OWNER'S MANUAL

DIRECT CONNECTED STEAM-IT WITH GAS BOILER BASE, STYLE G

MODEL ST-AS

MARKET FORGE INDUSTRIES INC
An Employee Owned Company

35 Garvey Street • Everett • MA • 02149-4403
Tel: (617) 387-4100 • Fax: (617) 387-4456 (MA)
Toll Free: (866) 698-3188 • Outside MA Fax: (800) 227-2659
Customer Service: custserv@mfii.com • Visit Us At: www.mfii.com

Form No. S-21B • 06/07

TABLE OF CONTENTS

INTRODUCTION

STEAM REQUIREMENTS:
The ST-AS is designed for operation with a piped-in steam supply not in excess of 15 lbs. per square inch, a pressure regulator must be used on the steam input line to reduce and regulate the steam pressures within the operational range of the steam-it.

SUGGESTED STEAM CONNECTIONS:
The illustration shows a recommended system of illustration which provides a regulating valve for delivery of 15 lbs. of steam pressure, a globe valve for emergency cut-off, a pressure gauge measures the pressure input from the source of supply, and a ball float trap to prevent dirt and water from entering the unit. The globe valve, regulating valve, and ball float trap and pressure gauge are not furnished with this equipment. The pressure gauge must be selected to operate within the range of the pressure experienced at the place of installation. With the introduction of a pressure reducing valve, the steam-it will then require input steam pressure in excess of 15 lbs. from its source of supply.

NOTE: With pressure constant and between 11 and 14 PSI use the same system of installation with the pressure reducing valve omitted.

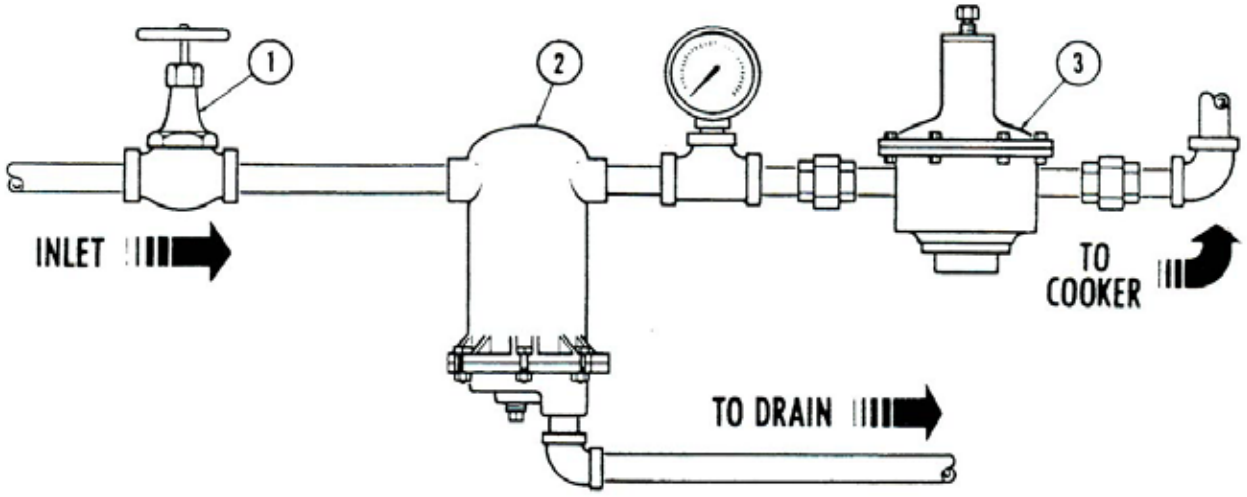


Figure 1.

ITEM	PART NO.	DESCRIPTION
1	10-2821	3/4” globe valve
2	10-5336	Ball float trap
3	10-1033	3/4” pressure reducing valve - enamel
-	10-1034	3/4” pressure reducing valve - chrome

STRONG PRESSURE REDUCING VALVE TYPE “K”:
The 3/4” pressure reducing valve is designed to operate from a 20 to 100 PSI source of steam and to reduce this to 15 PSI for delivery to your steam-it. Before final connection is made, blow down your steam line to remove all dirt, scale, packing and compound accumulated during the installation of the piping.

Steam enters inlet port and passes upward through seat into discharge side of valve. As pressure in discharge side increases, diaphragm is forced upward overcoming tension of adjusting spring and closing valve. As pressure drops, adjusting spring forces diaphragm down reopening valve.

INSTALLATION

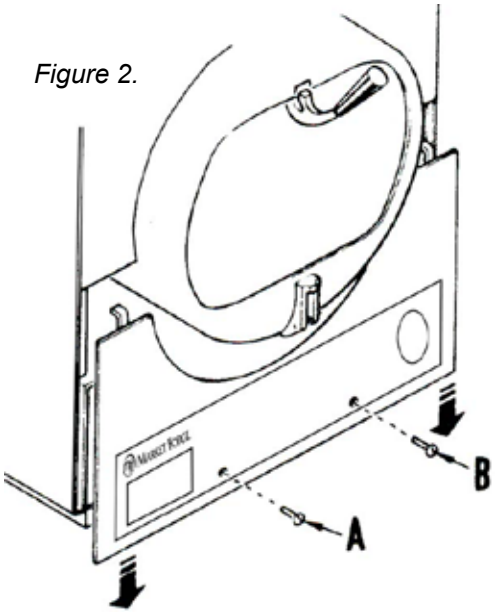
Locate the steam-it where it will be level and if possible, under an exhaust hood.

NOTE: *Steam-it without stand may be set on a table, counter, or cabinet base, but drain and steam connections must be made through supporting unit.*

PAN SUPPORTS:
The pans are an optional accessory and will be found inside the steam-it cooking chamber. The pan supports should be installed so that the horizontal keyhole is at the rear of the cooking chamber, and so that the flange and embossments face the middle of the chamber.

STEAM SUPPLY & EXHAUST CONNECTION:
In order to make the steam supply and steam exhaust connection, it is necessary to remove the lower from service panel.

Figure 2.



1. Remove screws A and B.
2. Slide service panel down, gradually pulling service panel forward.

CONNECTIONS REQUIRED:

1. Open Drain for Exhaust Line - Provide a 1/2" IPS drain line from exhaust valve to an open floor drain. Exhaust connection is located at the bottom center of the steam-it.
   WARNING: DO NOT UNDER ANY CIRCUMSTANCES connect the exhaust drain line directly to a sewer line.
2. Electrical Connection - One 115 volt AC single phase, two amp supply. Connection is for 1/2" conduit. This activates the timer.
3. Steam Connection - This connection can be made on the bottom left side as you stand facing the steam-it. Steam supply line should be at least 1/2" in size. If pressure is over 15 PSI a pressure reducing valve must be installed in the line to reduce the pressure going to the steam-it to 15 PSI.
   WARNING: NEVER connect a steam-it to a feed line supplying other steam consuming units, unless the pipe size and pressure has been carefully verified as to capacity. Whenever possible install a separate feed line for the steam direct from the boiler main.
4. Steam Consumption - This Market Forge direct connect steam-it requires 1 BHP or 34.5#'s of steam per hour at 15 PSI to operate efficiently.

BUILDING UP PRESSURE
Steam pressure must be built up in the steam cooker to properly adjust this valve. The following sequence of operation should be used to build up steam pressure in the cooker.

1. Turn on steam supply valve to unit.
2. Close the door and lock ion position by placing the tongue of the door lock under the roller on the drain castings and press downward until door lock comes to a firm stop. This lock makes the initial seal (*when steam pressure builds up in the compartment, it will force the door to a tighter closed position*).
3. Set timer to desired cooking time. As the pressure builds up, cold air is forces out of the cylinder through the thermostatic steam trap located in the collar at the top rear of the steam-it. The air will continue to escape as pressure builds up and the steam trap will close after all the air has been forces out of the cooking compartment.
4. At the close of the timing period a buzzer will ring advising that the cycle is complete. The supply valve will close and the exhaust valve will open letting the pressure out of the cooking compartment.

ADJUSTING PRESSURE REDUCING VALVE:

1. Release the adjusting screw locknut (*Figure 3, #2*) and run the steam-it through a trial cycle by turning the steam-it timer on. Turn on steam supply valve to unit. Set timer to desired cooking time. As the pressure builds up in the cooking compartment, cold air is forces out of the cylinder through the thermostatic steam trap located in the collar at the top rear of the steam-it. The sir will continue to escape as pressure build up and the steam trap will close after all the sir has been forced out of the cooking compartment.

INSTALLATION

2. Turn adjusting screw (*Figure3, #1*) down or up until the proper operating steam pressure of 15 lbs. is reached on the ST-AS steam-it pressure gauge.
3. Turn back the timer to the “OFF” position. The steam-it will free-vent. When the pressure gauge has reached to approximately 8 lbs., turn the timer on again to a short period of cooking.
4. The steam-it should build up to 15 lbs. maximum and hold until the cycle is complete. Should it fail to reach 15 lbs. or exceed it and blow off the safety valve, repeat the adjustment procedure and retest.
5. Tighten the adjusting screw locknut (*Figure3, #2*) when satisfactorily set and tested.

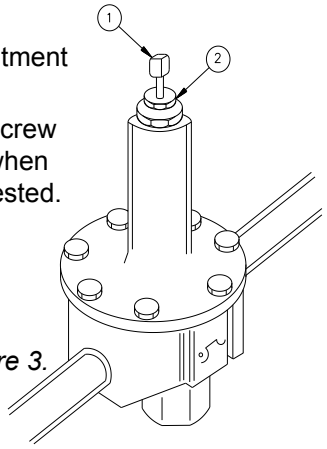
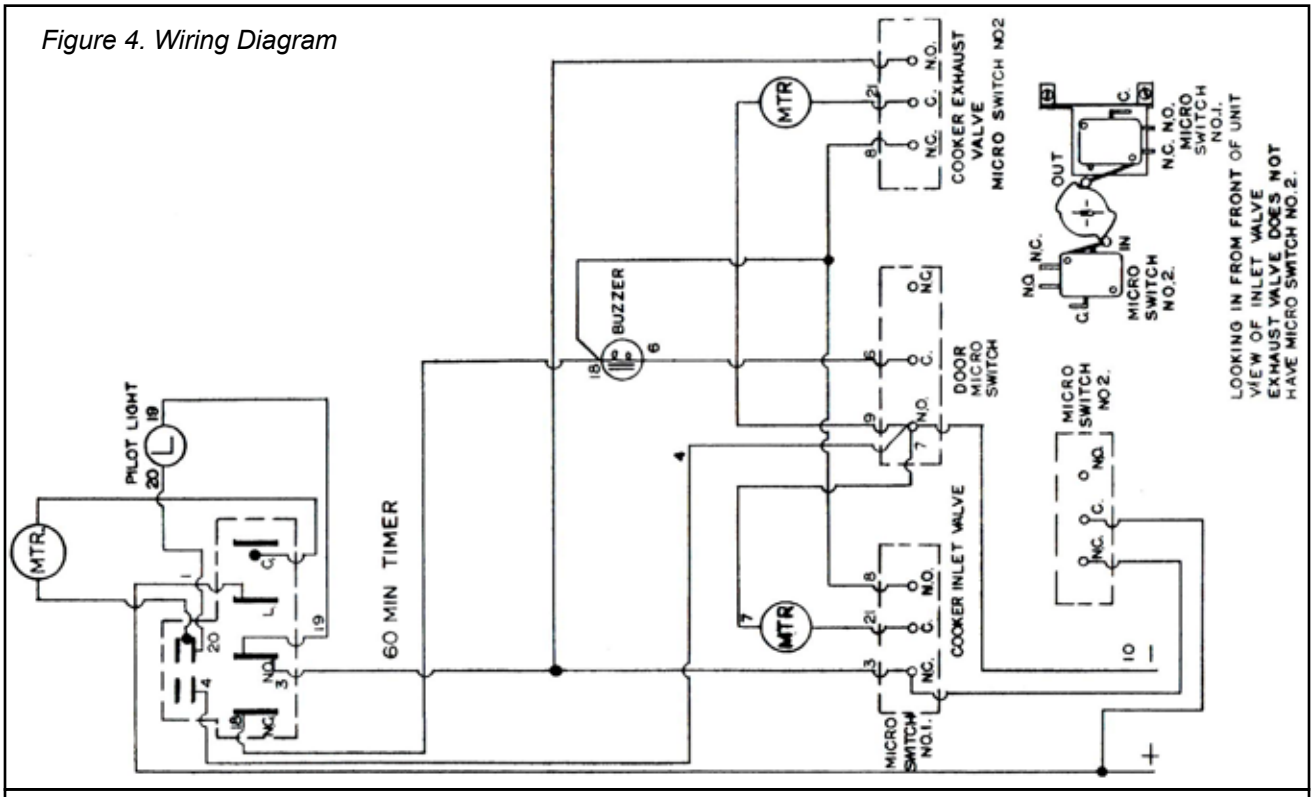


