SERVICE and PARTS MANUAL

SG, SU-L, SU-H DISHWASHERS

SG
SU-L
SU-H

TABLE OF CONTENTS

GENERAL

INTRODUCTION

This manual is applicable to the models on the cover page. Procedures apply to all models unless specified otherwise.

MODELS COVERED

The SU and SG Series dishwashers are fully automatic, front-loading dishwashing machines.

SU-L 33 racks per hour

SU-H 31 racks per hour

SG 34 racks per hour

All SU and SG Series dishwashers shut down automatically 4 hours after last use to conserve energy.

SU-H dishwashers include Rinse Assurance to insure proper hot water temperature during rinse.

MODEL	DESCRIPTION
SU-L SG	Fresh water rinse; low-temperature, chemical-sanitizing models for use with 6% or 8.40% sodium hypochlorite solution (bleach) as the sanitizing agent.
SU-H	Fresh water rinse with a built-in 70° F rise booster heater. This allows an incoming water temperature of 110° F.

TOOLS

Standard

- Standard set of hand tools.
- Metric set of hand tools.
- VOM with measuring micro amp current tester. Any VOM with minimum of CAT III 600V, CE certified. Sensitivity of at least 20,000 ohms per volt can be used. In addition, meter leads must also be a minimum of CAT III 600V.
- Temperature tester (thermocouple type).
- Field service grounding kit.

Special

- Precision Chlorine Test Paper Vial, for testing sanitizer p.p.m.
- Cleaner used in removal of switch membrane.
- T25 Torx bit. Used in removal of door.
- Service Tool: Used in removal of Wash Pump Nut and Wash Manifold Nut.

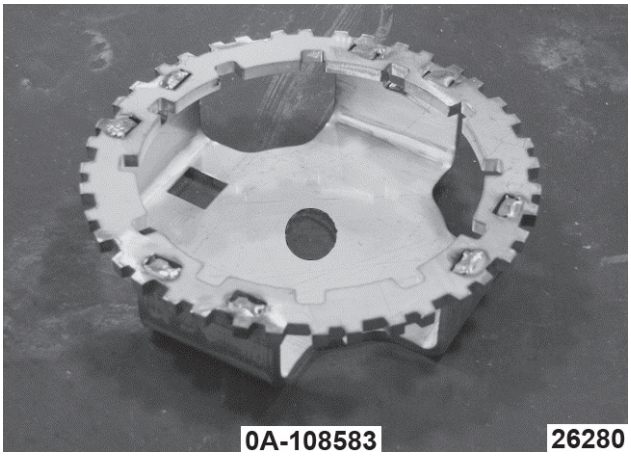


Fig. 1

ELECTRICAL SPECIFICATIONS

NOTE: Always check incoming voltage to verify service connection meets machine specification.

ELECTRICAL SPECIFICATIONS				
Model	**Volts / Hertz / Phase**	**Rated Amps**	**Minimum Supply Circuit Conductor Ampacity**	**Maximum Protective Device Ampacity**
SG	120/60/1	15.4	20	20
SU-L	120/60/1	13.4	20	20
SU-H	120/208-240(3W)/60/1	30.5	40	40
	NOTE: This system requires three power wires that include a current carrying neutral. An additional fourth wire must be provided for machine ground.			

ENGINEERING DATA

3/4 HP pump motor, thermally protected internally, automatic reset.

Required water supply characteristics are as follows:

Model	Temperature	Flowing Pressure
SG SU-L	120°F minimum	15 - 65 psi
SU-H	110°F minimum	15 - 65 psi

INSTALLATION AND OPERATION CYCLES

INSTALLATION

Generally, all installations are made by the dealer or others contracted by the dealer or owner.

POWER-UP DIAGNOSTICS

When the Power Button is pressed, the control board checks the probes and sensors to be within operational range. Once the self-check is passed, the machine automatically enters Fill/ Preheat Mode.

NOTE: If there is a detectable water level in the sump prior to turning the machine on, the dishwasher will perform a power drain.

PRIMING CHEMICAL PUMPS

Chemical pumps prime on Power Up or at the start of a Wash Cycle if sensors do not detect chemicals.

1. Initial prime attempt is 60 seconds.
   A. If chemical not sensed "Add Chemical" will display.

   NOTE: The 60 second prime is in intervals of 6 seconds.
2. If not primed after 3 attempts, the "Add Chemical" indicator will continue to display.
3. Priming is terminated.
4. Reset by cycling power.
5. Once chemical is sensed, pumps continue to prime for 10 seconds to allow chemicals to reach machine.

FILL/PREHEAT

Without Booster (SG & SU-L): The holding tank will fill. The water is then moved through the rinse arms to the sump. Process repeats until the sump is at operational water level. Sump heater maintains wash temperature.

With Booster (SU-H): The booster will fill and heat to 140°F. The booster water is then moved through the rinse arms to the sump. Process repeats until the sump is at operational water level. Sump heater maintains wash temperature.

NOTE: If the door is opened during the Fill cycle, the process is suspended. After door is closed the process continues where it left off.

NOTE: During the Fill cycle, the detergent pump is activated for the normal detergent cycle.

READY MODE

While a cycle is not in process, the SU and SG Series will maintain in idle state. In this mode, the heat will be maintained in both the sump and booster. The sump temperature will be displayed.

NORMAL OPERATION (WASH CYCLE)

After the fill cycle is completed, a wash cycle is begun by pressing the WASH key.

On 120VAC cold machines, sump heater is de-energized while wash motor is energized.

If the door is opened during the Wash cycle, the process is suspended. After door is closed the process continues where it left off.

During a cycle, both sump and booster heat are controlled. Hot machines only.

During the wash portion of the cycle, the sump temperature will be displayed. During the rinse, the final rinse temperature will be displayed.

RINSE

After the wash cycle ends, water is drained from the sump to allow for the rinse water from the holding tank (cold machines) or booster (hot machines).

POWER-DOWN / DRAIN

When the POWER key is pressed, the unit will enter a drain cycle. Booster or holding tank will be purged, and sump will be drained. After the completion of the drain cycle, power to the controls is removed under software control. At this point, the control is inoperable until the POWER key is pressed.

PROGRAMMING MENUS

There are 3 Programming Menus that can be accessed when the Menu/Down Arrow button is selected. Each menu has parameters that can be changed that affects the way the dishwasher operates. Each menu is protected by a 4 digit access code.

Use the arrow keys to change the (->) to the desired number and press enter to move to the next digit.

NOTE: The Manager Programming menu uses 1001 as the access code. Just select enter to move to the next digit.

- MANAGER PROGRAMMING (1001)
- SOAP PROGRAMMING (7627)
- SERVICE PROGRAMMING (8934)

REMOVAL AND REPLACEMENT OF PARTS

CONTROL PANEL SERVICE POSITION

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

NOTICE Certain components in this system are subject to damage by electrostatic discharge during field repairs. A field service grounding kit is required to prevent damage. The field service kit must be used anytime the control board is handled.

1. Pull dishwasher out from underneath counter.
2. Open door and remove two screws using #3 Phillips screwdriver.

Fig. 2

3. Pull out control cover, then hinge up and back.

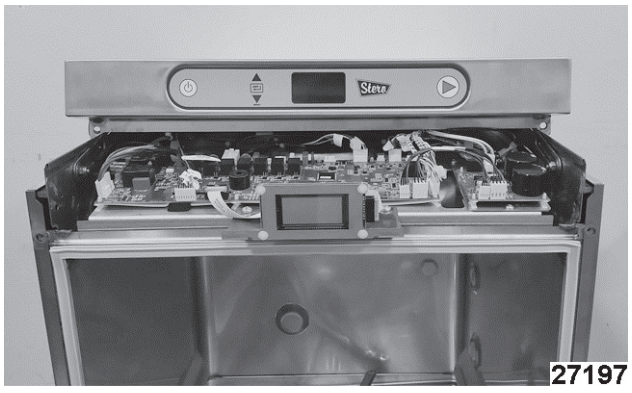


Fig. 3

4. Reverse procedure to install.
5. Check for proper operation.

LEFT AND RIGHT TRIM PANELS

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

NOTICE Certain components in this system are subject to damage by electrostatic discharge during field repairs. A field service grounding kit is required to prevent damage. The field service kit must be used anytime the control board is handled.

Control Panel Service Position

1. Open door and remove (2) screws.

Fig. 4

2. Slide control cover forward (Approximately 2-3").

Left and Right Trim Panel Removal

1. Remove left and right trim panel screws, using #3 Phillips screwdriver.

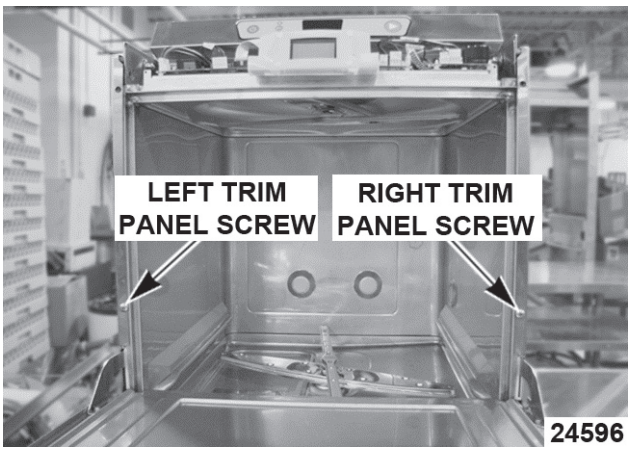
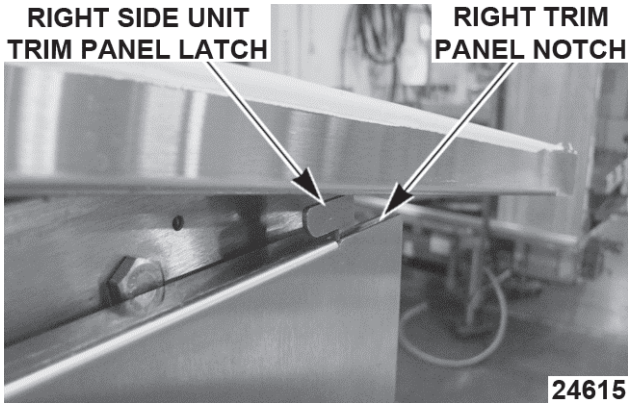


Fig. 5

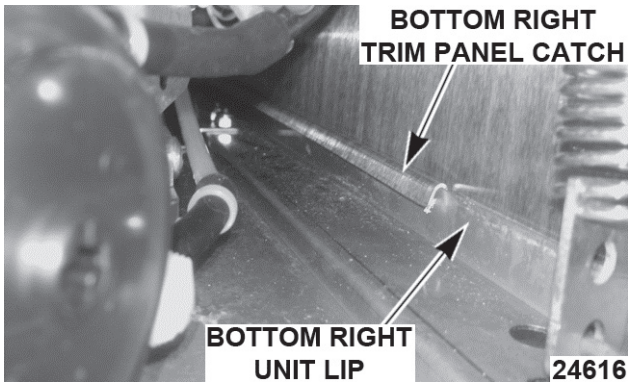
2. Remove left and right trim panels.
3. Close unit door.

Left and Right Trim Panel Installation

1. Insert right trim panel notch into right side unit trim panel latch.



2. Verify bottom right trim panel catch is fastened to the bottom right lip of the unit.



3. Insert and tighten right trim panel screw. (Fig. 5)
4. Repeat steps 1 - 3 for left trim panel installation.
5. Slide control cover back in place and tighten with (2) screws. (Fig. 4)

SWITCH MEMBRANE

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Open door and remove screws, using #3 Phillips screwdriver.

Fig. 8

2. Pull out control cover and disconnect switch membrane ribbon cable from connector.
3. Pry up switch membrane.

Fig. 9

4. Reverse procedure to install.

NOTE: Before installing replacement membrane, use cleaner to remove old adhesive and allow to dry.

5. Check for proper operation.

CONTROL PANEL COVER

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Pull dishwasher out from underneath counter, when CONTROL PANEL SERVICE POSITION is not possible or entire cover needs replaced.
2. Open door and remove two screws, using #3 Phillips screwdriver.

Fig. 10

3. Slide control cover forward and disconnect switch membrane ribbon cable from connector.
4. Loosen nut, washer and center bearing washer from both sides. (Do **NOT** remove hardware)

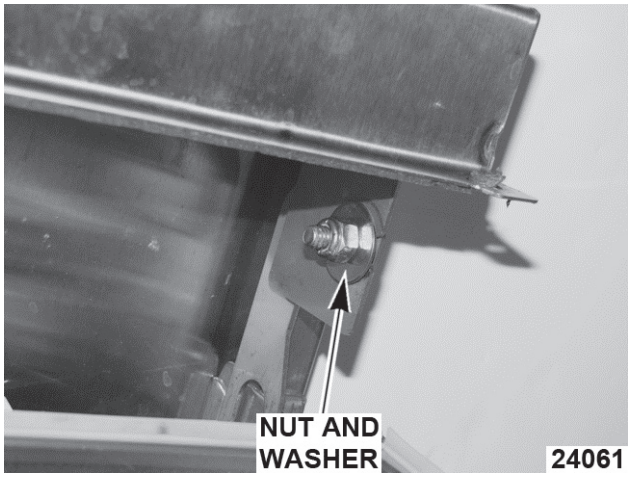


Fig. 11

5. Remove control cover.
6. Reverse procedure to install.

NOTE: Center bearing washer must be centered in hole to allow rotation.

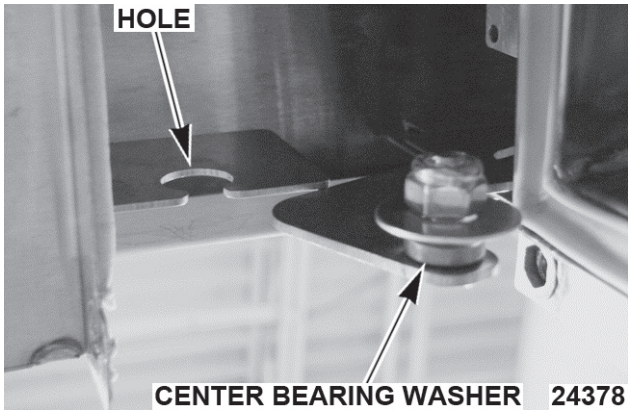


Fig. 12

7. Check for proper operation.

WATER LEVEL SENSORS

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove CONTROL PANEL COVER.
2. Remove LEFT AND RIGHT TRIM PANELS (Booster/Holding Tank) or LEFT AND RIGHT TRIM PANELS (Sump tank).
3. Drain sump or Booster/Holding tank below air trap (1, Fig. 13) inlet.

NOTE: Not draining sump or booster / holding tank may cause a leak.

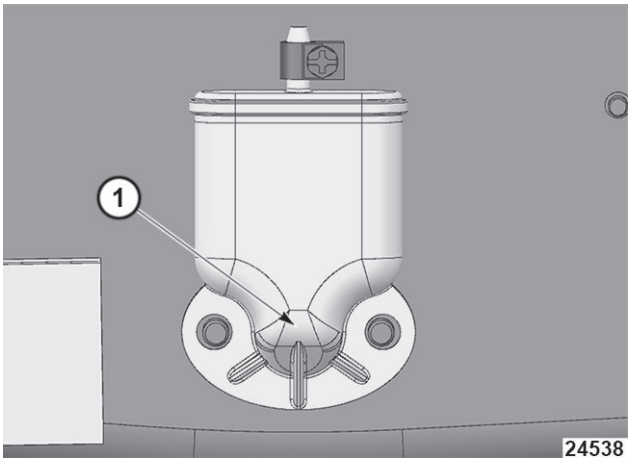


Fig. 13

4. Disconnect water level cable from sensor and tube clamp.
5. Push plastic tabs (using screwdriver or pliers) to remove.

NOTE: Do **NOT** over squeeze pinch clamps on bottom of sensors.

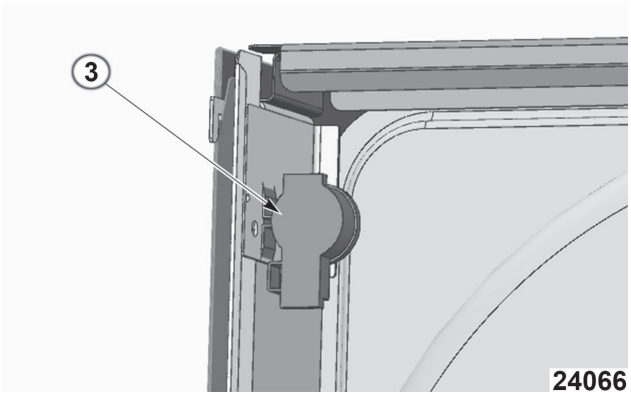


Fig. 14

6. Reverse procedure to install.
   A. Verify there is no water in air trap.
   B. Verify there is no water, kinks or holes in pressure sensor tubing.
   C. Verify tubing clamp is properly installed.
7. Check for proper operation.

CHEMICAL PUMPS - WELCO

If chemical pump label is no longer visible, replace label to identify pump for future servicing.

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

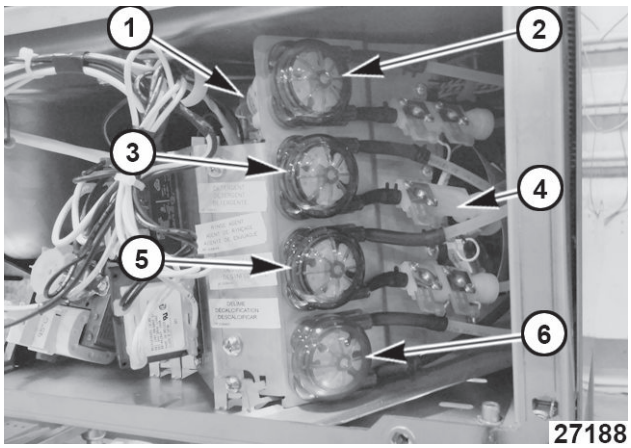


Fig. 15

NUMBER	DESCRIPTION
1	Chemical Pump Motor
2	Detergent Chemical Pump
3	Rinse Aid Chemical Pump
4	Chemical Sensor
5	Sanitizing Chemical Pump (SU-L & SG only)

1. Remove front trim panel.
2. Remove clamps and tube and pull from sensor.
3. Remove snap cover.
4. Remove tube from chemical sensor [5].
5. Replace with new chemical sensor [5].
6. Replace snap cover.
7. Replace hose to tube and sensor. Secure with clamps.

NOTE: Do **NOT** use zip ties.

NOTE: Do **NOT** over squeeze clamp. Over squeezing causes leaks.

Replacing Chemical Pump

1. Twist pump Counter Clock Wise and slide off shaft.
2. Reverse procedure to install.

DRAIN PUMP

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front trim panel and LEFT AND RIGHT TRIM PANELS.
2. Remove electrical connections noting their location.

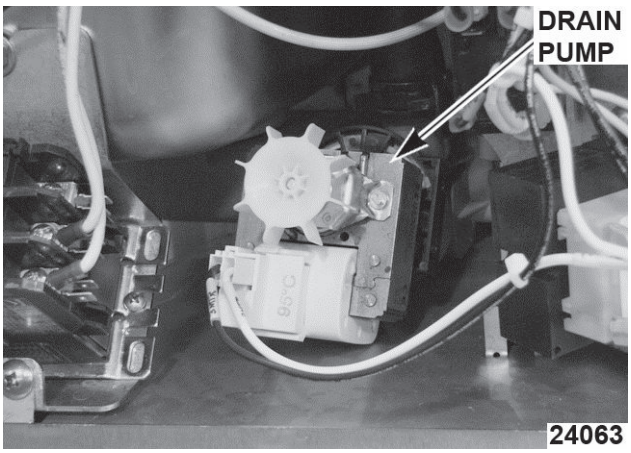


Fig. 16

3. From left side using a long flathead screwdriver, **GENTLY** open tab securing drain pump.

NOTE: Tab is easily broken. Do not need to replace broken tab.

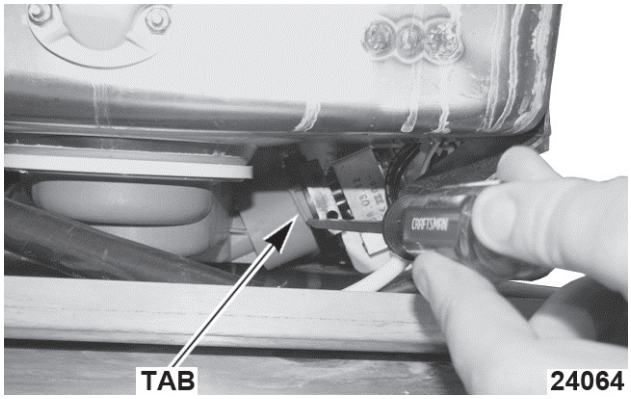


Fig. 17

4. Twist drain pump clockwise (CW) to remove.

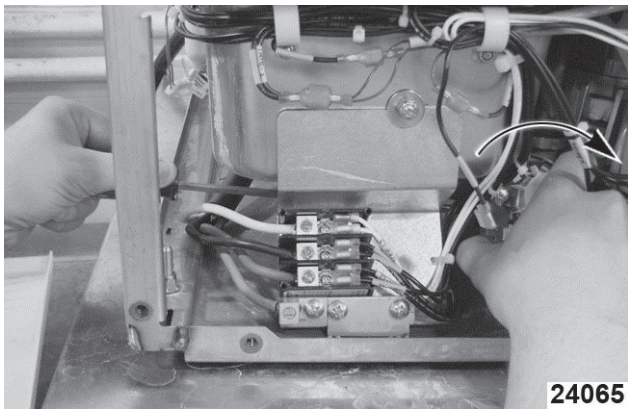


Fig. 18

5. Reverse procedure to install.

NOTE: If tab on wash manifold is broken during drain pump replacement, **DO NOT** replace wash manifold. Drain pump can still be mounted securely without tab.

6. Check for proper operation.

FILL VALVE (1SOL)

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Shut off water supply.
2. Remove LEFT AND RIGHT TRIM PANELS.
3. Disconnect and drain water hose.

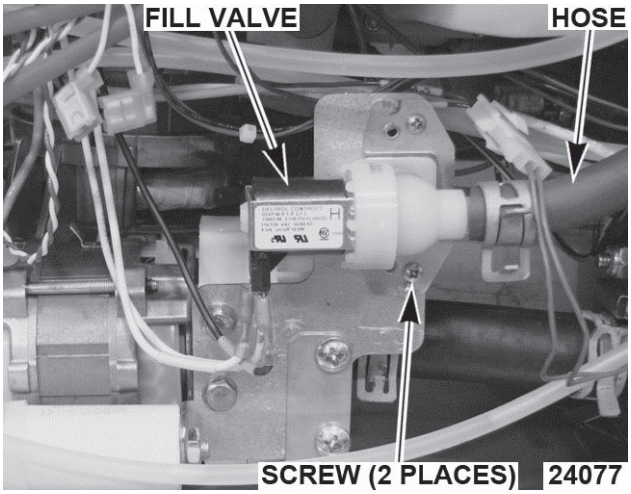


Fig. 19

4. Disconnect electrical connections from valve.
5. Remove mounting bracket screws.
6. Remove fill valve from bracket.
7. Disconnect and drain braided water line.
8. Reverse procedure to install.
9. Check for proper operation.

RINSE PUMP

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front trim panel.
2. Disconnect rinse motor connections, 2MTR-1, 2MTR-2 and Ground.

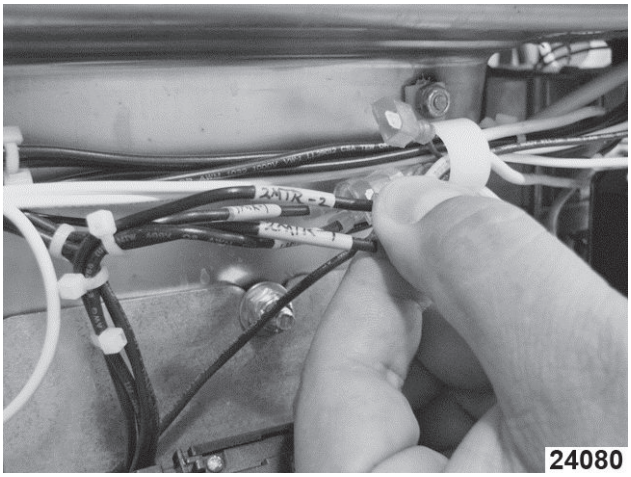


Fig. 20

3. Remove LEFT AND RIGHT TRIM PANELS.

4. Remove fill valve (1SOL) from rinse pump.

NOTE: Leave electrical connections and hoses connected to fill valve. Fill valve will be transferred to replacement rinse pump.

