages the frame. The panel is shown as item #25 in Figure 7-1. The electric control panel, shown in Figure 7-3, may also be removed as a unit by removing screws and pulling the panel forward. Removal of the control panel is completed by unplugging interconnecting wiring at the pin housing.

6.3.5 Steam & Water Solenoid Valve Replacement

Replacements for the 1/2-inch steam solenoid valves and the 1/4-inch water valves are available as complete units from Market Forge Authorized Service Agencies. It is necessary to replace an entire steam valve when the coil is faulty or the diaphragm ruptures. Replacement coils are available for the water valves. The valves are accessed as explained in Subsection 6.3.4.

SECTION 7 ILLUSTRATED PARTS LIST

7.1 General

This section contains a complete listing of all replaceable parts of the ST-12. For the purpose of parts identification, the unit is broken down into functional assemblies, and each assembly is shown in an exploded view that is keyed to the accompanying parts list. Each parts list contains the figure index number, the Market Forge part number, and an abbreviated description.

7.2 Ordering Information

Orders for repair parts should be directed to the nearest authorized parts distributor. For a current Market Forge Authorized Parts Distributor List, contact:

Product Service Department
Market Forge Industries Inc.
35 Garvey Street
Everett, Massachusetts 02149
Telephone: (617) 387-4100

All orders should contain the Market forge part number(s), the part description(s), and the model and serial number of the cooker for which the part or parts are ordered.

7.3 Index of Illustrated Parts List

Figure	Part	Page
7-1	Cabinet Assembly	7-2
7-2	Door Assembly	7-3
7-3	Control Panel Assembly	7-4
7-4	Condensor Assembly	7-5

SECTION 7 ILLUSTRATED PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	08-6308	REED SWITCH	1
2	98-1691	ASSY, PLUMBING DRAIN	1
3	98-1709	POST, REAR	2
4	08-4912	COUPLER, 1/2"NPT X 5/8"ID BARB	2
5	10-2793	ELBOW, 90, 1/2" IPS	2
6	08-6538	CHECK VALVE 3/8 OD BLACK	1
7	91-6491	GROMMET, SILICONE, RED	1
8	91-7318	WELD ASSY, TOP	1
9	10-9174	RELAY, TUBE	2
10	10-9175	RELAY, BASE	2
11	91-6940	BRACKET, RELAY	1
12	91-6475	HINGE, ASSY TOP	1
13	91-6476	HINGE, ASSY BOTTOM	1
14	91-7334	TROUGH, DRIP, ST-12/ST-24	1
15	91-7385	ASSY, DOOR, ST-12/ST-24	1
16	91-5621	ASSY, JET PIPE	2
17	91-6492	LATCH, DOOR	1
18	08-4600	SPRING, COMPRESSION	2
19	91-7684	STRAINER, CAVITY	1
20	98-1605	WELD ASSY, MIDDLE RACK	1
21	91-7699	RACK SIDE	2
22	10-4586	NUT, 1/2" IPS, S.S. W/TEFLON	3
23	10-8105	THERMOSTAT, SNAP DISC, PROBE TYPE	1
24	10-3343	NUT, BRASS, 1/2" IPS	1
25	10-1956	SCREW, TAPTIGHT, 8-32 X 3/8"	20
26	10-2571	NUT, LOCK, 8-32	17
27	08-1204	PLUG, HOLE WHITE	2
28	10-2184	SCREW, HEX HEAD, 10-32, 3/4" LG	4
29	98-1705	PANEL, SIDE	2
30	98-1708	PANEL, REAR	1
31	98-1632	INSULATION, FRONT	1
32	98-1631	INSULATION, REAR	1
33	08-7959	TUBING, NORPRENE 3/8" I.D.	AS MEASURED
34	08-7960	TUBING, NORPRENE 5/8" I.D.	AS MEASURED
35	98-1712	MECHANICAL CNTRL PANEL	1
36	~NPN~	DIGITAL CNTRL PANEL	1
37	08-2702	BUSHING, DOOR, WHITE	2
38	91-7690	BRACKET, REED SWITCH	1

