

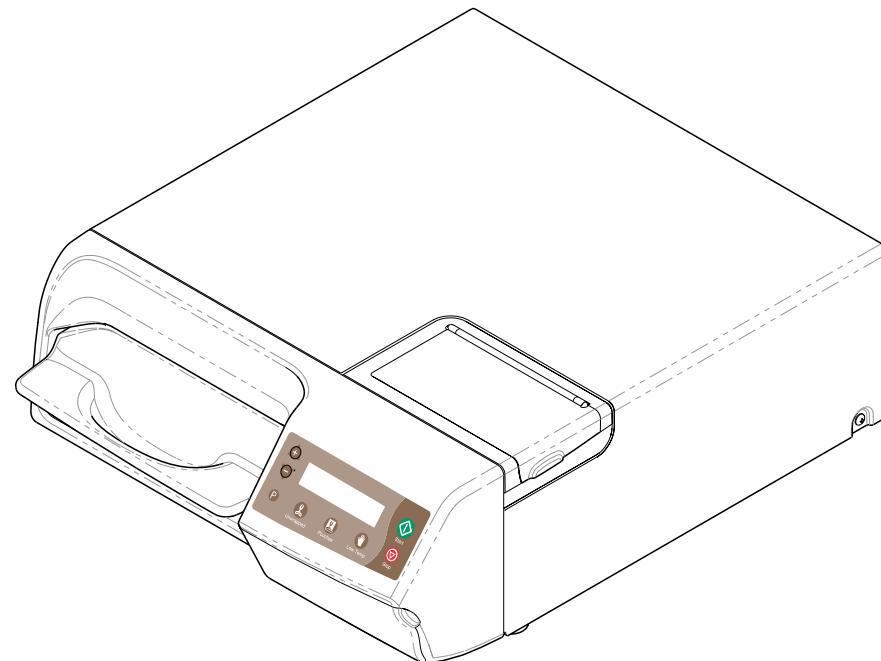
M3 UltraFast® Dental Handpiece Sterilizer



Model Numbers:

M3 -001 thru -004

Service and
Parts Manual



SA104100i

FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY

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(*) Indicates multiple pages due to model / serial number break(s).

General Information

Symbols

**DANGER**

Indicates an imminently hazardous situation which will result in serious or fatal injury if not avoided.
This symbol is used only in the most extreme conditions.

**WARNING**

Indicates a potentially hazardous situation which could result in serious injury if not avoided.

**Caution**

Indicates a potentially hazardous situation which may result in minor or moderate injury if not avoided. It may also be used to alert against unsafe practices

**Equipment Alert**

Indicates a potentially hazardous situation which could result in equipment damage if not avoided.

Note

Used for special instructions or additional information.

The symbols below may be used in this manual to represent the operational status of sterilizer 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 is not working at all, or that the component is faulty.

Ordering Parts

The following information is required when ordering parts:

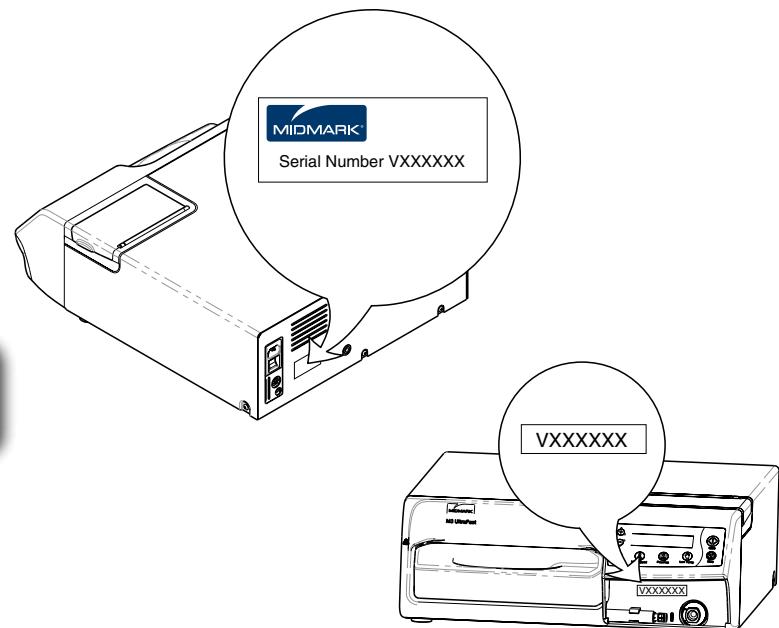
- Serial number & model number
- Part number for desired part
[Refer to Section E: Exploded Views & Parts Lists]

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 to 5:00 p.m. EST (Monday thru Friday)
Phone: 1-800-Midmark (1-800-643-6275)

Serial Number Location



SA103100i

General Information

Weights, Dimensions, Electrical Specifications

Note

To ensure unit is properly grounded, it must be connected to a matching grounded, dedicated, correctly polarized receptacle.

Electrical Ratings:

115 VAC Unit

Circuit Requirements* 120 VAC, 50/60 Hz, 12 amp
Max. Power Consumption 1400 watts

230 VAC Unit

Circuit Requirements* 230 VAC, 50/60 Hz, 6 amp
Max. Power Consumption 1400 watts

*Power source must have over voltage limits less than 1500 watts from mains to ground. (Installation Category II in accordance to IEC 664)

Fuse Ratings:

115 VAC Unit

F1 15 Amp, 250 V, Fast Acting, 1/4" x 1 1/4"
F2 0.25 Amp, 250 V, Slo-blo, 1/4" x 1 1/4"

230 VAC Unit

F1 8 Amp, 250 V, Fast Acting, 5 x 20mm
F2 0.125 Amp, 250 V, Slo-blo, 5 x 20mm

Certifications:

ASME Boiler & Pressure Vessel Code, Section VIII, Division 1

Canadian Registration Number Available

UL 61010-1 2nd Edition

IEC 61010-2-040 1st Edition

CAN/CSA-C22.2 No. 61010-1 2nd Edition

FCC Part 15, Sub-part B

Physical Dimensions:

Overall Length (A) 21 in. (53.3 cm)
Overall Width (B) 17.8 in. (45.2 cm)
Overall Height (C) 6.9 in. (17.5 cm)
Shipping Carton Length 25 in. (63.5 cm)
Shipping Carton Width 22 in. (55.9 cm)
Shipping Carton Height 16.6 in (42.2 cm)
Counter Area 24 in. (61 cm) deep x 22 in. (55.9 cm) wide
Chamber Volume 0.49 gal (1.8 liter)

Weight:

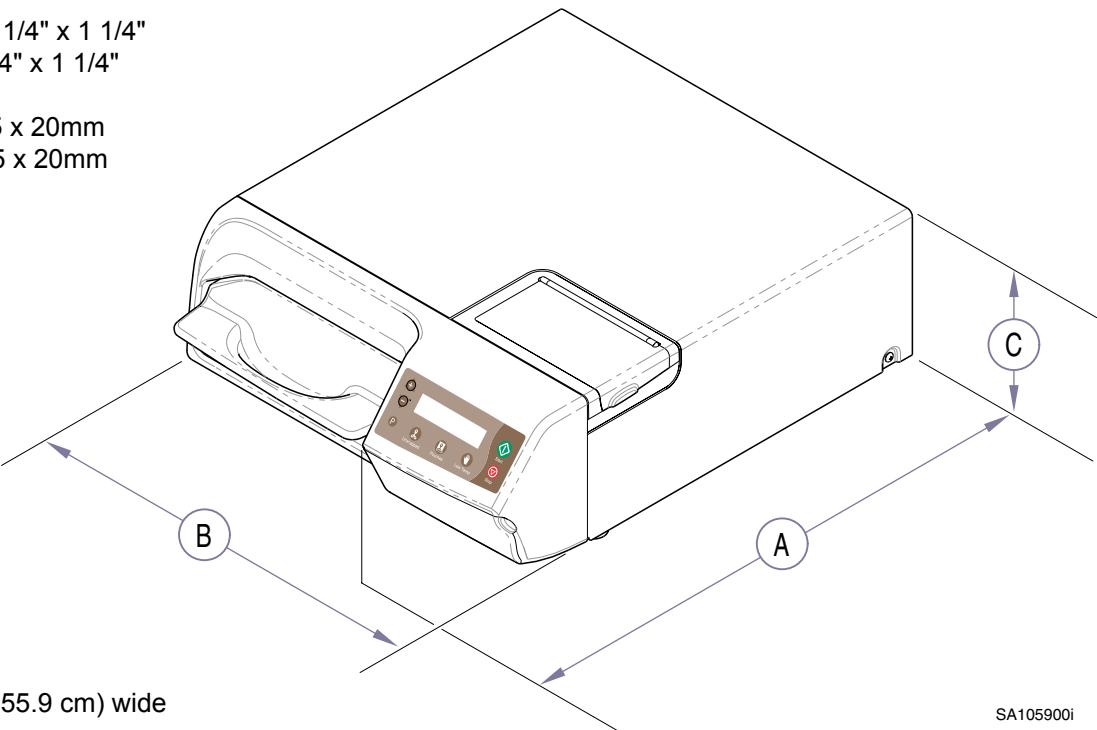
Empty Reservoir 71 lbs. (32.2 kg)
Full Reservoir 80 lbs (36.3 kg)
With Shipping Carton 80 lbs (36.3 kg)

Water Reservoir Capacity: 1.20 gal (4.5 liter)

Pressure Relief Valve Setting: 40 PSI (275.8 kPA)

Chamber Pressure:

@ 270° F (132° C) 27.1 PSI (186.2 kPA)



SA105900i

Scheduled Maintenance / Cleaning Chart

Interval	Inspection / Service	Description
Periodically	Cleaning	Clean external surfaces, tray, & chamber with mild soap and distilled water. Wipe dry.
		Clean door gasket & mating surface with a damp cloth. Inspect gasket for damage, replace gasket if necessary.
		Empty water from condensing tank. Clean tank with diluted bleach solution (<i>1/4 cup bleach : 1 gallon water</i>) & a brush. Rinse tank, then fill to the minimum water level indicator line.
	Obvious Damage	Visually inspect components for damage that could cause problems during operation or unsafe operation.
	Drain / Refill Reservoir	Using the drain hose, drain all water from the reservoir. Refill reservoir with distilled water.
	Hardware	All fasteners must be present and fastened securely.
	Electrical System	Inspect power cord and all wiring for damage.
		Be sure all electrical connections are tight.
Monthly	Cleaning	Remove & clean filter using a mild soap solution & a brush. Place in ultrasonic cleaner if necessary. Rinse with distilled water.
		Clean condensing tank level sensors with mild soap solution. Wipe dry.
Date of Service:		Model Number:
Location:		Serial Number:
Service Technician:		Notes:

Cycle Parameters

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

(ATTENTION: Before sterilizing any item in the M3, refer to **Loading the Tray** in the user's guide).

CYCLE	STERILIZATION PARAMETERS	DRY TIME	ITEMS TO BE STERILIZED
 Unwrapped	Temperature: 270° F (132° C) Pressure: 27.1 psi (186 kPa) Time: 3:30 Minutes	Time: 25 Minutes	<ul style="list-style-type: none">Dental Instruments / handpieces loose on a tray.Other items manufacturers recommend for exposure at 270° F (132° C), loose on a tray.
 Pouches	Temperature: 270° F (132° C) Pressure: 27.1 psi (186 kPa) Time: 5:30 Minutes	Time: 30 Minutes	<ul style="list-style-type: none">Dental Instruments / handpieces in pouches, wrapped, or in a wrapped cassette.Other items manufacturers recommend for exposure at 270° F (132° C), in pouches, wrapped, or in a wrapped cassette.
 Low Temp	Temperature: 250° F (121° C) Pressure: 15.0 psi (104 kPa) Time: 20:00 Minutes	Time: 50 Minutes	<ul style="list-style-type: none">Rubber or plastic dental items, dental instruments / handpieces loose on a tray, in pouches, wrapped, or in a wrapped or unwrapped cassette.Other items manufacturers recommend for exposure at 250° F (121° C), loose on a tray, in pouches, wrapped, or in a wrapped or unwrapped cassette.

Warranty Information

Limited Warranty

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 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, EXPRESSED 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.

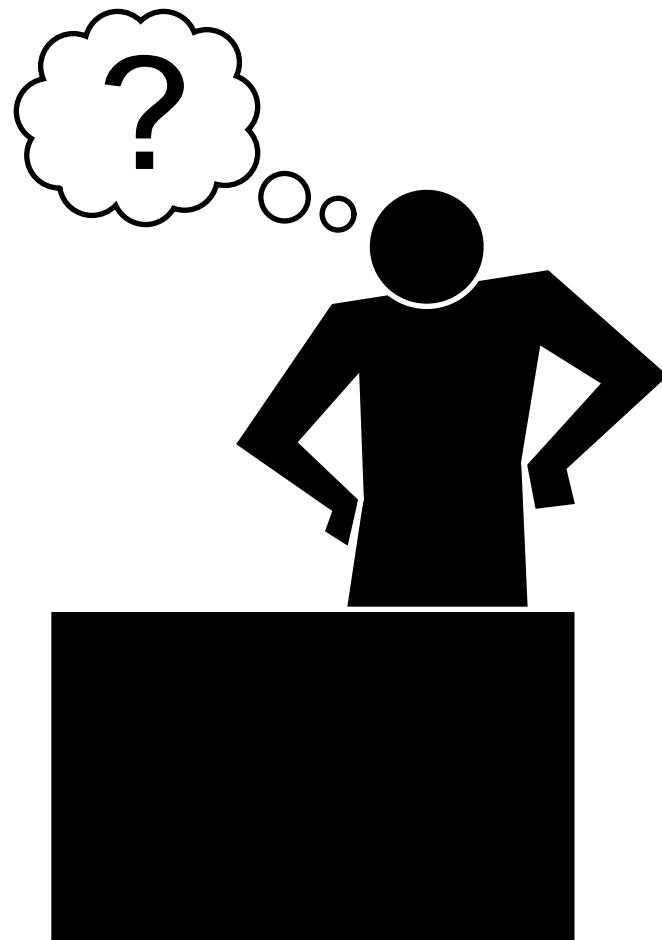
Additional Information

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 sterilizeruntil 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.

A Section

Troubleshooting

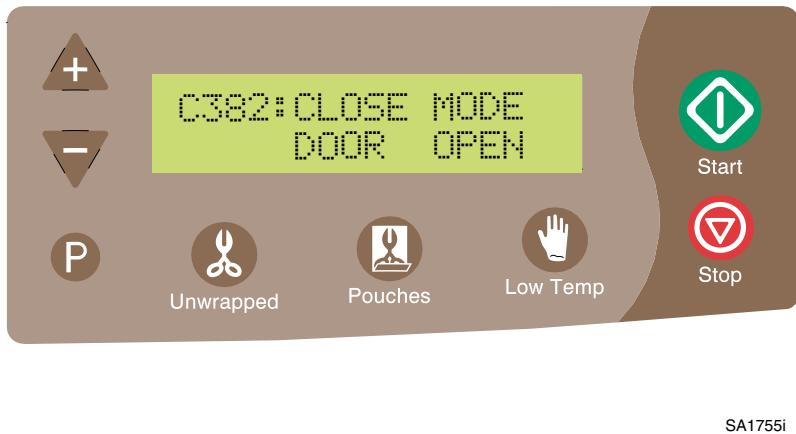


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Error Codes

If a system 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 occurs.
(example: 3 = door)

Second Digit = What?

The second digit indicates what problem or symptom was detected.
(example: 8 = Open)

Third Digit = When?

The third digit indicates when the problem was detected.
(example: 2 = Door Close Mode)

Error Codes

C010: (System Power Loss).....	A-3
C060: (System Hardware)	A-4
C100 Series: (Stop Key)	A-4
C230 Series: (Water Low)	A-4
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The table below cross-references the numeric error code with the Component, Problem, and Mode.

First Digit (Component)	Second Digit (Problem)	Third Digit (Mode)
0 = General System	0 (Blank) *	0 = Power Up Mode
1 = Stop Button	1 = Power Loss	1 = Select Cycle Mode
2 = Water Level Sensor	2 = Closed	2 = Door Close Mode
3 = Door Switch	3 = Low	3 = Heat Up Mode
4 = Ext. Condensing Tank	4 = High	4 = Sterilize Mode
5 = Temperature Sensor	5 = Tray Switch Open	5 = Vent Mode
6 = Pressure Sensor	6 = Hardware	6 = Door Open Mode
7 = Boiler Temperature	7 = Over Limit	7 = Dry Mode
8 = Dry Heater Temperature	8 = Open	8 (not used)
9 = High Limit Thermostat	9 (not used)	9 = Misc.

* 0 is used in the 100 series error codes to indicate the STOP key was pressed.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
Sterilizer has <u>no</u> power.	Touchpad & display do not work. (Switch failure under probable cause would only be on newer style PC boards)	Sterilizer not plugged in.	Check power cord connections at wall outlet and on back of sterilizer.	Secure power cord connections.
		Power switch turned off.	Check power switch.	Turn power switch on.
		No power at wall outlet.	Check voltage at wall outlet.	Reset facility circuit breaker. The sterilizer should be plugged into a dedicated 20 amp circuit.
		F1 fuse on PC board is blown or open.	Check F1 fuse for continuity.	Replace fuse.
		Inlet switch module failure.	Check inlet switch module. Refer to: Inlet Switch Module Test	Perform continuity test on inlet switch module.
Sterilizer <u>has</u> power, but touchpad & display do not work.	Touchpad & display do not work.	F2 fuse on PC board is blown or open.	Check F2 fuse for continuity.	Replace fuse.
		Ribbon cable from J15 on main PC board to J3 on display PC board is loose or disconnected.	Check ribbon cable connections at J15 on main PC board & J3 on display PC board.	Secure ribbon cable connections.
		J15 / J3 ribbon cable has open lead(s).	Check J15 / J3 ribbon cable for continuity.	Replace ribbon cable.
		Main PC board is malfunctioning.	Check for 5 VDC between TP1 & TP4, and on J15 across pins 1 & 2 on main PC board.	If 5 VDC is not present at these points, replace main PC board.
	Display is blank or undefined characters & intermittent beeps.	Display PC board is malfunctioning	Check for 5 VDC between R1 & J1 on display PC board.	If 5 VDC is not present, replace display PC board.
	Display works but touch pad doesn't.	Ribbon cable from J2 to touch pad is disconnected.	Check J2 Plug connection.	Assure J2 Plug pins are aligned and connected securely.
		J2 ribbon cable to touch pad has open lead(s).	Check continuity of J2 ribbon cable and touch pad.	Replace touch pad and ribbon cable assembly.
Unit has power, but the door is not open in Select Cycle Mode, and there is no error code associated with this condition.	Display is normal.	Door motor connecting rod is broken.	Remove top cover and verify that the door motor connecting rod is intact.	Replace door motor connecting rod.
C010	C010: POWER UP MODE SYSTEM POWER LOSS ... ITEMS NOT STERILE PUSH STOP TO RESTART Power interruption during any mode in which sterilization may be compromised.	User turned power off during Chamber Close, Heat Up, or Sterilization Mode.	Ask questions about usage patterns	Train user on proper operation.
		Unit plugged into a non dedicated, 20 amp circuit.	Check if unit is plugged into a dedicated 20 amp circuit.	Connect unit to a dedicated 20 amp circuit.
		Some other event (such as a storm, a power outage, ect.) interrupted power.	Ask questions about recent electrical events (storms, outages, ect.).	If this is a common occurrence, isolate from source of electrical interference.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
C060	C060: POWER UP MODE SYSTEM HARDWARE ... TURN POWER OFF/ON At power-up, memory or other hardware cannot be properly read or initialized.	(If occasional) power has been rapidly cycled off then on again by user (possibly to clear another error).	Ask questions about usage patterns.	Train user on proper operation.
		(If occasional) power has been rapidly cycled off then on again by an electrical interruption (such as a storm, power outage, ect.).	Check if sterilizer is plugged into a dedicated 20 amp circuit.	Connect unit to a dedicated 20 amp circuit.
		(If persistent) damaged component on PC board.	Ask questions about recent electrical events.	If this is a common occurrence, isolate from source of electrical interference.
			Turn power switch off. Wait 20 seconds, and turn power back on. Repeat several times in a row.	Replace PC board if necessary.
C099	C099: MISC MODE ??? ??? ... UNPLUG / RE-PLUG UNIT An error that can occur while connected to a PC, ect. This error will never be caused by normal usage.	Code was generated at the factory during testing when an external device such as a PC or laptop was connected to the sterilizer main PC board.	No check necessary.	Contact Midmark's Technical Service Department.
C102: Close Mode C103: Heatup Mode C104: Sterilize Mode C105: Vent Mode C106: Open Mode	C10X: XXXX MODE STOP KEY ... ITEMS NOT STERILE PUSH STOP TO RESTART The STOP key was sensed during a cycle.	User pressed the STOP key during the cycle.	Ask questions about usage patterns.	Train user on proper operation. Press STOP key to clear error. Note: It may be necessary to wait briefly (up to 1 minute) while chamber pressure & temperature dissipate.
		Membrane switch (touchpad) is damaged.	Perform key test. Refer to: Service Diagnostics Key Test .	Replace membrane switch.
C232: Close Mode	C232: CLOSE MODE WATER LOW ... ITEMS NOT STERILE PUSH STOP TO RESTART Reservoir water level sensor detects the supply water is low.	Reservoir water level low.	Check water level in reservoir.	Fill reservoir with distilled water.
		Faulty water level sensor.	Refer to: I/O Test Water Level / External Tank Display Screen .	Replace water level sensor.
		Level sensor connection loose or disconnected, or broken wires.	Check level sensor connection at J13 on PC board, and related leads	Assure J13 plug connection is securely connected and related wires are not damaged.
		Malfunctioning PC board.	Run service diagnostics, and check for 4.5 to 5.0 VDC at J13 pins 1 & 2 on PC board when level sensor state is being displayed on LCD.	If no voltage, replace PC board.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
C321: Select Mode C326: Open Mode	C32X: XXXX MODE DOOR CLOSED ... PUSH STOP TO RESTART Door Motor Open Switch is not sensed as being open when should be.	Something outside of the unit is physically interfering with the movement of the door.	Verify that there is nothing outside of the unit stopping movement of the door.	Remove any external impediment to door movement.
		The door motor cam is not making contact with the Door Open Switch.	Remove top cover, put unit into Service Diagnostics, and verify that the door motor is not broken and physically attempts to operate.	Replace door motor.
		Door will not open because there is too much pressure in chamber.	Check for obstruction in plastic tube connecting unit to external condensing tank. Check copper coil in external condensing tank for blockage or damage.	Unkink plastic tube, remove obstruction, or replace. Clear obstruction or replace copper coil.
			Check vent port in chamber for blockage. Check filter for blockage.	Clear obstruction in vent port. Clean or replace filter.
			Check vent valve for blockage. Put unit into Service Diagnostics and check vent valve operation.	Clean or replace vent valve.
			Put unit into Service Diagnostics, and verify that the PC board is energizing vent valve when appropriate.	Replace PC board, if necessary.
		Pressure Interlock Assy. is stuck open.	Verify that chamber pressure is zero and then check the state of the pressure interlock assy.	Replace pressure interlock assy.
		Door Open Switch is stuck in the closed state.	Put unit into Service Diagnostics, and verify that the Door Open Switch is operating normally.	Replace door switch / harness assy.
		Something inside the chamber is physically interfering with the movement of the door.	Verify that there is nothing jammed inside the chamber stopping movement of the door by manually opening the door.	Turn power off, remove top cover, and purge chamber of pressure. Remove pivot pin from door motor connecting rod and pivot bracket, then manually open the door. Remove jammed instruments.
		PC Board is not energizing door motor.	Put unit into Service Diagnostics and verify that the PC board is energizing door motor when appropriate.	Replace PC board, if necessary.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
C352: Close Mode C353: Heatup Mode C354: Sterilize Mode C355: Vent Mode	C35X: XXXX MODE TRAY SWITCH OPEN ... ITEMS NOT STERILE PUSH STOP TO RESTART Tray Switch not sensed as fully closed when it should be.	Tray not properly staged when inserted into chamber. Tray handle's plastic key is broken off. Tray switch is not positioned correctly, and is not sensing presence of tray. Tray switch is faulty.	Ask questions about the way the user loads the tray. Ensure that left lower side of plastic tray handle has a "key" that sticks out about an inch. Use Service Diagnostics to verify that the tray switch actuates when the tray initially crests bump in the tusk. Use Service Diagnostics to ensure that the switch operates correctly.	Train user to fully stage the tray before attempting to start a cycle. Replace bottom door tray handle. Adjust the tray switch bracket. Replace door switch / harness assy.
C382: Close Mode C383: Heatup Mode C384: Sterilize Mode C385: Vent Mode	C38X: XXXX MODE DOOR OPEN ... ITEMS NOT STERILE PUSH STOP TO RESTART Door Motor Closed Switch has been activated, stopping the door motor, but the Door Claw Switch is not sensed as being closed.	Something outside of the unit is physically interfering with the movement of the door. The door motor cam is not making contact with the Door Closed Switch. Door will not close because there is too much pressure in chamber.	Verify that there is nothing outside of the unit stopping movement of the door. Remove top cover, put unit into Service Diagnostics, and verify that the door motor is not broken and physically attempts to operate. Check for obstruction in plastic tube connecting unit to external condensing tank. Check copper coil in external condensing tank for blockage or damage. Check vent port in chamber for blockage. Check filter for blockage. Check vent valve for blockage. Put unit into Service Diagnostics and check vent valve operation. Put unit into Service Diagnostics, and verify that the PC board is energizing vent valve when appropriate.	Remove any external impediment to door movement. Replace door motor. Unkink plastic tube, remove obstruction, or replace. Clear obstruction or replace copper coil. Clear obstruction in vent port. Clean or replace filter. Clean or replace vent valve. Replace PC board, if necessary.
		Door motor bracket not adjusted properly.	Verify that, when the door motor is in the closed position, there is enough throw to physically close the door all the way.	If there is not enough throw, adjust the door motor more toward the rear of the unit.
		Door Closed Switch is stuck in the closed state.	Put unit in Service Diagnostics, and verify that the door closed switch is operating normally.	Replace door switch / harness assy.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
C382: Close Mode C383: Heatup Mode C384: Sterilize Mode C385: Vent Mode (Continued)	Door Motor Closed Switch has been activated, stopping the door motor, but the Door Claw Switch is not sensed as being closed.	Something inside the chamber is physically interfering with the movement of the door. PC Board is not energizing door motor.	Verify that there is nothing jammed inside the chamber stopping movement of the door. Put unit into Service Diagnostics and verify that the PC board is energizing door motor when appropriate.	Remove any jammed instruments. Replace PC board, if necessary.
C442: Close Mode	C442: CLOSE MODE EXTERNAL TANK FULL ... PUSH STOP TO RESTART The external tank water level sensor detected water level in the external tank is too high to perform next cycle.	External condensing tank is full. Corrosion on condensing tank level sensors. Level sensors or attached wiring damaged. System is not processing data properly.	Visually check tank to see if full. Visually inspect external condensing tank water level sensors. Check level sensors and attached wiring for damage. Go into Service Diagnostics to verify sensor operation.	Empty external condensing tank.. Clean sensors, copper coil, and inside of condensing tank with a clean cloth. Replace level sensors and/or wiring. Refer to: I/O Test Water Level / External Tank Display Screen .
C533: Heatup Mode C534: Sterilize Mode	C53X: XXXX MODE STEAM TEMP LOW ... ITEMS NOT STERILE TURN POWER OFF/ON During heatup mode, sterilization mode is not reached within 15 minutes. During Sterilization Mode, steam temperature drops to a point less than or equal to the set point chosen during Select Cycle Mode.	Low water in reservoir Low water in reservoir not caught by a C23x error. Water pump not primed. Steam leakage. Chamber temperature sensor not functioning properly. Boiler temperature sensor not functioning properly. Boiler not functioning properly. PC Board is not processing temperature input(s) properly. Defective check valve in water pump.	Check water level in reservoir. Refer to: I/O Test Water Level / External Tank Display Screen . Refer to: Water pump priming instructions . Refer to: Five point leak check . Refer to: Temperature Sensor Resistance Test . Refer to: Temperature Sensor Resistance Test . Refer to: Service Diagnostics Boiler Test . Verify boiler and chamber temperature sensors are working properly. Check for large air pocket forming in tubing, that moves from the boiler to water pump.	Fill reservoir with distilled water. Replace water level sensor. Prime water pump. Repair steam leak. Clean or replace chamber temperature sensor. Replace boiler temperature sensor. Replace boiler if necessary. Replace PC board if necessary. Replace water pump.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
C540: Power Up Mode C544: Sterilize Mode C546: Open Mode	C54X: XXXX MODE STEAM TEMP HIGH ... ITEMS NOT STERILE TURN POWER OFF/ON During Sterilization Mode, steam temperature rises to a point greater than or equal to the set point + 8° F.	Steam not being released from chamber.	Check for obstruction in plastic tube connecting unit to external condensing tank. Check copper coil in external condensing tank for blockage or damage. Check vent port in chamber for blockage. Check filter for blockage. Check vent valve for blockage. Put unit into Service Diagnostics and check vent valve operation.	Unkink plastic tube, remove obstruction, or replace. Clear obstruction or replace copper coil. Clear obstruction in vent port. Clean or replace filter. Clean or replace vent valve.
C560: Power Up Mode C561: Select Mode C562: Close Mode C563: Heatup Mode C564: Sterilize Mode C565: Vent Mode C566: Open Mode C567: Dry Mode	C56X: XXXX MODE STEAM TEMP HARDWARE ... ITEMS NOT STERILE TURN POWER OFF/ON A/D converter on PC Board reports a steam temperature input value outside the normal limits.	Chamber temperature sensor disconnected from PC Board. Chamber temperature sensor not functioning properly. PC Board is not processing temperature input(s) properly	Check chamber temperature sensor wire connection at J11 on PC board. Refer to: Temperature Sensor Resistance Test. Verify boiler and chamber temperature sensors are working properly.	Secure wire connection. Clean or replace chamber temperature sensor. Replace PC board, if necessary.
C570: Power Up Mode C571: Select Mode C572: Close Mode C573: Heatup Mode C574: Sterilize Mode C575: Vent Mode C576: Open Mode C577: Dry Mode	C57X: XXXX MODE STEAM TEMP OVER LIMIT ... ITEMS NOT STERILE TURN POWER OFF/ON Steam temperature greater than 285° F (140.6° C)	Steam not being released from chamber.	Check for obstruction in plastic tube connecting unit to external condensing tank. Check copper coil in external condensing tank for blockage or damage. Check vent port in chamber for blockage. Check filter for blockage. Check vent valve for blockage. Put unit into Service Diagnostics and check vent valve operation.	Unkink plastic tube, remove obstruction, or replace. Clear obstruction or replace copper coil. Clear obstruction in vent port. Clean or replace filter. Clean or replace vent valve.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
C570: Power Up Mode C571: Select Mode C572: Close Mode C573: Heatup Mode C574: Sterilize Mode C575: Vent Mode C576: Open Mode C577: Dry Mode (Continued)	C57X: XXXX MODE STEAM TEMP OVER LIMIT ... ITEMS NOT STERILE TURN POWER OFF/ON Steam temperature is greater than 285° F (140.6° C)	Chamber temperature sensor not functioning properly. Boiler temperature sensor not functioning properly. PC Board is not processing temperature input(s) properly.	Refer to: Temperature Sensor Resistance Test.	Clean or replace chamber temperature sensor.
			Refer to: Temperature Sensor Resistance Test.	Replace boiler temperature sensor.
			Verify boiler and chamber temperature sensors are working properly.	Replace PC board, if necessary.
C630: Power Up Mode C633: Heatup Mode C634: Sterilizer Mode C635: Vent Mode C636: Open Mode	C63X: XXXX MODE PRESSURE LOW ... ITEMS NOT STERILE TURN POWER OFF/ON During Heatup Mode, the first vent valve open operation has to occur within 10 minutes.	Low water in reservoir Low water in reservoir not caught by a C23x error. Water pump not primed. Steam leakage. Chamber temperature sensor not functioning properly. Boiler temperature sensor not functioning properly. Boiler not functioning properly. Pressure transducer tubing damaged or disconnected. PC Board malfunctioning. Defective check valve in water pump. Pressure transducer port in chamber blocked	Check water level in reservoir. Refer to: I/O Test Water Level / External Tank Display Screen. Refer to: Water pump priming instructions. Refer to: Five point leak check. Refer to: Temperature Sensor Resistance Test. Refer to: Temperature Sensor Resistance Test. Refer to: Service Diagnostics Boiler Test. Inspect copper & neoprene tubing from chamber to pressure transducer. Varify that there are no other ways that pressure could not be transmitted from chamber to pressure transducer. Check for large air pocket forming in tubing, that moves from the boiler to water pump. Check for obstruction.	Fill reservoir with distilled water. Replace water level sensor. Prime water pump. Repair steam leak. Clean or replace chamber temperature sensor. Replace boiler temperature sensor. Replace boiler, if necessary. Repair or replace tubing, if necessary. Replace PC board, if necessary. Replace water pump. Remove obstruction.
C641: Select Mode C642: Close Mode C645: Vent Mode C646: Open Mode C647: Dry Mode Continue on Next Page....	C64X: XXXX MODE PRESSURE HIGH ... ITEMS NOT STERILE PUSH STOP TO RESTART The gauge pressure in the chamber is greater than 2.0 PSIG (13.8 kPag) when it should be near zero.	Steam not being released from chamber.	Check for obstruction in plastic tube connecting unit to external condensing tank Check copper coil in external condensing tank for blockage or damage. Check vent port in chamber for blockage. Check filter for blockage. Check vent valve for blockage. Put unit into Service Diagnostics and check vent valve operation.	Unkink plastic tube, remove obstruction, or replace. Clear obstruction or replace copper coil. Clear obstruction in vent port. Clean or replace filter. Clean or replace vent valve.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
Continued... C641: Select Mode C642: Close Mode C645: Vent Mode C646: Open Mode C647: Dry Mode	<i>Continued (same as previous page)....</i>	Pressure is being read abnormally high by pressure transducer.	Refer to: Service Diagnostics Chamber Pressure Display Screen.	Replace PC board, if necessary.
C660: Power Up Mode C661: Select Mode C662: Close Mode C663: Heatup Mode C664: Sterilize Mode C665: Vent Mode C666: Open Mode C667: Dry Mode	C66X: XXXX MODE PRESSURE HARDWARE ... ITEMS NOT STERILE TURN POWER OFF/ON A/D converter reports a gauge pressure input value outside the normal limits.	Electrical interruption.	If error is intermittent.	None. Ignore code.
		PC Board malfunctioning.	If error is persistent, then a problem exist.	Replace PC board, if necessary.
C670: Power Up Mode C671: Select Mode C673: Heatup Mode C674: Sterilize Mode C675: Vent Mode	C67X XXXX MODE PRESSURE OVER LIMIT ... ITEMS NOT STERILE TURN POWER OFF/ON Gauge chamber pressure greater than 40 PSI (275.8 kPa)	Steam not being released from chamber.	Check for obstruction in plastic tube connecting unit to external condensing tank	Unkink plastic tube, remove obstruction, or replace.
			Check copper coil in external condensing tank for blockage or damage.	Clear obstruction or replace copper coil.
			Check vent port in chamber for blockage. Check filter for blockage.	Clear obstruction in vent port. Clean or replace filter.
			Check vent valve for blockage. Put unit into Service Diagnostics and check vent valve operation.	Clean or replace vent valve.
		Chamber temperature sensor not functioning properly.	Refer to: Temperature Sensor Resistance Test.	Clean or replace chamber temperature sensor.
		Boiler temperature sensor not functioning properly.	Refer to: Temperature Sensor Resistance Test.	Replace boiler temperature sensor.
		PC Board is not processing temperature input(s) properly.	Verify temperature sensors are working properly.	Replace PC board, if necessary.
C760: Power Up Mode C761: Select Mode C762: Close Mode C763: Heatup Mode C764: Sterilize Mode C765: Vent Mode C766: Open Mode C767: Dry Mode	C76X: XXXX MODE BOILER TEMP HARDWARE ... ITEMS NOT STERILE TURN POWER OFF/ON A/D converter reports boiler temperature input value outside the normal limits.	Boiler temperature sensor disconnected at PC board.	Check for loose or broken wire connections at J10 on PC board.	Secure wire connections.
		Boiler temperature sensor not functioning properly.	Refer to: Temperature Sensor Resistance Test.	Replace boiler temperature sensor.
		Boiler not functioning properly.	Refer to: Service Diagnostics Boiler Test.	Replace boiler if necessary.
		PC Board is not processing temperature input(s) properly.	Verify boiler temperature sensor is working properly.	Replace PC board, if necessary.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
C770: Power Up Mode C771: Select Mode C772: Close Mode C773: Heatup Mode C774: Sterilize Mode C775: Vent Mode C776: Open Mode C777: Dry Mode	C77X: XXXX MODE BOILER TEMP OVER LIMIT ... ITEMS NOT STERILE TURN POWER OFF/ON Boiler temperature is greater than 340° F (171.1° C)	Steam not being released from chamber.	Check for obstruction in plastic tube connecting unit to external condensing tank	Unkink plastic tube, remove obstruction, or replace.
			Check copper coil in external condensing tank for blockage or damage.	Clear obstruction or replace copper coil.
			Check vent port in chamber for blockage. Check filter for blockage.	Clear obstruction in vent port. Clean or replace filter.
			Check vent valve for blockage. Put unit into Service Diagnostics and check vent valve operation.	Clean or replace vent valve.
		Boiler temperature sensor disconnected at PC board.	Check for loose or broken wire connections at J10 on PC board.	Secure wire connections.
		Boiler temperature sensor not functioning properly.	Refer to: Temperature Sensor Resistance Test .	Replace boiler temperature sensor.
		PC Board is not processing temperature input(s) properly	Verify boiler temperature sensors is working properly.	Replace PC board, if necessary.
C860: Power Up Mode C861: Select Mode C862: Close Mode C863: Heatup Mode C864: Sterilize Mode C865: Vent Mode C866: Open Mode	C86X: XXXX MODE DRYER TEMP HARDWARE ... ITEMS NOT STERILE TURN POWER OFF/ON A/D converter reports a dry heater temperature input value outside the normal limits.	Dry heater(s) disconnected from PC board.	Check dry heater connections at J7 & J8 on PC board.	Secure heater connections.
		Dry heaters malfunctioning.	Put unit into Service Diagnostics and verify heater operation.	If the condition persist, contact Midmark Technical Service Department.
		Dry heater (s) sensing circuit on PC Board malfunctioning.		If the condition persist, contact Midmark Technical Service Department.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
C870: Power Up Mode C871: Select Mode C872: Close Mode C873: Heatup Mode C874: Sterilize Mode C875: Vent Mode C876: Open Mode C877: Dry Mode	C87X: XXXX MODE DRYER TEMP OVER LIMIT ... ITEMS NOT STERILE TURN POWER OFF/ON Dry heater temperature greater than 325° F (162.8° C)	Dry heaters malfunctioning. Dry heater (s) sensing circuit on PC Board malfunctioning.	Put unit into Service Diagnostics and verify heater operation.	If the condition persist, contact Midmark Technical Service Department.
C881: Select Mode C887: Dry Mode	C88X: XXXX MODE DRYER HI-LIMIT OPEN ... ITEMS NOT STERILE TURN POWER OFF/ON Dry heater high-limit thermostat has opened for at least 0.25 seconds.	Dry heater(s) disconnected from PC board. PC board malfunctioning. Dry heater(s) malfunctioning. Dry heater (s) sensing circuit on PC Board malfunctioning.	Check dry heater connections at J7 & J8 on PC board. Refer to: Dry Heater Voltage Test . Refer to: Dry Heater Resistance Test .	Secure heater connections. Replace PC board, if necessary. If the condition persist, contact Midmark Technical Service Department. If the condition persist, contact Midmark Technical Service Department.
C981: Select Mode C982: Close Mode C983: Heatup Mode C984: Sterilize Mode C986: Open Mode C987: Dry Mode	C98X: XXXX MODE BOILER HI-LIMIT OPEN ... ITEMS NOT STERILE TURN POWER OFF/ON Boiler overheat thermostat has opened for at least 0.25 seconds & needs to be <u>manually reset</u> .	Water pump not primed. Boiler temperature sensor not functioning properly. Boiler overheat thermostat disconnected at PC board. Loose or broken wire connections at boiler overheat thermostat. Boiler overheat thermostat tripped open prematurely.	Refer to: Water pump priming instructions . Refer to: Temperature Sensor Resistance Test . Check wire connections at J3 on PC board. Check wire connections at boiler overheat thermostat. Check if overheat thermostat can be manually reset with a cooled boiler.	Prime water pump. Replace boiler temperature sensor. Secure wire connections. Secure wire connections. Replace overheat thermostat.
Sterilizer is not drying instruments properly.	Instruments are wet after dry cycle is complete.	Sterilizer not level. Sterilizer is over loaded. Pouches were placed in chamber with paper side up. Pouches are stacked on top of each other.	Check if sterilizer is level. Check if chamber is overloaded. Check if pouches are paper side up. Check if pouches are overlapping or stacked on top of each other.	Place sterilizer on a level surface. Reduce load size. Place pouches plastic side up. Pouches may overlap slightly, but items must not be layered.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
Sterilizer is not drying instruments properly. (continued)	Instruments are wet after dry cycle is complete.	Door tray was removed from chamber and reinserted.	Check if door tray was removed from chamber before completion of the dry cycle.	Instruct operator that once the door tray has been removed from chamber, the dry cycle will be terminated.
		Steam not being released from chamber.	Check for obstruction in plastic tube connecting unit to external condensing tank Check copper coil in external condensing tank for blockage or damage Check vent port in chamber for blockage. Check filter for blockage	Unkink plastic tube, remove obstruction, or replace. Clear obstruction or replace copper coil. Clear obstruction in vent port. Clean or replace filter.
			Check vent valve for blockage. Put unit into Service Diagnostics and check vent valve operation.	Clean or replace vent valve.
		Door tray is not opening to its fullest staged extent.	Check if door tray is opening enough to allow steam to escape from chamber.	Adjust door motor throw.
		Surface heater(s) malfunctioning.	Run Service Diagnostics and check operation of surface heater(s).	Contact Midmark's Technical Service Department.
Biological indicator or chemical indicator strip designates unit not sterilizing.	Positive biological indicator. No color change, or incomplete change has occurred on chemical indicator strip.	Sterilizer overloaded.	Check if chamber is overloaded.	Reduce load size.
		Improper usage.	Check user operating procedure.	Demonstrate proper operation to user.
		Wrong type of biological indicator or chemical indicator being used for this type of sterilizer.	Check biological or chemical indicator to assure it is for steam sterilization and is rated for the cycle times and temperature being used.	Refer to the Users Guide for proper sterilization monitoring guidelines.
		Biological indicator or chemical indicator being used is past the expiration date.	Check the indicator and / or packaging to determine what the expiration date is.	Use only biological and chemical indicators that haven't expired.
		Chemical indicator has come into contact with water in sterilizer.	Check with operator on the positioning of indicator in the chamber.	Demonstrate correct positioning of indicator to user.
		Biological or chemical indicators are being stored in a damp and / or hot environment.	Check condition of the area where indicators are being stored.	Inform operator to follow storage recommendations of indicator manufacturer.
		Sterilizer malfunction	Put unit into Service Diagnostics and check for stored error codes, correct temperature, and pressure readings.	Repair as needed based on results of Service Diagnostics test results.