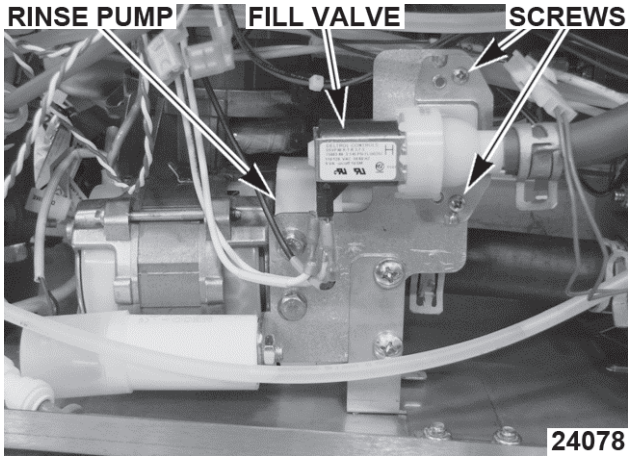


Fig. 21

5. Disconnect inlet and outlet hoses from rinse pump.
6. Remove 2 nuts securing rinse pump to base of unit.

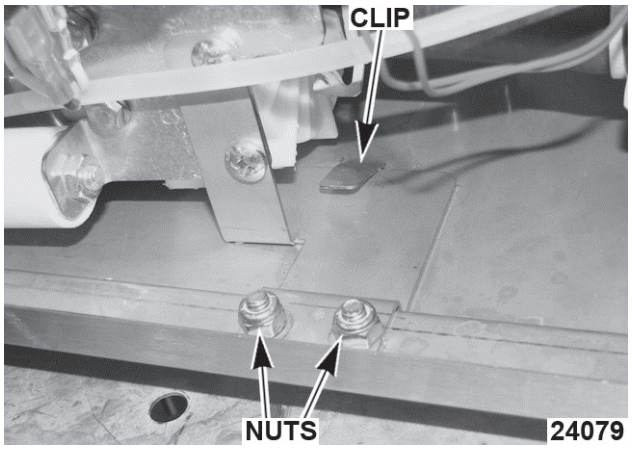


Fig. 22

7. Slide mounting bracket out from underneath clip on base of unit, and remove rinse pump.
8. Transfer mounting bracket and fill valve to replacement rinse pump.
9. Reverse procedure to install.
10. Check for proper operation.

RINSE PROBE (2QTM)

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove LEFT AND RIGHT TRIM PANELS.
2. Disconnect 2QTM at harness.

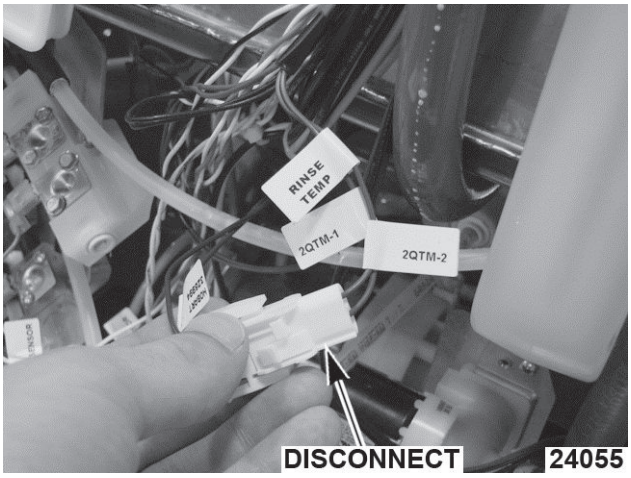


Fig. 23

3. Remove rinse probe from rinse tee.

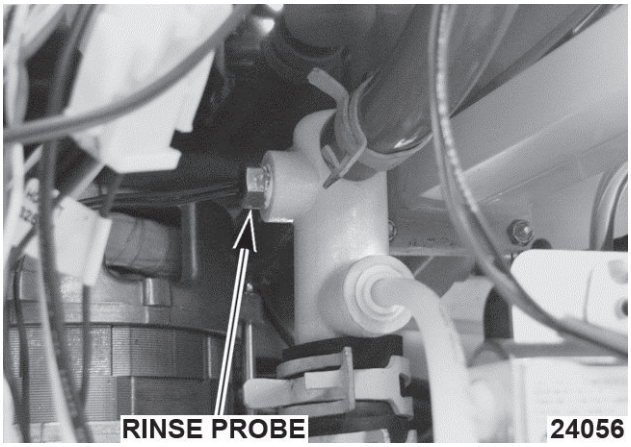


Fig. 24

4. Reverse procedure to install.

NOTE: Use tape or thread compound to help seal threads.

5. Check for proper operation.

WASH PIPE ASSEMBLY

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove rinse pump and chemical pump bracket.
2. Remove WASH PUMP/MOTOR (1MTR).
3. Remove upper and lower wash and rinse arms.
4. Remove screw and retainer (top and bottom).

NOTE: Be careful to not drop screw or retainer into wash pipe.

NOTE: Ensure retainer is off by removing wash pipe.

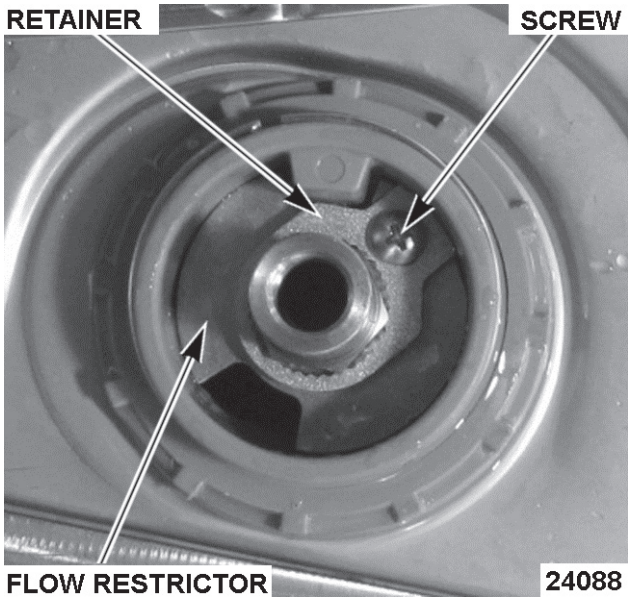


Fig. 25

NOTE: Ensure retainer is off before removing wash pipe.

5. Remove spindle using 13/16" deep well socket.
6. Remove flow restrictor (lower manifold only).

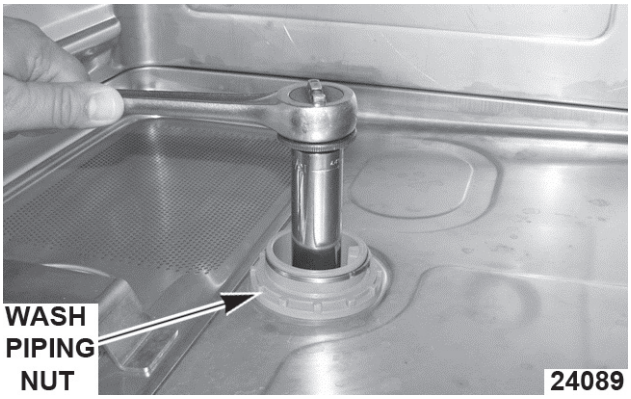


Fig. 26

7. Remove wash piping nut using service tool.

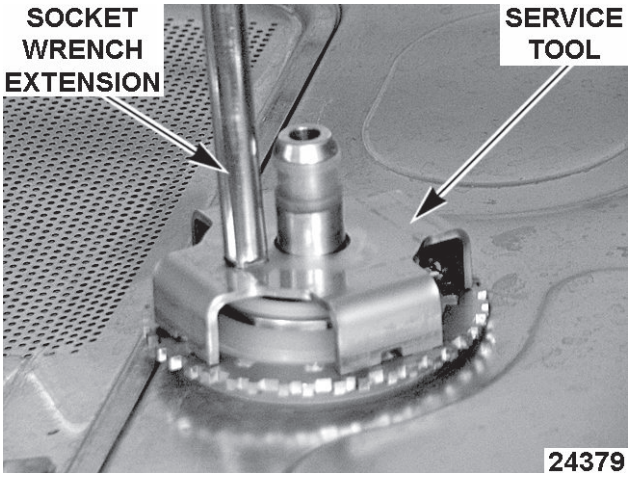


Fig. 27

8. Disconnect any wiring that impedes wash pipe assembly removal.
9. Remove CONTROL PANEL COVER.
10. Remove rear nut of rail.
11. Loosen front nut and rotate rail.

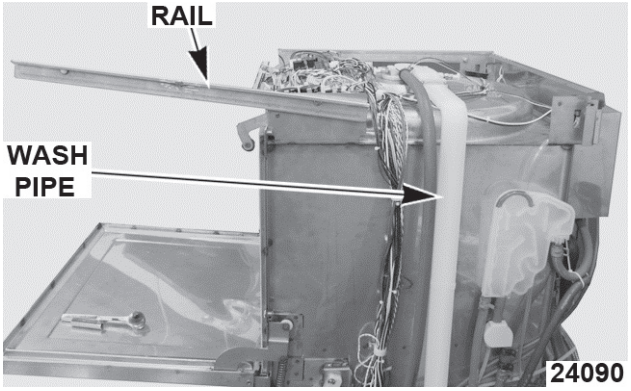


Fig. 28

12. Disconnect and note location of all electrical connections to wash pipe assembly as necessary.

13. Remove wash pipe assembly.

NOTE: If any tubes or wiring are routed between wash pipe and rinse hose, disconnect rinse hose at rinse tee to free tubes/wiring.

14. Transfer rinse hosing to replacement wash pipe.
15. Replace wash pipe O-rings.
16. Reverse procedure to install.
17. Check for proper operation.

WASH PUMP/MOTOR (1MTR)

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front and right trim panels.
2. PURGE BOOSTER/HOLDING TANK FOR SERVICE
3. Remove RINSE PUMP with fill valve (1SOL) attached for a path to remove wash pump/motor assembly.

NOTE: Stainless steel fill valve intake hose can remain connected, but slack will need to be fed through back of machine to clear assembly out of the way.

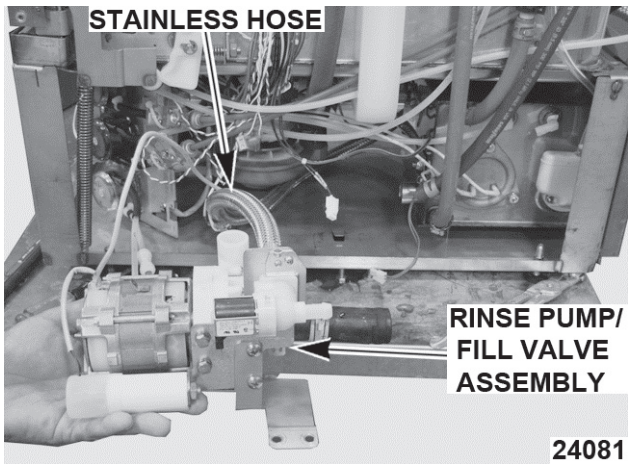


Fig. 29

4. Remove any chemical tubing blocking removal through the right side.
5. Disconnect pump manifold hose.

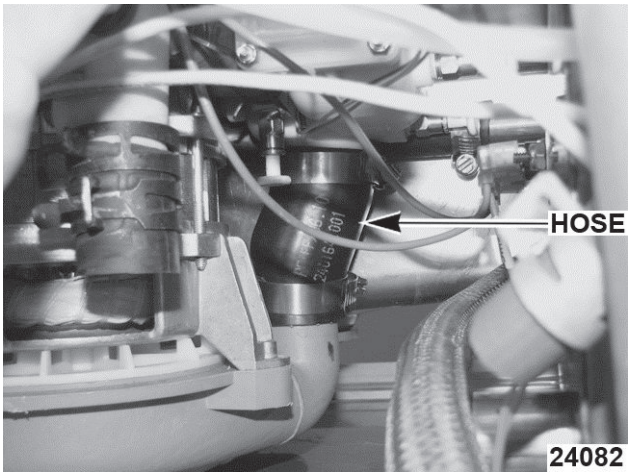


Fig. 30

6. Remove locator nut and rubber motor mount.

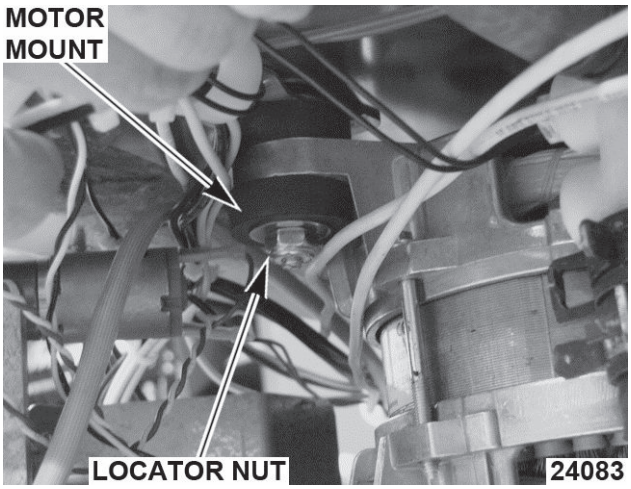


Fig. 31

7. From front of machine, unhook drain hose to pump manifold and disconnect 1MTR connections.

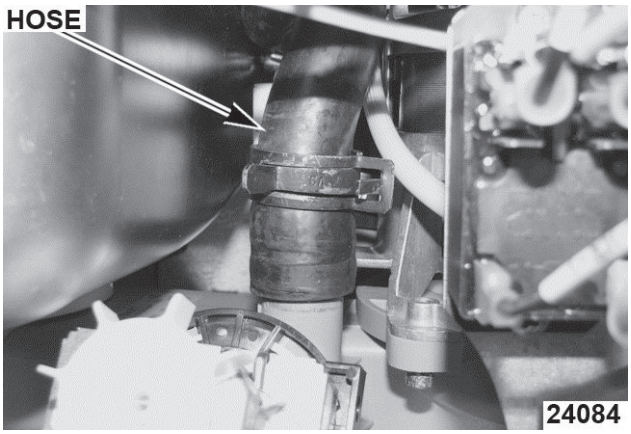


Fig. 32

8. Remove DRAIN PUMP.
9. Open door and remove strainers.

10. Using service tool, remove pump nut.

NOTE: ⅜" drive extension can be used to turn service tool.

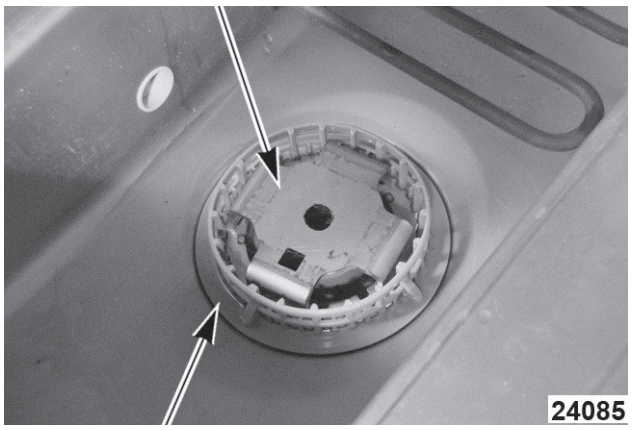


Fig. 33

11. If clearance is necessary to remove wash pump/motor, move chemical pump mounting bracket assembly.

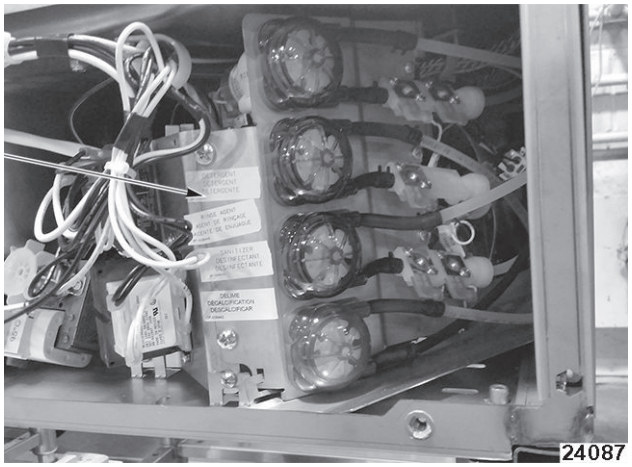


Fig. 34

12. Remove wash pump and motor assembly.
13. Reverse procedure to install.

NOTE: Transfer motor mount with locator nut just started on threads onto replacement wash pump/motor assembly.

NOTE: Once wash pump and motor are positioned under dishwasher with motor mount slid into place, tighten pump nut inside sump one thread for stability. Once hose and electrical connections have been made, tighten pump nut.

14. Check for proper operation.

BOOSTER HEATER (SU-H)

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove front trim and right side panel.
2. PURGE BOOSTER/HOLDING TANK FOR SERVICE.
3. Disconnect booster heater wires from contactor.
4. Remove mounting screws.

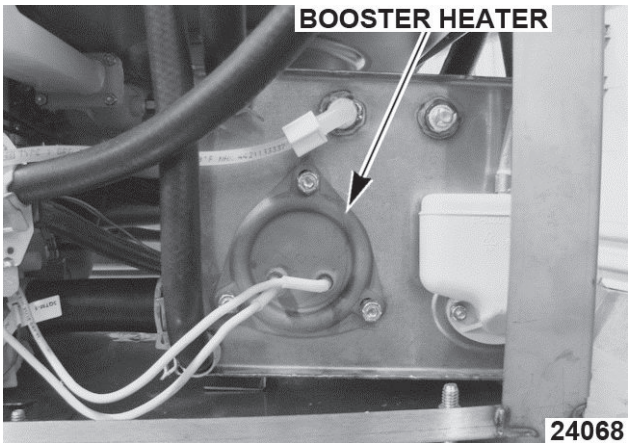


Fig. 35

NOTE: Proper position with element wires on bottom.

5. Remove booster heater.
6. Reverse procedure to install.
7. Check for proper operation.

BOOSTER THERMISTOR & HIGH LIMIT PROTECTION (SU-H)

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

NOTE: Before replacing the High Limit, push reset button on face of both high limit protectors. Verify that this does not fix issue before proceeding.

Surface-Mount Thermistor

1. Remove front, left, and right trim panels.
2. Remove mounting nut and disconnect wires at connector.

NOTE: When installing thermistor, verify there is thermal paste on the side of the thermistor that is mounted to the booster. Mount tightly to booster surface and in same position as from the factory. Thermal paste can be purchased at local store.

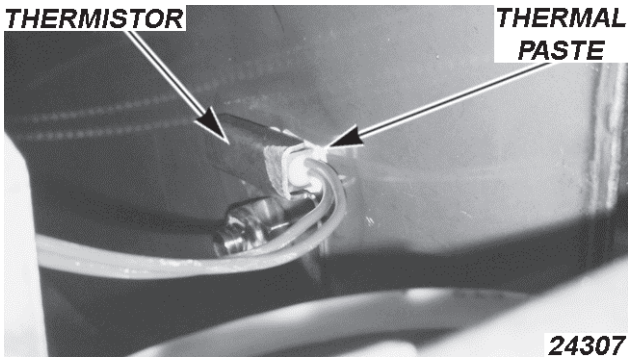


Fig. 36

3. Reverse procedure to install.
4. Check for proper operation.

High Limit Protectors

1. Remove front, left, and right trim panels.
2. Remove 2 screws and position FILL VALVE (1SOL) out of the way.
3. Remove mounting bracket for 3TAS / 4TAS high limit protectors.

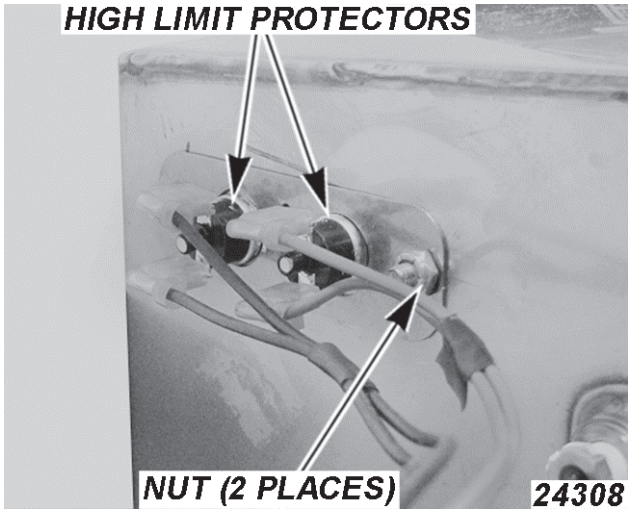


Fig. 37

4. Remove high limit protector.
5. Reverse procedure to install.
6. Check for proper operation.

SUMP THERMISTOR & HIGH LIMIT PROTECTION

NOTE: Before replacing the High Limit, push reset button on face of both high limit protectors. Verify that this does not fix issue before proceeding.

1. Drain the sump.
2. Remove LEFT SIDE PANEL.
3. **For Surface Mounted Thermistor,** remove mounting nut and disconnect lead wires at connector.

NOTE: When installing thermistor, mount tightly to booster surface and in same position as from the factory.

4. **For High Limit Protectors,** remove electrical connections at high limits [1] and heater element.

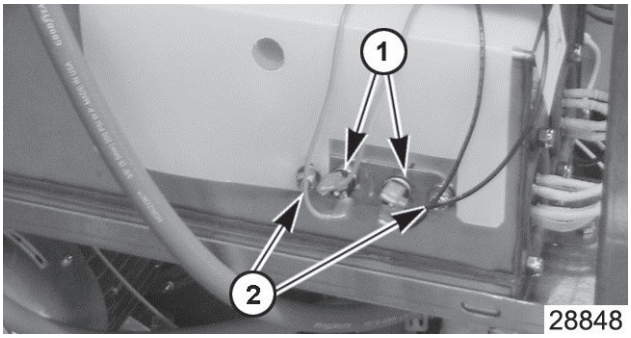


Fig. 38

5. Remove sump heater mounting nuts [2].
6. Remove high limit protector mounting bracket.
7. Remove high limit protector.
8. Reverse procedure to install.
9. Check for proper operation.

AIR GAP

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove right side panel.
2. Remove air gap mounting screw.

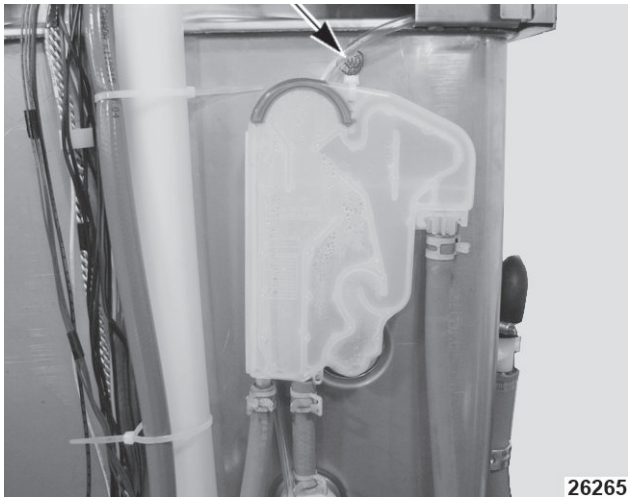


Fig. 39

3. Remove nuts from inside washer.

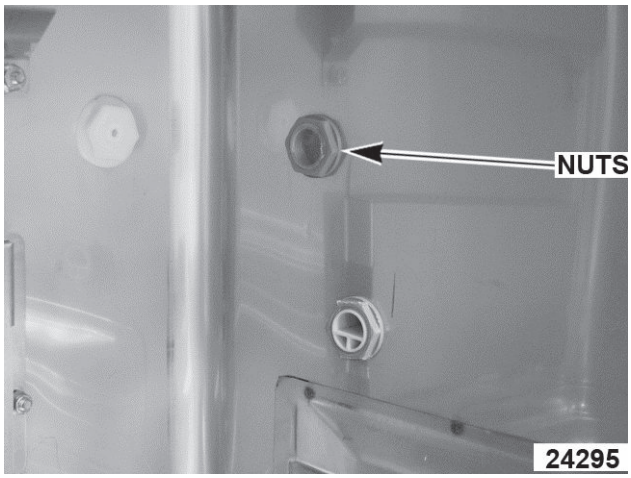


Fig. 40

4. Remove air gap.

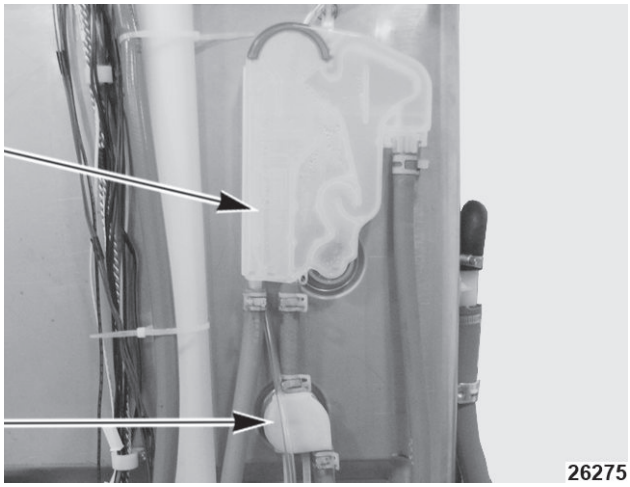


Fig. 41

5. Disconnect hoses.
6. Reverse procedure to install.

NOTE: Make sure gasket is installed between inside wall of tank and air gap. Replace gaskets as necessary.

7. Check for proper operation.

DOOR SWITCH

NOTE: Door magnet is part of door.

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Place dishwasher in CONTROL PANEL SERVICE POSITION.
2. Remove left side panel.
3. Disconnect door switch from control board (J10).
4. Remove screw securing door switch.