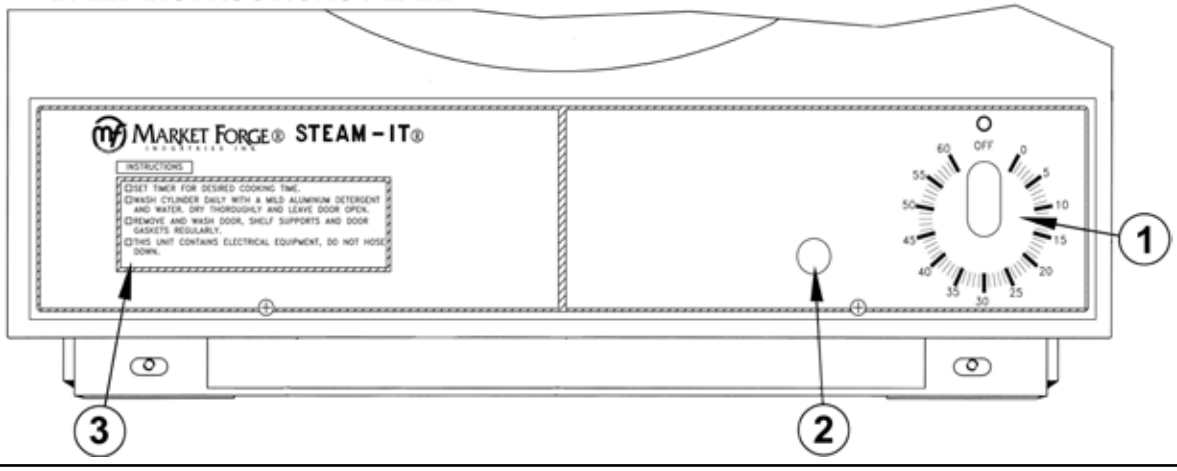
Figure 3.

Figure 4. Wiring Diagram



1. TIMER KNOB
2. TIMER INDICATOR LIGHT
3. DAILY INSTRUCTIONS PLATE

CONTROL PANEL



OPERATION

1. Be sure that steam supply is connected to unit and 120 VAC (*to operate controls*) is connected.
2. Pan supports (3) should be hung on pan support studs on cylinder side walls. The horizontal keyhole on the support should be at the rear of cylinder and the vertical keyhole near the front.
3. Preheat unit. Follow steps 5 through 7 for preheating, setting timer for one minute. Preheating is necessary only when unit is cold and will take 2 to 3 minutes.
4. Slide pans of food to be cooked onto pan supports (3).
5. Close door and lock in position by placing tongue of door lock casting (2) under roller on drain casting (6). Press downward on door lock knob (1) until door is secured.
6. Set timer (5) to desired cooking time (*refer to cooking guide on page 4*), turning it past the proper setting and then back. This will insure accuracy of setting. The pilot light is wired to operate only when the timer is set to a cooking cycle. The circuit will be broken when the timer returns to the “0” position. Thus, when lit, it signifies that the steam-it is in the act of cooking.
7. At end of cooking cycle, steam will automatically exhaust. When pressure reaches “0” on pressure gauge (4), door can be released by pulling up on door lock knob (1). Allow a few seconds for remaining vapor to leave cylinder before completely opening the door. To stop buzzer, turn timer to “OFF” position.
8. Remove cooked food, add desires seasoning, and transferred to serving area. Perforated pans, if they are to be transferred to the serving area, should be underlined with a sold pan.
9. Clean unit thoroughly at the end of each cooking day, making sure cylinder is left dry and the door open (*refer to the maintenance section of this manual*).

1. Door Lock Knob
2. Door Lock Casting
3. Pan Supports
4. Pressure Gauge
5. Timer
6. Drain Casting
7. Pilot Light

<u>WARNING:</u> A HIGH DEGREE OF MINERAL SALTS IN THE WATER CAN CAUSE PITTING OF THE COOKING CYLINDER UNLESS THE CLEANING DIRECTIONS ARE FOLLOWED. THE COOKING CYLINDER MUST BE THOROUGHLY CLEANED AND THE DOOR LEFT OPEN EVERY DAY.

NOTE: *If steam escapes around the steam-it door edges while pressure is building up, door seal adjustments can usually be made (refer to page 10 for door adjustments).*

THE BUZZER:

The function of the buzzer is to signify to the operator that the cycle of cooking has been terminated. The buzzer is mounted on a bracket which is positioned at the front of the unit just under the front removable panel. The buzzer electrical circuit is controlled by the timer. When the timer reaches zero the circuit will be completed and the buzzer will continue to sound until the timer knob is turned to the off position.

PILOT LIGHT:

The pilot light is located at the lower right front of the panel. This unit is wired to operate when the heating elements are on. The circuit will be broken when the timer returns to the “0” position. Thus, when the pilot light is on and off it signals that the heating elements are cycling on and off to maintain cooking pressure in the cooking chamber.

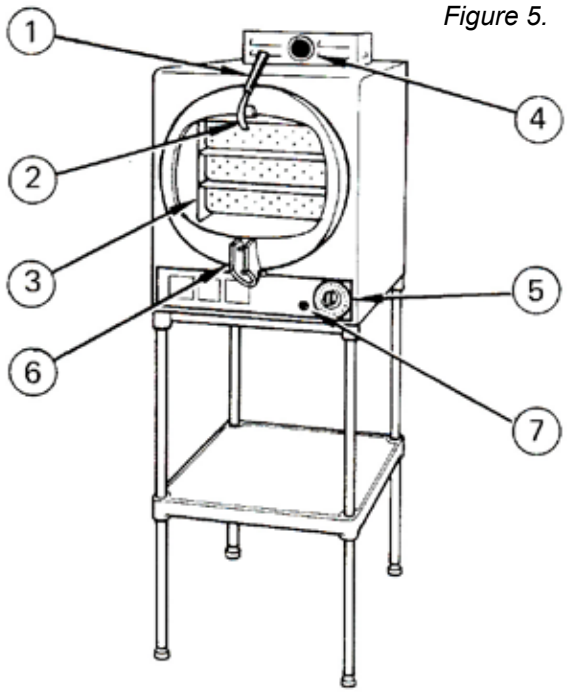


Figure 5.

OPERATION

ITEM	APPROX. WT. PER PAN	RECOMMENDED PAN SIZE, 12" x 20" PERFORATED	NUMBER OF PANS	TIMER SETTINGS IN MINUTES	APPROX/ NO. COOKED 2 Oz. (55g) SERVINGS PER PAN*
VEGETABLES, FROZEN - DEFROSTED					
Asparagus Spears	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	10-11 11-13	23-25
Beans, Green Regular	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	10-11 11-13	23-25
Beans, Green French Cut	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	10-12 12-14	23-25
Beans, Lima	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	9-10 10-11	23-25
Broccoli	#4 *(1.8 kg)*	2 1/2" *(65mm)*	1 2-3	8-9 9-10	18-20
Brussel, Sprouts	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	9-10 11-13	23-25
Carrots	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	8-9 10-12	23-25
Cauliflower	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	10-11 11-13	23-25
Corn	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	8-9 10-11	23-25
Peas	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	5-6 7-8	23-25

** All portions are equivalent to approximately 1/2 cup cooked.*

VEGETABLES, FRESH					
Beans, Wax Green	#6 *(2.7 kg)*	2 1/2" *(65mm)*	1 2-3	8-10 12-15	30-35
Broccoli, 1/2-3/4" Stalk	#6 *(2.7 kg)*	2 1/2" *(65mm)*	1 2-3	6-8 8-10	25-30
Cabbage, Cored - 1/4 1/6 of head	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	10-14 15-20	12-20
Carrots, Sliced	#9 *(4.1 kg)*	2 1/2" *(65mm)*	1 2-3	12-15 15-18	35-40
Cauliflower	#6 *(2.7 kg)*	2 1/2" *(65mm)*	1 2-3	8-10 10-12	30-35
Corn on Cob, Husked	1 Dozen	2 1/2" *(65mm)*	1 2-3	8-10 10-12	12
Potatoes, French Fry	#10 *(4.5 kg)*	2 1/2" *(65mm)*	1 2-3	11-13 14-16	50
Potatoes, Regular Cut	#10 *(4.5 kg)*	2 1/2" *(65mm)*	1 2-3	20-25 25-30	50
Spinach, Cut and Cleaned	#3 *(1.4 kg)*	4" *(100mm)*	1 2	2-3 3-4	4 oz (*110g*) 10-12

OPERATION

ITEM	APPROX. WT. PER PAN	RECOMMENDED PAN SIZE, 12" x 20" PERFORATED	NUMBER OF PANS	TIMER SETTINGS IN MINUTES	APPROX/ NO. COOKED 2 Oz. (55g) SERVINGS PER PAN*
Squash, Summer, 1" Slices	#7 *(3.2 kg)*	2 1/2" *(65mm)*	1 2-3	6-8 8-10	30-35
Squash, Winter, diced	#9 *(4.1 kg)*	2 1/2" *(65mm)*	1 2-3	10-12 13-15	30-35
Turnip, diced	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	15-20 20-25	4 oz (*110g*) 20-25

** All portions are equivalent to approximately 1/2 cup cooked.*

VEGETABLES, CANNED

Canned, Vegetables	#7.5 *(3.4 kg)*	2 1/2" *(65mm)*	1 2-3	6-7 7-9	26-30

MEAT - POULTRY - FISH

Chicken, cut-up, breaded	#8 *(3.6 kg)*	2 1/2" *(65mm)*	1 2-3	15-20 20-25	15-20 Protein
Chicken, Whole	3 - #4 *(1.8 kg)*	4" *(100mm)*	1 2-3	40-45 50-60	25-30 Protein
Fish, Fillets	#3 *(1.4 kg)*	2 1/2" *(65mm)*	1 2-3	8-12 10-13	12-15 Protein
Fowl, Whole	2 - #5 *(2.3 kg)*	4" *(100mm)*	1 2-3	45-60 50-65	20-25 Protein
Frankforts	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	2-3 3-4	35-40 Protein
Hamburgers, 3 oz (*85g*)	#5 *(2.3 kg)*	2 1/2" *(65mm)*	1 2-3	10-12 13-16	20-25 Protein
Lobster 1# size (*450g*)	#10 *(4.5 kg)*	2 1/2" *(65mm)*	1 2-3	4-7 6-10	10-1# (*150mm*)
Meatballs ** 1 oz. (*28g*)	#6 *(2.7 kg)*	2 1/2" *(65mm)*	1 2-3	17-19 20-22	20-25 Protein
Meatloaf **	#15 *(6.8 kg)*	2 1/2" *(65mm)*	1 2-3	30-35 35-40	50-60 Protein
Pork Chops 4 oz. (*114g*) with bone	#6 *(2.7 kg)*	2 1/2" *(65mm)*	1 2-3	20-25 25-30	24 Protein
Sausages, 10 per lb. (*45g*)	#6 *(2.7 kg)*	2 1/2" *(65mm)*	1 2-3	16-18 18-20	18-20 Protein
Turkey, on Carcass	20 - 22# *(9-10 kg)*	4" *(100mm)*	1	90-100	50-60 Protein
Turkey, off Carcass	10 - 12# *(4.5-5.4 kg)*	2 1/2" *(65mm)*	1 2	50-55 55-60	55-65 Protein

