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**HOSHIZAKI
DISHWASHER**

**MODEL JWE-2400CUA-L-25B
 JWE-2400CUA-R-25B**

SERVICE MANUAL

IMPORTANT

Only qualified service technicians should install, service, and maintain the unit. No service or maintenance should be undertaken until the technician has thoroughly read this Service Manual. Failure to service and maintain the equipment in accordance with this manual may adversely affect safety, performance, component life, and warranty coverage.

Hoshizaki provides this manual primarily to assist qualified service technicians in the maintenance and service of the unit.

Should the reader have any questions or concerns which have not been satisfactorily addressed, please call, write, or send an e-mail message to the Hoshizaki Technical Support Department for assistance.

HOSHIZAKI AMERICA, INC.
618 Highway 74 South
Peachtree City, GA 30269

Attn: Hoshizaki Technical Support Department

Phone: 1-800-233-1940 Technical Support
(770) 487-2331

Fax: 1-800-843-1056
(770) 487-3360

E-mail: techsupport@hoshizaki.com

Web Site: www.hoshizaki.com

NOTE: To expedite assistance, all correspondence/communication MUST include the following information:

- Model Number _____
- Serial Number _____
- Complete and detailed explanation of the problem.

IMPORTANT

This manual should be read carefully before the unit is serviced or maintenance operations are performed. Only qualified service technicians should install, service, and maintain the unit. Read the warnings contained in this booklet carefully as they give important information regarding safety. Please retain this booklet for any further reference that may be necessary.

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Important Safety Information

Throughout this manual, notices appear to bring your attention to situations which could result in death, serious injury, or damage to the unit.

⚠ WARNING Indicates a hazardous situation which could result in death or serious injury.

NOTICE Indicates a situation which could result in damage to the unit or property.

IMPORTANT Indicates important information about the use and care of the unit.

⚠ WARNING

This product should be destined only to the use for which it has been expressly conceived. Any other use should be considered improper and therefore dangerous. The manufacturer cannot be held responsible for injury or damage resulting from improper, incorrect, and unreasonable use.

To reduce the risk of death, electric shock, serious injury, or fire, follow basic precautions including the following:

- Only qualified service technicians should install, service, and maintain the unit.
- Electrical connection must be hard-wired and must meet national, state, and local electrical code requirements. Failure to meet these code requirements could result in death, electric shock, serious injury, fire, or severe damage to equipment.
- This unit requires independent power supplies for the dishwasher and for the booster tank. See the nameplate for proper voltage and breaker/fuse sizes. Failure to use proper breakers or fuses can result in tripped breakers, blown fuses, or damage to existing wiring. This could lead to heat generation or fire.
- **THIS UNIT MUST BE GROUNDED.** Failure to properly ground this unit could result in death or serious injury.
- Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies before servicing. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- Do not make any alterations to the unit. Alterations could result in electric shock, injury, fire, or damage to the unit.
- To avoid possible burns and spills, be sure to drain the wash tank and internal booster tank and let the components cool before servicing. When draining the internal booster tank, wait until the water temperature falls below 104°F (40°C).
- When disassembling components that have been in contact with detergent, wear rubber gloves and goggles. Before starting disassembly, thoroughly read the detergent safety instructions. Contact with skin may cause irritation and contact with eyes may cause blindness.
- When using an acidic descaling cleaner, wear rubber gloves and goggles. Contact with skin may cause irritation, and contact with eyes may cause blindness. Do not use or mix with a dishwashing detergent. Some detergents may generate toxic chlorine gas.

I. Specifications

A. Specification Sheet

1. JWE-2400CUA-L-25B

	DISHWASHER SIDE	BOOSTER SIDE
AC SUPPLY VOLTAGE	3 phase 3-wire 208-230V/60Hz (±10%) / 2 power supply lines	
POWER SUPPLY CAPACITY	208V : 18.4kVA(51.1A) 230V : 22.1kVA(55.5A)	208V : 20.6kVA(57.2A) 230V : 25.3kVA(63.5A)
AMPERAGE	Max Running 51.2A Rated Motor 9.0A	Max Running 63.3A
STARTING AMPERAGE	26.0A	
ELECTRICAL COMSUMPTION	Max 19.86kW Rated Motor 3.06kW Power Factor 84%	Max 25.20kW
HEATER	16.80kW(230V)	25.20kW(230V)
RACK SIZE	19-3/4" × 19-3/4"(500 × 500mm)	
NUMBER OF LARGE DISHES / RACK	16 plates (9.1" DIA)	
CAPACITY	240/200/160racks/hour adjustable in 3 steps (rotary switch)	
WATER COMSUMPTION	114Gal/hour(432L/hour), 0.48 Gal/rack(1.8L/rack) - at 240rack/hour	
PASSING HEIGHT	20.5" (520mm)	
DIRECTION OF OPERATION	Left to Right	
OUTSIDE DIMENSIONS	W57.3" × D27.6" × H58.1" (W1,455 × D700 × H1,475mm)	
EXTERIOR	Stainless Steel	
DOOR	Vertically Sliding Service Panel(Opening:W25.6" × H18.9")	
LEG	Stainless Steel Adjustable 9.4" - 11.0"	
WASH SYSTEM ,RINSE SYSTEM	Upper and Lower Fixed Spray	
PUMP	Wash 1HP x 2, Rinse 0.134HP	
DRAIN SYSTEM	Draw Out Overflow Pipe, Overflow Drain	
START	Rack Detection (Wash/Rinse)	
DRY SYSTEM	Residual Heat Drying	
REFUSE DISPOSAL	Filter Collection	
DETERGENT	Not Provided	
DISPLAY	Wash Water Temperature / Rinse Water Temperature (selectable by switch) Ready, Auto Fill, Wash, Error Code	
TANK CAPACITY	27.2Gal (103L)	12.4Gal (47L)
HOT WATER SUPPLY	Automatic Hot Water Supply by Microprocessor Control	Automatic Hot Water Supply by Water Valve
TEMPERATURE CONTROL	Wash: 160°F (71°C) min. Thermistor Control: 163°F(73°C) – 168°F(76°C)	Rinse: 180°F (82°C) min. Thermistor Control: 182°F(83°C)-185°F (85°C)
CONNECTION – WATER SUPPLY – DRAIN	Inlet: 3/4" FPT Outlet: 1-1/2" MPT	
CONTROL	Microprocessor control	
BOIL – DRY PROTECTION	Water Level Switch, Bimetal Thermostat (Manual - Reset), Thermistor (Auto - Reset)	Float Switch, Bimetal Thermostat (Manual - Reset), Thermistor (Auto - Reset)
SAFETY SYSTEM	Service Panel Switch, Emergency Stop by Microprocessor Control Table Limit Switch, Emergency Stop Button, Conveyor Overload Protector	
WEIGHT	Net 430lb (195kg) / Gross 584lb (265kg)	
PACKAGE	Carton + Crate W62.6"×D32.9"×H65.9" (W1,590mm × D 835mm × 1,675mm)	
CERTIFICATION	NSF ANSI-3, ETL, cETL, Energy Star	
ACCESSORIES-SUPPLIED	Universal rack (19-3/4" x 19-3/4"), Instruction manual, Installation manual Maintenance sheet, Curtain(L), Curtain(S) x 2, Shaft - curtain(L), Shaft - curtain (S) x 2 Guard(L), Guard(R), Hook - Drain, Table limit Switch, Upper wash spray arm, Operation box assembly, Cable cover, Inlet water strainer & Packing	
ACCESSORIES-REQUIRED	Universal rack (addition), Ventilation hoods x 2, Drain Tempering Kit	
OPERATION CONDITIONS	Ambient Temperature: 41 - 95°F (5°C - 35°C), Voltage Range: Rated Voltage ±10% Recommends Water Hardness : 4gpg (grains per gallon) (68.5ppm) or less Water Supply Temperature: 110 - 167°F (43°C - 75°C) (Recommends 140 °F (60°C)) Water Supply Pressure (Gauge Static Pressure): 10 - 70PSIG (0.07 - 0.48 MPa) Exhaust Requirements : 200CFM(Entrance End),400CFM(Discharge End)	
* The rated properties are based on measurements at ambient temperature of 86°F (30°C) according to the Technical Requirements for Electrical Appliances.		
* We reserve the right to make changes in specifications and design without prior to notice.		

2. JWE-2400CUA-R-25B

	DISHWASHER SIDE	BOOSTER SIDE
AC SUPPLY VOLTAGE	3 phase 3-wire 208-230V/60Hz (±10%) / 2 power supply lines	
POWER SUPPLY CAPACITY	208V : 18.4kVA(51.1A) 230V : 22.1kVA(55.5A)	208V : 20.6kVA(57.2A) 230V : 25.3kVA(63.5A)
AMPERAGE	Max Running 51.2A Rated Motor 9.0A	Max Running 63.3A
STARTING AMPERAGE	26.0A	
ELECTRICAL COMSUMPTION	Max 19.86kW Rated Motor 3.06kW Power Factor 84%	Max 25.20kW
HEATER	16.80kW(230V)	25.20kW(230V)
RACK SIZE	19-3/4" × 19-3/4"(500 × 500mm)	
NUMBER OF LARGE DISHES / RACK	16 plates (9.1" DIA)	
CAPACITY	240/200/160racks/hour adjustable in 3 steps (rotary switch)	
WATER COMSUMPTION	114Gal/hour(432L/hour), 0.48 Gal/rack(1.8L/rack) - at 240rack/hour	
PASSING HEIGHT	20.5" (520mm)	
DIRECTION OF OPERATION	Right to Left	
OUTSIDE DIMENSIONS	W57.3" × D27.6" × H58.1" (W1,455 × D700 × H1,475mm)	
EXTERIOR	Stainless Steel	
DOOR	Vertically Sliding Service Panel(Opening:W25.6" × H18.9")	
LEG	Stainless Steel Adjustable 9.4" - 11.0"	
WASH SYSTEM ,RINSE SYSTEM	Upper and Lower Fixed Spray	
PUMP	Wash 1HP x 2, Rinse 0.134HP	
DRAIN SYSTEM	Draw Out Overflow Pipe, Overflow Drain	
START	Rack Detection (Wash/Rinse)	
DRY SYSTEM	Residual Heat Drying	
REFUSE DISPOSAL	Filter Collection	
DETERGENT	Not Provided	
DISPLAY	Wash Water Temperature / Rinse Water Temperature (selectable by switch) Ready, Auto Fill, Wash, Error Code	
TANK CAPACITY	27.2Gal (103L)	12.4Gal (47L)
HOT WATER SUPPLY	Automatic Hot Water Supply by Microprocessor Control	Automatic Hot Water Supply by Water Valve
TEMPERATURE CONTROL	Wash: 160°F (71°C) min. Thermistor Control: 163°F(73°C) – 168°F(76°C)	Rinse: 180°F (82°C) min. Thermistor Control: 182°F(83°C)-185°F (85°C)
CONNECTION – WATER SUPPLY – DRAIN	Inlet: 3/4" FPT Outlet: 1-1/2" MPT	
CONTROL	Microprocessor control	
BOIL – DRY PROTECTION	Water Level Switch, Bimetal Thermostat (Manual - Reset), Thermistor (Auto - Reset)	Float Switch, Bimetal Thermostat (Manual - Reset), Thermistor (Auto - Reset)
SAFETY SYSTEM	Service Panel Switch, Emergency Stop by Microprocessor Control Table Limit Switch, Emergency Stop Button, Conveyor Overload Protector	
WEIGHT	Net 430lb (195kg) / Gross 584lb (265kg)	
PACKAGE	Carton + Crate W62.6"×D32.9"×H65.9" (W1,590mm ×D 835mm × 1,675mm)	
CERTIFICATION	NSF ANSI-3, ETL, cETL, Energy Star	
ACCESSORIES-SUPPLIED	Universal rack (19-3/4" x 19-3/4"), Instruction manual, Installation manual Maintenance sheet, Curtain(L), Curtain(S) x 2, Shaft - curtain(L), Shaft - curtain (S) x 2 Guard(L), Guard(R), Hook - Drain, Table limit Switch, Upper wash spray arm, Operation box assembly, Cable cover, Inlet water strainer & Packing	
ACCESSORIES-REQUIRED	Universal rack (addition), Ventilation hoods x 2, Drain Tempering Kit	
OPERATION CONDITIONS	Ambient Temperature: 41 - 95°F (5°C - 35°C), Voltage Range: Rated Voltage ±10% Recommends Water Hardness : 4gpg (grains per gallon) (68.5ppm) or less Water Supply Temperature: 110 - 167°F (43°C - 75°C) (Recommends 140 °F (60°C)) Water Supply Pressure (Gauge Static Pressure): 10 - 70PSIG (0.07 - 0.48 MPa) Exhaust Requirements : 200CFM(Entrance End),400CFM(Discharge End)	
* The rated properties are based on measurements at ambient temperature of 86°F (30°C) according to the Technical Requirements for Electrical Appliances.		
* We reserve the right to make changes in specifications and design without prior to notice.		

B. Nameplate Rating

HOSHIZAKI DISHWASHER	
MODEL NUMBER	JWE-2400CUA-L-25B
SERIAL NUMBER	
ELECTRIC DISHWASHER	
AC SUPPLY VOLTAGE	208-230V/60Hz/3PH
CAPACITY	22.1kVA (55.5A)
TOTAL	20.5kW (51.4A)
WASH PUMP	AC230V 9.0AMPS 2HP
RINSE PUMP	AC230V 0.7AMPS 0.13HP
WASH HEATER	AC230V 2.8kW × 6
ELECTRIC BOOSTER	
AC SUPPLY VOLTAGE	208-230V/60Hz/3PH
CAPACITY	25.3kVA (63.5A)
TOTAL	25.2kW (63.3A)
RINSE HEATER	AC230V 2.8kW × 9
HOSHIZAKI ELECTRIC CO., LTD.	
MADE IN SHIMANE, JAPAN	

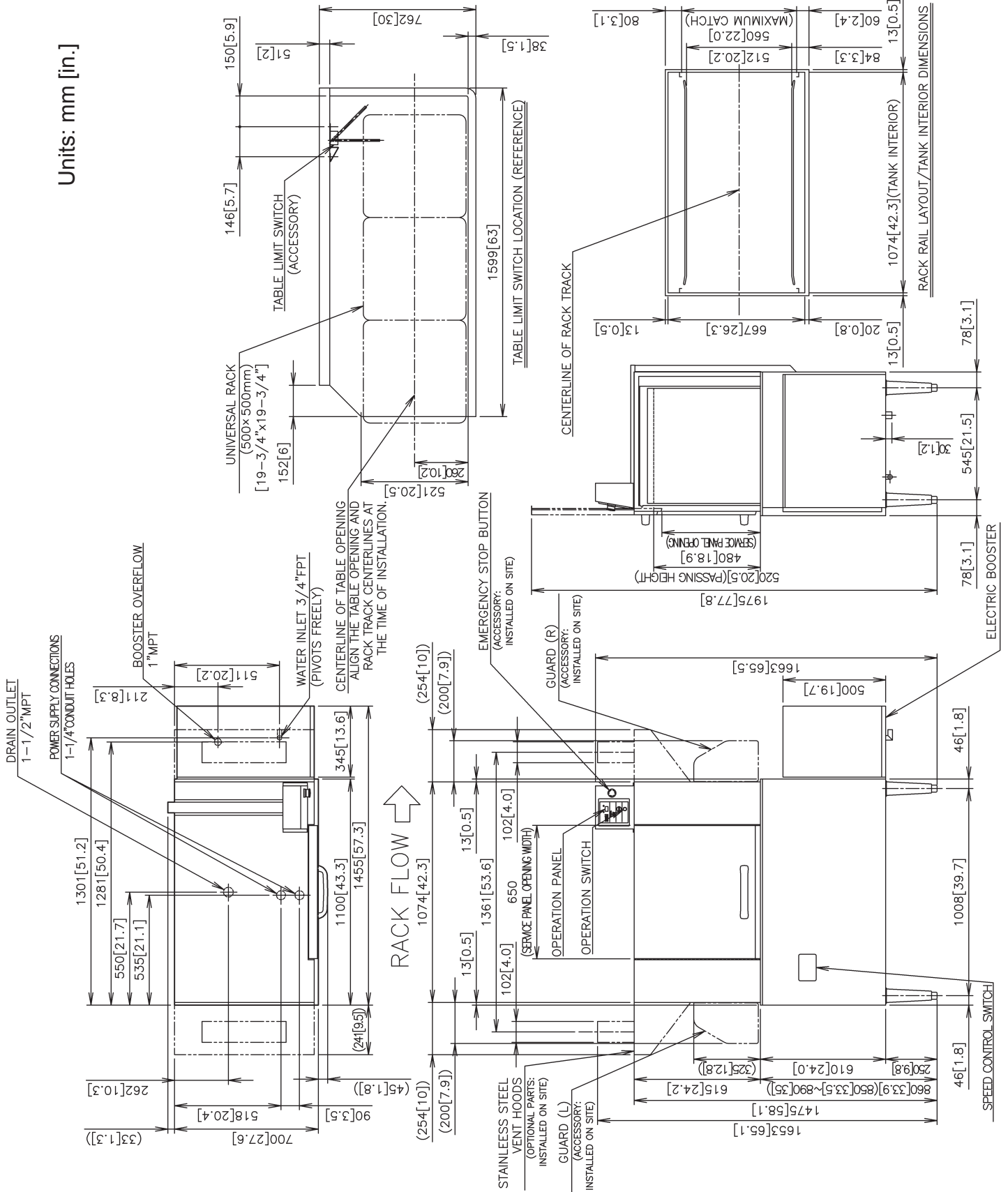
For certification marks, see the nameplate on the dishwasher.

We reserve the right to make changes in specifications and design without prior notice.

C. Dimensions/Connections

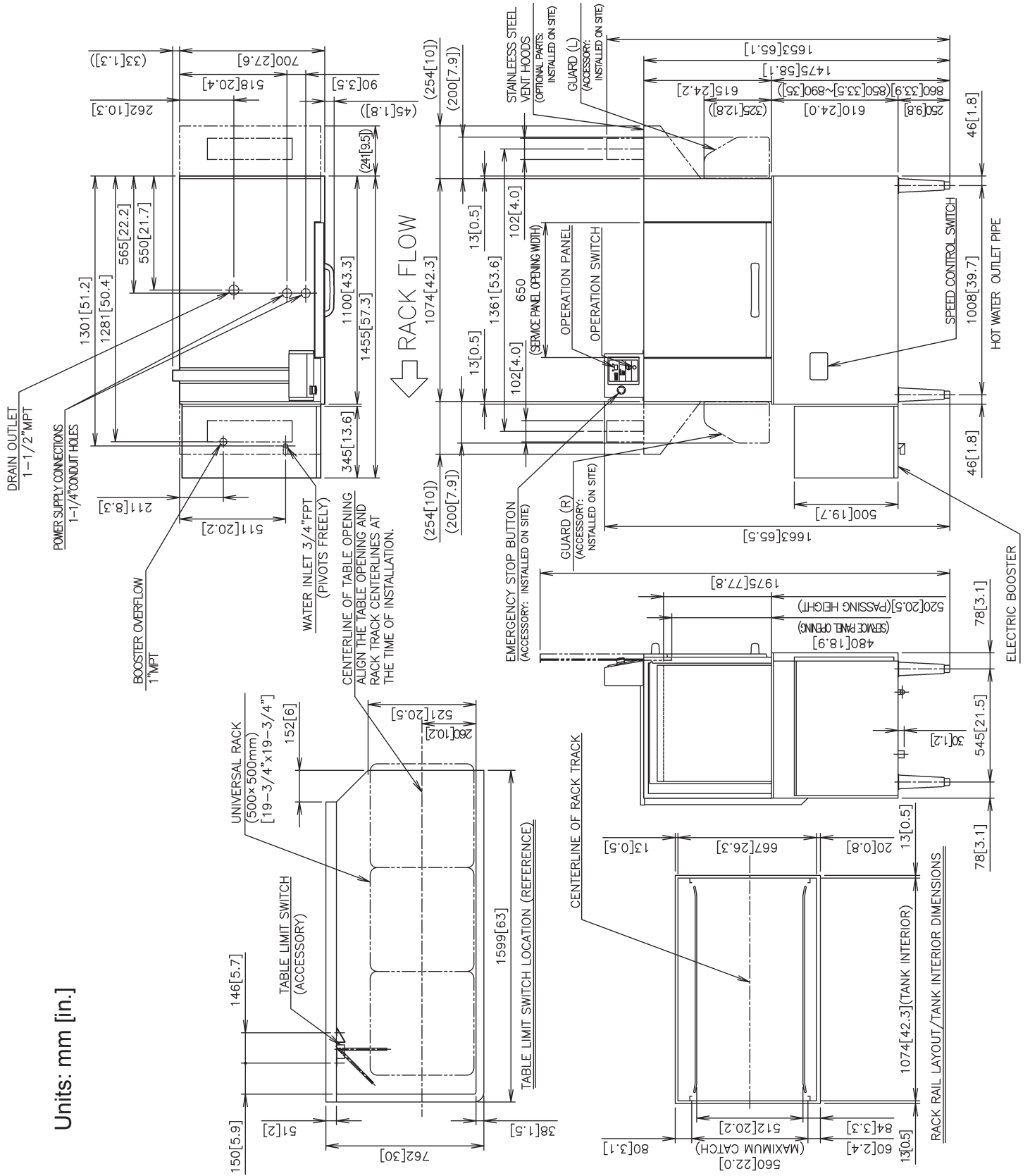
1. JWE-2400CUA-L-25B

Units: mm [in.]



2. JWE-2400CUA-R-25B

Units: mm [in.]

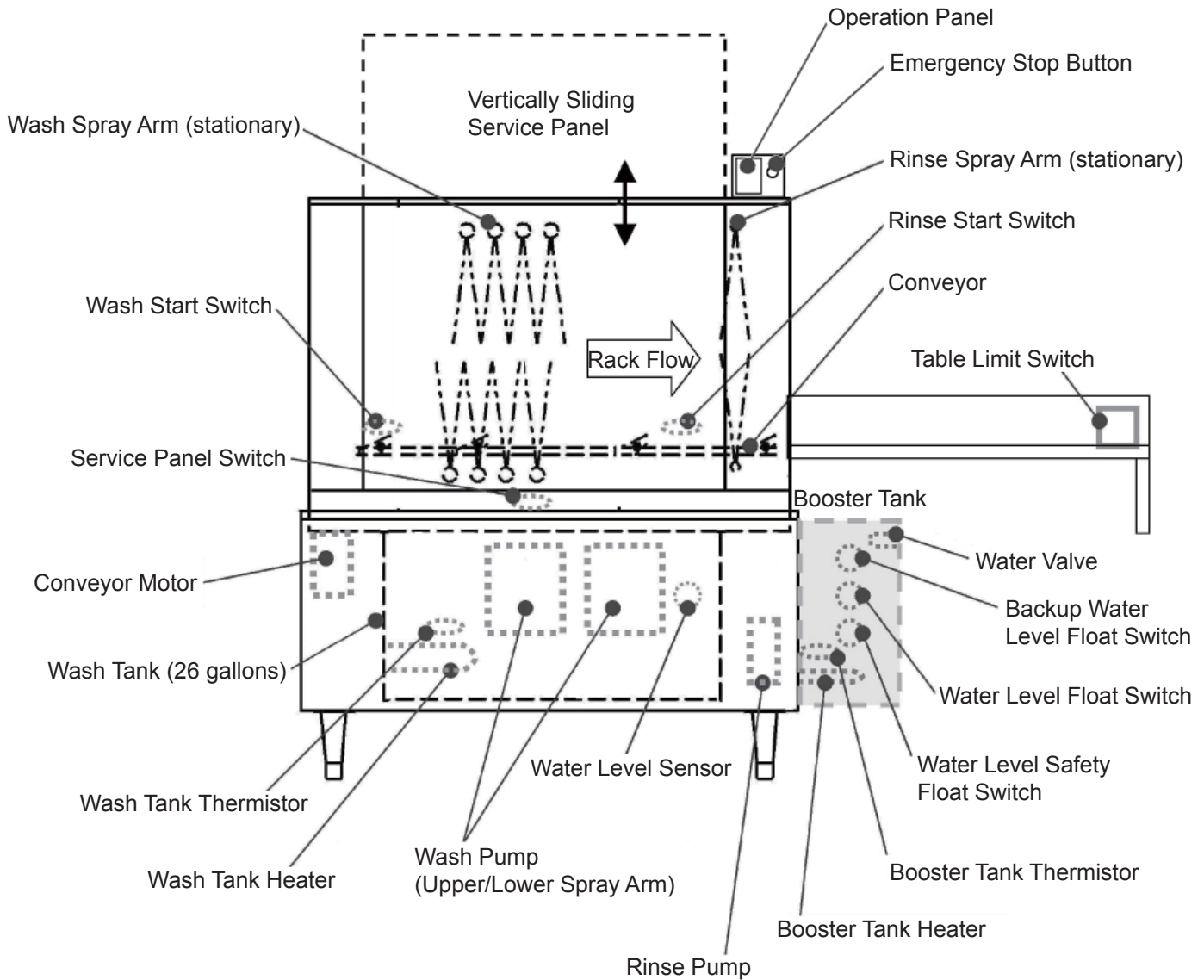


II. General Information

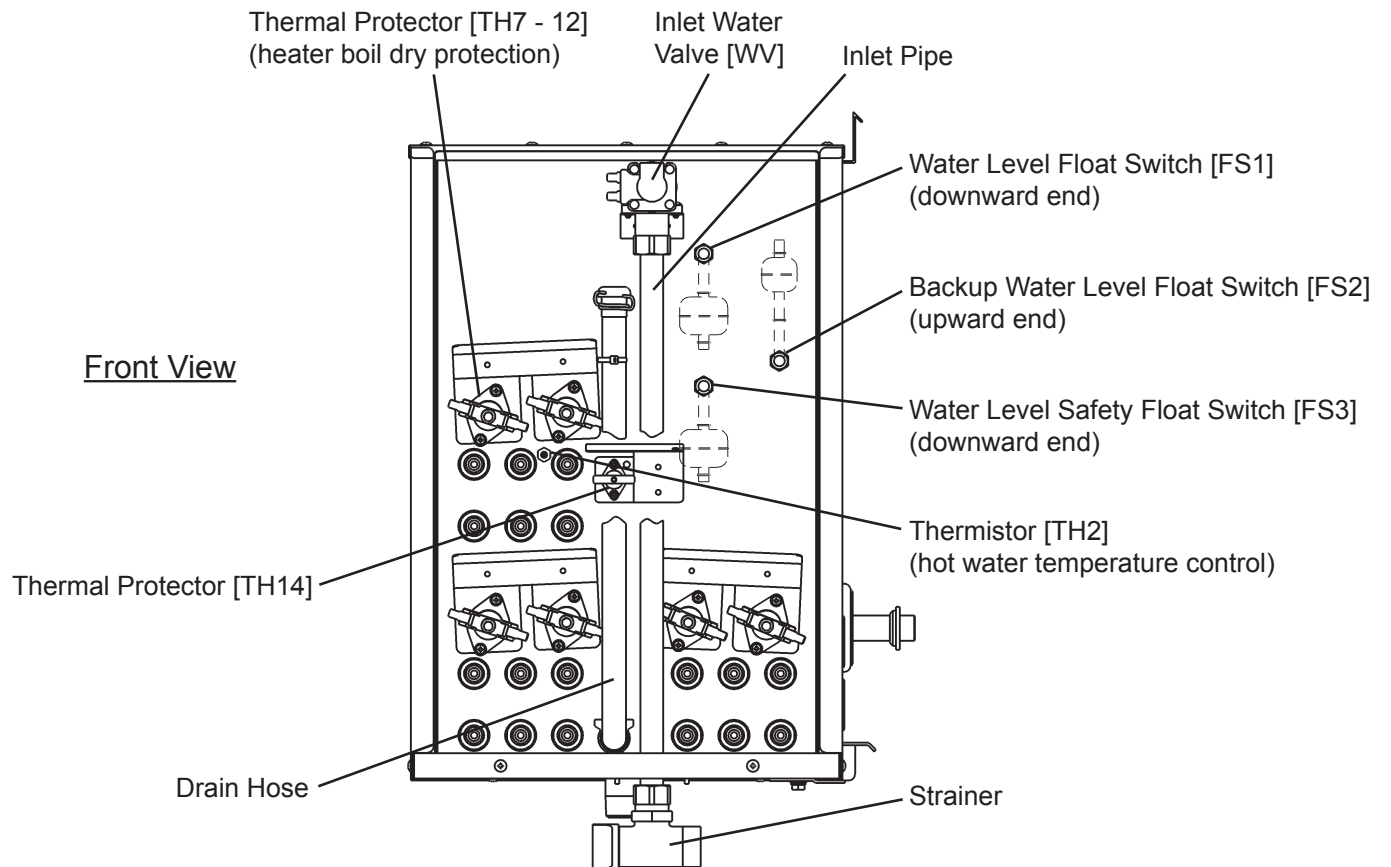
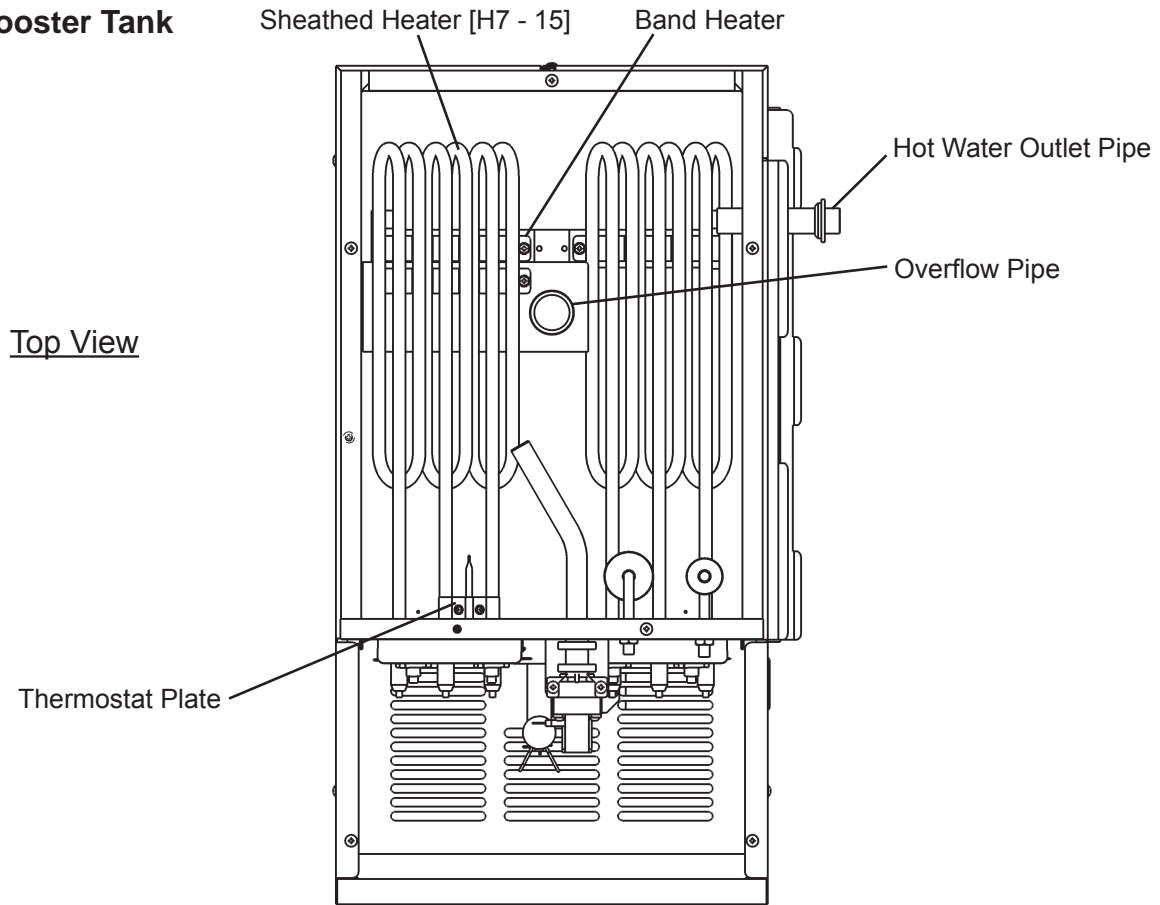
A. Construction