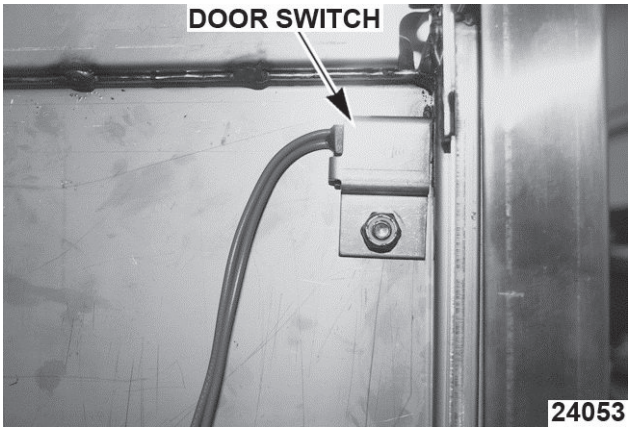


Fig. 42

NOTE: Door switch magnet is located inside the door and is not serviceable.

5. Reverse procedure to install.

NOTE: Add small amount of Permagum between sensor and bracket.

NOTE: Verify sensor is not lose and rattling.

6. Check for proper operation.
7. Check for rattles.

SERVICE PROCEDURES AND ADJUSTMENTS

REPLACEMENT CONTROL BOARD PROGRAMMING

⚠ WARNING Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

NOTICE Certain components in this system are subject to damage by electrostatic discharge during field repairs. A field service grounding kit is required to prevent damage. The field service kit must be used anytime the control board is handled.

NOTE: The replacement control board comes programmed as an SG, SU-L, and SU-H or other OEM machines must be reprogrammed to Stero.

Prior to removing board from machine, check and note the settings of programmable variables as outlined under SERVICE PROGRAMMING (8934) when possible. When unable to access SERVICE PROGRAMMING, check with establishment manager to determine customer control settings. If control settings cannot be determined, program according to machine type SG, SU-L, and SU-H.

1. Press MENU button on keypad.

NOTE: Menu can also be accessed by shorting J27 (SVC) pins on control board. See CONTROL PANEL SERVICE POSITION.

2. Enter SERVICE MENU.
3. Enter Service code 8934.
4. Select Edit Parameters, then Models.
5. Pick model based on data plate on door.
6. Select Exit Menu.
7. Shut down and cycle power to the dishwasher. (Reboot)
8. Once power is reapplied turn machine on and re-enter service programming to verify replacement board is still set for the appropriate model.
9. Program replacement board to customer's specifications using SERVICE PROGRAMMING (8934).
10. Check for proper operation.

SERVICE PROGRAMMING (8934)

Service Programming

- EDIT PARAMETERS
- VIEW ERROR LOG
- VIEW STATS
- TOGGLE DIAGNOSTICS
- PRIME PUMPS
- IMMEDIATE SHUTDOWN
- SHOW SOFTWARE REVISION
- RESET PARAMETERS
- EXIT MENU

1. Press MENU button on keypad.
2. Enter SERVICE MENU.
3. Enter Service code **8934**.

EDIT PARAMETERS					
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**	**Possible Values**	**Default Values**
Model	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Select programming for appropriate model of dishwasher.	Stero Hot SU-H Stero Cold SU-L Stero Cold SG	LXeH Base Hot

EDIT PARAMETERS					
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**	**Possible Values**	**Default Values**
Booster Temp Set Pt.	N/A	Stero Hot SU-H	Booster temperature set point.	FSP -12 to FSP +12	FSP 0
Sump Temp Set PT.	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Sump temperature set point.	120-170°F/49-77°C	130°F / 54°C (Stero SU-L & SG) 165°F / 77°C (Stero SU-H units only)
Detergent Pump	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Detergent pump option.	Disabled / Enabled	Enabled
Detergent Flow Rate	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Detergent flow rate measured in mL per cycle.	OFF through 20.0 mL	7.9 mL
Rinse Aid Pump	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Rinse Aid pump operation.	Disabled / Enabled	Enabled
Rinse Aid Flow Rate	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Rinse aid flow rate measured in mL per cycle.	OFF through 8.8 mL	1.8 mL
Sanitizer Flow Rate	Stero Cold SU-L Stero Cold SG	N/A	Sanitizer flow rate measured in mL per cycle.	Off to 100 mL	60 mL
Detergent PWM Freq	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	DO NOT ADJUST. Contact Stero technical support.	5000-50,000 (by 1000's)	10,000
Rinse Aid PWM Freq	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	DO NOT ADJUST. Contact Stero technical support.	5000-50,000 (by 1000's)	10,000
Sanitizer PWM Freq	Stero Cold SU-L Stero Cold SG	N/A	DO NOT ADJUST. Contact Stero technical support.	5000-50,000 (by 1000's)	10,000
Detergent Threshold	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Sets maximum allowable chemical sense reading (mV) for detergent.	0-4000 (by 100's)	1100

EDIT PARAMETERS					
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**	**Possible Values**	**Default Values**
Rinse Aid Threshold	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Sets maximum allowable chemical sense reading (mV) for rinse aid.	0-4000 (by 100's)	2500
Sanitizer Threshold	Stero Cold SU-L Stero Cold SG	N/A	Sets maximum allowable chemical sense reading (mV) for sanitizer.	500-4000 (by 100's)	1100
Rinse Assurance	N/A	Stero Hot SU-H	Lengthens wash time, if necessary, to allow booster to heat incoming 110°F water to 180°F. Time may vary.	Disabled / Enabled	Enabled
Soft Start Period	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Reduces voltage and current to wash pump at beginning of wash cycle for 5-6 seconds. Lower is not softer and higher is not harder. If unsure how to adjust, call Stero technical support.	1.67 ms 2.09 ms 2.50 ms 2.92 ms 3.34 ms 3.75 ms 4.17 ms 4.59 ms 5.00 ms 5.42 ms 5.84 ms 6.26 ms 6.67 ms	4.17 ms
Exit Menu	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Exits Parameter Menu.		

VIEW ERROR LOG

- Errors are displayed one at a time.
- The log will keep the last 10. If the log contains 10 errors when the eleventh error occurs it takes the place of 10. Number 1 drops off.
- Error log cannot be reset.
    - ʘ Navigate to log error #1, press up arrow. A menu comes up asking if you want to reset error log.

Log displays errors one at a time. Toggle down to see past errors.

Fig. 43

VIEW ERROR LOG				
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**	**Possible Values**
Log	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Displays last 10 log error entries.	Example: Type: Error WASH TEMP SENSOR

VIEW STATS

Hours of operation for various components of the dishwasher. The amount of wash cycles are recorded, since the last delime and how many cycles until the next scheduled delime.

NOTE: Hours of operation counters do no reset when a part is replaced, only when Control Board is replaced.

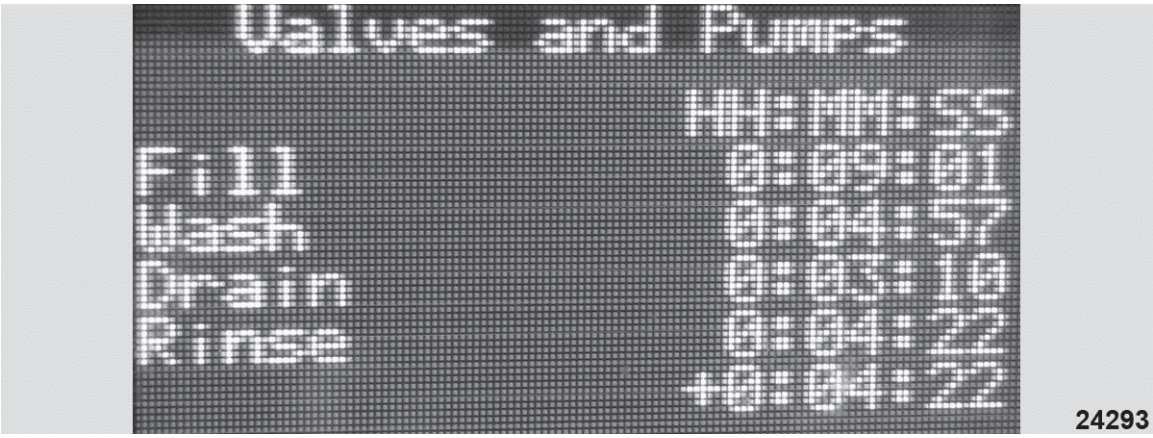


Fig. 44

NOTE: Use down arrow to scroll through all the screens.

Parameter Name	Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)	Hot Units (Stero Hot SU-H)	Display	
Valves and Pumps	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Valves and Pumps	
			HH:MM:SS	
			Fill	0:00:01
			Wash	0:00:01
			Drain	0:00:01
			Rinse	0:00:01
				+0:00:00
Heaters and Fan	Stero Cold SU-L	Stero Hot SU-H	Heaters and Fan	
			HH:MM:SS	
			Sump	0:00:01
			Booster	0:00:01
			Fan	0:00:01
Chemical Pumps	Stero Cold SU-L	Stero Hot SU-H	Chemical Pumps	
			HH:MM:SS	
			Detergent	0:00:01
			Rinse Aid	0:00:01
			Sanitizer	0:00:01

TOGGLE DIAGNOSTIC					
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**	**Possible Values**	**Default Values**
Toggle Diag	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Toggle on-screen diagnostics.	Toggle Diag: (off) Toggle Diag: (on)	Toggle Diag: (off)

PRIME PUMPS					
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**	**Possible Values**	
Pump Menu	Stero Cold SU-L Stero Cold SG		Manual prime for sanitizer pump. If chemical sensor value is below set threshold value, priming stops.	**Pump Menu**	
				Sanitizer **NOTE:** Default setting shown in **bold**.	**1100mV** Range: 70 to 2900 mV
	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Manual prime for detergent pump. If chemical sensor value is below set threshold value, priming stops.	Detergent **NOTE:** Default setting shown in **bold**.	**1100mV** Range: 70 to 2900 mV
	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Manual prime for rinse aid pump. If chemical sensor value is below set threshold value, priming stops.	Rinse Aid **NOTE:** Default setting shown in **bold**.	**2500mV** Range: 70 to 2900 mV

IMMEDIATE SHUTDOWN			
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**
Immediate Shutdown	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	When selected, shuts dishwasher down immediately even if in the middle of an operation. Machine will not drain and will not purge existing water at next start up. This function is to save fill and drain time when servicing.

SHOW SOFTWARE REV.			
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**
Show Software Rev	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Will display machine type and software revision. Example: Version 2.01

RESET PARAMETERS					
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**	**Possible Values**	**Default Value**
Reset Parameters	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Resets all parameters to factory default settings.	Yes No	No

EXIT MENU			
Parameter Name	**Cold Units (Stero Cold SU-L) (Glass Washer: Stero Cold SG)**	**Hot Units (Stero Hot SU-H)**	**Description**
Exit Menu	Stero Cold SU-L Stero Cold SG	Stero Hot SU-H	Exits menu.

SOAP PROGRAMMING (7627)

Service Programming

- EDIT PARAMETERS
- PRIME PUMPS
- EXIT MENU

1. Press MENU button on keypad.
2. Enter SERVICE MENU.
3. Enter Service code **7627**.

EDIT PARAMETERS					
Parameter Name	**Cold Units (Stero SU-L) (Stero Glass Washer SG)**	**Hot Units (Stero SU-H)**	**Description**	**Possible Values**	**Default Values**
Detergent Pump	Stero SU-L Stero SG	Stero SU-H	Detergent pump option.	Disabled / Enabled	Enabled
Detergent Flow Rate (Amount)	Stero SU-L Stero SG	Stero SU-H	Detergent flow rate (amount) measured in mL per cycle.	OFF through 20.0 mL	7.9 mL
Rinse Aid Pump	Stero SU-L Stero SG	Stero SU-H	Rinse Aid pump operation.	Disabled / Enabled	Enabled
Rinse Aid Flow Rate (Amount)	Stero SU-L Stero SG	Stero SU-H	Rinse Aid flow rate (amount) measured in mL per cycle.	OFF through 8.8 mL	1.8 mL
Sanitizer Flow Rate (Amount)	Stero SU-L Stero SG	N/A	Sanitizer flow rate (amount) measured in mL per cycle.	Off to 100 mL	60 mL
Detergent Threshold	Stero SU-L Stero SG	Stero SU-H	Sets detection amount. Sets maximum allowable chemical sense reading (mV) for detergent.	0-4000 (by 100's)	1100
Rinse Aid Threshold	Stero SU-L Stero SG	Stero SU-H	Sets detection amount. Sets maximum allowable chemical sense reading (mV) for rinse aid.	0-4000 (by 100's)	2500

EDIT PARAMETERS					
Parameter Name	**Cold Units (Stero SU-L) (Stero Glass Washer SG)**	**Hot Units (Stero SU-H)**	**Description**	**Possible Values**	**Default Values**
Sanitizer Threshold	Stero SU-L Stero SG	N/A	Sets detection amount. Sets maximum allowable chemical sense reading (mV) for sanitizer.	500-4000 (by 100's)	1100
Exit Menu	Stero SU-L Stero SG	Stero SU-H	Exits Edit Parameters menu.		

PRIME PUMPS					
Parameter Name	**Cold Units (Stero SU-L) (Stero Glass Washer SG)**	**Hot Units (Stero SU-H)**	**Description**	**Possible Values**	
Pump Menu	Stero SU-L Stero SG		Manual prime for sanitizer pump. If chemical sensor value is below set threshold value, priming stops.	**Pump Menu**	
				Sanitizer **NOTE:** Default setting shown in **bold**.	**1100mV** Range: 70 to 2900 mV
	Stero SU-L Stero SG	Stero SU-H	Manual prime for detergent pump. If chemical sensor value is below set threshold value, priming stops.	Detergent **NOTE:** Default setting shown in **bold**.	**1100mV** 70 to 2900 mV
	Stero SU-L Stero SG	Stero SU-H	Manual prime for rinse aid pump. If chemical sensor value is below set threshold value, priming stops.	Rinse Aid **NOTE:** Default setting shown in **bold**.	**2500mV** 70 to 2900 mV
Exit Menu	Stero SU-L Stero SG	Stero SU-H	Press ENT to exit the Prime Pumps Menu and return to the Soap Menu. Any settings that were changed are saved.		

EXIT MENU			
Parameter Name	**Cold Units (Stero SU-L) (Stero Glass Washer SG)**	**Hot Units (Stero SU-H)**	**Description**
Exit Menu	Stero SU-L Stero SG	Stero SU-H	Exits menu.

MANAGER PROGRAMMING (1001)

Service Programming

- EDIT PARAMETERS
- PRIME PUMPS
- EXIT MENU

1. Press MENU button on keypad.
2. Enter SERVICE MENU.
3. Enter Service code **1001**.

EDIT PARAMETERS					
Parameter Name	**Cold Units (Stero SU-L) (Glass Unit: Stero SG)**	**Hot Units (Stero SU-H)**	**Description**	**Possible Values**	**Default Values**
Detergent Pump	Stero SU-L Stero SG	Stero SU-H	Detergent pump operation.	Disabled / Enabled	Enabled
Rinse Aid Pump	Stero SU-L Stero SG	Stero SU-H	Rinse Aid pump operation.	Disabled / Enabled	Enabled

EDIT PARAMETERS					
Parameter Name	**Cold Units (Stero SU-L) (Glass Unit: Stero SG)**	**Hot Units (Stero SU-H)**	**Description**	**Possible Values**	**Default Values**
Low Temp Alarms	N/A	Stero SU-H	Enables or disables a visual alert on the display that indicates that the Final Rinse water temperature is below the required minimum of 180°F (82°C). When enabled, a message will display notifying the user of this condition after three consecutive cycles do not reach the required final rinse temperature. However, machine operation will not change and ware will continue to wash as expected. After the temperature increases past the minimum, the message stops. When disabled, there will be no extra message indicating a low temperature event.	Disabled / Enabled	Disabled
Add Chem Alerts	Stero SU-L Stero SG	Stero SU-H	Disables or enables an audible and visual alert if chemical is not being detected.	Disabled Visual Audio and Visual	Audio and Visual
End Cycle Audio Alert	Stero SU-L Stero SG	Stero SU-H	Disables or enables an audible and visual alert if chemical is not being detected.	Disabled Visual Audio and Visual	Disabled
Temperature Units	Stero SU-L Stero SG	Stero SU-H	Sets the display units to either Fahrenheit or Celsius.	Fahrenheit Celsius	Fahrenheit
Language	Stero SU-L Stero SG	Stero SU-H	Sets the language on the display.	English French Spanish	English
Exit Menu	Stero SU-L Stero SG	Stero SU-H	Exits Edit Parameters mode.		

PRIME PUMPS					
Parameter Name	**Cold Units (Stero SU-L) (Glass Unit: Stero SG)**	**Hot Units (Stero SU-H)**	**Description**	**Possible Values**	
Pump Menu				**Pump Menu**	
	Stero SU-L Stero SG		Manual prime for sanitizer pump. If chemical sensor value is below set threshold value, priming stops.	Sanitizer **NOTE:** Default values shown in **bold**.	**1100mV** Range: 70 to 2900 mV
	Stero SU-L Stero SG	Stero SU-H	Manual prime for detergent pump. If chemical sensor value is below set threshold value, priming stops.	Detergent **NOTE:** Default values shown in **bold**.	**1100mV** Range: 70 to 2900 mV
	Stero SU-L Stero SG	Stero SU-H	Manual prime for rinse aid pump. If chemical sensor value is below set threshold value, priming stops.	Rinse Aid **NOTE:** Default values shown in **bold**.	**2500mV** Range: 70 to 2900 mV
Exit Menu	Stero SU-L Stero SG		Press ENT to exit the Prime Pumps Menu and return to the Soap Menu. Any settings that were changed are saved.		

EXIT MENU			
Parameter Name	**Cold Units (Stero SU-L) (Glass Unit: Stero SG)**	**Hot Units (Stero SU-H)**	**Description**
Exit Menu	Stero SU-L Stero SG	Stero SU-H	Exits menu.

TESTING SANITIZER (BLEACH) CONCENTRATION (P.P.M.)

NOTE: If servicing a new machine or a machine that has run out of sanitizer and a new bottle is being installed, it may be necessary to prime the pump. Refer to Prime Pumps in SOAP PROGRAMMING (7627).

1. Be sure rack in dishwasher is empty.
2. Close the door and start a cycle.
3. After wash cycle and just before rinse cycle starts, open door and place a 6 to 8 ounce clean glass upright in each corner of the rack and one in the center to collect water. Be sure open end is up. Close the door and finish the rinse cycle.
4. Open the door and pour all the liquid from the five glasses into one of the glasses.
5. Follow the directions precisely that are on the litmus paper vial and test the water in the glass. Concentration should be 50 P.P.M. minimum to 100 P.P.M. maximum.
6. If reading is incorrect, adjust Sanitizer Flow Rate in SOAP PROGRAMMING (7627).

7. Repeat procedure until proper reading is obtained.

BYPASS WASH/HEAT CYCLES FOR TROUBLESHOOTING

NOTE: Must be in Toggle Diagnostics mode to bypass.

The Wash and Heat Cycle can be sped up to save time during troubleshooting or servicing.

Wash Cycle

1. Once wash cycle has begun, press hidden key between ENTER and POWER buttons.

   NOTE: Hidden key can be used to shorten the wash or heat cycle to 5 seconds.

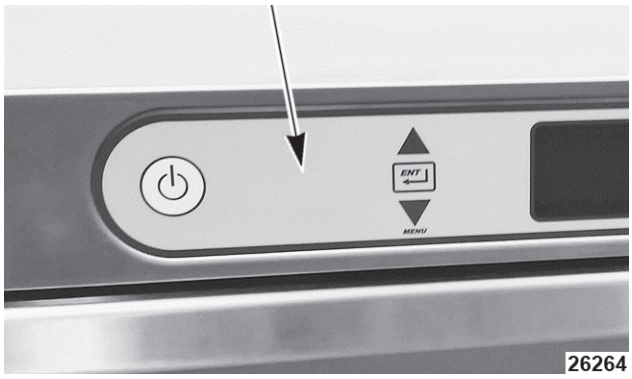


Fig. 45

2. Bypass rinse cycle as necessary.

Fill Cycle

1. During the heat up stages of the fill cycle, press the hidden key between ENTER and POWER buttons.
2. Bypass fill cycle as necessary.

10K OHM THERMISTOR TEST - BOOSTER (3QTM) & SUMP (1QTM)

NOTE: Surface mounted thermistor.

1. Determine temperature of water.
2. Disconnect thermistor leads.
3. Determine resistance of thermistor.
4. Compare resistance to chart.

Thermistor Temperature /Resistance Chart		
70°F = 11.9kΩ	130°F = 3.0kΩ	190°F = 982Ω
80°F = 9.3kΩ	140°F = 2.5kΩ	200°F = 827Ω
90°F = 7.3kΩ	150°F = 2.0kΩ	210°F = 701Ω
100°F = 5.8kΩ	160°F = 1.7kΩ	250°F = 377Ω
110°F = 4.7kΩ	170°F = 1.4kΩ	290°F = 215Ω
120°F = 3.8kΩ	180°F = 1.2kΩ	

PURGE BOOSTER/HOLDING TANK FOR SERVICE

NOTE: Booster or holding tank will still have 1" to 1-1/2" of water inside after purging.

If rinse pump operational:

1. Place dishwasher in .
2. Short rinse pump pins (J16) on control board to operate rinse pump.

If rinse pump not operational:

1. Remove right side panel.
2. Remove hose from air gap that runs to bottom of booster/rinse tank.

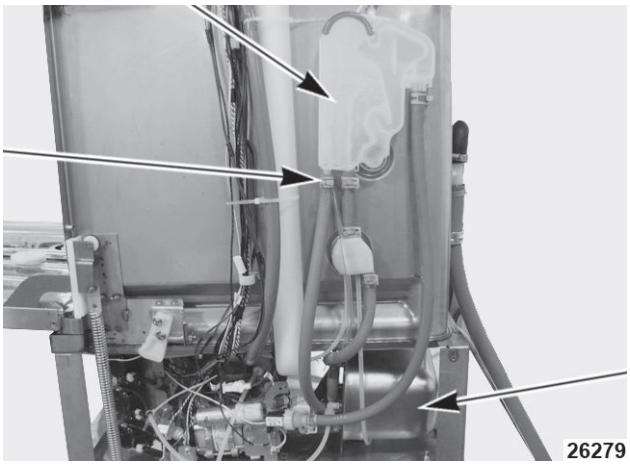


Fig. 46

3. Drain water in pan.

DOOR ADJUSTMENT

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove left and right panels as necessary.
2. Close door.
3. Roller should be positioned below cam to hold the door in place.

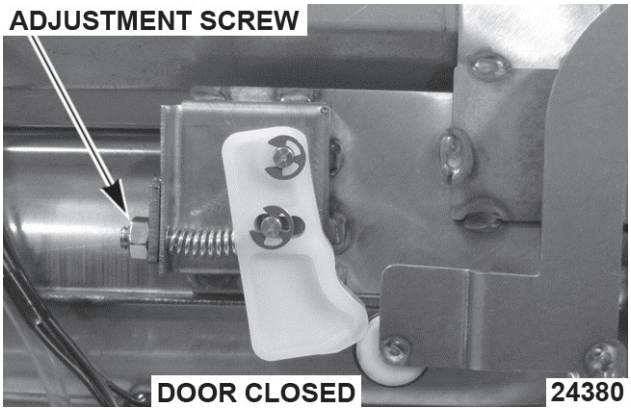


Fig. 47

   A. If door is not held closed, loosen lock nut and turn screw clockwise.

   B. If door is hard to open, loosen lock nut and turn screw counterclockwise.

   C. Tighten lock nut.

4. Open door a few inches until the roller is positioned in the indent of the cam. The door should stay in this position until moved by the operator.

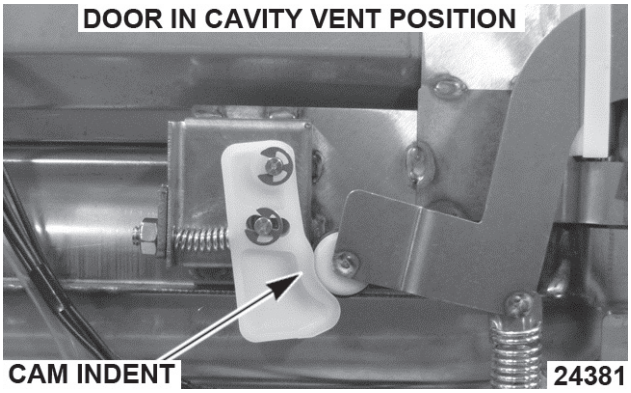


Fig. 48

5. Install panels and check for proper operation.

SUMP HEATER TEST

⚠ WARNING Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

NOTE: This test is to test the heating element. It is NOT a test for machine calling for heat.

NOTE: Tank must be filled with water (pressure switch closed) in order to test tank heat circuit.

1. Remove LEFT AND RIGHT TRIM PANELS.
2. Apply power to machine and turn machine on.
3. Verify voltage at element; verify it matches machine specifications on data plate, when calling for heat.
4. With voltage supplied and verified, take amp probe to one lead wire of element and verify current (amps) specifications per SUMP HEATER TEST SPECIFICATIONS.
5. If current (amps) is incorrect or does not match specifications on data plate, replace heating element.

