

# UltraClave® Automatic Sterilizers

## Model Numbers:

**M9** -020 thru -022

**M9D** -020 & -022

**M11** -020 thru -022

**M11D** -020 & -022

## Serial Number Prefixes:

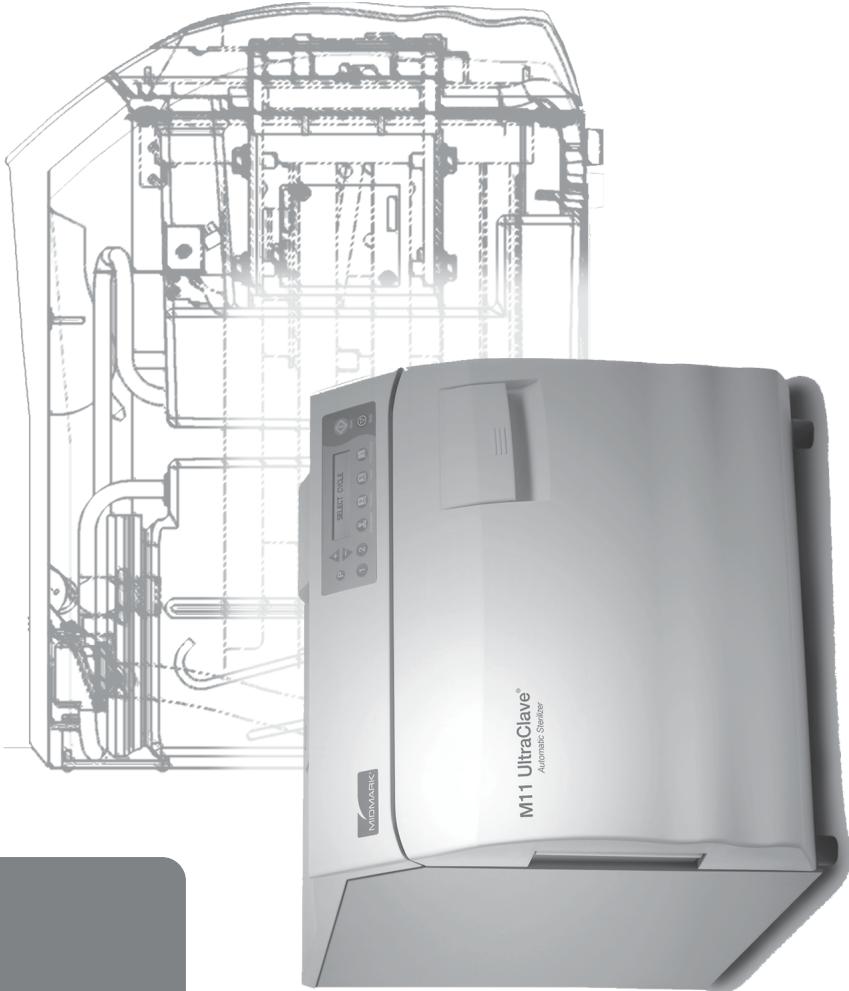
RN, RP, RR, V

RW, RX, V

RS, RT, RV, V

RY, RZ, V

## Service and Parts Manual



CE

SF-1854

FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY

Part No. 004-0453-00 Rev. E (1/20/12)

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# General Information

## Symbols

<b>Caution</b>  Indicates a potentially hazardous situation which could result in injury if not avoided.	<b>Equipment Alert</b>  Indicates a potentially hazardous situation which could result in equipment damage if not avoided.	<b>Note</b> Amplifies a procedure, practice, or condition.	 Indicates that the component the check mark appears beside should be tested before replacing it. In Section A, test the components in the order indicated. (ex. <b>1st ✓</b> then, <b>2nd ✓</b> )  Refer to Section B for component testing procedures.
---	---	---	--

These symbols are used throughout this manual to represent the operational status of functions and components.

 Indicates the function / component is working properly. No action required.	 Indicates the function / component is working, but a problem exists.	 Indicates the function / component is not working at all.
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## Ordering Parts

The following information is required when ordering parts:

- Serial number & model number
- Part number for desired part.

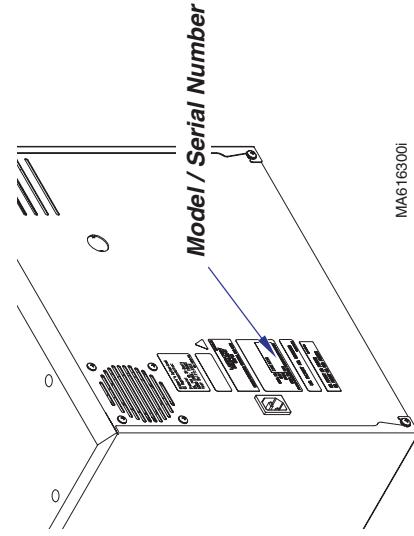
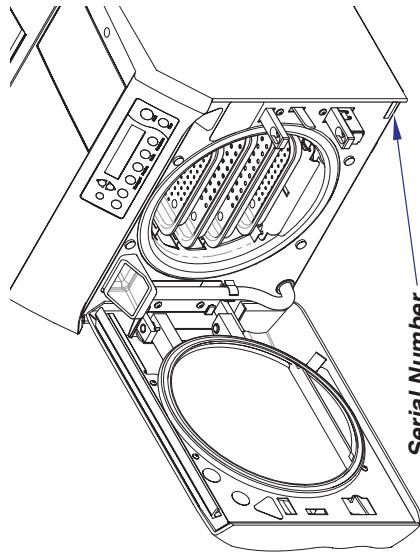
[Refer to Section E: Exploded Views / Parts Lists]

**Non-warranty parts orders may be faxed to Midmark using the Fax Order Form in the back of this manual.**

**For warranty parts orders, call Midmark's Technical Service Department with the required information.**

Hours: 8:00 am until 5:00 pm EST [Monday - Friday]  
Phone: 1-(800)-Midmark

### Model / Serial Number Location



MA616300i

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SF-1854

# General Information

## Weights, Dimensions, Electrical Specifications

### ATTENTION

A separate (dedicated) electrical circuit is recommended for all models (M9/D & M11/D). Do not connect to a circuit with other devices, unless the circuit is rated for the additional load.

### M9 / M9D Model Information

#### Dimensions [Refer to illustration]:

Front Height (A)	15.8 in. (40.1 cm)
Width (B)	15.3 in. (38.9 cm)
Depth w/plug (C)	20.1 in. (51 cm)
Back Height (D)	15.3 in. (38.9 cm)

#### Standard Tray Dimensions

M9 / M9D (Large)	7 5/16 in. x 12 in. x 7/8 in. (18.6 cm x 30.5 cm x 2.2 cm)
M9 / M9D (Small)	5 5/8 in. x 12 in. x 7/8 in. (14.3 cm x 30.5 cm x 2.2 cm)

Chamber Size:	Diameter: 9 in. (22.9 cm) Depth: 15 in. (38.1 cm)
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#### Fuses (on main PC board):

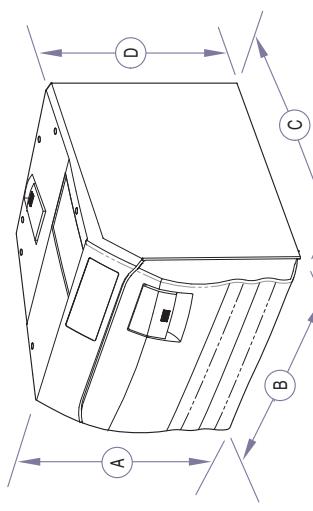
115 VAC model	0.250 amp, 250 V, Slo-Blo, 1/4" x 1-1/4" F1 ..... 0.250 amp, 250 V, Slo-Blo, 1/4" x 1-1/4"
230 VAC models:	15 amp, 250 V, Fast-Acting, 1/4" x 1-1/4" F2 ..... 15 amp, 250 V, Fast-Acting, 1/4" x 1-1/4"

#### Power Consumption:

115 VAC models	1425 watts, 12 amps @ 120 VAC F1 ..... 0.125 amp, 250 V, Slo-Blo, 5mm x 20mm F2 ..... 8 amp, 250 V, Fast-Acting, 5mm x 20mm
230 VAC models	1500 watts, 7 amps @ 240 VAC F1 ..... 0.125 amp, 250 V, Slo-Blo, 5mm x 20mm F2 ..... 8 amp, 250 V, Fast-Acting, 5mm x 20mm

#### Heat Emission:

M9 / M9D	5000 BTU/Hr during operation F1 ..... 1425 watts, 12 amps @ 120 VAC F2 ..... 1500 watts, 7 amps @ 240 VAC
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### M11 / M11D Model Information

#### Dimensions [Refer to illustration]:

Front Height (A)	17.8 in. (45.2 cm)
Width (B)	17.75 in. (45.2 cm)
Depth w/plug (C)	22.75 in. (57.8 cm)
Back Height (D)	17.0 in. (44.2 cm)

#### Standard Tray Dimensions

M11 / M11D (Large)	9 in. x 15 in. x 1 1/8 in. (22.9 cm x 38 cm x 2.9 cm)
M11 / M11D (Small)	6 5/8 in. x 15 in. x 1 1/8 in. (14.3 cm x 38 cm x 2.9 cm)

Chamber Size:	Diameter: 11 in. (27.9 cm) Depth: 18 in. (45.7 cm)
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#### Shipping Carton:

(Length x Width x Height)	24.2 in. x 20.5 in. x 21 in. (61.4 cm x 52 cm x 53.3 cm)
Weight:	Shipping Weight ..... 81 lbs (36.7 kg) w/reservoir empty ..... 73 lbs (33.1 kg) w/reservoir full ..... 82 lbs (37 kg)

#### Reservoir Capacity:

Approx. 1.1 gallon (4.1 liters)	at FULL mark
Pressure Relief Valve:	opens at approximately: 40 psi (275kPa)

Electrical Requirements:	[See Model Identification / Compliance Chart]
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#### Fuses (on main PC board):

115 VAC models	F1 ..... 0.250 amp, 250 V, Slo-Blo, 1/4" x 1-1/4" F2 ..... 15 amp, 250 V, Fast-Acting, 1/4" x 1-1/4"
230 VAC models:	F1 ..... 0.125 amp, 250 V, Slo-Blo, 5mm x 20mm F2 ..... 8 amp, 250 V, Fast-Acting, 5mm x 20mm

#### Heat Emission:

M11 / M11D	5000 BTU/Hr during operation F1 ..... 1425 watts, 12 amps @ 120 VAC F2 ..... 1500 watts, 7 amps @ 240 VAC
------------	---

# General Information

## Model Identification / Compliance Chart - M9/D & M11/D

Model	Description	Complies To:						Electrical Ratings:		
		Serial Number Prefixes	UL 61010A-1	UL 61010-2-041	CAN/CSA C22.2, #1010	CAN/CSA C22.2, #1010-2-041-96	ASME Boiler & Pressure Vessel Code	VAC +/- 10%	Amps	Cycles (Hz)
M9-020	Midmark M9 Ultrclave (115 VAC)	RN & V	X	X	X	X	X	115	12	50/60
M9-021	Midmark M9 Ultrclave (230 VAC)	RP & V	X	X	X	X	X	230	6.4	50/60
M9-022	Ritter M9 Ultrclave (115 VAC)	RR & V	X	X	X	X	X	115	12	50/60
M9D-020	Midmark M9D Ultrclave (115 VAC)	RW & V	X	X	X	X	X	115	12	50/60
M9D-022	Ritter M9D Ultrclave (115 VAC)	RX & V	X	X	X	X	X	230	12	50/60
M11-020	Midmark M11 Ultrclave (115 VAC)	RS & V	X	X	X	X	X	115	12	50/60
M11-021	Midmark M11 Ultrclave (230 VAC)	RT & V	X	X	X	X	X	230	6.4	50/60
M11-022	Ritter M11 Ultrclave (115 VAC)	RV & V	X	X	X	X	X	115	12	50/60
M11D-020	Midmark M11D Ultrclave (115 VAC)	RY & V	X	X	X	X	X	115	12	50/60
M11D-022	Ritter M11D Ultrclave (115 VAC)	RZ & V	X	X	X	X	X	230	12	50/60



# General Information

## Cycle Parameters

This table shows the temperature / pressure / time parameters for the pre-set cycles.

Cycle	Chamber Temperature (minimum)	Chamber Pressure (minimum)	Sterilization Mode Time	Dry Mode Time*
 Unwrapped	270°F (132°C)	27.1 psi (186 kPa)	3 minutes	30 minutes*
 Pouches	270°F (132°C)	27.1 psi (186 kPa)	5 minutes	30 minutes*
 Packs	250°F (121°C)	15 psi (104 kPa)	30 minutes	30 minutes*
 Handpieces	270°F (132°C)	27.1 psi (186 kPa)	6 minutes	30 minutes*

\* Dry Mode Time can be adjusted from 0 to 60 minutes

## Special Tools

This table lists all special tools needed to diagnose and repair the sterilizer.

Special Tool	Manufacturer	Part Number	Purpose of Tool
Digital Multimeter	Commercially available	any type	To perform continuity / voltage checks
Digital Thermometer	Commercially available	any type	To verify chamber temperature
Pressure Gauge Test Harness	Midmark Corporation	002-0372-00	To check chamber pressure during cycle

# General Information

## *Warranty Information*

### **SCOPE OF WARRANTY**

Midmark Corporation ("Midmark") warrants to the original purchaser its new Alternate Care products and components (except for components not warranted under "Exclusions") manufactured by Midmark to be free from defects in material and workmanship under normal use and service. Midmark's obligation under this warranty is limited to the repair or replacement, at Midmark's option, of the parts or the products the defects of which are reported to Midmark within the applicable warranty period and which, upon examination by Midmark, prove to be defective.

### **APPLICABLE WARRANTY PERIOD**

The applicable warranty period, measured from the date of delivery to the original user, shall be one (1) year for all warranted products and components.

### **EXCLUSIONS**

This warranty does not cover and Midmark shall not be liable for the following: (1) repairs and replacements because of misuse, abuse, negligence, alteration, accident, freight damage, or tampering; (2) products which are not installed, used, and properly cleaned as required in the Midmark "Installation" and/or "Installation / Operation Manual for this applicable product. (3) products considered to be of a consumable nature; (4) accessories or parts not manufactured by Midmark; (5) charges by anyone for adjustments, repairs, replacement parts, installation, or other work performed upon or in connection with such products which is not expressly authorized in writing in advance by Midmark.

### **EXCLUSIVE REMEDY**

Midmark's only obligation under this warranty is the repair or replacement of defective parts. Midmark shall not be liable for any direct, special, indirect, incidental, exemplary, or consequential damages or delay, including, but not limited to, damages for loss of profits or loss of use.

### **NO AUTHORIZATION**

No person or firm is authorized to create for Midmark any other obligation or liability in connection with the products.

**THIS WARRANTY IS MIDMARK'S ONLY WARRANTY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. MIDMARK MAKES NO IMPLIED WARRANTIES OF ANY KIND INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS.**

### **Additional Information**

Failure to follow the guidelines listed below will void the warranty and/or render the sterilizer unsafe for use.

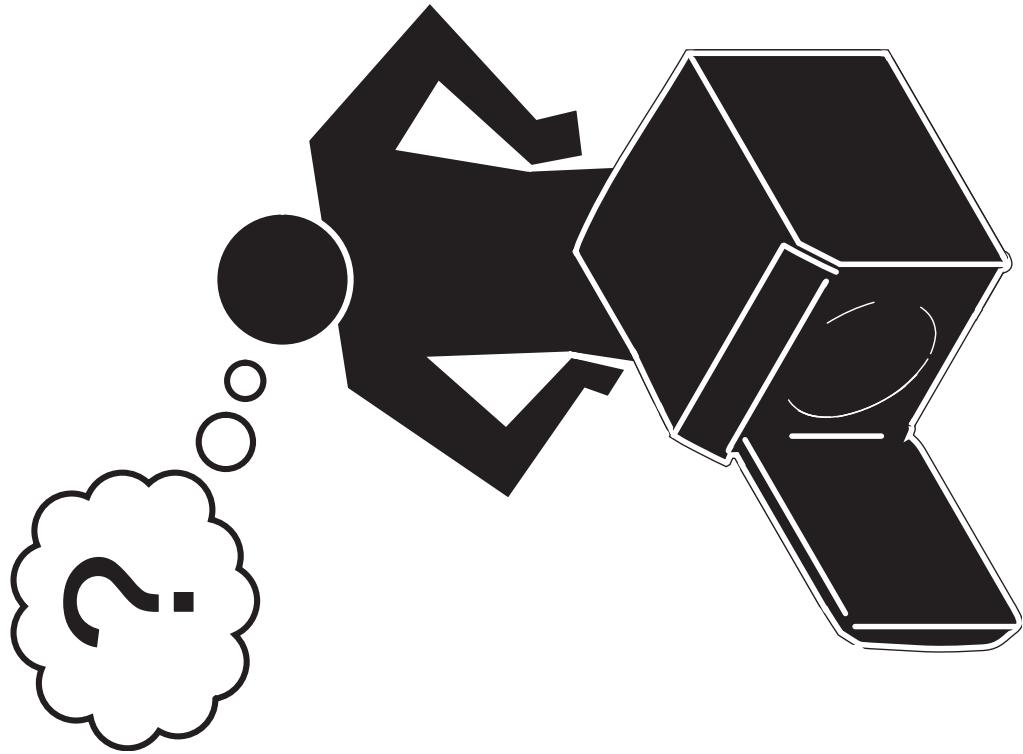
- If a malfunction is detected, do not use the sterilizer until necessary repairs are made.
- Do not attempt to disassemble sterilizer, replace components, or perform adjustments unless you are a Midmark authorized service technician.
- Do not use another manufacturer's parts to replace malfunctioning components. Use only Midmark replacement parts



# **Operation & Troubleshooting**

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# **Section A**



# Operation & Troubleshooting

## Error Codes

If an electronic malfunction is detected during a cycle, a numeric error code will appear on the display panel. Each digit in the error code provides information about the problem that occurred.

*Example:*

First Digit = Where?

The first digit indicates the component or system where the problem occurred.  
(example: **3** = Door Switch)



The table below cross-references the numeric error code with the Component, Problem, and Mode.

<i>First Digit (Component)</i>	<i>Second Digit (Problem)</i>	<i>Third Digit (Mode)</i>
<b>0</b> = General System	0 (not used)	0= Power-Up Mode
<b>1</b> = Stop Button	1= Power Loss	1= Select Cycle
<b>2</b> = Water Level Sensor	2= Closed	2= Fill Mode
<b>3</b> = Door Switch	3= Low	3= Heat-Up Mode
<b>4</b> (not used)	4= High	4= Sterilizing Mode
<b>5</b> = Temperature Sensor	5= (not used)	5= Vent
<b>6</b> = Pressure Sensor	6= Hardware	6= "Door To Open"
<b>7</b> (not used)	7= Over Limit	7= Dry
<b>8</b> (not used)	8=Open	8 (not used)
<b>9</b> = High Limit Thermostat	9 (not used)	9 (not used)

Error Codes

Models:  
Serial Numbers:

## Troubleshooting [Error Codes]

### Error Codes

#### Page

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# Operation & Troubleshooting

## Error Codes: C010 / C060

**Problem:** Power interruption

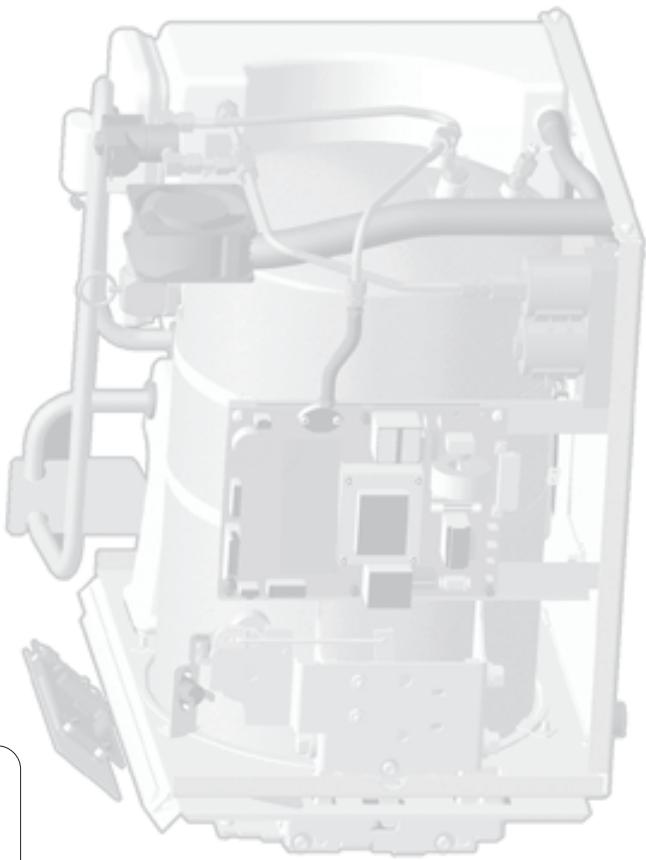
### C010

- Press stop to restart.
- 1st ✓ Check power cord connections at wall outlet and on back of sterilizer..
- 2nd ✓ Check if sterilizer is plugged into a dedicated 15 amp circuit.



### C060

- Unplug and re-plug unit.  
(Unplug sterilizer for a full 60 seconds.)
- 1st ✓ Check power cord connections at wall outlet and on back of sterilizer.
- 2nd ✓ Check if sterilizer is plugged into a dedicated 15 amp circuit.



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### Error Codes

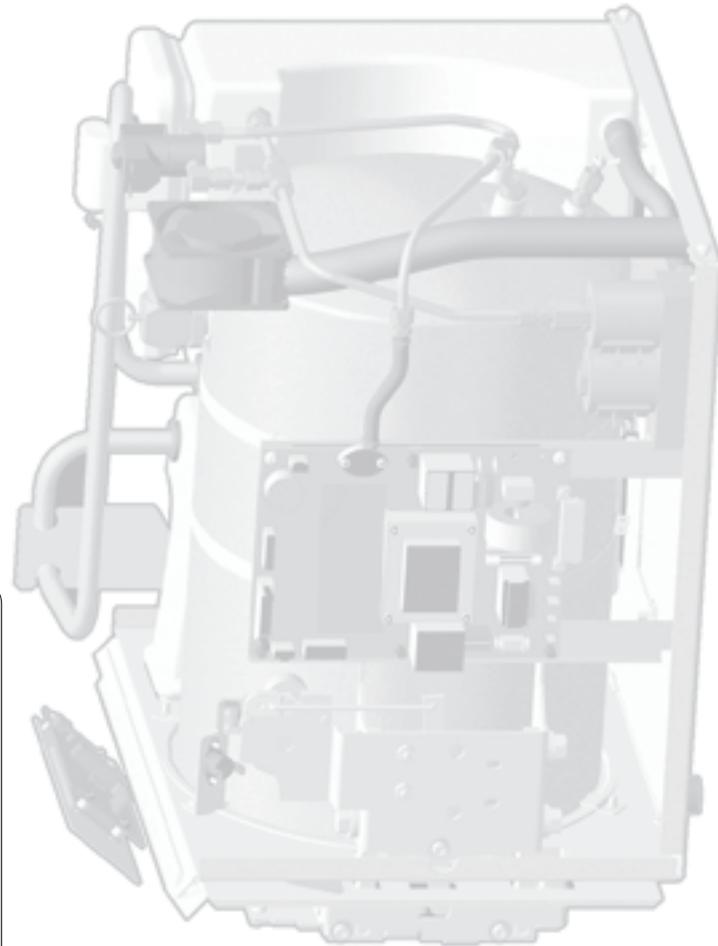
# Operation & Troubleshooting

## Error Code: C099

**Problem:** None. [This code was generated during testing at the factory]

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**Ignore this error code.**  
*(Push STOP to restart)*



Error Codes

ALL

**Models:**  
Serial Numbers:

A-4

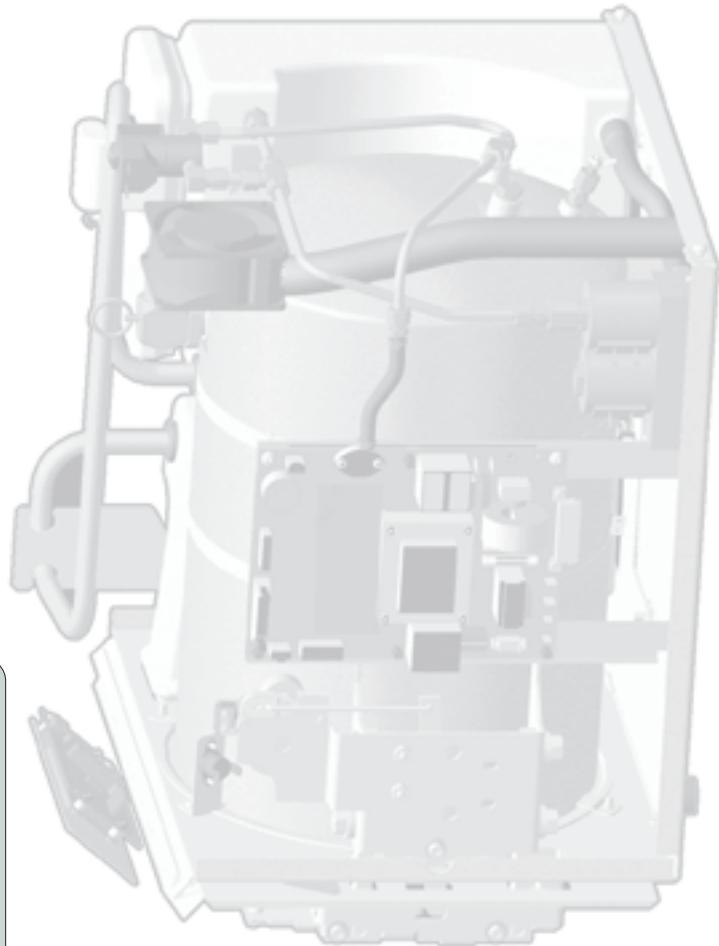
# Operation & Troubleshooting

## Error Codes: C100 Series (all)

**Problem:** STOP button was pressed during a cycle.

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**Explain proper operation to users.** *(Push STOP button to restart)*



**Models:** ALL |   
**Serial Numbers:**

**Error Codes**

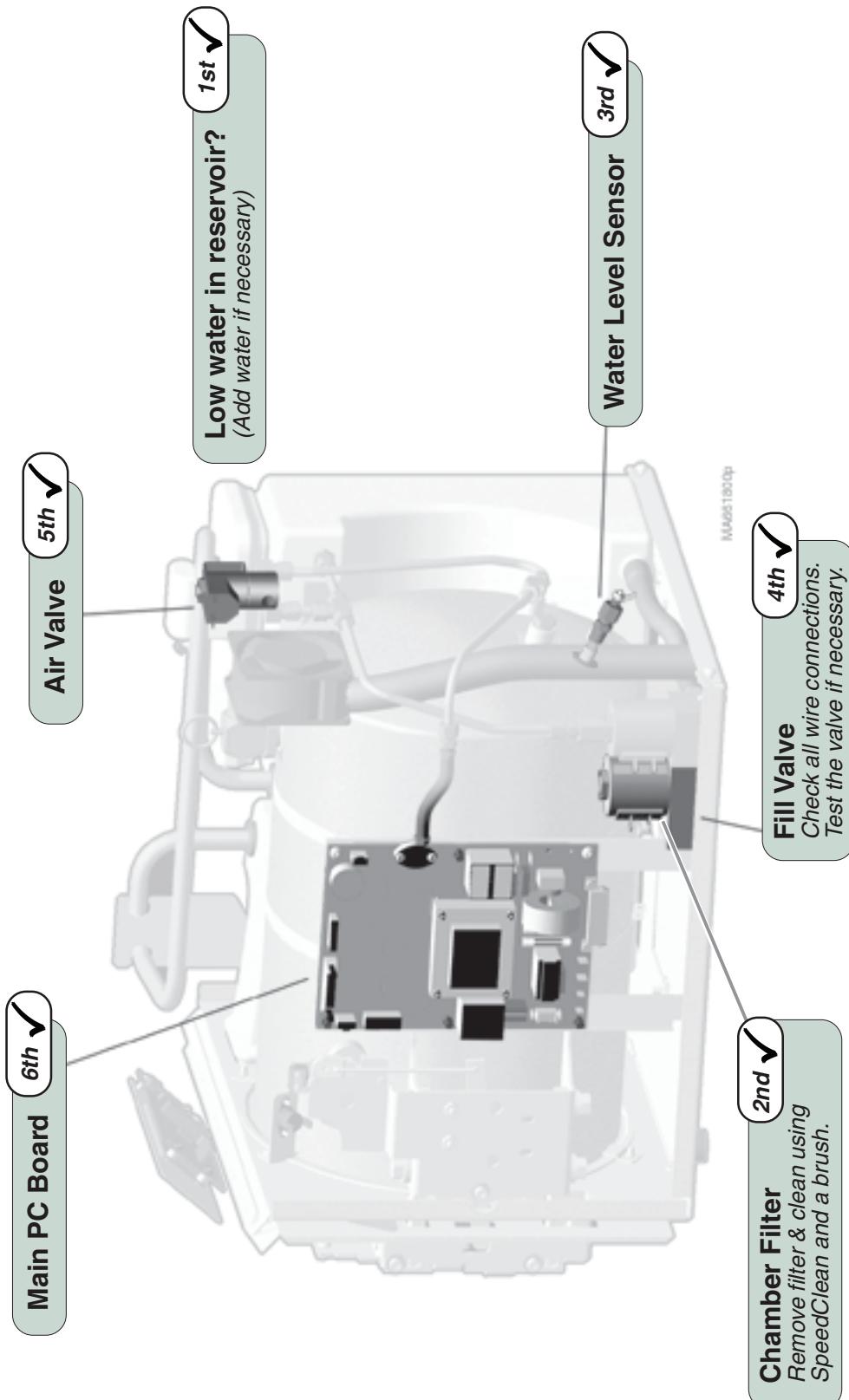
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# Operation & Troubleshooting

## Error Codes: C200 Series (all)

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**Problem:** Water level sensor did not detect a full chamber within 5 minutes of starting the cycle.



Error Codes

Models:  
Serial Numbers:

All

A-6

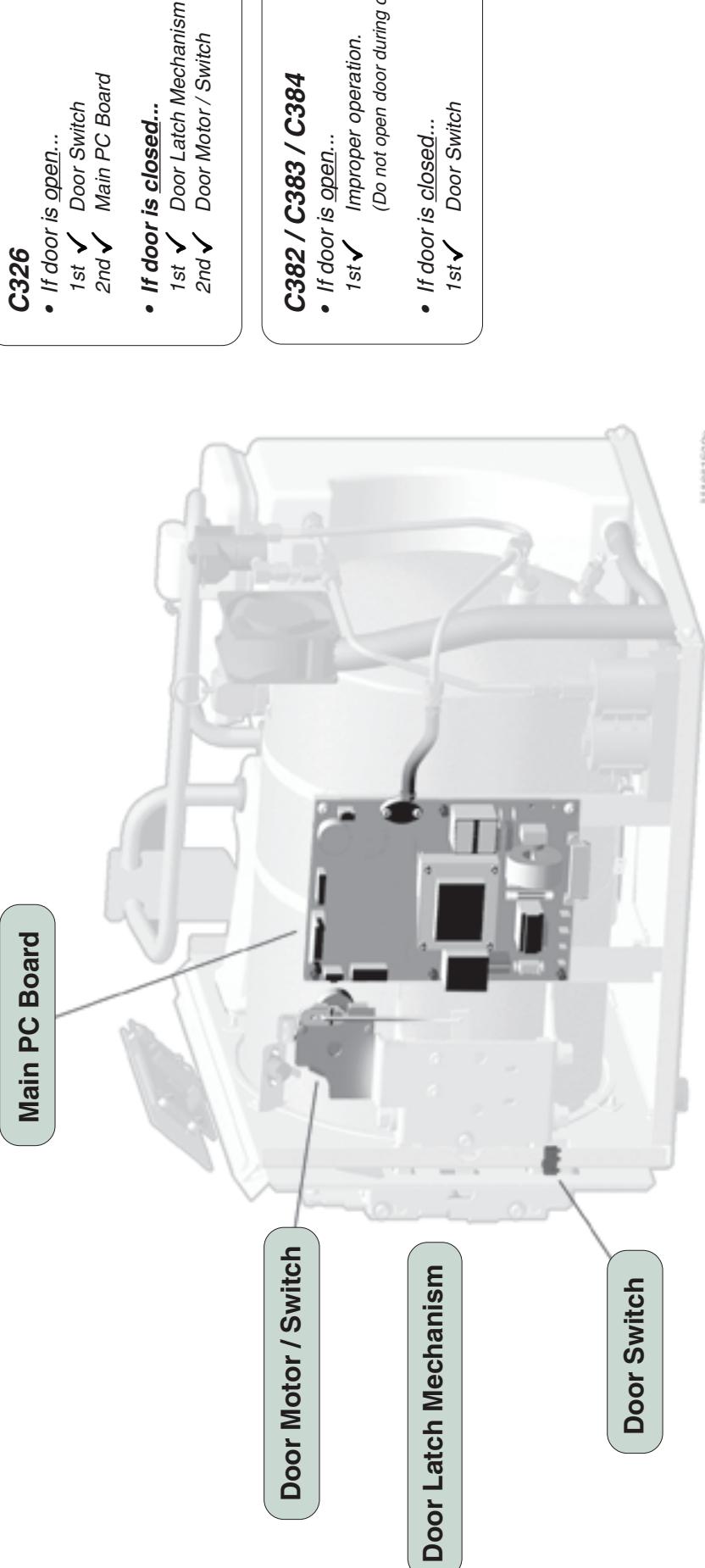
# Operation & Troubleshooting

## Error Codes: C300 Series (all)

**Problem:** PC board detected open door switch contacts during a cycle. **or**  
Door switch contacts remained closed after door motor shut off.

<u>Refer To:</u>	<u>Page</u>
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Main PC Board



### C326

- If door is open...  
1st ✓ Door Switch  
2nd ✓ Main PC Board
- **If door is closed...**  
1st ✓ Door Latch Mechanism  
2nd ✓ Door Motor / Switch
- If door is open...  
1st ✓ Improper operation.  
(Do not open door during cycle)
- If door is closed...  
1st ✓ Door Switch

### C382 / C383 / C384

- If door is open...  
1st ✓ Improper operation.  
(Do not open door during cycle)
- If door is closed...  
1st ✓ Door Switch

Models: | ALL | Serial Numbers: |

Error Codes

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Rev.7/08

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# Operation & Troubleshooting

## Error Codes: C500 Series (all)

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Component Testing / Repair .....	B-1
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**Problem:** Chamber temperature reading was not within the acceptable range for the current cycle.

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Component Testing / Repair ..... B-1

Access Procedures ..... C-1

Wiring Diagrams ..... D-1

Exploded Views / Part Numbers ..... E-1

### Attention:

**C560 & C570** indicate a power interruption occurred after an error code was displayed.

When these errors appear, always check the five previous error codes.

[Refer to Section B: Service Diagnostics]

### Main PC Board

7th ✓

### Is sterilizer level?

Adjust leveling feet as necessary.

### Check for pressure leaks.

Refer to Section B for checkpoints.



1st ✓

2nd ✓

### Temperature Sensor

4th ✓

### Water Level Sensor

5th ✓

### Chamber Filter

Remove filter & clean using SpeedClean and a brush.

6th ✓

### Heating Element

3rd ✓

### Error Codes

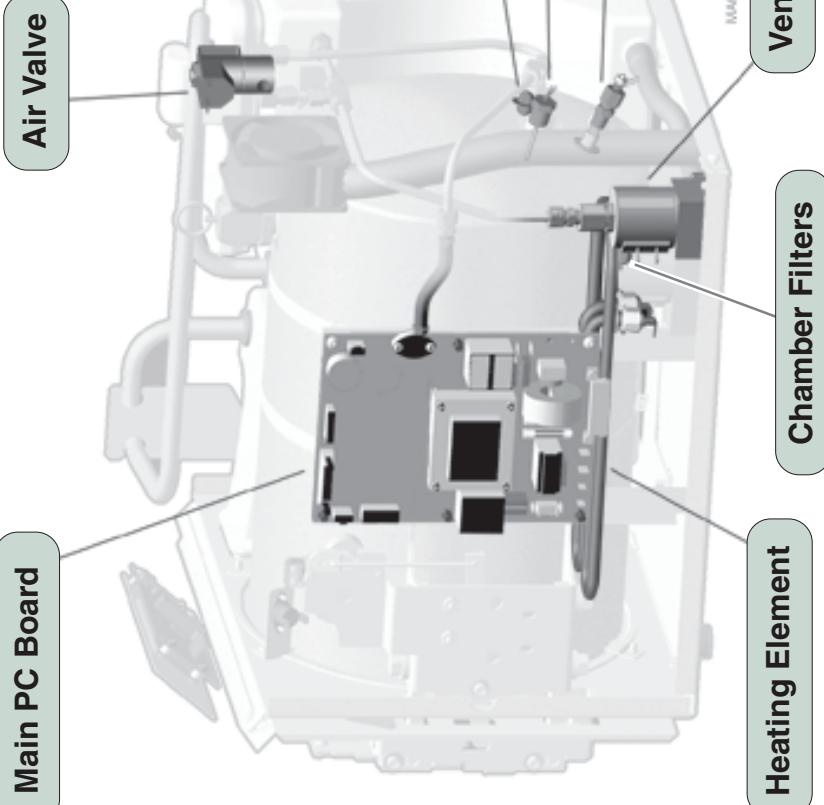
Models: |  
Serial Numbers: |

All

## Error Codes: C600 Series (all)

**Problem:** Chamber pressure reading was not within the acceptable range for the current cycle.

**Check for pressure leaks.**  
Refer to Section B for checkpoints.



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Component Testing / Repair .....	B-1
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### Low Pressure Error (C633)

- 1st ✓ Pressure Leaks
- 2nd ✓ Water Level Sensor
- 3rd ✓ Heating Element
- 4th ✓ Main PC Board

### High Pressure Errors (C645 / C647 / C671 / C675 / C677)

- 1st ✓ Vent Valve
- 2nd ✓ Chamber Filters
- 3rd ✓ Main PC Board

### Hardware Errors (C672 / C673 / C674)

- 1st ✓ Air Valve
- 2nd ✓ Main PC Board

### Hardware Errors (C661 / C662 / C663 / C664 / C665 / C667)

- 1st ✓ Main PC Board

### Attention:

**C660 & C670** indicate a power interruption occurred after an error code was displayed.

When these errors appear, always check the five previous error codes.  
[Refer to Section B: Service Diagnostics]

**Models:** | ALL | | |

**Serial Numbers:** | | | |

**Error Codes**

# Operation & Troubleshooting

## Error Codes: C900 Series (all)

**Problem:** High-limit thermostat contacts opened during cycle.

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### Attention:

**C980** indicates a power interruption occurred after an error code was displayed.

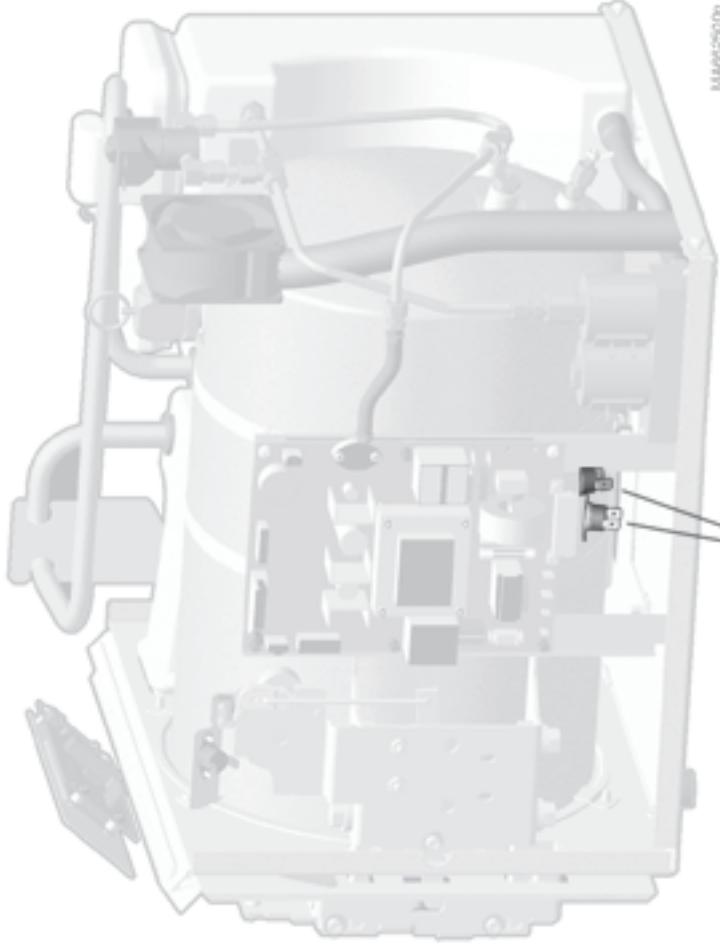
When this error appears, always check the five previous error codes.  
[Refer to Section B: Service Diagnostics]

**Is the sterilizer overloaded?**  
Reduce load size.

1st ✓

**Check for pressure leaks.**  
Refer to Section B for checkpoints.

4th ✓



WMA0225010p

**Check if unit skips Fill Cycle .**  
Dry and test water level sensor.

2nd ✓

**Is sterilizer level?**  
Adjust leveling feet as necessary.

3rd ✓

**High-Limit Thermostats**

5th ✓

Error Codes

Models:  
Serial Numbers:

All

## Power-Up Mode

**Problem:** Display panel is blank.  
Touch pad does not work.

# Operation & Troubleshooting

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6th ✓

Main PC Board

4th ✓

Display Panel

**Loose / Damaged Wire Connections**  
(Ribbon connector between Main PC Board / Display Panel)

2nd ✓

Fuses

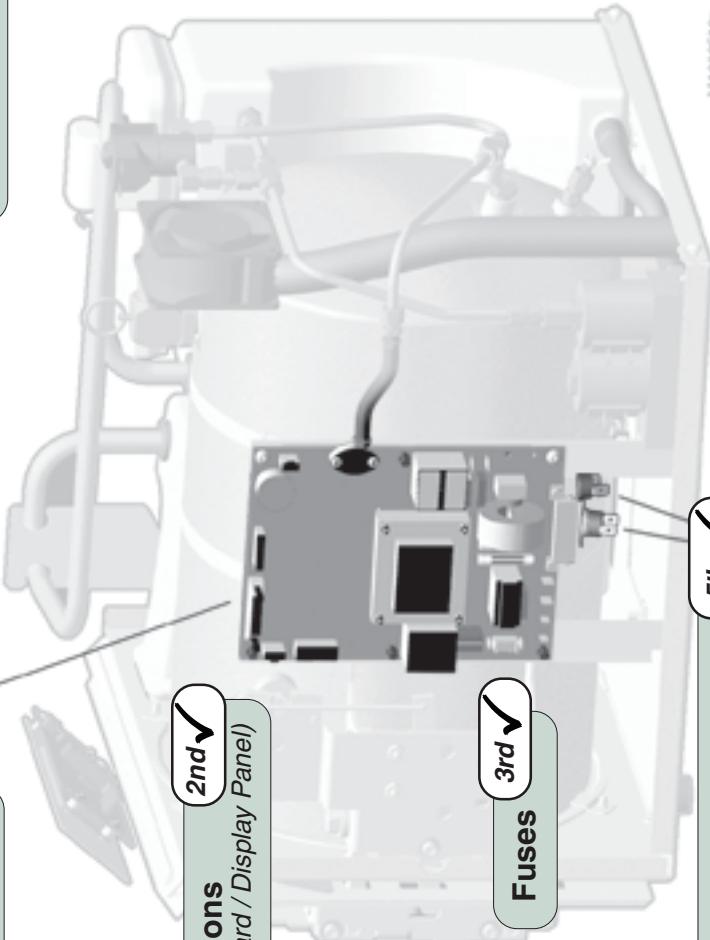
3rd ✓

High-Limit Thermostats

5th ✓

1st ✓

**Check supply voltage.**  
(Power cord connection, facility circuit breaker, etc.)



**Models:** ALL  
**Serial Numbers:**

Troubleshooting

# Operation & Troubleshooting

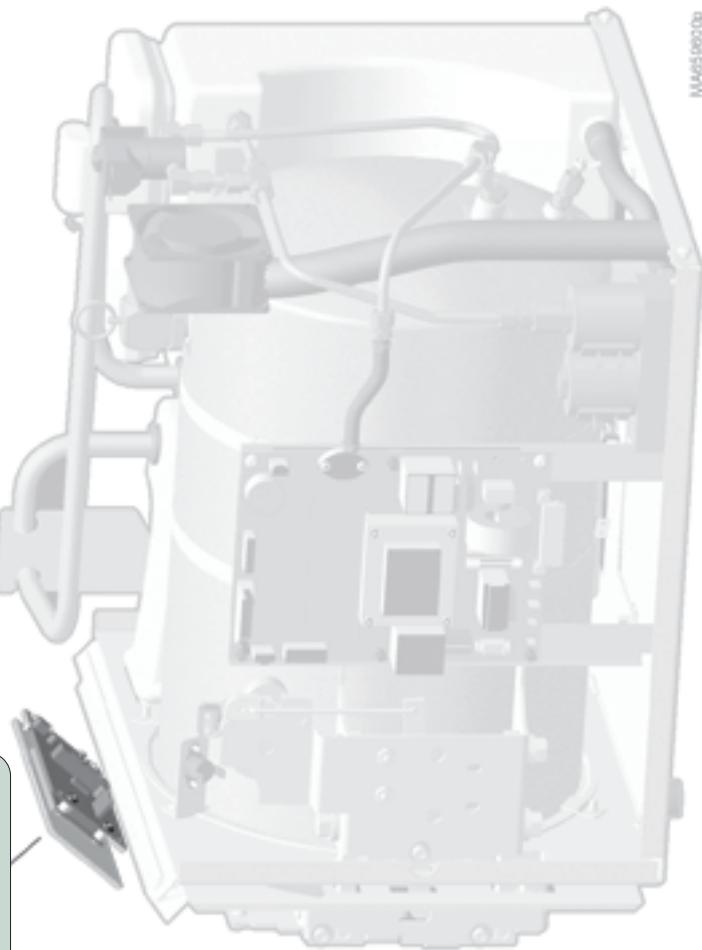
## Power-Up Mode

**Problem:** "Foreign" characters appear on the display panel.  
Touch pad works properly. [ "Beeps" continuously ]



### Loose / Damaged Wire Connections

(Ribbon connector between Display PC Board / Display Panel)



Refer To:	Page
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1

Troubleshooting

Models:  
Serial Numbers:

A-12

## Sterilization Mode

# Operation & Troubleshooting

**Problem:** Biological test strips indicate items are not sterile.  
[No error code appears on display]

**Type / condition of indicator strips**  
This unit requires test strips rated for:  
**Gravity Displacement Steam Sterilizers**

Test strips must be stored in a cool, dry location.  
Failure to do so will result in faulty readings.

(Follow all instructions provided with test strips)

**Are the correct trays being used?**  
Some trays may prevent proper air flow.  
Be sure trays are designed for this sterilizer.

### Refer To:

	Page
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1

1st ✓

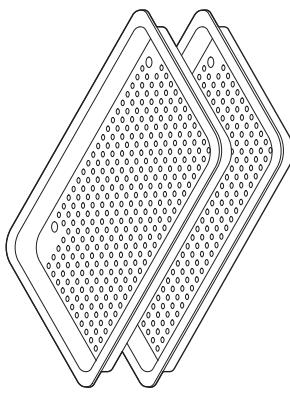
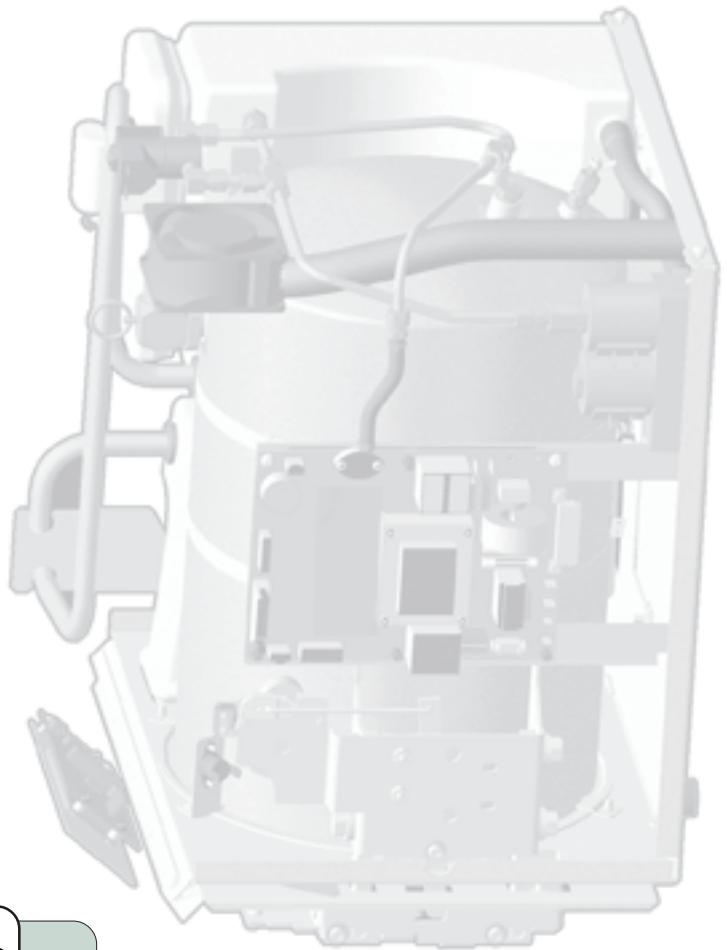
**Is the sterilizer overloaded?**

Large loads or heavy linen packs may prevent strips from changing.

2nd ✓

**Are the correct trays being used?**

Some trays may prevent proper air flow.  
Be sure trays are designed for this sterilizer.



**Models:** ALL | Serial Numbers:

Troubleshooting

# Operation & Troubleshooting

## Drying Mode

Refer To:	Page
Operation & Troubleshooting	A-1
Component Testing / Repair	B-1
Access Procedures	C-1
Wiring Diagrams	D-1
Exploded Views / Part Numbers	E-1

**Problem:** Instruments are still wet after Drying Mode. -or-  
Packs are burning during Dry Mode.

### Improper Operation

Sterilizer may be overloaded.  
Door must remain partially open during Dry Mode.  
(If door is closed, or fully opened, items may not dry properly)

**1st ✓**

### Is sterilizer level?

Adjust leveling feet as necessary.

### Adjust Drying Time

Refer to Section B: Adjusting the Dry Time

**2nd ✓**

### Temperature Probe

**4th ✓**

**5th ✓**

### Vent Valve

**3rd ✓**

### Chamber Filter

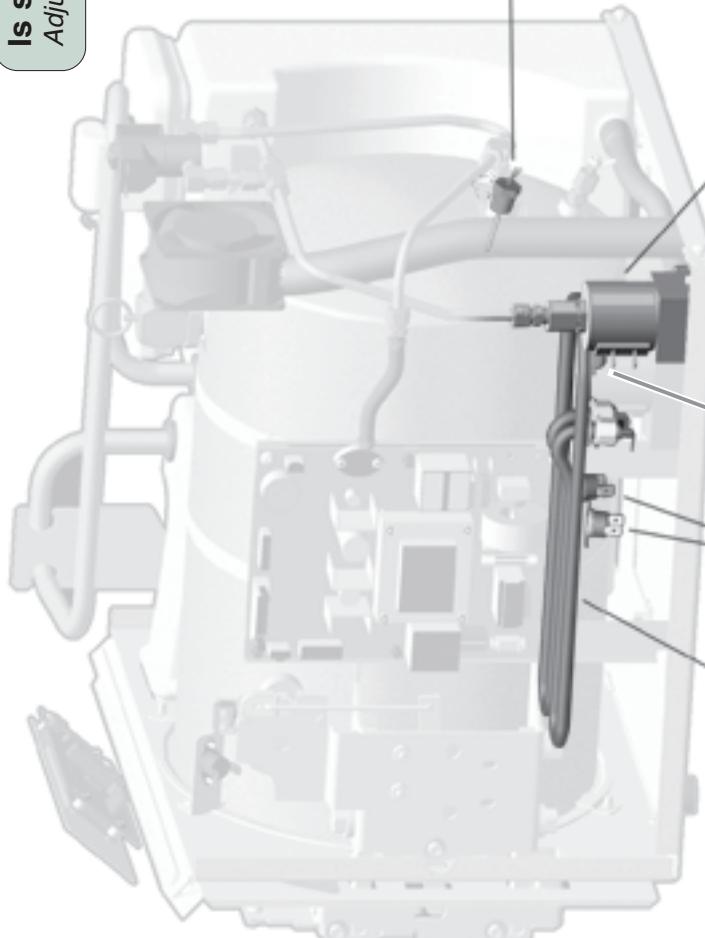
Remove filter & clean using  
SpeedClean and a brush.

