"If You Can Find It, You Can Fix It!" ™

And If You Can Fix It, You Can Save BIG MONEY

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"Autoclave Repair Made Simple"

This Chemiclave 5000 Troubleshooting Guide Is Brought To You By AllClaveParts.com With Our Compliments

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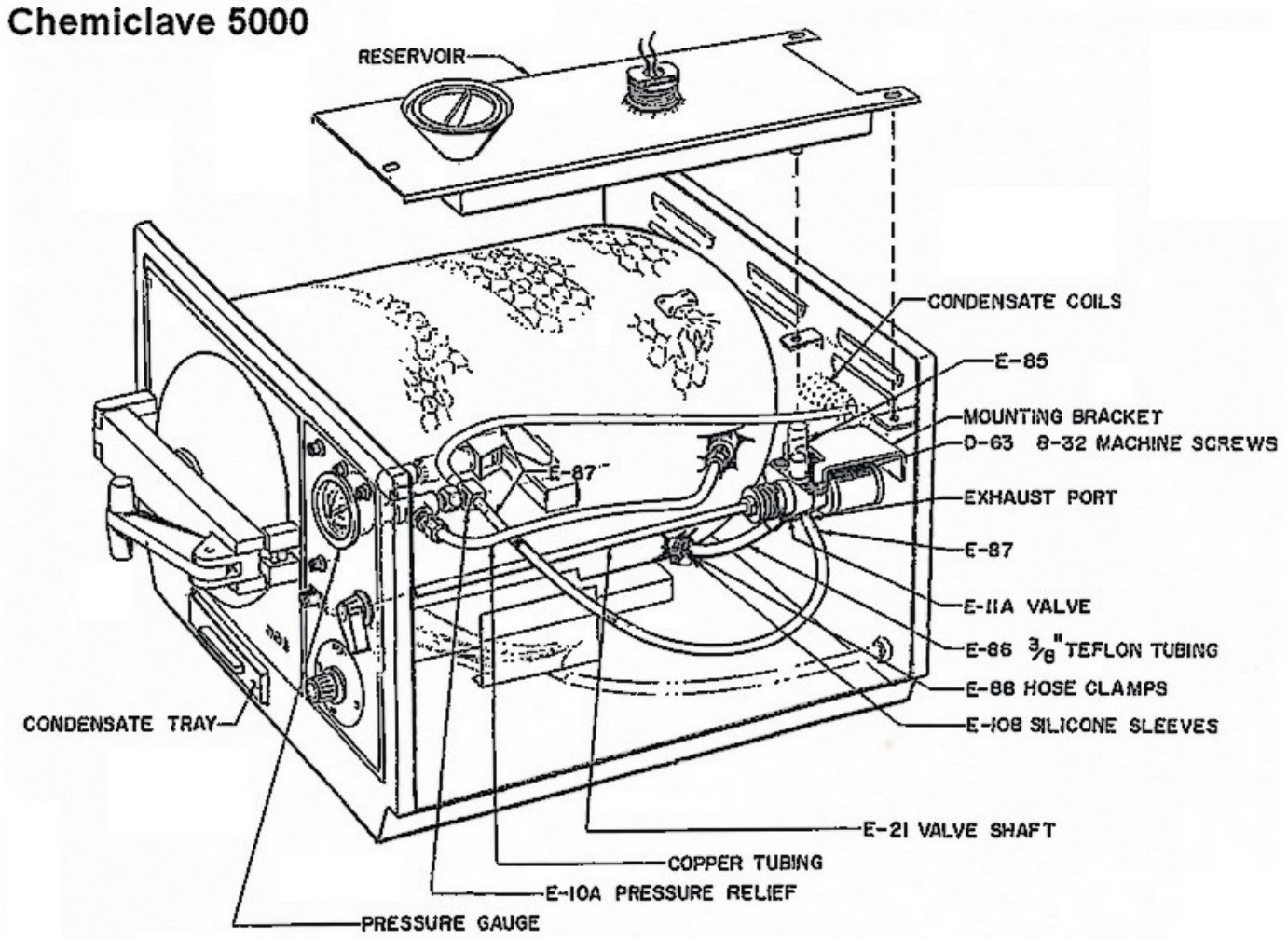
CHEMICLAVE 5000 TROUBLESHOOTING