1. Dishwasher

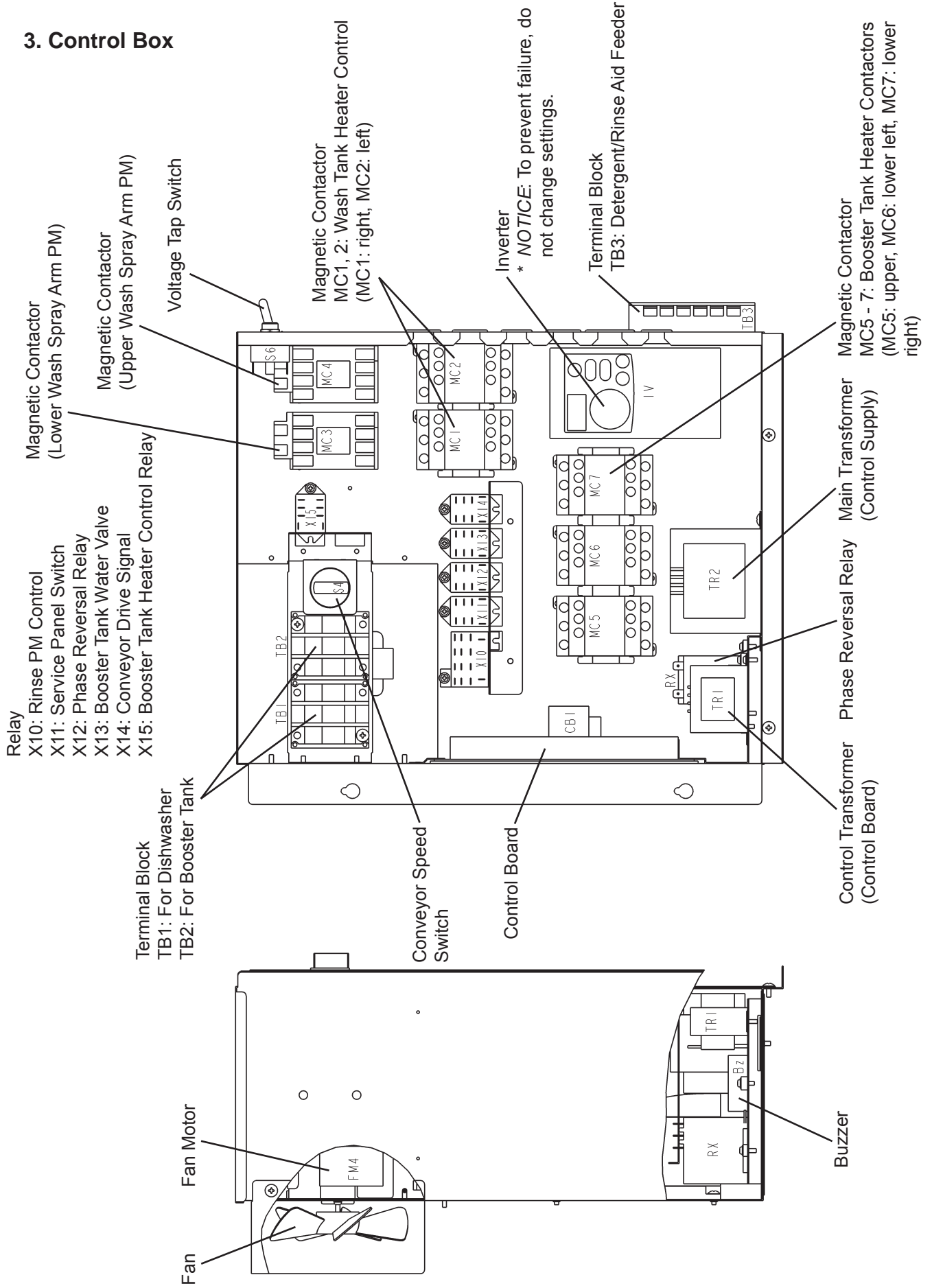
The illustration below shows JWE-2400CUA-L-25B (left-to-right rack flow).



2. Booster Tank



3. Control Box

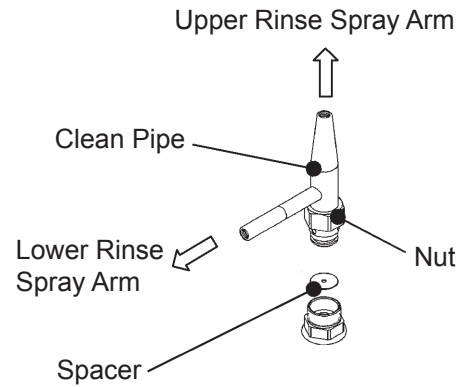


B. Functions

1. Increasing Rinse Water Flow Rate

The rinse water flow rate is factory adjusted to 1.90 gal/min (7.2 L/min). To increase the flow rate to 3.17 gal/min (12 L/min), follow the steps below. **Hot water supply of at least 3.44 gal/min (13 L/min) and 113°F (45°C) will be required.**

- 1) Remove the upper and lower rinse spray arms.
- 2) Loosen the clean pipe nut, and remove the clean pipe.
- 3) Remove the spacer (with 4.5 mm DIA hole) from the nut at the unit side.
- 4) Replace the clean pipe and the upper and lower rinse spray arms in their correct positions.



C. Sequence of Operation

The steps in the sequence are as outlined below.

1. Auto Fill Cycle

"AUTO FILL" lamp flashing and "RINSE TEMP." or "WASH TEMP." lamp on.

If BT WLF/S is open when the "ON/OFF" button is pressed, WV energizes after BT auto fill delay time (factory default: 10 seconds).

When BT WLF/S closes, WV de-energizes, the "AUTO FILL" lamp flashes and the auto fill cycle starts.

RPM energizes for length of time set by the auto fill cycle rinse time setting (factory default: 13 minutes). For details, see "Auto Fill Cycle Rinse Time" (service menu item 03) in "II.F.7.b) Service Menu Chart."

At the end of the auto fill cycle, there is a 5-second dwell time. CB checks WT WLS. If WT WLS is closed, BZ beeps, the "AUTO FILL" lamp goes off and the "READY" lamp comes on. If WT WLS is open, BZ beeps continuously, the "AUTO FILL" lamp goes off and "A1" flashes in the display. For details, see "III.B.3.a) Auto Fill Error (A1)."

If the BT water level goes down and BT WLF/S opens during the auto fill cycle, WV energizes after BT auto fill delay time (factory default: 10 seconds). For adjustment of this delay time, see "Booster Tank Auto Fill Delay Time" (service menu item 08) in "II.F.7.b) Service Menu Chart." If delay time is set shorter, WV energizes/de-energizes frequently and BT may not supply hot water of proper temperature.

If SP is opened during the auto fill cycle, SPS opens, RPM de-energizes. The "AUTO FILL" lamp keeps flashing and the rinse cycle time keeps counting down. When SPS closes again, RPM energizes.

If WLS is closed when the "ON/OFF" button is pressed, the "READY" lamp comes on and the unit is ready to start.

Note:

1. If SP is opened during the auto fill cycle, RPM de-energizes to stop hot water supply. If SP is left open for a long time, WT may not fill by the end of the auto fill cycle. In this case, WT WLS opens when the unit starts, and the supplementary fill cycle begins.
2. WTH is energized when WT WLS closes during the auto fill cycle.
3. BTH is energized during the auto fill cycle if WLSF/S is closed.

4. If BT WLF/S fails, BT BUWLF/S assumes control. If BT BUWLF/S remains closed for 1 minute, o1 or o2 error appears in the display. For details, see "III.B. Error Codes."
5. The wash/rinse start switch is inactive during the auto fill cycle.

2. Ready Cycle (Unit Inactive)

"READY" lamp and "RINSE TEMP." or "WASH TEMP." lamp on.

WT WLS closed. After a rinse cycle, RPM de-energizes, and the "READY" lamp comes on. WTH energizes when WT water temperature is at the wash temperature setpoint or lower. WTH de-energizes when WT water temperature is 5°F (3°C) above the setpoint. For details, see "Wash Temperature Setpoint" (service menu item 04) in "II.F.7.b) Service Menu Chart."

BTH energizes when BT water temperature is 3°F (2°C) below the rinse temperature setpoint or lower. BTH de-energizes when BT water temperature reaches the setpoint. WV energizes/de-energizes when BT WLF/S opens/closes. For details, see "Rinse Temperature Setpoint" (service menu item 05) in "II.F.7.b) Service Menu Chart."

Note:

1. The thermistors control WT and BT water temperatures.
2. If one of the thermistors has an open or short circuit, WTH or BTH de-energizes and an error code appears in the display.
3. WTH and BTH are controlled regardless of SPS operation.

3. Wash Cycle/Rinse Cycle

"WASH" lamp and "RINSE TEMP." or "WASH TEMP." lamp on.

When a rack is loaded from the wash compartment entrance and the wash start switch closes, WPM energizes, power is supplied to DFT and the "WASH" lamp comes on. WPM draws water from WT and sends it through the wash spray arms. The upper spray arm WPM starts first, followed by the lower spray arm WPM. Then, the conveyor starts to move the rack. After the wash start switch opens and the extended wash cycle time (factory default: 30 seconds) has expired, WPM de-energizes and power is cut to DFT. For details, see "Extended Wash Cycle Time" (service menu item 01) in "II.F.7.b) Service Menu Chart." When the rinse start switch closes, RPM energizes and power is supplied to RFT. RPM draws water from BT and sends it through the rinse spray arms. Rinse aid is fed into the rinse water line and sprayed from the rinse spray arms together with rinse water. Any excess water in WT drains through the overflow pipe. After the rinse start switch opens and the extended rinse cycle time (factory default: 15 seconds) has expired, RPM de-energizes, power is cut to RFT, the "WASH" lamp goes off and the "READY" lamp comes on. For details, see "Extended Rinse Cycle Time" (service menu item 02) in "II.F.7.b) Service Menu Chart."

After both WPM and RPM de-energize, the conveyor stops. If SP is opened during operation, SPS opens, WPM and RPM de-energize and the conveyor stops. If the wash/rinse start switch is closed when SPS closes, WPM and RPM energize and the conveyor restarts.

Note:

1. If WT WLS opens after WPM energizes, WPM de-energizes and RPM energizes for the supplementary fill cycle time (factory default: 450 seconds) to supply hot water into

WT. The conveyor does not start during the supplementary fill cycle. "A3" appears in the display and the "AUTO FILL" lamp flashes. BZ beeps three times only at the beginning. If WT WLS is still open after the supplementary fill cycle, another cycle starts. If WT WLS still does not close, "A3" appears in the display, BZ beeps and the unit shuts down. For adjustment of the supplementary fill cycle time, see "Supplementary Fill Cycle Time" (service menu item 07) in "II.F.7.b) Service Menu Chart." For details, see "III.B.3.c) Wash Tank Water Level Error (A3)."

2. If WT WLS and the wash start switch are closed after RPM runs for the supplementary fill cycle time, WPM energizes and the conveyor starts.
3. If SP is opened and closed during operation and the wash/rinse start switch is open, the unit does not resume operation. Load another rack to close the wash start switch. The unit resumes operation if SP is closed during the extended wash/rinse cycle time.

4. Table Limit Switch

If a rack reaches the end of the clean dishtable and actuates TLS lever (TLS closed), WPM and RPM de-energize, the conveyor stops and "L1" appears in the display. When the rack is removed and TLS lever returns to the original position (TLS open), WPM and RPM energize and the conveyor starts after 3 seconds unless the wash/rinse start switch is open.

5. Emergency Stop Button

To shut down the unit in case of emergency, press ESB on top of the unit (wash compartment exit side). To resume operation, turn ESB clockwise to unlock and press the "ON/OFF" button on the operation panel.

Note: The unit is inoperative without ESB connected at the time of installation.

6. Drain

This unit does not have a drain valve.

The overflow pipe in WT drains excess water from WT. To completely drain WT, remove the overflow pipe.

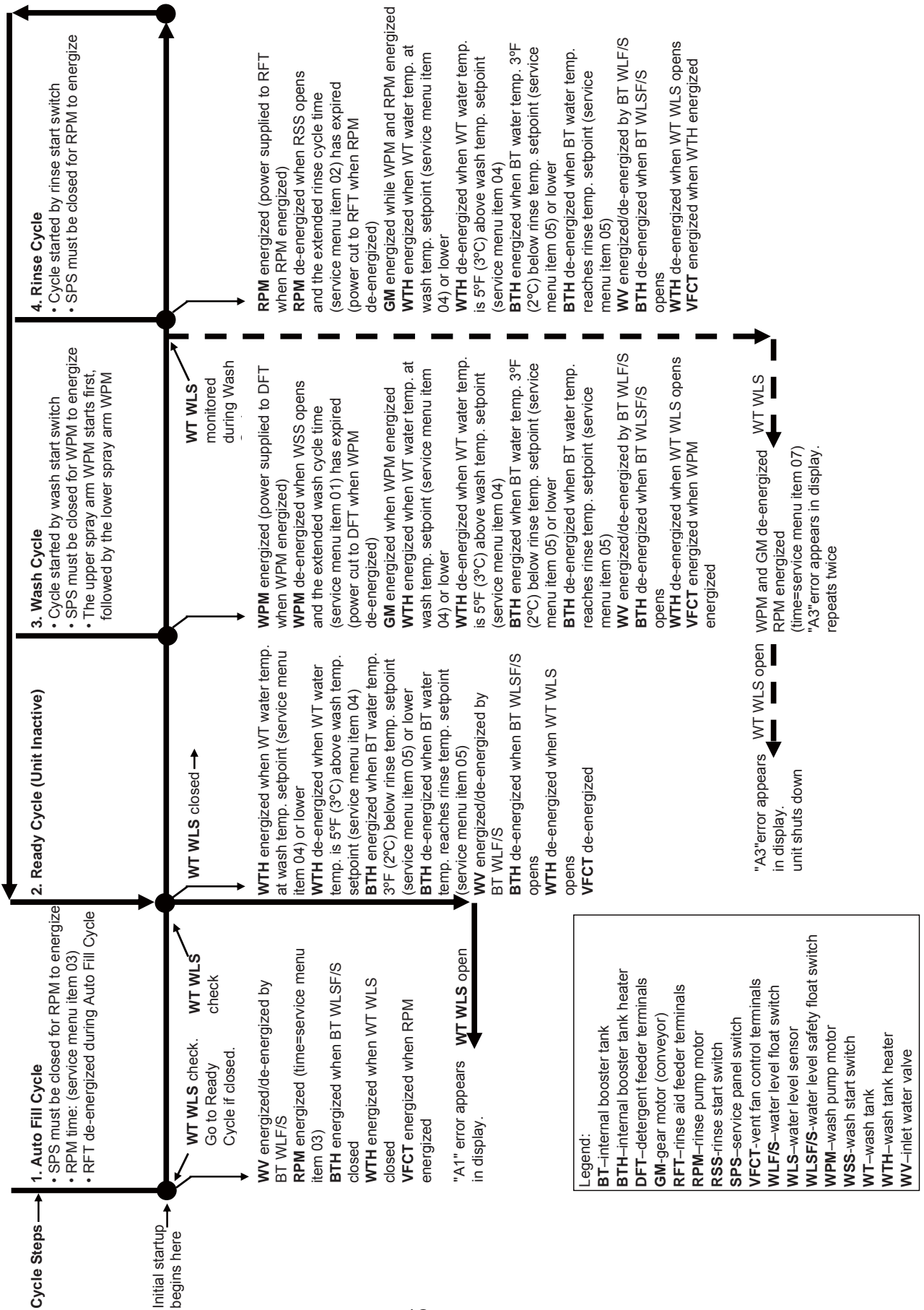
To drain BT, use the "ON/OFF" button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.

Use BT drain hose to drain BT. **WARNING! To avoid possible burns, allow BT water temperature to fall below 104°F (40°C) before draining.**

Legend: **BT**–booster tank; **BTH**–booster tank heater; **BUWLF/S**–backup water level float switch; **BZ**–buzzer; **CB**–control board; **DFT**–detergent feeder terminals (detergent feeder not provided by Hoshizaki); **DS**–door switch; **ESB**–emergency stop button; **RFT**–rinse aid feeder terminals (rinse aid feeder not provided by Hoshizaki); **RPM**–rinse pump motor; **SP**–service panel; **SPS**–service panel switch; **WLSF/S**–water level safety float switch; **TLS**–table limit switch; **WLF/S**–water level float switch; **WLS**–water level sensor; **WPM**–wash pump motor; **WT**–wash tank; **WTH**–wash tank heater; **WV**–inlet water valve

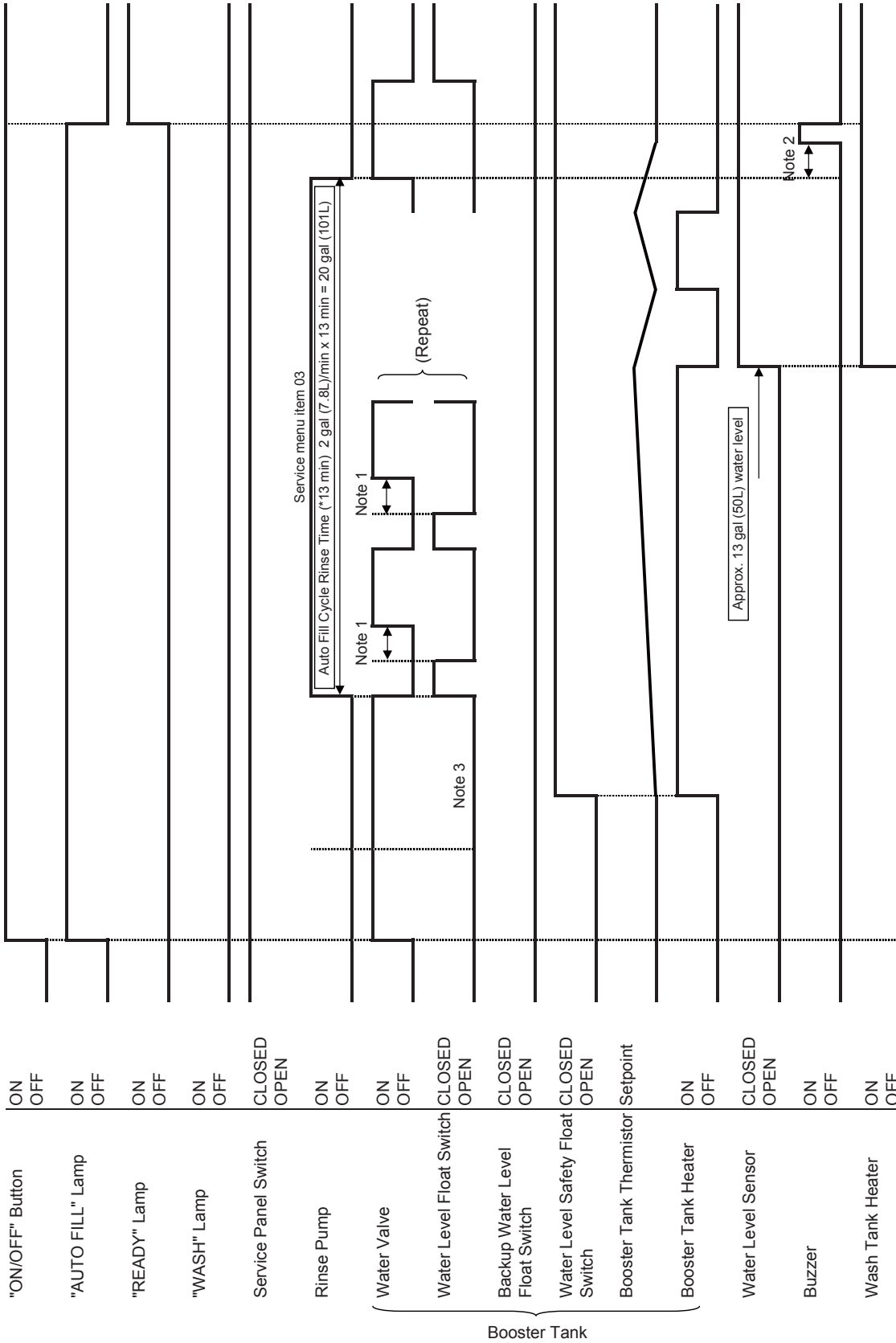
D. Sequence of Operation Flow Chart

Dishwasher Sequence Flow Chart JWE-2400CUA-25B



E. Timing Chart

1. Auto Fill Cycle



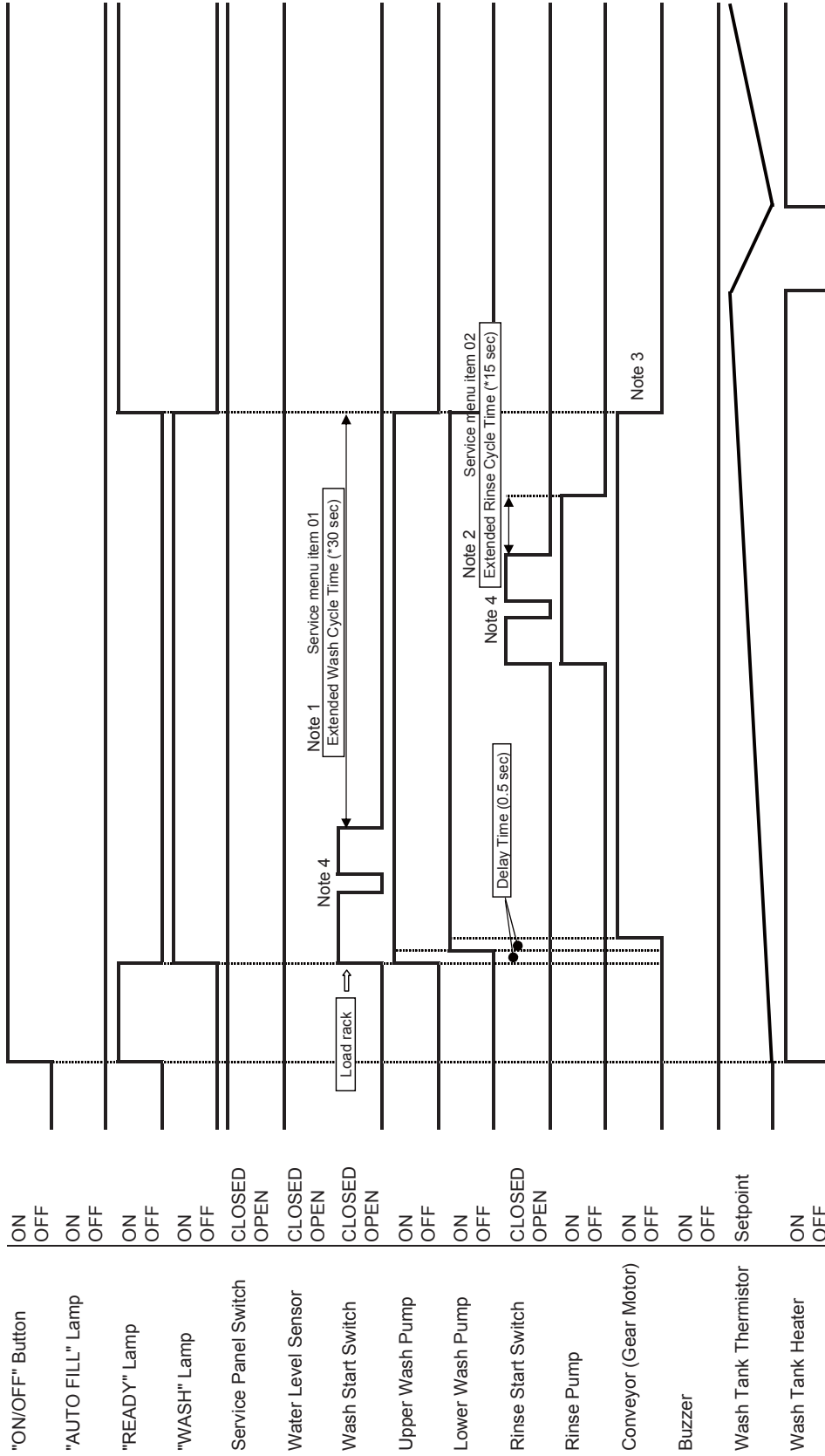
* Factory default, adjustable by service menu

Note 1: Booster tank auto fill delay time (*10 seconds): If auto fill cycle starts immediately after the booster tank water level float switch opens, the booster tank fills up too soon, and the water valve energizes/de-energizes frequently, resulting in no hot water supply.

Note 2: After the rinse pump motor de-energizes, there is a 5-second dwell time to stabilize the water level before checking the water level sensor status.

Note 3: If the booster tank water level float switch does not close after 10 minutes in booster tank auto fill, error code "A2" (booster tank auto fill error) appears in the display, and the unit shuts down.

2. Wash Cycle/Rinse Cycle



* Factory default, adjustable by service menu

Note 1: If another rack is loaded during this time to close the wash start switch, wash cycle continues

Note 2: If another rack is loaded during this time to close the rinse start switch, rinse cycle continues

Note 3: The conveyor stops when both the wash pump and the rinse pump de-energize

Note 4: The rack handle shape opens the wash/rinse start switch for a moment. But the extended wash/rinse cycle time prevents interruption of the wash/rinse cycle.

F. Control Board and Operation Board

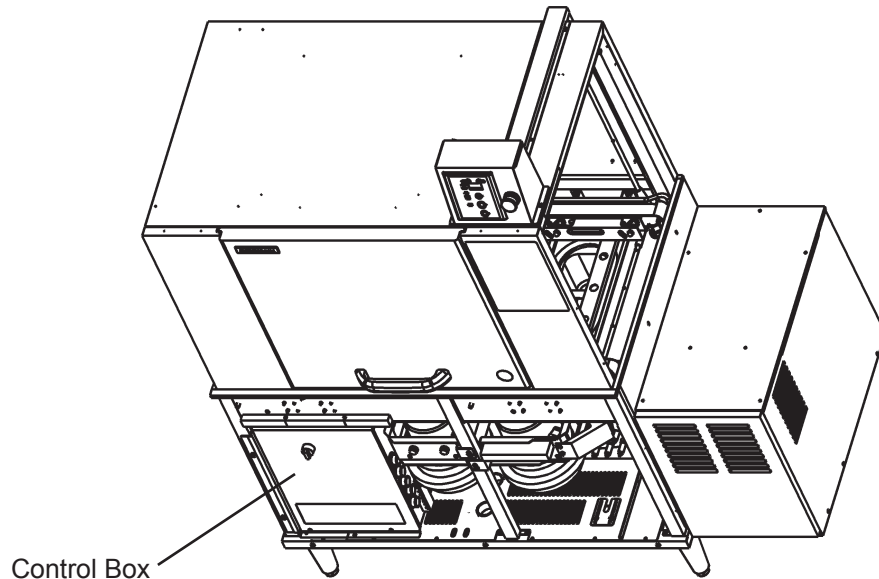
- A Hoshizaki exclusive solid-state control board and operation board are employed in all Hoshizaki dishwasher units.
- All models are pretested and factory set.

NOTICE

1. The control board and operation board are fragile; handle very carefully.
2. The control board and operation board contain integrated circuits, which are susceptible to failure due to static discharge. It is especially important to touch the metal part of the unit when handling or replacing the control board or operation board.
3. Do not touch the electronic devices on the control board or operation board or the back of the control board or operation board.
4. Do not attempt to repair the control board or operation board.
5. Do not short out power supply to test for voltage.