Troubleshooting Chart

Problem	Display / Symptom	Probable Cause	Check	Correction
Maintenance message is displayed.	PERFORM PERIODIC or MONTHLY MAINTENANCE	Sterilizer software senses that the cycle count has reached 7, 14, or 21 days from initial start-up or monthly maintenance.	Refer to the user guide for periodic maintenance procedures.	Perform periodic maintenance.
		Sterilizer software senses that the cycle count has reached 28 days from initial start-up or monthly maintenance	Refer to the user guide for monthly maintenance procedures.	Perform monthly maintenance.
Printer (Optional) does not print.	Printer does not generate data.	Printer is out of paper.	Lift printer cover and check condition of paper.	Install new roll of paper (refer to user guide).
		Printer cartridge is dry.	Check condition of printer cartridge.	Replace printer cartridge (refer to user guide).
		Printer wire harness is disconnected.	Check printer wire harness connections on printer and on back of sterilizer.	Secure printer wire harness connections.
		Printer wire harness has broken or open leads.	Check printer wire harness leads for continuity.	Replace printer wire harness.
		Printer is malfunctioning.	Check for 5 VDC at TP3 & TP4 on PC board.	If voltage is present, replace printer.
		PC board is malfunctioning.	Check for 5 VDC at TP3 & TP4 on PC board.	If voltage is not present, replace PC board.
Chamber fills with water.	Chamber fills with water when cycle is aborted with the door closed.	Unit lost power in heatup or sterilize modes due to a power failure or user turned power off. Chamber filled with water from the reservoir as unit cooled.	Ask questions about recent usage patterns and electrical events (storms, outages, ect.).	Replace check valve on copper tubing between the boiler and the pressure interlock assembly.
English / Metric display units can not be changed from display panel.	When in User Diagnostic mode, English / Metric display units can not be changed.	Version 1.1.4 main PCB.	If main PCB version is 1.1.4.	On version 1.1.4 main PCB, flip #7 dip switch ON.

ITEMS NOT STERILE message will be displayed if an error occurs in any of the following modes:

Close mode, Heat Up Mode, or Sterilize Mode. Otherwise, message will not appear.

This message is intended to indicate to the user that the items in the chamber may or may not be sterile, and must be reprocessed.

Power Up / Select Cycle Mode

During the Select Cycle Mode, the user chooses the appropriate sterilization cycle for a load. The Select Cycle Mode ends when the cycle has been chosen and the START button is pressed.

With the power cord properly connected...

Line voltage is supplied to the power switch.

When the switch is ON, power is supplied to the PC board (thru F1 fuse)

[NOTE: F2 fuse provides protection for PC board transformer.]

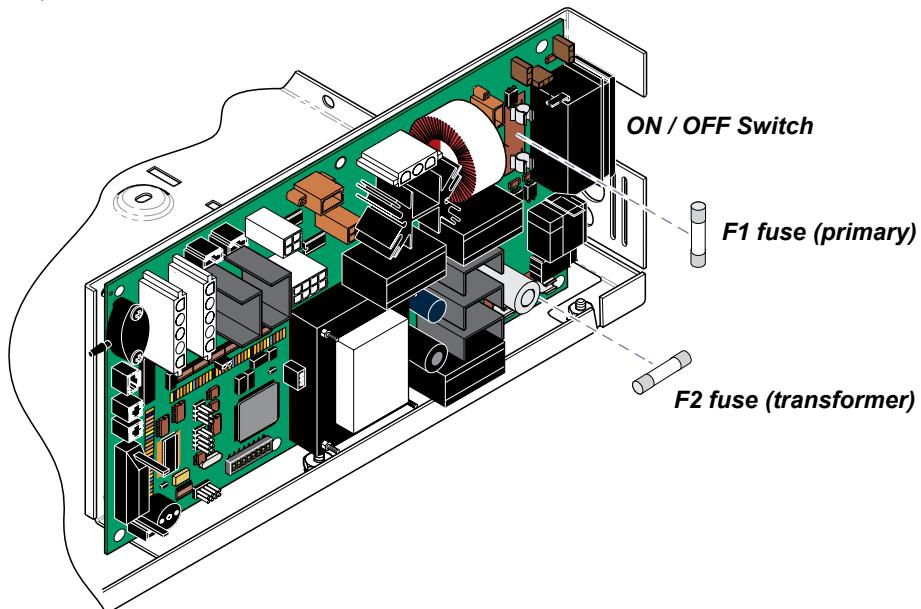
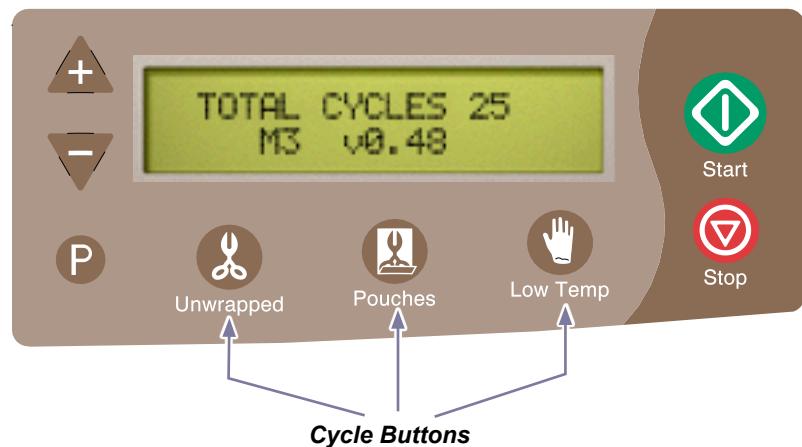
Any time the unit is powered ON, the display will show the total number of cycles run on the sterilizer, the model number, & the software version.

When the display shows, 'Select Cycle' the unit is ready for the user to press the desired cycle button.

When a cycle button is pressed, the parameters for the selected cycle are displayed (*temperature / sterilization time / drying time*).

Pressing the START button initiates the Door Close Mode.

Next: Door Close Mode



SA125100i

Models:	M3	
Serial Numbers:	all	

Door Close Mode

During the Door Close Mode, the door motor system is activated to lock the tray in position. The Door Close Mode ends when the door claw switch is tripped.

Tray switch

The PC board monitors the status of the normally open tray switch. With the tray in proper position, this switch is tripped and the Door Close Mode is initiated. If the tray switch is not tripped, the display will show 'TRAY NOT IN POSITION' until the tray has been properly installed.

Door Motor

When the Door Close Mode is initiated, the door motor is activated. As the door motor runs, the cam arm & connected linkage rotate the door claws into the locked position to secure the tray assembly. The motor runs until the cam arm trips the Door Closed Switch.

Door Position Switches

The two door position switches (*Door Open & Door Closed*) monitor the position of the door motor cam arm. During the Door Close Mode, the motor cam arm rotates counter-clockwise. When the cam arm contacts the Door Close Switch, the switch opens and the door motor stops running.

Door Claw Switch

The Door Claw Switch is tripped when the claws reach the locked position. When this switch is tripped, the display will show 'CHAMBER CLOSED' and the Heat Up Mode is initiated.

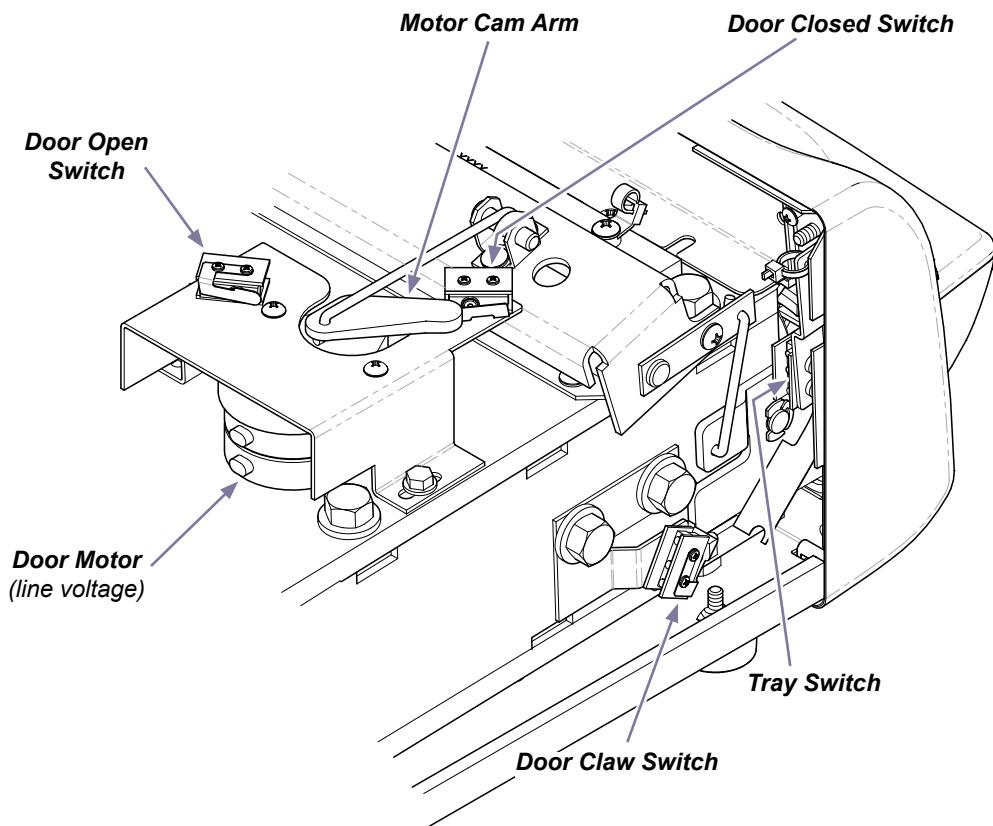
Next: Heat Up Mode

Other component(s) that are monitored:

Water Level Sensor: if reservoir level is low, an error will result
Ext. Condensing Tank Sensors: if tank is full, an error will result

Other component(s) that are energized:

Vent Valve: Open
Condensate Heater: ON
Boiler: energized based on boiler temperature
($<270^{\circ}$ F = ON) ($>270^{\circ}$ F = OFF)



SA125300i

Models:	M3	
Serial Numbers:	all	

Heat Up Mode

During the Heat Up Mode, the steam temperature in the chamber is brought up to the sterilization set point for the selected cycle. The Heat Up Mode ends when the chamber reaches the sterilization temperature for selected cycle.

Pump

Throughout the Heat Up Mode, the pump is energized periodically based on control temperatures & time. When activated, the pump squirts water from the reservoir into the pre-heated boiler.

At the beginning of the Heat Up Mode, the pump is activated for 1.5 seconds, then OFF for approximately 12 seconds. After 12 seconds, the pump begins "normal operation", wherein the pump is cycled ON/OFF at pre-set intervals based on the temperature inside the boiler.

Boiler

The boiler is designed to heat the water pumped in from the reservoir, creating steam to pressurize the chamber.

The boiler is energized based on the temperature readings from the boiler temperature sensor. The target temperature for the boiler is approximately 18° F above the sterilization temperature for the selected cycle. The boiler cycles ON/OFF to maintain this target temperature.

Vent Valve

Throughout the Heat Up Mode, the vent valve is energized periodically based on chamber pressure, chamber temperature, and time. When activated, the vent valve opens to purge air from the chamber.

At the beginning of the Heat Up Mode, the vent valve opens until chamber temperature reaches 212° F; then closes. The vent valve remains closed until chamber conditions are appropriate for venting.

Pressure Interlock Assembly

The pressure interlock assembly prevents the door from opening while the chamber is pressurized. When the pressure in the chamber reaches approximately 4 - 6 PSI, the plunger extends, not allowing the door to open.

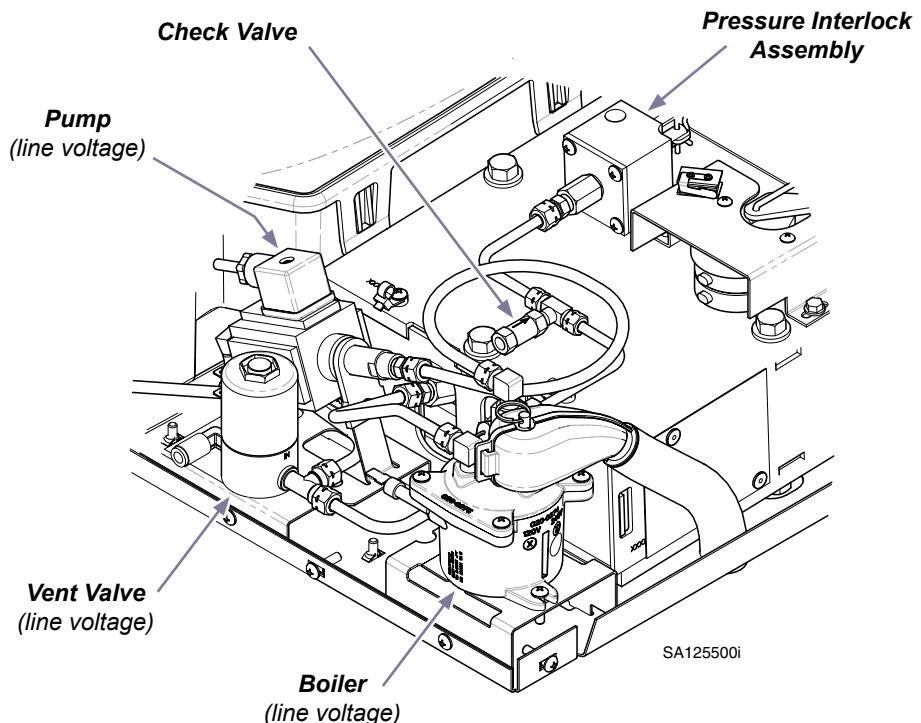
Check Valve

The Check Valve will close as pressure builds in the chamber. In the event the power is interrupted during heat up or sterilization and the unit cools off with the door closed the check valve will open to prevent water from being siphoned from the reservoir into the chamber. The valve is directional, please note arrow if replacing.

Other component(s) that are energized:

Condensate Heater: ON

Next: Sterilization Mode



Models:	M3
Serial Numbers:	all

Sterilization Mode

During the Sterilization Mode, the steam temperature in the chamber is maintained at the pre-set parameters (*temperature & time*) for the selected cycle.

The Sterilization Mode ends when the sterilization time for the selected cycle expires.

The display will count down the sterilization time, & display the chamber temperature & pressure.

Pump

Throughout the Sterilization Mode, the pump is energized periodically based on control temperatures & time. When activated, the pump quirts water from the reservoir into the pre-heated boiler.

Boiler

The boiler heats the water pumped in from the reservoir, creating steam to pressurize the chamber and maintain sterilization temperature.

The boiler is energized based on the temperature readings from the boiler temperature sensor. The target temperature for the boiler is approximately 18° F above the sterilization temperature for the selected cycle. The boiler cycles ON/OFF to maintain this target temperature.

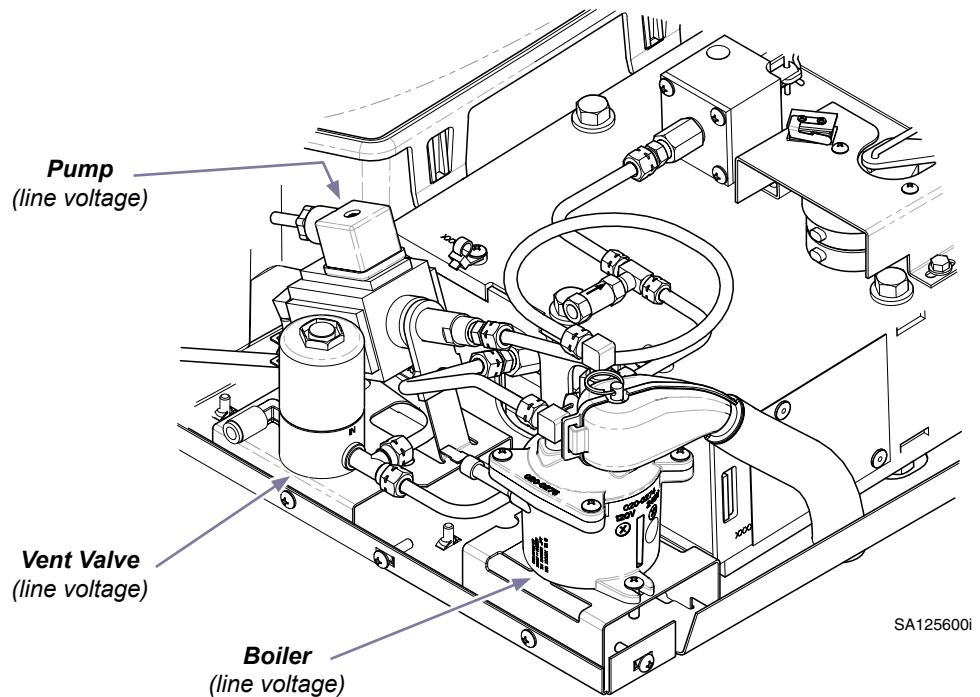
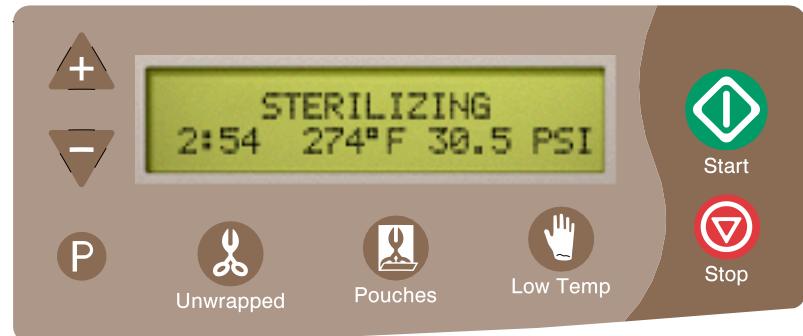
Vent Valve

Throughout the Sterilization Mode, the vent valve is energized periodically based on control temperatures and time. When activated, the vent valve opens to purge air from the chamber.

Other component(s) that are energized:

Condensate Heater: ON

Next: Vent Mode



Models:	M3	
Serial Numbers:	all	

Vent Mode

During the Vent Mode, the pressure in the chamber is released thru the vent valve. This reduces the temperature and creates a safe condition to open the door. The vent mode ends when the chamber pressure drops below 1.0 PSI.

Vent Valve

The vent valve is activated throughout the entire Vent Mode. When activated, the vent valve opens, releasing the steam pressure from the chamber.

The pressure in the chamber forces the steam thru the open vent valve. The steam condenses as it passes thru the vent tubing, and condensing coil. The resulting water is collected in the condensing tank.

External Condensing Tank

The condensing coil attached to the tank lid, cools the steam when it is released thru the vent valve. The tank collects the condensation that is produced.

There are two level sensors on the tank lid to monitor the amount of water in the tank. When the water level reaches the sensors, the completed circuit produces an error message on the display* ("EXTERNAL TANK FULL").

*Note: The error message will not appear until the start of the next cycle.