SUMP HEATER TEST SPECIFICATIONS		
VOLTAGE	**CURRENT**	**RESISTANCE**
120 V	10.1 - 11.8 Amps	9.6 - 11.2 Ω
208 V	5.9 - 6.8 Amps	28.9 - 33.5 Ω
240 V	6.8 - 7.9 Amps	28.9 - 33.5 Ω

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

Resistance Test on Heating Element

1. Remove LEFT AND RIGHT TRIM PANELS.
2. Disconnect lead wires to heater.
3. Test the heater for resistance and compare meter reading to SUMP HEATER TEST SPECIFICATIONS.

BOOSTER HEATER TEST

⚠ WARNING Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

NOTE: This test is to test the booster heating element. It is NOT a test for machine calling for heat.

NOTE: Tank must be filled with water (pressure switch closed) in order to test tank heat circuit.

1. Remove LEFT AND RIGHT TRIM PANELS.
2. Apply power to machine and turn machine on.
3. Verify tank heat contactor is energized.
4. Take voltage reading across all legs of booster heating element.
5. Verify voltage at element; verify it matches machine specifications on data plate, when calling for heat.
6. With voltage supplied and verified, take amp probe to one lead wire of element and verify current (amps) specifications per BOOSTER HEATER TEST SPECIFICATIONS.
7. If current (amps) is incorrect or does not match specifications on data plate, replace booster heating element.

BOOSTER HEATER TEST SPECIFICATIONS		
SUPPLY VOLTAGE	**CURRENT**	**RESISTANCE**
208/60/1	16.0 - 18.7 Amps	10.6 - 12.3 Ω
240/60/1	18.5 - 21.6 Amps	10.6 - 12.3 Ω

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures.

Resistance Test on Booster Heating Element.

1. Remove LEFT AND RIGHT TRIM PANELS.
2. Disconnect lead wires to heater.

3. Test the heater for resistance and compare meter reading to BOOSTER HEATER TEST SPECIFICATIONS.

100K OHM THERMISTOR TEST - RINSE PROBE (2QTM)

1. Determine temperature of water.
2. Disconnect thermistor leads.
3. Determine resistance of thermistor.
4. Compare resistance to chart.

Thermistor Temperature /Resistance Chart		
70°F = 120kΩ	130°F = 28kΩ	190°F = 8.2kΩ
80°F = 91kΩ	140°F = 22.5kΩ	200°F = 6.9kΩ
90°F = 72kΩ	150°F = 18kΩ	210°F = 5.8kΩ
100°F = 55kΩ	160°F = 14.5kΩ	250°F = 2.9kΩ
110°F = 44kΩ	170°F = 12kΩ	290°F = 1.6kΩ
120°F = 34.5kΩ	180°F = 10kΩ	

ELECTRICAL OPERATION

COMPONENT FUNCTION

Control Board	Controls operation of dishwasher.
F1	2.5A slow blow fuse. Provides over current protection for 120VAC control circuit.
F2	0.5A slow blow fuse. Provides over current protection for fill valve (1SOL).
F4	1.25A slow blow fuse (3-phase and 1-phase/2-wire units only) . Provides over current protection for primary of transformer (2T).
Power Supply Board	Manages power supply and distributes to control board and other components.
Power Supply Board Fuse (F1)	1.0A slow blow fuse. Provides over current protection for 12VAC supply.
Keypad	Provides user interface to control board.
Display Module	Visual display shown in window of keypad. Shows machine operation and programming.
Transformer (1T)	Transforms primary voltage down to secondary voltage (24VAC).
Transformer (2T)	Steps down primary voltage to 120VAC for control circuit. (3-phase and 3-wire units only)
Relay (1CR)	Controls power to sump heater (1HTR).
Sump Heater (1HTR)	Heats water in sump.
1TAS/2TAS	Sump high limit protection.
1PRS Water Level Sensor	Supplies mV reading for water level in sump. Acceptable range: 500 - 850 mV.
Contactor (1CON)	Controls power to booster heater. (SU-H only)
Booster Heater (2HTR)	Heats water in booster for hot rinse cycles. (SU-H only)
Booster Thermistor (3QTM)	Booster temp sensor. (SU-H only)
Sump Thermistor (1QTM)	Sump temp sensor. (Surface mounted)
3TAS/4TAS	Booster high limit protection. (SU-H only)
2PRS Water Level Sensor	Supplies mV reading for water level in booster. Acceptable range: 500 - 1400 mV.
Soft Start (Q16)	Control Soft Start on the wash pump motor.
Wash Pump Motor (1MTR)	Drives wash pump, which pumps for wash and autoclean cycles.
Rinse Pump Motor (2MTR)	Drives rinse pump, which pumps water for rinse cycle and fill cycle.
Rinse Probe (2QTM)	Monitors rinse water temperature.
Fill Valve (1SOL)	When energized, allows water to enter the holding tank or booster.

Drain Pump Motor (3MTR) . . . . . . When energized, pumps water from the tank.

Door Switch (1LS) . . . . Disables wash and rinse pumps while door is open.

5MTR . . . . . . Detergent pump motor. Runs on 12VDC.

6MTR . . . . . . Rinse aid pump motor. Runs on 12VDC.

7MTR . . . . . . Sanitizer pump motor. Runs on 12VDC.

1CHS . . . . . . Detects presence of detergent in tube.

2CHS . . . . . . Detects presence of rinse aid in tube.

3CHS . . . . . . Detects presence of sanitizer in tube.

COMPONENT LAYOUT

NOTE: SU & SG series shown below.

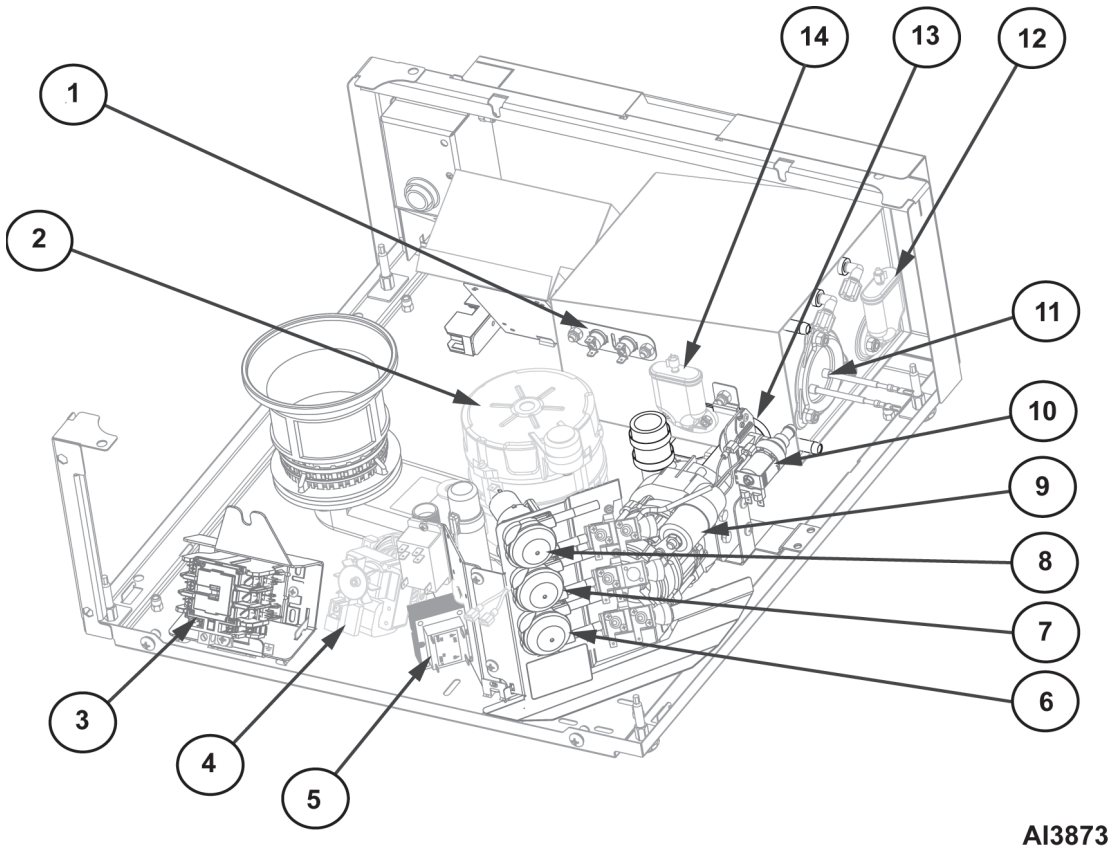


Fig. 49

NUMBER	DESCRIPTION	ELECTRICAL CALLOUT
1	Booster Overtemp Thermostat (Hot unit only: SU-H)	3TAS / 4TAS
2	Wash Pump Motor	1MTR
3	Booster Heat Contactor (Hot unit only: SU-L) Terminal Block (COLD units only: SU-L & SG)	1CON 1TB

NUMBER	DESCRIPTION	ELECTRICAL CALLOUT
4	Drain Pump	3MTR
5	Transformer	1T
6	Sanitizing Pump (COLD units only: SU-L & SG)	1MTR
7	Rinse Aid Pump	6MTR
8	Detergent Pump	5MTR
9	Rinse Pump	2MTR
10	Fill Valve	1SOL
11	Booster Heater (Hot unit only: SU-H)	2HTR
12	Booster Water Level Air Trap (Hot unit only: SU-H)	—
13	Booster Temperature Sensor (Hot unit only: SU-H)	3QTM
14	Booster Water Level Air Trap (COLD units only: SU-L & SG)	—

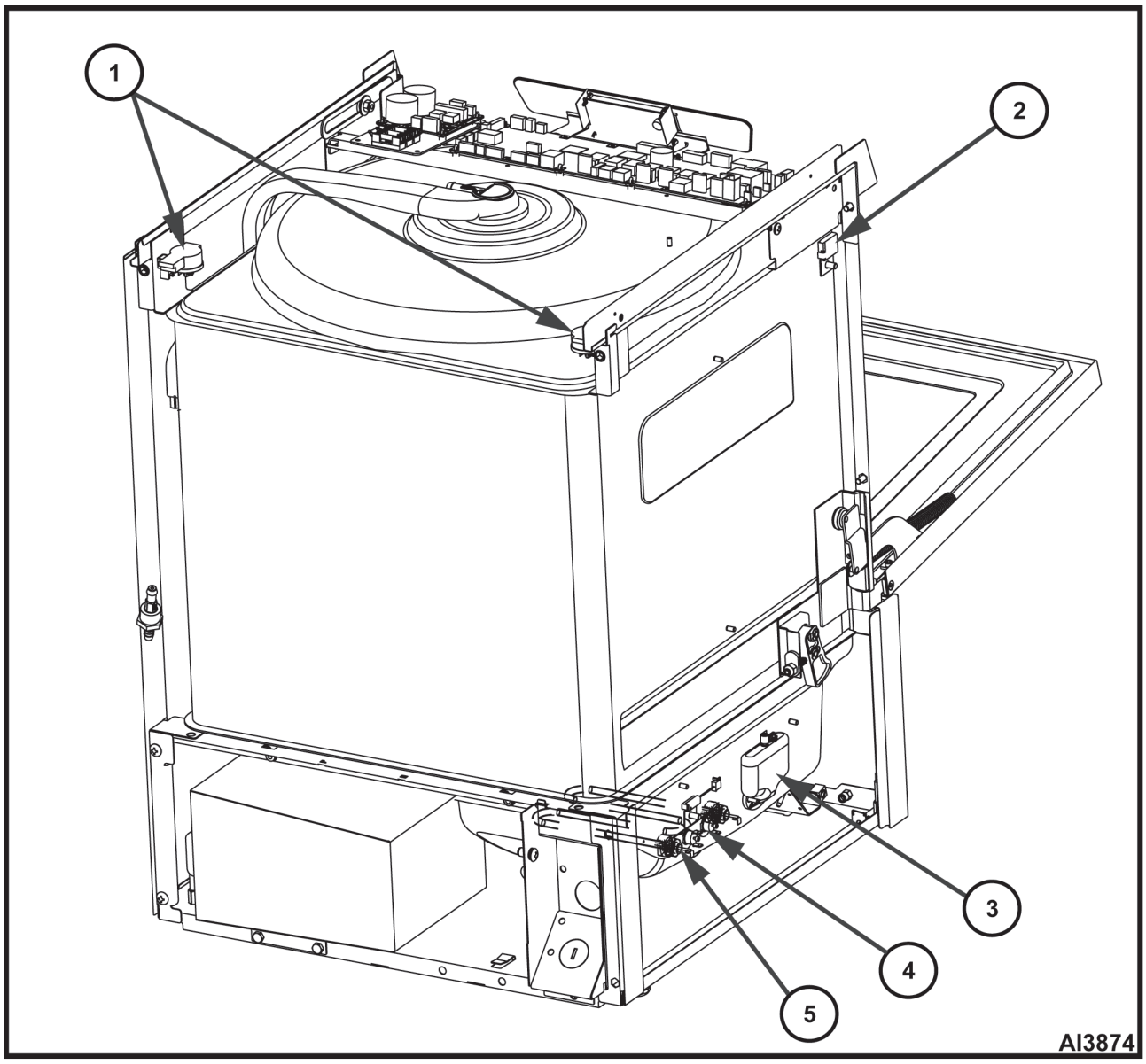


Fig. 50

NUMBER	DESCRIPTION	ELECTRICAL CALLOUT
1	Water level sensors	1PRS / 2PRS
2	Door Switch	1LS
3	Sump level air trap	--
4	Sump heater overtemp thermostat	1TAS / 2TAS
5	Sump heater	1HTR

CONTROL BOARD LEDs

Place unit in CONTROL PANEL SERVICE POSITION to access control board.

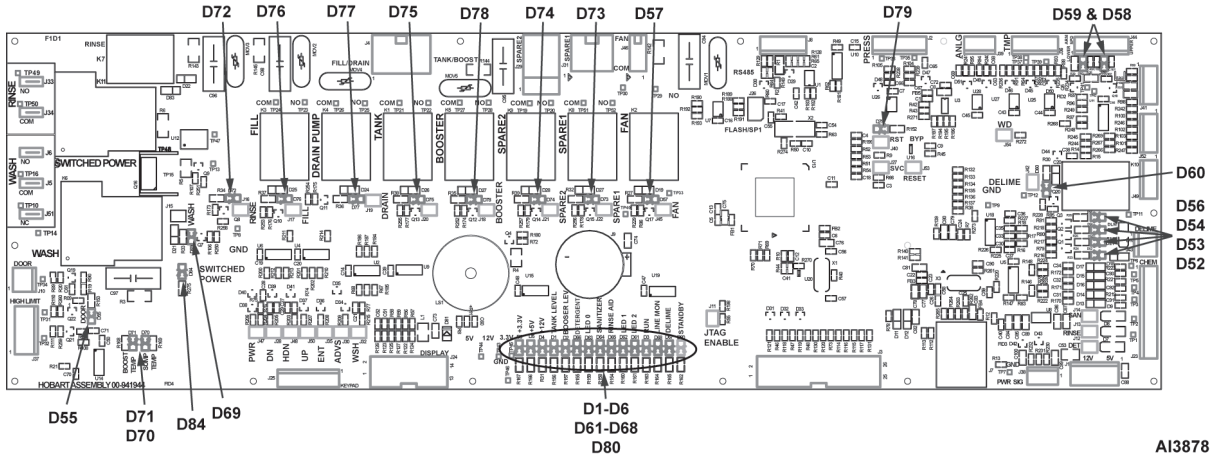


Fig. 51

CONTROL BOARD LEDs		
Designation	**Function**	**Color**
D1	Sump Water Level	Green
D2	Booster Water Level	Green
D3	Run	Green
D4	+12VDC	Green
D5	+5VDC	Green
D6	+3.3VDC	Green
D52	Detergent Pump ON	Red
D53	Rinse Aid Pump ON	Red
D54	Sanitizer Pump ON	Red
D55	Door Switch Closed	Green
D61	LED 2	Red
D62	LED 1	Red
D63	LED 0	Red
D64	Sanitizer Sensor ON - Chemical Detected	Red

CONTROL BOARD LEDs		
Designation	**Function**	**Color**
D65	Rinse Aid Sensor ON - Chemical Detected	Red
D66	Detergent Sensor ON - Chemical Detected	Red
D68	Line Monitor	Red
D69	Wash Pump ON	Red
D70	Sump High Limit ON - Tripped	Red
D71	Booster High Limit ON - Tripped	Red
D72	Rinse Pump ON	Red
D73	Spare Relay 1 ON	Red
D74	Spare Relay 2 ON	Red
D75	Sump Heater Relay ON	Red
D76	Fill Valve Relay ON	Red
D77	Drain Pump Relay ON	Red
D78	Booster Relay ON	Red
D79	Reset Active	Red
D80	Standby	Amber
D84	Switched Power Relay ON	Red

CONTROL BOARD TEST POINTS

Place unit in CONTROL PANEL SERVICE POSITION to access control board.

NOTICE Line voltage test points cannot be tested using control board ground, use N for 120 volt machines and L3/N for 120 volt components of the 208-240 volt machines and L2 for line voltage components.

NOTE: N.O. contacts will show 0 volts until the relay is energized, they will then show the same voltage that is present on the COM terminal.

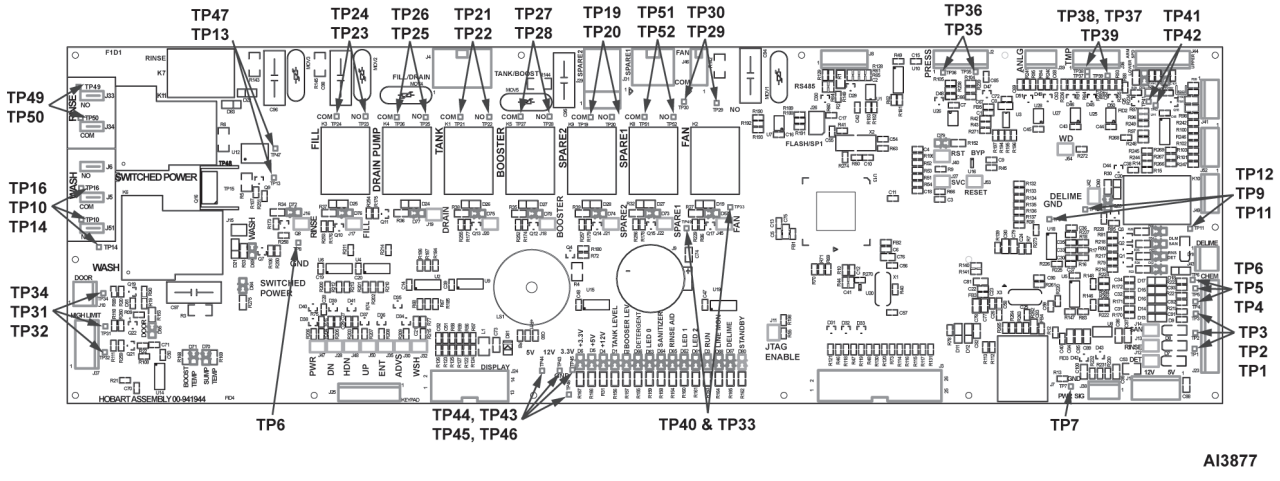


Fig. 52

CONTROL BOARD TEST POINTS 120 - 240 VAC & VDC			
Designation	**Function**	**SU-L** **SG**	**SU-H**
TP1 to Board GND	Detergent Pump	11-12VDC	11-12VDC
TP2 to Board GND	Rinse Aid Pump	11-12VDC	11-12VDC
TP3 to Board GND	Sanitizer Pump	11-12VDC	11-12VDC
TP4 to Board GND	Detergent Sensor	0-3.3VDC	0-3.3VDC
TP5 to Board GND	Rinse Aid Sensor	0-3.3VDC	0-3.3VDC
TP6 to Board GND	Sanitizer Sensor	0-3.3VDC	0-3.3VDC
TP7	Board GND for VDC	GND	GND
TP8	Board GND for VDC	GND	GND
TP9	Board GND for VDC	GND	GND
TP10 to L3/N	Wash Pump Relay - N.C. (cold machines)	120VAC	Not used
TP13 to Board GND	Soft Start Option ON	11-12VDC	11-12VDC
TP14	Door Switch Relay - N.O.	L3/N for 120VAC	L2 for208-240VAC
TP15	Door Switch Relay - N.O.	L3/N for 120VAC	L2 for208-240VAC
TP16	Wash Pump Relay - COM	L3/N for 120VAC	L2 for208-240VAC
TP19 to L3/N	Spare Relay 2 - COM (not used)	120VAC	120VAC
TP20 to L3/N	Spare Relay 2 - N.O. (not used)	120VAC	120VAC
TP21 to L3/N	Sump Heater K1-COM	120VAC	120VAC
TP22 to L3/N	Sump Heater K1-N.O.	120VAC	120VAC
TP23 to L3/N	Fill Valve K3-N.O.	120VAC	120VAC
TP24 to L3/N	Fill Valve K3-COM	120VAC	120VAC
TP25 to L3/N	Drain Pump K4-N.O.	120VAC	120VAC
TP26 to L3/N	Drain Pump K4-COM	120VAC	120VAC
TP27 to L3/N	Booster Relay K5-COM	120VAC	120VAC
TP28 to L3/N	Booster Relay K5-N.O.	120VAC	120VAC
TP31 to Board GND	Sump High Limit Status	11-12VDC	11-12VDC
TP32 to Board GND	Booster High Limit Status	11-12VDC	11-12VDC
TP34 to Board GND	Door Switch	11-12VDC	11-12VDC
TP35 to Board GND	Sump Pressure Sensor Water Level	0.450-3.3VDC	0.450-3.3VDC
TP36 to Board GND	Booster Pressure Sensor Water Level	0.450-3.3VDC	0.450-3.3VDC
TP37 to Board GND	Rinse Temperature Probe	0-3.3VDC	0-3.3VDC
TP38 to Board GND	Booster Temperature Probe	0-3.3VDC	0-3.3VDC
TP39 to Board GND	Sump Temperature Probe	0-3.3VDC	0-3.3VDC
TP43 to Board GND	+12VDC	11-12VDC	11-12VDC
TP44 to Board GND	+5VDC	4.95VDC	4.95VDC
TP45 to Board GND	+3.3VDC	3.2-3.3VDC	3.2-3.3VDC
TP46	Board GND for VDC	GND	GND
TP47 to Board GND	Soft Start Option ON	11-12VDC	11-12VDC

CONTROL BOARD TEST POINTS 120 - 240 VAC & VDC			
Designation	**Function**	**SU-L** **SG**	**SU-H**
TP48	Soft Start Triac Active	L3/N for 120VAC	L2 for208-240VAC
TP49	Rinse Pump Relay K7-COM	L3/N for 120VAC	L2 for208-240VAC
TP50	High Voltage Present	L3/N for 120VAC	L2 for208-240VAC
TP51 to L3/N	Spare Relay 1 - COM (not used)	120VAC	120VAC
TP52 to L3/N	Spare Relay 2 - N.O. (not used)	120VAC	120VAC

CONTROL BOARD JUMPERS

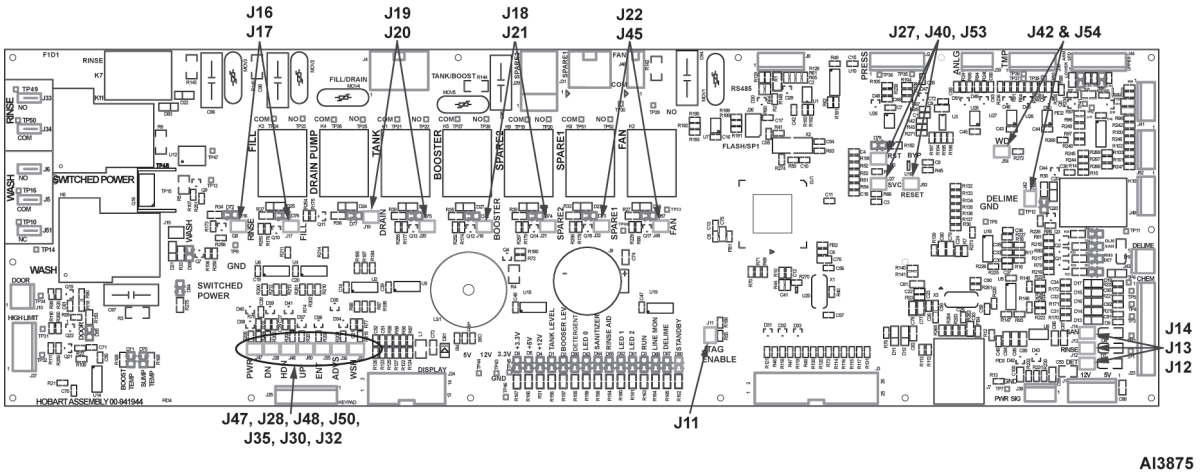


Fig. 53

JUMPER	COMPONENT	ACTION
J11	DO NOT USE	N/A
J12	DETERGENT PUMP	PUMP ON
J13	RINSE AID PUMP	PUMP ON
J14	SANITIZER PUMP	PUMP ON
J15	WASH PUMP	PUMP ON
J16	RINSE PUMP	PUMP ON
J17	FILL VALVE	VALVE ON
J18	BOOSTER HEATER CONTACTOR	BOOSTER HEATER ON
J19	DRAIN PUMP	PUMP ON
J20	SUMP HEATER RELAY	SUMP HEATER ON
J21	SPARE RELAY 2	RELAY ON
J22	SPARE RELAY 1	RELAY ON
J27	SERVICE	SERVICE DISPLAY
J28	KEYPAD - DOWN BUTTON	DOWN BUTTON
J32	KEYPAD - WASH BUTTON	WASH BUTTON
J35	KEYPAD - ENTER BUTTON	ENTER BUTTON