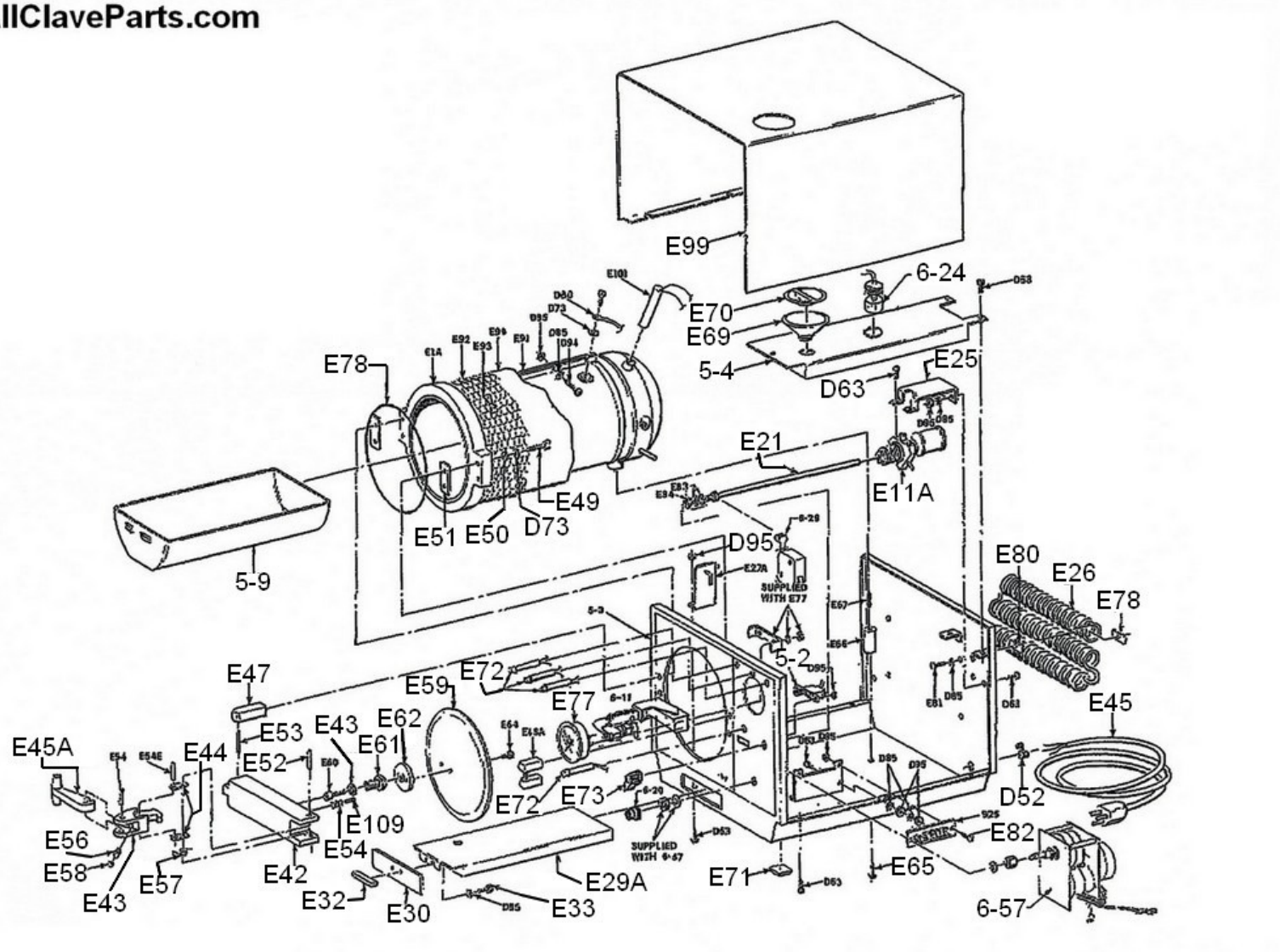
Valve & Tubing Drawing

AllClaveParts

MDT Harvey Chemiclave 5000
Troubleshooting, Service & Repair Manual
(Check Each Item In Sequence)

Problem	Procedure
1. Pressure Too Low - Will Not Reach Vaporization (Green) Zone	a) Check that reservoir is filled with Vapo-Sterilization Solution b) Check that sterilizer is not being overloaded in use. Extremely large loads of heavy metal may prolong heating and pressure build-up time c) Check if user is wrapping instruments in multiple wraps of linen or cloth or is lining the tray with cloth towel. Heavy cloth insulation may prolong heating and pressure build up time. Chemically pure, hard surface paper bags and liners, such as Harvey Indicator Bags (sterilization bags/pouches) and tray liners should be used in place of multiple wrapped or folded cloth d) Check for leaks (See Sections 7, 8, 9 and 10 Below) e) Check for proper temperature (See Section 6 Below)
2. Pressure Rises, But Drops	a) Check for Door Seal Leaks (See Section 8 Below) b) Check for internal tubing fittings, pressure attachments and hose clamp leaks (See Section VII Below c) Check for pressure relief valve leaks (See Section 9 Below) **d)** Check for Metering Valve Leaks (See Section 10 Below)
3. Pressure Too High	a) Check if user is placing excessively wet instruments in sterilizer. For proper operation, instruments must be cleaned, rinsed and towel dried before sterilizing. Rinsing in Vapo-Steril Solution assures water removal b) Check if user allows "Depressurize" cycle to be completed before "Pressurize Cycle is restarted. USER MUST WAIT AT LEAST 15 SECONDS BETWEEN TURNS OF VALVE

	c) Check if temperature is too high (See Section 11 Below)
4. Door Difficult To Open	Tension on the door is preset at the factory. Adjustment of door tension may be desirable after the Chemicals have been in use. Door should never be adjusted to permit pressure to bypass gasket at less than 40 PSI If door is difficult to open when chamber is not pressurized, relieve tension on door. To relieve tension, close door and turn 9/16" hex bushing (E-61) counter-clockwise. Bushing is located between bridge (E-42) and door (E-59). Use wrench on end of tray handle (E-100) or thin 9/16" end wrench and adjust UNTIL LATCH CAN JUST BE OPENED WITHOUT SAFETY HANDLE BREAKING AT HINGE. DO NOT BEND SPRING
5. Timer Will Not Start	The timer is activated by a pressure switch (6-11) when pressure builds to approximately 20psi a) Check that pressure builds to 20 psi (See Sections 7, 8, 9, 10 and 11 Below) b) Check Pressure Switch Function (See Section 7 Below) c) Check Timer Function (Section 7 Below)
6. Solution Light Will Not Turn On	The solution light is turned on by a float system which rises and falls with the level of the Vapo-Steril Solution. a) Check that light is not burned out (See Section 8 Below) **b)** Check float system function (See section 8 below)



