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MEDALIST 200 STERILIZERS
 • steam • electric
 (4/83) P-763701-001

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SAFETY PRECAUTIONS

The following are personnel (WARNINGS) and equipment (CAUTIONS) safety precautions to be observed when operating or servicing this Sterilizer. The page or pages on which they appear in the text of this manual is indicated by the number in the lower right-hand corner of the precaution.

WARNING LIQUID STERILIZATION

TO PREVENT THE POSSIBILITY OF PERSONAL INJURY OR PROPERTY DAMAGE RESULTING FROM BURSTING BOTTLES AND HOT FLUID, YOU MUST TAKE THE PRECAUTIONS LISTED IN THE PROCEDURE BELOW:

PROCEDURE

- USE ONLY VENTED CLOSURES — DO NOT USE SCREW CAPS OR RUBBER STOPPERS WITH CRIMPED SEAL.
- USE ONLY TYPE I BOROSILICATE (PYREX) GLASS BOTTLES — DO NOT USE ORDINARY GLASS JUGS OR ANY CONTAINER NOT DESIGNED FOR STERILIZATION.
- USE ONLY STERILIZER LIQUIDS CYCLE. NO OTHER CYCLE IS SAFE FOR LIQUID STERILIZATION.
- AT END OF CYCLE, CRACK STERILIZER DOOR, BUT NO MORE THAN 1-1/4 INCHES (31.8 MM). WAIT 10 MINUTES BEFORE UNLOADING STERILIZER.
- DO NOT ALLOW HOT BOTTLES TO BE JOLTED. THIS CAN CAUSE HOT-BOTTLE EXPLOSIONS! DO NOT MOVE BOTTLES IF ANY BOILING OR BUBBLING IS PRESENT.
- BOTTLES SHOULD BE COOL TO TOUCH BEFORE ATTEMPTING TO MOVE THEM FROM STERILIZER LOADING CAR OR FROM SHELVES TO THE STORAGE AREA.

2-4

WARNING: SUDDEN FULL OPENING OF THE DOOR FOLLOWING A STERILIZATION CYCLE COULD CAUSE LIQUIDS TO BOIL OVER OR BOTTLES TO BURST.

2-5

WARNING: BE SURE TO PRESS THE POWER SWITCH OFF AND WAIT UNTIL CHAMBER COOLS TO ROOM TEMPERATURE BEFORE STARTING ANY MAINTENANCE OPERATIONS.

4-1

WARNING: BE CAREFUL OF STEAM ESCAPING FROM SAFETY VALVE(S). TO PREVENT BURNS, WEAR GLOVES OR USE AN EXTENSION DEVICE IF IT BECOMES NECESSARY TO OPERATE THE TRY LEVER.

4-2

WARNING: ALWAYS SHUT OFF ELECTRIC POWER TO STERILIZER AT WALL DISCONNECT SWITCH BEFORE STARTING THE FOLLOWING PROCEDURE.

4-4

WARNING: DO NOT LET THE DOOR ACCIDENTALLY ROLL OFF THE SUPPORT ARM.

6-2

WARNING: CADMIUM IS TOXIC.

6-8

WARNING: DO NOT TOUCH HOT SURFACES OF THE CHAMBER AFTER PREHEATING THE STERILIZER.

6-8

WARNING: DO NOT HEAT SURFACE ABOVE 450 F (232 C) WITHOUT ADEQUATE VENTILATION. TEMPERATURES ABOVE THIS LEVEL WILL PRODUCE TOXIC FUMES.

6-8

WARNING: DO NOT INSERT FUSES IN LIVE CIRCUITS. VOLTAGES PRESENT IN THE STEAM GENERATOR ARE DANGEROUS AND MAY BE FATAL IF CONTACTED.

6-9

CAUTION: Never use abrasive cleaning compounds, wire brush or steel wool on door and chamber assembly.

4-4

CAUTION: To service the solid-state control used on this Sterilizer, a knowledge of basic electronics will be required. The printed circuit boards are designed for easy replacement (Par. 6-8), but should never be replaced without first ensuring that the inputs are correct. Attempts to repair the boards in the field are not recommended.

5-1

CAUTION: Allow thermostatic traps to cool to room temperature before removing cover. Since there is nothing to limit expansion, the diaphragm may rupture or fatigue if trap is opened when hot.

6-3

CAUTION: Replace PC boards only after you have checked all other possible causes of machine malfunctioning, including all input signals to the boards. Because of the extreme reliability of the boards, board replacement should be considered only as a last resort.

6-8

CAUTION: Too much heat may separate the cadmium.

6-8

SECTION 1 GENERAL INFORMATION

1-1. APPLICATION AND DESIGN

The product literature included in this section contains factual data relating to the principal descriptive and identifying characteristics of particulars for the subject Sterilizers. The literature is informational rather than instructional. It provides and conveys, textually and illustratively, a general concept of the equipment, its purpose, capabilities, limitations, and technical specifications.

1-2. LIQUID STERILIZATION

Your AMSCO Sterilizer is designed to process liquids when borosilicate (Pyrex) flasks with vented closures are used.

Borosilicate (Pyrex) glass is recommended because it is a superior glass capable of containing higher pressures, of resisting thermal shock (such as cold air striking the hot glass), and of withstanding repeated handling.

Vented closures are recommended because, by design, they will prevent excess pressure by automatically venting a flask!

If other types of glass (such as flint glass) and non-venting (sealed) closures are used to sterilize liquids in your AMSCO Sterilizer, a potentially dangerous condition, capable of causing personal injury and property damage, is created. As the liquid and residual air in a sealed flask are heated, they expand and create an internal pressure greater than the external pressure of the steam. With the weaker glass, a greater potential for bursting exists.

After the sterilization exposure, the chamber is exhausted slowly but it still exhausts more rapidly than the pressure within a sealed flask.

This pressure within the flask will exist until the residual air and the liquid have cooled (unlike a flask with a vented closure that prevents this excess pressure). Thus, the potential exists for the flask to burst and cause personal injury or property damage.



Small Sterilizer

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APPLICATION

For sterilizing heat- and moisture-stable fabrics, hard goods, and liquids, using steam under pressure. The sterilizer functions by the gravity air-removal principle, and the automatic controls provide the correct sterilizing temperature for the cycle selected: 250 F (121 C) for wrapped goods (fabrics) or liquids, 270 F (132 C) for unwrapped (hard) goods.

SIZE

Internal chamber dimensions: 20" diameter x 24" long (508 mm x 610 mm).

DESIGN AND CONSTRUCTION

General. The sterilizer is listed by the Canadian Standards Association. It conforms to the requirements of International Electrical Code (IEC) and National Electric Code (NEC). The pressure vessel complies with applicable requirements of ASME Code, Section VIII, Division 1, for unfired pressure vessels and is so stamped. One completed and signed copy of ASME Form U-3 is furnished. The chamber and door can withstand an internal pressure of 35 psig (2.46 kg/cm²).

Chamber is constructed of cadmium-plated steel. A silicone-rubber, self-sealing door gasket is installed in the chamber end frame. The gasket is replaceable without tools. Steam heating coils on the outside of the chamber are provided to maintain a minimum chamber temperature throughout the working day. The chamber and coil are insulated with a foam-type insulation which meets the requirements of ASTM standard E-84, Test for Surface Burning Characteristics of Building Materials.

MEDALIST 200 Cylindrical Sterilizer

• steam • electric

TECH DATA

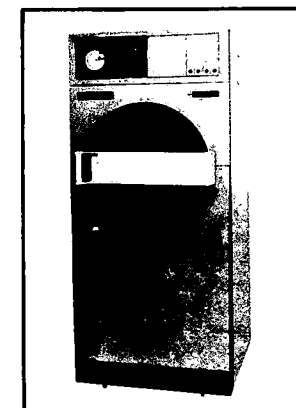
A removable, welded stainless-steel rack with two full-length shelves is provided. Angle guides support the shelves. Stops allow each shelf to be withdrawn approximately one-half of its length for easy loading and unloading. Each shelf includes a frame and crossbraces made of welded stainless-steel rod.

Door is cadmium-plated steel. It is held to its frame by a bearing-mounted hinge assembly on either the right or left side of the chamber, as specified. When closed, the door slides horizontally on bearing-mounted rollers to lock and unlock and to assure proper alignment of the door with the gasket. Door cannot be opened once a cycle has started. An electrical interlock prevents steam from entering the chamber until door is closed and locked.

AUTOMATIC CONTROLS

Medalist 200 has a solid-state control system which features the reliability and accurate control typical of state-of-the-art, solid-state technology. The controls are contained on printed circuit boards.

When electric power and steam are available to the sterilizer, the operator must only select the sterilizing time and push the desired cycle selector. After operation is initiated, all sterilizing cycles are fully automatic and require no further attention from the operator. The sterilizer will automatically proceed through the following sequence:



Typical only — some details may vary.

THE SELECTIONS CHECKED BELOW APPLY TO THIS EQUIPMENT

Power System

- ☐ Steam ☐ Electric
☐ 200 Volts
☐ 230 Volts
☐ 460 Volts

Door Swing

- ☐ Right Hand ☐ Left Hand

Mounting

- ☐ Cabinet Enclosed
☐ For Recessing

Materials Handling Accessories

- ☐ Surgical Instrument Tray(s)
 Qty: 8" (229 mm) Long _____
 15" (381 mm) Long _____
 20 1/2" (521 mm) Long _____
 Emergency _____

Item No. _____

Location(s) _____

- admit steam to chamber, with exhaust valve open, to purge chamber of air for a thirty second period
- charge the chamber to the selected pressure/temperature
- maintain sterilizing temperature for the pre-selected time
- exhaust the chamber to atmospheric pressure
- indicate the completion of the cycle with visual and audible signals

Opening the door slightly, at the end of cycle, will assist in drying the load, if required.

INSTRUMENTATION

Main Control Panel is at the top front of the sterilizer. The panel includes • cycle selectors • temperature recorder • color-coded, cycle-phase indicating lights • thumbwheel switch for sterilizing exposure timer • chamber pressure gauge • RESET switch.

Secondary Control Panel is adjacent to the main-control panel, behind a hinged access door. The panel includes a fuse-indicating light, an "ON/OFF" power switch, and Operating Instructions.

Recorder indicates and records the chamber temperature throughout the cycle. The recorder has a 4-inch (102 mm) diameter chart driven by a synchronous (24 hour) timing motor. The recording pen consists of a porous fiber tip and self-contained ink supply housed together in a replaceable cartridge. One hundred charts are furnished.

Exposure Timer is a solid-state device, adjustable from 0 to 99 minutes. Timer automatically resets at completion of selected time interval, if chamber temperature drops 2 F (1.1 C) below set point, or if there is an interruption in the sterilizer supply current.

COMPONENT OPERATING SYSTEMS

Condenser, with baffle, converts chamber steam to condensate and disposes it to waste. It is manually oper-

ated by a control knob (WATER) located behind the lower access door. Condenser is manufactured of cast aluminum alloy.

Steam Separator Assembly is manufactured of cadmium-plated iron pipe. The unit separates and removes entrained liquid from the steam supply.

Chamber Drain System, as piped to the waste terminal, includes a strainer, steam trap, check valve, and waste funnel.

STEAM SOURCE (Power System)

The sterilizer can be equipped with an integral steam generator, or can be arranged to utilize an existing steam supply.

External Steam Supply. The sterilizer is piped, valved, and trapped for an external steam source, to be supplied at 45 to 60 psig (3.17 to 4.22 kg/cm²). The sterilizer is provided with fittings ready for connection to building service lines. Steam supply line includes strainer, manual shut-off valve, and solenoid valve for regulating chamber pressure. A pressure regulator (by others) will be necessary if steam supply to sterilizer exceeds 60 psig (4.22 kg/cm²).

Integral Steam Supply (Electrically powered). Steam is supplied by a CSA listed steam generator that complies with applicable requirements of ASME Code, Section I, Part PMB, for power boilers and is so stamped. The steam generator is the automatic water-filling type and can withstand internal working pressure of 100 psig (7.03 kg/cm²). It automatically generates and is factory set to supply steam at 45 psig (3.17 kg/cm²). The unit is housed beneath the sterilizer chamber assembly. The generator body is insulated with 1-inch thick (25 mm) glass fiber faced on both sides with aluminum foil.

The generator heaters operate on 200-, 230-, or 460-volt, 50/60 Hz, 3-phase electrical power as specified. They have a nominal capacity of 15 kw, and are accessible from the front of the sterilizer. Electrical control components, located at the top of the sterilizer behind the control panel, operate on 115-volt, 50/60 Hz, single-phase electrical power.

The generator feedwater line has a strainer, vacuum breaker, and a solenoid valve for controlling the generator water supply. A separate valve is provided to drain the generator. Sterilizer steam-supply piping includes a strainer, manual shut-off valve, and a solenoid valve for regulating chamber pressure. The shut-off and drain valve handles are behind the access door at the lower front of the sterilizer. The return line from the sterilizer chamber includes a strainer, trap, and check valve. NOTE: A feedwater pressure of 50 to 80 psig (3.52 to 5.62 kg/cm²) is required to operate the generator.

MOUNTING ARRANGEMENT

A welded-steel floor stand (with height-adjustable, cadmium-plated leveling screws and aluminum pads) supports the sterilizer. It is further arranged for mounting as a cabinet-enclosed model or for recessing, as specified.

- **Subframe.** One end of the floor stand has a subframe, with synthetic rubber gasket, to ensure tight fit of cabinet panels to each other or front panel to wall partition.
- **Front Panels.** The front panels are epoxy-coated steel. The area above the door contains the control panels, and the area below the door comprises a service access door. The inside of the access door contains a rack for instructional material.
- **Top and Side Panels** (Only Cabinet-enclosed Models). A louvered top panel and side panels enclose the sterilizer body and piping. These removable panels are also epoxy-coated steel.

OTHER APPURTENANCES

The following are furnished to obtain a complete working unit, ready for (but not including) connection to the building utility service lines.

- **Thermostatic Steam Traps** are pressure and temperature com-

pensated. They have renewable elements and seats.

- **Baffle** (stainless steel) shields the steam-supply opening inside the chamber.
- **Pipe and Electrical Connections** terminate within the confines of sterilizer.
- **Sanitary Safeguards** prevent backflow of pollutants into the water-supply system and sterilizer.

MATERIALS HANDLING ACCESSORIES

Optional materials handling accessories are as follows:

- **Surgical Instrument Trays** are welded Monel with perforated bottoms. Each tray has a carrying handle which, when not in use, folds inward parallel to the top. All trays are 10½ inches wide (267 mm) x 3 inches (76 mm) deep. They are available in three different lengths: 20½ inches (521 mm), 15 inches (381 mm), or 9 inches (229 mm).
- **Emergency Instrument Mini Tray** is 9½ inches long x 4 inches wide x 1¾ inches deep (241x102x44 mm) and is constructed of stainless steel. It has a wire-mesh bottom to allow efficient sterilant circulation and includes a removable (sterilizable) handle.

MATERIAL SPECIFICATIONS

Stainless Steel conforms with ASTM Specification A240 for alloy 302 or 304, if welded; alloy 301, if formed without welding.

Painted Panels. Epoxy-coated panels are cold rolled steel. A powder coating method, using epoxy powder, is utilized on all exposed surfaces.

Steam, Water and Waste Lines are seamless, copper tubing (conforming with ASTM Specification B 88) and seamless, red-brass tubing (conforming with ASTM Specification B 135, alloy 1). Fittings are brass.

ENGINEERING DATA

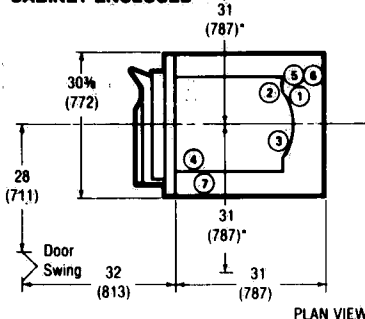
WEIGHT LBS (Kg)		UTILITIES CONSUMPTION								HEAT LOSS BTU/hr at 70 F (21 C)		
		WATER CONSUMPTION gph (l/hr)		STEAM CONSUMPTION lbs/hr/cycle (kg/hr/cycle)	ELECTRICITY — AMPS							
					STEAM POWERED UNIT	ELECTRICALLY POWERED UNIT				CABINET ENCLOSED	RECESSED	
						CONTROLS 115V	CONTROLS	HEATER				
STEAM POWERED UNIT	ELEC- TRICALLY POWERED UNIT	HOT- COLD (FOR OPTIONAL GENERATOR FOR CONDENSER)								TO ROOM	FRONT OF WALL	BEHIN WALL
650 (296)	875 (397)	65 (246)	4 (15)	30 (14)	1.5	1.5	40	40	25	2800	1900	850

*Hot water is recommended for optional steam generator.

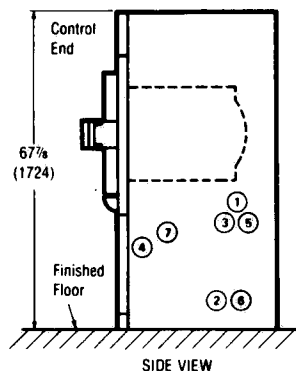
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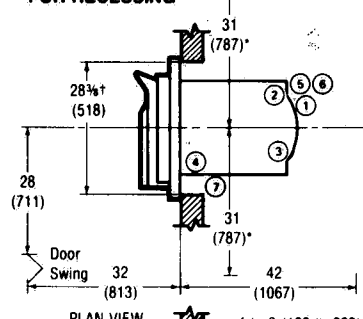


PLAN VIEW

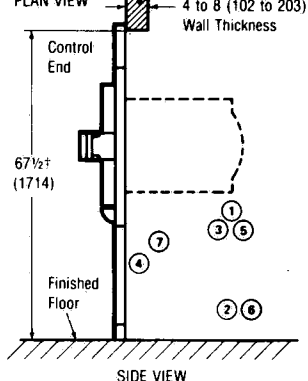


SIDE VIEW

FOR RECESSING



PLAN VIEW



SIDE VIEW

DIMENSIONS ARE INCHES (MILLIMETRES) — DRAWING IS NOT TO SCALE

*Service Clearance
†Wall Opening

OPERATING REQUIREMENTS

Steam and Electric Units:

① COLD WATER — 3/4 NPT, 20 to 50 psig (1.41 to 3.52 kg/cm²) dynamic

② DRAIN — 1/4 NPT

Steam Units Only:

③ STEAM SUPPLY — 3/4 NPT, 45 to 60 psig (3.17 to 4.22 kg/cm²) dynamic, condensate free, between 97 and 100% saturated vapor

④ TERMINAL BOX — 115-V, 60-Hz, Single-phase Service

Electric Units Only:

⑤ HOT WATER — 3/4 NPT, 50 to 80 psig (3.52 to 5.63 kg/cm²) dynamic

Note: Cold water (approximate 5 gr. hardness) may be substituted but with a sacrifice on heat-up time.

⑥ DRAIN — 1/2 NPT (For generator)

⑦ TERMINAL BOX — 115-V, 60-Hz, Single-phase Service for controls, 200, 230- or 460-V, 60-Hz, Three-phase Service for generator heaters.

NOTES

- Pipe sizes shown indicate terminal outlets. Building service lines to and from the equipment should be increased one pipe size to ensure optimum equipment performance.
- Access to the recessing area from the control end of the sterilizer is recommended.
- Clearances shown are minimal for installing and servicing the equipment.
- Right-hand door-swing clearances shown. Clearances for left-hand door swing are identical.
- Floor drain should be provided within the confines of the sterilizer framework.
- Clearance in front of the sterilizer should be 36 inches (915 mm) for convenient withdrawal of shelves from chamber.

... CHECK LOCAL CODES ...

This print is for guidance when planning space and utility services. Actual installation prints may be obtained from any AMSCO office or representative.

Medalist 200 Sterilizers

SECTION 2

GENERAL OPERATING INSTRUCTIONS

2-1. GENERAL

The following instructions are intended to guide the serviceman when: (1) instructing operators in techniques designed to ensure optimum equipment performance; and (2) verifying the validity of operator complaints. See Section 5, TROUBLESHOOTING, if the Sterilizer is not operating properly. Refer to Section 1, GENERAL INFORMATION, for capabilities of the equipment.

Figure 2-1 shows the controls in their approximate location.

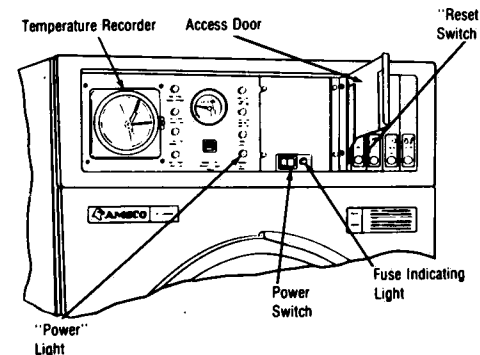


Figure 2-1. CONTROL PANEL.

2-2. BEFORE OPERATING THIS EQUIPMENT

- For sterilizers with steam generator, open building hot water supply valve to sterilizer.
- Open secondary control access door and switch POWER to ON. POWER light will come on.
- Open lower access door. Push STEAM SUPPLY knob in to allow steam to enter external steam coil and heat the chamber. Keep chamber door closed during this period. The condenser WATER SUPPLY valve may be opened slightly (push knob in) to condense vapors.
- Install a new chart on the temperature recorder (Par. 6-2). Be sure recorder power switch is on.

5. If sterilizer uses external (house) steam supply, wait fifteen minutes to allow chamber heating coils to warm, and then begin operation. If sterilizer is equipped with a steam generator, wait thirty minutes before beginning sterilizing procedure.

NOTE: Steam pressure should be maintained in the coil throughout the day, if the sterilizer is frequently used. Also, the chamber should be kept closed. This will keep the chamber warm. If desired, the condenser WATER SUPPLY valve may be left slightly open (push knob in) to condense vapors.

6. At the end of each workday:

- Switch POWER switch to OFF.
- Close the STEAM and WATER SUPPLY valves ... pull knobs all the way out.
- For sterilizers with steam generator, close building water supply valve to generator.

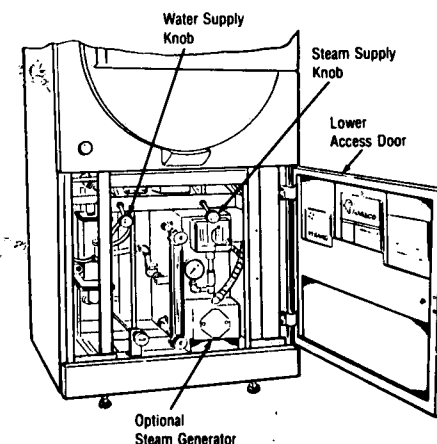


Figure 2-2. VALVE LOCATIONS.

2-3. DOOR OPERATING INSTRUCTIONS

To unlock door

1. Push control panel RESET selector.
2. Pull out and hold DOOR UNLOCK knob.
3. While holding DOOR UNLOCK knob, slide the door away from hinge about one inch (2.5 cm) and release DOOR UNLOCK knob. Continue sliding the door until it stops. Pull door open.
4. If, after operation of sterilizer, door does not open easily, there may be a slight amount of pressure still in the chamber. Allow it to cool, then try the door again.

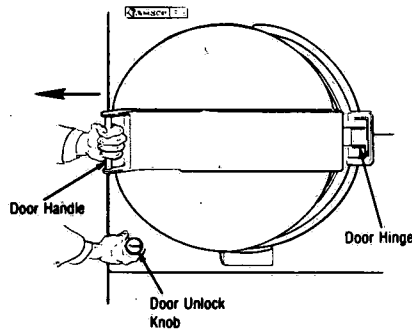


Figure 2-3. DOOR OPENING.

To lock door

1. Slide door closed (toward hinge) until it stops — red area around door frame must be entirely covered.
2. When door is properly positioned, it locks automatically.

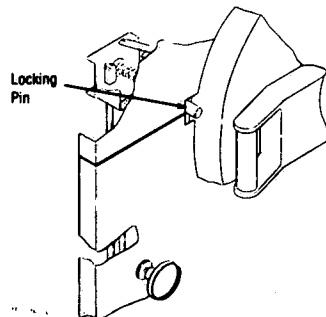


Figure 2-4. DOOR LOCKING.

2-4. AUTOMATIC OPERATION — WRAPPED OR UNWRAPPED GOODS

1. Be sure you have followed the instructions in Paragraph 2-2.

2. Refer to Table 2-1, Minimum Sterilization Exposure Periods, and select the correct exposure time for the material to be sterilized.

NOTE: If the first cycle of the day is to be a Wrapped cycle, an Unwrapped cycle with empty chamber and three-minute exposure must first be run to properly heat the chamber.

3. Dial the correct exposure period on the thumbwheel switches on the control panel.

4. Load the sterilizer. Be sure the goods do not contact the door or chamber walls.

5. Close the door, making sure red area around door frame is completely covered. DOOR LOCKED light will come on when door is properly in place.

6. Open the lower access door and turn on condenser WATER SUPPLY (push knob until there is sufficient flow to condense the vapors).

7. Push the UNWRAPPED cycle selector if you desire to sterilize at 270 F (132 C); push the WRAPPED cycle selector if you wish to sterilize at 250 F (121 C). Both cycles have fast exhaust. The cycle will then start and continue automatically to completion.

NOTE: If you push the wrong selector switch, simply press and release the RESET selector. Wait for chamber pressure to reach ambient, then make correct selection. (DOOR LOCKED light will flash when RESET selector is pushed, and will continue flashing until chamber pressure reaches ambient.)

8. The cycle sequence will be as follows:

a. When cycle selector is depressed, corresponding program light will come on for duration of the cycle.

b. Steam is admitted to the chamber, with the exhaust valve open, to purge chamber of air for a thirty-second period.

c. Exhaust valve closes. When temperature inside chamber reaches set-point, STERILIZING light comes on. When STERILIZING light is on steadily, electronic timer begins to time.

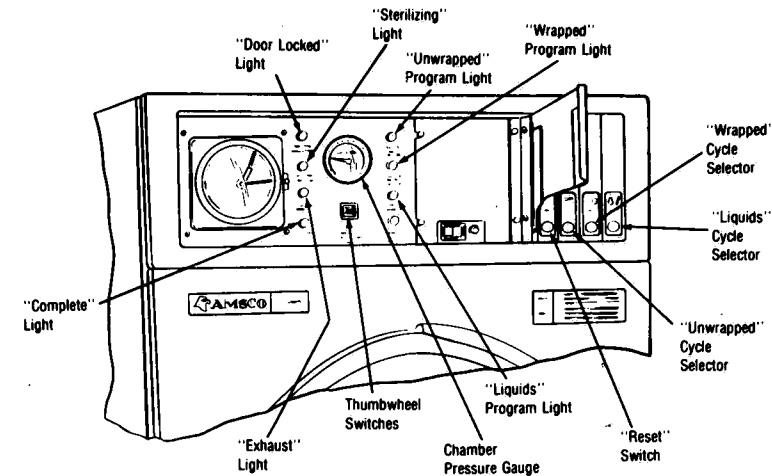


Figure 2-5. CONTROL PANEL.

d. When exposure period is completed (timer times out), EXHAUST light comes on.

e. When chamber pressure is approximately at atmospheric, COMPLETE light comes on and the buzzer sounds.

9. When buzzer sounds, press panel RESET selector to turn off buzzer and reset controls.

10. Slide chamber door to the "cracked" position — distance between door and inside of end frame on hinge side will be 1 to 1-1/4 inches (25.4 to 31.8 mm).

11. If a wrapped cycle, allow door to remain in the "cracked" position for 15 minutes to assure dry goods. If an unwrapped cycle, proceed as soon as the residual steam has escaped.

12. Open door and remove load.

13. Close (or reduce) condenser WATER SUPPLY valve if additional cycles are not required at this time.

IMPORTANT: If there is an interruption of electric power when a cycle is in progress, cycle will NOT continue when power is restored. Instead, DOOR LOCKED light will flash. If this happens, wait until the light stops flashing — indicating ambient pressure in chamber — then press desired cycle selector to restart the cycle. (A cycle can never be initiated until DOOR light stops flashing.) Pushing RESET selector during cycle operation will have the same effect as a power interruption.

TABLE 2-1
MINIMUM STERILIZATION EXPOSURE PERIODS

ITEMS	250-254 F (121-123 C)	270 F (132 C)
	MINUTES	MINUTES
Dressings, wrapped in paper or muslin	30	15
Glassware, empty, inverted	15	3
Instruments, metal only, any number (unwrapped)	15	3
Instruments, metal, combined with suture, tubing or other porous materials (unwrapped)	20	10
Instruments, wrapped in double thickness muslin	30	
Linen, packs, (maximal size: 12"x 12"x20"; maximal weight 12 pounds)	30	
Rubber gloves, wrapped in muslin or paper	20	10
Treatment trays, wrapped in muslin or paper	30	
Utensils, unwrapped	15	3
Utensils, wrapped in muslin or paper	20	10

NOTE: Wrapped goods may be processed at 270 F (132 C) by using the UNWRAPPED cycle.