**6th ✓**

### Heating Element

**7th ✓**

**8th ✓**



## Troubleshooting

Models: **ALL**

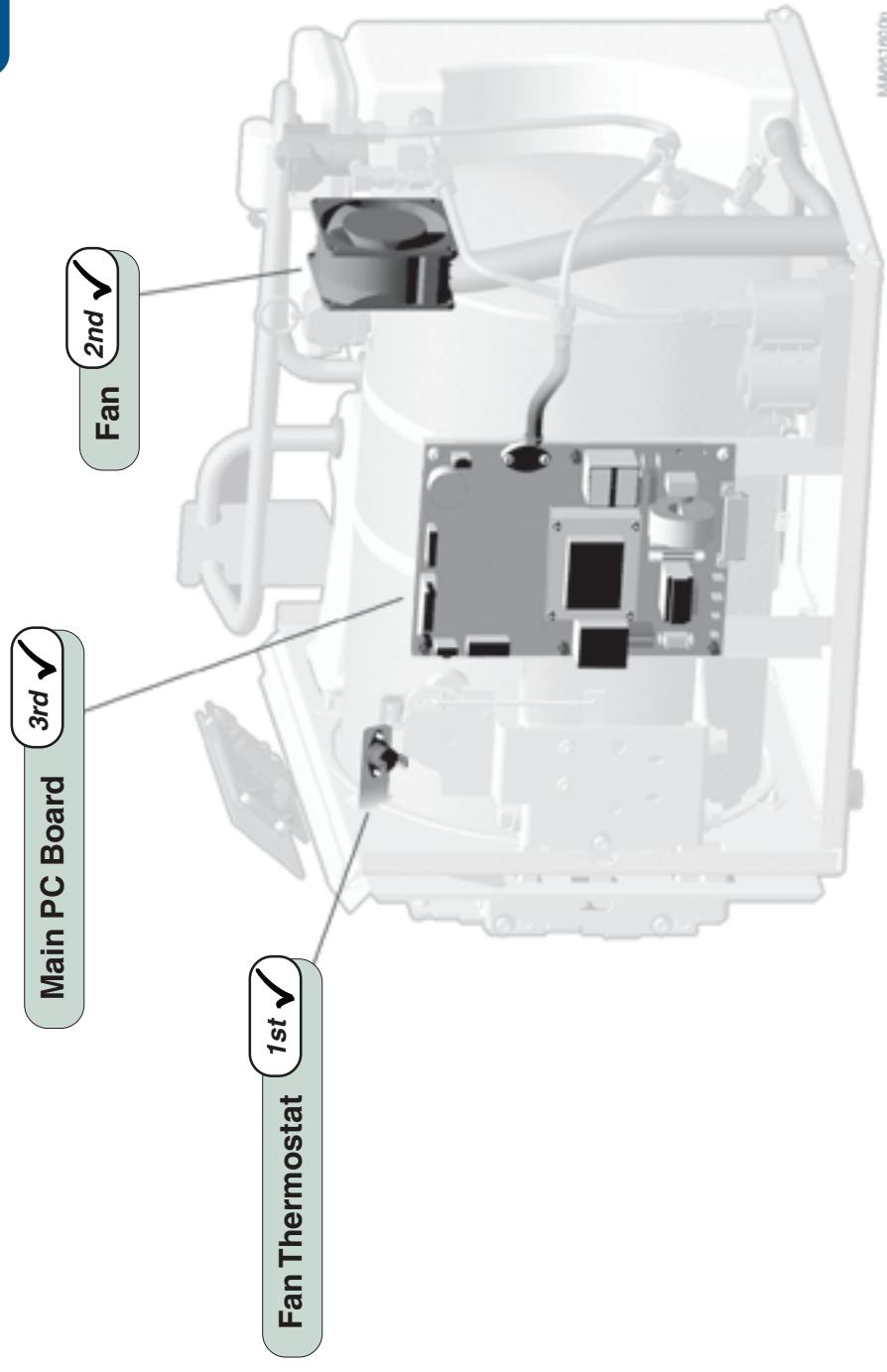
Serial Numbers:

## Fan System

# Operation & Troubleshooting

**Problem:** Fan does not run when temperature exceeds 130°F. -or- Fan continues to run after temperature drops below 100°F.

<u>Refer To:</u>	<u>Page</u>
Operation & Troubleshooting	A-1
Component Testing / Repair	B-1
Access Procedures	C-1
Wiring Diagrams	D-1
Exploded Views / Part Numbers	E-1



**Models:** ALL  
**Serial Numbers:** [Redacted]

**Troubleshooting**

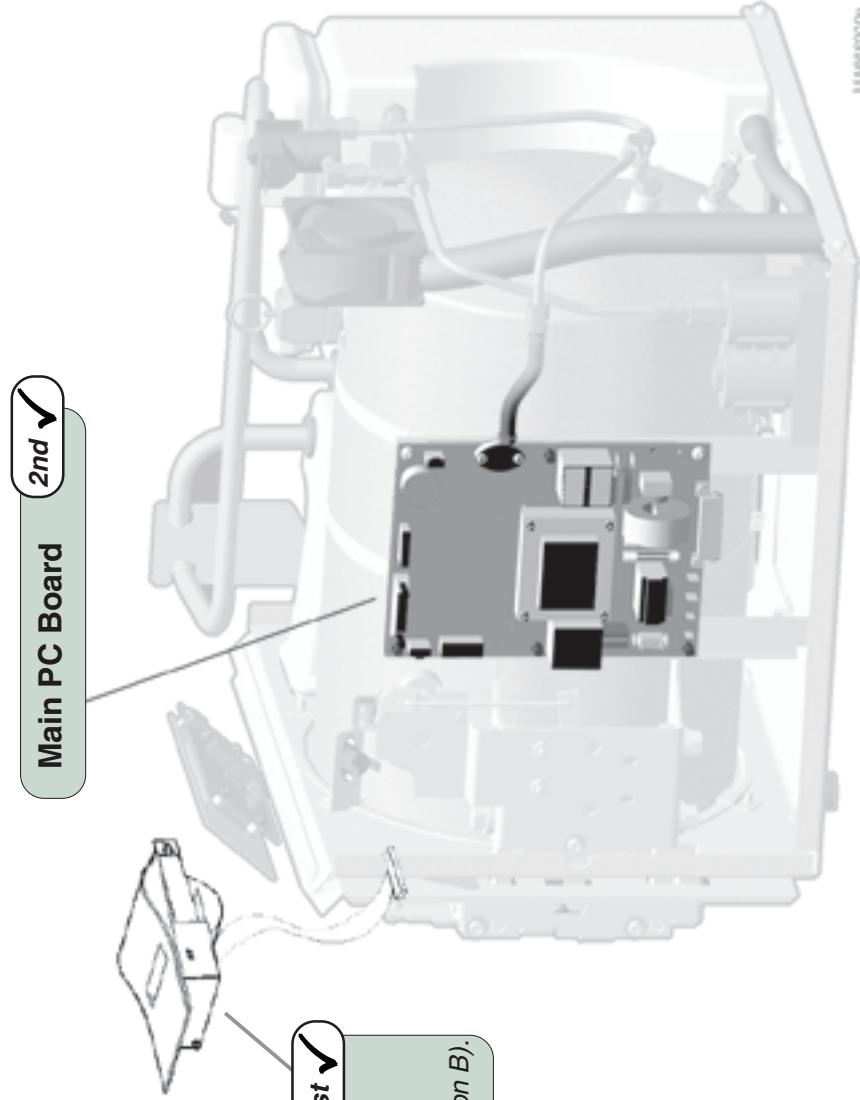
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# Operation & Troubleshooting

## Printer (optional)

**Problem:** Printer does not generate a print-out.

Refer To:	Page
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1



### Printer

Check the following:

- Printer paper
  - Ink cartridge
  - Ribbon harness connections
- If necessary, perform Printer Test (Section B).

Troubleshooting

**Models:** | Optional on all models |  
**Serial Numbers:** | |

# Operation & Troubleshooting

*This page intentionally left blank*

**Models:** \_\_\_\_\_  
**Serial Numbers:** \_\_\_\_\_

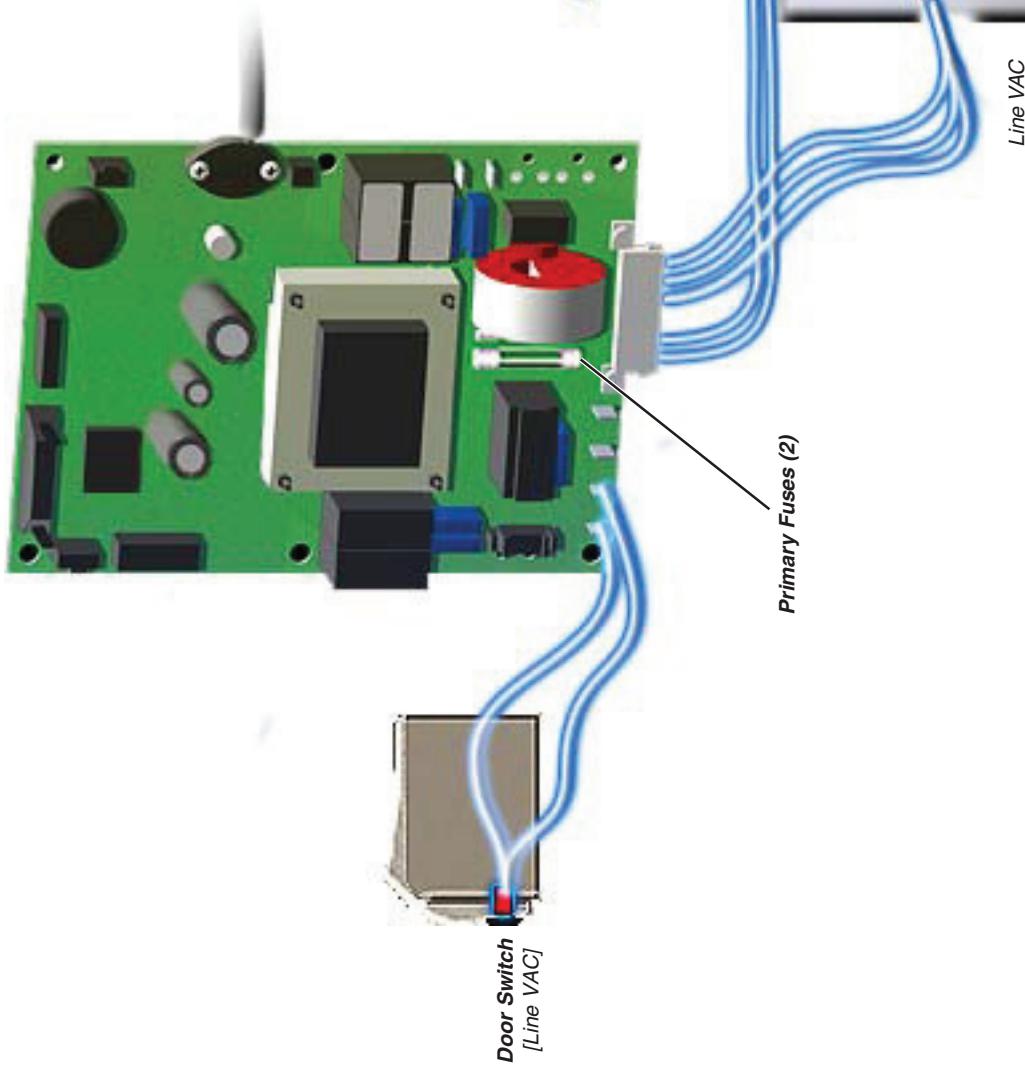
**Troubleshooting**

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# Operation & Troubleshooting

## Power-Up Mode

This illustration shows the components that affect, or are monitored during all cycle modes.  
Refer to the following page for a detailed description of the Power-Up Mode.



## Troubleshooting [Power-Up Mode]

### Problem:

Error Codes:

C010 .....	A-3
C060 .....	A-3
C099 .....	A-4
<i>Display panel is blank, &amp; touch pad does not work .....</i>	A-11
<i>Display panel shows foreign characters ("beeps" continuously) .....</i>	A-12

### Page:

Error Codes:

C010 .....

C060 .....

C099 .....

*Display panel is blank, &  
touch pad does not work .....*

Digital panel shows foreign characters  
("beeps" continuously) .....

A-11

A-12

MA659800

Power-Up Mode

Models:  
Serial Numbers:

All

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# Operation & Troubleshooting

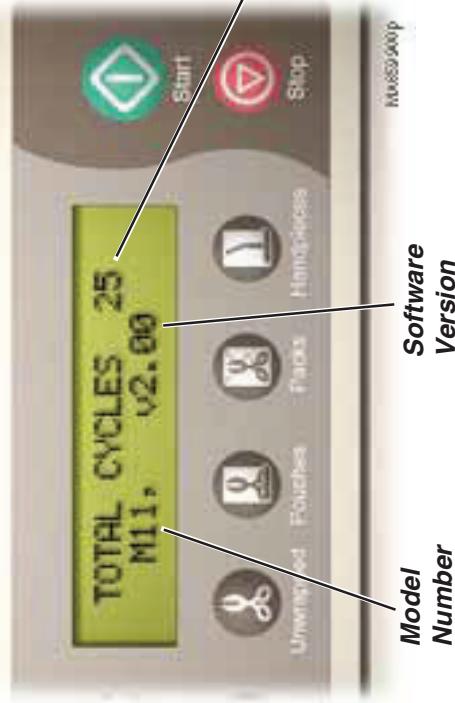
## Power-Up Mode

### Primary Fuses

With the sterilizer's power cord properly connected, facility supply voltage is supplied to the Main PC Board thru the two primary fuses.

If either fuse is faulty, the sterilizer will have no power.

*Each time power is reconnected, the display panel will show:*



### High-Limit Thermostats

When power is supplied to the Main PC Board, current continuously flows thru the two (*normally closed*) High-Limit Thermostats. This circuit powers all line voltage components (*except Fan System*).

If either thermostat opens for any reason (*overheat or malfunction*), the sterilizer will shut down until unit cools, or thermostat is replaced.

### Door Switch

Once a cycle is initiated, the Main PC Board continuously monitors the status of the Door Switch.

If an open door is detected, the cycle will not start. If the door switch opens during a cycle, the cycle will be terminated and the corresponding error code will appear in the display.

**Models:** | ALL | Serial Numbers: |

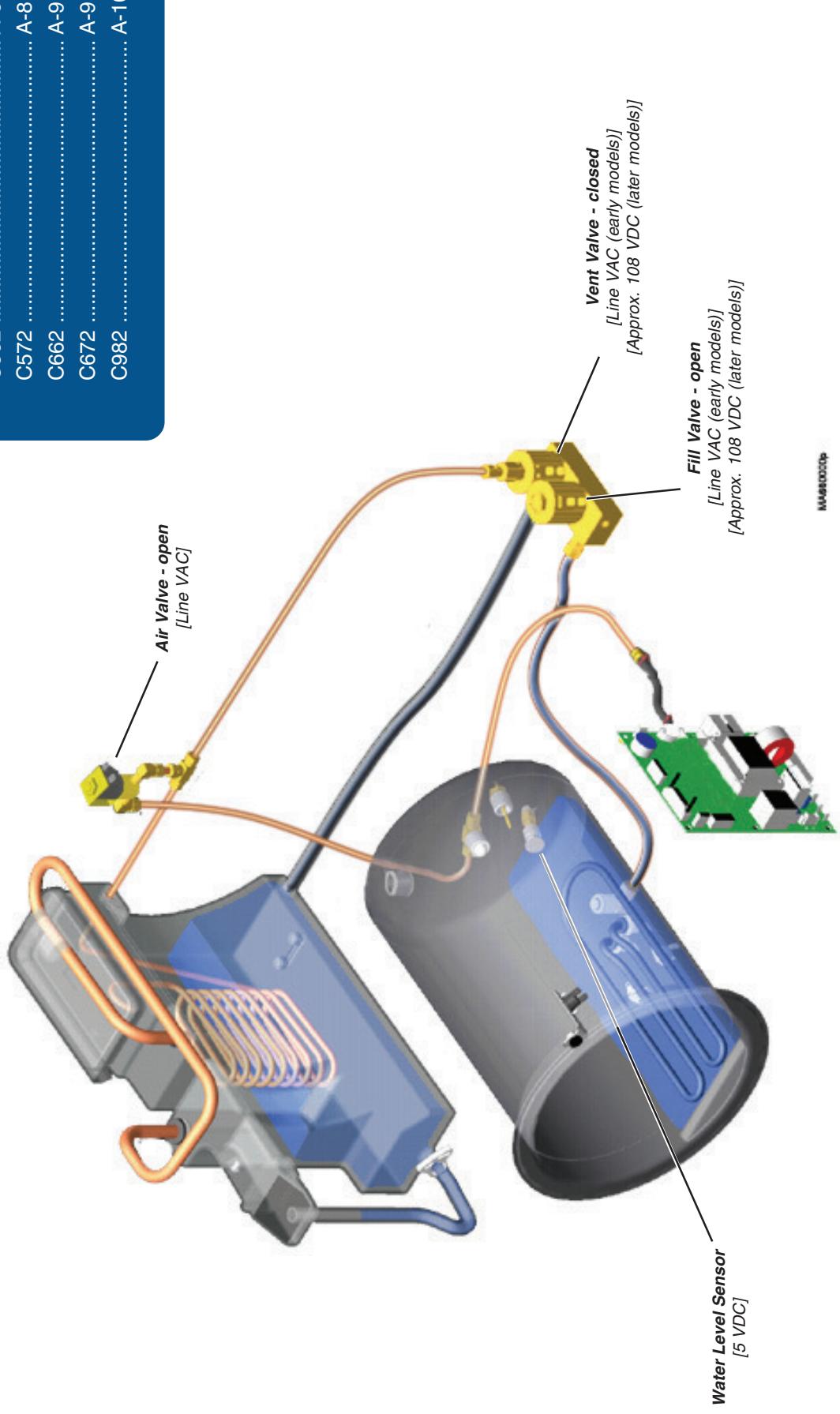
**Power-Up Mode**

# Operation & Troubleshooting

## Fill Mode

This illustration calls out the components that are energized / monitored during the Fill Mode.  
Refer to the following page for a detailed description of the Fill Mode.

*[Refer to **Main Power System** for components that are continually monitored during all modes]*



## Troubleshooting [Fill Mode]

### Page

C102 .....	A-5
C232 .....	A-6
C382 .....	A-7
C562 .....	A-8
C572 .....	A-8
C662 .....	A-9
C672 .....	A-9
C982 .....	A-10

### Error Codes

**Models:** | **Serial Numbers:** |  
ALL | | |

**Fill Mode**

# Operation & Troubleshooting

## Fill Mode

During the Fill Mode, water flows from the reservoir, thru the fill valve into the chamber.

*[All electrical current is supplied thru the two high-limit thermostats (on bottom of chamber). Refer to 'Power-Up Mode', for further detail].*

### Air Valve

Throughout the Fill Mode, line voltage is supplied to the (*normally closed*) air valve. When energized, the air valve opens. *[This allows air to pass thru the valve so that water can flow from the reservoir].*

### Vent Valve

Throughout the Fill Mode, voltage is supplied to the (*normally open*) vent valve. When energized, the vent valve closes. *[This prevents water from flowing back into the reservoir thru the vent valve].*

### Fill Valve

During the Fill Mode, voltage is supplied to the (*normally closed*) fill valve. When energized, the fill valve opens allowing water to flow into the chamber.

When the water level in the chamber reaches the water level sensor, the PC Board stops the current flow to the fill valve. This allows the valve to close, stopping the flow of water into the chamber.

*During the Fill Mode, the display panel will show:*



### Water Level Sensor

Throughout the Fill Mode, 5 VDC is supplied to the water level sensor. When the water level in the chamber reaches the sensor, a circuit is completed and current flows back to the PC Board.

When the 5 VDC from the water level sensor is detected, the PC Board stops the current flow to the fill valve.

**Models:** | ALL | Serial Numbers: |

Fill Mode

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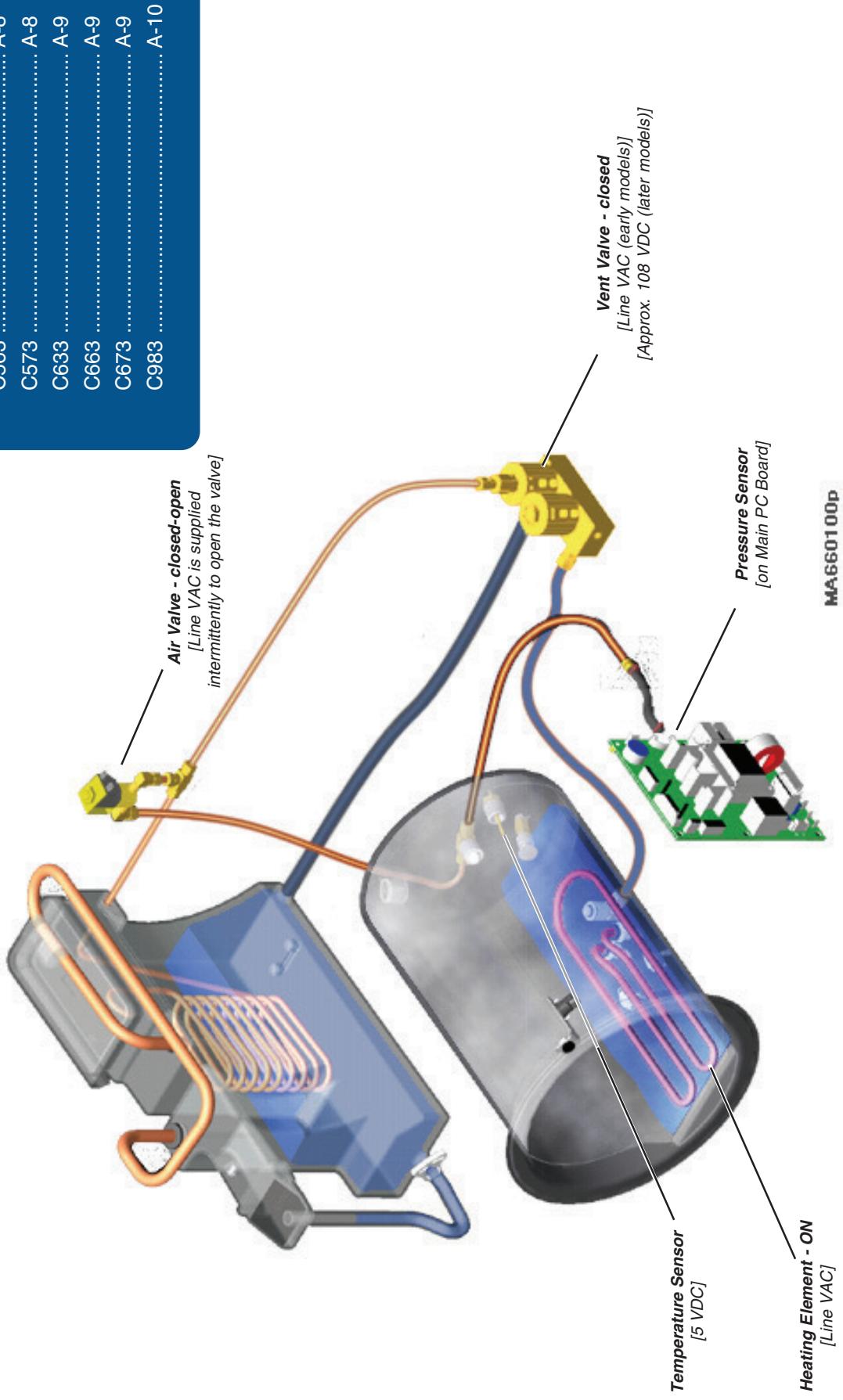
A-21 Rev. 10/10

# Operation & Troubleshooting

## Heat-Up Mode

This illustration calls out the components that are energized / monitored during the Heat-Up Mode.  
Refer to the following page for a detailed description of the Heat-Up Mode.

[Refer to **Main Power System** for components that are continually monitored during all modes]



## Troubleshooting [Heat-Up Mode]

Page	
Error Codes	
C103	A-5
C383	A-7
C533	A-8
C563	A-8
C573	A-8
C633	A-9
C663	A-9
C673	A-9
C983	A-10

# Operation & Troubleshooting

## Heat-Up Mode

During the Heat-Up Mode, the water in the chamber is heated to achieve the proper temperature for sterilization.

[All electrical current is supplied thru the two high-limit thermostats (on bottom of chamber). Refer to 'Power-Up Mode', for further detail].

### Heating Element

Throughout the Heat-Up Mode, line voltage is continually supplied to the heating element. The heating element heats the water in the chamber until sterilization temperature is achieved.

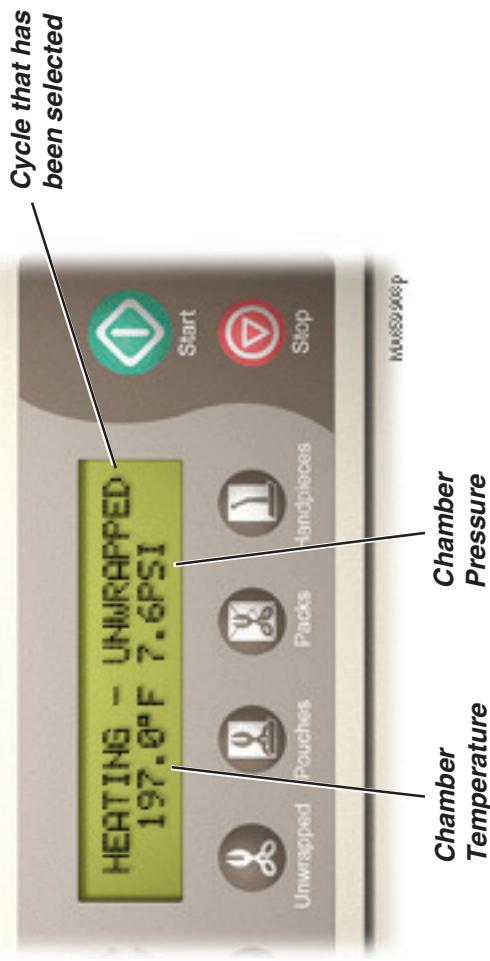
### Vent Valve

Throughout the Heat-Up Mode, voltage is supplied to the (*normally open*) vent valve. When energized, the vent valve closes. [This prevents water from flowing back into the reservoir thru the vent valve].

### Air Valve

Periodically during the Heat-Up Mode, line voltage is supplied to the (*normally closed*) air valve. When energized, the air valve opens. [This occurs three times during this mode to expel air from the chamber.]

*During the Heat-Up Mode, the display panel will show:*



### Temperature Sensor & Pressure Sensor

The temperature sensor (*inside chamber*) & pressure sensor (*on Main PC Board*) monitor the temperature & pressure conditions inside the chamber.

When the pre-set sterilization conditions are met, the Heat-Up Mode is complete & the unit goes into the Sterilization Mode.

**Models:** | ALL | Serial Numbers: |

## Heat-Up Mode

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A-23

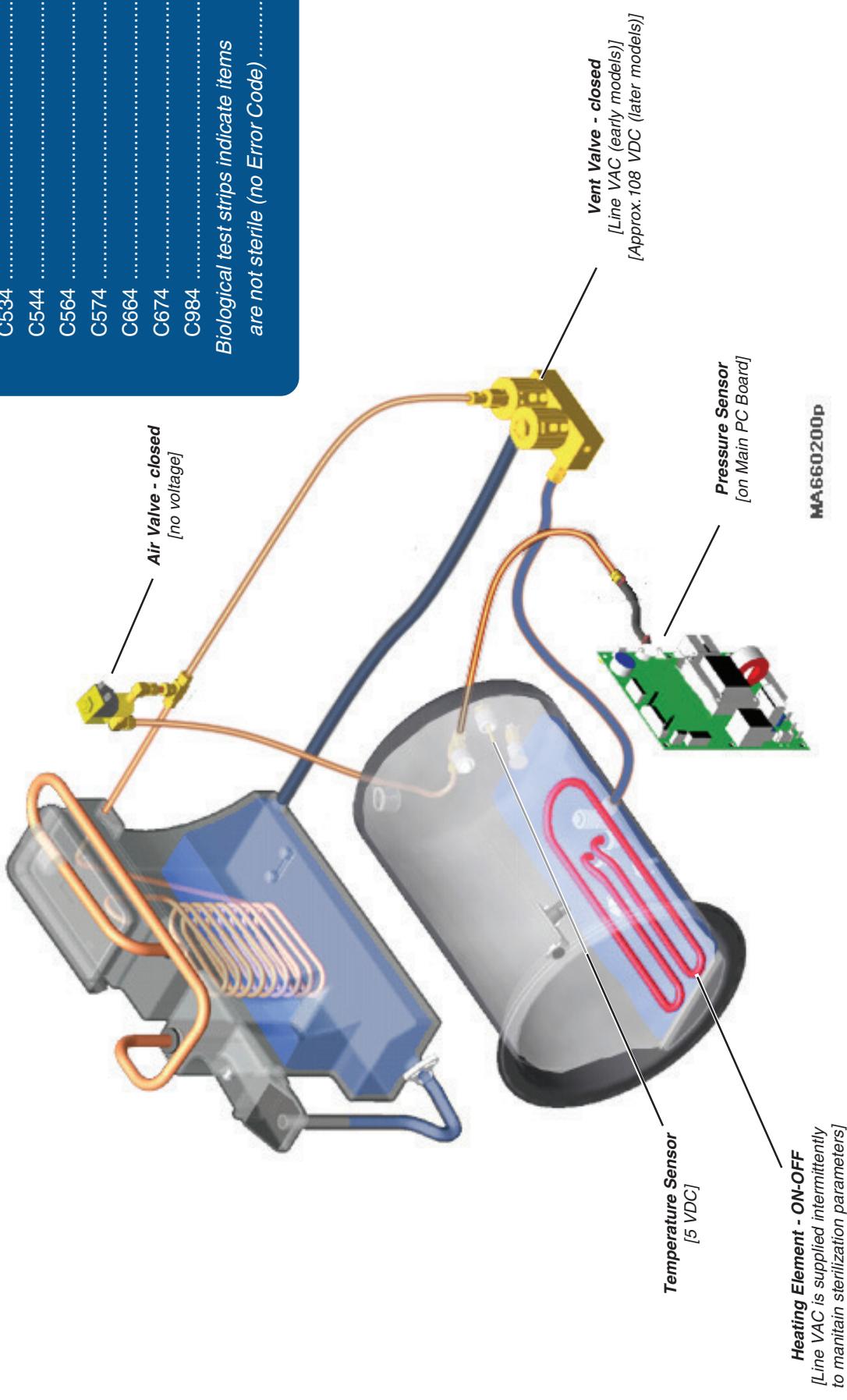
Rev. 10/10

# Operation & Troubleshooting

## Sterilization Mode

This illustration calls out the components that affect the Sterilization Mode.  
Refer to the following page for a detailed description of the Sterilization Mode.

[Refer to **Power-Up Mode** for components that are continually monitored during all modes]



## Troubleshooting [Sterilization Mode]

### Problem:

#### Error Codes:

C104 .....	A-5
C384 .....	A-7
C534 .....	A-8
C544 .....	A-8
C564 .....	A-8
C574 .....	A-8
C664 .....	A-9
C674 .....	A-9
C984 .....	A-10

**Biological test strips indicate items are not sterile (no Error Code)** ..... A-13

# Operation & Troubleshooting

## Sterilization Mode

During the Sterilization Mode, the temperature and pressure parameters for the selected cycle are maintained for the required time.

[All electrical current is supplied thru the two high-limit thermostats (on bottom of chamber). Refer to 'Power-Up Mode', for further detail].

### Temperature Sensor & Pressure Sensor

The temperature sensor (*inside chamber*) & pressure sensor (*on Main PC Board*) monitor the temperature & pressure conditions inside the chamber throughout the Sterilization Mode.

### Heating Element

Based on readings from the temperature sensor & pressure sensor, the heating element is cycled ON / OFF to maintain the required temperature and pressure for the selected cycle.

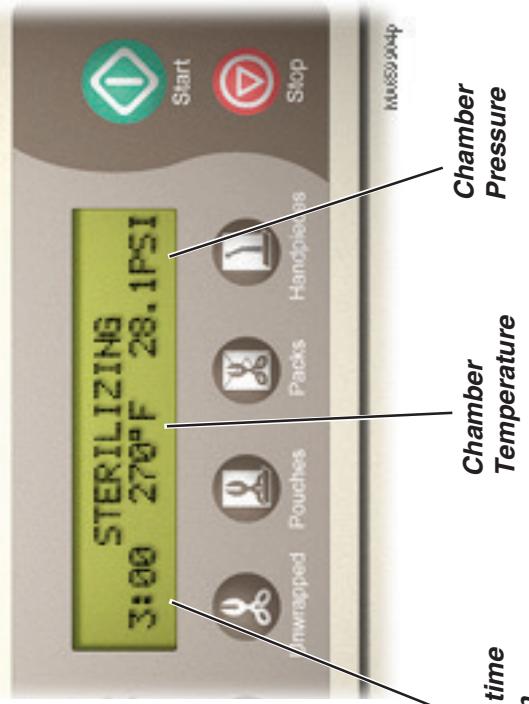
### Vent Valve

Throughout the Sterilization Mode, voltage is supplied to the (*normally open*) vent valve. When energized, the vent valve closes. [This prevents water from flowing back *into the reservoir thru the vent valve*].

### Air Valve

The air valve is closed (*no voltage*) throughout the entire Sterilization Mode. [This prevents pressure from escaping the chamber].

During the Sterilization Mode, the display panel will show:



Models: | ALL | Serial Numbers: |

Sterilization Mode

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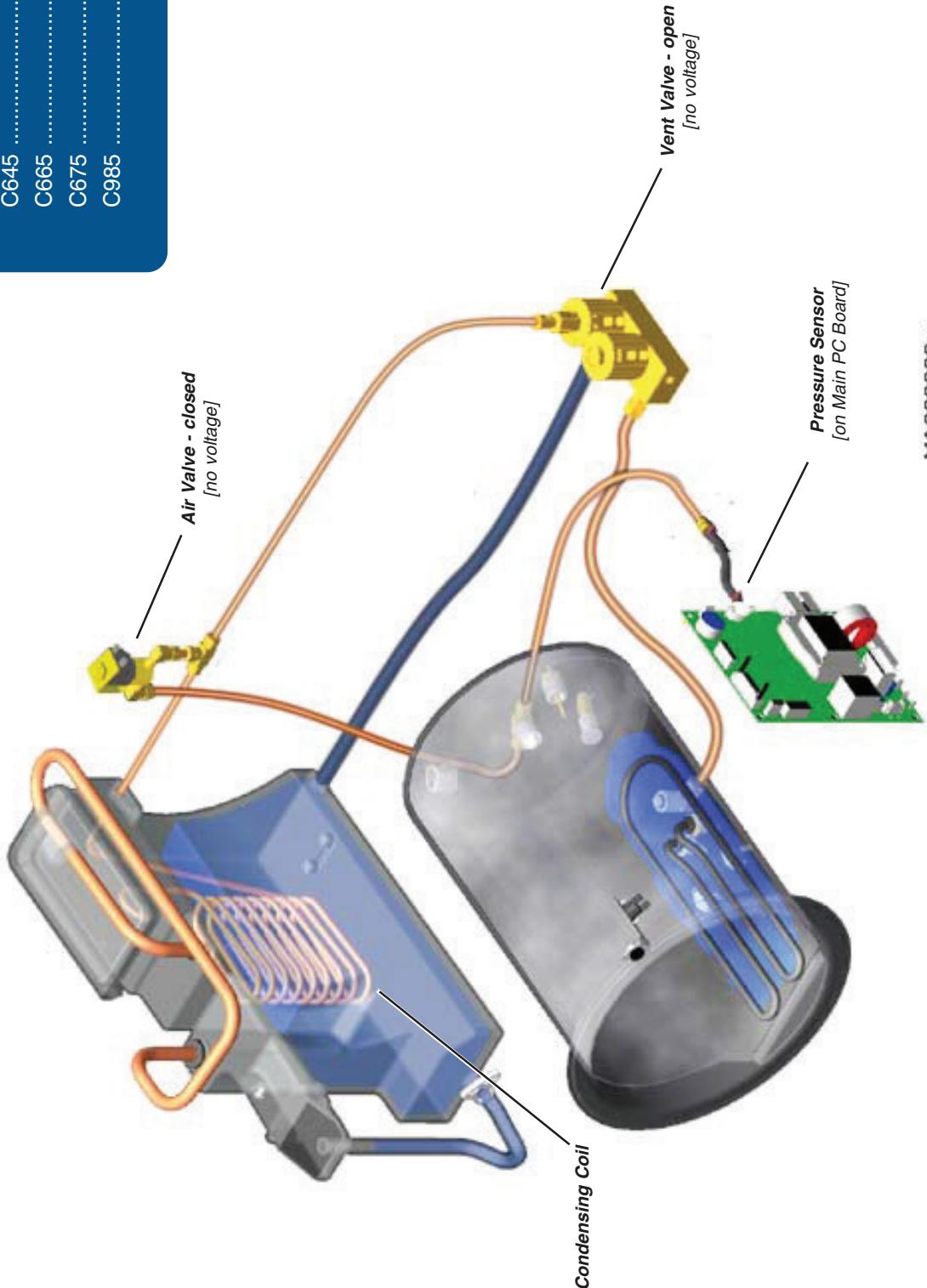
SF-1854

# Operation & Troubleshooting

## Vent Mode

This illustration calls out the components that affect the Vent Mode.  
Refer to the following page for a detailed description of the Vent Mode.

*[Refer to Power-Up Mode for components that are continually monitored during all modes]*



## Troubleshooting [Vent Mode]

Error Codes	Page
C105	A-5
C565	A-8
C575	A-8
C645	A-9
C665	A-9
C675	A-9
C985	A-10

# Operation & Troubleshooting

## Vent Mode

During the Vent Mode, pressure is released from the chamber. The steam cools as it passes thru the condensing coil and the water is returned to the reservoir.

[All electrical current is supplied thru the two high-limit thermostats (on bottom of chamber). Refer to 'Power-Up Mode', for further detail].

### Vent Valve

During the Vent Mode, the PC Board stops the current flow to the (normally open) vent valve. This allow the valve to open, and the pressure (steam) is released from the chamber.

### Condensing Coil

When the steam is released from the chamber, it passes thru the condensing coil. The coil cools the steam and returns the water back to the reservoir.

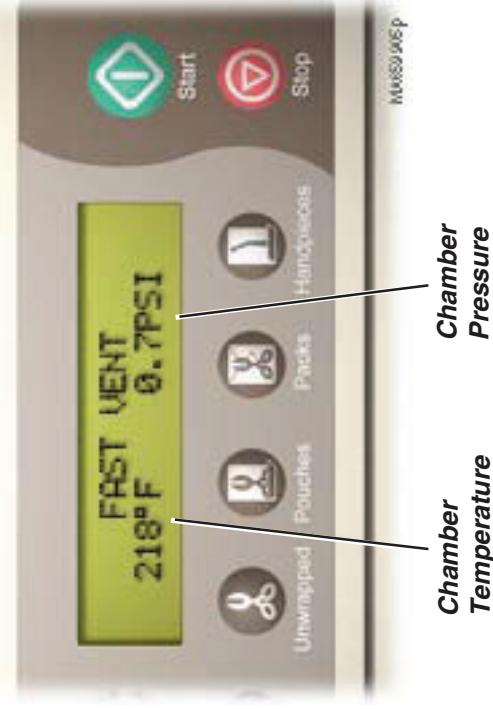
### Air Valve

The air valve is closed (no voltage) throughout the entire Vent Mode.

### Pressure Sensor

The pressure sensor (*on Main PC Board*) monitors the chamber pressure as it is released. When the pressure reaches 0.7 psi (5kPa), you will hear several "beeps". This indicates the door will open in approximately 5 seconds.

*During the Vent Mode, the display panel will show:*



Models: | ALL | Serial Numbers: |

Vent Mode

# Operation & Troubleshooting

## Door Motor System

This illustration shows only the components that affect the Door Motor System.  
Refer to the following page for a detailed description of the Door Motor System.



**Door Switch**  
[Closed - when door is closed]  
[Open - when door is open]



## Troubleshooting [Door Motor System]

### Error Codes

Page	.....	A-5
C106	.....	
C326	.....	A-7



<b>Models:</b>	<b>M9 (-020 thru -022)</b>	<b>M11 (-020 thru -022)</b>
<b>Serial Numbers:</b>	<b>all</b>	<b>all</b>

## Door Motor System

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# Operation & Troubleshooting

## Door Motor System

The Door Motor System automatically opens the sterilizer door when the Vent Mode is complete.

[All electrical current is supplied thru the two high-limit thermostats (on bottom of chamber). Refer to 'Power-Up Mode', for further detail].

### Door Motor / Door Motor Switch

For the first 15 seconds, line voltage is supplied directly to the door motor. This causes the motor to run, rotating the cam and linkage downward.

As the cam mechanism rotates, the motor switch closes. After 15 seconds, the current to the door motor flows thru the closed door switch. The cam continues to rotate, causing the linkage to lift the door latch mechanism and open the door.

When the cam reaches the bottom of its travel, the door motor reverses direction. When the mechanism reaches its original position, the motor switch is opened. This stops current flow to the motor, and the motor stops.

### Door Switch

The status of the (*normally open*) door switch reflects the position of the door. (ex. Door open= switch open)

When the Door Motor System is activated, the display panel will show:



**Models:** M9 (-020 thru -022) | M11 (-020 thru -022)  
**Serial Numbers:** all | all

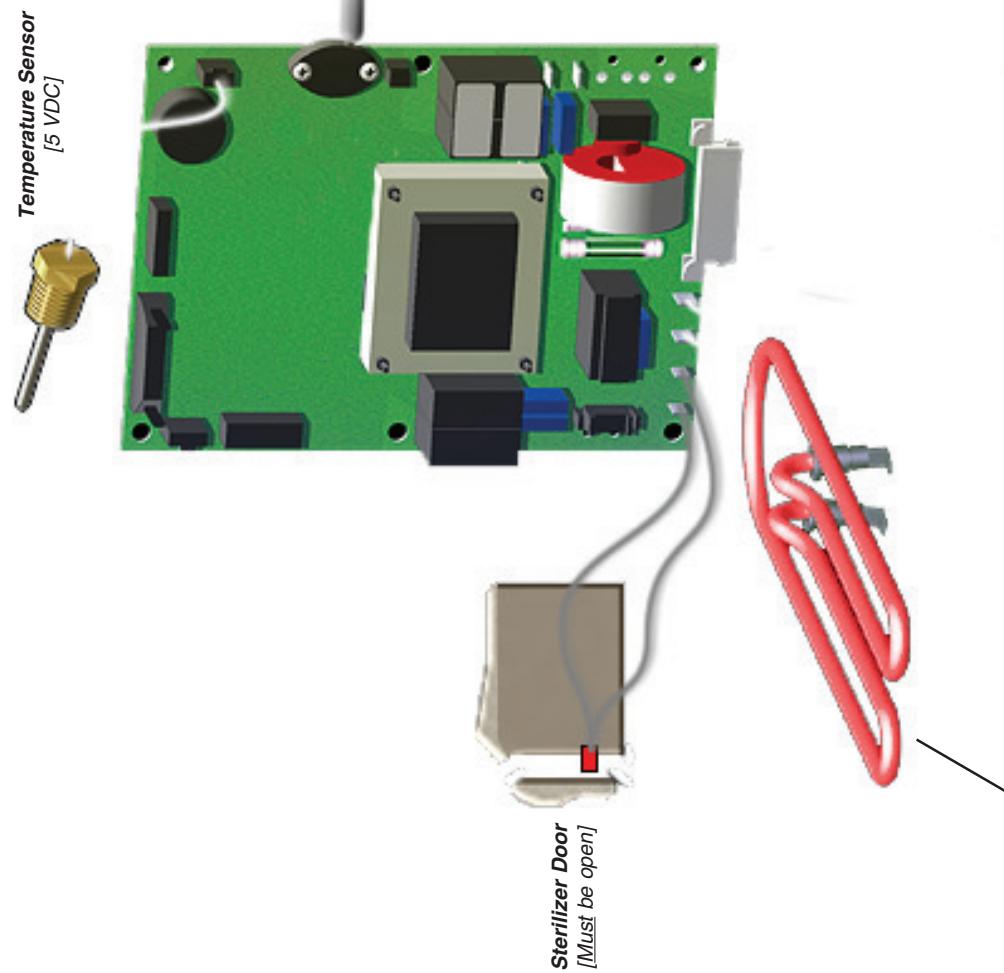
**Door Motor System**

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# Operation & Troubleshooting

## Drying Mode

This illustration shows only the components that affect the Drying Mode.  
Refer to the following page for a detailed description of the Drying Mode.



## Troubleshooting [Drying Mode]

Problem:	Page
<i>Error Codes:</i>	
C567	A-8
C577	A-8
C647	A-9
C667	A-9
C677	A-9
C987	A-10
<i>Instruments still wet after Dry Mode</i>	A-14
<i>Packs are burning during Dry Mode</i>	A-14



**Heating Element - ON-OFF**  
[Line VAC is supplied at pre-set intervals  
for the duration of the Drying Mode]

**Models:** | ALL |  
**Serial Numbers:**

**Drying Mode**

# Operation & Troubleshooting

## Drying Mode

During the Drying Mode, the heating element is energized to dry the instruments in the chamber.

*[All electrical current is supplied thru the two high-limit thermostats (on bottom of chamber). Refer to 'Power-Up Mode', for further detail].*

### Heating Element

During the Drying Mode, line voltage is supplied to the heating element at pre-set intervals to turn it ON / OFF. This continues for the duration of the Drying Mode.

When the drying time expires, voltage is removed from the high-limit thermostats and the heating element.

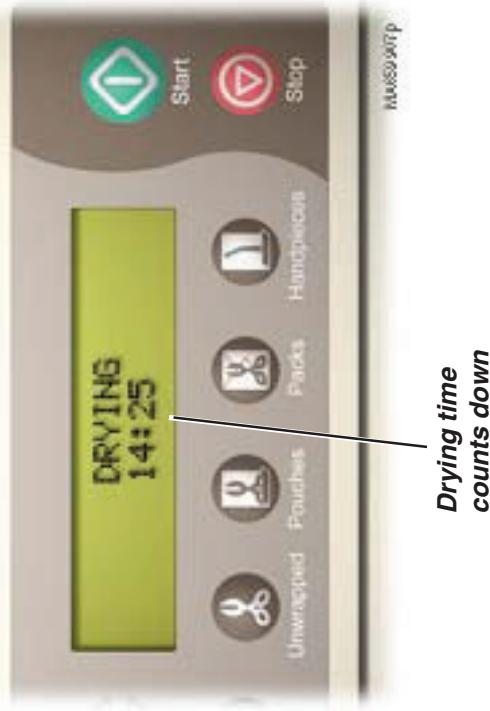
### Temperature Sensor

The temperature sensor (*inside chamber*) monitors the temperature throughout the Drying Mode. If the temperature exceeds 240°F (115°C), the PC board stops the current flow to the heating element until the temperature drops.

### Sterilizer Door

The sterilizer door must remain open throughout the Drying Mode. If the door is closed, pressure may build up in the chamber resulting in an error code.

*During the Drying Mode, the display panel will show:*



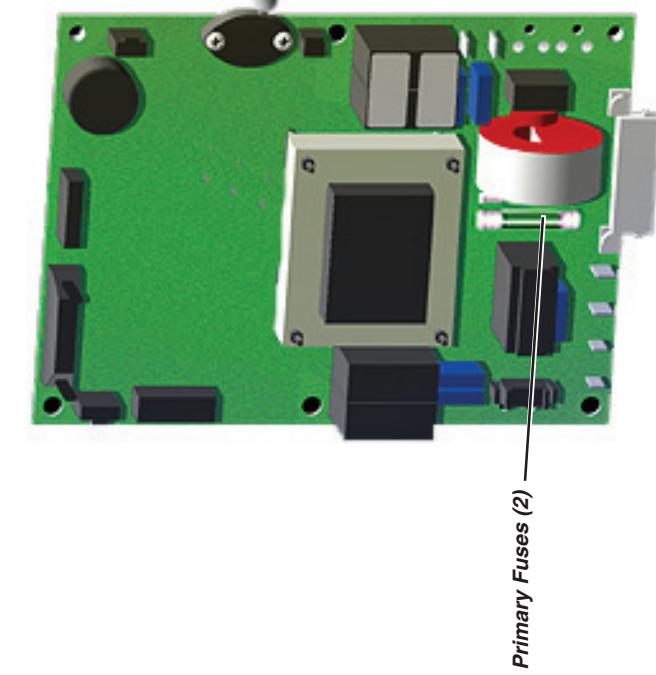
**Models:** | ALL | Serial Numbers: |

**Drying Mode**

# Operation & Troubleshooting

## Fan System

This illustration shows only the components that affect the Fan System.  
Refer to the following page for a detailed description of the Fan System.



## Troubleshooting [Fan System]

### Problem

*Fan does not run when temperature exceeds  $130^{\circ}$  ....*

*Fan continues to run after temperature drops below  $100^{\circ}$  ....*



Temperature at Fan Thermostat



### Fan Thermostat [Line VAC]

[less than  $130^{\circ}$  - contacts are open]  
[more than  $130^{\circ}$  - contacts are closed]



### Fan [Line VAC]

[OFF when fan thermostat contacts are open]  
[ON when fan thermostat contacts are closed]

## Fan System

Models:  
Serial Numbers:

# Operation & Troubleshooting

## Fan System

The Fan System reduces heat inside the enclosure by circulating air between the chamber and the covers.

*[The electrical current to the fan system does not pass thru the high-limit thermostats (on bottom of chamber)].*

### Primary Fuses

With the table's power cord properly connected, facility supply voltage is supplied to the Main PC Board thru the two primary fuses.

If either fuse is faulty, the sterilizer will have no power.

### Fan Thermostat

When power is supplied to the Main PC Board, current continuously flows to the fan thermostat.

The fan thermostat controls the ON/OFF function of the fan. When the temperature (*at the thermostat*) is less than 130°, the fan thermostat contacts are open (*no current to the fan*). When the temperature reaches 130°, the fan thermostat contacts close (*current flow to the fan*).

When the temperature drops to approx. 100°, the contacts of the fan thermostat open and the fan stops running.

### **ATTENTION**

The fan may run continuously when running consecutive cycles.



- Fan**
- When the contacts of the fan thermostat are closed, line voltage is applied to the fan causing the fan to run.
  - When the contacts of the thermostat open, current is removed, and the fan stops.

**Models:** ALL | **Serial Numbers:**

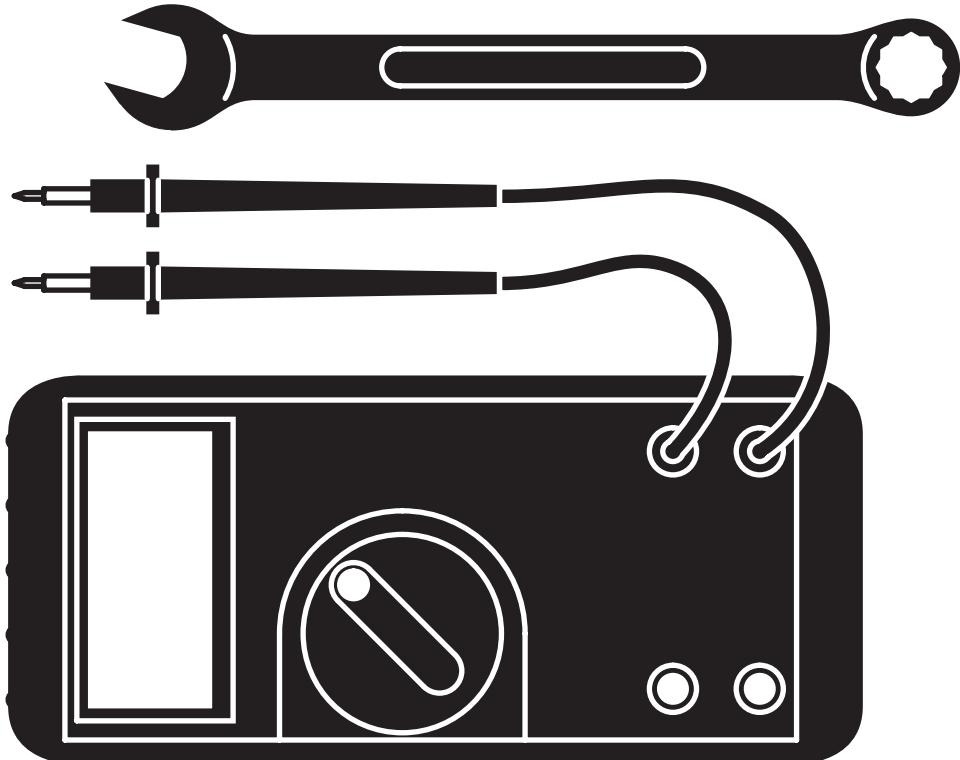
**Fan System**

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# Testing & Repair

<b>Component / Procedure</b>	<b>Page</b>
Checking For Pressure Leaks .....	B-2
Using a Pressure Gauge .....	B-3
Fuses .....	B-4
Service Diagnostics .....	B-5
Air Valve .....	B-12
Fill / Vent Valves .....	B-15
Pressure Relief Valve .....	B-18
Heating Element .....	B-20
Temperature Sensor .....	B-23
Water Level Sensor .....	B-27
High-Limit Thermostats .....	B-31
Door Switch .....	B-34
Touch Pad / Display Panel .....	B-37
Door Motor System .....	B-39
Fan / Fan Thermostat .....	B-42
Main PC Board .....	B-46
Printer ( <i>optional</i> ) .....	B-50
Adjusting the Drying Mode .....	B-53

# Section B



# Component Testing & Repair

## Checking for Pressure Leaks

This illustration shows the areas to check for pressure leaks.



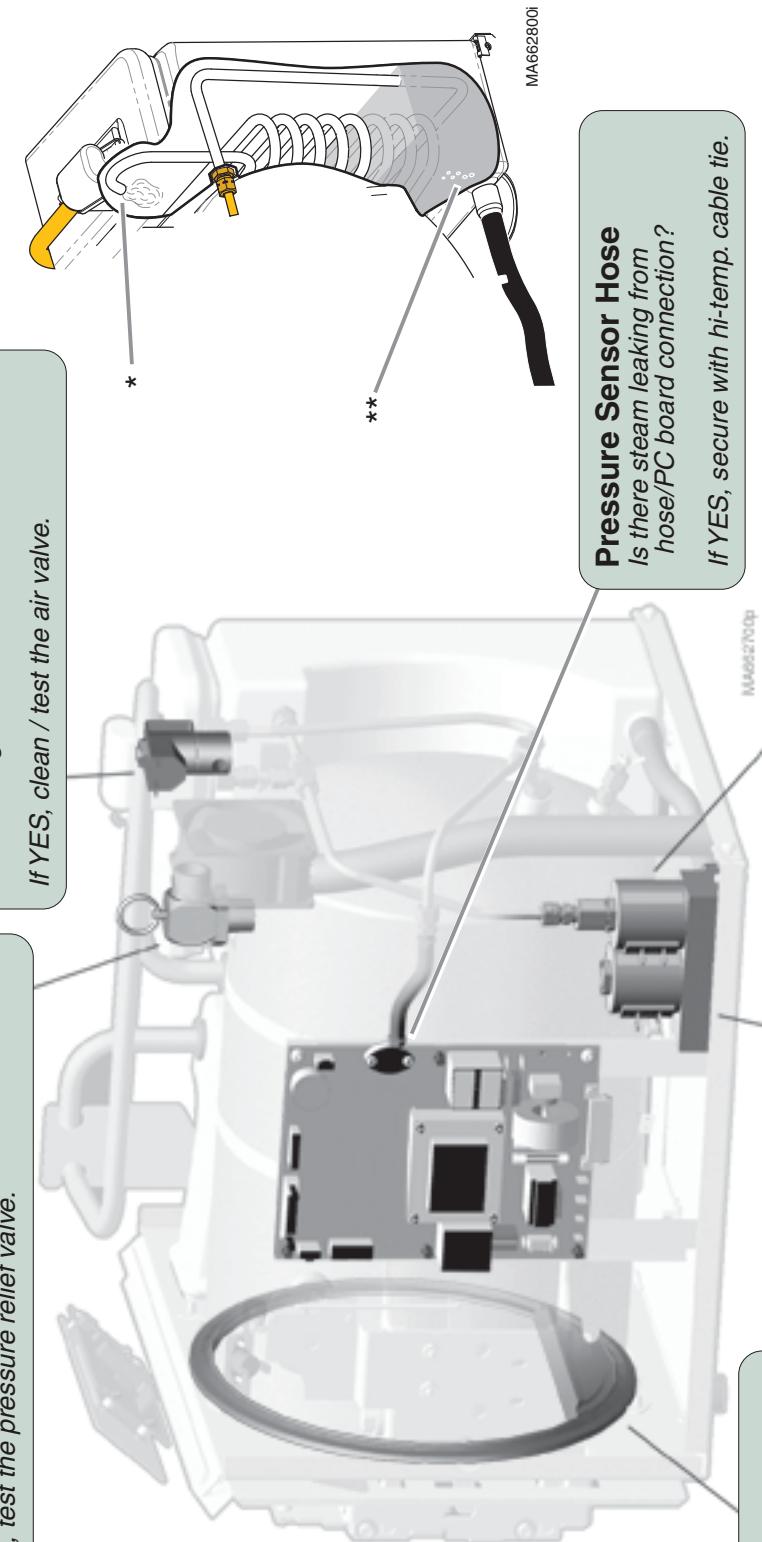
**WARNING**  
Do not attempt to adjust,  
modify, or alter in any manner, any part  
of the pressure vessel. Serious injury  
and/or damage to the unit could result.