Checking & Corrective Procedures

7. Leaks At Fittings **(See Valve & Tube Drawing)**	a) Check for leaks throughout the pressure system by using compressed air with the Chemiclave at room temperature. Remove outside cover (E-99) by loosening six screws on bottom of cover lip. Remove reservoir (E-23A) by removing three screws and lifting reservoir straight up. Quickly place finger over outlet under reservoir to prevent spilling Vapo-Steril Solution. Next remove Teflon tubing from valve (E-11A) b) Open door and turn control knob (E-78) to "Pressurize" to drain Vapo-Steril Solution from Valve. Wipe Solution from bottom of Chamber. c) Turn control knob to "Depressurize". Latch door and, with a compressed air nozzle held tightly against exhaust port on metering valve tubing stub, blow air into Chemiclave until indicator gauge on front panel reaches Vaporization (green) range, then turn control knob to "pressurize". d) Check for leaks around tube fittings and pipe threads at gauge, metering valve, and chamber by brushing with soapy water. Leaks will appear as bubbles or foam. No foaming should occur except possibly around the taper of the metering valve. If foaming occurs at taper of metering valve, leakage should be slight. e) Foaming or bubbling indicate leakage. To correct, first tighten leaking part and repeat pressure test. If leakage still occurs, check for damage to fittings or threads and replace as necessary. If damage is extensive, return Chemiclave to factory for repairs. f) If Chemiclave is heated, turn know to "Pressurize" and check for leaks at fittings and pipe threads by brushing with soapy water as described in 7d above. If foaming or bubbling indicate leakage, follow procedure outlined in Section 7E above
8. Leaks At	The door gasket serves two functions. On function is to seal the

Gasket And Door	chamber at Sterilization pressure to 40 psi. The Second function is to act as a safety relief over-ride system in addition to the pressure relief valve. The gasket should only be bypassed by pressures exceeding 40psi. For leaks below 40 psi, follow each procedure in sequence. a) If Chemiclave is at room temperature, leaks around door gasket can be checked by using compressed air, soapy water and a brush as described in Section 7 above. Foaming or bubbling indicates leakage. b) If Chemiclave is heated, turn control knob to "Pressurize" and check for leaks around door gasket by placing a few drops of oil at top edge of door and allowing oil to flow completely around door. If foaming or bubbling indicate leakage, turn control know to "Depressurize" and, after pressure reaches Zero, open door. c) To replace Gasket, remove old gasket by lifting from gasket grove with a dull instrument, being careful not to cut or scratch groove. Using a bristle brush and Harvey Metal Cleaner, clean bottom of groove and sealing surface of door before installing new gasket. Force new gasket into groove until seated evenly at four or five widely divided points. Seat as completely as possible with finger pressure, then slowly close door to apply pressure until gasket is completely sealed. **BE CAREFUL NOT TO CUT OR DAMAGE GASKET WHEN SEATING.** d) If the gasket is not defective and the door still leaks, increase tension on door. To increase tension, close door and turn 9/16 hex bushing (E-61) clockwise. Bushing is located between bridge (E-42) and door (E-59). Use wrench on end of tray handle (E-100) or thin 9/16" end wrench and adjust **UNTIL LATCH CAN JUST BE OPENED WITHOUT SAFETY HANDLE BREAKING AT HINGE. DO NOT BEND SPRING**
9. Leaks At Pressure Relief Valve **(See Valve and Tube Drawing)**	As a safety factor, excessive pressure is released by the pressure relief valve in a range between 40 & 60 psi. After prolonged use of Chemiclave, leaking at the pressure relief valve may develop. a) If Chemiclave is at room temperature, leaks at pressure relief