2-5. AUTOMATIC OPERATION — LIQUIDS

**WARNING
LIQUID STERILIZATION**

TO PREVENT THE POSSIBILITY OF PERSONAL INJURY OR PROPERTY DAMAGE RESULTING FROM BURSTING BOTTLES AND HOT FLUID, YOU MUST TAKE THE PRECAUTIONS LISTED IN THE PROCEDURE BELOW:

PROCEDURE

- USE ONLY VENTED CLOSURES — DO NOT USE SCREW CAPS OR RUBBER STOPPERS WITH CRIMPED SEAL.
- USE ONLY TYPE I BOROSILICATE (PYREX) GLASS BOTTLES — DO NOT USE ORDINARY GLASS JUGS OR ANY CONTAINER NOT DESIGNED FOR STERILIZATION.
- USE ONLY STERILIZER LIQUIDS CYCLE. NO OTHER CYCLE IS SAFE FOR LIQUID STERILIZATION.
- AT END OF CYCLE, CRACK STERILIZER DOOR, BUT NO MORE THAN 1-1/4 INCHES (31.8 MM). WAIT 10 MINUTES BEFORE UNLOADING STERILIZER.
- DO NOT ALLOW HOT BOTTLES TO BE JOLTED. THIS CAN CAUSE HOT-BOTTLE EXPLOSIONS! DO NOT MOVE BOTTLES IF ANY BOILING OR BUBBLING IS PRESENT.
- BOTTLES SHOULD BE COOL TO TOUCH BEFORE ATTEMPTING TO MOVE THEM FROM STERILIZER LOADING CAR OR FROM SHELVES TO THE STORAGE AREA.

OPERATION

1. Be sure that you have followed the instructions in paragraph 2-2.
2. Refer to the Table 2-2, Minimum Exposure Periods For Liquids, and select the correct exposure time for the flask size to be sterilized.
3. Dial the correct exposure period on the thumb-wheel switches on the control panel. (Correct temperature and exhaust are automatic.)
4. Load sterilizer. Close the door, making sure red area around door frame is completely covered. DOOR LOCKED light will come on when door is properly in place.

NOTE: Sterilization of saline solutions in this sterilizer is **not recommended**. However, if saline solutions are sterilized, following each such cycle allow chamber to cool and then clean with fresh tap water. This will remove residual salts and prevent corrosion.

5. Open the lower access door and turn on condenser WATER SUPPLY (push knob in until there is sufficient flow to condense the vapors).

6. Push LIQUIDS selector. The cycle will provide 250 F (121 C) sterilization temperature with slow exhaust. When the cycle starts it will continue automatically to completion.

NOTE: If you push the wrong cycle selector, simply press and release the RESET selector. Wait for chamber pressure to reach ambient, then make correct selection. (DOOR LOCKED light will flash when RESET selector is pushed, and will continue flashing until chamber pressure reaches ambient.)

7. The cycle sequence will be as follows:

a. When cycle selector is depressed, LIQUIDS program light will come on for duration of the cycle.

b. Steam is admitted to the chamber, with the exhaust valve open, to purge chamber of air for a thirty-second period.

c. Exhaust valve closes. When temperature inside chamber reaches 250 F (121 C), STERILIZING light will come on. When the STERILIZING light is on steadily, electronic timer begins to time.

d. When exposure period is completed (timer times out), EXHAUST light comes on.

e. When chamber pressure is approximately atmospheric, COMPLETE light comes on and the buzzer sounds.

8. When buzzer sounds, press panel RESET selector to turn off buzzer and reset controls.

WARNING: SUDDEN FULL OPENING OF THE DOOR FOLLOWING A STERILIZATION CYCLE COULD CAUSE LIQUIDS TO BOIL OVER OR BOTTLES TO BURST.

9. Slide chamber door to the "cracked" position ... distance between door and inside of end frame on hinge side will be 1 to 1-1/4 inches (25.4 to 31.8 mm). Wait a minimum of ten minutes before opening door fully, then remove load.

10. Close (or reduce) condenser WATER SUPPLY valve if additional cycles are not required at this time.

IMPORTANT: If there is an interruption of electric power when a cycle is in progress, cycle will **NOT** continue when power is restored. Instead, DOOR LOCKED light will flash. If this happens, wait until the light stops flashing — indicating ambient pressure in chamber — then press cycle selector to restart the cycle. (A cycle can never be initiated until DOOR LOCKED light stops flashing.) Pushing the RESET selector during cycle operation will have the same effect as a power interruption.

**TABLE 2-2
MINIMUM STERILIZATION EXPOSURE PERIODS**

FULL LOAD OF SQUARE-PAK® FLASKED SOLUTIONS	
FLASK CAPACITY (ML)	TIME (MINUTES)
75	25
250	35
500	40
1000	40
1500	50
2000	55

SECTION 3

CONTROL SYSTEM

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3-1. GENERAL

The Medalist 200 Sterilizer is equipped with an automatic control system. This system employs various sensing and timing devices which regulate the sterilizer in predetermined operational stages. When a cycle is begun, the sterilizer will proceed through the various phases of that cycle without further attention, and will signal when the cycle has been completed.

The sterilizer is equipped with manually operated steam supply and water supply (for condenser) valves, which isolate the unit from the general supply lines when not in use. Within the control system are fuses, overload devices, and safety valves to prevent circuits or piping from being overloaded.

IMPORTANT: Before checking a faulty or malfunctioning control system, make sure that the above devices are in place and operable, that electric, steam and water supply line switches or valves are in correct operating position, and that these services are available.

3-2. OPERATION

Before beginning a sterilization cycle, the sterilizer chamber must be heated. For sterilizers with a steam generator, the building hot water supply valve to the sterilizer must first be opened. When the POWER switch is ON, and the STEAM SUPPLY knob is pushed in, the heating coil will begin to warm the sterilizer chamber. For sterilizers with a steam generator, it will take about thirty minutes to warm the chamber. For sterilizers with an external (house) steam supply, it will take about fifteen minutes for the chamber to warm. (Chamber door must be kept closed during the warm-up period.) After the chamber is warmed and the door securely locked (DOOR LOCKED light on), any sterilization cycle may be selected. The length of the cycle will be determined by the time dialed on the thumbwheel switches.

When a cycle is selected, the corresponding cycle indicating light will come on and the steam-to-chamber solenoid valve will open. For the first thirty seconds after a cycle selector is depressed, the fast-exhaust solenoid valve will be open to purge the chamber of air. Steam

pressure will then increase in the chamber until the correct pressure and temperature are attained. For the UNWRAPPED cycle these will be 30 psig (2.11 kg/cm²) and 270 F (132 C); for the WRAPPED or LIQUIDS cycle, they will be 20 psig (1.41 kg/cm²) and 250 F (121 C). During the warm-up period, the appropriate pressure switch will cycle the steam-to-chamber solenoid valve to keep the pressure at set-point. When the controlling temperature is reached, the STERILIZING light will come on. From the time that the sterilizing temperature is reached until the end of the cycle, the temperature sensor will cycle the steam-to-chamber valve to maintain the sterilizing temperature.

When the pre-set sterilization time is complete, the STERILIZING light will go off and the steam-to-chamber valve will close (if open at that time). If the cycle is WRAPPED or UNWRAPPED, the fast exhaust valve will open to quickly evacuate the chamber. If the cycle is LIQUIDS, the exhaust will be controlled in order to evacuate the chamber slowly. During this phase of the cycle, the EXHAUST light will be on.

When pressure in the chamber is approximately atmospheric, as sensed by the pressure switch, the delay timer will begin timing. After thirty seconds the timer will time out, the EXHAUST light will go out, and the COMPLETE light will come on. A buzzer will sound to signal completion of the cycle, and the fast exhaust valve will open, if not already open. When the RESET switch is pushed, the buzzer will stop and the COMPLETE light will go off.

3-3. OPERATION OF THE RESET MODE

If a cycle is started, and the RESET switch is pushed, the cycle will stop. The chamber will be evacuated, and the DOOR LOCKED light will flash. It will not be possible to open the sterilizer door until the DOOR LOCKED light stops flashing, indicating approximately atmospheric pressure in the sterilizer chamber. After atmospheric pressure is reached, any cycle may be started or restarted.

If there is an interruption of electric power to the sterilizer during operation, upon restoration of power to control system, the reset mode will automatically be initiated, and the sequence of the controls signals will be the same as if the RESET switch was pushed.

3-4. OPERATION OF STEAM GENERATOR

General. The AS Series Electro-Steam Generator basically consists of a tube-type boiler section fired by a submerged electrical heating element. The boiler is insulated with aluminum-backed fiber glass and enclosed in a metal cabinet. Automatic controls maintain preset operating pressures and keep the water supply at the proper level in the boiler. Safety features include automatic low-water cutoff, automatic pressure control, safety valve, and a visible water-level sight gauge. The entire unit, built in accordance with the A.S.M.E. Miniature Boiler Code, is individually inspected and stamped by an authorized National Board insurance inspector, and approved and listed by The Canadian Standards Association.

Operational Description

1. The electro-steam generator has two main automatic controls, one for regulating the steam pressure and the other for maintaining the required water level.

2. The pressure-differential switch automatically regulates the steam pressure by turning the heating elements on and off by operating a magnetic contactor. (Refer to the applicable Schematic for details.) When the steam pressure drops below the preset level, the

pressure-differential switch energizes the magnetic contactor coil and applies power to the heating elements. When the pressure increases above another preset level, the switch deenergizes the magnetic contactor coil and power is disconnected from the elements. The pressure in the steam chamber is maintained between the two settings of the pressure-differential switch when the generator is in operation.

3. The water-level control opens the water-feed solenoid valve and admits water to the boiler. When the water is restored to a preset level, the control closes the water-feed solenoid valve. In addition, the water-level control overrides the pressure-differential switch by opening the circuit to the magnetic contactor when the water is below the proper level. This ensures that the heating elements will not be energized when the water level is low.

4. The check valves in the water feed line allow water to flow into the boiler but prevent it from flowing back into the water line.

5. A safety valve is provided to release excessive boiler pressure in the event that the pressure-differential switch malfunctions and does not turn off the heating element. The safety valve releases the boiler pressure before the boiler rating is exceeded.

SECTION 4

INSPECTION AND MAINTENANCE

4-1. GENERAL

Maintenance described in paragraphs 4-2 through 4-4 should be performed periodically. The frequency, unless otherwise indicated, will be determined by usage of the sterilizer. Should a problem occur, refer to Section 5, TROUBLESHOOTING.

WARNING: BE SURE TO PRESS THE POWER SWITCH OFF AND WAIT UNTIL CHAMBER COOLS TO ROOM-TEMPERATURE BEFORE STARTING ANY MAINTENANCE OPERATIONS.

4-2. ROUTINE INSPECTION

1. Inspect cabinetry for any signs of damage or misaligned parts.
2. Inspect the control panel for loose or missing parts, cracked or broken glass, lenses or buttons, and other obvious defects.
3. Open lower access door and check chamber piping for loose fittings and other obvious defects.

4-3. PREVENTIVE MAINTENANCE

Daily

1. Check recorder chart for inked record after each cycle. Refer to paragraph 6-2 if recorder is not operating properly.
2. Check the door gasket. Replace it if it has become deformed, brittle, or cracked (Paragraph 6-3).

Weekly

1. Check control panel and status signals as follows:
 - a. With an empty chamber, set the thumbwheel switches for one minute. Watch the control panel as the sterilizer operates through each phase.
 - b. Replace lamps (Fig. 7-5) if any lights are out.
2. Flush chamber drain line as follows:

a. Remove chamber drain strainer.

b. Rinse drain with hot solution of trisodium phosphate (two tablespoons to one quart of water). If the use of trisodium phosphate is objectionable, use instead a solution of 1/2 cup of AMSCO Sonic Detergent (Part P-41591-091) and one quart of hot water.

c. Wait five minutes.

d. Then flush drain with one quart of hot water.

e. Place the strainer back in the chamber drain.

3. Check bleed hole in chamber end ring ... lift gasket at its bottom-most point. If necessary, clean hole with a 3/32" (2.4 mm) diameter (or smaller) rod. Reinstall gasket in its groove ... see Paragraph 6-3 for installation instructions.

4. For sterilizers supplied with a steam generator, flush the generator weekly as follows (Fig. 4-1):

- a. Shut off the main power switch (located behind the upper access door). Wait until generator pressure gauge indicates zero.
- b. Open GENERATOR DRAIN valve (located behind lower access door). Drain generator for five minutes.
- c. Close drain valve and turn on power switch. The generator will refill with clean water.

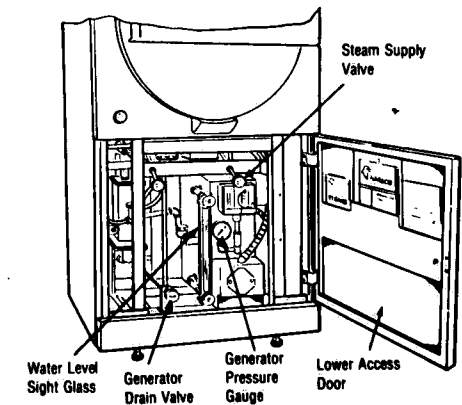


Figure 4-1. OPTIONAL STEAM GENERATOR.

Quarterly

Check chamber safety valve as follows: (Note: Also check safety valve on electro-steam generator if generator is provided.)

Be sure sterilizer is cool.

Inspect safety valve(s) for accumulations of rust, scale or other foreign substances which would prevent free operation of the valve(s). The opening of any discharge piping must be clear and free from restrictions.

Operate try lever (or pulling) several times. The lever should move freely and return to its closed position after each operation.

Follow operating instructions on page 2-2, and allow chamber to reach operating pressure.

WARNING: BE CAREFUL OF STEAM ESCAPING FROM SAFETY VALVE(S). TO PREVENT BURNS, WEAR GLOVES OR USE AN EXTENSION DEVICE IF IT BECOMES NECESSARY TO OPERATE THE TRY LEVER.

Check safety valve(s) for steam leakage. If valve is leaking, operate the try lever several times to see if the leakage will stop.

If leakage continues, discontinue operation of sterilizer until a qualified technician replaces the leaky safety valve.

Quarterly

Clean steam generator (if supplied with sterilizer) as follows (Fig. 4-2):

NOTE: Quarterly cleaning is minimum recommended frequency. If mineral deposits form rapidly — causing slow heat-up — generator chamber should be cleaned more often to maintain it in peak condition.

1. Shut off POWER switch (behind upper access door). Wait until generator pressure gauge indicates zero.

2. Open GENERATOR DRAIN valve by turning handle to left and allow generator to empty completely. With the valve still open, turn POWER switch on. This will allow water to flow through the generator and flush out loose sediment. Allow flushing action to continue several minutes.

3. Close drain valve and allow generator to fill to normal level. When normal level is reached, generator will automatically cut off water supply valve.

4. Turn POWER switch off. Be sure STEAM supply valve is closed (pulled all the way out). Disconnect steam line union (see Fig. 4-2).

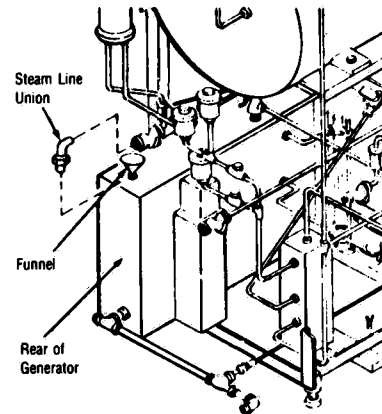


Figure 4-2. CLEANING OPTIONAL STEAM GENERATOR.

5. Shut off water supply to the generator either by closing the sterilizer building supply shutoff valve or by breaking the water line and plugging it.

6. Insert funnel into open line at top of generator and pour 1/2 gallon (1.9 liters) AMSCO Descaler*, very slowly, into generator chamber. When pouring, be sure the fumes are removed by adequate ventilation, using an electric fan if necessary.

7. Turn POWER SWITCH on for only 3 to 5 minutes, to heat solution slightly. Then turn POWER switch off. Allow solution to remain in chamber for at least 60 minutes, depending on amount of scale to be removed.

8. After adequate descaling time, open GENERATOR DRAIN valve and drain generator completely. Close GENERATOR DRAIN valve.

9. Open water supply hand valve, or reconnect the water line to the generator. Turn POWER switch on, and allow generator to fill to normal level.

*Available from your local AMSCO representative (P-764315-722, Case of 4 — 1 gallon containers).

10. When generator has again filled, turn POWER switch off and again open GENERATOR DRAIN valve to flush the generator chamber.

11. Flush generator and drain again as described above. Reconnect the steam line union. The generator is now ready for use.

Quarterly

Cleaning and changing generator gauge glass — for units with integral steam generator (Fig. 4-3).

1. With no pressure in generator, attach rubber tubing to petcock drain; turn petcock drain to the vertical position and allow water to drain from the gauge glass.

2. When gauge glass is empty, close the petcock drain by turning the handle to the horizontal position. If this action adequately cleans glass, proceed no further. If glass requires changing, proceed through following steps.

3. Open top and bottom gauge glass valves and petcock. Remove the two vertical protective rods.

4. Loosen the two hex nuts, which hold the glass in place, and slide them into the glass — about an inch (25 mm) from each end.

5. Remove the glass by lifting it up and out of the lower fitting, and then pulling the bottom forward and downward to clear the upper fitting.

6. Reverse the procedure to install new gauge glass.

Yearly

Descalc steam generator — for units with integral steam generator (Fig. 4-3).

NOTE: Normally, descaling should be done once a year; however, excessive scale formation due to poor water conditions may require more frequent descaling. Failure to descale adequately could result in slow heating or heater burn-out.

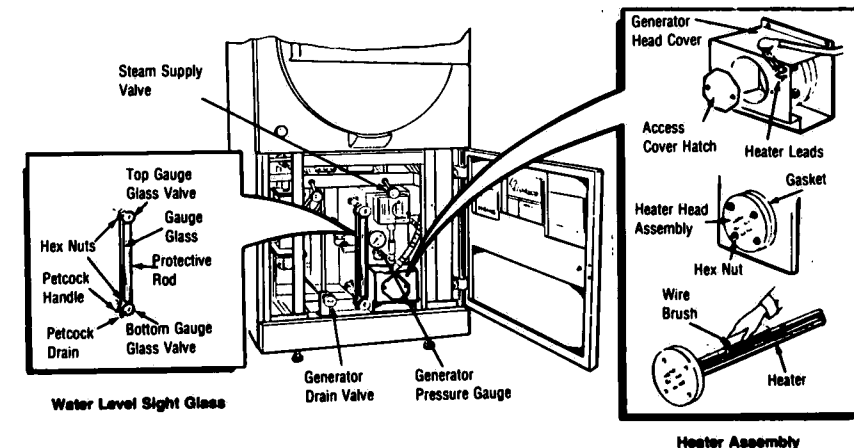


Figure 4-3. MAINTENANCE OF OPTIONAL STEAM GENERATOR.

WARNING: ALWAYS SHUT OFF ELECTRIC POWER TO STERILIZER AT WALL DISCONNECT SWITCH BEFORE STARTING THE FOLLOWING PROCEDURE.

1. Remove access cover hatch.
2. Disconnect heater leads.
3. Remove the generator head cover.
4. Disconnect heater head assembly by removing the four hex nuts; remove and set aside.
5. Clean heater with wire brush.
6. Replace heater head assembly, using new gaskets (page 6-9). Replace generator head cover and heater leads.
7. Reconnect heater leads and turn on power to the generator.
8. With steam pressure in the generator set at 5 psi (0.35 kg/cm²) below inlet line water pressure, examine heater head gasket for leakage.
9. If leakage is present, tighten head nuts or — if necessary — replace gaskets.
10. Replace access cover hatch.
11. Clean generator (refer to page 4-2) before placing in service.

Yearly

Clean Water-level Control (units with steam generator only).

The four rods controlling the chamber water level are contained within the control head located on top of the generator cabinet. These rods are connected to spark plugs which, in turn, are connected to the generator electrical control circuit. Clean the Water-level Control as follows:

1. Disconnect the electric power source from the generator; allow it to cool to approximately room temperature.
2. Remove the four screws from the cover of the water level control head.
3. Remove the cover.

4. Carefully identify both wires and spark plugs with small pieces of tape so that they can be returned to their original locations. Then remove the wires from the spark plugs.

5. Remove the spark plugs, complete with rods, from the control head. Thoroughly clean rods of all lime or other deposits with a small wire brush. Then replace the rods and spark plugs in their original locations and tighten connections.

6. Reconnect wiring to their respective spark plugs and replace cover.

4-4. CLEANING

Daily

1. Remove chamber drain strainer. Clean out all lint and sediment, then reverse flush strainer under running water.

CAUTION: Never use abrasive cleaning compounds, wire brush or steel wool on door and chamber assembly.

2. Wash chamber interior and loading equipment with a mild detergent solution such as Calgonite® (Calgon Corporation).

3. Rinse items with tap water and dry with lint-free cloth. Replace strainer.

Monthly

1. Clean gasket sealing surface on chamber door frame with a mild detergent solution.

2. Clean the door gasket with alcohol or mild detergent.

IMPORTANT: Do not clean the gasket with carbon tetrachloride, kerosene, gasoline or other hydrocarbons.

3. Spray sealing surface on door frame with AMSCO Fluorocarbon Spray (Part P-752870-091) to prevent gasket from sticking.

As Necessary

Use a mild detergent solution such as Calgonite® (Calgon Corporation) to wash exterior surfaces. Rinse with tap water, using a sponge or damp cloth. Wipe dry with a lint-free cloth.

4-5. FIELD TEST PROCEDURE

Preliminary Check

1. Check gasket is correctly in place.
2. Check door closes easily, and top of door is reasonably flush with top of end ring. Repeat, opening and closing 2 or 3 times.
3. Check door lock operates smoothly. Also check the hold open catch and the full open stop.
4. Check manual valves and assure their rods operate smoothly.
5. Check all information and logos are in their correct places.
6. Check ASME plate is correctly fitted and completed.
7. Examine piping for correct appearance and secure fastening. Check flex runs of solenoid valves, moxie, etc.
8. Check the insulation is adequately covered with the ablative paint.
9. Check for proper operation of leaf spring to hold the door open 1" to 1-1/2" for drying purposes.
10. Check the door lock assembly for proper aligning and tighten securely all bolts and nuts. Give particular attention to the washer which activates the door switch. Check and verify that both nuts are tight and Locktite has been applied.

Installation Check

1. Make sure cold water supply line to sterilizer cold water fitting is adequate for sterilizer 3/8 N.P.T. pipe size. Cold water supply is to be 20-50 psig (1.4 to 3.5 kg/cm²).
2. Check that building steam supply line is 1/2 N.P.T. size, reduced by 3/8 at shutoff valve which is connected to sterilizer steam terminal fitting. Steam pressure should be 45 to 60 psig (3.2 to 4.2 kg/cm²).
3. Check that hot water supply line (sterilizers with steam generator only) to strainer is adequate for 3/8 N.P.T. fitting. Hot water supply is to be 45 to 60 psig (3.2 to 4.2 kg/cm²).
4. Make sure machine is grounded. If a generator is used, connect to the voltage marked on the electrical data plate.
5. Adjust the feet so machine is level both ways.

Safety Valve Test

Check chamber safety valve using instructions under Quarterly, in Paragraph 4-3. Also check safety valve on electro-steam generator if sterilizer is equipped with one.

Temperature and Pressure Settings

These adjustments are required only if the Mother board or the temperature probe is replaced. If one of these has been replaced, follow instructions in section 6-7 of this manual, "Temperature and Pressure Adjustments."

Procedure — Operational Check

See Section 3, "Control System," for descriptions of cycle operation.

1. Following are the design tolerances for the operational cycles of the Medalist sterilizer. Check that operation is as indicated below. If operation of any cycle or phases vary widely from the times or temperatures indicated below, use the Troubleshooting Chart (Section 5) to locate the problem and follow recommended corrective measures.

2. Install a clean chart on recorder for recording following test results.

3. Set timer to 0 time and check purge is 30 seconds \pm 1 second. (Use wrapped or unwrapped.) Hold your hand on solenoid drain valve. When the valve closes check the time. Push reset button after exhaust light comes on and pressure is down to ambient.

4. Set sterilize time to one minute.

5. Check come up time (including purge) on empty chamber.

a. (Line steam at 45 psig [3.17 kg/cm²] dynamic)

1. Unwrapped time@ 120 seconds
2. Wrapped time @ 60 seconds
3. Liquids time @ 60 seconds

b. Generator:

1. Unwrapped time@ 120 seconds
2. Wrapped time@ 60 seconds
3. Liquids time @ 60 seconds

6. Check exhaust time on empty chamber.

a. (Line steam at 45 psig [3.17 kg/cm²] dynamic)

1. Unwrapped time @ 60 seconds
2. Wrapped time @ 55 seconds
3. Liquids time @ 13 minutes

b. Generator at 40-45 psi (2.82-3.17 kg/cm²)

1. Unwrapped time @ 60 seconds
2. Wrapped time @ 55 seconds
3. Liquids time @ 13 minutes

7. Recorder: Recorder range:

Check 270 Cycle	270-276 F
Check 250 Cycle	250-256 F

NOTE: Leave Recorder's ON/OFF switch in ON position after testing.

Reset Switch Check

For a description of normal operation, see Section 3-3, "OPERATION OF THE RESET MODE." Set STERILIZE time to one minute. Press UNWRAPPED paddle switch. When pressure is 5-10 psi (.35-.70 kg/cm²), press RESET paddle switch. Note **DOOR LOCKED** light: it should flash until the pressure in the

chamber is approximately atmospheric. Check to see that exhaust mode is the "slow exhaust."

Check Low Water Cut-off On Generator

When the generator is blown down at the end of testing, check for low water cut-off to be operational.

Final Check

1. Shut off all services to sterilizer.
2. Remove test chart and install new chart. Attach test chart to service order.
3. Reinstall any panels or covers that may have been removed for test purposes, and replace all screws, bolts, etc.
4. Clean exterior of unit to remove dust, fingerprints and any adhesive remaining on panels.
5. Clean up immediate work area around unit.
6. If a new installation, complete "New Equipment Warranty Card and Acknowledgement Card" and turn over to administrator or other persons authorized to sign receipts for new equipment warranties. Affix the **Warranty Sticker** to unit.
7. Explain operating instructions and the literature package furnished with equipment.

SECTION 5

TROUBLESHOOTING

This section contains detailed information for locating and correcting the cause of Sterilizer malfunctions.

5-1. HELPFUL HINTS

1. Use the operating procedures presented in Section 2 to verify the trouble symptom. If necessary, use Reset Button and operate Sterilizer more than once in case reported problem is being caused by periodic component malfunction.
2. Refer to paragraph 5-2 and the TROUBLE-SHOOTING CHART (Table 5-1) after symptom has been verified.
3. Use the operational descriptions (Section 3), wiring diagram (Fig. 5-1 or 5-2), optional steam generator schematic (Fig. 5-3, 5-4, 5-5 or 5-6), and piping diagram (Fig. 5-7) as aids in understanding system operation and how the malfunction of a specific component would affect it.
4. Refer to the following guides for examples of what to look for and what to do when you are doing the actual troubleshooting.

• Steam & Water Supplies

- a. Be sure the building-supply valves are fully open.
- b. Be sure the supply pressure is the proper value and that it does not fluctuate. Be sure that gauge readings are correct.
- c. Be sure the steam supply is of the proper quality and that the steam-supply line is well drained. This will ensure condensate-free steam of between 97 and 100 percent saturated vapor.
- d. Check all valves and adjust, repair or replace as necessary.
- e. Clean the supply strainers.

f. Check the drain thermostatic traps; replace the elements if necessary.

g. Inspect the entire system; correct all leaks.

• Electronic/Electrical System

CAUTION: To service the solid-state control used on this Sterilizer, a knowledge of basic electronics will be required. The printed circuit boards are designed for easy replacement (Par. 6-8), but should never be replaced without first ensuring that the inputs are correct. Attempts to repair the boards in the field are not recommended.

a. Using the electrical schematic and operational descriptions, determine the circuit and component function. Correct all loose wires or improper connections.

b. Inspect the individual components and adjust, repair or replace as necessary.

• Drain and Exhaust System

- a. Clean the chamber drain strainer.
- b. Be sure the drain line is clear; clean if necessary.
- c. Be sure the Sterilizer is steam tight.
- d. Check all valves; adjust, repair or replace as necessary.
- e. Check the thermostatic trap; replace element if necessary.
- f. Be sure the Sterilizer is properly leveled; consult the Installation Instructions.

5-2. THE TROUBLESHOOTING CHART — EXPLANATION OF ITS CONTENTS

COLUMN HEADING	EXPLANATION
OPERATIONAL STATUS	Select a symptom from this column that most nearly corresponds with the position to which the Sterilizer cycle progressed before the trouble occurred.
TROUBLE	Select the problem you think is most appropriate to the particular trouble symptom. The examples are presented in cycle sequence.
POSSIBLE CAUSE AND/OR CORRECTION	This column lists the specific conditions that should be checked to isolate and correct the one causing the malfunction. The conditions are presented in the order in which they should be checked. NOTE: If the symptom for a malfunction is established as mechanical, the electrical components may be omitted and vice versa.
WHERE TO FIND ITEMS IN MANUAL	Where applicable, the particular illustration on which a given component may be found is provided in this area. The illustrations are included in Section 7. The index number after the figure number denotes the specific component.