*** Raw weight for meatballs and meatloaf includes hamburg and extenders and yields 2 oz. (55g) protein plus extenders for 3 oz. (85g) total portion.*

OPERATION

ITEM	APPROX. WT. PER PAN	RECOMMENDED PAN SIZE, 12" x 20" PERFORATED	NUMBER OF PANS	TIMER SETTINGS IN MINUTES	APPROX/ NO. COOKED 2 Oz. (55g) SERVINGS PER PAN*
MISCELLANEOUS					
Eggs, out of shell	4 Dozen	2 1/2" *(65mm)*	1 2-3	5-6 7-8	48 48
Rice, 1 gal. water (*3.78 liters*)	4# *(1.8kg)*	4" *(100mm)*	1 2	20-25 25-30	60 3 oz. *(85g)* Portions
Spaghetti, 1.5-2 gal. Water (*5.7-7.6 liters*)	3# *(1.4kg)*	4" *(100mm)*	1 2	20-25 25-30	40-45 4 oz. *(110g)* Portions

TROUBLE-SHOOTING

TROUBLE TESTS & REMEDIES:

TIMER:

If setting the timer fails to operate the steam-it and the pilot light also fails to light, look first for a break in the electrical supply line (*main switch off, burned out fuse, defective wiring, etc.*) then look for poor connections or defective wiring within the steam-it itself. With these initial checks accomplished satisfactory and the unit is still inoperative:

1. Apply 115 volts across the motor coil terminals of the steam inlet valve and the steam exhaust valve, in turn, to determine if their motors or ball type valves are in proper working order.
2. Check the microswitchs of both valves. Usually a manual check by activating each microswitch's roller arm and noting a distinct click is sufficient to prove the microswitch is in order. A move exacting test can be made of a suspect microswitch by testing for continuity to only one of the terminals at its base, in turn this test must show continuity to only one of the terminals at the base of the microswitch. If continuity cannot be established at all, or established through both base terminals simultaneously, the faulty is a defective microswitch.
3. If all the above checks prove that both valve assemblies are in order and all wiring is known to be intact, the timer is defective and must be replaced.

The timer is replaceable only as a complete unit as factory repairs of it are not practical in the economic interest of the customer.

STEAM TRAP:

The first indication of a defective steam trap operation will usually be evidence by uneven cooking. If working properly, the steam temperature will be even and cooking will be uniform through the cooking compartment. Trouble may occur either through premature closing of the steam trap before all the cold air has exhausted or by its failure to close sufficiently to enable a proper steam pressure build-up. Either case warrants the replacement of the steam trap.

TROUBLE-SHOOTING

TROUBLE-SHOOTING GUIDE

POSSIBLE CAUSE	CORRECTION
SETTING THE TIMER FAILS TO LIGHT THE PILOT LIGHT.	
1. Power not reaching unit. 2. Pilot light burned out; connection loose; defective wiring. 3. Timer circuit not completed; loose connections; defective wiring; defective timer.	1. Check for interruption in your electrical input line. 2. Replace pilot light assembly; tighten connections; replace defective wiring. 3. Check connection; replace defective wiring. If pilot light lights and unit is inoperative check for defective timer. Replace is defective.
STEAM FAILS TO ENTER COOKING CHAMBER	
1. Operating circuit broken; inlet valve defective; timer defective.	1. Check for faulty connections of defective wiring, tighten or replace. Make continuity check of inlet valve motor and inlet valve microswitchs for positioning and continuity, also check the valve for binding. Replace any defective components. If okay, replace timer.
STEAM-IT OPERATES, BUT FAILS TO BUILD-UP PRESSURE TO 15 LBS. PRESSURE.	
1. Induced steam to unit has insufficient pressure. 2. Steam leaks around door. 3. Steam trap fails to properly close. 4. Safety valve blows off below 15 lbs. pressure. 5. Exhaust valve fails to close.	1. Provide suitable pressurized steam to unit. 2. Check for worn gasket. Adjust door or replaces gasket. 3. Replace thermostatic element within the steam trap. 4. Replace safety valve. 5. Check exhaust valve motor continuity and microswitch positioning and continuity. Check for binding valve. Replace defective components.
STEAM-IT DOES NOT SHUT DOWN WHEN TIMER REACHES "0".	
1. If unit fails to exhaust all steam; circuit to exhaust valve motor is broken or exhaust valve is binding in a closed position. 2. If neither the exhaust valve or the inlet valve operates to shutdown position, timer is defective. 3. Check to see if circuit to inlet valve motor is broken or inlet valve is binding in an open position.	1. Make continuity checks of components on line to exhaust valve motor. Reestablish circuit if found broken. Repair or replace valve if found binding. 2. Replace timer. 3. Make continuity checks of components on line to inlet valve motor. Reestablish circuit if found broken. Repair or replace valve if found binding.
UNEVEN COOKING	
1. Steam trap closing prematurely.	1. Replace the thermostatic elements within the steam trap.
BUZZER FAILS TO STOP BUZZING WHEN HANDLE IS RELEASED.	
1. Plunger sticking. 2. Short. 3. Defective microswitch.	1. Remove and clean plunger shaft. 2. Check connections or replace wire were needed. 3. Replace.

MAINTENANCE

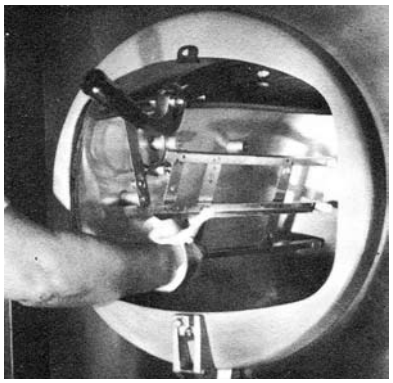


Figure 6.

The Market Forge Steam-it Must be cleaned every day as follows:

Daily:
Remove pan supports (*Figure 6.*) by lifting front up and off stud. Pull back of pan support forward and off stud. Wash with mild detergent and water. Rinse and dry thoroughly.

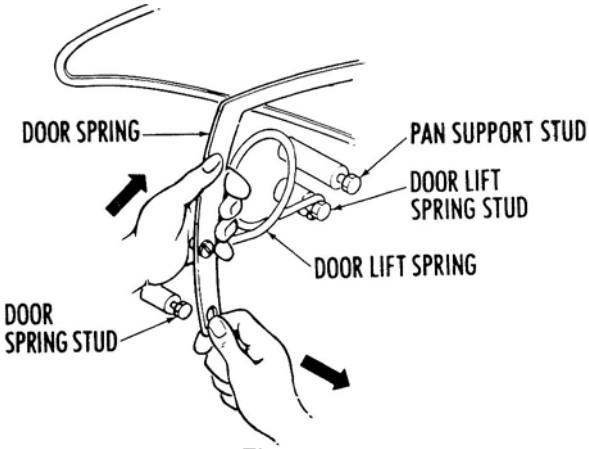


Figure 7.

Weekly:
Remove door (*Figure 7.*). (*Follow these instructions carefully as the clearances through the portal are close and much confusion can result if not removed in the sequence described below*).

Raise the door to a fully open position and disengage the door spring from each of the door spring studs. Do this by counter-acting the force of the door lift spring with one hand while working the end of the door spring off the door assembly with the free hand. Do this on both sides of the door assembly.

When the ends of the door spring have been completely freed from their respective door spring studs, the door lift springs on either side of the door assembly can easily be slipped off their studs.

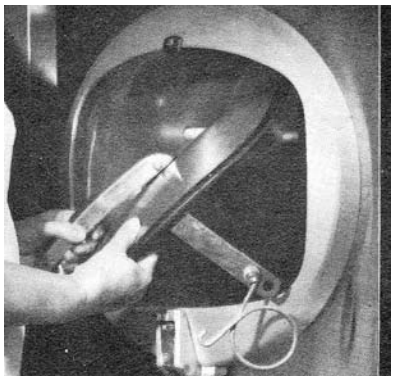


Figure 8.

Weekly:
Rotate the entire door assembly out through the door opening (*Figure 8.*). Pass the door handle through the opening first and then one end of the door spring as shown. The remainder of the door assembly will then pass through the door opening quite easily.

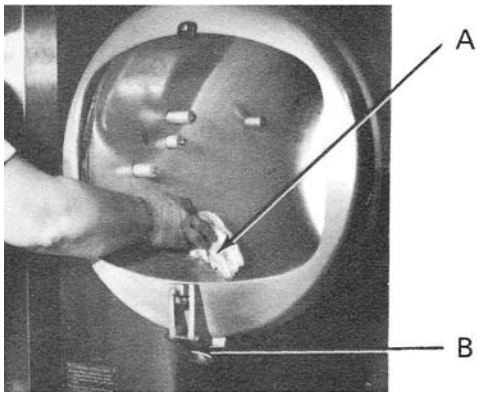


Figure 9.

Daily:
Wash interior of Steam-It thoroughly with mild detergent and water (*Figure 9-A*). Rinse and dry thoroughly. Cylinder is aluminum and can pit if not cleaned properly. Be sure to wash drain plug area if you model is so equipped (*Figure 9-B*).

MAINTENANCE

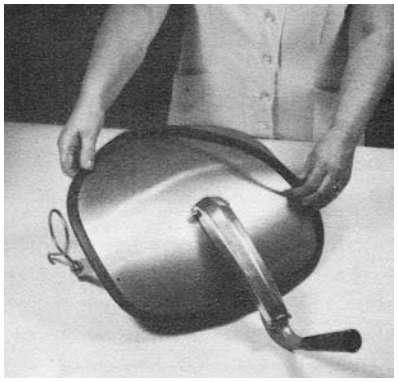


Figure 10.

Weekly:
Gasket should be removed and washed when necessary. Replace gasket only when door has been removed (*Figure 10.*). Replace door and pan supports after unit has been thoroughly cleaned.

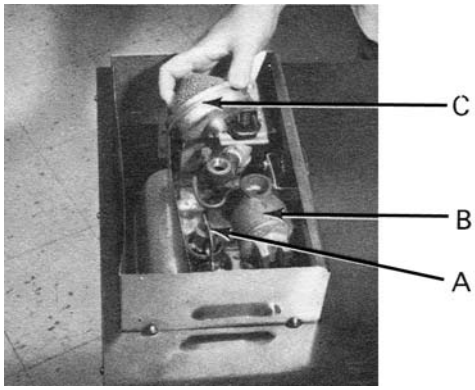


Figure 11.

Weekly:
Check safety valve (*Figure 11-A*). Lift handle on valve when Steam-It is under pressure. Steam should escape. (Note: Dirty water may escape for a few seconds, but then steam should flow freely).

Steam trap (*Figure 11-B*) should first allow air to escape and then slowly close as all air is forced out of the compartment. The sound of air escaping is quite noisy but subsides once steam pressure is built up and cooking takes place. If steam trap does not close it should be replaced.

Exhaust silencer (*Figure 11-C*) must be cleaned by rinsing in mild detergent and water or change whenever it becomes clogged.

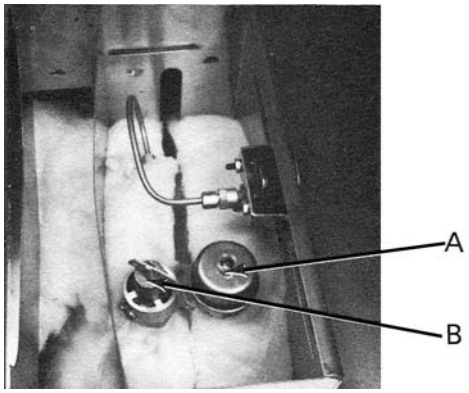


Figure 12.

