STERIS®

Maintenance Manual

EAGLE® SERIES
EAGLE TEN & EAGLE TEN + STERILIZERS

(9/25/97) **P-764323-978**

LIMITATIONS AND LIABILITY AND INDEMNITY

In no case, whether as a result of a Breach of Contract, Breach of Warranty or Tort (including STERIS's or customer's willful acts or negligence or strict liability) shall STERIS or customer be liable to the other for any consequential or incidental damages incurred by the other, including, but not limited to, loss of revenue, profits or goodwill. However, nothing contained in this agreement is intended to relieve either STERIS or customer from claims, liability, damages or expenses resulting from bodily injury, including death, or from property damage incurred due to the willful acts, the negligence of or the strict liability of that party.

STERIS agrees to defend, indemnify and hold customer harmless from any and all claims, liability damages or expenses due to personal injuries, including death, to employees of STERIS and customer and to third parties and for property damage to the extent of the willful acts of the negligence of STERIS or the strict liability of STERIS caused by the acts or omissions of STERIS. Customer agrees to defend, indemnify and hold STERIS harmless from any and all claims, liability, damages or expenses due to personal injuries, including death, to employees of customer and STERIS and to third parties and from property damage to the extent of the willful acts or the negligence of customer or the strict liability of customer caused by the acts or omissions of customer.

A Word From STERIS Corporation

IMPORTANT

The operation and maintenance procedures recommended by STERIS are described in this manual. Only these recommended maintenance procedures should be followed.

A summary of the safety precautions to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service this equipment until you have become familiar with this information.

Any alteration of this equipment not authorized or performed by STERIS Engineering Service which could affect its operation will void the warranty, could violate Federal, state, and local regulations and jeopardize your insurance coverage.

INDICATIONS FOR USE

The Eagle Ten Table Top sterilizers efficiently sterilize unwrapped, wrapped, packed, and liquid products in Hospital, Laboratories, Scientific, and Medical Office environments.

The Eagle Ten sterilizer is not designed to process flammable liquids nor liquids in containers that are not designed for sterilization (e.g., containers having screw caps, nonvented stoppers, etc.)

This sterilizer is specifically designed to process goods using only cycles as specified in this manual. If there is any doubt about specific material or product, contact the manufacturer of the product for the recommended sterilization technique.

SERVICE INFORMATION

A thorough preventive maintenance program is essential to safe and proper unit operation. This manual contains maintenance schedules and procedures which should be followed for satisfactory equipment performance.

You are encouraged to contact STERIS concerning our comprehensive Preventive Maintenance Agreement. Under the terms of this agreement, preventive maintenance, adjustments, and replacements of worn parts are done on a scheduled basis to assure equipment performance at peak capability and to help avoid untimely or costly interruptions. STERIS maintains a nationwide staff of well equipped, factory-trained technicians to provide this service, as well as expert repair services. Please contact your STERIS representative for details.

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LIST OF ILLUSTRATIONS

Section 1: Summary of Warnings and Cautions

The following are personnel (WARNINGS) and equipment (CAUTIONS) safety precautions to be observed when operating or servicing this unit. This is a summary listing of safety precautions appearing in the text. Carefully read them before proceeding to use or service the unit. The precautions are repeated where applicable throughout the manual. Observance of these safety precautions will minimize the risk of personal injury or the possible use improper maintenance methods which may damage the unit or render it unsafe. It is important to understand that these precautions are not exhaustive. STERIS could not possibly know, evaluate and advise maintenance departments of all conceivable ways in which maintenance might be done or the possible hazardous consequences of each way.

The operation and maintenance procedures recommended by STERIS are described in this manual. Only these recommended maintenance procedures should be followed.

WARNING - BURN HAZARD:

To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading, performing maintenance, or cleaning.

Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading sterilizer following previous operation.

It is inappropriate to sterilize liquids intended for direct patient contact.

Beware of steam escaping from safety valve. To prevent burns, wear gloves or use an extension device if it becomes necessary to operate the pull ring.

WARNING - INJURY HAZARD:

Use only vented closures - do not use screw caps or rubber stoppers with crimped seals.

Use only Type I borosilicate glass bottles - do not use ordinary glass jugs or any container not designed for sterilization.

Open door slowly at the end of a liquid sterilization cycle. Do not allow hot bottles to be jolted. This can cause bottle explosions! Do not move bottles if any boiling or bubbling is present.

Allow bottles to cool to touch before attempting to move them from sterilizer shelf or tray(s) to the storage area.

Do not overfill reservoir. To avoid slippery conditions and possible load recontamination, immediately wipe up all spillage resulting from overfilling chamber or reservoir. (Reservoir overflow tube exits on back of unit.)

Repairs and adjustments, other than those described in these instructions, should be attempted only by experienced mechanics fully acquainted with this equipment. Use of inexperienced, unqualified persons to work on the equipment or the installation of unauthorized parts could cause personal injury or result in costly damage.

When performing adjustments, use only an insulated screwdriver. Also, ensure metal of screwdriver does not come in contact with any grounded surface.

Always use two persons when lifting/moving unit to prevent personal injury or equipment damage.

Disconnect power to sterilizer and allow sterilizer to cool to room temperature before performing any maintenance procedure.

WARNING - FIRE HAZARD:

When sterilizing wrapped goods, do not allow pouches or wraps to touch chamber wall.

WARNING - EXPLOSION HAZARD:

This sterilizer is not designed to process flammable liquids.

Do not operate this sterilizer in the presence of flammable compounds.

WARNING - FALL HAZARD:

To prevent falls keep floors dry by immediately wiping up any spilled liquids or condensation in sterilizer loading or unloading area.

WARNING - STERILITY ASSURANCE HAZARD:

The cycles listed in Tables 3-1 and 3-2 have been validated. If different cycle parameters are required, it is the responsibility of the healthcare facility to validate the cycle to assure that the proper sterility assurance (SAL) as well as drying efficiency is met.

CAUTION - POSSIBLE EQUIPMENT DAMAGE:

Never use wire brushes, abrasives, steel wool, or chloride-containing products to clean door and chamber .

If media is processed, bottles and tubes should contain no more than 1/2 the total volume of the container. When processing water bottles and test tubes, the bottles and tubes should contain no more than 3/4 the total volume of the container. Chamber, filter, and water level probe should be cleaned daily when processing media.

To avoid equipment damage, use de-ionized or distilled water ONLY for filling reservoir and cleaning.

Do not remove or replace printed circuit boards unless facility power is off and electrostatic precautions are taken.

To avoid thermistor damage, when installing new thermistor, ensure that it does not touch outer cover.

Sterilization of chloride-containing solutions can cause chamber corrosion and is not recommended by the manufacturer. However, if chloride-containing solutions must be processed, clean the chamber, filter, and water level probe after each use.

Section 2: General Information

2.0 GENERAL INFORMATION

The product information included in Table 2-1, along with Figure 2-1, provides a general concept of the equipment and its technical specifications.

TABLE 2-1: EAGLE TEN & EAGLE TEN + LEADING PARTICULARS	
· Unit Dimensions	19-3/4 x 15-1/2 x 20-1/2 inches (502 x 394 x 521 mm)
· Chamber Dimensions	10 x 16 inches (254 x 406 mm)
· Weight	Approximately 80 lbs (36.2 kg)
· Power Requirements	120 VAC, 50/60 Hz, single phase, 12.5 Amps **(dedicated)** 220/240 VAC, 50/60 Hz, single phase, 20 Amps **(dedicated)**
· Mounting	Countertop
· Construction: Shell Door Insulation	 304SS Aluminum Glass Fiber
· Reservoir	1 Gallon capacity (3.8L)
· Water	Distillied or Deionized ONLY (with a minimum resistivity of 1 megohm/cm)
· Temperature Control (Eagle Ten) Temperature Time (Eagle Ten +)	Preset Adjustable from 215-275°F
· Exposure Time (Eagle Ten) Exposure Time (Eagle Ten +)	Preset Adjustable from 0-99 Minutes
· Overtemperature Output	400°F
· Eagle Ten & Eagle Ten +	ASME Rated Units, ETL, TUV-IES 601

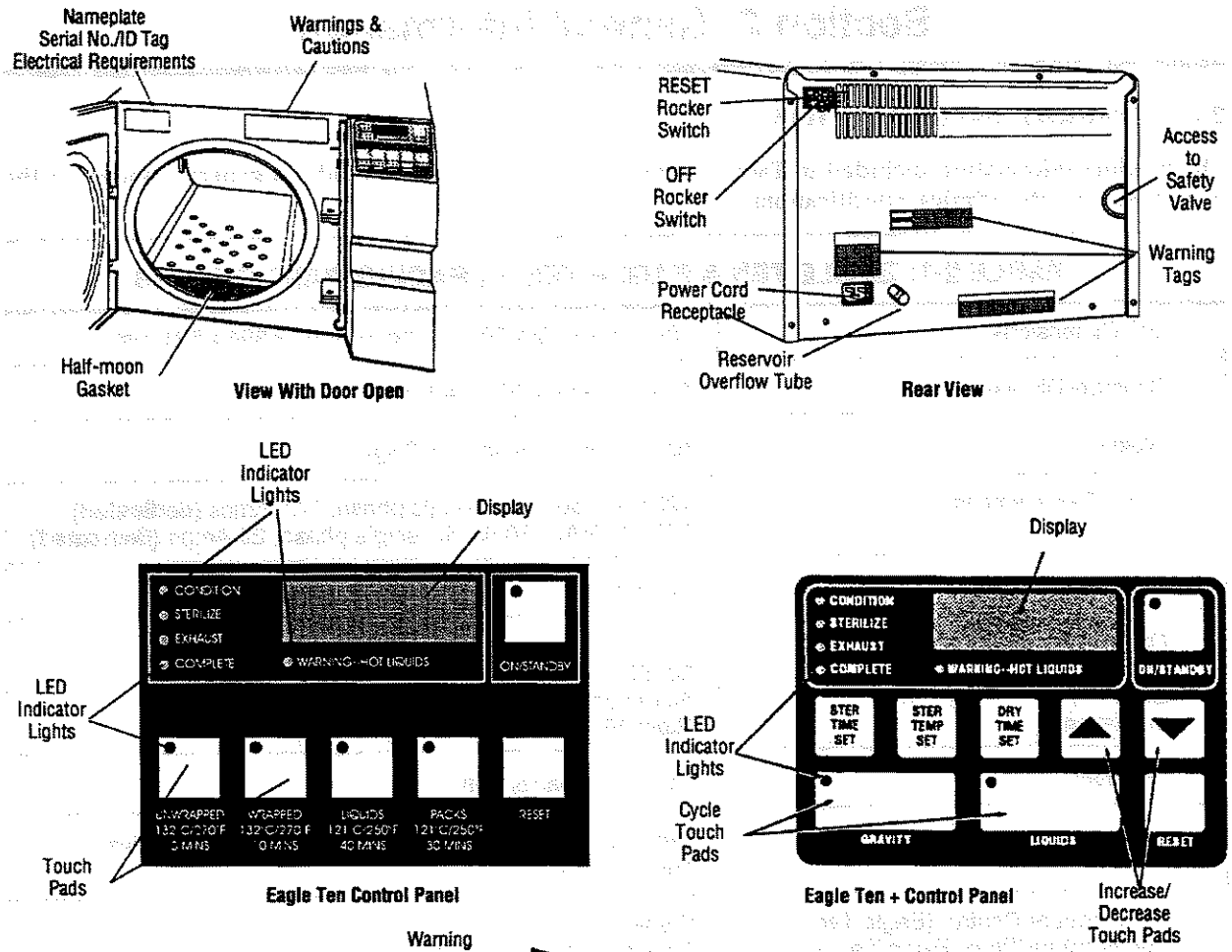


Figure 2-1. Eagle Ten, Eagle Ten + Series Sterilizer

STERIS®

AMSCO® EAGLE® TEN™ TABLETOP STEAM STERILIZERS

APPLICATION

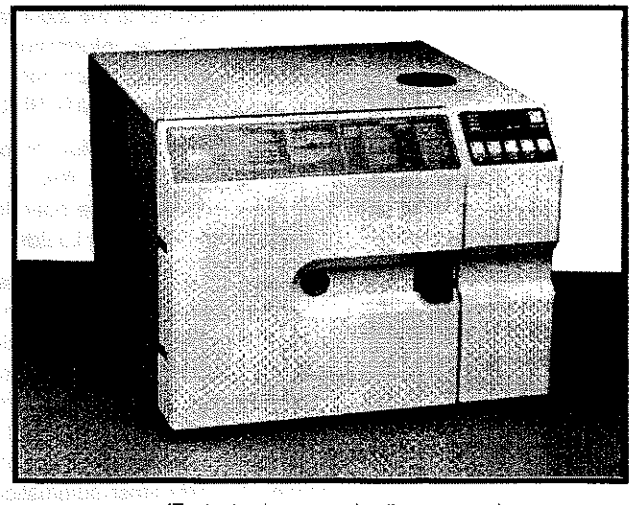
Amsco Eagle Ten Tabletop Steam Sterilizers are for sterilizing unwrapped, wrapped, packed and liquid products used in hospital, laboratory, scientific, and medical office environments.

Eagle Ten Sterilizers are available in two configurations:

- **Eagle Ten** - for hospital, dental, and veterinary applications, featuring four preprogrammed cycle selections:
  - » unwrapped (270°F/132°C)
  - » wrapped (270°F/132°C)
  - » liquid (250°F/121°C)
  - » packed (250°F/121°C).
- **Eagle Ten+** - for laboratory/scientific applications, featuring programmable cycles for:
  - » gravity (215-275°F/102-135°C, 1-99 min.)
  - » liquid (215-255°F/102-124°C, 1-99 min.).

DESCRIPTION

Eagle Ten Sterilizers feature state-of-the-art microcomputer control systems providing the latest standards in cycle setup, selection, and monitoring. Once selections are made and a cycle initiated, microcomputers accurately monitor and control system operations.



(Typical only - some details may vary.)

The control panel provides an easy-to-read LED display and an optional integral thermal printer prints relevant cycle data. Two instrument trays are provided with each unit to enable maximum loading. Tray sizes are:

- 6-1/2" (165 mm) W x 13-1/8" (333 mm) D x 1-5/8" (41 mm) H
- 9" (229 mm) W x 13-1/8" (333 mm) D x 2-1/2" (64 mm) H

Size

Both the Eagle Ten and Eagle Ten+ feature a 10" diameter x 16" long cylindrical chamber.

STANDARDS

Each sterilizer meets the applicable requirements of the following standards:

- **Underwriters Laboratories (UL) Standard 544** as certified by ETL Testing Laboratories, Inc.
- **Canadian Standards Association (CSA Standard 125)** as certified by ETL Testing Laboratories, Inc.
- **ASME Code, Section VIII, Division 1** for unfired pressure vessels. The pressure vessel is so stamped; ASME Form U-1 is furnished. Shell and door are constructed to withstand working pressure of 42 psig (2.1 bar).
- **Electromagnetic Compatability Directive 89/336/EEC, 92/31/EEC, 93/68/EEC**
- **Low Voltage Directive 73/23/EEC, 93/68/EEC**
- **Medical Device Directive 93/42/EEC** (Eagle Ten only)

The Selections Checked Below Apply to This Equipment

MODEL
- ❑ Eagle Ten
- ❑ Eagle Ten with Printer
- ❑ Eagle Ten+
- ❑ Eagle Ten+ with Printer

POWER SUPPLY
- ❑ 120V, 50/60 Hz*
- ❑ 220-240V, 50/60 Hz

* *Includes power cord (110V).*

ACCESSORIES
- ❑ Large Instrument Tray (9x13-1/8x2-1/2")
- ❑ Small Instrument Tray (6-1/2x13-1/8x1-5/8")

Item _____

Location(s) _____

_____

FEATURES

Microcomputer monitors and controls system operations and functions. Cycle progresses automatically through fill, condition, sterilize and exhaust phases. Indicator lights on the control panel indicate specific phase of cycle while display shows temperature and time. Control indicates cycle completion visually and audibly. At end of cycle, timer returns to precycle operating parameters, eliminating the need to reset values between repeated cycles. Timer also resets if sterilization temperature drops 2°F/1°C below set point during sterilization phase. If temperature does not reach 212°F/100°C within 20 minutes of cycle start-up or if sterilization temperature is not reached within 15 minutes of unit reaching 212°F/100°C, the unit will abort the cycle.

CONTROL PANEL

Touch sensitive pads are conveniently located at the upper right side of the sterilizer, away from heat, vapor and condensate resulting from the sterilization process.

Salient features include:

1. Optional printer provides easy-to-read permanent printed record of all pertinent cycle data, providing assurance to the operator that cycle parameters have been met. Alphanumeric printer documents power-on, control-on, starting time of cycle, temperature, key transition points in cycle, a cycle summary and any deviation which might jeopardize the sterilization process. Printer information does not state if sterilization has occurred (see MONITORING).
2. Indicator lights display the phase of the current cycle. Also, a light is provided to warn the operator of the presence of hot liquids.

Sterilize times, dry times and sterilize temperature settings are locked in and cannot be changed once a cycle is started. The control retains precycle operating parameters upon completion of a cycle, eliminating the need for reprogramming between repeated cycles. Sterilize timer automatically resets if chamber temperature drops 2°F (1°C) below set point during exposure time. Exposure timing resumes when chamber has returned to set temperature.

The timer displays in minutes and seconds. Temperature displays in either Fahrenheit or Celsius (user selectable).

A chamber pressure gauge is mounted in the center of the door assembly.

TECHNICAL DATA

Automatic Control

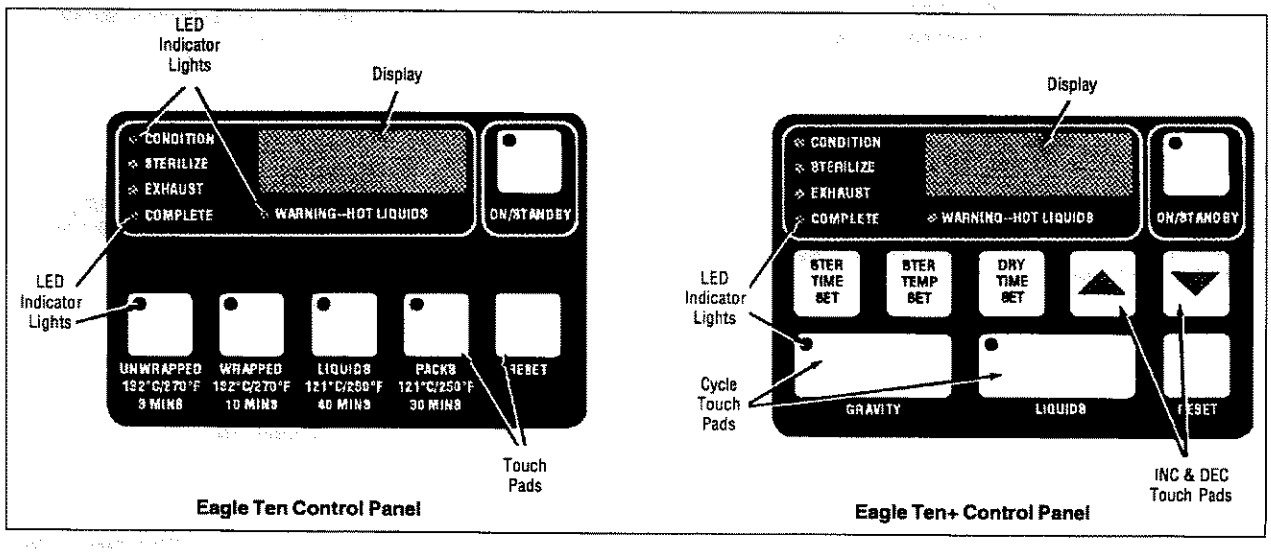
Sterilize times, dry times, and temperatures are self-contained in an intelligent, controller based microcomputer consisting of either one PC board (if unit not equipped with printer) or two connected PC boards, control and printer (if unit equipped with printer).

Control Board monitors all sterilizer functions, and includes time of day clock and an 8 bit A/D converter controlling temperature between 212° and 275°F (100° and 135°C). A watchdog-timer protects AC outputs, and an audible piezoelectric alarm is provided.

Printer Board (if unit equipped with printer) operates a 24-column thermal digital alphanumeric printer, producing characters within a five-by-seven dot matrix on 2-1/4 inch single-ply, thermal paper. Print speed is approximately 48 lines per minute. Five tape rolls are furnished with each unit.

- Printer is controlled by its own microcomputer.
- Used tape is rerolled onto a take-up reel for a permanent record of cycle data. Data is automatically printed at various points during the sterilization cycle.

Control Panel includes a large, easy-to-read LED readout, visible legends and touch-sensitive pads. Display panel shows all messages, phase times, current clock value, and temperature, or timer set-up points. Pressing ▲ or ▼ (Eagle Ten+) or Liquids or Packs (Eagle Ten) touch pads at the appropriate time changes control parameters (i.e., time, date, etc.).



Sterilizer operates on 120 VAC, 50/60 Hz or 220-240 VAC, 50/60 Hz, single-phase **electrical power service**. Internal power supply provides regulated voltage levels for display, optional printer, analog circuits, and digital circuits. Solenoid valves and take-up motor operate on 120 VAC.

Chamber and Door Assembly

The cylindrical chamber is made of 304 stainless steel. Glass-fiber blanket insulation on chamber is 1-inch (25 mm) thick (nominal) and single faced with aluminum foil, held in place by pressure-sensitive tape.

ASME certified stainless steel chamber and welded hinge assembly features a manually operated door with left-hand hinge. Replaceable door gasket is made of silicon rubber. Sound-deadened door cover features a manual locking/opening mechanism matching the appearance of the overall unit. Microswitch prevents inadvertent start of cycle before door is locked.

Chamber drain is located at bottom rear of shell to remove chamber condensate.

Drying System

At conclusion of Exhaust phase, the door must be manually opened 1/4 inch. The dry heaters will then turn on and the control panel will count upwards until the specified dry time (preprogrammed in Eagle Ten) is achieved.

Other Components

Two solenoid valves simplify sterilizer piping and are placed conveniently. They can be serviced individually.

Air vent is pressure and temperature compensated, and allows for efficient air removal during conditioning phases.

Piping and electrical connections terminate within confines of sterilizer.

INSTALLATION

The Eagle Ten Sterilizers require at least 19-3/4" W x 15-1/2" H x 20-1/2" D of free counter space to be properly positioned.

MONITORING

STERIS recommends testing of all steam sterilizers on a daily basis and after any repairs or adjustments, as well as monitoring every sterilizer load.

NOTES

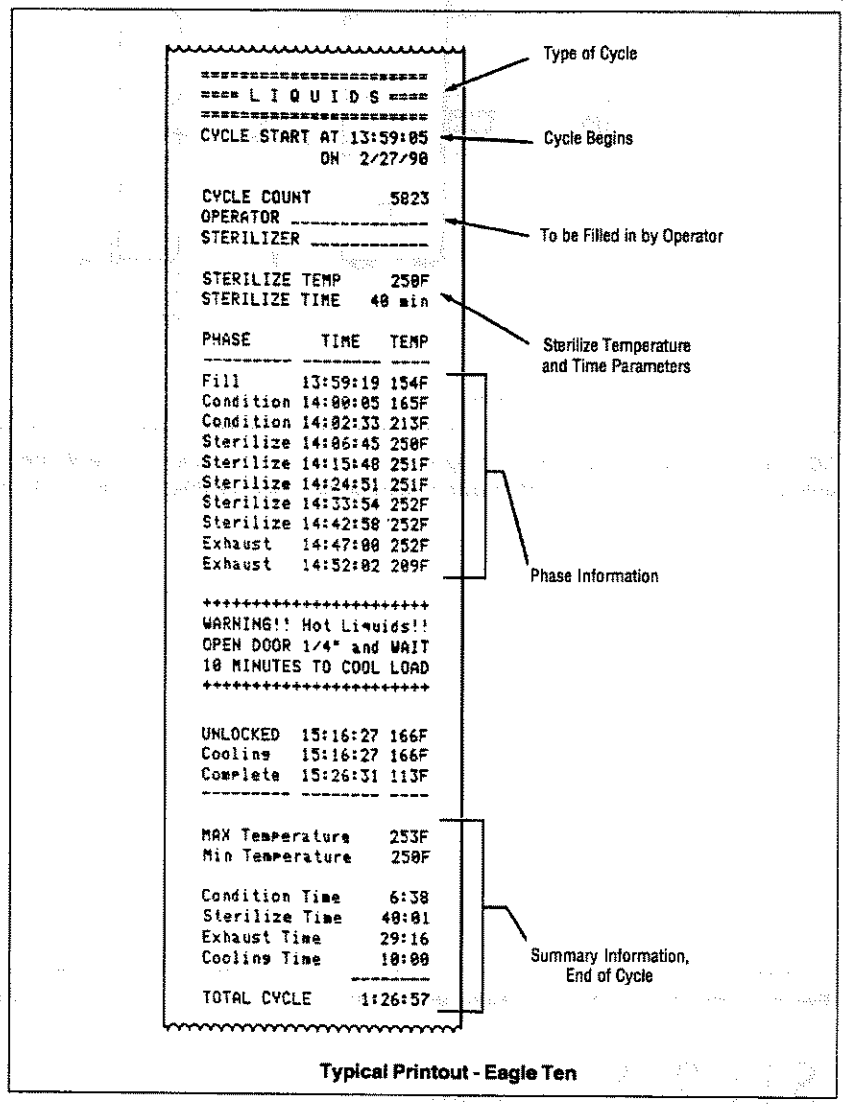
1. Clearances shown are minimal for installing and servicing the equipment.
2. Dedicated power supply is recommended.

ENGINEERING DATA

Weight - 80 lbs (36 kg)

Max. Heat Loss - 3070 BTU/hr (774 KJ/h)

Reservoir Capacity - 1 gal (3.8 L)



Typical Printout - Eagle Ten

TÜV PRODUCT SERVICE Quality system certified to ISO 9001

Manufactured exclusively by STERIS Corporation, in our Montgomery, AL facility which is ISO 9001 certified by TUV.

UTILITY REQUIREMENTS

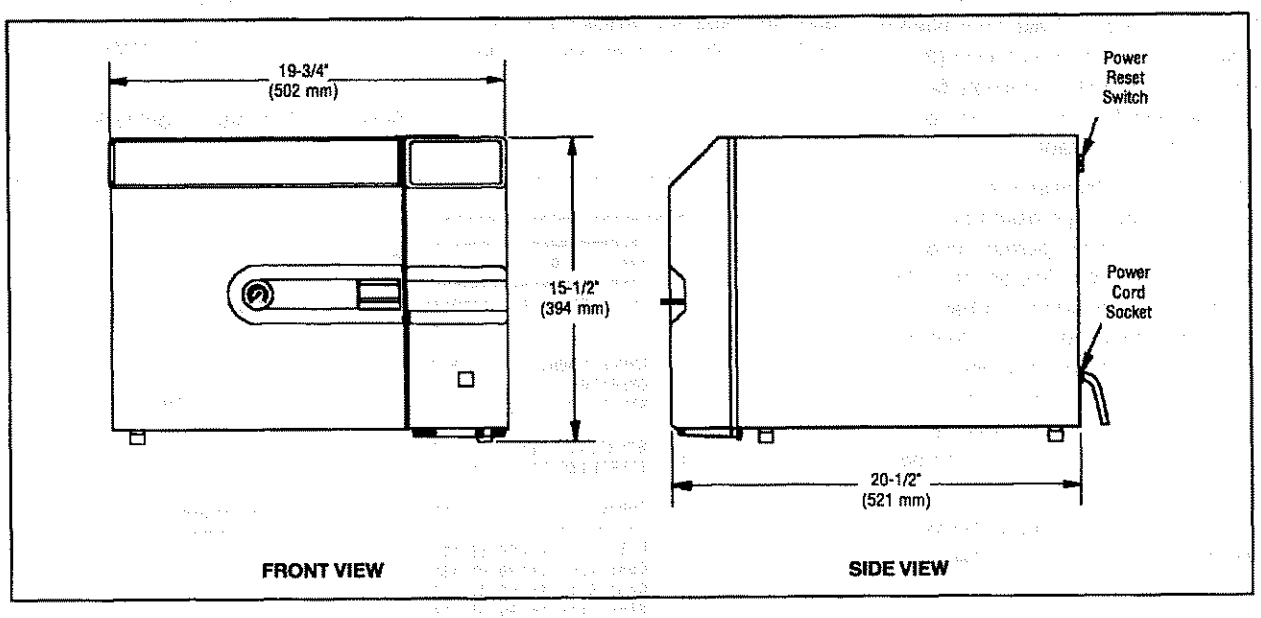
Distilled or Deionized Water

Minimum resistivity of 1.0 megohm/ cm recommended.

Electricity

120 V, 50/60 Hz, 12.5 A or
220-240 V, 50/60 Hz, 7 A.

. . . CHECK LOCAL CODES . . .



NOTE: Because of STERIS's continuing program of research and development, all specifications and descriptions are subject to change without notice. Some options may affect utility consumptions. Obtain certified drawings for design and installation.

For further information, please contact:

STERIS®

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Singapore	65 841 7677
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United Kingdom	44 1 608 811 822

Section 3: Operating Instructions

3.0 GENERAL

The following procedures are intended to guide maintenance personnel when: (1) instructing operators in techniques designed to ensure optimum equipment performance; and (2) verifying the validity of operator complaints. As a reminder for operators, a simplified version of the operating instructions can be found on a permanent plate mounted on the front panel of the unit. New operators should always use the supplied Equipment Manual

See Troubleshooting Chart and Functional Description found in Section 4-4 if this unit is not operating properly. Refer to Section 2, **GENERAL INFORMATION**, for capabilities of the unit. Figure 3-1 shows the control panel for the Eagle Ten Sterilizer.

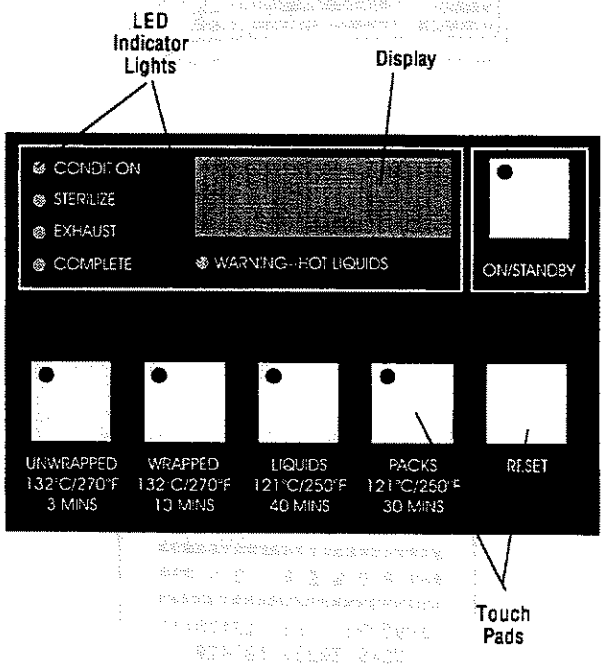


Figure 3-1. Eagle Ten Control Panel

3.1 OPERATING INSTRUCTIONS (EAGLE TEN)

3.1.1 Preparing Unit for Initial Use (Figure 3-2)

The following procedure shall be followed closely to ensure proper setup and operation of the sterilizer.