### All Fittings

Tighten / replace fittings if necessary.

### Pressure Relief Valve

Is there water or steam leakage under back of sterilizer?  
If YES, test the pressure relief valve.



### Components

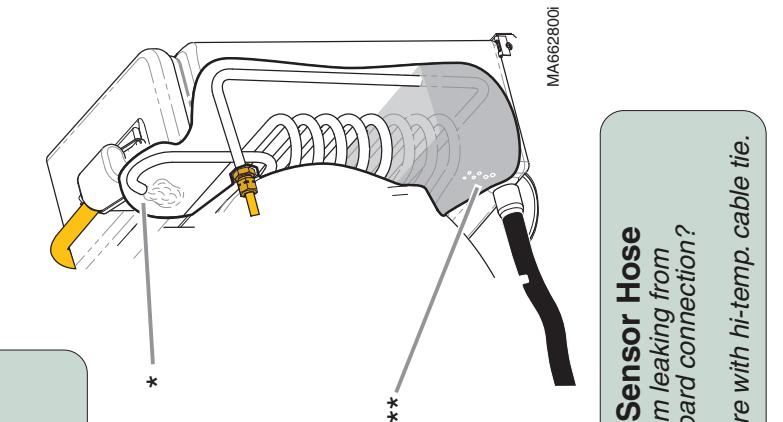
Page	
Air Valve	B-12
Fill Valve	B-15
Vent Valve	B-15
Pressure Relief Valve	B-18

### Checking for Pressure Leaks

This illustration shows the areas to check for pressure leaks.

### Air Valve

Is there steam exhausting from condensing coil\* during the Sterilization Mode?  
If YES, clean / test the air valve.



### Pressure Sensor Hose

Is there steam leaking from  
hose/PC board connection?  
If YES, secure with hi-temp, cable tie.

### Fill Valve

Are there bubbles coming from  
the bottom of the reservoir\*\*?  
If YES, clean / test the fill valve.

### Door Gaskets

Is there water leaking around door?  
If YES, replace gasket(s).

### Checking for Pressure Leaks

**Models:** ALL  
**Serial Numbers:**

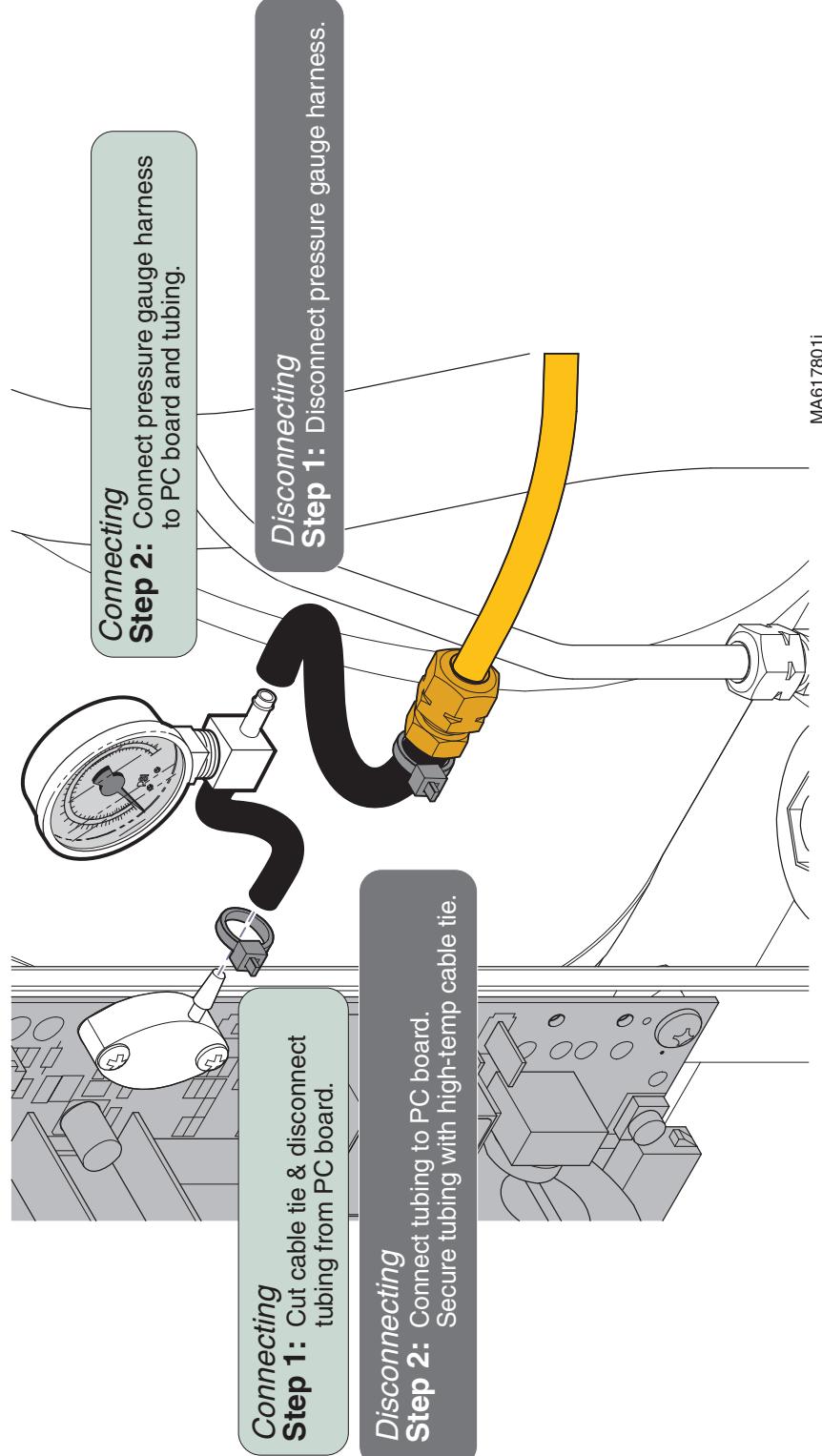
# Component Testing & Repair

## Using a Pressure Gauge

**Note**  
To test chamber pressure, a Pressure Gauge Harness is available (002-0372-00).

Refer To:  
Cover Removal

Page  
..... C-2



Models: ALL | Serial Numbers:

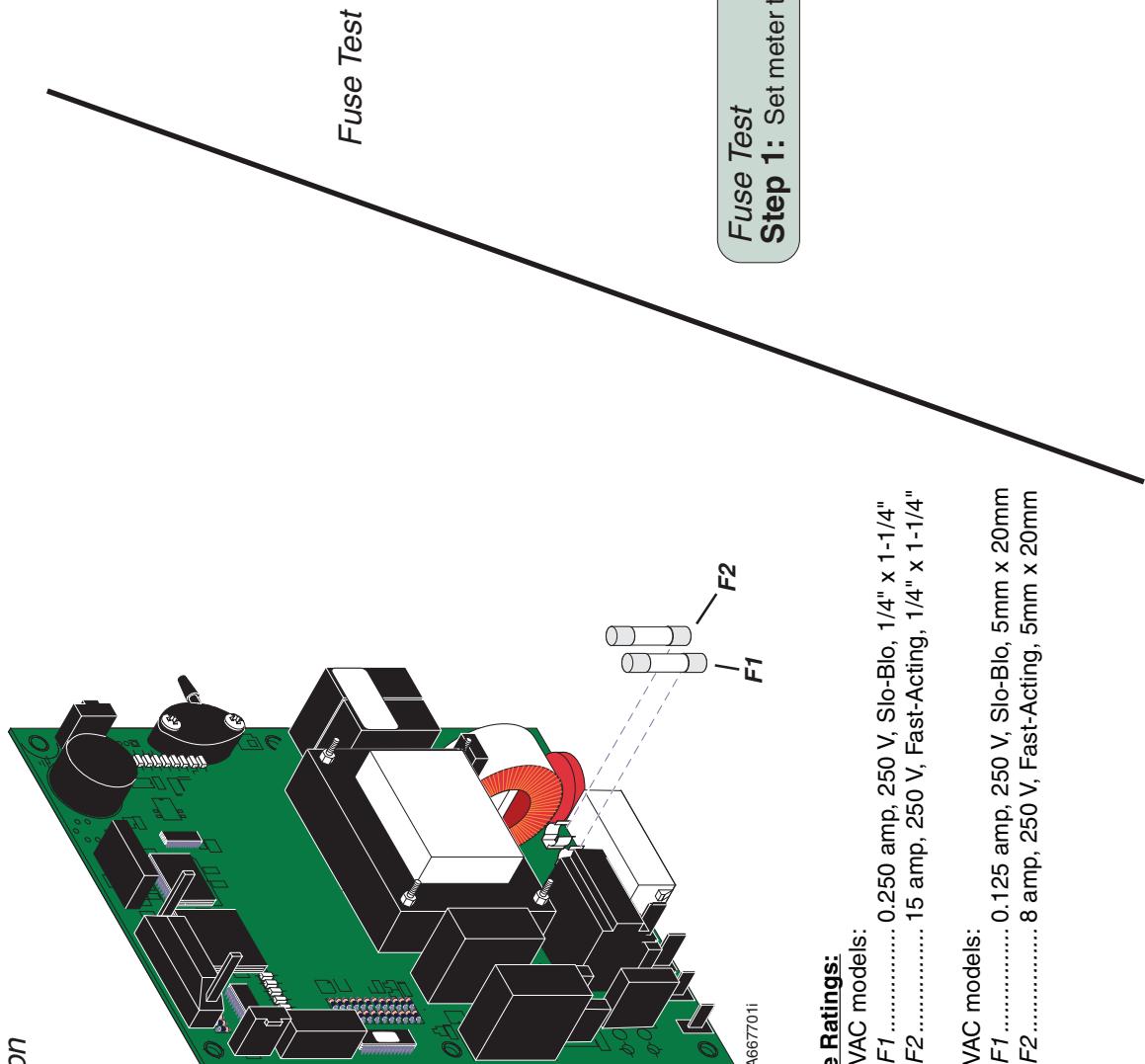
Using a  
Pressure Gauge

# Component Testing & Repair

## Fuses

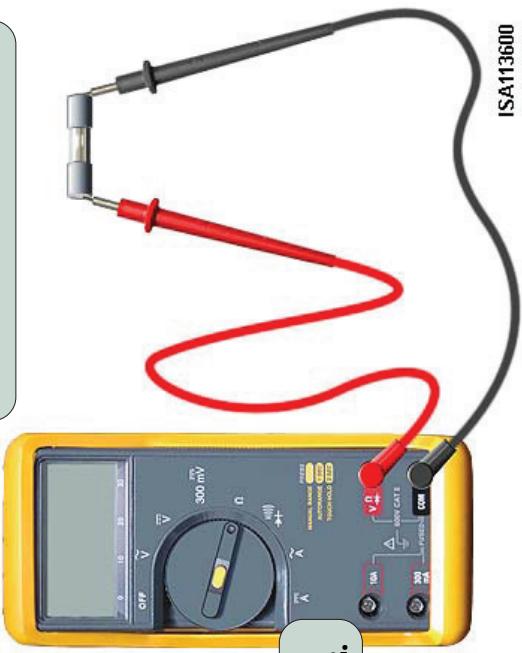
### Location

<b>Fuses</b>	<b>Page</b>
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Fuse Test .....	B-4
Cover Removal .....	C-2
Wiring Diagrams .....	D-1
Part Numbers .....	E-16



## Fuse Test

**Fuse Test**  
**Step 2:** Place meter probes on each end of fuse.



**Fuse Test**  
**Step 1:** Set meter to 200 Ω.

- Fuse Ratings:**
- 115 VAC models:  
F1 ..... 0.250 amp, 250 V, Slo-Blo, 1/4" x 1-1/4"  
F2 ..... 15 amp, 250 V, Fast-Acting, 1/4" x 1-1/4"
- 230 VAC models:  
F1 ..... 0.125 amp, 250 V, Slo-Blo, 5mm x 20mm  
F2 ..... 8 amp, 250 V, Fast-Acting, 5mm x 20mm

115 VAC models:  
F1 ..... 0.250 amp, 250 V, Slo-Blo, 1/4" x 1-1/4"  
F2 ..... 15 amp, 250 V, Fast-Acting, 1/4" x 1-1/4"

- 230 VAC models:  
F1 ..... 0.125 amp, 250 V, Slo-Blo, 5mm x 20mm  
F2 ..... 8 amp, 250 V, Fast-Acting, 5mm x 20mm

Meter Reading	Status	Required Action
OL		Replace both fuses.
less than 5 Ω		Fuse - OK

## Fuses

**Models:**  ALL   
**Serial Numbers:**

# Component Testing & Repair

## Service Diagnostics

The Service Diagnostics feature allows you to view recent error codes and test the sterilizer's major components without running a complete cycle. The Service Diagnostics tests should always be done before replacing any major component.



**CAUTION**  
This operation requires power to be connected to the unit with the panels removed.  
Use caution when performing this procedure.

### Activating Service Diagnostics

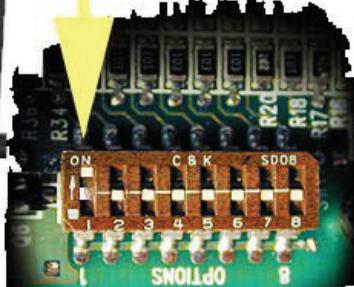
#### Service Diagnostics

**Step 1:** Disconnect power cord.



#### Service Diagnostics

**Step 2:** Remove right side panel.



#### Service Diagnostics

**Step 4:** Reconnect power cord.

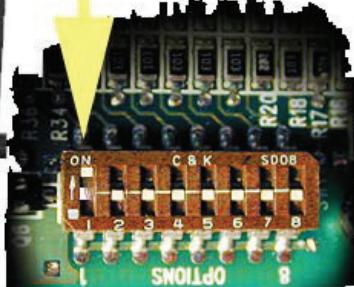


#### Service Diagnostics

**Step 5:** Press START button.  
[Then, go to Test Selection Screen page.]



**Service Diagnostics**  
**Step 3:** Move switch #1 on  
the SW1 block to ON.



#### Attention

To return to normal operating mode...  
A. Disconnect power cord.  
B. Move #1 switch (SW1 block) to OFF.  
C. Reconnect power cord.

Models: ALL | Serial Numbers:

Service Diagnostics

# Component Testing & Repair

## Service Diagnostics

### Test Selection Screen

<u>Service Diagnostics</u>	<u>Page</u>
Test Selection:	
I/O Test .....	B-7
Recall Errors .....	B-10
Keytest .....	B-11



Press the **START** button to initiate the *I/O Test*. This test allows you to energize the air valve, vent valve, fill valve, door motor, and heating element independently without running a cycle.

This test also displays the temperature & pressure inside the chamber, and the status of the high-limit thermostats, door switch, and the water level sensor

Press the **STOP** button to show the last five error codes displayed on the unit



Press the **HANDPIECES** button to initiate the *Keytest*. This test allows you to check the functionality of the buttons on the touch pad.

# Component Testing & Repair

## Service Diagnostics

I/O Test



Refer to:

	Page
Air Valve .....	B-12
Vent Valve .....	B-15
Fill Valve .....	B-15
Main PC Board .....	B-46

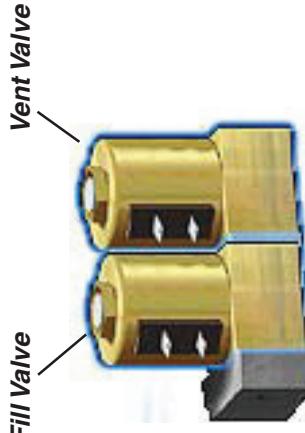


**I/O Test  
Press the START button.**

This energizes the Air Valve, causing it to open. Pressing the START button again, closes the valve.

[You should hear a "click" when the valve opens / closes. This indicates the PC Board and valve are functioning properly].

Press the STOP button for the next test.



**I/O Test  
Press the START button.**

This energizes the Vent Valve, causing it to close. Pressing the START button again, opens the valve.

[You should hear a "click" when the valve opens / closes. This indicates the PC Board and valve are functioning properly].

Press the STOP button for the next test.

**Attention**

The door switch must be tripped when testing the Fill Valve. Close the door or manually trip the switch. The water level sensor does not function during this test. The chamber will overflow if the valve is left open too long.

**FILL VALUE TEST  
<START> TO TOGGLE**

**I/O Test  
Press the START button.**

This energizes the Fill Valve, causing it to open. Pressing the START button again, closes the valve.

[Water will flow into the chamber when the valve opens. This indicates the PC Board and valve are functioning properly].

Press the STOP button for the next test.

Service Diagnostics

Models:  ALL

Serial Numbers:

# Component Testing & Repair

## Service Diagnostics

I/O Test - continued

**Attention**  
This test should be done with the door closed.



### I/O Test Press the START button.

This energizes the Door Motor System.

[The door should open after approx. 15 seconds. This indicates the PC Board and door motor are functioning properly.  
Press the STOP button for the next test.]

*Door Motor System*



Refer to:

Page	
Door Motor System	B-39
Heating Element	B-20
Main PC Board	B-46



### I/O Test Press the START button.

This energizes the Heating Element.

[The heating element should heat up for approx. 15 seconds, then shut off.  
This indicates the PC Board and heating element are functioning properly.  
Press the STOP button for the next test.]



*Heating Element*

Service Diagnostics

Models:  
Serial Numbers:

# Component Testing & Repair

## Service Diagnostics

### I/O Test - continued

**High-Limit Thermostats**  
Status should always be: **CLOSED**.  
**OPEN**, indicates malfunctioning  
thermostat(s), or that the unit has  
overheated.

### Door Switch

Status should correctly  
reflect the position of the door.  
(**OPEN** or **CLOSED**)



Refer to:	Page
High-Limit Thermostats .....	B-31
Door Switch .....	B-34
Water Level Sensor .....	B-27

**Water Level Sensor**  
Status should reflect the amount of  
water in the chamber. If water is  
contacting the sensor, status should  
be: **FULL**. If not: **EMPTY**

### I/O Test

The display shows the status of the High-Limit Thermostats,  
the Door Switch, and the Water Level Sensor.

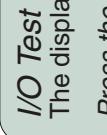
*If the display reading shows a malfunction, test the corresponding component.*

*Press the STOP button for the next test.*



**Chamber Temperature**  
[verify w/ thermometer]

**Chamber Pressure**  
With the door open, display  
should show: 0.0 PSI (0.0 kPa)



**I/O Test**  
The display shows the chamber temperature & pressure.  
Press the STOP button to return to the Test Selection Screen.

## Service Diagnostics

**Models:** ALL |   |   |  

**Serial Numbers:**   |   |   |

# Component Testing & Repair

## Service Diagnostics

### Recall Errors



**Refer to:** Error Codes .....  
**Page** ..... A-2

**Recall Errors**  
The display shows the last five error codes displayed on the unit.  
[NOTE: 1: is the most recent error code, 5: is the oldest]

**Recall Errors**  
**To erase all five error codes from memory...**  
Press the START button.  
**To retain the error codes...**  
Press the STOP button.

<START> TO ZERO  
<STOP> FOR NEXT TEST

Service Diagnostics

**Models:** | ALL | | |

# Component Testing & Repair

## Service Diagnostics

Keytest

Refer to:  
Touch Pad / Display Panel ..... B-37

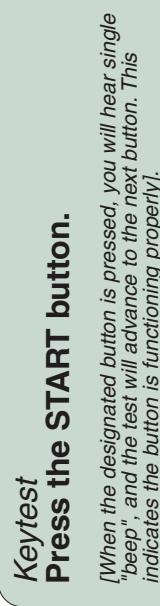
Page  
B-37



PRESS <START>  
TO TEST KEY INPUT



PRESS <HANDPIECES>  
TO TEST KEY INPUT



PRESS <STOP>  
TO TEST KEY INPUT



PRESS <HANDPIECES>  
TO TEST KEY INPUT

Service Diagnostics

Models: | ALL | Serial Numbers: |

B-11

# Component Testing & Repair

## Air Valve

### Location & Function



<b>Air Valve</b>	<b>Page</b>
Location & Function .....	B-12
Electrical Testing .....	B-13
Replacement .....	B-14
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### **During the Fill Mode...**

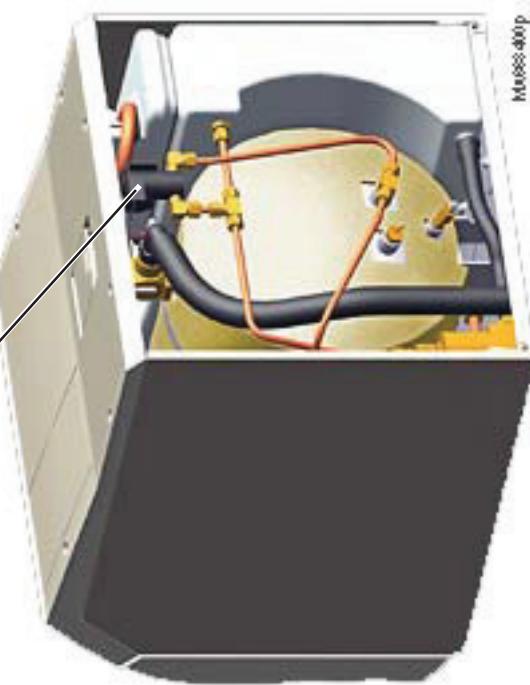
Line voltage is supplied to the air valve. This causes the valve to open so that water can flow into the chamber.

### **During the Heat-Up Mode...**

When the Heat-Up Mode begins, the PC board stops the current flow to the air valve. This allows the valve to close. The PC board opens the air valve three times during the Heat-Up Mode to release air from the chamber (*this prevents vacuum-effect*).

### **During the Sterilization, Vent, & Drying Modes...**

There is no current flow to the air valve - the valve is closed.



<b>Models:</b>	<b>ALL</b>
<b>Serial Numbers:</b>	

## Air Valve

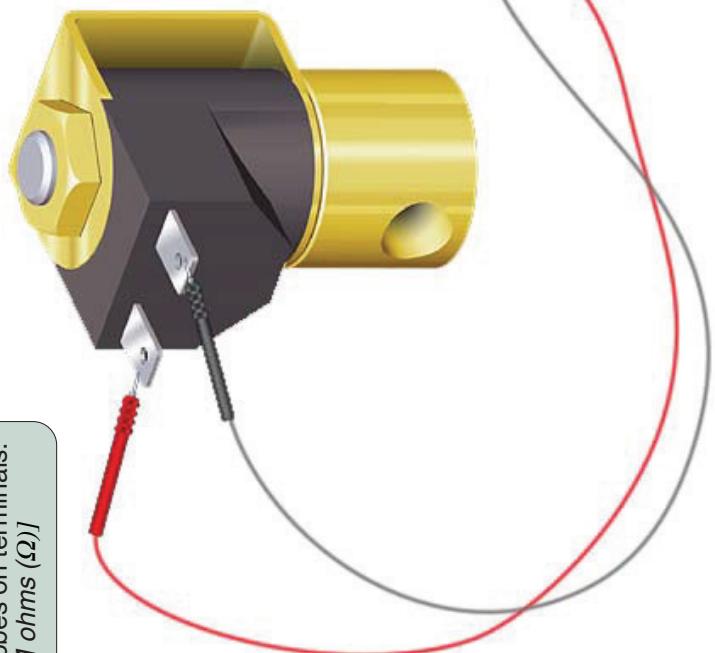
# Component Testing & Repair

## Air Valve

### Electrical Testing

**Air Valve Test**  
**Step 1:** Disconnect wires from air valve.

**Air Valve Test**  
**Step 2:** Place meter probes on terminals.  
[Set meter to M ohms ( $\Omega$ )]



<u>Refer to:</u>	<u>Page</u>
PC Board Relay Test .....	B-48
Cover Removal .....	C-2

**Note:**  
For Solenoid coils marked with FWR (Full Wave Rectified) use the M ohms Scale to check the coil. An OL or Open reading indicates a bad or open coil.  
Always use the Service Diagnostic function to check valve operation.

**Acceptable Range:**



**Air Valve Test**  
**If reading is out of acceptable range...**  
Replace air valve.  
**If reading is within acceptable range...**  
Perform PC Board Relay Test.

Air Valve

Models: | ALL | | | |

Serial Numbers: | | | | |

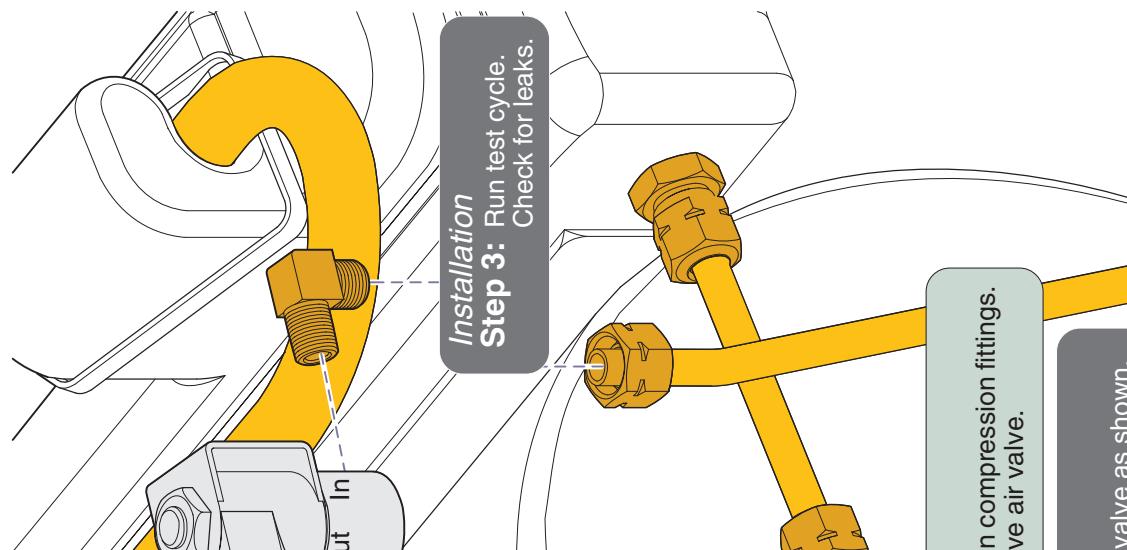
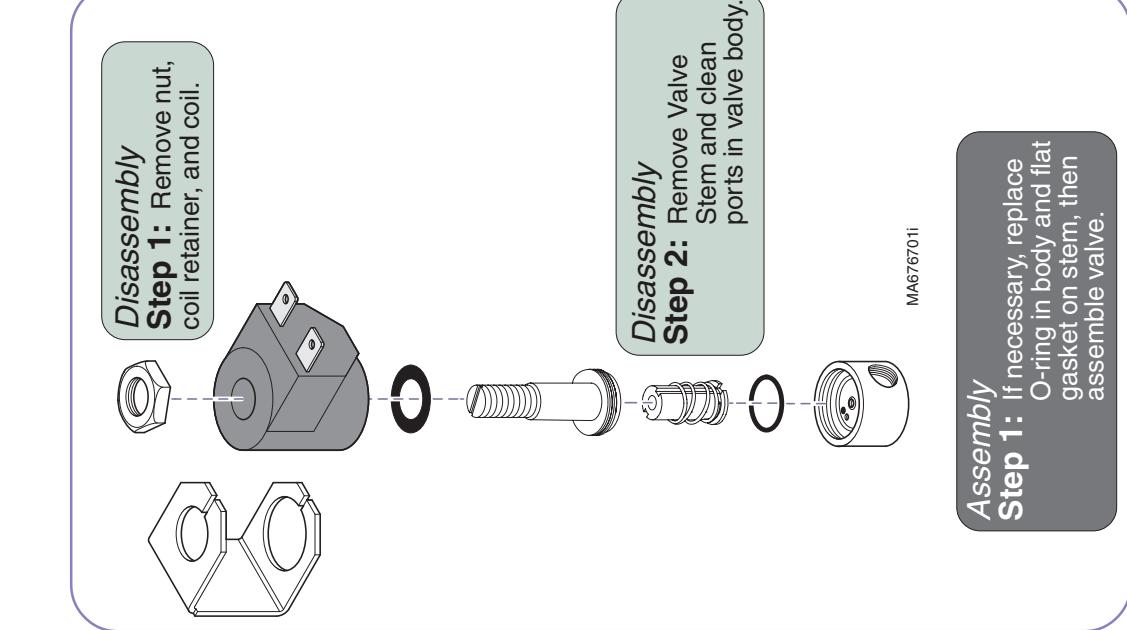
# Component Testing & Repair

## Air Valve

### Replacement / Cleaning

Refer to:

Page  
Cover Removal ..... C-2



Air Valve

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# Component Testing & Repair

## Fill / Vent Valves

### Location & Function

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Cleaning / Replacement .....	B-17
Wiring Diagrams .....	D-1
Exploded View / Part Numbers .....	E-10

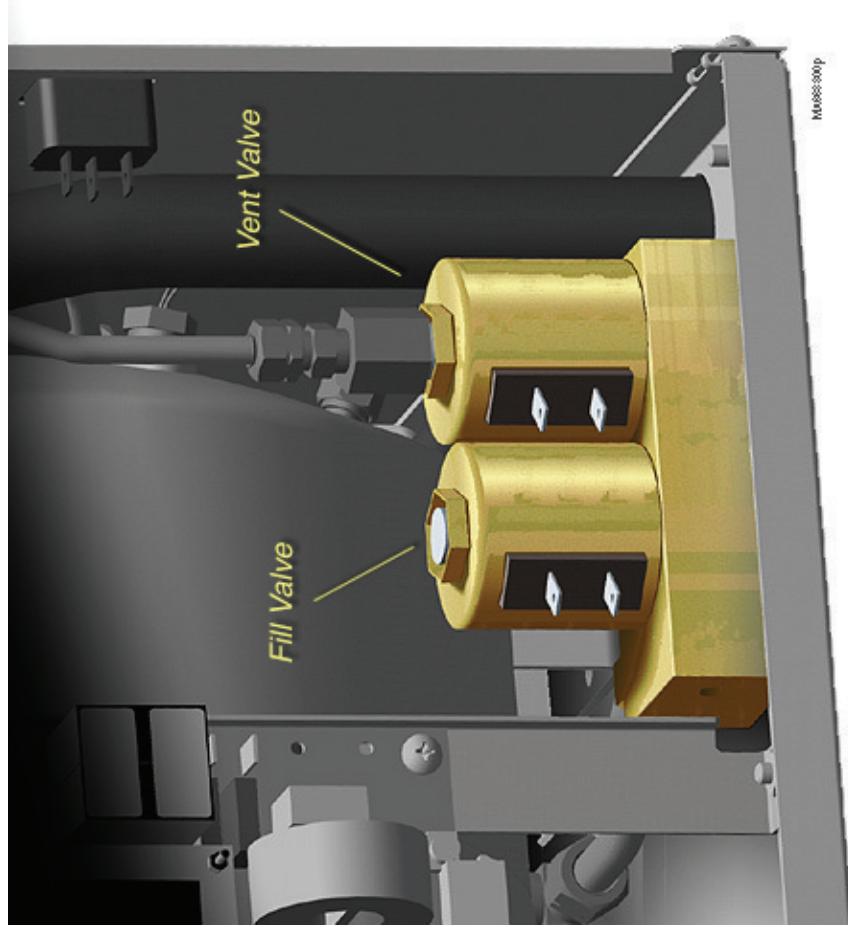
### Fill Valve During the Fill Mode...

Voltage is supplied to the fill valve. This causes the valve to open, allowing water to flow into the chamber.

When the water in the chamber reaches the water level sensor, the PC board stops the current flow to the fill valve. This allows the valve to close, stopping the flow of water into the chamber.

### During the Heat-Up, Sterilization, Vent, & Drying Modes...

There is no current flow to the fill valve. The valve is closed.



### Vent Valve

### During the Fill, Heat-Up, & Sterilization Modes...

Voltage is supplied to the vent valve. This causes the valve to close so that pressure can build in the chamber.

### During the Vent Mode...

The PC board stops the current flow to the vent valve. This allows the valve to open, releasing pressure from the chamber.

### During the Drying Mode...

There is no current flow to the vent valve. The valve is open.

**Models:** | ALL | | |  
**Serial Numbers:** | | |

Fill / Vent Valve

# Component Testing & Repair

## Fill / Vent Valves

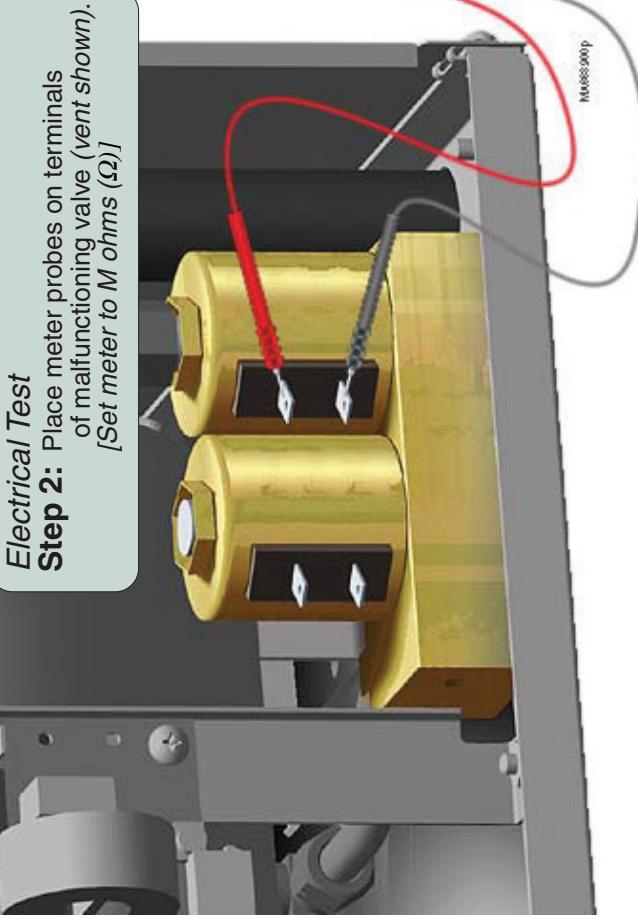
### Electrical Testing

[The testing procedure is the same for the fill valve and the vent valve].



#### Electrical Test

**Step 1:** Disconnect wires from valve terminals.



#### Electrical Test

**Step 2:** Place meter probes on terminals of malfunctioning valve (vent shown).  
[Set meter to M ohms ( $\Omega$ )]

**Note:**  
For Solenoid coils marked with FWR (Full Wave Rectified) use the M ohms Scale to check the coil. An OL or Open reading indicates a bad or open coil.  
Always use the Service Diagnostic function to check valve operation.

### Refer To:

Page
PC Board Relay Test .....
Cover Removal ..... C-2

**Electrical Test**  
**If reading is displayed OL...**  
Replace faulty valve.  
**If reading is within acceptable range...**  
Perform PC Board Relay Test.

**Acceptable Range (230 VAC Units):**  
Fill Valve ..... Any reading other than OL  
Vent Valve ..... Any reading other than OL

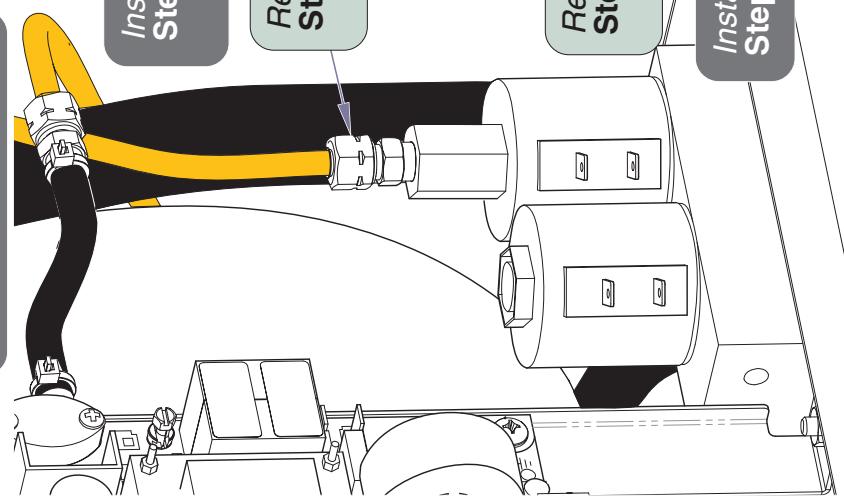
# Component Testing & Repair

## Fill / Vent Valves

### Cleaning / Replacement

**Removal (Fill / Vent)**  
**Step 1:** Drain water from reservoir.

**Installation (Fill / Vent)**  
**Step 4:** Refill reservoir.  
Run test cycle.  
Check for leaks.



MA664000i

MA664101i

### Refer to:

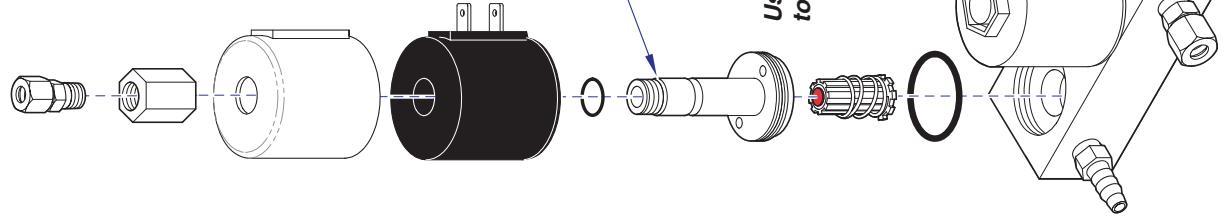
Page	
	Draining the Reservoir ..... C-4
	Cover Removal ..... C-2

### Page

Draining the Reservoir .....	C-4
Cover Removal .....	C-2

**Removal (Fill / Vent)**  
**Step 4:** Disassemble valve  
(Vent valve shown - Fill valve is similar)  
Remove any debris.

**Installation (Fill / Vent)**  
**Step 1:** Assemble valve.  
(Vent valve shown - Fill valve is similar)



**Models:** ALL | Serial Numbers:

Fill / Vent Valve

# Component Testing & Repair

## Pressure Relief Valve

### Location & Function

The pressure relief valve opens if the pressure inside the chamber reaches 40 psi (275 kPa). When the valve opens, pressurized steam is released from the bottom of the sterilizer thru the relief valve tubing.

The valve can be opened manually by pulling the pressure relief handle.

### Testing

*Note: This test should be performed whenever the unit is serviced.*

**Pressure Relief Valve Test**  
**Step 1:** Start an Unwrapped cycle.

**Pressure Relief Valve Test**

#### Caution

To prevent burns, place a towel around bottom of sterilizer.

**Step 2:** When chamber pressure reaches 25 psi, pull pressure relief handle briefly, then release.  
[Steam should discharge when handle is pulled, and completely stop when handle is released.]

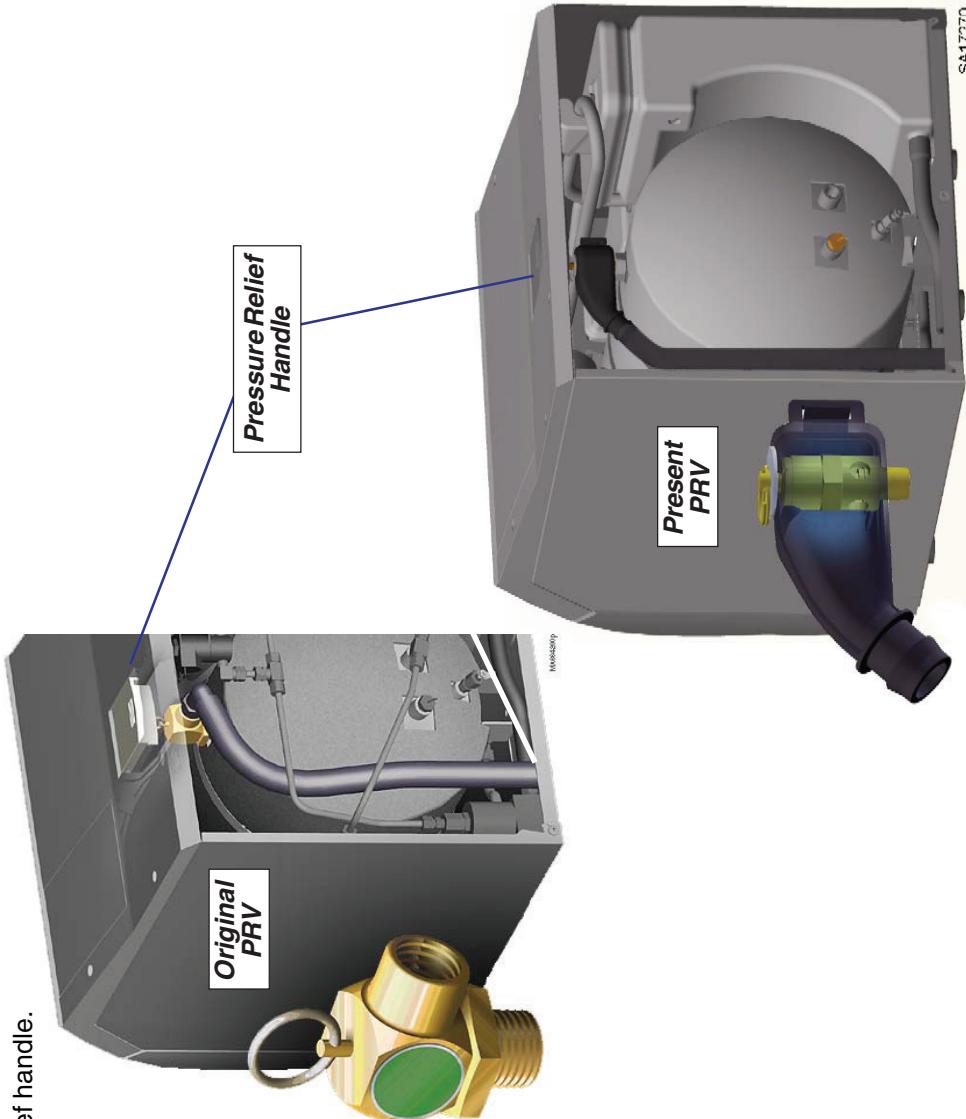
**Pressure Relief Valve Test**

#### If steam continues to discharge when handle is released...

Pull handle, then quickly release until valve "snaps" closed.

If valve will not close, replace valve.

<b>Pressure Relief Valve</b>	<b>Page</b>
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SA17270

### Pressure Relief Valve

**Models:** ALL |  
**Serial Numbers:**

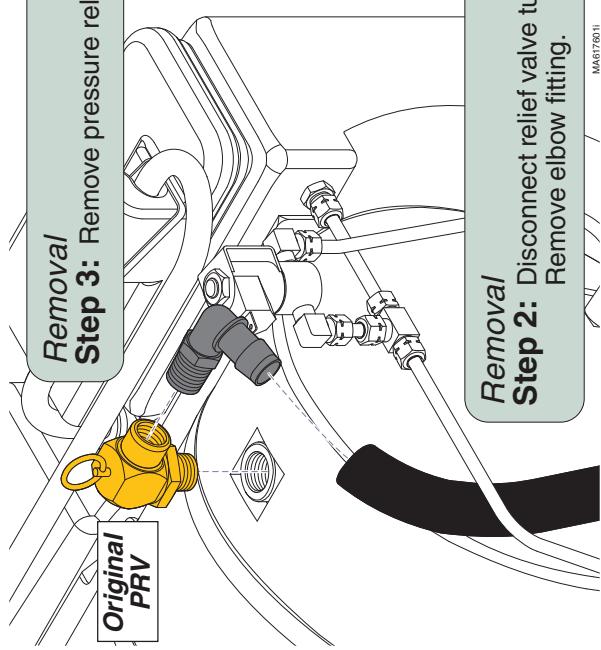
# Component Testing & Repair

## Pressure Relief Valve

### Replacement

**Removal**  
**Step 1:** Pull pressure relief handle to purge pressure from chamber.

**Removal**  
**Step 3:** Remove pressure relief valve.



**Removal**  
**Step 2:** Disconnect relief valve tubing.  
Remove elbow fitting.

MA61778011

**Installation**  
**Step 1:** Install the Reducer and then the Pressure Relief Valve.

Note: The PRV and Reducer have a thread sealant on them to prevent leakage.

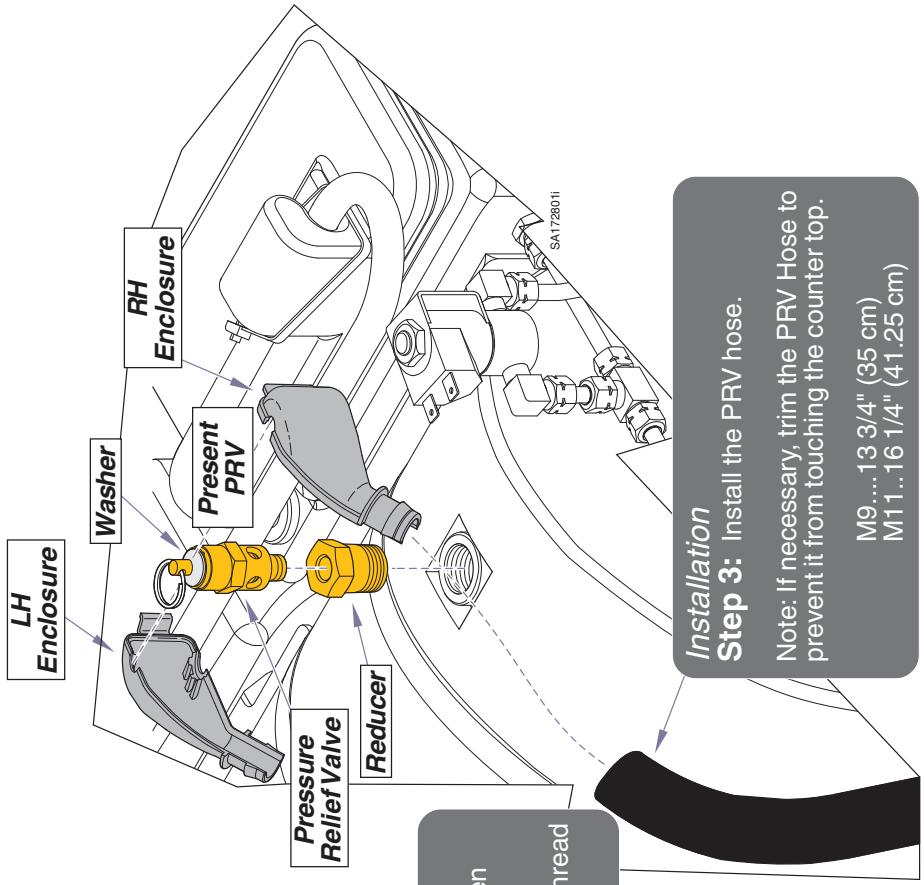
**Refer to:**  
Cover Removal ..... C-2

**Page**

**C-2**

**Installation**  
**Step 2:** Install the LH & RH Enclosures.

Note: Locate the Washer between the top of the Enclosure and the ring on the PRV.



**Models:** | ALL | Serial Numbers:

**Pressure Relief Valve**

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**B-19**

SF-1854 Rev.3/09

# Component Testing & Repair

## Heating Element

### Location & Function

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### **During the Fill & Vent Modes...**

There is no current flow to the heating element.  
Heating element is OFF.

### **During the Heat-Up Mode...**

Line voltage is continually supplied to the heating element.  
The heating element heats the water in the chamber until  
sterilization temperature is achieved.

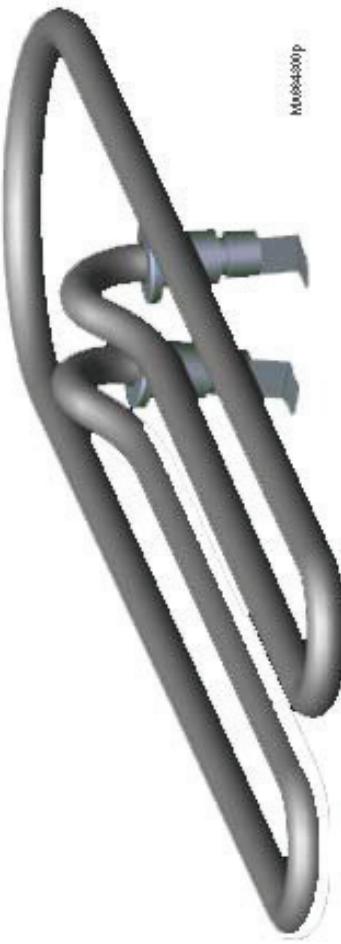
### **During the Sterilization Mode...**

Based on readings from the temperature and pressure sensors,  
the heating element is cycled ON and OFF to maintain the required  
parameters for the selected cycle.

### **During the Drying Mode...**

Line voltage is supplied to the heating element at pre-set intervals

to turn it ON / OFF. This continues for the duration of the Drying  
Mode.