Weekly:
The steam trap is shown in (Figure 12-A) and the safety valve is shown in (Figure 12-B). Inspection and maintenance procedures are the same.

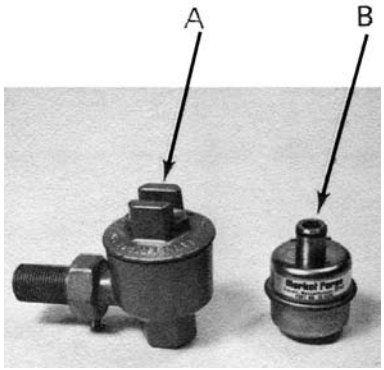


Figure 13.

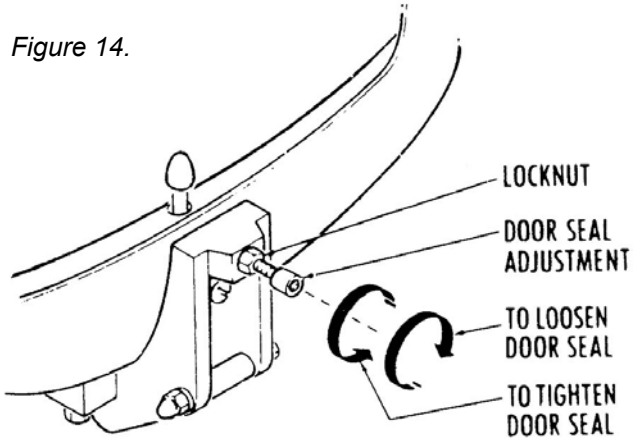
Weekly:
Your particular unit may be equipped with a different trap.

Old style: (*Figure 13-A*) or new style (*Figure 13-B*). Replacement steam traps will be of the new style.

MAINTENANCE

DOOR ADJUSTMENT:
The door adjustment is located in the fulcrum casting at the base of the door opening. This adjustment employes the use of a screw and locknut. To adjust the cooker door to a tighter closed position (to prevent steam from leaking by the door gasket as pressure builds-up) its necessary to loosen the locknut and back off the screw at least one-quarter of a turn and retighten the locknut.

Figure 14.

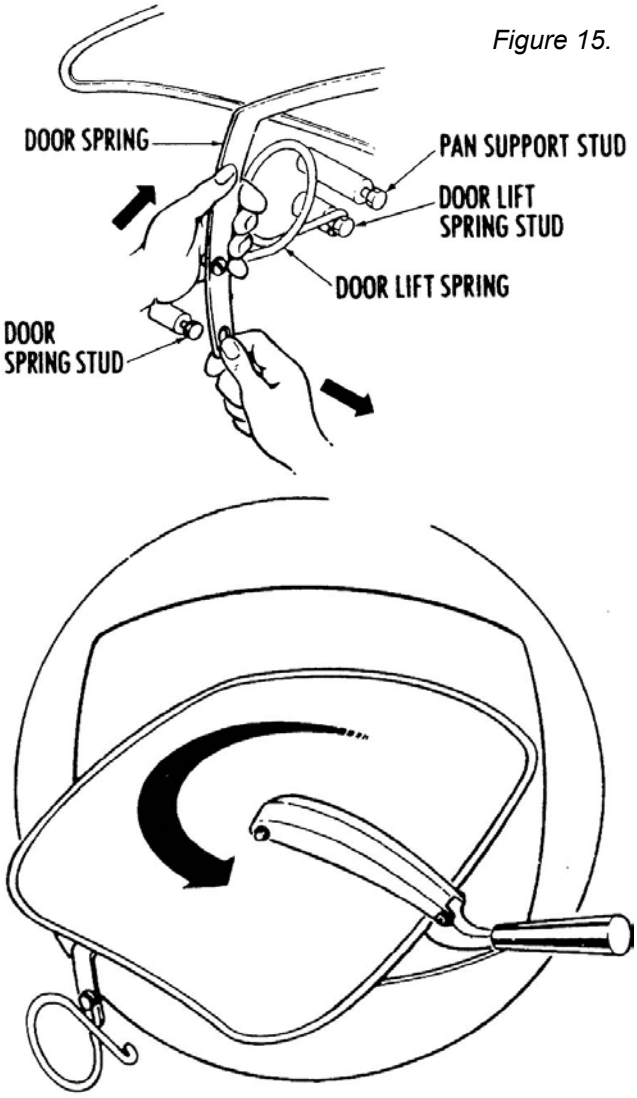


REMOVE THE DOOR ASSEMBLY:
The door assembly can be removed from the inner cooking chamber as a unit without the use of any special tools or equipment. However, a system attic approach to this is warranted as the clearances through the portal are close and much confusion can result if not removed in the sequence described below.

1. First, lift off and remove the two pan supports to expose the door spring from each of the door spring studs. Accomplish this by counter-acting the force of the door lift spring with one hand while working the end of the door spring of the door assembly.
2. When the ends of the door spring have been completely freed from their respective door spring studs, the door lift springs on either side of the door assembly can easily be slipped off their studs.
3. When the ends of the door spring have been completely freed from their respective door spring studs, the door lift springs on either side of the door assembly can easily be slipped off their studs.
4. Rotate the entire door assembly out through the door opening, passing the door handle through the opening first, and then one end of the door spring as shown in the illustration. The remainder of the door assembly will then pass through the door opening quite easily.
5. To replace the door assembly, reverse the step by step procedure backwards.

DOOR LIFT SPRING REPLACEMENTS:
Market Forge supplies replacement door lift springs in sets only. This policy has been found to be in the best interest of the customer. The loft springs are marked left and right. They must be installed properly in their marked left and right positions.

Figure 15.



MAINTENANCE

WATTS PRESSURE REDUCING VALVE:
To provide adequate steam pressure regulation, your unit may be equipped with a watts steam pressure reducing valve. The 3/4" watts pressure reducing valve is designed to operate from a 7 to 50 PSI source of steam pressure and reduce this to 5 PSI for delivery to your cooker. Installation must be made from your source of steam supply, through the pressure reducing valve, and into the manifold input part of the steam cooker.

<u>WARNING:</u> BEFORE FINAL CONNECTION IS MADE, BLOW DOWN YOUR STEAM LINE TO REMOVE ALL DIRT, SCALE, PACKING AND COMPOUND WHICH MAY HAVE ACCUMULATED DURING THE INSTALLATION OF PIPING TO THE COOKER.

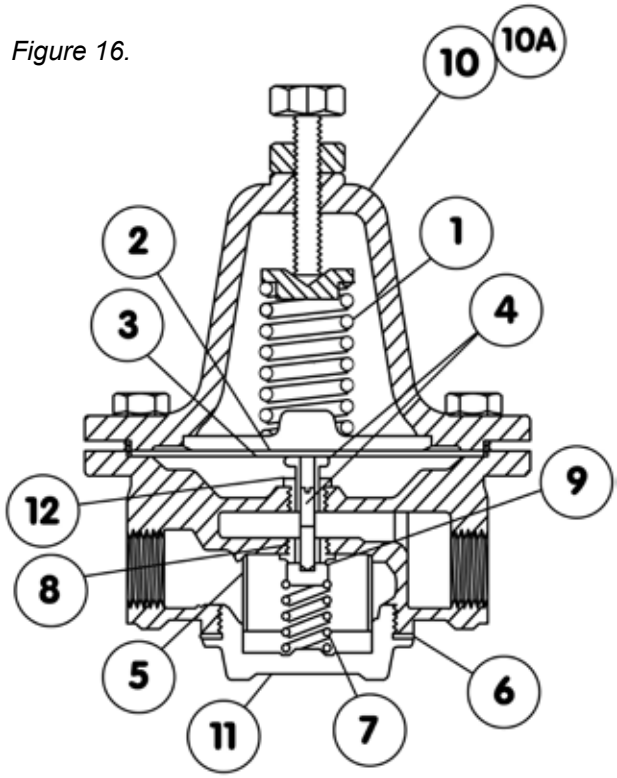
ADJUSTING WATTS PRESSURE REDUCING VALVE:
1. Release the adjusting screw lock nut and loosen the adjusting screw enough to release all tension on adjusting spring (*#1, Figure 16*).
2. Turn steam on slowly. Then turn adjusting screw clockwise just enough to allow the valve to open slightly. Allow cooker to operate in this manor for several minutes.
3. Turn adjusting screw down slowly, at intervals until reducing pressure reaches the desired point (*5 PSI*).
4. Tighten adjusting screw lock nut.
5. If chattering noise should occur, turn adjusting screw located in bottom half of valve body, clockwise or counterclockwise, until chattering stops.

WATTS PRESSURE REDUCING VALVE INSPECTION:
Reports of unsatisfactory regulation of the pressure reducing valve is usually due to dirt, pipe compound, etc. blocking the internal strainer or gumming up the seat and disc assembly.

WATTS PRESSURE REDUCING VALVE CLEANING:
To clean the strainer, seat and disc assembly remove the bottom plug (6) and remove strainer screen (5), bottom spring (7) and disc assembly (9). Clean the lower part of the valve. This can be accomplished without removing the valve from the line or unbolting the cover. If cleaning the strainer and disc assembly does not correct fault the disc assembly should be removed and the diaphragm button stem assembly should be removed and cleaned.

OPERATION WATTS PRESSURE REDUCING VALVE:
Steam enters the valve at the inlet port and passes upward through the seat (8) into the discharge side of the valve. As pressure in the discharge side increases, it forces the diaphragm (2) upward, overcoming the tensions of the adjusting spring (1) and closing valve. As the pressure drops, the adjusting spring forces the diaphragm down, reopening the valve. Where demand and initial pressures are fairly constant, the valve opens to the proper position and maintains the desired reduced pressure.

Figure 16.



REPAIRING WATTS PRESSURE REDUCING VALVE:
The following should be cleaned or replaced should the watts pressure reducing valve fail to operate:

Both the disc assembly (9) and strainer (5) are removed by removing the bottom plug (11) and bottom spring (7). upon cleaning or replacing these items, be sure that the disc assembly (9) is seated properly on the steam assembly (4) otherwise the steam assembly will be bent restricting its movement and regulation of steam through the valve.

Should there be a restriction in the diaphragm button and steam assembly (4) it will cause a drop in steam flow or large fluctuations in steam pressure. It is then necessary to replace diaphragm button and steam assembly (4), valve stem guide (12) and diaphragm gasket (3) as well as items (5, 7, 9, & 11).

Upon completion of the above removal of any loose scale, which may be found in the valve, the valve should be reassembled; upon installation, function properly.

MAINTENANCE

FULCRUM & DRAIN ASSEMBLY:
The fulcrum and drain assembly is located at the lower front of the cooking cylinder and furnishes a sturdy anchorage for the door locking system of the door handle. Also provided in this assembly is a means of adjust for the door seal. The drain port and drain plug provide a means of discharging accumulations of water from the cooking cylinder.

ROLLER ASSEMBLY:
The roller assembly must be kept free-rolling at all times. Should this assembly be allowed to become frozen due to lack of lubrication, undue strain will be put on the door handle and the fulcrum casting while the door is being locked. Use only a dry lubricant such as graphite, as oil or grease will tend to attract dirt to this area.

SAFETY VALVE:
The safety valve is set to automatically relieve the cooking compartment of excessive pressure build-up by opening at a point between 15.5 lbs. and 16 lbs. If the safety valve should leak continually with a pressure build-up, or should it cause an interruption of the cooking cycle prematurely (*less then 15.5 lbs., on steam gauge*) it must be determined to be defective and be replaced. However, the steam gauge should first be checked for accuracy before making this determination. The steam gauge should register absolute zero setting with no pressure in the cooking cylinder. If the normal zero setting has advanced somewhat through usage (*a characteristic of steam gauges*) the amount of advancement from absolute zero must be subtracted from its registered reading to determine the true steam pressure.