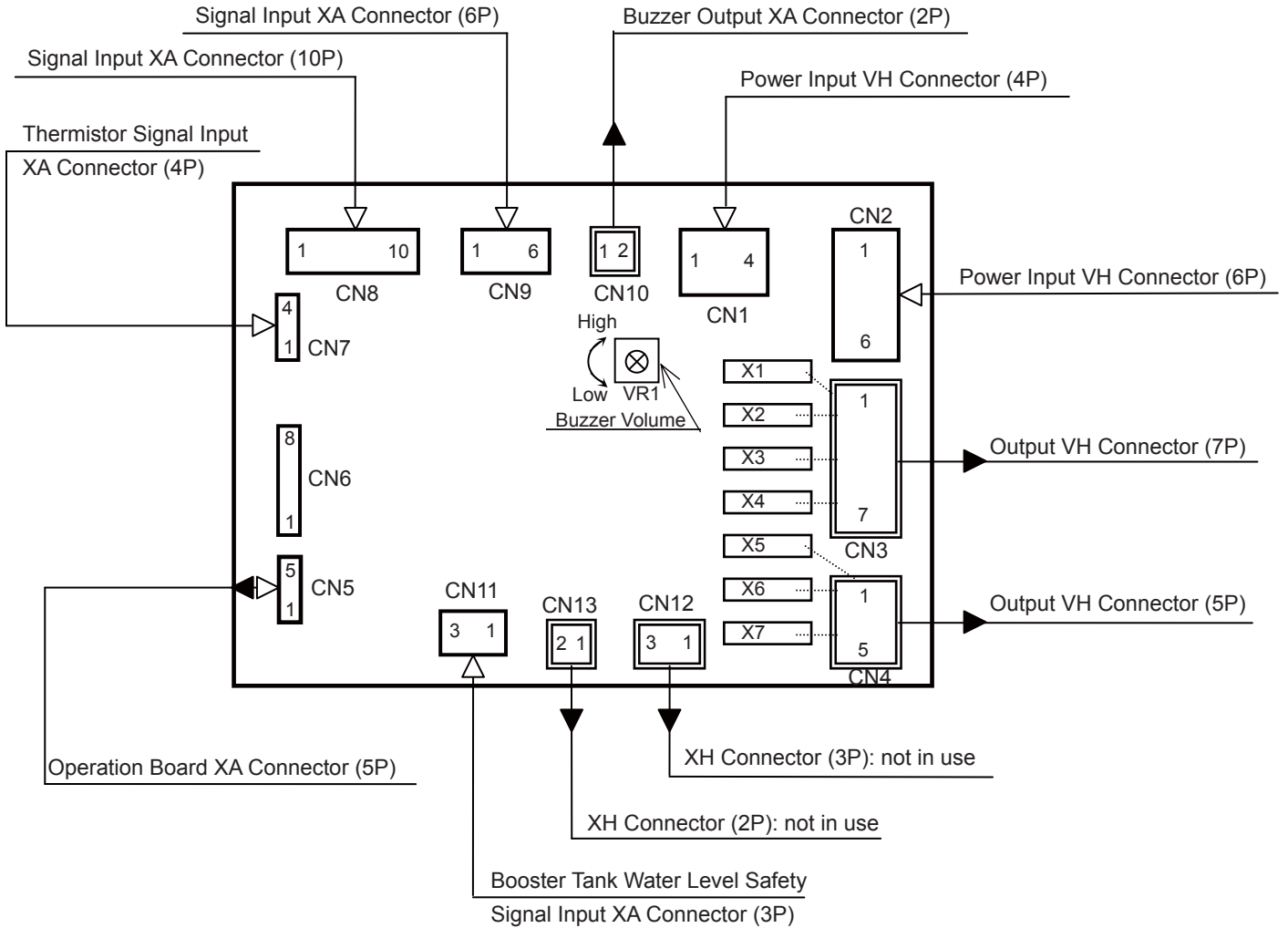
1. Control Board Location

The control box is located behind the front panel. Follow the instructions and warnings for safe and efficient operation of the unit.

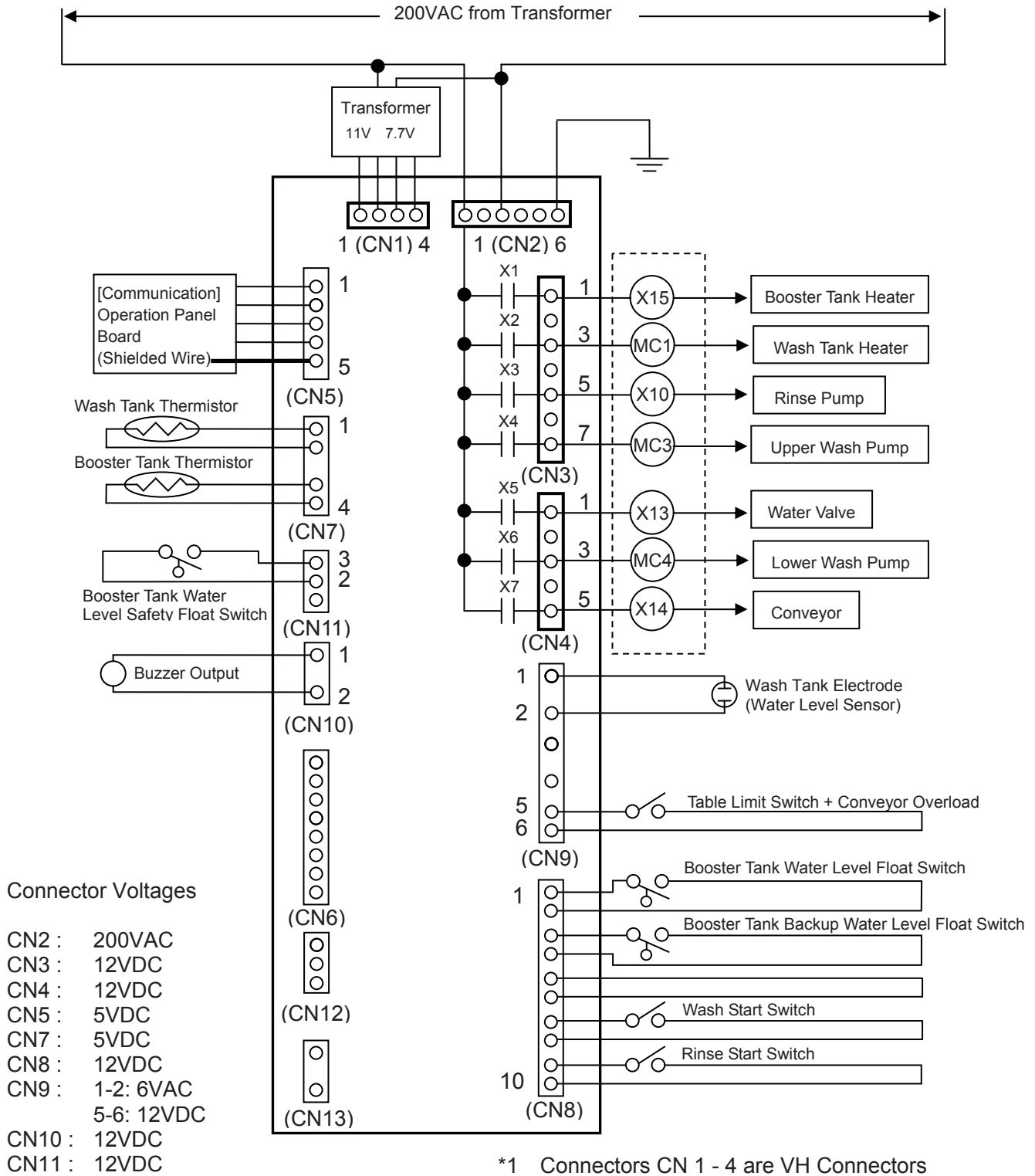


2. Control Board Layout

Inputs and outputs are laid out on the control board as illustrated below.

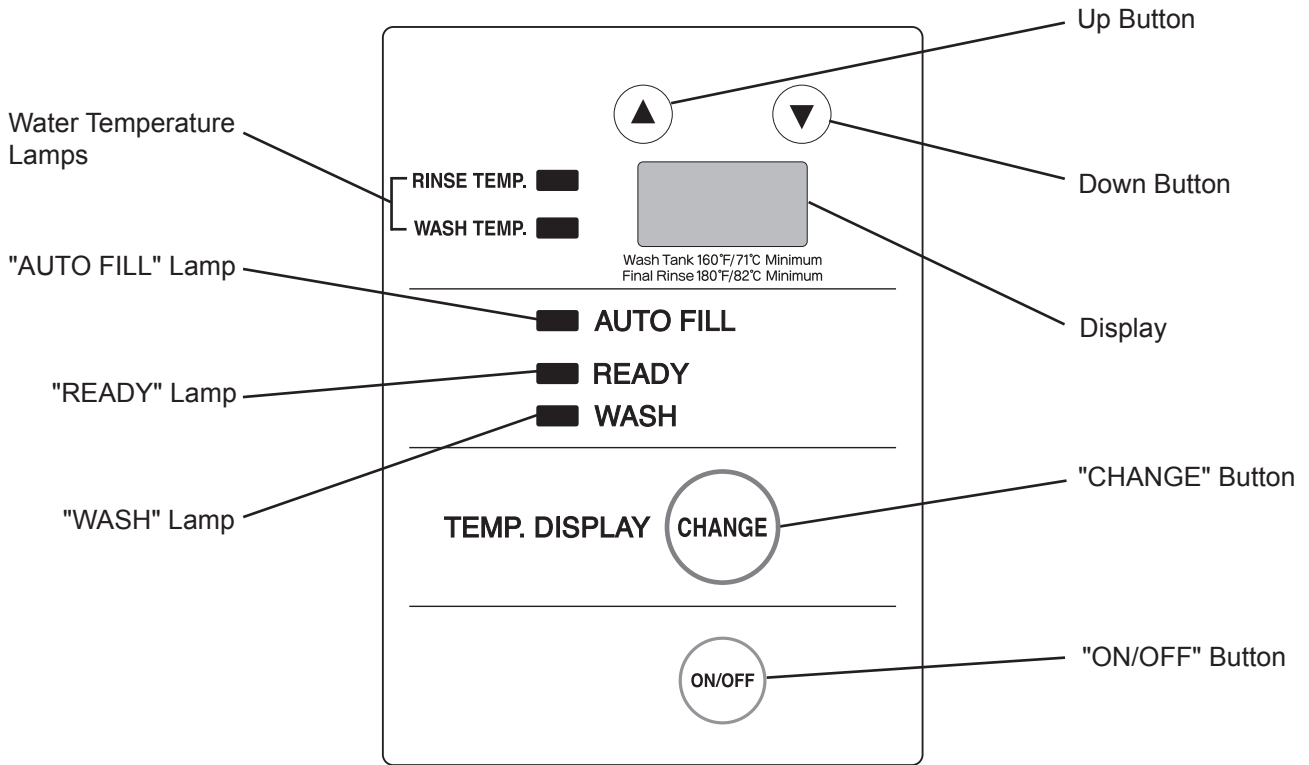


3. Control Board Diagram



4. Operation Panel Layout

The operation panel is mounted on top of the unit (wash compartment exit side) and is connected to the CN5 connector on the control board.



5. Features

a) Display

This operation board uses an LED display to show system details and diagnostic information.

b) Service Menu and Error Log

A service menu ("01" to "19" and "21" to "25") allows for viewing and setting of system operating details and parameters. See "II.F.7. Service Menu and Error Log."

c) Error Codes

Error codes ("A1" to "A3," "H1" to "H6," "L1," "L2," "b1," "b2," "o1," "o2") are designed to protect the unit. These codes give information or warnings in the event the unit is operating out of acceptable parameters. See "III.B. Error Codes."

6. Controls, Adjustments, and Lamps

a) Water Temperature Lamps

Light up to indicate the water temperature shown in the display.

b) "AUTO FILL" Lamp

Flashes during the auto fill cycle, and goes off at the end of the cycle.

c) "READY" Lamp

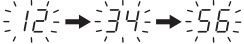
Lights up when the auto fill cycle completes and the dishwasher is ready to wash.

d) "WASH" Lamp

Lights up during washing operation.

e) Up Button, Down Button

▲ Indicates the total hours of operations in six digits by two digits each time.

Example: 123,456 hours are indicated by 

▼ Press to stop the beep in case of error.

Service personnel also use these buttons to change the controller settings.

f) Display

Indicates wash water temperature in wash cycle, rinse water temperature in rinse cycle, and error codes in case of trouble.

g) "CHANGE" Button

Press to change the wash water temperature shown in the display to the rinse water temperature.

h) "ON/OFF" Button

Turns on/off the power for operation.

i) Conveyor Speed Switch

Located on front panel. Changes the rack conveyor speed in three levels (high = 240 racks/hour, medium = 200 racks/hour, low = 160 racks/hour).

7. Service Menu and Error Log

The service menu ("01" to "19" and "21" to "25") may be used to change settings, acquire diagnostic information, and to view error history.

a) Service Menu Access

- Enter Service Menu: Use the "ON/OFF" button to turn off the unit. Press and hold the "CHANGE" button, then press the "ON/OFF" button. "01" should appear on the display.
- Scroll: Use the up and down arrow buttons to scroll through the service menu list, settings, and data.
- View Service Menu Setting: Press the "CHANGE" button to view the selected menu setting.
- Change Setting: Use the up and down arrow buttons to change the setting value.
- Return to Service Menu List: Press the "CHANGE" button once again to return to the main service menu list.
- Exit Service Menu and Save Settings: Press the "ON/OFF" button to exit the service menu and save the settings. The display goes blank.

b) Service Menu Chart

Service Menu	Item and Details	Setting Range		Display	Factory Default
01	Extended Wash Cycle Time	1 to 99 seconds (in 10 second steps)		1 to 99	30
02	Extended Rinse Cycle Time	1 to 99 seconds (in 1 second steps)		1 to 99	15
03	Auto Fill Cycle Rinse Time	0 to 99 minutes (in 1 minute steps)		0 to 99	13
04	Wash Temperature Setpoint	Fahrenheit	32 to 176°F (in 1°F steps)	32 to 176	163
		Celsius	0 to 80° (in 1°C steps)	0 to 80	73
05	Rinse Temperature Setpoint	Fahrenheit	32 to 185°F (in 1°F steps)	32 to 185	185
		Celsius	0 to 85° (in 1°C steps)	0 to 85	85
06	Booster Tank Heating Time	0 to 99 seconds (in 10 second steps)		0 to 99	0
07	Supplementary Fill Cycle Time	0 to 990 seconds (in 10 second steps)		0 to 99	450
08	Booster Tank Auto Fill Delay Time	0 to 99 seconds (in 1 second steps)		0 to 99	10
09	Water Temperature Display	ON: wash water temperature OFF: rinse water temperature		on or oF	on
10	Booster Tank Auto Fill Timer	1 to 99 minutes (in 1 minute steps)		1 to 99	20
11	Booster Tank Temperature Correction	Fahrenheit	0 to 9R (in 1R steps)	0 to 9	0
		Celsius	0 to 5K (in 1K steps)	0 to 5	0
12	Water Temperature Display Change	ON: alternate OFF: fixed		on or oF	on
13	Temperature Display Scale	Fahrenheit or Celsius		°F or °C	°F
14	Water Temperature Display Change Cycle Time	1 to 10 seconds (in 1 second steps)		1 to 10	5
15	Low Water Temperature Lock Function	ON: lock function on OFF: lock function off		on or oF	oF
16	Wash Tank Refill Alert	ON: alert on OFF: alert off		on or oF	oF
17	Total Operation Time Before Alert	10 to 600 minutes		1 to 60	12 (2h)
18	Display Hold Function	ON: stays on OFF: goes off after preset time		on or oF	oF
19	Power Supply Lock Function	ON: "Ch" keeps flashing until electrode is turned off OFF: "Ch" goes off when "ON/OFF" button is switched off		on or oF	oF
21 through 25	Error Log Note: To erase the log, press and hold the up and down buttons for 3 seconds with one of the error codes displayed. The unit beeps once and the entire log clears.	NA		Most Recent Errors 21 is most recent. "--" is displayed if the log is empty.	NA

8. Temperature Display

- Indicates the average water temperature read by the wash tank or booster tank thermistor. Indicates water temperature selected by the water temperature lamps beside the display. The factory default setting is to indicate wash water temperature and rinse water temperature alternately every 5 seconds. To adjust the display change cycle time, or to fix the temperature display for either wash or rinse water temperature and indicate the other temperature while the "CHANGE" button is pressed, see service menu items 09, 12 and 14 in "II.F.7.b) Service Menu Chart."
- The temperature display range is 32°F to 199°F (0°C to 99°C). To change the display scale, see "Temperature Display Scale" (service menu item 13) in "II.F.7.b) Service Menu Chart."
- The temperature display updates every 5 seconds for the wash tank and the booster tank.

9. Error Codes

In the event of operation outside of normal parameters, the control board identifies the issue with an error code and beeps. If more than one error occurs, the display cycles through the relevant error codes. For service corrections, see "III.B. Error Codes."

Error Codes	
A1	Wash Tank Auto Fill Error
A2	Booster Tank Auto Fill Error
A3	Wash Tank Water Level Error
o1	Booster Tank Water Level Error 1 (Booster Tank Water Level Float Switch Closed)
o2	Booster Tank Water Level Error 2 (Booster Tank Water Level Float Switch Open)
H1	Wash Tank Thermistor Error (short)
H2	Wash Tank Thermistor Error (open)
H3	Booster Tank Thermistor Error (short)
H4	Booster Tank Thermistor Error (open)
H5	ROM/RAM Error
H6	EEPROM Error
L1	Conveyor Overload or Table Limit Error 1
L2	Conveyor Overload or Table Limit Error 2
b1	Booster Tank Error
b2	Booster Tank Water Level Safety Error

10. Buzzer

- At the end of an auto fill cycle or other mode operation, the buzzer turns on for 0.1 second and off for 0.1 second 10 times.
- In case of an error, the buzzer turns on for 0.1 second and off for 0.9 second repeatedly until the error is reset. To turn off the beep, press the down button.
- When a button is pressed, the buzzer turns on for 0.1 second.
- To adjust the buzzer volume, use the volume control on the control board.

11. Operation Time Display

To indicate the total hours of operation in the display, press the up button on the operation panel. The number appears from the hundred-thousands place by two digits each for 1 second. The maximum number is 999,999 hours, and the display does not change for the higher numbers.

Example: 19,302 hours are indicated as

12. Special Modes



a) Continuous Wash Mode

The continuous wash mode (also used when descaling) allows the wash pump motor to run continuously. In this mode, the wash tank heaters and booster tank heaters remain de-energized.

To enter the continuous wash mode, use the "ON/OFF" button to turn off the unit. Press and hold the up and down buttons and the "CHANGE" button for 3 seconds and press the "ON/OFF" button. As long as the service panel switch and wash tank water level sensor are closed, the wash pump motor runs and power is supplied to the detergent feeder terminals. "PC" (preventative cleaning) appears in the display and the lamps are off.

To cancel the continuous wash mode, press the "ON/OFF" button.

b) Low Water Temperature Lock Function

To ensure the NSF specified minimum wash water temperature of 160°F, this unit is provided with a function to lock the washing operation until water in the wash water tank reaches 160°F even if a rack is loaded (factory default: OFF).

To activate this function, set service menu item 15 to "ON" referring to "II.F.7.a) Service Menu Access." The minimum temperature of 160°F cannot be changed.

c) Alert Function

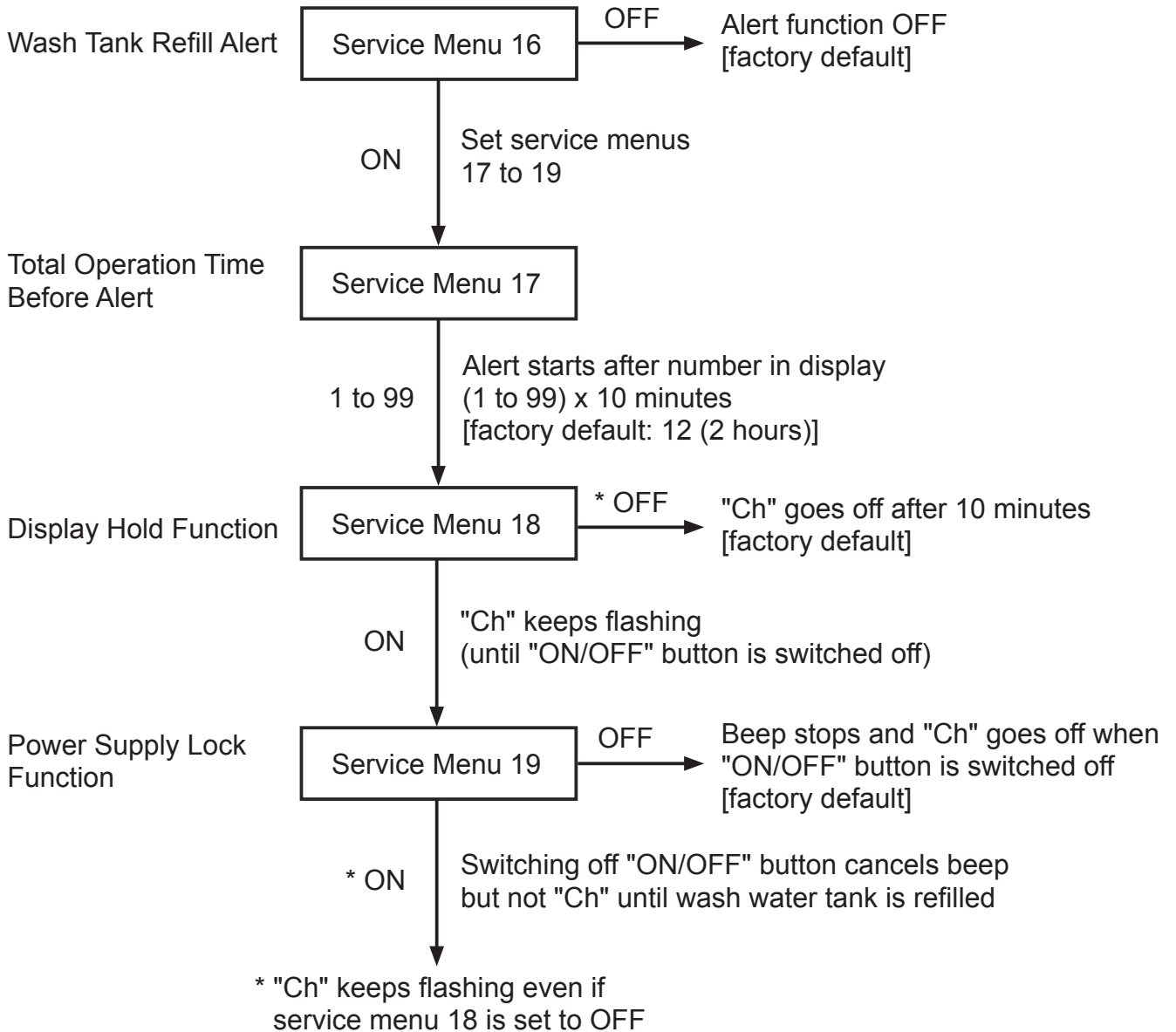
To keep water in the wash water tank clean, this unit is provided with functions to beep and flash "Ch" (= Change) in the display when wash water should be changed and to continue this alert until the wash water tank is refilled (factory default: OFF).

To activate this function, set service menu items 16, 17, 18 and 19 referring to "II.F.7.a) Service Menu Access."

- 1) Set service menu item 16 to ON to activate this function (factory default: OFF).
- 2) Set service menu item 17 to the desired total operation time before alert [number in display x 10 minutes] (factory default: 12 (2 hours)). Change this setting according to the advice of the relevant health department and customer demands.
- 3) Set service menu item 18 to either OFF ["Ch" goes off after 10 minutes] or ON ["Ch" keeps flashing] (factory default: OFF). Even if set to ON, "Ch" goes off when the "ON/OFF" button on the operation panel is switched off.

- 4) Set service menu item 19 to ON to stop the beep when the "ON/OFF" button is switched off but to resume flashing "Ch" when the "ON/OFF" button is switched back on unless the wash water tank is refilled (factory default: OFF). Press the emergency stop button or turn off the external power supply to stop both the beep and "Ch" indication. Set service menu item 19 to OFF to stop both the beep and "Ch" indication once the "ON/OFF" button is switched off. If service menu item 19 is set to ON, "Ch" keeps flashing even if service menu item 18 is set to OFF.

Alert Function Setting Flow



III. Service Diagnosis

⚠ WARNING

1. This unit should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
2. Risk of electric shock. Use extreme caution and exercise safe electrical practices.
3. Moving parts (e.g., fan blade) can crush and cut. Keep hands clear.
4. Do not make any alterations to the unit. This could cause water leak, electric shock, or fire.
5. To help reduce the risk of electric shock, do not touch switches with damp hands.

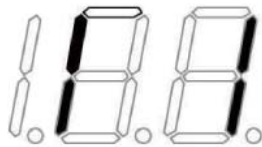
A. Diagnostic Procedure

The diagnostic procedure is a sequence check of the switches and sensors while operating the unit, by using the switch open/closed display mode.

Switch Open/Closed Display Mode

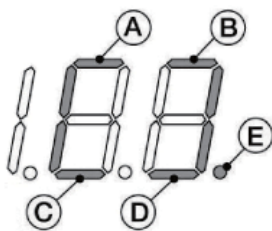
The switch open/closed display mode indicates when the wash start switch, rinse start switch, wash tank water level sensor, booster tank water level float switch, and booster tank backup water level float switch are open or closed.

To enter the switch open/closed display mode, use the "ON/OFF" button to turn on the unit. Press and hold the up and down buttons for 3 seconds. The following appears in the display:



Load a rack to engage the wash start switch and start a cycle. The display indicates whether a switch is open or closed. When a switch is closed, its corresponding segment is illuminated in the display. See the illustration below.

To resume the normal display, press the down button.



- Ⓐ Booster Tank Backup Water Level Float Switch
- Ⓑ Wash Start Switch
- Ⓒ Booster Tank Water Level Float Switch
- Ⓓ Rinse Start Switch
- Ⓔ Wash Tank Water Level Sensor

It is recommended to conduct this sequence check in the auto fill cycle after draining the wash tank and booster tank. See “II.C. Sequence of Operation” for further details.

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit.
- 2) Pull out the overflow pipe to drain the wash tank.
- 3) Drain the booster tank through the drain hose.
- 4) Replace the overflow pipe and drain hose in their correct positions.
- 5) Enter the switch open/closed display mode according to the above procedure.
- 6) Auto Fill Cycle
 - a. After the service panel is closed and the “ON/OFF” button is pressed, the inlet water valve in the booster tank opens in 10 seconds to start water supply.
 - b. After a while, the booster tank water level float switch closes, segment C in the display comes on, and the inlet water valve closes to stop water supply.
 - c. The rinse pump starts to feed water to the wash tank. When the booster tank water level goes down, the water level float switch opens, segment C in the display goes off, and the inlet water valve opens to start water supply.
 - d. After the rinse pump is energized for a preset time to fill the wash tank, the wash tank water level sensor closes, and segment E in the display comes on.
 - e. In normal operation, the booster tank backup water level float switch does not close, and segment A in the display stays off. If the booster tank water level float switch fails or the booster tank water level reaches the overflow level, segment A comes on.
- 7) Wash Cycle/Rinse Cycle
 - a. When a rack is loaded from the wash compartment entrance and the wash start switch closes, segment B in the display comes on and the wash pump starts the wash cycle for a preset time. When the conveyor moves the rack forward and the wash start switch opens, segment B goes off and the wash pump stops after the preset time. Segment E in the display stays on.
 - b. If the booster tank is below the predetermined water level, segment C in the display stays off. The inlet water valve stays open until segment C comes on.
 - c. When the wash cycle ends and the rinse start switch closes, segment D in the display comes on and the rinse pump starts the rinse cycle for a preset time. When the rinse start switch opens, segment D goes off and the rinse pump stops after the preset time. When the rinse cycle starts, the booster tank water level goes down and segment C in the display goes off. The inlet water valve stays open until segment C comes on.

Diagnosis: If any problem is found by the above sequence check, refer to “III.B. Error Codes,” “III.C. Service Flow Charts,” “III.D. Float Switch Check and Cleaning” and “III.E. Thermistor Check.”

B. Error Codes

In the event of operation outside of normal parameters, the control board identifies the issue with an error code. For further service information, see "III.C. Service Flow Charts."

1. Error Code Table

Error Code	Problem	Operation	Reset
A1	Wash Tank Auto Fill Error Water level in wash tank does not reach water level sensor after rinse pump has run for preset time.	Whole unit stops	Use "ON/OFF" button to turn the unit off and then back on.
A2	Booster Tank Auto Fill Error In auto fill cycle, booster tank water level float switch does not close within 10 minutes (or 20 minutes in "READY" mode) after inlet water valve is opened.	Whole unit stops	Use "ON/OFF" button to turn the unit off and then back on.
A3	Wash Tank Water Level Error Water level in wash tank goes below water level sensor in "READY" mode or during operation.	Supplementary fill cycle starts (Whole unit stops if water level sensor does not close after two cycles)	After supplementary fill cycle ends, alarm resets. (If whole unit stops, use "ON/OFF" button to turn the unit off and then back on.)
o1	Booster Tank Water Level Error 1 (Booster Tank Water Level Float Switch Closed) Both booster tank water level float switch and booster tank backup water level float switch have remained closed for 1 minute.	Whole unit stops	Use "ON/OFF" button to turn the unit off and then back on.
o2	Booster Tank Water Level Error 2 (Booster Tank Water Level Float Switch Open) Booster tank water level float switch is open and booster tank backup water level float switch has remained closed for 1 minute.	Whole unit stops	Use "ON/OFF" button to turn the unit off and then back on.
H1	Wash Tank Thermistor Error (short) Thermistor senses abnormal temperature (at or above 231°F (110°C)).	Normal (Wash tank heaters off)	After replacing failed component, alarm resets.
H2	Wash Tank Thermistor Error (open) Thermistor senses abnormal temperature (at or below -6°F (-21°C)).	Normal (Wash tank heaters off)	After replacing failed component, alarm resets.
H3	Booster Tank Thermistor Error (short) Thermistor senses abnormal temperature (at or above 231°F (110°C)).	Normal (Booster tank heaters off)	After replacing failed component, alarm resets.