SECTION 7 ILLUSTRATED PARTS LIST

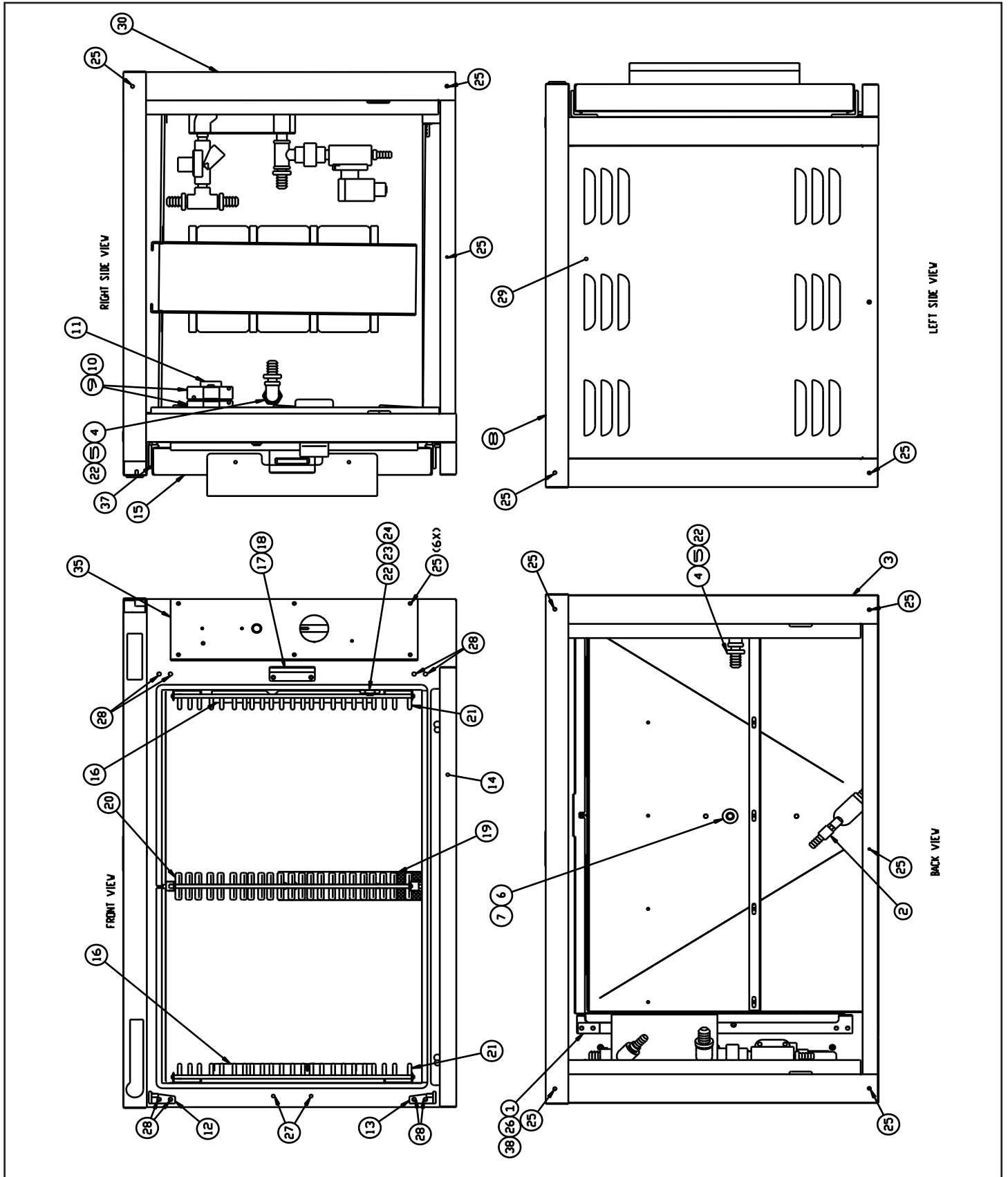


Figure 7-1 Cabinet Assembly

SECTION 7 ILLUSTRATED PARTS LIST

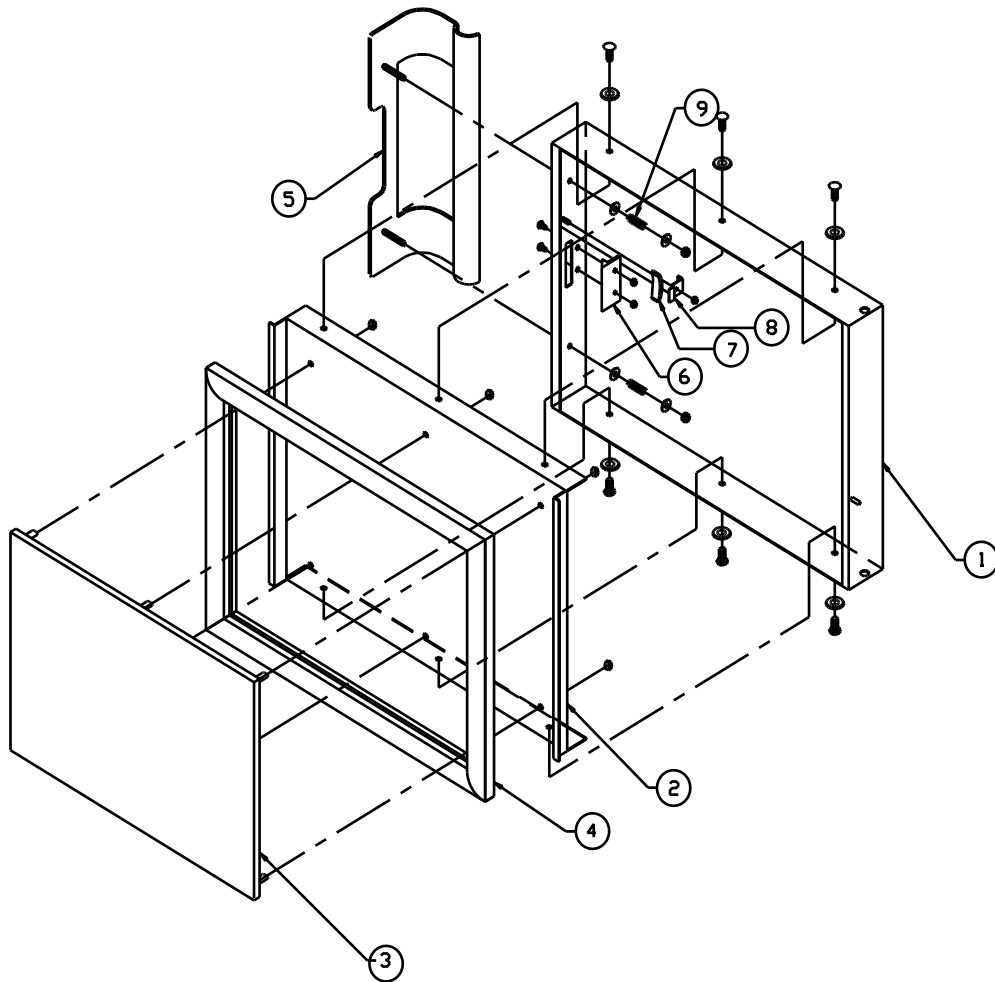


Figure 7-2 Door Assembly

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	91-7386	OUTER DOOR	1
2	91-7387	INNER DOOR	1
3	91-7388	GASKET RETAINING PLATE	1
4	91-7389	DOOR GASKET	1
5	91-5745	DOOR HANDLE	1
6	09-1608	STRIKER	1
7	08-5027	MAGNET	1
8	91-5901	MAGNET BRACKET	1
9	08-4600	COMPRESSION SPRING	2