STEAM TRAP (*B, Figure 17*):
The steam trap is located with in the flue at the top rear od the steam-it. It has the very important automatic dual function of exhausting all cold air from the cooking compartment and of making a suitable seal allow a pressure build-up of live steam during the cooking cycle. Failure of this unit to operate properly will result in uneven cooking (*see page 7 for trouble-shooting*).

FLUE:
The flue serves as a protection shield for the steam trap (B), safety valve (A), as well as a front-facing mount for the steam gauge (D). As servicing of these parts may at times require the removal of the flue, an exploded view drawing is provided to show their proper relative positions within the flue and the method of their assembly to the cooking cylinder.

REMOVE THE FLUE:
1. Detach the 3/16” copper tube connector (C) from the steam gauge (D) at the ferrule nearest the steam gauge. Then, remove the copper tube entirely by freeing it at the other ferrule.
2. Apply inward pressure at either sides of the flue at points (1) and (2) with a screwdriver. This will collapse the side walls slightly to allow the small fluted sections of sheet metal to clear the edges of the flue opening provided in the outer shell of the stem-it. With the restrictions of the flue removes, the flue may then be lifted up over the parts it houses.

Figure 17.

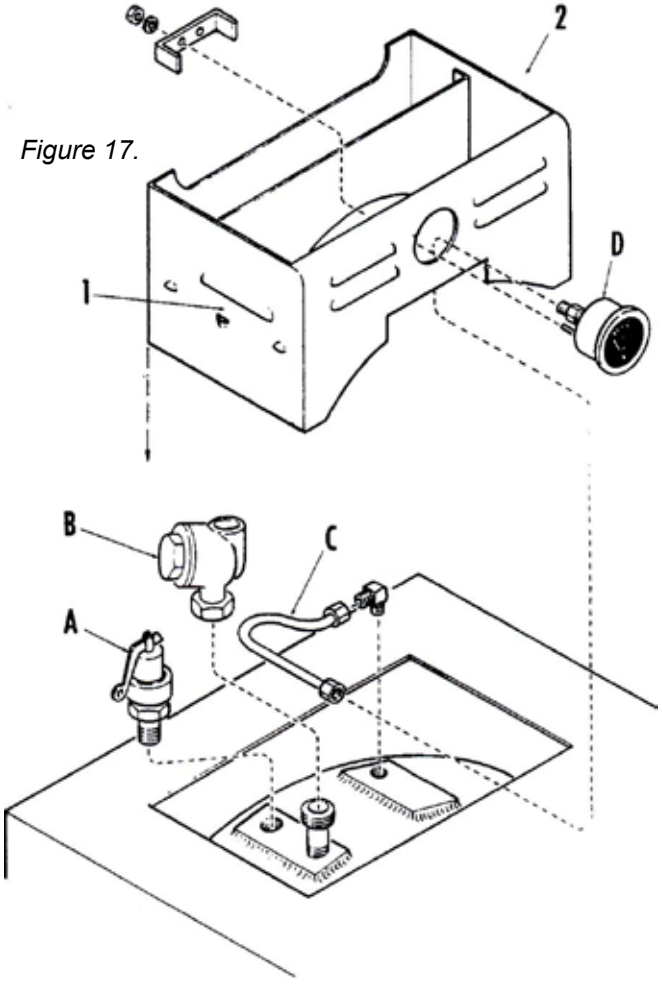


Figure 17. Flue

ITEM	PART NO.	DESCRIPTION
A	10-4636	1/2” - 15 lb. safety valve
B	10-6156	Steam trap
	10-6158	Steam trap adapter
C	15-7054	Pressure gauge tubing
D	10-0883	0-30 lb. pressure gauge

MAINTENANCE

STEAM PRESSURE GAUGE (*D, Figure 17*):
Located at the top rear of the Steam-It and mounted into the forward face of the flue for visibility, the steam pressure gauge registers the pressure within the Steam-It cooking chamber. To replace this unit it is necessary to disconnect the 3/16" copper tube connector and remove the two nuts holding the gauge framework in place.

SAFETY FUSE BLOW-OUT PLUG (*OBSOLETE*):
Located in the door under the door handle assembly, the safety fuse blow-out plug acts as an added insurance to supplements the safety valve in the event of its failure. Its construction characteristics cause it to "blow out" in the event pressure working upon it should exceed 28 lbs. As an added safety factor, should a plug that the safety valve, located in the flue, has failed to function properly to relieve cooking chamber pressure in excess of 16 lbs. However, should the safety fuse blow-out plug itself be defective and "blow off" prematurely, a replacement of the safety valve would not be necessary. The condition of the safety valve may be determined by installing a new blow-out plug and then testing to see that pressure build up does not exceed 16 lbs. on the steam gauge without automatically opening the safety valve.

NOTE: *Now that the safety fuse blow-out plug is not available please contact the factory for alternative options.*

SAFETY VALVE (*A, Figure 17*):
The safety valve is located within the flue at the top rear of the steam-it. This valve is set to open between 15 1/2 and 16 lbs. pressure and to exhaust steam from within the cooking cylinder, thereby assuring that operating pressure do not become excessive.

Maintenance of the safety valve is simple in that just normal precautions need to be taken. The lever action of the safety valve must be free to operate unrestricted at all times and its factory set opening point must remain within the recommended pressure setting.

CHECKING THE SAFETY VALVE:
If the safety valve should leak continually with a pressure build-up, or should it cause an interruption of the cooking cycle prematurely (less then 15 1/2 lbs. on the steam gauge), it must be determined to be defective and replaced. However, the steam gauge should first be checked for accuracy before making this determination. The steam gauge should register absolute zero with no pressure in the coking cylinder. It the normal zero setting has advanced somewhat through usage (*a characteristic of steam gauges*), the amount of advancement from absolute zero must be subtracted from its registered reading to determine the true steam pressure.

STEAM INLET VALVE:
The steam inlet valve assembly is mounted on the base plate of the steam-it to the left of center as viewed from the front of the unit. The complete assembly consists of a #1 microswitch, a #2 microswitch, a cam, a motor assembly, a ball type valve, and related mounting hardware. Its purpose is to control the inlet of steam from the source of supply to the cooking cylinder (*refer to page 23, Figure 29 Steam Inlet Valve Assembly*).

The design of the bal valve is such that it alternately opens and closes with each 90^{O} of rotation. The cam, which is mounted to and rotates with the motor driven, valve stem, trips both the #1 and #2 microswitchs with each 90^{O} of rotation. The #1 microswitch initially opens the valve by transmitting operating current to the valve motor only long enough to accomplish a 90^{O} rotation of the valve to its fully opened position. When the timer reaches "0", The #1 microswitch again passes current to the valve motor until another 90^{O} of valve rotation to completely shut off the source of steam supply. During the valve opening and valve closing, the valves operating electrical circuit runs from #1 microswitch, to the timer motor and to the valve motor.

However, should the timer be manually turned back to "0" before the steam inlet valve has complete its initial rotation to the fully opened position the #2 microswitch will continue the direction of operating current to the valve motor until the valve has rotated sufficiently to fully close. It is important to note that current will flow to the valve motor in this situation even though the timer is at "0". This feature automatically brings the steam -it back to its original starting position and readies it to be set for another cycle of cooking. The electrical operating circuit during this sequence passes through the #2 microswitch, to the timer motor and then to the valve motor. The positioning of the #2 microswitch in relation to the cam is critical to its proper operation and careful attention should be given the following instructions before servicing the steam inlet valve.

STEAM INLET VALVE MICROSWITCH ADJUSTMENTS:
It should be noted that the #1 microswitch acts to break the current flow to the valve motor only when its roller rides INTO or OFF the high points of the cam. The rotation of the valve is counterclockwise as viewed from the valve end of the complete assembly and rolling OFF the high points will stop the valve in the closed

MAINTENANCE

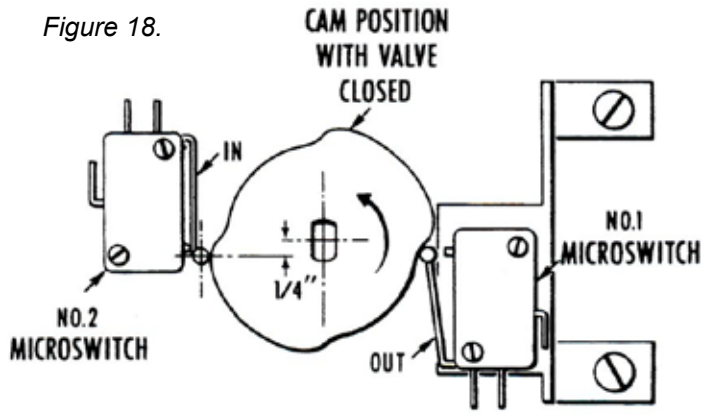
position. The #1 microswitch roller riding INTO the high points of the cam will stop the valve in the opened position.

The position of the #2 microswitch is more critical, With the calve in the fully closed position the roller of the #2 microswitch must be making contact with the high side of the cam at a pint just opposite the roller of the #1 microswitch. The lever of the #2 microswitch must be fully depressed to the IN position when at this location on the cam.

IMPORTANT: When servicing the steam inlet valve, the steam inlet valve motor, the #1 microswitch, or the #2 microswitch care must be taken that the following holds true upon reassembly:

1. The valve is placed in a fully closed position.
2. The #1 microswitch is adjusted and set so that its roller is in a position of having just rolled OFF a high side of the cam and simultaneously the #2 microswitch roller has just advanced ALONG the opposite high side of the cam to a point 1/4" from an imaginary center line extending vertically from the valve stem (*Figure 18*).

Figure 18.



INLET VALVE – as viewed from front of unit.

3. Each microswitch roller makes very light contact when riding upon the low sides of the cam just tight enough contact to trip the microswitch when riding on the high sides.
4. All wiring is placed to the proper terminals in conformance with the wiring diagram.

THE STEAM EXHAUST VALVE:

The steam exhaust valve assembly is mounted on the base plate to the right os center as viewed from the front of the unit. The complete assembly consists of a single microswitch, a cam, a motor assembly, a ball type valve and related mounting hardware (*refer to page 22, Figure 28 Steam Exhaust Valve Assembly*). The steam exhaust valve automatically closes to trap steam within the cooking cylinder at the start of a cooking cycle. It holds this closed position until the cycle of cooking has been completed, at which point, it automatically opens to free the steam and direct it harmlessly away.

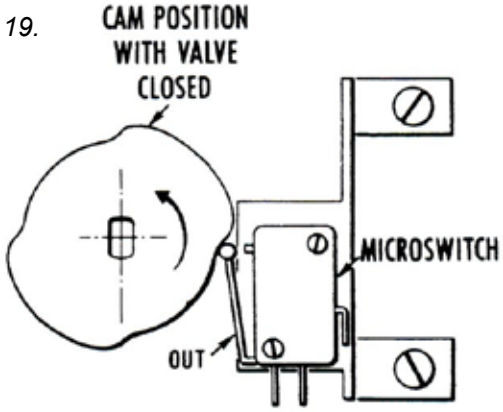
THE STEAM EXHAUST VALVE ADJUSTMENTS:

The rotation of the steam exhaust valve is counterclockwise as viewed from the valve side of the complete assembly. The steam exhaust valve microswitch acts to break the current only when its roller rides INTO or OFF the high points of the cam. Rolling OFF the high points will stop the valve in the closed position. The roller riding INTO the high points of the cam will stop the valve in the opened position (*Figure 19*).

IMPORTANT: When servicing the steam exhaust valve, the steam exhaust valve motor, or the microswitch care must be taken that the following holds true upon reassembly:

1. The valve is placed in a fully closed position.
2. The microswitch is adjusted and set so that its roller is in the OFF position of a high side of the cam (*Figure 19*).