Error Code	Problem	Operation	Reset
H4	Booster Tank Thermistor Error (open) Thermistor senses abnormal temperature (at or below -6°F (-21°C)).	Normal (Booster tank heaters off)	After replacing failed component, alarm resets.
H5	ROM/RAM Error Control board ROM/RAM fails.	Whole unit stops	After replacing control board, alarm resets.
H6	EEPROM Error EEPROM fails.	Whole unit stops	After replacing control board, alarm resets.
L1	Conveyor Overload or Table Limit Error 1 Inverter sends conveyor overload signal or table limit switch closes.	Unit stops	After error signal stops, alarm resets.
L2	Conveyor Overload or Table Limit Error 2 After unit stops with "L1" error and restarts, another error signal is sent within 3 seconds.	Whole unit stops	Use "ON/OFF" button to turn the unit off and then back on.
b1	Booster Tank Error Booster tank error output contacts open.	Normal	After booster tank error is resolved, alarm resets.
b2	Booster Tank Water Level Safety Error Booster tank water level safety float switch opens after booster tank water level float switch closes.	Whole unit stops	Use "ON/OFF" button to turn the unit off and then back on.

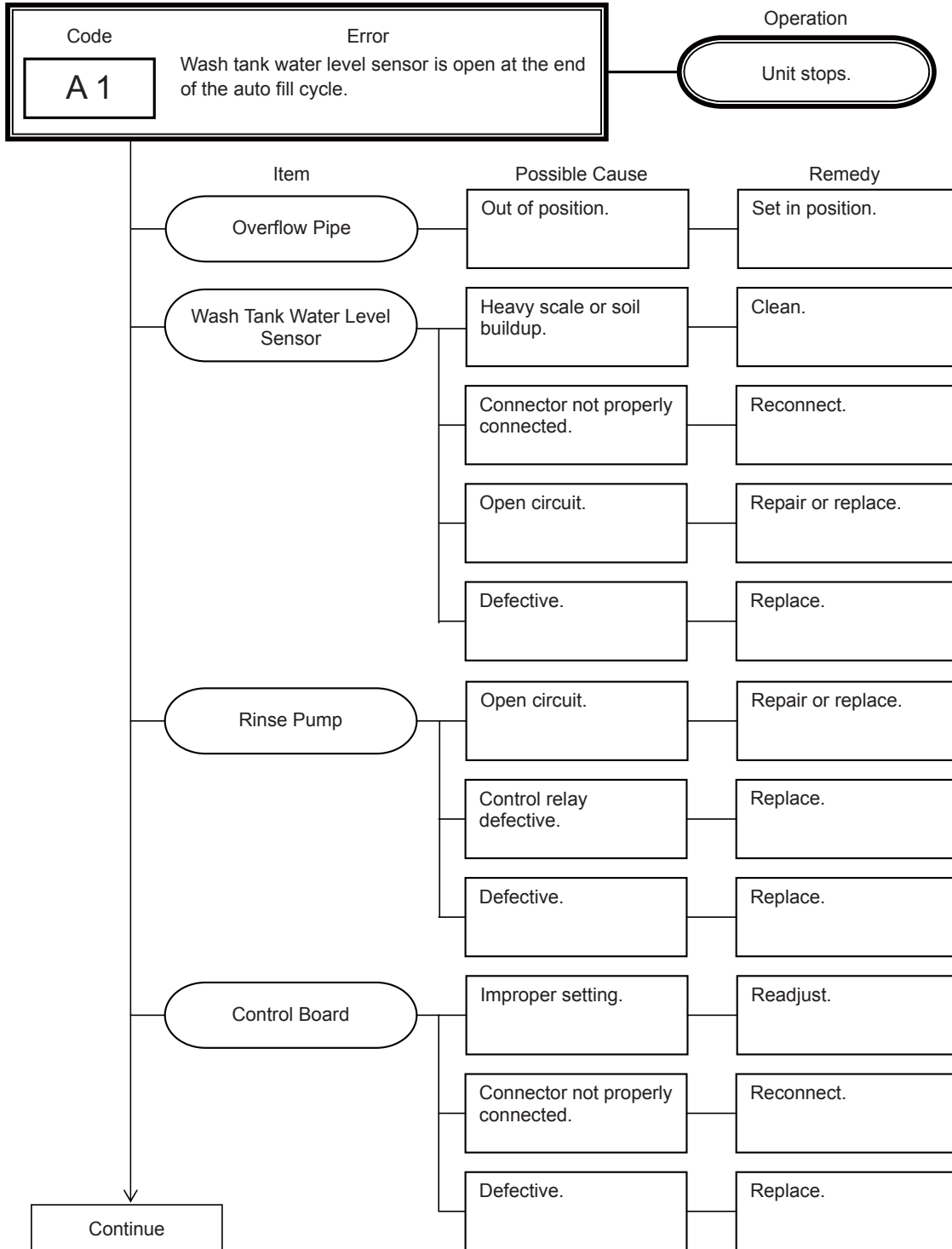
2. Error Code Log

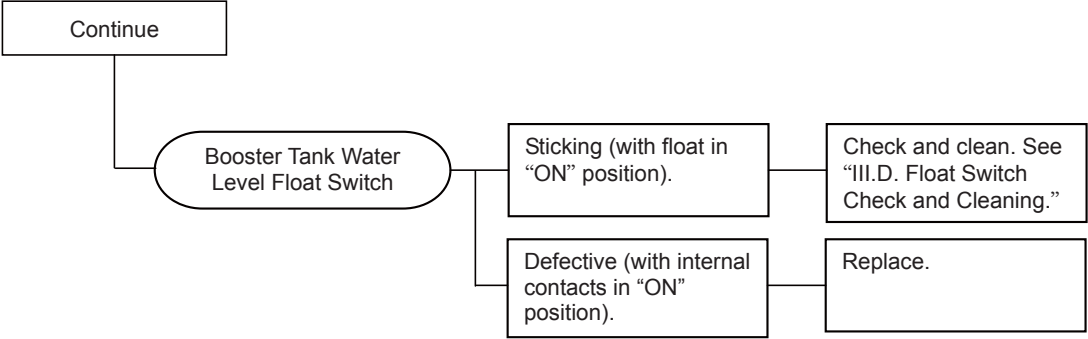
Use the "ON/OFF" button to turn off the unit. Press and hold the "CHANGE" button, then press the "ON/OFF" button. "01" should appear on the display. Use the down arrow button to scroll to service menu items 21 through 25. 21 is the most recent error. Press the "CHANGE" button to view the selected service menu item. Press the "CHANGE" button once again to return to the main service menu list. If no errors exist in the log, "--" is displayed. Press the "ON/OFF" button to exit the service menu. The display goes blank. To erase the log, press and hold the up and down buttons for 3 seconds with one of the error codes displayed. The unit beeps once and the entire log clears.

3. Error Code Details

a) Auto Fill Error (A1)

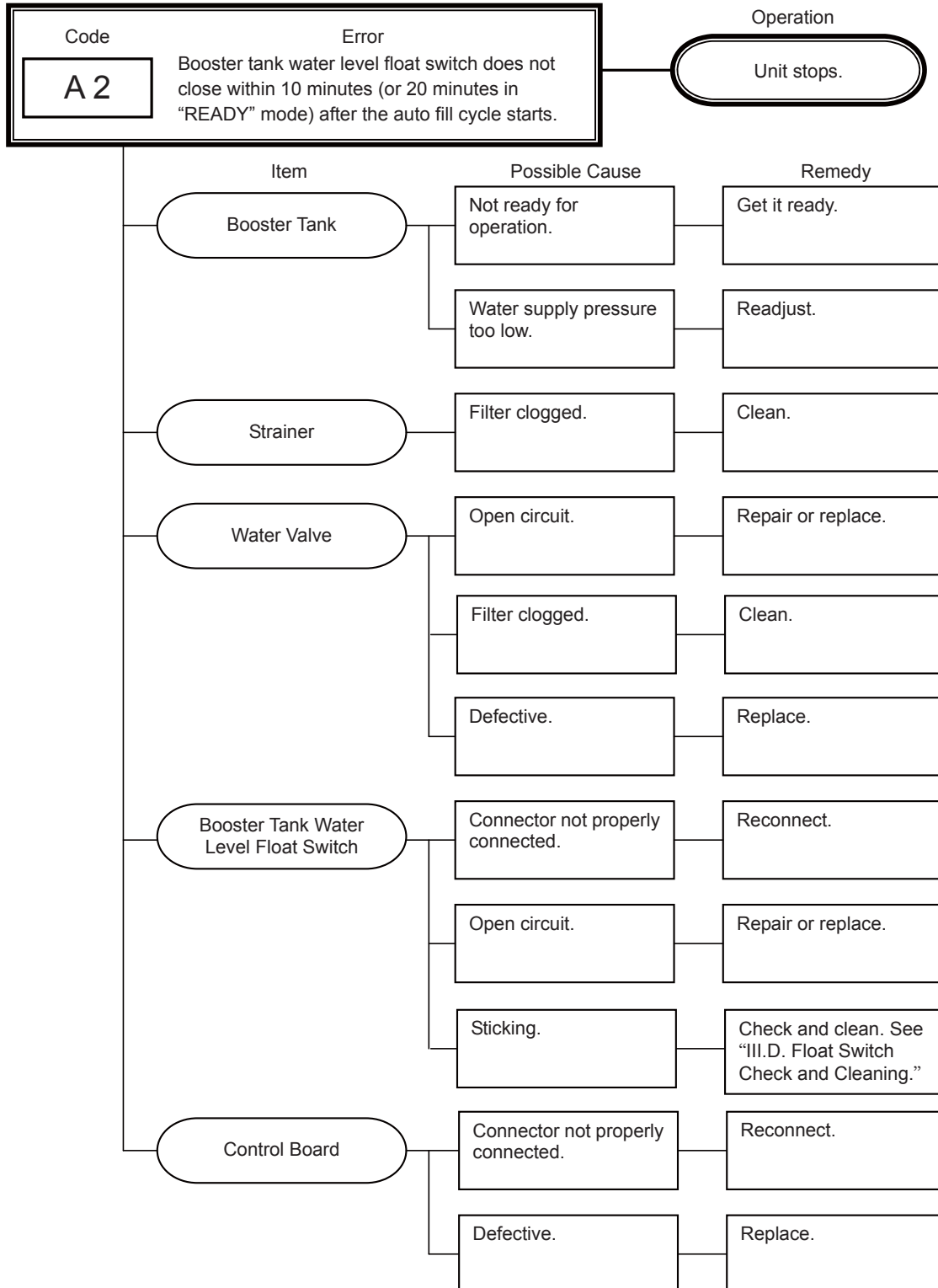
- If the water level sensor in the wash tank is not closed at the end of the auto fill cycle, the unit shuts down, "A1" appears in the display, and the buzzer sounds.
- To reset, use the "ON/OFF" button to turn the unit off and then back on.
- See the chart below for possible causes and remedies.





b) Booster Tank Auto Fill Error (A2)

- In the auto fill cycle, if the booster tank water level float switch does not close within 10 minutes (or 20 minutes in "READY" mode) after the cycle starts, the unit shuts down, "A2" appears in the display, and the buzzer sounds.
- To reset, use the "ON/OFF" button to turn the unit off and then back on.
- See the chart below for possible causes and remedies.

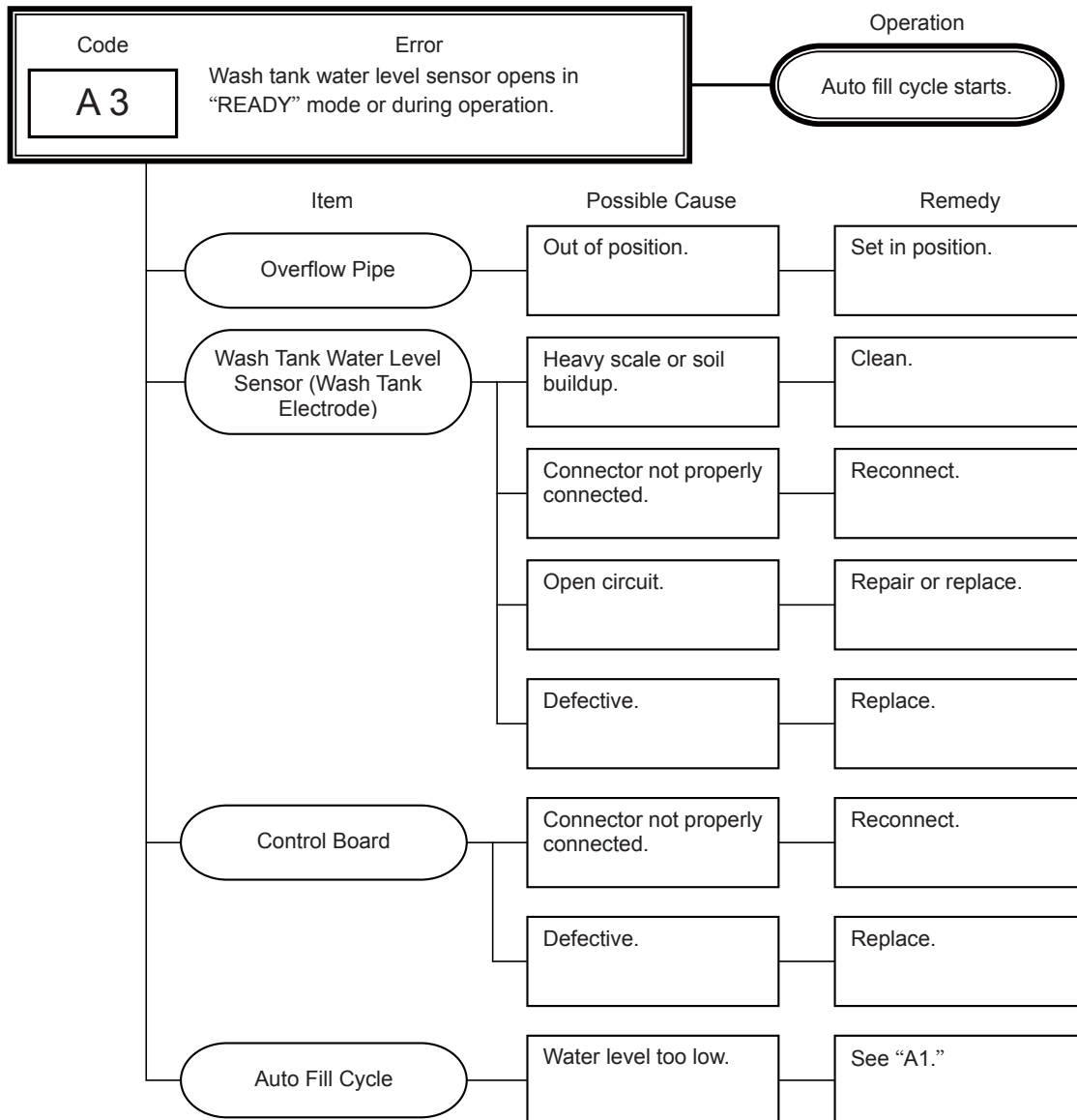


c) Wash Tank Water Level Error (A3)

- If the water level in the wash tank goes below the water level sensor in "READY" mode or during operation, the supplementary fill cycle starts, "A3" appears in the display, the "AUTO FILL" lamp flashes, and the buzzer sounds three times only at the beginning.
- If the wash tank water level sensor is closed after the supplementary fill cycle, the alarm resets. If the wash tank water level sensor is still open after the supplementary fill cycle, another cycle starts.

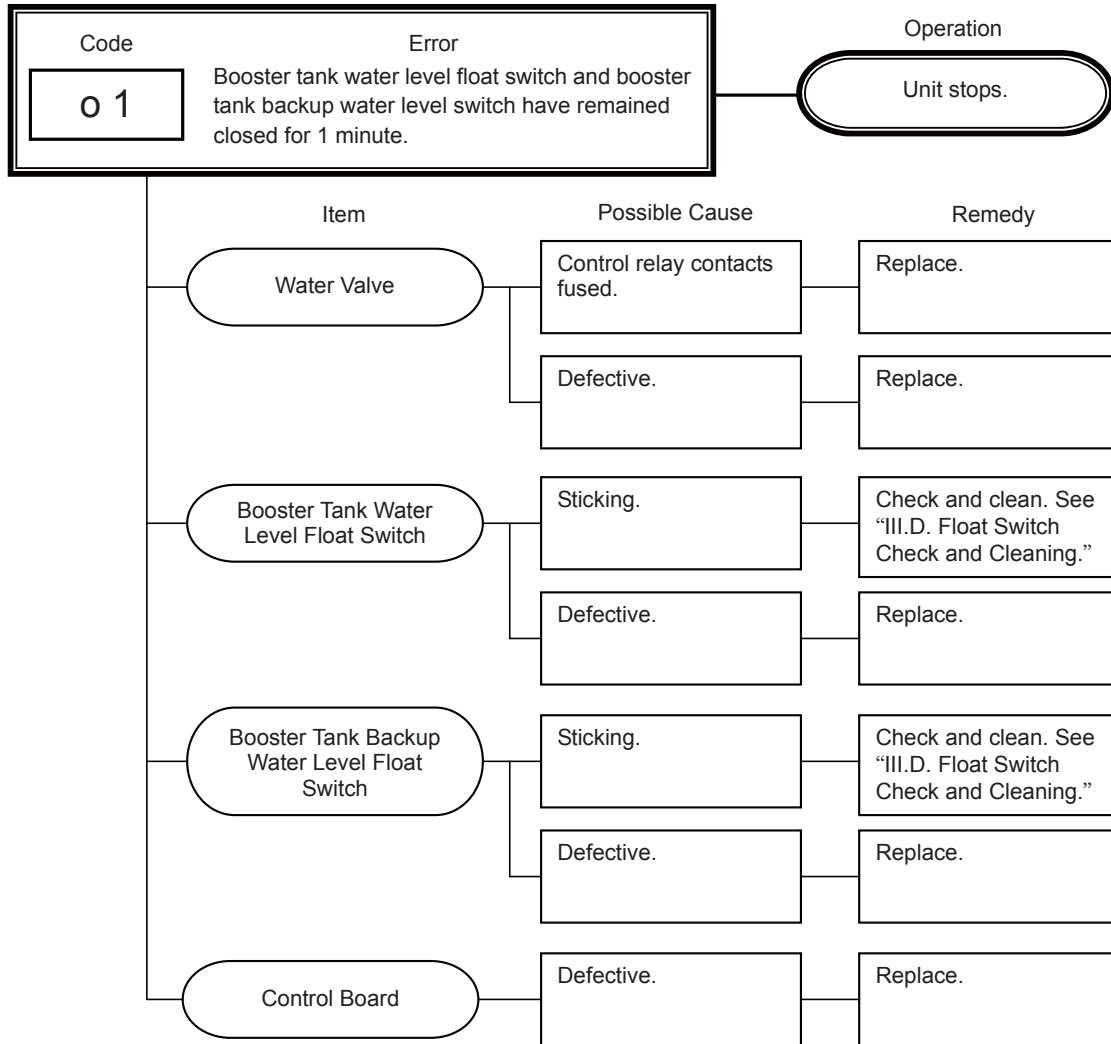
If the wash tank water level sensor is closed after the second cycle, the alarm resets. If the wash tank water level sensor still does not close after the second cycle, the buzzer sounds, and the unit completely shuts down.

- See the chart below for possible causes and remedies.



d) Booster Tank Water Level Error 1 (Booster Tank Water Level Float Switch Closed) (o1)

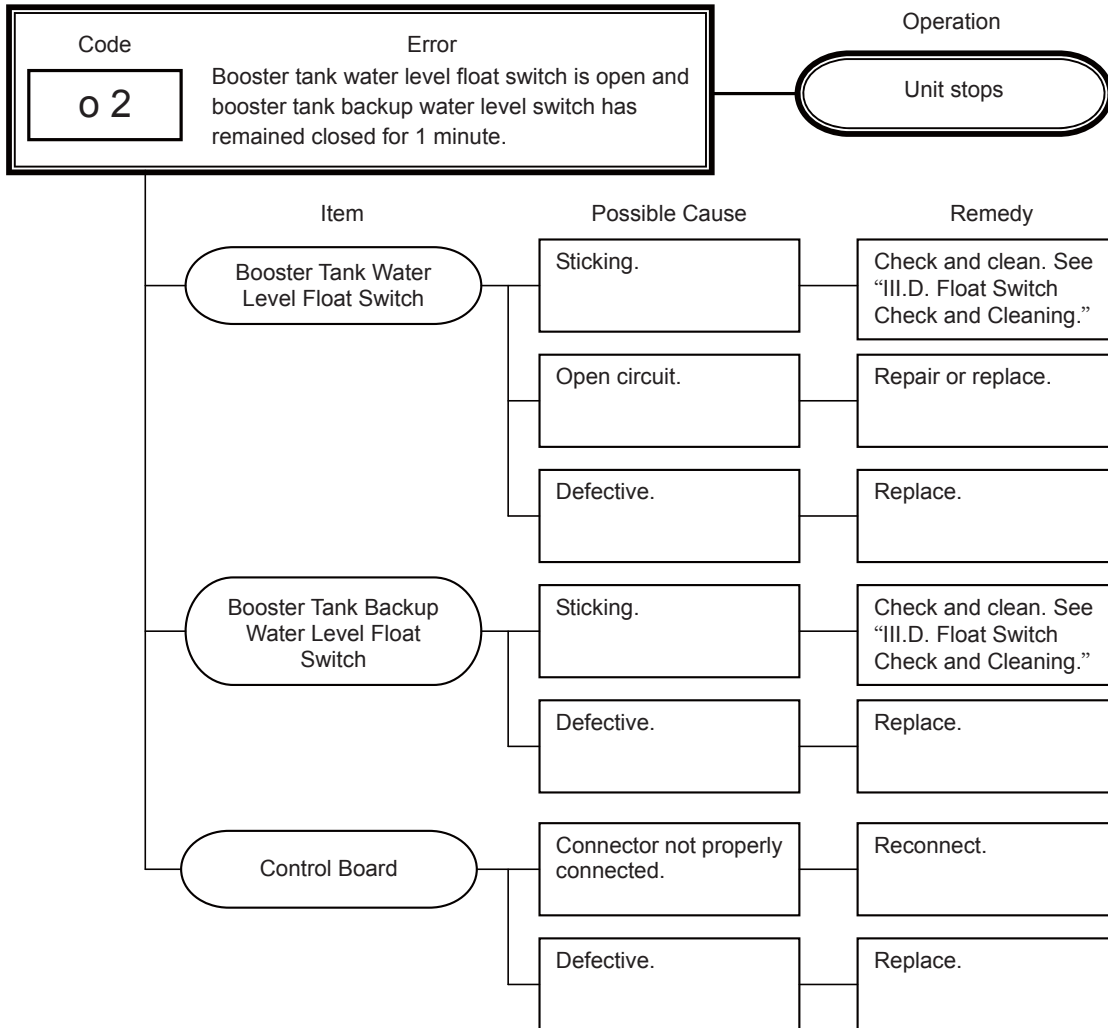
- If both the booster tank water level float switch and the booster tank backup water level float switch have remained closed for 1 minute, the booster tank heaters de-energize, "o1" appears in the display, and the buzzer sounds.
- The error resets if the booster tank backup water level float switch opens or when the "ON/OFF" button is used to turn the unit off and then back on.
- See the chart below for possible causes and remedies.



Note: See "III.D. Float Switch Check and Cleaning."

e) Booster Tank Water Level Error 2 (Booster Tank Water Level Float Switch Open) (o2)

- If the booster tank water level float switch is open and the booster tank backup water level float switch has remained closed for 1 minute, the booster tank heaters de-energize, "o2" appears in the display, and the buzzer sounds.
- The error resets if the booster tank backup water level float switch opens or when the "ON/OFF" button is used to turn the unit off and then back on.
- See the chart below for possible causes and remedies.

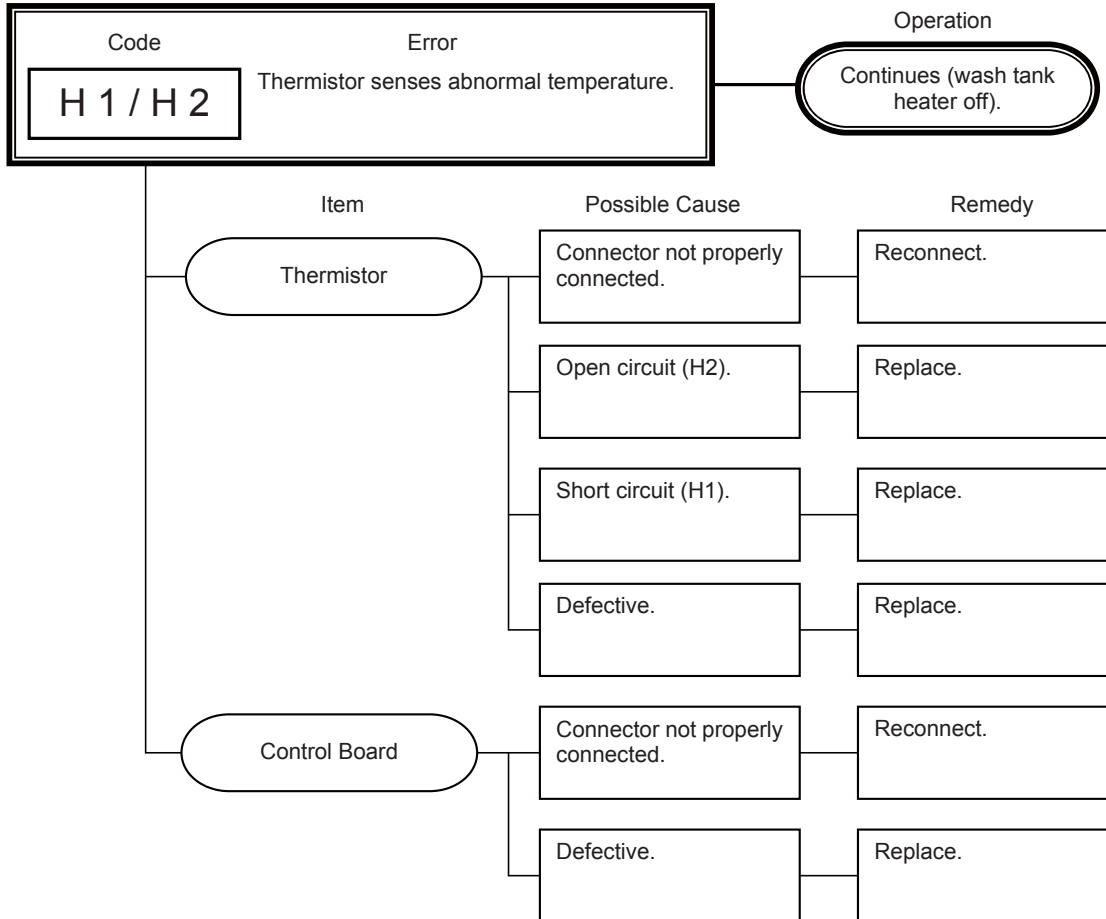


Note: See "III.D. Float Switch Check and Cleaning."

f) Wash Tank Thermistor Error (H1, H2)

- If the wash tank thermistor senses a temperature at or above 231°F (111°C) (2.4kΩ), the thermistor leads are considered shorted and the wash tank heaters de-energize, "H1" appears in the display, and the buzzer sounds.
- If the wash tank thermistor senses a temperature at or below -6°F (-21°C) (517kΩ), the thermistor leads are considered open and the wash tank heaters de-energize, "H2" appears in the display, and the buzzer sounds.
- After replacing the failed component, the alarm resets.
- See the chart below for possible causes and remedies.

Note: The auto fill cycle and the wash/rinse cycle will start even after this error occurs.

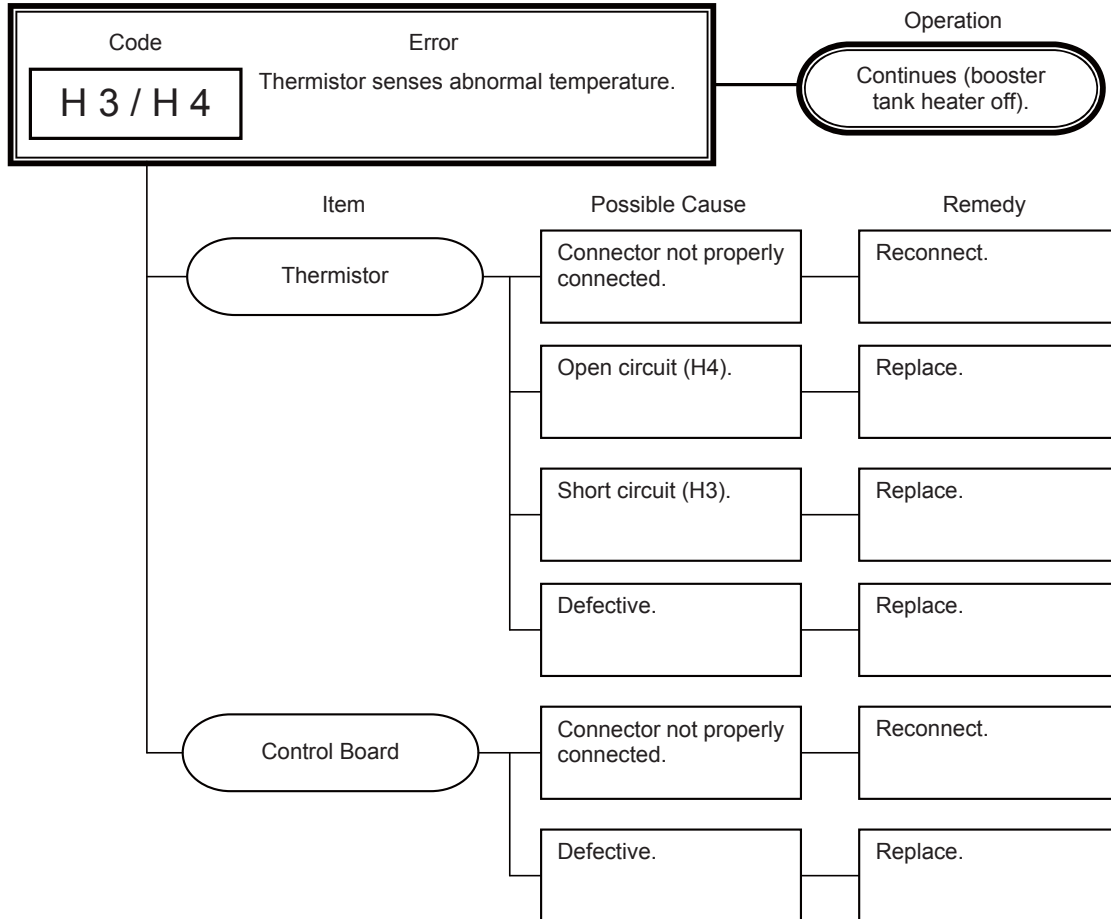


Note: See "III.E. Thermistor Check" and "IV.H. Removal and Replacement of Thermistor."

g) Booster Tank Thermistor Error (H3, H4)

- If the booster tank thermistor senses a temperature at or above 231°F (111°C) (2.4kΩ), the thermistor leads are considered shorted and the booster tank heaters de-energize, "H3" appears in the display, and the buzzer sounds.
- If the booster tank thermistor senses a temperature at or below -6°F (-21°C) (517kΩ), the thermistor leads are considered open and the booster tank heaters de-energize, "H4" appears in the display, and the buzzer sounds.
- After replacing the failed component, the alarm resets.
- See the chart below for possible causes and remedies.