SECTION 7 ILLUSTRATED PARTS LIST

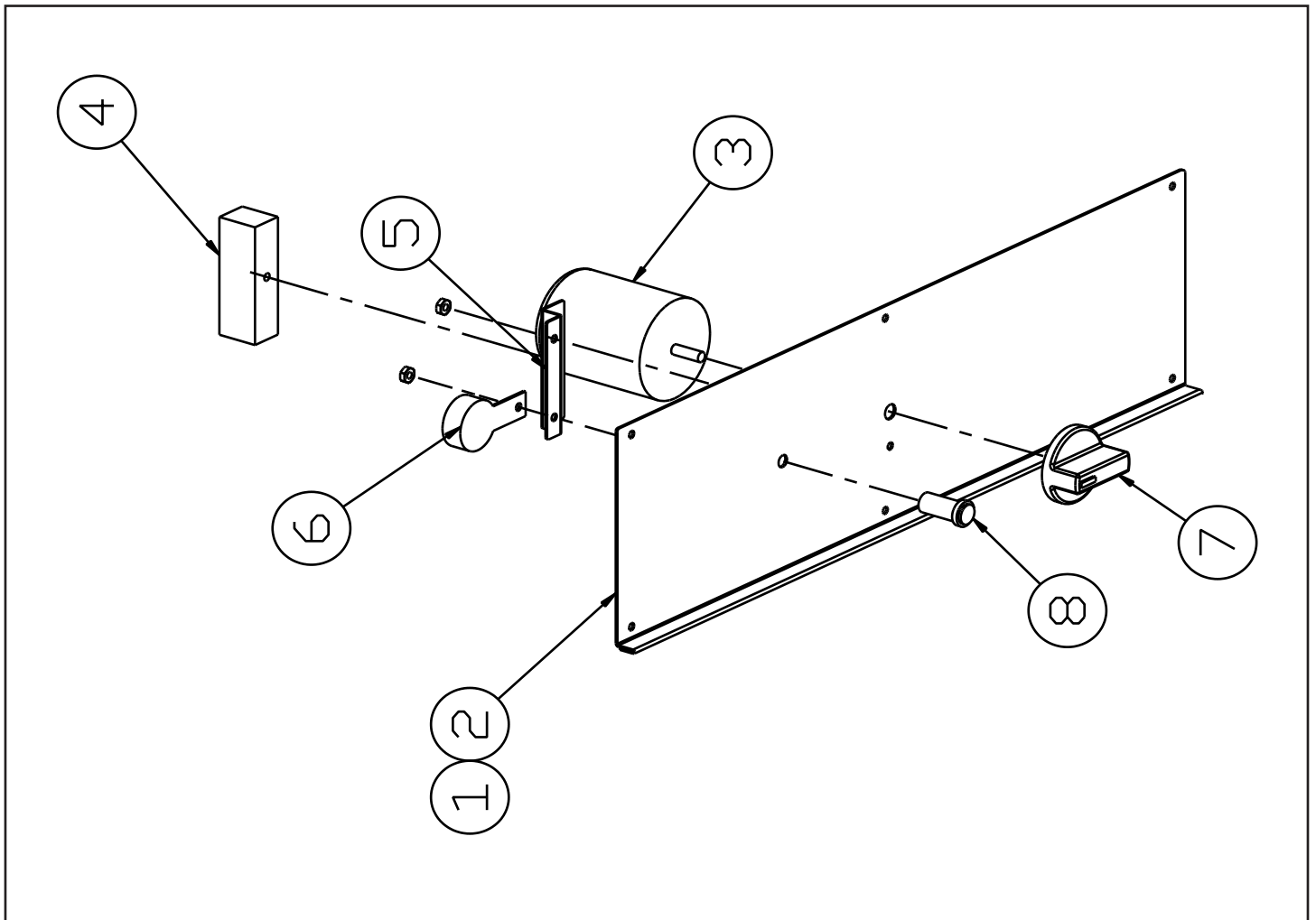


Figure 7-3 Control Panel Assembly

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	98-1706	CONTROL PANEL	1
2	98-1698	ARTWORK, CONTROL PANEL	1
3	08-6464	60 MIN. TIMER	2
4	08-6541	TERMINAL STRIP	2
5	91-6471	BRACKET, TERMINAL STRIP	2
6	10-7395	BUZZER	2
7	08-3826	KNOB, TIMER	2
8	10-5052	LIGHT, RED	2