Figure 19.



EXHAUST VALVE – as viewed from front of unit.

3. The microswitch roller makes very light contact when riding upon the low sides of the cam just tight enough contact to trip the microswitch when riding on the high sides.
4. All wiring is placed to the proper terminals in conformance with the wiring diagram.

CHECKING VALVE MICROSWITCHS FOR CONTINUITY:

1. Disconnect all wiring at the microswitch terminals.
2. With an ohmmeter, check each of the two grouped terminals, in turn, to the common terminal which is located singularly to one sire of the microswitch. Continuity should be established in ONLY one of the two.

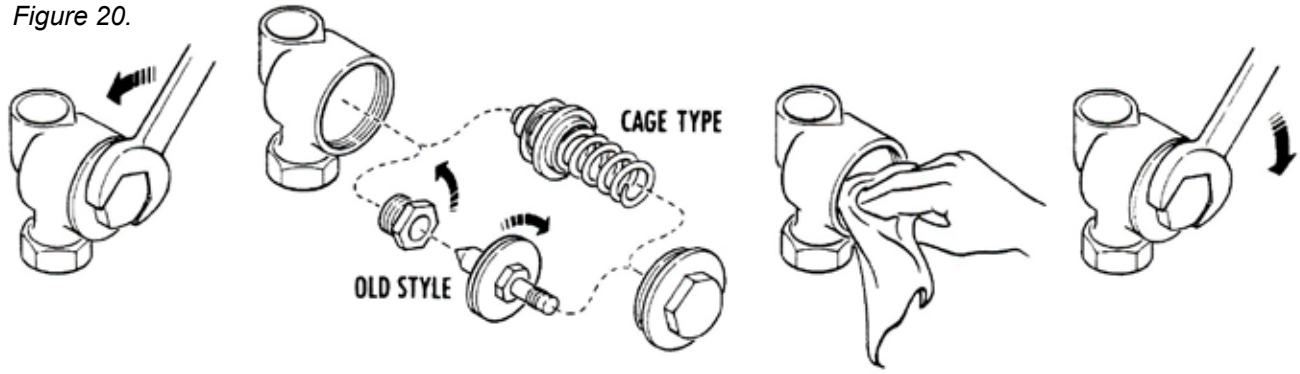
MAINTENANCE

3. Trip the microswitch level manually. Repeating step 2 should now find continuity still through ONLY one terminal but exactly revered.
4. Replace the microswitch if the above continuity sequences cannot properly be established.

REPLACE THERMOSTATIC ELEMENT:
It is recommended that a replacement cage type thermostatic element (*P/N: 10-4938*) be installed at least once a year or more often where such foods as potatoes, chicken or sea foods are cooker in large quantities (*Figure 20*).

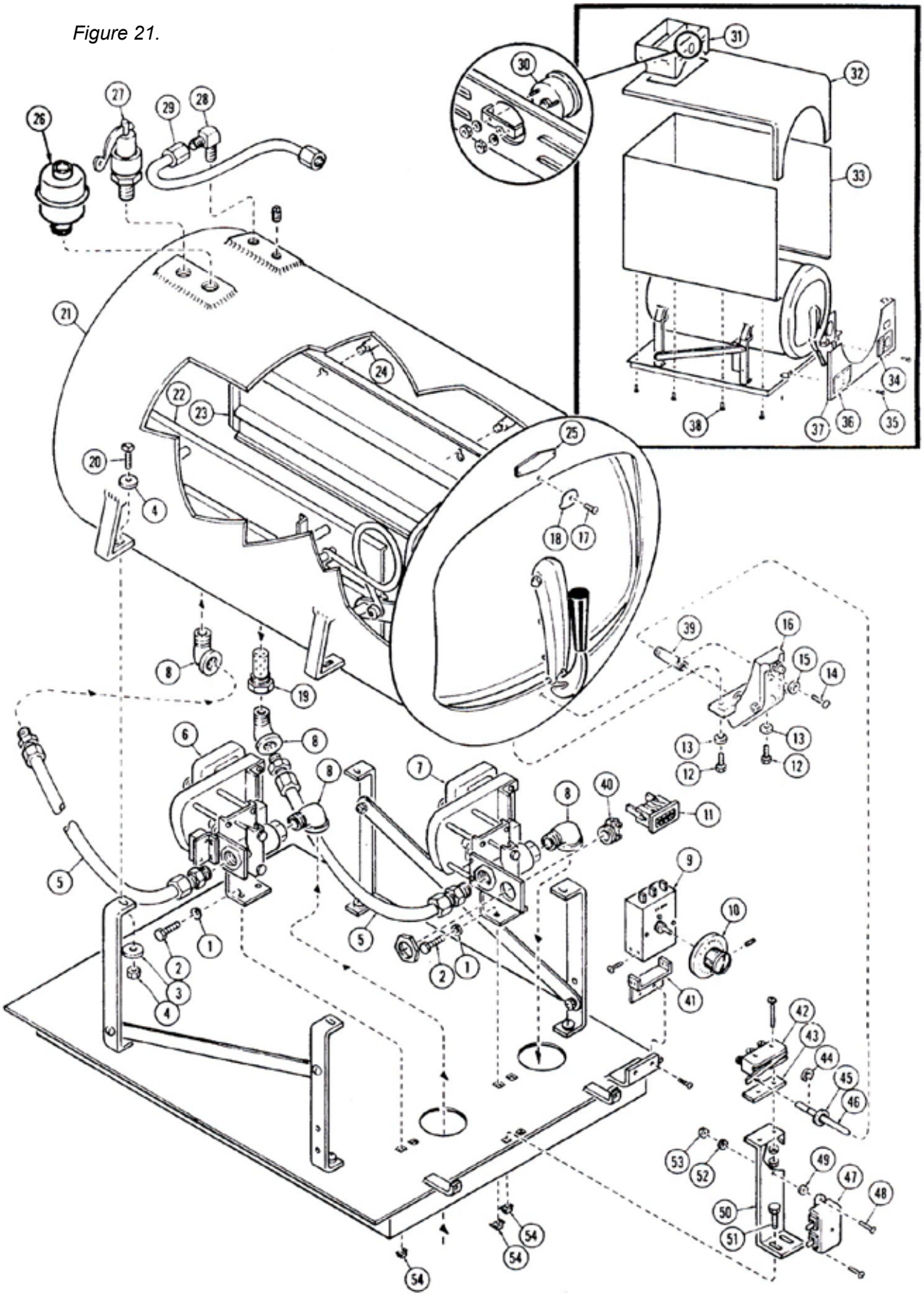
1. Remove the small section of bent copper tubing leading to the steam gauge.
2. Remove the flue by compressing it at its sides and lifting it straight up and off.
3. Unfasten the steam trap at the union and remove to a bench for servicing.
4. Remove the cap of the steam trap (*turn counter-clockwise*). Tap the cap against a solid object to break the thread seal if removal proves difficult.
5. Unscrew the old style diaphragm and seat, or lift out previous replacement cage type thermostatic element, if so equipped, and discard.
6. Wipe all dirt and scale from inside the steam trap.
7. Place a new thermostatic element in the steam trap body so that the bottom projection is in the trap orifice.
8. Apply any good quality pipe compound to the threads of the cap and secure it firmly in place (*clockwise*).
9. Recouple the reconditioned steam trap back in place and press the flue back into position. Connect the bent copper tube to the steam gauge.

Figure 20.



ILLUSTRATED PARTS

Figure 21.



ILLUSTRATED PARTS

Figure 21. Master ST-AS Steam-It Illustration

ITEM	PART NO.	DESCRIPTION
1	10-2500	1/4” lockwasher
2	10-2073	1/4-20 machine screw, 1/2” long
3	10-2307	5/16-18 hex nut
4	10-2405	5/16” washer
5	15-7051	5/8” OD copper tube
6	10-5859	Steam inlet valve, complete
7	10-5787	Steam exhaust valve, complete
8	10-2863	90° street elbow
9	10-4562	0-60 minute timer
10	10-4487	0-60 minute timer knob assy.
11	10-4578	Pilot light assy.
12	10-1790	1/4-20 cap screw, 7/8” long
13	10-2500	1/4” internal washer
14	10-1763	1/4”-20 machine screw, 3/4” long
15	10-2513	1/4” shake-pproof washer
16	95-2003	Fulcrum assy.
17	10-1774	Handle bumper screw
18	10-0226	Handle bumper
19	95-0516	Strainer
20	10-2105	5/16-18 machine bolt, 1” long
21	95-2156	Replacement cylinder, style G
22	95-0097	Pan support, left
23	95-0096	Pan support, right
24	10-1937	Short shoulder, pan support stud
	10-1939	Long shoulder, pan support stud
25	10-4752	ST-AS nameplate
26	10-6156	Steam trap
	10-6158	Steam trap adapter
27	10-4636	1/2”-15 lb. safety valve
28	10-3360	1/8” male x 3/16: tube elbow
29	15-7054	Pressure gauge tubing
30	10-0883	0-30 lb. pressure gauge
31	95-3135	Flue
32	95-3131	Case, top & upper front
33	95-3140	Case, left side
	95-3141	Case, right side
	95-3126	Case, back
34	10-5379	Timer plate
35	10-1776	10-32 x 1/2” Binding head screw
36	10-6587	Cooking time chart

ILLUSTRATED PARTS

Figure 21. Master ST-AS Steam-It Illustration

ITEM	PART NO.	DESCRIPTION
37	95-1109	Lower front panel assy.
38	10-1735	#8 sheet metal screw
39	95-2008	Microswitch control guide
40	10-5151	3/8” straight greenfield connector
41	95-0462	Timer bracket
42	10-4987	Buzzer microswitch
43	95-2112	Insulation plate
44	10-2502	Retaining ring
45	10-2405	Flat washer, 5/16 x 7/8”
46	95-2009	Microswitch actuating pin
47	91-0121	Buzzer
48	10-1717	8-32 screw, 3/8” long
49	10-2408	#8 flat washer
50	95-2007	Microswitch & buzzer support
51	10-2073	1/4-20 x 1/2 cap screw
52	10-2518	#8 lockwasher
53	10-2378	8-32 nut
54	10-2312	Grip nut

Figure 22.

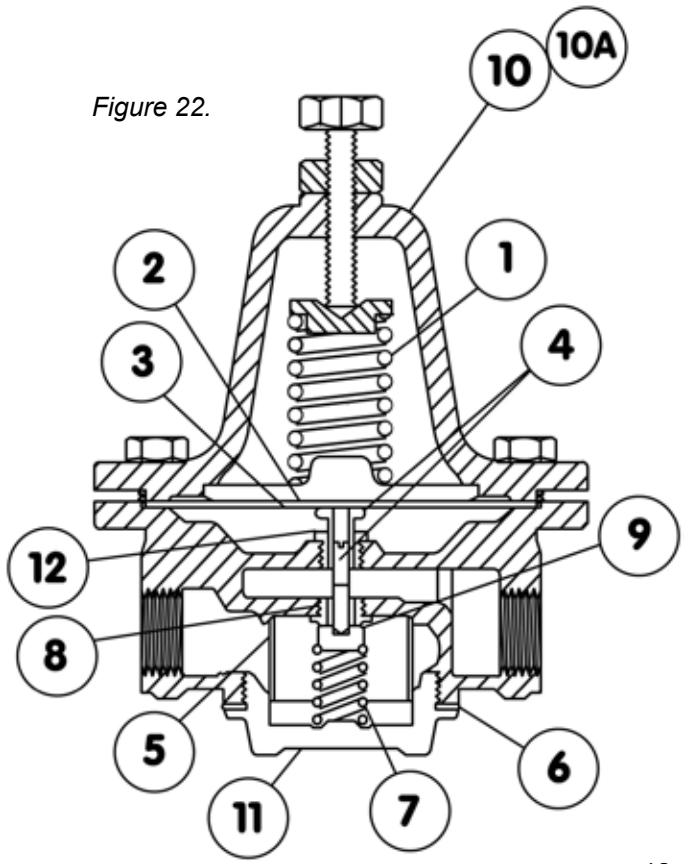


Figure 22. Watts 3/4” Pressure Reducing Valve

ITEM	PART NO.	DESCRIPTION
1	10-1083	Adjusting spring
2	10-1082	Diaphragm
3	10-1075	Diaphragm gasket
4	10-1076	Diaphragm button & stem assembly
5	10-1077	Strainer
6	10-1078	Bottom plug gasket
7	10-1079	Bottom spring
8	10-1080	Seat
9	10-1081	Disc assembly
10	10-1033	3/4” complete valve, painted
11	10-1034	3/4” complete valve, chrome
12	10-0893	Valve stem guide

ILLUSTRATED PARTS LIST

Figure 23.