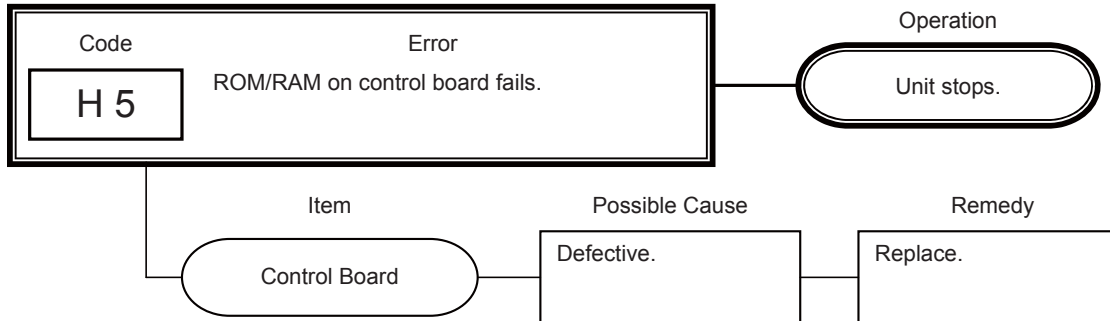
Note: The auto fill cycle and the wash/rinse cycle will start even after this error occurs.



Note: See "III.E. Thermistor Check" and "IV.H. Removal and Replacement of Thermistor."

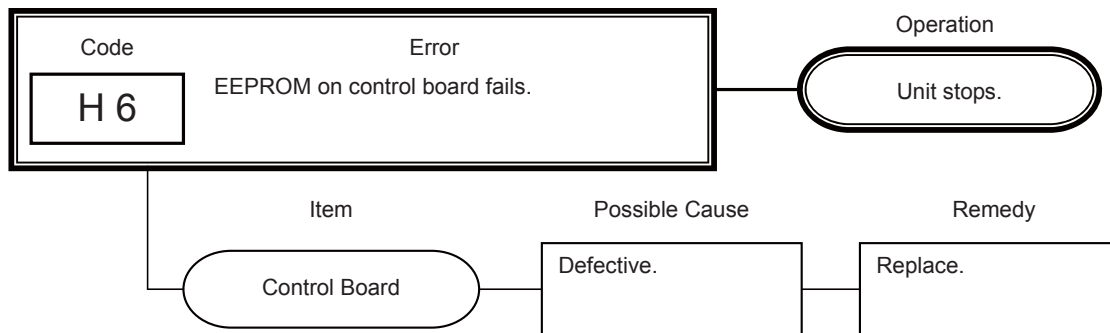
h) ROM/RAM Error (H5)

- If a ROM/RAM error is detected, the unit shuts down, "H5" appears in the display, and the buzzer sounds.
- After replacing the failed component, the alarm resets.
- See the chart below for possible causes and remedies.



i) EEPROM Error (H6)

- If an EEPROM error is detected, the unit shuts down, "H6" appears in the display, and the buzzer sounds.
- After replacing the failed component, the alarm resets.
- See the chart below for possible causes and remedies.



Note: See "IV.I. Removal and Replacement of Control Board or Operation Board."

j) Conveyor Overload or Table Limit Error 1 (L1)

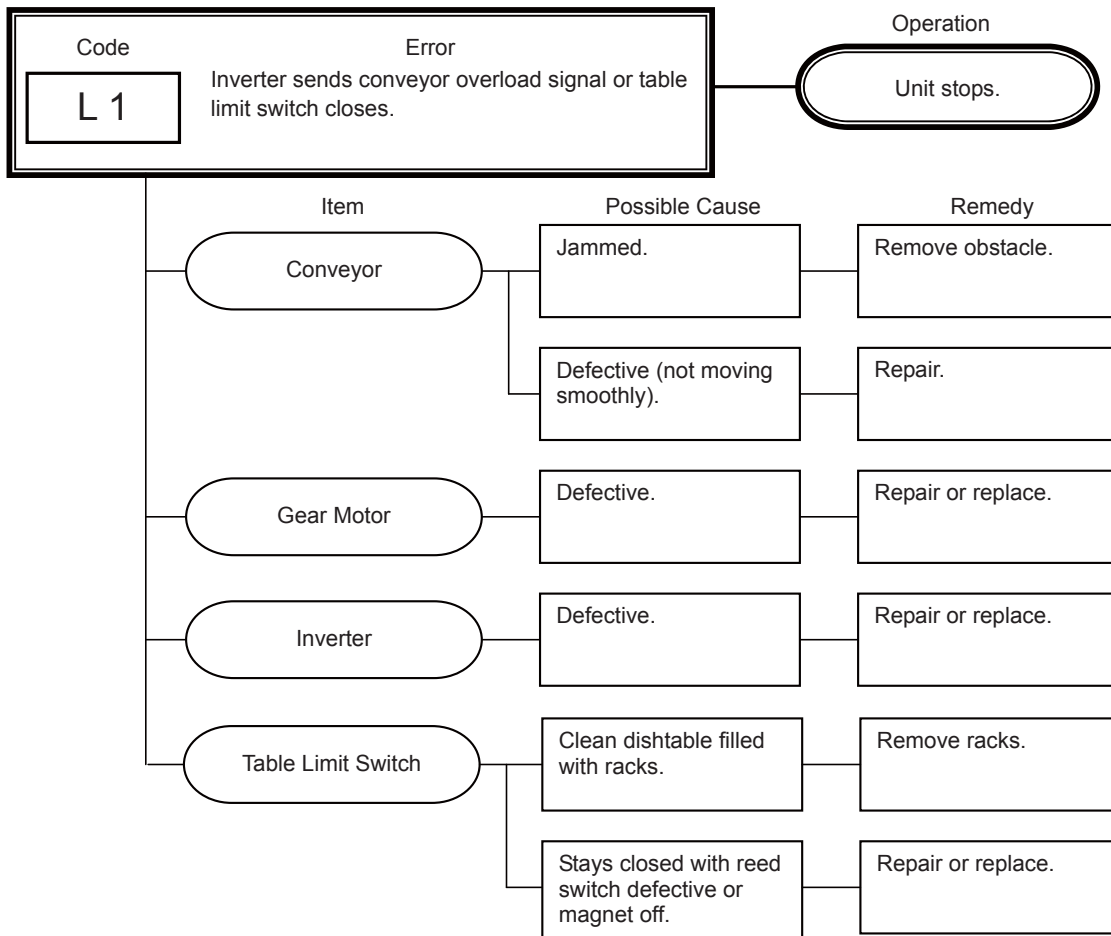
- If the inverter sends an overload signal or the table limit switch closes, the unit shuts down, "L1" appears in the display, and the buzzer sounds.
- After removing the jammed rack or the cause of the overload (the table limit switch opens or the inverter stops sending the overload signal), the alarm resets after 3 seconds, and the unit is ready to resume operation.

If the wash start switch is closed when the alarm resets, the upper spray arm wash pump starts first, followed by the lower spray arm wash pump, then the conveyor moves.

If the rinse start switch is closed when the alarm resets, the rinse pump starts, then the conveyor moves.

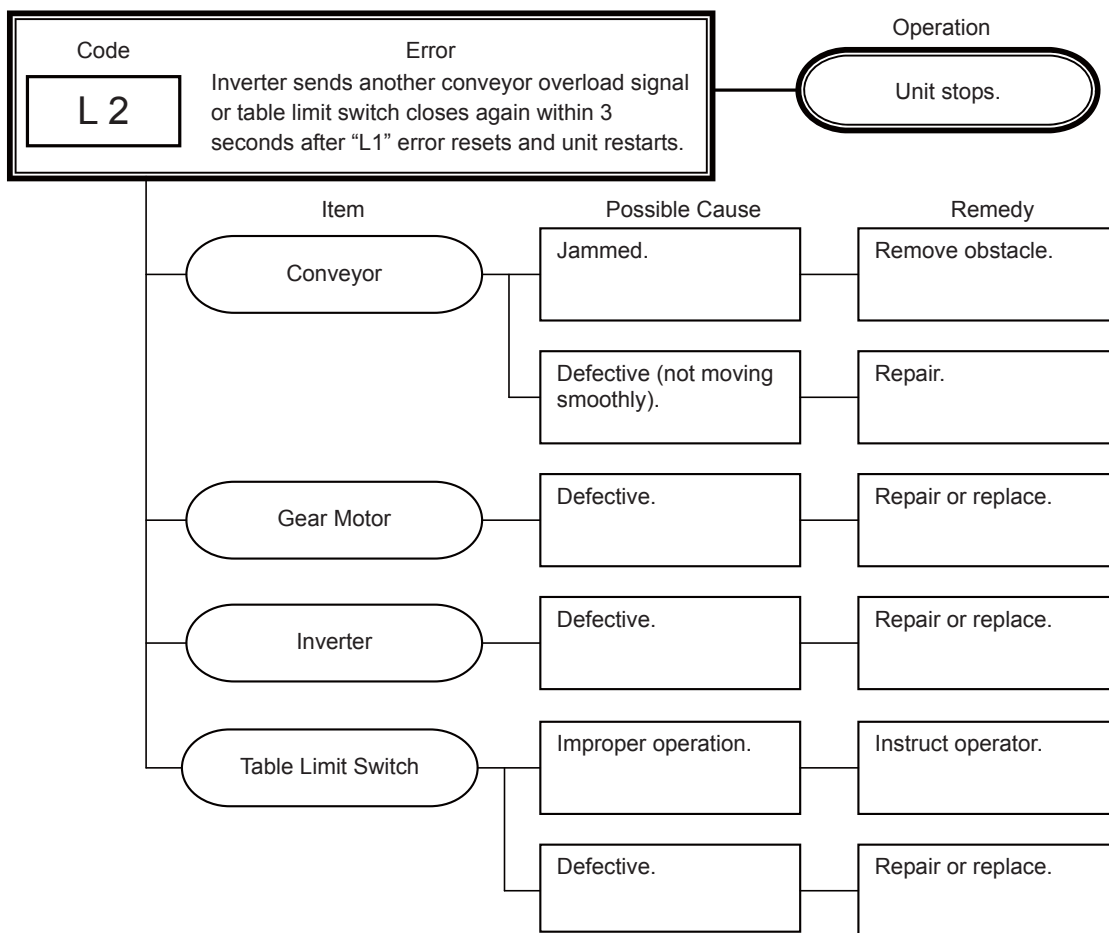
The heaters stay energized while the unit is off with "L1."

- See the chart below for possible causes and remedies.



k) Conveyor Overload or Table Limit Error 2 (L2)

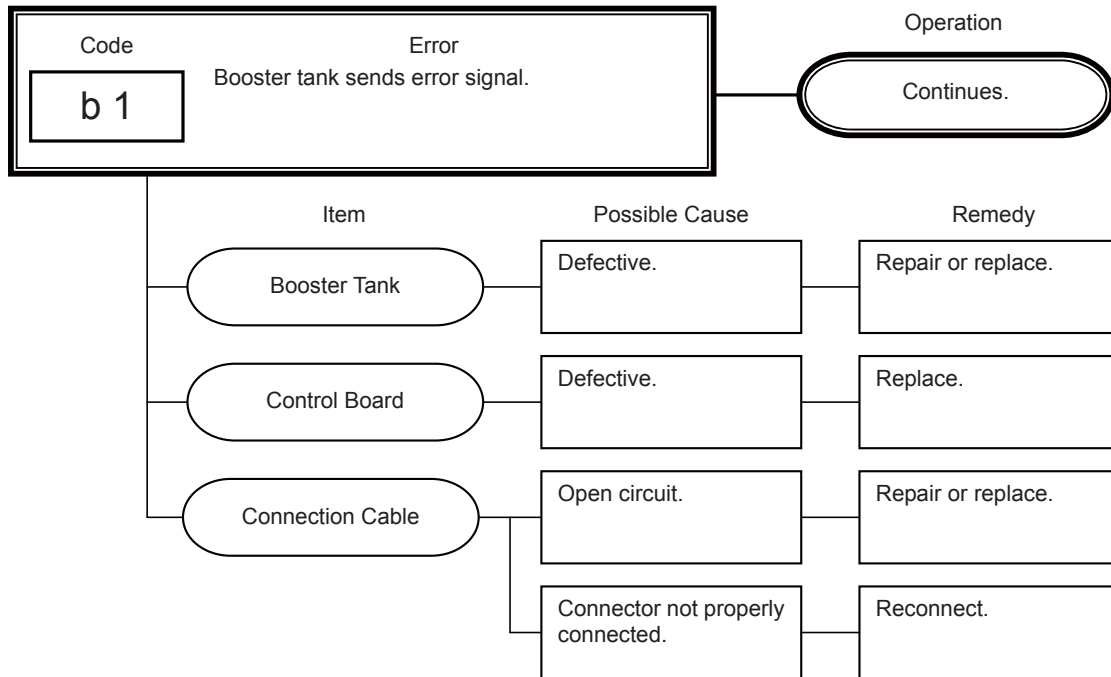
- If the unit shuts down with "L1" in the display and restarts in 3 seconds after the cause of the overload is removed, and the inverter sends another overload signal within 3 seconds after the conveyor moves, the unit completely shuts down, "L2" appears in the display, and the buzzer sounds.
- To reset, use the "ON/OFF" button to turn the unit off and then back on.
 If the unit shuts down with a conveyor overload error, the error signal from the inverter is reset, and the unit restarts after 3 seconds. If the cause of the overload (e.g. dish caught in conveyor) has not been removed by then, the unit starts and stops repeatedly. To prevent this repetition, if the same error occurs within 3 seconds, the unit remains shut down.
 If the unit shuts down with the table limit switch closed, the unit restarts after one or more racks are removed, and the table limit switch does not normally close again within 3 seconds.
- See the chart below for possible causes and remedies.



l) **Booster Tank Error (b1)**

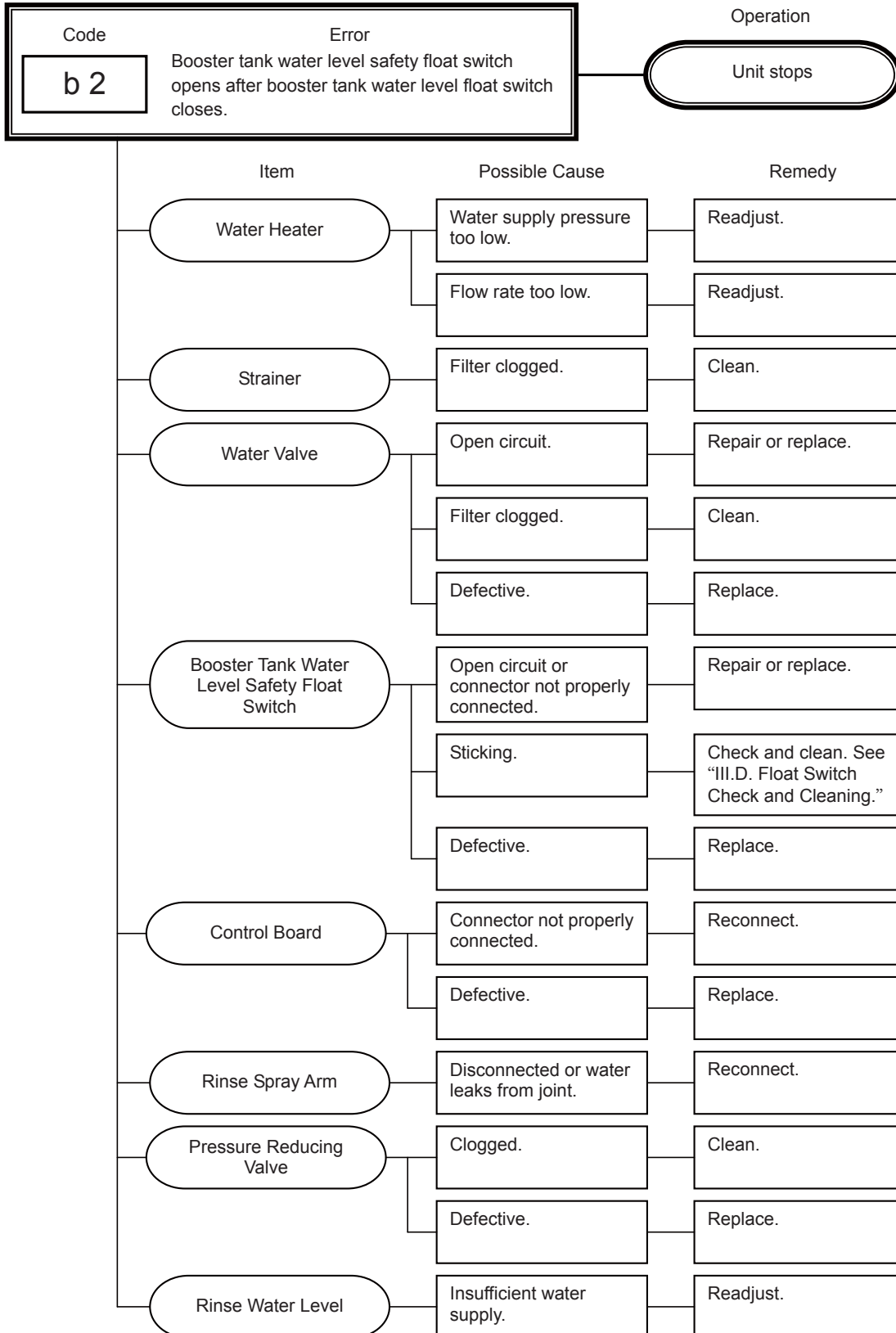
- If the booster tank error input contacts stay open for more than 2 seconds, "b1" appears in the display, and the buzzer sounds.
- If the booster tank error input contacts stay closed for more than 2 seconds, the alarm resets.

Note: The booster tank error input must be connected to indicate this error code.



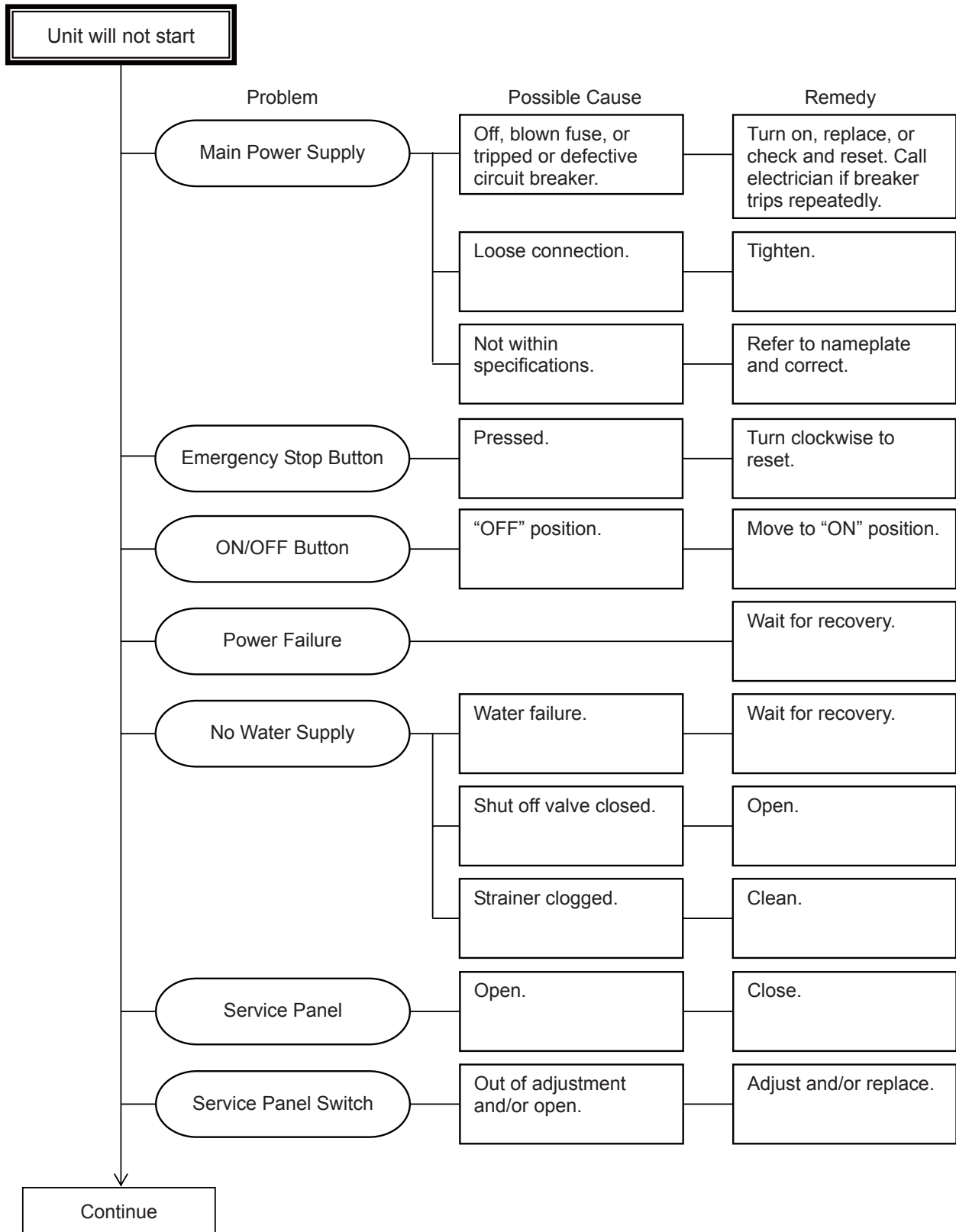
m) Booster Tank Water Level Safety Error (b2)

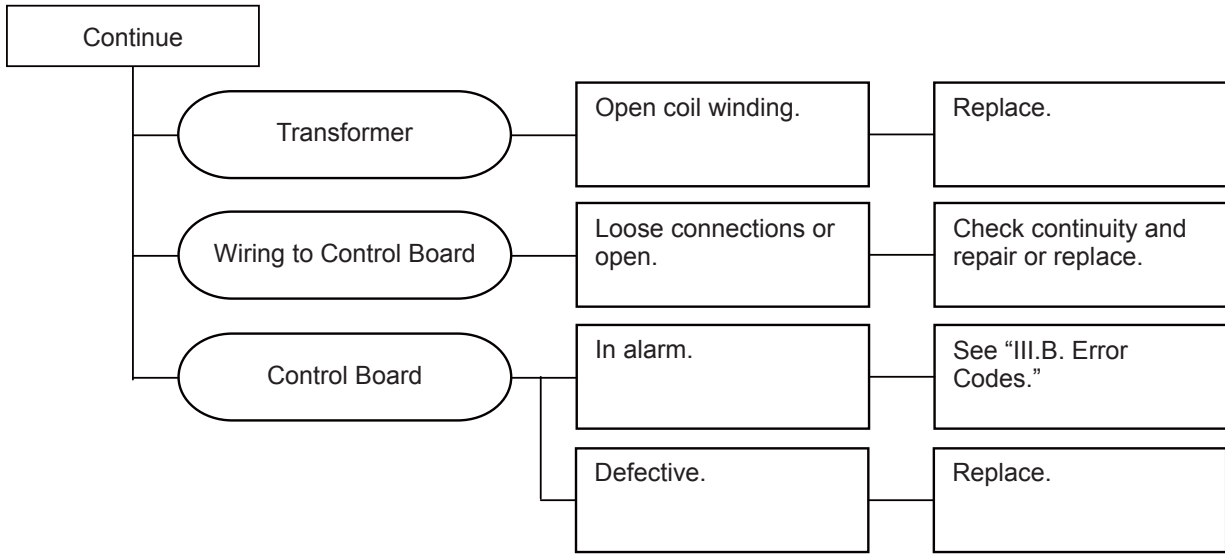
- If the booster tank water level safety float switch opens after the booster tank water level float switch closes, the unit shuts down, "b2" appears in the display, and the buzzer sounds.
- To reset, use the "ON/OFF" button to turn the unit off and then back on.