SECTION 7 ILLUSTRATED PARTS LIST

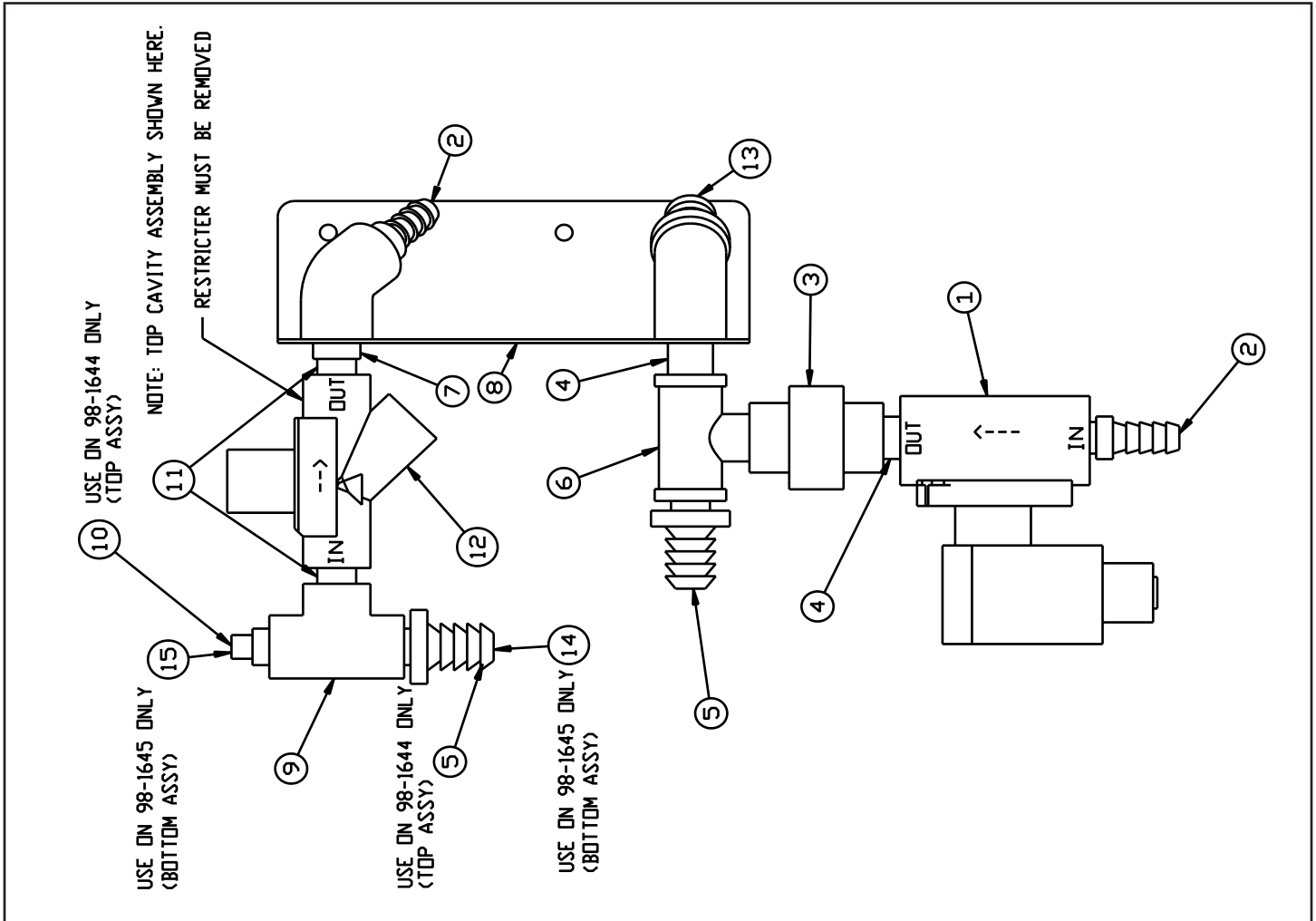


Figure 7-4 Condenser Assembly

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	10-5859	VALVE, STEAM SOLENOID	1
2	08-4892	COUPLER, BRS 3/8ODX1/2THRD NPT	2
3	10-2885	UNION, FEMALE 1/2 IPS	1
4	10-2849	NIPPLE, CLOSE 1/2" NPT BRS	2
5	98-1477	COUPLERBRS, BARB 3/8"X3/8" NPT	1
6	08-6581	TEE, MALE 1/2" NPTX FEML 1/2" BRANCH	1
7	10-3739	1/2"X 3/8 REDUCING BUSHING	1
8	98-1630	WELDMENT, COLDH20/STEAM VALVE	1
9	10-1055	TEE, 3/8" ALL AROUND	1
10	10-3644	PLUG, SQ HEAD 3/8"IPS BRASS	1
11	08-7525	NIPPLE, CLOSE 3/8" NPT BRASS	2
12	08-6498	VALVE, 3/8" NPT, COLDW COND	1
13	08-4912	COUPLER, BARB 5/8"ODX1/2" IPS	1
14	08-7962	COUPLER, BARB 5/8"ODX3/8"THD	1
15	98-1477	COUPLER, BRS BRARB, 3/8"X3/8" THD NPT	1