TABLE 5-1
TROUBLESHOOTING

OPERATIONAL STATUS	TROUBLE	POSSIBLE CAUSE AND/OR CORRECTION	WHERE TO FIND ITEMS IN MANUAL
1. Sterilizer in "ready" position	A. Door does not open or close properly.	1) Door sticking to gasket — clean gasket and door surface (Par. 4-4). 2) Bleed hole in gasket groove plugged — open bleed line (Par. 4-3, Weekly Maintenance). 3) Door rollers damaged or improperly adjusted — check operation (Par. 6-3).	7-1, 39 7-2 (Pt. 2), 11
	B. POWER light does not come on when power is switched on.	1) Make sure building disconnect switch is on. 2) Blown fuse — replace. 3) Burnt out lamp — replace. 4) POWER switch malfunctioning — replace.	7-6, 20 7-6, 18 7-6, 19
	C. Steam enters chamber when door is not fully closed.	1) Steam-to-chamber solenoid valve malfunctioning — replace (Par. 6-5). 2) Vacuum breaker malfunctioning — replace. 3) Door lock switch malfunctioning — replace. 4) Printed circuit (PC) board malfunctioning — replace (Par. 6-8).	7-10, 5 7-13, 1 7-3, 1 7-6, 15 & 16
	D. Steam generator (optional) does not come up to pressure	Mechanical 1) Make sure sterilizer building water supply valve is open. 2) Clean strainer in generator water supply line. 3) Check valve in water inlet line is defective — replace. Electrical (Par. 6-10) 1) Generator liquid level fuse is defective — replace. 2) Heating element fuses or fuse connections are defective — replace. 3) Points, connections, or magnetic contactor is defective — repair or replace. 4) Heating element is defective — replace. 5) Water-level switch is defective — replace. 6) Relay in water-level control is defective — replace. 7) Hot water solenoid valve is clogged or defective — clean or replace.	7-18, 8 7-23, 6 & 7 7-26 7-24 7-24, 4 7-24, 5 7-26 7-26, 6 7-23, 4

OPERATIONAL STATUS	TROUBLE	POSSIBLE CAUSE AND/OR CORRECTION	WHERE TO FIND ITEMS IN MANUAL
2. Sterilizer in "ready" position, door is closed and locked.	A. DOOR LOCKED light does not come on.	1) Make sure door is latched. 2) Burnt out lamp — replace. 3) Door Lock switch malfunctioning — replace. 4) PC board malfunctioning — replace (Par. 6-8).	7-1, 20 & 21 7-5, 15 7-3, 1 7-6, 15 & 16
	B. Program light does not come on when selector is pushed.	1) Make sure RESET switch has been pushed. 2) Burnt out lamp — replace. 3) Selector switch defective — replace. 4) PC board malfunctioning — replace.	7-5, 15 7-4, 10 7-6, 15 & 16
3. Beginning of any cycle. DOOR LOCKED and program lights on.	A. Steam does not enter chamber at beginning of cycle.	1) Be sure building steam supply valve is open. 2) Make sure manual STEAM valve is open (pushed in). 3) Make sure steam supply pressure is at least 45 psig (3.17 kg/cm ²). 4) Clean steam-supply line strainer. 5) Steam-to-chamber solenoid valve or manual STEAM valve clogged or malfunctioning — clean or replace (Par. 6-5). 6) Fast exhaust solenoid valve stuck open — clean or replace (Par. 6-5). 7) Chamber-drain steam trap element is defective — replace (Par. 6-4). 8) Applicable pressure switch is out of adjustment — readjust (Par. 6-7). 9) PC board malfunctioning — replace (Par. 6-8).	7-10, 29 7-10, 28 7-10, 5 7-10, 24 7-11, 3 7-12, 5 7-6, 11 7-6, 15 & 16
		1) Steam-to-chamber or fast exhaust solenoid valve is malfunctioning — clean or replace (Par. 6-5). 2) PC board malfunctioning — replace (Par. 6-8).	7-10, 5 7-11, 3 7-6, 15 & 16
		1) Be sure gasket fits properly into groove on frame (outer and inner lip of gasket base). 2) Remove gasket and rotate 180°, then retry. 3) Gasket is cracked in web (cross-bar section of H-shape) — replace (Par. 6-3). 4) Door rollers damaged or improperly adjusted — check operation (Par. 6-3).	7-1, 39 7-1, 39 7-1, 39 7-2 (Pt. 2), 11
		1) Dynamic steam pressure is not adequate — assure that it is between 45 and 60 psig (3.17 to 4.24 kg/cm ²). 2) Generator (optional) supply voltage is not correct — assure that it is the voltage indicated on the generator electrical data plate ($\pm 10\%$).	
	B. Thirty-second purge part of cycle is not operating correctly.		
	C. Steam escapes around door gasket seal.		
	D. Chamber temperature does not come up to sterilization temperature		

OPERATIONAL STATUS	TROUBLE	POSSIBLE CAUSE AND/OR CORRECTION	WHERE TO FIND ITEMS IN MANUAL
	E. Chamber reaches sterilizing temperature, but STERILIZE light does not come on.	3) Chamber-drain steam trap element is defective — replace (Par. 6-4). 4) Exhaust solenoid valve is stuck open — clean or replace (Par. 6-5). 5) PC board malfunctioning — realign or replace (Par. 6-8). 6) Temperature probe (moxie probe) failure. 1) Burnt out lamp — replace. 2) Pressure switch and temperature adjustments are incorrect — readjust (Par. 6-7). 3) PC board malfunctioning — realign or replace (Par. 6-8). 4) Temperature probe (moxie probe) failure.	7-12, 5 7-11, 3 7-6, 15 & 16 7-12, 11 7-5, 15 7-6 7-6, 15 & 16 7-12, 11
4. Chamber is at sterilizing temperature. STERILIZE light is on.	A. Excessive steam around drain funnel.	1) Make sure cold water manual valve is pushed in far enough. 2) Clean cold water line strainer.	7-14, 19 7-14, 15
	B. Safety valve is releasing	1) "Unwrapped" pressure switch is not turning off steam-to-chamber solenoid valve at 31 psig (2.18 kg/cm ²) — readjust (Par. 6-5) or replace. 2) Steam-to-chamber solenoid valve is stuck open — clean or replace (Par. 6-5). 3) If safety valve on optional steam generator is releasing, pressure exceeds 85 psig (5.98 kg/cm ²) — readjust or replace pressure switch (Par. 6-7).	7-6, 11 7-10, 5 7-23, 1
	C. Steam generator (optional) overflows into sterilizer piping system.	1) Generator hot water solenoid valve is malfunctioning — repair or replace (Par. 6-10). 2) Water-level control is defective or clogged — clean or replace (Par. 6-10). 3) Relay in water-level control is malfunctioning — repair or replace (Par. 6-10).	7-23, 4 7-26 7-26, 6
	D. STERILIZE light does not stay on.	1) Loose bulb — tighten. 2) Chamber temperature is dropping below the controlling temperature — readjust pressure switch and temperature adjustments (Par. 6-7). 3) PC board malfunctioning — replace (Par. 6-8).	7-5, 15 7-6, 15 & 16
	E. DOOR LOCKED light flashes.	1) Temporary power failure — wait for chamber to reach atmospheric, then push RESET switch and reinitiate cycle.	
	F. Exposure time elapses, but EXHAUST light does not come on.	1) Burnt out lamp — replace. 2) Pressure switch and temperature adjustments are incorrect — readjust (Par. 6-7). 3) PC board malfunctioning — replace (Par. 6-8).	7-5, 15 7-6, 15 & 16

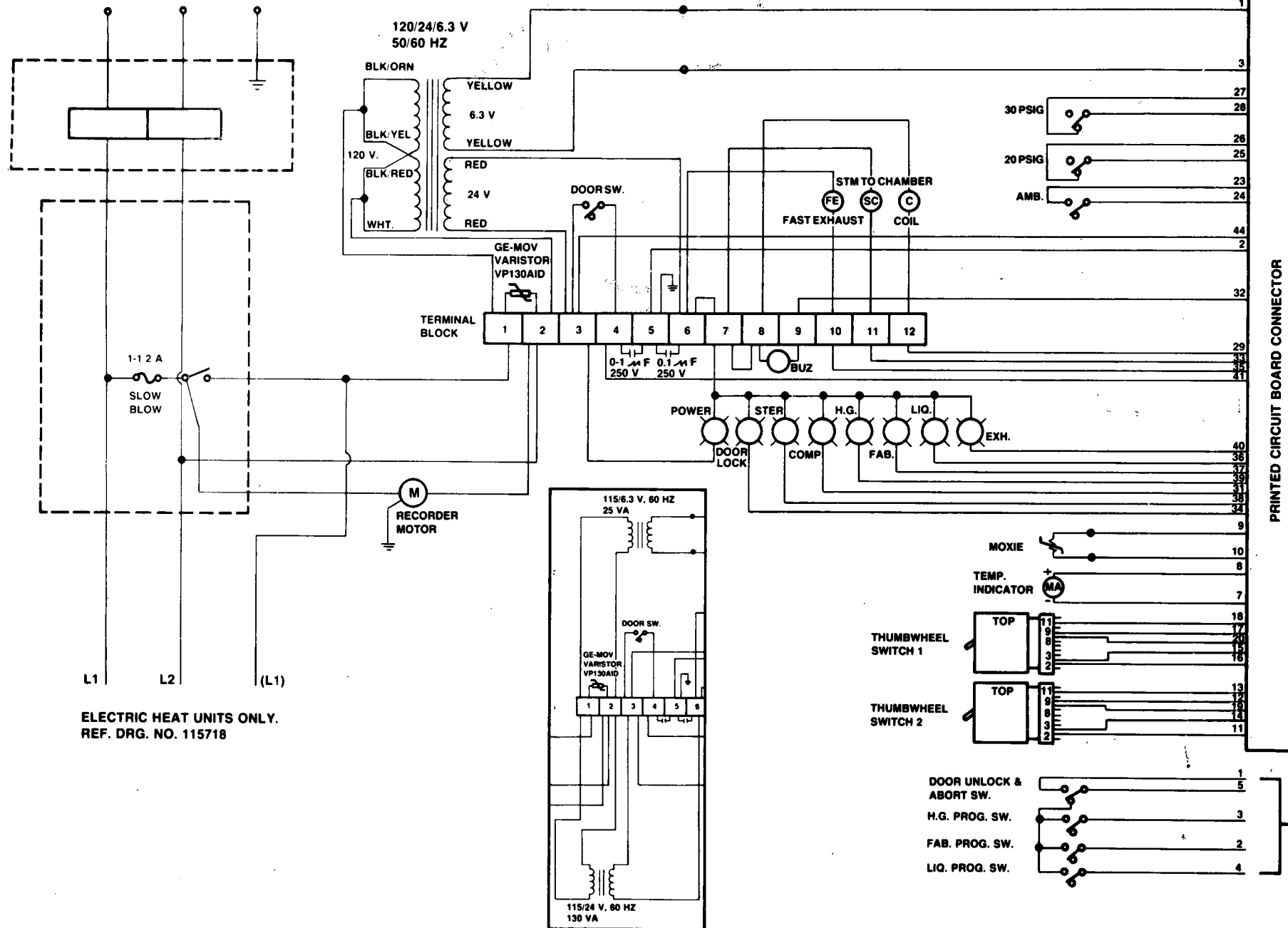
OPERATIONAL STATUS	TROUBLE	POSSIBLE CAUSE AND/OR CORRECTION	WHERE TO FIND ITEMS IN MANUAL
5. End of cycle. EXHAUST light is on.	A. Chamber exhausts too quickly after a Liquids cycle.	1) Fast exhaust solenoid valve is stuck open — repair or replace (Par. 6-5). 2) Element in chamber drain steam trap is defective — replace (Par. 6-4).	7-11, 3 7-12, 5
	B. Chamber does not fast exhaust following a WRAPPED or UNWRAPPED cycle.	1) Fast exhaust valve is not opening — repair or replace (Par. 6-5). 2) PC board malfunctioning — replace (Par. 6-8)	7-11, 3 7-6, 15 & 16
	C. Chamber exhausts, but CYCLE COMPLETE light and/or buzzer does not come on.	1) Burnt out lamp or buzzer — replace. 2) Pressure switch and temperature adjustments are incorrect — readjust (Par. 6-7) 3) PC board malfunctioning — replace (Par. 6-8).	7-5, 15 7-6, 15 & 16
	D. Materials are too wet after wrapped cycle completion.	1) After COMPLETE signal, make sure door is slid to the cracked position (but do not open). Keep door in cracked position for 15 minutes. 2) Clean chamber drain screen. 3) Element in steam separator is defective — replace.	7-1, 21 7-1, 40 7-28, 2
	E. Excessive moisture in sterilizer after unwrapped cycle completion.	1) Clean chamber drain screen. 2) Element in steam separator is defective — replace steam separator.	7-1, 40 7-28 & 7-10
	F. Water on floor of chamber.	1) Clean drain cup and tube. 2) Clean drain screen. 3) Element in steam separator is defective — replace steam separator. 4) Vacuum breaker malfunctioning — clean or replace.	7-8 7-1, 40 7-28 & 7-10 7-13, 1
6. Miscellaneous	A. Cycles are inconsistent	1) PC board malfunctioning — replace (Par. 6-8).	7-6, 15 & 16
	B. Excessive cold water usage by condenser.	1) Make sure cold water manual valve is pushed in only far enough to condense steam.	7-14, 19
	C. Not able to obtain 3.2 Volts when adjusting R39 during calibration.	1) Moxie probe defective.	

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STEAM HEAT UNITS ONLY
115 VOLT, 60 HZ SINGLE PHASE

Medalist 200 Sterilizers

DWG. NO. 130803-001

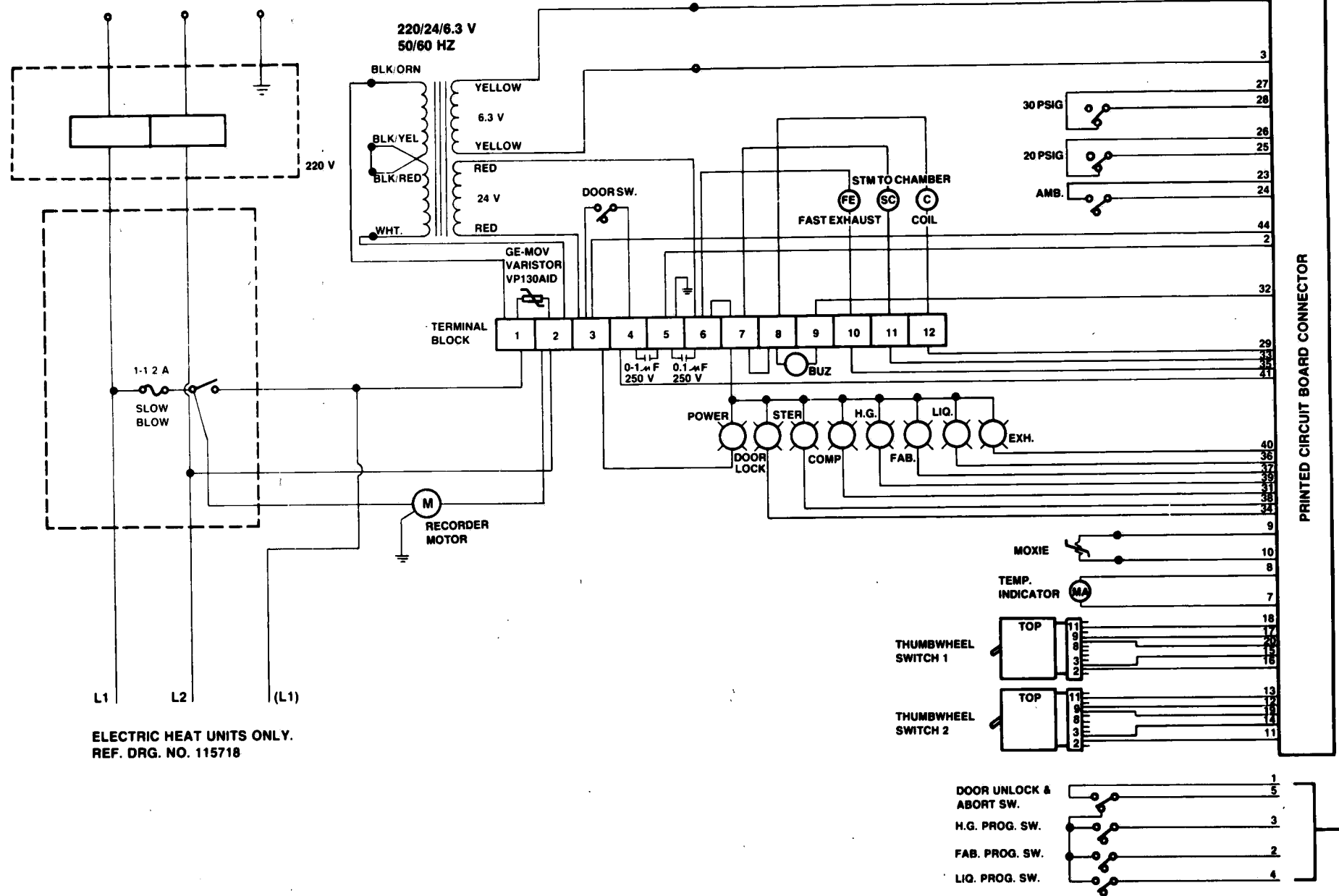


ONLY FOR EARLY MODELS WITH
TWO TRANSFORMERS.

Figure 5-1. WIRING DIAGRAM, STERILIZER (115 V).

5-7/5-8

STEAM HEAT UNITS ONLY
220/240 VOLT, 50 HZ SINGLE PHASE



ELECTRIC HEAT UNITS ONLY.
REF. DRG. NO. 115718

Figure 5-2. WIRING DIAGRAM, STERILIZER (220/240 V).

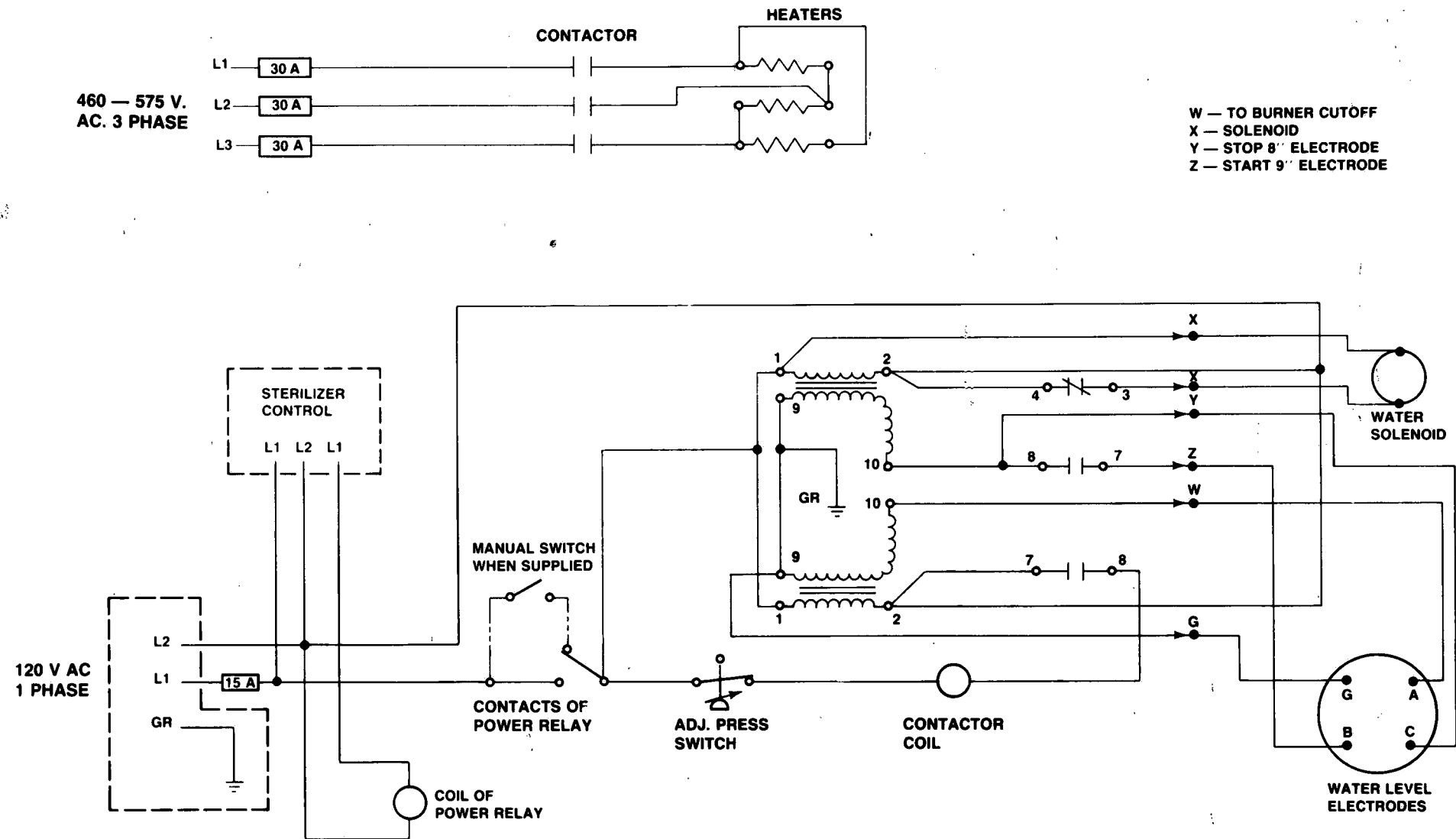
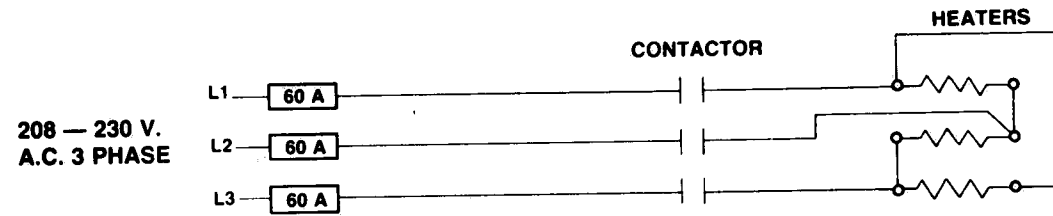


Figure 5-3. ELECTRICAL SCHEMATIC,
Optional Steam Generator (460-575 V, 3 PH Heaters).

5-11/5-12



W — TO BURNER CUTOFF
X — SOLENOID
Y — STOP 8" ELECTRODE
Z — START 9" ELECTRODE

NOTE: RESTAMP NAMEPLATE
208 OR 230 V 60 CY. 1 PH 70 AMPS

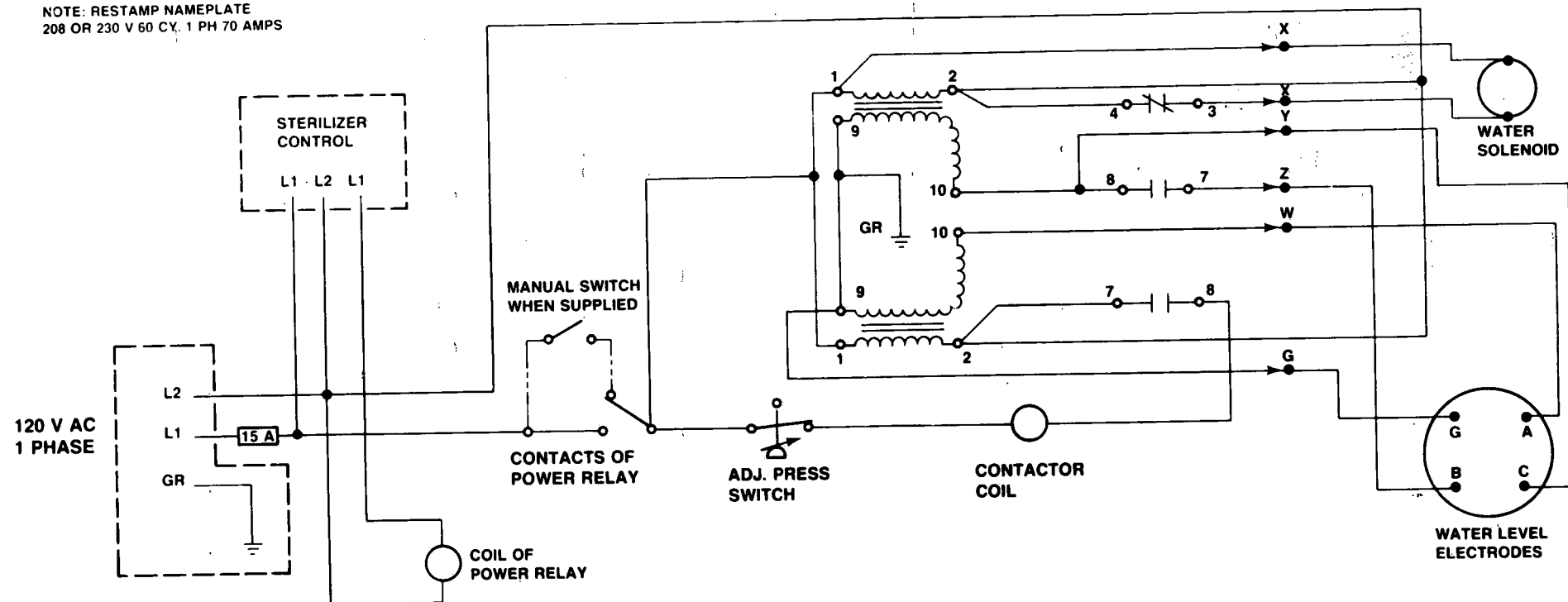


Figure 5-4. ELECTRICAL SCHEMATIC,
Optional Steam Generator (200-230 V, 3 PH Heaters).

5-13/5-14

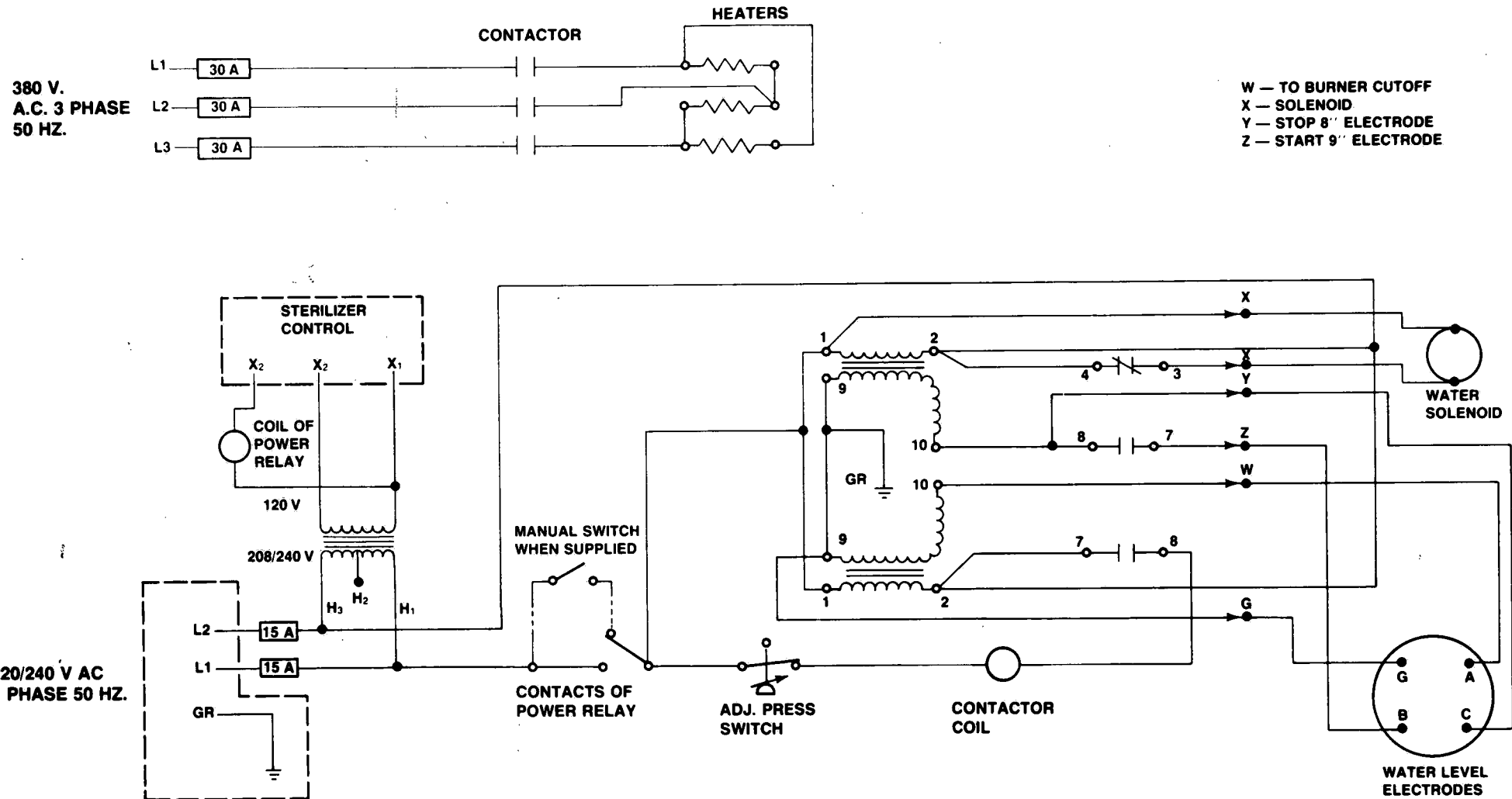
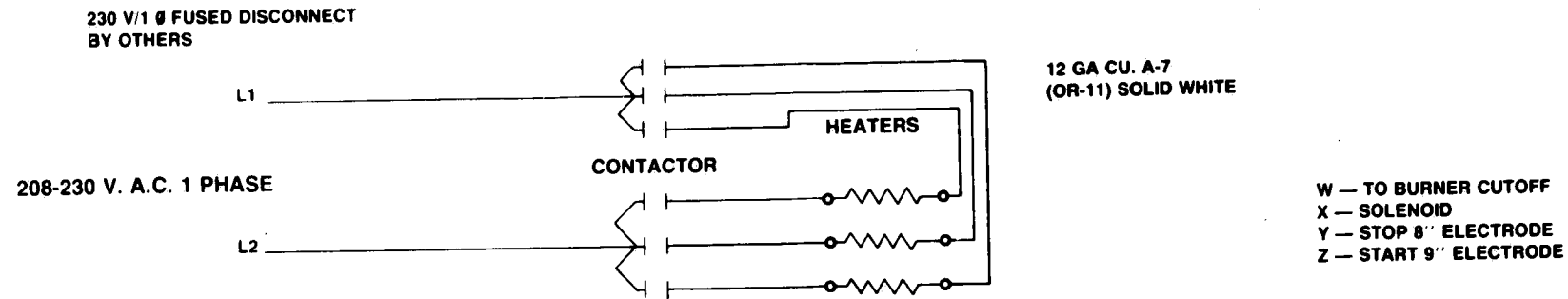


Figure 5-5. ELECTRICAL SCHEMATIC, Optional Steam Generator (380 V, 3 PH, 50 HZ Heaters).