Heating Element

ALL

Models:  
Serial Numbers:

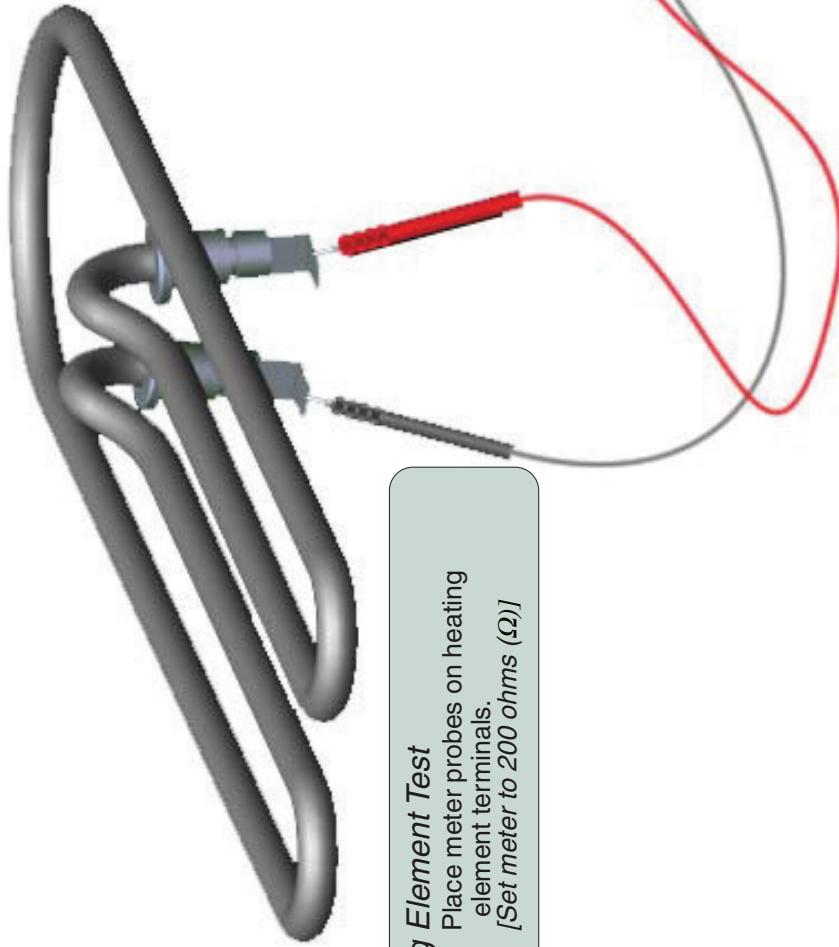
# Component Testing & Repair

## Heating Element

Testing

### Heating Element Test

**Step 1:** Remove bottom cover.  
Disconnect wires from heating element.



### Heating Element Test

**Step 2:** Place meter probes on heating element terminals.  
[Set meter to 200 ohms ( $\Omega$ )]

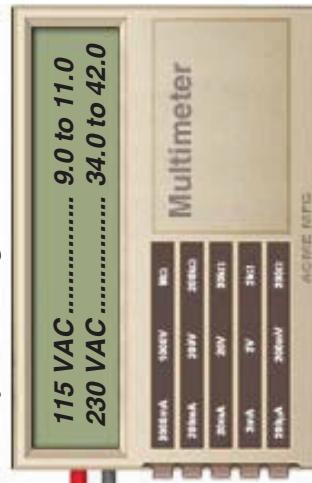
### Refer To:

Page
Cover Removal..... C-2
PC Board Relay Test ..... B-48

**Heating Element Test**  
**If reading is out of acceptable range...**  
Replace heating element.

**If reading is within acceptable range...**  
Perform PC Board Relay Test.

### Acceptable Range:



Multimeter

**Models:** ALL  
**Serial Numbers:**

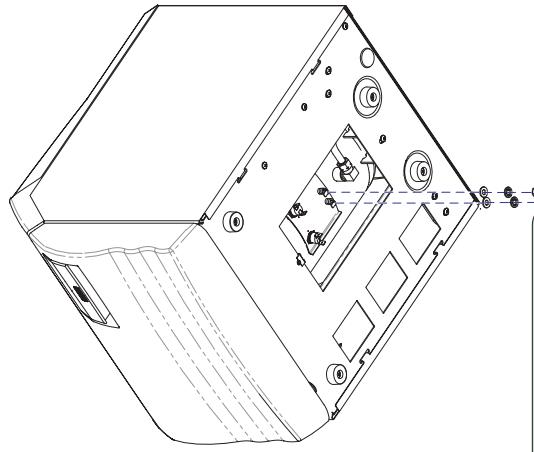
**Heating Element**

# Component Testing & Repair

## Heating Element

### Replacement

**Removal**  
**Step 1:** Drain water from reservoir.



**Removal**  
**Step 2:** Disconnect wires from heating element.  
Remove nuts, lockwashers, & brass washers.

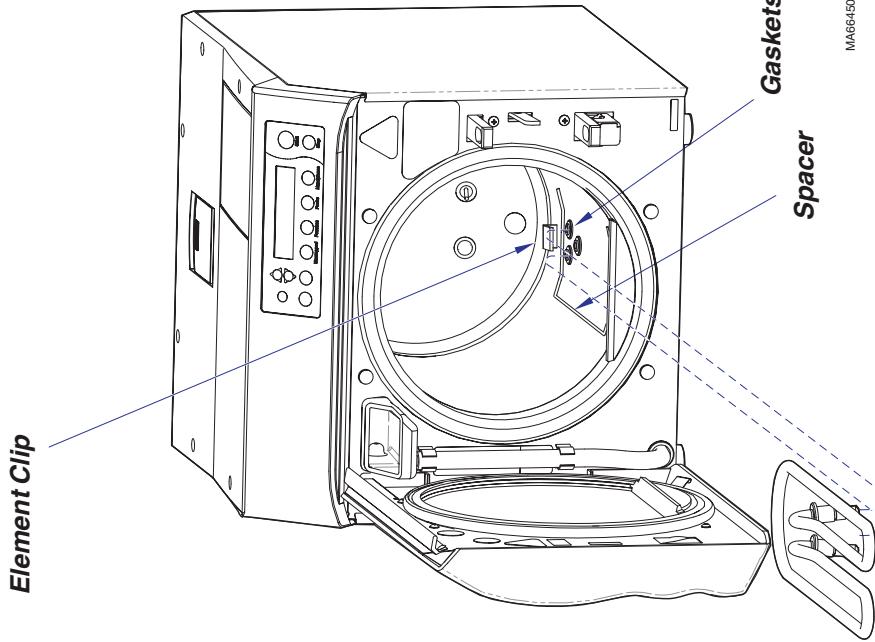


**Installation**  
**Equipment Alert**

1. Do not overtighten nuts!  
Torque must not exceed 25 ft/lbs (34N·M).
2. Make sure when replacing the element in a M11,  
that the element coil is placed under the element clip.  
(see diagram)

**Step 2:** Install brass washers, lockwashers, & nuts.  
Connect wires to heating element.

**Element Clip**



**Removal**  
**Step 3:** Remove heating element and spacer.

**Installation**  
**Step 1:** Install gaskets onto heating element.  
Install spacer and heating element.

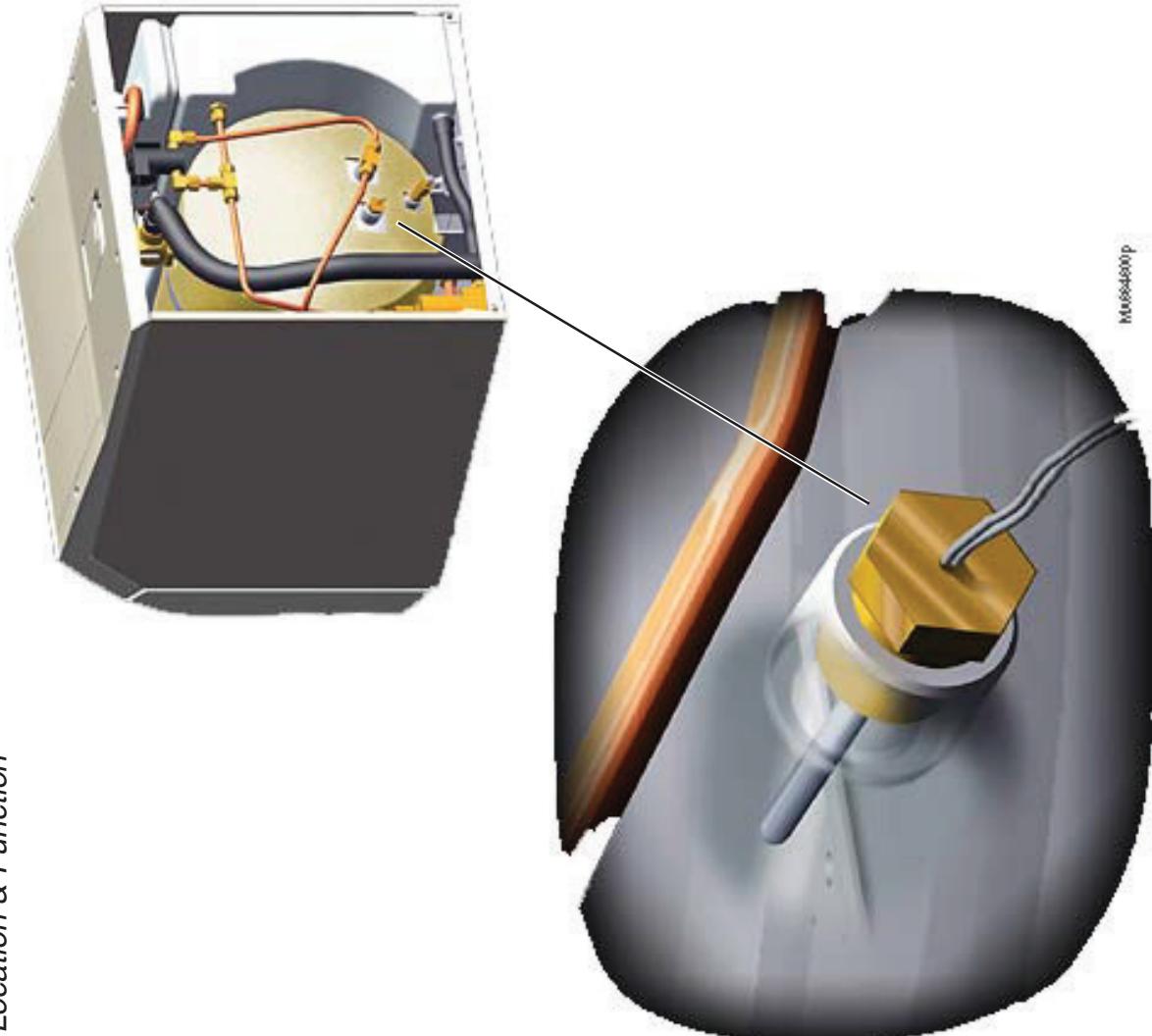
<b>Refer to:</b>	<b>Page</b>
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# Component Testing & Repair

## Temperature Sensor

### Location & Function

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### During the Fill Mode...

The temperature sensor is not monitored.

### During the Heat-Up & Sterilization Modes...

The temperature sensor continually monitors the chamber temperature and transmits this information to the PC board.

The PC board turns the heating element ON / OFF based on the readings from the temperature sensor.

### During the Vent Mode...

The temperature sensor continually monitors the chamber temperature and transmits this information to the PC board.

### During the Drying Mode...

The temperature sensor continually monitors the chamber temperature and transmits this information to the PC board.

If the temperature exceeds 240°F (115°C), the PC board stops the current flow to the heating element until the temperature drops.

**Models:** | ALL | Serial Numbers:

**Temperature Sensor**

# Component Testing & Repair

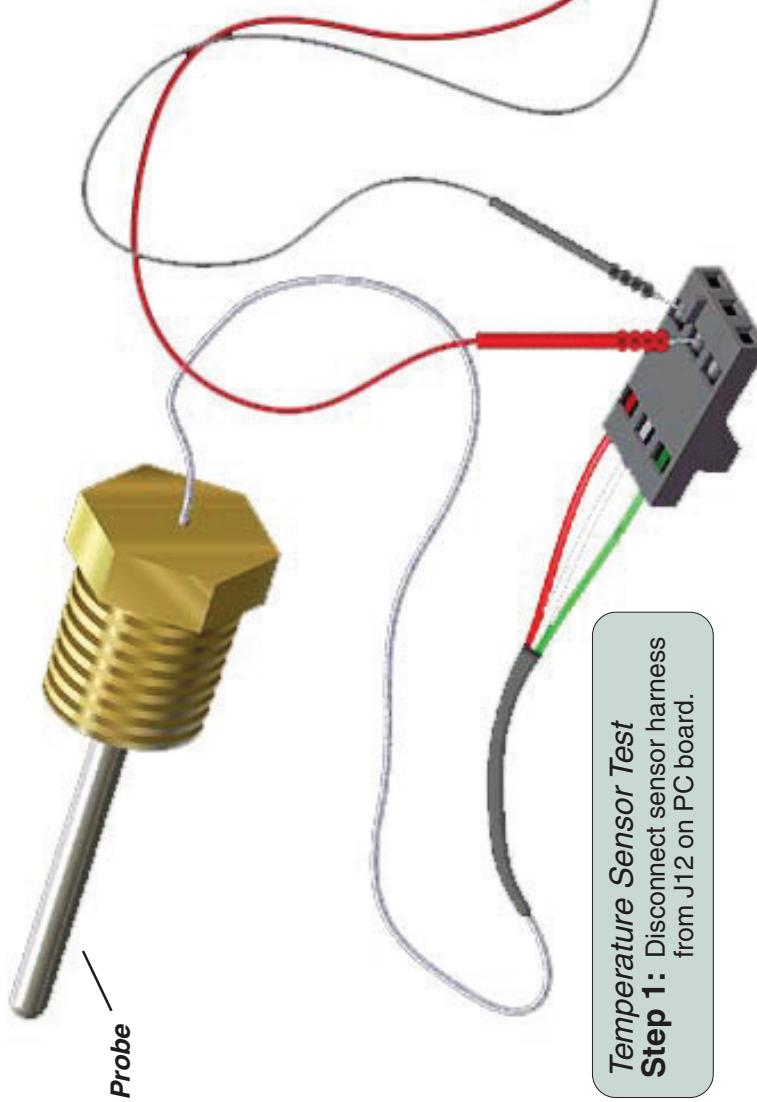
## Temperature Sensor

### Testing

#### Service Tip

Residue can build up on the sensor probe causing inaccurate temperature readings.

Clean the probe with SpeedClean and an abrasive pad.



#### Refer To:

Page	
Supply Voltage Test .....	B-25
Cover Removal .....	C-2

**Temperature Sensor Test**  
**If reading is out of acceptable range...**  
Replace temperature sensor.  
**If reading is within acceptable range...**  
Perform Supply Voltage Test.

Acceptable Range:



**Temperature Sensor Test**  
**Step 2:** Place meter probes on red and white wires.  
[Set meter to 2K ohms ( $\Omega$ )]

### Temperature Sensor

Models:

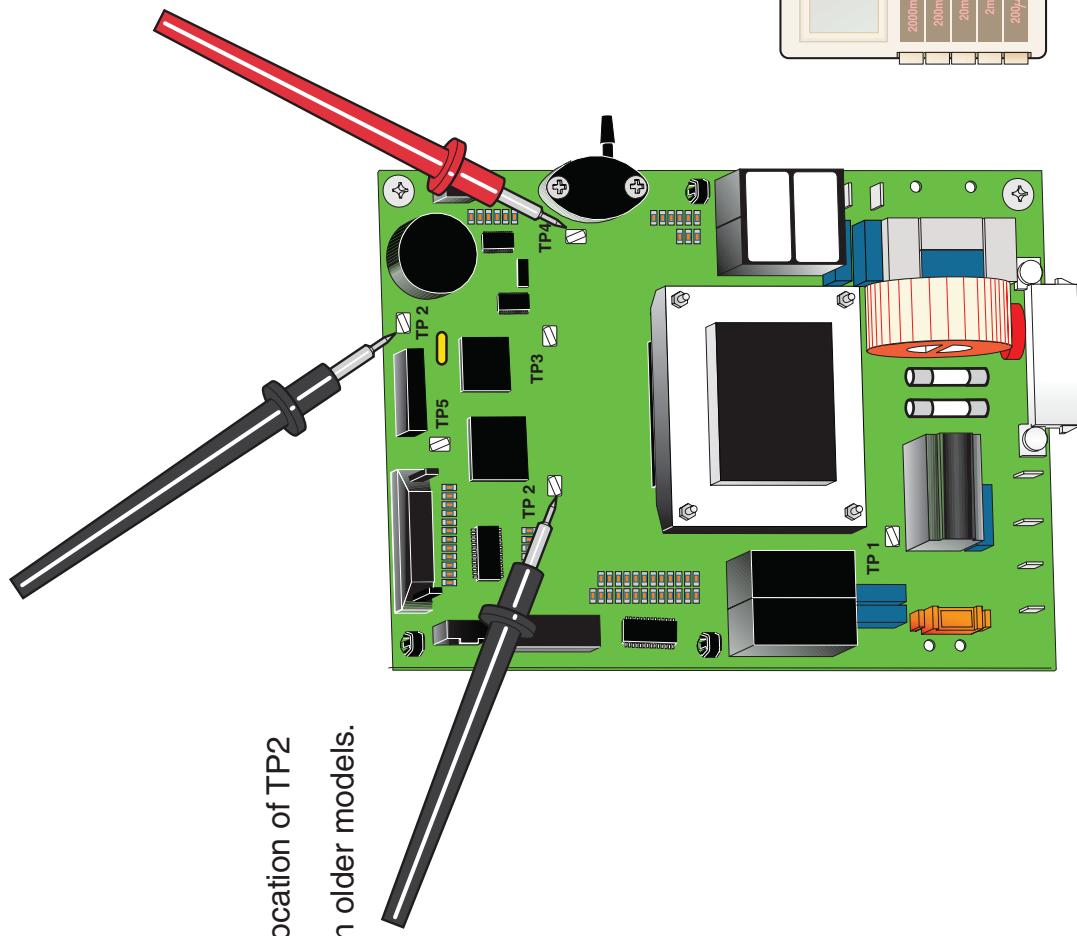
Serial Numbers:

# Component Testing & Repair

## Temperature Sensor

### Supply Voltage Test

**Refer To:**  
Cover Removal ..... C-2

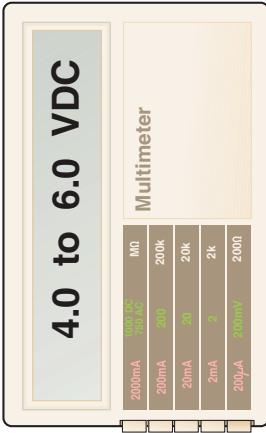


Location of TP2  
on older models.

**Supply Voltage Test**  
**Step 1:** Place meter probes on test points:  
Black probe: TP2  
Red probe: TP4  
*[Set meter to 20 VDC]*

**Supply Voltage Test**  
**If reading is out of acceptable range...**  
Replace main PC board.  
**If reading is within acceptable range...**  
Main PC board is functioning properly

**Acceptable Range:**



SA110600

**Temperature Sensor**

**Models:** | ALL | | |  
**Serial Numbers:** | | |

# Component Testing & Repair

## Temperature Sensor

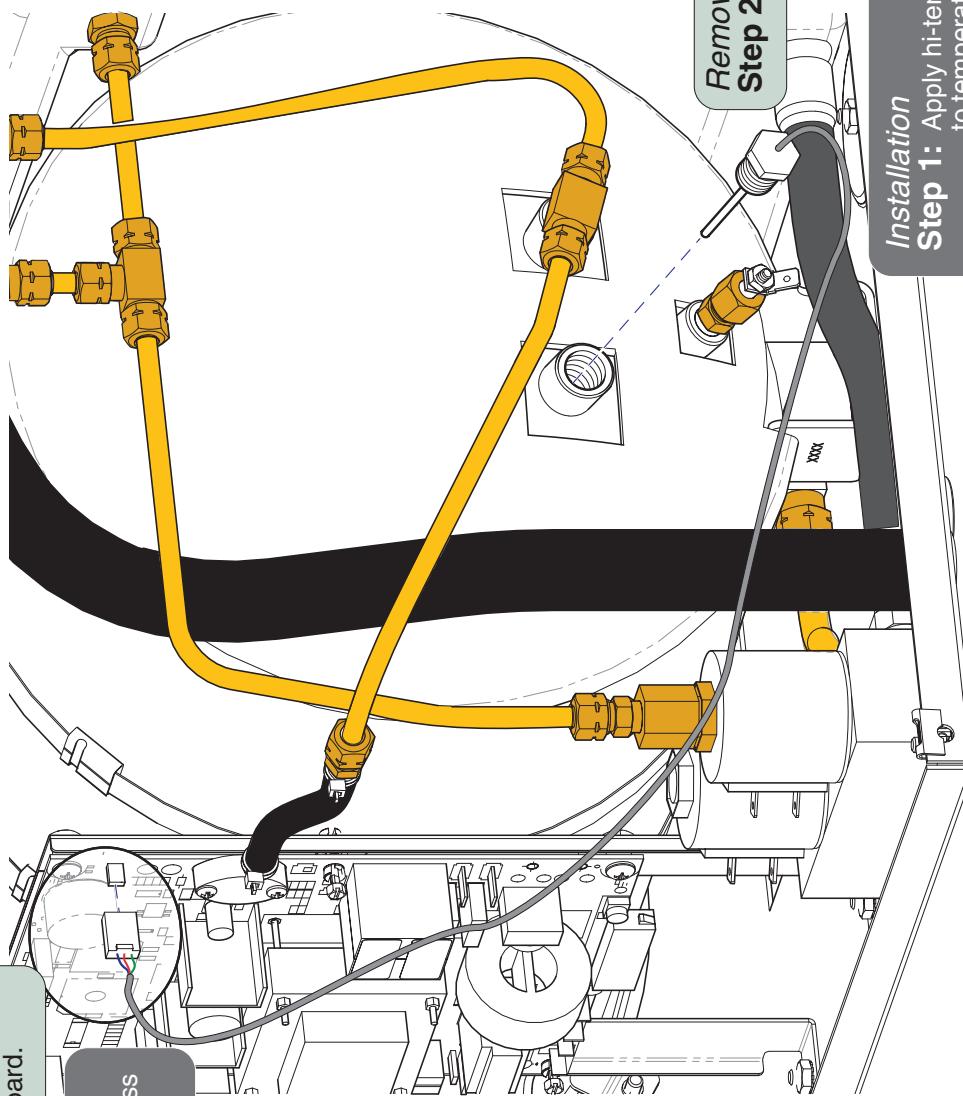
### Replacement

Refer To:

Page  
..... C-2

*Removal*  
**Step 1:** Disconnect sensor harness from J12 on PC board.

*Installation*  
**Step 2:** Connect sensor harness to J12 on PC board.



*Removal*  
**Step 2:** Remove temperature sensor.

*Installation*  
**Step 1:** Apply hi-temp hydraulic sealant (*Loctite 565*) to temperature sensor threads.  
**Do not use teflon tape!**

Install temperature sensor.

MA664700i

**Temperature Sensor**

**ALL**

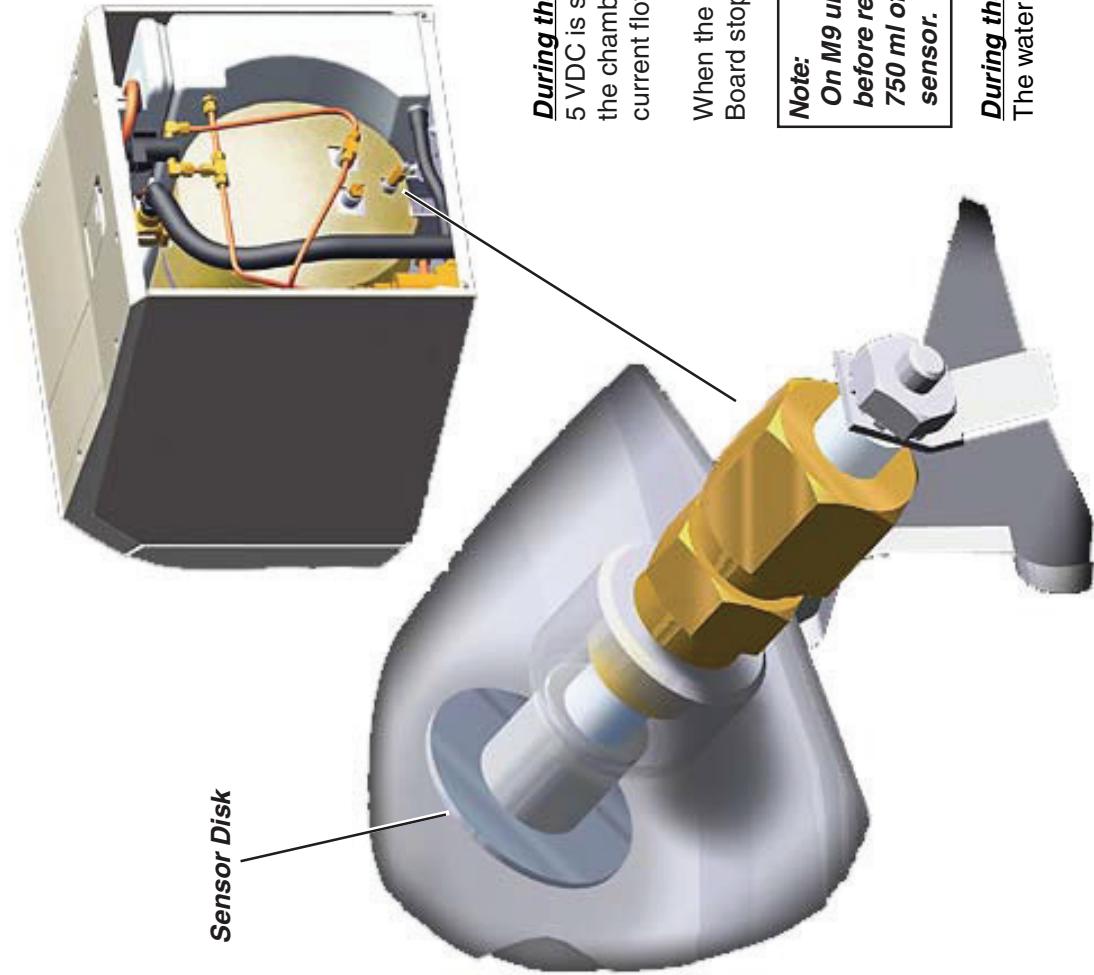
**Models:** |  
**Serial Numbers:** |

# Component Testing & Repair

## Water Level Sensor

Location & Function

Water Level Sensor	Page
Location & Function .....	B-27
Testing .....	B-28
Replacement .....	B-30
Wiring Diagrams .....	D-1
Exploded View / Part Numbers .....	E-9



### During the Fill Mode...

5 VDC is supplied to the water level sensor. When the water level in the chamber reaches the sensor disk, a circuit is completed and current flows back to the PC Board.

When the 5 VDC from the water level sensor is detected, the PC Board stops the current flow to the fill valve.

#### **Note:**

*On M9 units, approximately 650 ml of water will enter chamber before reaching the water sensor. On M11 units, approximately 750 ml of water will enter chamber before reaching the water sensor.*

### During the Heat-Up, Sterilization, Vent, & Drying Modes...

The water level sensor is not monitored.

M6084300P

Models: | ALL |

Serial Numbers: |

Water Level Sensor

# Component Testing & Repair

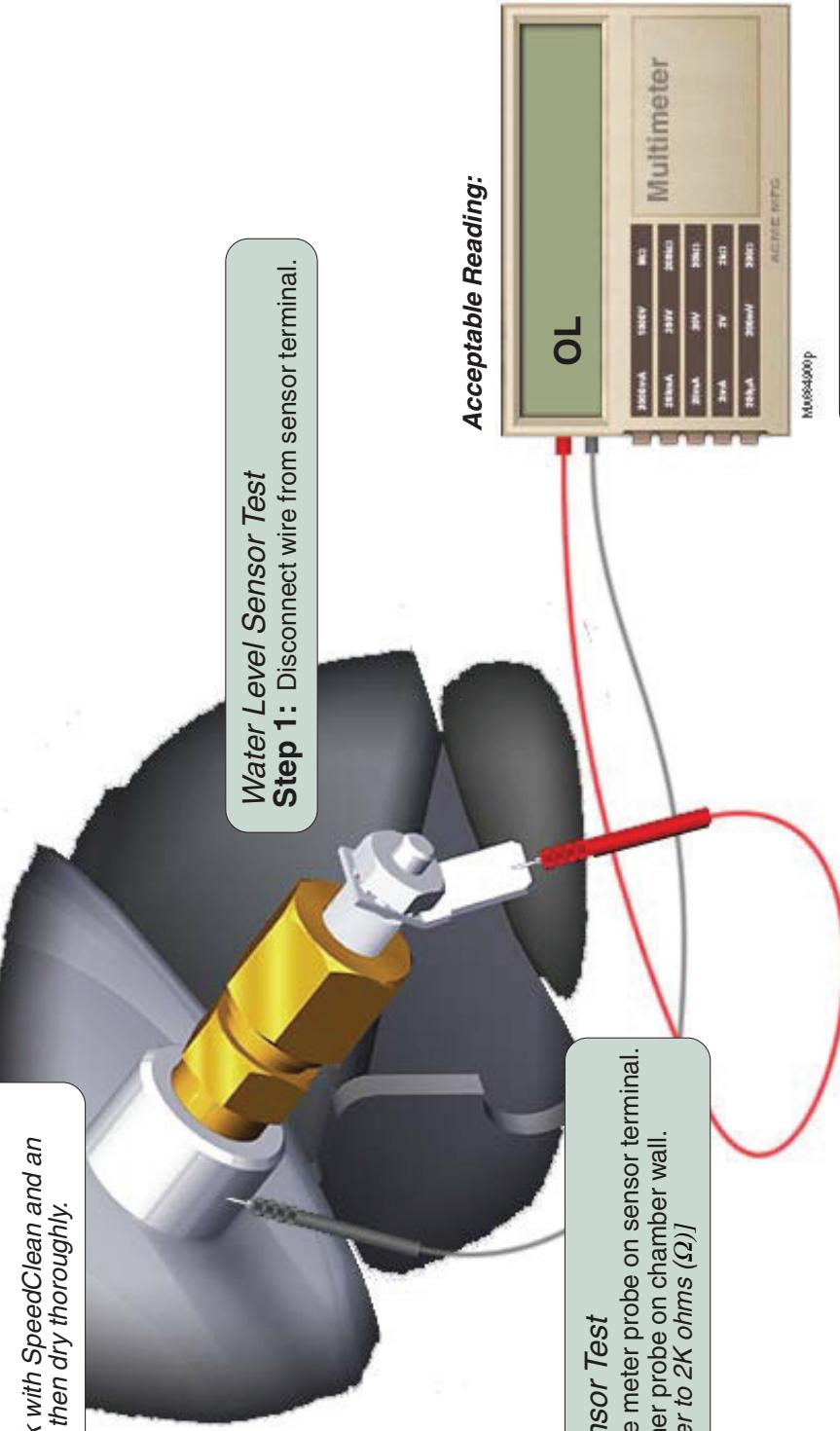
## Water Level Sensor

### Testing

#### Service Tip

Residue can build up on the sensor disk causing malfunctions during the Fill Mode.

Clean the disk with SpeedClean and an abrasive pad, then dry thoroughly.



#### Refer To:

Page	Supply Voltage Test	B-29
	Cover Removal	C-2

Water Level Sensor Test  
**If reading is anything other than OL...**  
Replace water level sensor.  
**If reading is OL...**  
Perform Supply Voltage Test.

Water Level Sensor

ALL

Models:  
Serial Numbers:

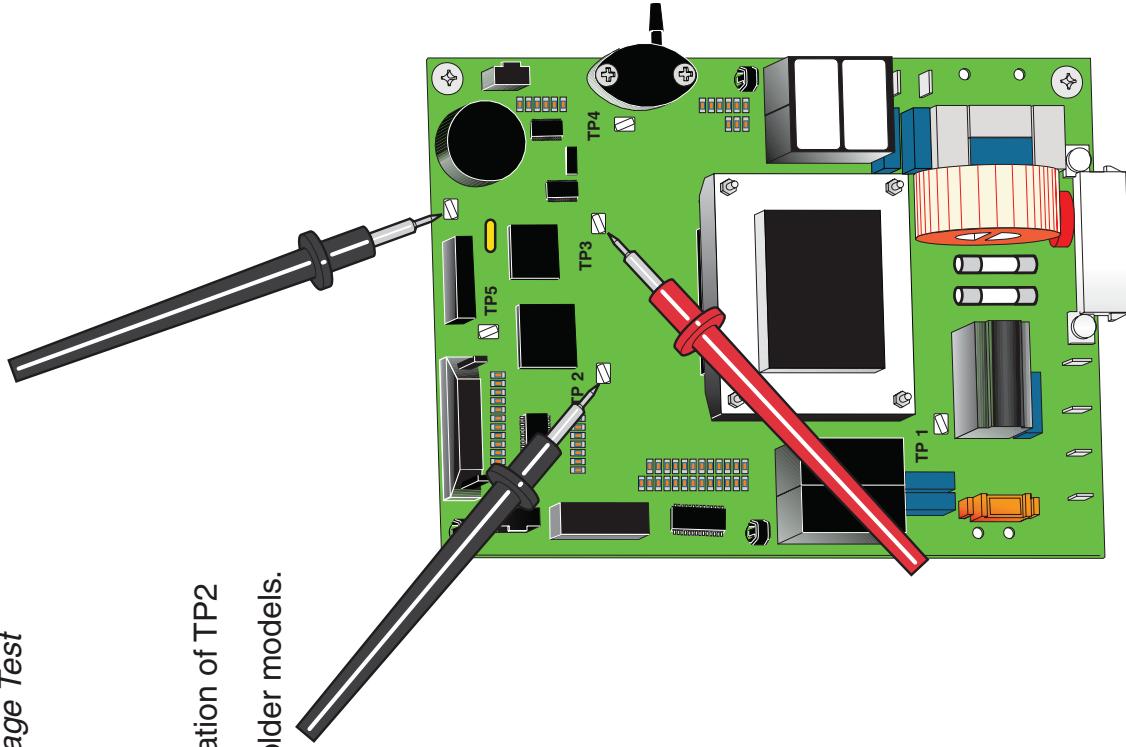
B-28

# Component Testing & Repair

## Water Level Sensor

### Supply Voltage Test

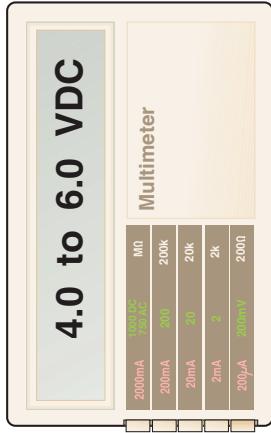
Location of TP2  
on older models.



**Supply Voltage Test**  
**Step 1:** Place meter probes on test points:  
Black probe: TP2  
Red probe: TP3  
*[Set meter to 20 VDC]*

**Supply Voltage Test**  
**If reading is out of acceptable range...**  
Replace main PC board.  
**If reading is within acceptable range...**  
Main PC board is functioning properly

**Acceptable Range:**



SA110500

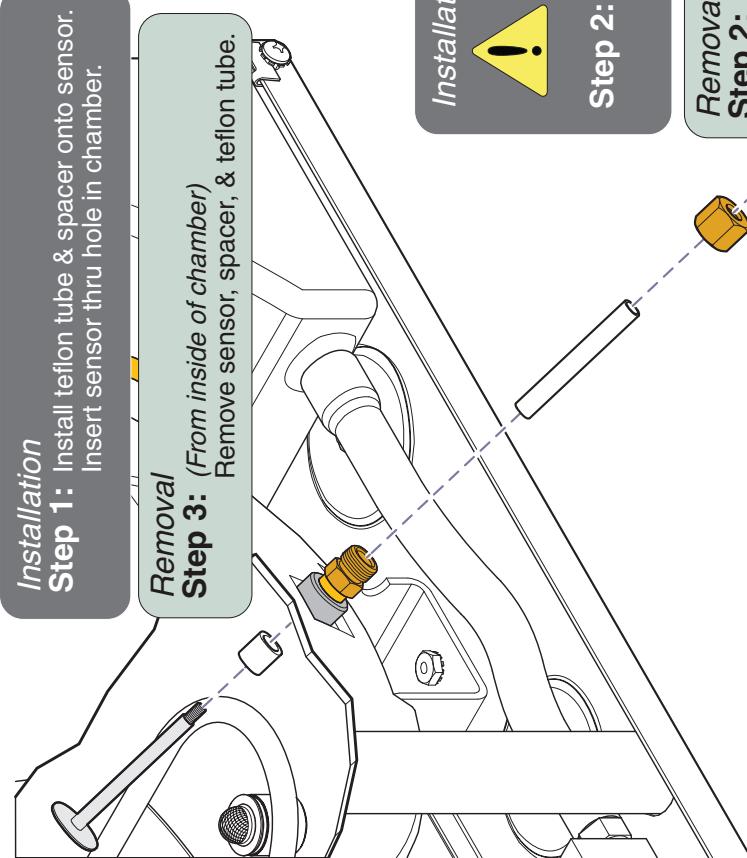
**Models:** ALL  
**Serial Numbers:** \_\_\_\_\_

**Water Level Sensor**

# Component Testing & Repair

## Water Level Sensor

### Replacement



**Refer To:**  
Cover Removal.....  
**Page**  
C-2

**Installation**  
**Step 1:** Install teflon tube & spacer onto sensor.  
Insert sensor thru hole in chamber.

**Removal**  
**Step 3: (From inside of chamber)**  
Remove sensor, spacer, & teflon tube.

**Installation**  
**Equipment Alert**  
Do not overtighten compression nut!  
[Tighten 1-1/4 turns from finger-tight]

**Step 2:** Install compression nut.  
Install terminal & nut.

**Removal**  
**Step 2:** Remove nut, terminal, & compression nut.

**Installation**  
**Step 3:** Perform test on page B-26 to  
assure sensor is not grounded.

**Removal**  
**Step 1:** Disconnect wire from sensor.  
**Installation**  
**Step 4:** Connect sensor wire.

MA665200i

Water Level Sensor

© Midmark Corporation 2004 SF-1854

B-30

**Models:** |  
**Serial Numbers:** |

# Component Testing & Repair

## High Limit Thermostats

### Location & Function

High-Limit Thermostats	Page
Location & Function .....	B-31
Testing .....	B-32
Replacement .....	B-33
Exploded View / Part Numbers .....	E-12

### During all modes...

Line voltage continually flows thru the normally closed contacts of the two high-limit thermostats. This circuit powers all of the line voltage components, except for the Fan System.

If the temperature at either of the thermostats exceeds 450°F ( $\pm 25^\circ$ ) / 232°C (+14°), the thermostat contacts open. This interrupts power, and terminates the cycle.  
*[An error code will appear on the display].*

The thermostat contacts reset to the closed position at approximately 325°F / 163°C.



## High-Limit Thermostats

Models: ALL | Serial Numbers:

# Component Testing & Repair

## High Limit Thermostats

### Testing

#### Note

High-limit thermostats must be tested at room temperature.



#### High-Limit Thermostat Test

**Step 1:** Disconnect wires from thermostat.

**High-Limit Thermostat Test**  
**Step 2:** Place meter probes on thermostat terminals.  
[Set meter to 200 ohms ( $\Omega$ )]

Acceptable Range:



**High-Limit Thermostat Test**  
**If reading is (approximately) 0.00 ...**  
High-limit thermostat is good.  
**If reading is OL...**  
Replace high-limit thermostat.

### High-Limit Thermostats

ALL

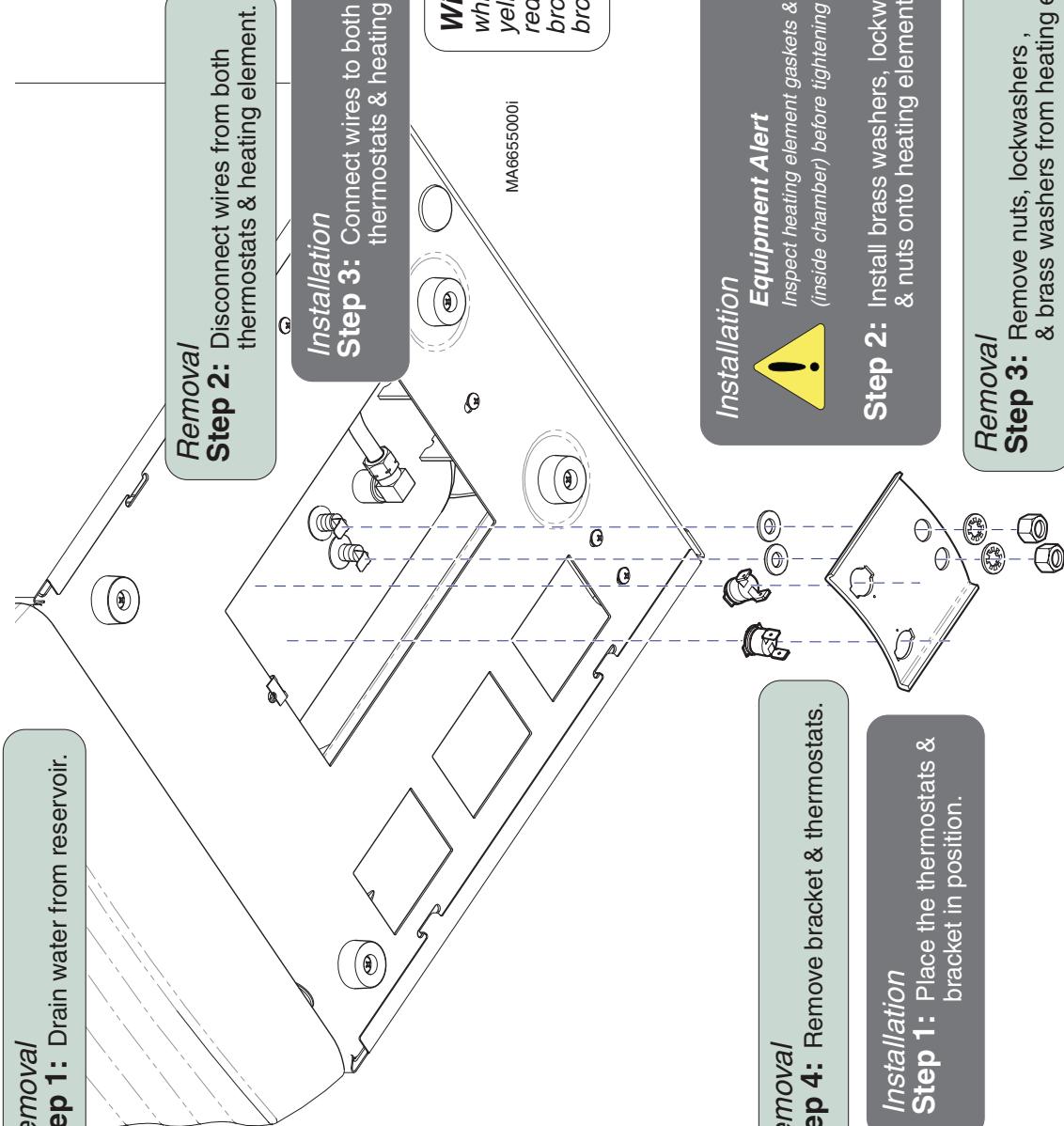
Models:  
Serial Numbers:

# Component Testing & Repair

## High Limit Thermostats

Replacement

**Removal**  
**Step 1:** Drain water from reservoir.



<b>Refer to:</b>	<b>Page</b>
Draining the Reservoir .....	C-4
Cover Removal .....	C-2

**Models:** | ALL | Serial Numbers:

**High-Limit Thermostats**

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# Component Testing & Repair

## Door Switch

### Location & Function

<b>Door Switch</b>	<b>Page</b>
Location & Function .....	B-34
Testing .....	B-35
Replacement .....	B-36
Wiring Diagrams .....	D-1
Exploded View / Part Numbers .....	E-7



### Note

*When the door is open, the door switch is untripped / open.  
When the door is closed, the door switch is tripped / closed.*

### During the Fill, Heat-Up, & Sterilization Modes...

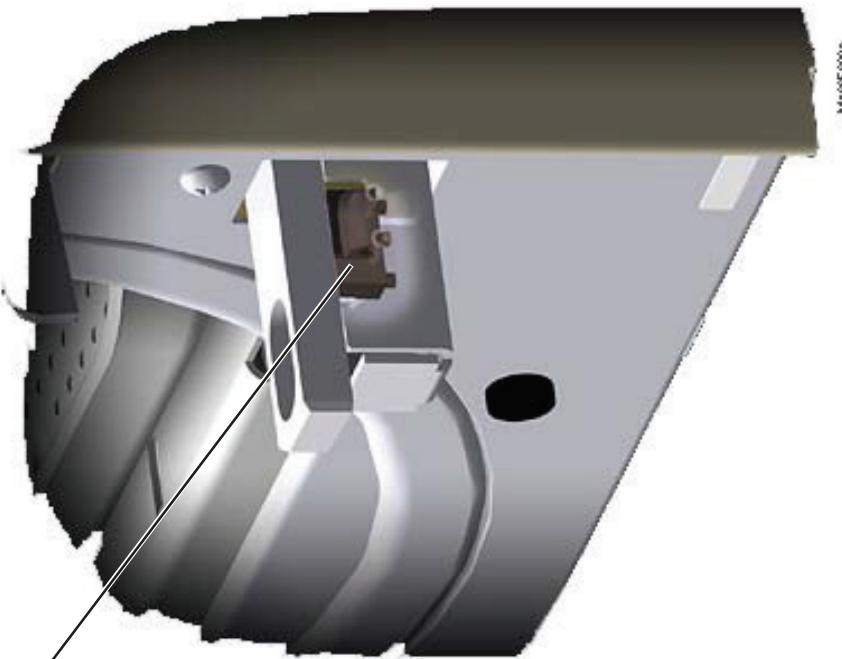
When a cycle is initiated, the PC board monitors the status of the door switch.

If an open door is detected, the cycle will not start.

If the door switch opens during a cycle, the cycle will be terminated and the corresponding error code will appear in the display.

### During the Vent, & Drying Modes...

The door switch is not monitored.



Model 600p

**Models:** ALL  
**Serial Numbers:**

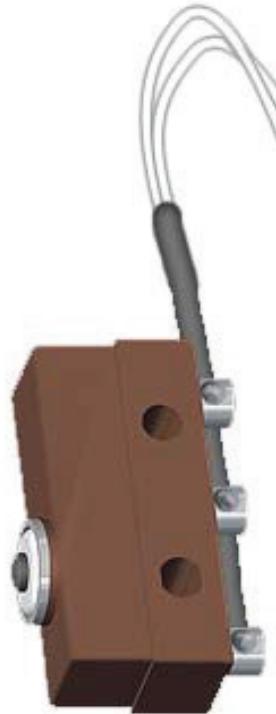
**Door Switch**

# Component Testing & Repair

## Door Switch

### Testing

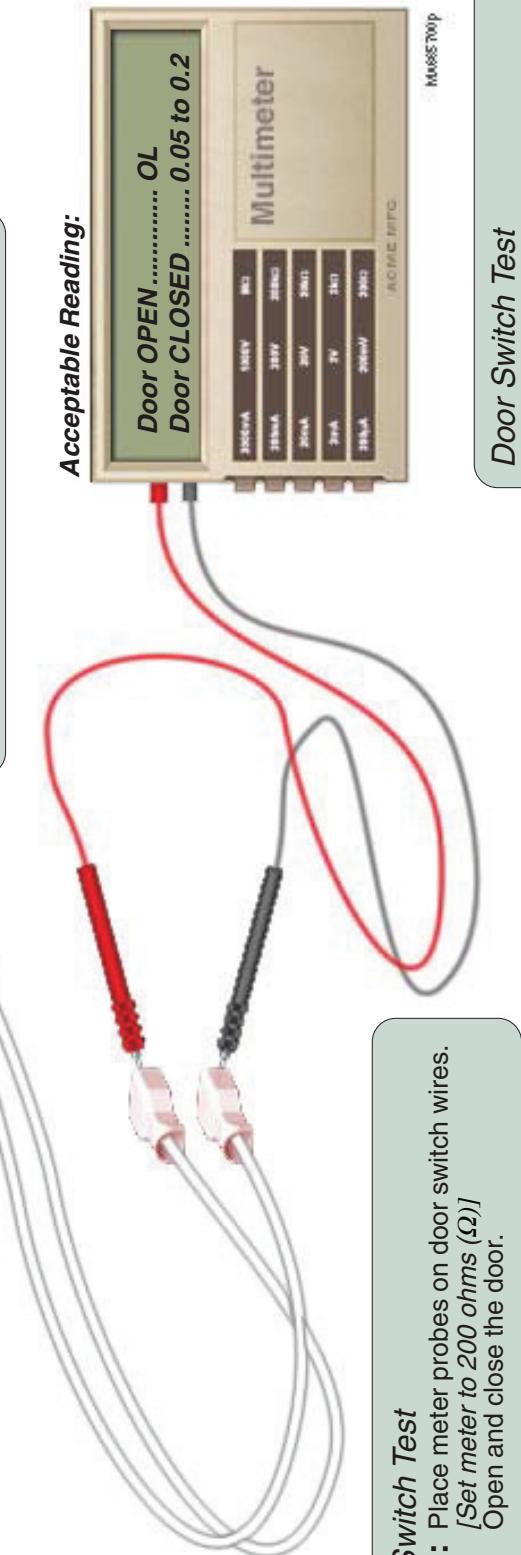
**Note**  
The door switch must be tested with the door OPEN and CLOSED.



**Refer To:**  
Cover Removal | ..... C-2

**Page**  
..... C-2

**Door Switch Test**  
**Step 1:** Disconnect two door switch wires from J1 & J2 of main PC board



**Door Switch Test**  
**If reading is out of acceptable range...**  
Replace door switch.

**If reading is within acceptable range...**  
Door Switch is functioning properly.

**Models:** | ALL | | |

**Door Switch**

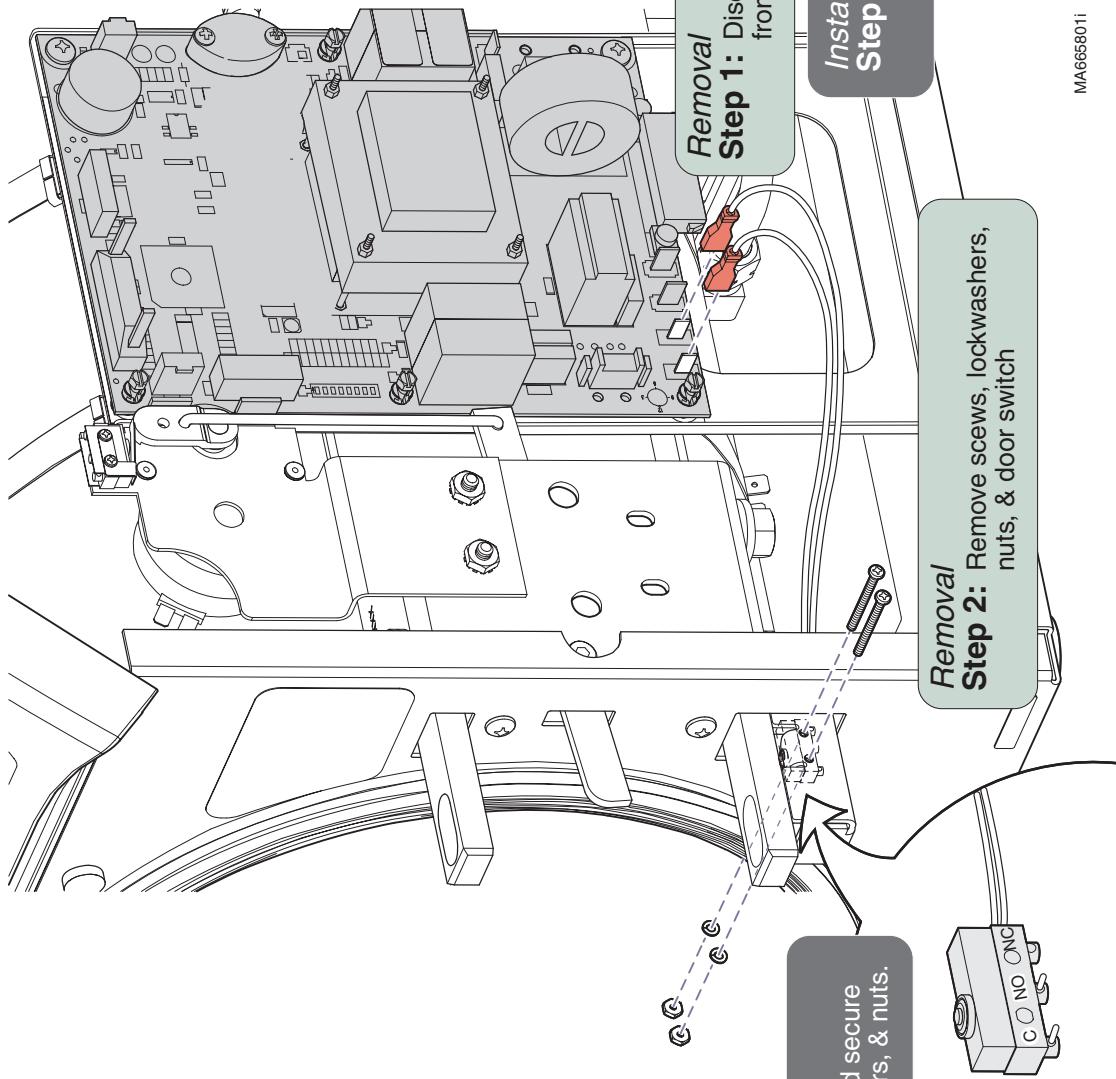
# Component Testing & Repair

## Door Switch

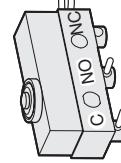
### Replacement

**Refer To:**  
Cover Removal .....

**Page**  
..... C-2



**Installation**  
**Step 1:** Position door switch and secure with screws, lockwashers, & nuts.



**Door Switch**

**Models:** |  
**Serial Numbers:** |

# Component Testing & Repair

## Touch Pad / Display Panel

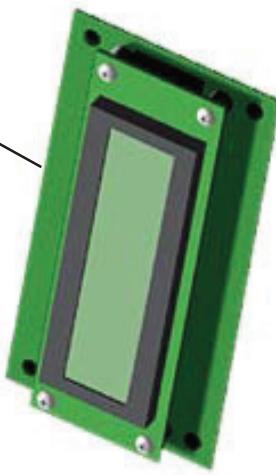
### Location & Function

Touch Pad / Display Panel	Page
Location & Function .....	B-37
Testing (Service Diagnostics: Keytest) ...	B-5
Replacement .....	B-38
Wiring Diagrams .....	D-1
Exploded View / Part Numbers.....	E-15

Touch Pad



Display Panel



**Note**  
The touch pad is attached to the outside of the top cover.  
The display panel is attached to the inside of the top cover.

### During all Modes...

When the buttons on the touch pad are depressed, the selection is transmitted to the main PC board through the display panel.

As the main PC board initiates the selected function, informational messages (time & temp., error codes, etc.) appear on the display panel.



Moes500p

**Models:** | ALL | Serial Numbers:

## Touch Pad / Display Panel

# Component Testing & Repair

## Touch Pad / Display Panel

### Replacement

**Removal**  
**Step 1:** Remove top cover.

#### Installation

**Equipment Alert**  
Be sure the arrow on the display panel  
points UP when installing panel!

**Installation**  
**Step 3:** Connect ribbon harnesses  
to display panel (J2 & J3).

**Step 2:** Slide display panel under tab.  
Install two screws

#### Removal

**Step 3:** Remove two screws.  
Slide display panel out from under tab.

**Removal**  
**Step 2:** Disconnect ribbon harnesses  
from display panel (J2 & J3).

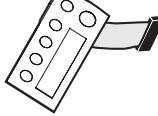
**Refer To:**  
Cover Removal .....

**Page**  
..... C-2

#### Installation

#### Installation

**Step 1:** Peel backing from touch pad.  
Feed ribbon harness thru slot.  
Position touch pad on top cover.



**Removal**  
**Step 4:** Peel touch pad off of top cover.

[Remove adhesive residue w/ a citrus-based  
solvent that is safe for use on plastics]

MA666001

Touch Pad /  
Display Panel

Models:  
Serial Numbers:

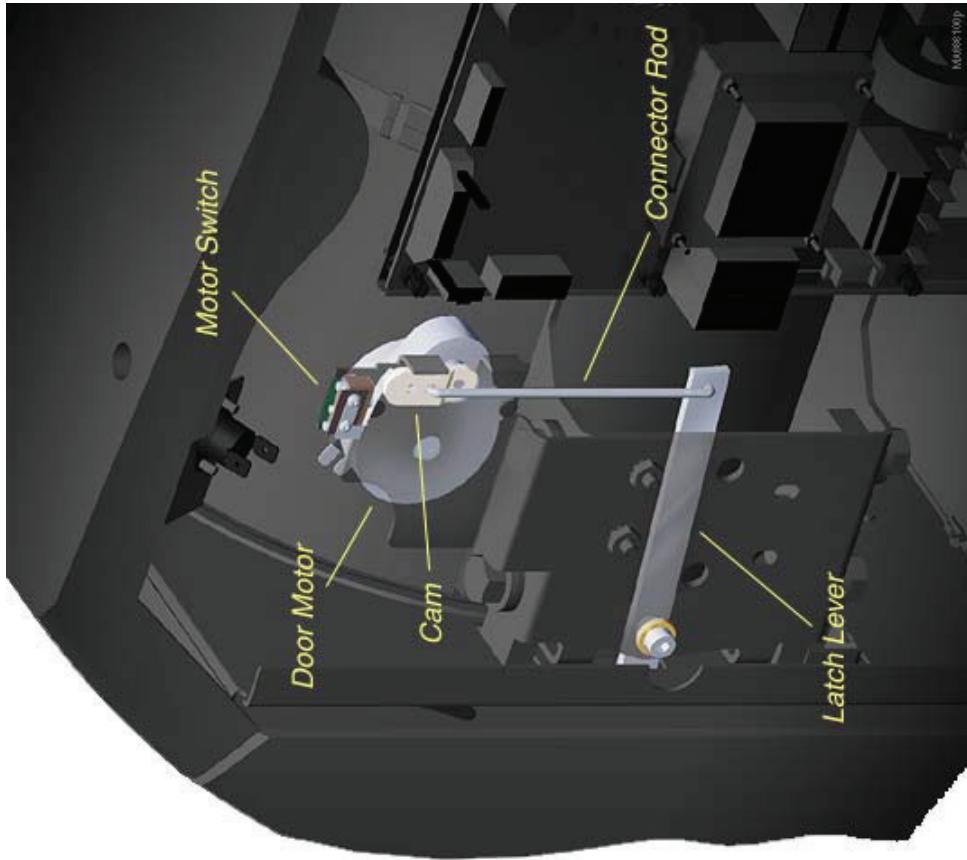
ALL

# Component Testing & Repair

## Door Motor System

### Location & Function

<u>Door Motor System</u>	<u>Page</u>
Location & Function .....	B-39
Testing .....	B-40
Replacement .....	B-41
Wiring Diagrams .....	D-1
Exploded View / Part Numbers.....	E-14*



### **At the end of the Sterilizing Mode...**

When the pressure in the chamber drops to 0.7 psi (5 kPa), the PC board bypasses the motor switch and supplies line voltage to the door motor. The door motor rotates the cam causing the motor switch to close. Now, the current to the door motor flows thru the motor switch. As the cam rotates, the connector rod causes the latch lever to open the door.