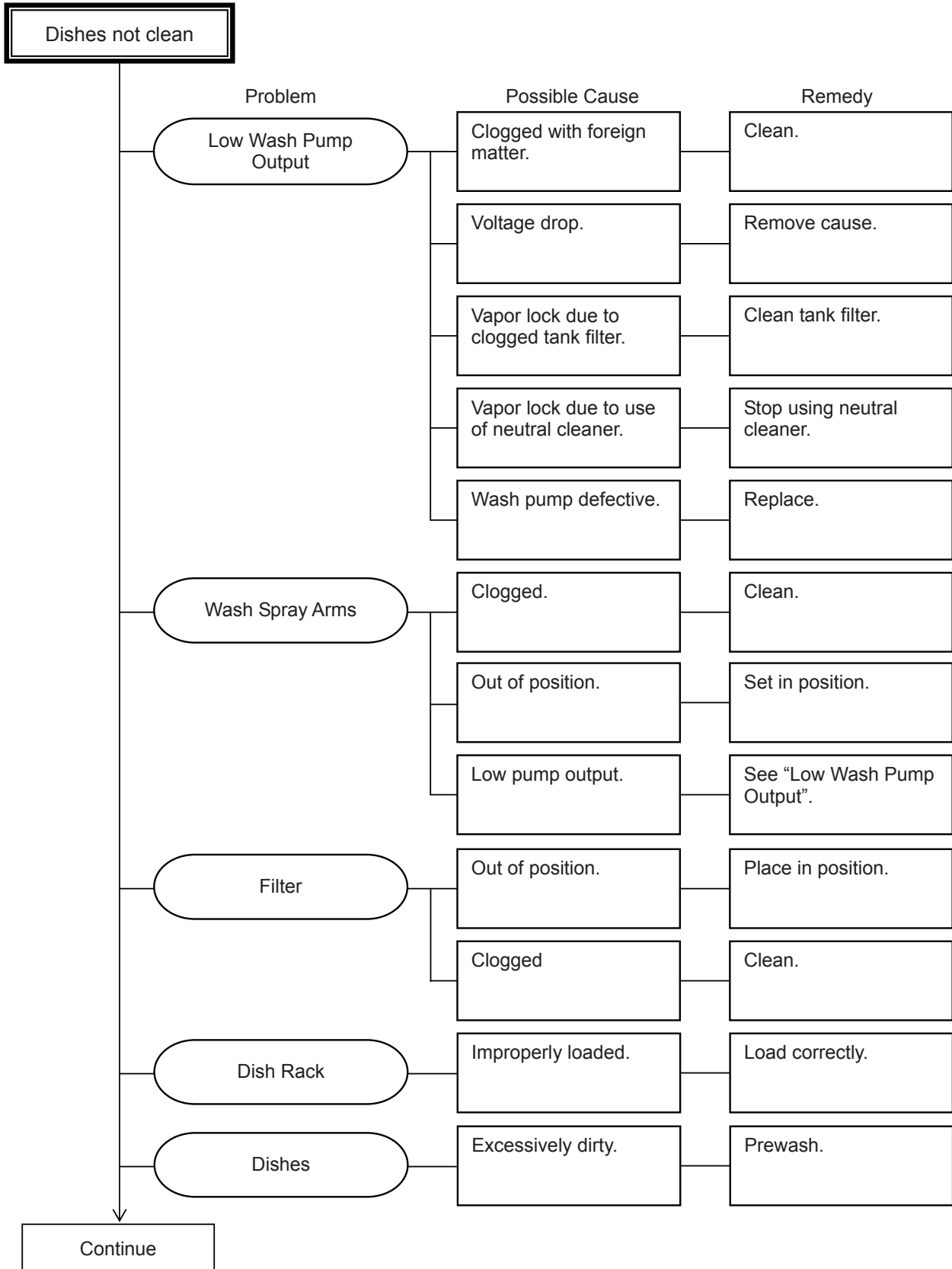
C. Service Flow Charts

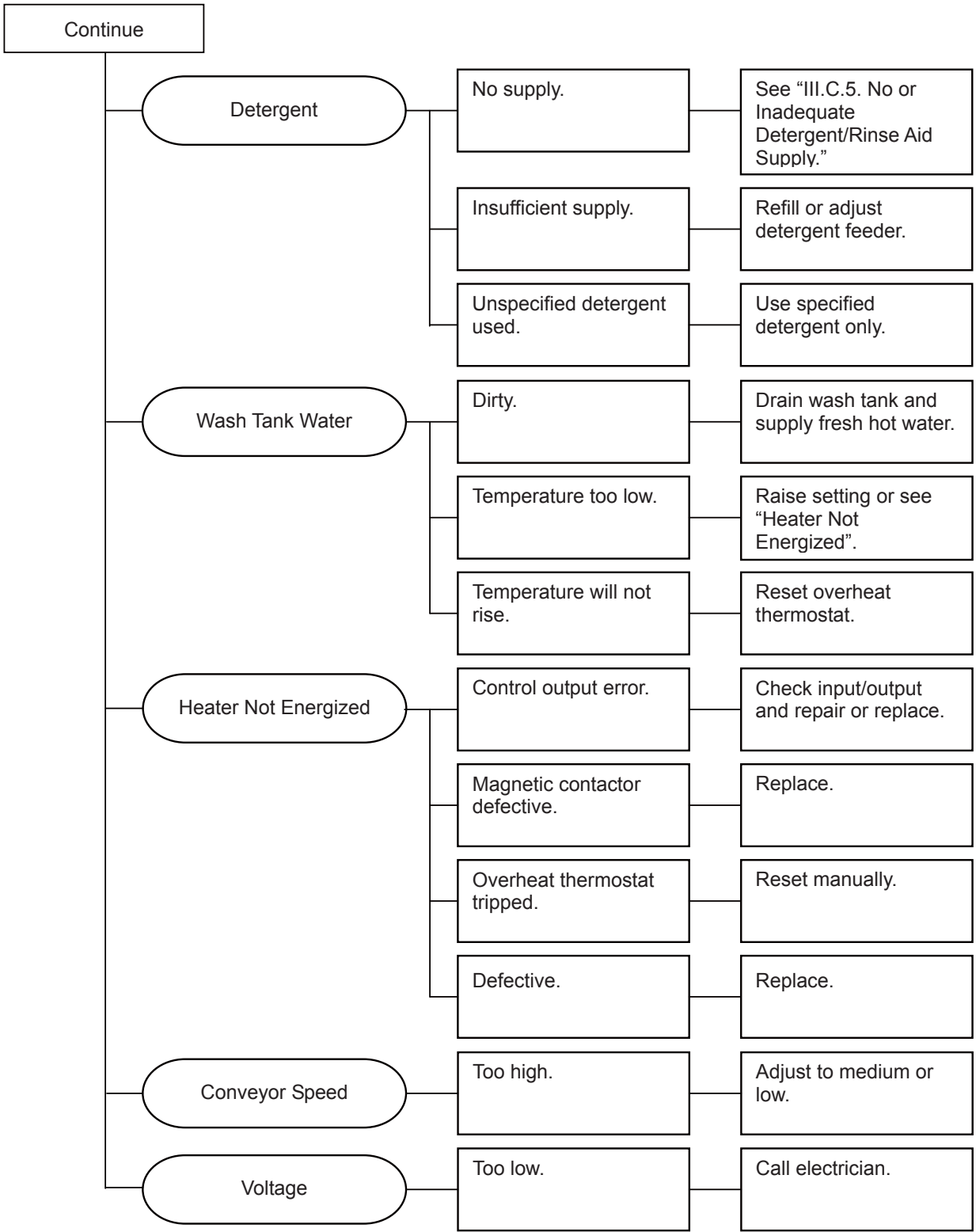
1. Unit Will Not Start



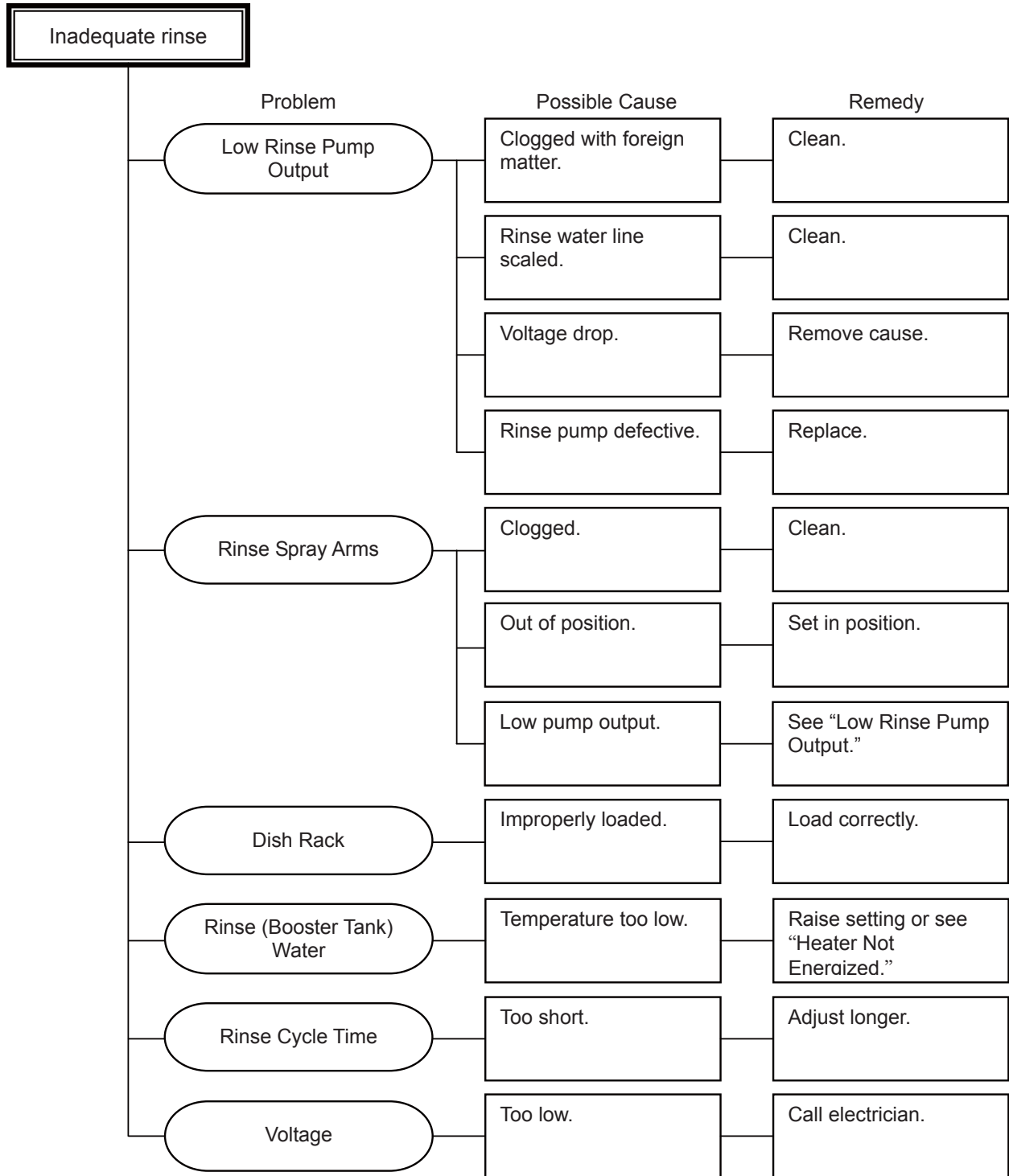


2. Dishes Not Clean

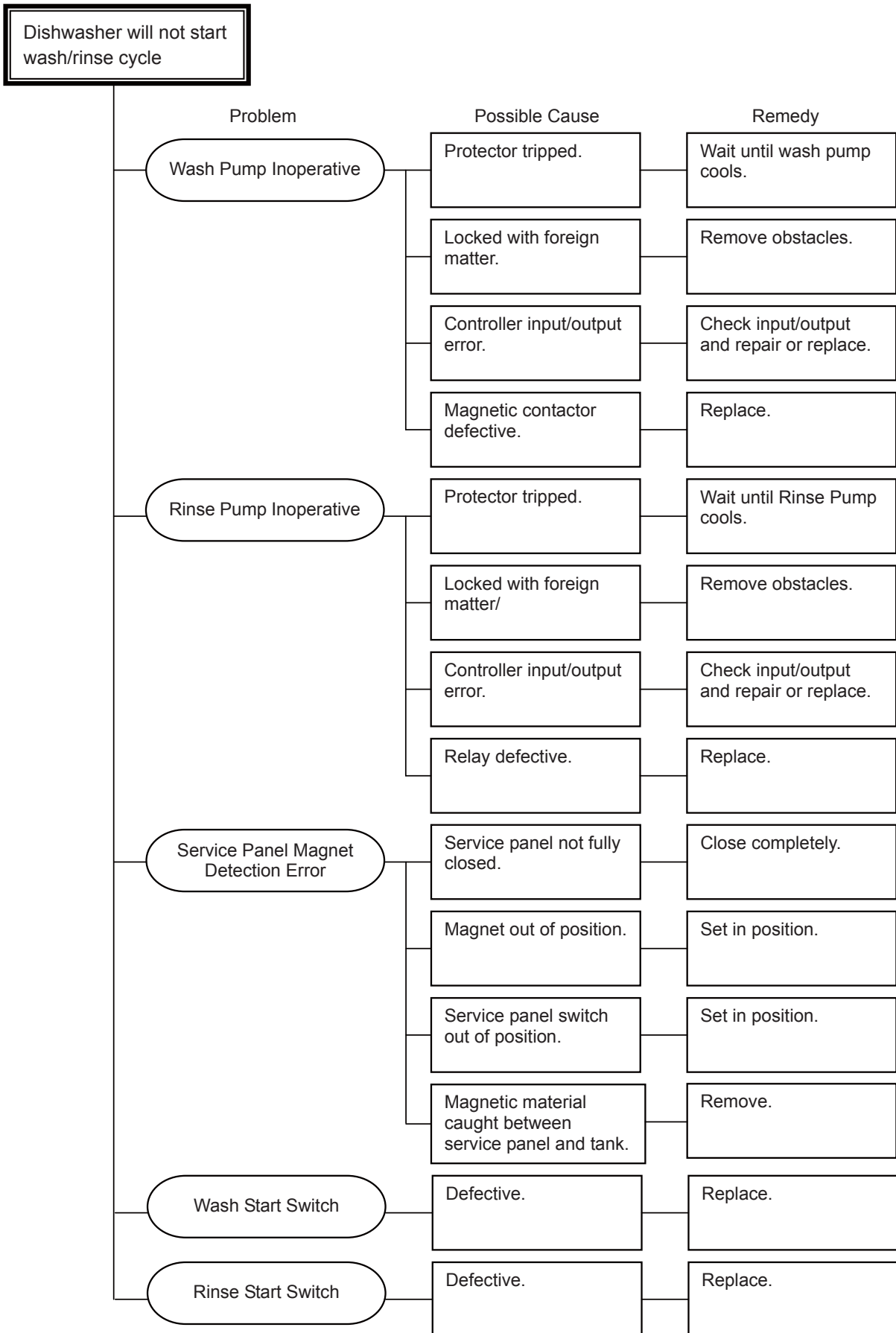




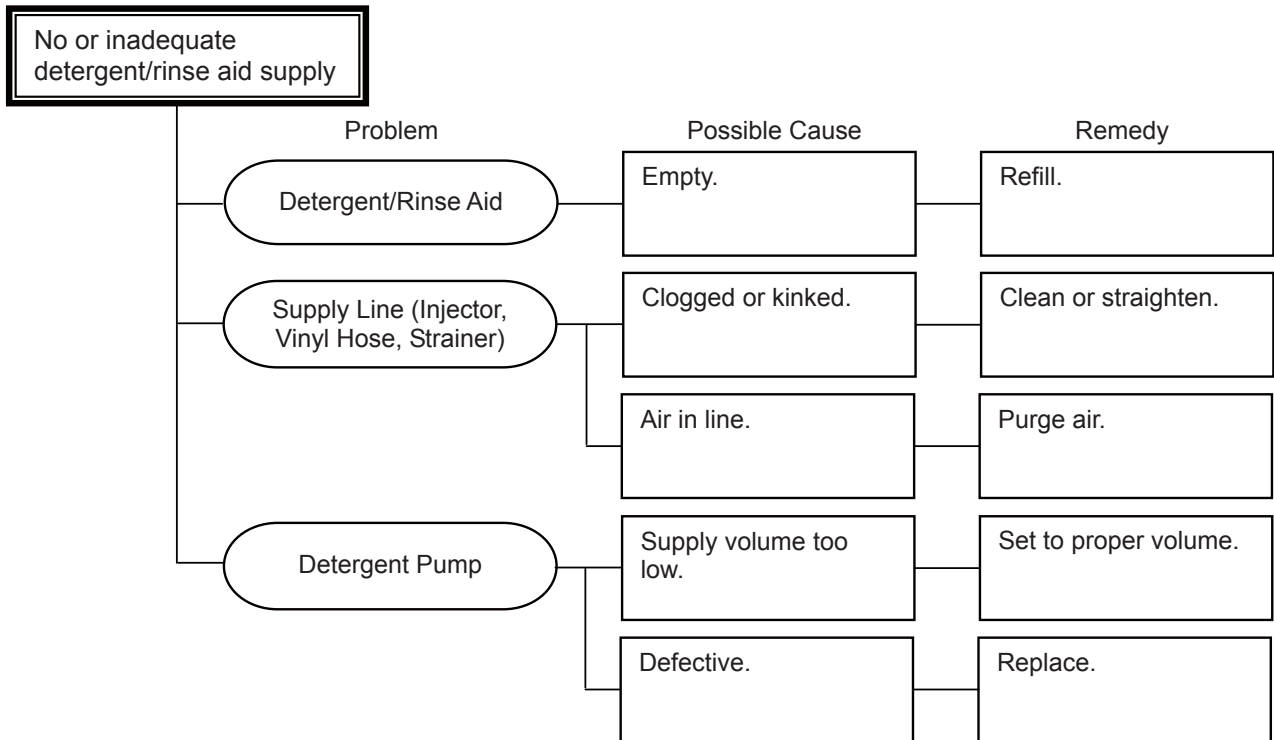
3. Inadequate Rinse



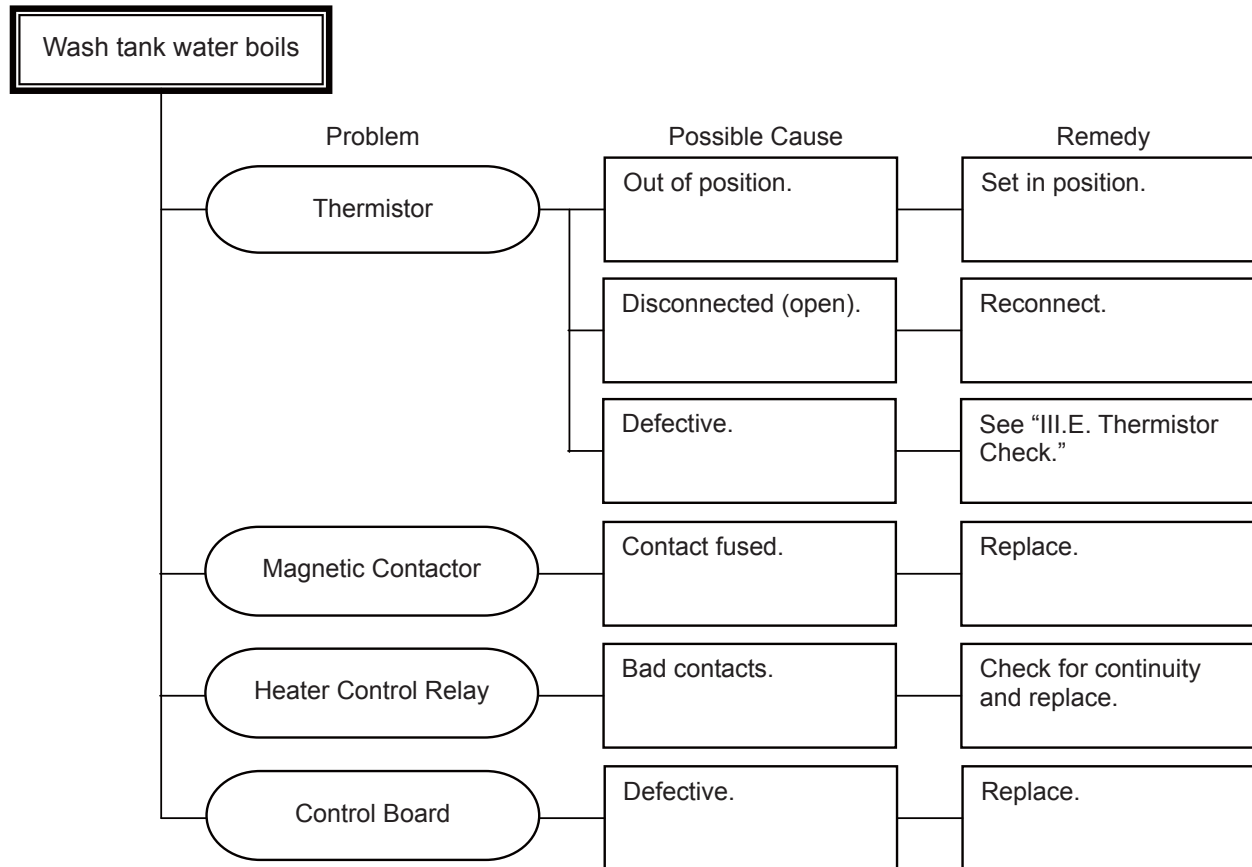
4. Dishwasher Will Not Start Wash/Rinse Cycle



5. No or Inadequate Detergent/Rinse Aid Supply

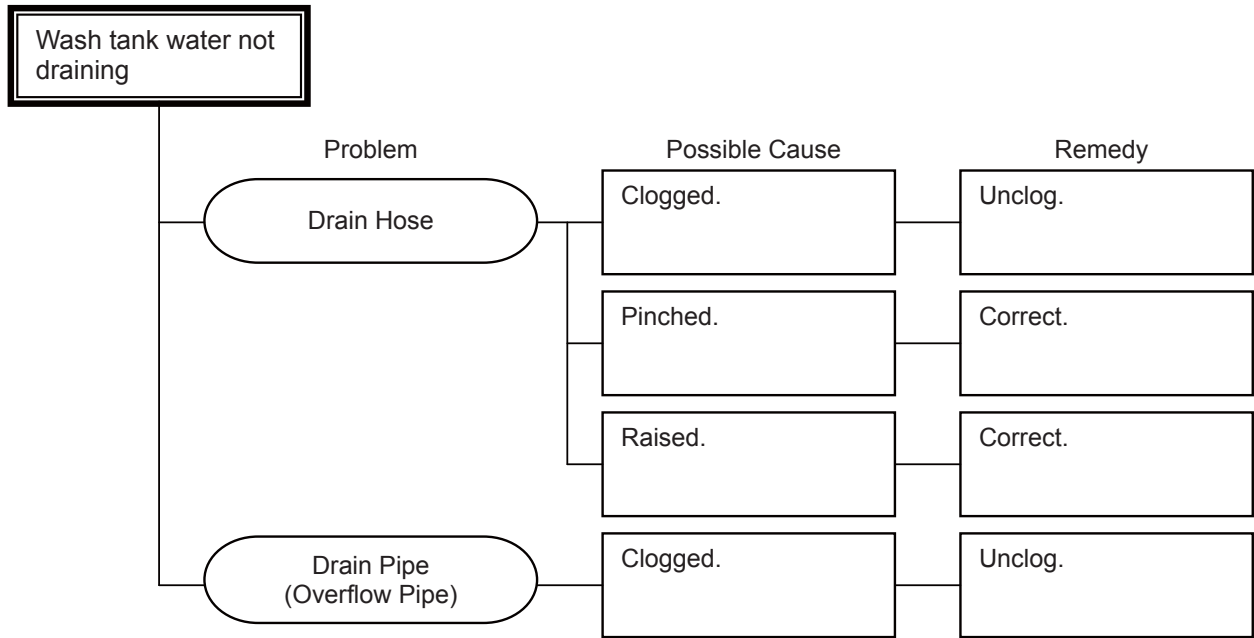


6. Wash Tank Water Boils



Note: See "III.E. Thermistor Check" and "IV.H. Removal and Replacement of Thermistor."

7. Wash Tank Water Not Draining



D. Float Switch Check and Cleaning

(for Booster Tank Water Level Float Switch and Backup Water Level Float Switch)

If an abnormal input signal is found by “III.A. Diagnostic Procedure” or the error code “o1” or “o2” is displayed, check and clean/replace the float switches according to the procedure below.

1. Float Switch Check

To check the float switches, follow the steps below.

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the front panel and top panel of the booster tank.
- 3) Remove the control box cover, and disconnect the CN8 connector from the control board (see “II.F.2. Control Board Layout”).
- 4) To check the booster tank water level float switch, check for continuity across the orange and red wires (#1 and #2) on the CN8 connector. Confirm that the float switch is open when the float is down and closed when the float is up.
- 5) To check the booster tank backup water level float switch, check for continuity across the pink and light blue wires (#3 and #4) on the CN8 connector. Confirm that the float switch is open when the float is down and closed when the float is up.
- 6) If any problem is found, repair or replace the float switch.
- 7) If the float switch is scaled up or dirty, clean it according to “2. Float Switch Cleaning.”

2. Float Switch Cleaning

Depending on local water conditions, scale may build up on the float switches. Scale on the switches can cause the floats to stick. In this case, the float switches should be cleaned.

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the front panel and top panel of the booster tank.
- 3) Use a soft brush to remove scale or soil on the float switches, or wipe down the float switches with a mixture of 1 part of Hoshizaki “Scale Away” and 25 parts of warm water.
- 4) Rinse the parts thoroughly with clean water.
- 5) If the float switch is removed, replace it in its correct position. Be careful not to confuse the positions and directions of the booster tank water level float switch and the booster tank backup water level float switch. Make sure the floats can move freely in the vertical directions (see “II.A.2. Booster Tank”).
- 6) Replace the booster tank panels.

E. Thermistor Check

If the error code “H1” “H2” “H3” or “H4” or an abnormal temperature [above 231°F (111° C) or below -6°F (-21°C)] appears in the display, or the wash tank water boils, check the thermistor(s) according to the procedure below. If replacement is required, see “IV.H. Removal and Replacement of Thermistor.”

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the front panel, then pull out the control box.
- 3) Remove the control box cover, then disconnect the CN7 connector from the control board (see “II.F.2. Control Board Layout”).
- 4) To check the wash tank thermistor, check the resistance across the white wires (#1 and #2). To check the booster tank thermistor, check the resistance across the pink wires (#3 and #4). See the table below for proper resistance and temperature relations.

Temperature [°F (°C)]	Resistance [kΩ]
194 (90)	4.30 to 4.62
176 (80)	5.87 to 6.38
158 (70)	8.13 to 8.96
140 (60)	11.5 to 12.8
104 (40)	24.3 to 28.0
68 (20)	56.3 to 67.1
32 (0)	145.6 to 180.6

- 5) If any problem is found, replace the thermistor according to “IV.H. Removal and Replacement of Thermistor.”

IV. Removal and Replacement of Components

WARNING

1. This unit should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
2. Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
3. When draining the booster tank, wait until the water temperature falls below 104°F (40°C) to avoid possible burns.
4. To avoid possible burns and spills, be sure to drain the wash tank and booster tank and let the components cool before servicing.
5. When disassembling components that have been in contact with detergent, wear rubber gloves and goggles. Before starting disassembly, thoroughly read the detergent safety instructions. Contact with skin may cause irritation and contact with eyes may cause blindness.
6. When reassembling components, be sure to use new O-rings and gaskets.

A. Removal of Panels

- 1) The front panel and side panels (L) and (R) are inserted inside the tank rim at the top and secured with 2 screws at the bottom. Unscrew and pull down to remove.
Note: The side panel at the booster tank side is not removable.
- 2) To replace, reverse the above procedure.

B. Removal and Replacement of Wash Pump Motors

To remove:

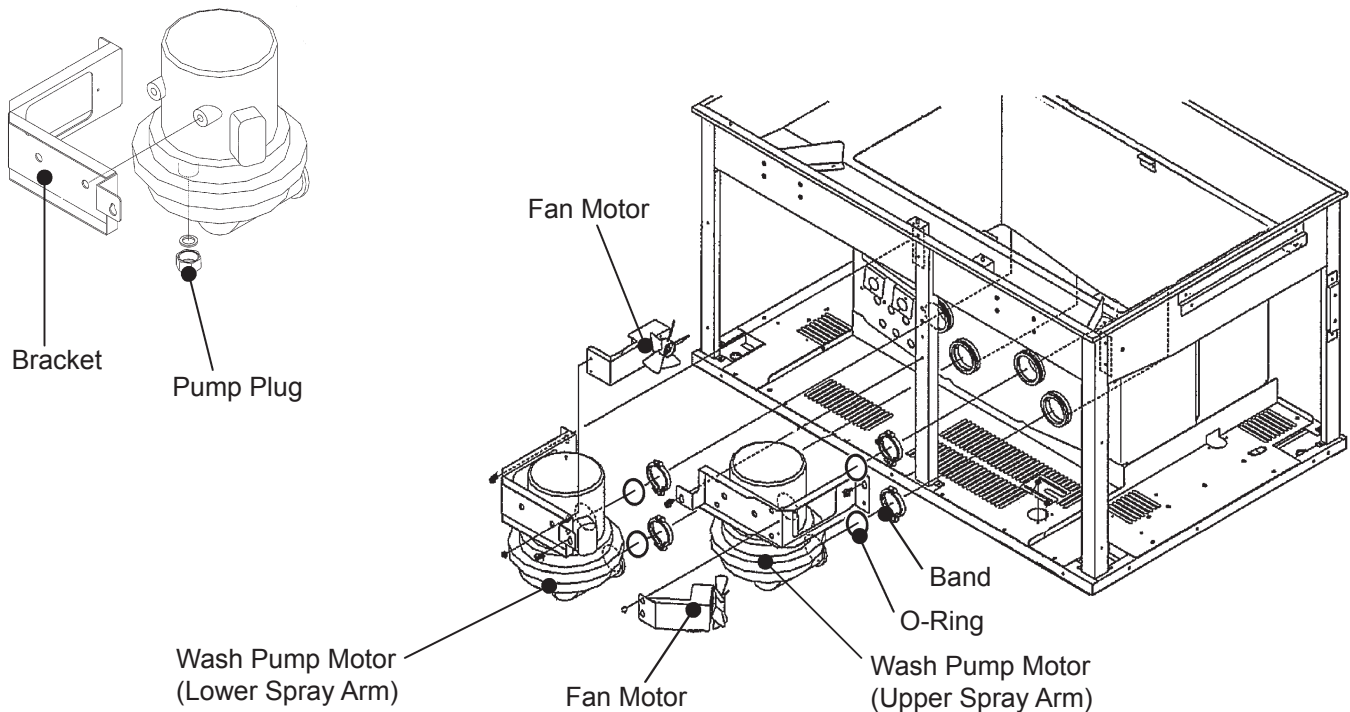
- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Drain the wash tank.
- 3) Remove the front panel.
- 4) Remove the fan motors.
- 5) Disconnect the wash pump motor wiring at the closed end connectors.
- 6) Remove the bands, and disconnect the wash pump motors from the tank discharge outlets and suction inlets.
- 7) Loosen the wash pump motor bracket mounting screws to remove the wash pump motors together with the brackets.
- 8) Remove the pump plugs and the brackets from the wash pump motors.

To replace:

Note: Be sure to use new O-rings and gaskets.

- 1) Attach the brackets and the pump plugs to the wash pump motors.
- 2) Fit the O-rings to the wash pump motor discharge outlets and suction inlets.
- 3) Hook the brackets on the mounting screws left on the unit.

- 4) Make sure the O-rings are in place, and attach the wash pump motors to the tank discharge outlets and suction inlets. Secure the connections with the bands.
- 5) Tighten the bracket mounting screws.
- 6) Fill the tank with water, then check for water leaks from the joints. If there is a water leak, check the connections, and retighten the bands. If there are no water leaks, drain the tank.
- 7) Connect the wiring. When finished, cover the connections with the original plastic sheet cover and secure with a nylon tie. Make sure the connections are situated so that water and condensation cannot reach the connections.
 Note: Be careful not to mix up the wire colors. Miswiring will cause reversal of the pump motor, resulting in improper operation.
- 8) Replace the front panel.
- 9) Make a trial run, and check for water leaks.



C. Removal and Replacement of Rinse Pump Motor

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the front panel.
- 3) Use the booster tank drain hose to drain the booster tank. **WARNING! To avoid possible burns, allow the rinse water temperature to fall below 104°F (40°C) before draining.**
- 4) The rinse pump motor is located at the rear right side of the machine compartment (JWE-2400CUA-L-25B) or located behind the control box and at the rear left side of the machine compartment (JWE-2400CUA-R-25B).
- 5) Remove the fan motor in front of the rinse pump motor.

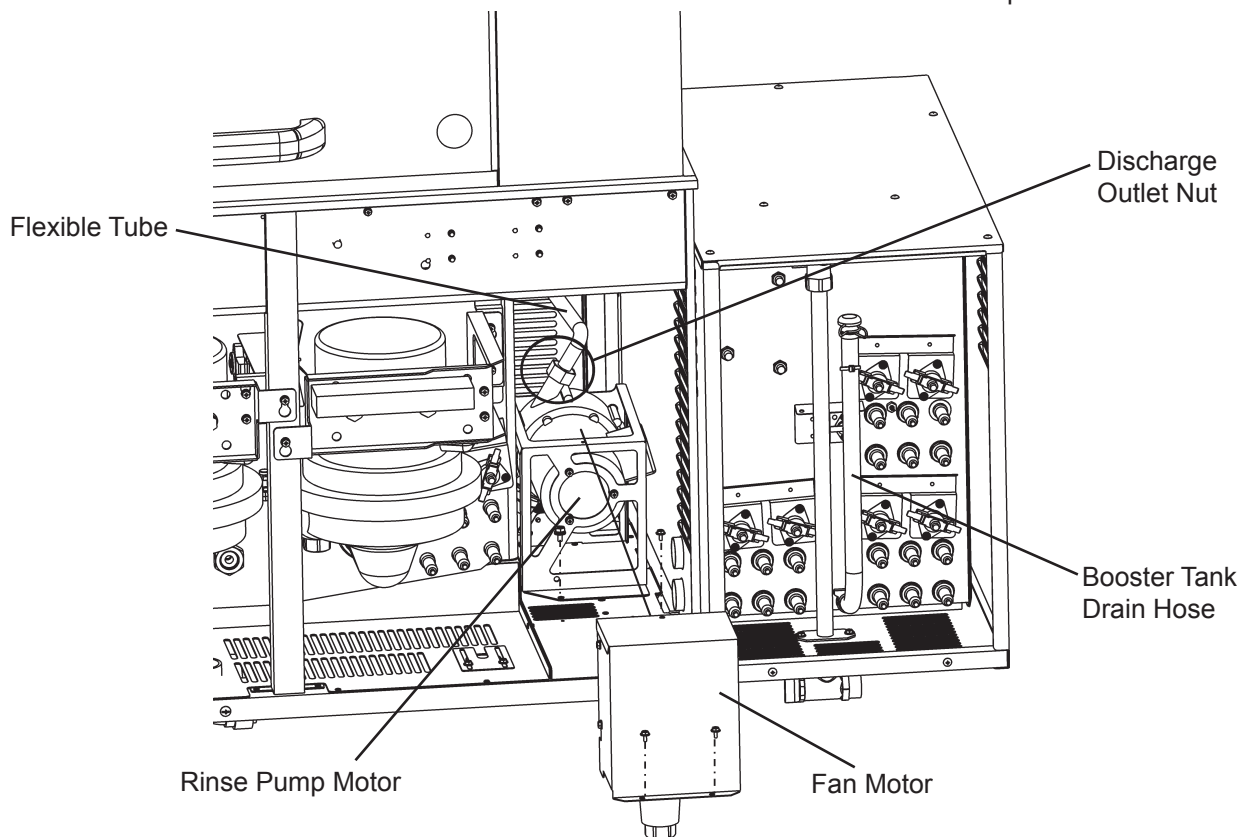
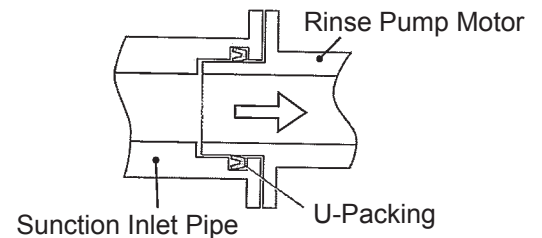
- 6) Disconnect the rinse pump motor wiring at the closed end connectors.
- 7) Remove the nut from the flexible tube at the rinse pump motor discharge outlet and the bolts securing the bracket to the unit base.
- 8) Remove the band from the pipe joint of the booster tank discharge pipe behind the rinse pump motor and the flexible tube at the rinse pump motor suction inlet. Pull the end of flexible tube out of the booster tank discharge pipe.
- Note: Use a hand mirror for easy removal.
- 9) Remove the rinse pump motor together with the bracket. Remove the band from the pipe joint of the rinse pump motor suction inlet pipe and flexible tube to release the flexible tube.
- 10) Unscrew the bracket, and remove the rinse pump motor.
- 11) To replace, reverse the above procedure.