**NOTE: RESTAMP NAMEPLATE
208 OR 230 V/60 HZ/1 PH 70 AMPS**

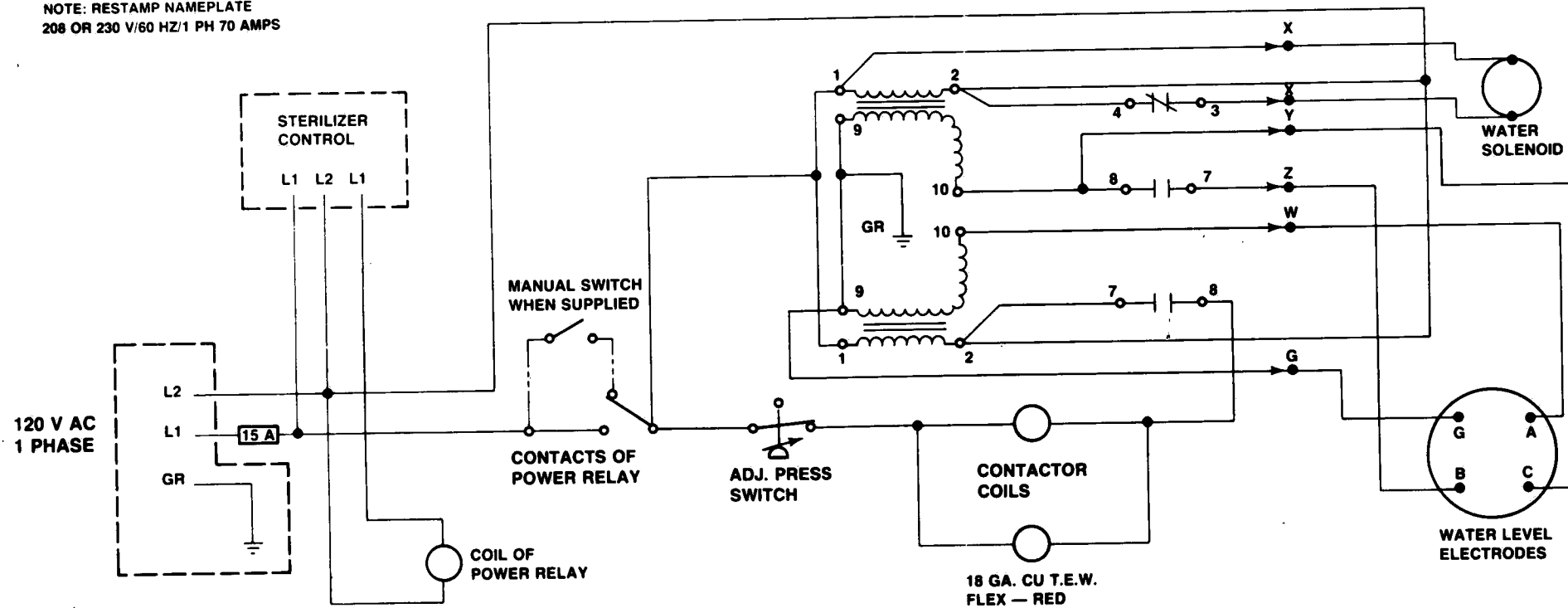
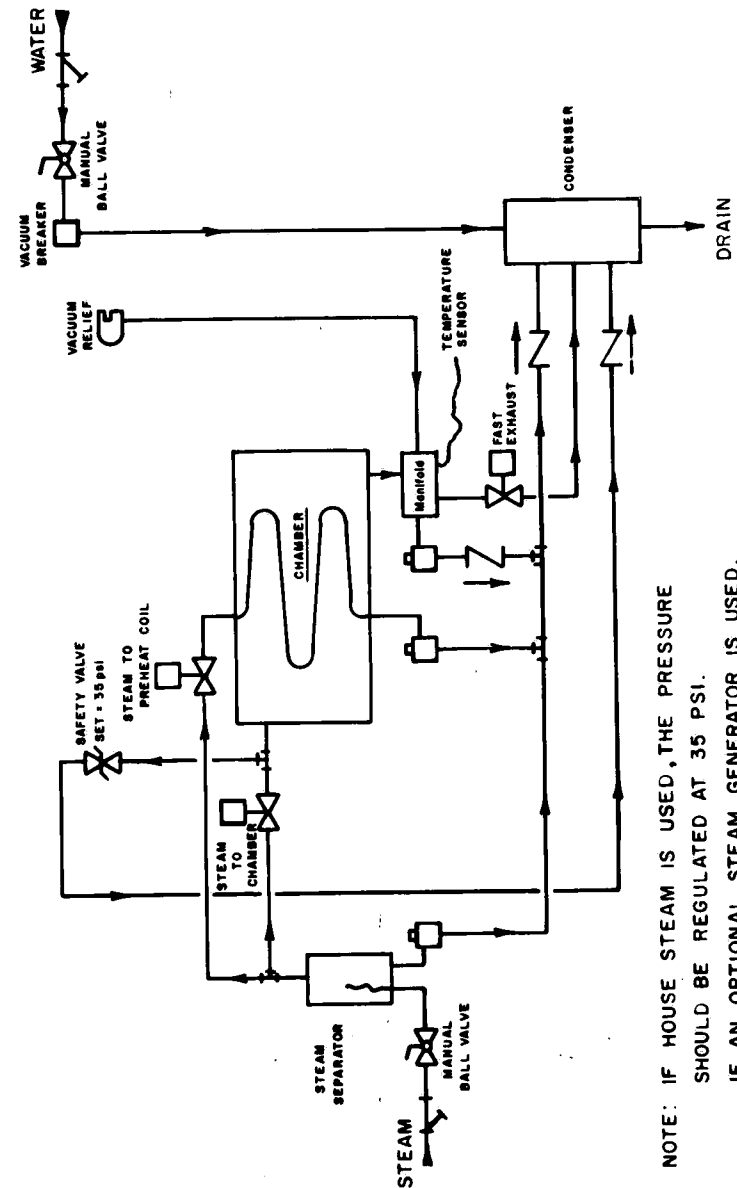


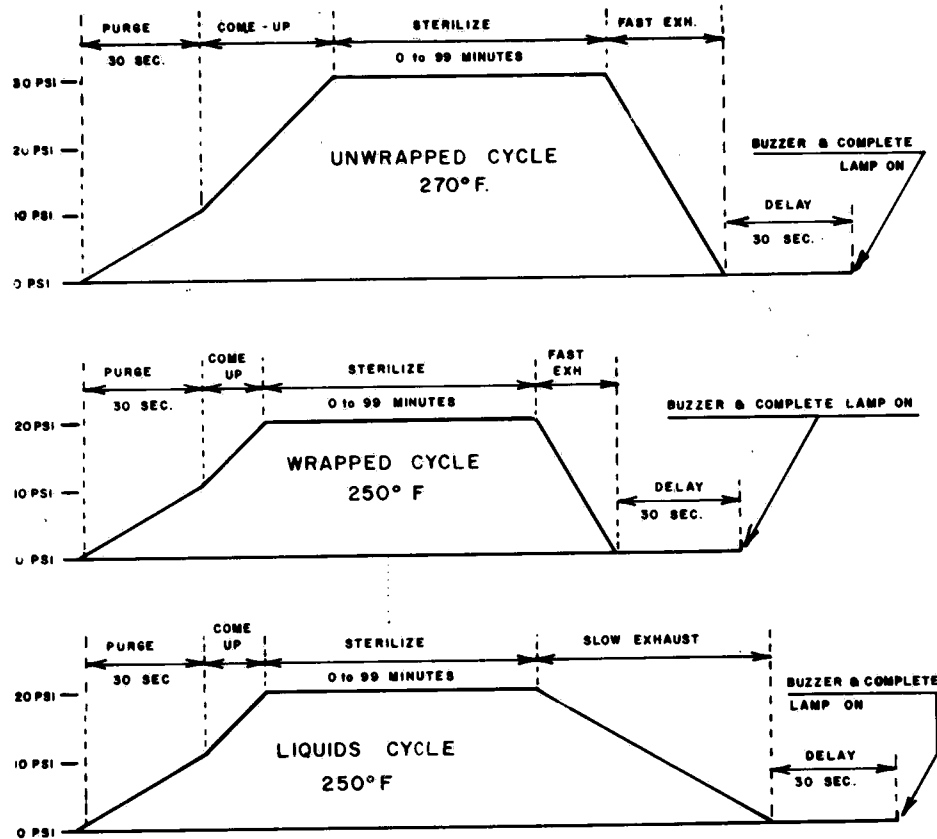
Figure 5-6. ELECTRICAL SCHEMATIC, Optional Steam Generator (208-230 V, 1 PH Heaters).

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NOTE: IF HOUSE STEAM IS USED, THE PRESSURE
SHOULD BE REGULATED AT 35 PSI.
IF AN OPTIONAL STEAM GENERATOR IS USED,
THE PRESSURE SHOULD BE 45 PSI.

Figure 5-7 . PIPING SCHEMATIC, STERILIZER.



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NOTES:

1. Slow Exhaust will occur if ;
 - a. the control is reset during any cycle.
 - b. there is a power failure during any cycle.
2. Door locked lamp flashes until 0 psi is reached, if a power failure occurred, or if the control is reset during a cycle.

Figure 5-8. CYCLE GRAPHS.



SECTION 6

COMPONENT REPAIR AND REPLACEMENT

6-1. GENERAL

This section includes instructions for the adjustment, disassembly, repair and replacement of selected sterilizer components. Exploded views and assembly drawings showing the various parts and assemblies referred to in this section are in Section 7.

6-2. TEMPERATURE RECORDER

Starting Ink Flow (Fig. 6-1)

1. Make sure recorder switch is on.
2. Lift pen, using pen lifter.
3. Remove cap from fiber tip.
4. Place a scrap of paper under tip; move slightly to initiate flow. (If necessary, slightly moisten tip.)

Changing the Chart

1. Lift pen, using pen lifter.
2. Slip edge of chart out from under the chart clips.
3. Lift chart off hub and remove.
4. Slip new chart under pen arm and locate chart hole over hub.

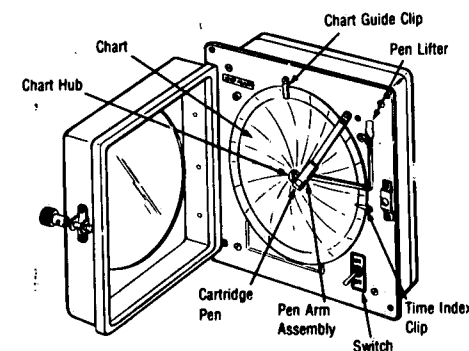


Figure 6-1. TEMPERATURE RECORDER.

5. Slip edge of chart under the chart guide clip and time index clip. Push chart flat against dial plate.

6. With a coin or screwdriver, rotate chart hub until the time index clip is aligned with the correct time on the edge of the chart.

Replacing Ink Cartridge (Figs. 6-2, 6-3)

1. Lift pen, using pen lifter.
2. Grasp cartridge near tip end with thumb and forefinger.
3. Note the position of the metal retaining clip.
4. Pull steadily, in a straight line, taking care not to distort pen arm (Fig. 6-2).
5. Using thumb and forefinger, hold clip under pen arm as shown in Figure 6-3, then slide new cartridge into engagement with the clip. Release clip.
6. Holding the pen arm behind the cartridge, slide cartridge onto the arm until the tip boss is centered in the V-shaped cut at the end of the pen arm. A slight shifting or centering motion at the front of the cartridge will ensure proper positioning.

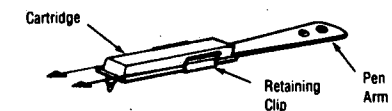


Figure 6-2. REMOVING INK CARTRIDGE.

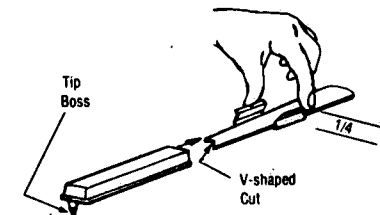


Figure 6-3. REPLACING INK CARTRIDGE.

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6-3. DOOR ASSEMBLY

Replacement of Door Gasket (Fig. 6-4)

1. Wait until the machine is cool before installing new gasket.
2. Remove the old gasket by pulling it out of the groove.
3. Clean the groove; **do not** use metallic or abrasive objects or materials.
4. The new gasket will have a coating of powder to help fit it into place. **Do not** remove the powder.
5. Grasp the (thicker) base of the gasket between the thumb and forefinger, and with smaller, higher lip to the outside, squeeze the gasket.
6. Starting at the nine o'clock position, insert 3 or 4 inches (8 to 10 cm) of the gasket into the groove and tape temporarily in position.
7. Install the remainder of the gasket a few inches at a time by first inserting the outer edge and then using your finger or a smooth object to roll the inner edge into position. Remove tape.
8. Check to see that the inner and outer lips are seated. To do this, you may use a smooth object to lift the pressure lips.

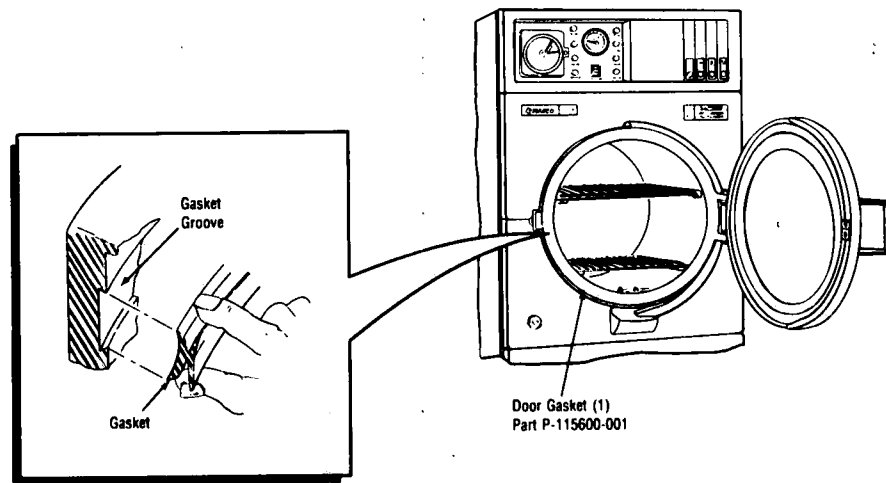


Figure 6-4. REPLACING DOOR GASKET.

IMPORTANT: If a used gasket is reinstalled, reinstall it in the same position it was in originally. Make sure the exposed surface is clean.

Removal of Door (Fig. 7-2, Part 1)

1. Remove the two (2) 1/4" cap screws and lock washers (item 19) that secure the handle cover. They are located at the end of the cover next to the hinge. . . be careful not to drop the cover.
2. Remove the four (4) 3/8" stud nuts and washers (item 23) and the hold plate (item 22).
3. Remove the door handle and the eight (8) stud nuts behind it. Observe the position of the four (4) outer nuts before removing them. These are used to properly space the door handle away from the blue cover plate, preventing friction between them. Take off the blue cover plate.
4. If any of the rollers are cracked or chipped, they **must** be replaced.

WARNING: THE DOOR WEIGHS APPROXIMATELY 50 POUNDS. USE EXTREME CARE WHEN SLIDING IT ON THE SUPPORT ARM SO THAT IT DOES NOT ROLL OFF THE ARM AND FALL.

Door Adjustment (Fig. 7-2, Part 2)

1. In order to accurately adjust the door, the door gasket **must** be removed from the end ring. Remove it **slowly** or the inner lip will tear, making it necessary to replace the gasket.
2. Notice — some studs may have washers on them. Be sure they are replaced when assembling the door.
3. Loosen the stud nuts on the **bottom rollers while holding the eccentric bushings** (item 9).
4. Turn the eccentrics slightly counterclockwise — only enough so that the rollers will be at their furthest position away from the support arm. **DO NOT** rotate the eccentric more than 180° from its original position or the door will not slide easily and may be pushed out of its parallel position with respect to the support arm.
5. Retighten the stud nuts to hold the rollers and eccentrics in this lowest position. Use care not to disturb the eccentrics positions.
6. Loosen the top stud nuts and adjust the eccentrics so that the **top of the door and the top of the end ring are flush**. Gaps at the top and bottom of the door will usually be less than 1/4" and are not critical **providing** the end ring and door are flush.
7. Tighten the stud nuts while holding the eccentrics — to keep them from moving.
8. Once again, loosen the bottom stud nuts. Turn the eccentrics so that the rollers move upward to the support arm. Rollers should be engaged with the support arm, but not so tight that they cannot be turned by hand. Tighten the stud nuts securely.
9. Check for ease of sliding. If sticking occurs, adjust the proper bottom eccentric very slightly.

10. Follow Steps 1 through 3 in the section **Removal of Door**, in reverse, to reassemble the door.

NOTE: If an eccentric has to be replaced, thread the new one all the way back to the end of the stud. Then adjust it forward so that a 1/8" gap exists between the door plate and the **end of the support arm**. Then fine adjust it so the roller groove engages the support arm.

6-4. STEAM TRAP (Fig. 7-12, items 5 and 14)

CAUTION: Allow thermostatic traps to cool to room temperature before removing cover. Since there is nothing to limit expansion, the diaphragm may rupture or fatigue if trap is opened when hot.

1. Unscrew and remove cap and diaphragm assembly. Use a hex socket wrench to unscrew and remove seat. See Figure 6-5.

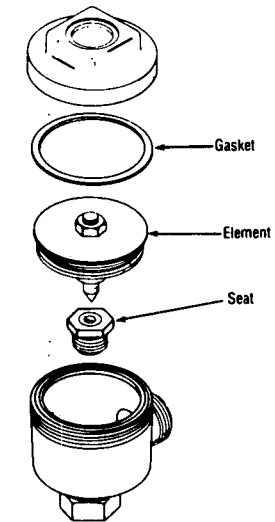


Figure 6-5. STEAM TRAPS.

2. Wipe parts clean, taking care to avoid damage to diaphragm, seat and pointed diaphragm stem.

3. Wipe out bowl, taking care that loose material does not enter piping.

4. Test diaphragm for flexibility. Examine solder joints for cracks or leaks; dip it in boiling water and look for a noticeable expansion. An element in good condition will be difficult to stretch by hand and will return to original condition quickly when released.

5. Reassemble steam trap in reverse order of disassembly. Install new diaphragm assembly if required. Make certain that all pipe fittings are tight after assembly.

6-5. SOLENOID VALVES

NOTE: It is recommended that in most cases solenoid valves be replaced without repair if they become defective. When installing new valves in any line, note the arrow stamped on the valve body or the words "In" and "Out" stamped at the inlet and outlet ports. A reversed valve will not operate properly.

Testing

1. Energize solenoid coil. A metallic "click" signifies solenoid operation. Absence of the "click" indicates loss of power supply, defective coil or improper connection; proceed as follows:

a. Check voltage across the coil leads; it should be approximately 24 volts.

b. Check solenoid coil for open circuit or ground.

2. Energize and deenergize the coil. Check valve operation for proper opening and closing. A loud hum and sluggish operation usually indicates the coil is defective.

3. Inspect the valve for evidence of leakage. A worn valve seat will cause the valve to leak when closed.

6-6. SELECTOR SWITCHES (Fig. 7-4)

1. Make sure all power is off to the machine.

2. Open swing door (7) and remove the two screws (5) that secure its hinge to the black panel behind that door. Remove the door.

3. This exposes another screw (Fig. 7-7, 1) at the top under the swing door hinge. Remove this screw. Slide

the paddles to the left, being careful not to damage the switches underneath. Remove the paddle assembly.

4. All four screws (Fig. 7-7, 10 and Fig. 7-4, 8) securing the black panel are now accessible. Remove the screws, and then the panel. Selector switches are now accessible.

5. Follow the above steps in reverse to replace the panel, being careful not to damage the switches.

6-7. TEMPERATURE AND PRESSURE ADJUSTMENTS

Equipment required: digital voltmeter; thermocouple; digital temperature indicator or temperature potentiometer; test pressure gauge.

NOTE: Read through this procedure completely, before beginning, in order to find out how best to set up equipment for your particular location. Also refer to step 8 in Paragraph 6-8 if a recessed unit.

Set-up

1. Remove the control panel cover (Fig. 7-4, 1).

2. Remove the selector switch assembly (see Par. 6-6) for access to the pots.

3. Carefully remove the vacuum relief line fitting (Fig. 7-13, 3) from the drain casting (Fig. 7-12, 12). Do not crimp, crush, or otherwise damage the tubing during removal.

4. Using a ConaxTM (Conax Corporation, Buffalo, N.Y.) adapter, install a thermocouple in the drain casting, through the tapped hole from which the vacuum relief line fitting was removed.

5. Position the thermocouple on the recorder bulb or the moxie probe. Do this by looking down into the drain casting from inside the chamber. Do not allow the thermocouple to rest on any part of drain casting.

6. Remove plug from the steam-to-chamber fitting and replace with test pressure gauge. Position gauge so that it is easily readable.

Initial Settings

1. See Figure 6-6. Turn trimmers (potentiometers) R39, R40, R41, R42, R43 on the Mother Board at least 20 turns counterclockwise.

2. Set thumbwheel switches to read 33 minutes.

3. Set all three pressure switches (Fig. 7-6, 11) to ambient (all the way counterclockwise).

4. Remove connection from "normally open" side of the ambient pressure switch. (Removal of this wire results in fast exhaust for all cycles, which is necessary for testing purposes.) Tape the open end of the loose wire.

5. Switch power to ON.

Pressure Settings

1. Push UNWRAPPED cycle selector.

2. Wait thirty seconds for the purge to finish. Then adjust the "high" pressure switch so that chamber steam cuts off at 31 psig (2.18 kg/cm²). If you are at first unable to obtain the 31 psig (2.18 kg/cm²) by adjusting the pressure switch, turn R43 clockwise three turns, then repeat pressure switch adjustment.

3. Push RESET switch to abort the cycle.

4. Wait for chamber to return to atmospheric pressure.

5. Push WRAPPED cycle selector.

6. Wait thirty seconds for the purge portion of the cycle to finish. Then adjust the "low" pressure switch so that chamber steam cuts off at 20 psig (1.4 kg/cm²). If you are at first unable to obtain the 20 psig (1.4 kg/cm²) by adjusting the pressure switch, turn R40 three turns clockwise, then repeat the pressure switch adjustment.

7. Connect an ohmmeter to the normally open contact of the ambient switch (ambient switch is all the way counterclockwise). With pressure in chamber, check for contact. If contact is not made, turn it clockwise a few clicks until contact is made. With Dymo tape mark the switches "31 PSI", "20 PSI", and "Amb."

8. Push RESET switch to abort the cycle.

Temperature Settings

NOTE: The accuracy of the settings depends on accurate readings and prompt adjustment of the correct potentiometers. Perform the following without loss of time between the successive steps.

1. Push UNWRAPPED cycle selector.

2. Wait for chamber drain temperature to reach a temperature of 274 F (134 C), as indicated on the digital temperature indicator.

3. Install the DVM to read the voltage between test points TP2 (meter pos.) and TP1 (meter neg.). (See Fig. 6.6.)

4. Turn R39 clockwise to attain voltage of 3.2 +0.1V.

5. Move DVM positive lead from test point TP2 to TP3.

6. Turn R43 clockwise until the DVM indicates zero.

NOTE: Move to step 7 as soon as possible since temperature will drop when R43 is adjusted to zero.

7. Move the probe from TP3 back to TP2.

8. Note the DVM indications as the temperature drops to 272 F (133 C), 270 F (132 C), 252 F (122 C) and 250 F (121 C); record them below:

272 F (133 C) _____ 252 F (122 C) _____

270 F (132 C) _____ 250 F (121 C) _____

9. Move the probe from TP2 to TP3.

10. Turn R43 counterclockwise until the DVM indicates the same voltage as the 272 F (133 C) indication recorded in step 8.

11. Move the probe from TP3 to TP4.

12. Turn R42 clockwise until DVM indicates the same voltage as 270 F (132 C) voltage recorded in step 8.

13. Move the probe from TP4 to TP5, and turn R40 until DVM indicates the same voltage as the 252 F (122 C) indication recorded in step 8.

14. Move the probe from TP5 to TP6, and turn R41 until DVM indicates the same voltage as the 250 F (121 C) reading recorded in step 8.

15. Push RESET switch to abort the cycle.

16. When chamber returns to atmospheric pressure, reinstall the connection to the "normally open" side of the ambient pressure switch.

17. Set thumbwheel switches to 3 minutes.

18. Set STERILIZE time to 3 minutes. Push UNWRAPPED cycle selector and let sterilizer run through the cycle. Record temperature and time on the chart below.

Push the WRAPPED cycle selector and let the sterilizer run through the cycle. Record the temperature and time on the chart below.

	TEMP.	TIME
UNWRAPPED Cycle
WRAPPED Cycle

UNWRAPPED temperature should be between 272-275 F (133-135 C); WRAPPED temperature should be between 252-255 F (122-124 C). If necessary, adjust the temperature set points (R40, R41, R42, R43) as described above: ccw to increase temperature set point, cw to decrease temperature set point. Do not readjust R39 once R40, R41, R42, and R43 have been set.

6-8. REPLACEMENT OF PRINTED CIRCUIT BOARDS

CAUTION: Replace PC boards only after you have checked all other possible causes of machine malfunctioning, including all input signals to the boards. Because of the extreme reliability of the boards, board replacement should be considered only as a last resort.

1. If the sterilizer is free-standing, replacement of boards will be accomplished from the back of the machine; if it is a recessed unit, replacement will be accomplished from the front.

2. Make sure electrical power to the machine is turned off at the disconnect switch.

3. If the sterilizer is free-standing, remove the top cabinet panel. Remove the enclosure covering the control section (Fig. 7-4, 1).

4. Note the position of the logic board (Fig. 7-7, 16) in relation to the mother board: electronic components are facing the mother board (Fig. 7-7, 15).

5. If the logic board is to be replaced, pull it out of the connector and insert the new one in the connector, making sure electronic components are facing the mother board.

6. If the mother board is to be replaced, first detach the harness connector, then remove the terminals in front by pulling them up. Pull the logic board out of the connector. After that, remove the four screws holding the board in place. Remove the board. If the sterilizer is freestanding, place the new board in position and secure it with the four screws. If the sterilizer is recessed, see step 8 below. Attach the harness connector, making sure that the numbers on the harness are facing up. Replace the terminals by lightly pushing them down to lock them in place. Replace the logic board in the connector.