JUMPER	COMPONENT	ACTION
J40	DO NOT USE	N/A
J47	KEYPAD - POWER BUTTON	POWER BUTTON
J48	KEYPAD - HIDDEN BUTTON	HIDDEN BUTTON
J50	KEYPAD - UP BUTTON	UP BUTTON
J53	RESET	RESET MICRO
J54	DO NOT USE	N/A

CONTROL BOARD WIRE CONNECTIONS

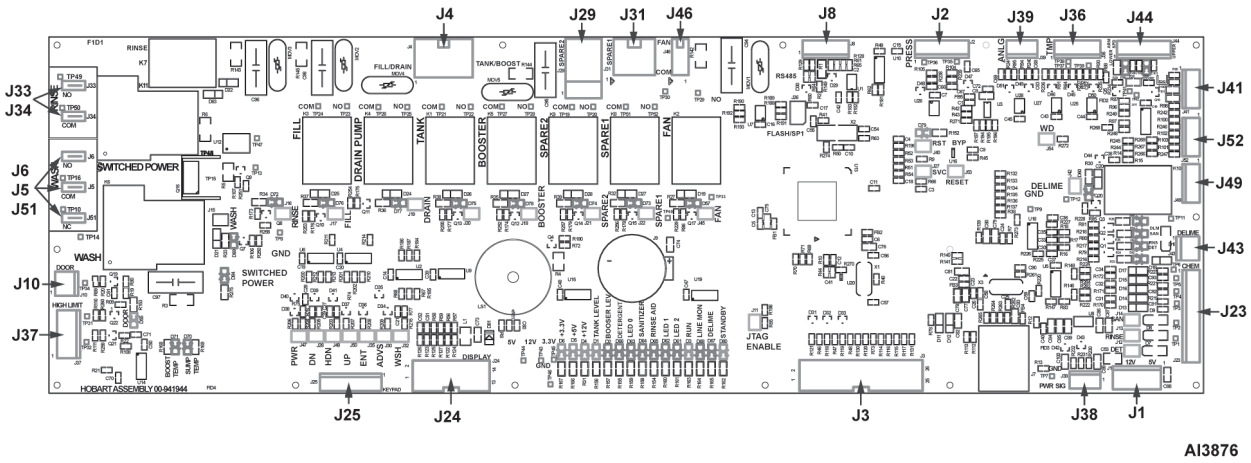


Fig. 54

WIRE CONNECTION	COMPONENT
J1	5V & 12V Supply
J2	Sump and Booster Water Level Pressure Sensors
J3	Not Used
J4	120V Control Circuit
J5	Wash Pump (Normally Open)
J6	Wash Pump
J8	RS485
J10	Door Switch
J23	Chemical Sensors & Pumps
J24	Display
J25	Keypad
J29	Not Used
J31	Not Used
J33	Rinse Pump
J34	Rinse Pump
J36	Sump, Booster, Rinse Temperature Probes
J37	Sump & Booster High Limits

J38	12V Control
J39	Not Used
J41	Not Used
J49	Not Used
J51	Wash Pump (Normally Closed)
J52	Not Used

POWER SUPPLY BOARD LEDs & TEST POINTS

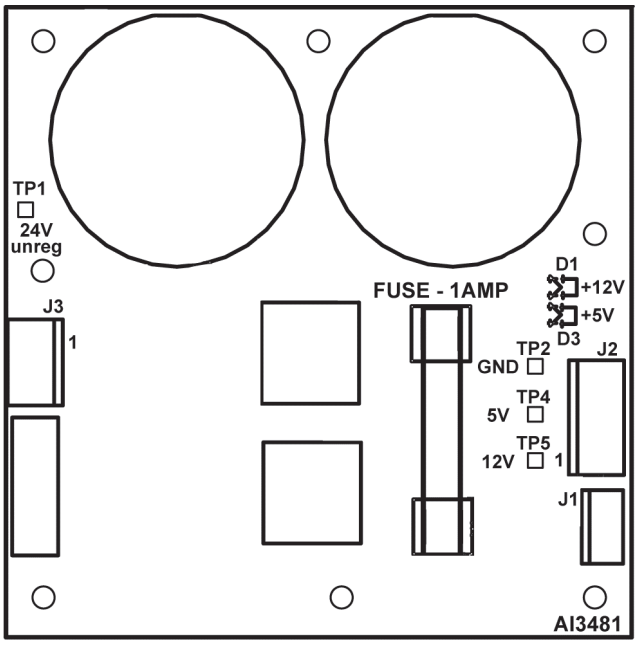


Fig. 55

POWER SUPPLY BOARD LEDs		
Designation	**Function**	**Color**
D1	+12VDC ON	Green
D3	+5VDC ON	Green

POWER SUPPLY BOARD TEST POINTS		
Designation	**Function**	**Voltage or Ground**
TP1	24V Unregulated	24V
TP2	Common	GND
TP4	+5VDC	4.9-5VDC
TP5	+12VDC	11-12VDC

SU-L & SG WIRING DIAGRAM

NOTE: Wiring diagrams are for both SU-L & SG.

SUPPLY	*	AMP**	NOTES
120/60/1	C	20	USE L1, N

ALIMENTATION	*	A**	REMARQUES
120/60/1	C	20	UTILISER L1, N

***C = CHEMICAL (NON BOOSTER)**

* = CHIMIQUE (NON SURVOLTEUR)

****** Minimum supply conductor ampacity / maximum protective device.**

** INTENSITÉ D'ALIMENTATION MINIMALE AU CONDUCTEUR / DEPOSITIF DE PROTECTION MAXIMALE

NOTE: For supply connection use copper wire only, suitable for 90°C min.

AVIS: POUR LES CONNEXIONS À L'ALIMENTATION, UTILISER UNIQUEMENT DES FILS DE CUIVRE SUPPORTANT AU MOINS 90°C.

NOTE: Torque power lugs to 40-45 inch pounds.

AVIS: SERRER LES COSSES DE PUISSANCE À UN COUPLE DE 40-45 LB-PO

⚠ WARNING For continued protection against fire, replace only with same type and rating fuse.

A VERTISSEMENT: POUR UNE PROTECTION CONTINUE CONTRE LE FEU, REMPLACER LE FUSIBLE UNIQUEMENT PAR UN FUSIBLE DE MÊME TYPE ET DE MÊME CALIBRE.

⚠ WARNING
Electrical and grounding connections must comply with the applicable portions of the National Electrical Code, ANSI/NFPA 70, latest edition, and /or other local electrical codes.

A VERTISSEMENT
Le raccordement électrique et la mise à la terre doivent être conformes aux normes concernées du code canadien del'électricité et/ou de tout autre code d'électricité en vigueur.

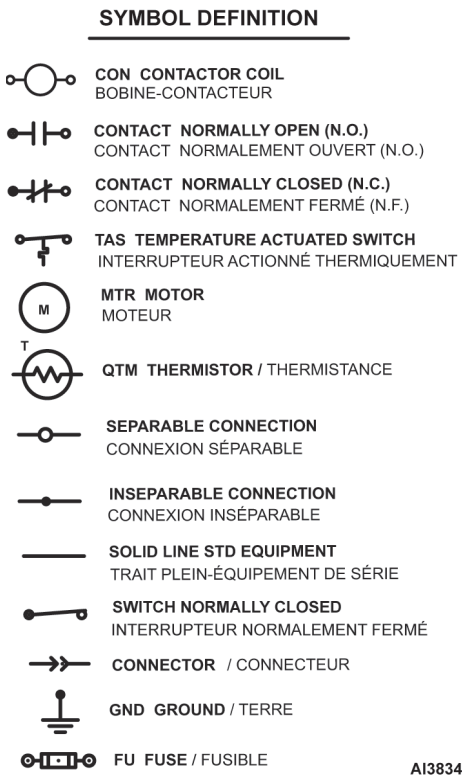

SYMBOL DEFINITION
CON CONTACTOR COIL
BOBINE-CONTACTEUR
CONTACT NORMALLY OPEN (N.O.)
CONTACT NORMALEMENT OUVERT (N.O.)
CONTACT NORMALLY CLOSED (N.C.)
CONTACT NORMALEMENT FERMÉ (N.F.)
TAS TEMPERATURE ACTUATED SWITCH
INTERRUPTEUR ACTIONNÉ THERMIQUEMENT
M
MTR MOTOR
MOTEUR
T
QTM THERMISTOR / THERMISTANCE
SEPARABLE CONNECTION
CONNEXION SÉPARABLE
INSEPARABLE CONNECTION
CONNEXION INSÉPARABLE
SOLID LINE STD EQUIPMENT
TRAIT PLEIN-ÉQUIPEMENT DE SÉRIE
SWITCH NORMALLY CLOSED
INTERRUPTEUR NORMALEMENT FERMÉ
CONNECTOR / CONNECTEUR
GND GROUND / TERRE
FU FUSE / FUSIBLE
AI3834

Fig. 56

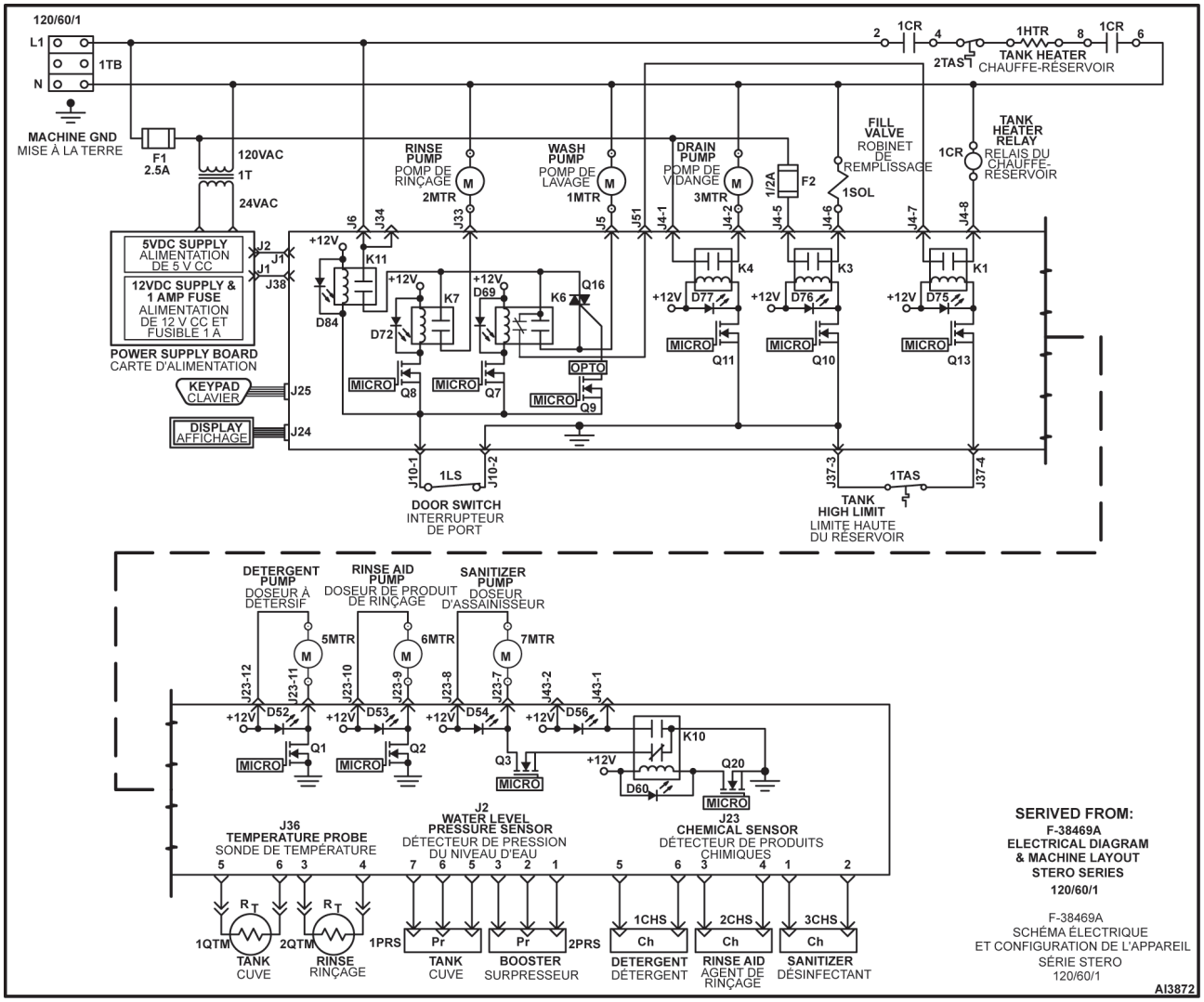


Fig. 57

SU-H (3 WIRE - 1PH) WIRING DIAGRAM

NOTE: Wiring diagrams are for SU-H.

SUPPLY	*	AMP**	NOTES
120/208-240(3W)/60/1	H	40	CURRENT CARRYING NEUTRAL.

ALIMENTATION	*	A**	REMARQUES
120/208-240(3W)/60/1	H	40	NEUTRE SOUS TENSION.

*** Hot - Hot (Booster)**

* CHARGÉ = CHARGÉ (SURVOLTEUR)

**** Minimum supply conductor ampacity / maximum protective device.**

** INTENSITÉ D'ALIMENTATION MINIMALE AU CONDUCTEUR / DEPOSITIF DE PROTECTION MAXIMALE

NOTE: For supply connections use copper wire only, suitable for 90°C min.

AVIS: POUR LES CONNEXIONS À L'ALIMENTATION, UTILISER UNIQUEMENT DES FILS DE CUIVRE SUPPORTANT AU MOINS 90°C.

NOTE: Torque power lugs to 40-45 inch pounds.

AVIS: SERRER LES COSSES DE PUISSANCE À UN COUPLE DE 40-45 LB-PO.

⚠ WARNING For continued protection against fire, replace only with same type and rating fuse.

AVERTISSEMENT: POUR UNE PROTECTION CONTINUE CONTRE LE FEU, REMPLACER LE FUSIBLE UNIQUEMENT PAR UN FUSIBLE DE MÊME TYPE ET DE MÊME CALIBRE.

⚠ WARNING
Electrical and grounding connection must comply with the applicable portions of the National Electrical Code, ANSI / NFPA 70, latest edition, and / or other local electrical code.

AVERTISSEMENT
Le raccordement électrique et la mise à la terre doivent être conformes aux normes concernées du code canadien de l'électricité et/ou de tout autre code d'électricité en vigueur.

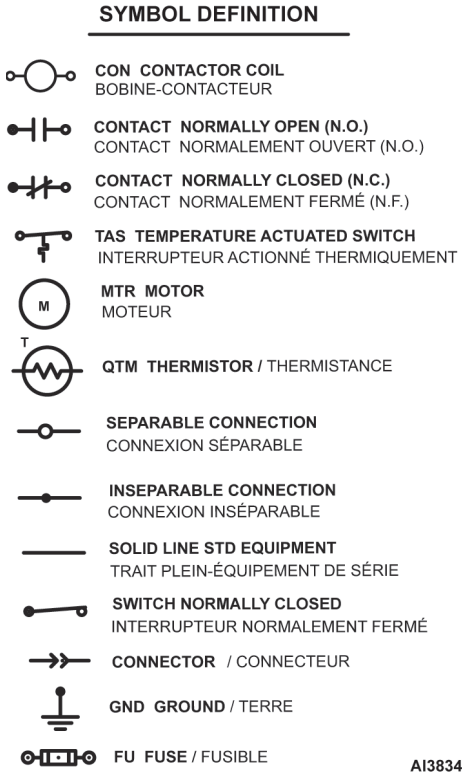


Fig. 58

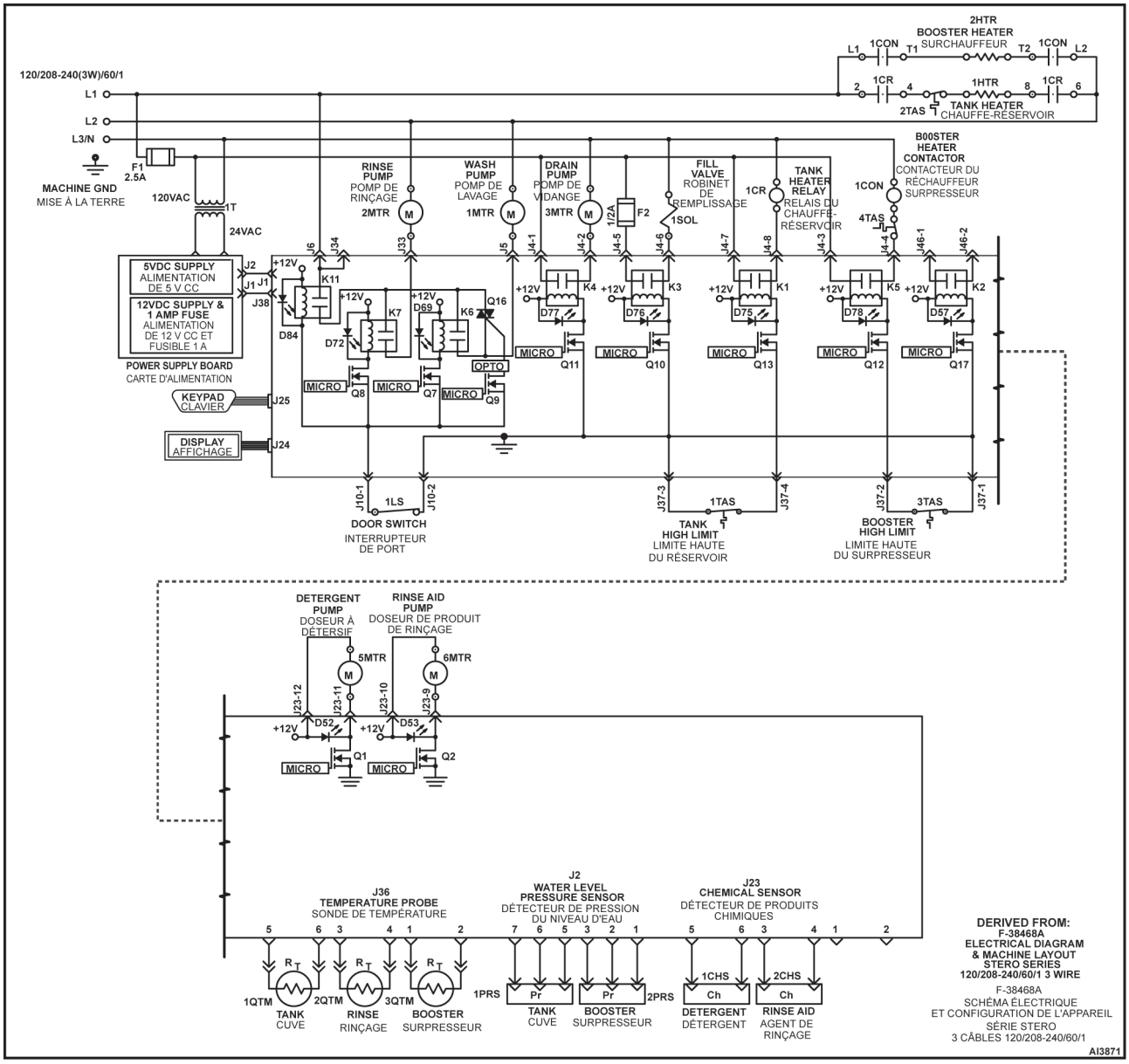


Fig. 59

SU-L & SG SEQUENCE OF OPERATION

NOTE: Machine connected to Supply Voltage - Power Button has not been pushed.

NOTE: Use SU-L & SG WIRING DIAGRAM for sequence.

Conditions

1. 120 VAC to 1T and 24VAC to Power Supply Board.
2. Power Supply Board 5VDC to Control Board.
3. Control Board supplies 3.3 VDC processor circuit voltage.
4. L1 to one side of K11-COM / 1CR-2 / K4-COM / K3-COM.
5. N to one side of 2MTR / 1MTR / 3MTR / 1SOL / 1CR-6 / 1CR-1.
6. Door closed.
7. Water supply at correct temperature and manual supply valve is on.
8. 1TAS and 2TAS closed.

Power-Up Diagnostics

1. Power Button pushed.
2. Machine type **SU-L** displayed.
3. Processor checks all sensors and probes for being within range of operation.

- Item name displayed on error.

4. K11 energized - N.O. contacts close.
   A. 120 VAC to K6-COM / K7-COM.
5. If water is detected in sump or holding tank, the machine will empty prior to filling.
   A. 1PRS has a reading of 500 mV or higher a drain cycle is initiated.
   B. Sump is drained - 3MTR energized for 80 sec.
   C. 3MTR de-energized.
   D. 2PRS has a reading of 500 mV or higher holding tank is emptied into sump - 2MTR energized for 20 sec.
   E. Sump is drained 3MTR energized.
   F. 3MTR de-energized when cycle time reaches 0.
6. Fill is initiated.
7. If chemical sensors do not detect chemicals, PRIMING CHEMICAL PUMPS is initiated.

Fill/Preheat Cycle

1. FILL displayed.
   A. K3 relay energizes.
   B. D76 turns on.
   C. Counter counts down from 300 seconds.
   D. 1SOL energized holding tank begins to fill.
2. Chemical pumps prime.
3. 2PRS senses 1400 mV.

NOTE: If counter counts down to 0, before holding tank reaches 1400mV, a FILL ERROR will occur and the problem must be fixed before proceeding.

   A. K3 relay de-energizes.
   B. D76 turns off.
   C. 1SOL de-energized.
4. 2MTR energized for 10 sec then de-energized.
   A. K7 energizes for 10 sec.
   B. D72 turns on for 10 sec.

NOTE: If all variables are met, counter will reset to 300 when returning to step 2.

5. Sump heater 1HTR energized when 1PRS senses 600 mV.
   A. K1 relay energizes.
   B. D75 turns on.
6. Steps 2 - 5 repeat until 1PRS senses 840 mV.
7. 1MTR energized for 3 - 10 sec to prime wash arms.
   A. K6 energizes.
   B. D69 turns on.
8. At end of 3 - 10 sec K1 cycles sump heater at 155°F (1QTM) until wash button is pressed.
9. READY displayed.

Wash and Drain Cycle SU-L 120/60/1

1. Wash button pressed.
2. WASH displayed.
3. K6 energizes.
   A. N.C. contacts open and power is prevented from energizing 1HTR during wash cycle.
   B. N.O. contacts close and 1MTR energized.
      1) 1MTR energized and runs at soft start speed for 5 sec.
      2) Operates at full speed for remainder of wash cycle.
   C. D69 turns on.
4. 5MTR detergent pump energized for 10 sec.
   A. D62 turns on for 10 sec.
5. 1SOL energized to fill holding tank.
   A. K3 energized.
   B. D76 turns on.

NOTE: If Rinse Aid is being used, 6MTR energized to add Rinse aid to the holding tank.

6. 2PRS senses 1400 mV.
   A. 1SOL de-energized.
      1) K3 de-energizes.
      2) D76 turns off.
7. Wash cycle time ends.
   A. 1MTR de-energized.
      1) K6 de-energizes.
      2) D69 turns off.
   B. 2 sec delay to stabilize water for accurate 1PSR reading.
   C. 1CR energized if temp below 155°F.
8. Drain cycle begins - WASH still displays.
   A. 3MTR energized.

1) K4 energizes.
2) D77 turns on.

B. 1PRS senses 840 mV.

C. 3MTR de-energized.
1) K4 de-energizes.
2) D77 turns off.

Rinse Cycle

1. 7MTR energized to add Sanitizer for 8 sec of 10 sec rinse cycle.
   A. D64 turns on for 8 sec.
2. RINSE displayed.
3. 2MTR energized for 10 sec.
   A. K7 energizes.
   B. D72 turns on.
4. 2MTR de-energized.
   A. K7 de-energizes.
   B. D72 turns off.
5. READY displayed.
6. Unit stays in the ready mode until a wash cycle is initiated or power is turned off.

Power Down Sequence

1. Push Power Button.
2. DRAIN displayed.
   A. 3MTR Drain pump energized.
      1) K4 energizes.
      2) D77 turns on.
   B. Water is pumped from sump.
   C. 3MTR Drain pump de-energized.
      1) K4 de-energizes.
      2) D77 turns off.
3. Water is pumped from holding tank.
   A. 2MTR energized for 18 sec.
      1) K7 energizes.
      2) D72 turns on.
   B. 2MTR de-energized.
      1) K7 de-energizes.
      2) D72 turns off.
4. Drain pump energized for 20 sec.
   A. 3MTR energized.
      1) K4 energizes.
      2) D77 turns on.
   B. At end of 20 sec 3MTR de-energized.
      1) K4 de-energies
      2) D77 turns off.
5. Dishwasher shuts off.