1. Open the sterilizer door (push handle in and slide upward) and remove all chamber contents: trays, videotape, and power cord.)
2. Unwrap the loading trays and power cord.
3. Carefully remove bottom shelf from inside the chamber and verify that the filter is connected to the fill port and is resting on bottom of chamber.
4. Verify that the water level tube is in an upright position and secure in its holders.
5. Replace bottom shelf and make sure the front edge of the shelf is inserted into tab for shelf support (see Figure 3.2). Close and lock the chamber door (push handle in and slide downward).
6. Attach the female end of the power cord to the rear of the sterilizer. (Figure 2.1)
7. Plug the male end of the power cord into a dedicated, properly grounded electric outlet of the voltage and current specified on the serial no. / ID nameplate located on inside front panel of sterilizer).
8. Press the RESET rocker switch on the rear of the sterilizer. The front panel display will alternate between OFF and time of day. The optional printer will print "POWER ON".
9. Press the ON / STANDBY touch pad and verify that the indicator light turns on and TIME is displayed. The heaters will begin to cycle to preheat the chamber. The optional printer will print "CONTROL ON".
10. Set the correct time and date (see Para. 4.1.8 "Setting Time of Day").

⚠ WARNING - INJURY HAZARD: Do not overfill reservoir. To avoid slippery conditions and possible load recontamination, immediately wipe up all spillage resulting from overfilling reservoir. (Reservoir overflow tube exits on back of unit).

⚠ CAUTION: To avoid equipment damage, use deionized or distilled water only for filling reservoir and cleaning.

11. Remove the water reservoir cover and slowly fill reservoir with distilled or deionized water (minimum resistivity of one megohm / cm) until water level in water level tube is between REFILL and MAX indicators. Reservoir capacity is approximately one gallon. DO NOT OVERFILL. Replace the water reservoir cover.

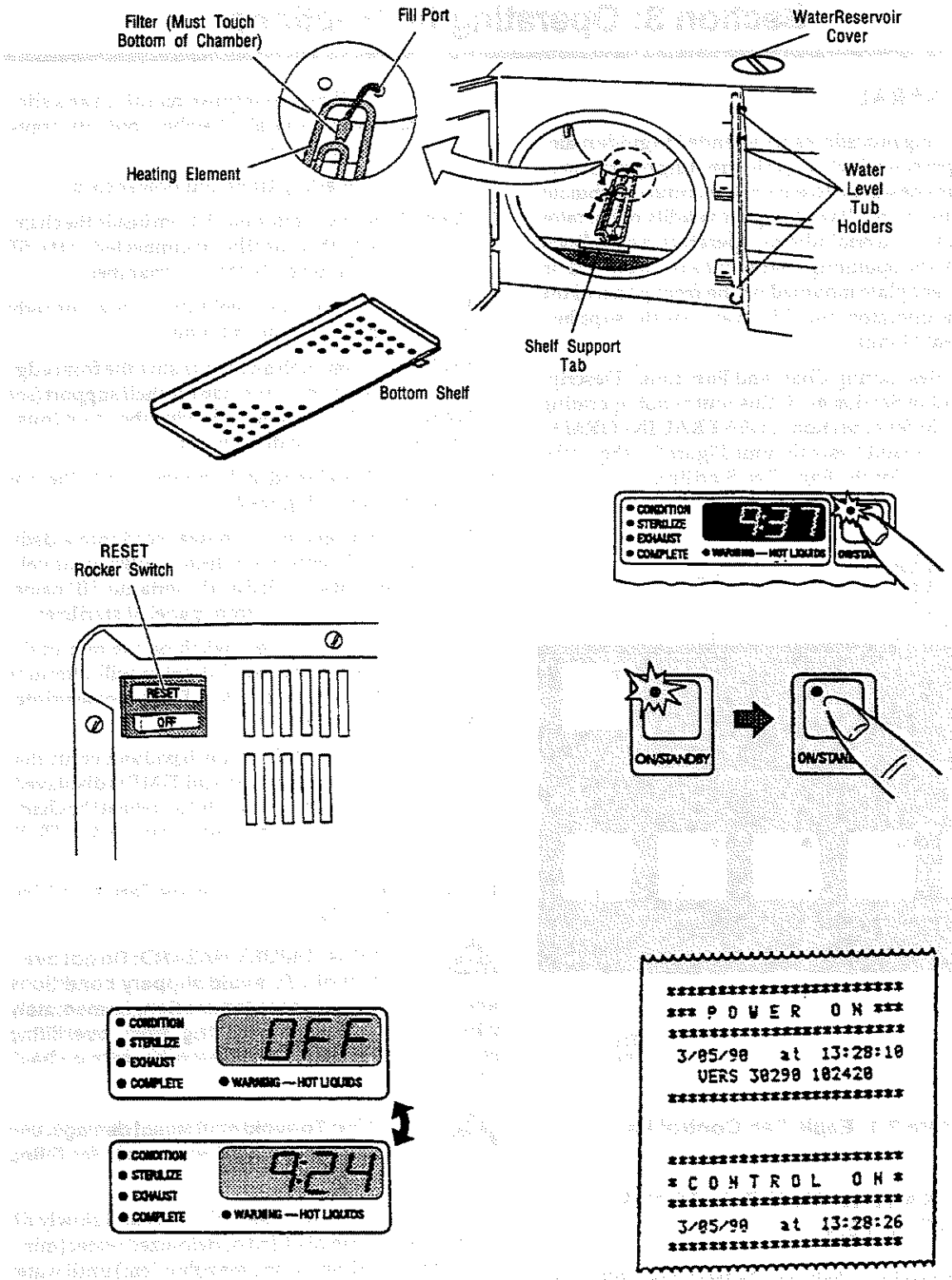


Figure 3-2. Sterilizer Set-Up

NOTE: Do not add water to reservoir when there is water in the chamber. This may cause an overfill situation during the next cycle.

12. Verify that there are no Error Messages on the front panel display. If there are, consult Section 3.3 for corrective measures.
13. Press the ON/STANDBY touch pad and verify the indicator light is extinguished. The sterilizer should remain in the STANDBY mode (indicator light off) when the unit is not in use.

NOTE: Initial odor (from insulation) will disappear after approximately 24 hours use.

3.1.2 Control Measures for Verifying Sterilization Process

As part of your verification of the sterilization process, biological indicators may be used to demonstrate that sterilization conditions have been met. To conform with AAMI standards, steam sterilizers should be tested weekly; STERIS, however, recommends daily testing to minimize the impact of a possible recall. A live spore test utilizing *B. Stearothermophilus* is the most reliable form of biological monitoring.

3.1.3 Sterilizing Wrapped, Unwrapped, and Packed Goods

IMPORTANT: Should an abnormal cycle condition occur, it will be displayed as indicated in Table 3-3, Troubleshooting Error Codes.

PREUSE CHECKOUT PROCEDURE

1. Prior to the first cycle of the day (be sure the chamber is not hot), wipe out the cooled chamber using a clean cloth with deionized or distilled water. Dry the chamber with a lint-free cloth. If the chamber needs cleaning, refer to Para. 4.1.1 ("Daily").

WARNING - INJURY HAZARD: Do not overfill reservoir. To avoid slippery conditions and possible load recontamination, immediately wipe up all spillage resulting from overfilling reservoir. (Reservoir overflow tube exits on back of unit).

2. Verify that the water reservoir is full (water level should be between REFILL and MAX indications on the water level tube, Figure 3-3). If needed, slowly add distilled or deionized water (minimum resistivity of one megohm/cm). **Do not overfill.** Replace the water reservoir cover.
3. Without closing the chamber door, press the ON/STANDBY touch pad; verify that the indicator light is on.

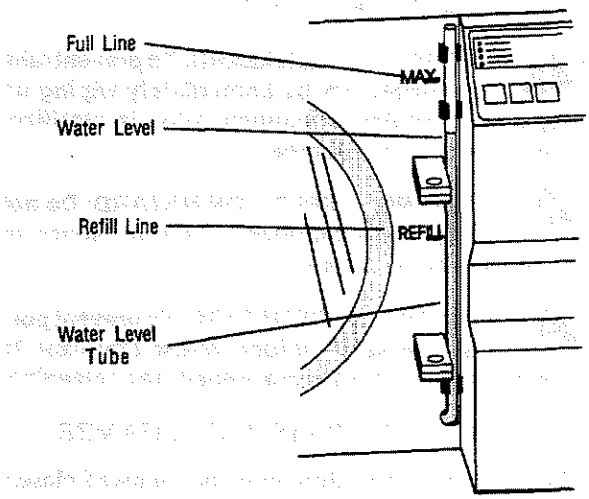


Figure 3-3. Water Level Tube

PREPARATION

1. Use freshly laundered 140 thread count muslin (or equivalent)*. This helps prevent superheating and provides longer life of the textiles.
2. Limit the size and density of each muslin pack. This ensures complete steam permeation, and assists drying.
3. Limit the size and density of wrapped instrument sets in order to assist in minimizing "wet pack" problems during post sterilization.
4. Do not stack or nest utensils unless they are separated by muslin (or equivalent)*.
5. Use two double-thickness 140 thread count muslin (or equivalent)* wrappers for surgical supplies. This provides protection after sterilization.

WARNING - INJURY HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

** Muslin of 140 thread count is the present standard for steam sterilization. The manufacturers of other materials should show data that indicates their product is equivalent to the muslin profile in steam sterilization, drying, and sterility maintenance.*

WARNING - FIRE HAZARD: When sterilizing wrapped goods, do not allow pouches or wraps to touch chamber wall.

WARNING - FALL HAZARD: To prevent falls keep floors dry by immediately wiping up any spilled liquids or condensation in sterilizer loading or unloading area.

WARNING - EXPLOSION HAZARD: Do not operate this sterilizer in the presence of flammable compounds.

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading or cleaning.

LOADING THE TRAYS AND CHAMBER

The following procedure must be followed closely when sterilizing wrapped, unwrapped, and packed goods.

NOTE: When positioning the loading trays, the small tray must always be used under the large tray even if the large tray is the only one containing items to be sterilized. For additional information on sterilization, please consult publication ED-1099.

4. Place items to be sterilized into the trays loosely allowing space for proper air removal and steam penetration through the load. See Figure 3.4. Pay special attention to the following:
   a. Place all fabric packs on edge and arrange packs for maximum steam exposure.
   b. Place items that might entrap air or water, such as bowls or pitchers, upside down or on edge so they will be sterilized and dried properly (i.e. they will not "catch" condensate during the drying process).
   c. Place instrument sets, unwrapped or wrapped, flat in the tray.
   d. Remove any caps from empty jars, canisters, and nonporous containers and place them upside down in the tray to facilitate sterilization and drying.
   e. Place hard goods (i.e. metallic instruments) on the bottom when processing mixed loads combining fabrics and hard goods. This prevents wetting of wrapped packs from condensed water dripping from the hard goods load.
5. Carefully insert trays into the sterilizing chamber.

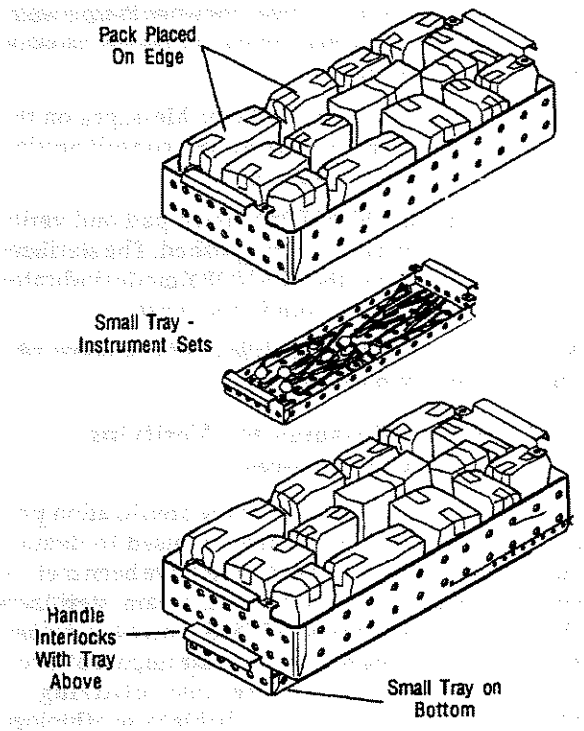


Figure 3-4. Loading Trays, Mixed Load

WARNING - INJURY HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

6. Close and lock the chamber door.

INITIATING A STERILIZATION CYCLE (non-liquids)

NOTE: Pressing the RESET touch pad while a cycle is in progress will always abort the cycle. If a cycle is aborted, the load must be reprocessed.

The following procedure is used to initiate a sterilization cycle for non-liquid goods. See Table 3-1 for preprogrammed times and temperatures for various load types.

7. After the door is closed, press the appropriate cycle touch pad (UNWRAPPED, WRAPPED, or PACKS). The corresponding indicator light illuminates. Display will read "FILL" (it takes one to two minutes to fill).
8. Next, the optional printer will print relevant data in the format shown in Figure 3-5.

Table 3-1: Pre-programmed Sterilize Times and Temperatures with Recommended Dry Times and Minimum Pressures

CYCLE TYPE	LOAD*	CONTROL SETTINGS			
		STERILIZE CYCLE SETTINGS		DRY TIME	MIN PRESSURE** (psig)
		STERILIZE TIME (min)	TEMPERATURE °F (°C)		
PACKED	Fabric Packs	30	250(121)	30	15
WRAPPED	Wrapped Instrument Sets	10	270 (132)	45	27
UNWRAPPED***	Unwrapped Metal Instruments (without lumens), Trays and Other Empty, Non-Porous Containers	3	270 (132)	0	27

**If processing mixed loads, always use the longer exposure time setting.*

***This pressure reading is the minimum necessary to achieve sterilty. Actual readings may be higher.*

****The unwrapped cycle is typically used for non-porous, unwrapped instruments for immediate use only.*

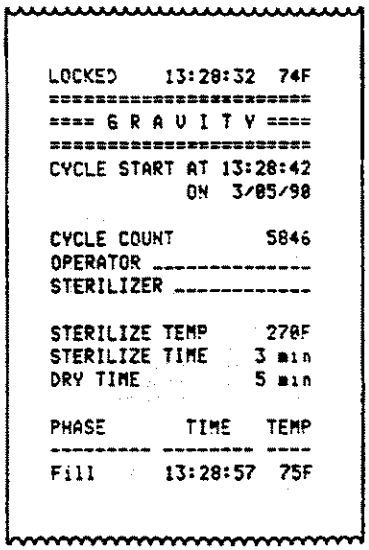


Figure3-5. Sample Printout

NOTE: If the cycle does not start when the appropriate touch pad is pressed, consult Section 4, "Troubleshooting".

After successfully starting the cycle, the Eagle Ten automatically begins the sterilization process (CONDITION, STERILIZE, EXHAUST, DRY, and COMPLETE phases.)

Following this is a brief description of each stage in this process.

3.1.3.1 Condition

During the CONDITION phase, the CONDITION indicator light illuminates and the chamber heater turns on. The temperature is then displayed on the front panel display and rises until the preset sterilization temperature is reached.

If the chamber is cold, allow up to 30 minutes for chamber to reach sterilization temperature.

If the chamber is hot, allow up to 20 minutes for chamber to reach sterilization temperature.

NOTE: If 212°F (100°C) is not reached within 20 minutes or if exposure temperature is not reached within an additional 15 minutes, the unit will abort the cycle. If this occurs, see Para. 4.3, "Troubleshooting".

NOTE: Once sterilization temperature is reached, verify that the chamber pressure gauge indicates at least the minimum pressure for the cycle selected as shown in Table 3-1. If the pressure is less than specified, press RESET to abort the cycle, then consult Section 4, "Troubleshooting".

3.1.3.2 Sterilize

The STERILIZE indicator light illuminates once the chamber attains the temperature specified through the program control (the time then counts downward from the preset exposure time to zero). During the

STERILIZE phase, temperature and time remaining in phase are displayed alternately on the front panel display once sterilization temperature is achieved.

NOTE: Temperature may rise 3-5°F above the preset cycle temperature parameter.

3.1.3.3 Exhaust

The EXHAUST indicator light illuminates once the sterilize phase is complete. During the EXHAUST phase, the heater turns off, the chamber exhausts, and the chamber temperature is shown on the front panel display. The buzzer sounds for four (4) seconds when EXHAUST is complete; "door" is shown on the front panel display and the buzzer sounds every minute until the door is opened. Be sure chamber pressure is at zero prior to opening.

At the end of the EXHAUST phase, open the door (push in and lift the handle), then push the door in until it rests against the door latching mechanism (DO NOT CLOSE DOOR) as pictured in Figure 3-6. The dry heaters will automatically turn on and begin DRY phase.

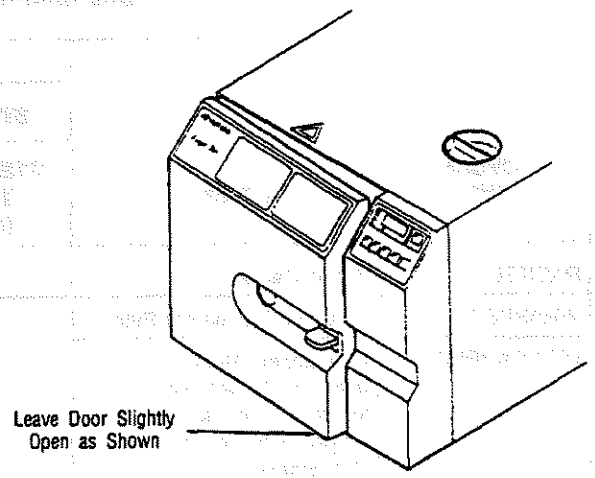


Figure 3-6. Door Ajar Following Exhaust Phase

3.1.3.4 Dry

During the DRY phase, the phase time is shown on the front panel display and counts upward (min:sec) for 60 minutes. A buzzer will sound at 30, 45 and 60 minute intervals. The operator may terminate the DRY phase at anytime by pressing the ON/STANDBY touch pad. When the touch pad is pressed, or 60 minutes has elapsed, "donE" appears in the front panel display indicating the phase is complete.

3.1.3.5 Complete

Once the DRY phase is complete, the COMPLETE indicator light illuminates and the "donE" appears in the front panel display. The optional printer also prints out pertinent cycle information as shown in Figure 3-7.

Pressing the RESET touch key completes the cycle and the time of day is shown in the front panel display.

⚠ WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

Finally, remove the tray containing the sterilized items from the chamber (remember, protective gloves are necessary when removing items from the sterilizer). See Figure 3-8.

Visually check outside of wrapper for dryness. A pack or instrument tray is considered unacceptable if there

```
PHASE        TIME    TEMP
---------- -------- ----
Fill       13:28:57  75F
Condition  13:29:22  75F
Condition  13:41:59 213F
Sterilize  13:50:29 270F
Sterilize  13:51:29 271F
Sterilize  13:52:30 271F
Sterilize  13:53:30 271F
Exhaust    13:57:31 271F

**********************
OPEN DOOR 1/4" and WAIT
 RECOMMENDED DRY TIME.
**********************



UNLOCKED   13:57:08 223F
Drying     13:57:08 223F
Complete   14:02:02 108F
---------- -------- ----

MAX Temperature     272F
Min Temperature     270F

Condition Time     20:59
Sterilize Time      3:01
Exhaust Time        3:28
Dry Time            5:00
                   -----
TOTAL CYCLE        0:33:11
Complete   14:02:15 107F
```

Figure 3-7. Sample Printout, End of Cycle

are water droplets or visible moisture on the exterior of the package or on the tape used to secure it.

Transfer to surface which is well padded with fabric to prevent condensation. Do not place on a cold surface. Be sure there is no air conditioning or cold air vents in close proximity.

Remove packs or instrument trays from padded surface when they have reached ambient (room) temperature.

NOTE: A small puddle of water may be found on the counter when the door is opened at the end of a cycle due to steam condensation on the door and gasket.

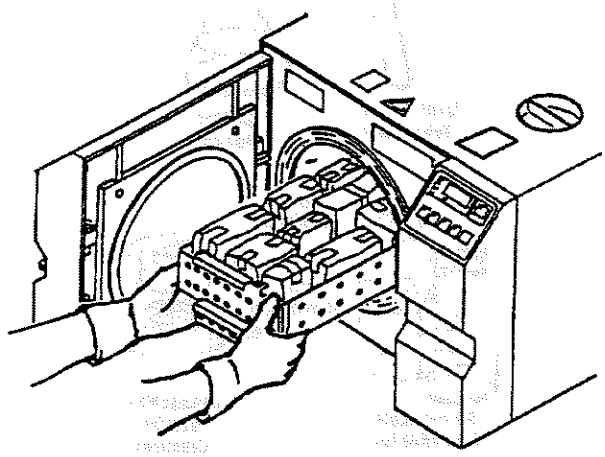


Figure 3-8. Unloading the Sterilizer

3.1.4 STERILIZING LIQUIDS

Liquid sterilization is accomplished by utilizing a specially designated sterilization cycle.

IMPORTANT: Should an abnormal cycle condition occur, it will be displayed as indicated in Table 3-3 Troubleshooting Error Codes.

WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading or cleaning.

WARNING - INJURY HAZARD: Use only vented closures - do not use screw caps or rubber stoppers with crimped seals.

WARNING - INJURY HAZARD: Use only Type I borosilicate glass bottles - do not use ordinary glass jugs or any container not designed for sterilization.

WARNING - INJURY HAZARD: Open door slowly at the end of a liquid sterilization cycle. Do not allow hot bottles to be jolted. This can cause bottle explosions! Do not move bottles if any boiling or bubbling is present.

WARNING - INJURY HAZARD: Allow bottles to cool to touch before attempting to move them from sterilizer shelf or trays(s) to the storage area.

If media is processed, bottles and tubes should contain no more than 1/2 the total volume of the container. When processing water bottles and test tubes, the bottles and tubes should contain no more than 3/4 the total volume of the container. Chamber, filter, and water level probe should be cleaned daily when processing media.

WARNING - EXPLOSION HAZARD: This sterilizer is not designed to process flammable liquids.

WARNING - EXPLOSION HAZARD: Do not operate this sterilizer in the presence of flammable compounds.

CAUTION: Sterilization of chloride-containing solutions can cause chamber corrosion and is not recommended by the manufacturer. However, if chloride-containing solutions must be processed, clean the chamber, filter, and water level probe after each use.

PREUSE CHECKOUT PROCEDURE

1. Prior to the first cycle of the day (be sure the chamber is not hot), wipe out the cooled chamber using a clean cloth with deionized or distilled water. Dry the chamber with a lint-free cloth. If the chamber needs cleaning, refer to Para. 4.1.1 ("Daily").

⚠ WARNING - INJURY HAZARD: Do not overfill reservoir. To avoid slippery conditions and possible load recontamination, immediately wipe up all spillage resulting from overfilling chamber or reservoir. (Reservoir overflow tube exits on back of unit.)

2. Verify that the water reservoir is full (water level should be between REFILL and MAX indications on the water level tube, Figure 3-3). If needed, slowly add distilled or deionized water (minimum resistivity of one megohm/cm). Do not overfill. Replace the water reservoir cover.
3. Without closing the chamber door, press the ON/STANDBY touch pad; verify that the indicator light is ON.

LOADING THE TRAY AND CHAMBER

The following procedure must be followed precisely when sterilizing liquids.

NOTE: When positioning trays, the small tray must always be used under the large tray even if the large tray is the only one containing items to be sterilized. For additional information on sterilization, please consult publication ED-1099.

4. Place items to be sterilized into tray allowing space for proper air removal and steam circulation between items (Figure 3-9). Only use Type 1 borosilicate glass containers and do not overload the trays (Figure 3-10). Do not squeeze bottles against each other.

⚠ WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

5. Carefully insert trays into the sterilizing chamber.
6. Close and lock the chamber door.

INITIATING A STERILIZATION CYCLE (liquid)

NOTE: Pressing the RESET touch pad while a cycle is in progress will always abort the cycle. If a cycle is aborted, the load must be reprocessed.

The following procedure is used to initiate a sterilization cycle for liquid goods. See Table 3-2 for preprogrammed times and temperature.

1. After the door is closed, press the appropriate cycle touch pad (LIQUID). The corresponding indicator light illuminates. Display will read "FILL" (it takes one to two minutes to fill).

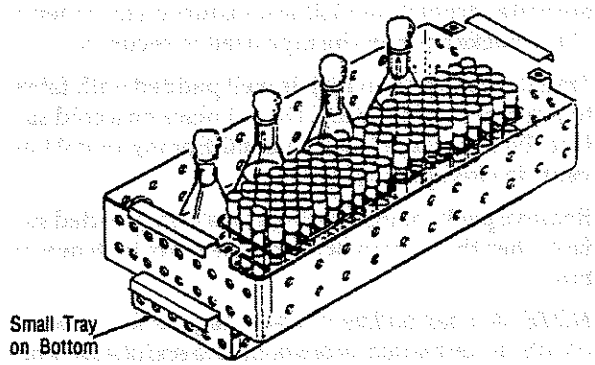


Figure 3-9. Loading Tray, Liquid Cycle

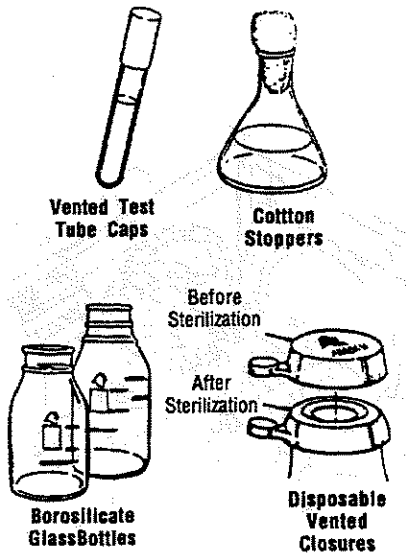


Figure 3-10. Proper Liquid Containers & Vented Closures

2. Next, the optional printer will print relevant data in the format shown in Figure 3-11.

NOTE: If the cycle does not start when the appropriate touch pad is pressed, consult Section 4, "Troubleshooting".

After successfully starting the cycle, the Eagle Ten automatically begins the sterilization process (CONDITION, STERILIZE, EXHAUST, COOL, and COMPLETE phases.)

Following is a brief description of each stage in this process.

3.1.4.1 Condition

During the CONDITION phase, the CONDITION and WARNING-HOT LIQUIDS indicator lights illuminate and the chamber heater turns on. The tempera-

Table 3-2: Pre-programmed Exposure Time and Temperature Settings - Liquid Cycle

FLASK SIZE	STERILIZE CYCLE SETTINGS		MINIMUM* PRESSURE (psig)
	EXPOSURE TIME (minutes)	TEMPERATURE °F(°C)	
500 ml or Smaller	40	250 (121)	15

**This pressure reading is the minimum necessary to achieve sterility. Actual readings may be higher.*

```
LOCKED     13:58:59 137F

======================
==== L I Q U I D S ====
======================
CYCLE START AT 13:59:05
            ON  2/27/98

CYCLE COUNT          5823
OPERATOR _____________
STERILIZER ___________

STERILIZE TEMP      250F
STERILIZE TIME    40 min

PHASE        TIME    TEMP
---------- -------- ----
Fill       13:59:19 154F
```

Figure 3-11. Sample Printout

ture is then displayed on the front panel display and rises until the preset sterilization temperature is reached.

If the chamber is cold, allow up to 30 minutes for chamber to reach sterilization temperature.

If the chamber is hot, allow up to 20 minutes for chamber to reach sterilization temperature.

NOTE: If 212°F (100°C) is not reached within 20 minutes or if sterilization temperature is not reached within an additional 15 minutes, the unit will abort the cycle. If this occurs, see Section 4, "Troubleshooting".

NOTE: Once sterilization temperature is reached (250°F, 121°C), verify that the chamber pressure gauge indicates at least the minimum pressure for the cycle selected as shown in Table 3-2. If the pressure is less than specified, press RESET to abort the cycle, then consult Section 4, "Troubleshooting".

3.1.4.2 Sterilize

The STERILIZE indicator light illuminates once the chamber attains the temperature specified through the program control (the time then counts downward from the preset exposure time to zero). During the STERILIZE phase, temperature and time remaining in phase are displayed alternately on the front panel display once sterilization temperature is achieved.

NOTE: Temperature may rise 3-5°F above preset cycle temperature parameter.

3.1.4.3 Exhaust

The EXHAUST indicator light illuminates once the STERILIZE phase is completed. During the EXHAUST phase, the heater turns off, the chamber exhausts, and the chamber temperature is shown on the front panel display.

The buzzer sounds for four (4) seconds, when EXHAUST is complete; "door" is shown on the front panel display and the buzzer sounds every minute until the door is opened. Be sure chamber pressure is at zero prior to opening.

Open the door (push in and lift the handle), then push the door in until it rests against the door latching mechanism (DO NOT CLOSE DOOR) as shown in Figure 3-6.

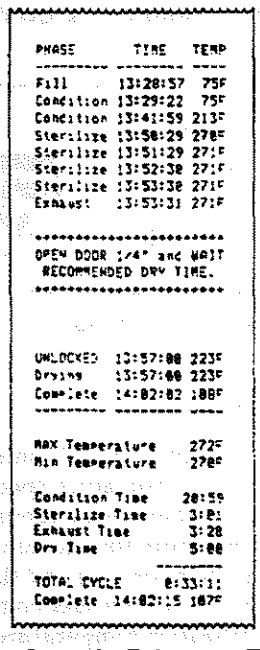
3.1.4.4 Cool

During the COOL phase, the phase time is shown on the front panel display and counts upward (10 min.) until the COOL time automatically specified by program control is achieved.

3.1.4.5 Complete

Once the COOL phase is complete, the COMPLETE indicator light illuminates and the "donE" appears in the front panel display. The optional printer also prints out pertinent cycle information as shown in Figure 3-12.

Pressing the RESET touch key completes the cycle and



PHASE	TIME	TEMP
Fill	13:28:57	75F
Condition	13:29:22	75F
Condition	13:41:59	213F
Sterilize	13:50:29	270F
Sterilize	13:51:29	271F
Sterilize	13:52:30	271F
Sterilize	13:53:30	271F
Exhaust	13:53:31	271F

OPEN DOOR 1/4" and WAIT
RECOMMENDED DRY TIME.

UNLOCKED	13:57:00	223F
Drying	13:57:00	223F
Complete	14:02:02	188F

MAX Temperature	272F
Min Temperature	270F
Condition Time	28:59
Sterilize Time	3:01
Exhaust Time	3:28
Dry Time	5:00
TOTAL CYCLE	0:33:11
Complete	14:02:15 187F

Figure 3-12. Sample Printout, End of Cycle

the time of day is shown in the front panel display.

WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

WARNING - INJURY HAZARD: Do not allow hot bottles to be jolted. This can cause bottle explosions! Do not move bottles if any boiling or bubbling is present.

WARNING - INJURY HAZARD: Allow bottles to cool to touch before attempting to move them from sterilizer shelf or tray(s) to the storage area.

Finally, remove the trays containing sterilized items from the chamber (remember, protective gloves and a face mask are necessary when removing items from the sterilizer).

3.1.5 LIQUID/MEDIA LOSS

Certain biological media may boil more vigorously during slow exhaust because of vented closure being used, and/or ratio of liquid to volume of media container. If excessive liquid/media loss or if media spills are discovered in the bottom of chamber, proceed as follows:

1. Verify that media containers are not overly full. If uncertain about volume of media recommended per container, contact a STERIS Customer Account Representative.
2. Use appropriate vented closure for media being processed.
3. Certain liquid/media processes may require extended exhaust rates beyond standard EXHAUST phase. For additional information, contact a STERIS Customer Account Representative.