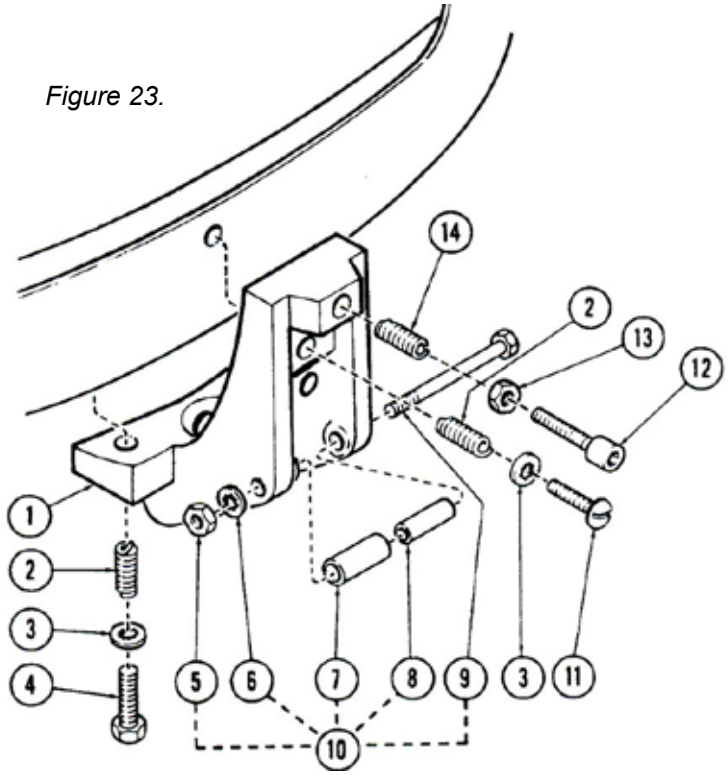


Figure 23. Fulcrum Assembly

ITEM	PART NO.	DESCRIPTION
1	95-2176	Fulcrum casting
2	10-3111	1/4-20 x 3/8 helicoil
3	10-2513	1/4” shake-proof washer
4*	10-1790	1/4-20 cap screw, 7/8” long
5	10-2339	10-32 hex nut
6	10-2514	#10 shake-proof lockwasher
7	95-1578	Bronze bearing
8	95-0120	Bearing spacer
9	10-1999	10-32 machine screw 1.5” long
10	95-0149	Roller assy. (*#5 thru 9*)
11*	10-1763	1/4-20 machine screw, 3/4” long
12	10-2087	1/4-20 allen set screw
13	10-2353	1/4-20 jam nut
14	10-3116	1/4-20 x 5/8 helicoil
--	95-2003	Complete fulcrum assy. (*#1 thru 14*)

** Obtain at local hardware store.*

Figure 24.

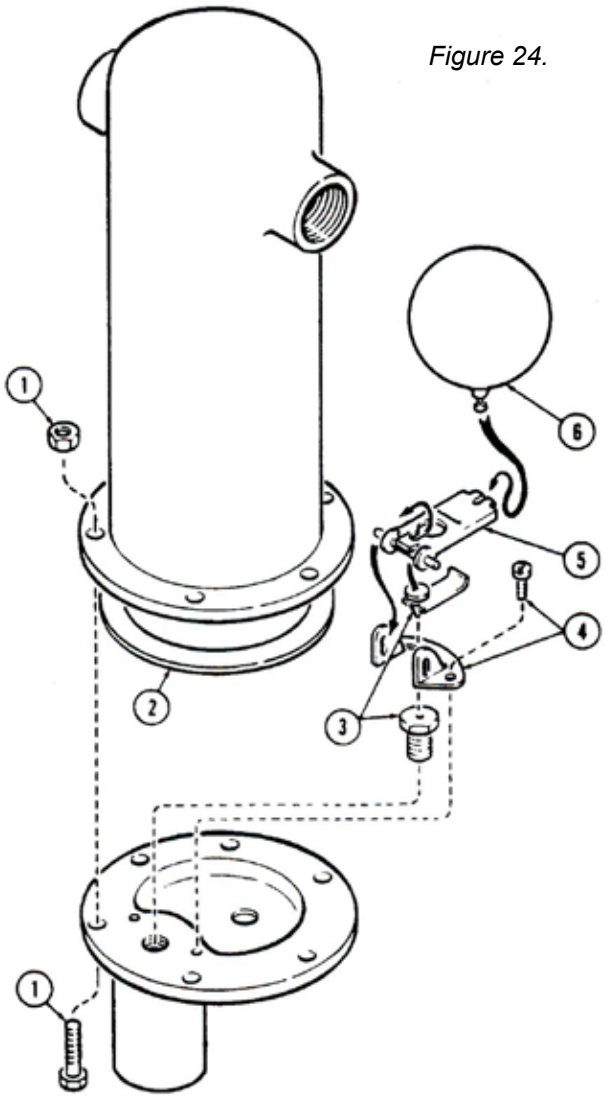


Figure 24. Ball Float trap Assembly

ITEM	PART NO.	DESCRIPTION
1	10-5644	Cover bolt & nut
2	10-5639	Cover gasket
3	10-5640	Valve & seat
4	10-5641	Lever assy. with bracket & screw
5	10-5643	Ball float
-	10-5336	Ball float trap assy.
-	10-5473	Ball float trap assy., chrome

ILLUSTRATED PARTS LIST

Figure 25.

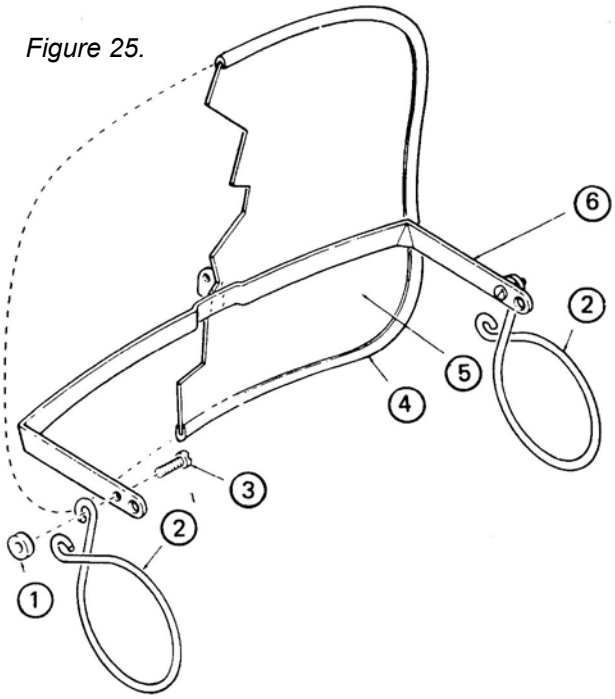


Figure 25. Door Assembly

ITEM	PART NO.	DESCRIPTION
1	10-6765	Pivot spring bearing
2	10-2785	Door lift springs (*pair*)
3	10-1776	10-32 machine screw 1/2” long
4	10-2666	Door gasket
5	95-3204	Door & door spring assy.
6	95-0127	Door spring
--	95-0124	Complete door assy. (1 thru 6)

Figure 26.

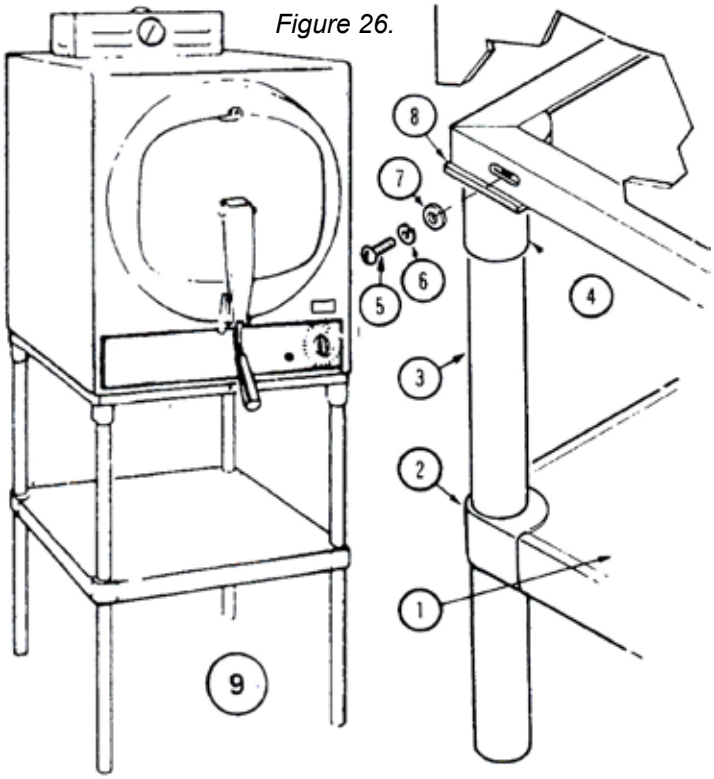


Figure 26. Stand Assembly - Optional Steam-It Stand

ITEM	PART NO.	DESCRIPTION
1	95-1680	Shelf
2	25-1507	Corner bracket w/ set screw
3	10-0634	27” leg
4	10-0635	Leg top
5	10-1804	Rd. Hd. Screw 1/4”-20 x 5/8”
6	10-2520	Lockwasher 1/4”
7	10-2400	Flat washer 1/16” thick
8	95-3211	Cap bracket
9	95-0300	Complete stand assy.

ILLUSTRATED PARTS LIST

Figure 27.