SU-H SEQUENCE OF OPERATION

NOTE: Machine connected to Supply voltage - Power Button has not been pushed

NOTE: Use SU-H (3 WIRE - 1PH) WIRING DIAGRAM for sequence

Conditions 120/208-240/60/1

1. 120 VAC to 1T and 24VAC to Power Supply Board
2. Power Supply Board 5VDC to Control Board
3. Control Board supplies 3.3 VDC processor circuit voltage
4. L1 to one side of K11-COM / 1CON-L1 / 1CR-2
5. L2 (208-240V) to one side of 2MTR / 1MTR / 1CON-L2 / 1CR-6
6. L3/N to one side of 3MTR / 1SOL / 1CR / 1CON
7. Door closed
8. Water supply at correct temperature and manual valve is open
9. 1 thru 4TAS closed

Power-Up Diagnostics

1. Power button pushed
2. Machine type **SU-H** displayed
3. Processor checks all sensors and probes for being within range of operation
   - Item name displayed on error
4. K11 relay energized - N.O. contacts close
   A. L1 voltage to K6-COM / K7-COM
5. If water is detected in sump or booster/holding tank, the machine will empty prior to filling.
   A. 1PRS has a reading of 500 mV or greater a drain cycle is initiated.
   B. Sump is drained - 3MTR energized for 80 sec
   C. 3MTR de-energized

D. 2PRS has a reading of 500 mV or greater - 2MTR is energized for 20 sec

E. Sump is drained - 3MTR energized.

F. 3MTR de-energized when timed cycle reaches 0

6. Fill is initiated.

7. If chemical sensors do not detect chemicals, PRIMING CHEMICAL PUMPS is initiated.

8.

Fill/Preheat Cycle

1. FILL displayed
   A. K3 relay energizes
   B. D76 turns on
   C. Counter counts down from 300 seconds
   D. 1SOL energized and booster begins to fill
2. Chemical pumps prime
   A. If rinse aid is used - 6MTR energized to add rinse aid to booster
3. 2PRS senses 830 mV
   A. K5 relay energizes
   B. D78 turns on
   C. 1CON energized
   D. 2HTR Booster Heater energized
4. 2PRS senses 1400 mV
   A. K3 relay de-energizes
   B. D76 turns off
   C. 1SOL de-energized
   D. WARMING UP displayed

NOTE: If counter counts down to 0, before holding tank reaches 1400Mv, a FILL ERROR will occur.

5. Booster temp reaches 140°F
   A. FILL displayed
   B. K5 relay de-energizes
   C. D78 turns off
   D. 1CON de-energized
   E. Counter resets to 30 seconds
6. 2MTR energized for 10 sec
   A. K7 energized for 10 sec
   B. D72 turns on for 10 sec

NOTE: If the cycle timer reaches 0 before 2PRS senses 500 mV the booster heater and rinse pump will be de-energized.

NOTE: Counter will reset before 0, if all variables are met.

7. 2PSR senses 500 mV - 2MTR de-energized.
8. Sump heater energized when 1PRS senses 600 mV
   A. K1 relay energizes
   B. D75 turns on
9. Steps 2 -8 repeat until 1PRS senses 840 mV
10. Tank probe senses 155°F
    A. K1 relay de-energizes
    B. D75 turns off
    C. 1MTR energized for 5 sec to prime wash arms
11. READY displayed
    A. Machine cycles at 155°F (1QTM)until wash button is pressed
    B. Booster heater cycles at 180°F (3QTM)

Wash and Drain Cycle SU-H

1. Wash button pressed
2. WASH displayed
3. K6 energizes
   A. 1MTR energized and runs at soft start speed for 5 sec.
   B. D69 turns on
   C. Operates at full speed for remainder of wash cycle
4. Counter counts down from 85 sec.
5. 5MTR detergent pump energized for 10 sec.
   A. D62 runs on for 10 sec.
6. 1SOL energized to fill booster tank
   A. K3 energized
   B. D76 turns on

NOTE: If Rinse Aid is being used, 6MTR energized to add Rinse aid to the holding tank.

7. 2PRS senses 1400 mV
   A. K3 de-energized
   B. D76 turns off
   C. 1SOL de-energized

8. Wash cycle time ends
   A. 1MTR de-energized
      1) K6 de-energizes
      2) D69 turns off
   B. Control checks booster temp (3QTM)
   C. If below 180°F wash cycle is extended 120 sec (Sense-A-Temp is optional)
      1) Booster reaches 180°F before 120 sec - wash cycle terminates.
      2) End of 120 sec Sense-A-Temp cycle before booster at 180°F, wash cycle terminates
   D. 2 sec delay to stabilize water for accurate 1PSR reading
   E. 1CR energized if temp below 155°F
9. Drain cycle begins - WASH still displays
   A. 3MTR energized
      1) K4 energizes
      2) D77 turns on
   B. 1PRS senses 840 mV
   C. 3MTR de-energized
      1) K4 de-energizes
      2) D77 turns off

Rinse Cycle

1. RINSE displayed
2. 2MTR energized for 10 sec
   A. K7 energizes
   B. D72 turns on
3. 2PRS senses 830 mV from booster
4. 1CON de-energized
5. 2MTR de-energized after 10 sec cycle
   A. K7 de-energizes
   B. D72 turns off
6. 1SOL energized to refill booster
   A. K3 energized
   B. D76 turns on
7. 5 sec into fill - READY displayed
8. 2PRS senses 1400 mV
9. 1SOL de-energized
   A. K3 de-energized
   B. D76 turns off
10. 2HTR cycles on 3QTM at 180°F
11. Unit stays in Ready Mode until a wash cycle is initiated or power is turned off.

Power Down Sequence

1. Push Power Button
2. DRAIN displayed.
   A. 3MTR Drain pump energized
      1) K4 energizes
      2) D77 turns on
   B. Water is pumped from sump.
   C. 3MTR Drain pump de-energized
      1) K4 de-energizes
      2) D77 turns off
3. Water is pumped from booster
   A. 2MTR energized for 18 sec
      1) K7 energizes
      2) D72 turns on
   B. 2MTR de-energized
      1) K7 de-energizes
      2) D72 turns off
4. Drain pump energized for 20 sec
   A. 3MTR energized
      1) K4 energizes
      2) D77 turns on
   B. At end of 20 sec - 3MTR de-energized
      1) K4 de-energies
      2) D77 turns off
5. Dishwasher shuts off.

CYCLE TIMING CHART

SU-L & SU-H - Cycle Timing						
Model	**Fill/Preheat**	**Wash**	**Dwell**	**Drain (max.)**	**Rinse**	**Dwell**
SU-L	Varies	85 sec.	3 sec	15 sec.	12 sec.	N/A
SU-H	Varies	85 sec. *	3 sec	15 sec.	11 sec.	5 sec.
* Maximum wash time may vary, depending on operation voltage and incoming water temperature for 70°F rise on SU-H (HOT ONLY) machines.						

SG - Cycle Timing						
Model	**Fill/Preheat**	**Wash**	**Dwell**	**Drain (max.)**	**Rinse**	**Dwell**
SG	Varies	56 sec. *	3 sec	15 sec.	10 sec.	N/A
* Maximum wash time may vary, depending on operation voltage and incoming water temperature for 70°F rise on SG machines.						

NOTE: Timing chart for base units. Unit timing may vary depending on customer settings.

TROUBLESHOOTING

TOGGLE DIAGNOSTICS

Toggle diagnostic screen is a useful tool for understanding the operation of the dishwasher. Toggle diagnostic screen allows values from the water level sensors in millivolts and water temperature in °F to be monitored in real time. There are other values monitored as shown on the Toggle Diagnostics graphic Fig. 60.

Real time means the numbers are constantly updating. The target number may be difficult to visualize because it will only be displayed for a short period of time.

The key to using this screen is knowing whether the numbers should be increasing, decreasing or staying relatively constant.

For example, if you are filling the booster or holding tank, the water level millivolt reading should be increasing.

- When the target of 830 mV is reached, you may not see 830 mV, but it will trigger the control board to energize Booster Relay K5. D78 will light and the Millivolt reading will still be increasing.
- When the target value of 1400 mV is reached, you may not see 1400 mV, but it will trigger the control board to de-energize Fill Relay K3. D76 will go out. The millivolt reading remains somewhat steady. You will still see the numbers move around due to the water still heating.

NOTE: Toggle diagnostic screen can be accessed two ways: through SERVICE PROGRAMMING (8934), or by shorting service pins (SVC) on control board if unit is in CONTROL PANEL SERVICE POSITION.

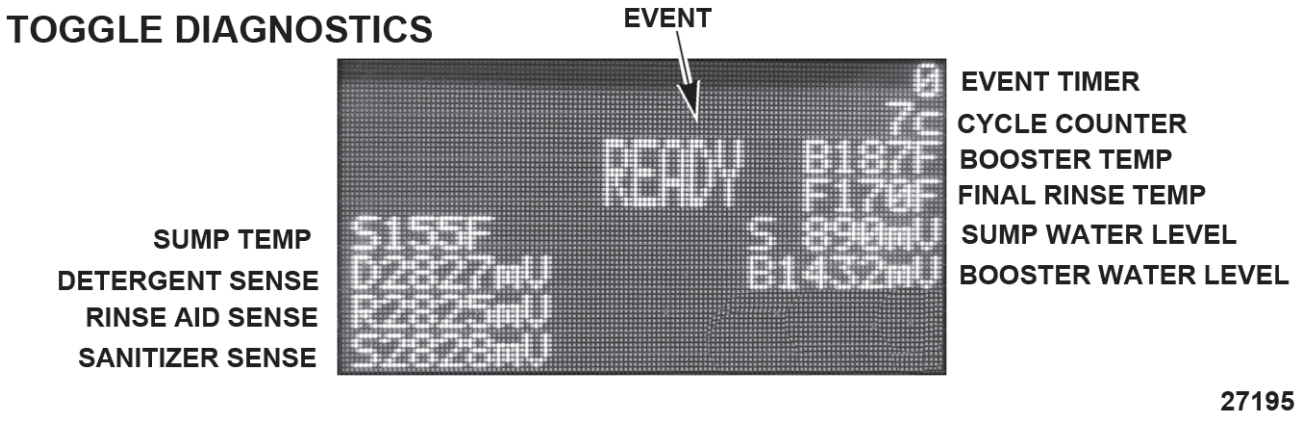


Fig. 60

ERROR CODES

The error codes will display as a result of the control board monitoring the operation of the machine. You will have to follow troubleshooting procedures in order to correct the problem.

There can be more than one error occurring during a cycle. If there are multiple errors, the left side of the display will have an up arrow ↑ and a down arrow ↓ indicating the need to scroll through the errors using the up and down arrows on the control panel.

During the repair procedure, power will be removed from the control board. This resets the error codes and allows the machine to be started.

Error	Display		Description
LOW RINSE TEMPERATURE LOW	LOW RINSE TEMP		After two consecutive low temperatures, if problem occurs on the third consecutive cycle, the error will display. The machine will continue to run cycles. (SU-H models only)
LOW RINSE TEMPERATURE LOW	LOW RINSE TEMP Check Water Input		If the Low Rinse Temperature error occurs for 10 consecutive cycles, the error will change. The machine will continue to run cycles. (SU-H models only)
WASH THERMISTOR ERROR	WASH TEMP SENSOR Service Required (Service Phone Number)		Error displayed if wash temperature probe is out of range. The machine will continue to run cycles.
BOOSTER THERMISTOR ERROR	BOOSTER TEMP SENSOR Service Required (Service Phone Number)		Error displayed if booster temperature probe is out of range. The machine will continue to run cycles. (SU-H models only.)
FINAL RINSE THERMISTOR ERROR	RINSE TEMP SENSOR Service Required (Service Phone Number)		Error displayed if final rinse temperature probe is out of range. The machine will continue to run cycles.
LOW WATER IN BOOSTER (TIME OUT WITHIN ANY CYCLE	FILL ERROR Service Required (Service Phone Number)		Error displayed if the unit times out before the unit is completely filled. The machine will not operate and will only allow power down.
DRAIN ERROR	DRAIN ERROR Service Required (Service Phone Number)		Error displayed if the water level in the unit will not lower to the set point after draining attempts. The machine will not operate and will only allow power down. Check for obstruction in drain or kinked hoses.
Door Open	Door Open		Displayed when the door of the machine is opened.
Sump Level Error	SUMP LEVEL SENSOR Service Required (Service Phone Number)		Error displayed if sump pressure sensor is out of range. The machine will not operate and will not allow power down.
Booster Level Error	BOOSTER LEVEL SENSOR Service Required (Service Phone Number)		Error displayed if booster pressure sensor is out of range. The machine will not operate and will not allow power down.

TROUBLESHOOTING GUIDE WARE

Symptom	Possible Causes
Dishes not clean.	1. Strainers clogged causing inadequate water supply to pump. 2. Obstruction in wash arm(s) or wash arms will not turn. 3. Wash and/or rinse arms will not turn – check that they spin freely. 4. Detergent pump inoperative. 5. Soil quantity – scrape dishes before cycle. 6. Improper rack loading. 7. Low water – check water supply. 8. Water temperature too low – note wash temperature on display during WASH; should be above 120°F for chemical sanitizing machines and above 150°F for high temperature machines.
Spotting of silverware, glasses, or dishes.	1. Improperly loaded racks. 2. Water temperature too low. 3. Improper type or concentration of detergent – contact your chemical representative. 4. Hard water – install a water softener; use a rinse agent. 5. Insufficient fill – check water supply.
Food soils remain in dishwasher.	1. Dishwasher not being cleaned thoroughly daily. 2. Strainer plugged.
Unexpected results on dishes.	1. Etching – usually caused by any combination of high temperatures, soft water, soft glass, or high alkaline washing solutions. 2. Tarnishing – avoid washing silver, silver plates, and pewter in chemical sanitizing machines. 3. Pitting – stainless steel may pit with lengthy contact of foods containing salt, fruit juices, vinegar, etc. Wash immediately. 4. Black or gray marks – may have been rubbed with aluminum. 5. Brown stains – may be due to high iron content in water supply. 6. Chipping – improper loading or ware is too delicate. 7. Fading of china patterns – usually due to high water temperature and strong detergent. Check that china is dishwasher compatible. 8. Wooden ware damage – avoid washing in dishwasher. 9. Rust on cast iron – seasoning is lost in dishwasher. Avoid washing in dishwasher. 10. Plastic ware distortion – high temperatures. Check plastic ware instructions.

TROUBLESHOOTING GUIDE MACHINE

Symptom	Possible Causes
No machine operation (no display).	1. Machine OFF. 2. Open fuse or circuit breaker off at power supply. 3. Cord not plugged in (corded models only). 4. L1 fuse F1 open. (120/60/1 and 120/208-240/60/1 and 3) 5. L1 fuse F4 open. (208-240/60/1 and 3) 6. 1T malfunction. 7. 2T malfunction. (208-240/60/1 and 3) 8. Power Supply Board malfunction. 9. Power Supply Board fuse F1 open. 10. Control Board malfunction. 11. Keypad malfunction.
No machine operation (with display).	1. ERROR CODES. 2. Keypad inoperative. 3. Control Board malfunction. 4. See MACHINE WILL NOT FILL OR NOT FILL HIGH ENOUGH..
Low temperature readings.	1. Low water supply temperature. 2. Rapid cycle use. 3. Heavy ware load cools wash water. 4. Incorrect line voltage. 5. Booster heater or sump heater set low – See SERVICE PROGRAMMING (8934). 6. Temperature probes open or shorted. 7. High limits open. 8. Heater malfunction. 9. 1CR malfunction. 10. 1CON malfunction (hot machines) 11. Lime build up on heater. 12. Control Board malfunction.
Booster not heating. (SU-H models ONLY)	1. Incorrect line voltage. 2. 2PRS malfunction including pressure sensor tubing and water trap. 3. Booster heater inoperative. 4. Temperature probe 3QTM open or shorted. 5. High limit 4TAS or 3TAS open. 6. 1CON malfunction. 7. Control Board malfunction.

Symptom	Possible Causes
Sump not heating.	1. Incorrect line voltage. 2. 1PRS malfunction including pressure sensor tubing and water trap. 3. Sump heater inoperative. 4. Temperature probe 1QTM open or shorted. 5. High limit 1TAS or 2TAS open. 6. 1CR malfunction. 7. Control Board malfunction.
Wash motor won't start.	1. Door open or door switch 1LS malfunction. If suspected, remove wire from control board, jumper J10 to test functionality. 2. 1PRS malfunction including pressure sensor tubing and water trap. 3. Pump motor 1MTR inoperative. 4. Control board malfunction.
Machine will not fill sump or will not fill high enough.	1. Rinse Relay K7 malfunction. 2. Switch Power Relay K11 malfunction. 3. Rinse Motor/Pump 2MTR inoperative. 4. 1PRS malfunction including pressure sensor tubing and water trap. 5. Control Board malfunction. 6. Booster/Holding Tank Water Level Sensor 2PRS inoperative including pressure sensor tubing and water trap. 7. Door Switch 1LS inoperative. 8. 1PRS and 2PRS are wired backwards.
Machine fills too high.	1. Sump Water Level Sensor 1PRS malfunction including pressure sensor tubing and water trap. 2. Booster/Holding Tank Water Level Sensor 2PRS malfunction including hose and water trap. 3. Fill valve 1SOL malfunction. 4. DRAIN PUMP malfunction. 5. Drain hose clogged or kinked. 6. Control Board malfunction.
Machine won't stop when door is opened.	1. Door switch 1LS inoperative. 2. Control board malfunction.

Symptom	Possible Causes
Machine leaks from door.	1. Machine not level. 2. Machine operated without a rack. 3. Door gasket malfunction. 4. Door not adjusted correctly. See DOOR ADJUSTMENT. 5. DRAIN PUMP malfunction. 6. Sump Water Level Sensor 1PRS malfunction. 7. Booster/Holding Tank Water Level Sensor 2PRS malfunctions. 8. Control Board malfunction. 9. Soft start not operational COMPONENT FUNCTION.
Door not staying closed during wash.	1. Roller and cam mechanism not adjusted as outlined under DOOR ADJUSTMENT. 2. Door spring malfunction. 3. Other door components malfunction.
Machine will not drain.	1. Drain hoses restricted. 2. Dishwasher needs power cycled. 3. DRAIN PUMP malfunction. 4. Door open during power down. 5. Control Board malfunction. 6. Sump water level sensor 1PRS malfunction including pressure sensor tubing and water trap.
Some water occasionally drips out of rinse arms.	1. This is normal due to expansion of water being heated in the booster tank.
Booster or holding tank takes too long to fill or won't fill.	1. Low water pressure. 2. Clogged hose strainer. 3. No water flow. 4. Fill valve malfunction. 5. Fill valve fuse F2 open. 6. Water level sensor 2PRS malfunction including hose and water trap. 7. Control board malfunction. 8. 1PRS and 2PRS may be wired backwards.
Chemicals not feeding	1. Low supply or tubing not positioned in bottle correctly. 2. Pumps not primed. 3. Air in lines. 4. Lines kinked. 5. Amount not programmed correctly. 6. Chemical Sensors malfunction. 7. Control Board malfunction. 8. Pinched tubing.

Symptom	Possible Causes
Noisy Wash Arm	1. Loose Wash Ring in upper wash arm, lower wash arm, or both. 2. Verify wash arm sealing ring is not warn.

CATALOG OF REPLACEMENT PARTS

SG & SU SERIES UNDERCOUNTER DISHWASHERS

ML-130273	SU-H
ML-130274	SU-L
ML-130259	SG (Cold)
ML-130260	SG (Cold)

A product of The Stero Company 1758 Corporate Circle Petaluma, CA 95476

FORM 43317 (October 2015)

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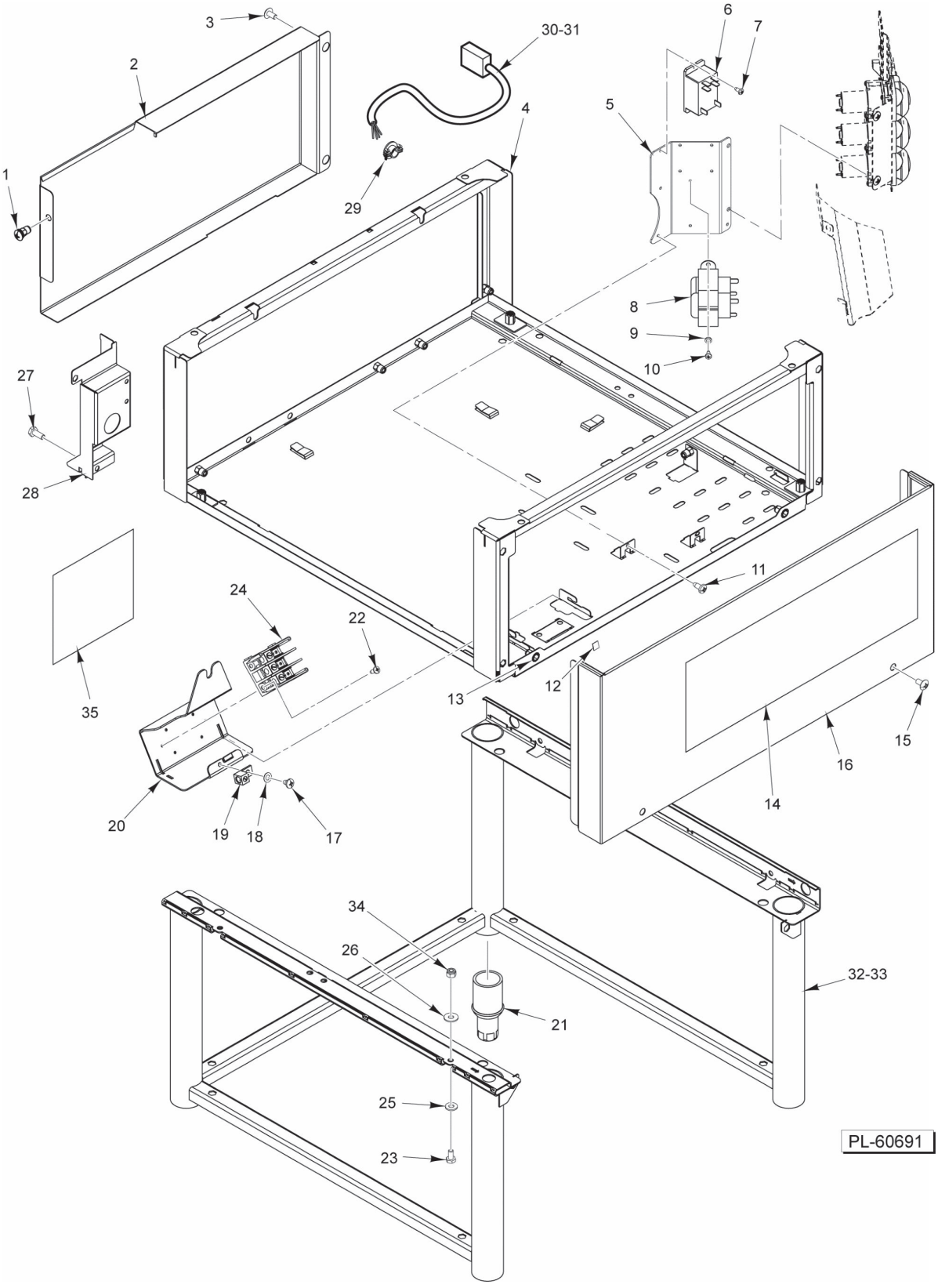
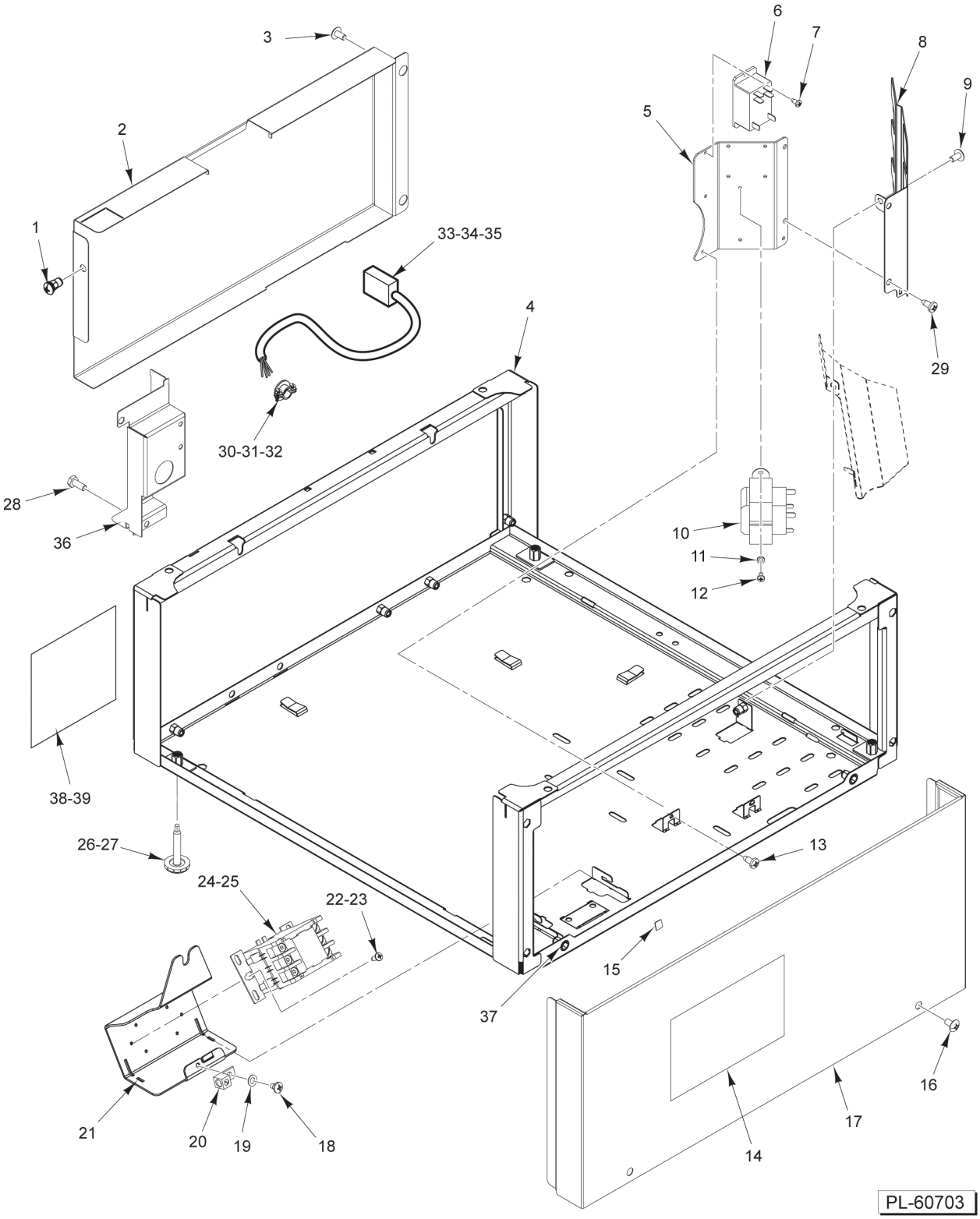