NOTE: Chamber, filter and water level probe should be cleaned daily when processing media. See Section 4 for cleaning instructions.

3.2 OPERATING INSTRUCTIONS (EAGLE TEN +)

The Eagle Ten+ allows the user to alter the preset values for sterilize temperature, sterilize time, and dry time for gravity cycles and for sterilize temperature and sterilize time for liquid cycles.

3.2.1 Preparing Unit for Initial Use (see Figure 3-2)

Follow the procedure outlined below closely to ensure proper setup and operation of the sterilizer.

1. Open the sterilizer door (push handle in and slide upward) and remove all chamber contents: trays, videotape, and power cord.
2. Unwrap the loading trays and power cord.
3. Carefully remove bottom shelf from inside the chamber and verify that the filter is connected to the fill port and is resting on bottom of chamber.
4. Verify that the water level tube is in an upright position and secure in its holders.
5. Replace bottom shelf and make sure the front edge of the shelf is inserted into tab for shelf support. Close and lock the chamber door (push handle in and slide downward).
6. Attach the female end of the power cord to the rear of the sterilizer.
7. Plug the male end of the power cord into a dedicated, properly grounded electric outlet of the voltage and current specified on the serial no./ID nameplate (located on inside front panel of sterilizer).
8. Press the RESET rocker switch on the rear of the sterilizer. The front panel display will alternate between OFF and time of day. The optional printer will print "POWER ON".
9. Press the ON/STANDBY touch pad and verify that the indicator light turns on and TIME is displayed.

The heaters will begin to cycle to preheat the chamber. The optional printer will print "CONTROL ON".

10. Set the correct time and date (see Para. 4.1.6. "Setting Time of Day").

⚠ WARNING - INJURY HAZARD: Do not overfill reservoir. To avoid slippery conditions and possible load recontamination, immediately wipe up all spillage resulting from overfilling chamber or reservoir. (Reservoir overflow tube exits on back of unit.)

⚠ CAUTION: To avoid equipment damage, use deionized or distilled water only for filling reservoir and cleaning.

11. Remove the water reservoir cover and slowly fill reservoir with distilled or deionized water (minimum resistivity of one megohm / cm) until water level in the water level tube is between REFILL and MAX indicators. Reservoir capacity is approximately one gallon. DO NOT OVERFILL. Replace the water reservoir cover.

NOTE: Do not add water to reservoir when there is water in the chamber. This may cause an overfill situation during the next cycle.

12. Verify that there are no Error Messages on the front panel display. If there are, consult Section 4 for corrective measures.
13. Press the ON/STANDBY touch pad and verify the indicator light is extinguished. The sterilizer should remain in the STANDBY mode (indicator light off) when the unit is not in use. The RESET rocker switch does not have to be pressed at the end of each day or between cycles.

NOTE: Initial odor (from insulation) will disappear after approximately 24 hours use.

3.2.2 Control Measures for Verifying Sterilization Process

As part of your verification of the sterilization process, biological indicators may be used to demonstrate that sterilization conditions have been met. To conform with AAMI standards, steam sterilizers should be tested weekly; STERIS, however, recommends daily testing to minimize the impact of a possible recall. A live spore test utilizing *B. Stearothermophilus* is the most reliable form of biological monitoring.

3.2.3 Gravity Sterilization

Gravity sterilization is a method of sterilization in which air in the sterilizing chamber is forced out and replaced with saturated steam.

IMPORTANT: Should an abnormal cycle condition occur, it will be displayed as indicated in the "Error Code Troubleshooting Chart" at the end of this section.

PREUSE CHECKOUT PROCEDURE

1. Prior to the first cycle of the day (be sure the chamber is not hot), wipe out the cooled chamber using a clean cloth with deionized or distilled water. Dry the chamber with a lint-free cloth. If the chamber needs cleaning, refer to Para. 4.1.1. ("Daily").

⚠ WARNING - INJURY HAZARD: Do not overfill reservoir. To avoid slippery conditions and possible recontamination, immediately wipe up all spillage resulting from overfilling reservoir. (Reservoir overflow tube exits on back of unit.)

2. Verify that the water reservoir is full (water level between REFILL and MAX indications on the water level tube). If needed, slowly add distilled or deionized water (minimum resistivity of one megohm / cm). Do not overfill. Replace the water reservoir cover.
3. Without closing the chamber door, press the ON / STANDBY touch pad; verify that the indicator light is ON.

PREPARATION

1. Use freshly laundered 140 thread count muslin (or equivalent)*. This helps prevent superheating and provides longer life of the textiles.
2. Limit the size and density of each muslin pack. This ensures complete steam permeation, and assists drying.
3. Limit the size and density of wrapped instrument sets in order to assist in minimizing "wet pack" problems during post sterilization.
4. Do not stack or nest utensils unless they are separated by muslin (or equivalent)*.
5. Use two double-thickness 140 thread count muslin (or equivalent)* wrappers for surgical supplies. This provides protection after sterilization.

⚠ WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

* *Muslin of 140 thread count is the present standard for steam sterilization. The manufacturers of other materials should show data that indicates their product is equivalent to the muslin profile in steam sterilization, drying, and sterility maintenance.*

WARNING - FALL HAZARD: To prevent falls keep floors dry by immediately wiping up any spilled liquids or condensation in sterilizer loading or unloading area.

WARNING - FIRE HAZARD: When sterilizing wrapped goods, do not allow pouches or wraps to touch chamber wall.

WARNING - EXPLOSION HAZARD: Do not operate this sterilizer in the presence of flammable compounds.

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading or cleaning.

LOADING THE TRAYS AND CHAMBER

The following procedure must be followed closely when sterilizing wrapped, unwrapped, and packed goods.

NOTE: When positioning trays, the small tray must always be used under the large tray even if the large tray is the only one containing items to be sterilized. For additional information on sterilization, please consult publication ED-1099.

4. Place items to be sterilized into tray allowing space for proper air removal and steam penetration throughout the load, see Figure 3-4. Pay special attention to the following:
   a. Place all fabric packs on edge and arrange packs for maximum steam exposure.
   b. Place items that might entrap air or water, such as bowls and pitchers, upside down or on edge so they will be sterilized and dried properly (i.e. they will not "catch" condensate during the drying process).
   c. Place instrument sets, unwrapped or wrapped, flat in the tray.
   d. Remove any caps from empty jars, canisters, and nonporous containers and place them upside down in the tray to facilitate sterilization and drying.
   e. Place hard goods (i.e. metallic instruments) on the bottom when processing mixed loads combining fabrics and hard goods. This prevents wetting of wrapped packs from condensed water dripping from the hard goods load.

WARNING - BURN HAZARD: Sterilizer chamber walls and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

5. Carefully insert trays into the sterilizing chamber.
6. Close and lock the chamber door. Verify the door is locked and ready for operation.

PROGRAMMING THE CONTROLLER: GRAVITY CYCLE

WARNING - STERILITY ASSURANCE HAZARD: The cycles listed in Table 3-1 and 3-2 have been validated. If different cycle parameters are required, it is the responsibility of the healthcare facility to validate the cycle to assure that the proper sterility assurance level (SAL) as well as drying efficiency is met.

The following procedure is used to alter preset cycle parameters for a given load (see Figure 3-13 for touch key locations). Consult Table 3-1 for minimum times and temperatures for various load types. Read through the entire procedure prior to programming the controller as there is a five second time limit between steps.

1. After the door is closed, press the STER TIME SET touch pad. The GRAVITY and LIQUID indicator lights will both turn on.
2. Press the GRAVITY touch pad. The LIQUID indicator light will extinguish.
3. Use the increase or decrease keys to set the proper sterilization time for the load (consult Table 3-1 for proper sterilization times).

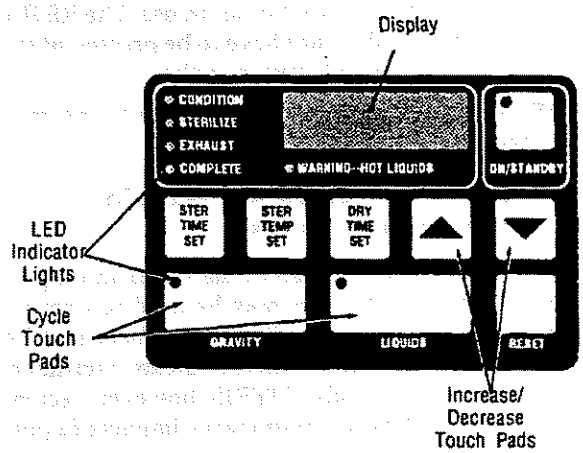


Figure 3-13. Eagle Ten + Control Panel

4. Press the STER TEMP SET touch pad. The GRAVITY and LIQUID indicator lights will both turn on.
5. Press the GRAVITY touch pad. The LIQUID indicator light will extinguish.
6. Use the increase or decrease keys to set the proper sterilization temperature for the load (consult Table 3-1 for proper sterilization temperatures).
7. Press the DRY TIME SET touch pad. The GRAVITY indicator light will turn on.
8. Press the GRAVITY touch pad.
9. Use the increase or decrease keys to set the proper sterilization dry time for the load (consult Table 3-1 for proper sterilization dry times).

INITIATING A GRAVITY CYCLE

NOTE: Pressing the RESET touch pad while a cycle is in progress will always abort the cycle. If a cycle is aborted, the load must be reprocessed.

1. Press the GRAVITY touch pad once to verify settings, set values will be displayed in succession (if incorrect, follow the previous procedure to alter parameters), then again within five seconds to initiate the cycle. The panel will display 'FILL' (it takes one to two minutes to fill).
2. Next, the optional printer will print out relevant data, Figure 3-14.

NOTE: If the cycle does not start when the GRAVITY touch pad is pressed, consult Section 4, "Troubleshooting".

After successfully programming the cycle controller,

```
LOCKED     13:28:32  74F
==========================
==== G R A V I T Y ====
==========================
CYCLE START AT 13:28:42
            ON  3/05/90

CYCLE COUNT          5846
OPERATOR _____________
STERILIZER ___________

STERILIZE TEMP       270F
STERILIZE TIME     3 min
DRY TIME           5 min

PHASE        TIME    TEMP
---------- -------- ----
Fill       13:28:57  75F
```

Figure 3-14. Sample Printout

the Eagle Ten Plus automatically begins the sterilization process (CONDITION, STERILIZE, EXHAUST, DRY, and COMPLETE phases.)

Following this is a brief description of each stage in this process.

3.2.3.1 Condition

During the CONDITION phase, the CONDITION indicator light illuminates and the chamber heater turns on. The temperature is then displayed on the front panel display and rises until the preset sterilization temperature is reached.

If the chamber is cold, allow up to 30 minutes for chamber to reach sterilization temperature.

If the chamber is hot, allow up to 20 minutes for chamber to reach sterilization temperature.

NOTE: If 212°F (100°C) is not reached within 20 minutes or if sterilization temperature is not reached within an additional 15 minutes, the unit will abort the cycle. If this occurs, see Section 4, "Troubleshooting".

NOTE: Once sterilization temperature is reached, verify that the chamber pressure gauge indicates at least the minimum pressure for the cycle selected as shown in Table 3-1. If the pressure is less than specified, press RESET to abort the cycle, then consult Section 4, "Troubleshooting".

3.2.3.2 Sterilize

The STERILIZE indicator light illuminates once the chamber attains the temperature specified through the program control (the time then counts downward from the preset exposure time to zero). During the STERILIZE phase, temperature and time remaining in phase are displayed alternately on the front panel display once sterilization temperature is achieved.

NOTE: Temperature may rise 3-5°F above the preset cycle temperature parameter.

3.2.3.3 Exhaust

The EXHAUST indicator light illuminates once the STERILIZE phase is complete. During the EXHAUST phase, the heater turns off, the chamber exhausts, and the chamber temperature is shown on the front panel display. The buzzer sounds for four (4) seconds when EXHAUST is complete; "door" is shown on the front panel display and the buzzer sounds every minute until the door is opened. Be sure chamber pressure is at zero prior to opening.

At the end of the EXHAUST phase, open the door (push in and lift the handle), then push the door in until it rests against the door latching mechanism

(DO NOT CLOSE DOOR) as pictured in Figure 3-6. The dry heaters will automatically turn on and begin DRY phase.

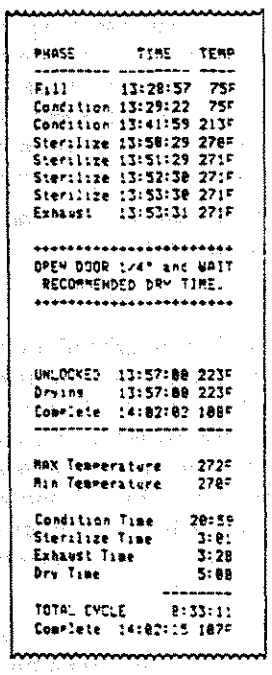
3.1.3.4 Dry

During the DRY phase, the phase time is shown on the front panel display and counts upward (min:sec) until the DRY time specified through the program control is achieved. The operator may terminate the DRY phase at anytime by pressing the ON/STANDBY touch pad. When the touch pad is pressed, or the programmed DRY time is achieved, "donE" appears in the front panel display indicating the phase is complete.

3.1.3.5 Complete

Once the DRY phase is complete, the COMPLETE indicator light illuminates and the "donE" appears in the front panel display. The optional printer also prints out pertinent cycle information as shown in Figure 3-15.

Pressing the RESET touch key completes the cycle and the time of day is shown in the front panel display.



PHASE	TIME	TEMP
Fill	13:28:57	75F
Condition	13:29:22	75F
Condition	13:41:59	213F
Sterilize	13:50:29	270F
Sterilize	13:51:29	271F
Sterilize	13:52:30	271F
Sterilize	13:53:30	271F
Exhaust	13:53:31	271F

OPEN DOOR 1/4" and WAIT
RECOMMENDED DRY TIME.

UNLOCKED	13:57:00	223F
Drying	13:57:00	223F
Complete	14:02:02	108F

MAX Temperature	272F
Min Temperature	270F
Condition Time	20:59
Sterilize Time	3:01
Exhaust Time	3:28
Dry Time	5:00
TOTAL CYCLE	0:33:11
Complete	14:02:15 107F

Figure 3-15. Sample Printout, End of Cycle

WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

Finally, remove the tray containing the sterilized items from the chamber (remember, protective gloves are necessary when removing items from the sterilizer).

Visually check outside of wrapper for dryness. A pack or instrument tray is considered unacceptable if there are water droplets or visible moisture on the exterior of the package or on the tape used to secure it.

Transfer to surface which is well padded with fabric to prevent condensation. Do not place on a cold surface. Be sure there is no air conditioning or cold air vents in close proximity.

Remove packs or instrument trays from padded surface when they have reached ambient (room) temperature.

NOTE: A small puddle of water may be found on the counter when the door is opened at the end of a cycle due to steam condensation on the door and gasket.

3.2.4 LIQUID STERILIZATION

Liquid sterilization is accomplished by utilizing a specially designated sterilization cycle.

WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading or cleaning.

WARNING - BURN HAZARD: It is inappropriate to sterilize liquids intended for direct patient contact.

WARNING - INJURY HAZARD: Use only vented closures - do not use screw caps or rubber stoppers with crimped seals.

WARNING - INJURY HAZARD: Use only Type I borosilicate glass bottles - do not use ordinary glass jugs or any container not designed for sterilization.

WARNING - INJURY HAZARD: Open door slowly at the end of a liquid sterilization cycle. Do not allow hot bottles to be jolted. This can cause bottle explosions! Do not move bottles if any boiling or bubbling is present.

WARNING - INJURY HAZARD: Allow bottles to cool to touch before attempting to move them from sterilizer shelf or trays(s) to the storage area.

WARNING - INJURY HAZARD: To prevent falls, keep floors dry by immediately wiping up any spilled liquids or condensation in the sterilizer loading or unloading area.

If media is processed, bottles and tubes should contain no more than 1/2 the total volume of the container. When processing water bottles and test tubes, the bottles and tubes should contain no more than 3/4 the total volume of the container. Chamber, filter, and water level probe should be cleaned daily when processing media.

WARNING - EXPLOSION HAZARD: This sterilizer is not designed to process flammable liquids.

WARNING - EXPLOSION HAZARD: Do not operate this sterilizer in the presence of flammable compounds.

CAUTION: Sterilization of chloride-containing solutions can cause chamber corrosion and is not recommended by the manufacturer. However, if chloride-containing solutions must be processed, clean the chamber, filter, and water level probe after each use.

PREUSE CHECKOUT PROCEDURE

1. Prior to the first cycle of the day (be sure the chamber is not hot), wipe out the cooled chamber using a clean cloth with deionized or distilled water. Dry the chamber with a lint-free cloth. If the chamber needs cleaning, refer to Para. 4.1.1 ("Daily").

WARNING - INJURY HAZARD: Do not overfill reservoir. To avoid slippery conditions and possible load recontamination, immediately wipe up all spillage resulting from overfilling chamber or reservoir. (Reservoir overflow tube exits on back of unit.)

2. Verify that the water reservoir is full (water level should be between REFILL and MAX indications on the water level tube). If needed, slowly add distilled or deionized water (minimum resistivity of one megohm / cm). Do not overfill. Replace the water reservoir cover.
3. Without closing the chamber door, press the ON / STANDBY touch pad; verify that the indicator light is ON.

WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

LOADING THE TRAY AND CHAMBER

The following procedure must be followed precisely when sterilizing liquids.

NOTE: When positioning trays, the small tray must always be used under the large tray even if the large tray is the only one containing items to be sterilized. For additional information on sterilization, please consult publication ED-1099.

4. Place items to be sterilized into tray allowing space for proper air removal and steam circulation between items, see Figure 3-9. Only use Type I borosilicate glass containers and do not overload the trays, see Figure 3-10.
5. Carefully insert trays into the sterilizing chamber.
6. Close and lock the chamber door.

PROGRAMMING THE CYCLE CONTROLLER

WARNING - STERILITY ASSURANCE HAZARD: The cycles listed in Tables 3-1 and 3-2 have been validated. If different cycle parameters are required, it is the responsibility of the healthcare facility to validate the cycle to assure that the proper sterility assurance level (SAL) as well as drying efficiency is met.

The following procedure is used to alter preset cycle parameters for a given load (see Figure 3-13 for touch key locations). Consult Table 3-2 for minimum time and temperature. Read through the entire procedure prior to programming the controller as there is a five second time limit between steps.

1. After the door is closed, press the STER TIME SET touch pad. The GRAVITY and LIQUID Indicator lights will both turn on.
2. Press the LIQUID touch pad. The GRAVITY Indicator light will extinguish.
3. Use the increase or decrease keys to set the proper sterilization time for the load (consult Table 3-2 for proper sterilization time).
4. Press the STER TEMP SET touch pad. The GRAVITY and LIQUID indicator lights will both turn on.

5. Press the LIQUID touch pad. The GRAVITY indicator light will extinguish.
6. Use the increase or decrease keys to set the proper sterilization temperature for the load (consult Table 3-2 for proper sterilization temperature).

INITIATING A LIQUID CYCLE

NOTE: Pressing the RESET touch pad while a cycle is in progress will always abort the cycle. If a cycle is aborted, the load must be reprocessed.

1. Press the LIQUID touch pad once, to verify settings, set values will be displayed in succession (if incorrect, follow the previous procedure to alter parameters), then again within five seconds to initiate the cycle. The panel will display "FILL" (it takes one to two minutes to fill).
8. Next, the optional printer will print relevant data in the format shown in Figure 3-16.

```
LOCKED     13:58:59 137F

========================
==== L I Q U I D S ====
========================
CYCLE START AT 13:59:05
            ON  2/27/90

CYCLE COUNT          5823
OPERATOR _____________
STERILIZER ___________

STERILIZE TEMP       250F
STERILIZE TIME     40 min

PHASE         TIME    TEMP
--------- -------- ----
Fill       13:59:19 154F
```

Figure 3-16. Sample Printout

NOTE: If the cycle does not start when the LIQUID touch pad is pressed, consult Section 4, "Troubleshooting".

After successfully starting the cycle controller, the Eagle Ten Plus automatically begins the sterilization process (CONDITION, STERILIZE, EXHAUST, COOL, and COMPLETE phases.)

Following is a brief description of each stage in this process.

3.2.4.1 Condition

During the CONDITION phase, the CONDITION and WARNING-HOT LIQUIDS indicator lights illuminate and the chamber heater turns on. The temperature is then displayed on the front panel display and rises until the preset sterilization temperature is reached.

If the chamber is cold, allow up to 30 minutes for chamber to reach sterilization temperature.

If the chamber is hot, allow up to 20 minutes for chamber to reach sterilization temperature.

NOTE: If 212°F (100°C) is not reached within 20 minutes or if sterilization temperature is not reached within an additional 15 minutes, the unit will abort the cycle. If this occurs, see Section 4, "Troubleshooting".

NOTE: Once sterilization temperature is reached (250°F, 121°C), verify that the chamber pressure gauge indicates at least the minimum pressure for the cycle selected as shown in Table 3-2. If the pressure is less than specified, press RESET to abort the cycle, then consult Section 4, "Troubleshooting".

3.2.4.2 Sterilize

The STERILIZE indicator light illuminates once the chamber attains the temperature specified through the program control (the time then counts downward from the preset exposure time to zero). During the STERILIZE phase, temperature and time remaining in phase are displayed alternately on the front panel display once sterilization temperature is achieved.

NOTE: Temperature may rise 3-5°F above preset cycle temperature parameter.

3.1.4.3 Exhaust

The EXHAUST indicator light illuminates once the STERILIZE phase is completed. During the EXHAUST phase, the heater turns off, the chamber exhausts, and the chamber temperature is shown on the front panel display.

The buzzer sounds for four (4) seconds, when EXHAUST is complete; "door" is shown on the front panel display and the buzzer sounds every minute until the door is opened. Be sure chamber pressure is at zero prior to opening.

Open the door (push in and lift the handle), then push the door in until it rests against the door latching mechanism (DO NOT CLOSE DOOR) as shown in Figure 3-6.

3.1.4.4 Cool

During the COOL phase, the phase time is shown on the front panel display and counts upward (10 min.)

until the COOL time automatically specified by program control is achieved.

3.1.3.5 Complete

Once the COOL phase is complete, the COMPLETE indicator light illuminates and the "donE" appears in the front panel display. The optional printer also prints out pertinent cycle information as shown in Figure 3-17.

Pressing the RESET touch key completes the cycle and the time of day is shown in the front panel display.

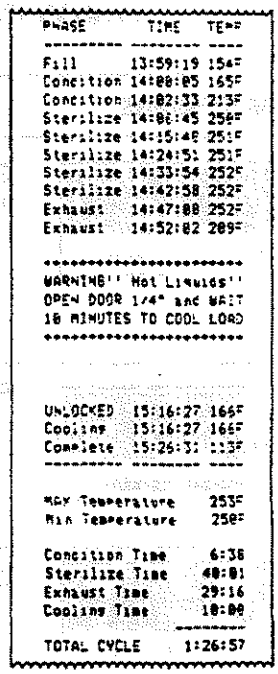
⚠ WARNING - BURN HAZARD: Sterilizer and trays will be hot after cycle is run. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron should also be worn when reloading a sterilizer following previous operation.

⚠ WARNING - INJURY HAZARD: Do not allow hot bottles to be jolted. This can cause bottle explosions! Do not move bottles if any boiling or bubbling is present.

⚠ WARNING - INJURY HAZARD: Allow bottles to cool to touch before attempting to move them from sterilizer shelf or tray(s) to the storage area.

Finally, remove the trays containing sterilized items from the chamber (remember, protective gloves and a face mask are necessary when removing items from the sterilizer).

NOTE: A small puddle of water may be found on the counter when the door is opened at the end of a cycle due to steam condensation on the door and gasket.



PHASE	TIME	TEMP
Fill	13:59:19	154F
Condition	14:00:05	165F
Condition	14:02:33	213F
Sterilize	14:06:45	250F
Sterilize	14:15:48	251F
Sterilize	14:24:51	251F
Sterilize	14:33:54	252F
Sterilize	14:42:58	252F
Exhaust	14:47:00	252F
Exhaust	14:52:02	209F

****
WARNING!! Hot Liquids!!
OPEN DOOR 1/4" and WAIT
10 MINUTES TO COOL LOAD
****

UNLOCKED	15:16:27	166F
Cooling	15:16:27	166F
Complete	15:26:31	113F

Max Temperature	253F
Min Temperature	250F

Condition Time	6:38
Sterilize Time	40:01
Exhaust Time	29:16
Cooling Time	10:00
TOTAL CYCLE	1:26:57

Figure 3-17. Sample Printout, End of Cycle

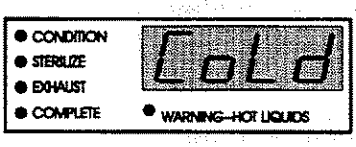
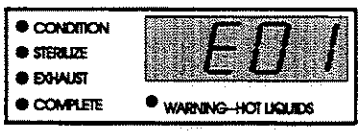
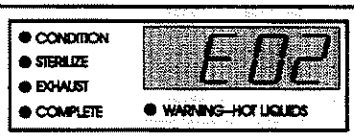
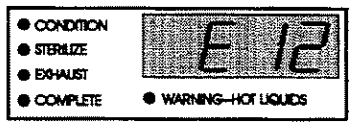
3.2.5 LIQUID/MEDIA LOSS

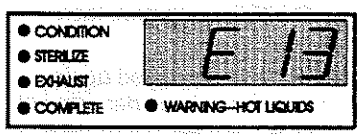
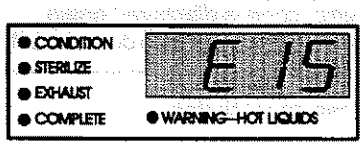
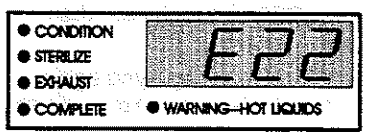
See Paragraph 3.1.5

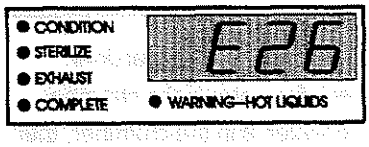
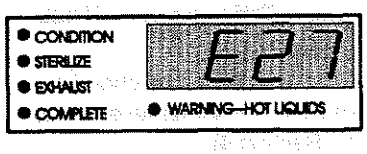
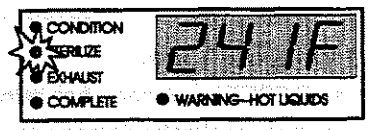
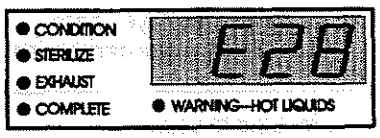
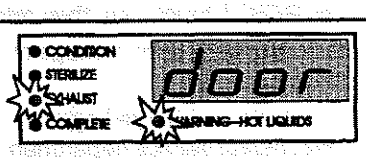
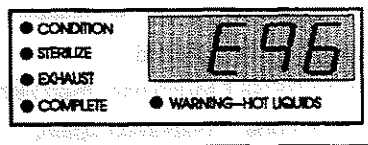
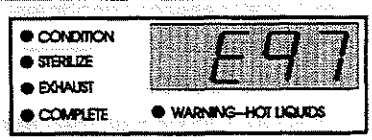
3.3 ERROR CODES

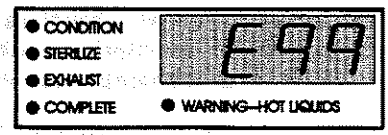
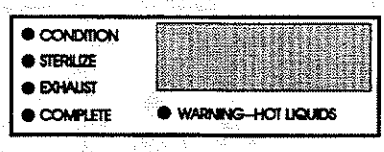
If any error codes appear on the display panel during sterilizer operation, users should consult the Error Code Troubleshooting Chart on the following pages for corrective actions.

ERROR CODE TROUBLESHOOTING CHART

ERROR MESSAGE	EXPLANATION	OPERATOR ACTION
	Chamber temperature is less than 60°F	• Open door and wait for unit to warm-up ("COLD" clears when chamber is greater than 60°F, and there is no mechanical problem). • If "COLD" does not clear, contact dealer service department
	Shorted temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.
	Open temperature sensor.	• Open the door and allow unit to stabilize at room temperature. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.
	Level sensor detects water in chamber. Possible water sensor failure.	• Open door and remove trays and shelf. If water present (correct water level is when heater is completely immersed in water), replace shelf and trays and start a cycle. • If no water present, clean water level sensor (See Section 4.1.4.2). • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.
	Shorted temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.
	Open temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.

ERROR MESSAGE	EXPLANATION	OPERATOR ACTION
	Water level sensor failure or insufficient water in chamber.	• Carefully open chamber door. • Check for water in the chamber. • If no water is in the chamber, then check reservoir for adequate supply. Slowly refill if necessary. If not, clean the filter. • If there is water in the chamber, then clean the water level sensor (See Section 4). • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.
	Heating problem.	• Wait for tone to sound. • Press RESET touch pad, then retry. • Check door gasket for damage or dirt build-up. • If error code is displayed again, contact dealer service department.
	Unit fails to reach sterilization temperature in allotted time.	• Wait for tone to sound. • Press RESET touch pad, then retry. • Check door gasket for damage or dirt build-up. • If error code is displayed again, contact dealer service department.
	Door unlocked during condition phase.	• Wait for tone to sound. • Press RESET touch pad then retry. • If error code is displayed again, contact dealer service department.
	Shorted temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.
	Open temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.

ERROR MESSAGE	EXPLANATION	OPERATOR ACTION
	Door unlocked during sterilize phase.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.
	Failed to maintain temperature set point.	• Wait for tone to sound. • Press RESET touch pad, then retry. • Check door gasket for damage/ dirt. Replace if necessary. • If error code is displayed again, contact dealer service department.
	Temperature has dropped below set point (blinking sterilizer indicator light). The timer resets and cycle will resume when preset temperature is achieved.	• Monitor cycle.
	Over temperature (cycle will abort).	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.
	Door unlocked at cycle start. Door locked during exhaust or dry phase.	• Close and lock door. • Unlock and open dor 1/4 inch.
	Power failure during cycle.	• Check for DRY (Gravity) or COOL (Liquid) load. If load still wet, let it DRY or COOL.
	Power failure during cycle.	• Load must be reprocessed.
	Power failure during cycle.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.

ERROR MESSAGE	EXPLANATION	OPERATOR ACTION
	Abnormal rapid rise in temperature (> 10° in 10 seconds).	• Wait for tone to sound. • Press RESET touch pad, then retry. • Check for water in reservoir. • Slowly fill if water is needed. • If error code is displayed again, contact dealer service department.
	RESET touch pad was pressed during a cycle.	• Wait for tone to sound. • Press RESET touch pad to clear.
	Chamber temperature exceeded 395 degrees.	• Press main reset switch on rear of unit. • Allow unit to cool. • Reprocess the load. • Rerun the selected cycle. • If display is blank again, contact dealer service department.

Section 4: Inspection and Maintenance

WARNING - INJURY HAZARD: Repairs and adjustments, other than those described in these instructions, should be attempted only by experienced mechanics fully acquainted with this equipment. Use of inexperienced, unqualified persons to work on the equipment or the installation of unauthorized parts could cause personal injury or result in costly damage.