When the cam reaches the bottom of its travel, the motor reverses direction. When the cam reaches its starting position, the motor switch opens, stopping the current flow to the door motor.

**Models:** M9 (-020 thru -022) | M11 (-020 thru -022)  
**Serial Numbers:** all

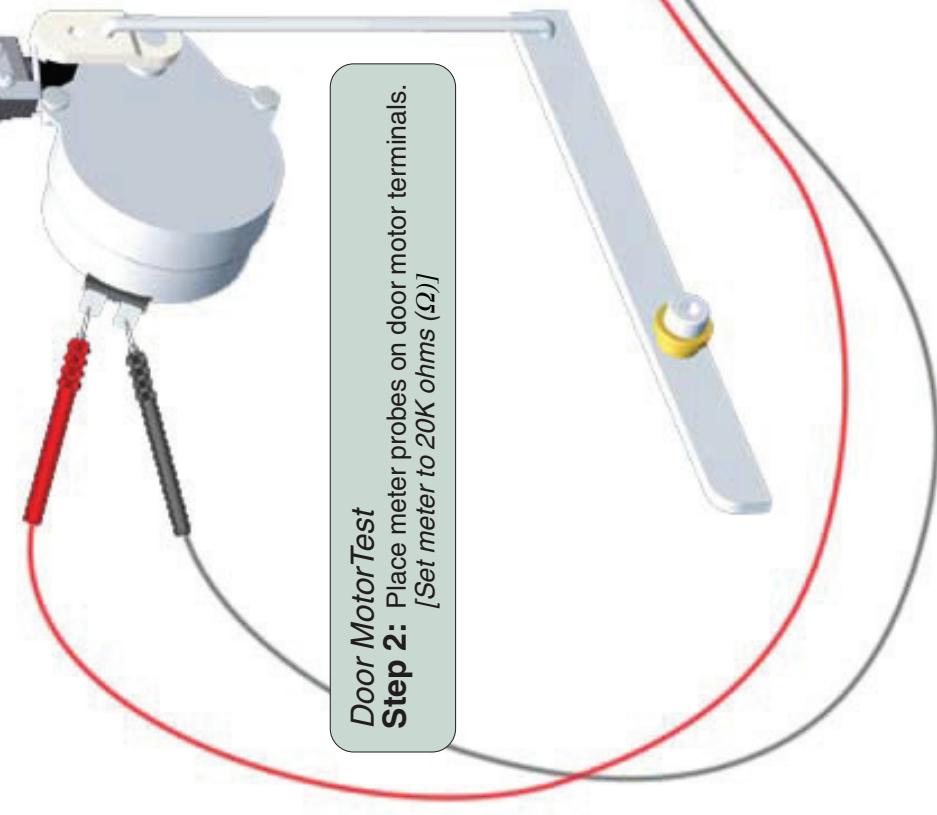
## Door Motor System

# Component Testing & Repair

## Door Motor System

Testing

**Door Motor Test**  
**Step 1:** Disconnect two wires from door motor.



### Refer To:

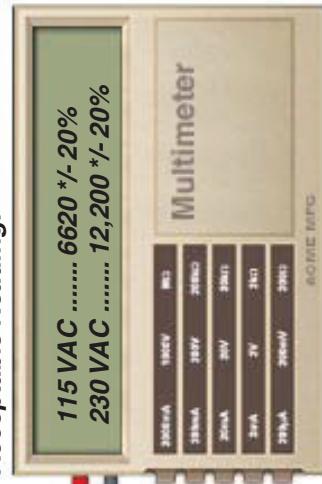
Page	
Cover Removal .....	C-2
PC Board Relay Test .....	B-48

**Door Motor Test**  
**Step 2:** Place meter probes on door motor terminals.  
(Set meter to 20K ohms ( $\Omega$ ))

**Door Motor Test**  
**If reading is out of acceptable range...**  
Replace door motor.

**If reading is within acceptable range...**  
Perform PC Board Relay Test.

### Acceptable Reading:



Model 280P

# Component Testing & Repair

## Door Motor System

Replacement

**Removal**  
**Step 3:** Disconnect motor switch wire harness.  
Remove motor switch.

**Installation**  
**Step 1:** Install motor switch.  
Connect motor switch wire harness.

**M11 Hole Position**  
**M9 Hole Position**  
**Connector Rod**

**Removal**  
**Step 2:** Remove nuts, connector rod,  
& motor bracket.

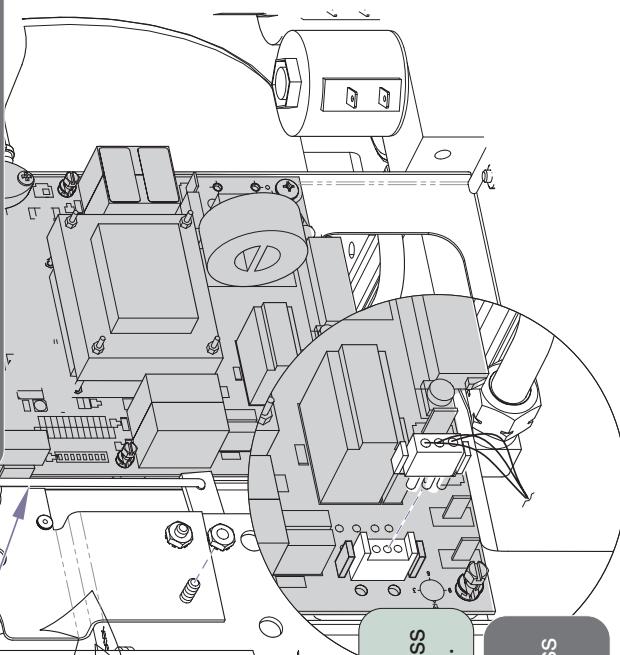
**Installation**  
**Equipment Alert**  
Connector rod must be inserted into proper  
hole in cam. (See illustration).

**Step 2:** Insert connector rod into hole in cam.  
Insert other end into hole in latch lever.  
Install motor bracket.

**Refer To:**  
Cover Removal ..... C-2

**Page**  
C-2

**Step 3:** Rotate cam down until it clears the motor switch.  
Loosen motor switch screws.  
Push right side of motor switch down.  
Tighten motor switch screws.



**Removal**  
**Step 1:** Disconnect wire harness  
from PC board (J15).

**Installation**  
**Step 4:** Connect wire harness  
to PC board (J15)

**Models:** M9 (-020 thru -022) | M11 (-020 thru -022)  
**Serial Numbers:** all | all

**Door Motor System**

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**B-41**

Rev.7/08

SF-1854

# Component Testing & Repair

## Fan / Fan Thermostat

### Location & Function

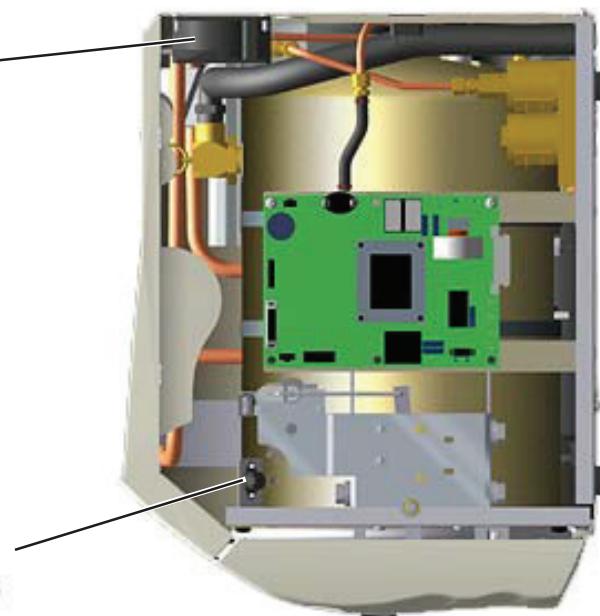
<b>Fan System</b>	<b>Page</b>
Location & Function .....	B-42
Testing:	
Fan .....	B-43
Fan Thermostat .....	B-44
Replacement .....	B-45
Wiring Diagrams .....	D-1
Exploded View / Part Numbers .....	E-13



Fan



Fan Thermostat



Me0888:400p

**Note**  
The fan may run continuously when running consecutive cycles.

### During all Modes...

When power is supplied to the main PC board, line voltage continuously flows to the fan thermostat.

The fan thermostat controls the ON/OFF function of the fan. When the temperature (*at the thermostat*) is below 130°F (54°C), the fan thermostat contacts are open (*no current to the fan - fan is OFF*). When the temperature reaches 130°F (54°C), the fan thermostat contacts close (*current flows to the fan - fan is ON*).

When the temperature drops to approx. 100°F (38°C), the contacts of the fan thermostat open and the fan stops running.

## Fan / Fan Thermostat

**Models:** | ALL |  
**Serial Numbers:**

# Component Testing & Repair

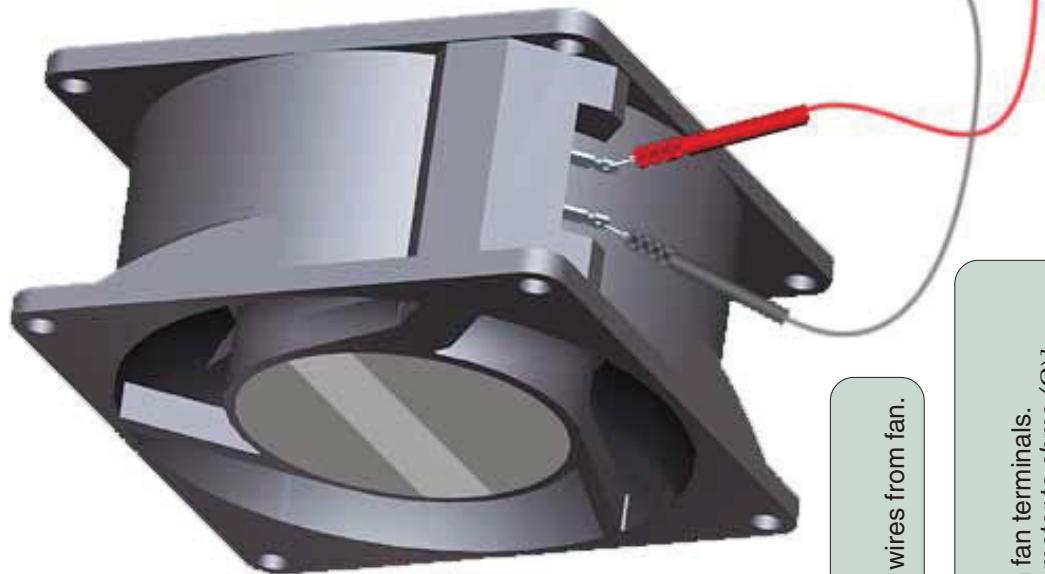
## Fan / Fan Thermostat

Testing: Fan

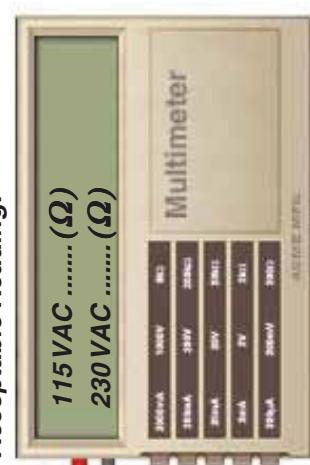
Refer To:  
Cover Removal..... C-2

Page

..... C-2



**Acceptable Reading:**



Multimeter  
MU98850Vp

**Fan Test**  
**Step 1:** Disconnect two wires from fan.

**Fan Test**  
**Step 2:** Place meter probes on fan terminals.  
[115 VAC Models: Set meter to ohms ( $\Omega$ )]  
[230 VAC Models: Set meter to ohms ( $\Omega$ )]

**Fan Test**  
**If reading shows 0 or no reading...**  
Replace fan.

**If reading shows continuity ( $\Omega$ )..**  
Fan is functioning properly.

**Fan / Fan Thermostat**

**Models:** ALL  
**Serial / Numbers:**

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**B-43**

Rev 8/08

SF-1854

# Component Testing & Repair

## Fan / Fan Thermostat

Testing: Fan Thermostat

**Fan Thermostat Test**  
**Step 1:** Disconnect two wires from fan thermostat.



**Fan Thermostat Test**  
**Step 2:** Place meter probes on fan thermostat terminals.  
[Set meter to 200 ohms ( $\Omega$ )]

**Refer To:**

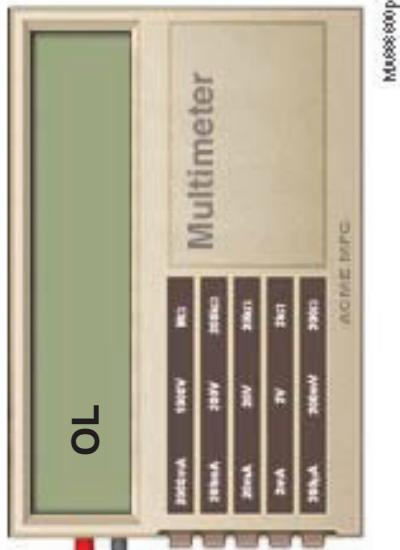
Cover Removal ..... C-2

**Page**

..... C-2

**Fan Thermostat Test**  
**If reading is anything other than OL...**  
Replace fan thermostat.  
**If reading is OL...**  
Fan thermostat is functioning properly.

**Acceptable Reading:**



Multimeter  
Model: 3390P

**Fan / Fan Thermostat**

**ALL**

**Models:**  
**Serial Numbers:**

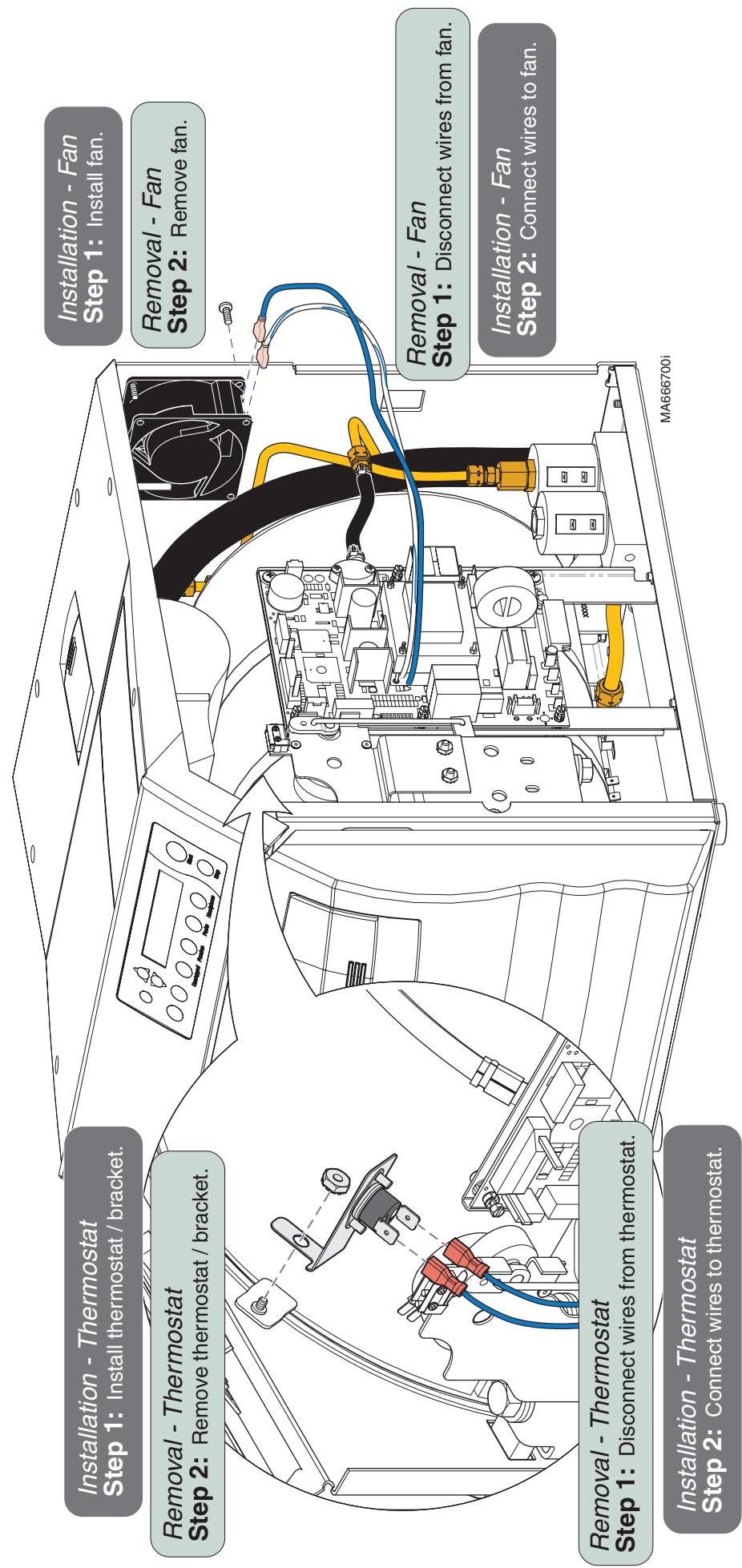
**B-44**

# Component Testing & Repair

## Fan / Fan Thermostat

Replacement

Refer To:	Page
Cover Removal	C-2



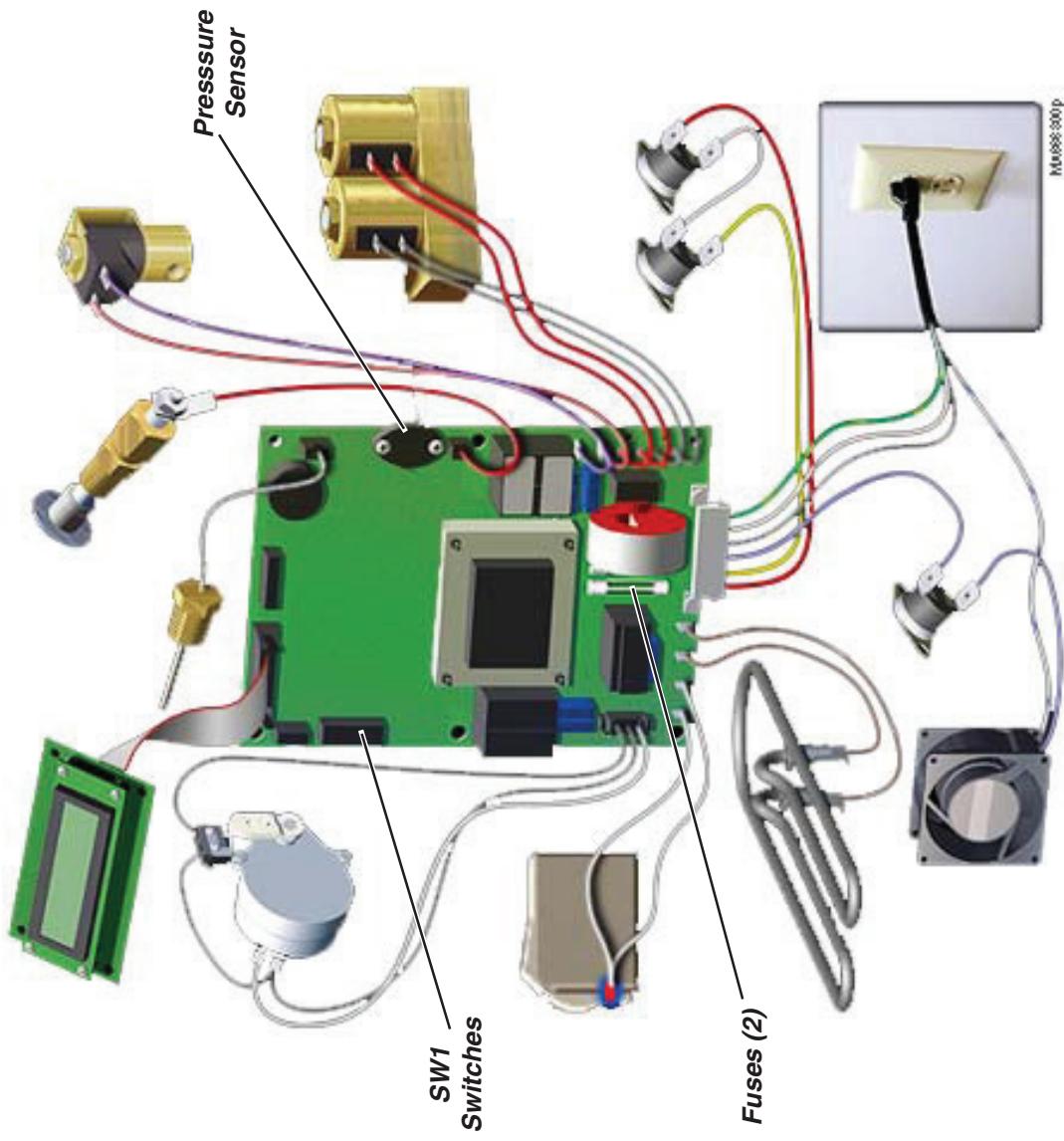
## Fan / Fan Thermostat

Models: ALL | Serial / Numbers:

# Component Testing & Repair

## Main PC Board

### Function



Main PC Board	Page
Function	B-46
SW1 Switch Settings	B-47
Testing:	
Temperature Sensor Voltage	B-25
Water Level Sensor Voltage	B-29
PC Board Relay Test	B-48
Printer Voltage	B-51
Replacement	B-49
Wiring Diagrams	D-1
Exploded View / Part Numbers	E-16

### During all Modes...

The Main PC Board controls all of the electronic components of the sterilizer. During operation, the pressure sensor monitors the chamber conditions to maintain the parameters for the selected cycle.

The two fuses (F1 & F2) protect the circuitry from excessive current draw. If either fuse is faulty, the unit will not operate.

The SW1 switches are used for *Service Diagnostics* and to adjust the display to metric units.

# Component Testing & Repair

## Main PC Board

### SW1 Switch Settings

The eight SW1 switches are set to the OFF position when shipped from the factory.  
These switches are used when:

- Activating the Service Diagnostics Mode.
- Configuring the PC Board (*required when board is replaced*).
- Changing the display to metric units (Celsius / kPa)

#### To activate the Service Diagnostics Mode...

Move Switch 1 to ON position.

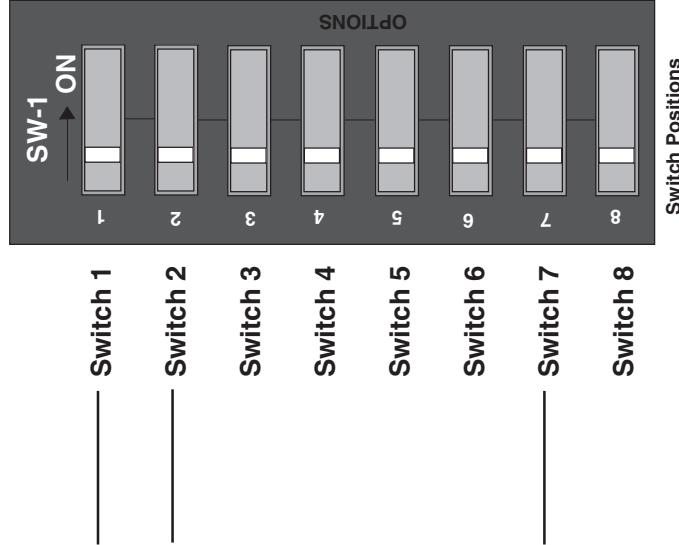
[Note: This switch must be turned OFF to resume normal operation]

#### To configure the PC Board...

[Note: This procedure changes the software settings for chamber size (ex. M9 - M11) and the door opening function (ex. M9 - M9D)]  
Move Switch 2 to ON position.

#### To change the display to metric units (°C / kPa)...

Move Switch 7 to ON position.



ISA102401i

**Models:** | ALL | | |

**Main PC Board**

**B-47**

# Component Testing & Repair

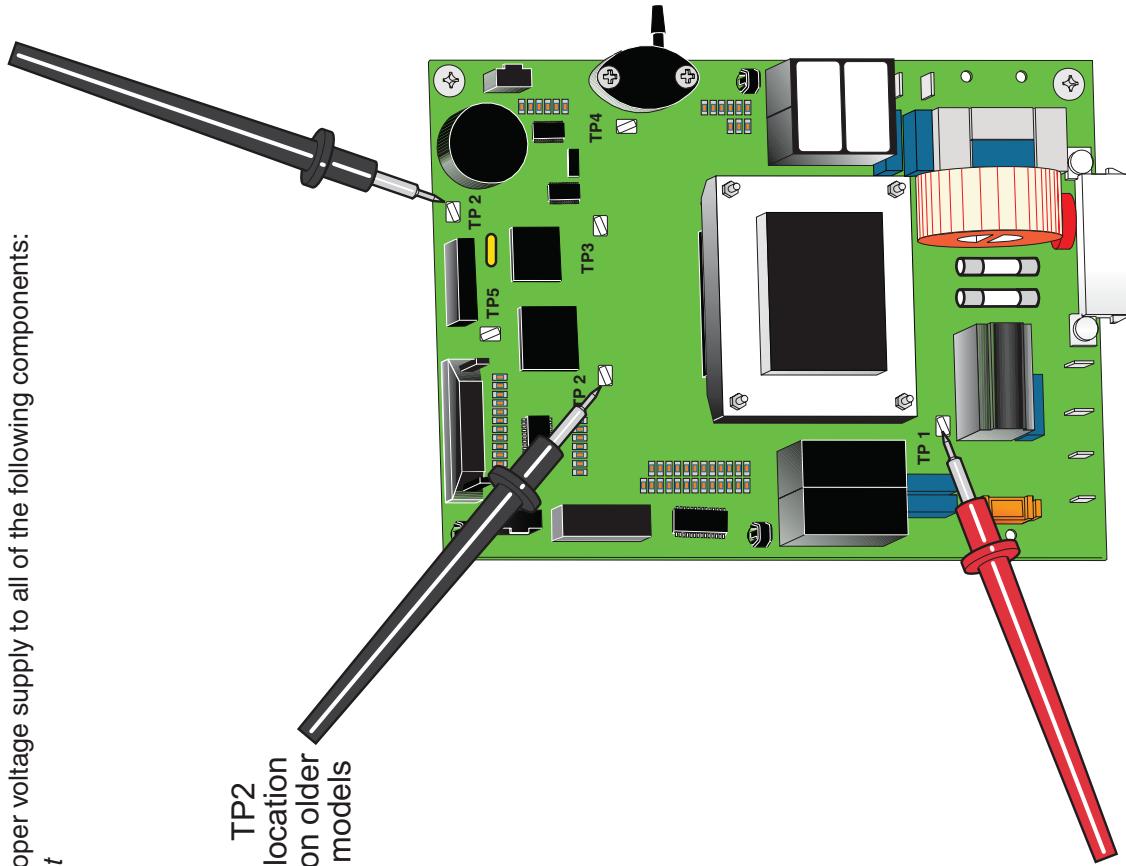
## Main PC Board

### PC Board Relay Test

This test checks for proper voltage supply to all of the following components:

- Heating Element
- Door Motor
- Fill Valve
- Vent Valve
- Air Valve

TP2  
location  
on older  
models



**Refer To:**  
Cover Removal.....

**Page**  
C-2

**PC Board Relay Test**

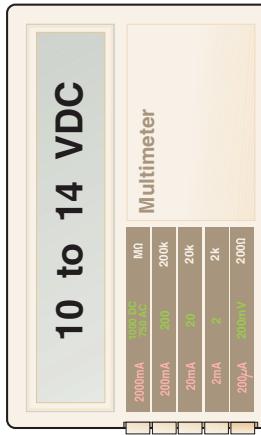
**Step 1:** Place meter probes on test points:  
Black probe: TP2  
Red probe: TP1  
*[Set meter to 20 VDC]*

**PC Board Relay Test**

**If reading is out of acceptable range...**  
Replace main PC board.

**If reading is within acceptable range...**  
Main PC board is functioning properly

**Acceptable Range:**



# Component Testing & Repair

## Main PC Board

### Replacement

#### Installation

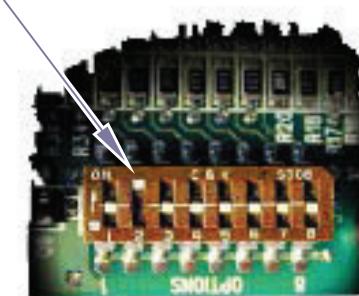
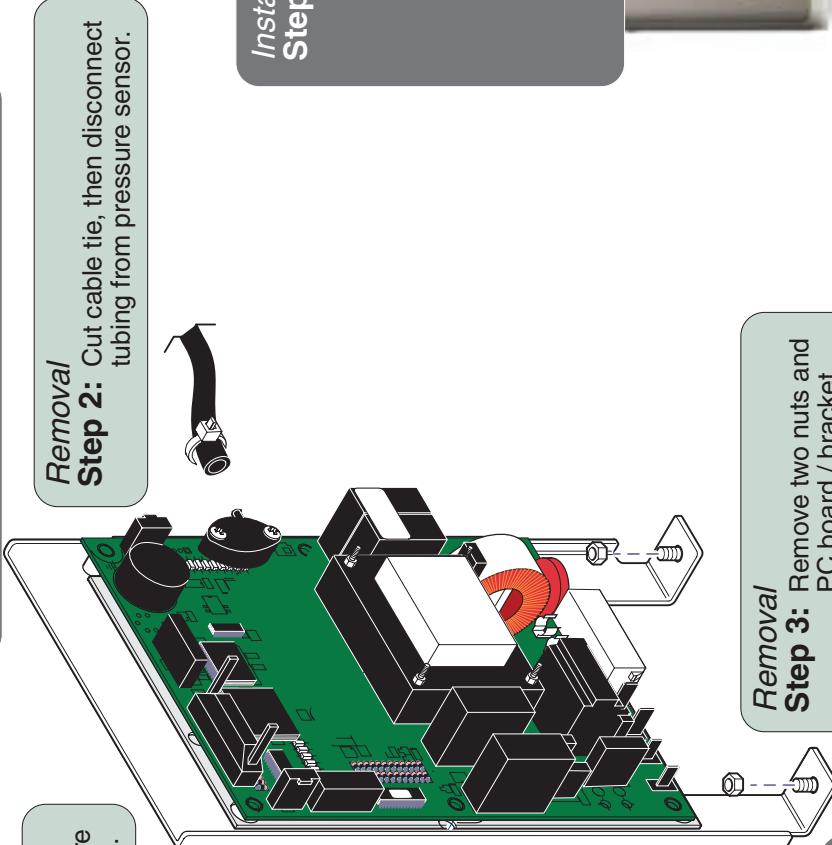
- Step 1:** Connect tubing to pressure sensor.  
Secure with a high temp. cable tie.

**Removal**  
**Step 1:** Tag and disconnect all wire harnesses from PC board.

#### Removal

- Step 2:** Cut cable tie, then disconnect tubing from pressure sensor.

**Installation**  
**Step 3:** Connect all wire harnesses to PC board.



**Refer To:**  
Cover Removal .....

**Page**  
..... C-2



#### Installation

- Step 5:** Adjust the PC Board configuration by following the prompts on the display panel.  
Use the **<+>** **<->** buttons to adjust settings.  
Press the **<P>** button when finished.

**CHAMBER SIZE:**  
M9/M9D ..... 9 INCH  
M11/M11D ..... 11 INCH

**FEATURE SETT:**  
M9/M11 ..... FULLY FEATURED  
M9D/M11D ..... DEFEATURED



**Removal**  
**Step 3:** Remove two nuts and PC board / bracket.  
Secure with two nuts

**Installation**  
**Step 1:** Install PC board / bracket.

**Installation**  
**Step 4:** Unplug power cord.  
Move switch #2 to ON.  
Reconnect power cord.

**Installation**  
**Step 6:** Unplug power cord.  
Move switch #2 to OFF.  
Reconnect power cord.

**Models:** | ALL | Serial Numbers:

**Main PC Board**

| |

| |

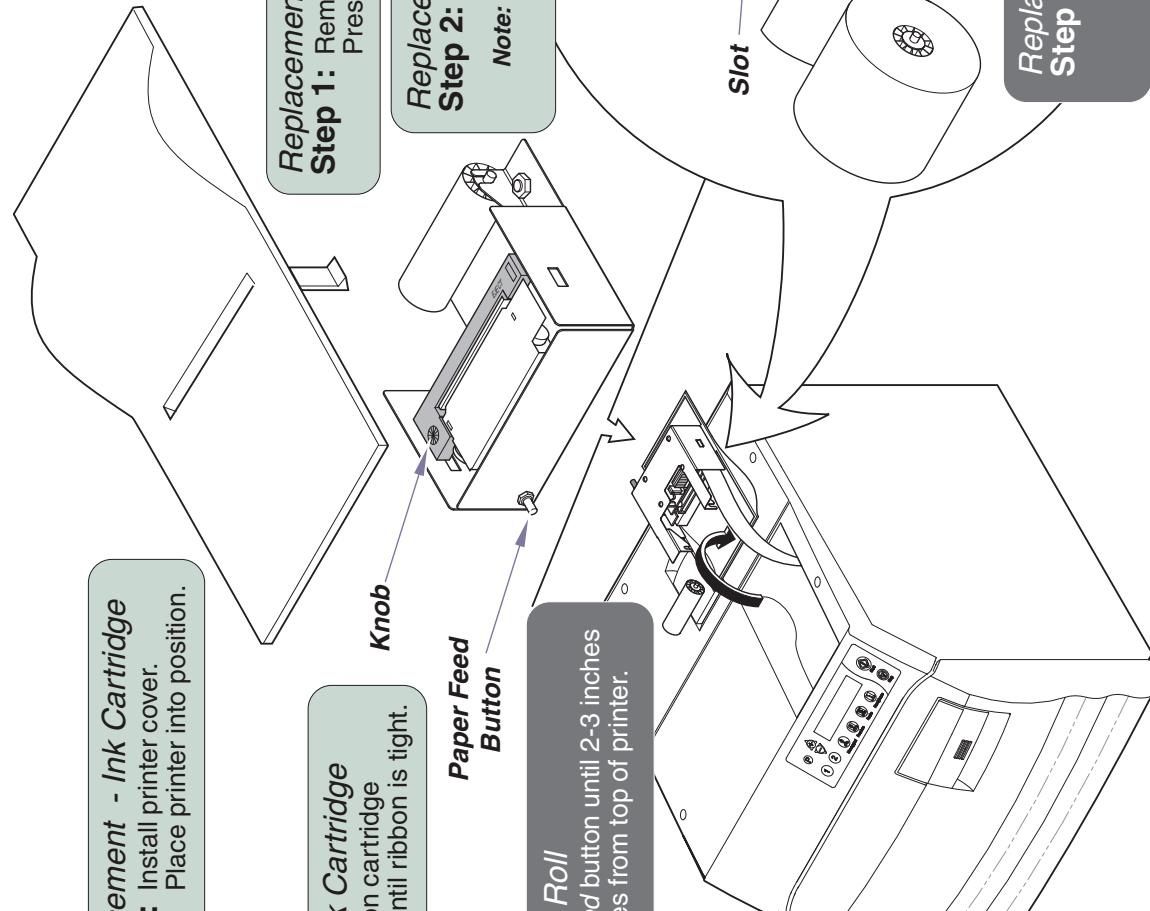
**B-49**

# Component Testing & Repair

## Printer (optional)

### Paper Roll / Ink Cartridge Replacement

Printer	Page
Paper Roll / Ink Cartridge	
Replacement ..... Printer Voltage Test.....	B-50 B-51
Printer Replacement.....	B-52
Printer Reset Procedure .....	B-53
Wiring Diagrams.....	D-1
Exploded View / Part Numbers .....	E-18



MA667100

Printer

**Models:** Optional on all models  
**Serial Numbers:**

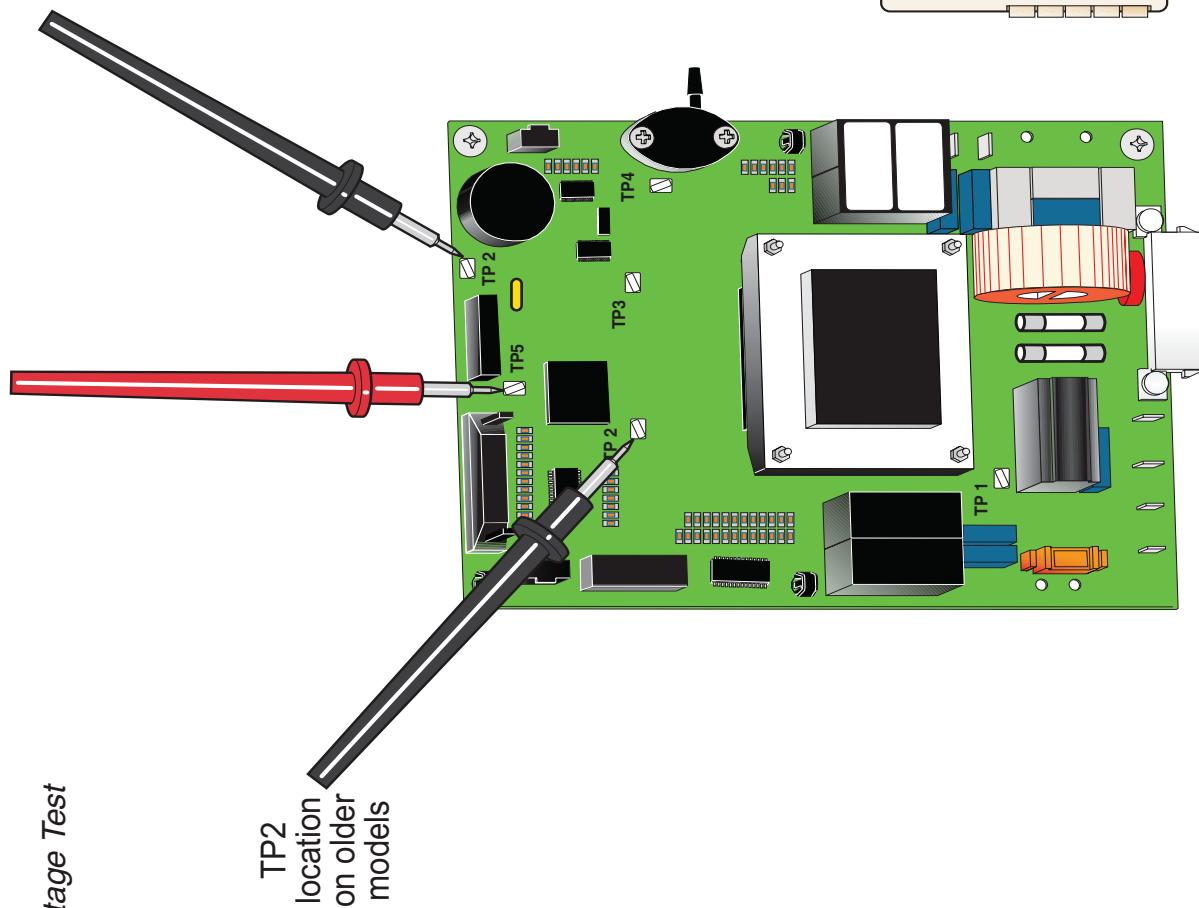
**B-50**

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# Component Testing & Repair

## Printer (optional)

### Printer Voltage Test



### Printer Voltage Test

**Step 1:** Place meter probes on test points:  
Black probe: TP2  
Red probe: TP5  
*[Set meter to 20 VDC]*

### Printer Voltage Test

**If reading is out of acceptable range...**

Replace main PC board.

**If reading is within acceptable range...**

Replace printer and/or printer harness.

### Acceptable Range:

**4 to 6 VDC**

Multimeter
2000mA
200mA
20mA
2mA
200µA

SA110401

**Models:** | Optional on all models |  
**Serial Numbers:** |

Printer

**B-51**

Rev.7/08

SF-1854  
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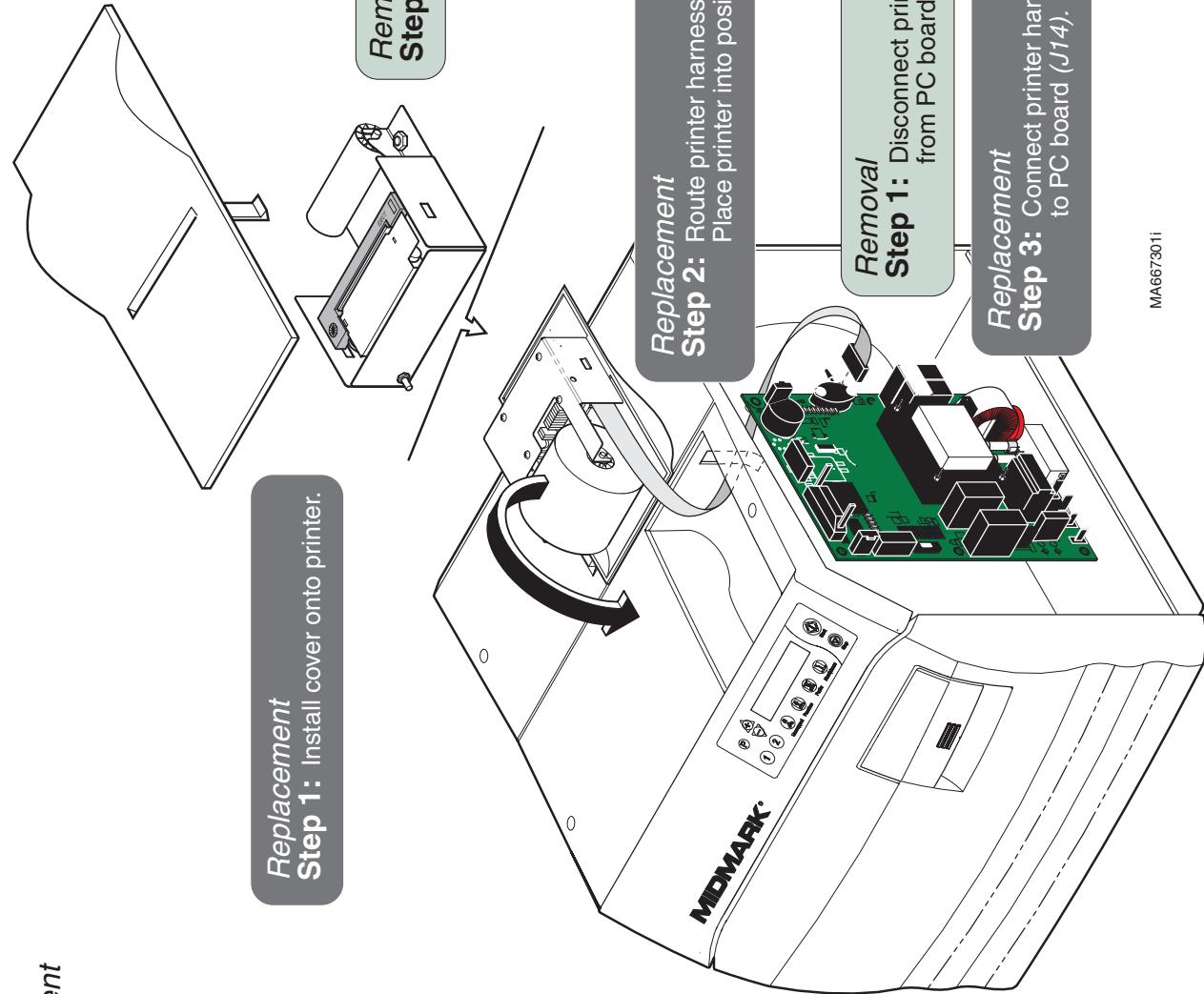
# Component Testing & Repair

## Printer (optional)

### Replacement

**Refer To:**  
Cover Removal

**Page**  
..... C-2



Printer

**Models:** | Optional on all models  
**Serial Numbers:** |

# Component Testing & Repair

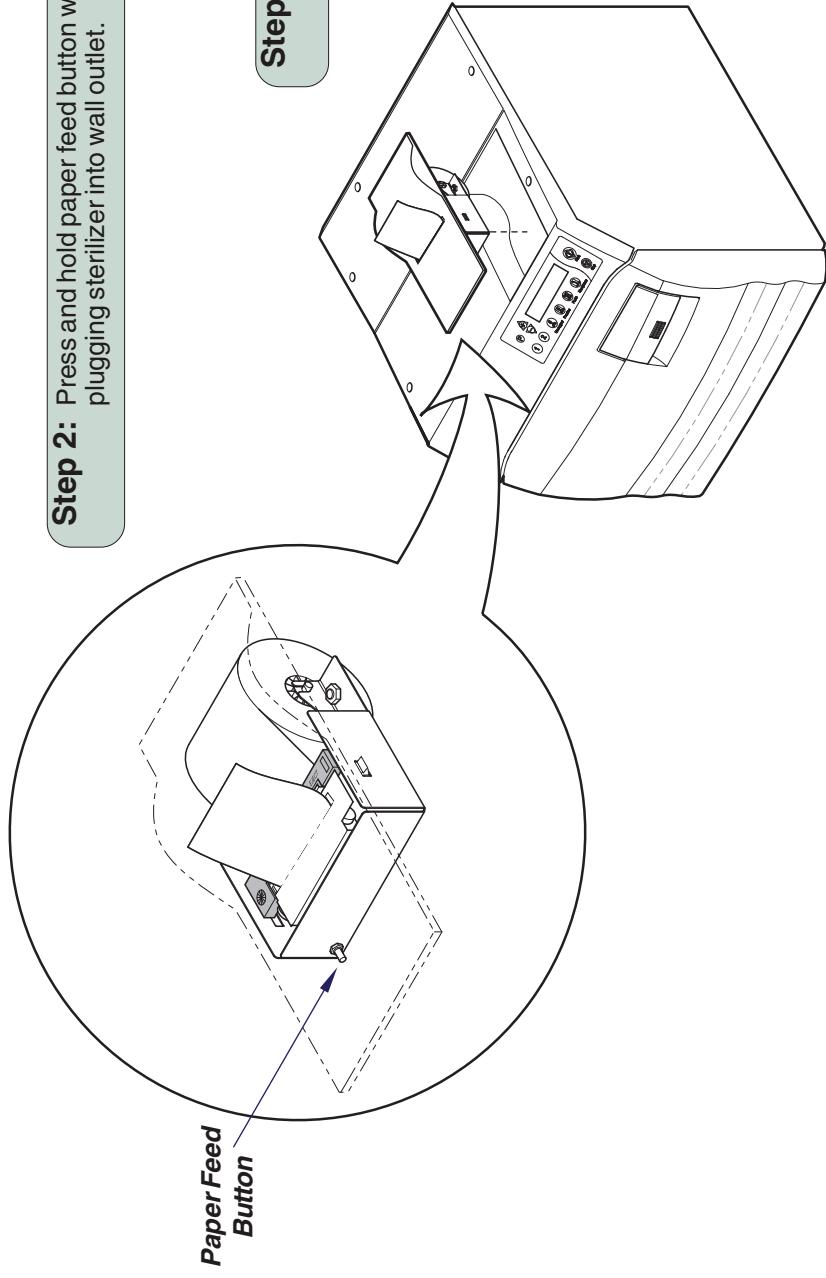
## Printer (optional)

### Printer Reset Procedure

**Step 1:** Unplug sterilizer from wall outlet.

**Step 2:** Press and hold paper feed button while plugging sterilizer into wall outlet.

**Step 3:** When test script begins to print, release paper feed button.



SA1771i

**Models:** | Optional on all models |  
**Serial Numbers:** |

Printer

## Adjusting the Dry Time

### Refer To:

	Page
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1



**Adjusting the Dry Time**  
**Step 2:** Press the <P> button.

**Adjusting the Dry Time**  
**Step 1:** Select the desired cycle.  
(Unwrapped, Pouches, etc.)

### Adjusting the Dry Time

**Step 4:** Press the <P> button.

**Note:** The adjusted dry time is stored in memory for the selected cycle.  
Repeat these steps for other cycles as required.



**Adjusting the Dry Time**  
**Step 3:** Press <+> or <-> button to adjust Dry Time.

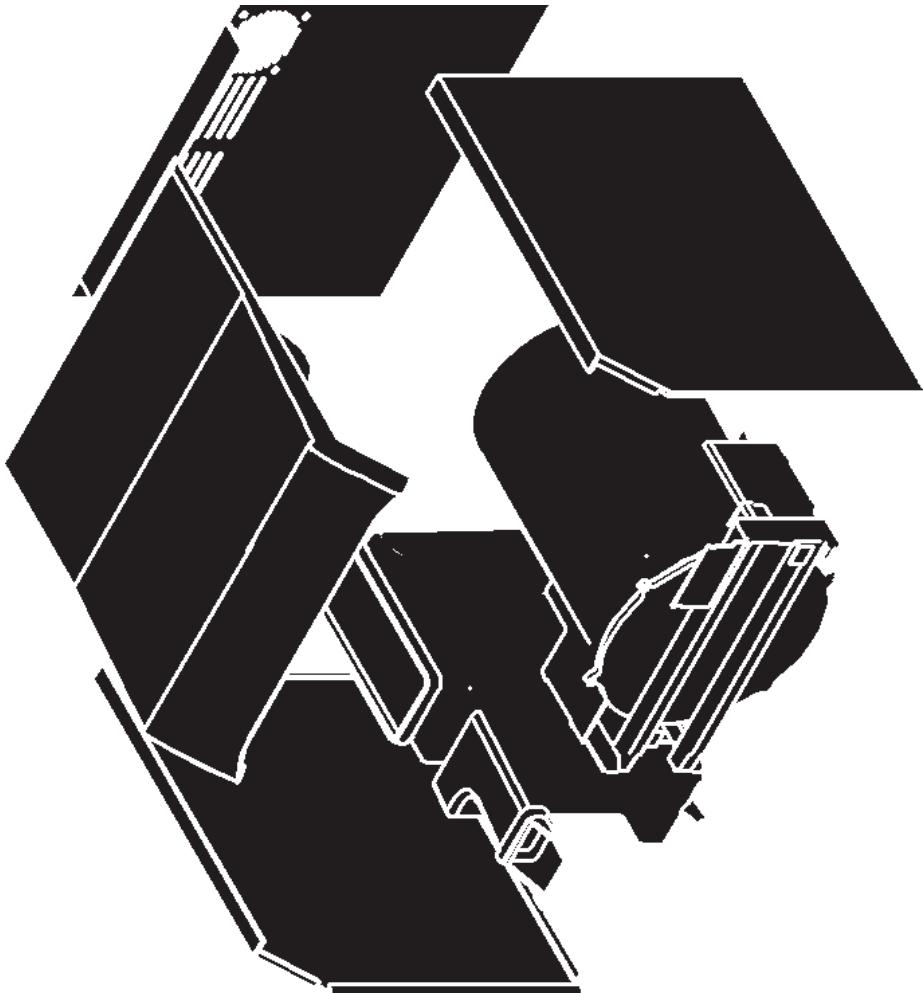
ALL

## Adjusting Dry Time

# Access Procedures

## Removing & Installing:

	<u>Page</u>
Covers / Panels .....	C-2
Tray Plate / Rack .....	C-3
Draining / Filling the Reservoir .....	C-4



# Section C

# Access Procedures

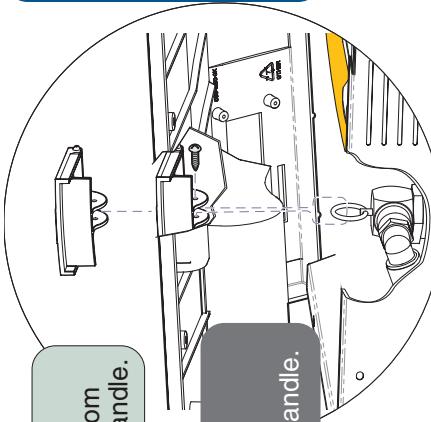
## Covers / Panels

### Removal / Installation

**Caution**  
Always unplug power cord before removing any covers / panels.

**Removal**  
**Step 1:** Remove screw from pressure relief handle.

**Installation**  
**Step 1:** Position top cover.  
Connect pressure relief handle.

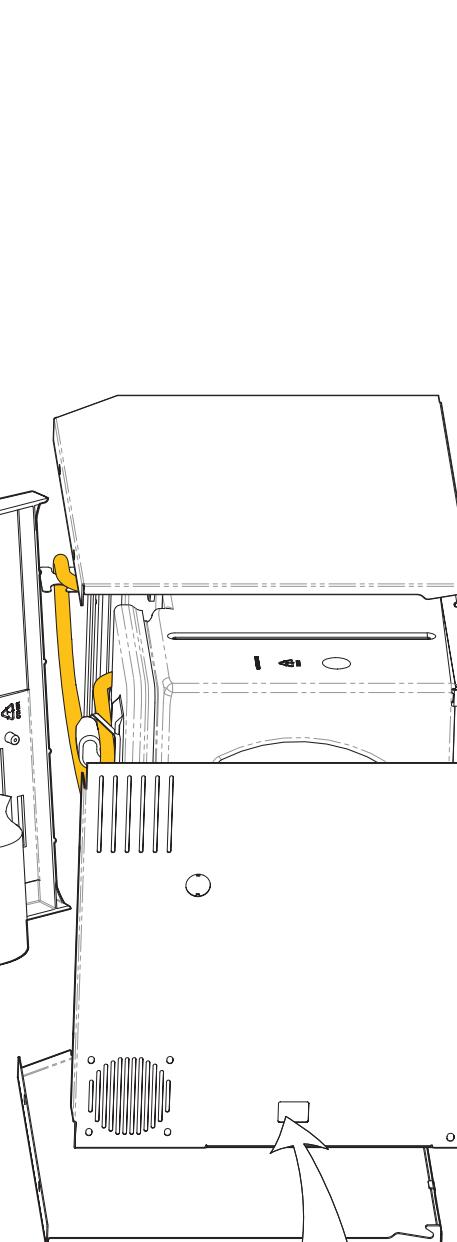


Refer To:	Page
Operation & Troubleshooting	A-1
Component Testing / Repair	B-1
Access Procedures	C-1
Wiring Diagrams	D-1
Exploded Views / Part Numbers	E-1

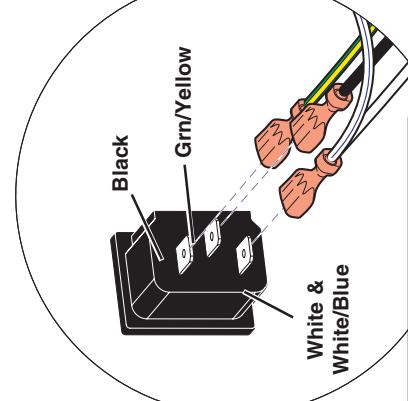
**Removal**  
**Step 3:** Remove remaining screws from top cover.  
Remove top cover left side panel.