7. After replacing the mother board, it will be necessary to make the temperature and pressure adjustments described in Paragraph 6-7.

8. For a recessed sterilizer, it may be necessary to follow these steps to set up mother board for adjustments:

a. Position the mother board so that the two screw holes on the back are placed over the two rolled spacers (Fig. 7-6, 14) closest to the front of the sterilizer. This position allows the mother board adjustments to be made.

b. Use two of the screws (Fig. 7-6, 13) to temporarily hold the board in this position, then attach the harness connector and terminals as described in step 6 above. Proceed with the temperature and pressure adjustments described in Paragraph 6-7. After adjustments are completed, secure the mother board in its normal position.

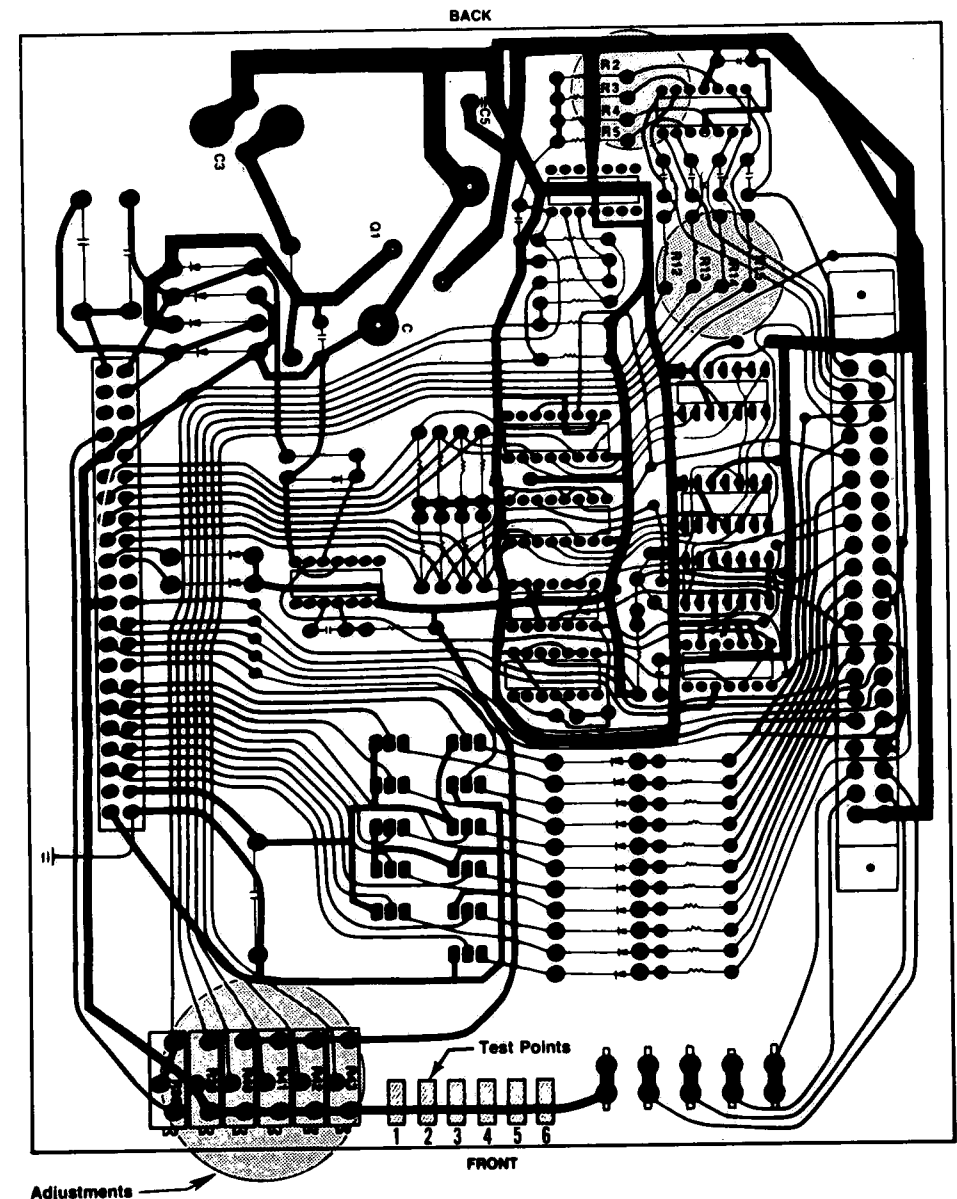


Figure 6-6. LOCATION OF TEST POINTS ON MOTHER BOARD.

6-9. REPAIR PROCEDURE FOR CADMIUM-PLATED SURFACES (CHAMBER INTERIOR AND DOOR)

This procedure is for filling in chips, gouges, scratches, etc., on the cadmium-plated surfaces of the door and chamber.

1. Materials required: Solder and flux. Recommended solder is Kester Solder Co. SN60 alloy, a flux cored, 33 mm dia., 58 core size. If extra oxide reduction is needed, use Kester 415 or 1429 liquid acid flux.

Heat source. Propane, natural gas, or air acetylene.

Sanding material. A "Scotchbrite" pad or stainless steel wool. Do not use standard steel wool since the particles will rust.

A surgical mask, or similar, to avoid breathing dust while sanding.

A 450 F (232 C) "Tempilstik" to measure surface temperature of chamber.

(A repair kit, consisting of a Tempilstik, solder, flux and an asbestos blanket, is available from AMSCO Regional Offices.)

WARNING: CADMIUM IS TOXIC

CADMIUM AND COMPOUNDS OF CADMIUM, WHEN INHALED OR INGESTED, ARE TOXIC. THE CADMIUM-PLATED SHELL OR DOOR MUST NOT BE WELDED, BRAZED, SOLDERED OR OTHERWISE HEATED ABOVE 450 F (232 C) WITHOUT ADEQUATE VENTILATION THAT WILL EFFECTIVELY REMOVE ALL TOXIC FUMES. WHEN SANDING, GRINDING, OR PERFORMING ANY OPERATION WHICH MIGHT CREATE FINE PARTICLES OF CADMIUM, MEASURES MUST BE TAKEN TO PREVENT INHALING OF THE CADMIUM DUST.

2. Put on the surgical mask or similar protective device. Wet sand clean area to be repaired. After sanding, wipe dry with a clean cloth.

WARNING: DO NOT TOUCH HOT SURFACES OF THE CHAMBER AFTER PRE-HEATING THE STERILIZER.

3. Before beginning soldering, preheat chamber by running sterilizer through a three-minute cycle. This will reduce spot overheating.

WARNING: DO NOT HEAT SURFACE ABOVE 450 F (232 C) WITHOUT ADEQUATE VENTILATION. TEMPERATURES ABOVE THIS LEVEL WILL PRODUCE TOXIC FUMES.

CAUTION: Too much heat may separate the cadmium.

4. Apply heat to area to be repaired. Use the "Tempilstik" to measure the temperature of the surface. Solder melting point is 375 F (191 C).

5. Flow flux over steel — don't move heat.

6. Flow solder over steel and cadmium — don't move heat. Continue heating until surface is well-coated with solder. **Note:** If extra oxide reduction is required, use Kester 415 or 1429 liquid acid flux.

6-10. STEAM GENERATOR (ONLY FOR STERILIZERS SO EQUIPPED)

Water-level Control, Charles F. Warrick

1. General — Repair of the electric water-level control is limited to replacement of entire relay assembly, control head, TG relays, or spark plug electrodes complete with level-measuring rods. The electrodes can be removed as described in the Water-level Control cleaning procedures.

2. Complete Electric Relay Assembly Replacement (Fig. 7-26).

a. Tag and disconnect electrical leads from relay box (5) to control head (1), water-inlet solenoid (Fig. 7-23, 4) and electric panel box.

b. Remove relay assembly box and replace with new unit. Reconnect tagged disconnected leads to their numbered positions on the two TG relays.

c. Operate the generator through several flush-and-fill cycles. If proper water level or cutoff action is not obtained, check to make certain that connections have been made to the properly numbered locations. These are clearly shown in the wiring diagrams.

3. TG Relay Replacement (Fig. 7-26, 6).

a. Tag and loosen connecting wires.

b. Remove relay by loosening four hold-down screws.

c. Replace with new relay and reconnect wires to correct locations which are numbered for convenience.

Check Valves (Fig. 7-23).

Repair of the check valves (6, 7) is limited to cleaning valve seats when foreign matter is the cause of improper operation. The spring-loaded check valve (6) can be cleaned without removing the valve body from the generator plumbing; however, the flapper check valve (7) must be removed for cleaning. When a valve of either type becomes defective, the entire valve must be replaced.

Water-level Sight Glass Replacement (Fig. 7-25).

1. Remove the sight glass guards (1).

2. Loosen the glass pipe retaining collars (2) on the top and bottom valves.

3. Carefully remove broken glass from the openings of the valves and clean the openings thoroughly.

4. Place retaining collars on the new glass pipe and then slide metal washer (4) over the ends of the pipe.

5. Slip new rubber seals (5) over each end of the pipe and position about 1 inch (2.5 cm) in from each end.

6. Carefully fit one end of the glass pipe into the bottom valve on the generator. Seat this end as far as possible; then lift back out approximately 1/4 inch (.625 cm) in order to slide the other end of the glass pipe into the top valve. Make sure that the glass pipe fits approximately 1/4 inch (.625 cm) into the top valve.

7. Slide the rubber seals and metal washers into the valve openings and secure with the retaining collars (2). Tighten the collars carefully to avoid breaking the glass pipe. Tighten the collars only enough to create a water-tight seal.

Electrical System Repairs (Fig. 7-24).

1. Fuse Replacement. When a fuse failure occurs, always locate the cause of the failure before replacing the fuse. Do not, under any circumstances, replace a blown fuse with one of a higher rating. When doubt exists as to the correct value, refer to the applicable schematic wiring diagram. If a short circuit caused the failure, make sure that the line is cleared before replacing the fuse. Poor contacts on, near, or in the fuse will cause fuse failures. Very often the fuse will indicate when a poor contact exists. A discolored fuse cap or fuse clip is a positive sign of poor contact of the fuse with the clip. If fuse caps or clips are discolored, brighten them with emery cloth. A fuse which can be easily inserted into its spring slips or can be rotated

easily after it is inserted indicates insufficient contact pressure. Remove the fuse from the clip and squeeze the clips together.

WARNING: DO NOT INSERT FUSES IN LIVE CIRCUITS. VOLTAGES PRESENT IN THE STEAM GENERATOR ARE DANGEROUS AND MAY BE FATAL IF CONTACTED.

2. Heating Element Replacement.

a. Allow the generator to cool completely and disconnect electrical power source from the generator.

b. Carefully tag each lead and note the position of the strapping bars on the heating element terminals so they can be returned to their original positions on the new element.

c. Remove the leads from the heating element terminals.

d. Remove the four bolts which secure the heating element to the boiler and carefully slide the heating element out of the boiler.

e. Install the new heating element and gasket in the boiler, with the nameplate of the element rotated toward the bottom.

f. Install the four mounting bolts and alternately tighten them.

g. Reconnect the wires to the heating element terminals. Check wiring connections against applicable schematic wiring diagram.

h. Perform an operational check as described in Paragraph 3-5 to ensure proper operation before returning the generator to service.

3. Magnetic Contactor. Repair of the magnetic contactor, other than routine point cleaning, is limited to replacement of the coil or point set. Replace the entire magnetic contactor if any other parts are defective.

Pressure-Differential Switch Adjustment

The pressure-differential switch is normally set at the factory to suit the particular application of the steam generator. If the pressure-differential setting must be changed, turn the adjusting screw (located on top of the controller) until the pressure setting indicator on the front of the controller is at the desired control pressure set point.

6-11. REPLACEMENT OF DOOR SWITCH

1. Make sure all power to the machine is off.
2. See Figure 7-3. This procedure is to be performed from the back of the machine.
3. The switch (7-3, 1) is held in the bracket (7-3, 3) by the compressible clips which form a part of the switch

housing. The only way to remove the switch is to break it out of the bracket. Do this by inserting a screwdriver between the bracket and the switch housing. Force the switch outward until it comes away from the frame.

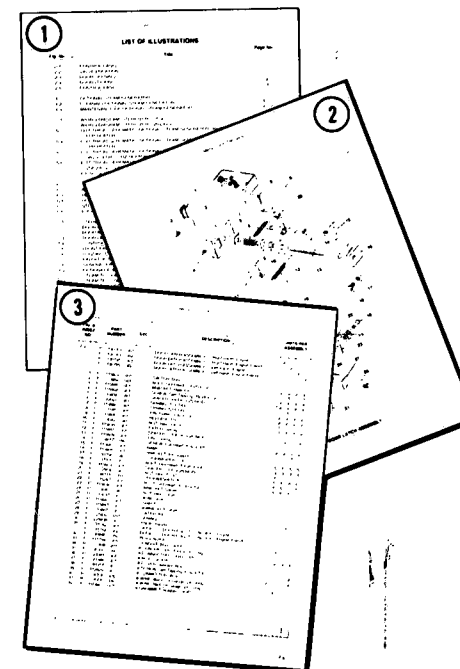
4. Detach the wires from the switch and attach them to the new switch. Push the new switch through the frame until it locks in place with the clips.

SECTION 7**EXPLODED VIEWS AND PARTS LISTS**

Assemblies and components of Medalist 200 sterilizers are illustrated and identified on the following pages. The part number, the description and the quantity required for each usage is given. Each indentation in the description represents the assembly level. The UNITS PER ASSEMBLY column is specific for the given assembly or subassembly level.

HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN

- ① Determine the function and application of the part required. Turn to the List of Illustrations and select the most appropriate title. Note the illustration page number.
- ② Turn to the page indicated and locate the desired part on the illustration.
- ③ From the illustration, obtain the index number assigned to the part desired. Refer to the accompanying description for specific information regarding the part.

**TYPICAL INDENTATION EXAMPLE**

No indentation —
part of top
assembly

One indentation —
(1st subassembly)
Part of above item
with no indentation

RELAY, Adjustable, time delay
WIRING ASSEMBLY, Buzzer
ASSEMBLY, Buzzer tray

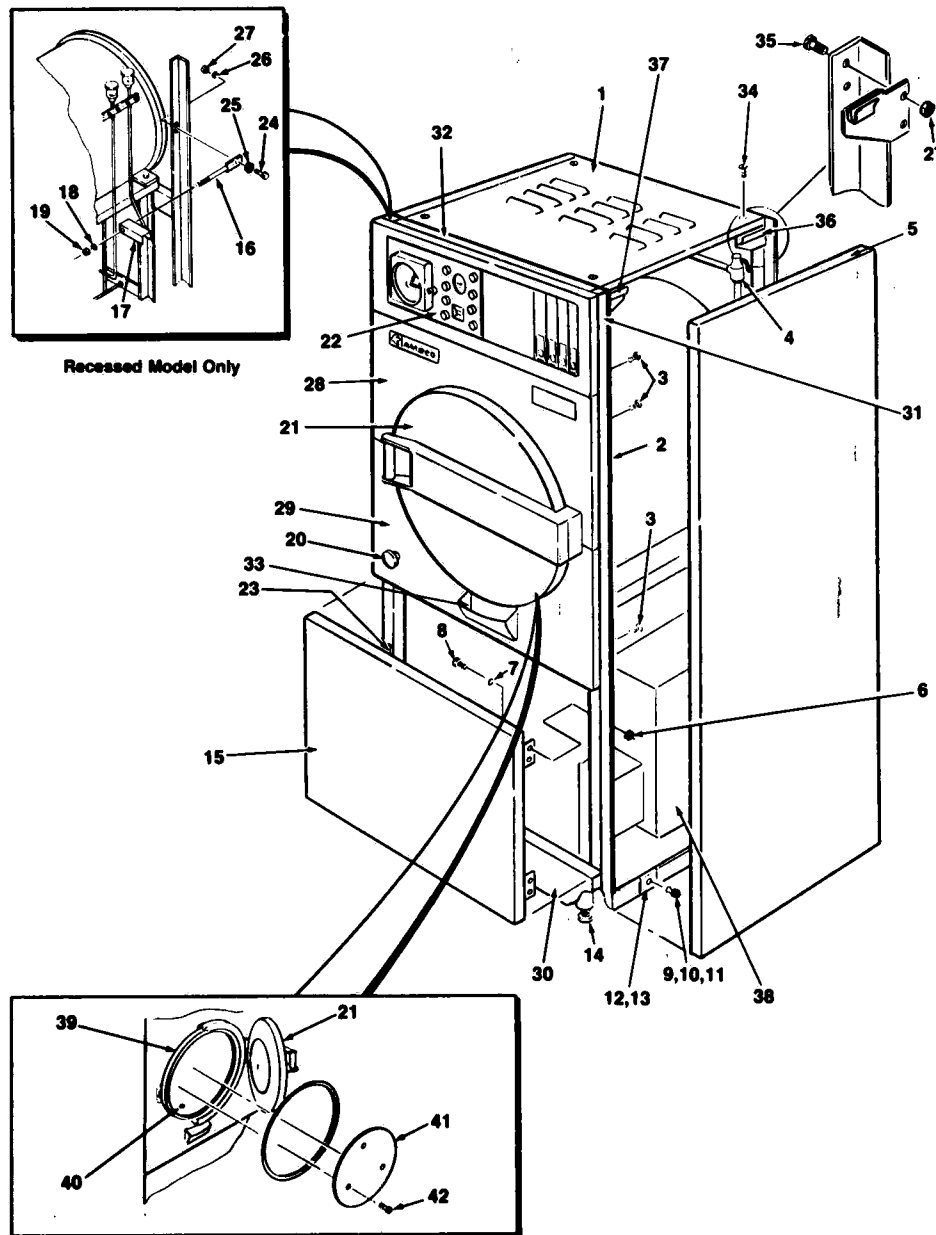


Figure 7-1. STERILIZER ASSEMBLY.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-1-			STERILIZER, Cabinet Enclosed (RH Door Swing)	X			
			STERILIZER, Cabinet Enclosed (LH Door Swing)		X		
			STERILIZER, For Recessing (RH Door Swing)			X	
			STERILIZER, For Recessing (LH Door Swing)				X
1	P	115670 001	PANEL, Top	1	1		
2	P	115768 001	GASKET, Rubber	1	1	1	1
3	P	115770 001	SCREW, Self Tapping (10-24 x 3/4)	18	18	18	18
4			PIPING ASSEMBLY (See Fig. 7-8)	1	1	1	1
5	P	130785 001	PANEL, Side	2	2		
6	P	3040 042	NUT, Hex	4	4	4	4
7	P	19678 045	WASHER	4	4	4	4
8	P	3848 051	SCREW, Hex Head (1/4-20 x 3/4)	4	4	4	4
9	P	51783 045	STUD (6-32)	4	4		
10	P	3037 041	NUT (6-32)	4	4		
11	P	51784 045	SPRING, Catch	4	4		
12	P	115664 001	CATCH, Panel	4	4		
13	P	114343 091	RIVET, Pop	8	8		
14	P	90407 045	SCREW, Leveling (5/8-11 NC x 2)	4	4	4	4
15	P	130772 001	ACCESS DOOR ASSEMBLY		1		
16	P	90430 010	SCREW, Brace		2	2	
17	P	81310 001	PLATE, Recessing		2	2	
18	P	19680 041	LOCKWASHER (3/8)		2	2	
19	P	3099 042	NUT, Hex (3/8-16)		2	2	
20			DOOR LATCH ASSEMBLY (See Fig. 7-3)	1	1	1	1
21			DOOR ASSEMBLY (See Fig. 7-2)	1	1	1	1
22			CONTROL ASSEMBLY (See Fig. 7-4)	1	1	1	1
23			CATCH AND STRIKE, Access Door	1	1	1	1
24	P	3847 042	SCREW (1/4-20 x 5/8)	8	8	10	10
25	P	5503 045	WASHER, Flat		2	2	
26	P	19678 045	LOCKWASHER (1/4)	8	8	10	10
27	P	3040 042	NUT, Hex (1/4-20)	8	8	10	10
28	P	130774 001	PANEL, Top (RH)	1	1		
	P	130794 001	PANEL, Top (LH)			1	
29	P	130775 001	PANEL, Bottom (RH)	1	1		
	P	130793 001	PANEL, Bottom (LH)			1	
30	P	115613 001	PANEL, Kick	1	1	1	1
31	P	115794 001	TRIM, Side	2	2	2	2
32	P	115796 001	TRIM, Top	1	1	1	1
33	P	115651 001	TRAY, Condensate	1	1	1	1
	P	115657 001	LOCKNUT, Buddy (Not Shown)	2	2	2	2
34	P	13411 091	SCREW, Socket Head (1/4-20 x 5/8)	4	4	4	4
35	P	44086 045	NUT, Speed (1/4-20)	4	4	4	4
36	P	115665 001	SUPPORT, Side Panel	2	2	2	2
37	P	115666 001	SUPPORT, Side Panel	2	2	2	2
38			ELECTRO-STEAM GENERATOR, Optional (See Fig. 7-23)	1	1	1	1
39	P	115600 001	GASKET, Chamber Door	1	1	1	1
40	P	12243 042	SCREEN, Chamber Drain	1	1	1	1
41	P	115602 001	BAFFLE, Steam	1	1	1	1
42	P	3969 041	SCREW (1/4-20 x 1/4)	3	3	3	3
	P	115829 001	RUBBER CHANNEL (Not Shown)	2	2	2	2

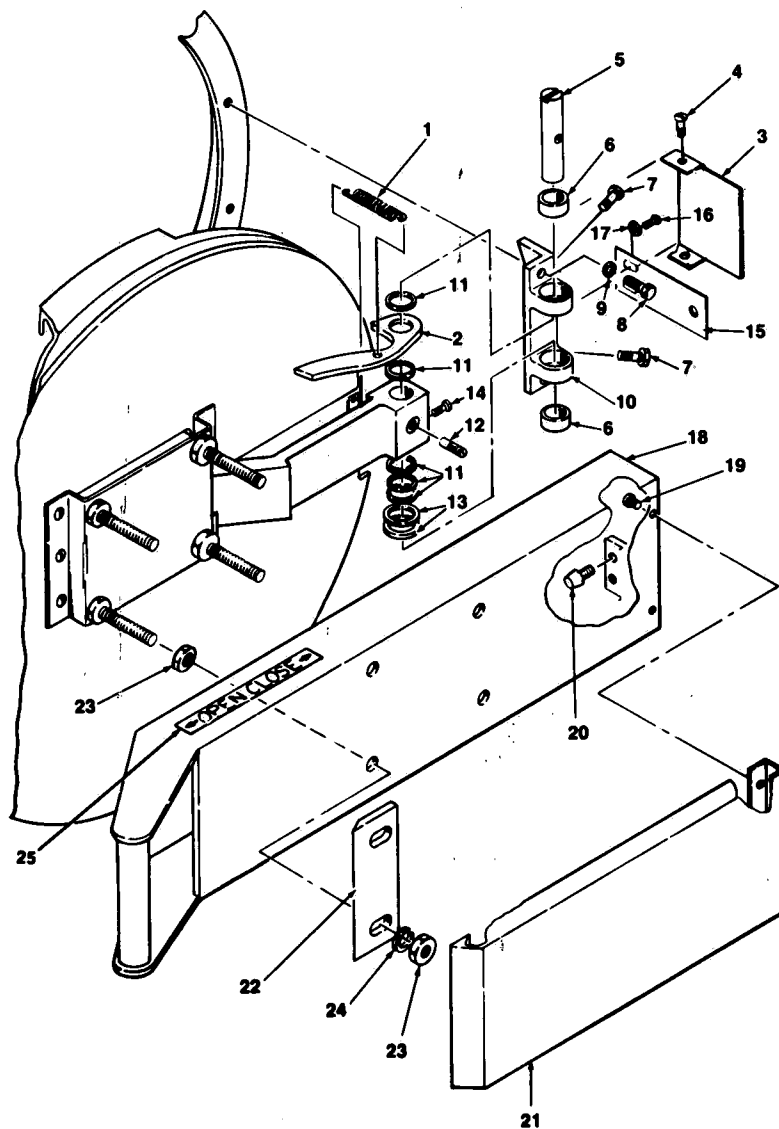


Figure 7-2. DOOR ASSEMBLY (Part 1 of 2).

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-2-	P 130764	001	DOOR ASSEMBLY (Part 1 of 2)	X
1	P 9621	091	SPRING, Latch	1
2	P 115663	001	LATCH, Door Open	1
3	P 115804	001	COVER, Side Hinge	1
	P 115698	001	HINGE ASSEMBLY	1
4	P 21617	091	• SCREW, Truss Head (10-24 x 3/8)	2
5	P 115642	001	• PIN, Hinge	1
6	P 115803	001	• BEARING, Hinge	2
7	P 3847	042	• SCREW, Hex Head (1/4-20 x 5/8)	2
8	P 20685	061	• BOLT (1/4-20 x 1/2)	2
9	P 31599	041	• WASHER (9/32 ID x 1/32 Thick)	2
10	P 130792	001	• CASTING, Hinge Bracket	1
11	P 115802	001	• WASHER, Thrust	5
12	P 15736	091	• SETSCREW (1/4-20 x 3/8)	1
13	P 33283	042	• SHIM (3/4 ID x 1-1/8 OD x 1/16)	2
14	P 33594	041	• SCREW, Drive	1
15	P 115905	001	• SPRING	1
16	P 33742	041	• SCREW, Round Head (10-24 x 1/4)	2
17	P 31599	041	• WASHER (10)	2
18	P 115815	001	DOOR HANDLE ASSEMBLY	1
19	P 114526	001	SCREW, Self Tapping (1/4-20 x 5/8)	2
20	P 115828	001	BUMPER, Rubber	2
21	P 115801	001	COVER, Handle	1
22	P 115837	001	HOLD PLATE, Cover	1
23	P 13606	061	NUT, Hex (3/8-16 UNC)	8
24	P 25832	041	LOCKWASHER (3/8 ID)	4
25	P 115687	001	DECAL, LH Door Swing	1
	P 115687	002	DECAL, RH Door Swing	1

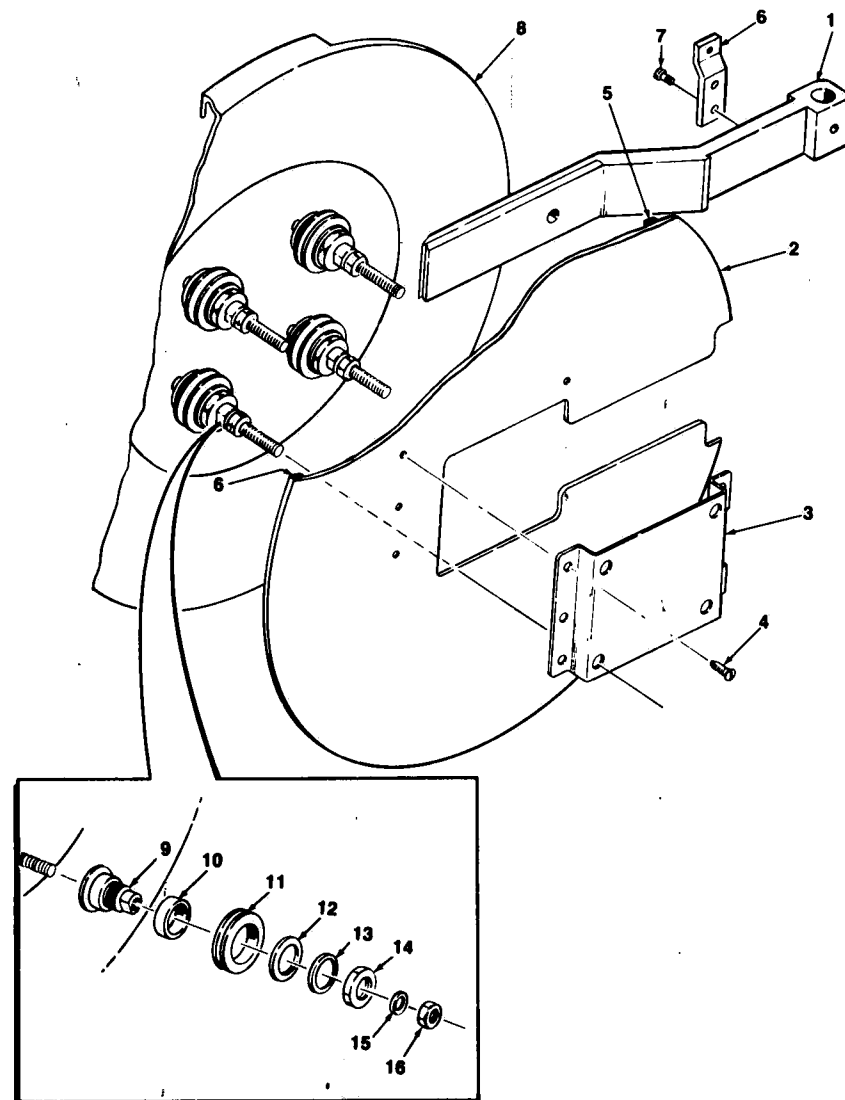


Figure 7-2. DOOR ASSEMBLY (Part 2 of 2).