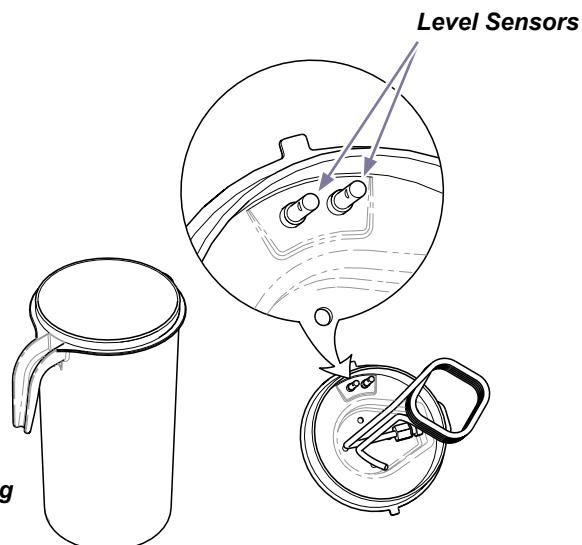
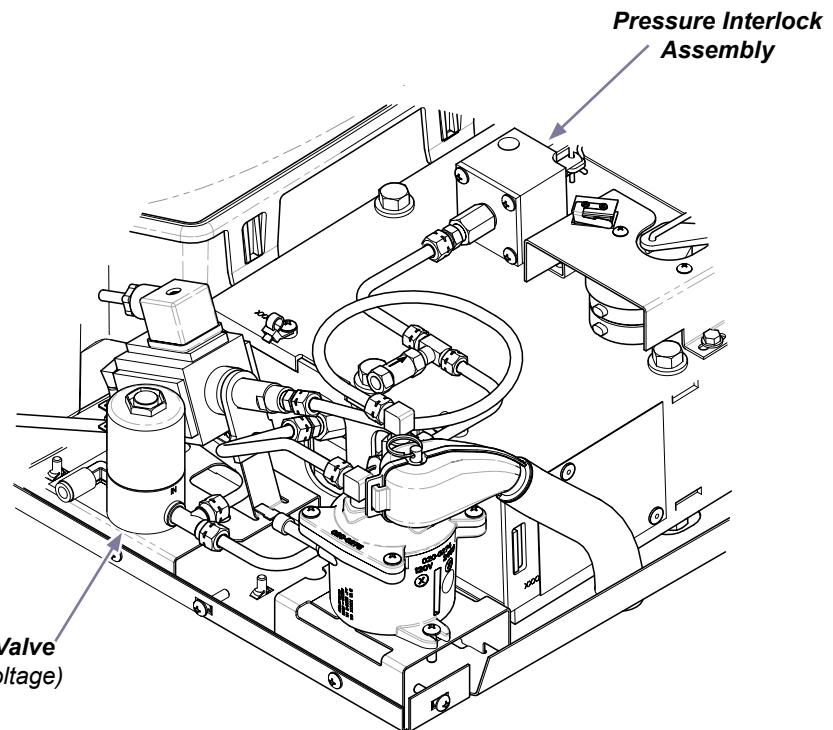
Pressure Interlock Assembly

When the pressure in the chamber drops to approximately 2 - 3 PSI, the assembly plunger retracts in preparation for the door opening mode.

Other component(s) that are energized:

Condensate Heater: ON

Next: Door Open Mode



External
Condensing
Tank

SA1257001

Models:	M3	
Serial Numbers:	all	

Door Open Mode

During the Door Open Mode, the door motor system is activated to open the door (*unlock tray*). The Door Open Mode ends when the door open switch is tripped.

Door Motor

When the Door Open Mode is initiated, the door motor is activated. As the door motor runs, the cam arm & connected linkage rotate the door claws to the unlocked position to release the tray assembly. The motor runs until the cam arm trips the Door Open switch.

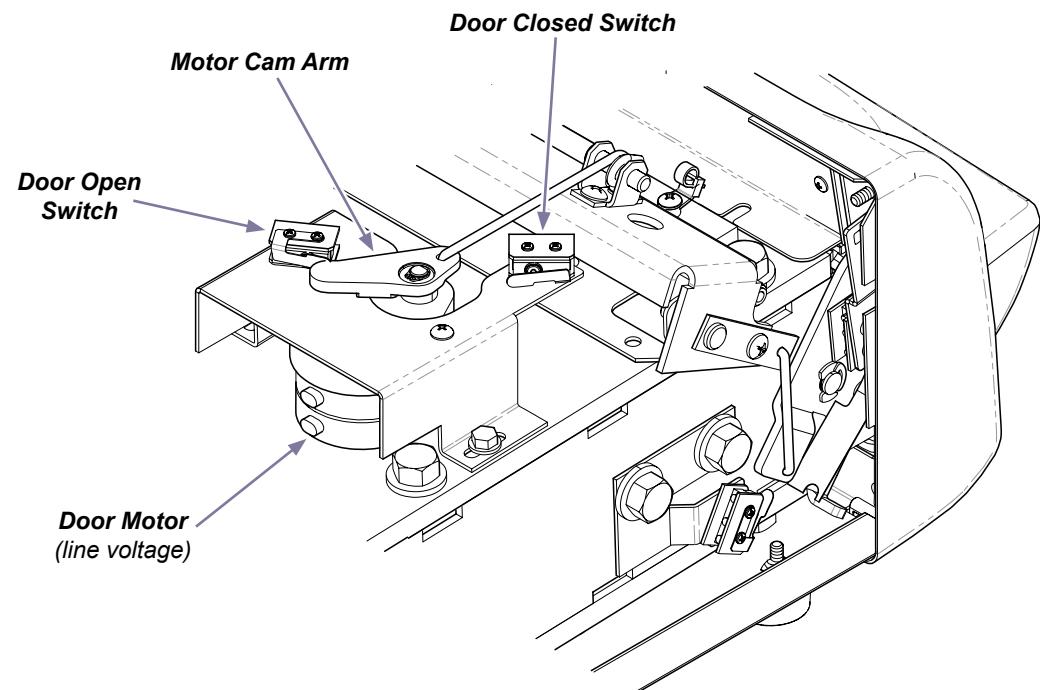
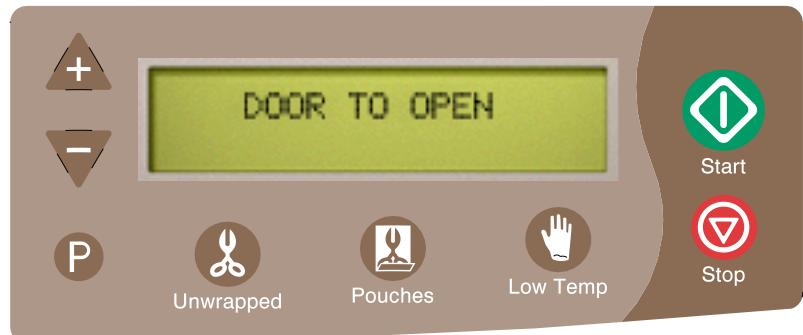
Door Position Switches

The two door position switches (*Door Open & Door Closed*) monitor the position of the door motor cam arm. During the Door Open Mode, the motor cam arm rotates clockwise. When the cam arm contacts the Door Open Switch, the switch opens and the door motor stops running.

Other component(s) that are energized:

Condensate Heater: ON

Next: Dry Mode



SA125400i

Models:	M3	
Serial Numbers:	all	

Dry Mode

During the Dry Mode, heat is applied to the chamber to dry the load at the end of the cycle. The Dry Mode ends when the specified dry time expires.

The maximum dry temperature in the Unwrapped and Pouches cycle is 250° F to 260° F. The maximum dry temperature in the Low Temp cycle is 245° F to 250° F.

The display will count down the drying time.

Dry Heaters

(Note: The dry heaters are inaccessible & non-serviceable).

There are two dry heaters mounted inside the chamber enclosure. They provide heat to dry the load at the end of a cycle.

Both heaters are energized intermittently (*based on a temperature regulation algorithm*) to maintain the target temperature for the selected cycle. When the dry time has expired, the dry heaters are turned OFF.

During the dry mode, the board is monitoring the tray switch. If it opens the drying mode is stopped.

Boiler

During the Dry Mode, the boiler is energized periodically based on the boiler temperature and the status of the dry heaters.

The boiler is ON if:

- dry heaters are OFF - **and**
- boiler temperature is < 240° F.

The boiler is OFF if:

- dry heaters are ON-**or**
- boiler temperature is > 240° F.

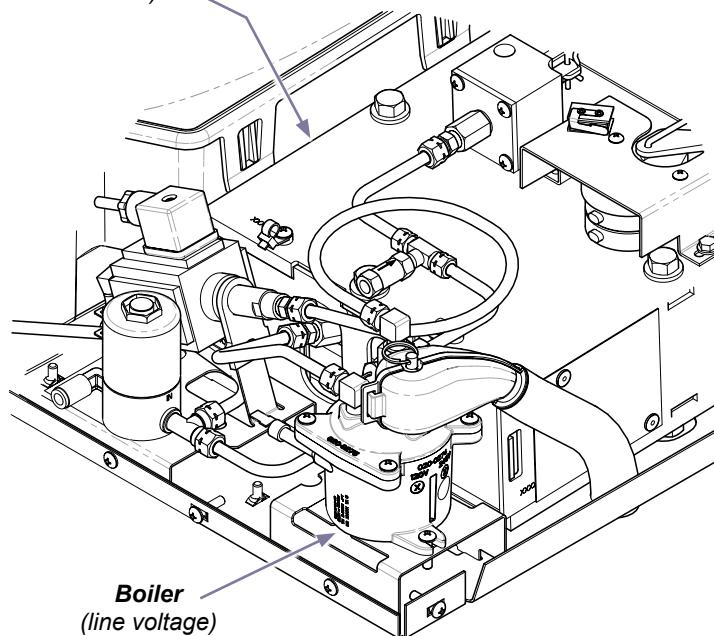
Other component(s) that are energized:

Condensate Heater: ON

Next: This completes the cycle



Chamber Enclosure
(The dry heaters are non-serviceable)

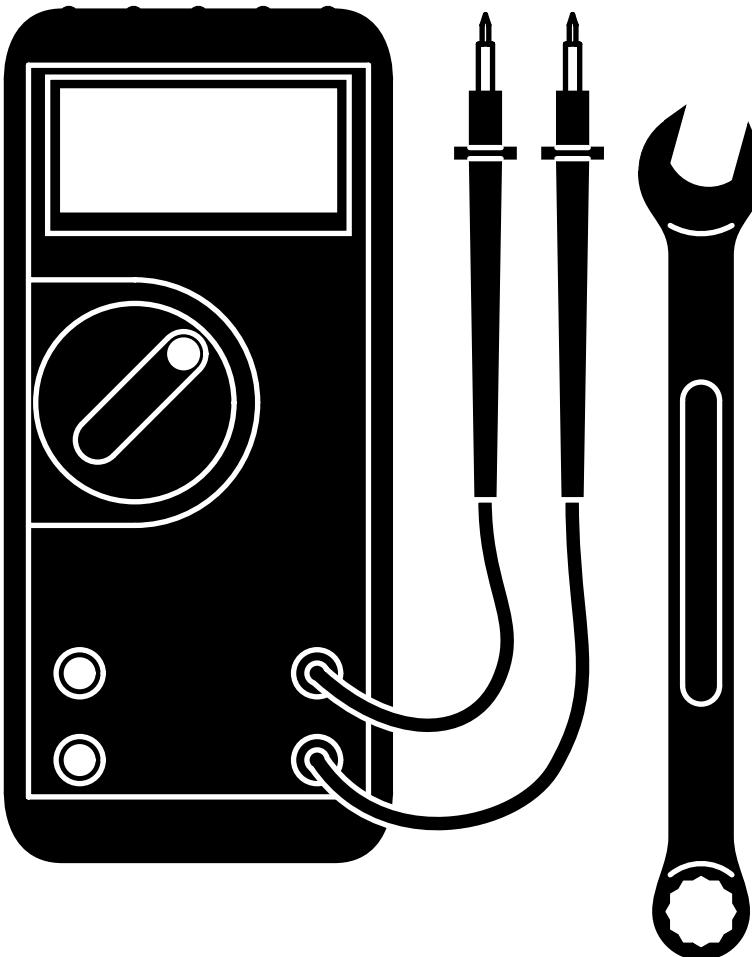


SA125800i

Models:	M3	
Serial Numbers:	all	

Section

Testing & Repair



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Inlet Switch Module Test.....	B-28

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 test should always be done before replacing any major component.



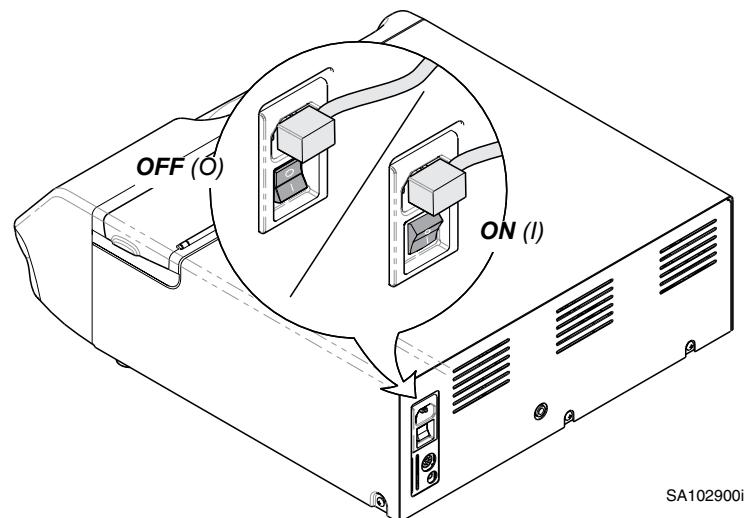
WARNING

This operation may require the cover to be removed while power is connected to the unit. Use caution when performing this procedure.

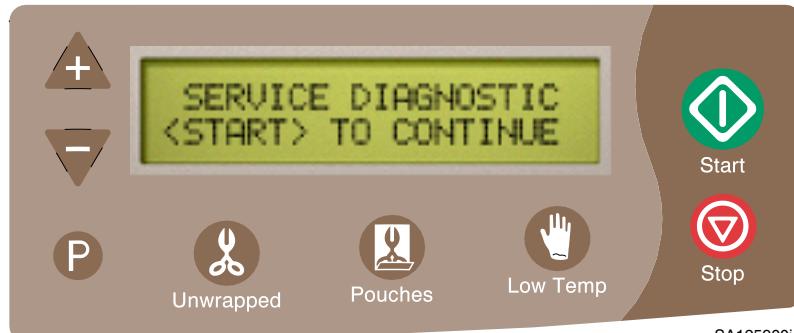
Activating Service Diagnostics

To activate Service Diagnostics...

- A) Turn power switch OFF.
- B) Press & hold the <P> button.
- C) Turn power switch ON.
- D) Release <P> button when display shows:
"SERVICE DIAGNOSTIC
<START> TO CONTINUE"
- E) Press <START> button to continue.



SA102900i



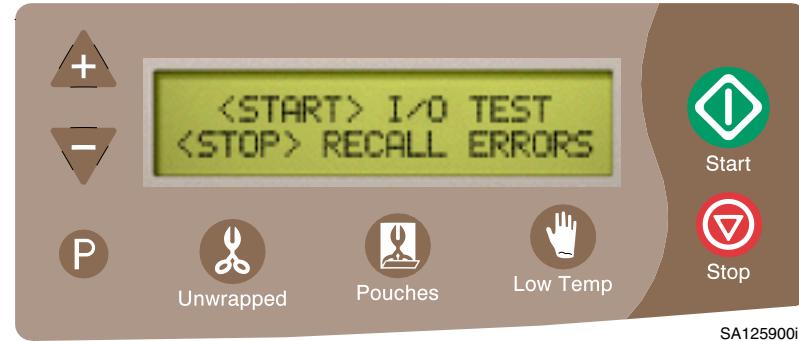
SA125900i

Models:	M3
Serial Numbers:	all

[Revised: mo/dd/yr]

Service Diagnostics

Test Selection Screen



Test Selection

- | | |
|---------------------------------|------|
| I/O Test | B-3 |
| Error Code Display Screen | B-23 |
| Key Test Display Screen | B-24 |

Press the <START> button to initiate the I/O Test.

This test allows you to energize the vent valve / door motor / pump / boiler / dry heaters / condensation heater independently without running a cycle.

This test also displays the status of the following components:
tray switch / door claw switch / door open switch / door closed switch /
water level sensor / ext. condensing tank sensors. In addition it shows
the chamber pressure, and the temperatures for the chamber, boiler
and each dry heater separately.

Press the <STOP> button to display previous error codes.

This feature allows you to view the last five error codes that have been stored in the unit.

Press the <P> button to test the touch pad.

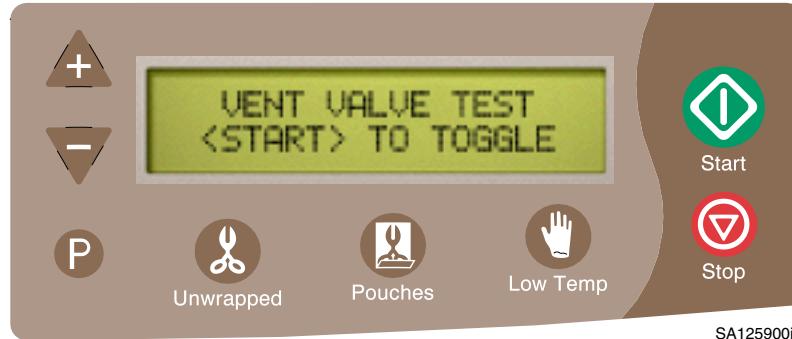
This test allows you to test the functionality of the buttons on the touch pad.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Vent Valve)

[Vent Valve Voltage Test.....B-5](#)

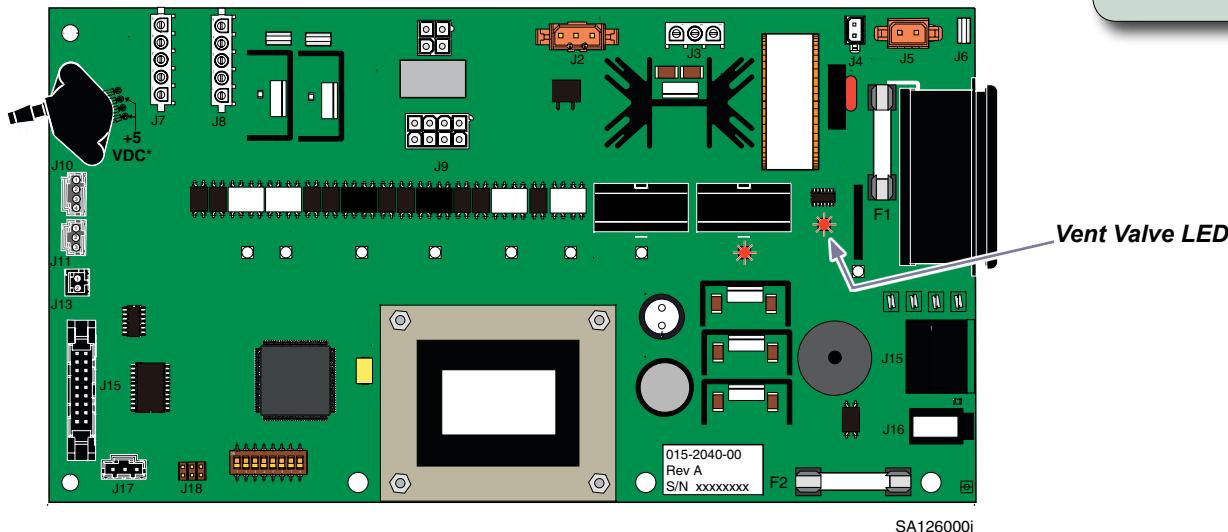


The vent valve is NORMALLY CLOSED. When energized, the valve opens. The vent valve LED on the PC board indicates current flow to the vent valve. (ON: valve energized) (OFF: valve not energized).

To turn current flow to vent valve ON / OFF...
Press the <START> button.

When the Vent Valve LED is...
ON - the PC board is supplying current to valve.
OFF - there is no current to valve.

If a problem is suspected, perform the
Vent Valve Voltage Test on the following page.



Press <STOP> button for next test.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Vent Valve - continued)

[Vent Valve](#)

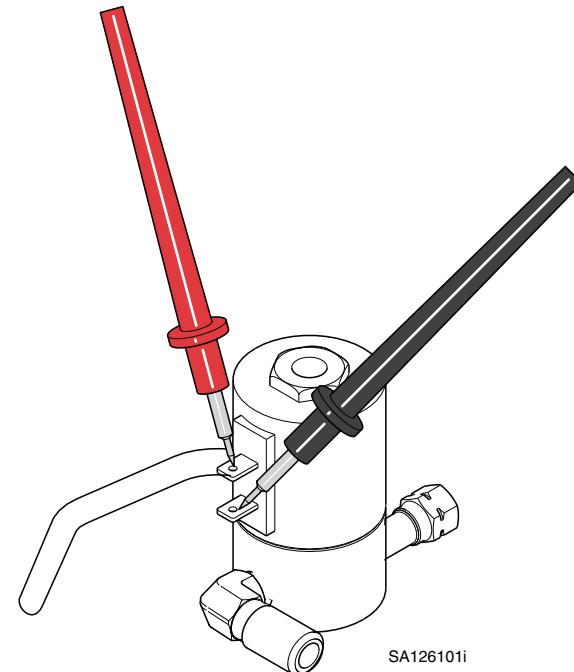
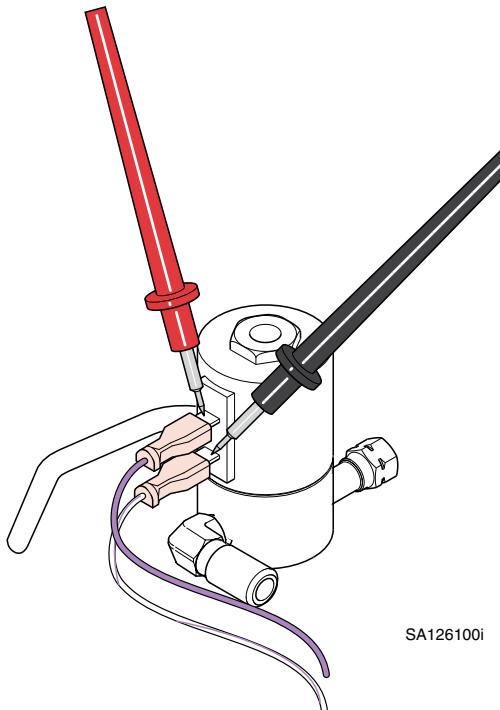
[Exploded View / Part Numbers.....E-7](#)

Vent Valve Voltage Test

- A) Press <START> button so that vent valve LED is ON.
- B) Set meter to read VAC.
- C) Place meter probes on vent valve terminals.

If meter reading shows...

- Line voltage: PC board is OK.
(Perform Vent Valve Resistance Test)
- No voltage: Replace PC board.



Vent Valve Resistance Test

- A) Tag & disconnect two wires from vent valve.
- B) Set meter to read ohms (Ω).
- C) Place meter probes on vent valve terminals.

If meter reading shows...

- Anything other than 'OL': Vent valve is OK.
- 'OL': Replace vent valve.

Models:

M3

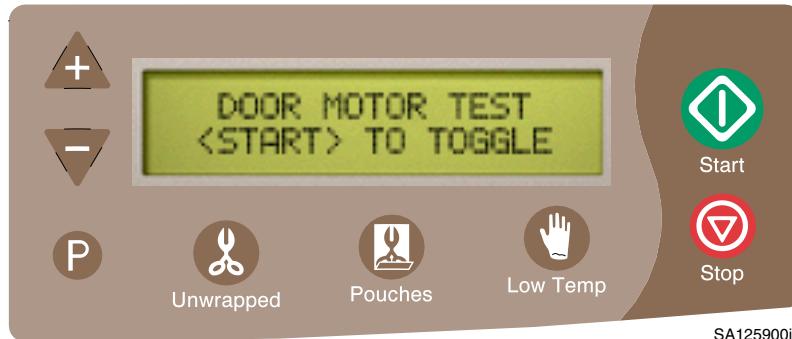
Serial Numbers:

all

Service Diagnostics

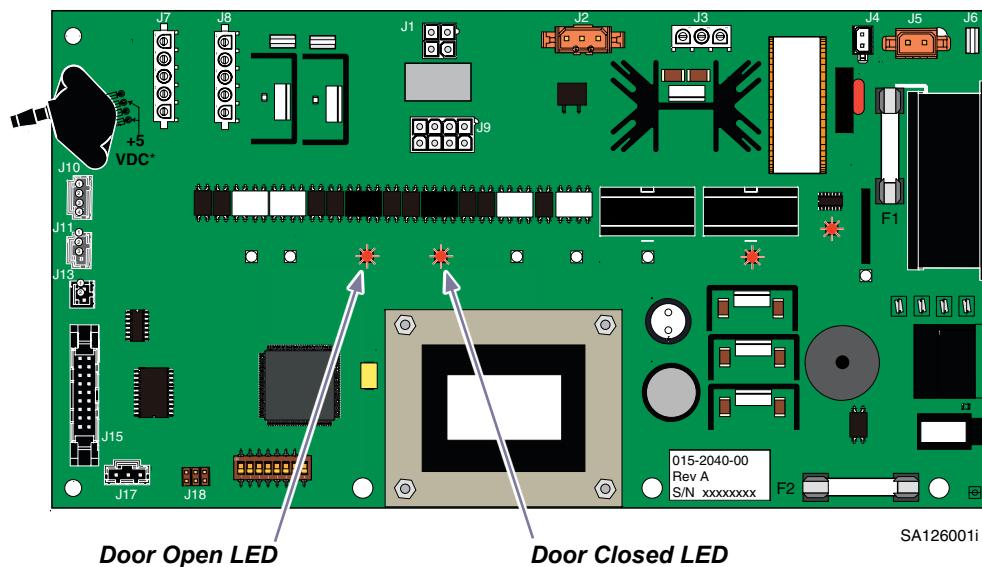
I/O Test (Door Motor)

Door Motor Voltage Test.....B-7



The door motor test allows you to operate the door motor without running a cycle. When energized, the door motor will run to open or closed the door - depending on the starting position of the door switches. (Example: If the door open switch is tripped, the door motor will close the door when energized. If the door closed switch is tripped, the door motor will open the door when energized).

The Door Open LED (on the PC board) is illuminated when the door motor is opening the door. The Door Closed LED (on PC board) is illuminated when the door motor is closing the door.



Equipment Alert

To perform this test, the door / tray assembly must be positioned so the tray switch is tripped.

To energize the door motor...

Press the <START> button.

When the Door Open LED or Door Closed LED is...

ON - the PC board is supplying current to door motor.
OFF - there is no current to door motor.

If a problem is suspected, perform the
Door Motor Voltage Test on the following page.

Press <STOP> button for next test.

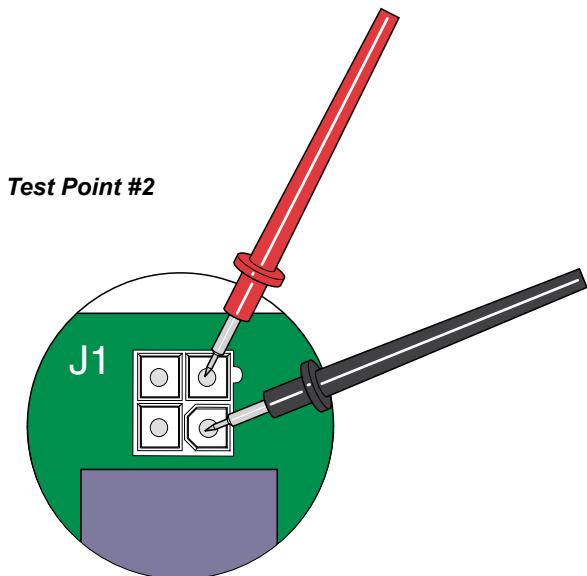
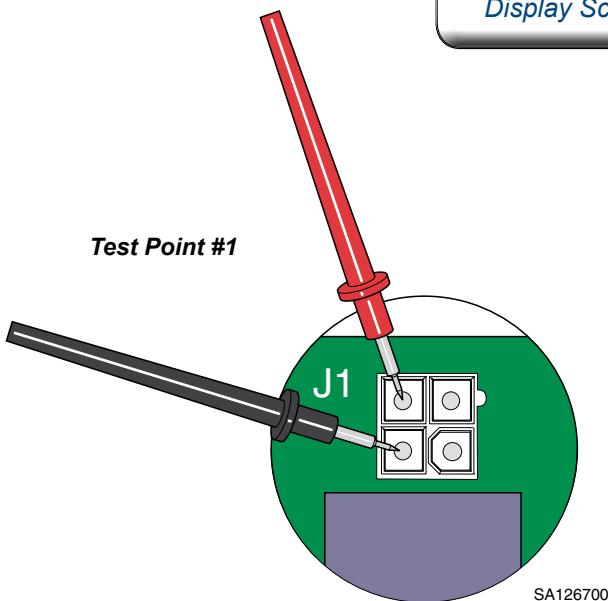
Service Diagnostics

I/O Test (Door Motor - continued)

Door Motor Resistance Test B-8
Tray / Door Position Switch
Display Screen B-19

Door Motor Voltage Test

- A) Disconnect door motor harness from PC board (J1).
- B) Press <START> button to energize the door motor.
- C) Set meter to read VAC.
- D) Place meter probes on test points of J1 as shown.
(Note: Check voltage at both test points shown).



If meter reading shows...

- Line voltage at both test points **and** Door Open / Closed LEDs function properly.
Perform **Door Motor Resistance Test** on the following page.
- No voltage at either test point **and** LEDs do not function.
Be sure tray is in position (tray switch must be tripped).
Check status of tray switch, door open / door closed switches*.
(*Refer to: **I/O Test - Tray / Door Position Switch Display Screen**)
- (During Door Open Test) No voltage at either test point but Door Open LED is ON.
(During Door Closed Test) Line voltage present / Door Closed LED is ON.
Perform **Pressure Interlock Assembly Test** on the following page.

Models:

M3

Serial Numbers:

all

Service Diagnostics

I/O Test (Door Motor - continued)

Door Motor

Exploded View / Part Numbers.....E-5

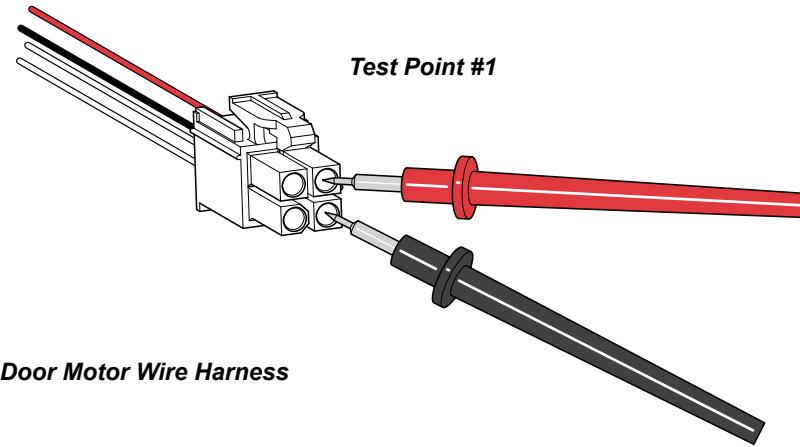
Door Motor Replacement ... 003-1778-00

Door Motor Resistance Test

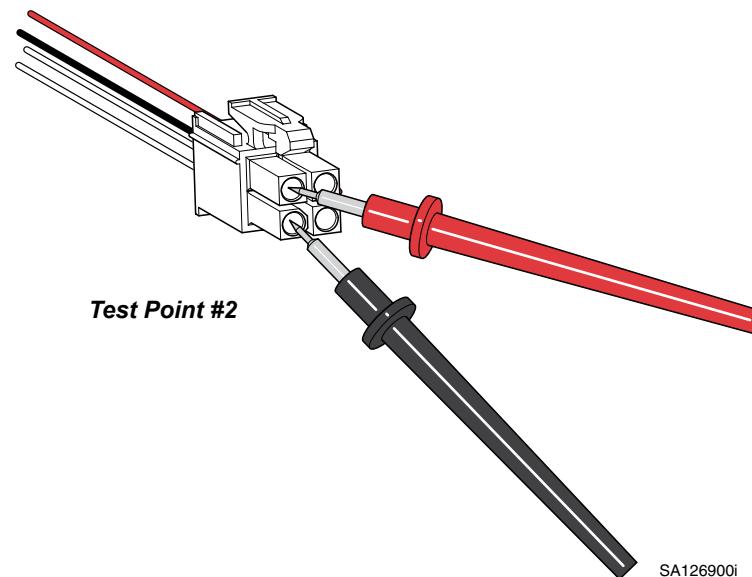
- A) Disconnect door motor wire harness from PC board (J1).
- B) Set meter to read ohms (Ω).
- C) Place meter probes on wire harness pins as shown.
(Note: Check resistance at both test points shown).