**Installation**  
**Step 3:** Connect display panel harness to PC board (J3).  
(If applicable) Install printer.

**Removal**  
**Step 2:** Remove right side panel.  
Disconnect display panel harness from PC board (J3).  
(If applicable) Remove printer.



**Installation**  
**Step 4:** Connect wires to receptacle & fan.  
Install right side panel



**Removal**  
**Step 4:** Disconnect wires from the receptacle and the fan motor.  
Remove back panel.

## Covers / Panels

**Models:** ALL  
**Serial Numbers:**

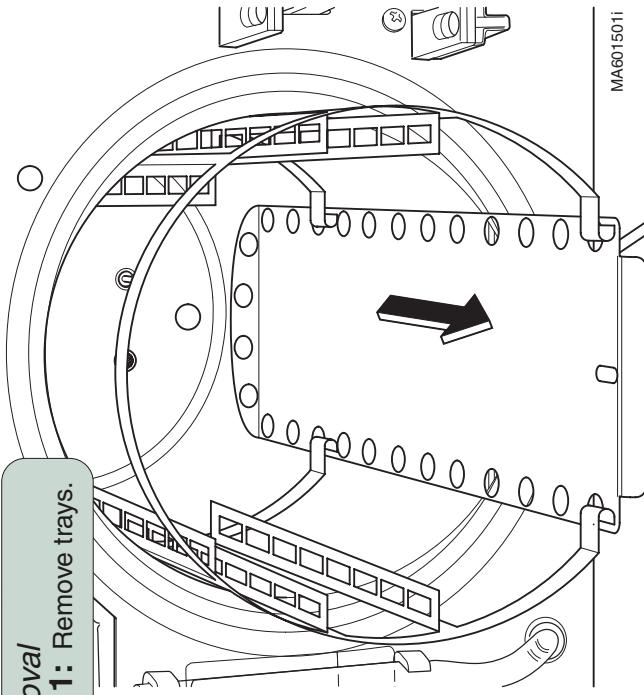
# Access Procedures

## Tray Plate / Rack

### Removal / Installation

**Caution**  
Always allow unit to cool before  
removing trays or rack.

**Removal**  
**Step 1:** Remove trays.

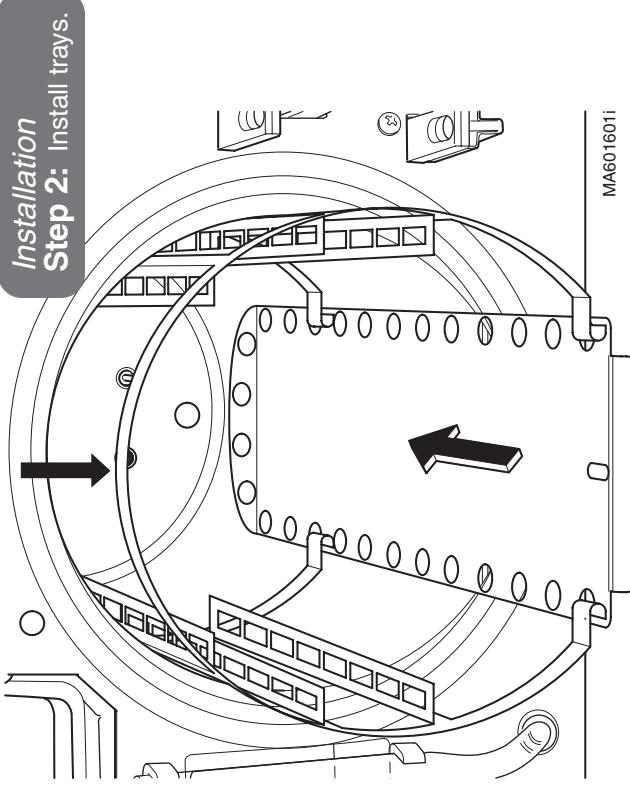


**Removal**  
**Step 2:** Pry tray plate up, while pulling out.

<b>Refer To:</b>	<b>Page</b>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1

**Equipment Alert**  
Install tray plate with the angled end  
toward the back. Do **not** allow the tray  
plate to contact the water level sensor.

**Installation**  
**Step 1:** Place back edge of tray in chamber.  
Press down on top of rack while  
sliding into chamber.



**Installation**  
**Step 2:** Install trays.

**Models:** |  
**Serial Numbers:** |

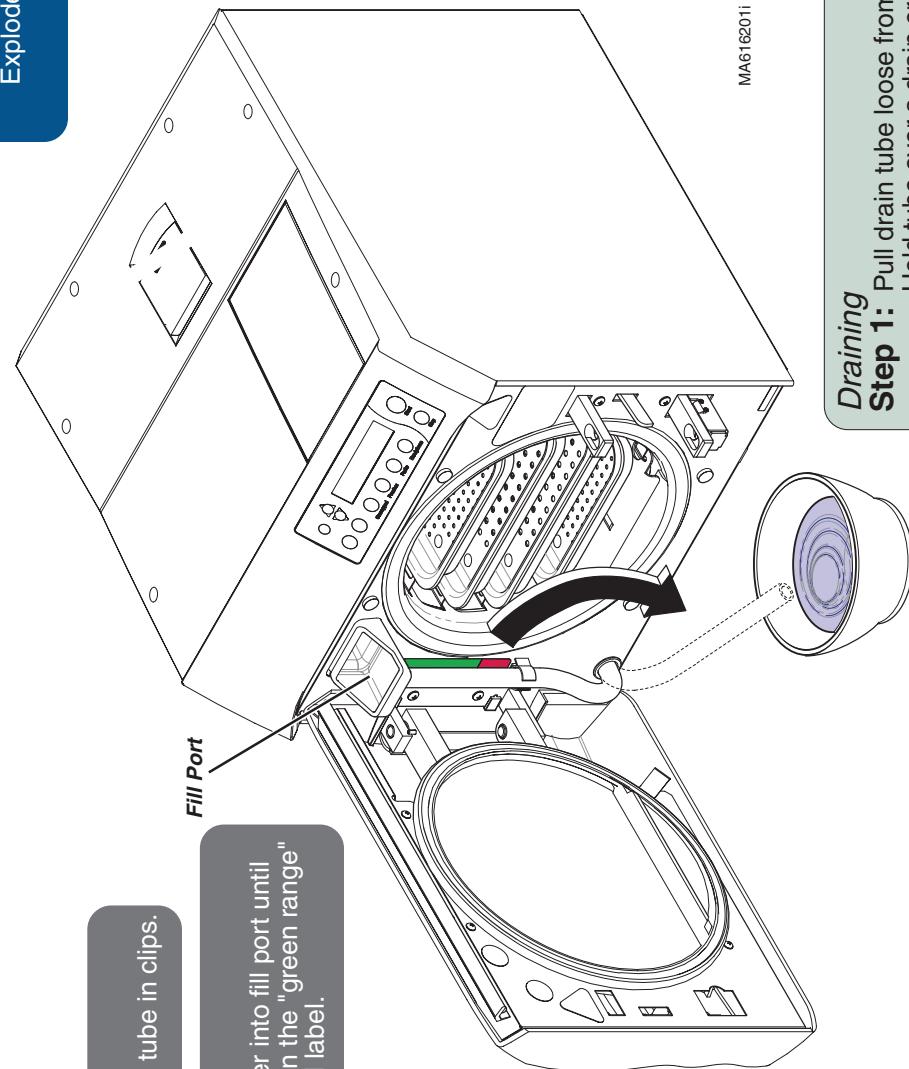
**Tray Plate / Rack**

# Access Procedures

## Draining / Filling the Reservoir

### Refer To:

	Page
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1



**Filling**  
**Step 1:** Secure drain tube in clips.

**Filling**  
**Step 2:** Pour distilled water into fill port until the water level is in the 'green range' on the the fill level label.

**Draining**  
**Step 1:** Pull drain tube loose from clips.  
Hold tube over a drain or suitable container to empty reservoir.

**Note:** The max. reservoir capacity is:  
**M9:** 1.1 gallon (4.1 liters)  
**M11:** 1.4 gallon (5.3 liters)

**Draining / Filling  
Reservoir**

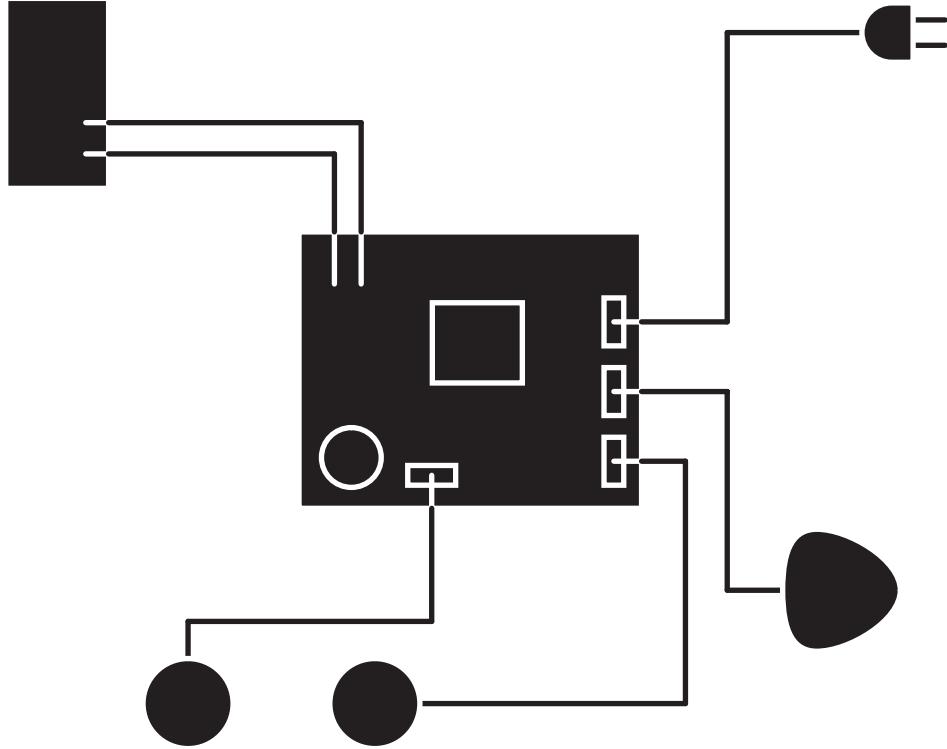
**ALL**

**Models:**  
**Serial Numbers:**

# Wiring & Flow Diagrams

# D Section

<u>Model</u>	<u>Page</u>
<b>M9 (-020 / -021 / -022):</b>	
<i>Wiring Diagram</i>	..... D-2
<i>Flow Diagram</i>	..... D-4
<b>M9D (-020 / -022):</b>	
<i>Wiring Diagram</i>	..... D-3
<i>Flow Diagram</i>	..... D-4
<b>M11 (-020 / -021 / -022):</b>	
<i>Wiring Diagram</i>	..... D-2
<i>Flow Diagram</i>	..... D-4
<b>M11D (-020 / -022):</b>	
<i>Wiring Diagram</i>	..... D-3
<i>Flow Diagram</i>	..... D-4



# Wiring Diagrams

## Refer To:

- Operation & Troubleshooting ..... A-1
- Component Testing / Repair ..... B-1
- Access Procedures ..... C-1
- Wiring Diagrams ..... D-1
- Exploded Views / Part Numbers ..... E-1



**Equipment Alert**  
Line voltage is present between  
Ground and Heater terminals  
**L1** and **L/N2** PCB connections at all times.

## Fuses:

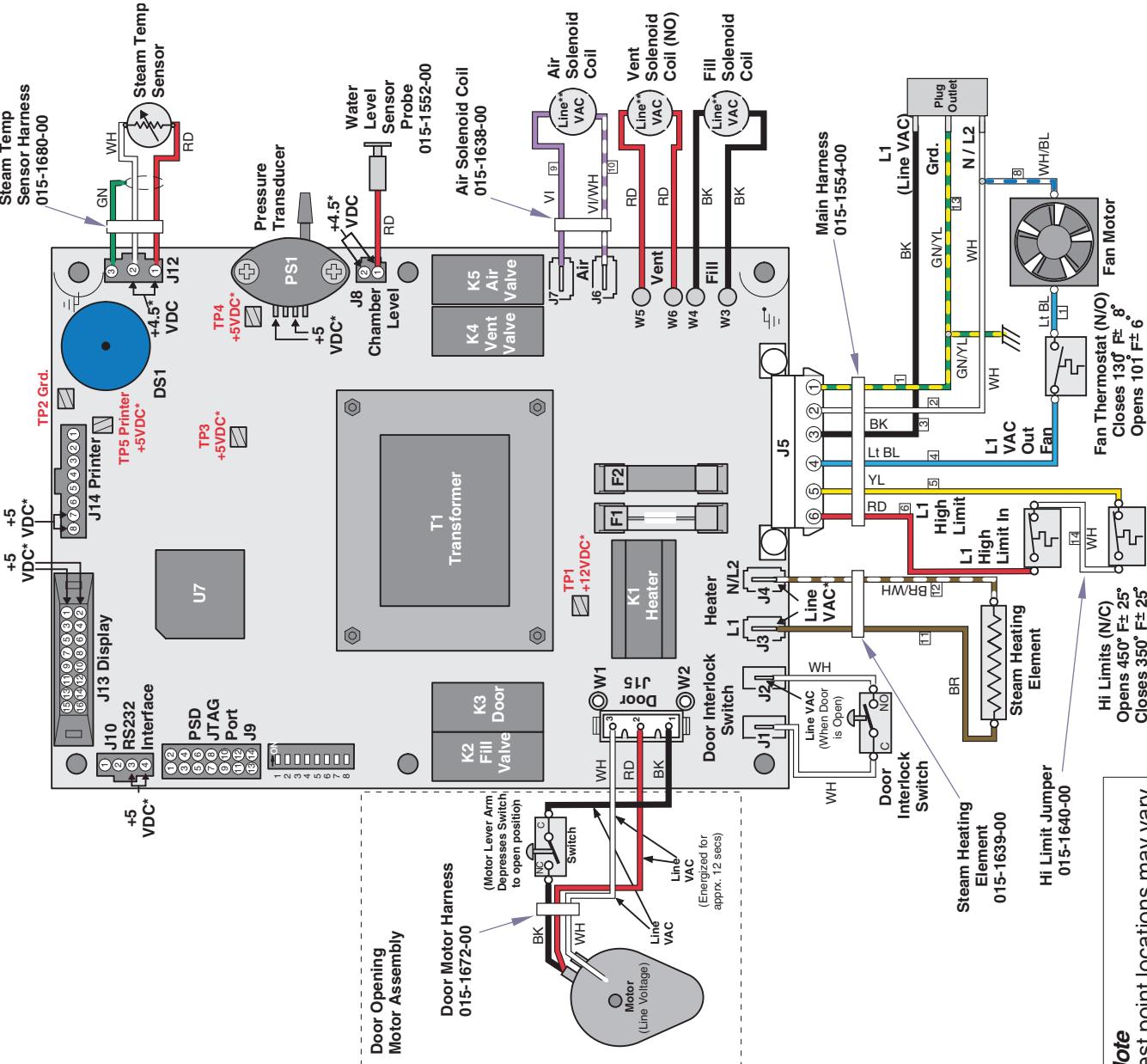
### 115 VAC models:

- F1 ..... 0.250 amp, 250 V, Slo-Blo, 1/4" x 1-1/4"
- F2 ..... 15 amp, 250 V, Fast-Acting, 1/4" x 1-1/4"

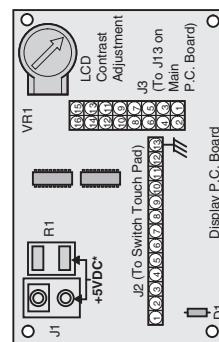
### 230 VAC models:

- F1 ..... 0.125 amp, 250 V, Slo-Blo, 5mm x 20mm
- F2 ..... 8 amp, 250 V, Fast-Acting, 5mm x 20mm

\* Constant Voltage  
\*\* Voltage Present Only  
\*\*\* Rectified DC Voltage Only  
Present During Operation  
Note: Disconnect plug connector  
when checking voltage.



**Note**  
Test point locations may vary.



## Wiring Diagrams

<b>Models:</b>	<b>M9</b> (-020/-021/-022)	<b>M11</b> (-020/-021/-022)
<b>Serial Numbers:</b>	Early Models	Early Models

# Wiring Diagrams

## Refer To:

- Operation & Troubleshooting ..... A-1
- Component Testing / Repair ..... B-1
- Access Procedures ..... C-1
- Wiring Diagrams ..... D-1
- Exploded Views / Part Numbers ..... E-1



## Fuses:

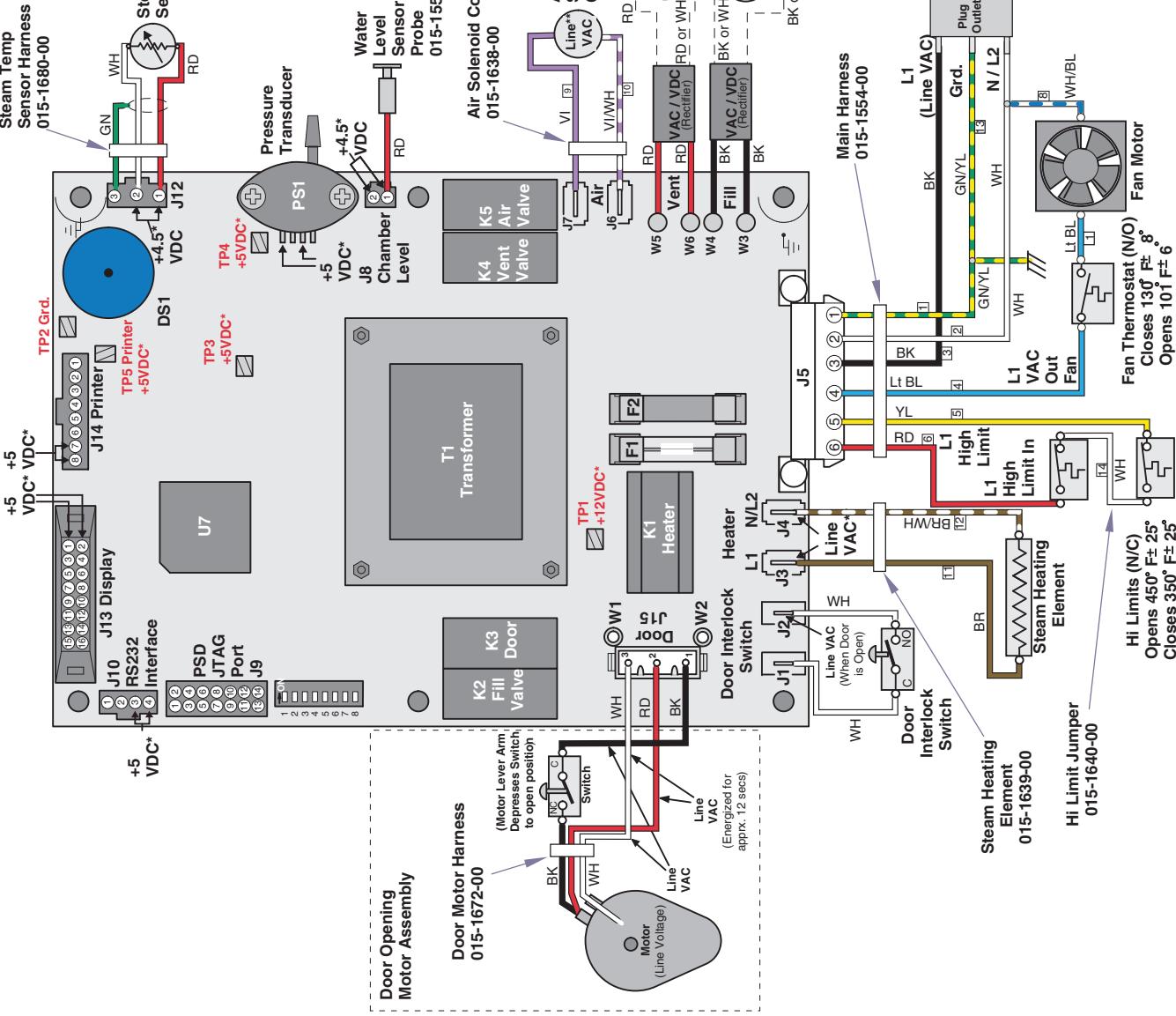
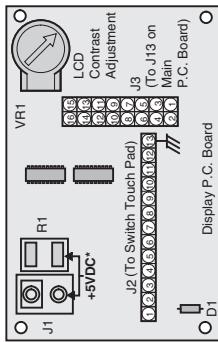
### 115 VAC models:

- F1 ..... 0.250 amp, 250 V, Slo-Blo, 1/4" x 1-1/4"
- F2 ..... 15 amp, 250 V, Fast-Acting, 1/4" x 1-1/4"

### 230 VAC models:

- F1 ..... 0.125 amp, 250 V, Slo-Blo, 5mm x 20mm
- F2 ..... 8 amp, 250 V, Fast-Acting, 5mm x 20mm

\* Constant Voltage  
\*\* Voltage Present Only  
During Component Operation  
\*\*\* Rectified DC Voltage Only  
Present During Operation  
**Note:** Disconnect plug connector  
when checking voltage.



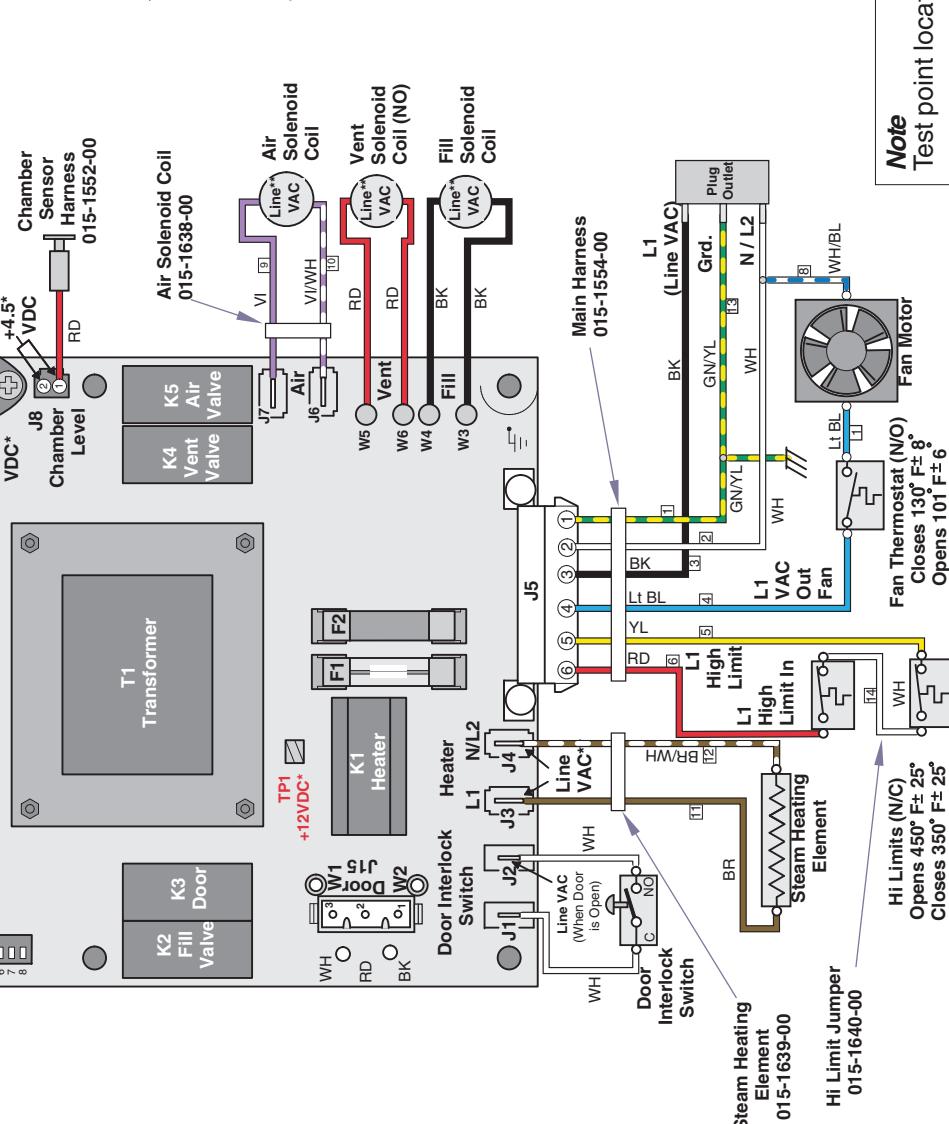
**Models:** **M9** (-020/-021/-022)  
Later Models | **M11** (-020/-021/-022)  
Later Models

## Wiring Diagrams

# Wiring Diagrams

## Refer To:

Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1

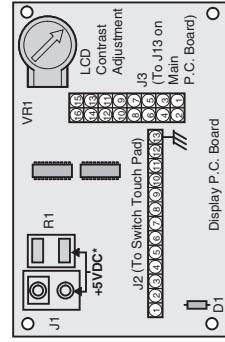


## Wiring Diagrams

Models:	M9D (-020-022)	M11D (-020-022)
Serial Numbers:	Early Models	Early Models

SA1765i

Constant Voltage  
Voltage Present Only  
During Component Operation  
\*\* Rectified DC Voltage Only  
Present During Operation



**Equipment Alert**  
Line voltage is present between Ground and Heater terminals L1 and L2 PCB connections at all times.

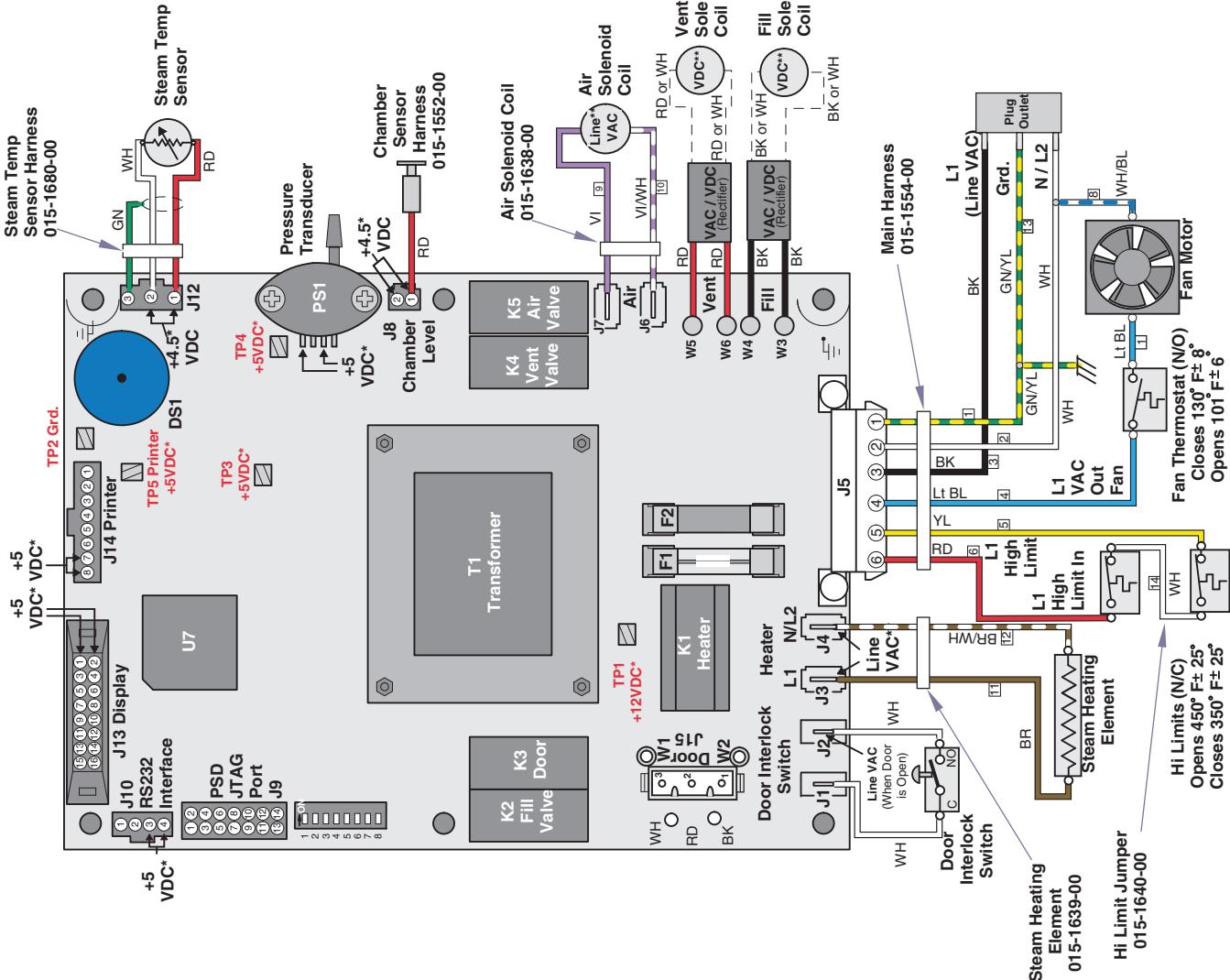
**Fuses:**  
115 VAC models:  
F1 ..... 0.250 amp, 250 V, Slo-Blo, 1/4" x 1-1/4"  
F2 ..... 15 amp, 250 V, Fast-Acting, 1/4" x 1-1/4"

230 VAC models:  
F1 ..... 0.125 amp, 250 V, Slo-Blo, 5mm x 20mm  
F2 ..... 8 amp, 250 V, Fast-Acting, 5mm x 20mm

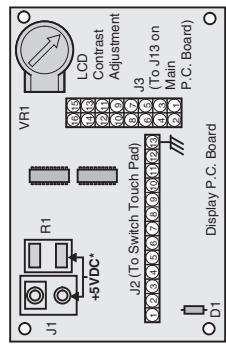
**Note:** Disconnect plug connector when checking voltage.

# Wiring Diagrams

Refer To:	Page
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1



\* Constant Voltage  
\*\* Voltage Present Only  
During Component Operation  
\*\*\* Rectified DC Voltage Only  
Present During Operation



SA1763i

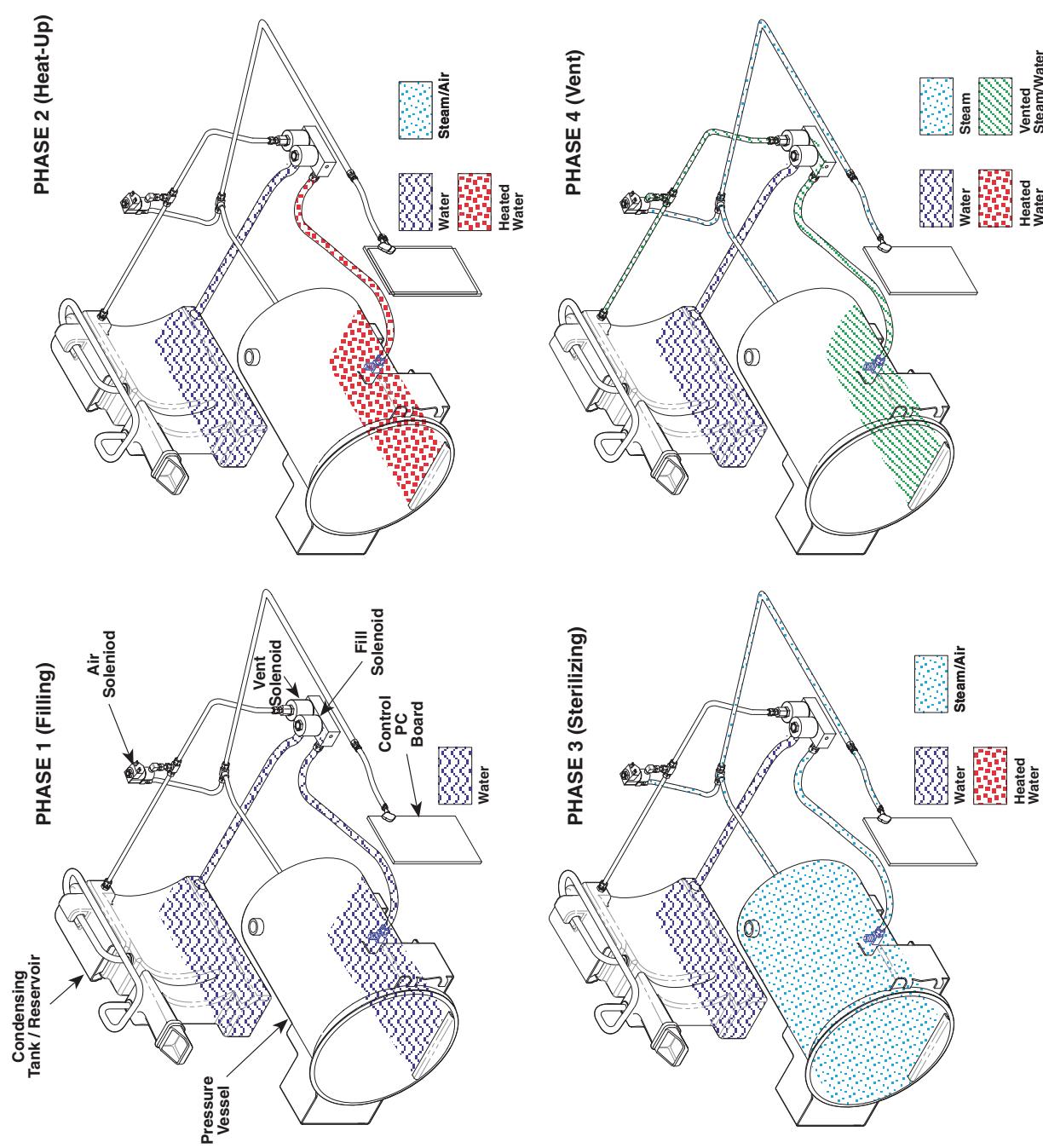
## Wiring Diagrams

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# Flow Diagrams

Refer To:	Page
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers .....	E-1

This diagram illustrates the flow of water, heated water, steam, and vented steam thru the sterilizer during each phase of a cycle.



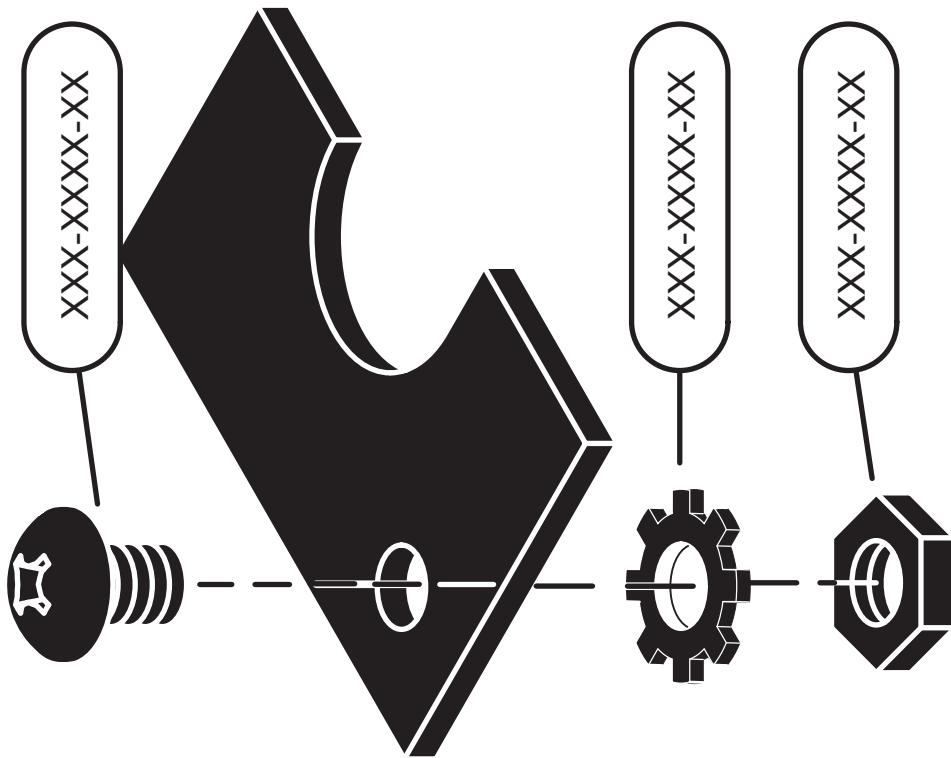
Flow Diagrams

Models:  
Serial Numbers:

MAG 18600

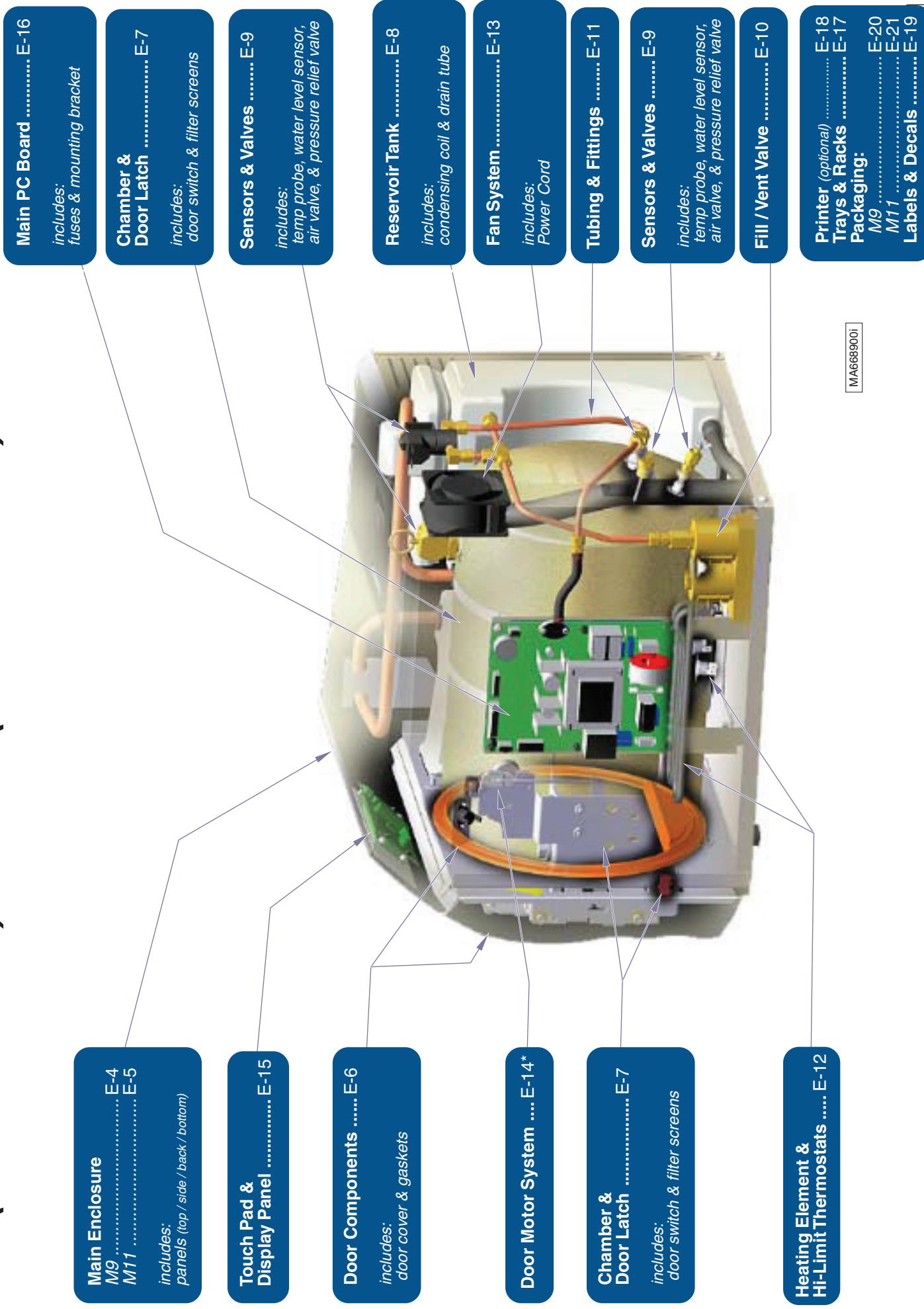
# ***Exploded Views & Parts Lists***

Model	Page
M9 (-020 / -021 / -022) .....	E-2
M9D (-020 / -022) .....	E-3
M11 (-020 / -021 / -022) .....	E-2
M11D (-020 / -022) .....	E-3

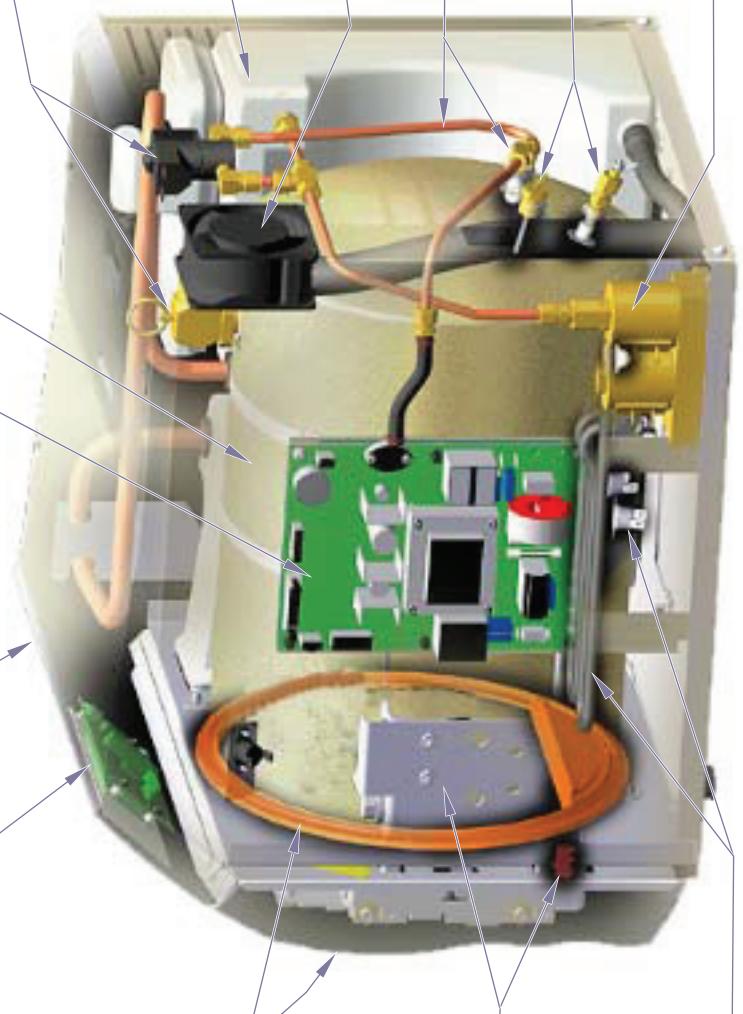


# **E** Section

# M9(-020/-021/-022) / M11 (-020/-021/-022)



# M9D(-020/-022) / M11D(-020/-022)



**Main Enclosure** ..... E-4  
*M9D* ..... E-5  
*M11D* ..... E-5  
*includes:*  
 panels (top / side / back / bottom)

**Touch Pad & Display Panel** ..... E-15

**Door Components** ..... E-6

*includes:*  
 door cover & gaskets

**Chamber & Door Latch** ..... E-7

*includes:*  
 door switch & filter screens

**Heating Element & Hi-Limit Thermostats** ..... E-12

**Main PC Board** ..... E-16

*includes:*  
 fuses & mounting bracket

**Chamber & Door Latch** ..... E-7

*includes:*  
 door switch & filter screens

**Sensors & Valves** ..... E-9

*includes:*  
 temp probe, water level sensor,  
 air valve, & pressure relief valve

**Reservoir Tank** ..... E-8

*includes:*  
 condensing coil & drain tube

**Fan System** ..... E-13

*includes:*  
 Power Cord

**Tubing & Fittings** ..... E-11

**Sensors & Valves** ..... E-9

*includes:*  
 temp probe, water level sensor,  
 air valve, & pressure relief valve

**Fill / Vent Valve** ..... E-10

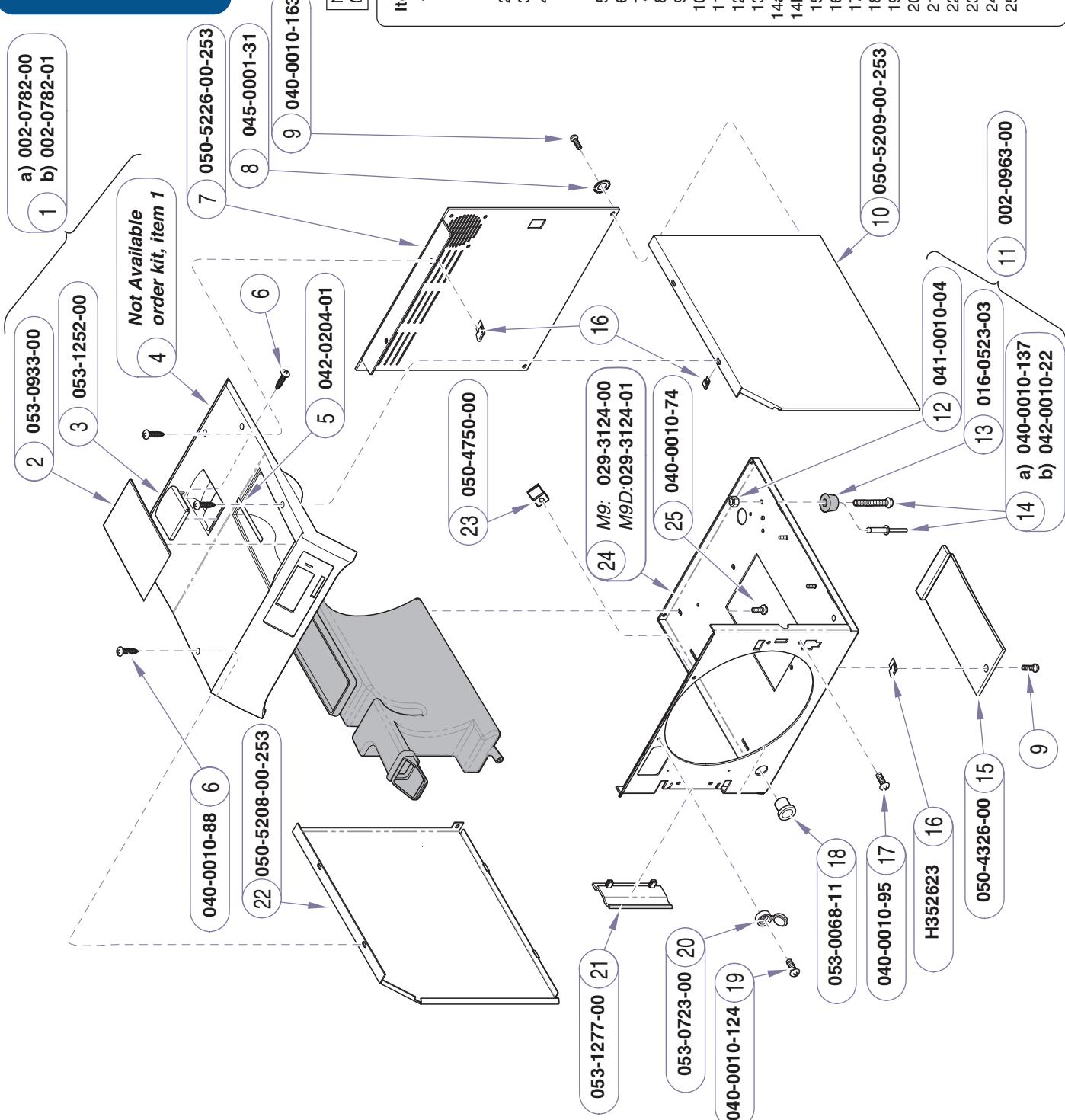
**Printer (optional)** ..... E-18  
**Trays & Racks** ..... E-17  
**Packaging:**  
*M9D* ..... E-20  
*M11D* ..... E-21  
**Labels & Decals** ..... E-19

MA669000I

\* Indicates multiple pages due to a serial number break for the parts illustration

**Refer To:**

- a) 002-0782-00
- b) 002-0782-01
- Operation & Troubleshooting ..... A-1
- Component Testing / Repair ..... B-1
- Access Procedures ..... C-1
- Wiring Diagrams ..... D-1
- Exploded Views / Part Numbers .. E-1



MA593407I

**Main Enclosure  
(M9/M9D)**

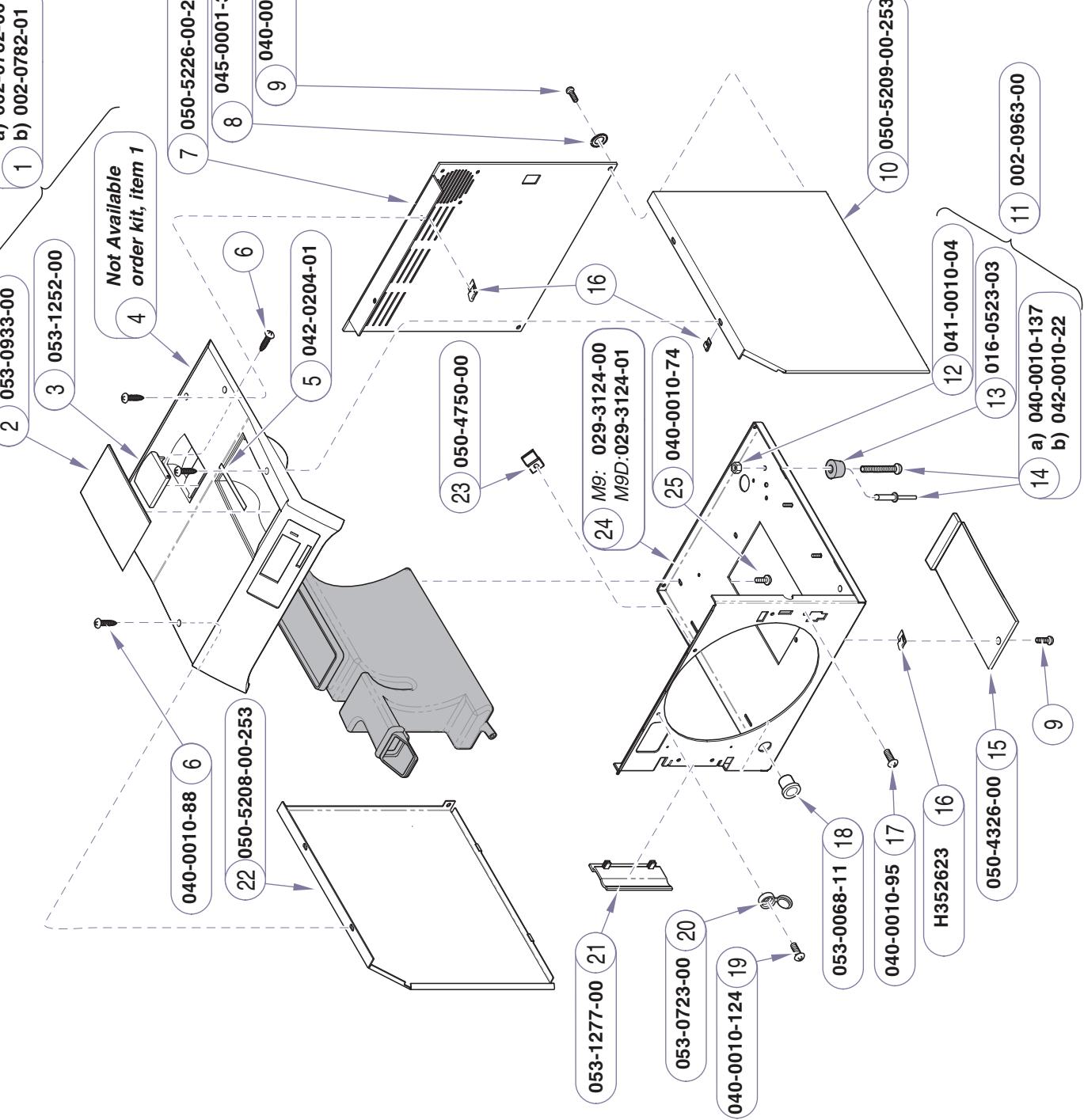
**Models:** **M9 (-020 thru -022)**  
**Serial Numbers:** **RN, RP, RR .... All**

**M9D (-020 & -022)**  
**V1000 to V659209**

**M9D (-020 & -022)**  
**V1000 to V659209**

**Refer To:**

- Operation & Troubleshooting ..... A-1
- Component Testing / Repair ..... B-1
- Access Procedures ..... C-1
- Wiring Diagrams ..... D-1
- Exploded Views / Part Numbers .. E-1