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-2-			DOOR ASSEMBLY (Part 2 of 2)	X
1	P 115800	001	SUPPORT, Door Arm	1
2	P 115643	001	PLATE, Front Cover	1
3	P 115681	001	SUPPORT, Cover Plate	1
4	P 115550	001	SCREW (6-32 x 38)	4
5	P 115719	001	MOULDING, Neoprene	1
6	P 115906	001	BRACKET, Spring	1
7	P 3986	041	SCREW, Machine (8-32 x 1/2)	2
8	P 130769	001	DOOR	1
9	P 115641	001	BUSHING, Eccentric	4
10	P 115761	001	BEARING, Garlock	4
11	P 115601	001	ROLLER, Door (1-7/8 OD x 1/2)	4
12	P 40429	045	WASHER, Flat (1-1/2 OD x 1/16)	4
13	P 32620	091	WASHER, Spring (3/4 ID)	4
14	P 115779	001	NUT, Half Jam (3/4-16 UNC)	4
15	P 25832	041	LOCKWASHER (3/8 ID)	4
16	P 13606	061	NUT, Hex (3/8-16 UNC)	12

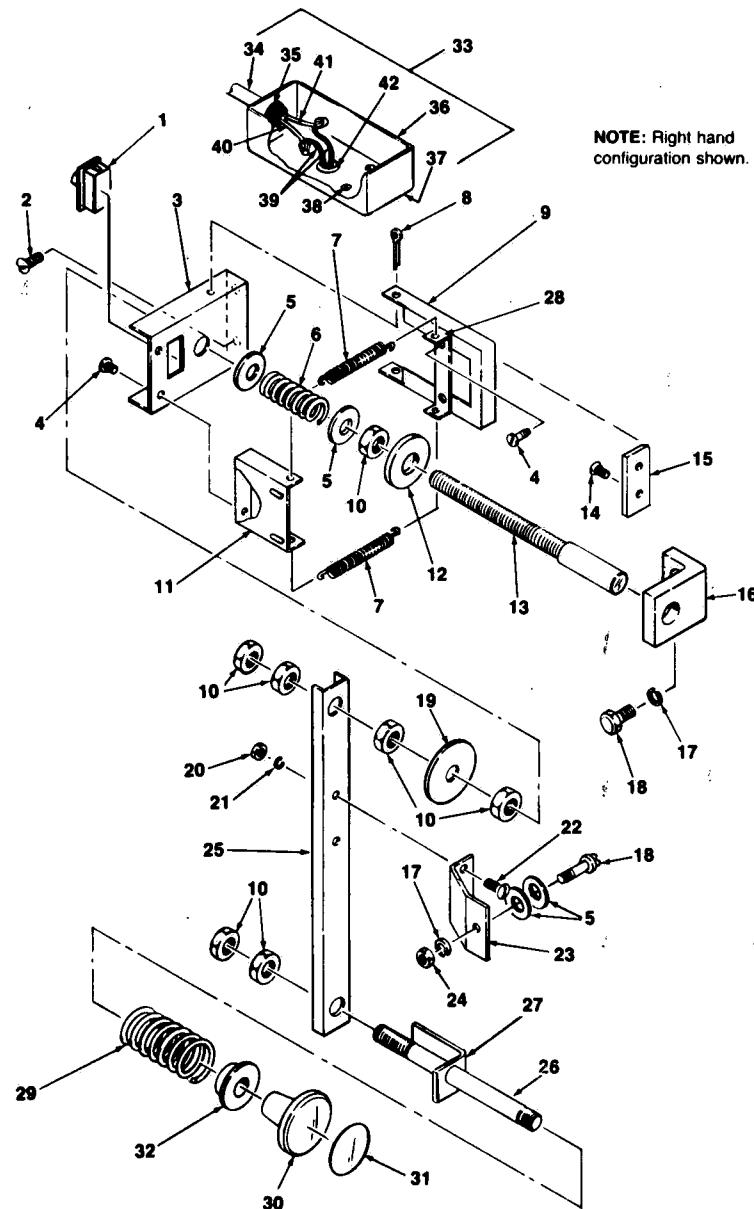


Figure 7-3. DOOR LATCH ASSEMBLY.

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-3-	P	130763	001		DOOR LATCH ASSEMBLY — Right Hand (English)	X			
	P	130763	002		DOOR LATCH ASSEMBLY — Right Hand (English/French)		X		
	P	130795	001		DOOR LATCH ASSEMBLY — Left Hand (English)			X	
	P	130795	002		DOOR LATCH ASSEMBLY — Left Hand (English/French)				X
1	P	115822	001		SWITCH, Door	1	1	1	1
2	P	3952	041		BOLT, Slot Head (1/4-20 x 1/2)	2	2	2	2
3	P	115646	001		BRACKET, Rear Pin	1	1	1	1
4	P	115904	001		SCREW, Self Tapping (10-24 x 1/2)	4	4	4	4
5	P	10456	091		SPACER (3/4 OD x 25/64 ID)	4	4	4	4
6	P	22021	061		SPRING (7/16 OD)	1	1	1	1
7	P	113880	061		SPRING (5/16 OD)	2	2	2	2
8	P	3185	091		PIN, Cotter (3/32 x 1/2)	2	2	2	2
9	P	115606	001		RELEASE, Pin	1	1	1	1
10	P	3042	041		NUT, Hex (3/8-16)	7	7	7	7
11	P	115635	001		CATCH, Spring	1	1	1	1
12	P	115655	001		SPACER (1-1/8 OD x 25/64 ID)	1	1	1	1
13	P	115609	001		PIN, Locking	1	1	1	1
14	P	4617	041		SCREW, Flat Head (8-32 x 3/8)	2	2	2	2
15	P	115647	001		RAMP	1	1	1	1
16	P	115605	001		BRACKET, Pin Support	1	1	1	1
17	P	91700	045		LOCKWASHER (1/4)	5	5	5	5
18	P	37316	051		BOLT, Hex Head (1/4-20 x 3/4)	3	3	3	3
19	P	115603	001		SPACER (2 OD x 25/64 ID)	1	1	1	1
20	P	2959	041		NUT, Hex (10-32)	5	5	5	5
21	P	46115	091		LOCKWASHER (10)	5	5	5	5
22	P	15287	041		SCREW, (10-32 x 1/2)	5	5	5	5
23	P	115636	001		BRACKET, Swivel	1	1	1	1
24	P	3040	042		NUT, Hex (1/4-20)	1	1	1	1
25	P	115637	001		ARM, Lever	1	1	1	1
26	P	115640	001		SHAFT	1	1	1	1
27	P	115897	001		• BRACKET, Shaft	1	1	1	1
28	P	115607	001		CATCH, Pin	1	1	1	1
29	P	25432	091		SPRING	1	1	1	1
30	P	115838	001		KNOB, Handle	1	1	1	1
31	P	115762	001		DECAL — "DOOR-PULL TO UNLOCK" (English)	1			1
	P	115762	002		DECAL — "DOOR-PULL TO UNLOCK" (English/French)		1		1
32	P	45690	091		PLUG, Button	1	1	1	1
33	P	115754	001		CONDUIT, Door Switch	1	1	1	1
34	R	808	215		• CONDUIT (3/8" Flex x 18" long)	1	1	1	1
35	P	90331	091		• CONNECTOR, Conduit (3/8)	2	2	2	2
36	P	23345	091		• BOX, Junction	1	1	1	1
37	P	23346	091		• COVER, Junction Box	1	1	1	1
38	P	40357	045		• SCREW, Self-Tapping (6-32 x 1/4)	2	2	2	2
39	P	112629	001		• CONNECTOR, Wire	2	2	2	2
40	R	4018	320		• WIRE, Black (18 Gauge, 24" long)	1	1	1	1
41	R	4018	330		• WIRE, Red (18 Gauge, 24" long)	1	1	1	1
42	P	115887	001		• GROMMET, Rubber (7/8 ID)	1	1	1	1

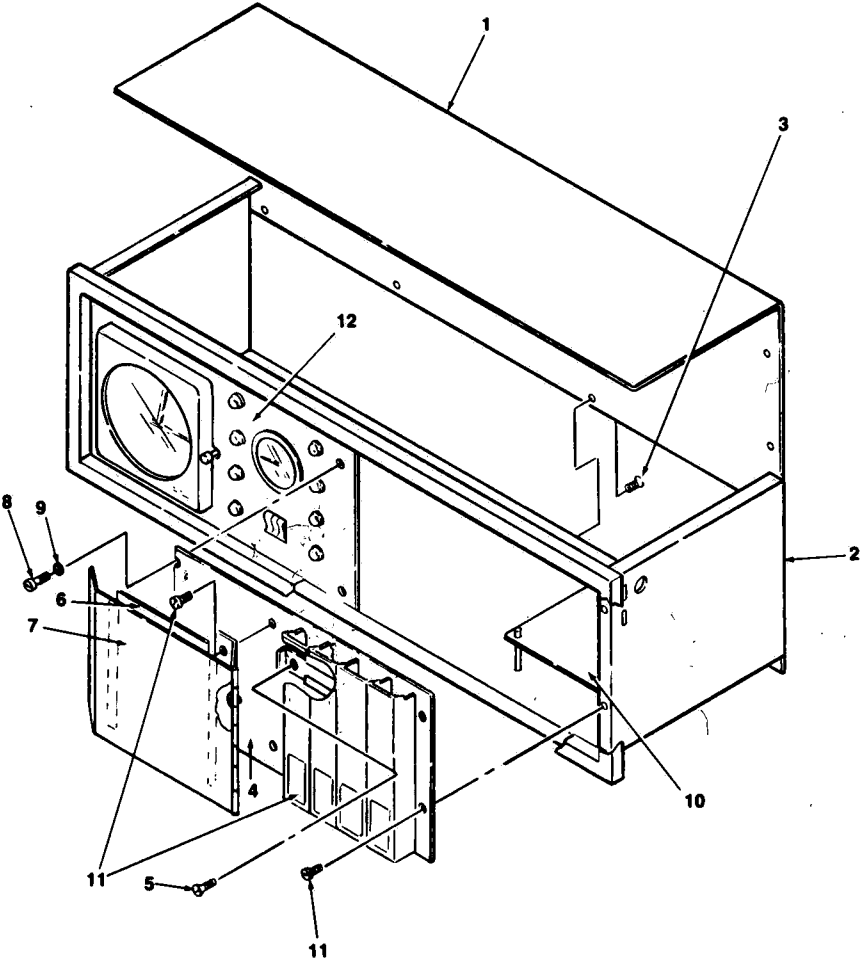


Figure 7-4. CONTROL ASSEMBLY.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY		
7-4-	P 130776	001	CONTROL ASSEMBLY (ENGLISH) — Part 1 of 3	X		
	P 130776	002	CONTROL ASSEMBLY (ENGLISH/FRENCH) — Part 1 of 3		X	
	P 115679	001	CONTROL HOUSING ASSEMBLY	1	1	
1	P 115653	001	• TOP, Control Housing	1	1	
2	P 130778	001	• BOTTOM, Control Housing	1	1	
3	P 115187	001	• SCREW, Self Tapping (10-24 x 7/16)	8	8	
4	P 115645	001	BRACKET, Door	1	1	
5	P 91022	045	SCREW, Self Tapping (8-32 x 5/16)	2	2	
6	P 115818	001	OPERATING INSTRUCTIONS	1	1	
7	P 115614	001	DOOR, Control Access	1	1	
8	P 37316	051	SCREW, Hex-Hd (1/4-20 x 3/4)	2	2	
9	P 19678	045	WASHER (1/4)	2	2	
10			NOT USED			
11			HOUSING COMPONENTS, Control Assembly (See Fig. 7-6)	1	1	
12			PADDLE ASSEMBLY (See Fig. 7-7)	1	1	
13			FRONT PANEL COMPONENTS, Control Assembly (See Fig. 7-5)	1	1	

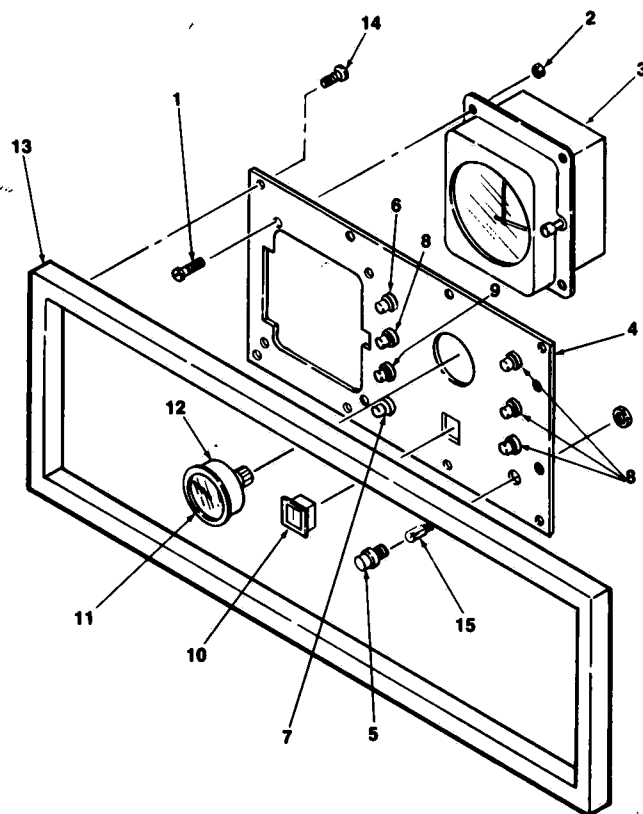


Figure 7-5. FRONT PANEL COMPONENTS.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-5-			CONTROL ASSEMBLY FRONT PANEL COMPONENTS (English) — Part 2 of 3	X			
			CONTROL ASSEMBLY FRONT PANEL COMPONENTS (English/French) — Part 2 of 3		X		
	1	P	11241 041			4	4
	2	P	3038 041			4	4
	3					1	1
		P	115825 001			1	1
		P	115825 002			1	1
	4	P	115648 001			1	1
	5	P	115819 001			1	1
	6	P	115819 002			1	1
	7	P	115819 003			1	1
	8	P	115819 004			4	4
	9	P	115819 005			1	1
	10	P	115820 001			1	1
	11	P	90062 033			2	2
	12	P	90525 091			1	1
	13	P	130777 001			1	1
	14	P	90169 045			8	8
	15	P	764317 536			8	8
			LAMP, #387 (84233)				

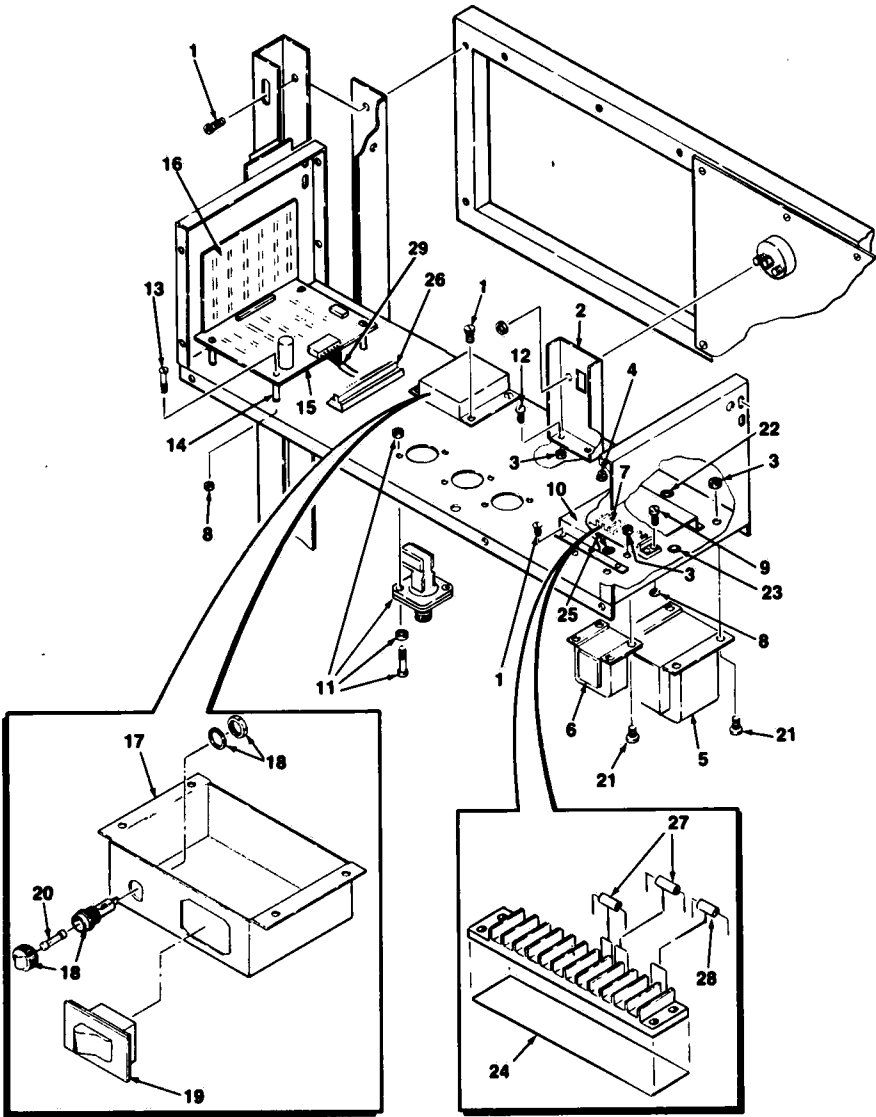


Figure 7-6. HOUSING COMPONENTS.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-6-			CONTROL ASSEMBLY HOUSING COMPONENTS — Part 3 of 3	X
1	P 91022	045	SCREW, Self Tapping (8-32 x 5/16)	15
2	P 115639	001	SUPPORT, Gauge	1
3	P 3040	042	NUT, Hex (1/4-20)	10
4	P 83933	002	BUZZER	1
5	P 115827	001	TRANSFORMER, Hammond 167-P25 (For Units With Two Transformers)	1
	P 115903	001	TRANSFORMER, 150 Volt amperes, X-mount Prim 120/240 V; Sec 7.7/25 V; 50/60 Hz (For Units With One Transformer)	1
6	P 115826	001	TRANSFORMER, Hammond 167-N6 (For Units With Two Transformers)	1
7	P 115823	001	BLOCK, Terminal	1
8	P 3038	041	NUT, Hex (8-32)	9
9	P 11241	041	SCREW, Slotted Head (1/4-32 x 5/8)	5
10	P 115808	001	COVER, Terminals	1
11	P 115824	001	SWITCH, Ambient Pressure (20, 38 PSI, Adj)	3
12	P 37316	051	BOLT, Hex (1/4-20 x 3/4)	10
13	P 43264	045	SCREW, Round Head (8-32 x 2-1/4)	4
14	P 115716	001	SPACER, Rolled (1-3/4)	4
15	P 130801	002	BOARD, Mother	1
16	P 130801	001	BOARD, Logic Control	1
17	P 115814	001	COVER, Fuse and Power	1
18	P 91713	091	HOLDER, Fuse	1
19	P 114359	091	SWITCH, Power On/Off	1
20	P 115690	001	FUSE, MOX, 1-5A, 125 V	1
21	P 3997	041	SCREW, Slotted Head (1/4-20 x 3/8)	8
22	P 24582	091	GROMMET, Rubber (1-1/8)	1
23	P 115887	001	GROMMET, Rubber (7/8)	1
24	P 115891	001	PAPER, Fish (6 x 1-1/8)	1
25	P 45625	091	GROMMET, Rubber (5/8)	1
26			CONNECTOR, Elgin TRW Cinch 22 Position	1
27	P 115831	001	CAPACITOR (0.01 μ F, 250 V)	2
28	P 115830	001	VARIATOR	1
	P 112609	001	CONNECTORS FOR WIRES TO TERMINAL BLOCK (Item 7) — (Not Shown)	39
	P 112608	001	CONNECTOR, Snap On (Not Shown)	5
	P 112615	001	CONNECTOR, Snap On (Not Shown)	9
29	P 764315	176	HARNESS, Wiring — 44 Pin Connector	1

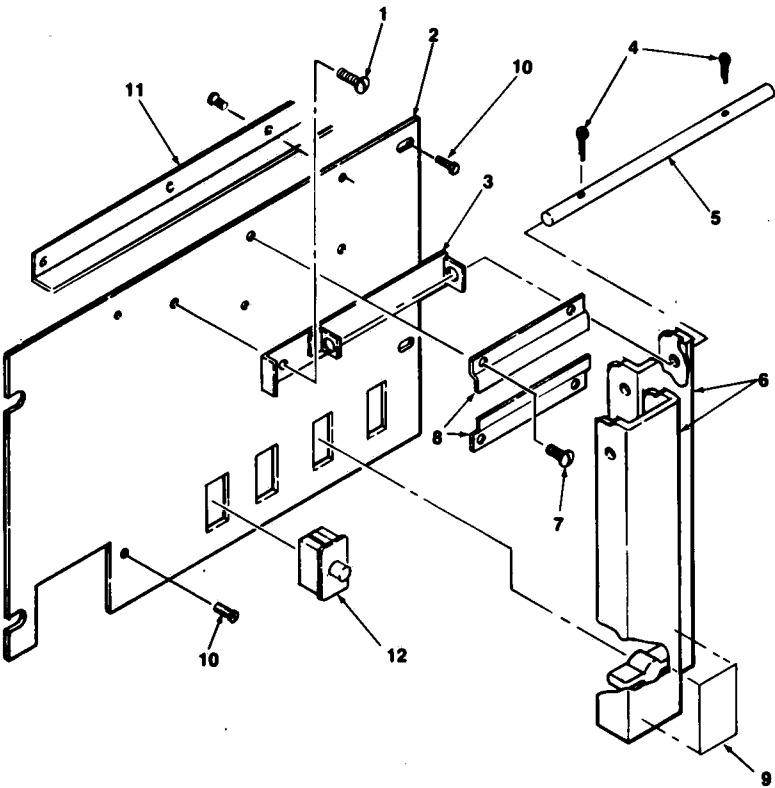


Figure 7-7. PADDLE ASSEMBLY.

FIG. & INDEX NO.	PART NUMBER		SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-7-	P	130779	001	PADDLE ASSEMBLY (English)	X			
	P	130779	002	PADDLE ASSEMBLY (English/French)		X		
1	P	90169	045	SCREW, Self Tapping (10-3/8)	1	1		
2	P	115811	001	PANEL	1	1		
3	P	115638	001	PADDLE BRACKET ASSEMBLY	1	1		
4	P	5397	091	PIN, Cotter (1/6 Diam.)	2	2		
5	P	115743	001	PIN, Hinge (1/4 Diam. x 6)	1	1		
6	P	115611	001	PADDLE, Zinc Die Cast	4	4		
7	P	24910	061	SCREW, Self Tapping (8-3/8)	7	7		
8	P	115812	001	GUIDE	2	2		
9	P	115799	001	DECAL — "LIQUIDS" (English)	1			
	P	115799	002	DECAL — "LIQUIDS" (English/French)		1		
	P	115798	001	DECAL — "WRAPPED" (English)	1			
	P	115798	002	DECAL — "WRAPPED" (English/French)		1		
	P	115797	001	DECAL — "UNWRAPPED" (English)	1			
	P	115797	002	DECAL — "UNWRAPPED" (English/French)		1		
	P	115816	001	DECAL — "RESET" (English)	1			
	P	115816	002	DECAL — "RESET" (English/French)		1		
10	P	42630	045	BOLT (10-24 x 1/2)	4	4		
11	P	115649	001	STOP, Return (16 Gauge x 6" long)	1	1		
12	P	115822	001	SWITCH, Cherry Pushbutton Program Selection	4	4		

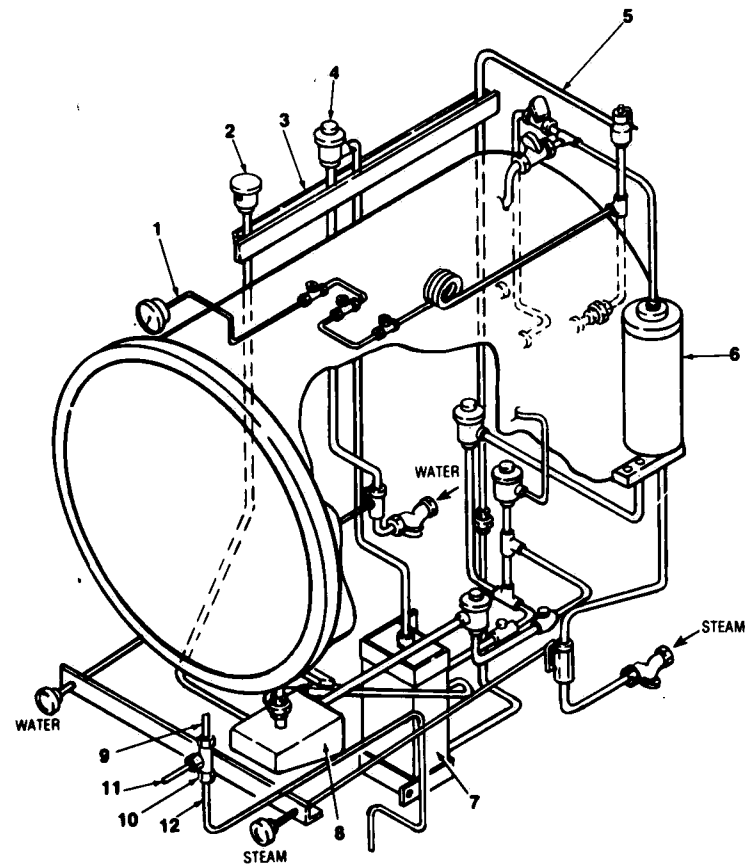


Figure 7-8. GENERAL PIPING ASSEMBLY.