If meter reading shows..

- 2000 to 3000 Ω : Door motor is OK.
- out of range: Replace door motor.



Door Motor Wire Harness



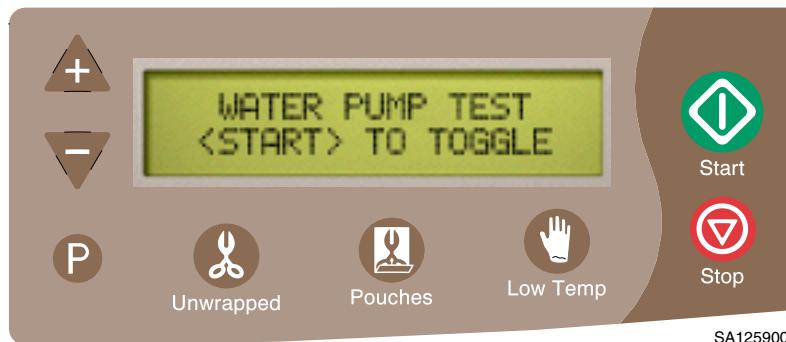
SA126900i

Models:	M3
Serial Numbers:	all

M3
all

Service Diagnostics

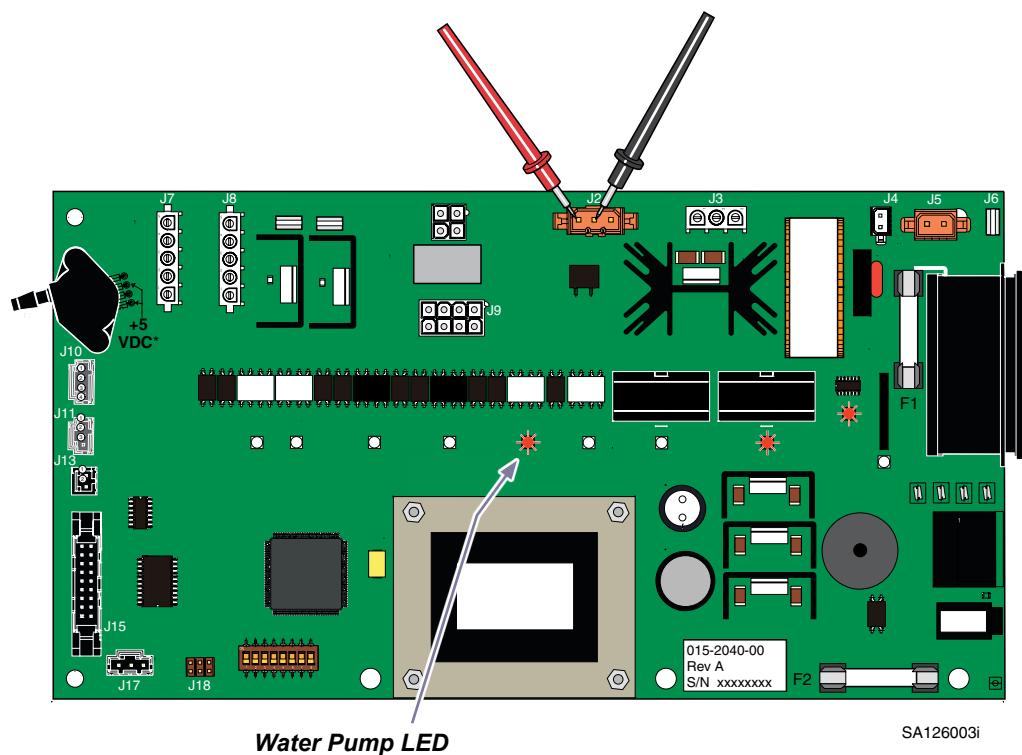
I/O Test (Water Pump)



The water pump test allows you to manually energize the pump. When energized, the water pump LED illuminates, indicating current flow to the pump.

Note

The door must be closed to perform the water pump test. If the door is open when this test is initiated, the door motor will automatically close the door before the water pump is energized. The door will open when the <STOP> button is pressed.



To turn current flow to water pump ON / OFF...
Press the <START> button.

When water pump LED is...

- ON - the PC board is supplying current to the pump.
- OFF - there is no current to pump.

NOTE: The pump will make a buzzing sound when energized.
If the water pump LED is ON, but no sound is heard, perform the **Water Pump Voltage Test** below.

Water Pump Voltage Test

- A) Disconnect water pump harness from PC board (J2).
- B) Press <START> button so that water pump LED is ON.
- C) Set meter to read VAC.
- D) Place meter probes on pin #1 & pin #2 of J2 on PC board.

If meter reading shows...

- Line voltage: PC board is OK. (Perform **Water Pump Resistance Test (Harness)** on the following page).
- No voltage: Replace PC board.

Press <STOP> button for next test.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Water Pump - continued)

Water Pump
Resistance Test (Direct) B-11

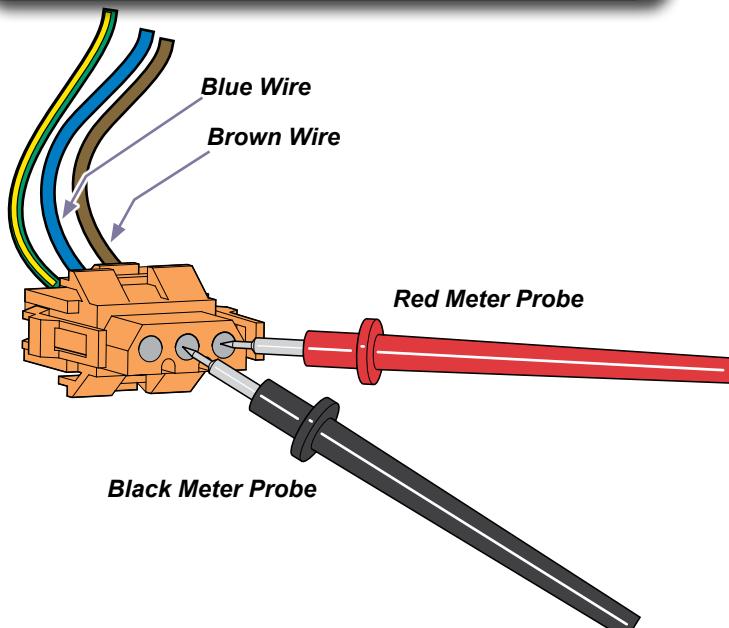
Water Pump Resistance Test (Harness)

- A) Disconnect water pump harness from PC board (J2).
- B) Set meter to read ohms (Ω).
- C) Place meter probes on pump harness pins as shown.
You must test harness with probes in **both** positions shown.
(Note the color of the meter probes & their positions in each illustration. This is critical to achieve proper reading).

Test Position #1

If meter reading shows...

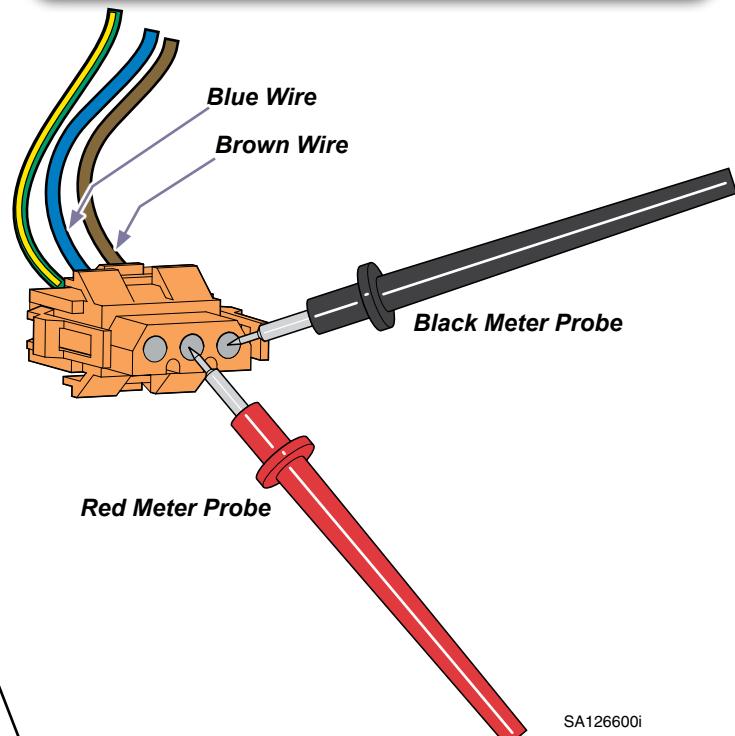
- 200 to 400 Ω : Check Test position #2.
- out of range: Perform **Water Pump Resistance Test (Direct)** on the following page.



Test Position #2

If meter reading shows...

- OL: Pump & harness are OK.
- out of range: Perform **Water Pump Resistance Test (Direct)** on the following page.



SA126600i

Models:	M3
Serial Numbers:	all

[Revised: mo/dd/yr]

Service Diagnostics

I/O Test (Water Pump - continued)

Water Pump
Exploded View / Part Numbers.....E-7

Water Pump
Replacement 003-1777-00
Water Pump Assy.
Replacement 003-1785-00

Water Pump Resistance Test (Direct)

- A) Remove screw, then disconnect water pump harness from pump.
- B) Set meter to read ohms (Ω).
- C) Place meter probes on pump terminals as shown.

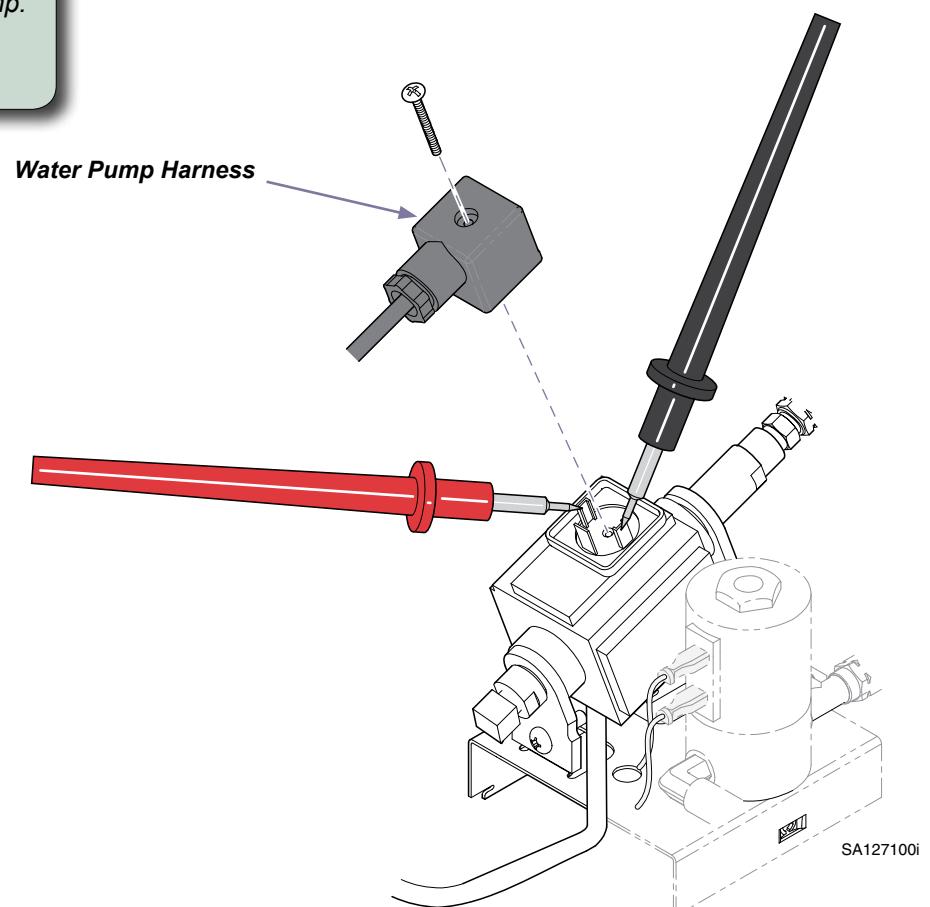
If meter reading shows...

115 VAC Models

- 20 to 40 Ω : Pump is OK - replace harness.
- out of range: Replace pump.

230 VAC Models

- 130 to 150 Ω : Pump is OK - replace harness
- out of range: Replace pump.



Models:

M3

Serial Numbers:

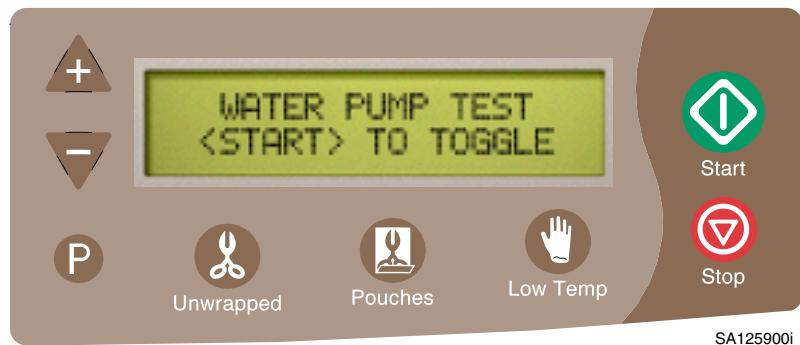
all

Service Diagnostics

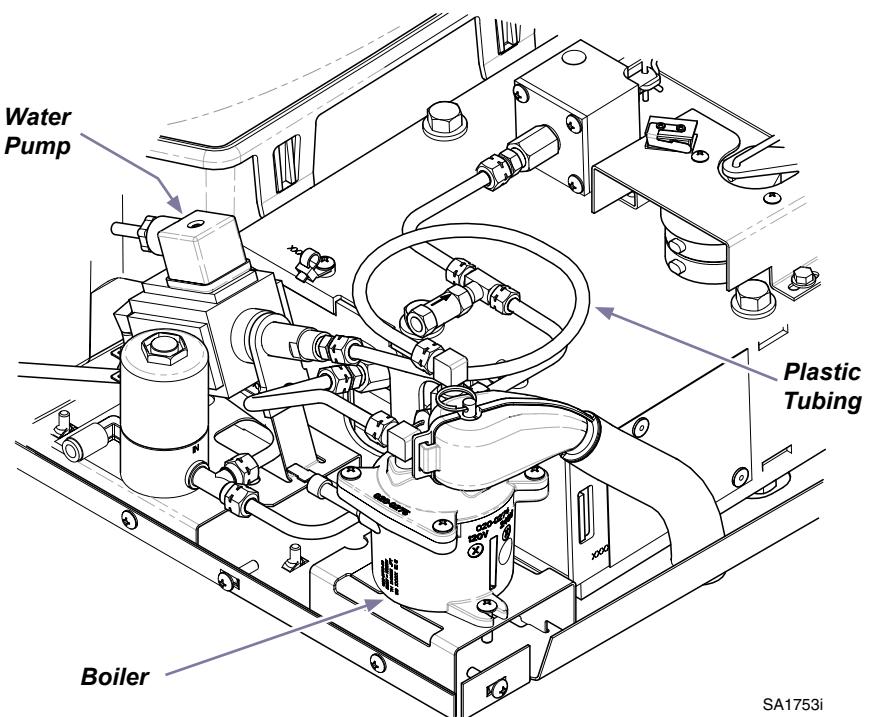
Water Pump Priming Instructions

**WARNING**

This operation requires the top cover to be removed while power is connected to the unit. Use caution when performing this procedure.

**Note**

The door will automatically close before the water pump will begin to run.

**To Prime The Water Pump...**

- A) Check that reservoir has been filled with distilled water.
- B) With top cover removed, go into Service Diagnostics.
- C) Toggle to the Water Pump Test display screen.
- D) Press <START> button once to energize and prime the water pump, until air is purged from plastic tubing connecting water pump to the boiler.
- E) Press <START> again to de energize water pump.

Note: Do not energize water pump for more than 20 seconds at a time.

Note

The pump should discharge approximately 3.25 ounces water every five seconds.

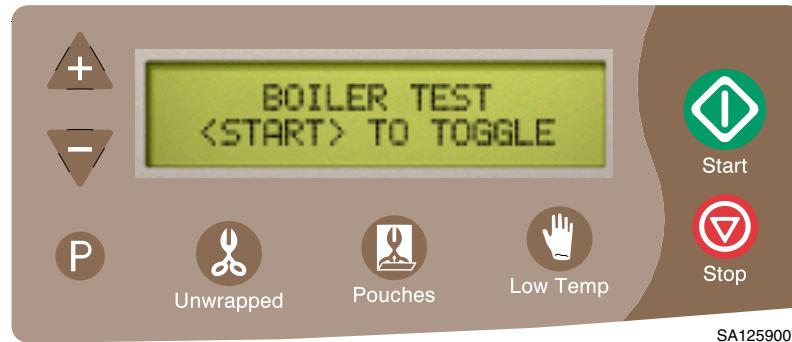
Models:	M3
Serial Numbers:	all

Service Diagnostics

Boiler Voltage Test.....B-14

I/O Test (Boiler)

The boiler test allows you to manually energize the boiler for 15 second increments. There are two boiler LEDs that illuminate to indicate current flow to the boiler.



To turn current flow to boiler ON / OFF...

Press the <START> button.

When the two boiler LEDs are...

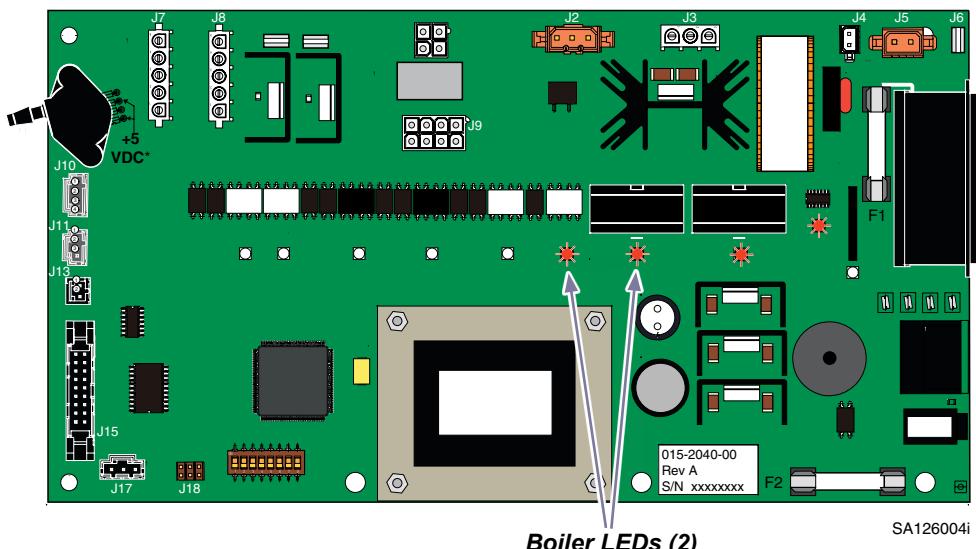
- ON - the PC board is supplying current to the boiler.
- OFF - there is no current to boiler.

Temperature Display Screen



To verify proper operation...

When the two boiler LEDs turn off (after approx. 15 seconds), press the <STOP> button to advance to the Temperature Display Screen. The internal temperature of the boiler is shown as "BOIL". If the display does not reflect an increase in temperature, perform the Boiler Voltage Test on the following page.



Press <STOP> button as necessary to advance to desired test.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Boiler - continued)

Boiler

Exploded View / Part Numbers.....E-6

Boiler Replacement 003-1776-00

Boiler O-Ring

Replacement 003-1779-00

Boiler Assy Replacement ... 003-1780-00

Boiler Voltage Test

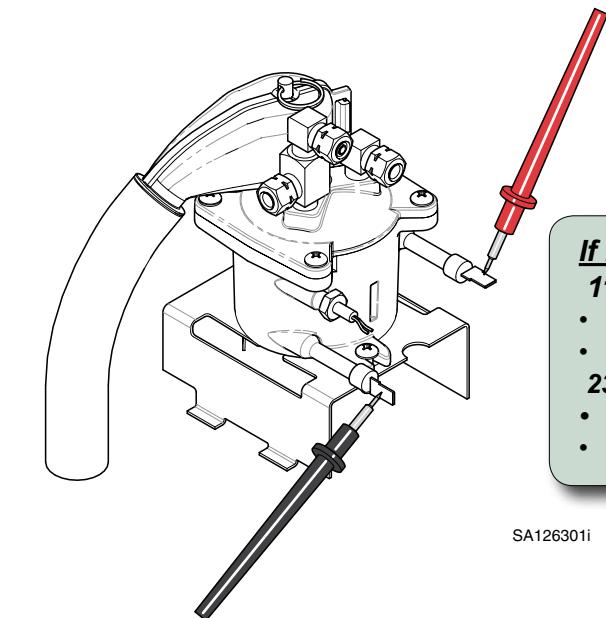
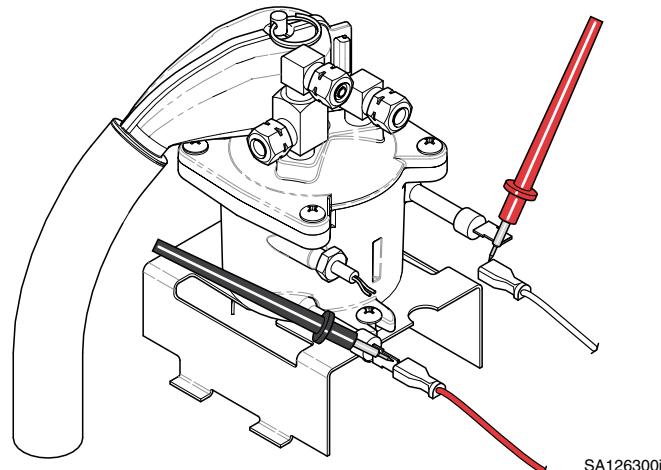
- A) Press <START> button so that boiler LEDs are ON.
- B) Set meter to read VAC.
- C) Place meter probes on boiler terminals.

If meter reading shows...

- Line voltage: PC board is OK.
(Perform **Boiler Resistance Test**).
- No voltage: Replace PC board.

Boiler Resistance Test

- A) Tag & disconnect two wires from boiler.
- B) Set meter to read ohms (Ω).
- C) Place meter probes on boiler terminals.



If meter reading shows...

115 VAC Models

- 9.8 to 10.8 Ω : Boiler is OK.
- out of range: Replace boiler.

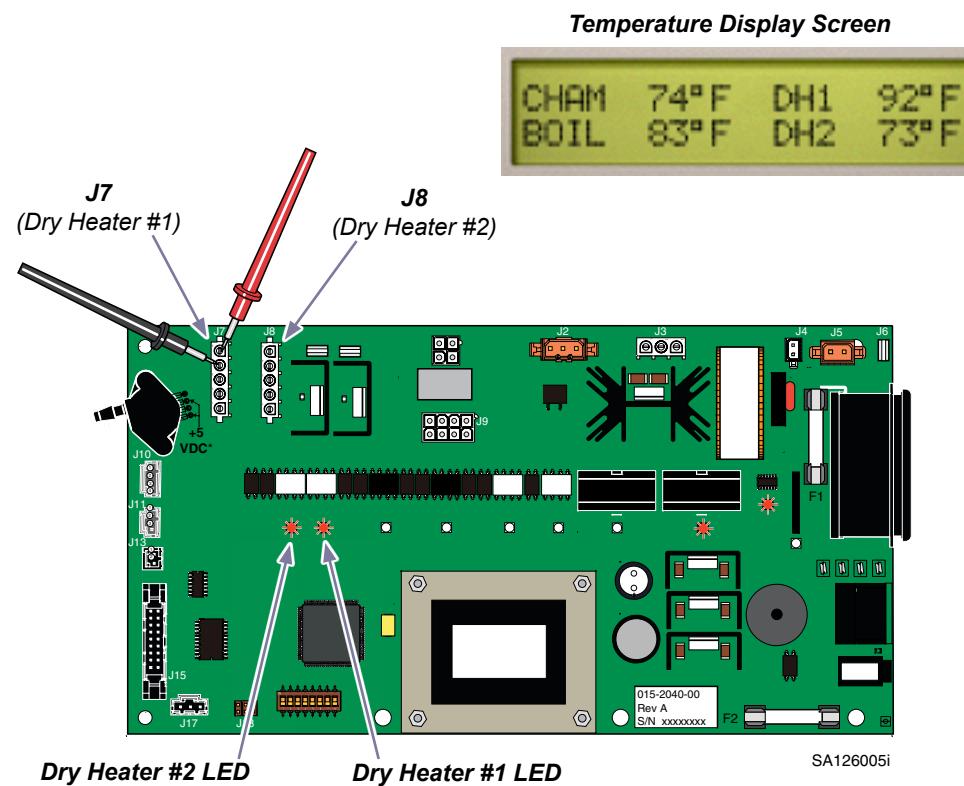
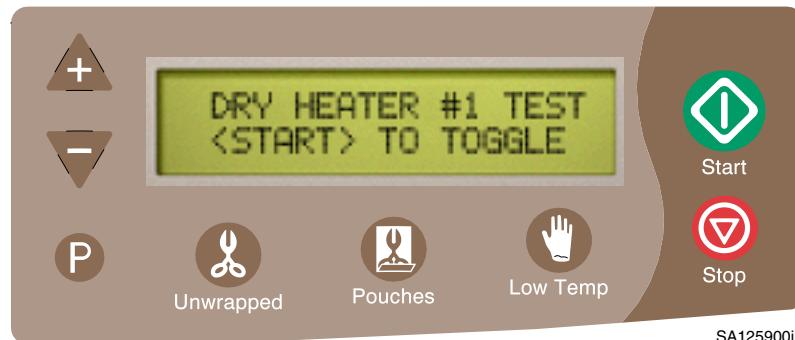
230 VAC Models

- 39.1 to 43.3 Ω : Boiler is OK.
- out of range: Replace boiler.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Dry Heaters #1 & #2)



Dry Heater Resistance Test.....B-16

The dry heater test allows you to manually energize each of the two dry heaters independently for 15 second increments. There is a separate LED for each heater that illuminates to indicate current flow to that heater.

To turn current flow to dry heater ON / OFF...

Press the <START> button.

When the dry heater LED is...

- ON - the PC board is supplying current to that dry heater.
- OFF - there is no current to dry heater.

To verify proper operation...

When the dry heater LED turns off (after approx. 15 seconds), press the <STOP> button to advance to the Temperature Display Screen. The temperature of the dry heater #1 is shown as "DH1". If the display does not reflect an increase in temperature, perform the **Dry Heater Voltage Test** below.

Dry Heater Voltage Test

- A) Disconnect dry heater harness from PC board (J7 / J8).
- B) Press <START> button so that dry heater LED is ON.
- C) Set meter to read VAC.
- D) Place meter probes on top two pins of J7 or J8 on PC board.

If meter reading shows...

- Line voltage and voltage drops to zero after 15 seconds: PC board is OK. (Perform **Dry Heater Resistance Test** on following page).
- No voltage or voltage doesn't drop to zero after 15 seconds: Replace PC board.

Press <STOP> button for next test.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Dry Heaters #1 & #2 - continued)

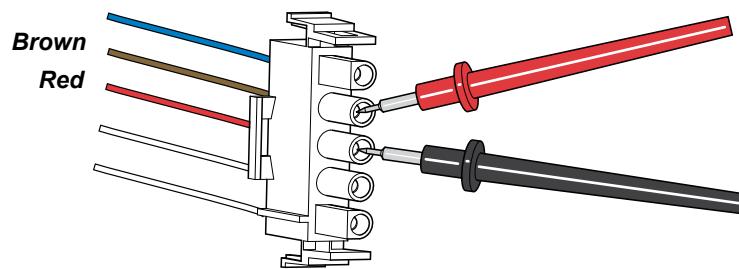
Dry Heater Resistance Test

(Allow unit to cool before performing this test)

- A) Disconnect dry heater wire harness from PC board (J7 / J8).
- B) Set meter to read ohms (Ω).
- C) Place meter probes on wire harness pins as shown.
(Note: Check resistance at all three test points shown)

If meter reading shows...

- 0Ω : Test #2 is OK.
- OL or >0 : Contact Midmark Technical Service.



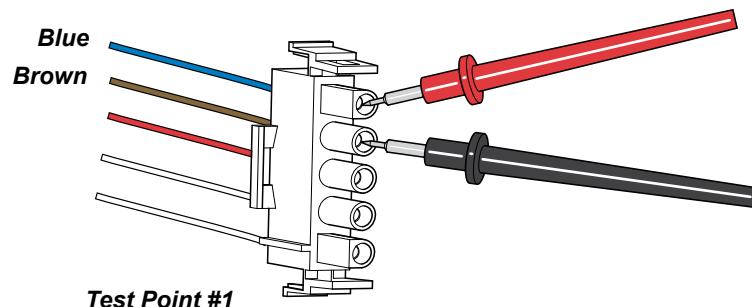
If meter reading shows...

115 VAC Models

- 68 to 80 Ω : Test #1 is OK.
- out of range: Contact Midmark Technical Service.

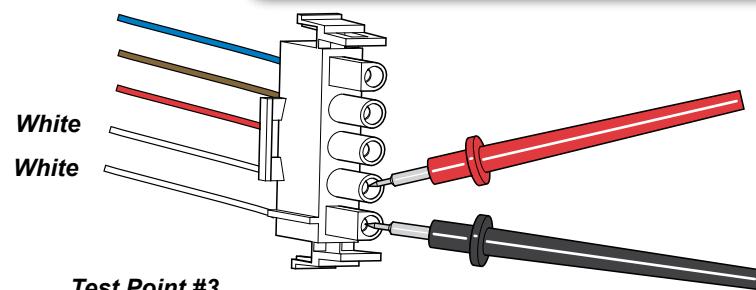
230 VAC Models

- 273 to 317 Ω : Test #1 is OK.
- out of range: Contact Midmark Technical Service.



If meter reading shows...

- 1.05 to 1.1 k Ω : Test #3 is OK.
- OL or 0 Ω : Contact Midmark Technical Service.



SA126400i

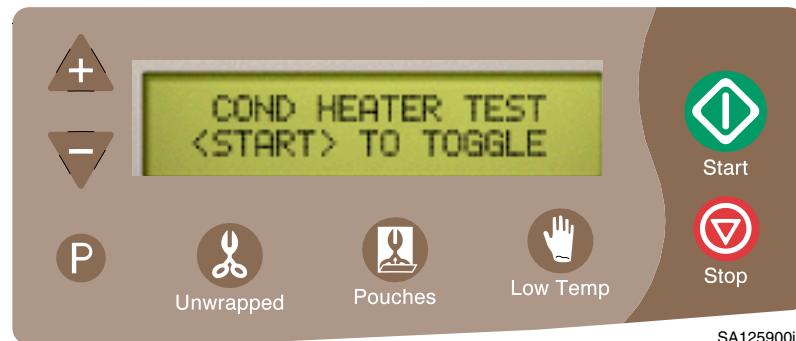
Models:	M3
Serial Numbers:	all

[Revised: mo/dd/yr]

Service Diagnostics

I/O Test (Condensation Heater)

Condensation Heater
Resistance Test.....B-18



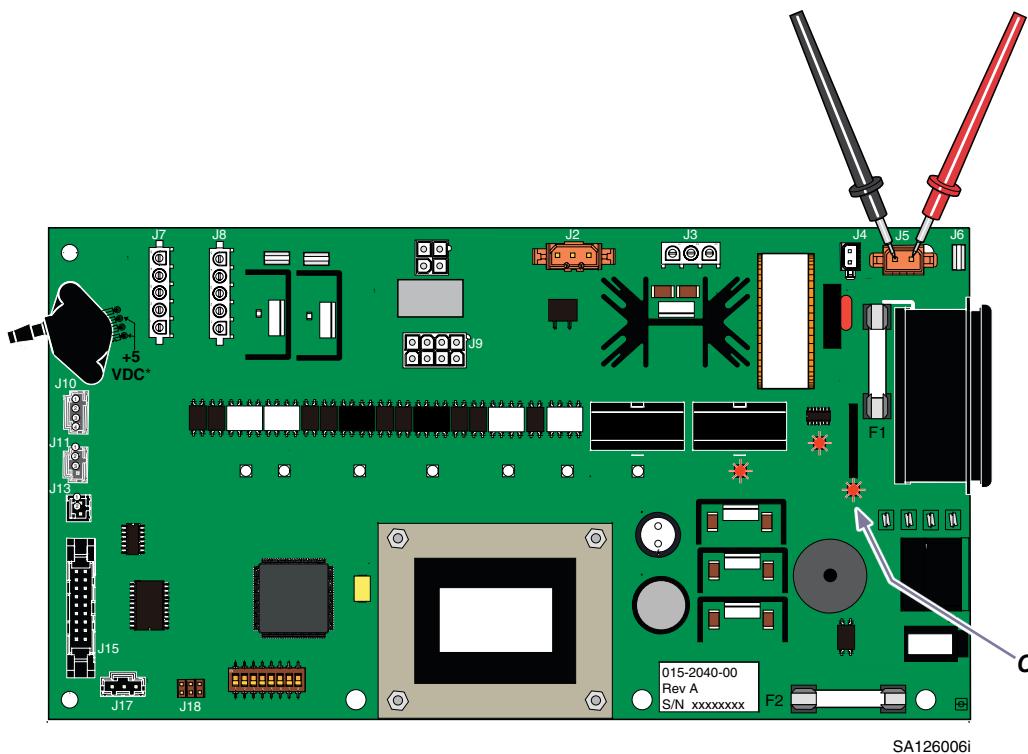
This test allows you to manually energize the condensation heater.
The condensation heater LED illuminates to indicate current flow to the heater.