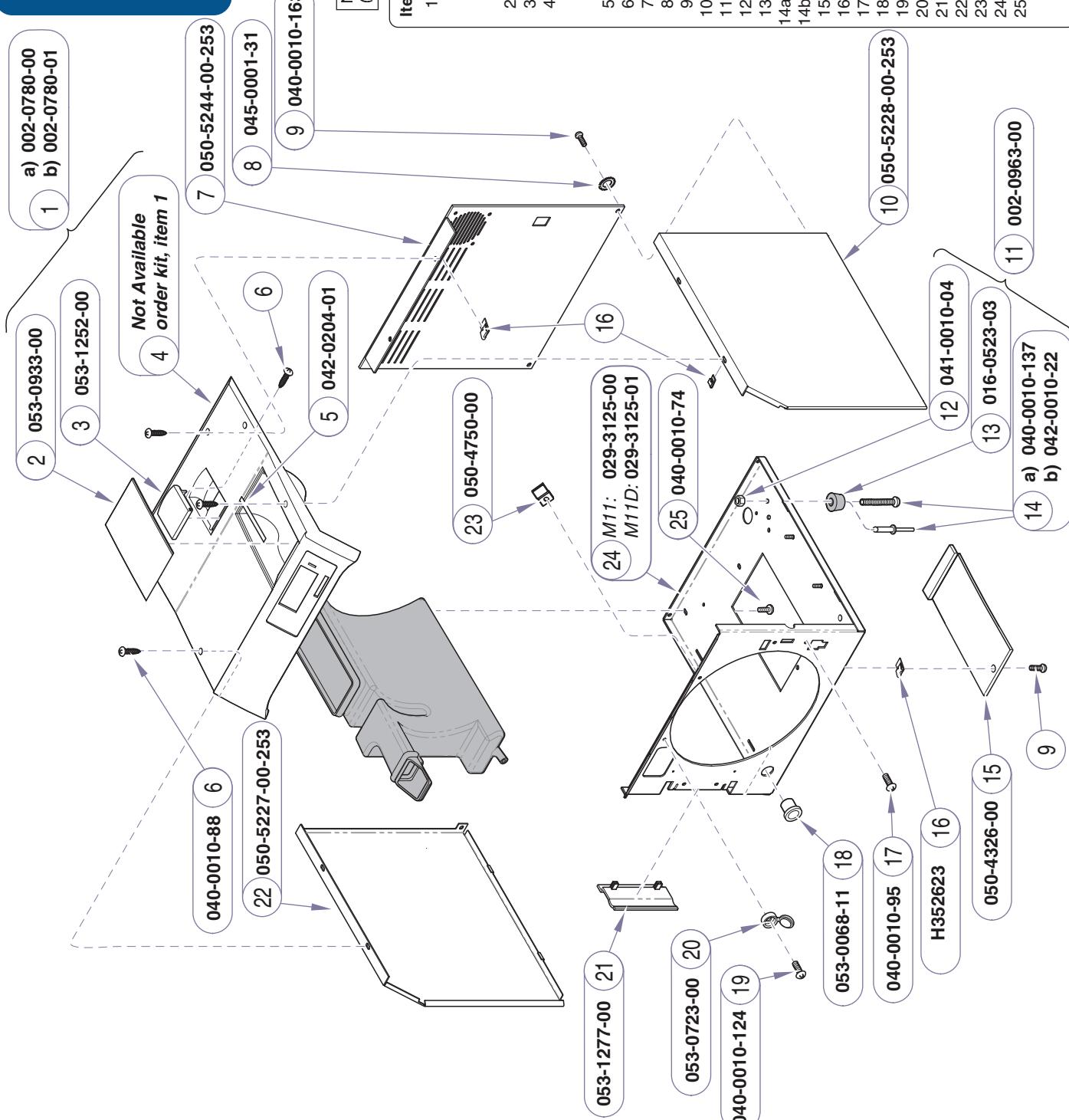
**Always Specify Model & Serial Number**

MA5934071

**Models:** | M9 (-020 thru -022) | M9D (-020 thru -022) |  
**Serial Numbers:** | V659210 to Present | V659210 to Present |

**Refer To:**

- a) 002-0780-00
- b) 002-0780-01
- Operation & Troubleshooting ..... A-1
- Component Testing / Repair ..... B-1
- Access Procedures ..... C-1
- Wiring Diagrams ..... D-1
- Exploded Views / Part Numbers .. E-1



MA593406I

**Main Enclosure  
(M11/M11D)**

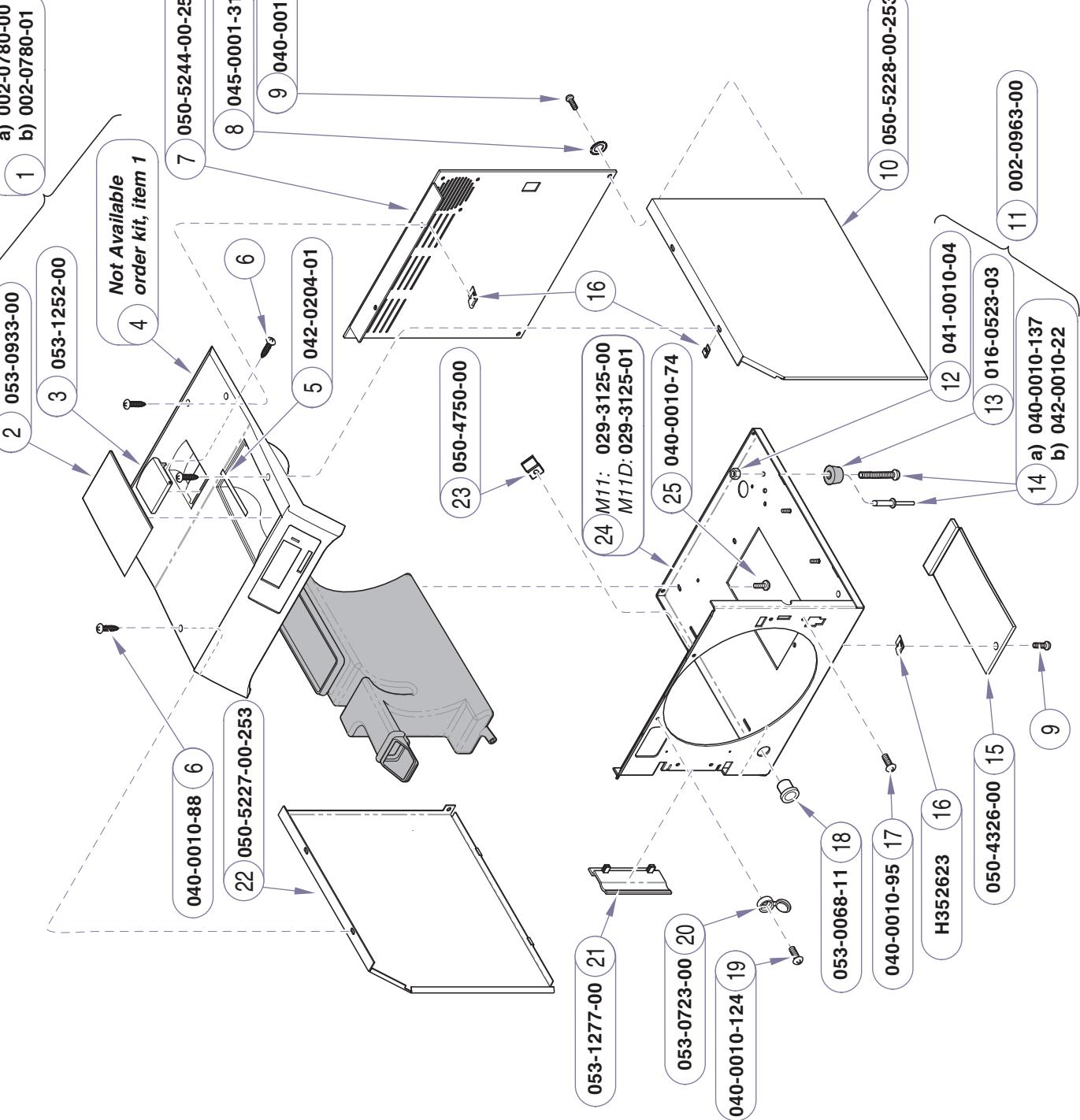
**Models:** *M11(-020 thru -022)* | *M11D(-020 thru -022)* | *M11(-020 thru -022)* | *M11D(-020 thru -022)*

**Serial Numbers:** *RS, RT, RV ... All* | *RY, RZ, .... All* | *V1000 to V655564* | *V1000 to V655564*

**M11D(-020 thru -022)**  
**V1000 to V655564**

**Refer To:**

- 1 Operation & Troubleshooting ..... A-1
- 2 Component Testing / Repair ..... B-1
- 3 Access Procedures ..... C-1
- 4 Wiring Diagrams ..... D-1
- 5 Exploded Views / Part Numbers .. E-1



MA593406I

**Models:** M11 (-020 thru -022) | M11D (-020 thru -022)  
**Serial Numbers:** V655565 to Present | V655566 to Present

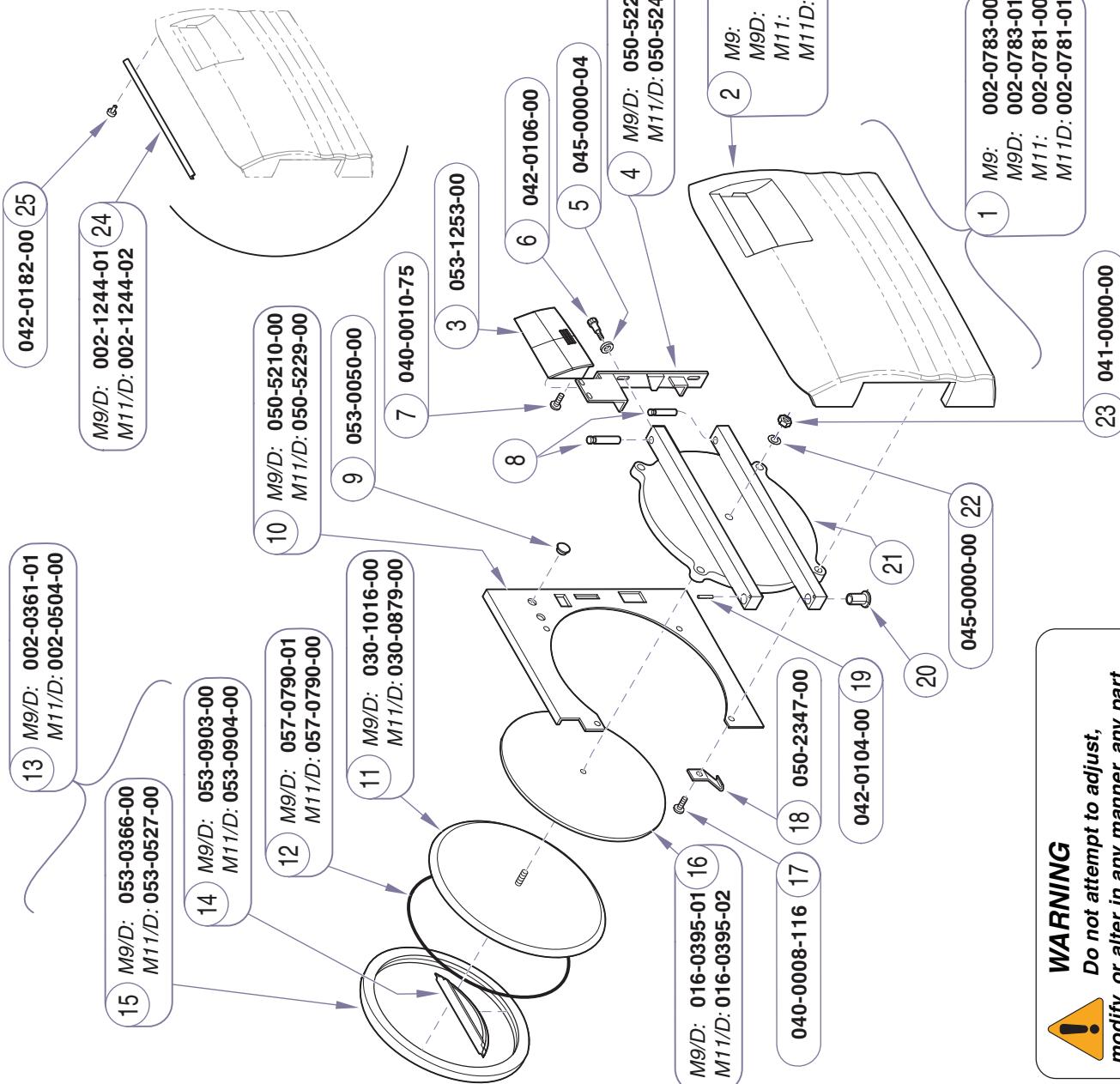
**Refer To:**

- Operation & Troubleshooting ..... A-1
- Component Testing / Repair ..... B-1
- Access Procedures ..... C-1
- Wiring Diagrams ..... D-1
- Exploded Views / Part Numbers .. E-1

Page	Item	Description	Qty.
A-1	1	Door Cover Kit (includes items 2 & 3)	1
B-1	2	• Door Cover	1
C-1	3	• Door Handle	1
D-1	4	Latch Bracket	1
E-1	5	Washer	2
	6	Shoulder Screw	2
	7	Screw (#10-24 x 3/8")	2
	8	Door Bolt (n/a)	2
	9	Hole Plug	2
	10	Inside Door Cover	1
	11	Housing	1
	12	Gasket Ring	1
	13	Gasket Kit (includes items 12, 14 & 15)	1
	14	• Dam Gasket	1
	15	• Door Gasket	1
	16	Door Insulation Pad	1
	17	Screw	4
	18	Door Spring	1
	19	Roll Pin	1
	20	Flange Bearing (see warning)	2
	21	Door (see warning)	1
	22	Lockwasher	1
	23	Nut (1/4-20)	1
	24	Steam Block Kit (includes item 25)	1
	25	• Snap Clip	4

**Always Specify Model & Serial Number**

MA668200i



**WARNING**

**Do not attempt to adjust, modify, or alter in any manner, any part of the pressure vessel. Serious injury and/or damage to the unit could result.**



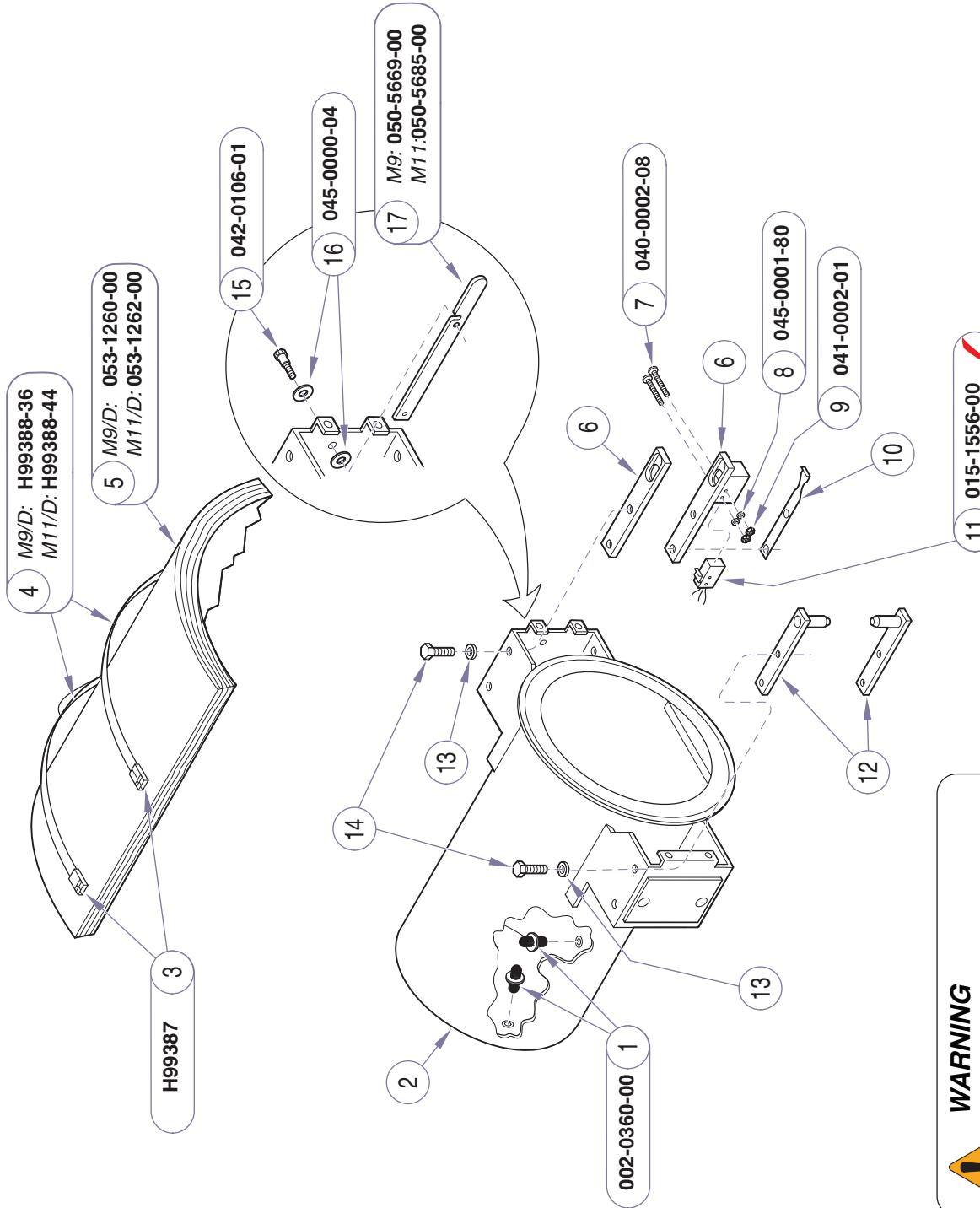
**Door Components**

**Models:**  
**Serial Numbers:**

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**Refer To:**

	Page
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



MA668400j

Always Specify Model & Serial Number

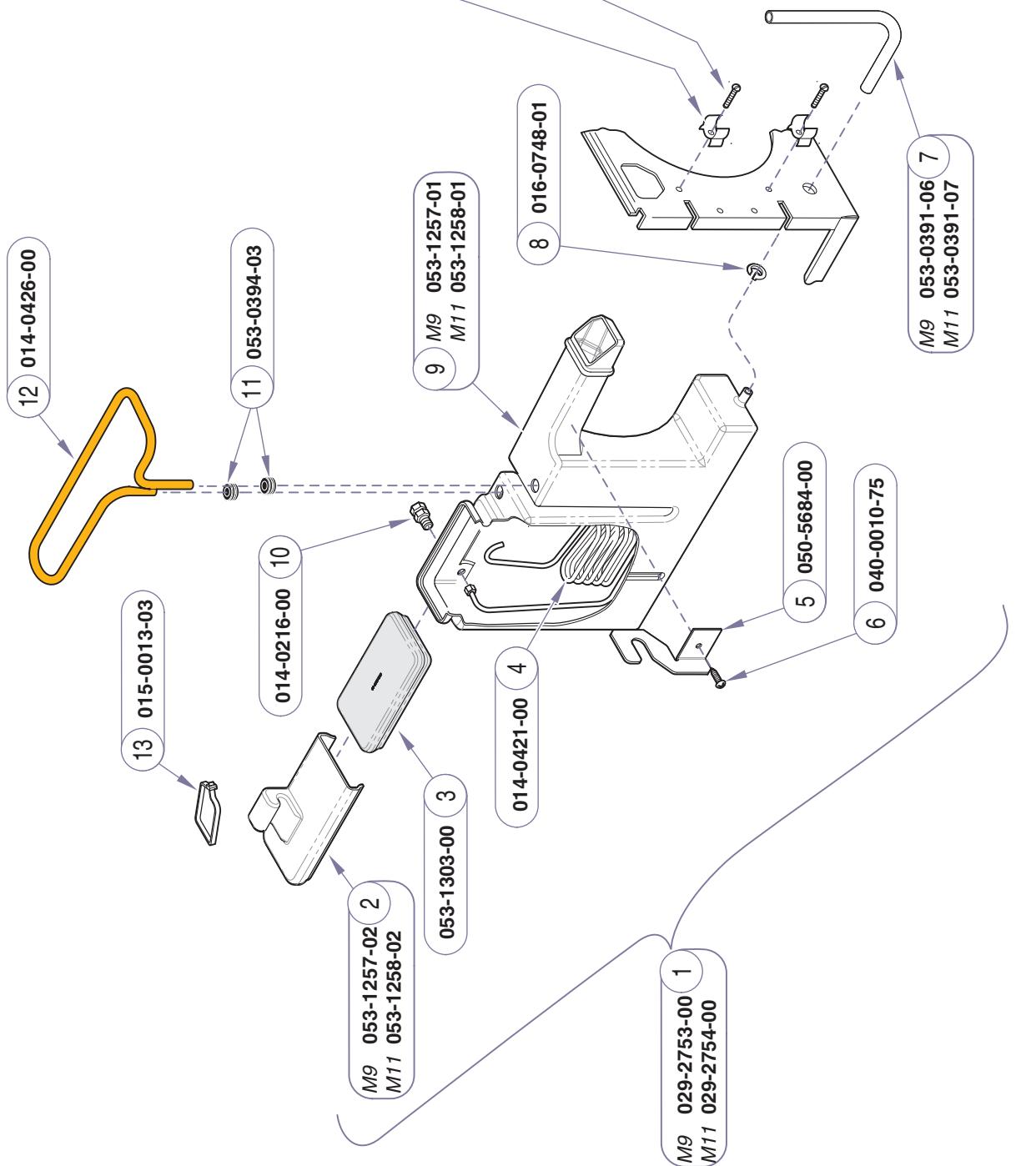
Item	Description	Qty.
1	Chamber Filter .....	2
2	Chamber (see warning) .....	1
3	Strap Fastener .....	2
4	Insulation Strap .....	2
5	Insulation Wrapper .....	1
6	Latch Brackets (see warning) .....	2
7	Screws (#2-56 x 1") .....	2
8	Lockwasher (#2) .....	2
9	Nut (#2-56) .....	2
10	Switch Spring Arm (see warning) .....	1
11	Door Switch .....	1
12	Hinge Brackets (see warning) .....	2
13	Washer (see warning) .....	8
14	Bolt (see warning) .....	8
15	Shoulder Screw (apply valve lubricant) .....	2
16	Flat Washer, Brass .....	2
17	Latch Lever .....	1

**Chamber & Door Latch**

**Models:** | **Serial Numbers:**

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<u>Refer To:</u>	<u>Page</u>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



<b>Qty.</b>	<b>Description</b>
1	Reservoir Tank Assembly (Incl. Items 2 thru 13)
2	Tank Lid .....
3	Tank Seal .....
4	Condensing Coil .....
5	Bracket .....
6	Screw .....
7	Drain Tube .....
8	Hose Clamp .....
9	Tank .....
10	Bulkhead Fitting .....
11	Grommet .....
12	Equalization Tube .....
13	Cable Tie .....
14	Hose Clip .....
15	Pop Rivet .....

MA667801 i

**Always Specify Model & Serial Number**

## Reservoir Tank

**Models:** **M9(-020 thru -022)** | **M9D(-020 thru -022)** | **M11(-020 thru -022)** | **M11D(-020 & -022)**  
**Serial Numbers:** **RN, RP, RR .... All** | **V1000 to V400876** | **V1000 to V400876**

**M9D(-020 & -022)**  
**M11D(-020 & -022)**  
**V1000 to V400876**

**Refer To:**

Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1

Page

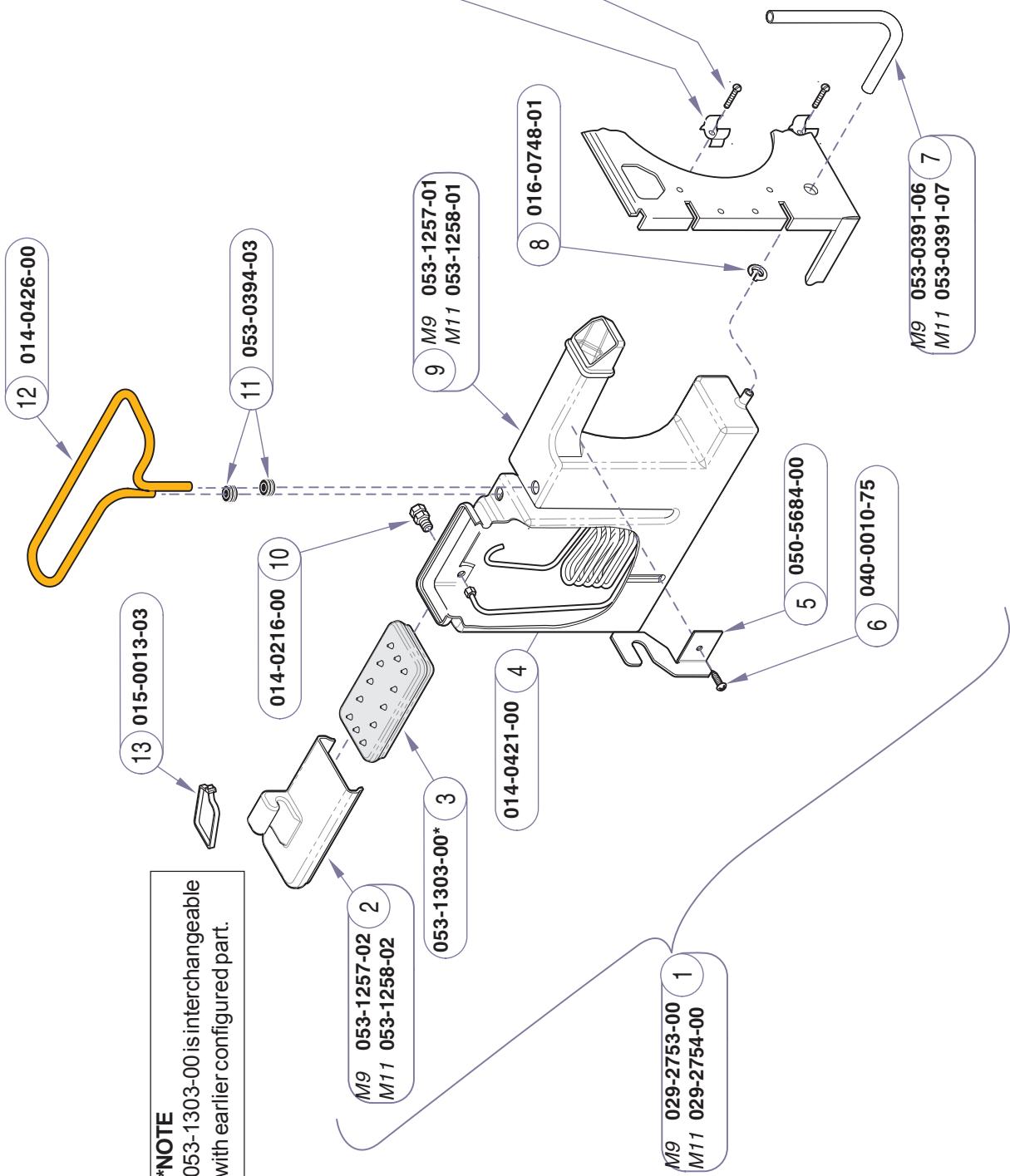
**Reservoir Tank**

**Models:** | M9 (-020 thru -022) | M9D (-020 & -022) |  
**Serial Numbers:** | M11 (-020 thru -022) | M11D (-020 & -022) |  
V400877 thru Present | V400877 thru Present |

**E-8.1**

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**\*NOTE**  
053-1303-00 is interchangeable  
with earlier configured part.



Item	Description	Qty.
1	Reservoir Tank Assembly (incl. items 2 thru 13)	1
2	Tank Lid .....	1
3	Tank Seal .....	1
4	Condensing Coil .....	1
5	Bracket .....	1
6	Screw .....	1
7	Drain Tube .....	1
8	Hose Clamp .....	1
9	Tank .....	1
10	Bulkhead Fitting .....	1
11	Grommet .....	2
12	Equalization Tube .....	1
13	Cable Tie .....	1
14	Hose Clip .....	2
15	Pop Rivet .....	2

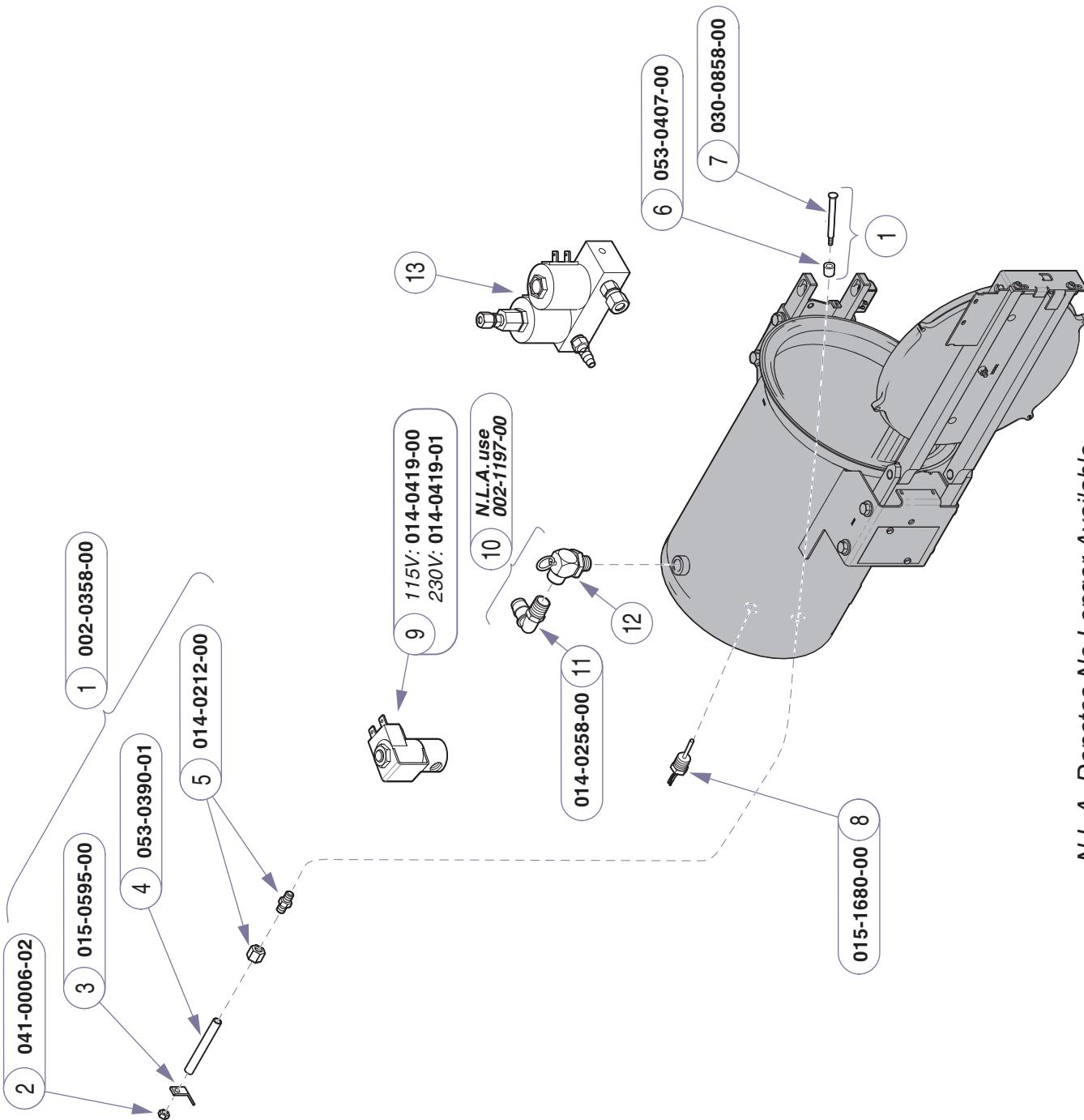
**Always Specify Model & Serial Number**M9 (-020 thru -022)  
M11 (-020 thru -022)V400877 thru Present  
V400877 thru Present

**Refer To:**

Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1

Item	Description	Qty
1	Water Level Sensor (incl. items 2 thru 7) ..	1
2	• Nut ..	1
3	• Terminal ..	1
4	• Teflon Tube ..	1
5	• Compression Fitting ..	1
6	• Spacer ..	1
7	• Water Level Sensor Probe ..	1
8	Temperature Sensor Assembly ..	1
9	Air Valve ..	1
10	Pressure Relief Valve Kit (includes items 11 & 12) ..	1
11	• Elbow Fitting ..	1
12	• Pressure Relief Valve ..	1
13	Refer to <i>Fill / Vent Valve</i> page ..	1

**Always Specify Model & Serial Number**



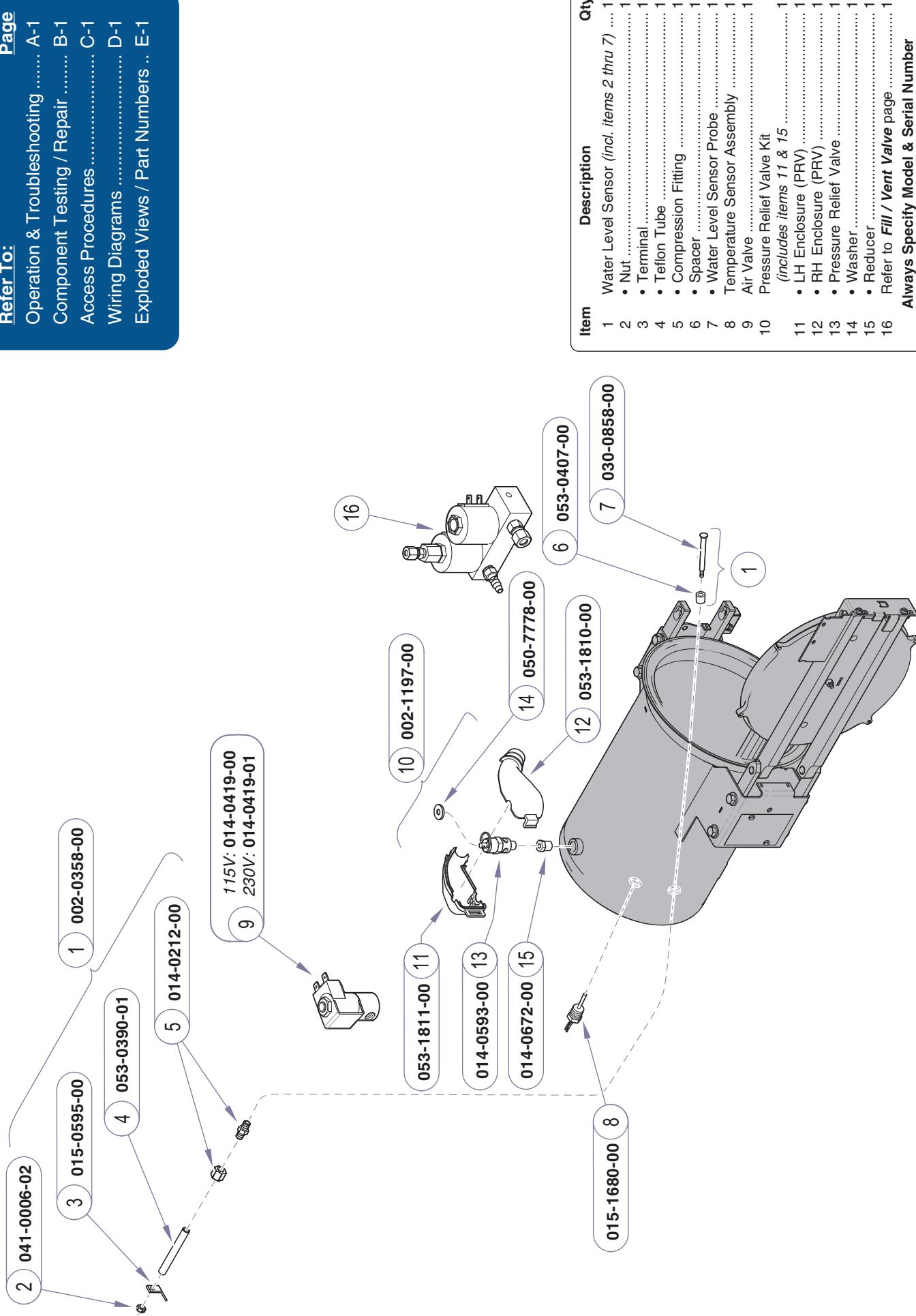
*N.L.A. Denotes No Longer Available*

**Sensors & Valves**

**Models:** | **M9D(-020 thru -022)** | **M9D(-020 & -022)** |  
**Serial Numbers:** | **M11D(-020 &-022)** | **M11D(-020 thru -022)** |  
                  | **RW, RX ... All** | **V1000 to V721880** | **V1000 to V721880**

**Refer To:**

Page	Refer To:
A-1	Operation & Troubleshooting .....
B-1	Component Testing / Repair .....
C-1	Access Procedures .....
D-1	Wiring Diagrams .....
E-1	Exploded Views / Part Numbers ..



Item	Description	Qty.
1	Water Level Sensor (incl. items 2 thru 7) ....	1
2	• Nut .....	1
3	• Terminal .....	1
4	• Teflon Tube .....	1
5	• Compression Fitting .....	1
6	• Spacer .....	1
7	• Water Level Sensor Probe .....	1
8	Temperature Sensor Assembly .....	1
9	Air Valve .....	1
10	Pressure Relief Valve Kit (includes items 11 & 15 .....	1
11	• LH Enclosure (PRV) .....	1
12	• RH Enclosure (PRV) .....	1
13	• Pressure Relief Valve .....	1
14	• Washer .....	1
15	• Reducer .....	1
16	Refer to <i>Fill / Vent Valve</i> page .....	1

SA12941

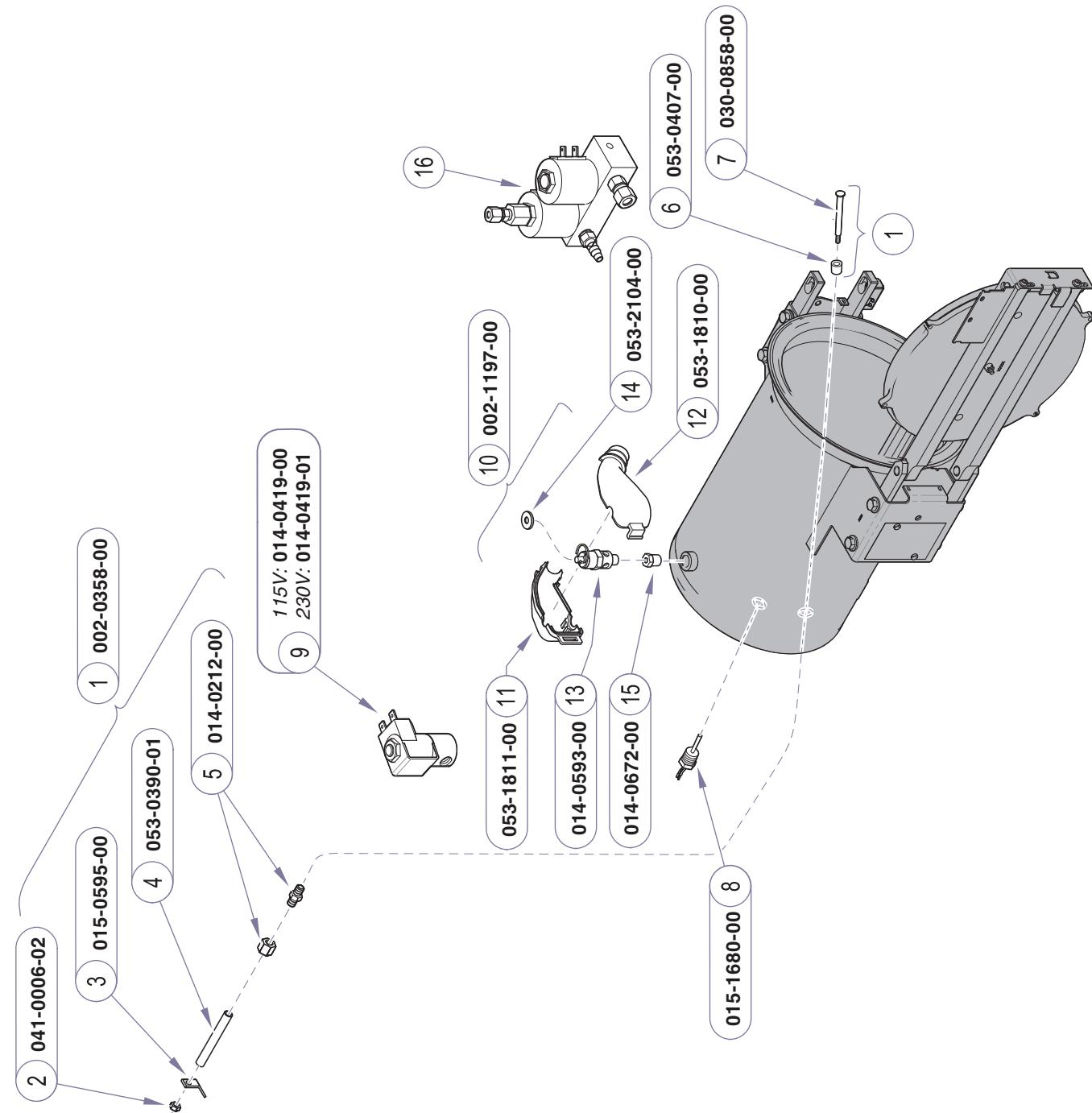
**Models:** | M9(-020 thru -022) | M9D(-020 & -022) |  
**Serial Numbers:** | M11(-020 thru -022) | M11D(-020 & -022) |  
V721881 thru V759602 | V721881 thru V759602 | V759602

**Sensors & Valves****E-9.1**

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<b>Refer To:</b>	<b>Page</b>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures.....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1

<b>Item</b>	<b>Description</b>	<b>Qty.</b>
1	Water Level Sensor (incl. items 2 thru 7) ..	1
2	• Nut .....	1
3	• Terminal .....	1
4	• Teflon Tube .....	1
5	• Compression Fitting .....	1
6	• Spacer .....	1
7	• Water Level Sensor Probe (PRV) .....	1
8	Temperature Sensor Assembly .....	1
9	Air Valve .....	1
10	Pressure Relief Valve Kit (includes items 11 & 15 ..)	1
11	• LH Enclosure (PRV) .....	1
12	• RH Enclosure (PRV) .....	1
13	• Pressure Relief Valve .....	1
14	• Washer .....	1
15	• Reducer .....	1
16	Refer to <i>Fill / Vent Valve</i> page Always Specify Model & Serial Number	1



SA1294i

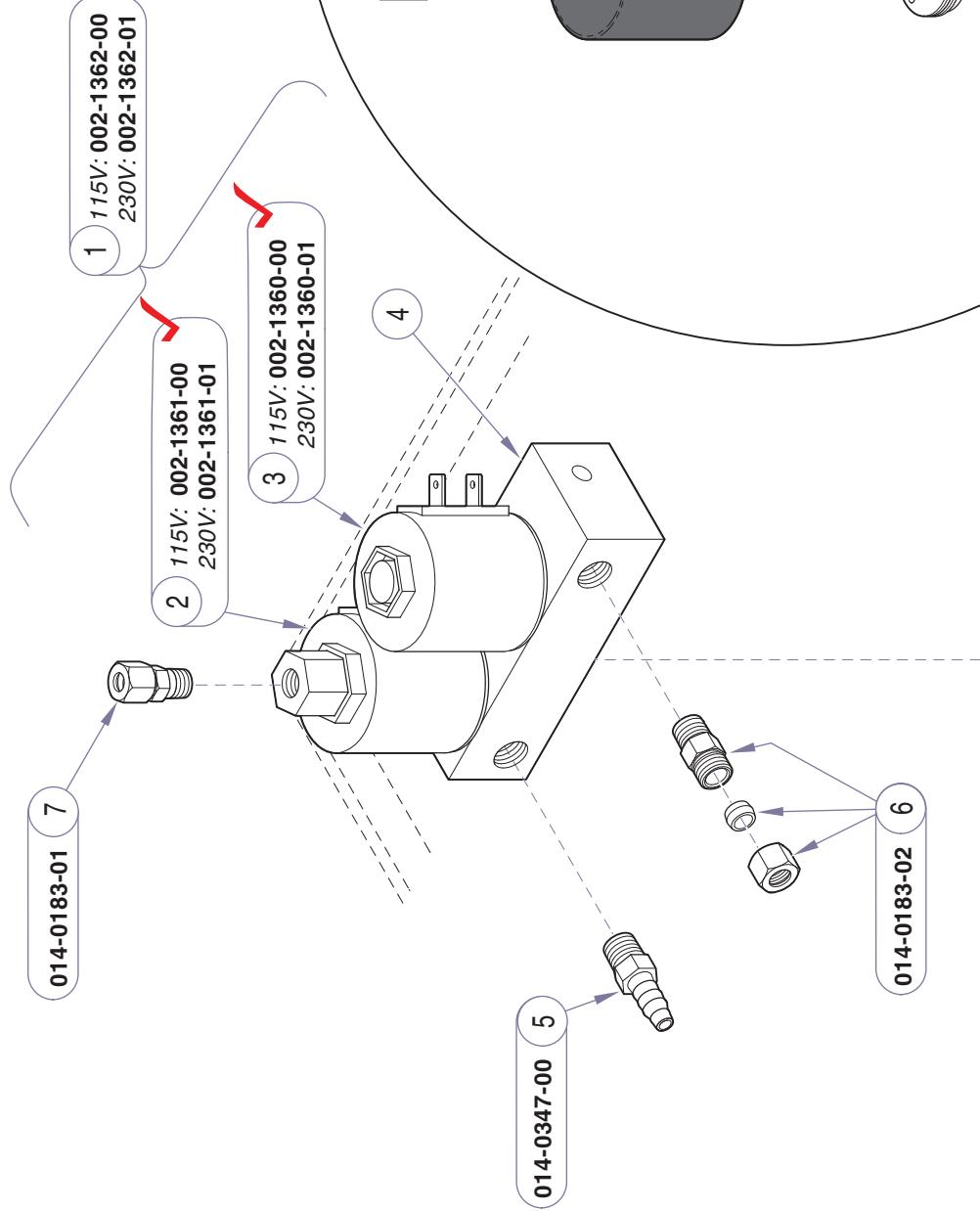
## Sensors & Valves

**Models:** | M9(-020 thru -022)  
M11(-020 thru -022) | M9D(-020 & -022)  
Serial Numbers:  
V759603 thru Present | M11D(-020 & -022)  
V759603 thru Present

**Refer To:**

Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1

**Page**



MAG606004i

Item	Description	Qty.
1	Fill / Vent Valve Assembly (Incl. items 2 thru 7)	1
2	• Vent Valve Repair Kit	1
3	• Fill Valve Repair Kit	1
4	• Manifold Block (n/a)	1
5	• Barb Fitting	1
6	• 3/8" Fitting	1
7	• 1/4" Fitting	1
8	Screw (#10-32 x 3/8")	1

**Always Specify Model & Serial Number**

**Models:**  
**Serial Numbers:**

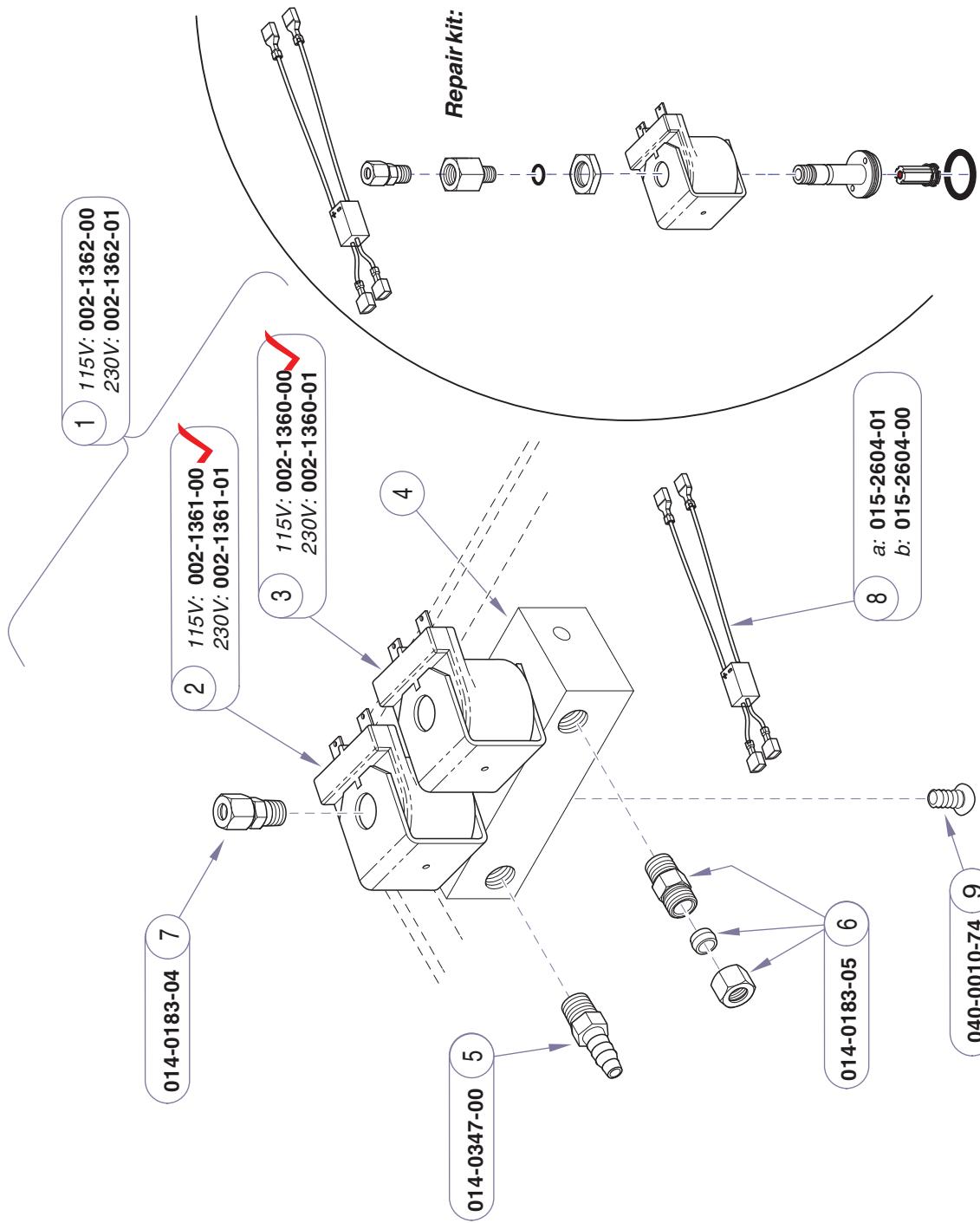
**ALL**  
RS, RT, RV, RN, RP, RR, RW, RX, RY, RZ,  
V1000 thru V933375

**Fill / Vent Valve**

**E-10**

**Refer To:**

	<b>Page</b>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



<b>Item</b>	<b>Description</b>	<b>Qty.</b>
1	Fill / Vent Valve Assembly (incl. items 2 thru 8)	1
2	Vent Valve Repair Kit	1
3	Fill Valve Repair Kit	1
4	Manifold Block (not serviceable)	1
5	Barb Fitting	1
6	3/8" Fitting	1
7	1/4" Fitting	1
8	a: Vent Valve Wiring Harness (Red) b: Fill Valve Wiring Harness (Black)	1
9	Screw (#10-32 x 3/8")	1

**Always Specify Model & Serial Number**

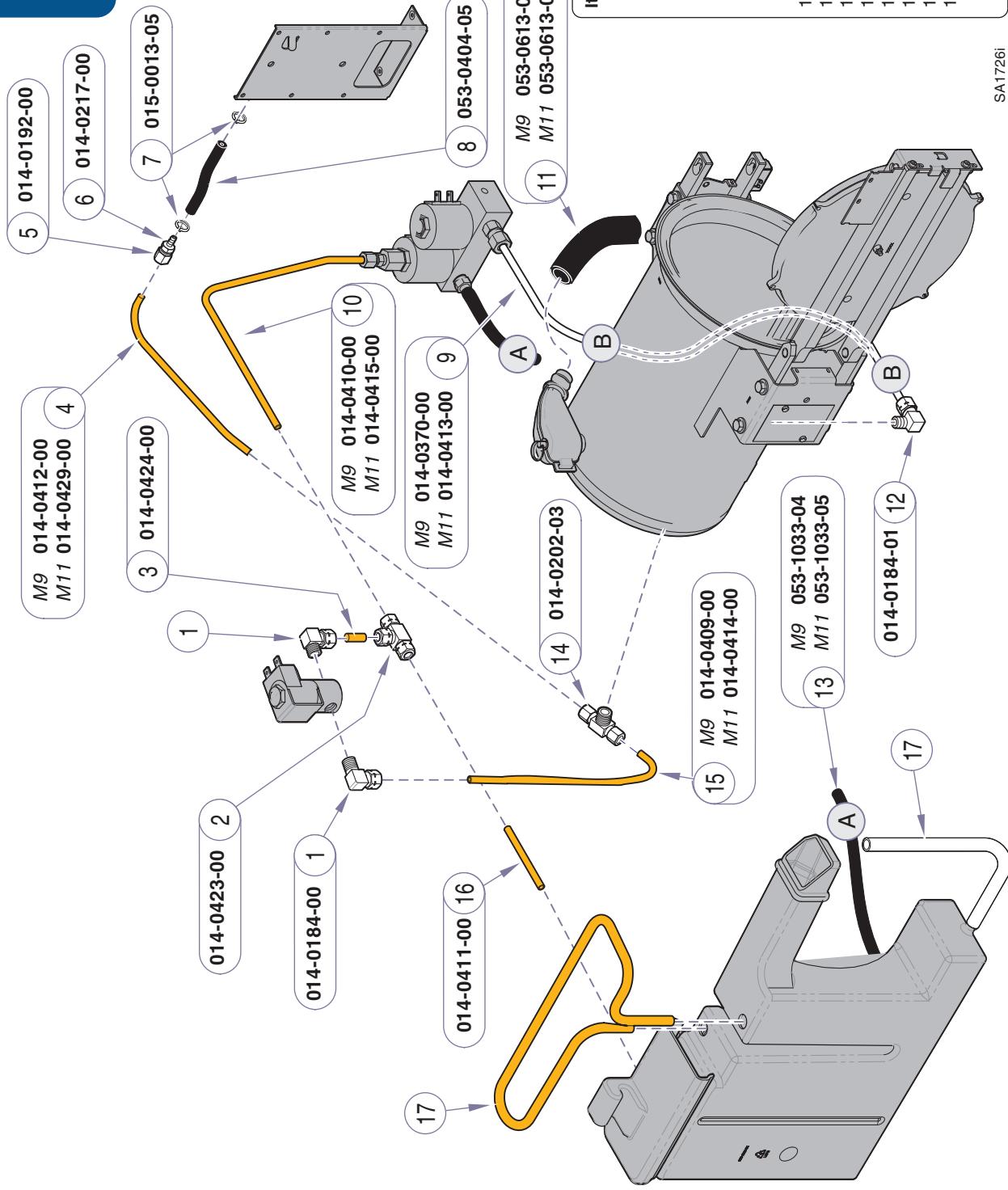
**Fill / Vent Valve**

**Models:** *ALL*  
**Serial Numbers:** *V933375 to Present*

**E-10.1**

**Refer To:**

Page	
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



Qty.	Description
1	Elbow Fitting .....
2	Tee Fitting .....
3	Tubing .....
4	Tubing .....
5	Compression Nut .....
6	Compression Connector .....
7	Hi-Temp Cable Tie .....
8	Tubing .....
9	Tubing .....
10	Tubing .....
11	Pressure Relief Tubing .....
12	Elbow Fitting .....
13	Reservoir Tubing .....
14	Tee Fitting .....
15	Tubing .....
16	Tubing .....
17	Refer to <b>Reservoir Tank</b> page .....
	Ref