BASE ASSEMBLY (SG)

BASE ASSEMBLY (SG)

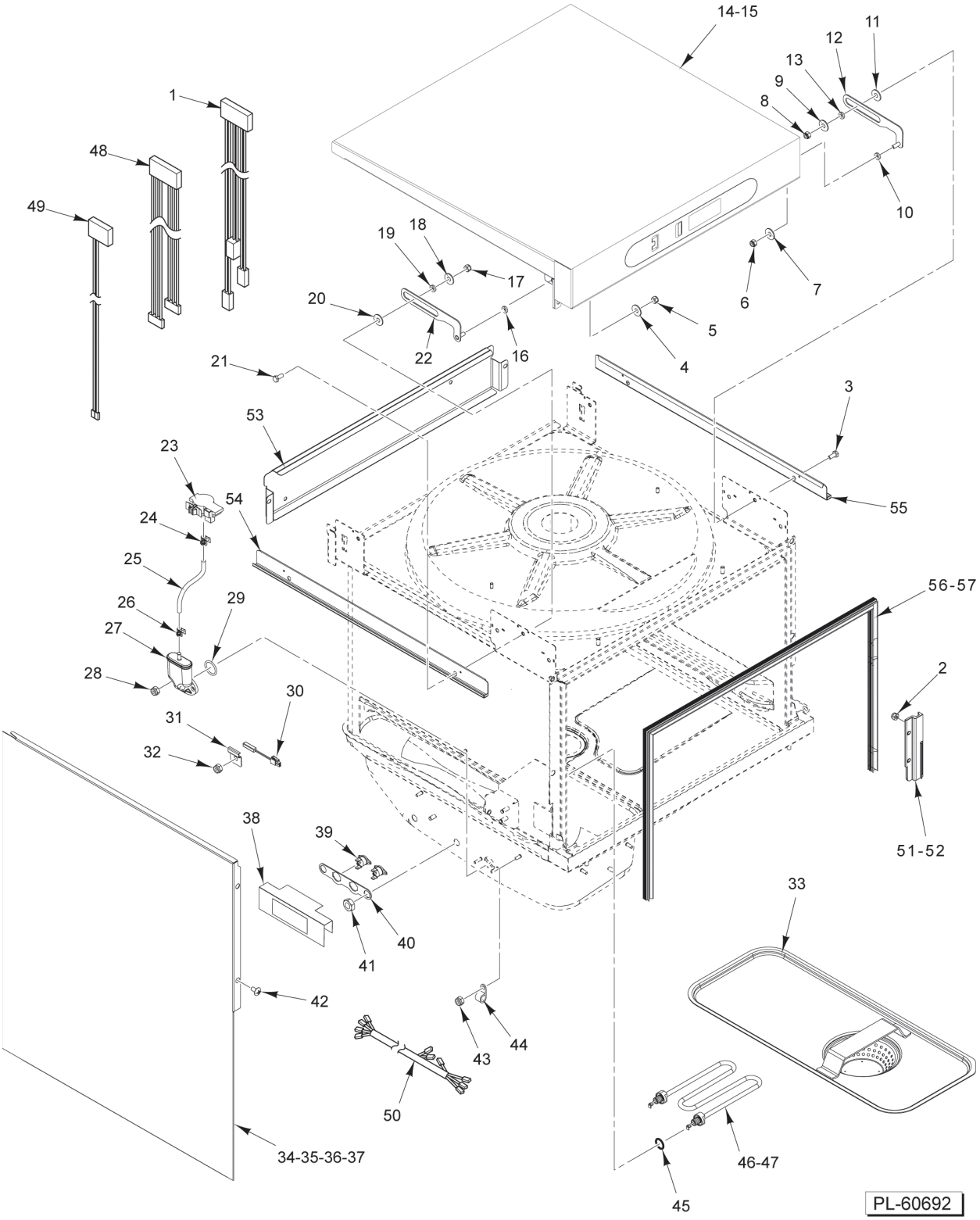
ILLUS. PL-60691	PART NO.	NAME OF PART	AMT.
1	0P-678345	Mach. Screw 1/4-20 x 1/2 Phil. Truss Hd	1
2	0A-108523	Panel - Cover (Rear)	1
3	0P-678345	Mach. Screw 1/4-20 x 1/2 Phil. Truss Hd	2
4	0A-108424	Base - Lower (Control Box)	1
5	0A-108428	Bracket - Contactor	1
6	0P-478361	Relay (2-Pole) (120 VAC) (30 Amp.)	1
7	0P-678160	Self-Tapping Screw 8-18 x 3/8 Phil. Bndg. Hd., Type B	2
8	0P-538484	Transformer (24 V., 30 Amp.)	1
9	0P-678163	Lockwasher #10 Helical (SST)	2
10	0P-678160	Self-Tapping Screw 8-18 x 3/8 Phil. Bndg. Hd., Type B	2
11	0P-678161	Self-Tapping Screw 10-16 x 1/2 Phil. Pan Hd., Type B	2
12	0A-698551	Label - Ground	1
13	0P-678390	Rivnut 1/4-20	AR
14	0A-698583	Label (Cleaning)	1
15	0P-678345	Mach. Screw 1/4-20 x 1/2 Phil. Truss Hd	2
16	0A-108514	Trim - Front	1
17	0P-678348	Self-Tapping Screw 1/4-20 x 3/8 Phil. Pan Hd., Type TT	1
18	0P-678351	Lockwasher 1/4 External Shakeproof	1
19	0P-528186	Lug - Grounding	1
20	0A-108539	Bracket	1
21	0P-608040	Foot - Adjustable (1-5/8) (SST)	4
22	0P-678160	Self-Tapping Screw 8-18 x 3/8 Phil. Bndg. Hd., Type B	2
23	0P-678568	Cap Screw 1/4-20 x 1/2 Hex Hd. (SST)	8
24	0P-528457	Block - Terminal (3-Pole)	1
25	0P-678170	Washer (SST)	8
26	0P-678575	Washer (SST)	4
27	0P-678568	Cap Screw 1/4-20 x 1/2 Hex Hd. (SST)	1
28	0A-108429	Box - Junction	1
29	0P-678560	Connector - Conduit	1
30	0A-108510	Kit - Power Cord Cord - Power (120 V.)	1
31	0A-108512	Kit - Power Cord 120/208-240 V., 3 Wire	1
32	0B-108516	Frame (Standard)	1
33	0B-108517	Frame (Short)	1
34	0P-678143	Stop Nut 1/4-20 Hex (SST)	4
35	0A-698553	Electric Diagram (120 V., 60 Hz., 1 Ph.)	1



BASE ASSEMBLY
(SU-H & SU-L)

BASE ASSEMBLY
(SU-H & SU-L)

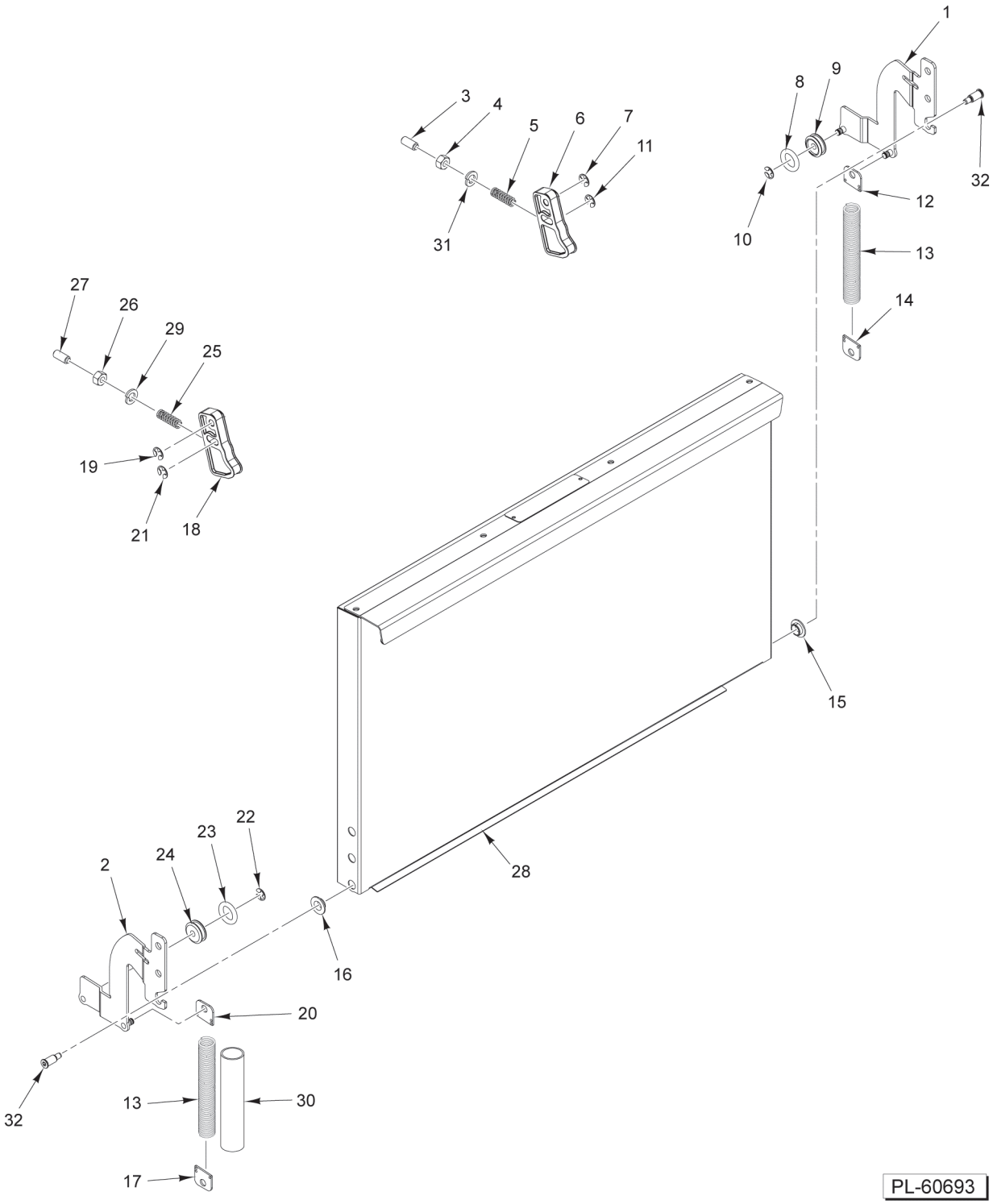
ILLUS. PL-60703	PART NO.	NAME OF PART	AMT.
1	0P-678345	Mach. Screw 1/4-20 x 1/2 Phil. Truss Hd	1
2	0A-108430	Panel - Cover (Rear)	1
3	0P-678345	Mach. Screw 1/4-20 x 1/2 Phil. Truss Hd	2
4	0A-108424	Base - Lower (Control Box)	1
5	0A-108428	Bracket - Contactor	1
6	0P-478361	Relay (2-Pole) (120 VAC) (30 Amp.)	1
7	0P-678160	Self-Tapping Screw 8-18 x 3/8 Phil. Bndg. Hd., Type B	2
8	0A-108427	Bracket - Chemical Pump (Welco)	1
9	0P-678345	Mach. Screw 1/4-20 x 1/2 Phil. Truss Hd	1
10	0P-538484	Transformer (24 V., 30 Amp.)	1
11	0P-678163	Lockwasher #10 Helical (SST)	2
12	0P-678160	Self-Tapping Screw 8-18 x 3/8 Phil. Bndg. Hd., Type B	2
13	0P-678161	Self-Tapping Screw 10-16 x 1/2 Phil. Pan Hd., Type B	2
14	0A-678380	Label (Cleaning)	1
15	0A-698551	Label - Ground	1
16	0P-678345	Mach. Screw 1/4-20 x 1/2 Phil. Truss Hd	2
17	0A-108431	Trim - Front	1
18	0P-678348	Self-Tapping Screw 1/4-20 x 3/8 Phil. Pan Hd., Type TT	1
19	0P-678351	Lockwasher 1/4 External Shakeproof	1
20	0P-528186	Lug - Grounding	1
21	0A-108539	Bracket	1
22	0P-678161	Self-Tapping Screw 10-16 x 1/2 Phil. Pan Hd., Type B (SU-H)	2
23	0P-678160	Self-Tapping Screw 8-18 x 3/8 Phil. Bndg. Hd., Type B (SU-L)	2
24	0P-478181	Contactor (25 Amp., 3-Pole) (SU-H)	1
25	0P-528457	Block - Terminal (3-Pole) (SU-L)	1
26	0A-108425	Foot - Leveling	4
27	0P-678426	Rivnut 5/16-18	4
28	0P-678568	Cap Screw 1/4-20 x 1/2 Hex Hd. (SST)	1
29	0P-678348	Self-Tapping Screw 1/4-20 x 3/8 Phil. Pan Hd., Type TT	2
30	0P-678558	Strain Relief - Electrical (1 In.)	1
31	0P-679559	Strain Relief - Electrical (3/4 In.)	1
32	0P-678555	Washer - Reducing (1 to 3/4 In.)	1
33	0A-108512	Kit - Power Cord (120-240 V., 60 Hz., 1 Ph.) (Incls. Item 30)	1
34	0A-108510	Kit - Power Cord (120-240 V., 60 Hz., 1 Ph.) (Incls. Items 31 & 32)	1
35	0A-108511	Kit - Power Cord (208-240 V., 60 Hz., 1 Ph.) (Incls. Item 30)	1
36	0A-108429	Box - Junction	1
37	0P-678390	Rivnut 1/4-20	AR
38	0A-698553	Electric Diagram (SU-L)	1
39	0A-698552	Electric Diagram (SU-H)	1



TANK ASSEMBLY

TANK ASSEMBLY

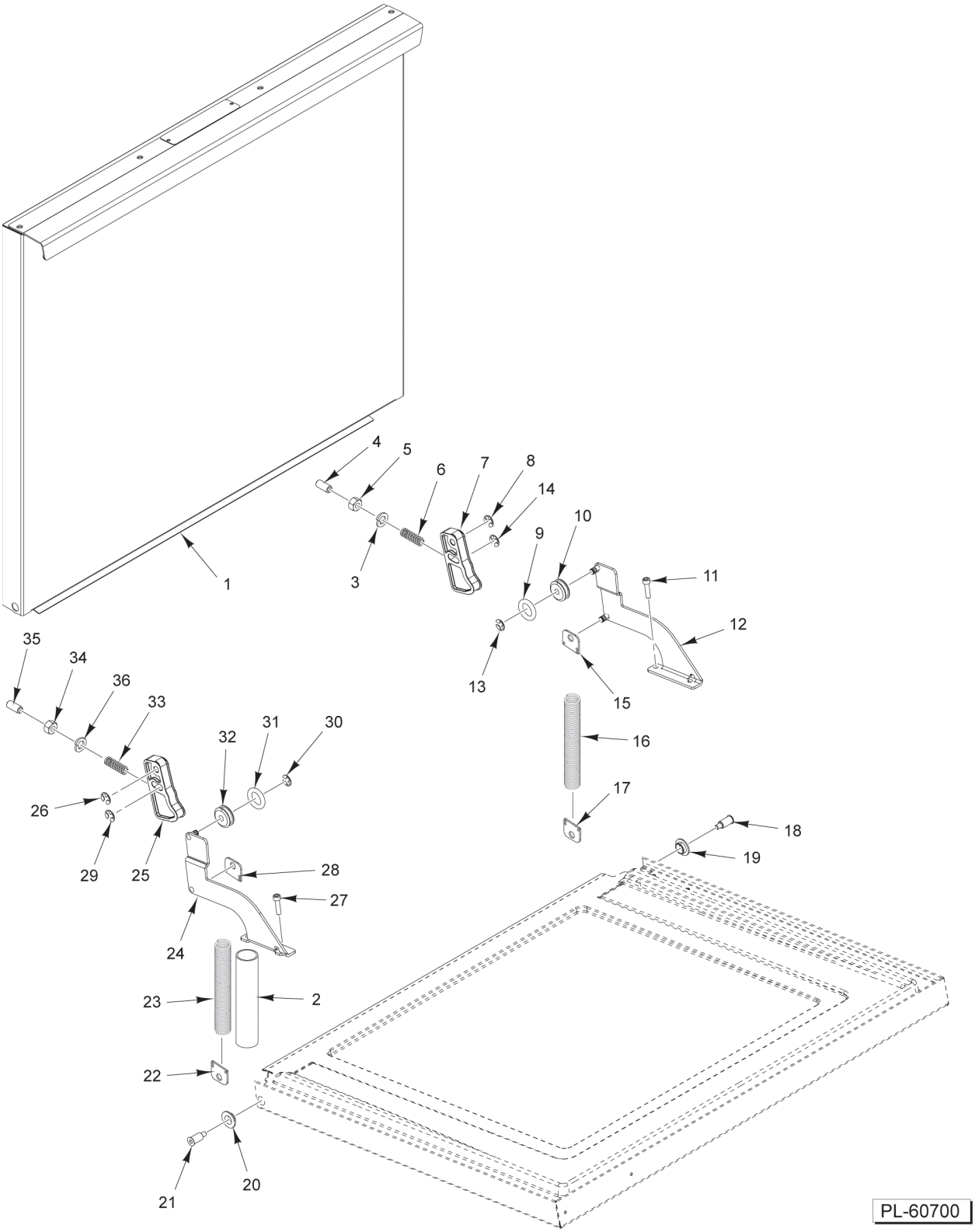
ILLUS. PL-60692	PART NO.	NAME OF PART	AMT.
1	0P-458471	Harness - Wire (Temperature Probes)	1
2	0P-678140	Stop Nut 10-24 Hex (SST)	4
3	0P-678148	Cap Screw 1/4-20 x 5/8 Hex Hd. (SST)	1
4	0P-678169	Washer (SST)	1
5	0P-678143	Stop Nut 1/4-20 Hex (SST)	1
6	0P-678143	Stop Nut 1/4-20 Hex (SST)	1
7	0P-678169	Washer (SST)	1
8	0P-678143	Stop Nut 1/4-20 Hex (SST)	1
9	0P-678169	Washer (SST)	1
10	0P-678574	Washer	1
11	0P-678169	Washer (SST)	1
12	0A-108439	Link - Control Box Pivot (RH)	1
13	0P-678574	Washer	1
14	0A-108524	Top - Control Box	1
15	0P-578505	Gasket - Control Box (Top)	1
16	0P-678574	Washer	1
17	0P-678143	Stop Nut 1/4-20 Hex (SST)	1
18	0P-678169	Washer (SST)	1
19	0P-678574	Washer	1
20	0P-678169	Washer (SST)	1
21	0P-678148	Cap Screw 1/4-20 x 5/8 Hex Hd. (SST)	1
22	0A-108440	Link - Control Box Pivot (LH)	1
23	0P-658387	Sensor - Pressure	2
24	0P-688362	Clamp - Spring Action Hose	1
25	0P-688537	Kit - Tubing (Incls. Items 24 & 26) (Cut to 28 In.)	1
26	0P-688362	Clamp - Spring Action Hose	1
27	0A-108501	Trap - Air	1
28	0P-678143	Stop Nut 1/4-20 Hex (SST)	2
29	0P-578564	O-Ring	1
30	0P-658423	Thermistor	1
31	0A-108451	Back - Thermistor	1
32	0P-678143	Stop Nut 1/4-20 Hex (SST)	1
33	0P-628422	Strainer	1
34	0B-108447	Panel - Side (RH) (SU-H & SU-L)	1
35	0B-108449	Panel - Side (RH) (SG)	1
36	0B-108448	Panel - Side (LH) (SU-H & SU-L)	1
37	0A-108450	Panel - Side (LH) (SG)	1
38	0A-108381	Barrier - Sump Heater (Mylar)	1
39	0P-658504	Protector - High Limit	2
40	0A-108386	Bracket - Overtemp Mounting	1
41	0P-678563	Lock Nut 1/2-13 Hex	2
42	0P-678345	Mach. Screw 1/4-20 x 1/2 Phil. Truss Hd	4
43	0P-678336	Lock Nut 3/16 Washer Type (SST)	12
44	0A-108045	Clamp - Wire (3/4 I.D.)	12
45	0P-578360	O-Ring	2
46	0P-558395	Element - Heater (Sump) (120 V.)	1
47	0P-558384	Element - Heater (Sump) (208-240 V.)	1
48	0P-458472	Harness - Wire (Pressure Sensor)	1
49	0P-458480	Harness - Wire (High Limit) (SU-L & SG)	1
50	0P-458479	Harness - Wire (Sump Heater)	1
51	0P-578497	Guide - Door (RH)	1
52	0P-578498	Guide - Door (LH)	1
53	0P-428526	Panel - Rear Trim (Upper) (SG)	1
54	0A-108528	Gutter - Left	1
55	0A-108527	Gutter - Right	1
56	0P-578545	Seal - Door (SU-H & SU-L)	1
57	0P-578550	Seal - Door (SG)	1



DOOR ASSEMBLY (SG)

DOOR ASSEMBLY (SG)

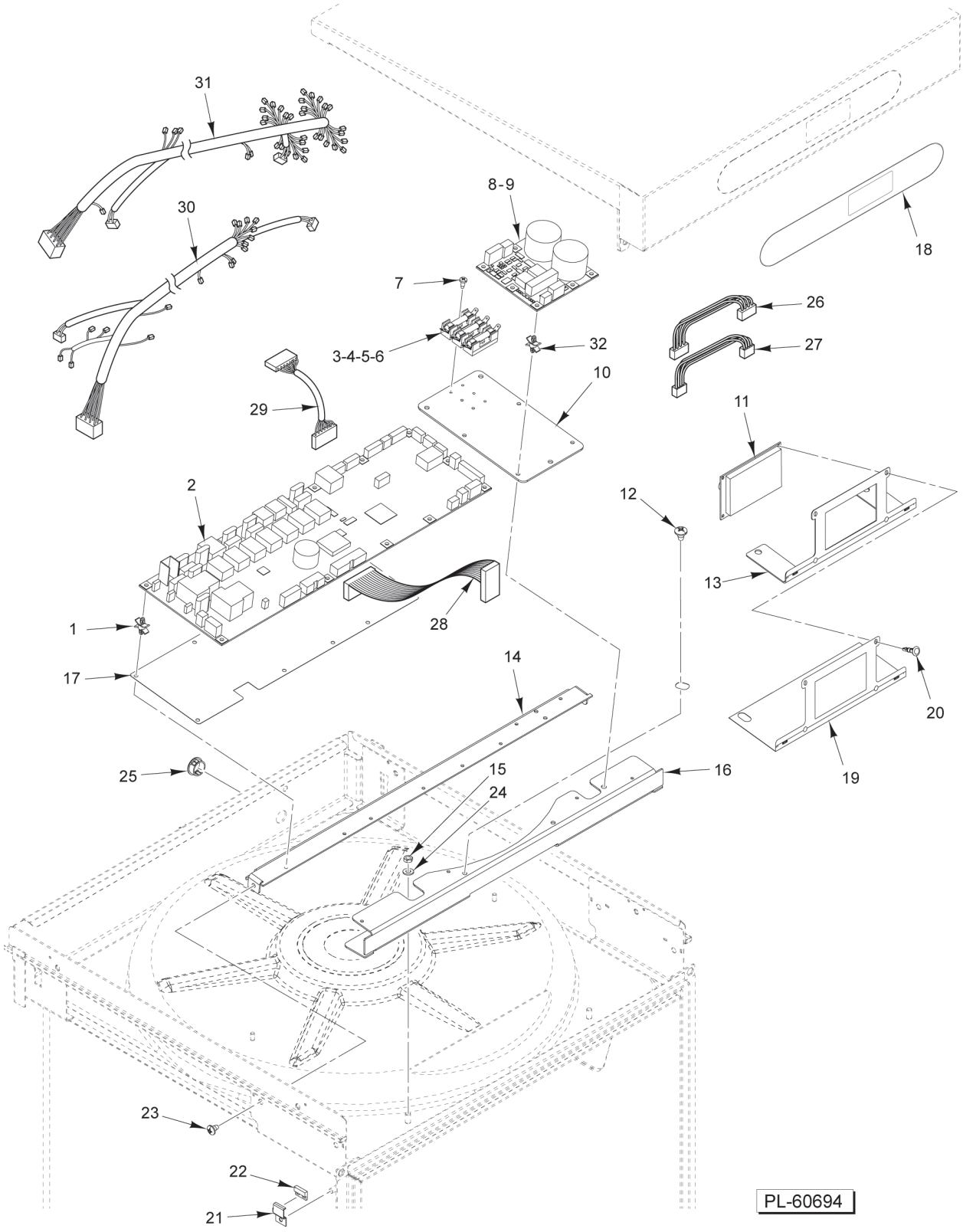
ILLUS. PL-60693	PART NO.	NAME OF PART	AMT.
1	0A-108519	Stop - Door (RH)	1
2	0A-108520	Stop - Door (LH)	1
3	0P-678570	Set Screw 5/16-18 x 3/4 Hex Hdls., Dog Pt. (SST)	1
4	0P-678139	Nut 5/16-18 Hex (SST)	1
5	0A-608462	Spring -Compression	1
6	0A-108463	Cam - Door Pivot	1
7	0P-678567	Retaining Ring 1/4 In. (SST)	1
8	0P-578565	O-Ring	1
9	0A-108465	Roller - Cam	1
10	0P-678567	Retaining Ring 1/4 In. (SST)	1
11	0P-678567	Retaining Ring 1/4 In. (SST)	1
12	0A-108464	Connector - Spring	1
13	0P-608538	Spring - Extension	2
14	0A-108464	Connector - Spring	1
15	0A-668460	Bearing - Door	1
16	0A-668460	Bearing - Door	1
17	0A-108464	Connector - Spring	1
18	0A-108463	Cam - Door Pivot	1
19	0P-678567	Retaining Ring 1/4 In. (SST)	1
20	0A-108464	Connector - Spring	1
21	0P-678567	Retaining Ring 1/4 In. (SST)	1
22	0P-678567	Retaining Ring 1/4 In. (SST)	1
23	0P-578565	O-Ring	1
24	0A-108465	Roller - Cam	1
25	0A-608462	Spring -Compression	1
26	0P-678139	Nut 5/16-18 Hex (SST)	1
27	0P-678570	Set Screw 5/16-18 x 3/4 Hex Hdls., Dog Pt. (SST)	1
28	0B-108521	Door Assy	1
29	0P-678165	Lockwasher 5/16 Helical (SST)	1
30	0P-678508	Cover - Spring	1
31	0P-678165	Lockwasher 5/16 Helical (SST)	1
32	0P-678518	Scew - Pivot	6