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY		
7-8-	P	130765	001		GENERAL PIPING ASSEMBLY — English	X		
	P	130765	002		GENERAL PIPING ASSEMBLY — English/French		X	
1					PRESSURE SWITCH AND GAUGE LINE (See Fig. 7-16)	1	1	
2					VACUUM RELIEF LINE (See Fig. 7-13)	1	1	
3					TUBE SUPPORT ASSEMBLY (See Fig. 7-17)	1	1	
4					COLD WATER LINE (See Fig. 7-14)	1	1	
5					SAFETY VALVE LINE (See Fig. 7-15)	1	1	
6					STEAM TO CHAMBER (See Fig. 7-10)	1	1	
7					STEAM TO CONDENSER, Fast Exhaust (See Fig. 7-11)	1	1	
8					STEAM TO CONDENSER, Slow Exhaust (See Fig. 7-12)	1	1	
9	P	115892	001		CONDENSATE DRAIN OFF LINE ASSEMBLY	1	1	
10	P	115893	001		• TUBE (1/4 ODT)	1	1	
11	P	46097	091		• TEE, Compression (1/4)	1	1	
12	P	115894	001		• TUBE (1/4 ODT)	1	1	
	P	115895	001		• TUBE (1/4 ODT)	1	1	

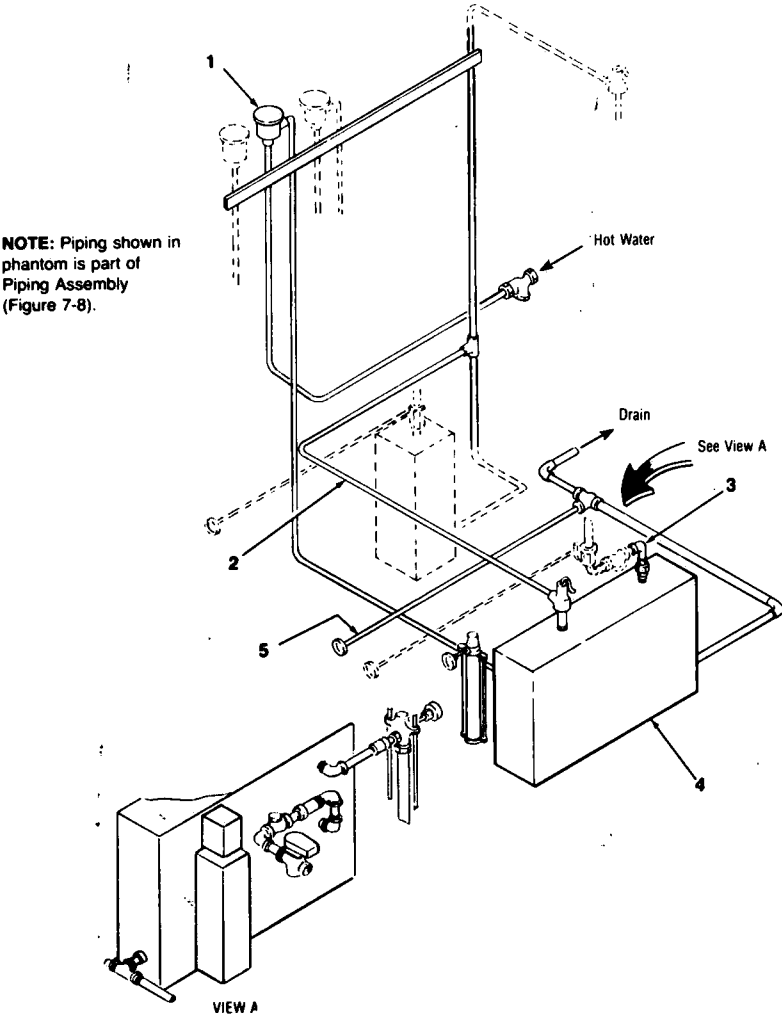


Figure 7-9. OPTIONAL ELECTRIC-POWERED STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY		
7-9- 1 2 3 4 5	P	115843	001		ELECTRIC-POWERED STEAM GENERATOR — 208/230 V	X		
	P	115844	001		ELECTRIC-POWERED STEAM GENERATOR — 460 V		X	
	P	115845	001		ELECTRIC-POWERED STEAM GENERATOR — 575 V			X
					HOT WATER SUPPLY LINE (See Fig. 7-18)	1	1	1
					GENERATOR TO CONDENSER (See Fig. 7-20)	1	1	1
					GENERATOR STEAM OUTLET (See Fig. 7-19)	1	1	1
					GENERATOR (See Fig. 7-23)	1	1	1
					GENERATOR BLOW DOWN ASSEMBLY (See Fig. 7-21)	1	1	1

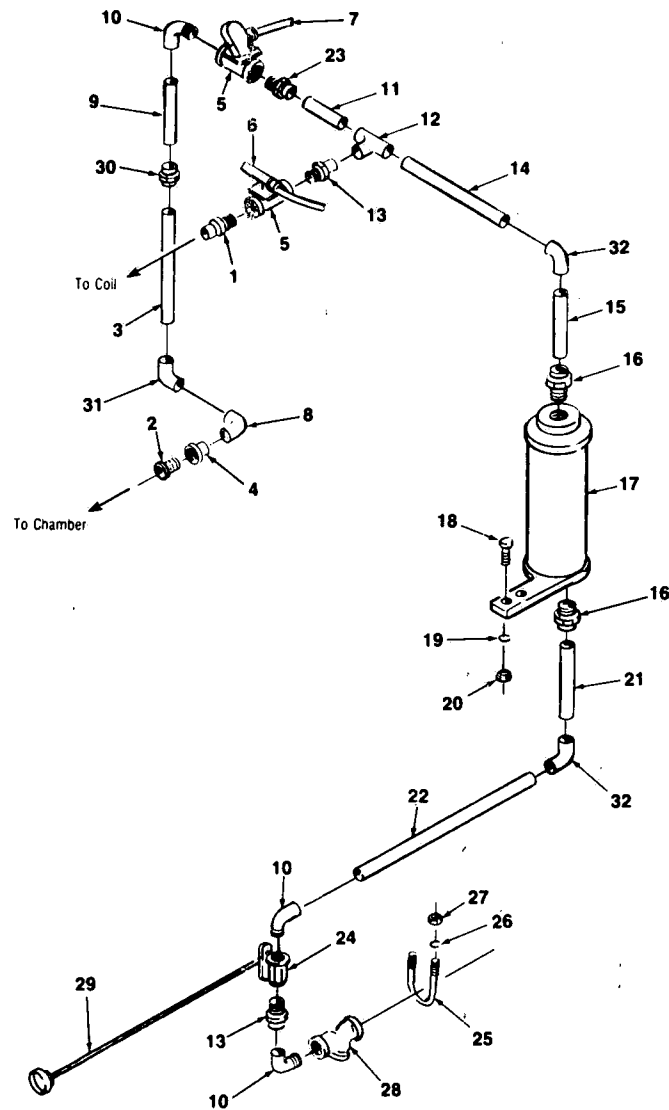


Figure 7-10. STEAM TO CHAMBER.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY	
7-10-	P 115691	001	STEAM TO CHAMBER — English	✓	
	P 115691	002	STEAM TO CHAMBER — English/French		X
1	P 763772	001	UNION (1/2 ODT x 3/8 IPS)	1	1
2	P 841	042	BUSHING, Reducing (1 x 3/4 IPS)	1	1
3	P 115722	001	TUBE (5/8 ODT x 2-1/4" long)	1	1
4	P 836	042	BUSHING, Reducing (3/4 x 1/2 IPS)	1	1
5	P 115729	001	VALVE, Solenoid (3/8)	2	2
	P 764265	001	• REPAIR KIT	A/R/A/R	
	P 764265	002	• COIL	A/R/A/R	
	P 115752	002	CONDUIT, Steam to Coil	1	1
6	P 90331	091	• CONNECTOR (3/8)	2	2
7	R 808	215	• CONDUIT (3/8 Flex x 24" long)	1	1
	P 115752	003	CONDUIT, Steam to Chamber	1	1
6	P 90331	091	• CONNECTOR (3/8)	2	2
7	R 808	215	• CONDUIT (3/8 Flex x 24" long)	1	1
8	P 44499	091	ELBOW, Street (5/8 ODT x 1/2 IPS)	1	1
9	P 115728	001	TUBE (5/8 ODT x 4-5/8" long)	1	1
10	P 90217	091	ELBOW, Street (5/8 ODT x 3/8 IPS)	3	3
11	P 115744	001	TUBE (5/8 ODT x 7-1/4" long)	1	1
12	P 90221	091	TEE (5/8 ODT)	1	1
13	P 90209	091	ADAPTER (5/8 ODT x 3/8 IPS)	2	2
14	P 115723	001	TUBE (5/8 ODT x 3-7/8" long)	1	1
15	P 115788	001	TUBE (5/8 ODT x 5-5/16" long)	1	1
16	P 90227	091	UNION (5/8 ODT x 1/2 IPS)	2	2
17			SEPARATOR, Steam (See Fig. 7-28)	1	1
18	P 4685	051	BOLT (1/4-20 x 1-1/4)	2	2
19	P 19678	045	LOCKWASHER (1/4)	2	2
20	P 3040	042	NUT, Hex (1/4-20)	2	2
21	P 115725	001	TUBE (5/8 ODT x 5-1/8" long)	1	1
22	P 115726	001	TUBE (5/8 ODT x 7-9/16" long)	1	1
23	P 90208	091	ADAPTER (5/8 ODT x 3/8 IPS)	1	1
24	P 115730	001	VALVE, Ball (3/8)	1	1
25	P 90301	045	U-BOLT	1	1
26	P 19685	061	LOCKWASHER (10)	2	2
27	P 3039	041	NUT, Hex (10-24)	2	2
28	P 47671	091	STRAINER (3/8 IPS) — (See Fig. 7-32)	1	1
29			STEAM ON-OFF ASSEMBLY (See Fig. 7-30)	1	1
30	P 90225	091	UNION (5/8 ODT)	1	1
31	P 90216	091	ELBOW, Solder (5/8 ODT)	1	1
32	P 90212	091	ELBOW, Solder (5/8 ODT)	2	2

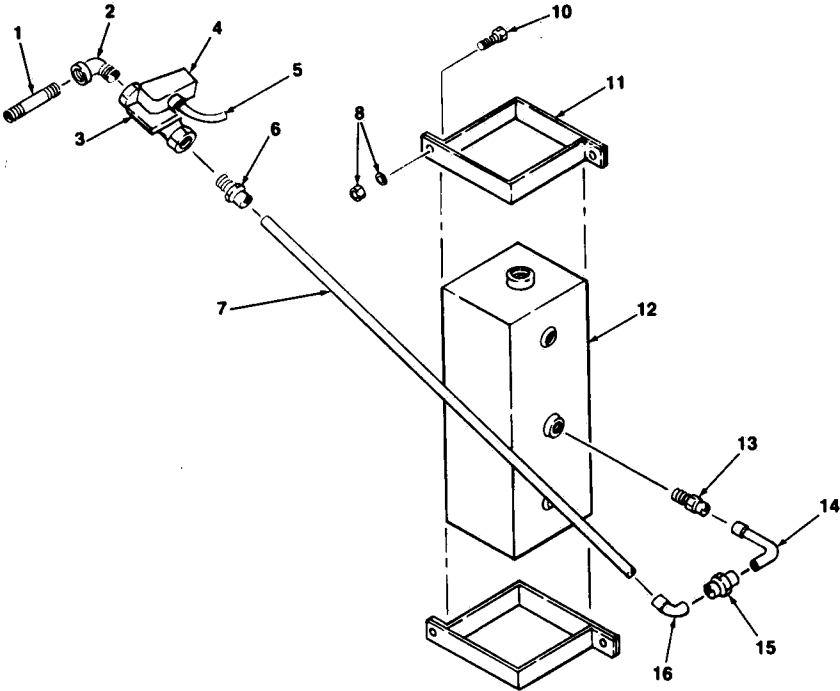


Figure 7-11. STEAM TO CONDENSER (Fast Exhaust).

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-11-	P	115692	001		STEAM TO CONDENSER (FAST EXHAUST)	X			
1	P	32828	091		NIPPLE (1/2 IPS)	1			
2	P	1634	091		ELBOW, Street (1/2 IPS)	1			
3	P	115737	001		VALVE, Solenoid (1/2 IPS)	1			
	P	764266	001		• REPAIR KIT	A/R			
	P	764266	002		• COIL	A/R			
	P	115752	001		CONDUIT	1			
4	P	90331	091		• CONNECTOR (3/8)	2			
5	R	808	215		• CONDUIT, Flexible (3/8-36" long)	1			
6	P	90211	091		ADAPTER (5/8 ODT x 1/2 IPS)	1			
7	P	115738	001		TUBE (5/8 ODT x 17-3/8" long)	1			
8	P	3040	042		NUT, Hex (1/4-20)	4			
9	P	91700	045		LOCKWASHER (1/4)	4			
10	P	37316	051		BOLT, Hex Head (1/4-20 x 3/4)	4			
11	P	115699	001		BRACKET, Condenser Support	4			
12	P	130791	001		CONDENSER, Steam	1			
	P	115782	001		• GASKET	2			
13	P	90762	091		ADAPTER (5/8 ODT x 1/2 IPS)	1			
14	P	90216	091		ELBOW, Long Sod (5/8 ODT)	1			
15	P	90225	091		UNION (5/8 ODT)	1			
16	P	90214	091		ELBOW, Sod (5/8 ODT)	1			

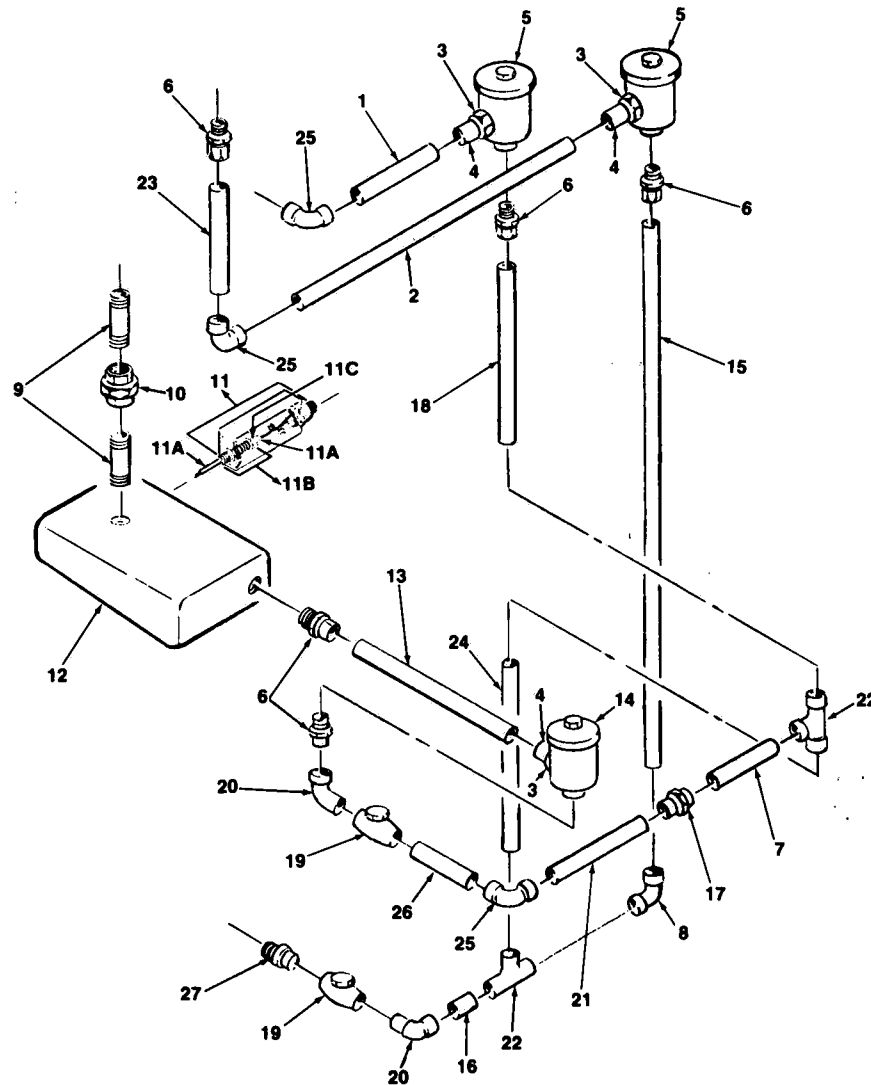


Figure 7-12. STEAM TO CONDENSER (Slow Exhaust).

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-12-	P 115693	001	STEAM TO CONDENSER (SLOW EXHAUST)	X
1	P 115740	001	TUBE (1/2 ODT x 6-3/8" long)	1
2	P 115902	001	TUBE	1
3	P 90125	091	NUT	3
4	P 90126	091	SPUD	3
5	P 9976	091	TRAP, Steam (3/8 IPS) — (See Fig. 7-29)	2
6	P 90208	091	ADAPTER (5/8 ODT x 3/8 IPS)	5
7	P 115736	001	TUBE (5/8 ODT x 2-3/4" long)	1
8	P 90216	091	ELBOW, Solder	1
9	P 29291	091	NIPPLE (3/4 NPT)	2
10	P 5269	091	UNION (3/4 NPT)	1
11	P 115686	001	MOXIE PROBE ASSEMBLY	1
11A	P 115672	001	• MOXIE PROBE	1
11B	P 115673	001	• BULKHEAD FITTING, 1/4 NPT	1
11C	P 25364	091	• FERRULE, 1/4" O.D.	1
12	P 130784	001	CASTING, Drain	1
13	P 115724	001	TUBE (5/8 ODT x 10-1/2" long)	1
14	P 45038	091	TRAP, Steam (See Fig. 7-31)	1
15	P 115901	001	TUBE	1
16	P 115735	001	TUBE (5/8 ODT x 1" long)	1
17	P 90225	091	UNION	1
18	P 115733	001	TUBE (5/8 ODT x 3-7/8" long)	1
19	P 90235	091	VALVE, Check (5/8 ODT)	2
20	P 90214	091	ELBOW, Solder (5/8 ODT)	2
21	P 115734	001	TUBE (5/8 ODT x 1-7/8" long)	1
22	P 90221	091	TEE (5/8 ODT)	2
23	P 115732	001	TUBE (5/8 ODT x 2-5/8" long)	1
24	P 115880	001	TUBE (5/8 ODT x 5-1/2" long)	1
25	P 90212	091	ELBOW, Solder (5/8 ODT)	3
26	P 115739	001	TUBE (5/8 ODT x 2-3/16" long)	1
27	P 90762	091	ADAPTER	1

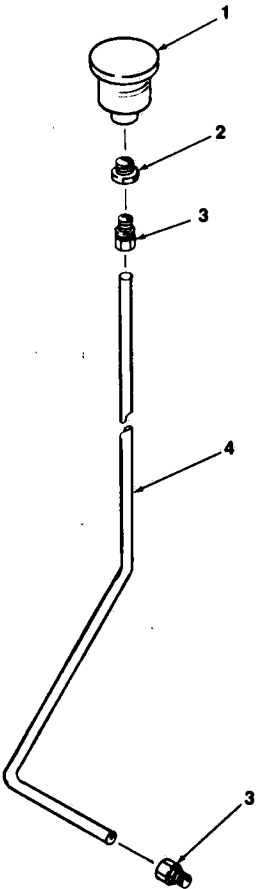


Figure 7-13. VACUUM RELIEF LINE.

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-13-	P	115694	001		VACUUM RELIEF LINE	X			
1					BREAKER, Vacuum (1/2 NPT) — (See Fig. 7-32)	1			
2	P	115898	001		COUPLING, Reducing (1/2 NPT x 3/8 NPT)	1			
3	P	30947	091		FITTING, Compression (3/8 NPT x 3/8 ODT)	2			
4	P	115741	001		TUBE (3/8 ODT)	1			

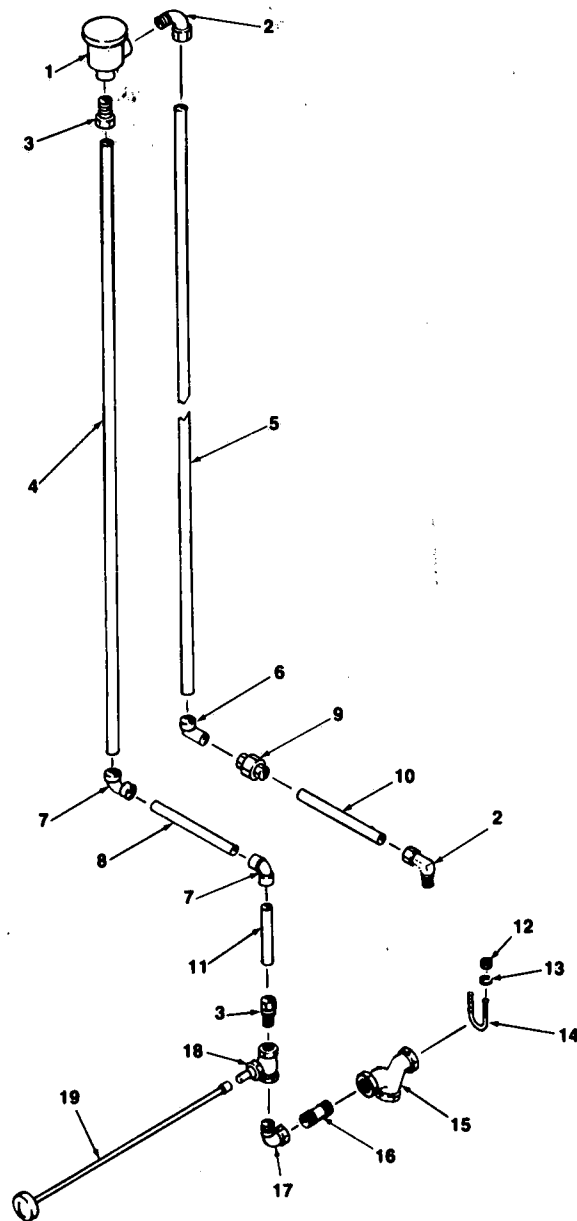


Figure 7-14. COLD WATER LINE.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-14-	P 115695 001		COLD WATER LINE — English	X			
	P 115695 002		COLD WATER LINE — English/French		X		
1			VACUUM BREAKER (See Fig. 7-32)	1	1		
2	P 90240 091		ELBOW, Street (1/2 ODT x 3/8 IPS)	2	2		
3	P 90242 091		ADAPTER (1/2 ODT x 3/8 IPS)	2	2		
4	P 115758 001		TUBE (1/2 ODT x 27-13/16" long)	1	1		
5	P 115759 001		TUBE (1/2 ODT x 38-3/8" long)	1	1		
6	P 90215 091		ELBOW, Sod (1/2 x 1/2 ODT)	1	1		
7	P 90213 091		ELBOW, Sod (1/2 x 1/2 ODT)	2	2		
8	P 115765 001		TUBE (1/2 ODT x 5-5/8" long)	1	1		
9	P 90226 091		UNION (1/2 x 1/2 ODT)	1	1		
10	P 115766 001		TUBE (1/2 ODT x 3-1/8" long)	1	1		
11	P 115767 001		TUBE (1/2 ODT x 3" long)	1	1		
12	P 3039 041		NUT, Hex (10-24)	2	2		
13	P 19685 061		LOCKWASHER (10)	2	2		
14	P 90301 045		U-BOLT	1	1		
15	P 47670 091		STRAINER (3/8 IPS) — (See Fig. 7-30)	1	1		
16	P 29014 051		NIPPLE (3/8 NPT)	1	1		
17	P 1631 091		ELBOW, Street (3/8 x 3/8 IPS)	1	1		
18	P 115730 001		VALVE, Ball (3/8 IPS)	1	1		
19			WATER ON-OFF ASSEMBLY (See Fig. 7-28)	1	1		

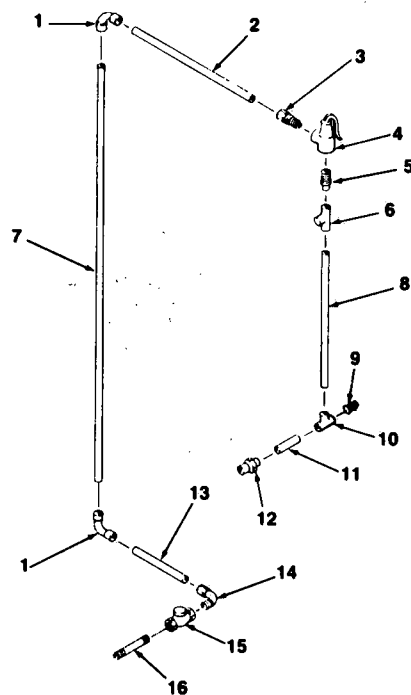


Figure 7-15. SAFETY VALVE LINE.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-15-	P 115707	001	SAFETY VALVE LINE	X
1	P 44492	091	ELBOW, Sod (1-1/8 x 1-1/8 ODT)	2
2	P 115884	001	TUBE (1-1/8 ODT x 14-1/8" long)	1
3	P 51761	091	ADAPTER (1-1/8 ODT x 1 IPS)	1
4	P 115742	001	VALVE, Safety (1/2 M x 1 F)	1
5	P 78476	091	ADAPTER	1
6	P 89864	091	TEE (5/8 ODT x 5/8 ODT x 3/16 IPS)	1
7	P 115774	001	TUBE (1-1/8 ODT x 47-1/2" long)	1
8	P 115883	001	TUBE (5/8 ODT x 10-1/4" long)	1
9	P 3441	091	CAP	1
10	P 90467	091	TEE (5/8 ODT x 3/8 IPS x 5/8 ODT)	1
11	P 115882	001	TUBE (5/8 ODT x 1" long)	1
12	P 90227	091	UNION (5/8 ODT x 1/2 IPS)	1
13	P 115885	001	TUBE (1-1/8 ODT x 4-1/8" long)	1
14	P 44490	091	ELBOW, Steel (1-1/8 ODT x 1 IPS)	1
15	P 51770	091	VALVE, Check (1 IPS)	1
16	P 29354	051	NIPPLE (1 IPS)	1

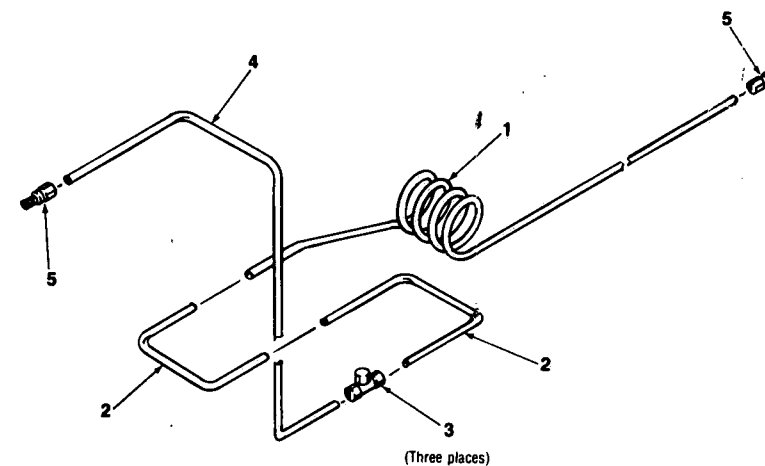


Figure 7-16. PRESSURE SWITCH AND GAUGE LINE.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-16-	P 115708	001	PRESSURE SWITCH AND GAUGE LINE	X
1	P 115785	001	TUBE, Coil (3/16 ODT)	1
2	P 115786	001	TUBE (3/16 ODT)	2
3	P 51388	091	TEE, Compression (3/16 ODT x 3/16 ODT x 1/8 IPS)	3
4	P 115787	001	TUBE (3/16 ODT)	1
5	P 37785	091	ADAPTER, Compression Fitting — Straight (3/16 ODT x 1/8 NPT)	2

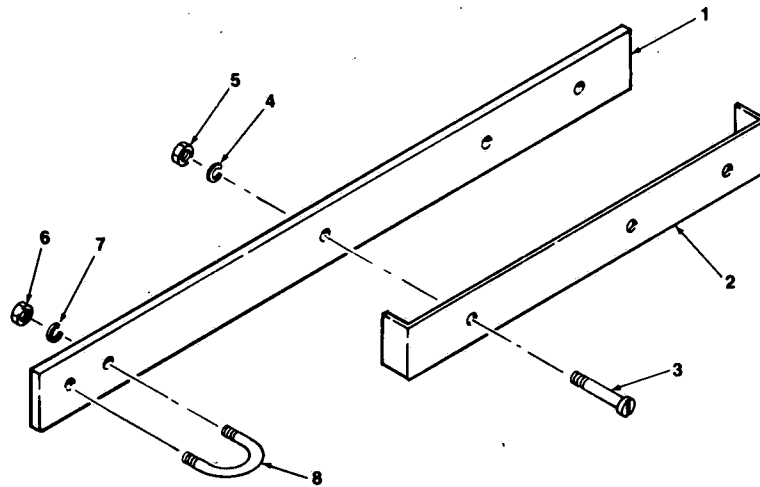


Figure 7-17. TUBE SUPPORT ASSEMBLY.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-17-	P 115792	001	TUBE SUPPORT ASSEMBLY	X
1	P 115745	001	SUPPORT	1
2	P 115790	001	CLAMP	1
3	P 4002	041	SCREW, Round Head (1/4-20 x 1)	3
4	P 19686	061	LOCKWASHER (1/4)	3
5	P 3097	041	NUT, Hex (1/4-20)	3
6	P 3039	041	NUT, Hex (10-24)	2
7	P 19677	041	LOCKWASHER (10)	2
8	P 90301	045	U-BOLT (10-24)	1

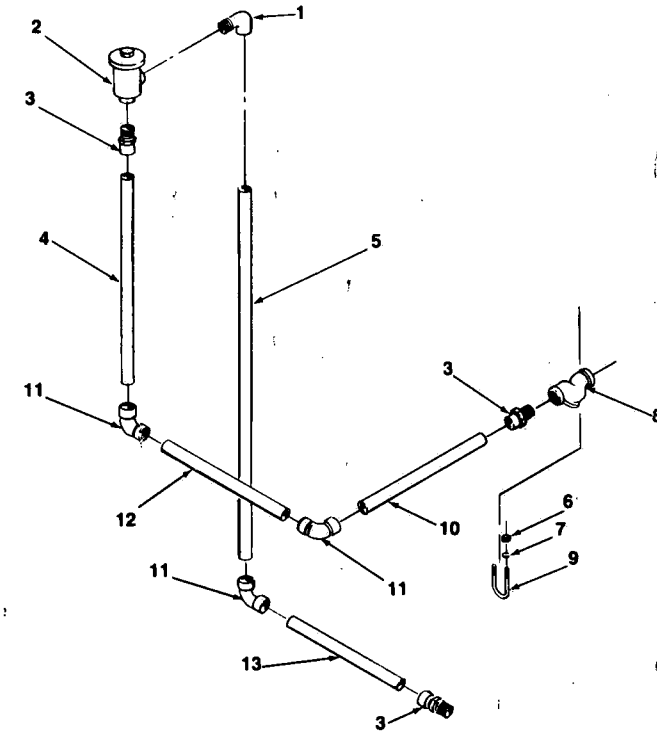


Figure 7-18. HOT WATER SUPPLY LINE — FOR OPTIONAL ELECTRIC-POWERED STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-18-	P 115706	001	HOT WATER SUPPLY LINE	X
1	P 90240	091	ELBOW, Street (1/2 ODT x 3/8 IPS)	1
2	P 77022	051	VACUUM BREAKER (See Fig. 7-31)	1
3	P 90242	091	ADAPTER (1/2 ODT x 3/8 IPS)	3
4	P 115775	001	TUBE (1/2 ODT x 33-3/4" long)	1
5	P 115776	001	TUBE (1/2 ODT x 45" long)	1
6	P 3039	041	NUT, Hex (10-24)	2
7	P 19685	061	LOCKWASHER (10)	2
8	P 47670	091	STRAINER (3/8 IPS) — (See Fig. 7-30)	1
9	P 90301	045	U-BOLT	1
10	P 115780	001	TUBE (1/2 ODT x 5-1/4" long)	1
11	P 90213	091	ELBOW, Sod (1/2 ODT)	3
12	P 115777	001	TUBE (1/2 ODT x 3-5/16" long)	1
13	P 115731	001	TUBE (1/2 ODT x 2-3/4" long)	1