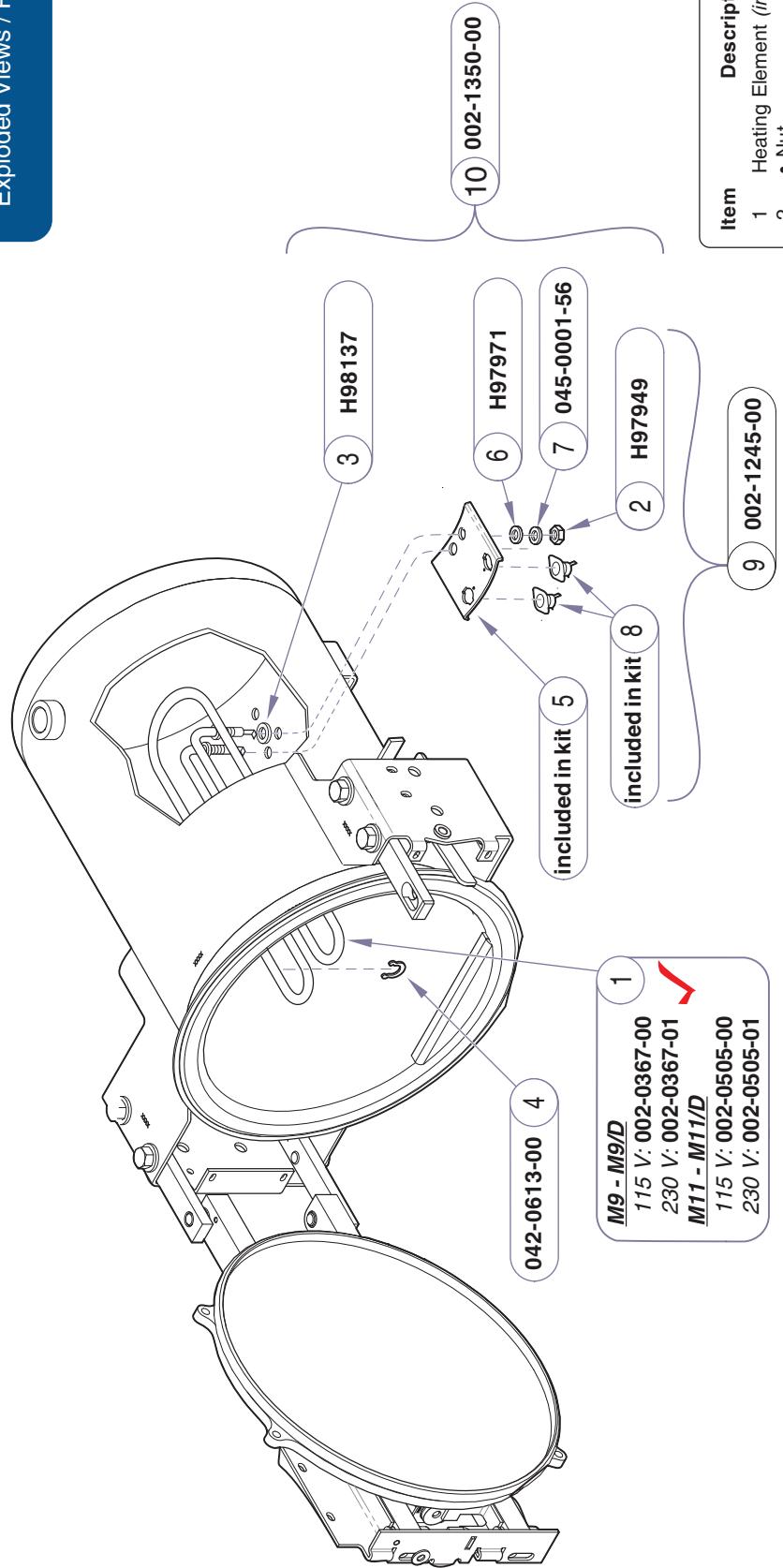
Always Specify Model & Serial Number

**Models:**  
Serial Numbers:

**Tubing & Fittings**

**Refer To:**

	<b>Page</b>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures.....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



<b>Item</b>	<b>Description</b>	<b>Qty.</b>
1	Heating Element (includes items 2 thru 4)..	1
2	• Nut .....	2
3	• Gasket .....	2
4	• Radial Gripring .....	4
5	Thermostat Bracket .....	1
6	Washer .....	2
7	Lockwasher (7/16", internal tooth) .....	2
8	High-Limit Thermostat .....	2
9	Thermostat Kit (incl. items 2, 3, 5, & 8) .....	1
10	Gasket Kit (incl. items 2, 3, 6, & 7) .....	1

**Always Specify Model & Serial Number**

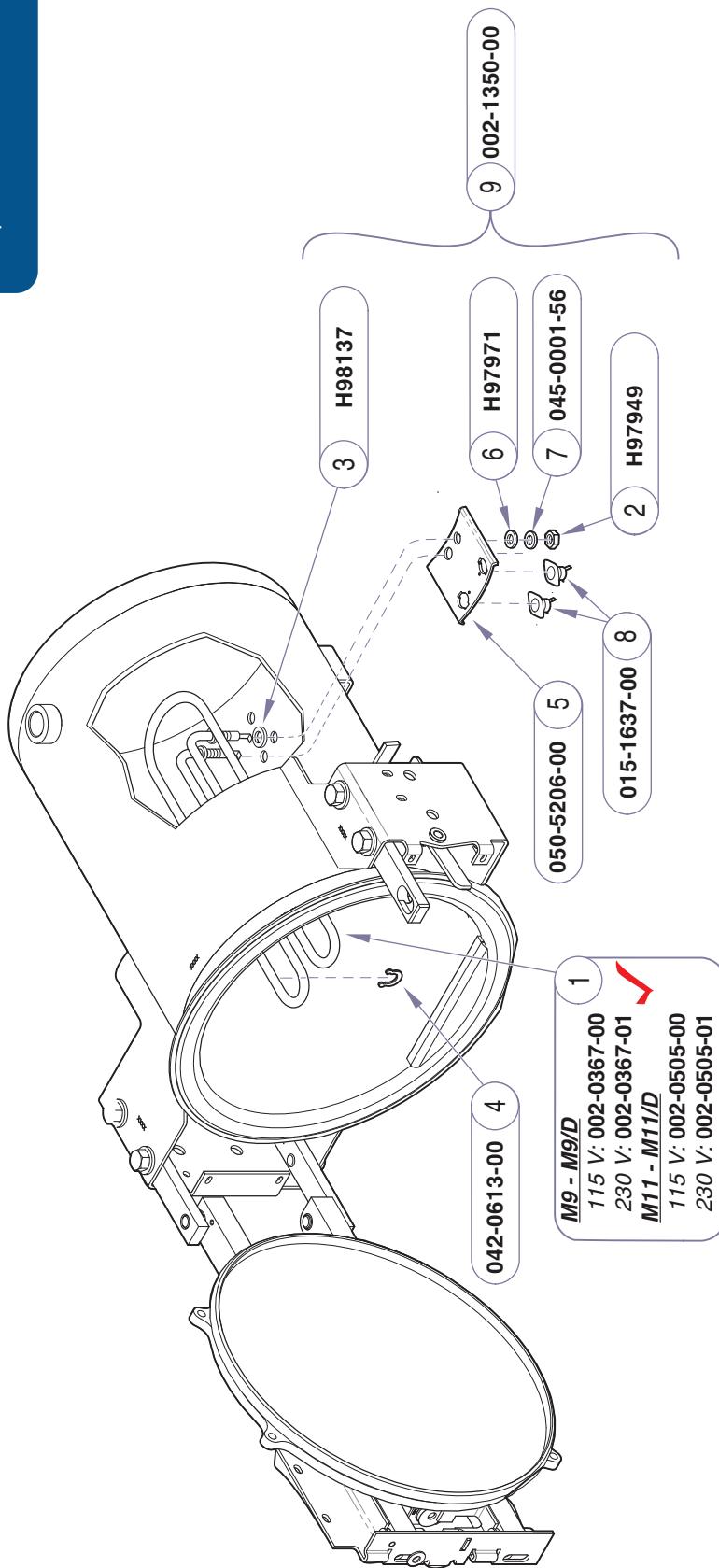
**Heating Element &  
Hi-Limit Thermostats**

**Models:** **M9(-020 thru -022)** | **M9D(-020 thru -022)** | **M11(-020 thru -022)** | **M11D(-020 & -022)**  
**Serial Numbers:** **RN, RP, RR .... All** | **V1000 to V400876** | **V1000 to V400876**

**M9D(-020 & -022)**  
**M11D(-020 & -022)**  
**V1000 to V400876**

**Refer To:**

	<b>Page</b>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures.....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



<b>Qty.</b>	<b>Description</b>
1	Heating Element ( <i>includes items 2 thru 4</i> ) ..
2	• Nut .....
2	• Gasket .....
2	• Radial Gripping .....
4	5 Thermostat Bracket .....
1	6 Washer .....
2	7 Lockwasher (7/16", internal tooth) .....
2	8 High-Limit Thermostat .....
1	9 Gasket Kit (incl. items 2, 3, 6, & 7) .....

MA668703I

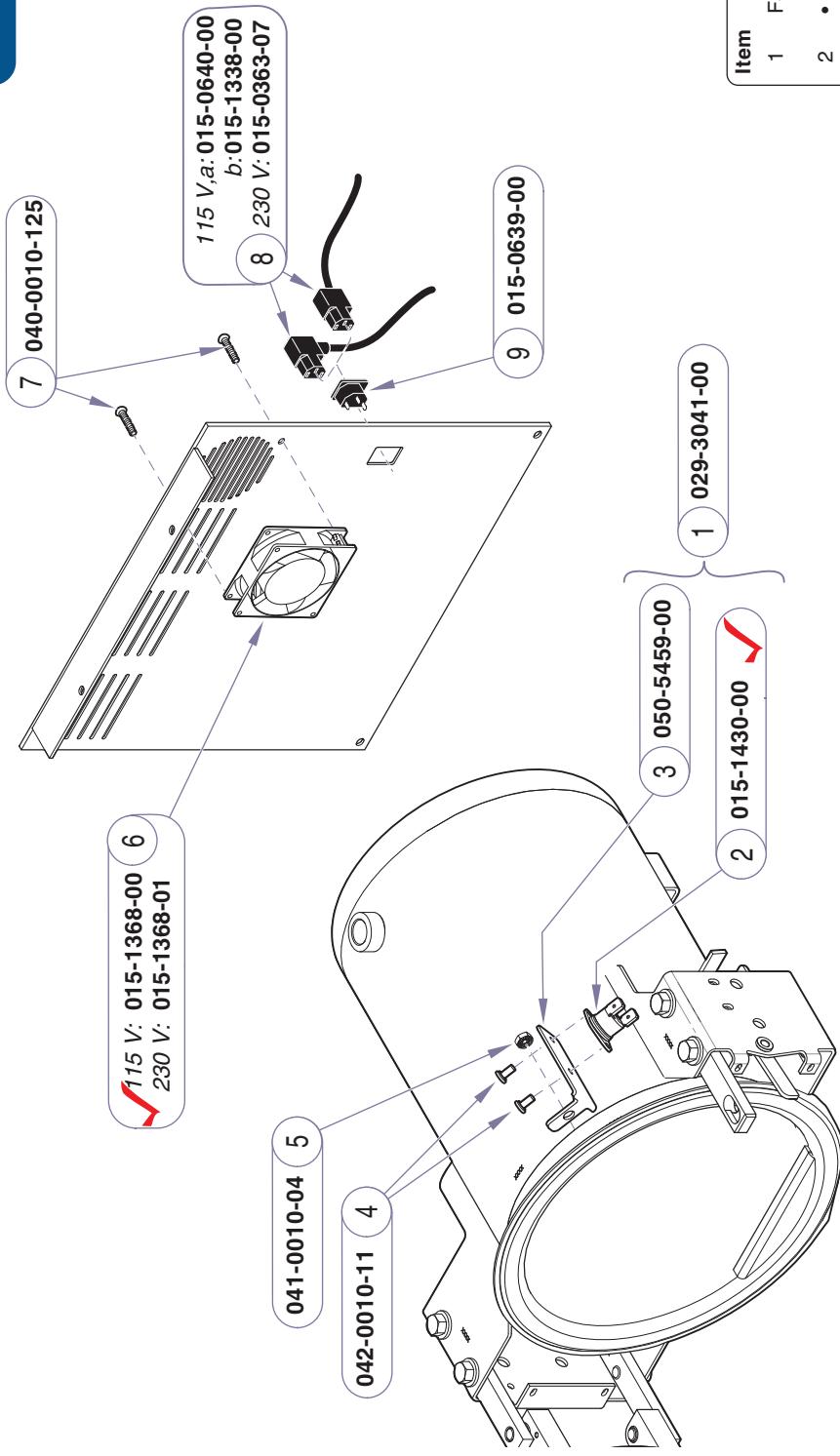
**Always Specify Model & Serial Number**

**Models:** | M9(-020 thru -022)  
| M11(-020 thru -022)  
**Serial Numbers:** | V400877 thru Present | M9D(-020 & -022)  
| M11D (-020 & -022)  
| V400877 thru Present

**Heating Element &  
Hi-Limit Termostats**

**Refer To:**

Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



Item	Description	Qty.
1	Fan Thermostat Assembly (includes items 2 thru 4)	1
2	• Thermostat	1
3	• Bracket	1
4	• Pop Rivet	2
5	Nut (#10-24)	1
6	Fan	1
7	Screw(#10 x 1/2", self-tapping)	2
8	Power Cord (a)- 90 degree plug	1
	(b)- straight plug	1
9	Power Cord Receptacle	1

MA668602i

**Always Specify Model & Serial Number**

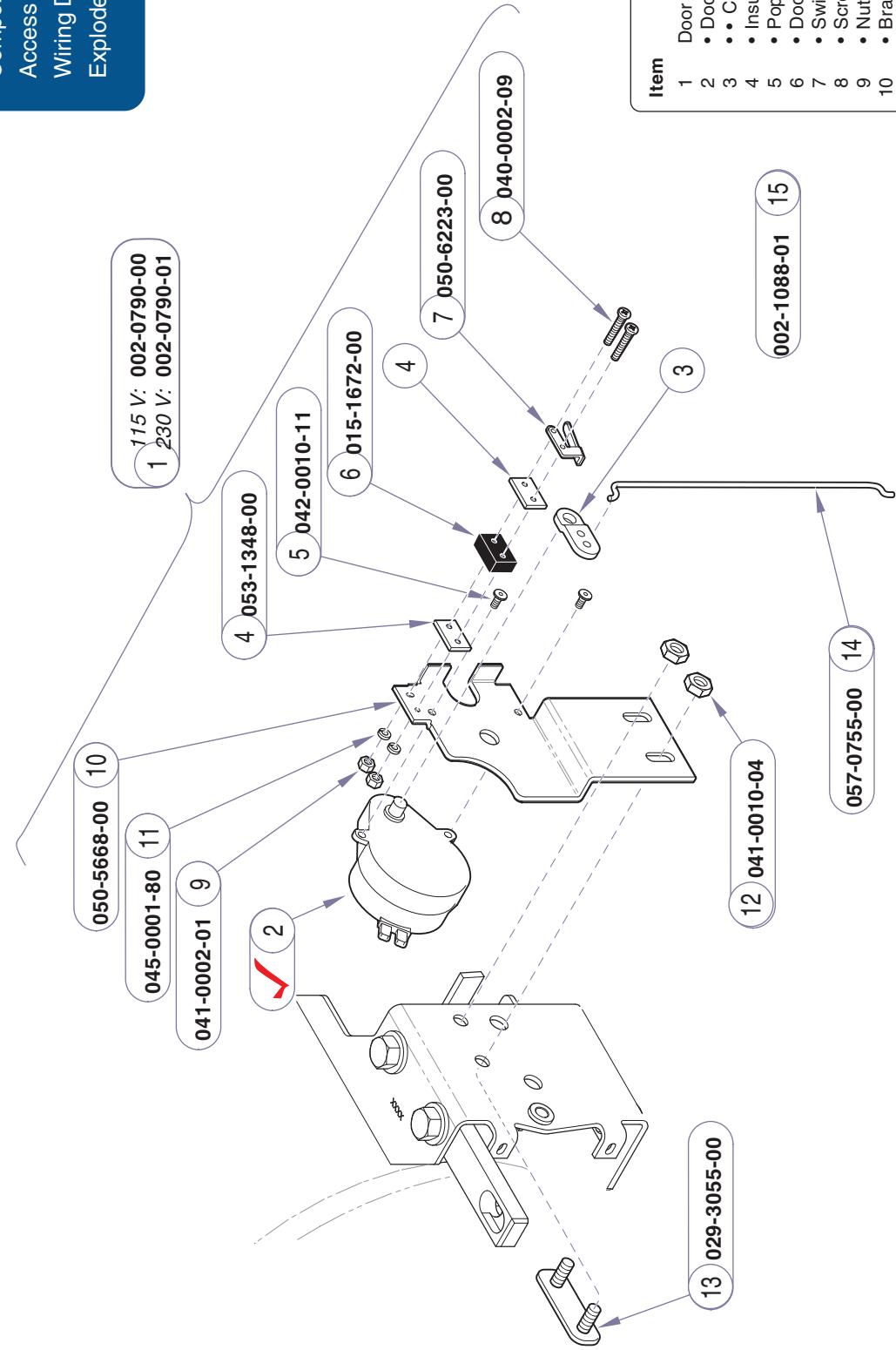
**Fan System**

**Models:**  ALL    
**Serial Numbers:**

**E-13**

**Refer To:**

Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1

**Page**

Item	Description	Qty.
1	Door Motor Kit (includes items 2 thru 11) ...	1
2	• Door Motor (includes item 3) .....	1
3	• Cam .....	1
4	• Insulation .....	1
5	• Pop Rivet .....	4
6	• Door Motor Switch .....	1
7	• Switch Actuator .....	1
8	• Screw (#10-24 x 3/8") .....	2
9	• Nut (#2-56).....	2
10	• Bracket.....	1
11	• Lock Washer (#2).....	2
12	Nut (#10-24) .....	2
13	Stud Plate .....	1
14	Connecting Rod .....	1
15	M9/M11 Switch Mounting/Insulator Kit (includes items 4, 7, 8, 9 and 11) .....	1

**Always Specify Model & Serial Number**

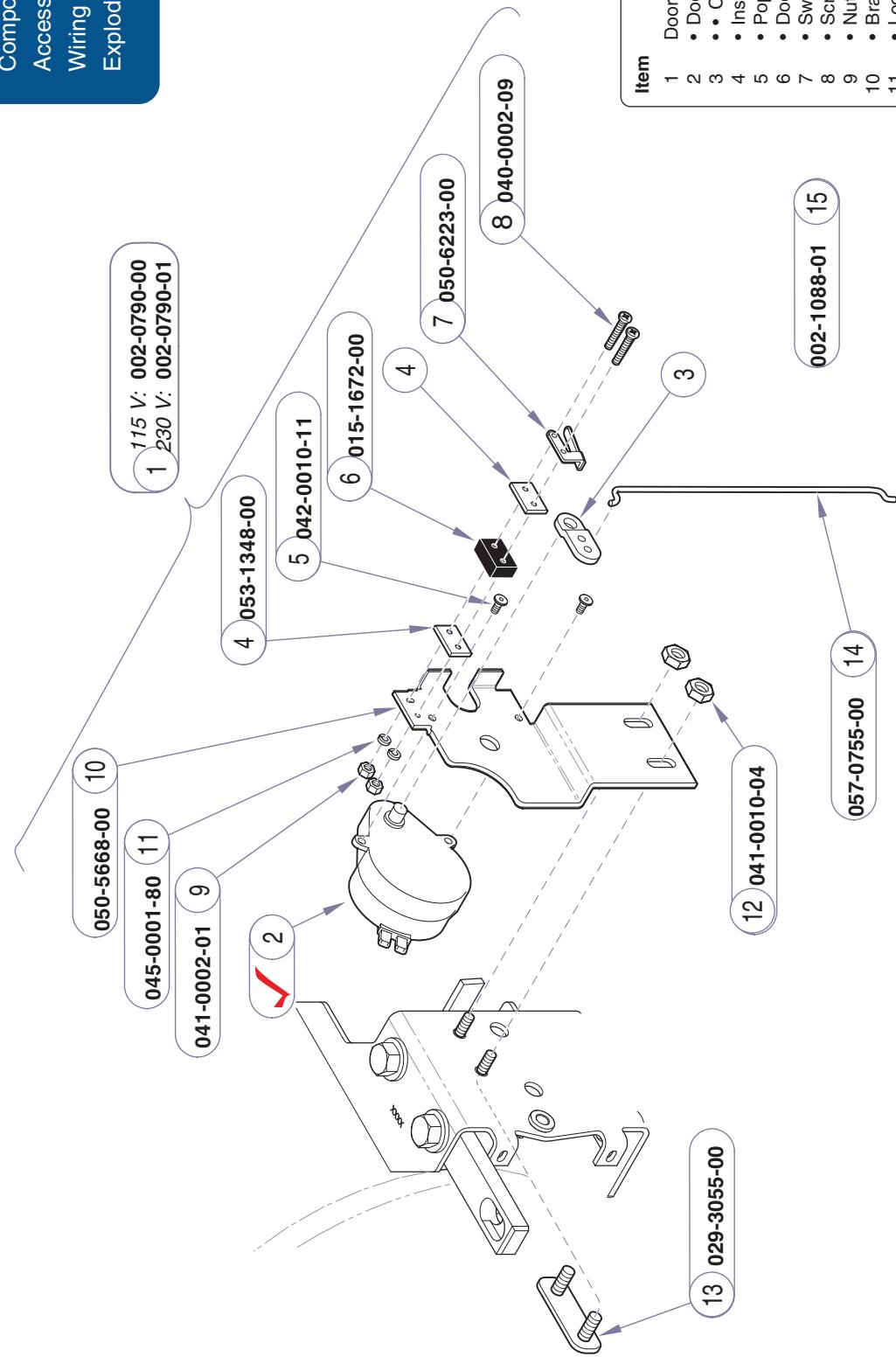
<b>Models:</b>	<b>M9 (-020)</b>	<b>M9 (-021 / -022)</b>	<b>M11 (-020/-021/-022)</b>
<b>Serial Numbers:</b>	RN1000 thru RN1184 RN1236 thru RN1240	RP1000 thru RP1368 RR1000 thru RR1368	RS1000 thru RS1299 RT1000 thru RT1025 RV1000 thru RV1179

**Door Motor System**

MA6685071

**Refer To:**

Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures.....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



Item	Description	Qty.
1	Door Motor Kit (includes items 2 thru 11)	1
2	Door Motor (includes item 3)	1
3	• Cam .....	1
4	• Insulation .....	1
5	• Pop Rivet .....	4
6	• Door Motor Switch .....	1
7	• Switch Actuator .....	1
8	• Screw (#10-24 x 3/8") .....	2
9	• Nut (#2-56) .....	2
10	• Bracket .....	1
11	• Lock Washer (#2) .....	2
12	Nut (#10-24) .....	2
13	Stud Plate .....	2
14	(used on earlier models w/o studs) .....	1
15	Connecting Rod .....	1
	M9/M11 Switch Mounting/Insulator Kit (includes items 4, 7, 8, 9 and 11) .....	1

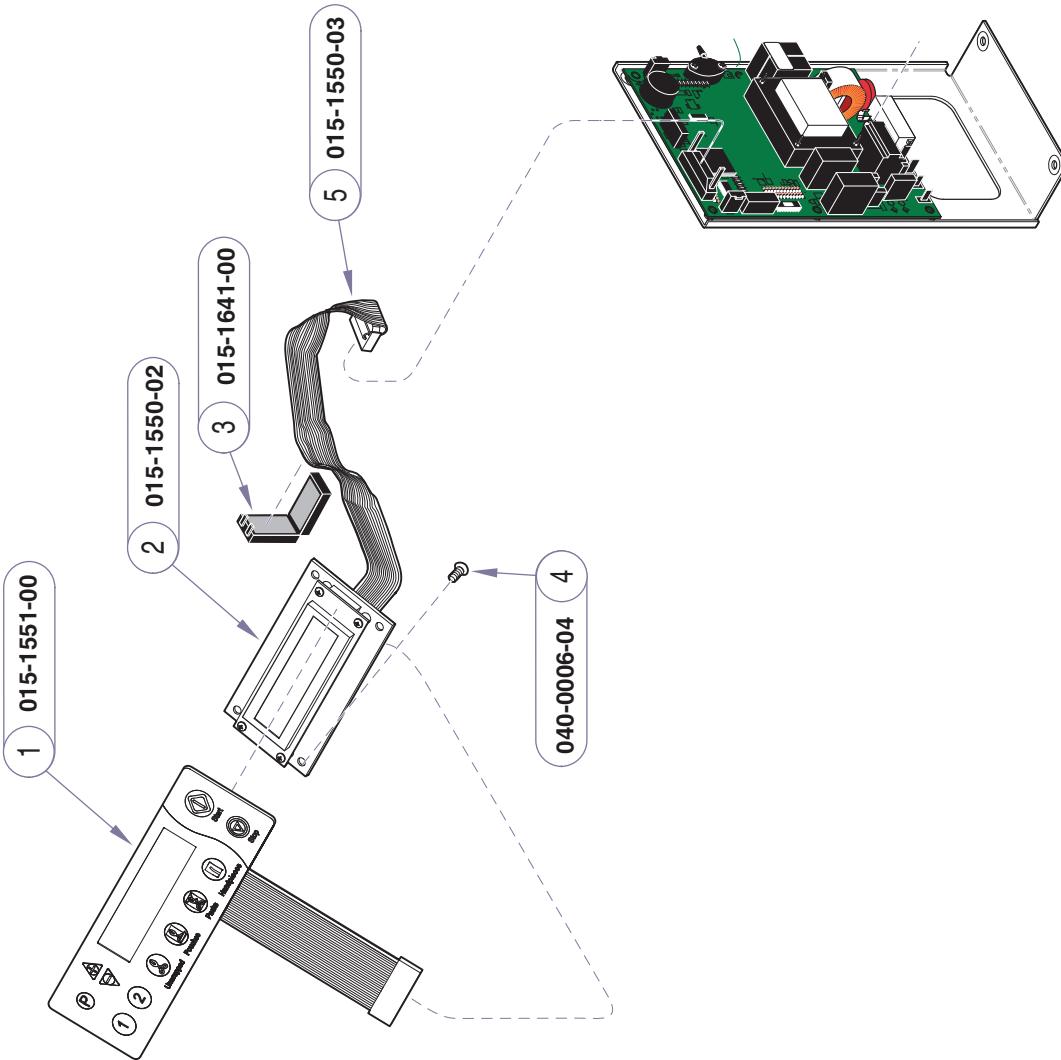
**Always Specify Model & Serial Number**

MA668508i

<b>Models:</b>	<b>M9 (-020)</b>	<b>M11 (-021 / -022)</b>
<b>Serial Numbers:</b>	RN1185 thru RN1235 RN1241 thru present V1000 thru present	RP1005 thru present RR1369 thru present RV1180 thru present V1000 thru present

**Door Motor System**

<b>Refer To:</b>	<b>Page</b>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



<b>Item</b>	<b>Description</b>	<b>Qty.</b>
1	Touch Pad .....	1
2	Display Panel (includes item 5) .....	1
3	Suspension Coil .....	1
4	Screw (#6 x 3/8") .....	1
5	Ribbon cable .....	2

**Always Specify Model & Serial Number**

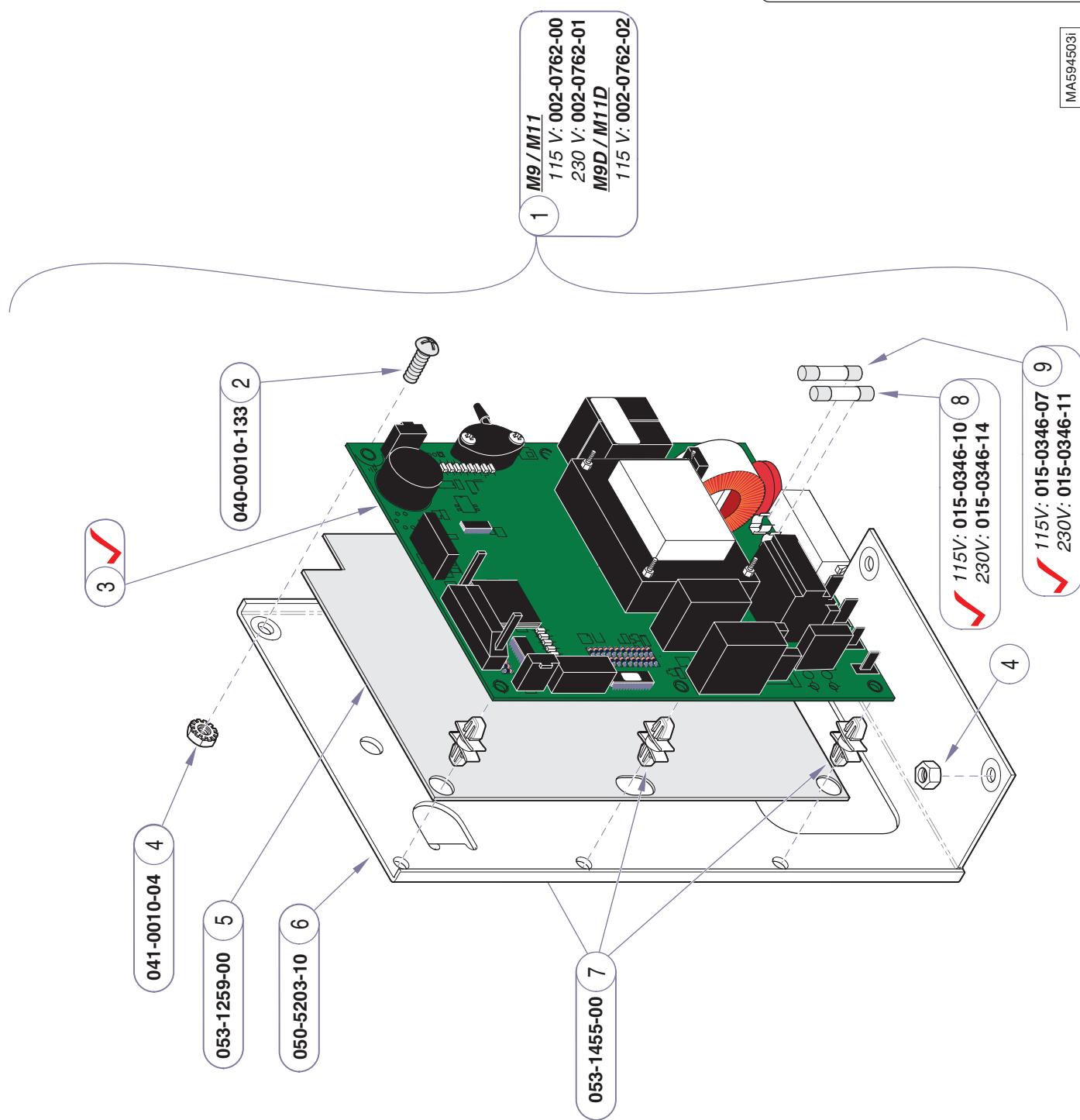
MAG68801i

**Models:**  ALL   
**Serial Numbers:**

**Touch Pad &  
Display Panel**

**Refer To:**

	<b>Page</b>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



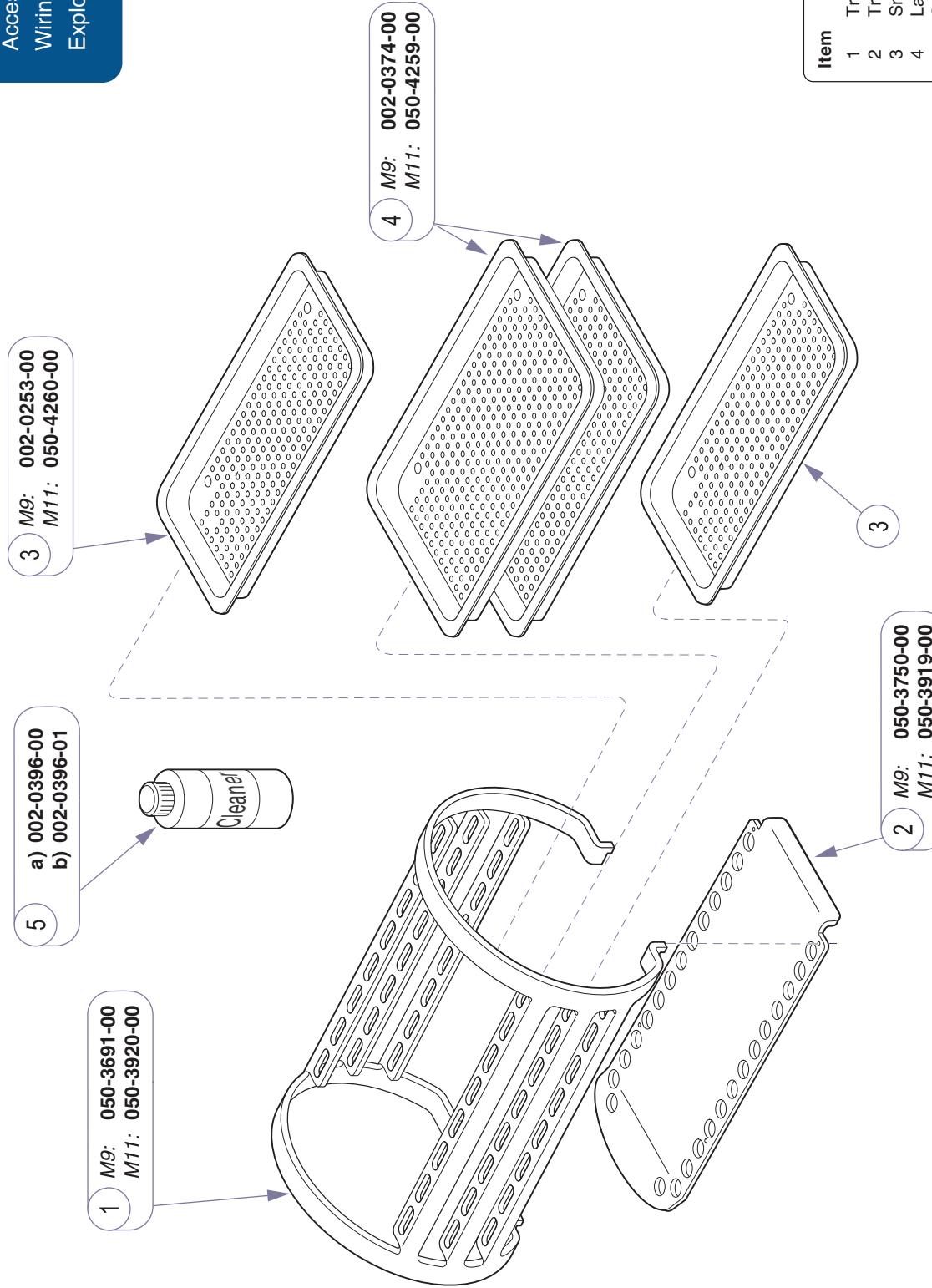
**Refer To:**

Page	
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1

3 M9: 002-0253-00  
M11: 050-4260-00

5 a) 002-0396-00  
b) 002-0396-01

1 M9: 050-3691-00  
M11: 050-3920-00



Item	Description	Qty.
1	Tray Rack .....	1
2	Tray Plate .....	1
3	Small Tray .....	2
4	Large Tray .....	2
5	SpeedClean (w/MSDS): a) One Bottle - Midmark .....	AR
	b) One Case - Midmark (12 bottles) .....	AR

MA604902I

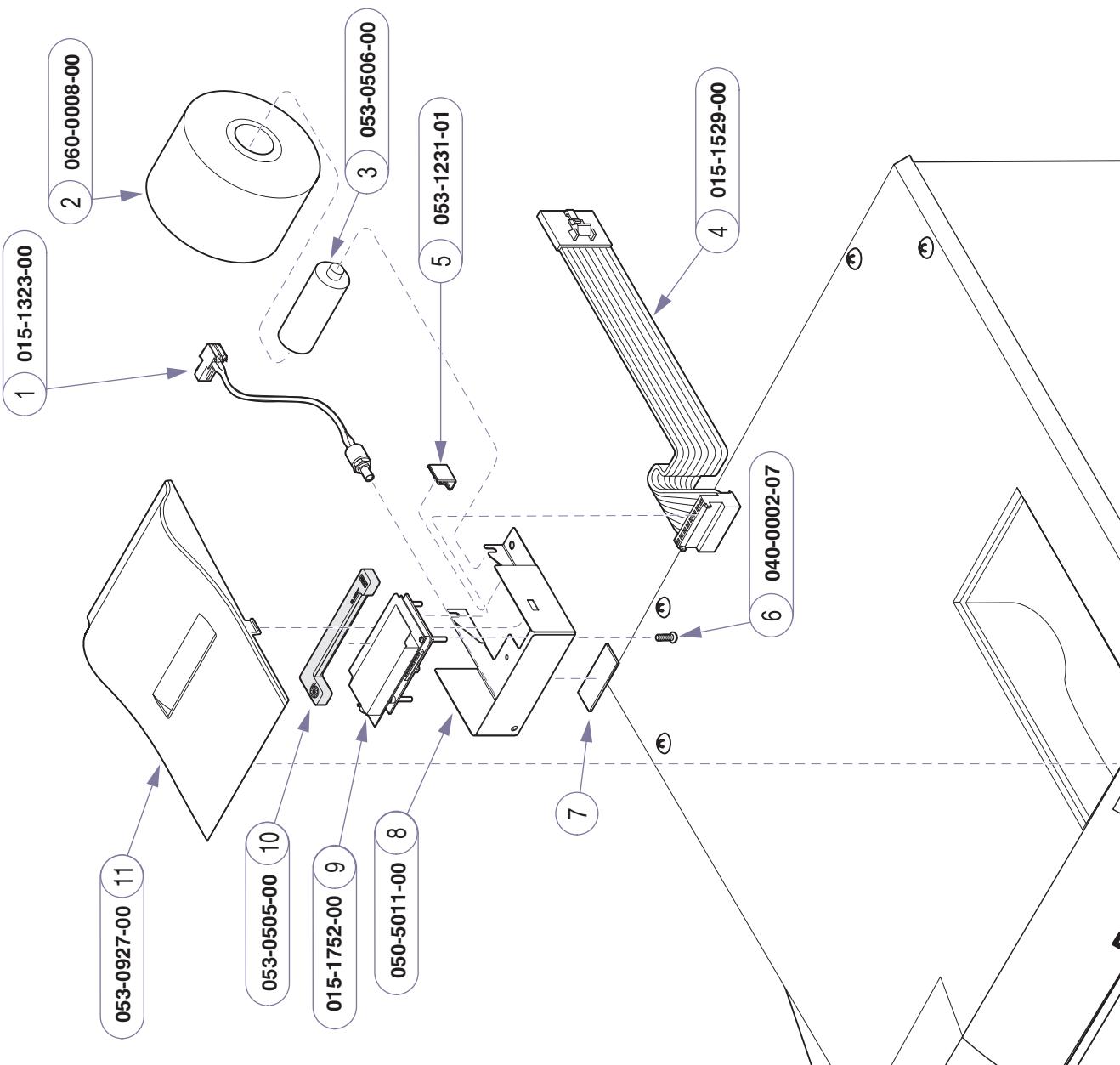
**Always Specify Model & Serial Number**

**Models:** | ALL |  
**Serial Numbers:** |

**Trays / Rack / Cleaner**

**Refer To:**

	<b>Page</b>
Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures .....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



<b>Item</b>	<b>Description</b>	<b>Qty.</b>
1	Feed Cable .....	1
2	Paper Roll .....	1
3	Spindle .....	1
4	Ribbon Harness .....	1
5	Cable Clamp .....	1
6	Screw (#2-56 x 1/4") .....	4
7	Serial Number_Label (n/a) .....	1
8	Bracket .....	1
9	Printer Module .....	1
10	Ribbon Cartridge .....	1
11	Cover .....	1

**Always Specify Model & Serial Number**

MAS598601i

**Models:**  
 Serial Numbers:

 9A259001 Printer  
*(optional)*

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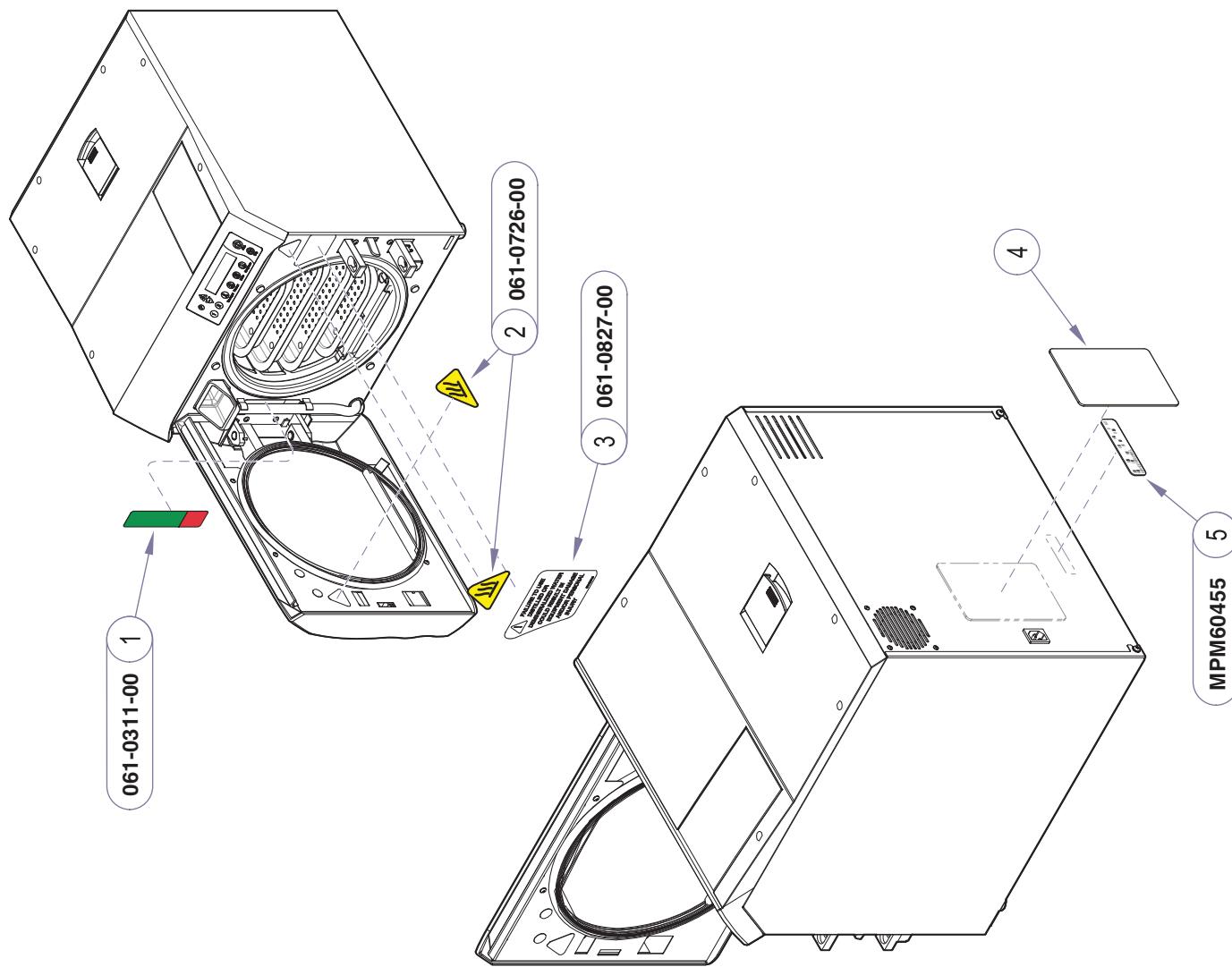
**Refer To:**

- Operation & Troubleshooting ..... A-1
- Component Testing / Repair ..... B-1
- Access Procedures ..... C-1
- Wiring Diagrams ..... D-1
- Exploded Views / Part Numbers ... E-1

**Page**

**E-19**

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<b>Item</b>	<b>Description</b>	<b>Aqty.</b>
1	Water Level Label	1
2	Hot Surface Label	2
3	Distilled Water Label	1
4	Serial Number Label (n/a)	1
5	Caution Label	1

MA606103i

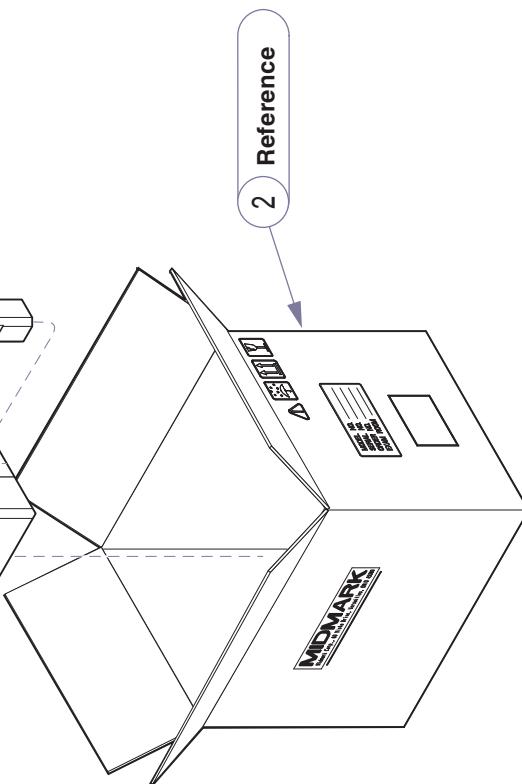
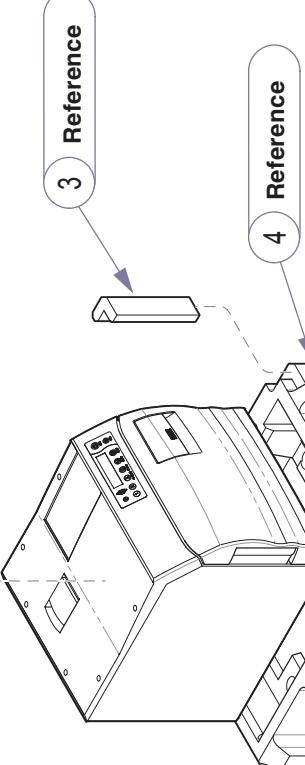
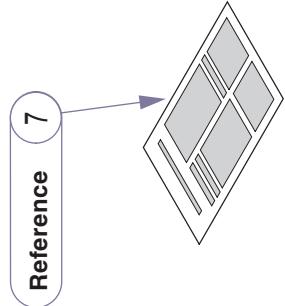
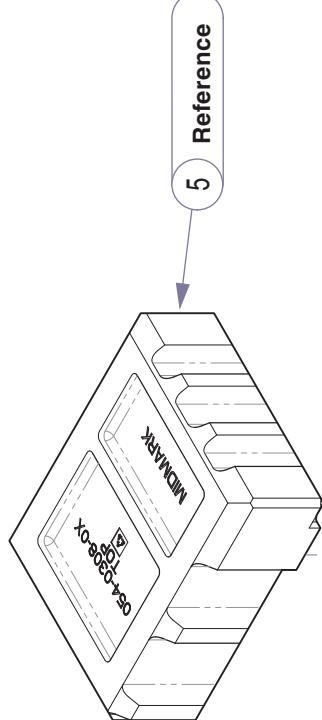
**Always Specify Model & Serial Number**

**Models:**  ALL    
**Serial Numbers:**

**Labels & Decals**

**Refer To:**

Operation & Troubleshooting .....	A-1
Component Testing / Repair .....	B-1
Access Procedures.....	C-1
Wiring Diagrams .....	D-1
Exploded Views / Part Numbers ..	E-1



1 002-0785-00

**Qty.**

**Description**

Item	Description	Qty.
1	M9/M9D Packaging <i>(Includes items 2 thru 6)</i>	1
2	• Carton .....	1
3	• Corners .....	1
4	• Bottom Pad .....	1
5	• Top Pad .....	1
6	• Plastic Bag .....	1
7	Material Safety Data Sheet .....	1

**Always Specify Model & Serial Number**

MA594604i

**Packaging  
(M9/D)**

**Models:** *M9 (-020 / -022)* | *M9D (-020 / -022)*  
**Serial Numbers:** *ALL*

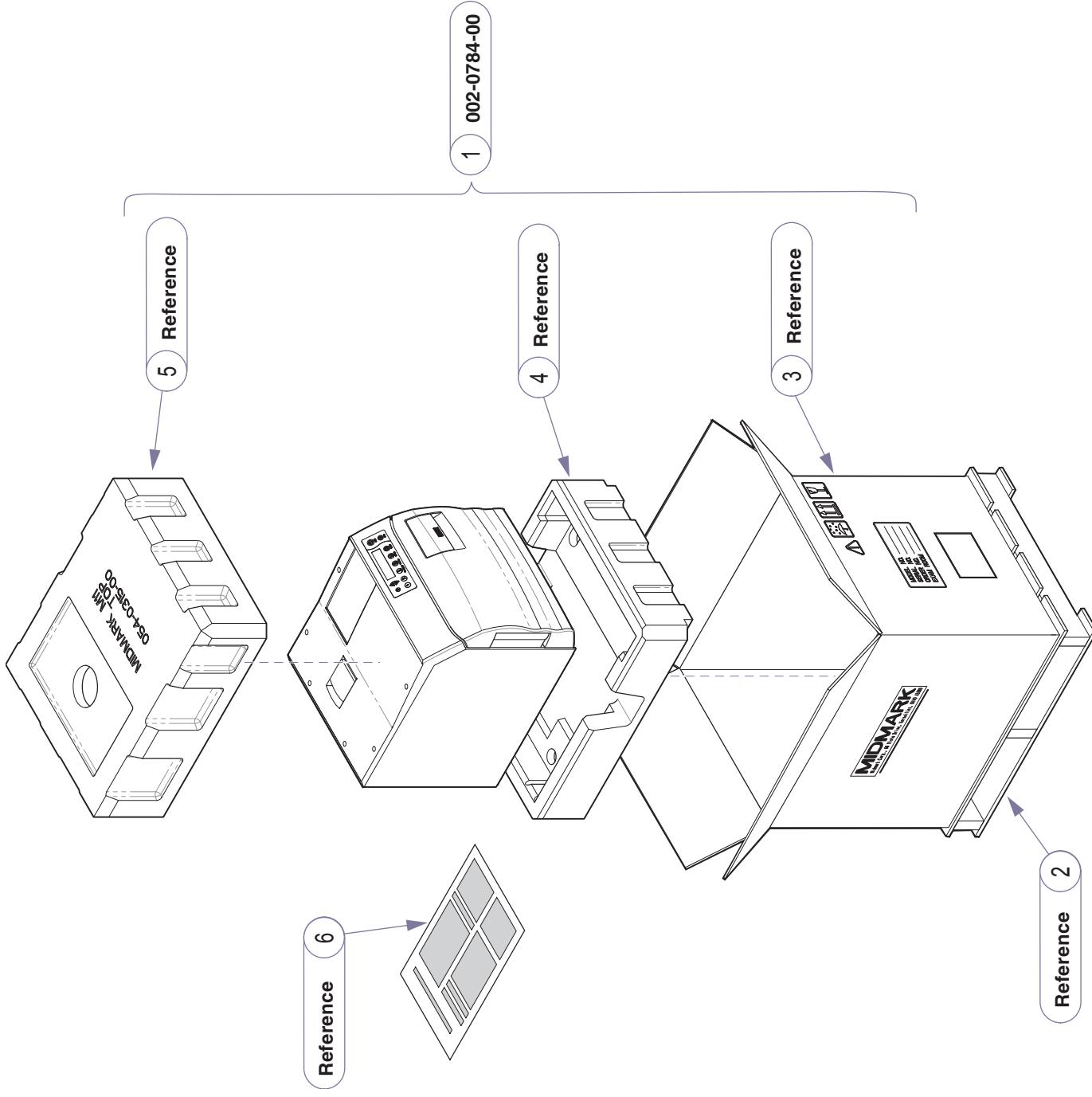
**ALL**

**Refer To:**

Page
Operation & Troubleshooting ..... A-1
Component Testing / Repair ..... B-1
Access Procedures ..... C-1
Wiring Diagrams ..... D-1
Exploded Views / Part Numbers .. E-1

Item	Description	Qty.
1	M11/M11D Packaging (Includes items 2 thru 8)	1
2	• Skid .....	1
3	• Carton .....	1
4	• Bottom Pad .....	1
5	• Top Pad .....	1
6	• Plastic Bag .....	1
7	Material Safety Data Sheet .....	1

MA598505i

**Always Specify Model & Serial Number**



## COMMENTS

The Technical Publications Department of Midmark Corporation takes pride in its manuals. We are sure that our manuals will fill all your needs when you are performing scheduled maintenance, servicing, or repairs on a Midmark product. However, if you find any errors or feel there should be a change, addition, or deletion to the manuals, please let us know. We will correct any errors that we are made aware of and we will review requests for changes, additions, or deletions to the manuals and incorporate those requests deemed appropriate. If you see something in one of our manuals that you like or dislike, please let us know. Also, if there is something you feel we could do to produce a better manual, please let us know.

If an error is found, please list the page and paragraph/figure in which the error was found along with a brief description of what the error is. If the correction to the error is known, please include that information also. If a change, addition, or deletion is being requested, please list the page and paragraph/figure needing the change, along with a brief description of how you feel the paragraph/figure should be changed.

Please fax or mail a copy of this completed comment sheet to:

Midmark Corporation  
ATTN: Technical Publications Dept.  
60 Vista Drive  
Versailles, Ohio 45380  
Fax: (937) 526-5542



## SERVICE PARTS FAX ORDERING FORM

(Do not tear out this page. Photo copy this page for use only.)

### IMPORTANT NOTES:

- 1) Use this form for all *non-warranty* orders only. Warranty orders must be telephoned in (1-800-643-6275).
- 2) FAX number to send order to:  
877-249-1793
- 3) All emergency orders must be received @ Midmark by 1:00 pm EST.
- 4) All underlined headings should be filled in prior to submittal.

### ATTENTION: CUSTOMER SERVICE DEPARTMENT

ADDITIONAL COMMENTS:

DATE: _____ / _____ / _____	TIME: _____	am pm
<b>METHOD OF SHIPMENT:</b>		
PRIORITY: <input type="checkbox"/>	NON-EMERGENCY ORDER {to ship within 72 hours if part(s) are in stock.}	
<input type="checkbox"/>	EMERGENCY ORDER {to ship within 24 hours if part(s) are in stock.} [see note 3]	

MODEL #:	SERIAL #:	SALES ORDER # (if applicable)
NAME: _____		
ADDRESS: _____		
CITY: _____	STATE: _____	ZIP: _____
CONTACT: _____		
PHONE: _____		
FAX #: _____		

LINE #	PART NUMBER	Q.TY.	DESCRIPTION	COLOR (if applicable)

CREDIT CARD INFORMATION  
 CARD TYPE \_\_\_\_\_  
 NAME ON CARD \_\_\_\_\_

EXP. DATE \_\_\_\_\_ / \_\_\_\_\_  
 CARD # \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_  
 SIGNATURE \_\_\_\_\_



Subject to change without notice.  
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