	valve can be checked by removing cover and using compressed air, soapy water and a brush as described in Section 7d. Check for leaks at pressure relief valve (E-10A) by removing condensate tray (E-29A). Hold finger over discharge tube (E-27A) and apply soapy water to end of Teflon exhaust tubing which was removed from valve. Foaming or bubbling indicates leakage. b) If Chemiclave is heated, turn control knob to "Pressurize, remove outside cover (E-99) and observe movement of Vapo-Steril Solution in Teflon tubing. If pressure relief valve is leaking, liquid will collect in Teflon tubing and move towards metering valve (E-11A). Also, liquid in exhaust tubing between condensor (E-26) and discharge bracket (E-27A) will move towards discharge bracket. c) To replace pressure relief valve, remove reservoir (E-23A) by removing three 8/32 machine screws (D-63) and lifting Reservoir straight up. Quickly place finger over outlet under reservoir to prevent spilling Vapo-Steril Solution. Remove Teflon tubing from hose stubs on pressure relief valve from pipe "T" (E-105) by turning pressure relief valve with 7/16" end wrench or crescent while preventing pipe "T" from moving by holding with suitable wrench. Install new pressure relief valve by reversing the process.
10. Leaks At Metering Valve (See Valve & Tube Drawing)	Vapo-Steril Solution is metered into the Chemiclave Chamber by the metering valve (E-11 A). Teflon coating is applied to the valve for longer life, but leakage may still occur with prolonged use. a) If Chemiclave is at room temperature, leaks at the metering valve can be checked by removing cover and using compressed air, soapy water and a brush as described in Section 7d above. Apply soapy water to exhaust port o metering valve tubing stub. Foaming or bubbling indicate leakage. b) If Chemiclave is heated, turn knob to "Pressurize". Remove outside cover (E-99) and observe movement of Vapo-Steril Solution in Teflon tubing. Liquid in exhaust line running from metering valve to pressure relief valve (E-10A) will move towards pressure relief valve.

	c) To replace metering valve, remove reservoir (E-23A), remove Teflon tubing (E-86), remove exhaust line from metering valve, and loosen hose clamps (E-88). Then remove retaining ring (E-83) from metering valve shaft, remove two 8/32 machine screws holding metering valve to bracket, and remove metering valve and tubing from chamber fitting. Install new metering valve, being careful not to damage end of 3/8" Teflon tubing (E-86). If necessary, flare end of Teflon tube slightly. Mounting holes in metering valve must line up with holes in bracket. Install metering valve mounting screws, but do not tighten. Move Red Silicone Sleeve downward on Teflon tube until approximately 1/16" of hose stub on chamber projects. Slide hose clamp to center of sleeve and tighten. Install metering valve shaft. Shaft should slide freely in end of metering valve (pin in metering valve and slot in shaft are purposely off-center to assure assembly one way only). Rotate metering valve until it moves freely. Tighten mounting screws. Install reservoir and check Chemiclave for proper function.
11. Temperature Control	**CAUTION: THE THERMOSTAT (E-101) IS DESIGNED AND CONSTRUCTED TO OPERATE FOR YEARS WITHOUT ADJUSTMENT. THE THERMOSTAT SHOULD NEVER BE ADJUSTED UNLESS TEMPERATURE IS PROVEN INCORRECT BY THE FOLLOWING PROCEDURE** a) Place accurate, etched stem, glass thermometer, with a maximum reading of at least 150 degrees C in the instrument tray. Position thermometer on blocks or rack to hold bulb of thermometer approximately one inch above bottom of tray. A thermometer and rack are available from MDT. b) Place tray containing thermometer inside chamber. Make certain reservoir contains Vapo-Steril Solution. Connect Chemiclave to A.C. Line power voltage and turn switch "ON". Close door and turn knob to "Depressurize" c) When temperature light (E-72) goes out (approximately 15 minutes on initial heat-up), turn control knob to "Pressurize". Pressure should reach Vaporization (Green) zone within 3 minutes and remain stable for 20 minutes. After buzzer