4.0 GENERAL

The following maintenance procedures and intervals are recommended for safe and proper operation. This frequency is the minimum and should be increased with usage of the sterilizer.

A Preventive Maintenance Agreement is available whereby maintenance, adjustments, and replacement of worn parts are performed by a qualified technician on a scheduled basis to assure peak equipment performance and to avoid unscheduled downtime. Contact your STERIS or dealer representative for more information.

Paragraph 4.2 is a Preventive Maintenance Guide which we suggest the facility keep. Such a guide will prove helpful in ensuring regular maintenance.

NOTE: Quarterly and semiannual maintenance procedures require reference to the Maintenance Manual and should only be performed by a qualified technician.

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading, performing maintenance, or cleaning.

4.1 ROUTINE MAINTENANCE

CAUTION: To avoid equipment damage, use deionized or distilled water only for filling reservoir and cleaning.

CAUTION: Sterilization of chloride-containing solutions can cause chamber corrosion and is not recommended by the manufacturer. However, if chloride-containing solutions must be processed, clean the chamber, filter, and water level probe after each use.

4.1.1 Daily (see Figure 4-1)

1. Inspect cabinetry for signs of damage or misaligned parts.
2. Remove bottom shelf and trays from chamber. Use only deionized or distilled water to wash the inside of sterilizer, bottom shelf, and trays with a damp cloth, and, if necessary, a mild detergent solution (products are available from your local STERIS or dealer representative). When cleaning, be careful not to damage the three sensors located to the left of the heating element.

CAUTION: Never use wire brushes, abrasives, steel wool, or chloride-containing products to clean door and chamber assembly.

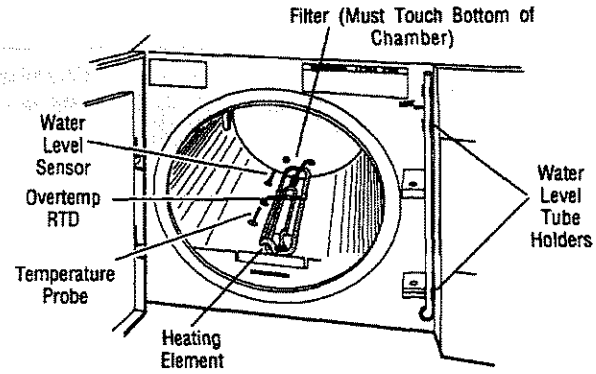


Figure 4.1. Cleaning the Chamber

3. Rinse chamber thoroughly with deionized or distilled water to remove all detergent residue.
4. Dry chamber with a lint-free cloth.
5. Verify that the filter is securely in place and is resting on the bottom of the chamber.
6. Check door gasket and wipe clean with a damp cloth. Replace it if it has become deformed, brittle, cracked, or leaks under pressure (see "Replacing Door Gasket").

NOTE: Clean chamber after each use if sterilizing chloride-containing solutions.

4.1.2 Weekly (see Figure 4-2)

NOTE: When draining reservoir, drain water into at least a one-gallon container. Wipe up any spilled water.

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading or cleaning.

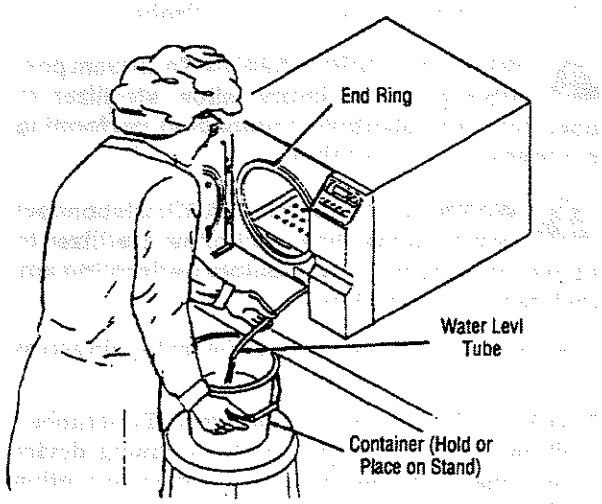


Figure 4-2. Draining Chamber

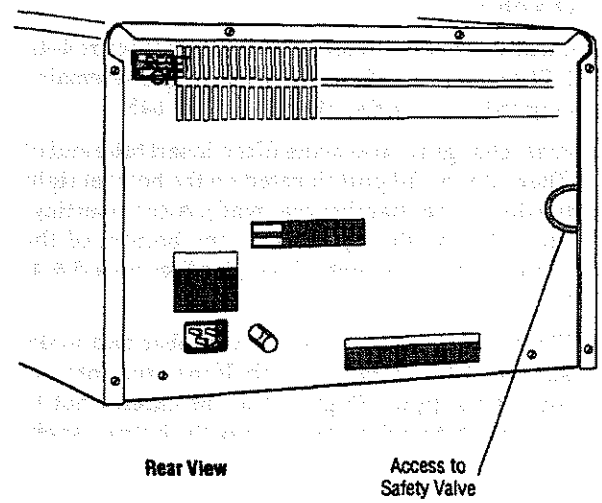


Figure 4-3. Checking Chamber Safety Valve

CAUTION: Never use wire brushes, abrasives, steel wool, or chloride-containing products to clean door and chamber.

1. Place or hold a container directly in front of the sterilizer below countertop level. The sterilizer should be positioned about six inches from the edge of the countertop.
2. Drain the reservoir by opening chamber door and removing water level tube from its holders, then twist elbow fitting 90° to the left. With forefinger covering the end of tube, lower tube into the container to drain the reservoir.
3. Reinstall the water level tube into its holders.
4. Check that the door gasket is not sticking to the end ring. Clean the end ring with a damp cloth or, if necessary, with a mild detergent solution (products are available from your local STERIS or dealer representative).
5. Clean the chamber filter by reverse flushing with water. Refer to Cleaning/Replacing the Chamber Filter.

4.1.3 Quarterly

Check chamber safety valve (Figure 4-3) as follows:

1. Verify sterilizer is cool.
2. Inspect safety valve for accumulations of rust, scale or other foreign substances which would prevent free operation of the valve. The opening of discharge pipe must be clear and free from restrictions.
3. Operate safety valve several times. The pull ring should move freely and return to the closed position after each operation.
4. Follow operating instructions found in Section 3 and allow chamber to reach operating pressure.

WARNING - BURN HAZARD: Beware of steam escaping from safety valve. To prevent burns, wear gloves or use an extension device if it becomes necessary to operate the pull ring.

5. Check safety valve for steam leakage. If valve is leaking, operate the pull ring several times to see if the leakage will stop. **Avoid letting moisture get under insulation on chamber.**
6. If leakage continues, discontinue operation of sterilizer and replace the safety valve.

4.1.4 As Necessary

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading or cleaning.

WARNING - INJURY HAZARD: Disconnect power to sterilizer and allow sterilizer to cool to room temperature before performing any maintenance procedure.

4.1.4.1 Cleaning Chamber Filter

1. Remove bottom shelf from chamber to gain access to the filter.

2. Pull filter out of fill port on the back wall of the chamber.
3. Clean by reverse flushing with water (Figure 4-4). If filter cannot be effectively cleaned, (i.e. it remains clogged) replace the filter, P-129357-645.
4. After changing / replacing filter, insert tube end of filter into the fill port (located on the bottom right portion of the chamber rear wall). After inserting, turn filter so the tip rests on the bottom of the chamber near the center line. (See Figures 4-5 & 4-6).
5. Place bottom shelf back into chamber and make sure the front edge of the shelf inserted into tab for shelf support (Figure 4-6). Be careful not to dislodge filter when reinserting the bottom shelf.

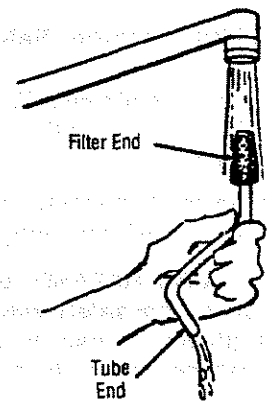


Figure 4-4. Reverse-Flushing Filter

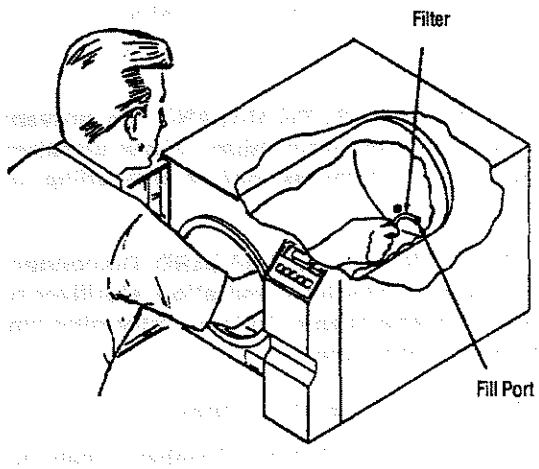


Figure 4-5. Re-Inserting Filter

4.1.4.2 Cleaning Water Level Probe

⚠ WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading, performing maintenance, or cleaning.

⚠ WARNING - INJURY HAZARD: Disconnect power to sterilizer and allow sterilizer to cool to room temperature before performing any maintenance procedure.

1. Remove bottom shelf from chamber to gain access to the water level probe.
2. Using a damp cloth or a non-metallic scrubber, clean the probe by placing the cleaning device over the probe and rotating in a circular motion (Figure 4-7).

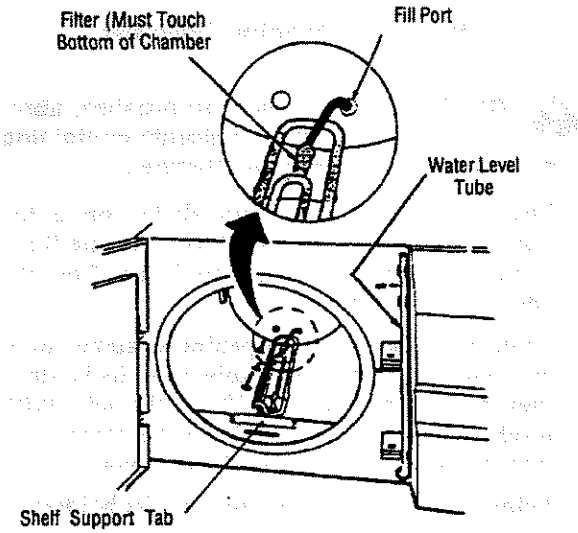


Figure 4-6. Proper Filter Placement

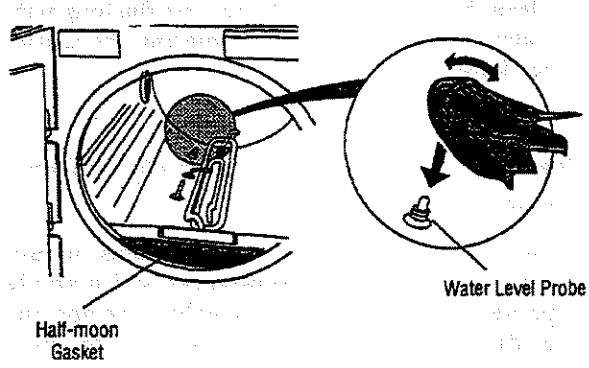


Figure 4-7. Clean Water Level Probe

3. If no water is present and the probe is dry and clean, Error code "03" should clear from the display. If the Error Code remains, contact the dealer service representative.
4. Place bottom shelf back into chamber and make sure the front edge of the shelf is inserted into tab for shelf support. Be careful not to dislodge filter when reinserting the bottom shelf.

4.1.4.3 Cleaning Media Spills and Clogged Piping

⚠ WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading, performing maintenance, or cleaning.

⚠ WARNING - INJURY HAZARD: Disconnect power to sterilizer and allow sterilizer to cool to room temperature before performing any maintenance procedure.

This procedure should be followed when piping is suspected to be clogged with media.

1. Open door and manually fill chamber with deionized water until the heater is covered with water.
2. Close and lock the chamber door.
3. Start a 270°F, 3 minute cycle. The "03" error message will appear on the display prior to starting cycle.
4. After the cycle is complete (and the chamber is cool), drain the reservoir, then clean the chamber, filter, door gasket, and water level sensor as described earlier in this section.

4.1.5 Replacing Printer Paper (if unit equipped with printer)

For quick reference, see Threading Diagram, Figure 4-8.

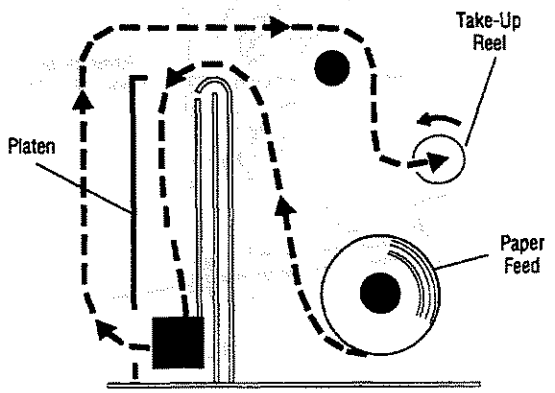


Figure 4-8. Threading Diagram

1. Pull out printer assembly (Figure 4-9).
   a. Open printer door by gently grasping both sides and pulling down.
   b. Slide printer assembly out of unit.
   c. Hold printer by the motor and remove take-up reel with used printer paper.
   d. Remove used printer paper from take-up reel and file.
2. Install new paper spool onto paper feed post (Figure 4-10).

NOTE: Check that the paper roll is positioned correctly. Thermal paper will not print if paper roll is inserted backwards.

3. Swing platen down (Figure 4-11).
   a. Pull approximately eight inches of paper out from roll and feed under guide post.
   b. Fold and crease paper end into a point.
4. Slide pointed end of paper into slot at top of printer until it exits from the front side of printer (Figure 4-12).
   a. Paper should extend out from printer approx. 1 inch.
5. Raise platen to operating position (Figure 4-13).
   a. Pointed end of paper should thread itself through slot in platen.
   b. Platen will snap in place under clip.
6. Grasp pointed end of paper, and in an upward motion to protect print head, pull out 10 to 12 inches of paper (Figure 4-14).
7. Insert pointed end of paper into slot of take-up reel and rotate in the direction shown to secure paper in slot (Figure 4-15).
8. Reinstall take-up reel onto the upper spindle (Figure 4-16).
   a. Slide printer assembly into unit and close printer door.

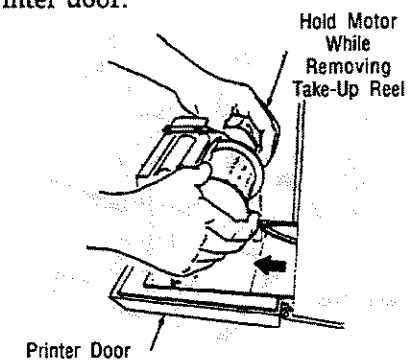


Figure 4-9.

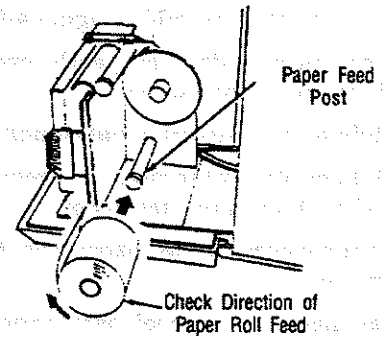


Figure 4-10.

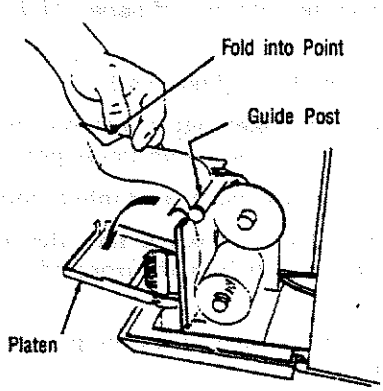


Figure 4-11.

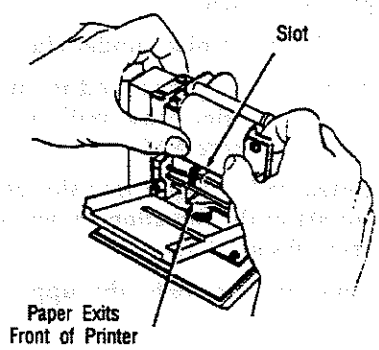


Figure 4-12.

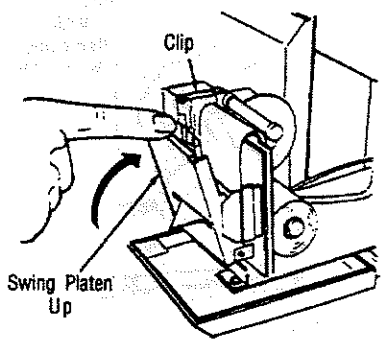


Figure 4-13.

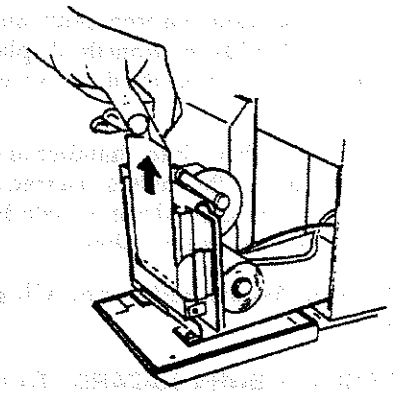


Figure 4-14.

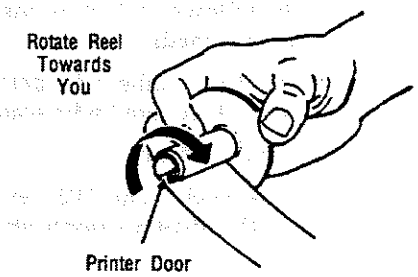


Figure 4-15.

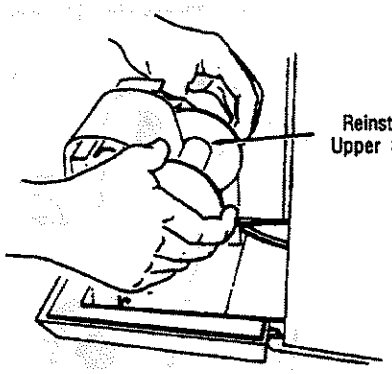


Figure 4-16.

4.1.6 Cleaning/Replacing Door Gasket

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading, performing maintenance, or cleaning.

WARNING - INJURY HAZARD: Disconnect power to sterilizer and allow sterilizer to cool to room temperature before performing any maintenance procedure.

CAUTION: Never use wire brushes, abrasives, steel wool, or chloride-containing products to clean door and chamber.

1. Door gasket, end ring and gasket groove must be completely clean or leaking may occur. To clean, thoroughly wipe each item with a damp lint-free cloth.

NOTE: Even small particle build-up may cause leakage. A thorough examination of the gasket, end ring and gasket groove is necessary before continuing operation.

2. If gasket cannot be effectively cleaned, remove and discard the old gasket (Figure 4-17).
3. Clean slot and end ring with a damp cloth.
4. Wipe the new gasket, P-426637-261, clean with a damp cloth. Then slide the outer edge of gasket into the door slot a short section at a time without stretching it in the process. Should the gasket appear too long, DO NOT CUT IT. Start the process again, compressing short sections into slot, until the entire length is inserted (Figure 4-17).
5. Check that the gasket is fully inserted into door slot around the entire perimeter (Figure 4-17).

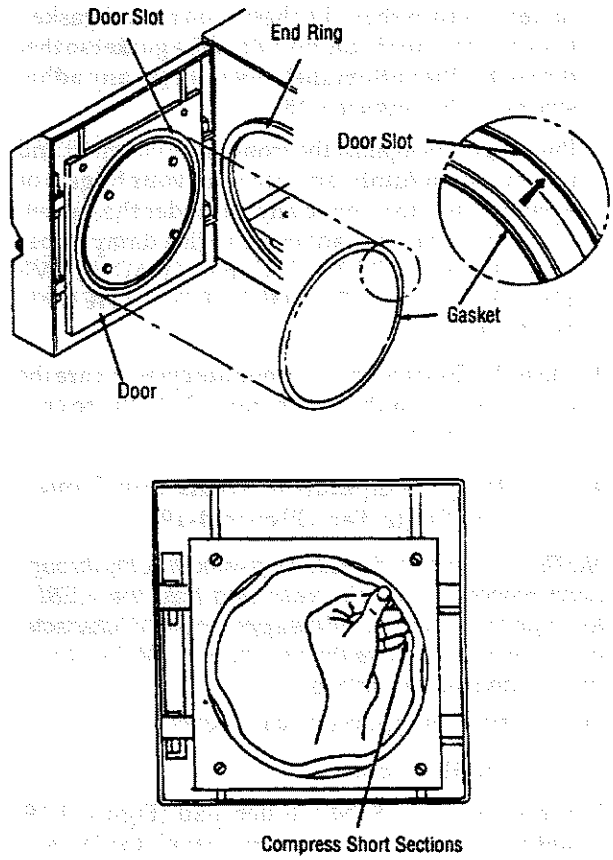


Figure 4-17. Door Gasket Replacement

4.1.7 Half-moon Gasket Installation Instructions

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading, performing maintenance, or cleaning.

WARNING - INJURY HAZARD: Disconnect power to sterilizer and allow sterilizer to cool to room temperature before performing any maintenance procedure.

1. Peel off the gasket that is being replaced. Clean off the remaining adhesive by rubbing with your finger or paper towel.
2. Apply a thin layer of adhesive to the chamber wall, as shown in Figure 4-18. Apply the adhesive in the

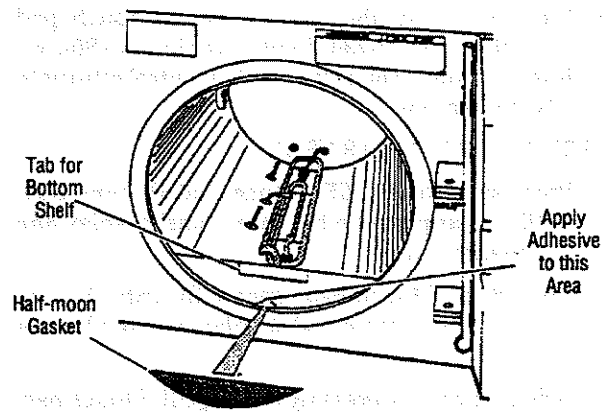


Figure 4-18. Install Half-moon Gasket

same pattern as the old adhesive on the old gasket. Leave a bare area in the middle of the gasket so that the tab for the bottom shelf does not get any adhesive on it. (See Figure 4-18)

3. Put the gasket against the front of the chamber and press it down firmly, smooth with your fingers or a paper towel to remove any air under the gasket. Wipe off any excess adhesive with a damp paper towel. BE SURE TO WIPE OFF ANY ADHESIVE THAT ROLLED ONTO THE TAB FOR THE BOTTOM SHELF.
4. Close the door and run a 10 minute cycle to cure the adhesive. (The adhesive requires 24 hours to cure at room temperature.)

4.1.8 Setting Temperature Units and Time/ Date, Eagle Ten (Figure 4-19)

NOTE: To set any of the following without going through each procedure, simply press and hold the RESET touch pad repeatedly until the appropriate "F" character is displayed. Then use the LIQUIDS or PACKS touch pads to change the setting.

SELECTING TEMPERATURE UNITS

1. Open sterilizer door.
2. Press and hold RESET touch pad (Figure 4-19) until -F1- appears on the front panel display and the buzzer sounds.
3. Press any cycle select touch pad to change the temperature units from degrees C to F or degrees F to C and set to the user's personal preference.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

SETTING CALENDAR YEAR

1. Press and hold RESET touch pad (Figure 4-19) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly until -F2- appears on the front panel display and the buzzer sounds.
3. Advance year by pressing the LIQUIDS touch pad. Decrease year by pressing the PACKS touch pad. Range is 00-99.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

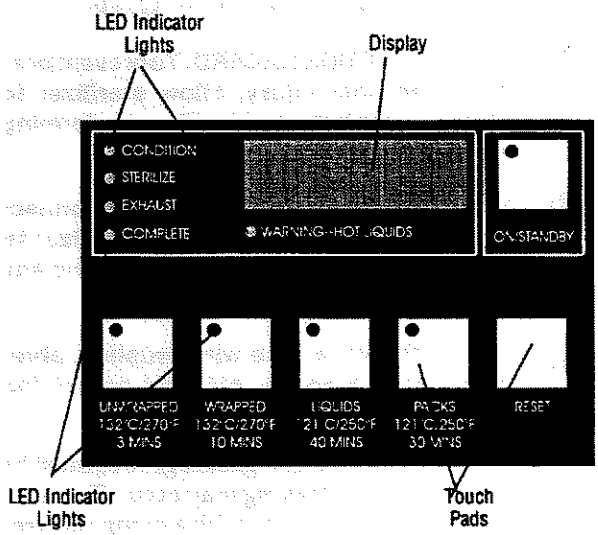


Figure 4-19. Eagle Ten Control Panel

SETTING CALENDAR MONTH

1. Press and hold RESET touch pad (Figure 4-19) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly until -F3- appears on the front panel display and the buzzer sounds.
3. Advance month by pressing the LIQUIDS touch pad. Decrease month by pressing the PACKS touch pad. Range is 01-12.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

SETTING CALENDAR DAY

1. Press and hold RESET touch pad (Figure 4-19) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly (Figure. 4-19) until -F4- appears on the front panel display and the buzzer sounds.
3. Advance day by pressing the LIQUIDS touch pad. Decrease day by pressing the PACKS touch pad. Range is 01-31.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

SETTING CALENDAR HOUR

1. Press and hold RESET touch pad (Figure 4-19) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly (Figure 4-19) until -F5- appears on the front panel display and the buzzer sounds.
3. Advance hour by pressing the LIQUIDS touch pad. Decrease hour by pressing the PACKS touch pad. Range is 00-24.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

SETTING CALENDAR MINUTE

1. Press and hold RESET touch pad (Figure 4-16) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly (Figure 4-19) until -F6- appears on the front panel display and the buzzer sounds.
3. Advance minute by pressing the LIQUIDS touch pad. Decrease minute by pressing the PACKS touch pad. Range is 00-59.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

4.1.9 Verifying and Setting Control Parameters, Eagle Ten + (Figure 4-20)

SELECTING TEMPERATURE UNITS

1. Open sterilizer door.
2. Press and hold the RESET touch pad (Figure 420) until -F1- appears on the front pane and the buzzer sounds.
3. Press either the increase or decrease touch pad to change the temperature units from degrees C to F or degrees F to C and set to the user's personal preference.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon as the buzzer sounds. Control returns to ON ready mode.

SETTING CALENDAR YEAR

1. Press and hold RESET touch pad (Figure 4-20) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly (Figure 4-20) until -F2- appears on the front panel display and the buzzer sounds.
3. Advance year by pressing the increase touch pad. Decrease year by pressing the decrease touch pad. Range is 00-99.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

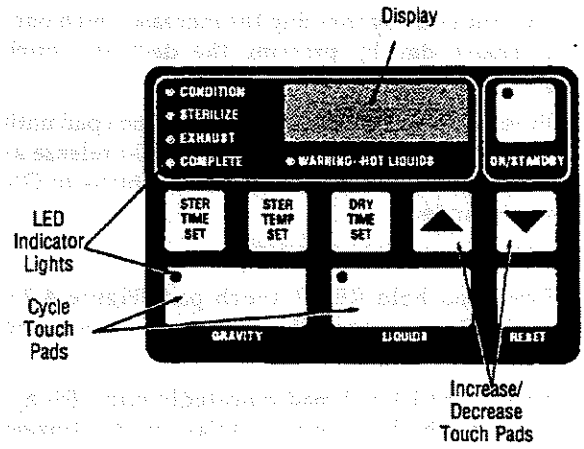


Figure 4-20. Eagle Ten + Control Panel

SETTING CALENDAR MONTH

1. Press and hold RESET touch pad (Figure 4-20) until -F1- appears on the front panel display and the tone sounds.
2. Press RESET touch pad repeatedly until -F3- appears on the front panel display and the buzzer sounds.
3. Advance month by pressing the increase touch pad. Decrease month by pressing the decrease touch pad. Range is 01-12.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

SETTING CALENDAR DAY

1. Press and hold RESET touch pad (Figure 4-20) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly until -F4- appears on the front panel display and the buzzer sounds.

3. Advance day by pressing the increase touch pad. Decrease day by pressing the decrease touch pad. Range is 01-31.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

SETTING CALENDAR HOUR

1. Press and hold RESET touch pad (Figure 4-20) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly until -F5- appears on the front panel display and the buzzer sounds.
3. Advance hour by pressing the increase touch pad. Decrease hour by pressing the decrease touch pad. Range is 00-24.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

SETTING CALENDAR MINUTE

1. Press and hold RESET touch pad (Figure 4-20) until -F1- appears on the front panel display and the buzzer sounds.
2. Press RESET touch pad repeatedly until -F6- appears on the front panel display and the buzzer sounds.
3. Advance minute by pressing the increase touch pad. Decrease minute by pressing the decrease touch pad. Range is 00-59.
4. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon the buzzer sounds. Control returns to ON ready mode.

4.2 SERVICE DIAGNOSTIC TESTS (EAGLE TEN AND EAGLE TEN +)

4.2.1 Verifying Touch Panel LED's

1. Press and hold RESET touch pad repeatedly (Figure 4-19 or 4-20) until -F7- appears on the front panel display. Hold until the buzzer sounds.
2. ON/STANDBY and all cycle select LED's will illuminate.
3. Press and hold any cycle select touch pad; all remaining panel lights will illuminate and the ON/STANDBY and cycle select LED's will extinguish.

4.2.2 Verifying Door Switch and Water Level Probe

1. Press and hold RESET touch pad repeatedly (Figure 4-19 or 4-20) until -F7- appears on the front panel display. Hold until the buzzer sounds.
2. Simultaneously press and hold the RESET and ON/STANDBY touch pads until -F8- appears on the display; release when buzzer sounds.
3. After the tone sounds, the display shows the status of the Door Limit Switch and Water Level Sensor as "1 1"; 1 signifying an open switch and 0 signifying a closed switch.
4. Activate the door limit switch; first digit must read "0". Deactivate the door limit switch; first digit must read "1".
5. Simultaneously touch the end of the water level sensor and inside chamber wall; second digit must read "0". Release and the second digit must read "1".
6. Press and hold RESET touch pad until -F8- appears on display. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon as the buzzer sounds. Control returns to ON ready mode.

4.2.1 Verifying Heater, Relay, and Valve Functions

1. Press and hold RESET touch pad repeatedly (Figure 4-19 or 4-20) until -F7- appears on the front panel display. Hold until the buzzer sounds.
2. Simultaneously press and hold the RESET and ON/STANDBY touch pads until -F8- appears on the display; press and hold RESET touch pad until -F9- appears, release when buzzer sounds.
3. Press and release WRAPPED touch pad (STER TIME SET on Eagle Ten+); audible click verifies that relay is activated. Second digit on the display must be "1".
4. Press and release UNWRAPPED touch pad (STER TEMP SET on Eagle Ten+); first digit on the display must be "1" indicating that the heater is activated. Immediately press and release the WRAPPED and UNWRAPPED touch pads to turn off the relay and heater; first two digits will be "0 0".
5. Press and release LIQUIDS touch pad (DRY TIME SET on Eagle Ten+); third digit on display must read "1". To activate the fill valve (indicated by an audible click), touch top of solenoid core with a screwdriver. Touch again to deactivate the fill valve; third digit must read "0".