Note:

1. Be careful not to mix up the wire colors. Miswiring will cause reversal of the pump motor, resulting in improper operation.
 2. Cover the connections with the original plastic sheet cover and secure with a nylon tie. Make sure the connections are situated so that water and condensation cannot reach the connections.
 3. Be sure to use new O-rings and gaskets. Be careful of the direction of the U-packing for the suction inlet pipe.
- 12) Make a trial run, and check for water leaks.

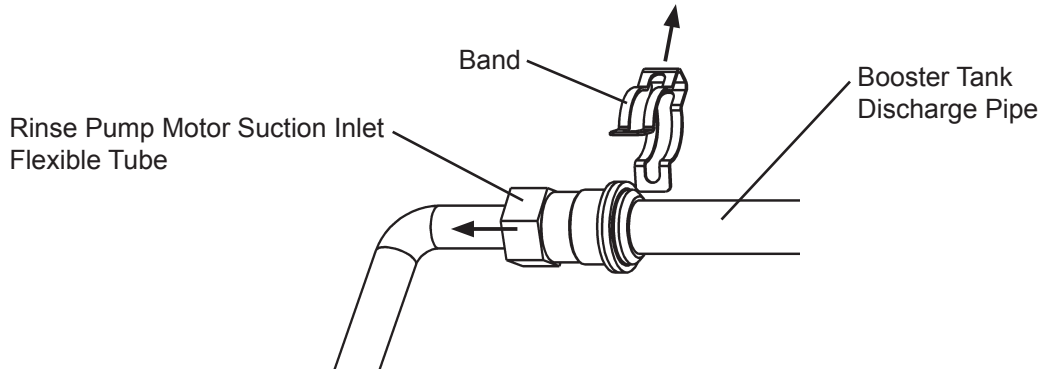
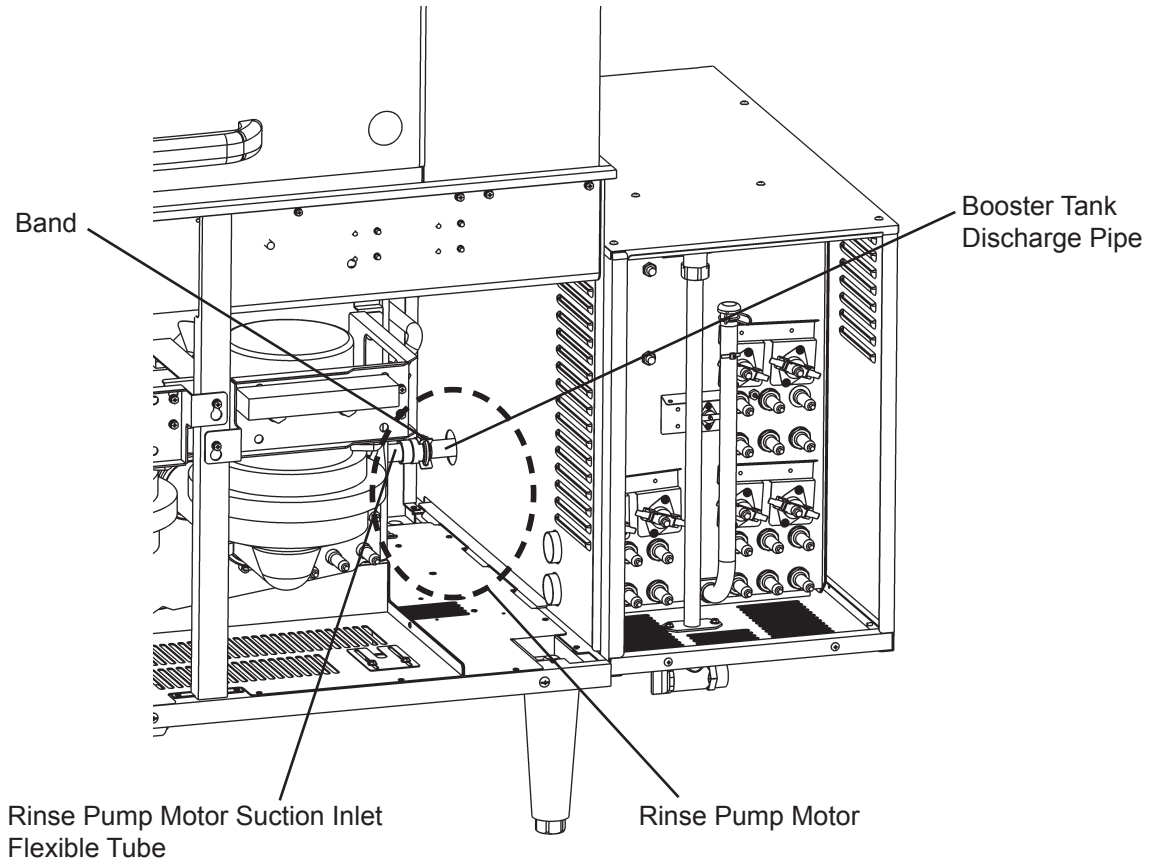
[JWE-2400CUA-L-25B]

* For JWE-2400CUA-R-25B, fan motor and rinse pump motor are located behind control box



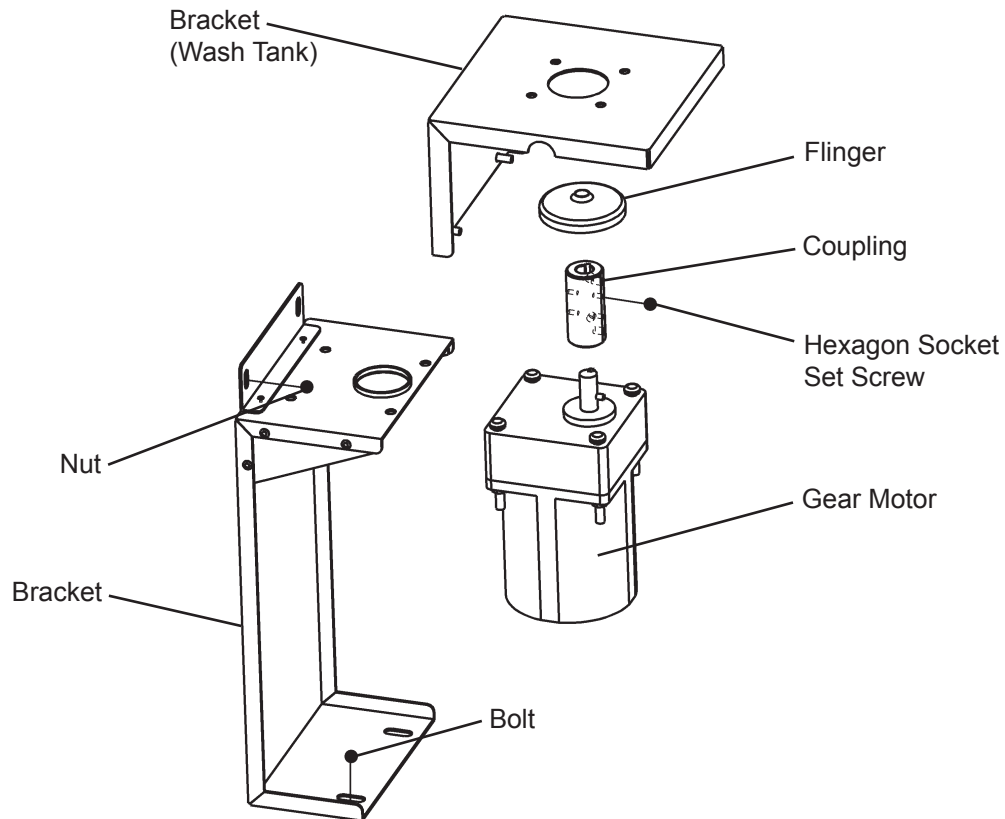
[JWE-2400CUA-L-25B]

* View without rinse pump motor



D. Removal and Replacement of Gear Motor

- 1) Use the "ON/OFF" button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
 - 2) Remove the front panel.
 - 3) The gear motor is located behind the control box and at the rear left side of the machine compartment (JWE-2400CUA-L-25B) or located at the rear right side of the machine compartment (JWE-2400CUA-R-25B).
 - 4) Disconnect the gear motor wiring at the closed end connectors.
 - 5) Remove the bolts securing the bracket to the unit base and the nuts securing the bracket to the wash tank.
 - 6) Loosen the 2 hexagon socket set screws for the coupling.
 - 7) Slide up the coupling, and remove the gear motor together with the bracket.
 - 8) Remove the gear motor from the bracket.
 - 9) To replace, reverse the above procedure.
- Note:
1. Fit the coupling securely on the gear motor shaft.
 2. Apply a thread sealant to the hexagon socket set screws, and tighten them securely.
 3. Align the gear motor shaft with the crankshaft from the wash tank.
 4. Be careful not to mix up the wire colors.
- 10) Make a trial run, and check for water leaks.

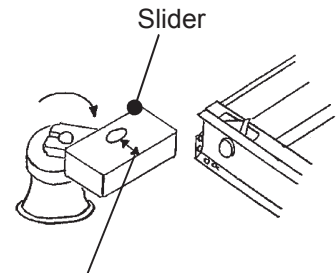


E. Removal and Replacement of Conveyor

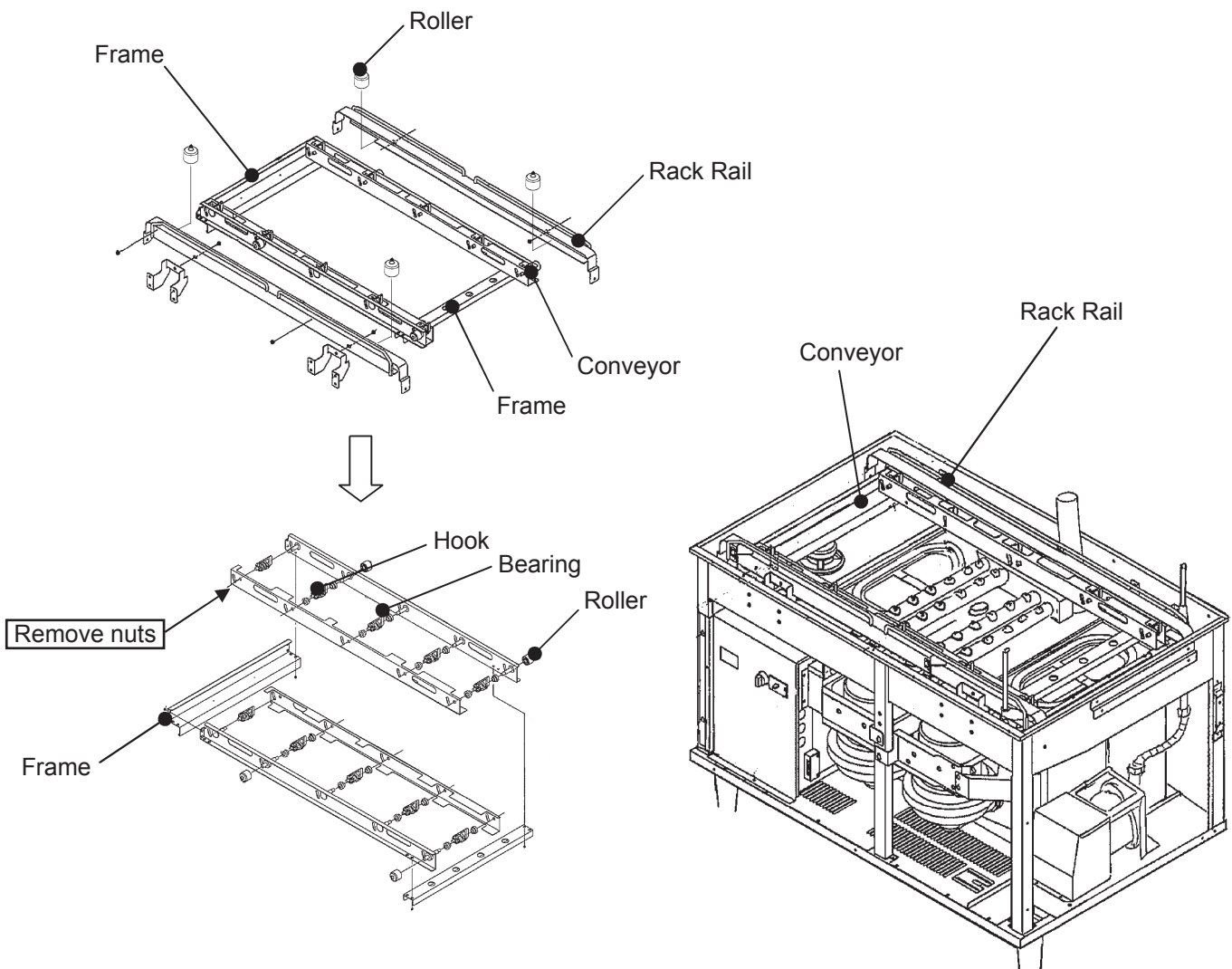
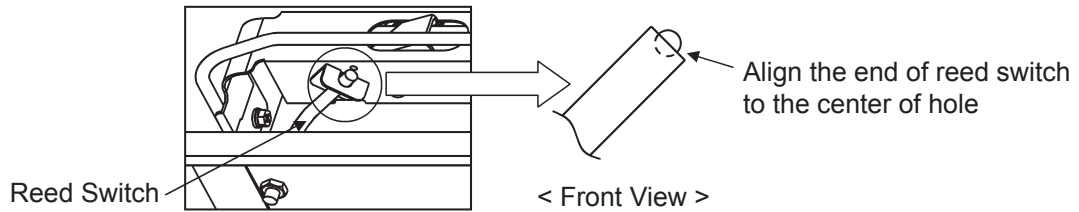
- 1) Remove the 4 bolts (2 at rear, 2 at both sides) securing the rear rack rail.
- 2) Hold the conveyor, and lift off the rear rack rail.
- 3) Take out the conveyor.
- 4) Remove the left and right frames from the conveyor.
- 5) Remove the 5 nuts each of the conveyor rails to release the hooks and the bearings.
- 6) To replace, reverse the above procedure.

Note: Be careful of the slider direction when fitting the conveyor on the crankshaft slider.

- 7) Adjust the reed switch position.
- 8) Make a trial run, and check for water leaks.



- Push out the wider side
- Face the reinforcing rib side down



F. Removal and Replacement of Crankshaft

To remove:

- 1) Remove the front panel.
- 2) Remove the conveyor.
- 3) Loosen the 6 hexagon socket set screws for the stopper and the coupling.
- 4) Lift off the crank together with the shaft.
- 5) Loosen the screw securing the crank to release the crank from the shaft.

Note: Do not disassemble the housing, oil seals and bearing.

To replace:

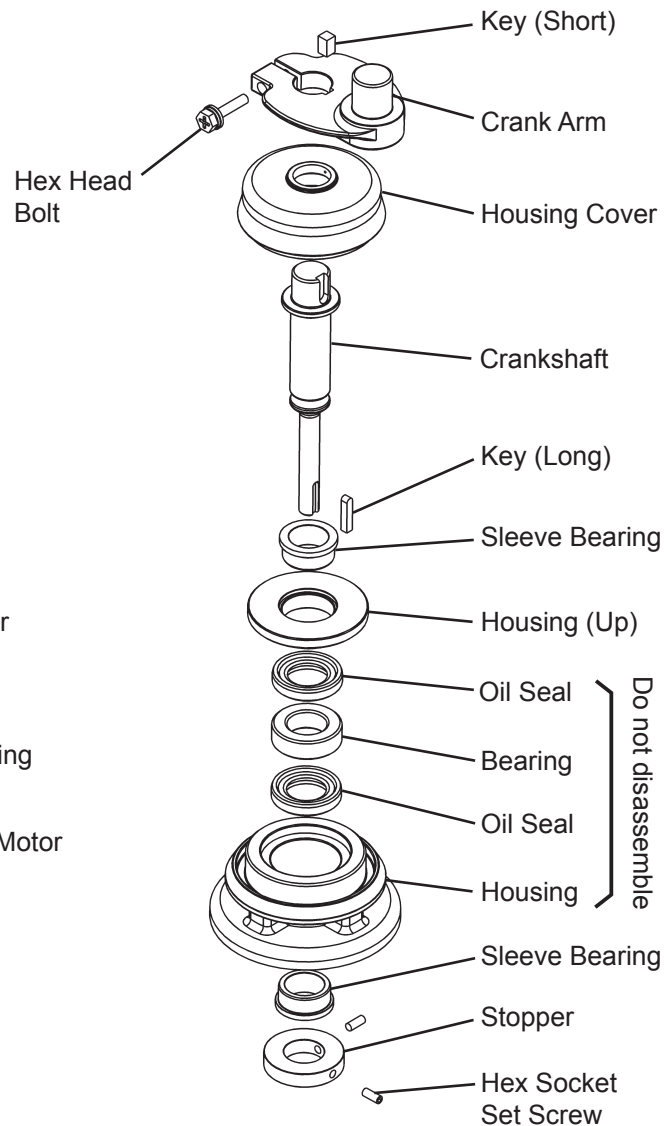
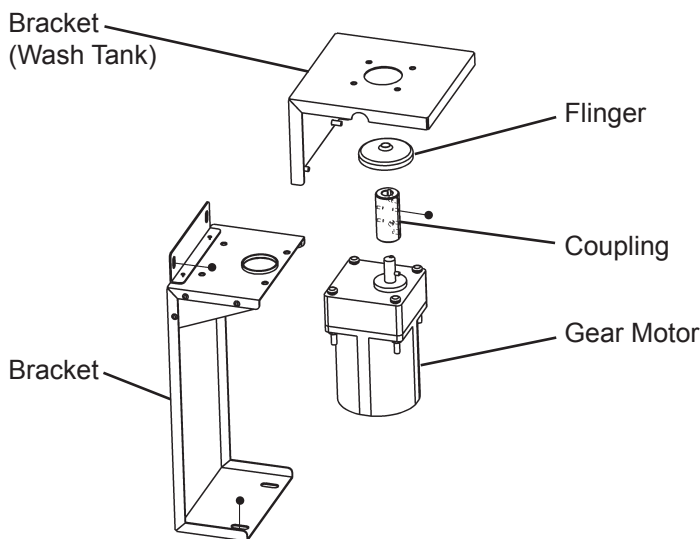
- 1) Fit the housing (up) on the housing, and put the sleeve bearing and the crankshaft into the housing.
- 2) Fit the sleeve bearing, stopper, flinger and coupling from the bottom of the crankshaft. Secure the 2 hexagon socket set screws for the stopper with their ends in the crankshaft groove. Secure the 4 hexagon socket set screws for the coupling to connect the crankshaft and the gear motor.

Note: Apply a thread sealant to the hexagon socket set screws, and tighten them securely.

- 3) Fit the housing cover, crank arm and keys, then secure them with the hexagon head bolt.
- 4) Replace the conveyor.
- 5) Make a trial run, and check for water leaks.

Note:

1. When replacing the bearing and shaft, apply plastics grease to the mating surfaces.
2. Be careful not to damage or pinch the oil seal lips.



G. Removal and Replacement of Control Box

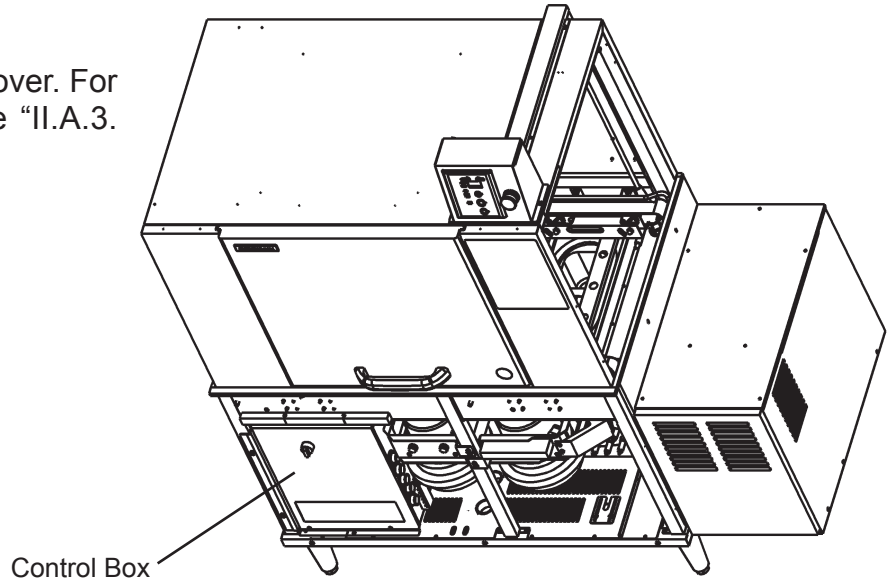
⚠ WARNING

Do not touch the live parts during a trial run or servicing operations.

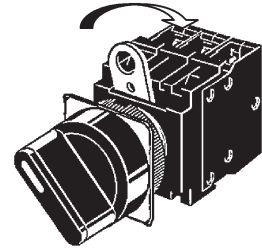
NOTICE

Be careful not to damage the wiring when handling the control box.

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the front panel.
- 3) Slide out the control box.
- 4) Remove the control box cover. For component locations, see “II.A.3. Control Box.”



- 5) To remove the conveyor speed switch, turn the lever behind the volume in the direction of the arrow, remove the switch body, remove the nut behind the volume, and pull out the volume.
- 6) To replace, reverse the above procedure.



H. Removal and Replacement of Thermistor

NOTICE

1. The thermistors are fragile; handle very carefully.
2. Always use the recommended sealant (high thermal conductive type), Model KE4560RTV manufactured by SHINETSU SILICONE, Part Code 60Y000-11, or Part Code 4A0683-01 or equivalent.
3. Do not shorten or cut the thermistor leads.

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.

- 2) Remove the front panel.
- 3) Slide out the control box.
- 4) Remove the plastic bag covering the thermistor connector, then disconnect the thermistor connector. If replacing the wash tank thermistor, disconnect the leads from the wash tank electrode. If replacing the booster tank thermistor, disconnect the closed end connectors for the booster tank water level float switch and the booster tank backup water level float switch.
- 5) Remove the tape or ties securing the thermistor leads, then pull out the thermistor from the wash tank or booster tank straight towards you.
- 6) Clean out all old sealant from inside the thermistor hole.
- 7) Route the wires from the new thermistor connector through the existing black plastic sleeve.
- 8) Apply the recommended sealant (KE4560RTV, Part Code 60Y000-11 or 4A0683-01) to the end of the new thermistor, then insert the thermistor quickly and securely.
- 9) Use tape or ties to secure the thermistor leads in their correct position.
- 10) Reconnect the thermistor connector and the wash tank electrode leads or the booster tank water level float switch and booster tank backup water level float switch leads, then bag and tie them.
- 11) Replace the control box and the front panel in their correct positions.

NOTICE

Be careful not to damage the wiring when handling the control box.

I. Removal and Replacement of Control Board or Operation Board

When replacing a control board or operation board, follow the precautions below.

NOTICE

1. The control board and operation board are fragile; handle very carefully.
2. The control board and operation board contain integrated circuits, which are susceptible to failure due to static discharge. It is especially important to touch the metal part of the unit when handling or replacing the control board or operation board.
3. Do not touch the electronic devices on the control board or operation board or the back of the control board or operation board.
4. Do not change wiring and connections.
5. Always replace the whole control board or operation board assembly if it goes bad.
6. Do not short out power supply to test for voltage.

1. Control Board

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the front panel and the control box cover.

- 3) Disconnect the control board connectors from the control board.
- 4) Slide out the control board.
- 5) Install the new control board.
- 6) To replace, reverse the above procedure.

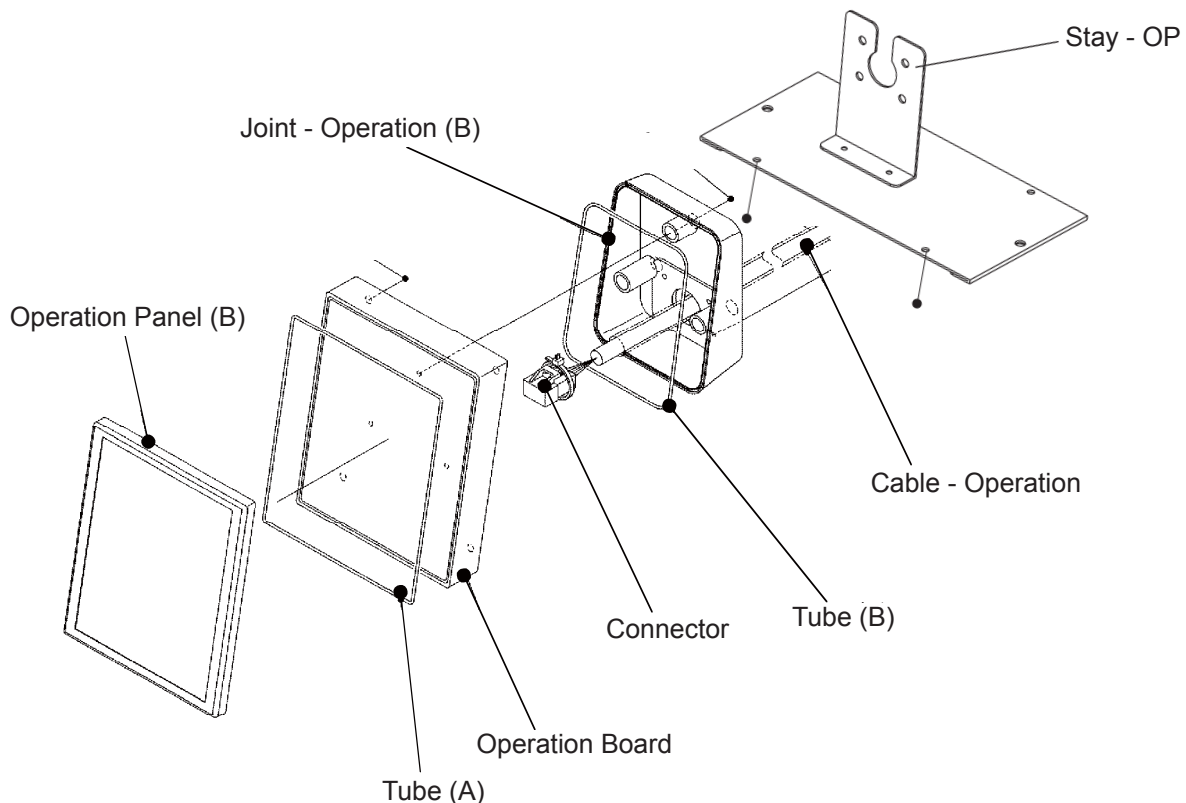
2. Operation Board

- 1) Use the "ON/OFF" button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the screws securing the operation box and the cable cover to the top of the dishwasher.
- 3) Remove the 4 screws from the bottom of the operation box, and remove the cover.
- 4) Remove the screws securing the stay - OP, joint - operation (B), and operation panel (B).
- 5) Disconnect the connector for the operation board cable and the cable - operation.
- 6) Install the new operation board.

Note: Remove the 2.0 mm dia tube (A) from the inside groove of the old board, and attach the tube (A) to the new board.

- 7) To replace, reverse the above procedure.

Note: Make sure the tubes are snug inside the joint - operation (B) and operation panel (B).



J. Removal and Replacement of Heater

When replacing the wash tank heater or the booster tank heater, remove the nuts using a 7/8" crowfoot wrench.

When replacing the booster tank heater, move the clean dishtable above the booster tank before following the procedure below.