	sounds, turn control knob to “Depressurize”. Pressure should reach zero in approximately 1 minute. d) Open door and using tray handle, slide tray out and QUICKLY read thermometer. Temperature should be between 129℃ and 135℃. If adjustment is necessary, follow procedure e (next). e) To correct temperature, remove outside cover (E-99) and adjust thermostat (E-101) located on right rear of chamber and to left of reservoir (E-23A). The thermostat is sprayed with red paint. Turning adjusting screw quarter turn clockwise lowers temperature approximately 11℃. turning adjusting screw one quarter turn counter-clockwise raises temperature approximately 11℃. After each adjustment, repeat temperature test, allowing thermometer to remain in “Pressurized” Chemiclave for at least 15 minutes before each reading. f) If thermostat cannot be adjusted to maintain temperature between 129℃ and 135℃ after REPEATED adjustments, replace with new thermostat.
12. Timer	The timer is activated by a pressure switch (6-11) when pressure builds to approximately 20 psi. a) Heat Chemiclave and turn control knob to “Pressurize”. Watch pressure rise on gauge. Listen closely and carefully to timer area. When pressure passes 20 psi, a clicking sound indicates pressure switch (6-11) IS FUNTIONING PROPERLY. b) Remove outside cover and disconnect timer (6-57) from electrical circuit. Check timer for correct electrical function. Replace if faulty.
13. Solution Light	The solution light on the front panel indicates when the reservoir needs refilling with Vapo-Steril Solution and the condensate tray needs emptying. The light is activated by a float system which rises and falls with level of Vapo-Steril Solution.

	a) Remove outside cover and remove solution light (E-72) from electrical circuit. Check light for correct electrical function. Replace if faulty. b) Check for free movement of float (6-24) by removing float from reservoir and checking function. Replace if faulty.

Controls & Indicators

Power & Temperature Lights	Two lights on the front panel indicate electrical and temperature functions of the Chemiclave. a) The “Power” light (E-72) will remain on until the switch is turned off at the end of the day, indicating the Chemiclave is receiving power. b) The “Temperature” light (E-72) will remain on up to 15 minutes during initial heating period. After initial heating, the “Temperature” light will turn off and on as the thermostat automatically maintains optimum temperature for sterilization.
Pressurize-Depressurize Control	The “Pressurize” “Depressurize” control meters Vapo-Steril Solution into the chamber when in the “Pressurize” position. At the end of the sterilization cycle, turning the control to “Depressurize” position vents vapors from the chamber through the condensate coils to the condensate tray.
Pressure Gauge	The pressure gauge (E-77) on the front panel indicates pressure only and has no effect on temperature. Since failure is very unusual, check other causes for pressure changes before replacing gauge.
Solution Light	The “Solution” light signals that the solution reservoir needs refilling and the condensate try needs emptying.
Switch	The switch controls power ON-OFF
Timer	The timer (6-57) indicates time only and has no function which can interfere with the sterilization cycle. The timer also activates a buzzer and light indicating completion of the sterilization cycle. Replacement may be required after extensive continued use. The timer is activated by a pressure switch (6-11)

IF ABOVE PROCEDURES AND/OR REPLACEMENT OF PARTS FAIL TO CORRECT MALFUNCTION, CHEMICLAVE SHOULD BE RETURNED TO MDT FOR FACTORY REPAIR

Preventative Maintenance

The following suggestions will help Chemiclave users prevent needless service calls and/or repairs.

A. Use Only Vapo-Steril Solution and store solution separately from other liquids to prevent inadvertent filling of reservoir with a foreign liquid. USE OF ANY LIQUID OTHER THAN VAPO-STERIL MAY PREVENT STERILIZATION AND MAY SEVERELY DAMAGE THE AUTOCLAVE,

B. Always line the instrument tray with chemically pure Harvey Tray liners. Certain papers (such as paper towels) contain paper processing impurities and may stain or cause deposits in the tray and chamber if used as liners,

C. Clean the tray at least weekly with Harvey Metal Cleaner to remove stains and prevent build-up of foreign deposits.

D. Use Harvey Metal Polish on external surfaces daily to prevent residue accumulation.

E. Check the door gasket periodically for cuts or wear to anticipate leaks and loss of Vapo-Steril Solution. Replace the door gasket yearly as a prevenative measure.