6. Press and release PACK touch pad (UP arrow on Eagle Ten +); fourth digit on display must read "1". To activate the vent valve (indicated by an audible click), touch top of solenoid core with a screwdriver. Touch again to deactivate the vent valve; third digit must read "0".
7. Press and hold RESET touch pad until -F8- appears on display. Press and hold the ON/STANDBY touch pad until the front panel display indicates -F0-; release as soon as the buzzer sounds. Control returns to ON ready mode.

4.3 RECOMMENDED PREVENTIVE MAINTENANCE - EAGLE TEN AND TEN + STERILIZERS

Recommended frequency of inspection is bi-monthly. Usage, utility conditions may require more or less inspections. Tasks are defined on a yearly basis.

		Min. Freq.
1.0	**PREPARATION FOR PREVENTIVE MAINTENANCE**	
1.1	Discuss equipment with operators & check printouts	Each
1.2	Follow appropriate safety procedures; Prepare unit for PM	Each
2.0	**DOOR ASSEMBLY**	
2.1	Verify proper door and door switch operation. Adjust switch if needed	Each
2.2	Verify door alignment with end ring and check condition of door gasket for wear and tear. Make adjustments/replacements as needed	Each
2.3	Verify that half-moon gasket is attached and undamaged	Each
2.4	Verify proper operation of door lock mechanism. Check for wear	Each
2.5	Check for loose screws and tighten	Each
2.6	Lubricate hinge and hinge pins (DO NOT lubricate locking mechanism)	Each
3.0	**PIPING COMPONENTS**	
3.1	Rebuild fill valve	1X/yr
3.2	Rebuild vent valve	1X/yr
3.3	Replace air vent (steam trap)	1X/yr
3.4	Chamber gauge - Verify proper operation. Replace if needed	Each
4.0	**CHAMBER & WATER RESERVOIR**	
4.1	Rinse/clean chamber filter. Verify proper attachment to piping	Each
4.2	Replace chamber filter	1X/yr
4.3	Check for residue in water reservoir. Clean if needed	Each
4.4	Verify that reservoir gasket is properly attached and undamaged.	Each
5.0	**CONTROL**	
5.1	Verify that printer and paper take-up operate properly. Check printout for darkness, missing dots, etc.	Each
5.2	Verify that all the touch pads function properly	Each
5.3	Verify that the date and time are correct. If not, correct	Each
5.4	Verify operation of the battery backed RAM. Replace as needed.	Each
5.5	Verify that the buzzer is working	Each
5.6	Verify temperature displays/printouts with potentiometer	Each
5.7	Verify proper operation of heaters	Each
5.8	Verify proper operation of overtemp control	Each
5.9	Verify proper operation of the water level probe	Each

4.3 RECOMMENDED PREVENTIVE MAINTENANCE - EAGLE TEN AND TEN + STERILIZERS (CONT.)

Recommended frequency of inspection is bi-monthly, utility conditions may require more or less inspections. Tasks are defined on a yearly basis.

		Min. Freq.
6.0	**Final Checkout and Test**	
6.1	Clean dirt and lint from components. Check all wiring, terminals and socket connections for damage or fraying	Each
6.2	Verify that unit has proper labels (caution, warning)	Each
6.3	Run machine through each cycle to verify proper operation. Check all displays and printouts. Note on tape "STERIS TEST"	Each
6.4	Reinstall any panel or cover removed. Check area to insure removal of all materials used during inspection	Each
6.5	Check electrical cord for damage or fraying	Each
6.6	Notify customer that PM inspection is complete	Each

4.4 TROUBLESHOOTING AND ERROR CODE CHARTS (EAGLE TEN & TEN +)

WARNING - INJURY HAZARD: Repairs and adjustments, other than those described in these instructions, should be attempted only by experienced mechanics fully acquainted with this equipment. Use of inexperienced, unqualified persons to work on the equipment or the installation of unauthorized parts could cause personal injury or result in costly damage.

This section describes the types of sterilizer malfunctions likely to occur, and indicates probable causes.

1. Use following Troubleshooting Chart and Error Code Chart to identify problem and probable cause.
2. Locate parts in Section 6, **ILLUSTRATED PARTS BREAKDOWN.**
3. If you are unable to correct problem with use of this Troubleshooting Chart, or if a problem occurs that is not described on the chart, please call a factory-trained technician. Never permit unqualified persons to work on the sterilizer.

Do not remove or replace printed circuit boards unless facility power is off and electrostatic precautions are taken.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
1. No power/control panel remains dark	1) Unit is not plugged into outlet-> plug unit into a properly grounded outlet. 2) POWER ON/RESET switch is not turned ON-> turn ON. 3) Check facility power source-> turn ON. 4) Check overtemperature control ->replace if needed. 5) Check RTD sensor-> replace if needed. 6) Check fuse FU1 -> replace if needed. 7) Check 120 VAC input to power supply assembly. 8) Check 5 VDC output from power supply->replace if needed. 9) Check rocker switch->replace if needed 10) Replace PC Board (Para. 5.2)
2. One or more legends on control panel fail to light.	1) Confirm by testing (Service Routine, -F7-). If legend fails to light -> replace time/temp display.
3. Unable to start cycle (unit displays "DOOR")	1) Chamber door open -> close and lock door. 2) Check continuity of touch pad when pressed (see P2-5-10 to P2-1) -> replace touch pad if needed. 3) Check continuity of door switch -> replace switch if necessary (see P7-1 to P7-2) 4) Replace PC Board (Para. 5.2)
4. Water continues entering chamber after FILL phase is complete	1) Fill valve has failed in open position -> repair or replace valve.
5. E13 is displayed. No water enters chamber during FILL phase.	1) Check for water in chamber. a. If no water in chamber, check reservoir for adequate supply. b. Clean or replace chamber filter. 2) If water in chamber, a. Clean water level probe (Section 4.1.4.2) b. Replace water level probe. 3) Check fill valve -> replace if needed. 4) Replace PC Board (Para. 5.2)
6. Loss of pressure during cycle.	1) Steam trap failed open-> replace trap (Figure 6-4) 2) Vent solenoid valve has failed open-> repair or replace valve (Figure 6-4) 3) Heater failed-> replace heater (Para. 5.4) 4) Safety valve has failed open -> repair or replace valve (Figure 6-4) 5) Faulty pressure gauge -> check connections or replace gauge (Figure 6-4) 6) Loose connection or fitting -> isolate and correct pressure leak.

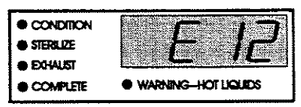
TROUBLESHOOTING CHART (CONT.)

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
6. Loss of pressure during cycle (cont.)	7) Check TRIAC control assembly -> replace if needed. 8) Replace PC Board (Para. 5.2)
7. Unable to open chamber door.	1) Cycle not complete-> wait for completion of exhaust phase. 2) Firmly push in on door handle while sliding handle up. 3) Door locking assembly stuck -> correct. 4) Faulty pressure gauge reading atmospheric pressure; however, slight pressure remains in chamber -> wait five minutes, then try again.
8. Water in chamber at end of cycle.	1) Filter assembly not properly installed or missing -> install filter assembly properly. NOTE: Filter must rest on chamber bottom near centerline.
9. Loads are not drying.	1) Door not opened to start dry phase -> open door. 2) Door switch failed-> replace switch (Figure 6-2 or 6-3). 3) Drain filter plugged -> clean filter.
10. Loads are not sterilized.	1) Improper pack preparation or sterilizer loading -> verify proper loading techniques. 2) Incorrect cycle parameters selected -> select correct parameters for load. 3) Bad steam trap element -> replace steam trap (Figure 6-4). 4) PC Board out of calibration -> recalibrate.
11. Erratic unit behavior.	1) Loose wire or cable -> firmly tighten wire or cable to connections. 2) Input voltage outside allowable limits (126 VAC max, 102 VAC min.) -> check power supply. 3) Unstable power supply (5 VDC) -> verify and replace. 4) PC Board defective -> replace PC Board (Para. 5.2)
12. Unit will not exhaust.	1) Plugged chamber filter -> unplug unit and let stand for one hour. Clean or replace filter (Fig. 6-3). NOTE: Filter must rest on chamber bottom near centerline. If filter is plugged with media, refer to chamber filter cleaning instructions. 2) Check for 120 VAC across P1-5 and P1-10 during Exhaust phase -> if no voltage present, replace PC Board, if voltage present, replace or repair vent solenoid valve.

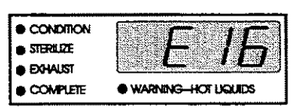
TROUBLESHOOTING CHART (CONT.)

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
13. Unit does not reach set temperature.	1) Check steam trap for excessive or no leak -> repair or replace trap (Figure 6-4). 2) Verify door gasket is not leaking -> clean end frame and seal, and if necessary replace gasket. 3) Check safety valve for leaks -> replace valve. 4) Check fill and vent solenoid valves for leaks -> repair or replace valve(s). 5) Check resistance of the heater -> if resistance is not approximately 10 m/ohm, replace heater. 6) With unit in cycle, measure 120 VAC across P9-9 and WIRE 101 on the AC receptacle. Voltage should be present -> if no voltage, replace triac control assembly.
14. Customer complaint of media loss.	1) Refer to Paragraph 5.13

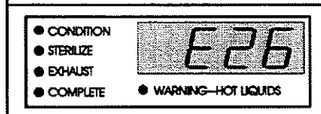
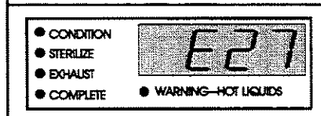
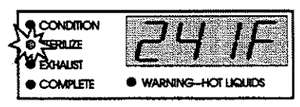
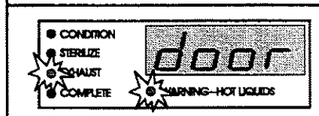
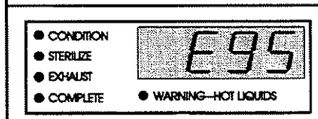
ERROR CODE TROUBLESHOOTING CHART

ERROR MESSAGE	EXPLANATION	OPERATOR ACTION	WHERE IN CYCLE	CORRECTIVE ACTION
	Chamber temperature is less than 60°F.	• Open door and wait for unit to warm-up ("COLD" clears when chamber is greater than 60°F, and there is no mechanical problem. • If "COLD" does not clear, contact dealer service department.	Control "ON", not in cycle	1. Open door and allow unit temperature to stabilize for 15 minutes. 2. Use Ohmmeter to test thermistor resistance. Refer to Thermistor Temperatures vs. Resistance, Para. 5.3. 3. If unit defective, replace. 4. If unit operational, replace PC Board.
	Shorted temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Control "ON", not in cycle	1. Use Ohmmeter to test thermistor resistance. Refer to Thermistor Temperatures vs. Resistance, Para. 5.3. 2. If unit defective, replace. 3. If unit operational, replace PC Board.
	Open temperature sensor.	• Open the door and allow unit to stabilize at room temperature. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Control "ON", not in cycle	Same as "E01".
	Level sensor detects water. Possible water sensor failure.	• Open door and remove trays and shelf. If water present (correct water level is when heater is completely immersed in water), replace shelf and trays and start a cycle. • If no water is present, cleat water level sensor (see section 4.1.4.2). • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Control "ON", not in cycle	NOTE: This does not always indicate a component failure, the control will display "E03" if cycle was aborted after filling. 1. Clean water level probe. 2. If no water in chamber: a) Disconnect water level probe signal wire. b) If "E03" goes away after pressing reset, replace probe. c) If "E03" continues, replace PC Board Assembly.
	Shorted temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Condition Phase	Same as "E01".
	Open temperature sensor.	Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Condition Phase Condition Phase	Same as "E01".

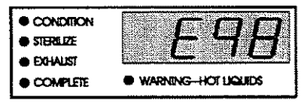
ERROR CODE TROUBLESHOOTING CHART

ERROR MESSAGE	EXPLANATION	OPERATOR ACTION	WHERE IN CYCLE	CORRECTIVE ACTION
	Water level sensor failure or insufficient water in chamber.	• Carefully open chamber door. • Check for water in the chamber. • If no water is in the chamber, then check reservoir for adequate supply. Refill if necessary. If not, clean the filter. • If there is water in the chamber, then clean the water level sensor. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Condition Phase	1. Inspect water level probe for corrosion or damage. 2. Inspect water level probe signal wire for corrosion or damage. 3. Test probe circuit as follows: a) Remove probe from chamber and isolate from chassis ground. b) Close and lock chamber door, then start a cycle. c) Display will indicate "FILL". d) Touch probe tip to the chassis ground. e) Unit should now display chamber temperature. f) If temperature not displayed, remove signal wire from probe and touch signal wire to chassis ground. g) Unit should now display chamber temperature. h) If temperature was displayed in f and not in d, replace the probe. i) If temperature was displayed in d and not in f, replace the PC Board.
	Heating problem	• Wait for tone to sound. • Press RESET touch pad, then retry. • Check door gasket for damage or dirt buildup. • If error code is displayed again, contact dealer service department.	Condition Phase	1. Check door gasket for dirt buildup or damage: clean or replace as needed. 2. Assure air vent closes properly during condition phase, if not, replace air vent. 3. Check heating element resistance: should be 9-11 ohms. 4. Check voltage to heating element during cycle. If not present: a) Test TRIAC module: 120 volts between P9-7 and wire 101 on AC receptacle. b) Test Triac R1, P9-1 to P9-3 should be 0 volts.
	Unit fails to reach sterilization temperature in allotted time.	• Wait for tone to sound. • Press RESET touch pad, then retry. • Check door gasket for damage or dirt buildup. • If error code is displayed again, contact dealer service department.	Condition Phase	Same as "E14".
	Door unlocked during condition phase.	• Wait for tone to sound. • Press RESET touch pad, close and lock door, then retry. • If error code is displayed again, contact dealer service department.	Condition Phase	1. Check door status; close or open as appropriate. 2. Inspect door switch for proper operation: adjust or replace as needed.

ERROR CODE TROUBLESHOOTING CHART

ERROR MESSAGE	EXPLANATION	OPERATOR ACTION	WHERE IN CYCLE	CORRECTIVE ACTION
	Shorted temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Sterilize Phase	Same as "E01".
	Open temperature sensor.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Sterilize Phase	Same as "E01".
	Door unlocked during sterilize phase.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Sterilize Phase	Same as "E16".
	Failed to maintain temperature set point	• Wait for tone to sound. • Press RESET touch pad, then retry. • Check door gasket for damage/dirt. • If error code is displayed again, contact dealer service department.	Sterilize Phase	Same as "E14".
	Temperature has dropped below set point (blinking sterilizer indicator light). The time resets and cycle will resume when preset temperature is achieved.	• Monitor cycle.	Sterilize Phase	After cycle completion: 1. Inspect Door gasket for dirt buildup or damage; clean or replace as needed. 2. Inspect plumbing for leaks; repair or replace as needed.
	Over temperature (cycle will abort).	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	Sterilize Phase	Test heating circuit as outlined in "E14", step #3. 1. Verify that the control signals Triac to OFF when unit reaches set temperature + 3 degrees. If not, replace the control board or Triac module as needed.
	Door unlocked at cycle start. Door locked during exhaust or dry phase.	• Close and lock door. • Unlock and open door 1/4 inch.	Prior to cycle starting, or at end of Exhaust Phase	Same as "E16".
	Power failure during cycle.	• Check for DRY (Gravity) or COOL (Liquid) load. If load still wet, let load DRY or COOL.	Exhaust Phase (Drying)	1. Check for DRY (Gravity) or COOL (Liquid) load. If load still wet, let load DRY or COOL.

ERROR CODE TROUBLESHOOTING CHART

ERROR MESSAGE	EXPLANATION	OPERATOR ACTION	WHERE IN CYCLE	CORRECTIVE ACTION
	Power failure during cycle.	• Load must be reprocessed.	reaching 212 degrees	1. Load must be reprocessed.
	Power failure during cycle.	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department.	~~Condition Phase (prior to temperature~~ reaching 212 degrees	1. Wait for tone to sound. 2. Press RESET touch pad, then retry.
	Abnormal rapid rise in temperature (greater than 10°F in seconds).	• Wait for tone to sound. • Press RESET touch pad, then retry. • If error code is displayed again, contact dealer service department. • Check for water in reservoir.	Any time control is ON	If in cycle: 1. Confirm water level in chamber and level probe is functioning. If not in cycle: 1. Test Heating circuit as outlined in "E14". 2. Confirm Air Vent is functioning.
	RESET touch pad was pressed during a cycle.	• Wait for tone to sound. • Press RESET touch pad, then retry.	~~Any time control is ON~~	1. Wait for tone to sound. 2. Press RESET touch pad to clear.
	Chamber temperature exceeded 395 degrees	• Press main reset switch on rear of unit. • Allow unit to cool. • Reprocess the load. • Retry cycle. • If display is blank again, contact dealer service department.	~~Any time control is ON~~	1. Test overtemperature control for proper operation replace if necessary.

4.5 FIELD TEST PROCEDURE

4.5.1 General

Every unit must be tested and inspected according to this procedure. Whenever a part is adjusted, repaired or replaced, retest using appropriate section of Field Test. Items of noncompliance must be corrected and retested. Each test must meet the standards of material, workmanship, and performance set forth in this procedure. Calibrated potentiometer must be used on each test. Refer to Section 5 should mechanical problems arise or adjustments be required.

4.5.2 Test Equipment Required

1. Calibrated potentiometer (Doric 400 or equivalent) with Conax adapter.
2. Calibrated compound test gauge.
3. Stopwatch.
4. Cross, 1/2 (P-150822-333).
5. Nipple, 4" (P-029174-091) 1/2 NPT x 4".
6. Amprobe.

4.5.3 Ensure Proper Installation

1. Verify unit is installed on a flat, level surface.
2. Ensure proper dedicated electrical service: 120 VAC (+5%, -15%), grounded, single phase, 15 Amps, 50/60 Hz or 240 VAC (+5%, -15%), grounded, single phase, at least 15 Amps, 50/60 Hz.

4.5.4 Install Test Equipment

⚠ WARNING - INJURY HAZARD: To prevent personal injury and equipment damage, unplug unit before removing outer cover.

1. Remove fastening screws and lift cover from unit.
2. Remove safety valve. Install 4" nipple then 1/2" cross. Attach safety valve to cross.
3. Attach compound gauge to cross and run thermocouple into chamber through remaining port in cross until it is in contact with thermistor.

4.5.5 Cycle Tests

Prior to tests, the following steps should be followed:

1. Fill reservoir with deionized or distilled water.
2. Plug unit into a 120 VAC, 15 Amp receptacle. Verify that at least 102 VAC and no more than 126 VAC exists during operation.
3. Press POWER RESET rocker switch on back panel. Verify that the display alternates between time (5 sec.) and OFF (1 sec.).
4. Press ON/STANDBY touch pad to ON. ON/STANDBY LED should illuminate and display should show time of day.

4.5.5.1 Eagle Ten Cycle Test

1. Close and lock door.
2. Press WRAPPED touch pad. Cycle should start and the following should occur:
   a. CONDITION indicator light illuminates.
   b. FILL appears on display.
   c. S1 and S2 solenoid valves energize. Check for water leaks.
   d. Within 1-1/2 minutes, the water fill should be complete; the display will indicate chamber temperature. S1 and S2 will de-energize.
   e. Heater turns ON and chamber temperature will start rising. Upon reaching 212°F/100°C, the gauge will display chamber pressure.
3. Visually check all gasket seal areas and piping connections for leaks. A mirror or highly polished piece of metal is needed. Check and correct gasket especially during 0-5 psig pressure range.
4. When the temperature reaches 270°F (132°C), STERILIZE indicator light illuminates. CONDITION indicator light turns off. Display will start counting down from 10 minutes and display temperature and time alternately. Check all piping and gasket areas for leaks.
5. Check pressure gauge on the sterilizer and verify that it reads within ±1.5 psig of the chamber test gauge.
6. After five minutes, verify that the chamber temperature is 272°F ±2°F (133°C ±1°C) corresponding with the digital thermometer. If not, refer to Thermistor Calibration Procedure in Para. 5.3.
7. After 10 minutes, EXHAUST indicator illuminates and STERILIZE indicator shuts off. Verify that the time for sterilize phase is 10 minutes.
8. Sterilizer will exhaust and at the end of the exhaust, display indicates "door".
9. Unlock and open chamber door 1/4".
10. Dry phase begins. Verify that the display progressively counts up dry time.
11. During dry phase, note the displayed DRY TIME, then close and lock chamber door. Verify the

display shows "door" and the buzzer sounds every minute.

12. Unlock and open the door 1/4". Verify the display shows the noted time (see above) and resumes counting up.
13. Time continues to count:
    a. At 30 minutes, a buzzer sounds for four seconds and the exhaust LED goes out and the COMPLETE LED illuminates.
    b. At 45 minutes, a buzzer sounds for four seconds.
    c. At 60 minutes, the display shows "DONE" and the buzzer sounds four times per minute.
14. At this point, drying is complete and the heater shuts off. Press RESET touch pad. Verify sterilizer cycles back to STAND BY condition (display alternates between time and OFF).

4.5.5.2 Eagle Ten + Cycle Test

1. Press and release STER TIME SET touch pad. Verify both cycle select touch pad indicator lights illuminate.
2. Press and release GRAVITY touch pad. Verify LIQUIDS indicator light goes out and time is displayed.
3. Press and hold INC touch pad. Verify time goes up to 99 and then to 0.
4. Release INC touch pad. Then press and hold DEC touch pad. Verify time decreases to 0, then to 99.
5. Press and release STER TEMP SET touch pad. Verify both cycle sect touch pad indicator lights illuminate.
6. Press and release GRAVITY touch pad. Verify LIQUID indicator light goes out and temperature is displayed.
7. Press and hold INC touch pad. Verify temperature goes up to 275 and then to 200. Release INC touch pad.
8. Press and hold DEC touch pad. Verify temperature goes down to 200 and then to 275. Release DEC touch pad.
9. Press and release DRY TIME SET touch pad. Verify only the GRAVITY indicator light illuminates.
10. Repeat Steps 2-4 above.
11. Set STER TIME SET to 10 minutes, STER TEMP SET to 270°F (132°C), DRY TIME SET to 10 minutes. Initiate a cycle by pressing GRAVITY button twice; first press displays "SET VALUES", second press initiates the cycle.
12. Repeat procedure 4.4.5.1 using the GRAVITY cycle.

4.5.5.3 Cycle Aborts

1. Initiate a 270°F (132°C) cycle. Allow chamber pressure to reach 20 psig. Press RESET touch pad. Verify the unit goes into exhaust and ensure pressure drops to atmospheric pressure before end of exhaust phase.
2. Initiate a 270°F (132°C) cycle. Press RESET touch pad during sterilization phase. Verify unit goes into exhaust and depressurizes.

4.5.5.4. Final Test

1. Ensure door swings easily without rubbing or binding.
2. Verify door gasket is properly installed.
3. Check unit for any water leaks at shell and reservoir.
4. Ensure all electrical connections are tight.
5. Remove all test equipment.
6. Police work area to ensure removal of all materials used during test.

4.6 FUNCTIONAL DESCRIPTION

When unit is plugged into a properly grounded 120 VAC outlet and the reset rocker switch, located on the back of the unit is pressed, AC power will be enabled to the unit. The display will alternate between OFF and the time of day. The optional printer will print "POWER ON". Pressing the ON/STANDBY touch pad will turn on the "ON" indicator light and the time will be displayed. The Optional printer will print, "CONTROL ON". The heater, HTR1, will be pulsed on by the control using Triac #1 and the CR1 heater disconnect relay.

After the door is closed and locked and a non-liquids cycle has been selected, the unit will automatically fill the chamber through fill valve V1 to the proper level detected by the water level probe FS1. The display will indicate "FILL". The optional printer will now print relevant cycle data through the remainder of the cycle. Typical fill time is one to two minutes. The condition light will now be lit, indicating advancement into this phase. After the fill is complete the heater, HTR1, is energized using triac #1 and the heater disconnect relay CR1. The display will indicate chamber temperature until selected sterilize temperature is reached. The heater will remain energized until a sterilize temperature plus 2 degrees

has been reached. Temperature is controlled by the use of thermistor QTM1.

Upon reaching the selected sterilizing temperature the "STERILIZE" phase indicator light will come on and the "CONDITION" light will go off. The display will now alternate the chamber temperature and the exposure time remaining until the exposure timer has counted down to zero.

Once the sterilize phase has been complete the "EXHAUST" indicator light illuminates signaling the beginning of the exhaust phase. The display will indicate chamber temperature. The heater will be deenergized and the vent valve, V2, will be energized by the control for a preset time of 4 minutes. Steam in the chamber is diverted through the vent piping into the condensing coil and back into the reservoir in the form of condensate. After the exhaust time has elapsed the display will indicate "door" and a buzzer will sound for 4 seconds. Opening the door will initiate the "DRY" phase. If the door is not opened the buzzer will sound every three minutes to indicate cycle status.

When the door is unlocked the "DRY" phase begins. The display indicates "00" and starts counting up. Locking the door at this time will cause the buzzer to sound, the dry time to stop counting, and the display to indicate "door". The heater, HTR1, will be energized during dry through Triac #1 and the heater disconnect relay. The buzzer will sound for 4 seconds at 30, 45, and 60 minutes. At the end of the 60 minute dry phase "DONE" will appear on the display and the heater will be deenergized. The dry phase may be terminated by pressing the ON/STANDBY touch key any time during the dry phase. When "DONE" appears on the display the complete phase indicator will light. Pressing the RESET touch key returns the time of day to the front panel display.

The liquids cycle varies from the gravity cycle as follows:

During the "EXHAUST" phase the vent solenoid is pulsed to maintain a slow exhaust rate. This is accomplished by the control pulsing the vent valve over a 10 minute period.

There is no "DRY" phase in a liquid cycle.