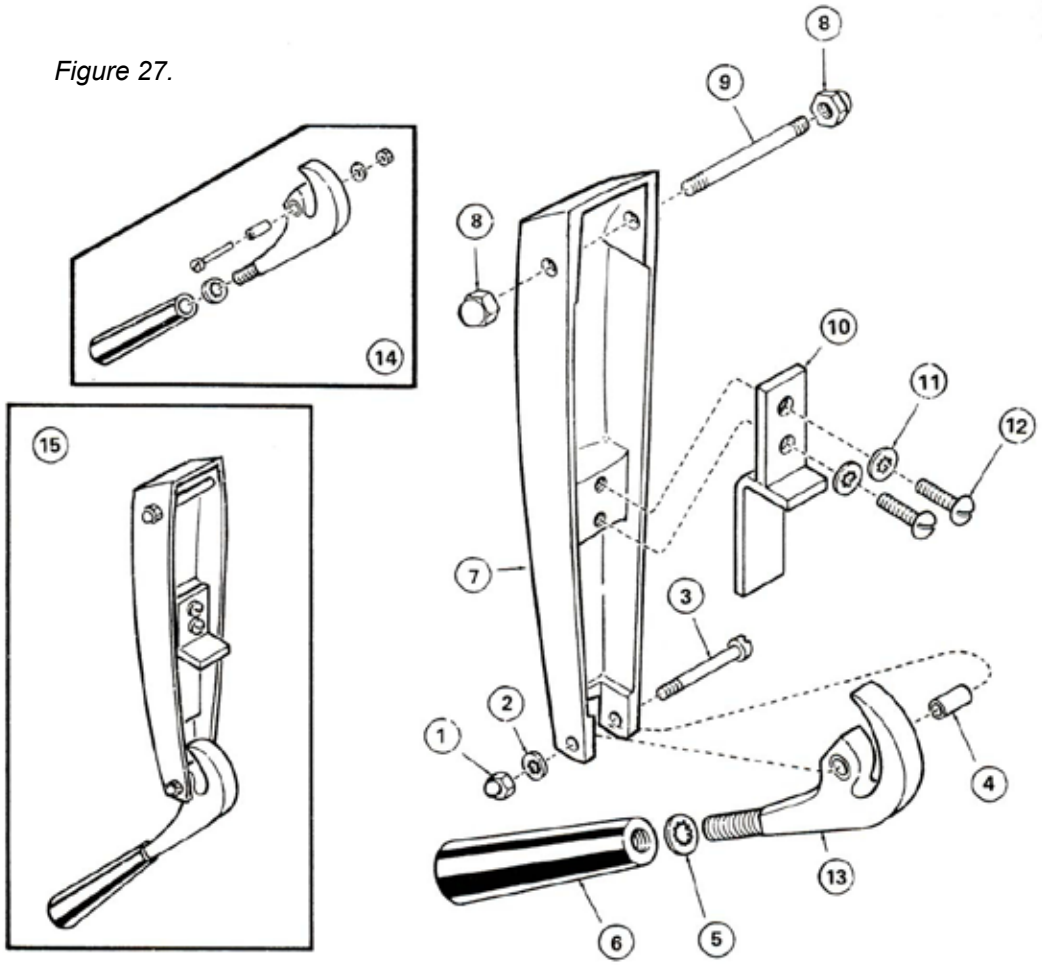


Figure 27. Door Handle Assembly

ITEM	PART NO.	DESCRIPTION
1	10-2318	#10-32 acorn nut
2	10-2514	#10 shake-proof lockwasher
3	10-1999	Locking screw
4	95-0120	Bearing spacer
5	10-2517	3/8” shake-proof lockwasher
6	10-0050	Door lock knob
7	95-0134	Door handle casting
8	10-2359	1/4”-20 acorn nut
9	95-0658	Door handle bearing stud
10	95-0659	Door handle bearing bracket
11	10-2513	1/4” shake-proof lockwasher
12*	10-1731	1/4”-20 x 5/8” rd. hd. screw
13	95-0136	Door lock assy.
14	95-0145	Door lock knob assy. (*#1 thru 7*)
15	95-0144	Complete door handle assy. (*#1 thru 13*)

** Obtain at local hardware store.*

ILLUSTRATED PARTS LIST

Figure 28.

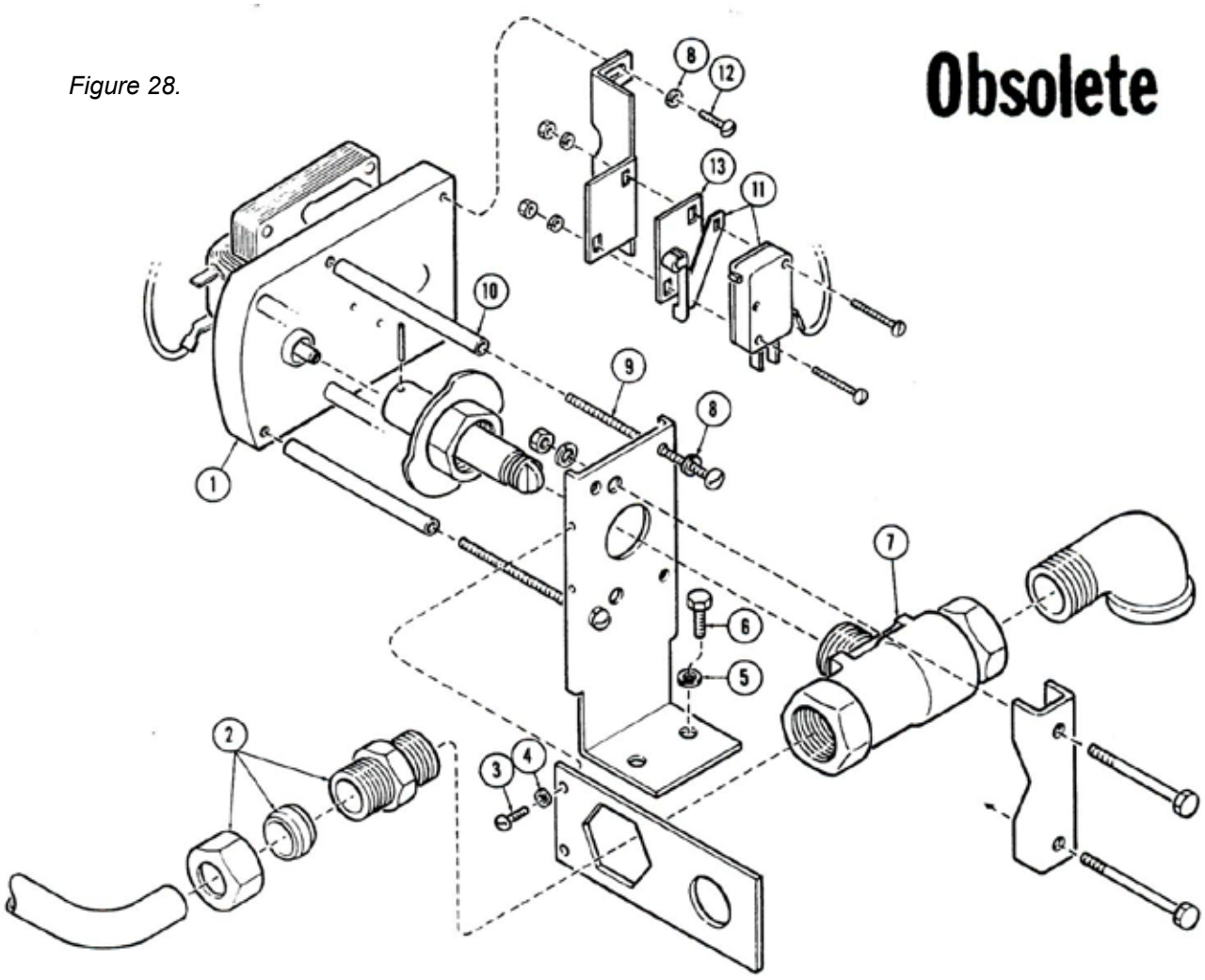


Figure 28. Steam Exhaust Vale Assembly (Obsolete)

ITEM	PART NO.	DESCRIPTION
1	10-5204	Gear motor coil assy.
2	10-2867	5/8” OD tube fitting, complete
3	10-1722	6-32 x 3/8” machine screw
4	10-2515	#6 lockwasher
5	10-2073	1/4-20 x 1/2” machine screw
6	10-2500	1/4” lockwasher
7	10-2827	1/2” ball valve
8	10-2522	#8 lockwasher
9	10-1711	8-32 x 2 1/2” machine screw
10	95-0216	Spacer
11	10-5186	Microswitch with actuator, screw & nuts
12	10-1817	8-32 x 3/8” machine screw
13	95-0219	Insulation plate
-	95-0215	Complete steam exhaust valve assy.

ILLUSTRATED PARTS LIST

Figure 29.

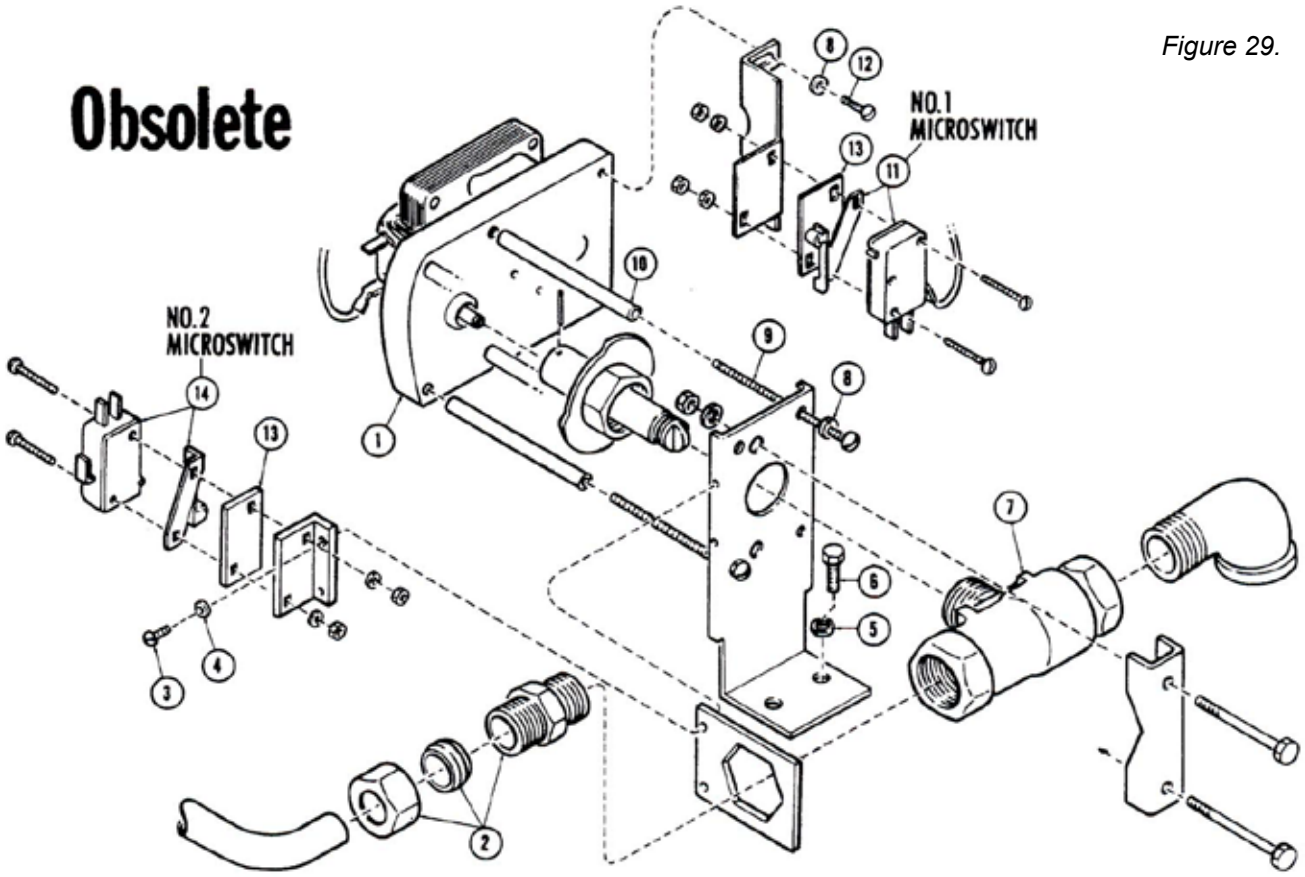


Figure 29. Steam Inlet Vale Assembly (Obsolete)

ITEM	PART NO.	DESCRIPTION
1	10-5204	Gear motor coil assy.
2	10-2867	5/8” OD tube fitting, complete
3	10-1722	6-32 x 3/8” machine screw
4	10-2515	#6 lockwasher
5	10-2073	1/4-20 x 1/2” machine screw
6	10-2500	1/4” lockwasher
7	10-2827	1/2” ball valve
8	10-2522	#8 lockwasher
9	10-1711	8-32 x 2 1/2” machine screw
10	95-0216	Spacer
11	10-5186	#1 microswitch assy.
12	10-1817	8-32 x 3/8” machine screw
13	95-0219	Insulation plate
14	10-5186	#2 microswitch assy.
-	95-2031	Complete steam inlet valve assy.