F. Do not leave the door latched when not in use. Unnecessary pressure will shorten the life span of he door gasket.

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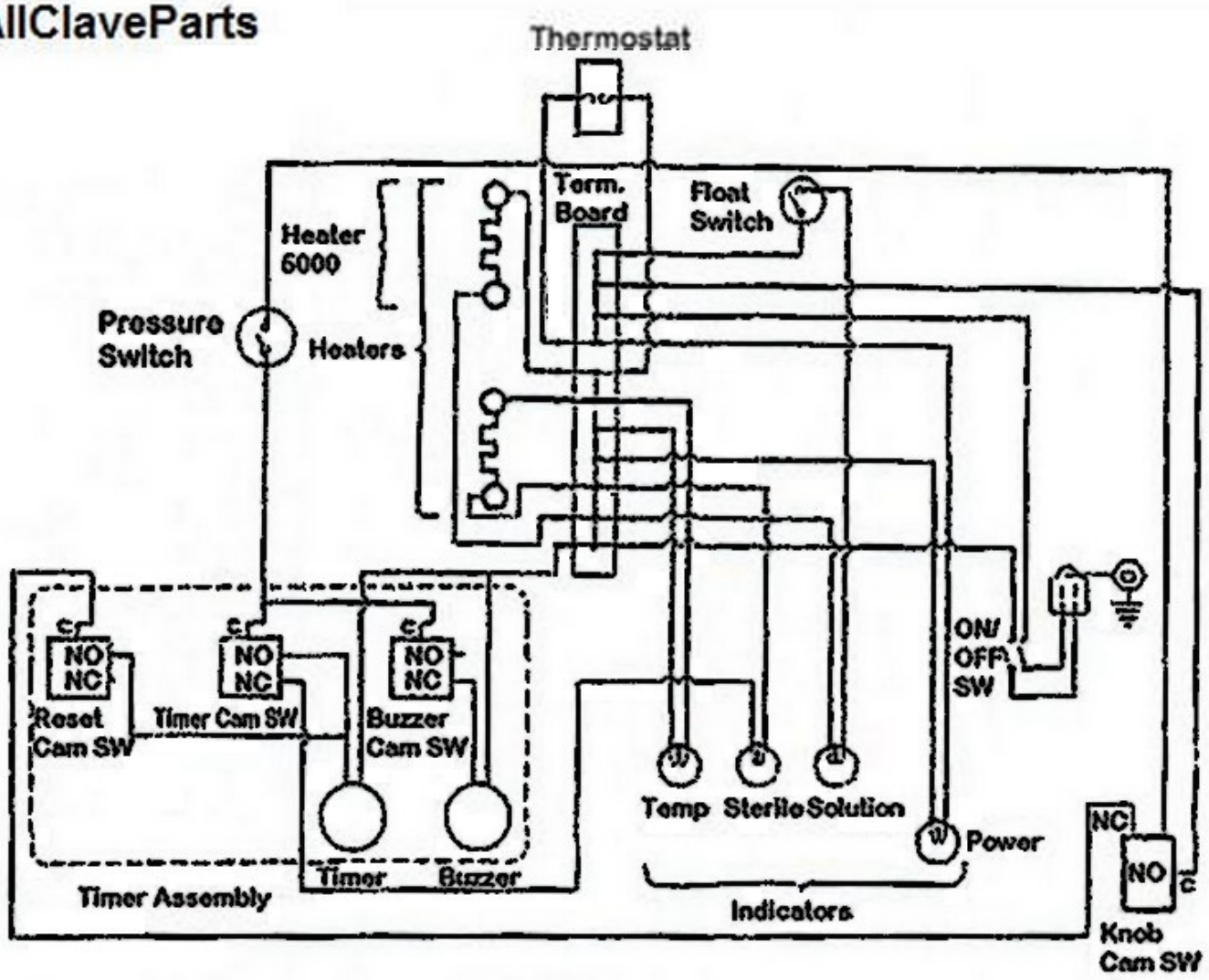

Wiring Diagram