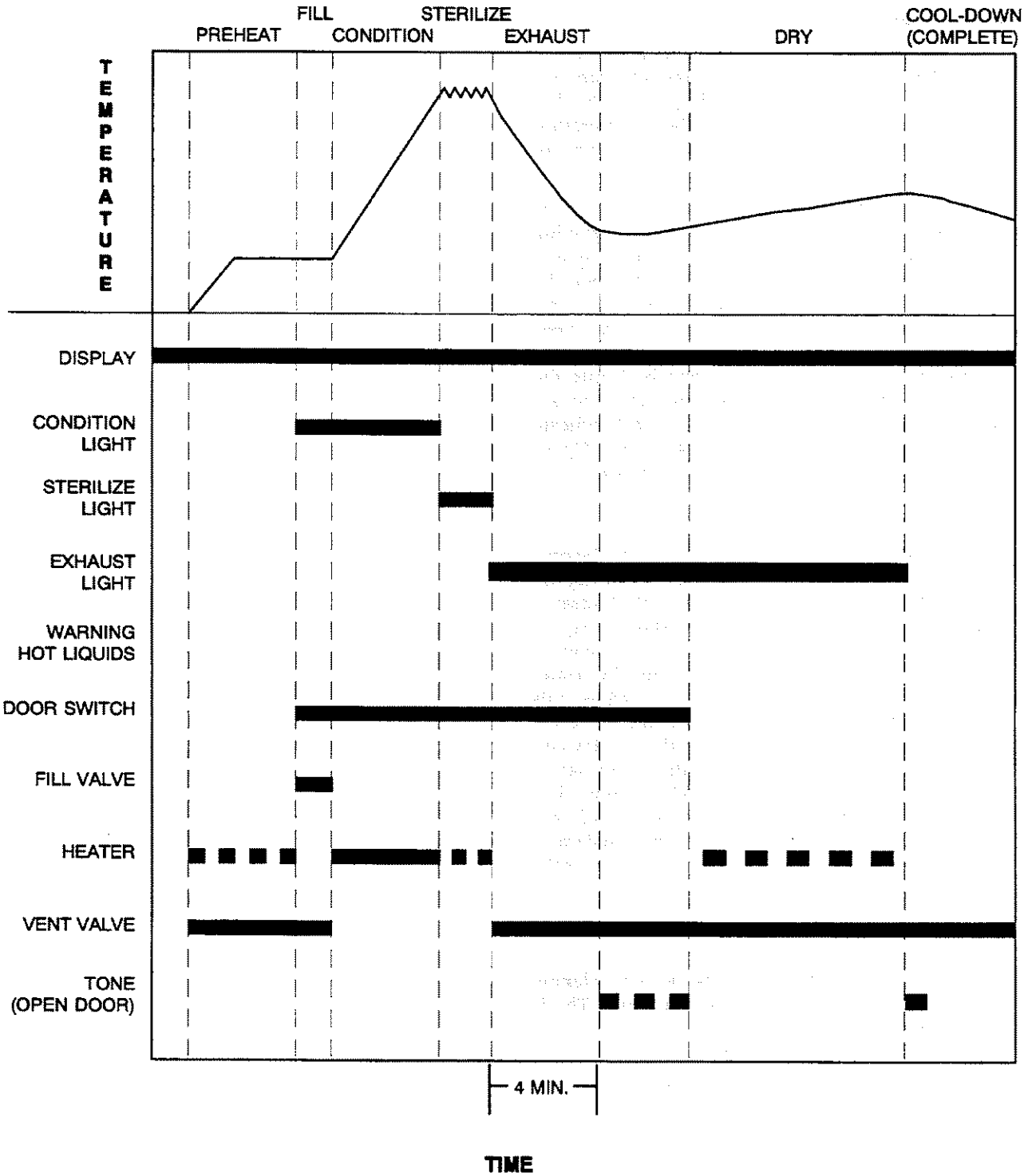


Figure 4-21. Cycle Graph - Gravity Cycle

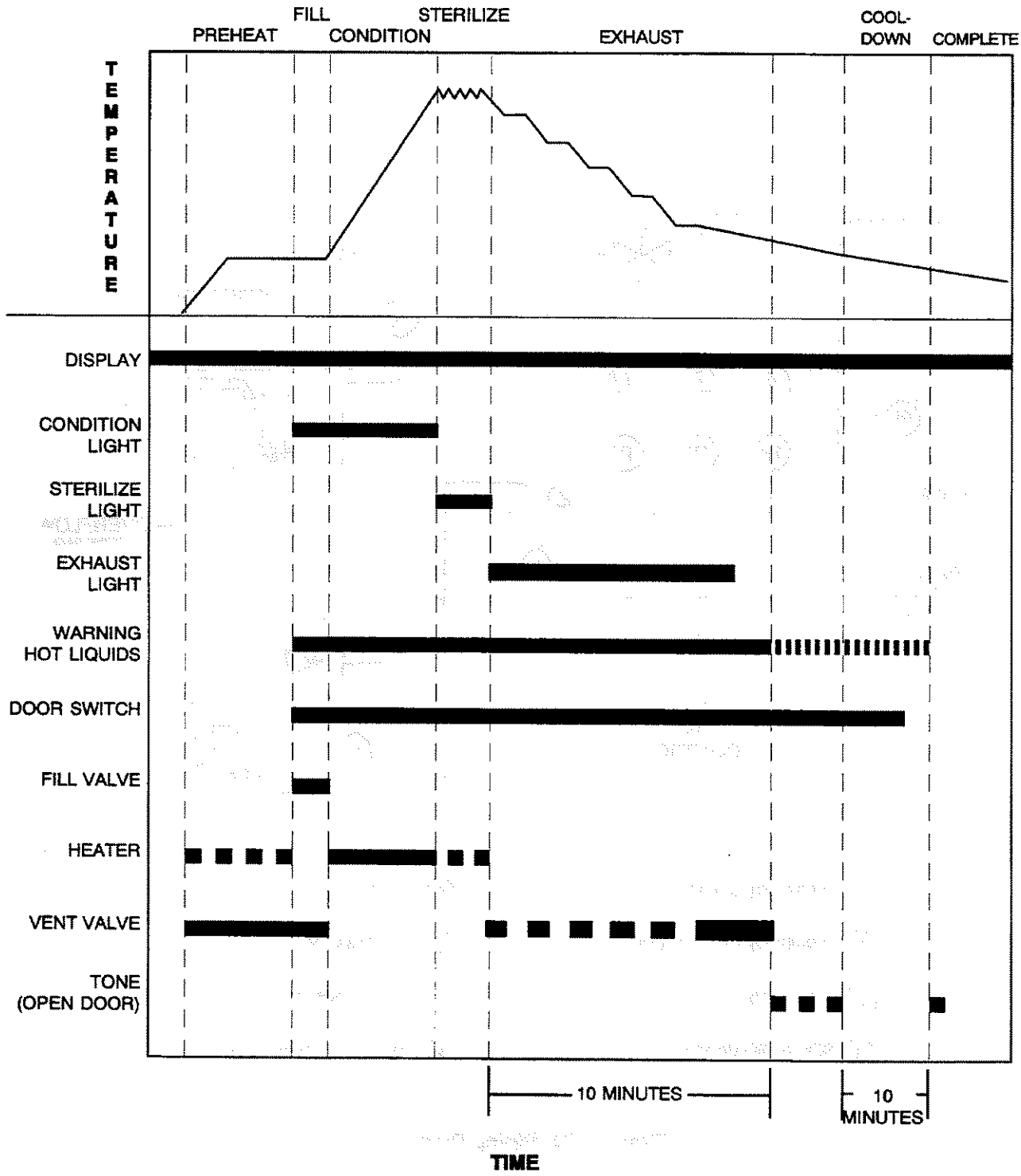
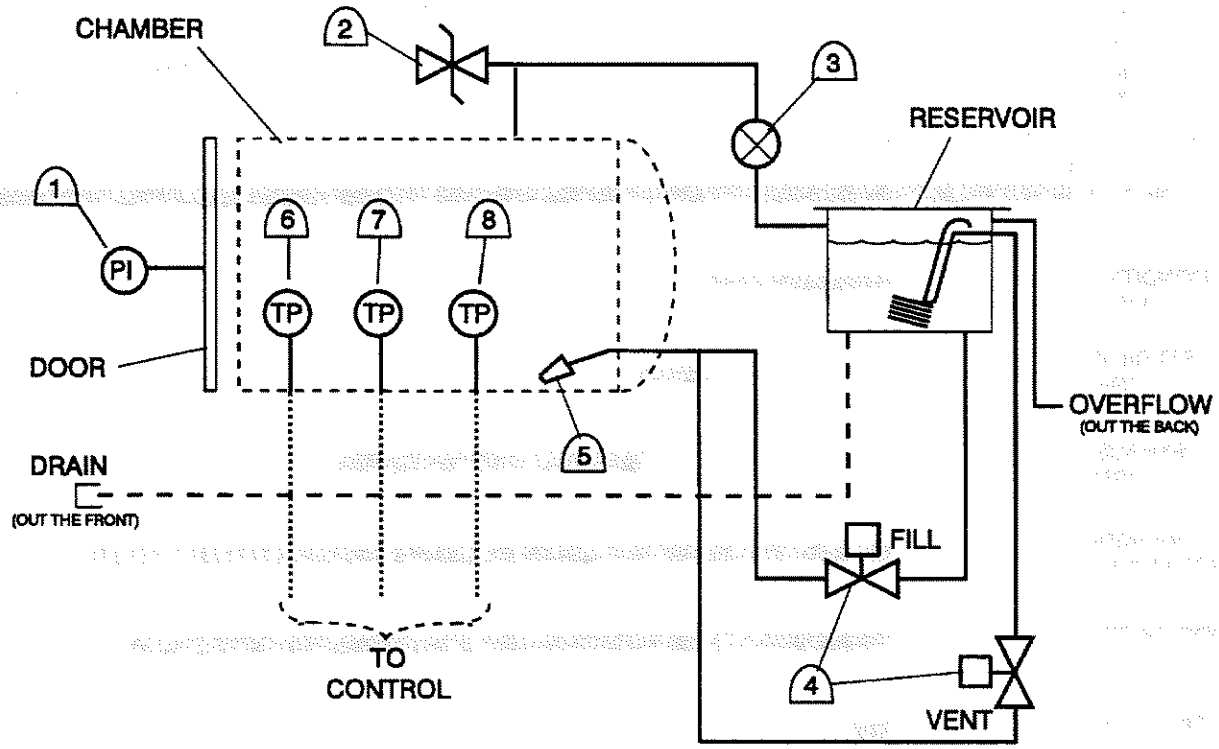


Figure 4-22. Cycle Graph - Liquid Cycle



1 PRESSURE GAUGE

2 PRESSURE RELIEF VALVE

3 STEAM TRAP

4 SOLENOID VALVES

5 FILTER

6 THERMISTOR

7 OVERTEMP RTD

8 WATER LEVEL SENSOR

Figure 4-23. Piping Diagram

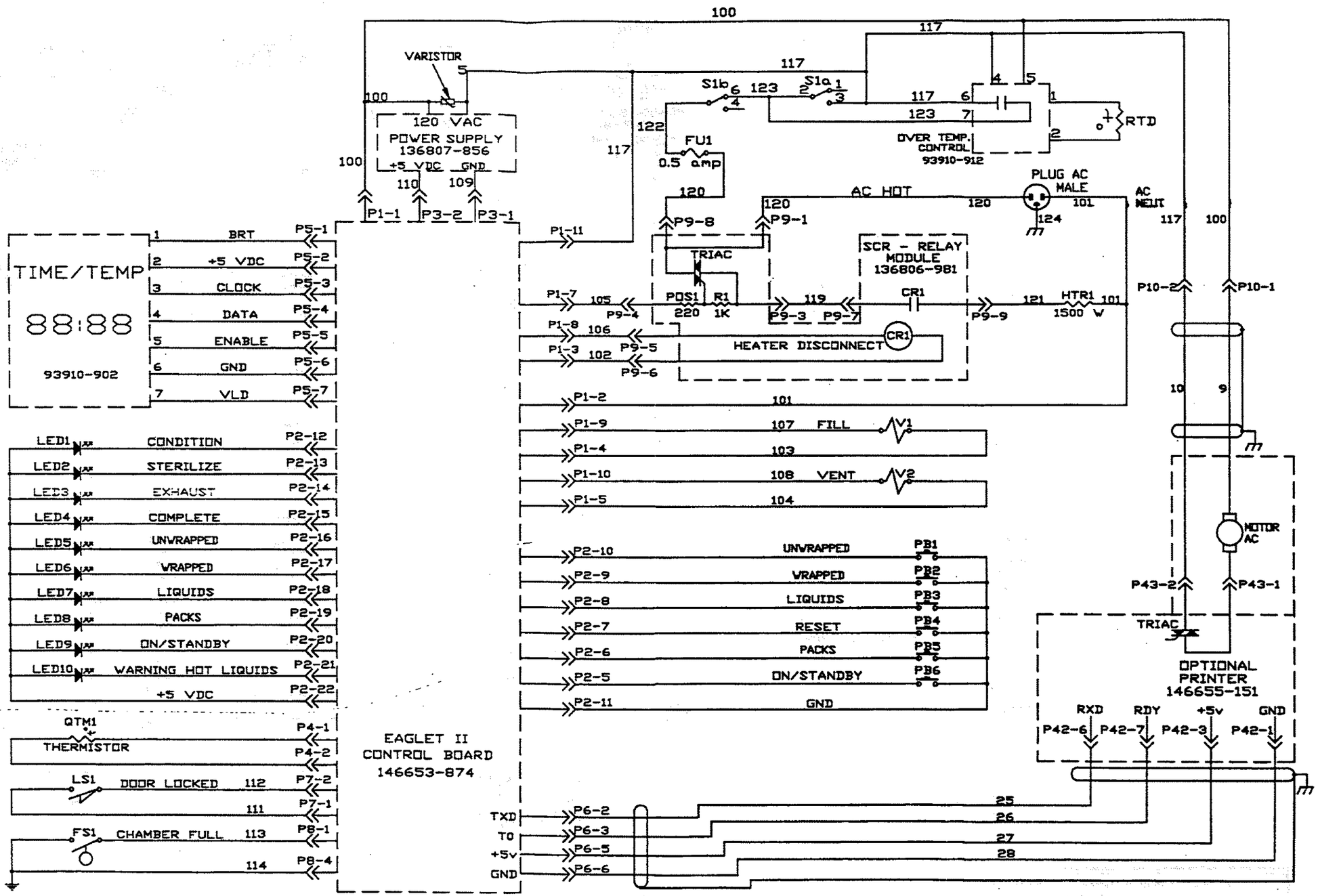


Figure 4-21: Electrical Schematic, Eagle Ten 120 Volt (Before 7/1/91)

4/11/90 P-136807-854

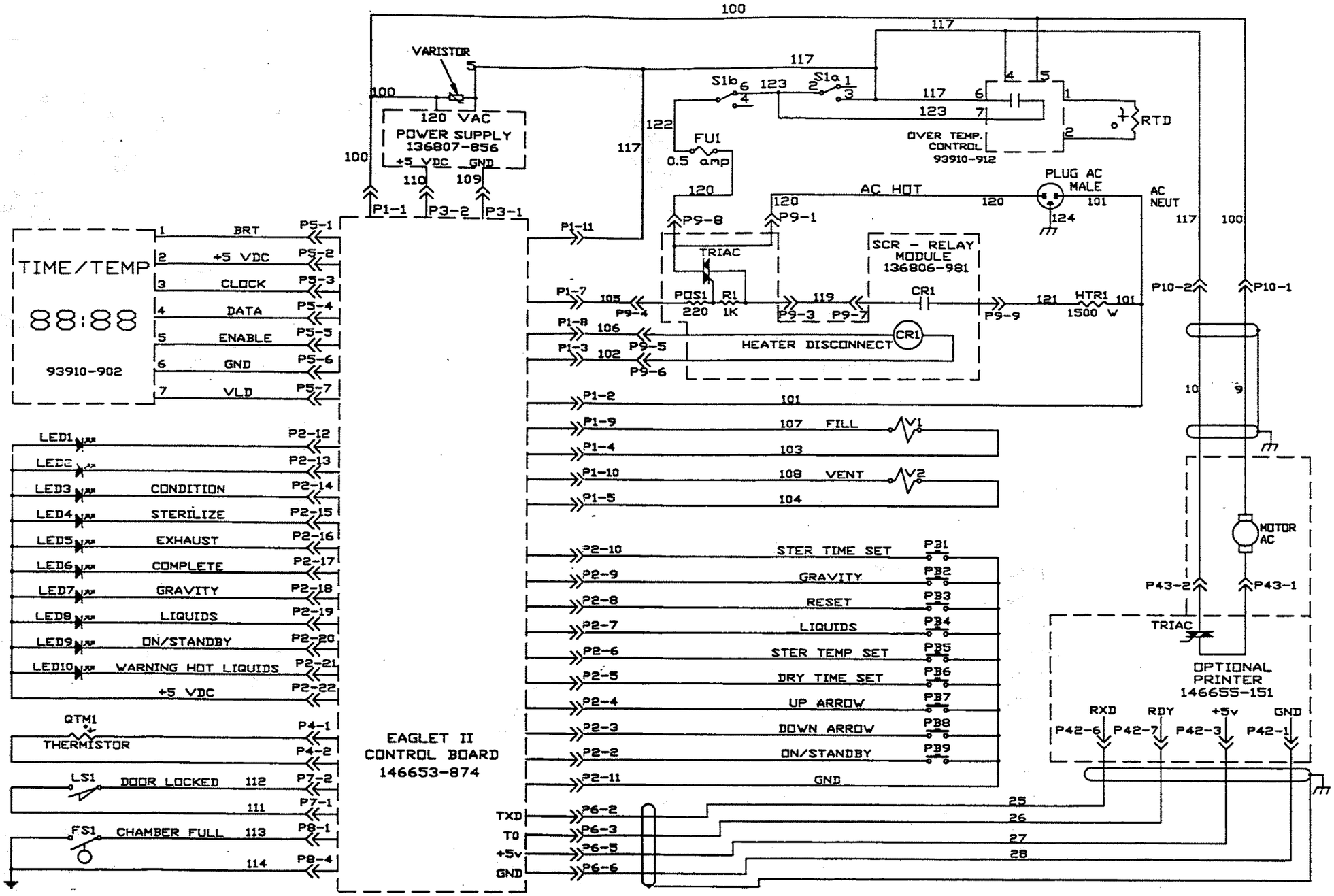


Figure 4-22: Electrical Schematic, Eagle Ten+ 120 Volt (Before 7/1/91)

4/11/90 P-136807-859

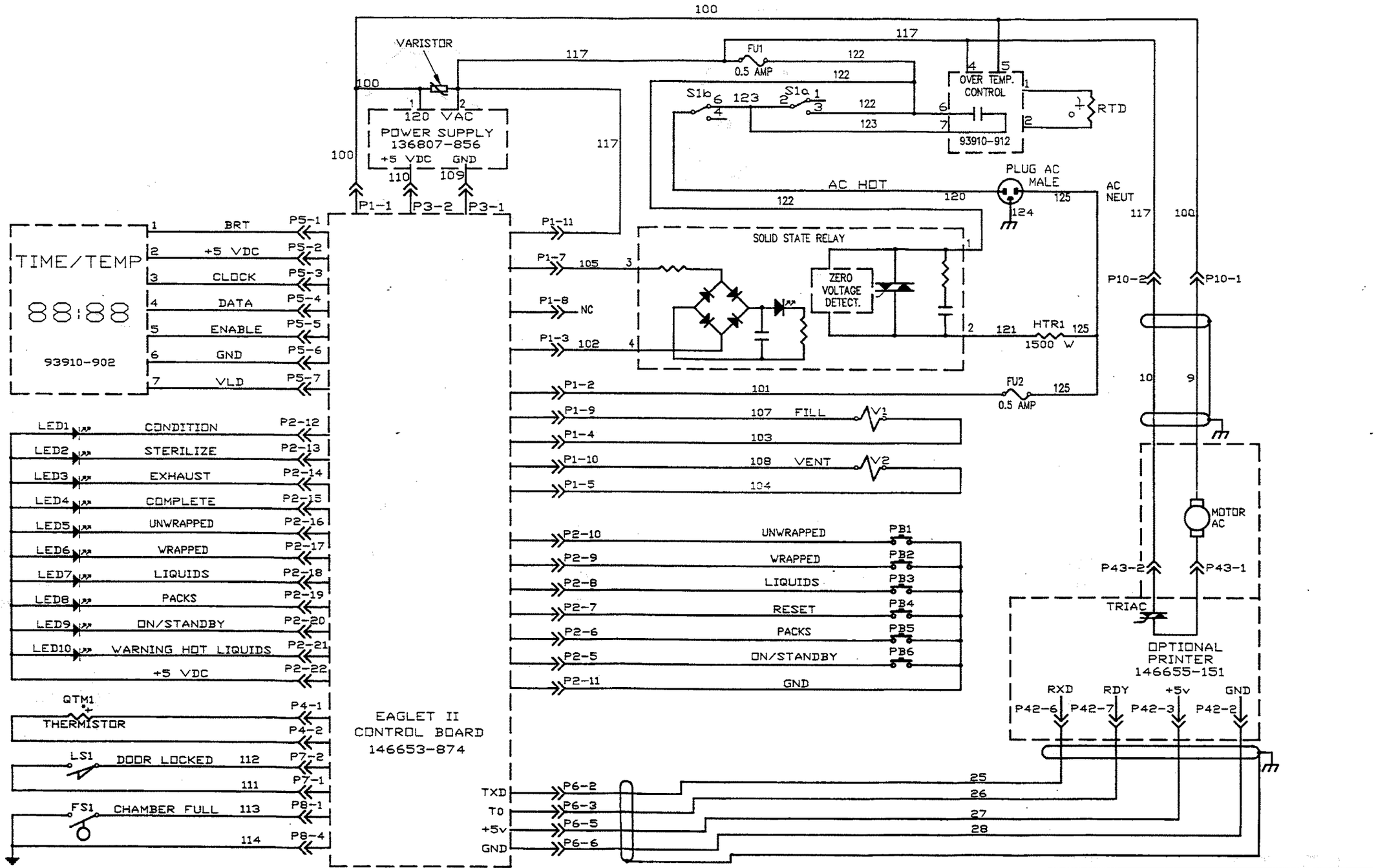


Figure 4-23: Electrical Schematic, Eagle Ten 120 Volt (After 7/1/91)

3/15/91 P-400077-503

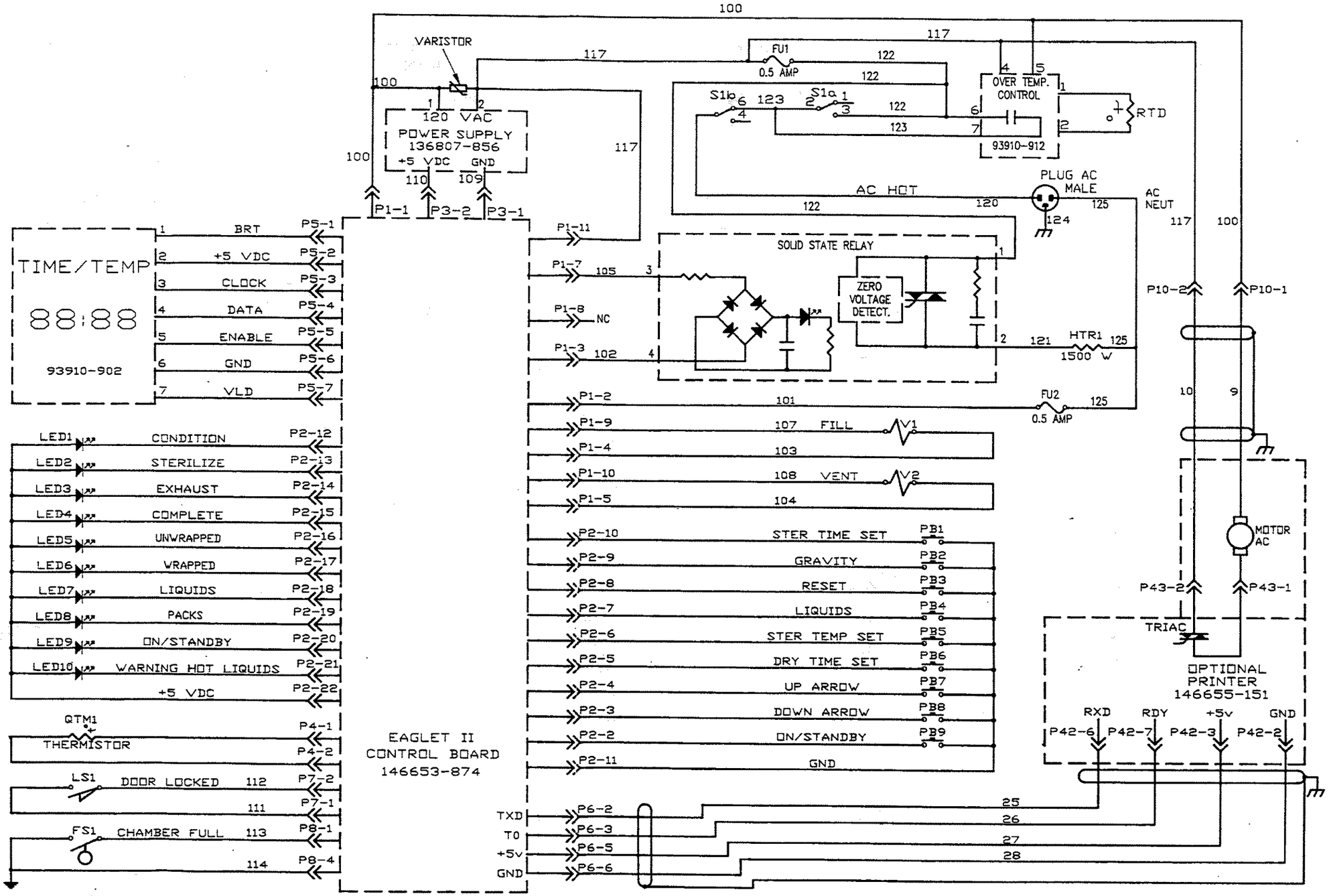


Figure 4-24: Electrical Schematic, Eagle Ten+ 120 Volt (After 7/1/91)

3/15/91 P-400077-473

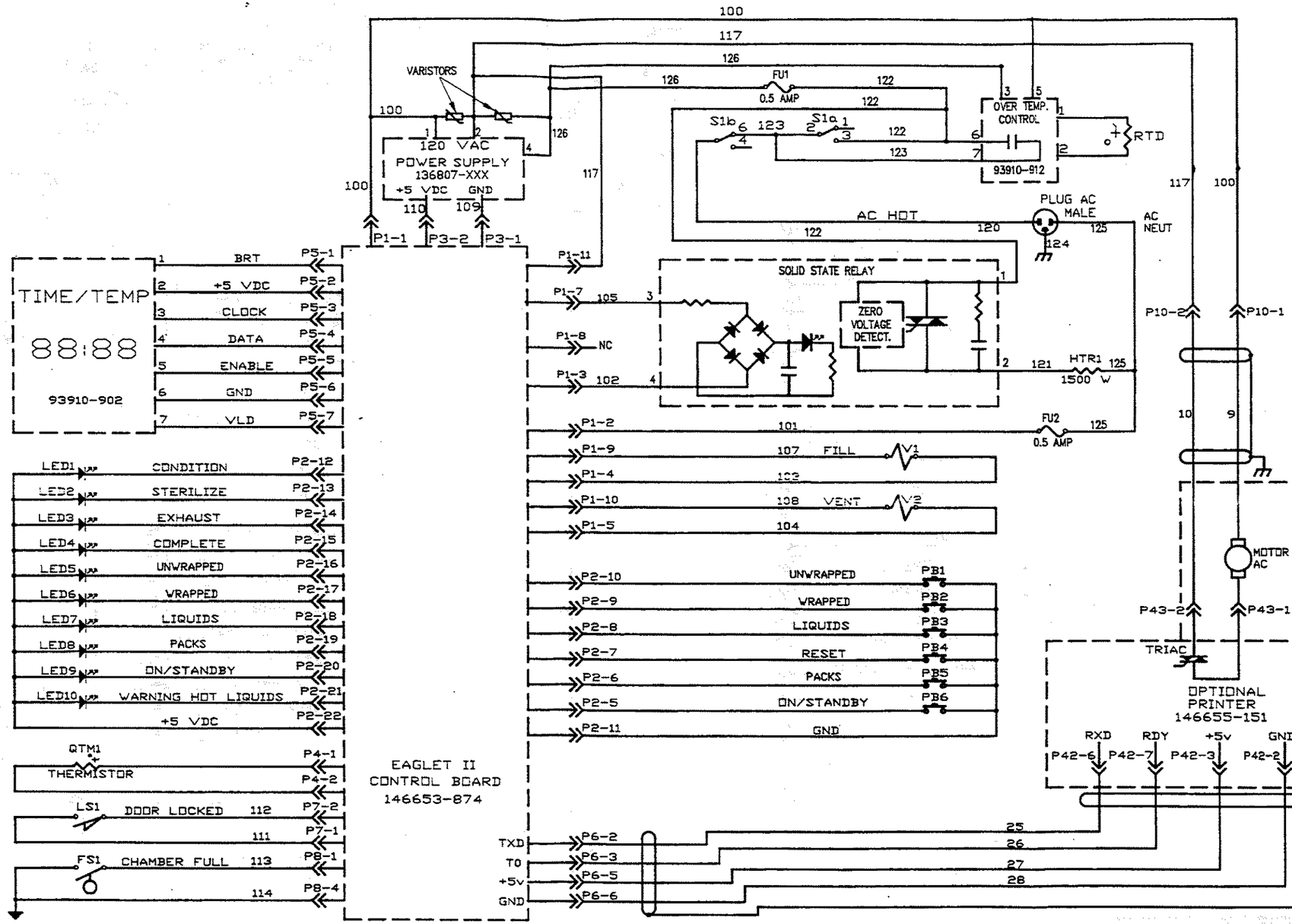


Figure 4-25: Electrical Schematic, Eagle Ten 240 Volt

3/15/91 P-400077-474

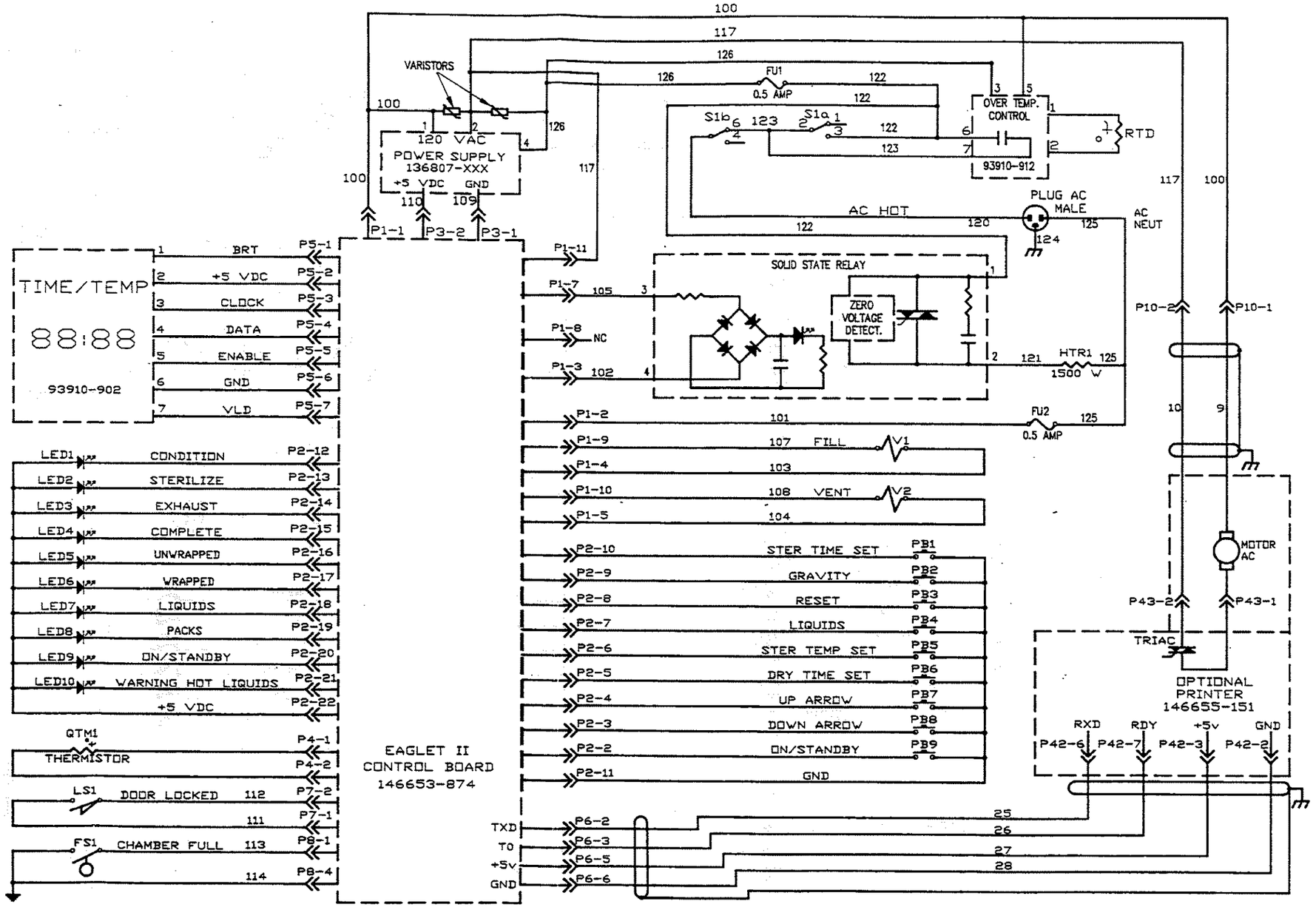


Figure 4-26: Electrical Schematic, Eagle Ten+ 240 Volt

3/15/91 P-400077-502

Section 5: Component Repair, Replacement and Adjustment

WARNING - INJURY HAZARD: Repairs and adjustments, other than those described in these instructions, should be attempted only by experienced mechanics fully acquainted with this equipment. Use of inexperienced, unqualified persons to work on the equipment or the installation of unauthorized parts could cause personal injury or result in costly damage.

Do not remove or replace printed circuit board unless unit is disconnedted at wall outlet and electrostatic precautions are taken (see Paragraph 5.1)

5.0 GENERAL

This section includes instructions for the diassembly, repair, and replacement of selected sterilizer components. Exploded views and assembly drawings showing the various parts and assemblies referred to are included in Section 6.

WARNING - BURN HAZARD: To prevent possible personal injury, allow sterilizer to cool for ten minutes before unloading, performing maintenance, or cleaning.

5.1 RECOMMENDED ELECTROSTATIC DAMAGE (ESD) PRECAUTIONS

NOTE: Following precautions should be taken whenever Printed Circuit Boards are being handled or replaced:

1. Always use an ESD safe container when transporting boards from one location to another.
2. No boards should be removed from their containers except at an approved static station or where personnel and machine are properly grounded.
3. At minimum, use a wrist strap grounded to the sterilizer when removing and/or replacing board.

NOTE: Failure to follow the above precautions may result in electrostatic damage to the Printed Circuit Board.

5.2 PC BOARD REPLACEMENT

WARNING - INJURY HAZARD: To prevent possible personal injury and equipment damage, unplug unit before removing outer cover.

1. Verify unit is cool, depressurized and disconnected from wall outlet.
2. Remove screws securing outer cover assembly (Figure 6-1).
3. Remove four screws securing control assembly to the front of the unit (Figures 6-2 or 6-3).
4. Disconnect all cable connections from the PC Board (note orientation of the cables).

Do not remove or replace printed circuit board unless unit is disconnected at wall outlet and electrostatic precautions are taken (see paragraph 5.1).

5. Remove the five mounting screws and carefully remove PC Board from control housing.
6. Install the new PC Board.

To avoid thermistor damage, when installing new thermistor, ensure that it does not touch outer cover.

7. Calibrate the thermistor as outlined in Paragraph 5.3.
8. Reassemble in reverse order.

5.3 THERMISTOR/PC BOARD CALIBRATION

1. Obtain test equipment and note Temperature/Resistance Data (see Figure 5-1):
   - Calibrated digital potentiometer (Doric 400 or equivalent)
   - Cross, 1/2 (P-150822-333)
   - Nipple, 1/2 (P-29162-091)
   - Tape

WARNING - INJURY HAZARD: To prevent possible personal injury and equipment damage, unplug unit before removing outer cover.