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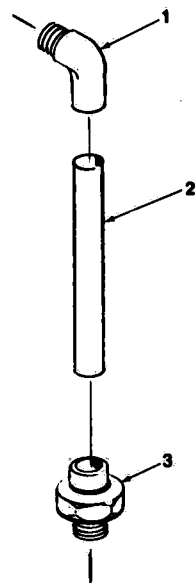


Figure 7-19. STEAM OUTLET — FOR OPTIONAL ELECTRIC-POWERED STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-19-	P 115709 001		GENERATOR STEAM OUTLET	X
1 P	90217 091		ELBOW, Street (5/8 ODT x 3/8 IPS)	1
2 P	115727 001		TUBE (5/8 ODT x 1-1/8" long)	1
3 P	90227 091		UNION (5/8 ODT x 1/2 IPS)	1

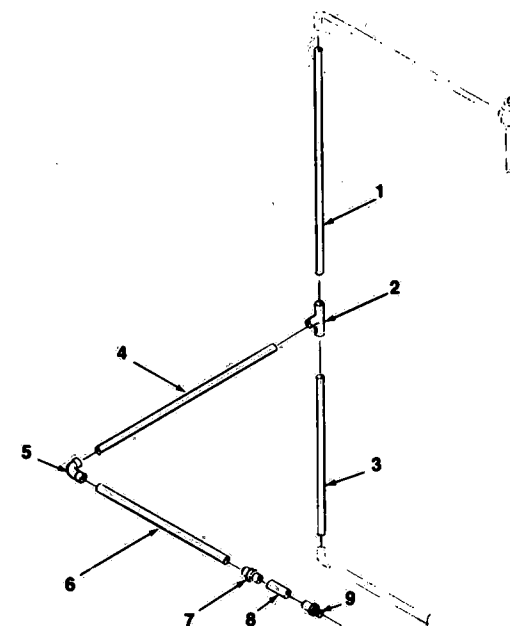


Figure 7-20. TO CONDENSER FROM OPTIONAL ELECTRIC-POWERED STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-20-	P 115791 001		GENERATOR TO CONDENSER	X
1 P	115793 001		TUBE (1-1/8 ODT x 36-1/4" long)	1
2 P	89713 091		TEE (1-1/8 ODT)	1
3 P	115773 001		TUBE (1-1/8 ODT x 10-1/4" long)	1
4 P	115789 001		TUBE (1-1/8 ODT x 13-3/16" long)	1
5 P	44492 091		ELBOW, Sod (1-1/8 ODT)	1
6 P	115772 001		TUBE (1-1/8 ODT x 12-3/16" long)	1
7 P	44491 091		UNION (1-1/8 ODT)	1
8 P	115771 001		TUBE (1-1/8 ODT x 2-5/16" long)	1
9 P	51761 091		ADAPTER (1-1/8 ODT x 1 IPS)	1

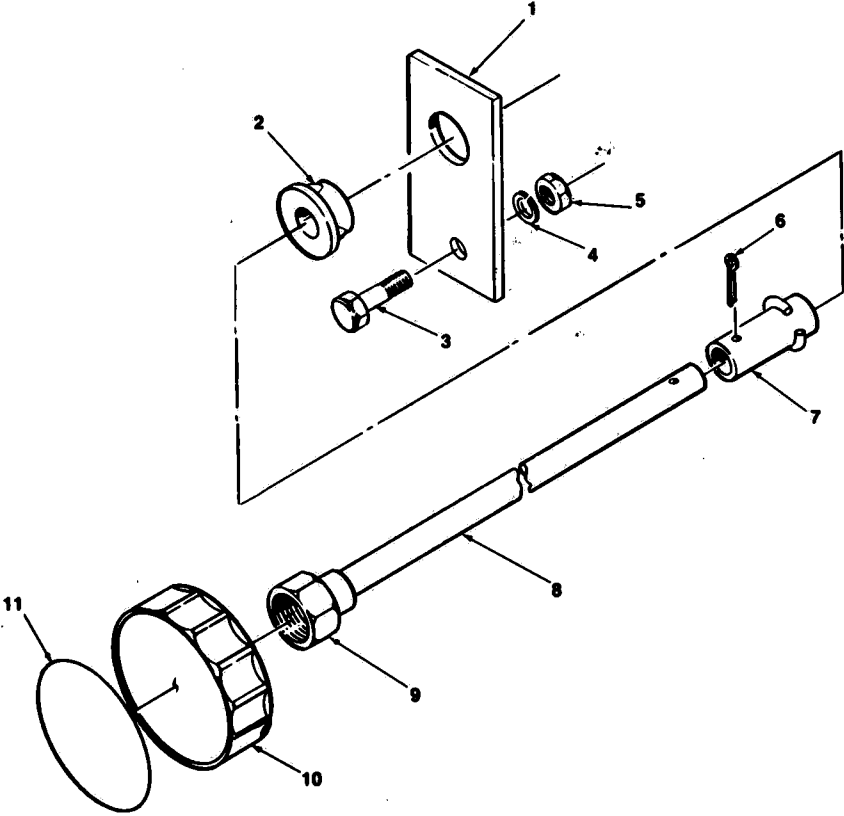


Figure 7-21. BLOW DOWN ASSEMBLY FOR OPTIONAL ELECTRIC-POWERED STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-21-	P 115660	001	GENERATOR BLOW DOWN ASSEMBLY	X
1	P 89465	010	BRACKET, Support	1
2	P 45690	091	BUTTON, Plug	1
3	P 4002	041	SCREW (1/4-20 x 1)	2
4	P 19686	061	LOCKWASHER (1/4)	2
5	P 3040	042	NUT (1/4-20)	2
6	P 46038	061	PIN, Cotter	2
7	P 45524	045	COUPLING	1
8	P 45503	043	ROD	1
9	P 8605	043	NUT	1
10	P 54899	091	WHEEL, Hand	1
11	P 90833	091	DECAL	1

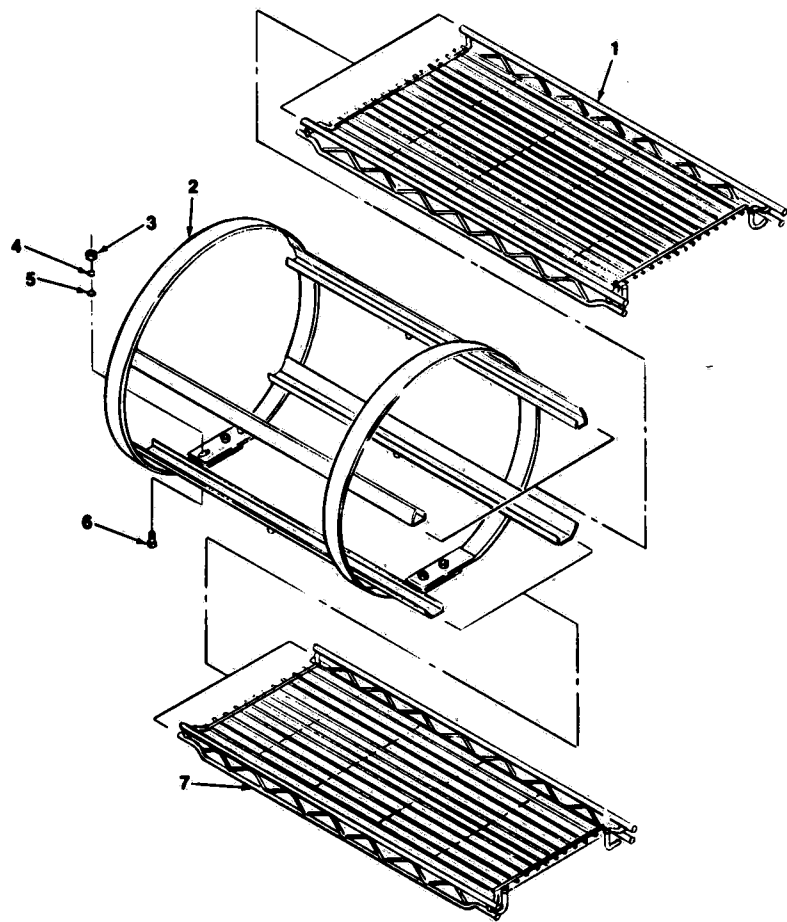


Figure 7-22. RACK AND TWO SHELVES.

FIG. & INDEX NO.	P	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-22-	P	130789	001	RACK AND TWO SHELVES	X			
1	P	115701	001	SHELF, Stainless-steel Top	1			
2	P	115700	001	RACK ASSEMBLY, Stainless-steel	1			
3	P	76239	061	NUT, Hex (1/4-20)	4			
4	P	19686	061	LOCKWASHER (1/4)	4			
5	P	49134	061	WASHER, Flat (1/4 ID x 1/2 OD)	4			
6	P	10572	061	SCREW, Hex Head (1/4-20 x 5/8)	4			
7	P	115702	001	SHELF, Stainless-steel Bottom	1			

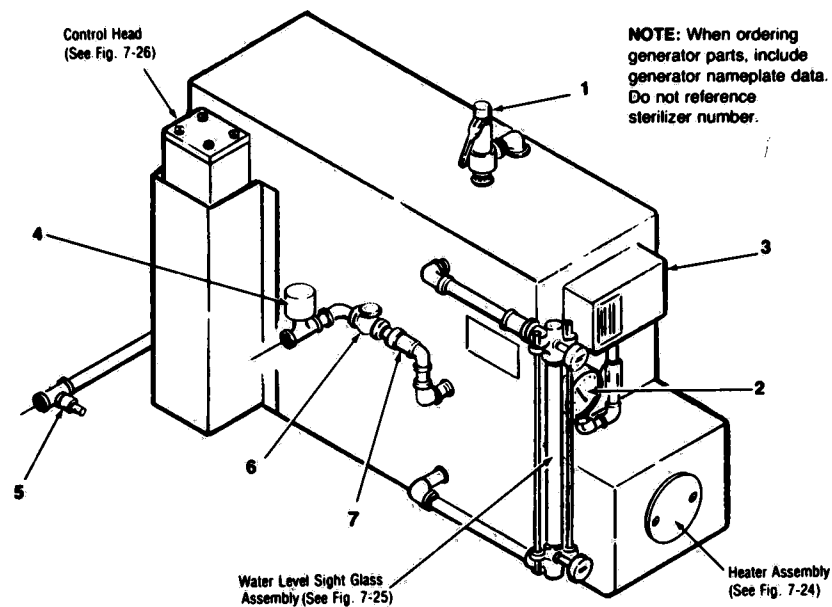


Figure 7-23. OPTIONAL ELECTRO-STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-23-	P 115840	001	ELECTRO-STEAM GENERATOR, 200/230 Volt Heaters	X			
	P 115841	001	ELECTRO-STEAM GENERATOR, 480 Volt Heaters		X		
	P 115842	001	ELECTRO-STEAM GENERATOR, 575 Volt Heaters			X	
1	P 77053	091	VALVE, Safety (85 psig)	1	1	1	
2	P 750488	091	GAUGE, Pressure (0-100 psi)	1	1	1	
3	P 764055	001	PRESSURE CONTROL, Honeywell L 404 A	1	1	1	
4	P 764055	001	• SWITCH, Mercury	1	1	1	
	NLA		VALVE, Solenoid (759742)				
	P 759742	002	VALVE, Solenoid 3/8" 120 Volt (Cat. #8210C73)	1	1	1	1
	P 764315	603	• REPAIR KIT	A/R	A/R	A/R	A/R
	P 761699	002	• COIL	A/R	A/R	A/R	A/R
	P 759742	003	VALVE, Solenoid 3/8" 120 Volt (Cat. #8210A21)	1	1	1	1
	P 764317	381	• REPAIR KIT	A/R	A/R	A/R	A/R
			• COIL	A/R	A/R	A/R	A/R
5	P 118810	091	VALVE, Manual Drain	1	1	1	
6	P 753187	091	VALVE, Spring-loaded Check	1	1	1	
7	P 75427	091	VALVE, Flapper, Union Check	1	1	1	

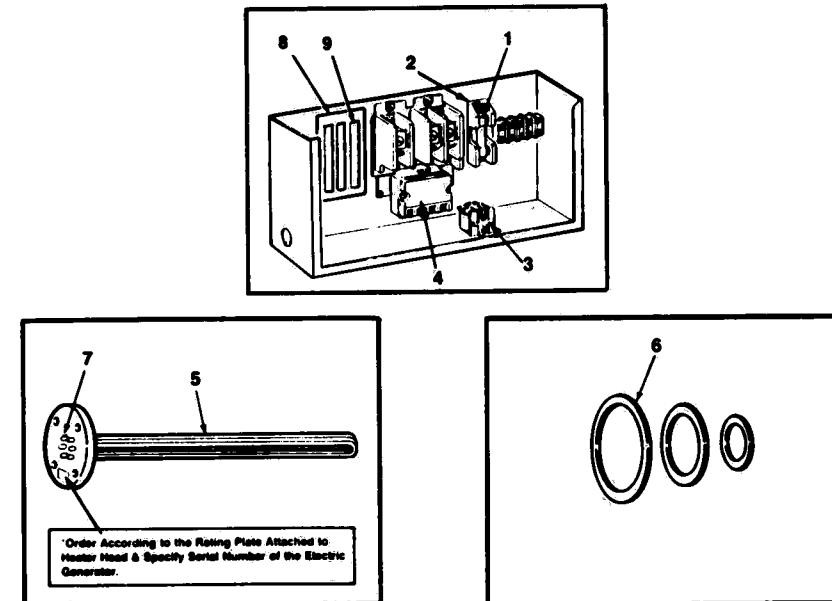


Figure 7-24. ELECTRIC COMPONENTS, OPTIONAL ELECTRO-STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-24-			ELECTRICAL COMPONENTS FOR ELECTRO-STEAM GENERATOR	X			
1	P 7626	091	FUSE, Control Circuit (15 Amp)	1			
2	P 18277	091	HOLDER, Fuse (One 15 Amp Fuse)	1			
3	P 37606	091	RELAY	1			
4	P 759747	001	CONTACTOR	1			
5	P 759749	001	• COIL	1			
	P 759081	091	• POINTS (Set)	1			
	P 752709	091	HEATING ELEMENT, 15 kw (208 Volt)	A/R			
	P 77318	091	HEATING ELEMENT, 15 kw (240 Volt)	A/R			
	P 761728	001	HEATING ELEMENT, 15 kw (360 Volt)	A/R			
	P 754749	091	HEATING ELEMENT, 15 kw (480 Volt)	A/R			
	P 115886	001	HEATING ELEMENT, 15 kw (575 Volt)	A/R			
6	P 75423	091	GASKET, Heater Head (Set of 3)	1			
7	P 759078	091	JUMPERS, NUTS AND WASHERS, Heater Terminal	1			
8	P 750400	091	HOLDER, Fuse (Three 50 Amp Fuses)	1			
9	P 750399	091	FUSE, 50 Amp	3			

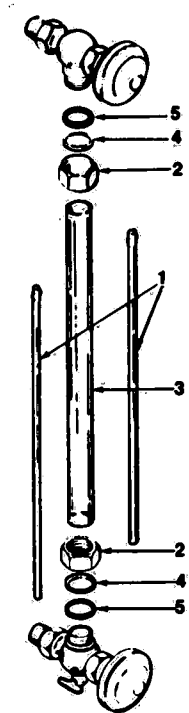


Figure 7-25. WATER-LEVEL SIGHT GLASS ASSEMBLY, OPTIONAL ELECTRO-STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-25-	P 750507	091	SIGHT GLASS ASSEMBLY	X
1	P 757717	091	ROD, Guard	2
2	P 781847	001	COLLAR, Retaining	2
3	P 75424	091	GLASS, Sight (Set of two with 12 washers)	1
4	P 752612	091	WASHER, Metal	2
5	P 751847	091	SEAL, Rubber	2

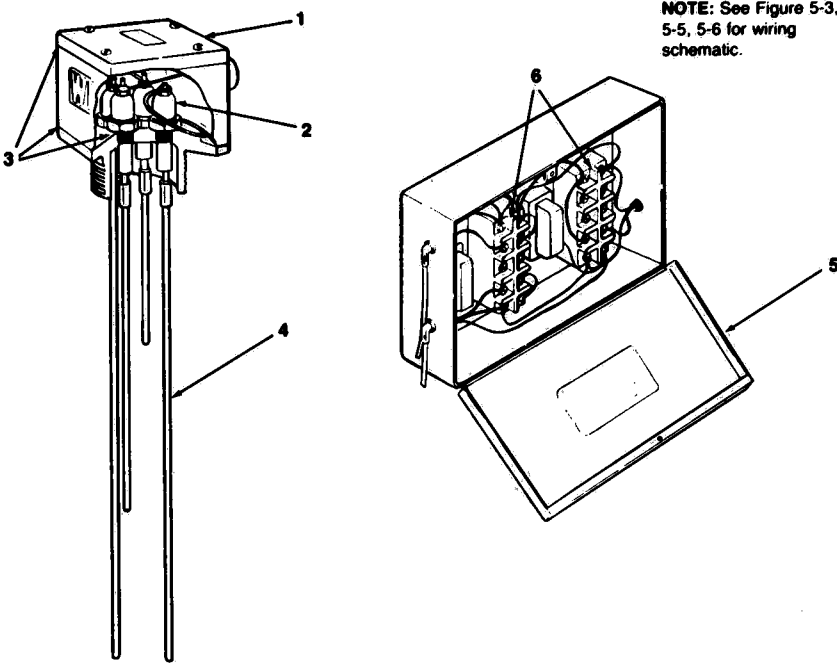


Figure 7-26. WATER-LEVEL CONTROL, OPTIONAL ELECTRO-STEAM GENERATOR.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
7-26-			WATER-LEVEL CONTROL	X
1	P 764316	746	CONTROL HEAD	1
2	P 756383	091	• SPARK PLUG (Electrode Holder)	4
3	P 764316	747	• GASKET KIT (Includes Electrode, Housing and Cover Gaskets) ..	1
4	P 764316	748	• ELECTRODE ASSEMBLY	4
5	P 759744	001	RELAY BOX, Level Control (120 Volt)	1
6	P 74473	091	• RELAY	2

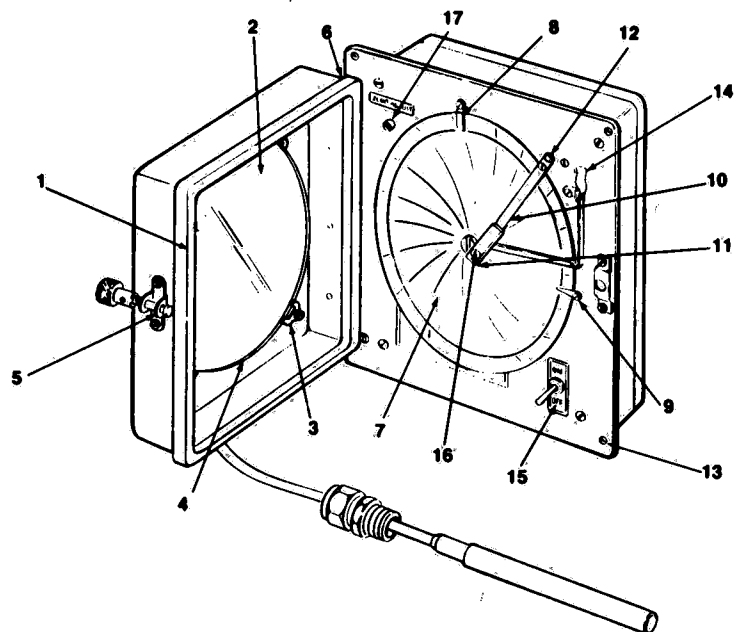


Figure 7-27. CHART RECORDER.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-27-	P 115817	001	CHART RECORDER, 120 Volt, 60 Hz	X			
	P 115817	002	RECORDER, 120 Volt, 50 Hz		X		
1	P 33337	091	GASKET, Rubber Door	1	1		
2	P 33336	091	GLASS, Window	1	1		
3			CLIP, Glass	4	4		
4			GASKET, Glass	1	1		
5			HASP ASSEMBLY	1	1		
6			HINGE, Door	1	1		
7	P 115720	001	CHART, °F (Box of 100)	A/R	A/R		
	P 115720	002	CHART, °C (Box of 100)	A/R	A/R		
8			CLIP, Chart Guide	1	1		
9			CLIP, Time Index	1	1		
10	P 33338	091	PEN ARM ASSEMBLY	1	1		
11	P 33335	091	POINT, "V" Standard Pen	1	1		
12			BRACKET, Pen Arm Shaft	1	1		
13			SCREW	4	4		
14			LIFTER, Pen	1	1		
15			SWITCH	1	1		
16	P 763944	001	CARTRIDGE, Ink	1	1		
17			SCREW, Calibration Adjustment	1	1		
18	P 754648	091	CHART DRIVE, 120 Volt, 60 Hz (Not Shown)	1			

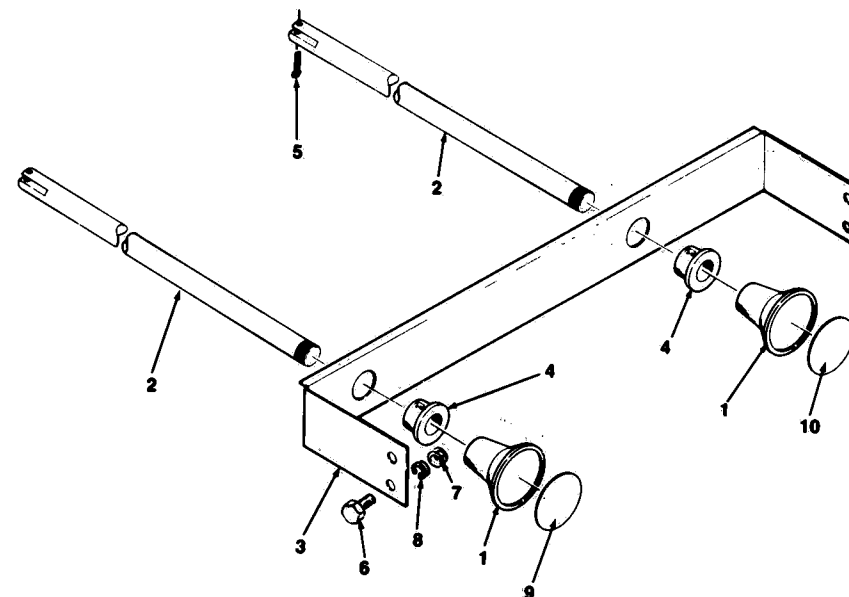


Figure 7-28. WATER AND STEAM ON-OFF ASSEMBLY.

FIG. & INDEX NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-28-	P 115751	001	WATER AND STEAM ON-OFF ASSEMBLY — ENGLISH	X			
	P 115751	002	WATER AND STEAM ON-OFF ASSEMBLY — ENGLISH/FRENCH		X		
1	P 115838	001	KNOB	2	2		
2	P 115753	001	ROD	2	2		
3	P 115755	001	SUPPORT, Rod	1	1		
4	P 45890	091	PLUG, Button	2	2		
5	P 3185	091	PIN, Cotter	2	2		
6	P 3848	051	BOLT, Hex Head (1/4-20 x 3/4)	4	4		
7	P 3040	042	NUT, Hex (1/4-20)	4	4		
8	P 19678	045	LOCKWASHER (1/4)	4	4		
9	P 115763	001	DECAL — "PULL TO OPEN WATER" (English)	1			
	P 115763	002	DECAL — "PULL TO OPEN WATER" (English/French)		1		
10	P 115762	001	DECAL — "PULL TO OPEN STEAM" (English)	1			
	P 115762	002	DECAL — "PULL TO OPEN STEAM" (English/French)		1		

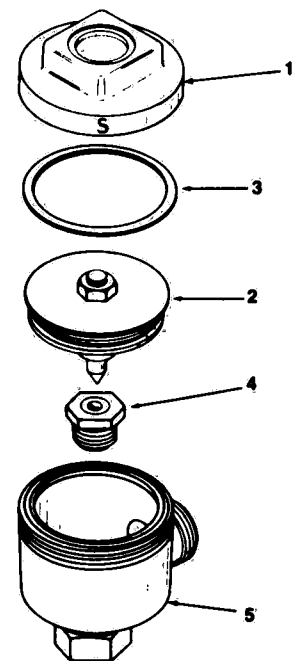


Figure 7-29. STEAM TRAP.

FIG. & INDEX NO.	PART NUMBER		SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-29-1	P	9976	091	STEAM TRAP (3/8)	X			
	P	45038	091	STEAM TRAP, Special (3/8)		X		
				CAP ("S" stamped on side)	1			
	P	20240	091	DIAPHRAGM ASSEMBLY	1	1		
	P	20239	091	• GASKET				
2	P	20240	091	SEAT	1			
3	P	30399	091	SEAT*		1		
4	P	48748	091	BODY	1	1		
5								
*Has notch where diaphragm mates								

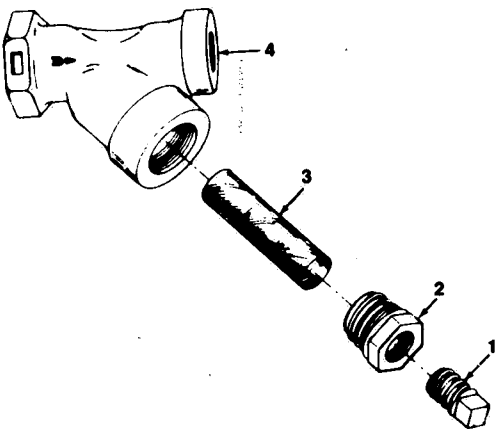


Figure 7-30. STRAINER.

FIG. & INDEX NO.	PART NUMBER		SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-30-1	P	47670	091	STRAINER, Water (3/8)	X			
	P	47671	091	STRAINER, Steam (3/8)		X		
				PLUG	1	1		
				RETAINER	1	1		
	P	756249	091	SCREEN, Monel Mesh (0.033" opening)	1			
3	P	50341	091	SCREEN, Monel Mesh (0.005" opening)		1		
				BODY	1	1		
4								

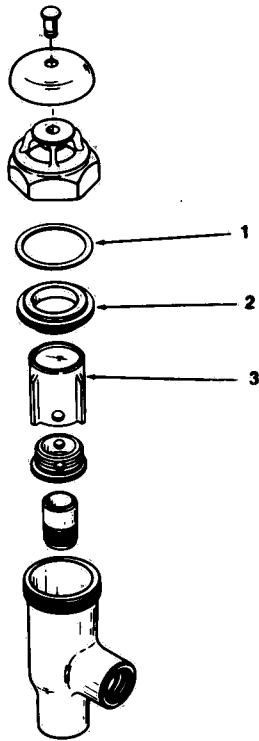


Figure 7-31. VACUUM BREAKER (3/8).

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-31- 1 2 3	P	77022	051		VACUUM BREAKER (V-370-A, 3/8 NPT)	X			
	P	751077	091		KIT, Internal Repair	A/R			
					• RING, Friction	1			
					• SEAT, Air Valve	1			
					• FLOAT	1			

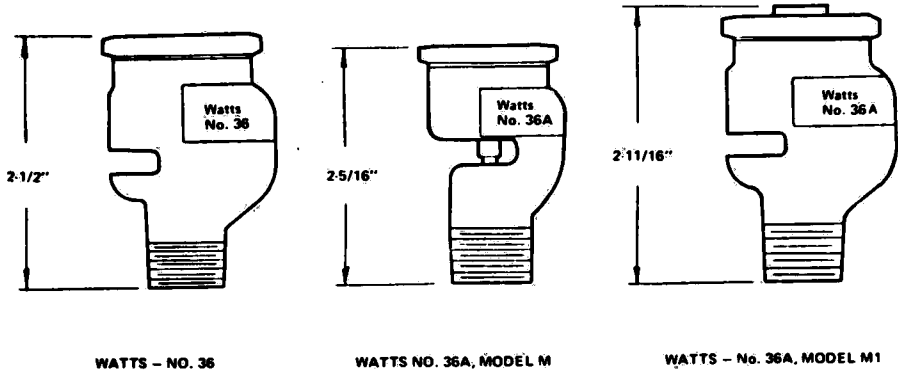


Figure 7-32. VACUUM BREAKER (1/2).

FIG. & INDEX NO.	PART NUMBER			SVC	DESCRIPTION	UNITS PER ASSEMBLY			
7-32-	P	29818	091		VACUUM BREAKER (1/2)	X			
	P	757588	091		KIT, Repair (Includes disc assembly and bonnet gasket for Watts 36 and 36 Model M1)	A/R			
	P	753646	091		KIT, Repair (Includes disc assembly and bonnet gasket for Watts 36A Model M)	A/R			



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