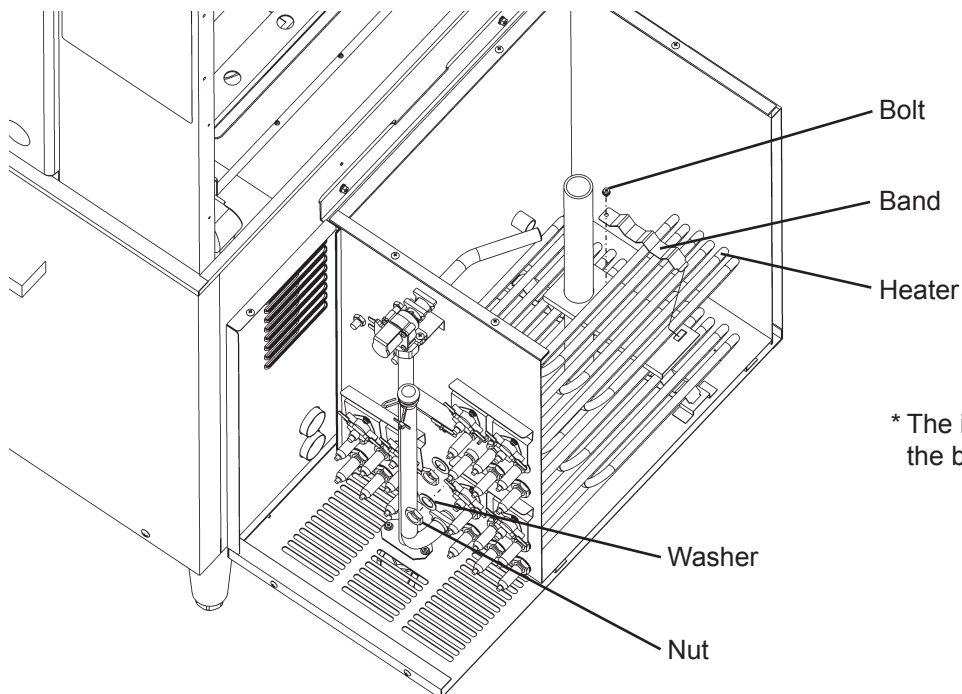
- 1) Use the "ON/OFF" button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the front panel of the dishwasher (wash tank heater).
Remove the front panel of the booster tank (booster tank heater).
- 3) Use the overflow pipe to drain the wash water tank (wash tank heater).
Use the booster tank drain hose to drain the booster tank (booster tank heater).

WARNING! To avoid possible burns, allow the rinse water temperature to fall below 104°F (40°C) before draining.

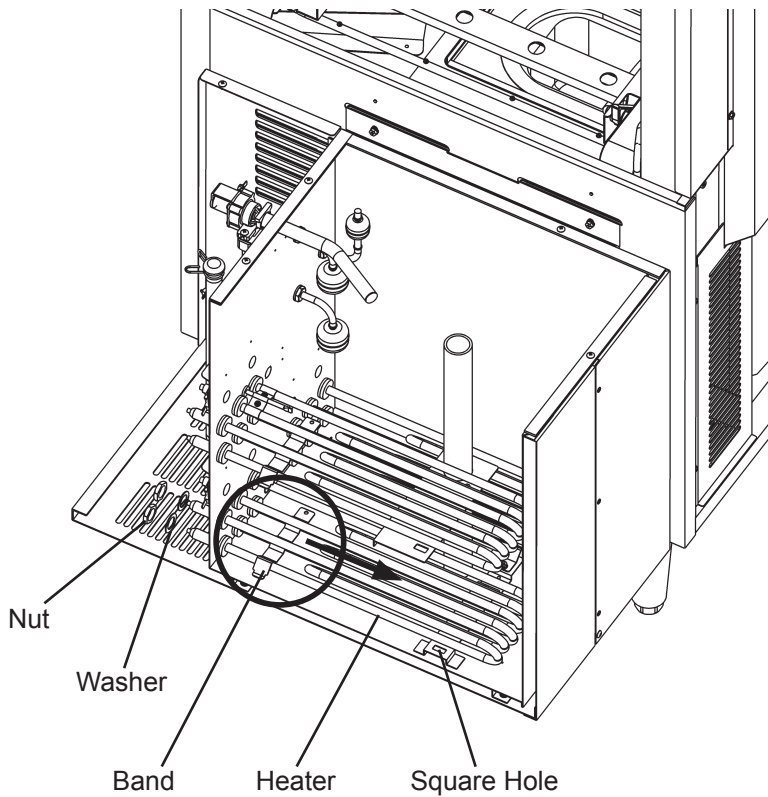
- 4) Remove the tank filters and the separator (wash tank heater).
Remove the top panel of the booster tank (booster tank heater).
- 5) Disconnect the heater wiring at the closed end connectors.
- 6) Use a 7/8" crowfoot wrench to remove the nuts from the heater.
- 7) Remove the band from the heater inside the tank.
- 8) Remove the heater.
- 9) To replace, reverse the above procedure.

Note:

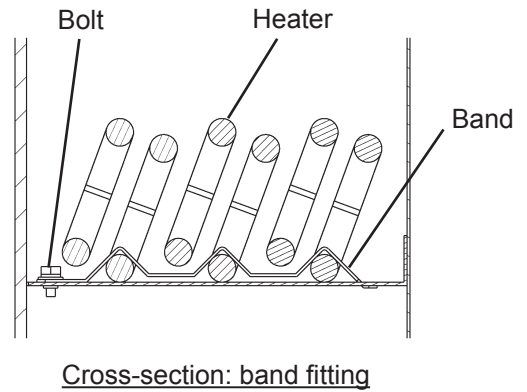
1. When rewiring the heater, refer to the wiring diagram to prevent miswiring.
2. The tightening torque for the nuts securing the heater must be no more and no less than 23 lbf•in.
3. To fit the band on the heater inside the tank, first slide the band from the front straight part to the back of the heater, hook one end in the square hole, and secure the other end with the bolt.



* The illustration shows the booster tank heater



* The illustration shows the booster tank heater



K. Removal and Replacement of Float Switch

When replacing the float switch, move the clean dishtable above the booster tank before following the procedure below.

- 1) Use the “ON/OFF” button on the operation panel to turn off the unit, then turn off the dishwasher and booster tank power supplies. Lockout/Tagout to prevent the power supplies from being turned back on inadvertently.
- 2) Remove the front panel of the booster tank.
- 3) Use the booster tank drain hose to drain the booster tank. **WARNING! To avoid possible burns, allow the rinse water temperature to fall below 104°F (40°C) before draining.**
- 4) Remove the top panel of the booster tank.
- 5) Disconnect the heater wiring at the closed end connectors.
- 6) Remove the nuts from the float switch.
- 7) To replace, reverse the above procedure.

Note:

1. Keep the float switch straight in the proper direction to prevent contact with the tank walls and other parts.
2. The tightening torque for the nuts securing the float switch must be no more and no less than 14 lbf•in.

L. Removal and Replacement of Thermostat

NOTICE

Always use the recommended sealant (high thermal conductive type), Model KE4560RTV manufactured by SHINETSU SILICONE, Part Code 60Y000-11, or Part Code 4A0683-01 or equivalent.

When replacing the thermostat in the wash water tank or the booster tank, remove the thermostat, clear any remaining sealant from the tank walls, apply a proper amount of the above recommended sealant to the new thermostat bulb, then install the new thermostat in its correct position.

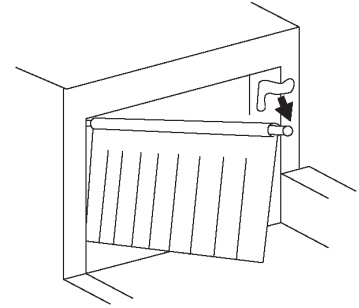
V. Cleaning and Maintenance Instructions

A. Daily Maintenance

IMPORTANT

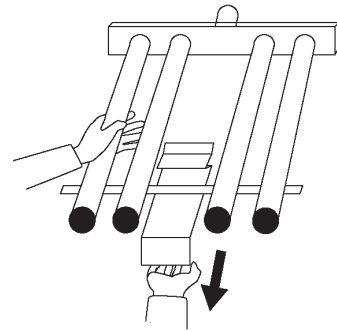
Be sure to clean the dishwasher after closing time every day. It is difficult to remove heavy soils left overnight. In high temperature conditions, food scraps will rot and affect sanitary operation.

1) Remove the three curtains at the entrance, center, and exit of the wash compartment.

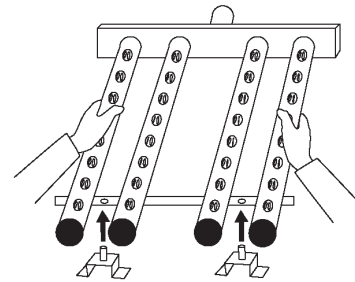


2) Open the service panel.

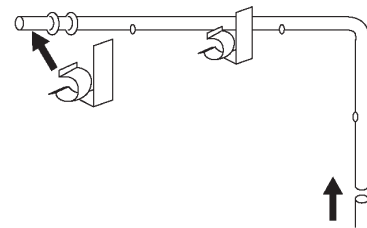
3) To remove the upper wash spray arm, hold it securely with one hand, then pull the front lever towards you with the other hand.



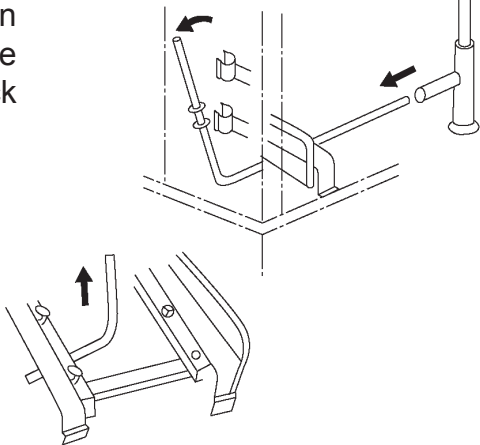
4) To remove the lower wash spray arm, hold both sides, slightly lift the front off the pins, pull the arm towards you, then lift off the back.



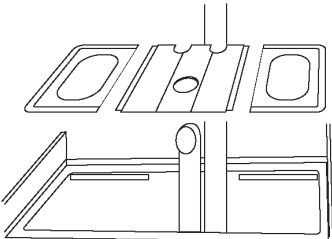
5) To remove the upper rinse spray arm, turn the top away from you to unhook, then lift off the end of the pipe.



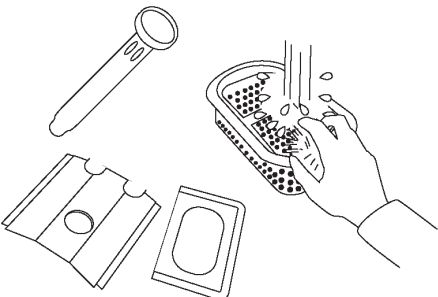
6) To remove the lower rinse spray arm, push down the rising part to unhook, pull off the end of the pipe towards you, then take it out from between the rack rails.



7) Remove the separators.



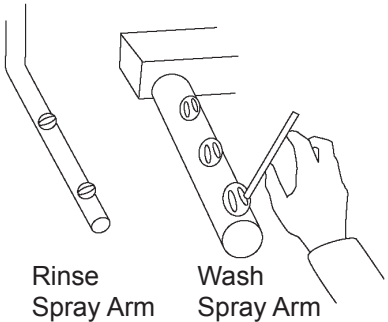
8) Take out scraps from the removed tank filters, drain pipe and separators, and wash them clean with a scouring pad.



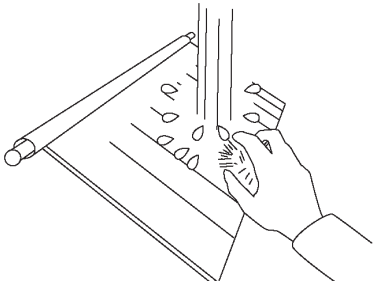
IMPORTANT

To prevent damage, do not hit the filters on the sink to drop scraps or to drain the filters.

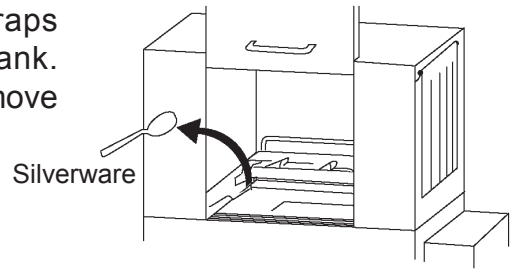
9) If the wash spray arm and rinse spray arm nozzles are clogged, use a wire or brush to unclog and wash them clean.



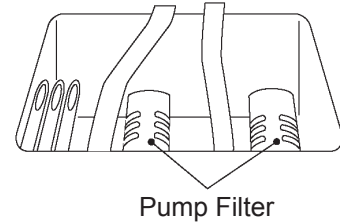
10) Wash the curtains.



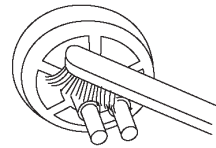
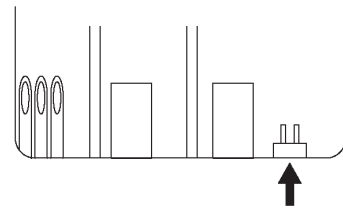
- 11) Clean the wash compartment. Remove any scraps from inside the wash compartment and wash tank. Use a scouring pad to wash off heavy soils. Remove any silverware left inside the wash compartment.



- 12) Check the pump filters inside the wash tank. If they are clogged, clean them with a scouring pad.



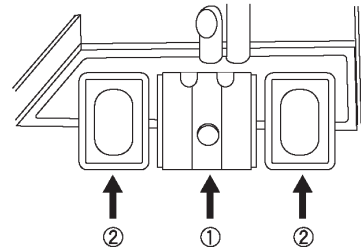
- 13) Check the water level sensor. If it is dirty, clean it with a soft brush.



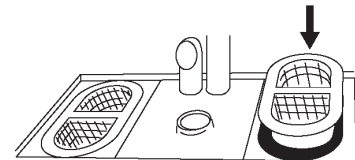
IMPORTANT

Do not use a metal brush to clean the water level sensor. The surfaces may be damaged, or metal particles attached to the sensor may cause malfunction.

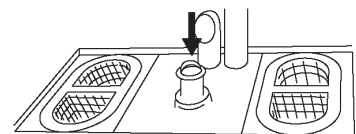
- 14) Replace the separators in their correct positions.



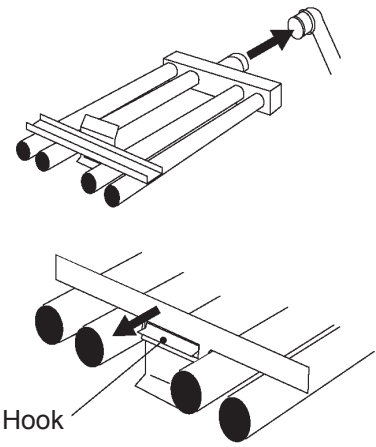
- 15) Install the left and right tank filters.



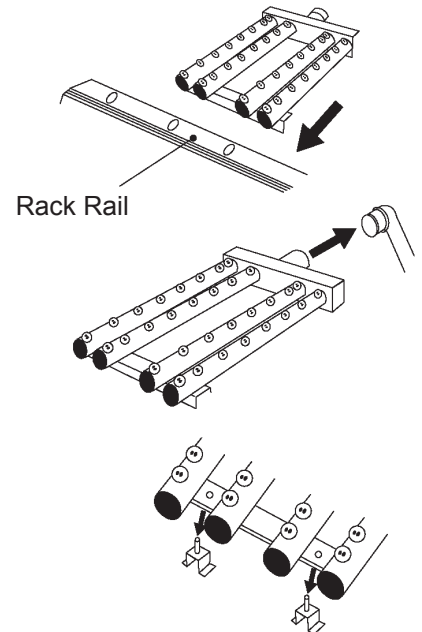
- 16) Insert the drain pipe.



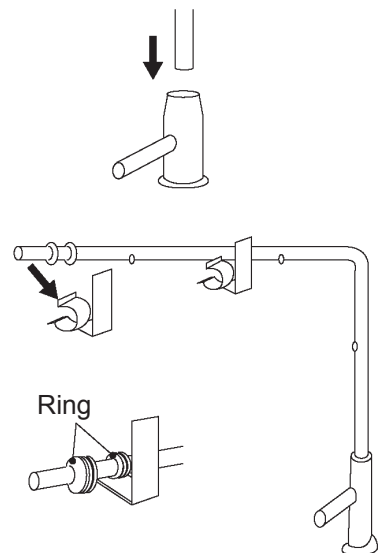
17) To replace the upper wash spray arm, hold it with the nozzles facing down, and insert the joint into the pipe located at the back of the wash compartment. Lift up the front, then securely hook in the square hole.



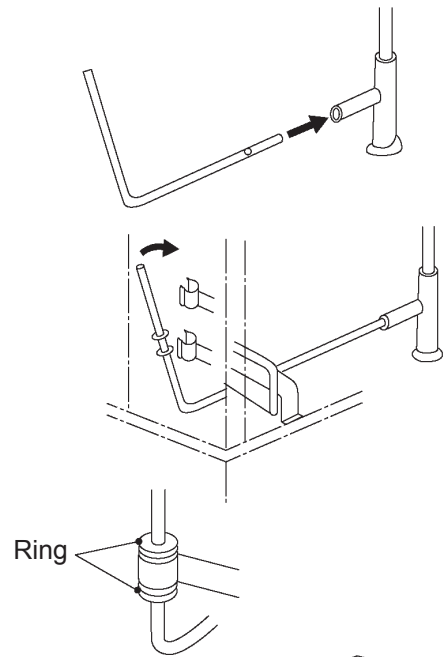
18) To replace the lower wash spray arm, hold both sides with the nozzles facing up, and put it under the rack rails from the front. Insert the joint into the pipe located at the back of the wash compartment. Fit the holes on the pins at the front of the wash tank.



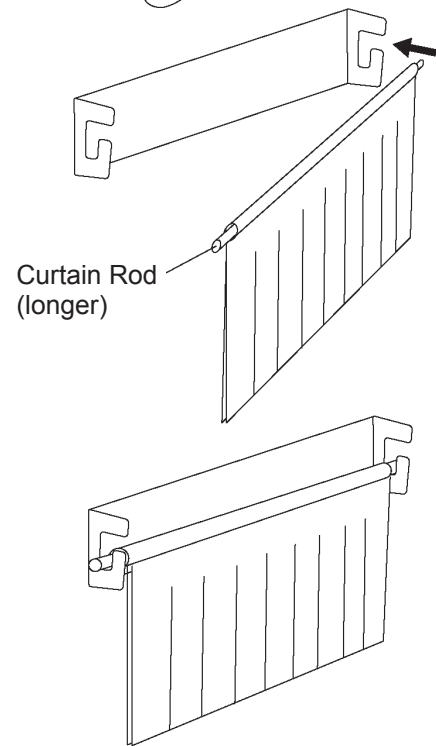
19) To replace the upper rinse spray arm, insert the end of the pipe into the joint, then turn and hook the top.



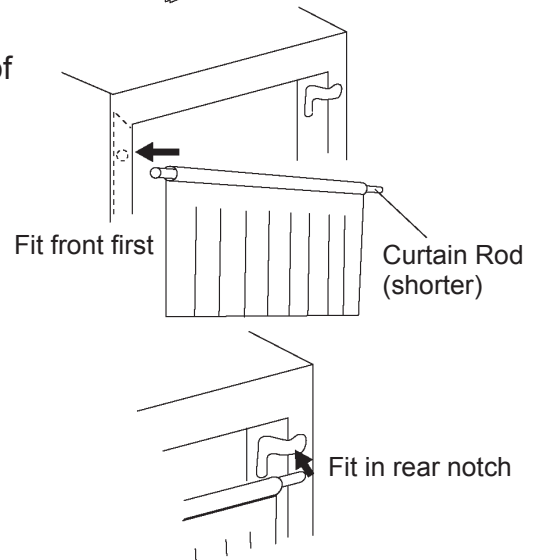
20) To replace the lower rinse spray arm, put it between the rack rails, insert the end of the pipe into the joint, then turn and hook the front.



21) Install the curtain (L) in the wash compartment.



22) Install the curtains (S) at the entrance and exit of the wash compartment.



23) Close the service panel.

⚠ WARNING

To prevent entrance of dust or insects and injuries by a sudden drop, do not leave the service panel open.

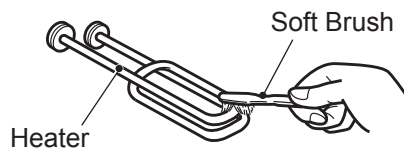
B. Weekly Maintenance

1. Heater

⚠ WARNING

To prevent burns, wait for 10 minutes after draining the unit to clean the interior.

Remove any scraps from the heater, and use a soft brush to wash off residue.



Do not use a metal brush which may damage the surface.

2. Exterior

- 1) Wipe the exterior with a soft cloth.
- 2) Use a damp cloth containing a neutral cleaner to wipe off dirt. Then wipe away the residue with a clean cloth.

C. Monthly Inspection

1. Water Supply Line

Check the water supply line for damage, deformation, or water leak marks (stains). If any of these conditions are found, contact an authorized Hoshizaki service company.

Recommendation of safety inspection by service personnel

Even if there is no problem with its use, a product out of warranty may have a risk of electric shock, fire, or water leak due to insulation degradation or aging of the electrical parts. Ask an authorized Hoshizaki service company for the following inspections (charged):

- Dust and dirt build-up or water leak inside the unit
- Aging conditions of the unit and its components
- Scale, silica, lime or other foreign matter in the water circuit

D. Descaling (As Required)

Use a descaler according to the supplier's instructions.

⚠ WARNING

1. Carefully follow any instructions provided with the descaler.
2. Always wear liquid-proof gloves and goggles to prevent the descaler from coming into contact with skin or eyes.
3. To prevent generation of toxic chlorine gas, do not mix a descaler with a chlorinated cleaner.

- 1) Pull out the drain pipe to drain water from the wash tank. Start the auto fill cycle to fill the wash tank with hot water.
- 2) Use the "ON/OFF" button to turn off the unit. Refer to the descaler's directions and add the proper amount of descaler to the wash tank. The wash tank holds 26.4 gallons of water.
- 3) Press and hold the up and down buttons and the "CHANGE" button, then press the "ON/OFF" button to select the "PC" (Preventative Cleaning) mode.
- 4) Refer to the descaler's directions for the proper duration of cleaning. When the proper amount of time has passed, press the "ON/OFF" button to stop cleaning.
- 5) Check the wash tank interior. Repeat steps 1) through 4) if necessary.

⚠ WARNING

Be careful not to burn yourself with the hot water or parts in the wash tank.

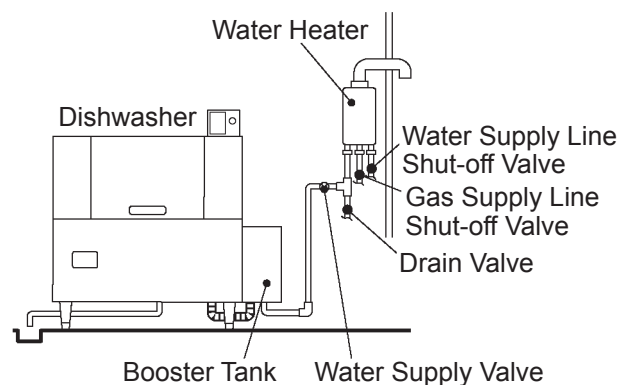
- 6) Drain the wash tank, then start the auto fill cycle. Run the dishwasher to rinse the wash tank thoroughly. Drain the wash tank.

E. Shutdown

NOTICE

If there is a possibility that the ambient temperature may fall below 32°F (0°C) and freeze the unit, be sure to drain the unit. The water supply line could be damaged and leak water, resulting in damage to the surrounding property.

To drain out the water heater, close the water supply line shut-off valve, and open the drain valve and water supply valve.

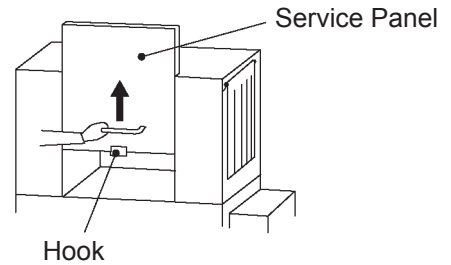


- 1) Press the “ON/OFF” button on the operation panel. The display and lamps go off.
- 2) Turn off the water heater.
- 3) Turn off the gas and water supplies.

IMPORTANT

To operate the water heater, follow its instruction manual.

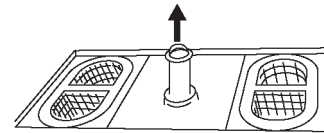
- 4) Open the service panel.



IMPORTANT

Be sure to hook the service panel in its open position.

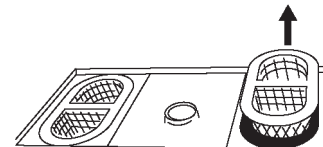
- 5) Pull out the drain pipe to drain water from the wash tank.



WARNING

When pulling out the drain pipe, be careful not to touch the wash water. It may cause burns or skin irritation. Turn the drain pipe if it is hard to pull out.

- 6) Remove the two tank filters without spilling scraps inside.



F. Long Storage, Relocation, Disposal, Transfer

When preparing the unit for long storage, shut down and clean the unit according to sections A - E.

If something seems wrong when restarting the unit after long storage, turn off the power supply, and immediately contact an authorized Hoshizaki service company.

WARNING

1. When restarting the unit after long storage, contact an authorized Hoshizaki service company. To prevent electric shock, do not restart the unit by yourself.
2. In case of relocation, contact an authorized Hoshizaki service company. Improper installation may cause water leak, electric shock or fire.
3. When disposing of the unit, contact an authorized Hoshizaki service company. Leaving the unit may violate laws or cause an unexpected accident.

NOTICE

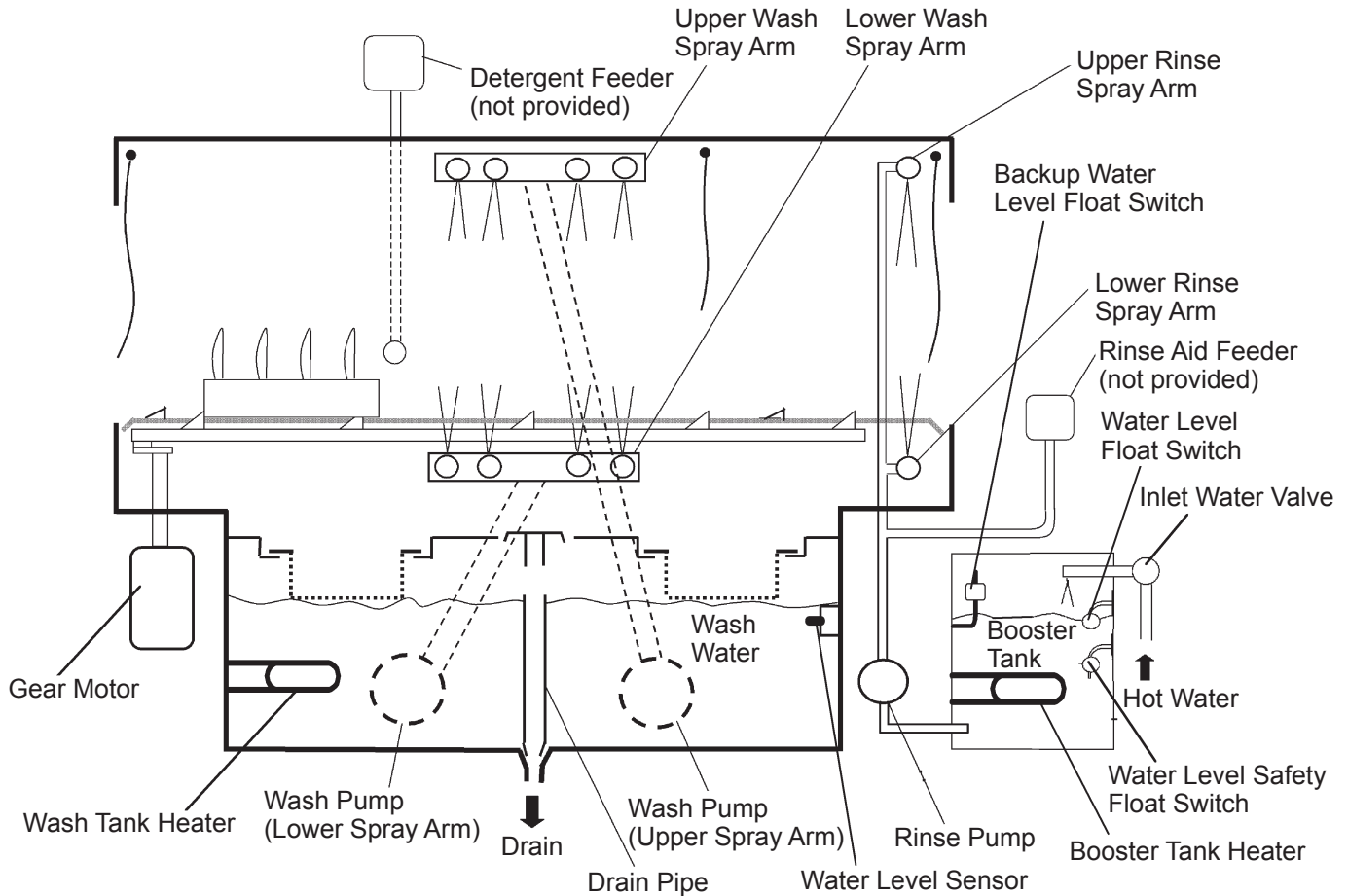
When selling or transferring this product, tape the instruction manual and the installation manual to the exterior to provide the new owner with information on safe and proper use of the product.

VI. Operating Instructions

- Before loading dishes in the rack, be sure to remove any leftovers (ex. meat, fish, vegetables), chopsticks, toothpicks, sticks, straws, paper products and plastics from the dishes. They may clog the piping and wash pump, resulting in reduction of washing performance or pump failure.
- Install the separator and tank filters without creating a large gap at the tank overlap. Do not bang the tank filters and separator to clean or drain, or they may be deformed. Leftovers and other foreign matter may enter the tank and clog the piping and wash pump, resulting in reduction of washing performance or pump failure.
- Insert the drain pipe (overflow pipe) after installing the separator. The separator may rise up to create a large gap at the tank overlap. Leftovers and other foreign matter may enter the tank and clog the piping and wash pump, resulting in reduction of washing performance or pump failure.
- After closing time, always clean the tank filters, wash/rinse spray arms and water level sensor. When disassembling the spray arms, check and remove any leftovers clogging the pipe joints. Otherwise the leftovers may become hard to remove or spoil.
- Read the instruction manual carefully to ensure safe and proper operation.

VII. Technical Information

A. Water Circuit



- The wash water is sprayed by the two wash pumps from the upper and lower wash spray arms into the wash compartment.
- The rinse water is sprayed by the rinse pump from the upper and lower rinse spray arms into the wash compartment.
- The detergent is fed by the detergent feeder (not provided by Hoshizaki) through the detergent outlet (not provided by Hoshizaki) into the wash tank.
- The rinse aid is fed by the rinse aid feeder (not provided by Hoshizaki) into the rinse water line and sprayed from the upper and lower rinse spray arms into the wash compartment.

B. Wiring Diagram