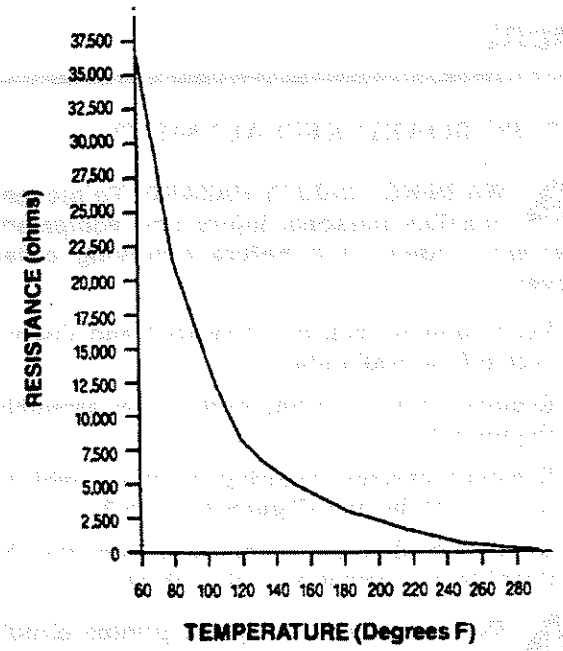


Figure 5-1. Temperature vs. Resistance

2. Remove outer cover from unit (Figure 6-1).
3. Remove safety valve. Install nipple and cross. Attach safety valve to cross.
4. Insert thermocouple through cross on side of unit (see Paragraph 4.5.4). Attach potentiometer thermocouple to thermistor using a small piece of tape.
5. Select WRAPPED 270°F / 132°C, 10 minute cycle for Eagle Ten units. On Eagle Ten + units, set sterilize temperature to 270°F and sterilize time to 10 minutes.
6. After five minutes has elapsed in the sterilize phase, verify that the chamber temperature is 272°F ±2°F (133 ±1°C) corresponding to the digital potentiometer. If temperatures do not correspond, adjust "R2" on the PC Board until temperature on the display panel matches potentiometer temperature.
7. Press RESET touch pad to abort cycle.
8. Remove thermocouple from thermistor. Remove test cross and nipple from side of unit. Replace safety valve.
9. Reinstall cover.

5.4 HEATER REPLACEMENT

WARNING - INJURY HAZARD: To prevent possible personal injury and equipment damage, unplug unit before removing outer cover.

1. Unplug unit from wall outlet. Verify unit is cool. Remove outer cover from unit (Figure 6-1).
2. Open door to gain access to drain hose. Drain reservoir.
3. Remove base assembly Access Panel as follows:
   a. Remove and save screws fastening panel to base assembly.
4. Carefully remove overtemperature RTD from shell assembly.
5. Disconnect wires from faulty heater.
6. Remove faulty heater and replace with new heater (see Figure 6-3).

Ensure overtemperature RTD is mounted 1/4" above inner shell and is positioned over heating element.

7. Reassemble in reverse order.

5.5 CHAMBER PRESSURE GAUGE

1. With the door open, remove the four screws securing door cover to the door. Note the orientation of the spacer washers between door cover and door.
2. Remove the old pressure gauge (P-93910-142).
3. Place teflon tape on the threads of the new pressure gauge (P-93910-142).
4. Install the new gauge assuring that the display is level.
5. Reassemble in reverse order. Note that spacer washers are properly oriented.

5.6 AIR VENT REPLACEMENT

1. Disconnect the power cord.
2. Remove outer enclosure (see Fig. 6-1).
3. Identify Air Vent (P-400009-085) (see Fig. 6-4).
4. Remove compression fitting on the air vent.
5. Remove the old air vent.
6. Install the new air vent.
7. Reassemble in reverse order.

5.7 OVERTEMPERATURE CONTROLLER REPLACEMENT

NOTE: The overtemperature controller and RTD are a matched pair and are not to be interchanged. When necessary, order and install kit 764322-357.

1. Disconnect power cord and allow unit to cool.
2. Remove outer enclosure (see Fig. 6-1).
3. Identify overtemperature controller (see Fig. 6-6).
4. Identify RTD and fitting (see Fig. 6-7).
5. Remove RTD from the chamber.
6. Note the orientation of the four black control wires on the overtemperature control module and then remove each.
7. Remove the lock nut securing controller to the mounting bracket and remove old controller.
8. Install the new overtemperature controller.
9. Reassemble in reverse order.
10. Verify overtemperature controller as outlined in Paragraph 5.10.

5.8 POWER SUPPLY REPLACEMENT

1. Disconnect the power cord.
2. Remove outer enclosure (see Fig. 6-1).
3. Identify the power supply (see Fig. 6-6)
4. Note the orientation of all connecting wires and carefully remove.
5. Remove screws securing power supply to the lower enclosure.
6. Install new power supply assembly.
7. Reassemble in reverse order.

5.9 EXHAUST/FILL VALVE REBUILDING (KIT 764320-920 REQ'D)

1. Disconnect the power cord.
2. Remove outer enclosure (see Fig. 6-1).
3. Identify exhaust/fill valve for rebuilding (see Fig. 6-4).
4. Remove fast-on terminals attached to the valve coil.
5. Remove the coil.
6. Rebuild valve as outlined in the Replacement Kit (764320-920) Instructions.
7. Reassemble in reverse order.

5.10 VERIFYING OVERTEMPERATURE CONTROLLER

NOTE: Attach potentiometer thermocouple to overtemperature RTD.

1. Remove thermistor from chamber.
2. Short level sensor to sterilizer chassis using a jumper wire.
3. Initiate any cycle.
4. Observe and note the temperature at which unit shuts down (blank display).
5. Verify that RTD shuts power OFF (blank display) and record shut down temperature.
6. Overtemperature controller must shut unit down prior to 450°F. If not, replace overtemperature controller module (P-93910-912).

5.11 DOOR PROCEDURES (SEE FIGURES 5-2 OR 6-2)

5.11.1 Replacing Door Gasket

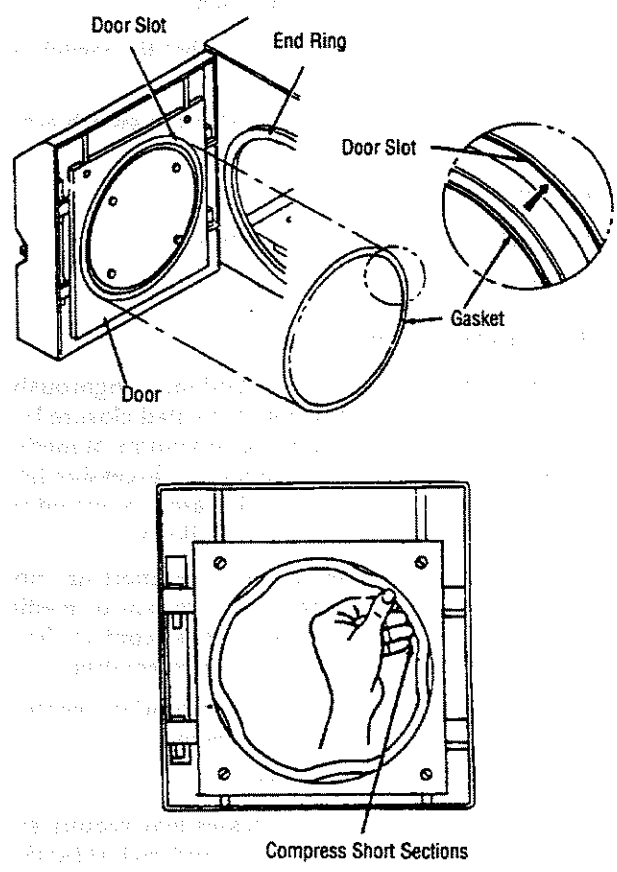


Figure 5-2 Door Gasket Replacement

5.11 DOOR PROCEDURES (SEE FIGURES 5-2 OR 6-2)

5.11.1 Replacing Door Gasket

1. Remove and discard the old gasket.
2. Clean slot and end ring with a damp cloth.
3. Wipe the new gasket (P-426637-261) clean with a damp cloth. Then slide the outer edge of gasket into the door slot a short section at a time without stretching it in the process. Should the gasket appear too long, DO NOT CUT IT. Start the process again, compressing short sections into slot, until the entire length is inserted.
4. Check that the gasket lip is fully inserted into door slot around the entire perimeter

5.11.2 Door Switch Adjustment

1. Remove outer cover assembly.
2. Close and lock door.
3. Loosen screws holding the limit switch bracket and adjust limit switch in a vertical direction to the activated position (clicks while moving switch up) and tighten screws (Fig. 5-3).
4. Unlock door and check to see that the switch is deactivated with a click.
5. Lock door again and verify that the switch activates with a click.
6. Reinstall outer cover.

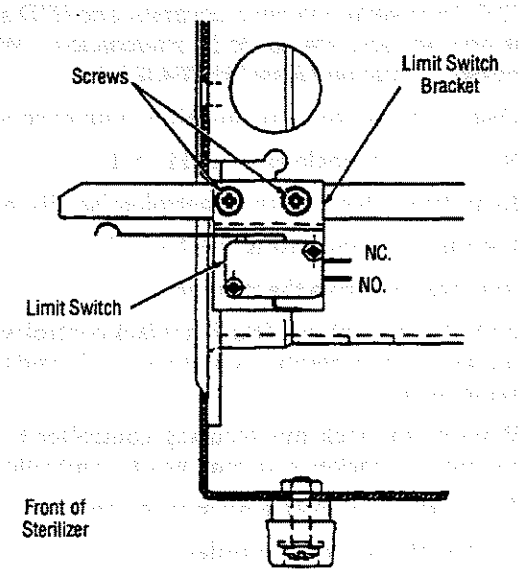


Figure 5-3. Door Switch Adjustment

5.12 Cleaning Chamber Filter

SEE PARAGRAPH 4.1.4.1

5.13 Liquid/Media Loss

Certain biological media may boil more vigorously during slow exhaust because of vented closure being used and/or ratio of liquid to volume of media container. If customer complains of excessive liquid/media loss or if media spills are discovered in bottom of chamber, proceed as follows:

1. Verify that customer media containers are not overly full. If customer is not certain of media volume per container, have them contact their STERIS Customer Account Representative.
2. Ensure customer is using appropriate vented closure for media being processed.
3. Check vent valve for leaks.
4. Certain liquid/media processes may require extended exhaust rates beyond standard EXHAUST phase. For additional information, contact STERIS Customer Account Representative.

Section 6: Illustrated Parts Breakdown

Eagle Ten and Ten + Sterilizer assemblies and components are illustrated and identified on the following pages. Part number description and quantity required for each usage are given. Each indentation in the description represents the assembly level. The UNITS PER ASSEMBLY column is specific for the given assembly or subassembly.

6.1 HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN

1. Determine the function and application of the part required. See Figure Index below 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.

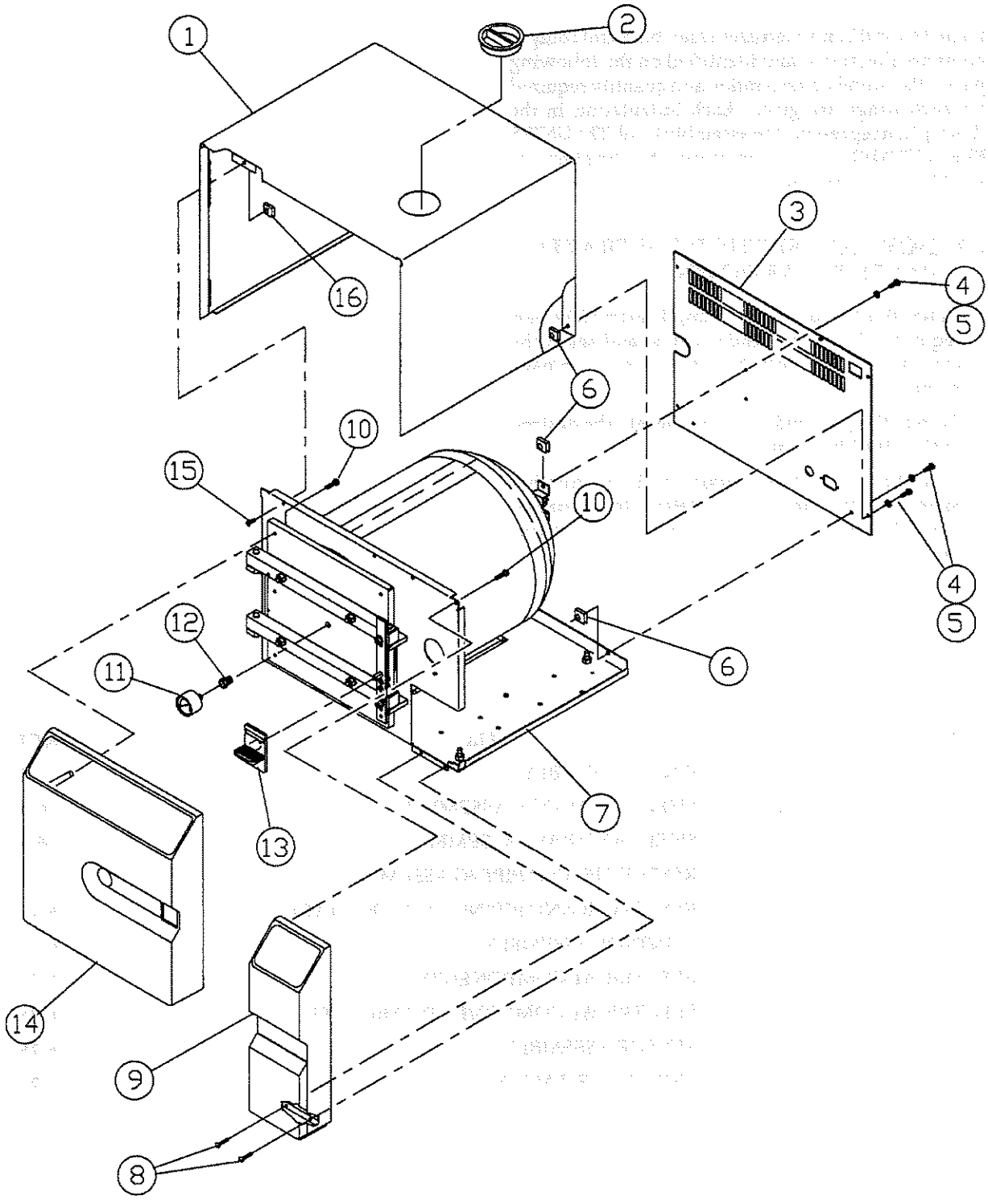


Figure 6-1. Final Assembly

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
6-1-			**FINAL ASSEMBLLY**				
			EAGLE TEN (Fixed)	X			
			EAGLE TEN (Fixed, W/Printer)		X		
			EAGLE TEN + (Programmable)			X	
			EAGLE TEN + (Programmable, W/Printer)				X
1	P426637263		ENCLOSURE, Shell	1	1	1	1
2	P418335208		CAP, Fill	1	1	1	1
3			BACK ENCLOSURE ASSEMBLY (See Figure 6-6)	1	1	1	1
4	P093910937		SCREW, Sems, #10-24 x 1/2	10	10	10	10
5	P020844061		WASHER, Flat, #10	10	10	10	10
6	P413720336		NUT, Speed, #10-24	10	10	10	10
7			SHELL, BASE, & DOOR ASSEMBLY (See Figure 6-2)	1	1	1	1
8	P031707041		SCREW, #10-24 x 1-1/8	2	2	2	2
9	P422637269		CONTROL ASSEMBLY, (Fixed)	1			
	P422637271		CONTROL ASSEMBLY, (Fixed W/Printer)		1		
	P422637270		CONTROL ASSEMBLY, (Programmable)			1	
	P422637272		CONTROL ASSEMBLY, (Programmable W/Printer)				1
10	P093910938		SCREW, Sems, #10-24 x 3/4	6	6	6	6
11	MZZA100290		GAUGE, Pressure	1	1	1	1
12	P129360899		EXTENSION, Pressure Gauge	1	1	1	1
13	P418335209		LATCH, Door	1	1	1	1
14	P426637264		COVER, Door	1	1	1	1
15	P150473132		SCREW, Flat Head, #6-32 x 1	2	2	2	2
16	P129361962		NUT, Speed, #6-32	2	2	2	2

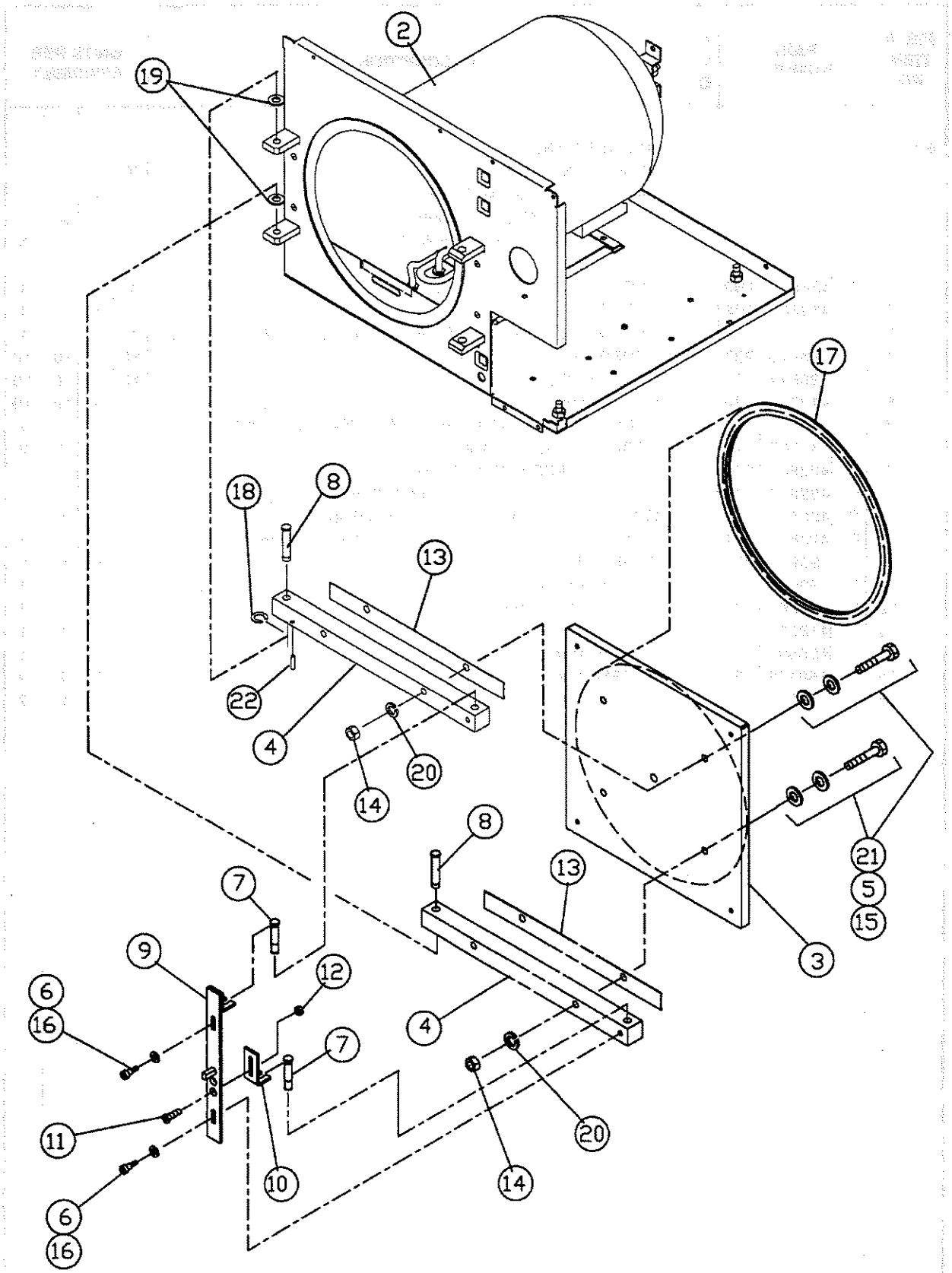


Figure 6-2. Shell and Door Assembly

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
6-2			SHELL AND DOOR ASSEMBLY	X
2			SHELL AND BASE ASSEMBLY (see Fig. 6-3)	1
3	P426637259		DOOR, Sterilizer	1
4	P418335205		BAR, Hinge	2
5	P033281061		WASHER, Flat .328ID x .687OD x .031THK	4
6	P031599041		WASHER, Flat .260ID x .562OD x .040THK	2
7	P413720325		PIN, Lock	2
8	P413720326		PIN, Hinge	2
9	P413720327		SLIDE, Weldment	1
10	P413720328		MOUNT, Pin	1
11	P430349045		SCREW (10-24 x 1/2") F.H.M.S	2
12	P430226045		NUT, Keps (10-24)	2
13	P093910914		GASKET	2
14	P003098045		NUT, Hex (5/16-18)	4
15	P129361723		BOLT (5/16-18 x 2")	4
16	P129356032		SCREW, Cap (10-32 x 3/16) HEX SOC HD	2
17	MZZA100299		GASKET, Door	1
18	P042641091		RING, Retain	2
19	P010456091		WASHER, FLAT (.390ID x .687OD x .031THK)	2
20	P019691061		LOCKWASHER, 5/16 LT. S/S	4
21	P129360774		WASHER, Sealing 5/16	4
22	P051084091		PIN, Dowel (3/16 x 3/4)	1

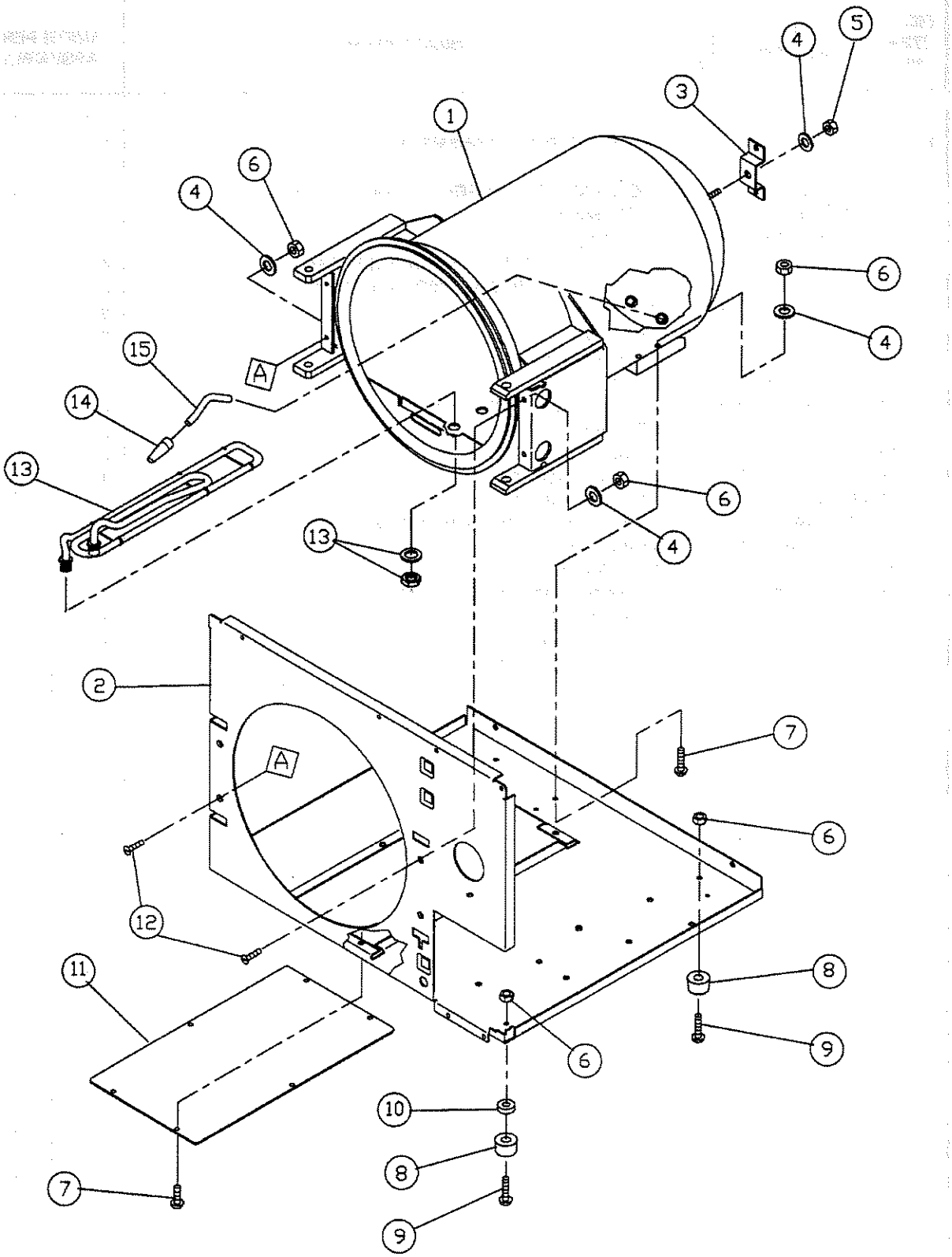


Figure 6-3. Shell and Base Assembly

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
6-3			SHELL AND BASE ASSEMBLY	X
1	P426637257		SHELL, Weldment	1
2	P426637268		ENCLOSURE, Bottom	1
3	P413720339		MOUNT, Rear	1
4	P020844061		WASHER, Flat #10	7
5	P129359532		NUT #10-32 Keps	1
6	P042387045		NUT #10-24	10
7	P093910937		SCREW, SEMS #10-24 x 1/2" lg	8
8	P033168091		BUMPER	4
9	P093910939		SCREW, SEMS #10-24 x 3/4" lg	9
10	P029919061		SPACER	2
11	P418335210		COVER, Lower Access	1
12	P430349045		SCREW, #10-24 Flat	4
13	MZZA100294		HEATER ASSEMBLY	1
14	P129357645		FILTER, Water	1
15	MZZA100293		TUBE, Filter	1

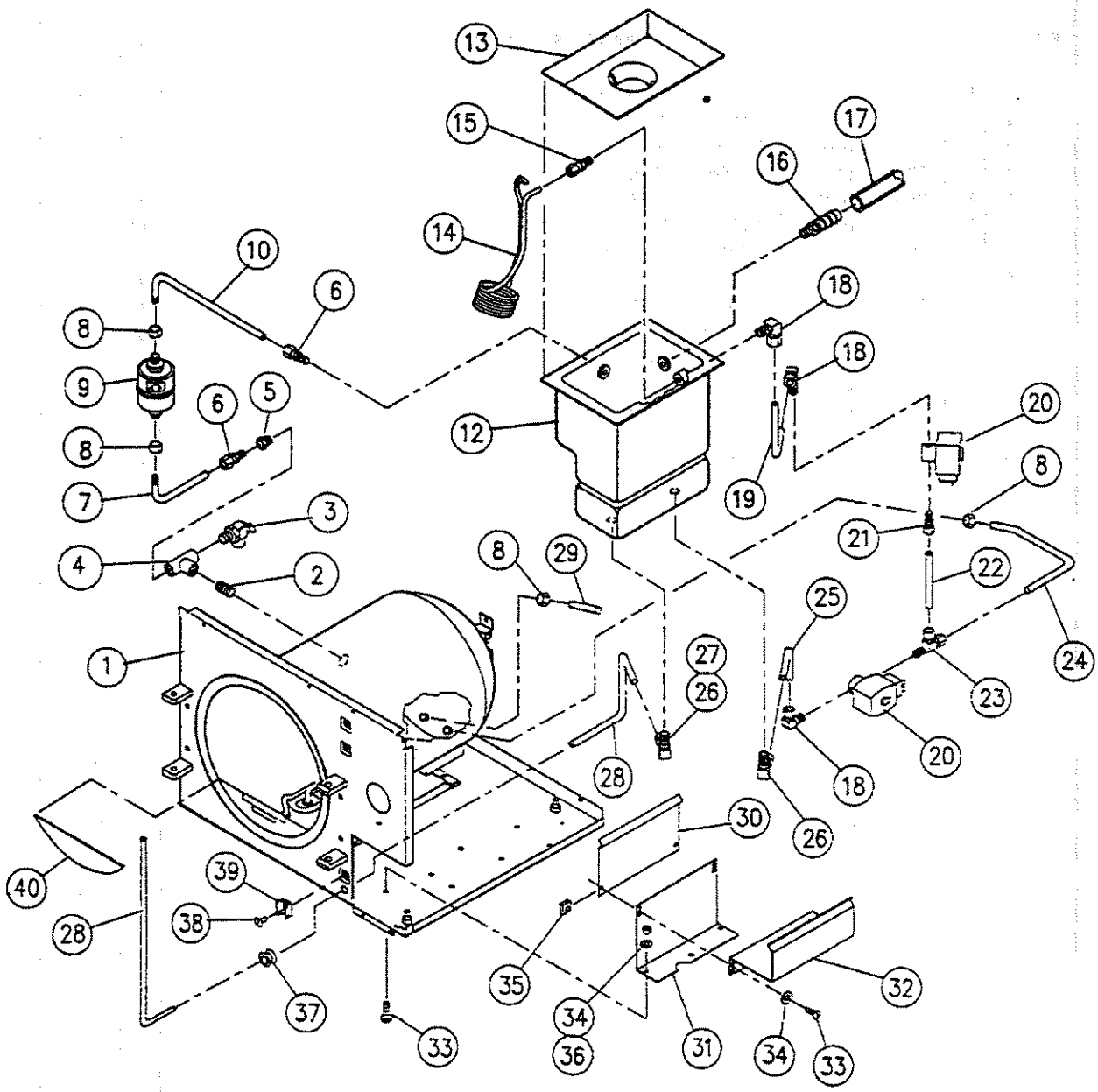


Figure 6-4. Reservoir and Piping Assembly (Before 7/1/91)

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
6-4			RESERVOIR AND PIPING ASSEMBLY (Before 7/91)	X
1			SHELL AND BASE ASSEMBLY	1
2	P029162091		NIPPLE, Pipe	1
3	MZZA100297		RELIEF VALVE	1
4	P400009087		TEE	1
5	P076053042		BUSHING, Reducing	1
6	P052737091		FITTING, Compression	1
7	P400027714		TUBE, Vent Lower	1
8	P129357611		NUT, Fitting	4
9	MZZA100295		AIR VENT	1
10	P400027715		TUBE, Vent Upper	1
11	P422922143		TANK ASSEMBLY (not shown)	1
12	P418335206		· TANK, Reservoir	1
13	P418335207		· COVER, Tank	1
14	MZZA100298		COIL, Condenser	1
15	P042564091		FITTING, STR 3/16ODT x 1/8NPT	1
16	P413720344		FITTING, Barb	1
17	P129357656		TUBING 1/2"ID	1
18	P006750091		FITTING, ELL, 5/16 ODT x 1/8 NPT	3
19	P413720341		TUBE, Copper	1
20	MZZA100292		VALVE, Solenoid Assembly	2
21	P129359112		FITTING, STR 5/16 ODT x 1/8 NPT x 5/16 ODT	1
22	P129361140		TUBE, Exhaust Lower	1
23	P006774091		FITTING, TEE 5/16 ODT x 1/8 NPT x 5/16 ODT	1
24	P418335215		TUBE, Fill	1
25	P413720342		TUBE, Copper	1
26	P007033091		FITTING, ELL	2
27	P084371004		TUBE, Tygon	1
28	P413720343		INSERT, Tube	1
29			TUBE, Plugging	1
30	P418335340		MOUNT, Rear, Reservoir	1
31	P418335212		SUPPORT, Reservoir	1
32	P418335211		MOUNT, Front, Reservoir	1
33	P093910937		SCREW, SEMS #10-24 x 1/2	6
34	P020844061		WASHER, Flat	6
35	P413720336		NUT, Speed, #10-24	2
36	P043287045		NUT, #10-24	6
37	P079821001		GROMMET	1
38	P074647061		SCREW, Self-Tapping, #4 x 1/4	1
39	P129360900		CLIP, Drain Tube	3
40	MZZA100296		SILICON FOAM	1