To turn current flow to condensation heater ON / OFF...
Press the <START> button.

When the condensation heater LED is...
ON - the PC board is supplying current to the heater.
OFF - there is no current to heater.

To verify proper operation...
After the heater has been ON for approx. 1 minute,
touch the front panel above the chamber.
This area should feel warm.

If the panel does not feel warm,
perform the **Condensation Heater Voltage Test**.



Condensation Heater Voltage Test

- Disconnect heater harness from PC board (J5).
- Press <START> button so that heater LED is ON.
- Set meter to read VAC.
- Place meter probes on pins of J5 on PC board.

If meter reading shows...

- Line voltage: PC board is OK.
(Perform **Cond. Heater Resistance Test** on following page).
- No voltage: Replace PC board.

Press <STOP> button for next test.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Condensation Heater - continued)

[Condensation Heater](#)

[Exploded View / Part Numbers.....E-3](#)

Condensation Heater Resistance Test

- A) Disconnect cond. heater wire harness from PC board (J5).
- B) Set meter to read ohms (Ω).
- C) Place meter probes on wire harness pins as shown.

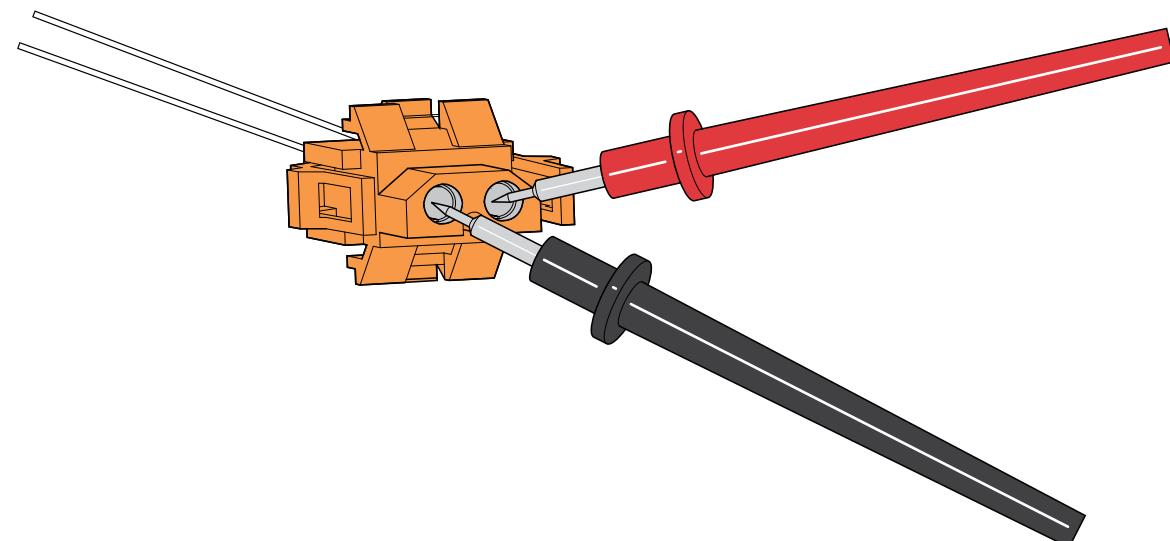
If meter reading shows...

115 VAC Models

- 716 to 727 Ω : Test #1 is OK.
- out of range: Replace Condensation Heater.

230 VAC Models

- 2736 to 3168 Ω : Test #1 is OK.
- out of range: Replace Condensation Heater.



SA126500i

Models:	M3
Serial Numbers:	all

M3
all

Service Diagnostics

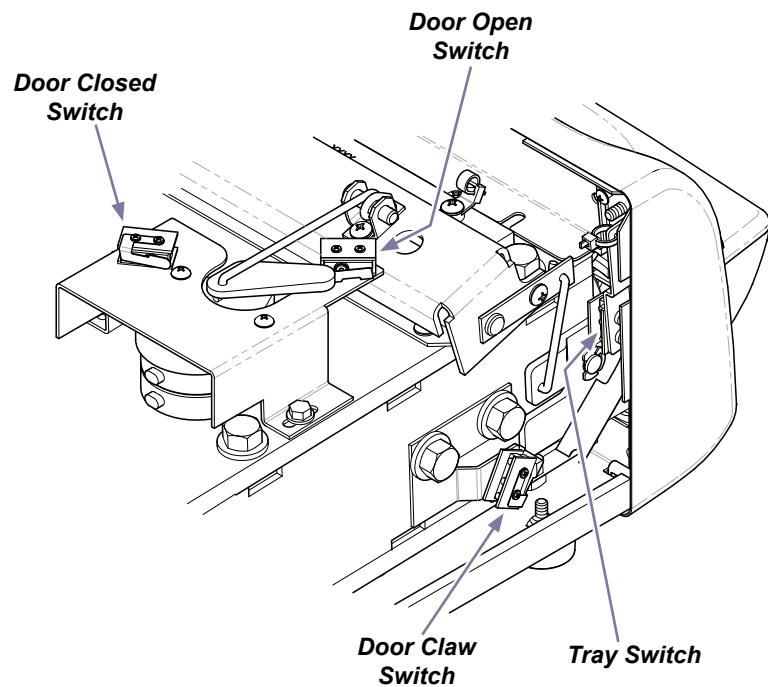
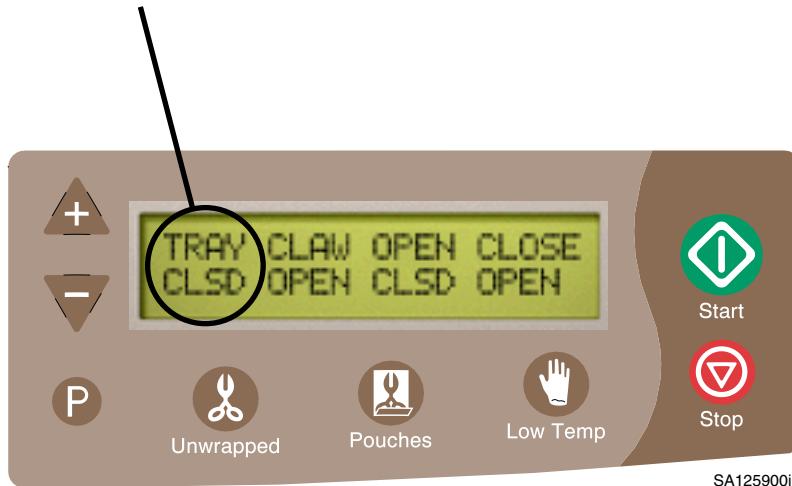
I/O Test (Tray / Door Position Switch Display Screen)

Note

To ensure accurate readings, the door / tray assembly must be positioned so the tray switch is tripped (CLSD).

This screen shows the status of the Tray Switch (TRAY), Claw Switch (CLAW), Door Open Switch (OPEN), & the Door Closed Switch (CLOSE). The status of the switch is shown directly below the switch display. The status (CLSD / OPEN) should accurately reflect the current position of that switch. The switches can be manually tripped / untripped to verify the reading is correct.

Example: This display shows that the Tray Switch (TRAY) is closed (CLSD).



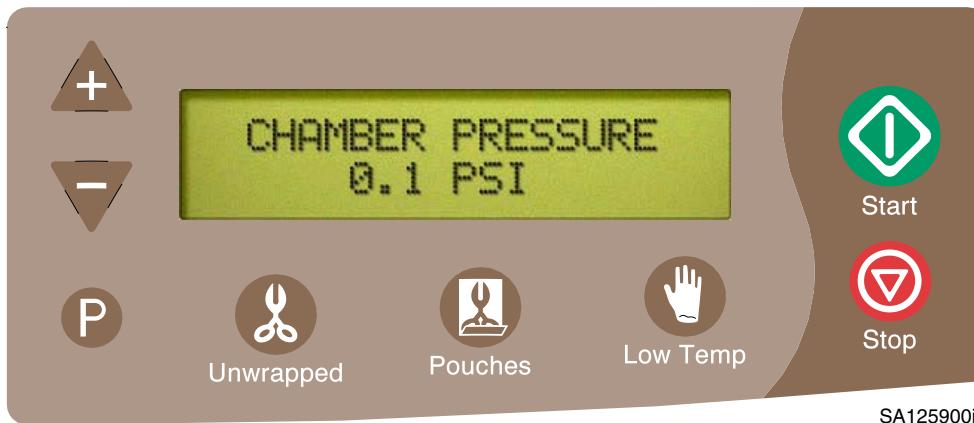
Press <STOP> button for next test.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Chamber Pressure Display Screen)

This screen shows the amount of pressure currently in the chamber. With the door open, the display should read "0.1 PSI".



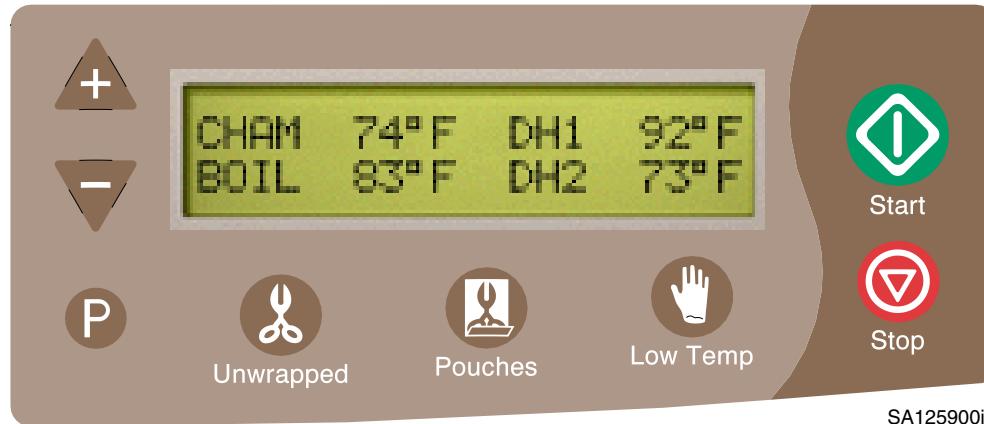
Press <STOP> button for next test.

Models:	M3
Serial Numbers:	all

Service Diagnostics

I/O Test (Temperature Display Screen)

This screen displays the temperature inside the chamber (*CHAM*), inside the boiler (*BOIL*), and for the two dry heaters (*DH1* & *DH2*).



Press <STOP> button for next test.

Models:	M3	
Serial Numbers:	all	

Service Diagnostics

I/O Test (Water Level / External Tank Sensor Display Screen)

This screen shows the status of the water level sensor in the reservoir (*WATER LVL*), & the sensors in the external condensing tank (*EXT TANK*).

Note: The sensor status is displayed in a numeric code. Refer to the illustration below for explanation of the numeric readout.

Water Level Sensor (reservoir)

# Code	Description
1023	Water level OK
0	Low water

External Tank Sensor

# Code	Description
> 950	Tank disconnected
910 - 920	Water level OK
< 750	Tank is full



Press <STOP> button to return to beginning of I/O Test.

Models:	M3
Serial Numbers:	all

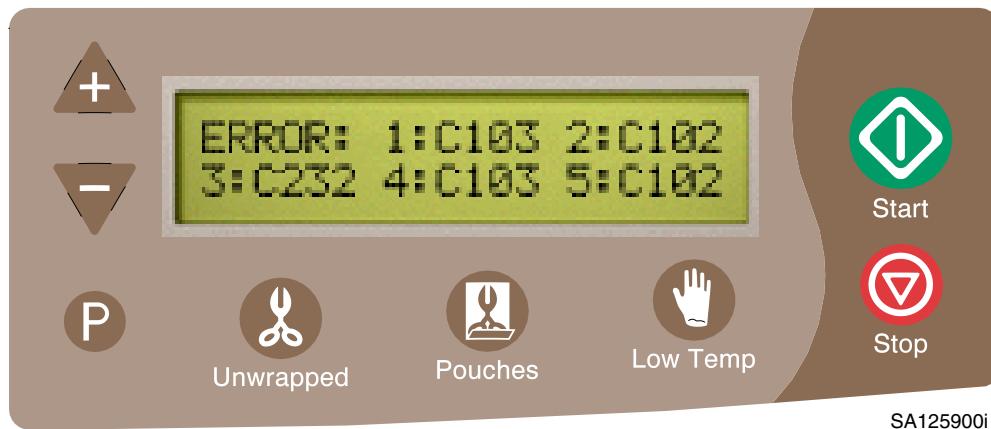
Service Diagnostics

Error Code Display Screen

This screen shows the last five error codes stored in the unit.

Note

- 1: indicates the most recent error code.
5: indicates the oldest.



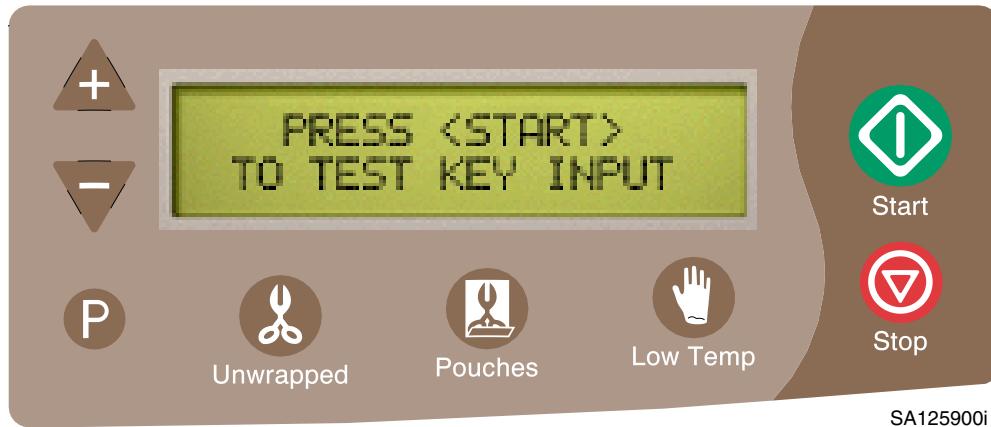
To erase all five error codes from memory...
Press <START> button.

To retain the error codes in memory...
Press <STOP> button.

Models:	M3
Serial Numbers:	all

Service Diagnostics

Key Test Display Screen



To test the functionality of the touch pad...

Press <START> button.

(When the designated button is pressed, you will hear a single "beep" and the test will advance to the next button. This indicates the button is functioning properly).

Continue for all remaining buttons.

Models:	M3
Serial Numbers:	all

Service Diagnostics

Five Point Leak Check

Point 1: Door / Tray Gasket.

- A) Check for water or steam leakage from around Door / Tray.
- B) Clean or replace Door / Tray Gasket.

Point 2: Vent Valve.

- A) Check plastic tube connecting unit to the external condensing tank for a flow of steam and hot water in between vent valve operations.
- B) Clean or replace Vent Valve.

Point 3: Pressure Relief Valve.

- A) Check for water or steam leakage from under the back left hand corner of sterilizer.
- B) Pop off and re-seat, or replace Pressure Relief Valve..

Point 4: Pressure Sensor Tubing.

- A) Check for water or steam leakage onto main PC board where pressure sensor tubing attaches to pressure transducer.
- B) Reattach or replace Pressure Sensor Tubing.

Point 5: Fittings.

- A) Check all plumbing fitting connections for leakage.
- B) Tighten or replace fittings.

Models:	M3
Serial Numbers:	all

Service Diagnostics

Temperature Sensor Resistance Test

Note

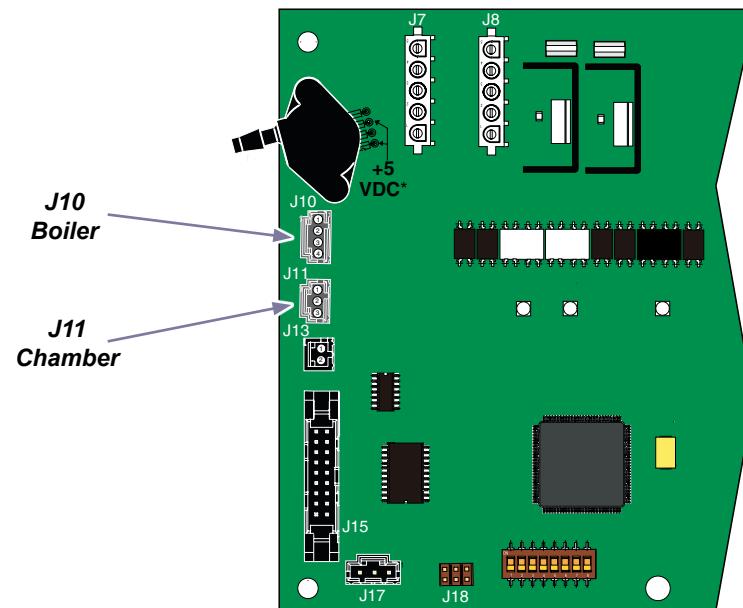
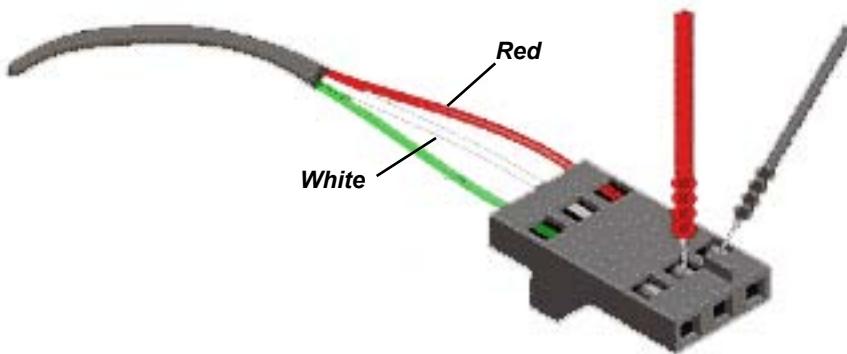
The sensor(s) must be tested at room temperature.

Boiler Temperature Sensor Test...

- A) Disconnect sensor harness from J10 on PC board.
- B) Set meter to 2k ohms (Ω).
- C) Place meter probes on the red and white wires.
The acceptable reading is 1.07 to 1.1 ohms (Ω).

Chamber Temperature Sensor Test...

- A) Disconnect sensor harness from J11 on PC board.
- B) Set meter to 2k ohms (Ω).
- C) Place meter probes on the red and white wires.
The acceptable reading is 1.07 to 1.1 ohms (Ω).
- D) Clean sensor with mild soap and distilled water.



SA1754i

Models:	M3
Serial Numbers:	all

Service Diagnostics

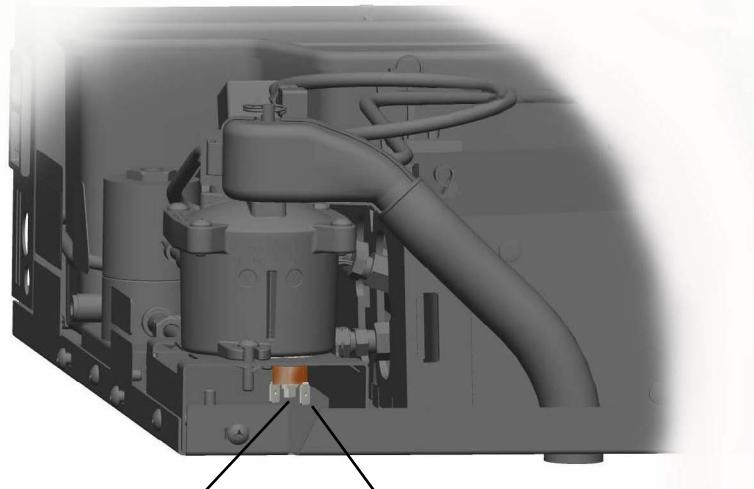
Boiler Overheat Thermostat

The thermostat is located under the boiler assembly. A manual reset button is located in between the terminals of the thermostat.

Note

Overheat Thermostat must be tested at room temperature.

Step 1: Disconnect wires from thermostat.



Step 2: Place meter probes on thermostat terminals
[Set meter to ohms (Ω)]



With switch 'untripped'...

Meter Reading Required Action

<i>Any resistance reading</i>	Switch is good.
<i>OL</i>	Replace switch

Models:	M3
Serial Numbers:	all

Service Diagnostics

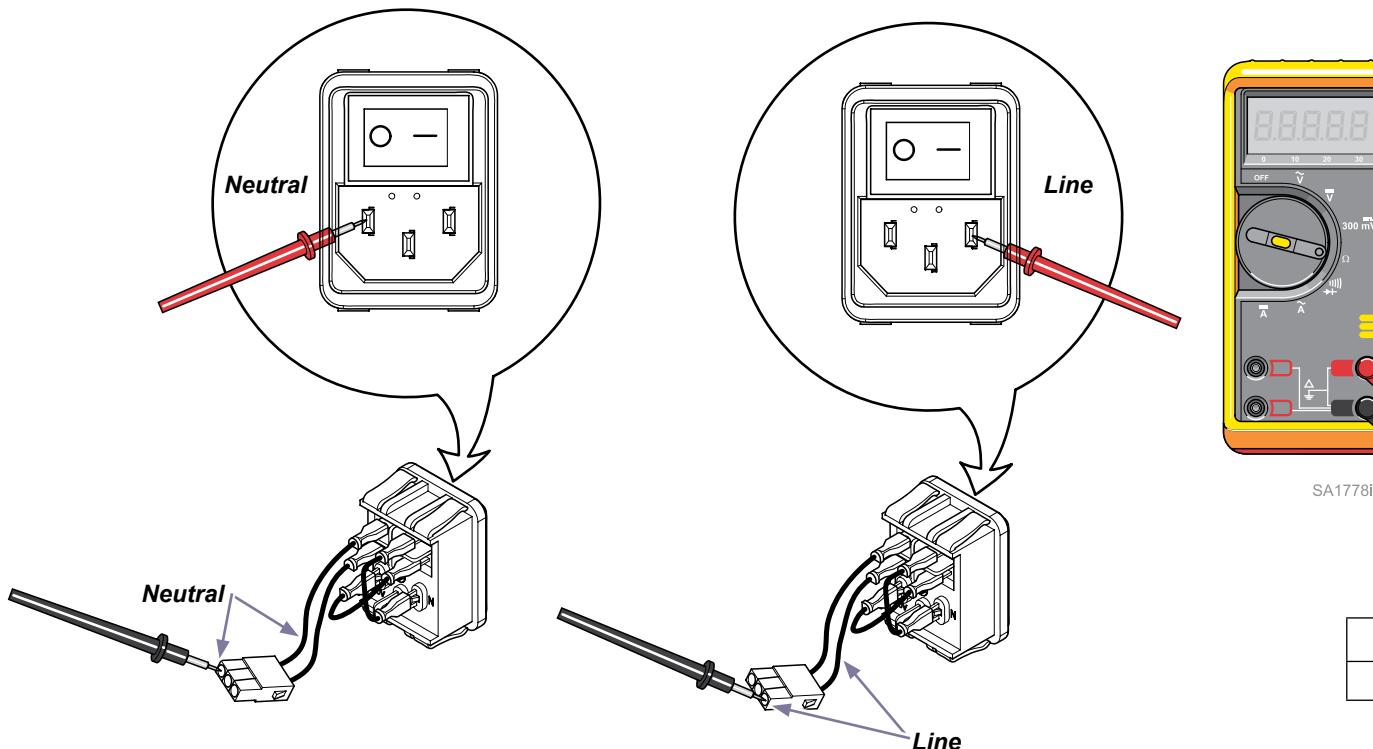
Inlet Switch Module Test (Used with New Style PC Boards)

Inlet Switch Module Continuity Test

- A) Unplug unit from power source.
- B) Remove top cover. Refer to: [Section C Top Cover](#)
- C) Disconnect switch connector from PC board.
- D) Set meter to check continuity.
- E) Flip switch to OFF and probe both neutral and line sides.
- F) Flip switch to ON and probe both neutral and line sides.

With switch 'OFF'...

Meter Reading	Required Action
OL	Switch is good.
any other reading	Replace switch



SA1778i

With switch 'ON'...

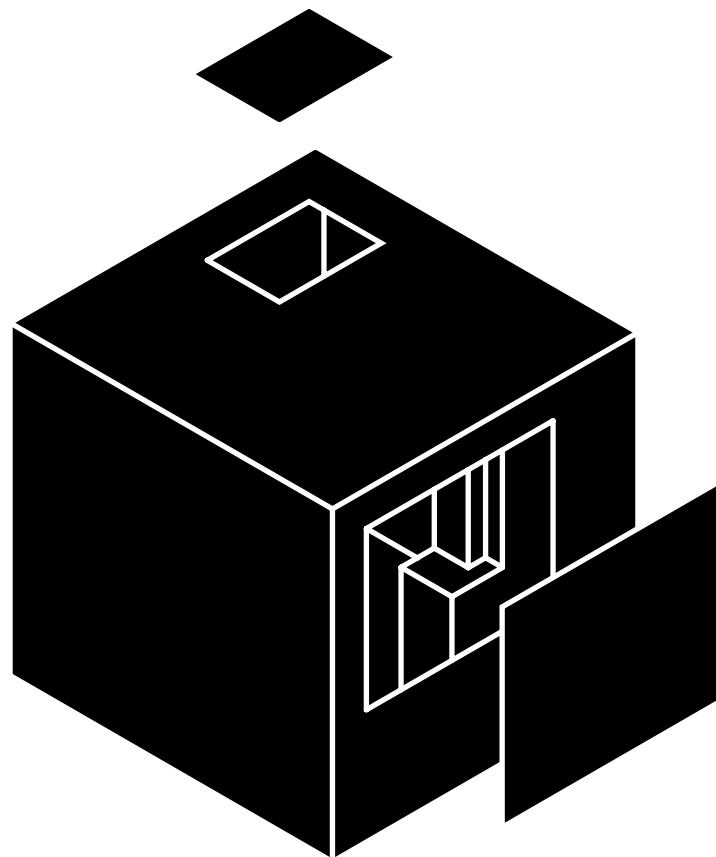
Meter Reading	Required Action
0 ohms	Switch is good.
any other reading	Replace switch

Models:	M3
Serial Numbers:	all units with newer style PC board

Section

Access Procedures

*Top Cover
Removal / Installation* C-2

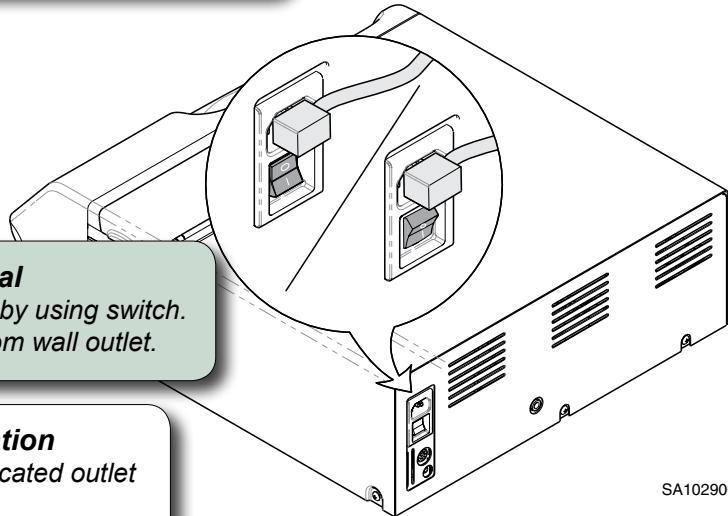


Top Cover

Removal / Installation

**WARNING**

Power unit off and unplug from outlet to prevent electrical shock.



SA102900i

Step 1: Removal

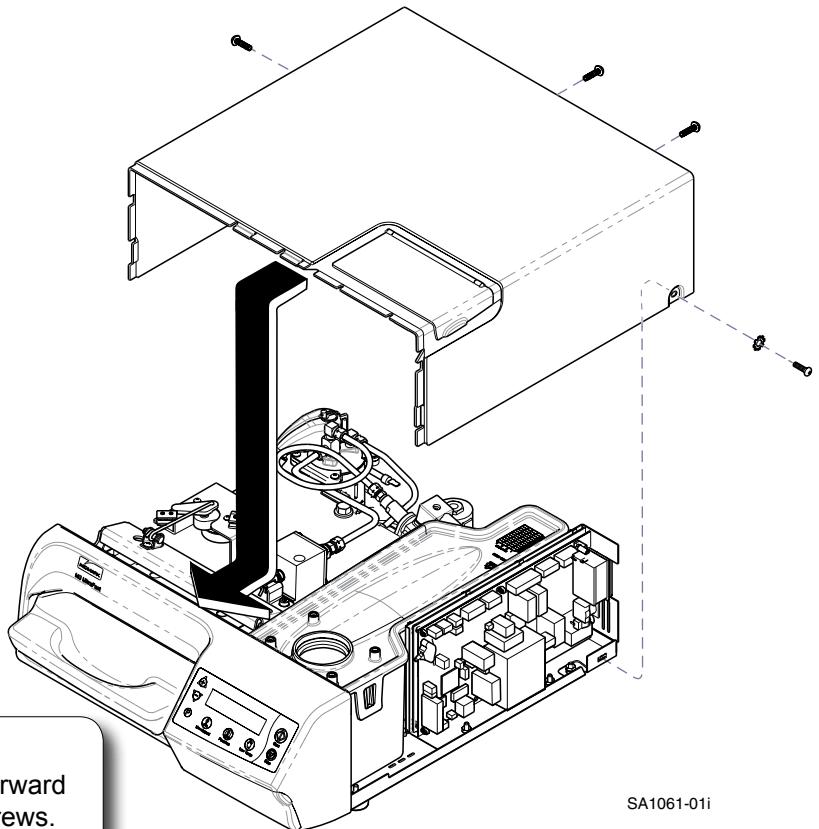
- A) Power unit off by using switch.
- B) Unplug unit from wall outlet.

Step 2: Installation

Plug unit into dedicated outlet and power on.

Step 2: Removal

Remove four screws (two from back and one from each side) and slide cover back and up.