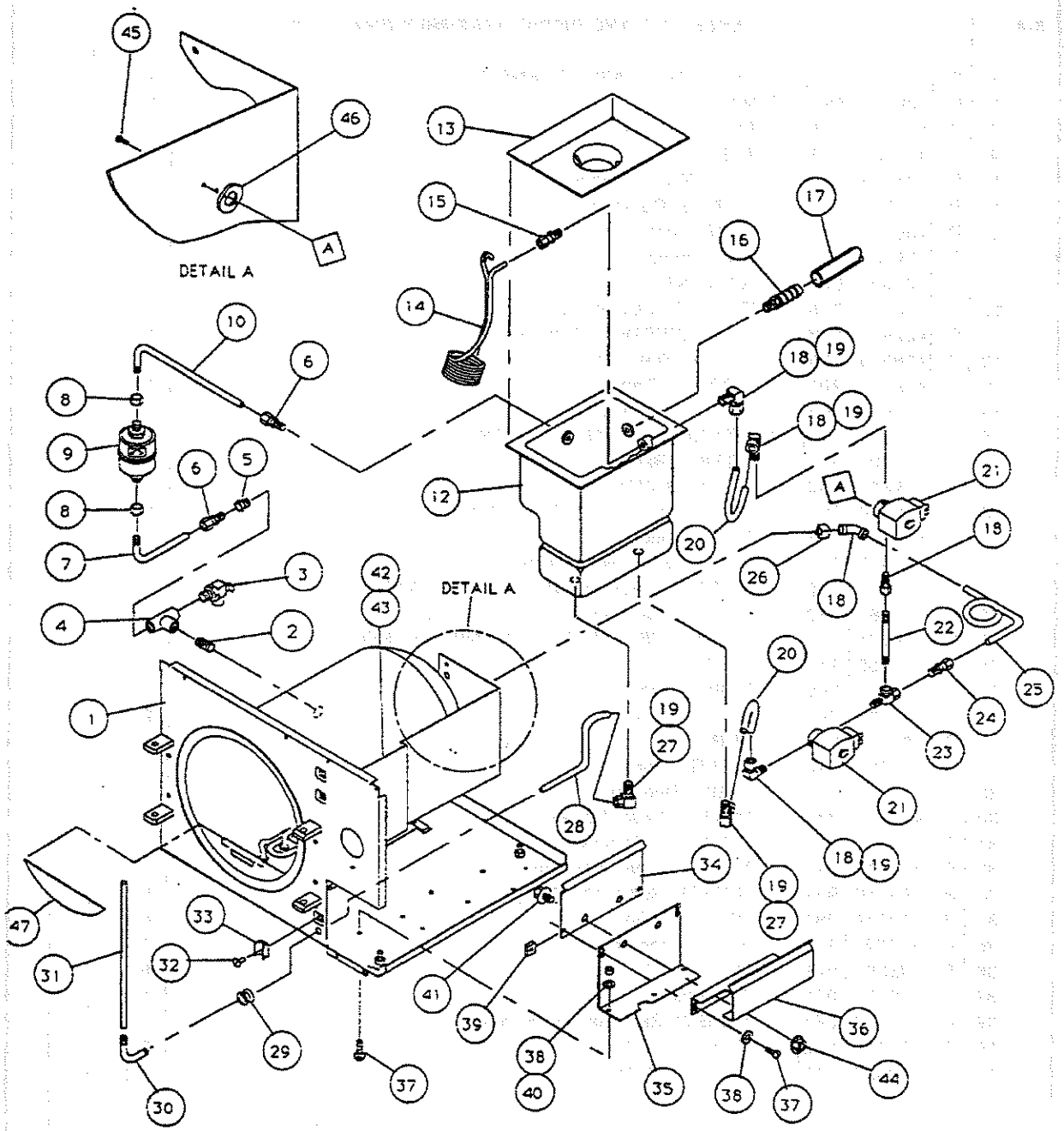


Figure 6-5. Reservoir and Piping Assembly (After 7/1/91)

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
6-4			RESERVOIR AND PIPING ASSEMBLY (After 7/91)	X
1			SHELL AND BASE ASSEMBLY	1
2	P029162091		NIPPLE, Pipe	1
3	MZZA100297		RELIEF VALVE	1
4	P400009087		TEE	1
5	P076053042		BUSHING, Reducing	1
6	P052737091		FITTING, Compression	1
7	P400027714		TUBE, Vent Lower	1
8	P129357611		NUT, Fitting	2
9	MZZA100295		AIR VENT	1
10	P400027715		TUBE, Vent Upper	1
11	P422922143		TANK ASSEMBLY (not shown)	1
12	P418335206		· TANK, Reservoir	1
13	P418335207		· COVER, Tank	1
14	MZZA100298		COIL, Condenser	1
15	P043289091		FITTING, STR 1/4ODT x 1/8NPT	1
16	P413720344		FITTING, Barb	1
17	P129357656		TUBING 1/2"ID	1
18	P400009211		FITTING, ELL, 5/16 ODT x 1/8 NPT	4
19	P084371004		INSERT, Tube	5
20	R003500772		TUBE, Teflon	A/R
21	MZZA100292		VALVE, Solenoid Assembly	2
22	P028904091		NIPPLE, Brass, 1/8 NPT x 3-1/2"	1
23	P400009213		TEE, Screet, Brass, 1/8 NPT	1
24	P129359112		FITTING, Straight, 5/16 ODT x 1/8 NPT	2
25	P129360474		TUBE, Drain/Fill, Brass	1
26	P400009202		ADAPTER, Brass (Loctite 271)	1
27	P400009212		FITTING, Tee, 1/8 NPT x 5/16 ODT	2
28	P400009206		TUBE, Reservoir Drain	1
29	P079821001		GROMMET	1
30	P400009205		ELBOW, Plastic	1
31	P400009207		TUBE, Sight Glass	1
32	P074647061		SCREW, Self-Tapping #4 x 1/4"	3
33	P129360900		CLIP, Drain Tube	3
34	P413720340		MOUNT, Rear, Reservoir	1
35	P418335212		SUPPORT, Reservoir	1
36	P418335211		MOUNT, Front, Reservoir	1
37	P093910937		SCREW, SEMS #10-24 x 1/2"	6
38	P020844061		WASHER, Flat	6
39	P413720336		NUT, Speed, #10-24	2
40	P129360541		NUT, Keps, #10-24	6
41	P129360011		FLANGEBOLT, 1/4-20 x 5/8"	2
42	P400077548		BRACKET, Shell Piping	1
43	P150828312		FLANGEBOLT, 1/4-20 x 5/8"	2
44	P129360015		LOCKNUT, Flange, 1/4-20	2
45	P093910934		SCREW, SEMS, #10-32 x 1/2	2
46	P400009208		BARRIER, Sound	1
47	MZZA100296		SILICON FOAM	1

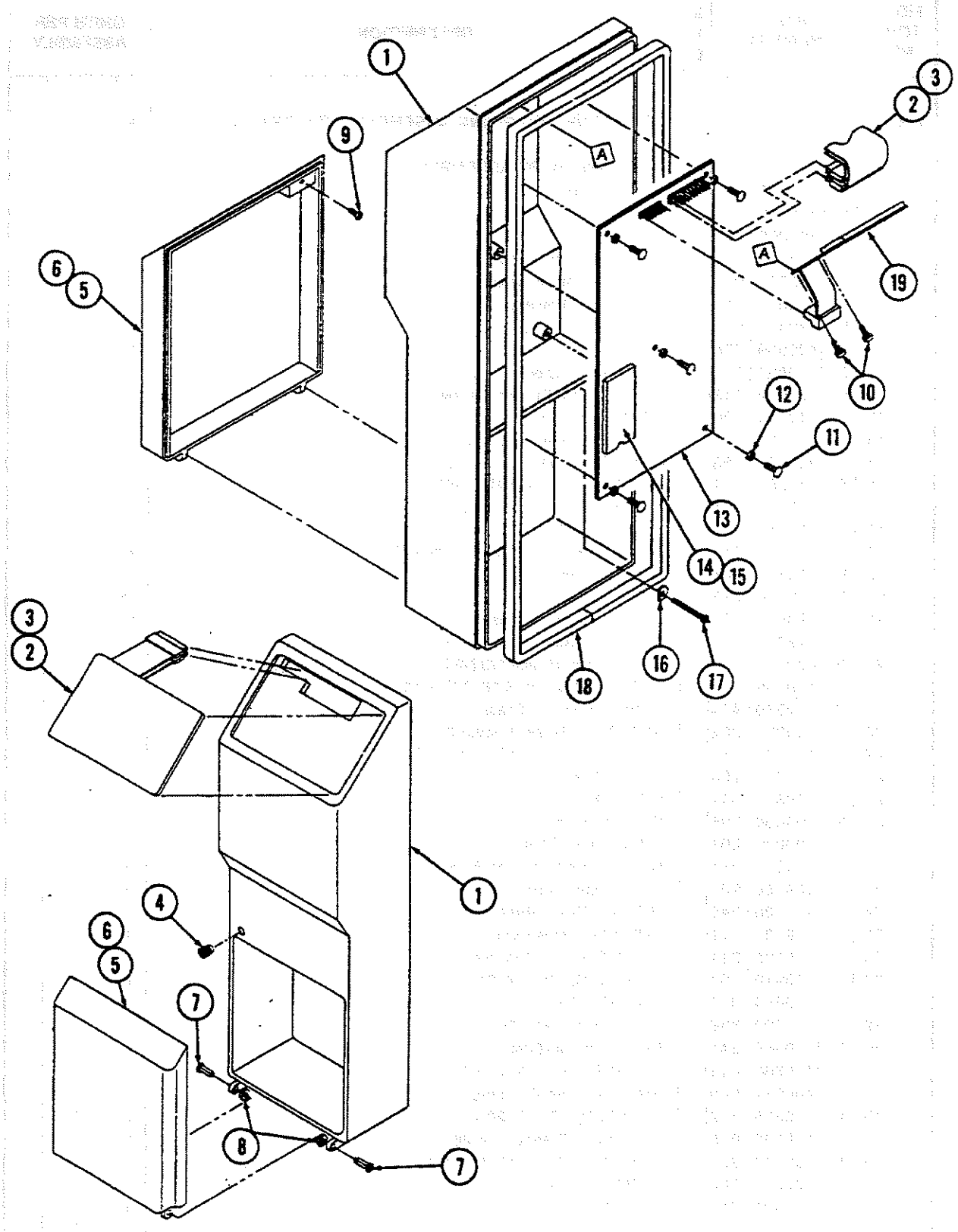


Figure 6-6. Control Assembly

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
6-6			**CONTROL ASSEMBLLY**				
	P426637269		EAGLE TEN (Fixed)	X			
	P426637271		EAGLE TEN (Fixed, W/Printer)		X		
	P426637270		EAGLE TEN + (Programmable)			X	
	P426637272		EAGLE TEN + (Programmable, W/Printer)				X
1	P426637265		COVER, Control	1	1	1	1
2	P146655114		PANEL, Touch, Eagle Ten	1	1		
3	P146655113		PANEL, Touch, Eagle Ten +			1	1
4	P129361133		CATCH, Magnetic		1		1
5	P422922145		DOOR, Printer	1		1	
6	P422922147		DOOR, Printer W/Window		1		1
7	P129361963		SCRW, RD Head #10-32 x 1/2	2	2	2	2
8	P129361964		NUT, Hex #10-32	2	2	2	2
9	P118404045		SCREW, #6-32 x 1/4		1		1
10	P129361967		SCREW, Self-Tapping #4-40 x 3/16	2	2	2	2
11	P081681001		SCREW, SEMS #6 x 32 x 3/8" lg	5	5	5	5
12	P129352094		WASHER, Flat#6	5	5	5	5
13	P146653874		CONTROL BOARD	1	1	1	1
14	P093910121		EPROM EAGLE 10	1	1		
15	P093910122		EPROM EAGLE 10+			1	1
16	P129361972		SCREW, #6-32 x1	1		1	
17	P118407045		DISPLAY, LED Assembly	1	1	1	1
18	P129361134		GASKET	1	1	1	1
19	P093910902		DISPLAY, LED Assembly	1	1	1	1

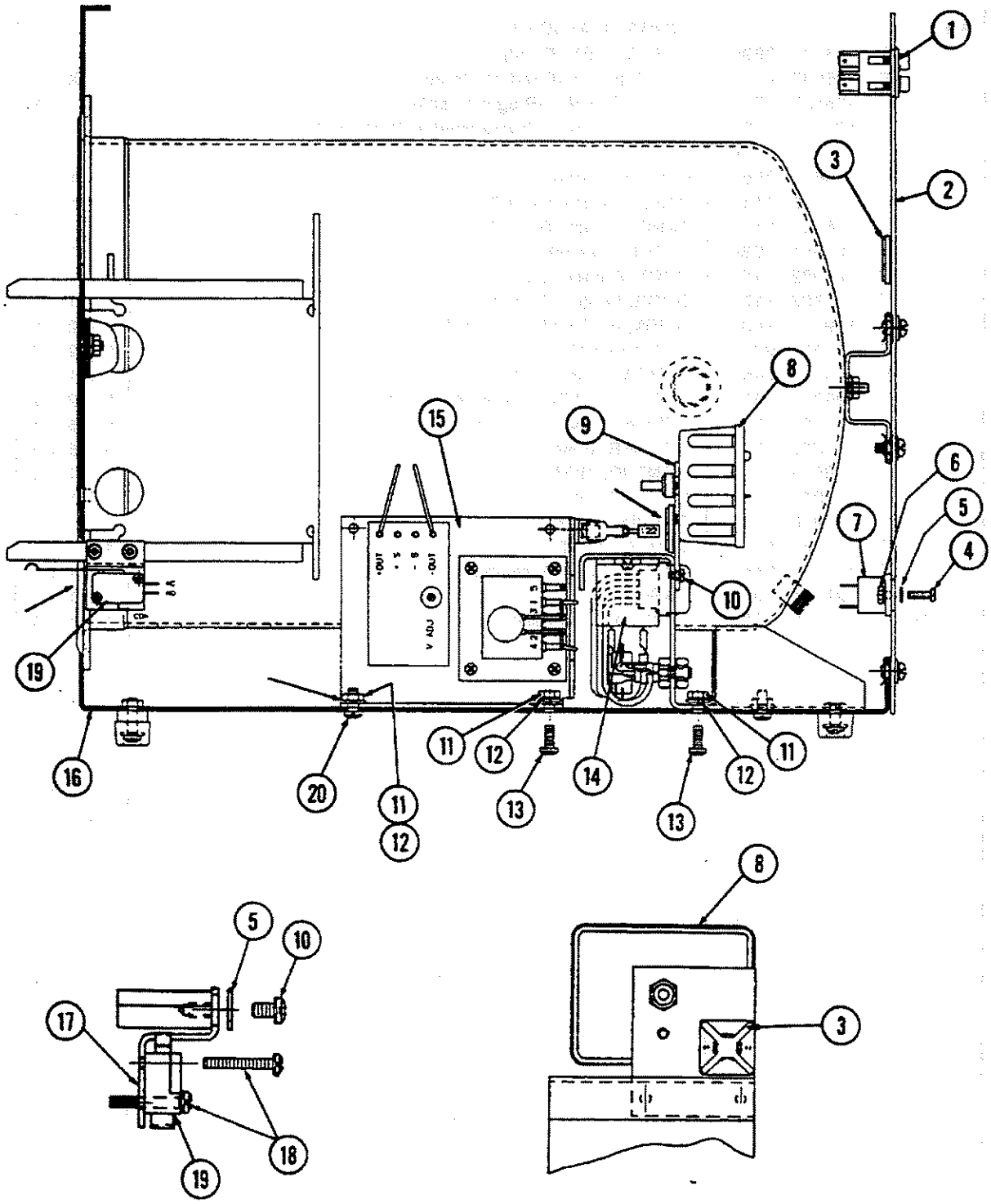


Figure 6-7. Electrical Components (Before 1/1/97)

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
6-7			ELECTRICAL COMPONENTS (120 V, Pre 7/91)	X
1	P093910913		SWITCH, Rocker	1
2	P422922144		ENCLOSURE, Back	1
3	P150476930		WIRE, Tie Mount	1
4	P093908034		SCREW, SEMS #6-32 x 1/2 lg	2
5	P084114001		WASHER, Flat	4
6	P084114002		NUT, #6-32	2
7	P093910911		RECEPTACLE	1
8	P093910912		CONTROL, Over-Temperature	1
9	P093910916		PLATE, Support	1
10	P093908033		SCREW, SEMS #6-32 x 1/4 lg	4
11	P043287045		NUT, #10-24	5
12	P020844061		WASHER, Flat #10	4
13	P093910937		SCREW, SEMS #10-24 x 1/2 lg	3
14	P136806981		TRIAC, Control Assembly	1
15	P136807856		POWER SUPPLY ASSEMBLY	1
16			ENCLOSURE (See Fig. 6-3)	1
17	P093910149		BRACKET, Door Switch	1
18	P093910936		SCREW, SEMS #4-40 x 3/4 lg	2
19	P093910148		SWITCH, Limit	1
20	P093910939		SCREW, SEMS #10-24 x 3/4 lg	1

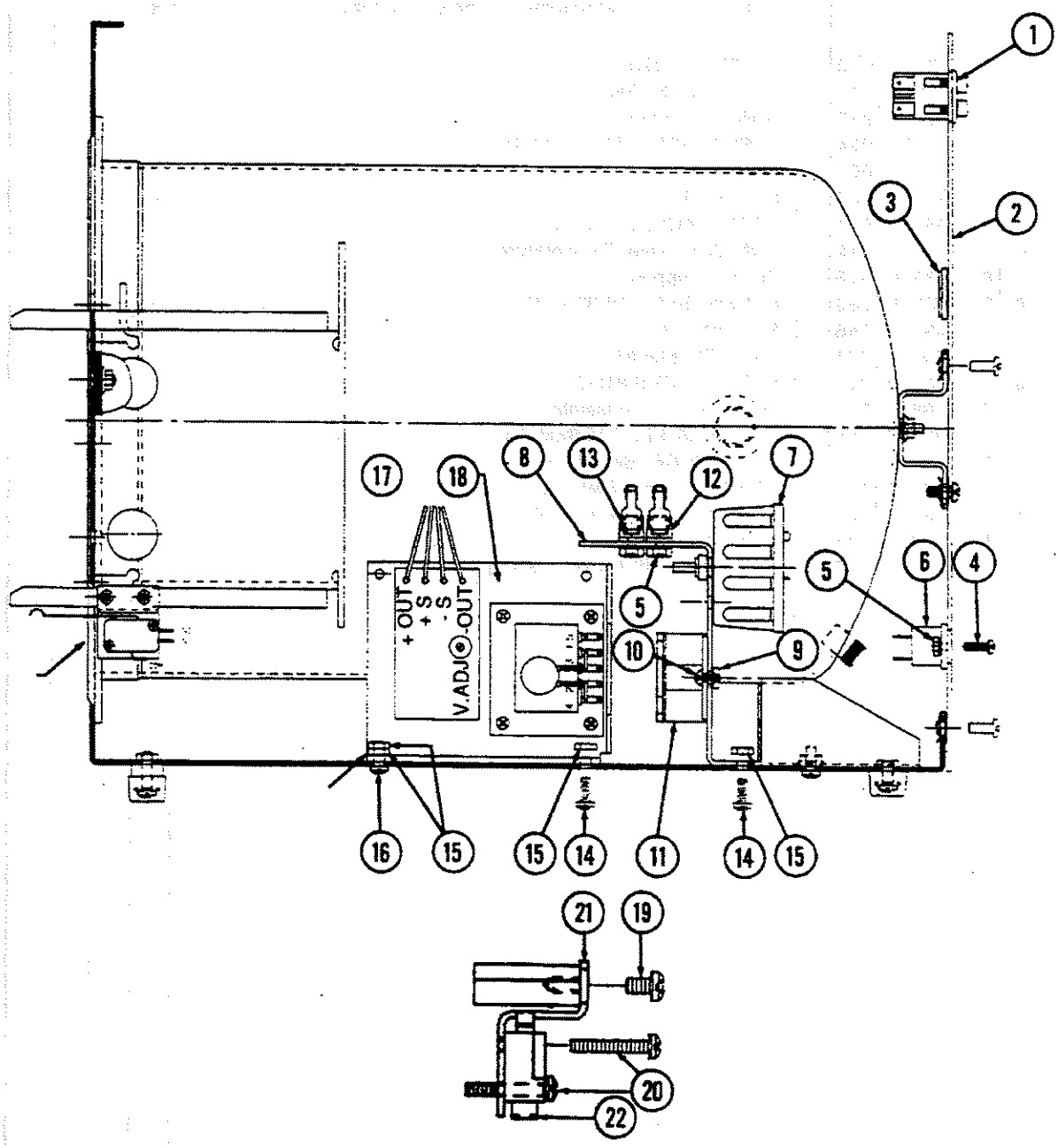


Figure 6-8. Electrical Components (After 1/1/97)

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY			
6-8			ELECTRICAL COMPONENTS (120 V, After 7/91)	X			
			ELECTRICAL COMPONENTS (240 V, After 7/91)		X		
1	P093910913		SWITCH, Rocker	1	1		
2	P422922144		ENCLOSURE, Back	1	1		
3	P150476930		WIRE, Tie Mount	1	1		
4	P093908034		SCREW, SEMS #6-32 x 1/2 lg	2	2		
5	P084121002		NUT, #6-32	4	4		
6	P093910911		RECEPTACLE	1	2		
7	P093910912		CONTROL, Over-Temperature	1	1		
8	P400077470		RELAY MOUNT	1	1		
9	P129359531		NUT, Keps, #8-32	2	2		
10	P093910935		SCREW, SEMS	2	2		
11	P129360018		RELAY	1	1		
12	P150822678		BLOCK, Fuse	2	2		
13	P093908039		SCREW, SEMS	2	2		
14	P093910937		SCREW, SEMS #10-24 x 1/2 lg	3	3		
15	P129360541		NUT, Keps, #10 x 24	2	2		
16	P093910939		SCREW, SEMS #10-24 x 3/4 lg	1	1		
17	P400077508		POWER SUPPLY (120 V)	1			
18	P400077509		POWER SUPPLY (240 V)		1		
19	P093908033		SCREW, SEMS #6-32 x 1/4 lg	4	4		
20	P093910936		SCREW, SEMS #4-40 x 3/4 lg	2	2		
21	P093910149		BRACKET, Door Switch	1	1		
22	MZZA100291		SWITCH, Limit	1	1		
23	P129361141		FUSE 120 VOLT	1			
	P400000154		FUSE 240 VOLT		1		

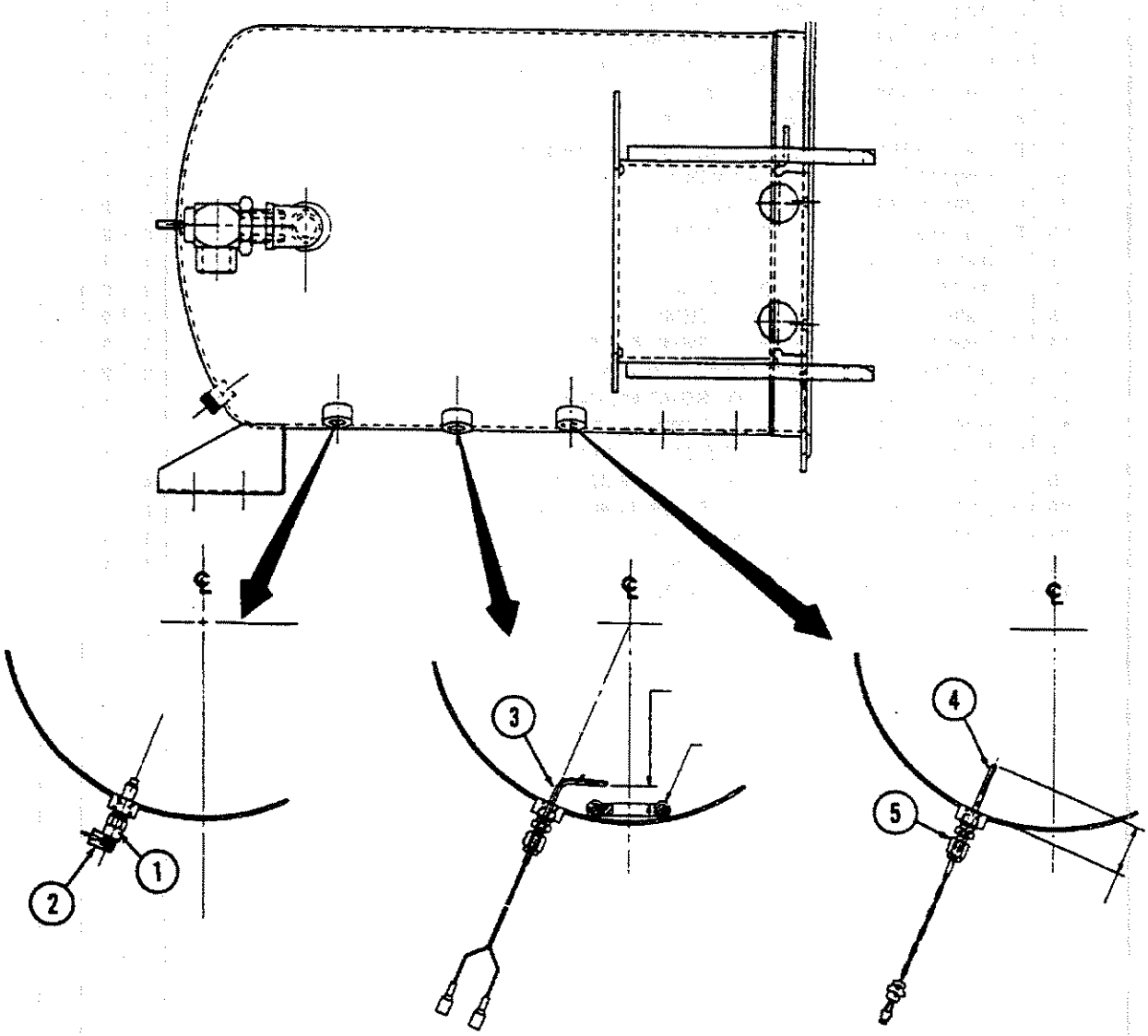


Figure 6-9. Sensor Assembly

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
6-9			**SENSOR ASSEMBLY**	X
1	P093910908		SENSOR, Water Level	1
2	P003500584		TUBING, Heat Shrink	A/R
3	P093910917		SENSOR, RTD Overtemp	1
4	P093910905		THERMISTOR ASSEMBLY	1
5	P129357536		FITTING, Thermistor	1

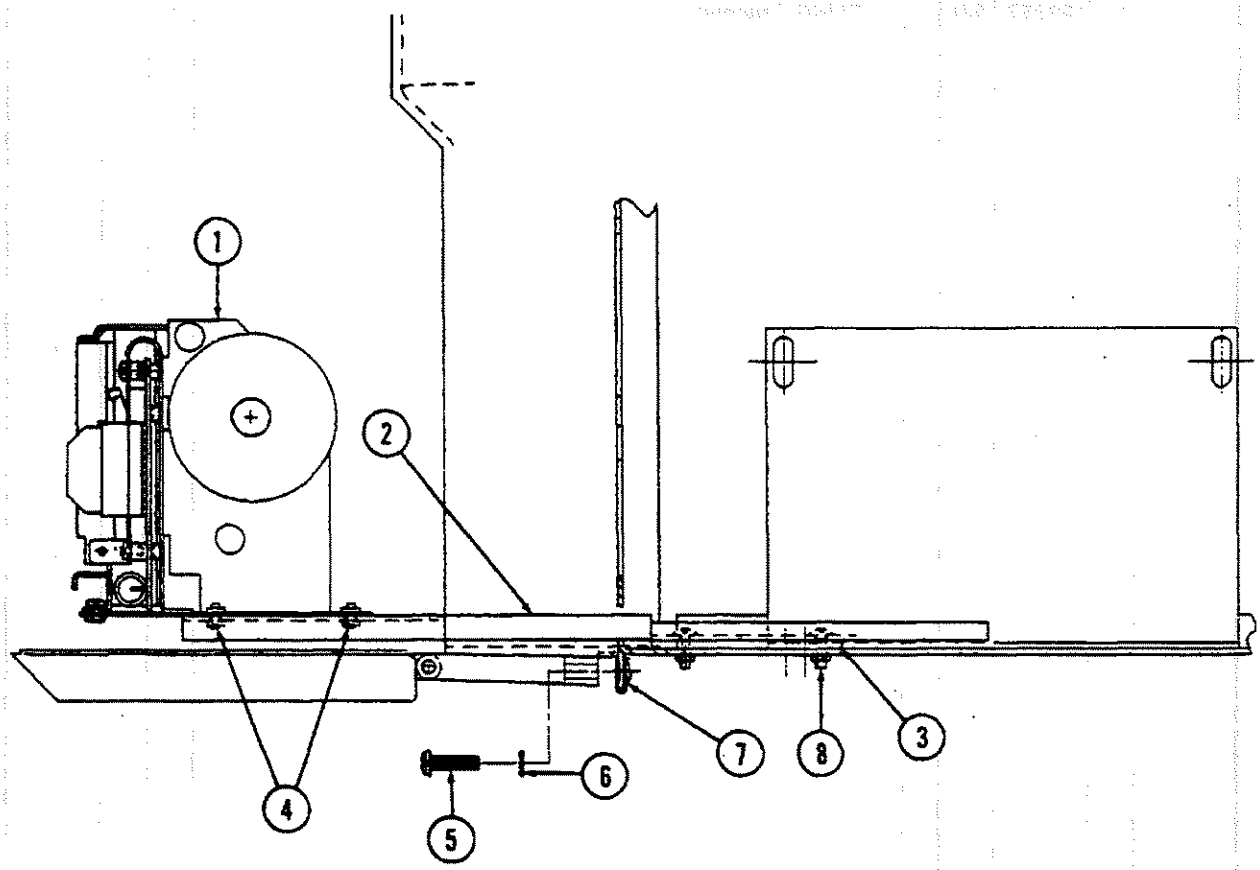


Figure 6-10. Printer Assembly (Optional)

FIG. & ITEM NO.	PART NUMBER	SVC	DESCRIPTION	UNITS PER ASSEMBLY
6-10			**PRINTER ASSEMBLY (units with printer)**	X
1	P400096017		PRINTER AND CABLE ASSEMBLY	1
	P129361195		· LIMIT SWITCH	1
	P093909399		· PRINTER MOTOR	1
	P755716005		· PRINTER & CONNECTOR ASSEMBLY	1
2	P400027755		SLIDE	1
3	P400009130		SPACER	1
4	P093908033		SCREW, SEMS #6-32 x 1/4"	2
5	P031707041		SCREW, #10-24 x 1-1/8"	2
6	P129354174		LOCKWASHER, Star, #10	2
7	P081015045		NUT, Speed, #10-32	2
8	P081669006		SCREW, Truss Head, #8-32 x 1/2"	2
9	P129359008		PAPER (NOT SHOWN)	1