SA1061-01i

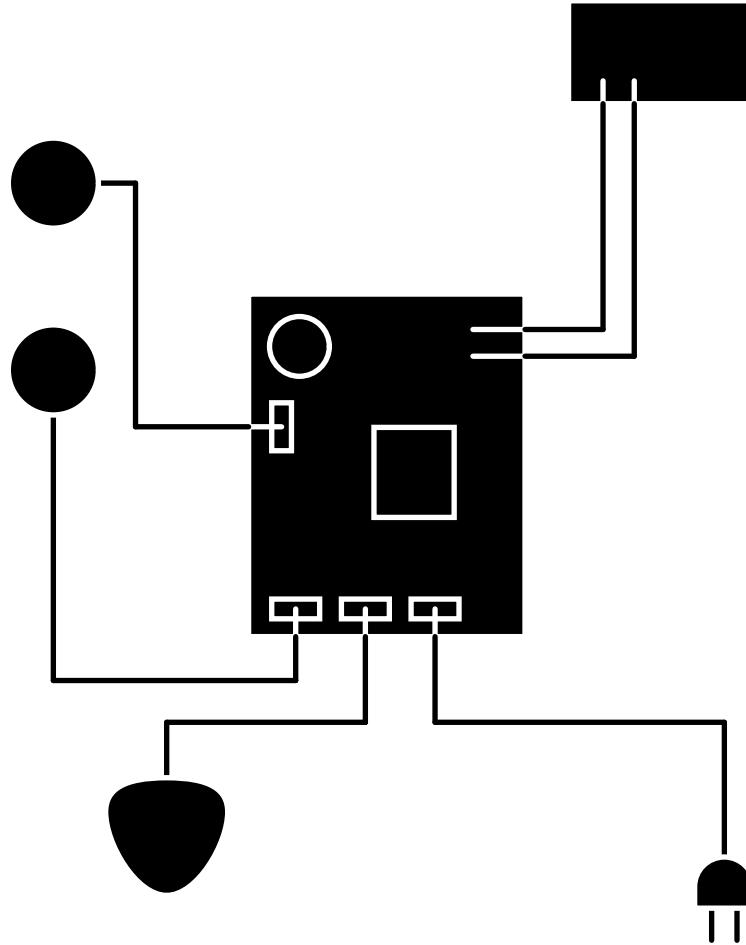
Step 1: Installation

Place cover on sterilizer and slide forward into position, and attach with two screws.

Models:	M3
Serial Numbers:	all

Section D

Wiring Diagrams



Wiring Diagrams

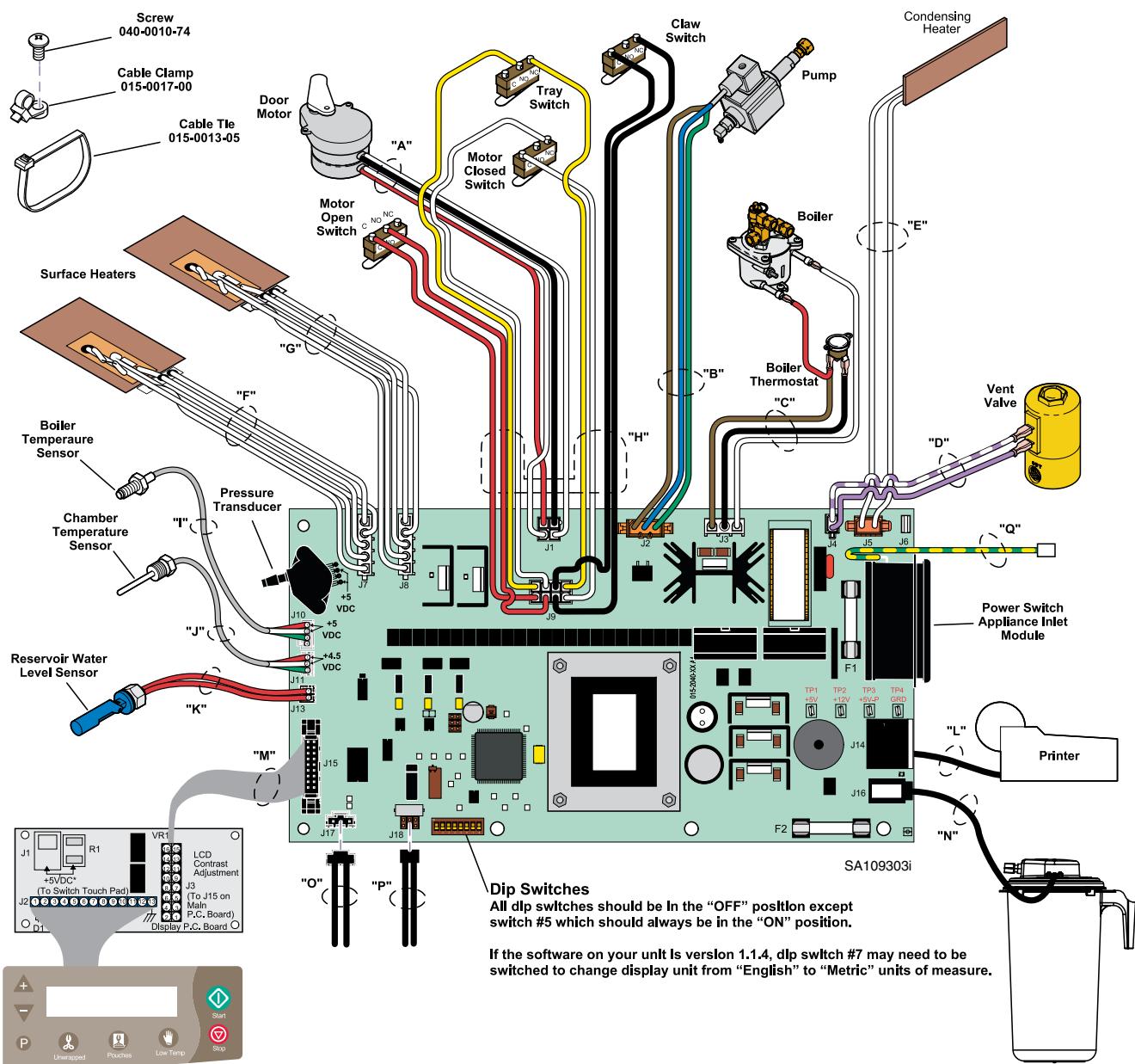
Wire Harness	From:	To:	Part Number	Ref. Page
A	Main PCB (J1)	Door Motor	Part of Door Motor Assy.	E-5**
B	Main PCB (J2)	Pump	002-1085-00	E-7**
C	Main PCB (J3)	Boiler Thermostat	015-2056-00	E-6***
D	Main PCB (J4)	Vent Valve	015-2057-00	E-7**
E	Main PCB (J5)	Condensing Heater	Part of Condensing Heater	E-3**
F	Main PCB (J7)	Chamber Surface Heater	Not Serviceable	**
G	Main PCB (J8)	Chamber Surface Heater	Not Serviceable	**
H	Main PCB (J9)	Switch Harness Assembly	002-1088-00	E-4* E-5*
I	Main PCB (J10)	Boiler Temperature Sensor	Part of Boiler Temperature Sensors	E-6***
J	Main PCB (J11)	Chamber Temperature Sensor	Part of Chamber Temperature Sensor	E-10***
K	Main PCB (J13)	Reservoir Water Level Sensor	Part off Reservoir Water Level Sensor	E-8***
L	Main PCB (J14)	Printer Port	015-2102-00	E-14***
M	Main PCB (J15)	Display Port	Part of Display PCB	E-3***
N	Main PCB (J16)	External Condensing Tank	015-2089-00	E-13***
O	Main PCB (J17)	Serial Communication	Not Supplied	
P	Main PCB (J18)	Programing Port	Not Supplied	
Q	Appliance Inlet	Base Assembly	015-2103-00	E-9.1

(*) Denotes constant voltage.

(**) Denotes voltage present only during component operation.

(***) Denotes rectified DC voltage present during operation.

Always disconnect plug connector when checking voltage.



Fuses:

115 VAC models:

F1.....15 amp, 250 V, Fast Acting, 1/4" x 1 1/4"

F2.....0.25 amp, 250 V, Slo Blo, 1/4" x 1 1/4"

230 VAC models:

F1.....8 amp, 250 V, Fast Acting, 5mm x 20mm

F2.....0.125 amp, 250 V, Slo Blo, 5mm x 20mm

Models: M3 (all) Standard up to V1408969

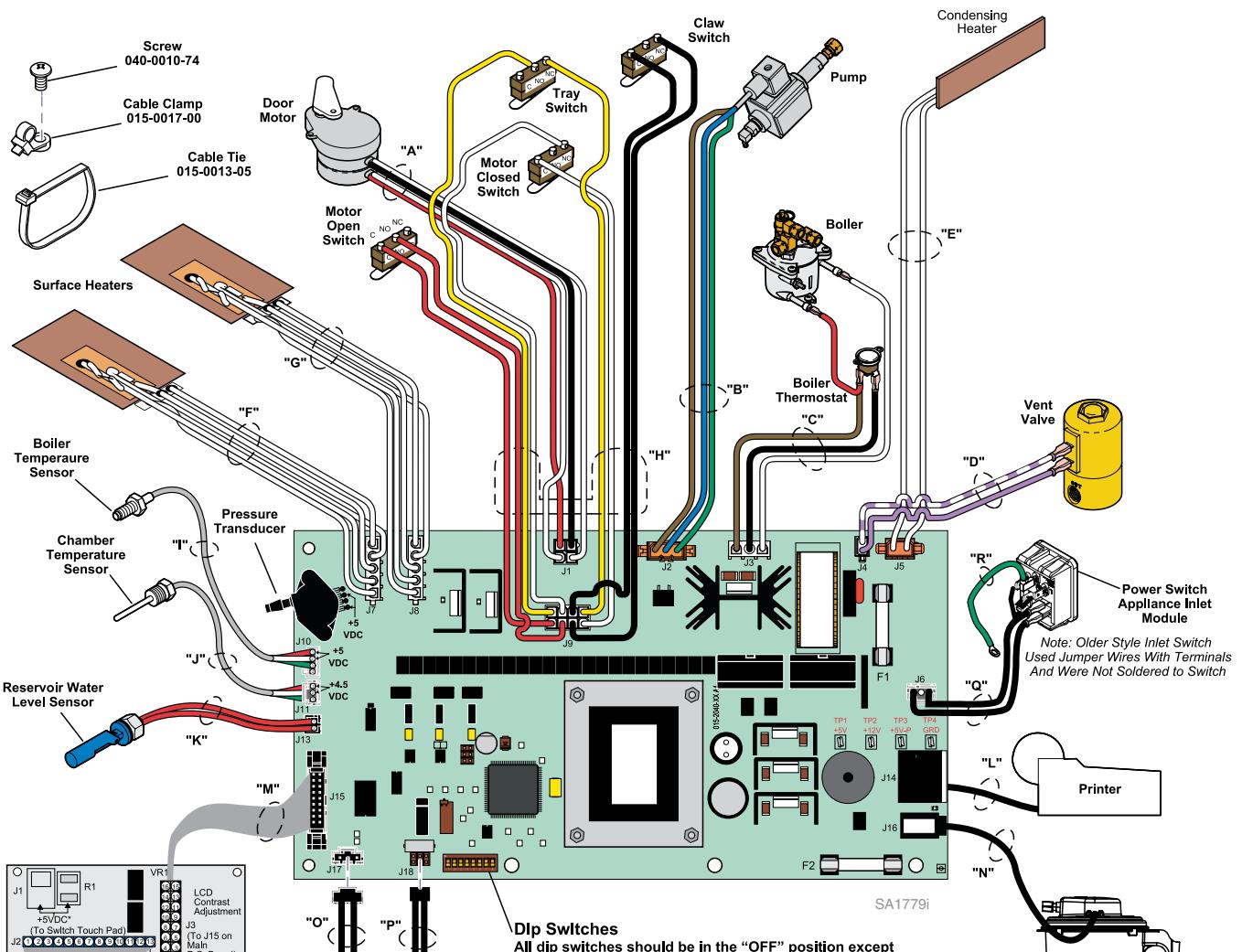
Serial Numbers: V792976 thru V1408969

Wiring Diagrams

Wire Harness	From:	To:	Part Number	Ref. Page
A	Main PCB (J1)	Door Motor	Part of Door Motor Assy.	E-5**
B	Main PCB (J2)	Pump	002-1085-00	E-7**
C	Main PCB (J3)	Boiler Thermostat	015-2056-00	E-6***
D	Main PCB (J4)	Vent Valve	015-2057-00	E-7**
E	Main PCB (J5)	Condensing Heater	Part of Condensing Heater	E-3**
F	Main PCB (J7)	Chamber Surface Heater	Not Serviceable	**
G	Main PCB (J8)	Chamber Surface Heater	Not Serviceable	**
H	Main PCB (J9)	Switch Harness Assembly	002-1088-00	E-4* E-5*
I	Main PCB (J10)	Boiler Temperature Sensor	Part of Boiler Temperature Sensors	E-6***
J	Main PCB (J11)	Chamber Temperature Sensor	Part of Chamber Temperature Sensor	E-10***
K	Main PCB (J13)	Reservoir Water Level Sensor	Part off Reservoir Water Level Sensor	E-8***
L	Main PCB (J14)	Printer Port	015-2102-00	E-14***
M	Main PCB (J15)	Display Port	Part of Display PCB	E-3***
N	Main PCB (J16)	External Condensing Tank	015-2089-00	E-13***
O	Main PCB (J17)	Serial Communication	Not Supplied	-
P	Main PCB (J18)	Programing Port	Not Supplied	-
Q	Main PCB (J6)	Appliance Inlet	015-3271-01	E-9.2
R	Serilizer	Power Switch	015-2054-00	-

(*) Denotes constant voltage.
 (**) Denotes voltage present only during component operation.
 (***) Denotes rectified DC voltage present during operation.

Always disconnect plug connector when checking voltage.



Models:

M3 (all) Standard After V1408970

Serial Numbers:

V1408970 thru Present

Fuses:

115 VAC models;

F1.....15 amp, 250 V, Fast Acting, 1/4" x 1 1/4"

F2.....0.25 amp, 250 V, Slo Blo, 1/4" x 1 1/4"

230 VAC models:

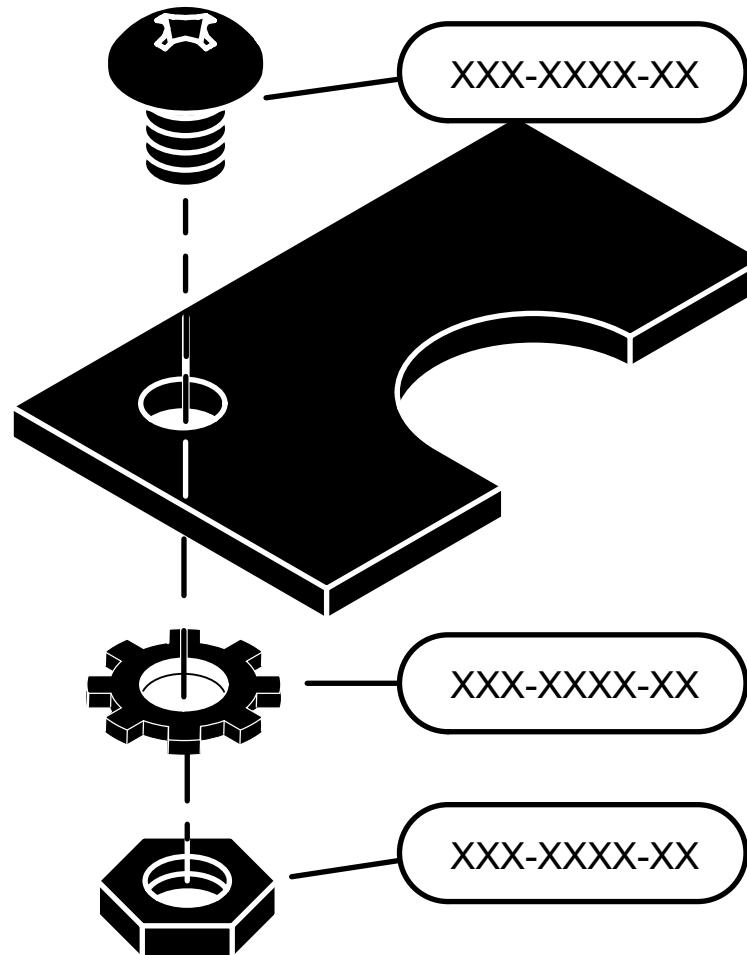
F1.....8 amp, 250 V, Fast Acting, 5mm x 20mm

F2.....0.125 amp, 250 V, Slo Blo, 5mm x 20mm

Section

Exploded Views & Parts Lists

M3: (-001, -002, -003, -004) E-2



M3 (-001 / -002 / -003 / -004)

Main Components E-4

Pressure Interlock Assembly E-5

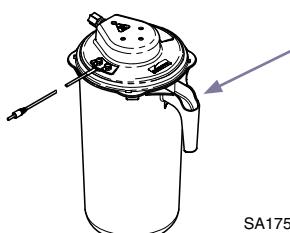
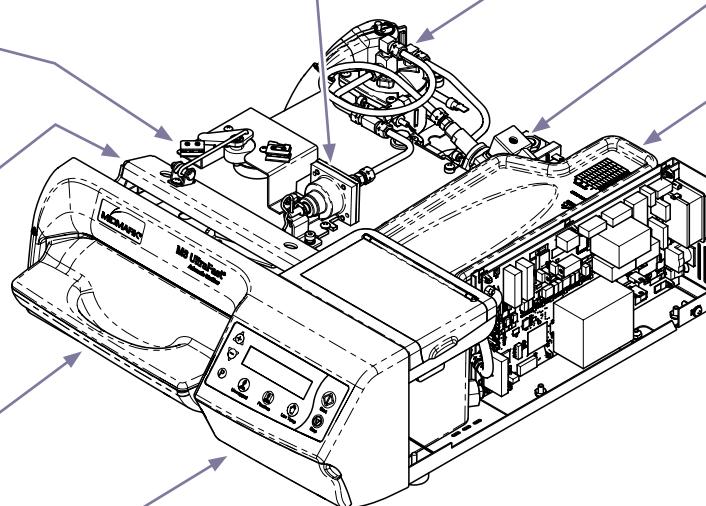
Switch Harness Assembly E-10

Door / Tray Latch Mechanism E-5

M3 Door / Tray Accessory (9A402xxx) E-12

Main Enclosure E-3

M3 Shipping Packaging E-14



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

M3 Boiler Assembly E-6

M3 Pump / Solenoid Assembly E-7

M3 Reservoir Assembly E-8

M3 PCB Assembly E-9

includes: power switch and outlet

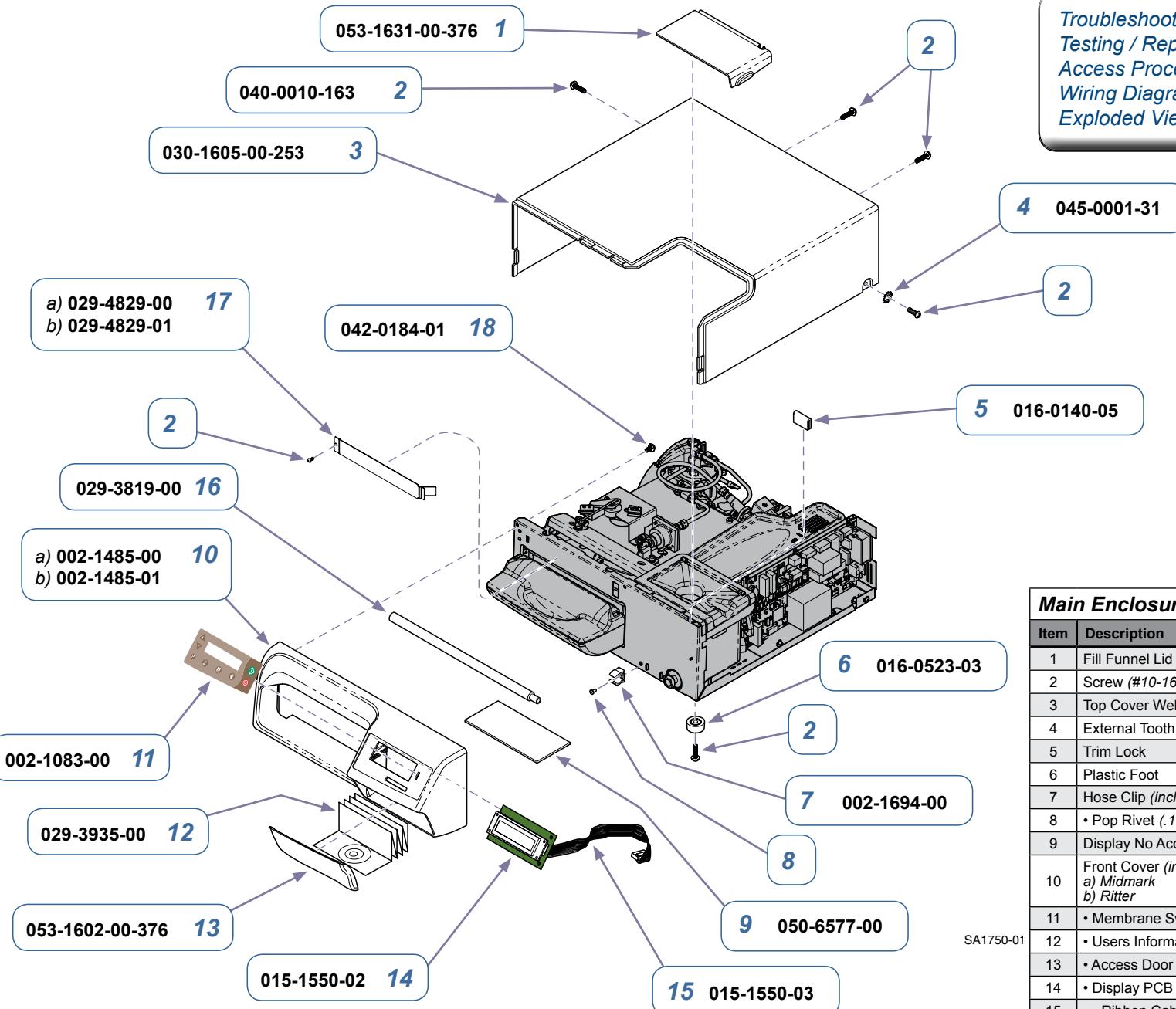
M3 External Tank E-13

Plumbing and Tubing Components E-11

M3 Label Location E-15

Models:	M3
Serial Numbers:	all

M3
all

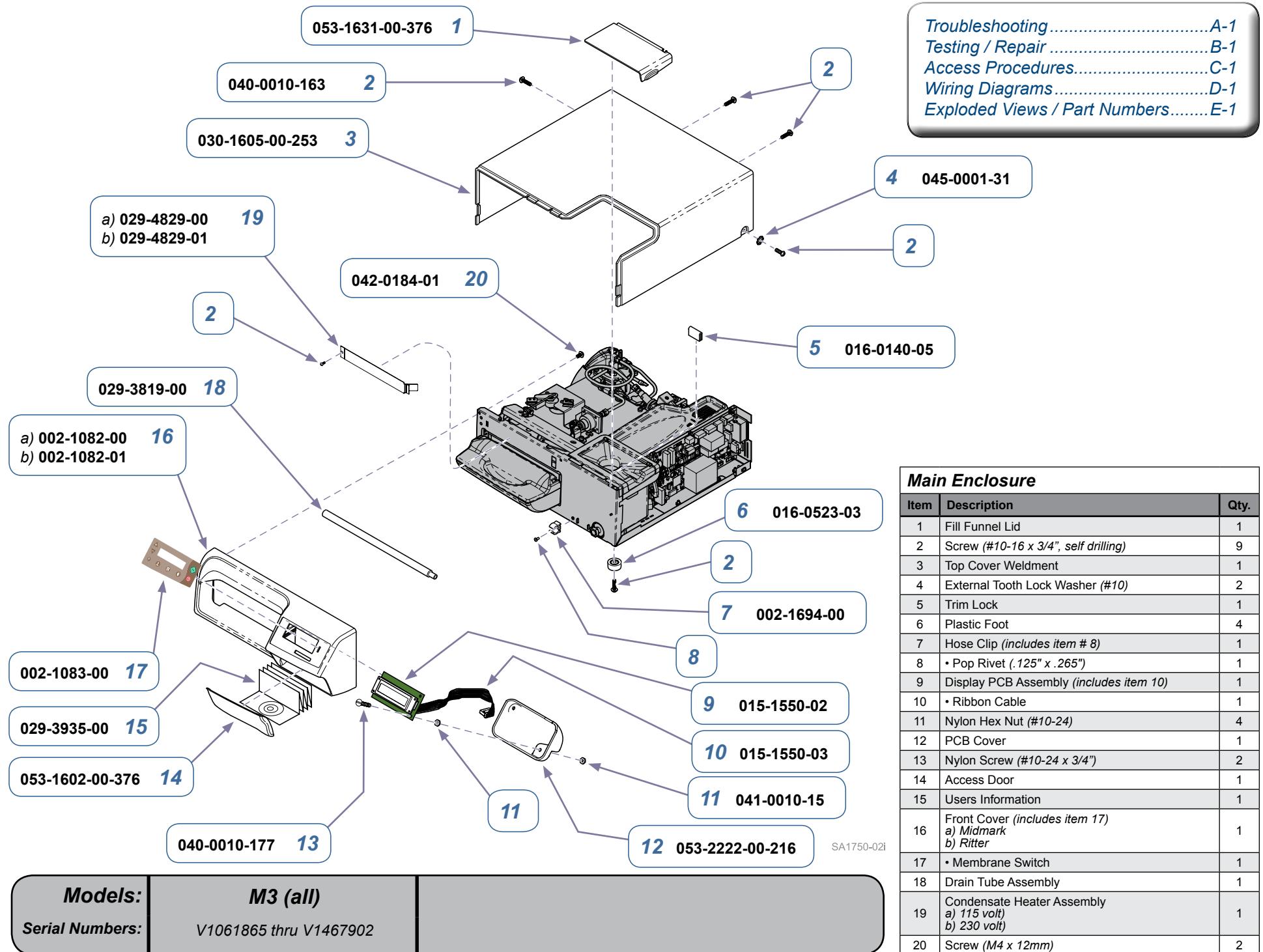


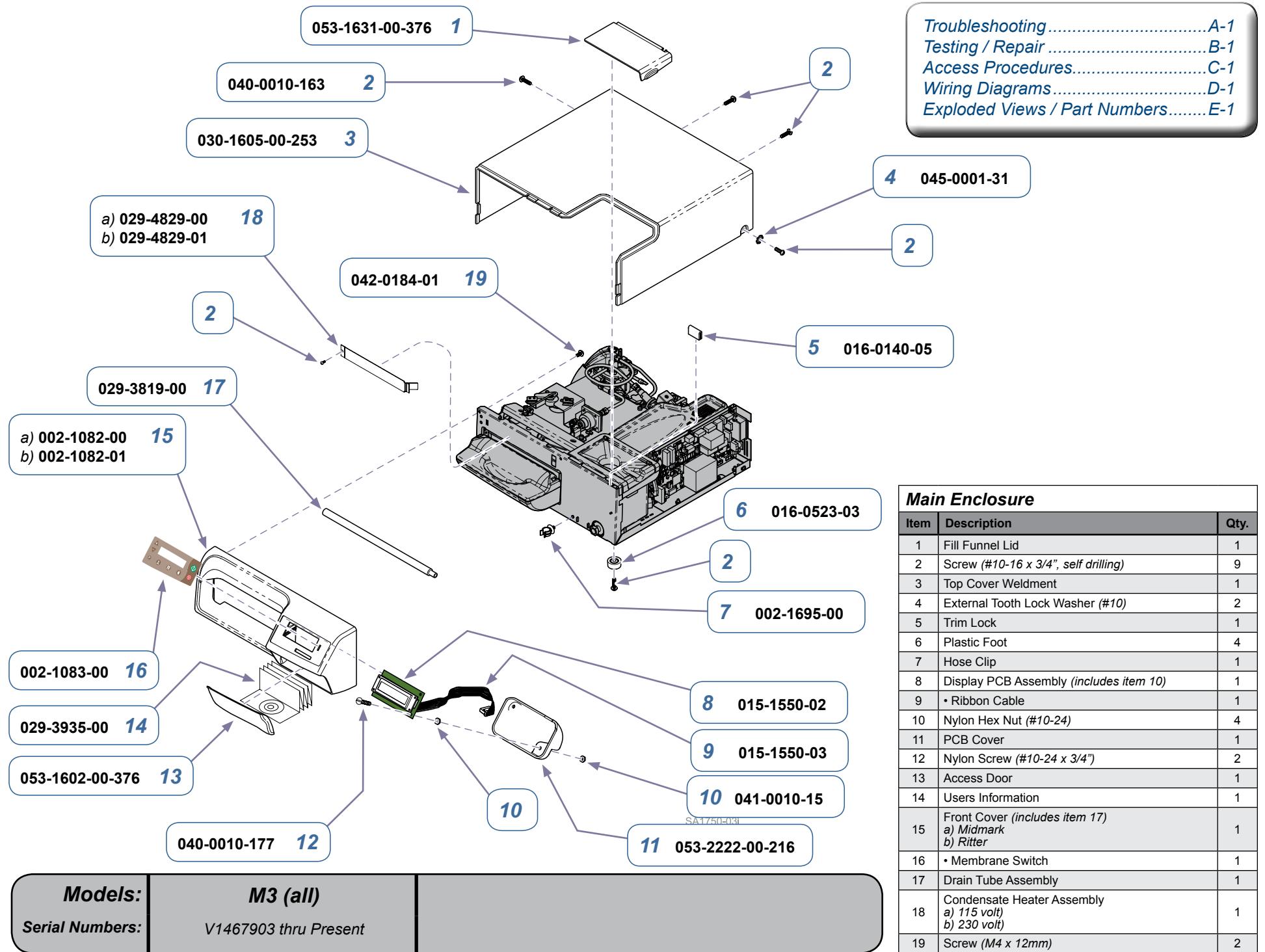
Troubleshooting	A-1
Testing / Repair	B-1
Access Procedures	C-1
Wiring Diagrams	D-1
Exploded Views / Part Numbers	E-1

Main Enclosure		
Item	Description	Qty.
1	Fill Funnel Lid	1
2	Screw (#10-16 x 3/4", self drilling)	9
3	Top Cover Weldment	1
4	External Tooth Lock Washer (#10)	2
5	Trim Lock	1
6	Plastic Foot	4
7	Hose Clip (includes item # 8)	1
8	• Pop Rivet (.125" x .265")	1
9	Display No Access Plate	1
10	Front Cover (includes items 11 thru 14) a) Midmark b) Ritter	1
11	• Membrane Switch	1
12	• Users Information	1
13	• Access Door	1
14	• Display PCB Assembly (includes item 15)	1
15	• Ribbon Cable	1
16	Drain Tube Assembly	1
17	Condensate Heater Assembly a) 115 volt b) 230 volt	1
18	Screw (M4 x 12mm)	2

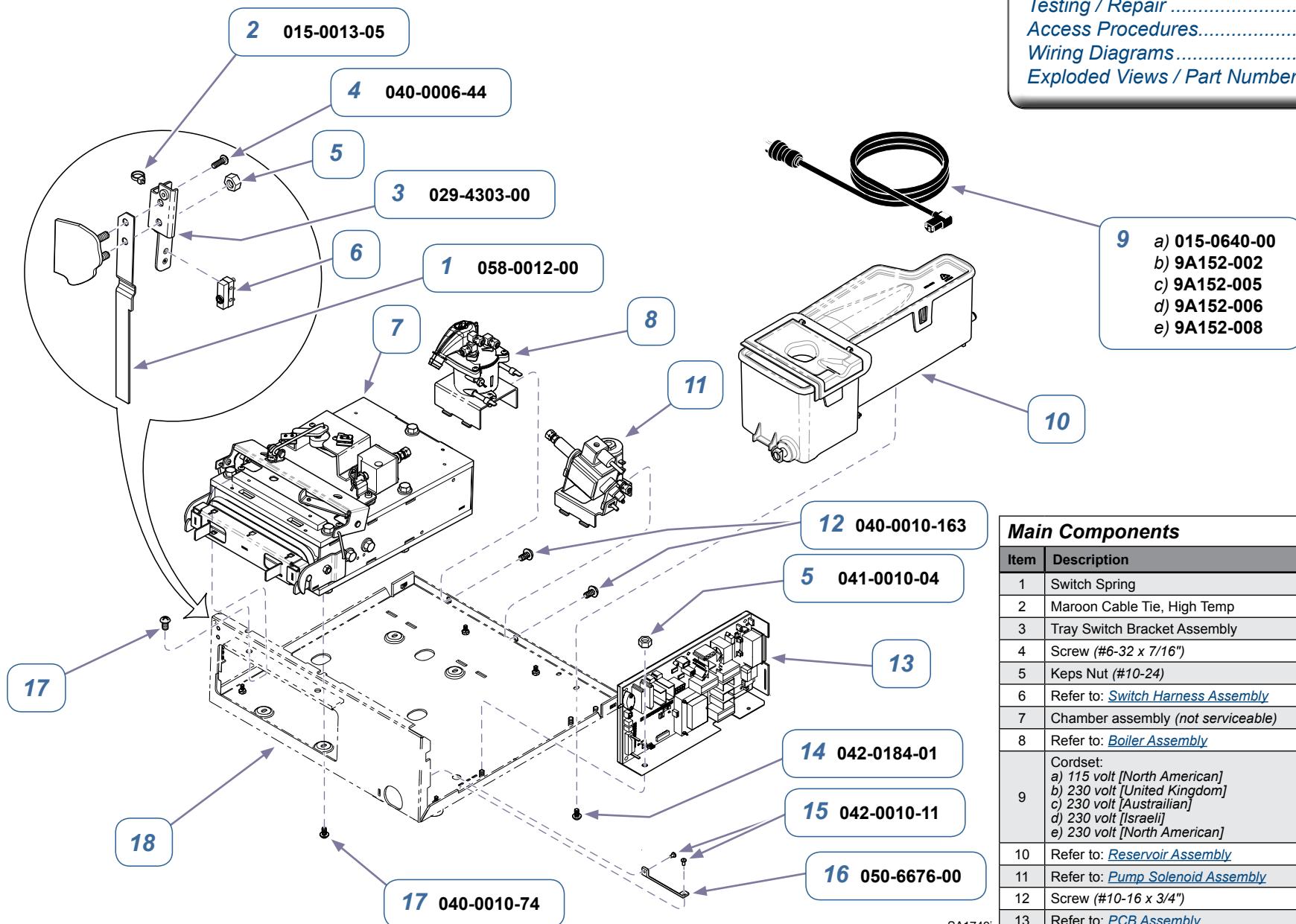
Models:	M3 (all)
Serial Numbers:	V792976 thru V1061864

SA1750-01





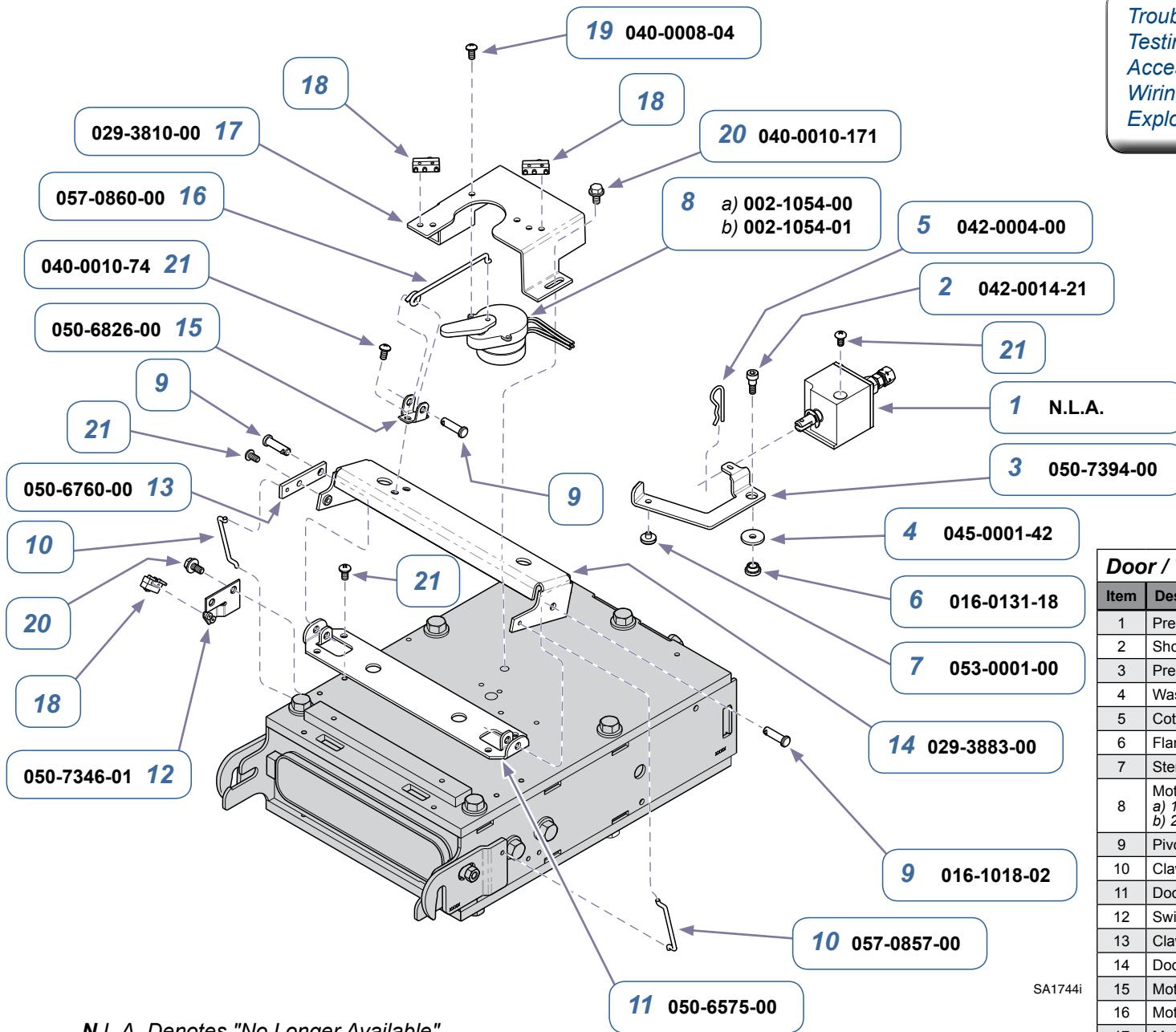
Troubleshooting	A-1
Testing / Repair	B-1
Access Procedures	C-1
Wiring Diagrams	D-1
Exploded Views / Part Numbers	E-1



Main Components		
Item	Description	Qty.
1	Switch Spring	1
2	Maroon Cable Tie, High Temp	1
3	Tray Switch Bracket Assembly	1
4	Screw (#6-32 x 7/16")	1
5	Keps Nut (#10-24)	4
6	Refer to: Switch Harness Assembly	Ref
7	Chamber assembly (not serviceable)	Ref
8	Refer to: Boiler Assembly	Ref
9	Cordset: a) 115 volt [North American] b) 230 volt [United Kingdom] c) 230 volt [Australian] d) 230 volt [Israeli] e) 230 volt [North American]	1
10	Refer to: Reservoir Assembly	Ref
11	Refer to: Pump Solenoid Assembly	Ref
12	Screw (#10-16 x 3/4")	3
13	Refer to: PCB Assembly	Ref
14	Screw (M4 x 12mm)	1
15	Pop Rivet	2
16	Base Gusset	1
17	Screw (#10-32 x 3/8")	6
18	NFS - Base Assembly	1

Models:
M3 (all)

Serial Numbers:
V792976 thru Present



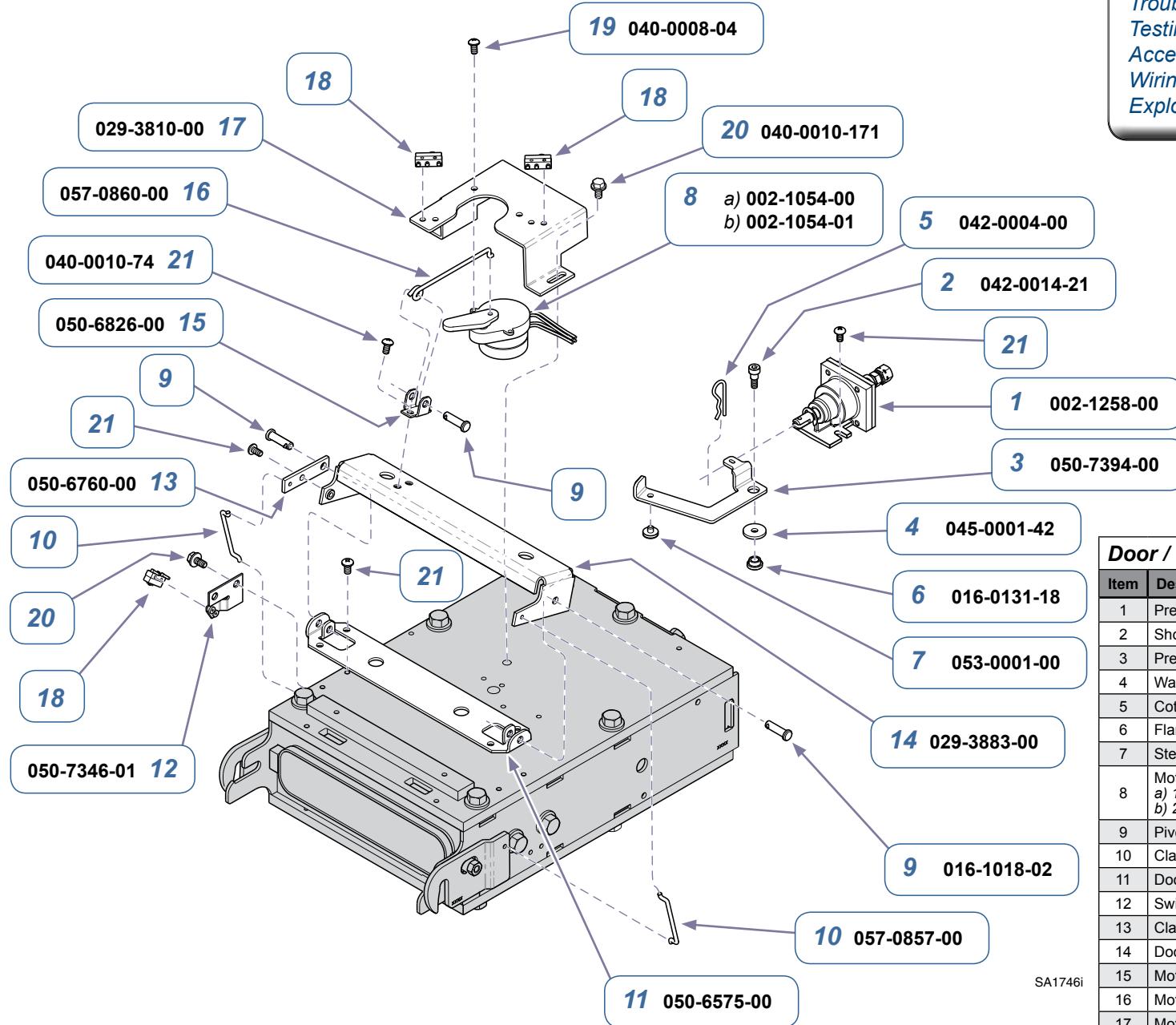
N.L.A. Denotes "No Longer Available"

Models:	M3 (all)	
Serial Numbers:	V792976 thru V811649	

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

Door / Tray Latch Mechanism

Item	Description	Qty.
1	Pressure Interlock Assembly (Use 002-1258-00)	1
2	Shoulder Screw (1/4" x 3/8")	1
3	Pressure Lock Bracket	1
4	Washer (#10)	1
5	Cotter Pin (1.438)	1
6	Flange Bearing	1
7	Stem Bumper	1
8	Motor Assembly a) 115 volt b) 230 volt	1
9	Pivot Pin	3
10	Claw Connecting Rod	2
11	Door Open Bracket	1
12	Switch Mounting Bracket	1
13	Claw Adjustment Plate	1
14	Door Open Pivot Bracket Assembly	1
15	Motor Connecting Fork	1
16	Motor Connecting Rod	1
17	Motor Mounting Bracket	1
18	Refer to: Switch Harness Assembly	Ref
19	Screw (#8-32 x 3/8")	2
20	Screw (#10-32 x 3/8" hex head)	2
21	Screw (#10-32 x 3/8" pan head)	AR



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

Door / Tray Latch Mechanism

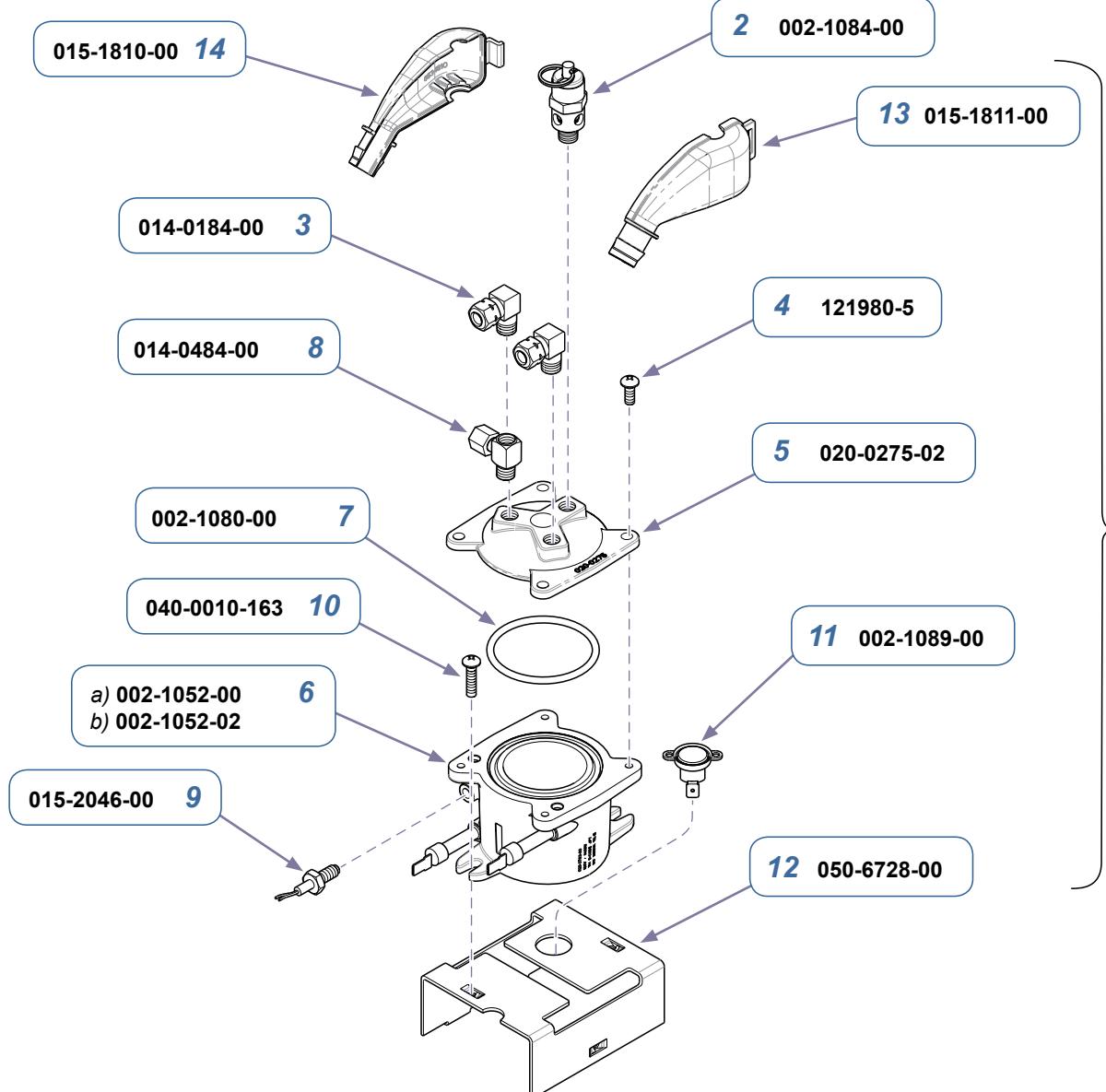
Item	Description	Qty.
1	Pressure Interlock Assembly	1
2	Shoulder Screw (1/4" x 3/8")	1
3	Pressure Lock Bracket	1
4	Washer (#10)	1
5	Cotter Pin (1.438)	1
6	Flange Bearing	1
7	Stem Bumper	1
8	Motor Assembly a) 115 volt b) 230 volt	1
9	Pivot Pin	3
10	Claw Connecting Rod	2
11	Door Open Bracket	1
12	Switch Mounting Bracket	1
13	Claw Adjustment Plate	1
14	Door Open Pivot Bracket Assembly	1
15	Motor Connecting Fork	1
16	Motor Connecting Rod	1
17	Motor Mounting Bracket	1
18	Refer to: Switch Harness Assembly	Ref
19	Screw (#8-32 x 3/8")	2
20	Screw (#10-32 x 3/8" hex head)	2
21	Screw (#10-32 x 3/8" pan head)	AR

Models:

M3 (all)

Serial Numbers:

V811650 thru Present



SA102300i

Models:	M3 (all)
Serial Numbers:	V792976 thru Present

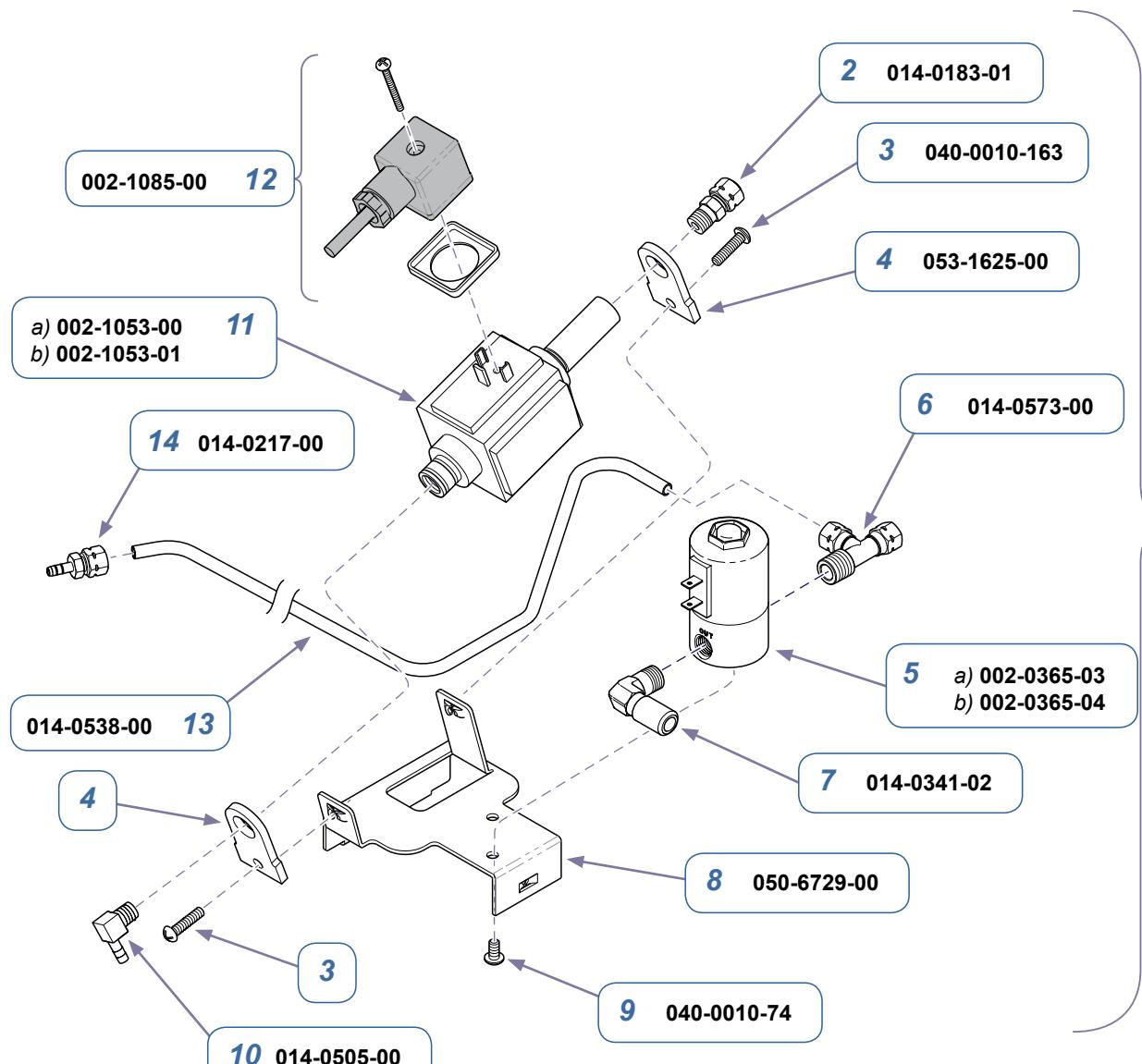
[Revised: 6/27/2011]

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

Boiler Assembly

Item	Description	Qty.
1	Boiler Assy. Kit (includes items 2 thru 8) a) 115 volt b) 230 volt	1
2	• 40 PSI Pressure Relief Valve Kit	1
3	• Male Elbow (1/4" OD x 1/8" NPT)	2
4	• Screw (#10-24 x 1/2" stainless steel)	4
5	• Boiler Cap, Coated	1
6	• Steam Boiler Kit (incl. item 11) a) 115 volt b) 230 volt	1
7	• Steam Boiler O-ring Kit	1
8	• Adapter Tee (1/4 OD x 1/8' NPT)	1
9	Temperature Sensor, Boiler	1
10	Screw (#10-16 x 3/4")	2
11	Manual Reset Thermostat Kit - 375° F	1
12	Boiler Mounting Bracket	1
13	PRV Enclosure - RH	1
14	PRV Enclosure - LH	1

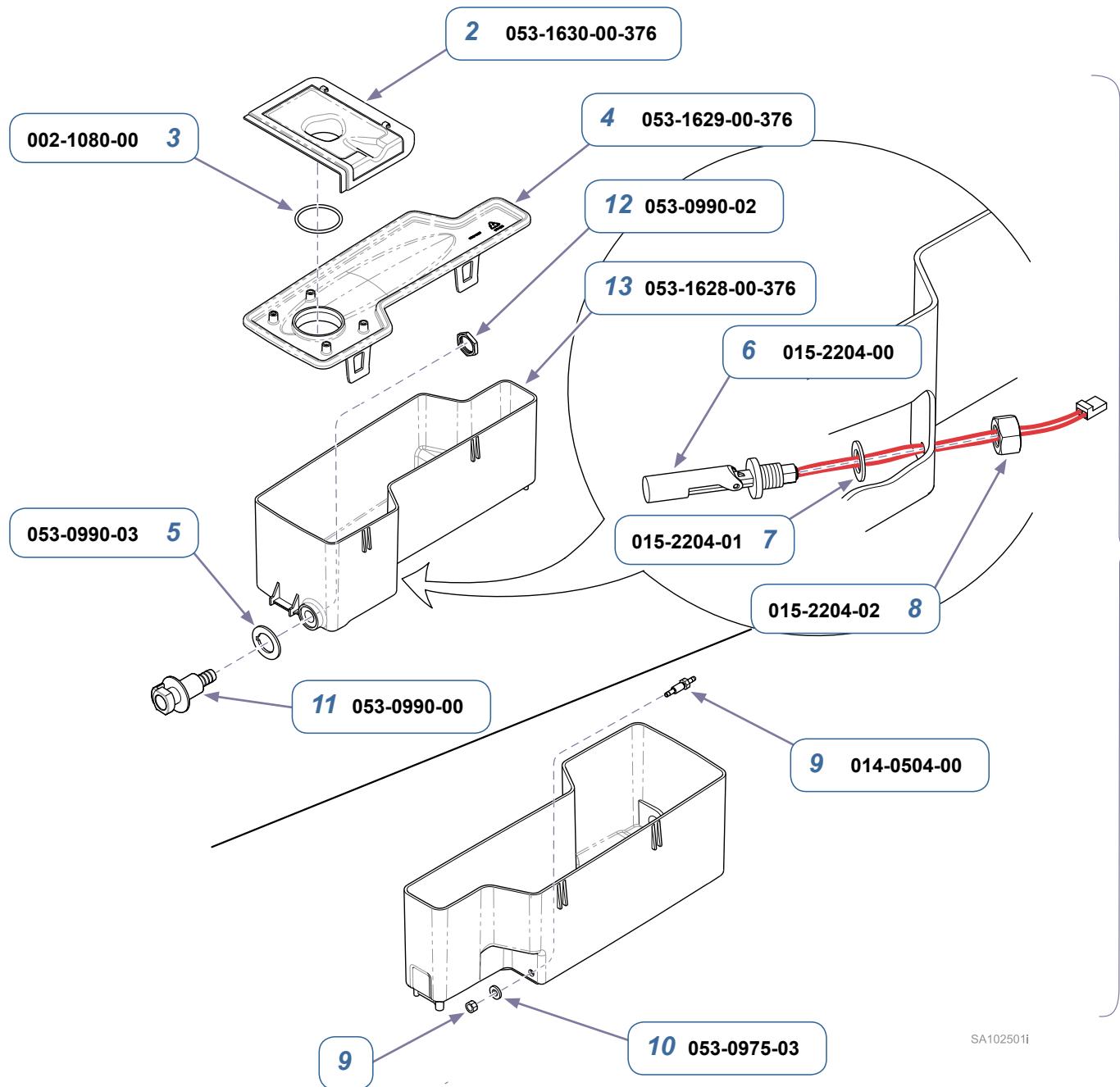
Troubleshooting	A-1
Testing / Repair	B-1
Access Procedures	C-1
Wiring Diagrams	D-1
Exploded Views / Part Numbers	E-1



SA1772i

Models:	M3 (all)	
Serial Numbers:	V792976 thru Present	

Pump / Solenoid Assembly		
Item	Description	Qty.
1	Pump / Solenoid Assy. Kit (includes 2 thru 13) a) 115 volt b) 230 volt	1
2	• Male Connector (1/4" OD x 1/8" NPT)	1
3	• Screw (#10-32 x 3/4")	2
4	• Water Pump Vibration Mount	2
5	• Solenoid Valve a) 115 volt • Replacement Coil (014-0236-10) • Replacement Plunger (014-0236-11) b) 230 volt	1
6	• Male Run Tee	1
7	• 90° Elbow Push Connect (1/4" NPT)	1
8	• Pump Solenoid Mounting Bracket	1
9	• Screw (#10-32 x 3/8")	1
10	• 90° Male Elbow Barb (1/4" OD x 1/8" NPT)	1
11	• Water Pump a) 115 volt b) 230 volt	1
12	• Pump Plug Diode Kit	1
13	Pressure Transducer Tube	1
14	Compression Connector	1



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

Reservoir Assembly

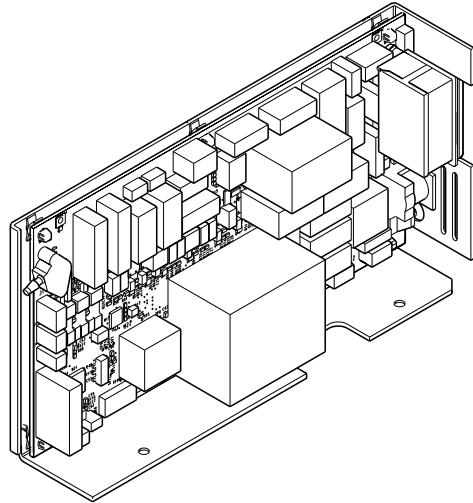
Item	Description	Qty.
1	Reservoir Assembly (includes 2 thru 13)	1
2	• Fill Funnel	1
3	• Steam Boiler O-ring Kit	1
4	• Reservoir Lid	1
5	• Coupling Washer	1
6	• Side Mount Float Assembly (includes 7 thru 8)	1
7	• • Panel Mount Gasket	1
8	• • Panel Mount Nut	1
9	• • 1/4" OD Bulkhead Union Barb (includes nut)	1
10	• Bulkhead Fitting Washer	1
11	• Quick Disconnect Coupling (includes item 12)	1
12	• • Nickle Brass Plated Nut	1
13	• Reservoir Tank	1

Models:
M3 (all)

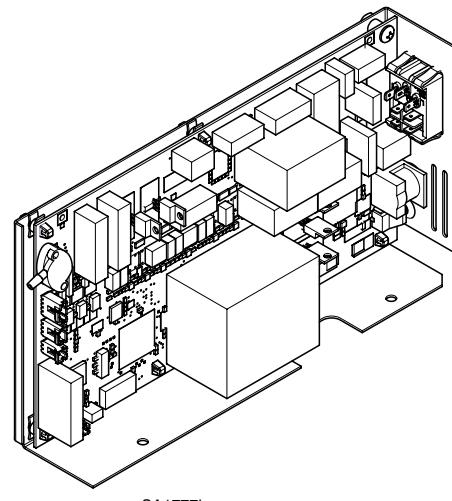
Serial Numbers:
V792976 thru Present

PC Board Identification

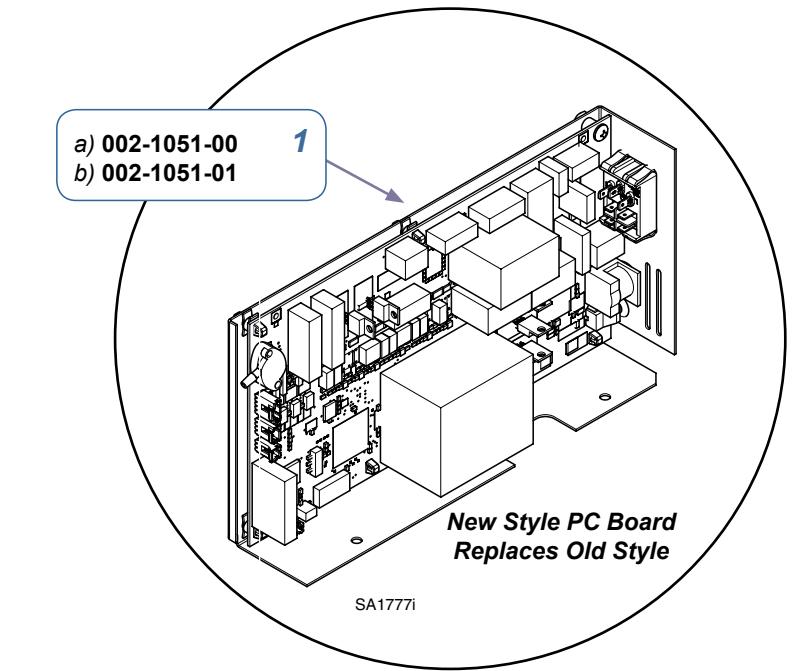
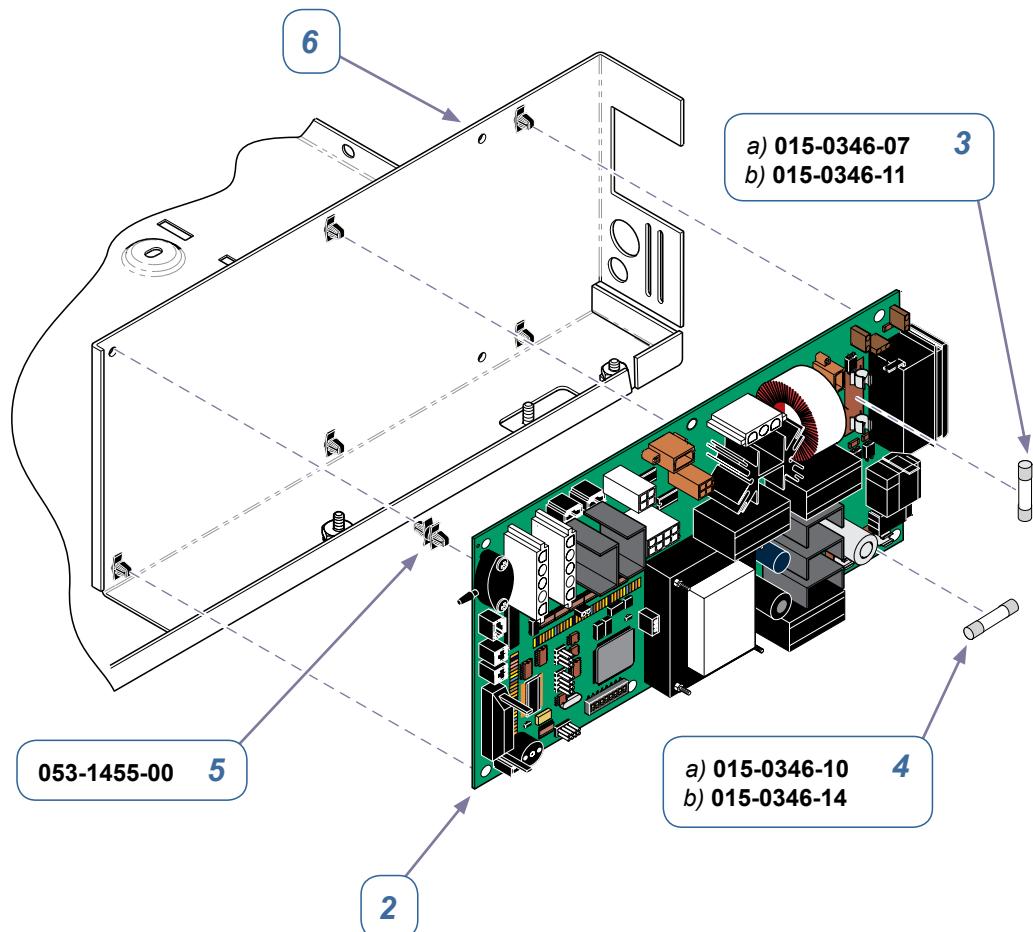
PC Board (Old-style)



PC Board (New-style)



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

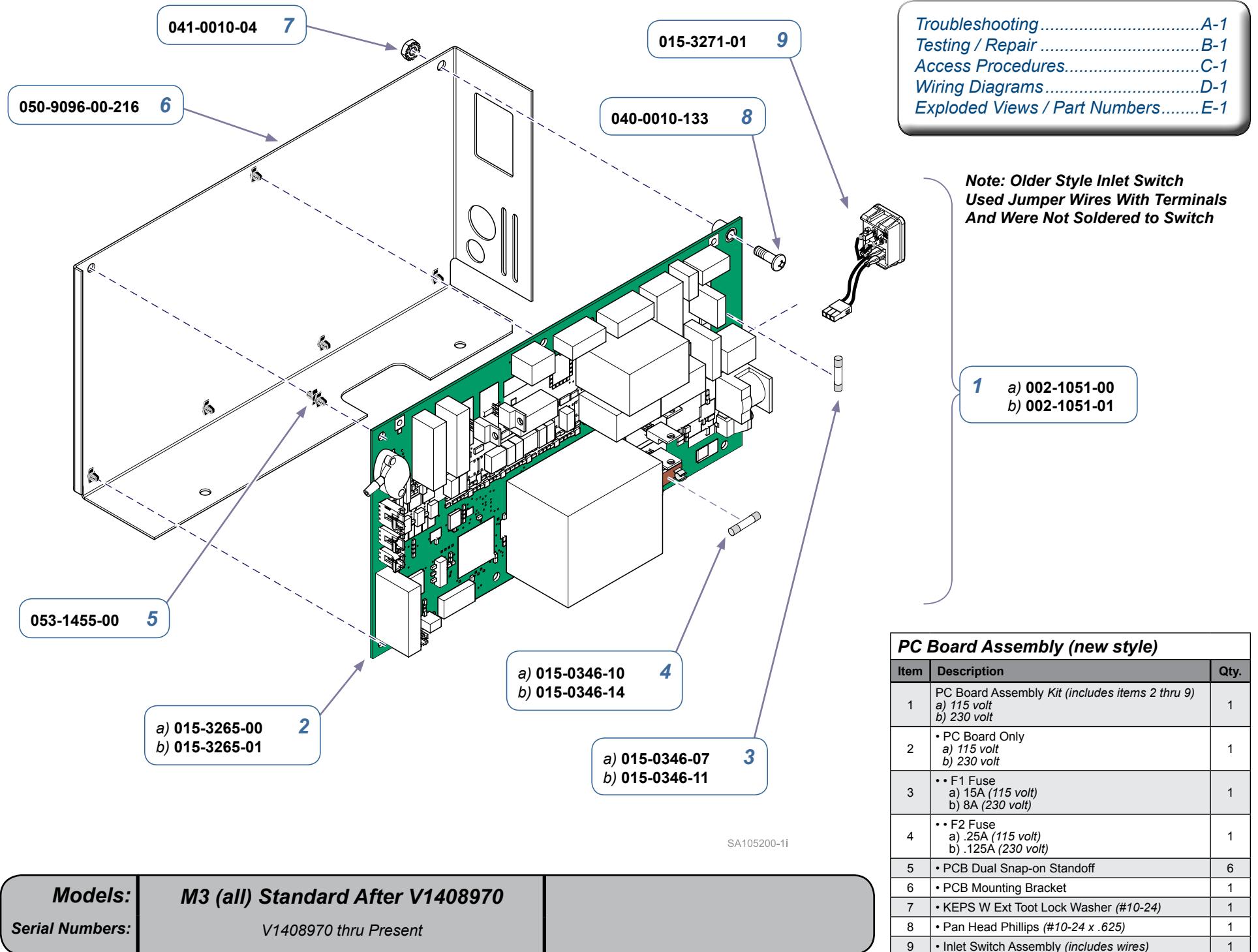


PC Board Assembly (old style)

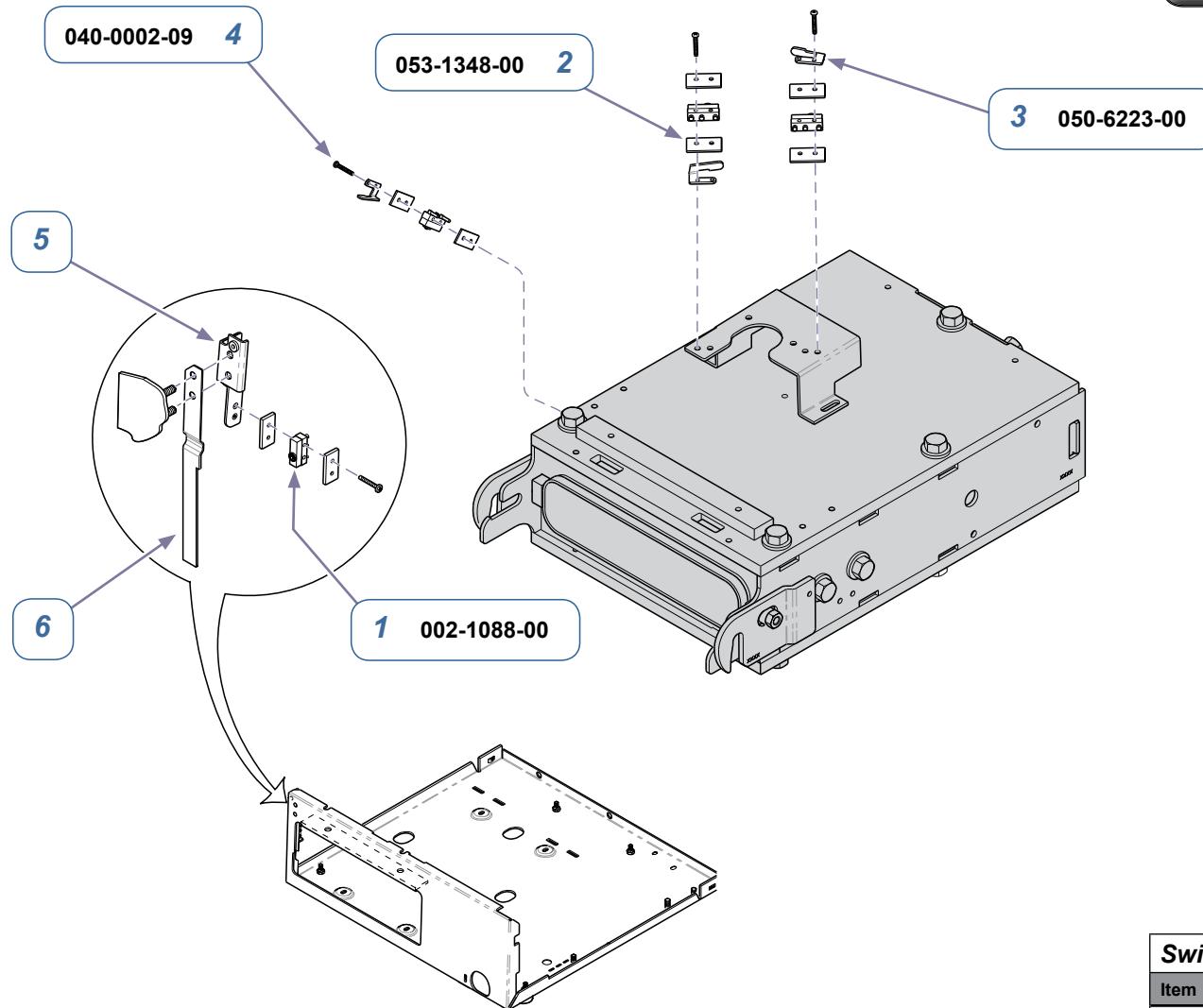
Item	Description	Qty.
1	New Style PC Board Assembly Kit (includes items 2 thru 6) a) 115 volt b) 230 volt	1
2	•PC Board No Longer Available - Replace with item 1	1
3	•• F1 Fuse a) 15A (115 volt) b) 8A (230 volt)	1
4	•• F2 Fuse a) .25A (115 volt) b) .125A (230 volt)	1
5	• PCB Dual Snap-on Standoff	7
6	• PCB Mounting Bracket No Longer Available - Replace with item 1	1

Models: M3 (all) Standard up to V1408969

Serial Numbers: V792976 thru V1408969



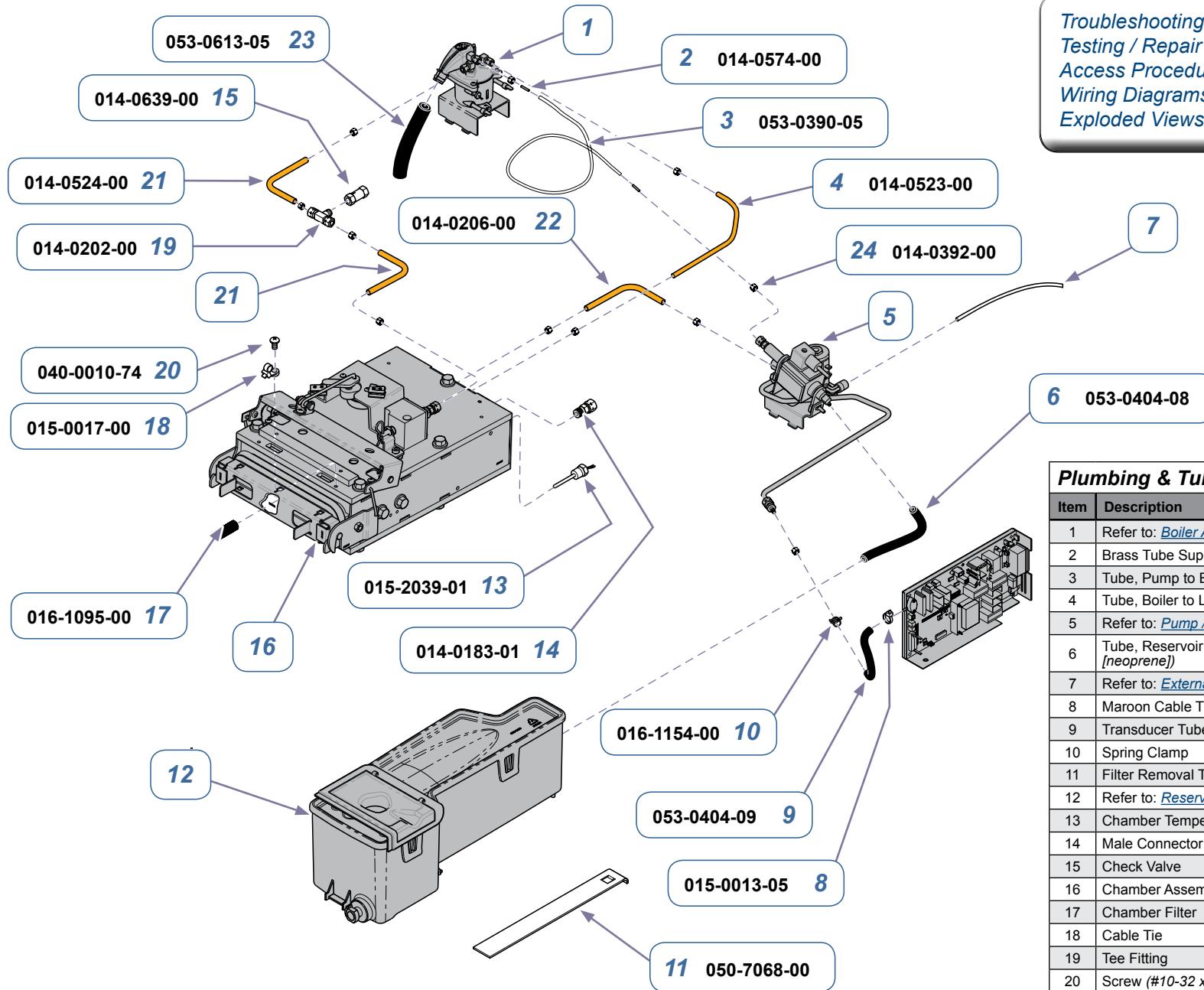
Troubleshooting	A-1
Testing / Repair	B-1
Access Procedures	C-1
Wiring Diagrams	D-1
Exploded Views / Part Numbers	E-1



SA1748i

Models:	M3 (all)	
Serial Numbers:	V792976 thru Present	

Switch Harness Assembly		
Item	Description	Qty.
1	• Switch Harness Kit (includes items 2 thru 4) [includes harness & four switches]	1
2	• Insulator	8
3	• Switch Actuator	4
4	• Screw	8
5	Refer to: Main Components	Ref
6	Refer to: Main Components	Ref



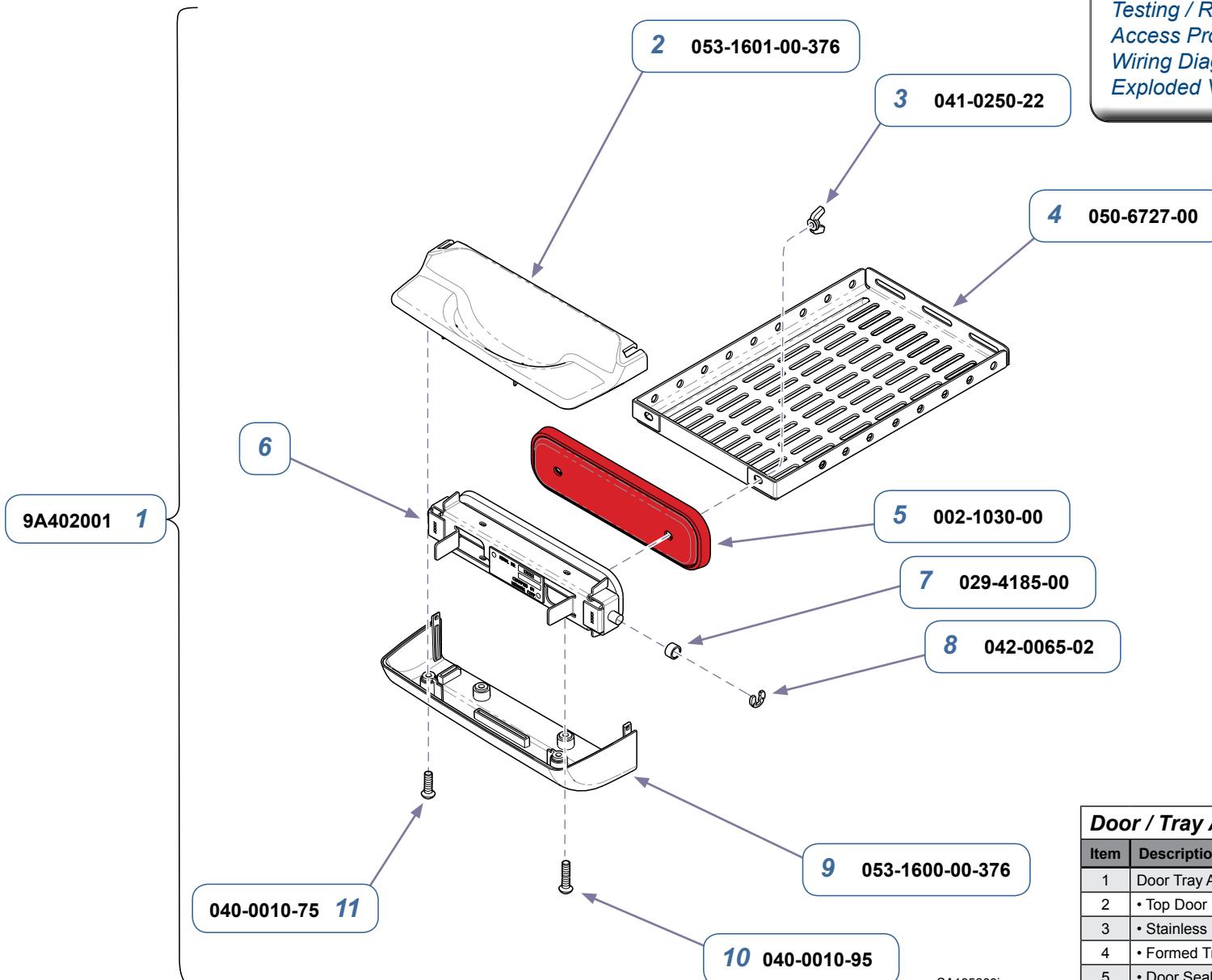
Troubleshooting	A-1
Testing / Repair	B-1
Access Procedures.....	C-1
Wiring Diagrams.....	D-1
Exploded Views / Part Numbers.....	E-1

Plumbing & Tubing Components		
Item	Description	Qty.
1	Refer to: Boiler Assembly	Ref
2	Brass Tube Support (1/4")	2
3	Tube, Pump to Boiler (16" teflon)	1
4	Tube, Boiler to Liner (copper)	1
5	Refer to: Pump / Solenoid Assembly	Ref
6	Tube, Reservoir to Pump (1/8" x 3/8" x 3.00" [neoprene])	1
7	Refer to: External Tank Assembly	Ref
8	Maroon Cable Tie, High Temp	3
9	Transducer Tube (1/8" x 3/8" x 4.00" [neoprene])	1
10	Spring Clamp	1
11	Filter Removal Tool	1
12	Refer to: Reservoir Assembly	Ref
13	Chamber Temperature Sensor	1
14	Male Connector (1/4" OD x 1/8" NPT)	2
15	Check Valve	1
16	Chamber Assembly (not serviceable)	Ref
17	Chamber Filter	1
18	Cable Tie	4
19	Tee Fitting	1
20	Screw (#10-32 x 3/8")	4
21	Tube (copper)	2
22	Tube (copper)	1
23	Tube, Pressure Relief (1/8" x 3/8" x 5.50" [neoprene])	1
24	Compression Nut / Sleeve Assembly (Only needed when changing Copper or Teflon tubing)	11

Models:
M3 (all)

Serial Numbers:
V792976 thru Present

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



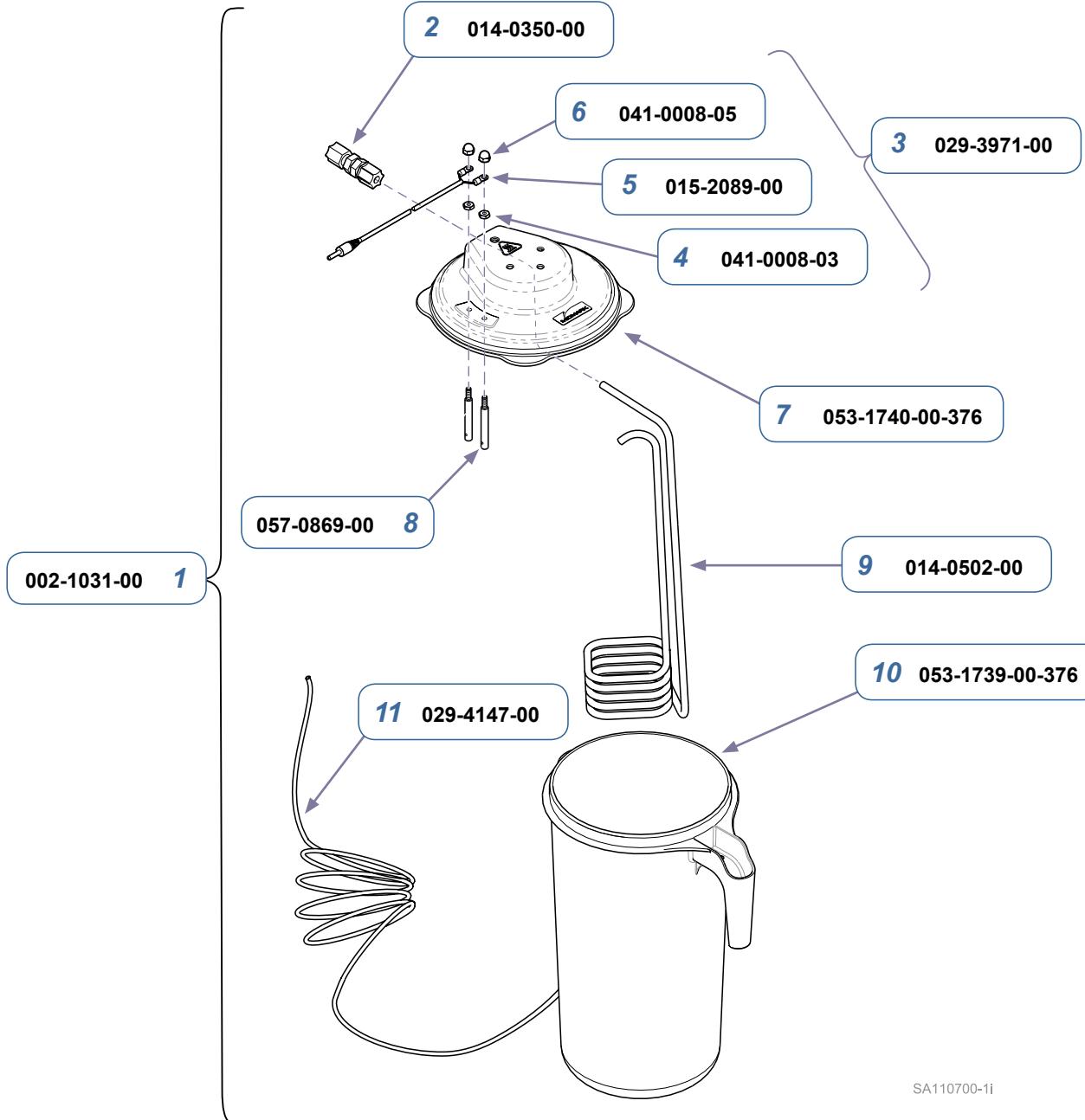
Door / Tray Accessory (9A402001)

Item	Description	Qty.
1	Door Tray Accessory (includes items 2 thru 11)	1
2	• Top Door Handle	1
3	• Stainless Steel Wing Nut (1/4"-20)	2
4	• Formed Tray	1
5	• Door Seal Gasket Kit	1
6	• Door Weldment (not serviceable)	Ref
7	• Bushing / Sleeve Assembly	2
8	• Klipring	2
9	• Bottom Door Handle	1
10	• Screw (#10-24 x 5/8")	2
11	• Screw (#10-24 x 3/8")	2

SA105800I

Models:	M3 (all)	
Serial Numbers:	V817423 thru Present	

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

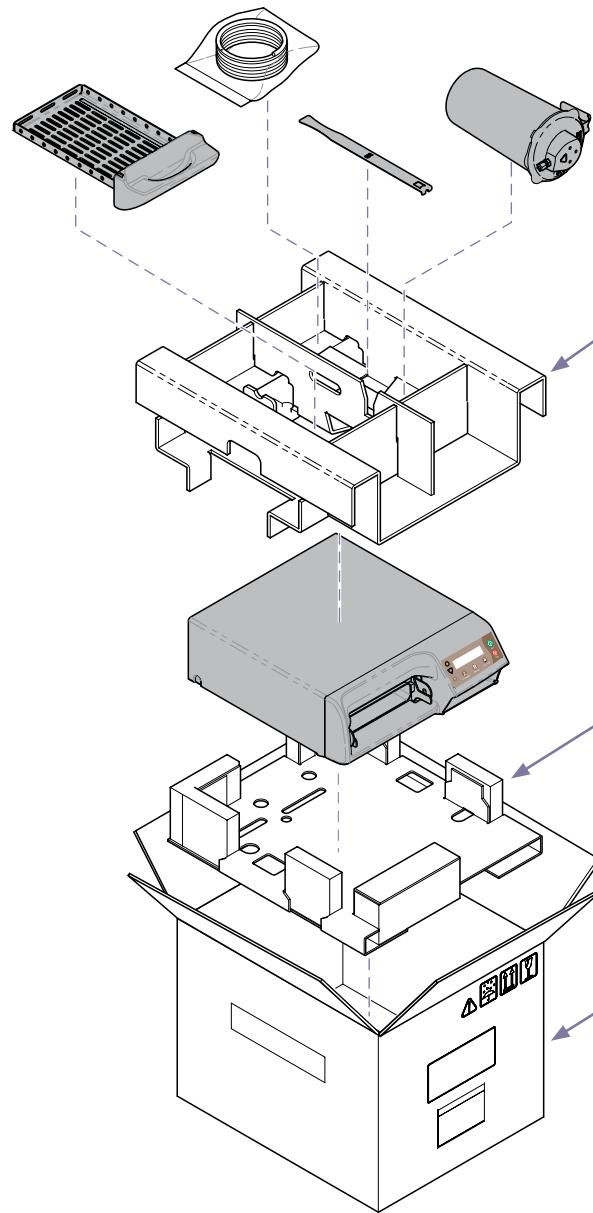


Models:

M3 (all)

Serial Numbers:

V818603 thru Present



SA1768i

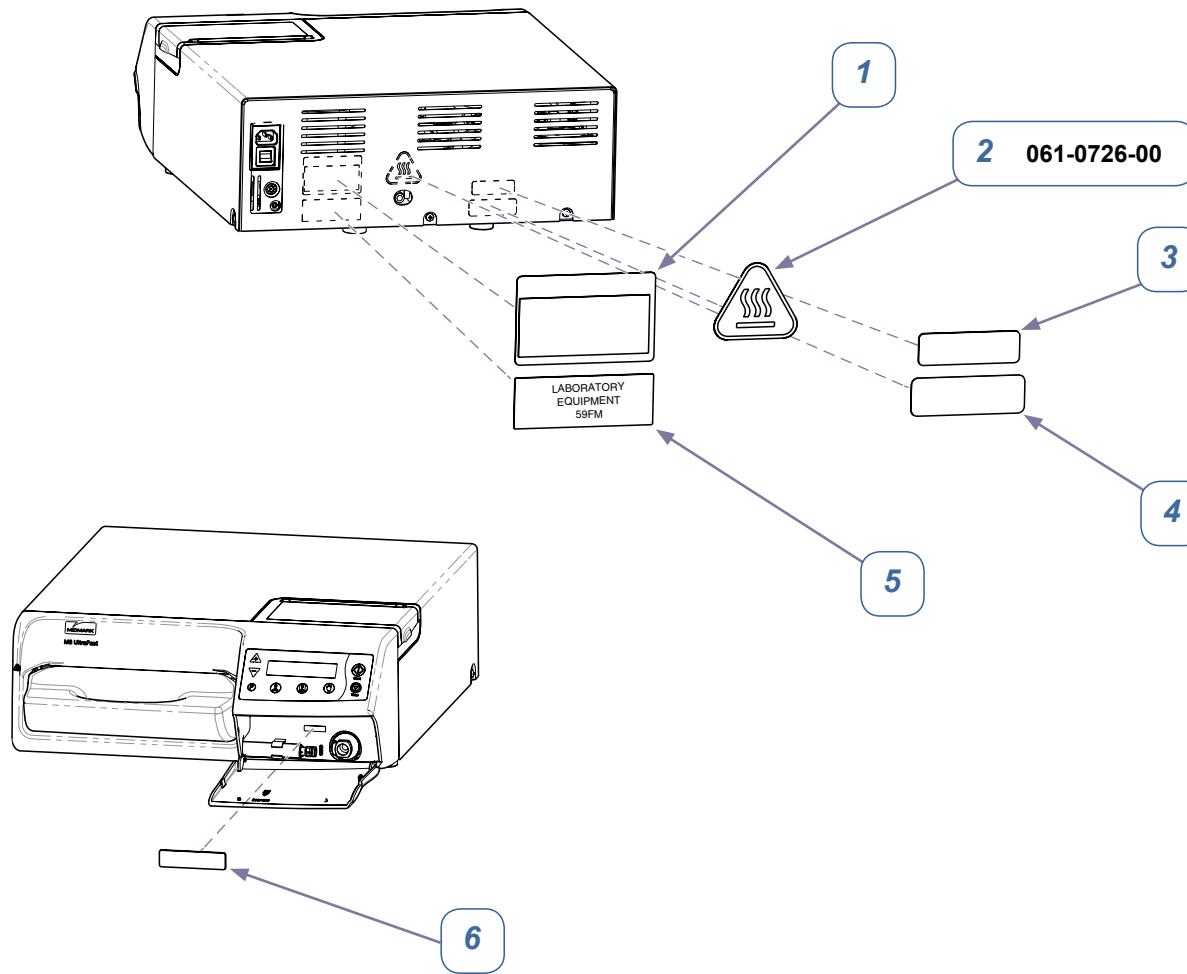
Troubleshooting	A-1
Testing / Repair	B-1
Access Procedures	C-1
Wiring Diagrams	D-1
Exploded Views / Part Numbers	E-1

Models:	M3 (all)	
Serial Numbers:	all	

Return Shipping Package

Item	Description	Qty.
1	Return Shipping Package (includes Items 2 thru 4)	1
2	• M3 Top Partition Assembly	1
3	• M3 Packaging Base Assembly	1
4	• M3 Carton	1

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



SA109800i

Models:	M3 (all)	
Serial Numbers:	V792976 thru Present	

M3 Label Location		
Item	Description	Qty.
1	Large Serial Number Label	Ref
2	Hot Surface Label	1
3	Patent Label	Ref
4	Switch Box Caution Sticker	Ref
5	C. U. L. Listing Label	Ref
6	Serial Number Identification Label	Ref

SUBJECT TO CHANGE WITHOUT NOTICE



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