DOOR ASSEMBLY
(SU-H & SU-L)

DOOR ASSEMBLY
(SU-H & SU-L)

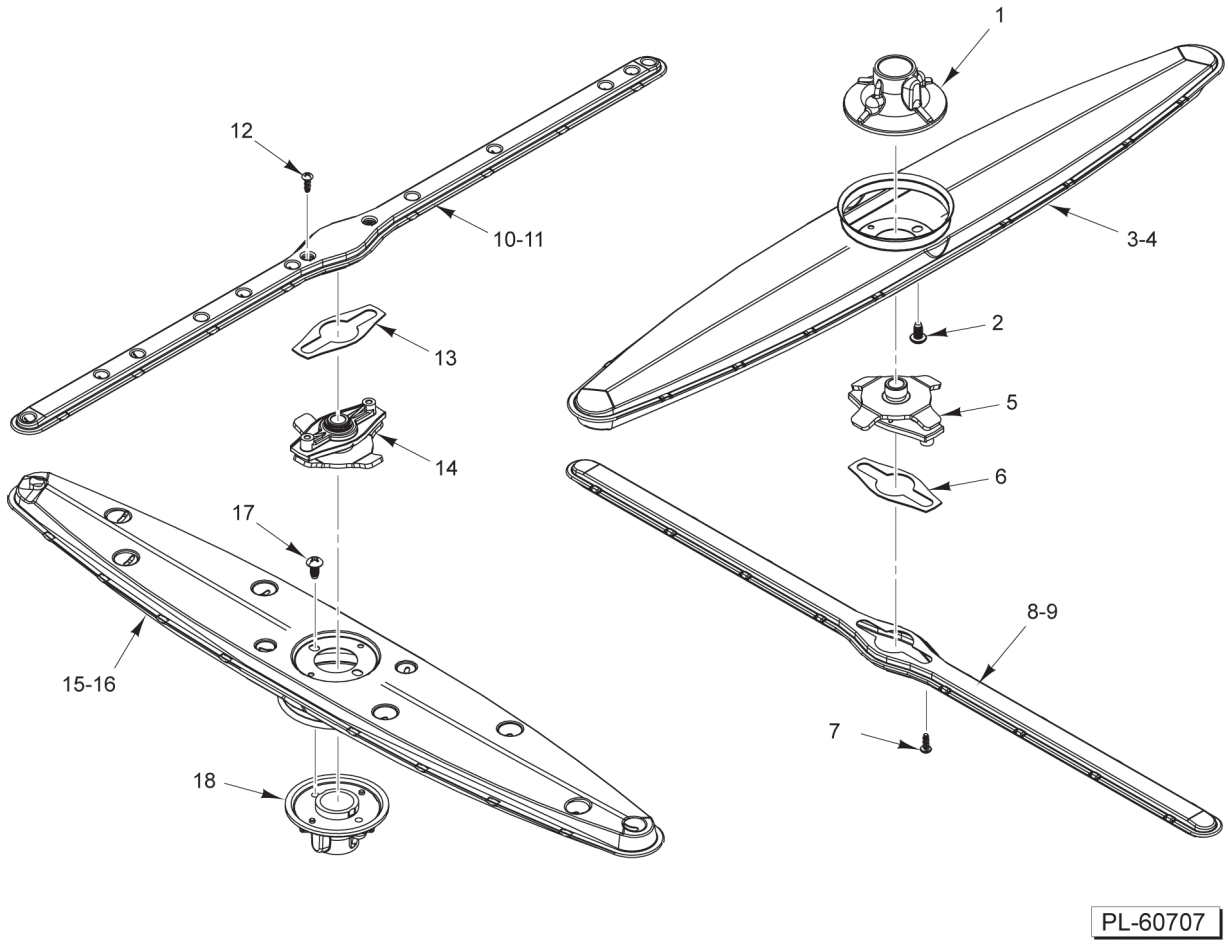
ILLUS. PL-60700	PART NO.	NAME OF PART	AMT.
1	0A-108530	Door Assy	1
2	0P-678508	Cover - Spring	1
3	0P-678165	Lockwasher 5/16 Helical (SST)	1
4	0P-678570	Set Screw 5/16-18 x 3/4 Hex Hdls., Dog Pt. (SST)	1
5	0P-678139	Nut 5/16-18 Hex (SST)	1
6	0A-608462	Spring -Compression	1
7	0A-108463	Cam - Door Pivot	1
8	0P-678567	Retaining Ring 1/4 In. (SST)	1
9	0P-578565	O-Ring	1
10	0A-108465	Roller - Cam	1
11	0P-678571	Cap Screw 10-32 x 7/16 Hex Socket Hd. (SST)	2
12	0A-108499	Stop - Door (RH)	1
13	0P-678567	Retaining Ring 1/4 In. (SST)	1
14	0P-678567	Retaining Ring 1/4 In. (SST)	1
15	0A-108464	Connector - Spring	1
16	0A-608461	Spring - Extension	1
17	0A-108464	Connector - Spring	1
18	0P-678466	Shoulder Bolt	1
19	0A-668460	Bearing - Door	1
20	0A-668460	Bearing - Door	1
21	0P-678466	Shoulder Bolt	1
22	0A-108464	Connector - Spring	1
23	0A-608461	Spring - Extension	1
24	0A-108500	Stop - Door (LH)	1
25	0A-108463	Cam - Door Pivot	1
26	0P-678567	Retaining Ring 1/4 In. (SST)	1
27	0P-678571	Cap Screw 10-32 x 7/16 Hex Socket Hd. (SST)	2
28	0A-108464	Connector - Spring	1
29	0P-678567	Retaining Ring 1/4 In. (SST)	1
30	0P-678567	Retaining Ring 1/4 In. (SST)	1
31	0P-578565	O-Ring	1
32	0A-108465	Roller - Cam	1
33	0A-608462	Spring -Compression	1
34	0P-678139	Nut 5/16-18 Hex (SST)	1
35	0P-678570	Set Screw 5/16-18 x 3/4 Hex Hdls., Dog Pt. (SST)	1
36	0P-678165	Lockwasher 5/16 Helical (SST)	1



CONTROL PANEL AND BOARDS

CONTROL PANEL AND BOARDS

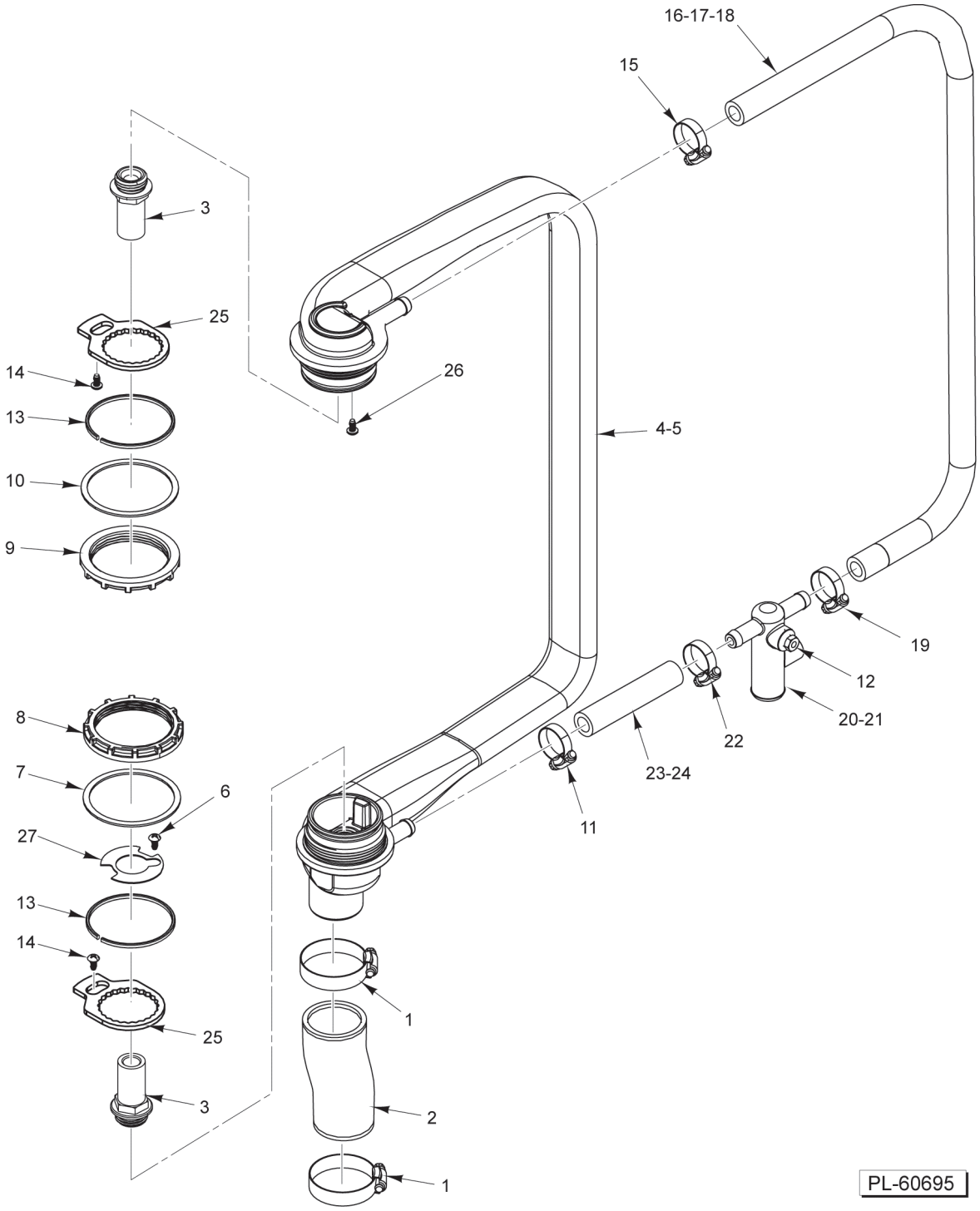
ILLUS. PL-60694	PART NO.	NAME OF PART	AMT.
1	0P-428051	Standoff	7
2	0P-428543	Board - Master	1
3	0P-528502	Block - Fuse	1
4	0P-529556	Fuse (0.5 Amp.) (250 V.)	1
5	0P-528561	Fuse (2.5 Amp.) (250 V.)	1
6	0P-528557	Fuse (1.5 Amp.) (250 V.) (Hot Only)	1
7	0P-678159	Self-Tapping Screw 6-20 x 3/8 Phil. Bndg. Hd., Type B	2
8	0P-428483	Board - Power Supply	1
9	0P-528313	Fuse (250 V.) (1 Amp.)	1
10	0A-108442	Mount - Power Supply	1
11	0P-428398	Display	1
12	0P-678348	Self-Tapping Screw 1/4-20 x 3/8 Phil. Pan Hd., Type TT	2
13	0P-428525	Mount - Display	1
14	0A-108444	Base - Control Box (Upper)	1
15	0P-678143	Stop Nut 1/4-20 Hex (SST)	2
16	0A-108443	Mount - Brace (Front)	1
17	0P-428509	Mylar - Barrier	1
18	0P-428529	Keypad - Membrane	1
19	0P-428503	Mylar - Display	1
20	0A-108445	Clip - Board	4
21	0A-108481	Bracket - Reed Switch	1
22	0B-108397	Switch Assy. - Door	1
23	0P-678348	Self-Tapping Screw 1/4-20 x 3/8 Phil. Pan Hd., Type TT	2
24	0P-678169	Washer (SST)	2
25	0P-678554	Bushing - Snap	1
26	0P-458475	Harness - Control (12 V.) (Control Signal from Control Board to Power Supply Board)	1
27	0P-458474	Harness - Power Supply (Power Supply Board to Control Board)	1
28	0P-458473	Cable - Display	1
29	0P-458477	Harness - Keypad	1
30	0P-458476	Harness - Wire (120 V.) (SU-H)	1
31	0P-428506	Harness - Wire (120 V.) (SU-L & SG)	1
32	0P-428051	Standoff	4



WASH ARM AND RINSE ARM ASSEMBLY

WASH ARM AND RINSE ARM ASSEMBLY

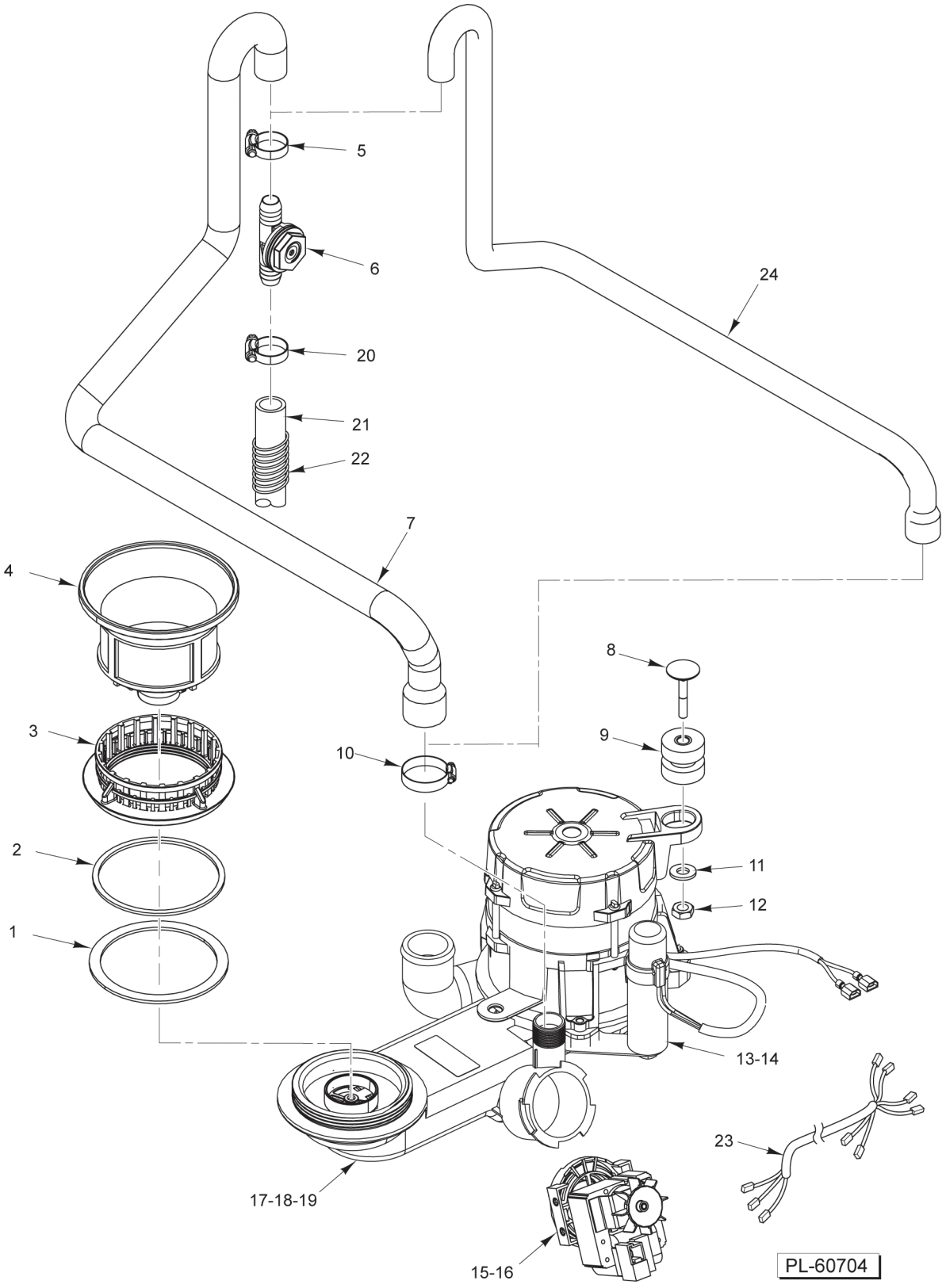
ILLUS. PL-60707	PART NO.	NAME OF PART	AMT.
1	0A-108459	Hub - Wash Arm	1
2	0P-678573	Self-Tapping Screw 10-16 x 3/8 Phil. Pan Hd., Type B	2
3	0A-108400	Arm - Wash	1
4	0A-108401	Wash Arm Assy. (Incls. Items 1, 2, & 3)	1
5	0B-108468	Base - Rinse Arm	1
6	0P-578467	Gasekt - Rinse Arm	1
7	0P-678572	Self-Tapping Screw	2
8	0A-108458	Arm - Rinse	1
9	0B-108408	Rinse Arm Assy. (Incls. Items 5 thru 8)	1
10	0B-108408	Rinse Arm Assy. (Incls. Items 11 thru 15)	1
11	0A-108458	Arm - Rinse	1
12	0P-678572	Self-Tapping Screw	2
13	0P-578467	Gasekt - Rinse Arm	1
14	0B-108468	Base - Rinse Arm	1
15	0A-108401	Wash Arm Assy. (Incls. Items 16, 17, & 18)	1
16	0A-108400	Arm - Wash	1
17	0P-678573	Self-Tapping Screw 10-16 x 3/8 Phil. Pan Hd., Type B	2
18	0A-108459	Hub - Wash Arm	1



WASH PIPE ASSEMBLY

WASH PIPE ASSEMBLY

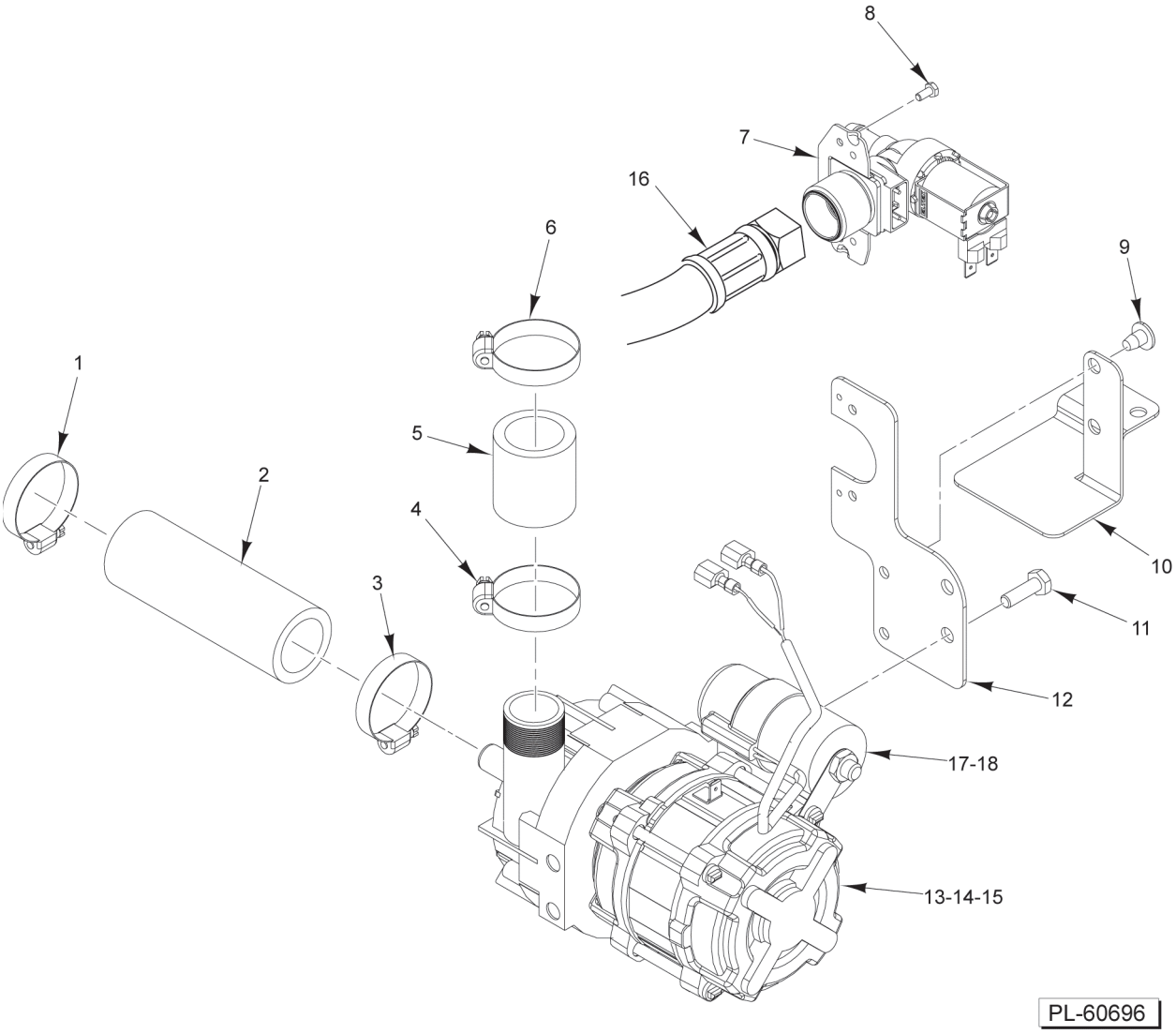
ILLUS. PL-60695	PART NO.	NAME OF PART	AMT.
1	0A-108082	Clamp - Hose	2
2	0P-688421	Hose - Outlet Pump	1
3	0A-108399	Shaft - Rinse	2
4	0A-108405	Wash Tube (SG)	1
5	0A-108405	Wash Tube (SU-H & SU-L)	1
6	0P-678573	Self-Tapping Screw 10-16 x 3/8 Phil. Pan Hd., Type B	1
7	0P-578566	O-Ring	1
8	0P-678409	Nut - Wash	1
9	0P-678409	Nut - Wash	1
10	0P-578566	O-Ring	1
11	0A-108383	Clamp - Hose	1
12	0P-658206	Probe Assy. - Rinse	1
13	0P-578513	Ring - Sealing	2
14	0P-678573	Self-Tapping Screw 10-16 x 3/8 Phil. Pan Hd., Type B	2
15	0A-108383	Clamp - Hose	1
16	0P-688378	Hose - Rinse (Upper) (SU-H)	1
17	0P-688393	Hose - Rinse (Upper) (Cold) (SG)	1
18	0P-688392	Hose - Rinse (Upper) (SU-L)	1
19	0A-108383	Clamp - Hose	1
20	0P-688453	Manifold - Rinse (Hot) (SU-H)	1
21	0P-688454	Manifold - Rinse (Cold) (SU-L & SG)	1
22	0A-108383	Clamp - Hose	1
23	0P-688377	Hose - Rinse (Lower) (Hot) (SU-H)	1
24	0P-688391	Hose - Rinse (Lower) (Cold) (SU-L & SG)	1
25	0P-678507	Retainer - Rinse Shaft	2
26	0P-678573	Self-Tapping Screw 10-16 x 3/8 Phil. Pan Hd., Type B	1
27	0A-108407	Choke - Wash	1



WASH PUMP AND DRAIN

WASH PUMP AND DRAIN

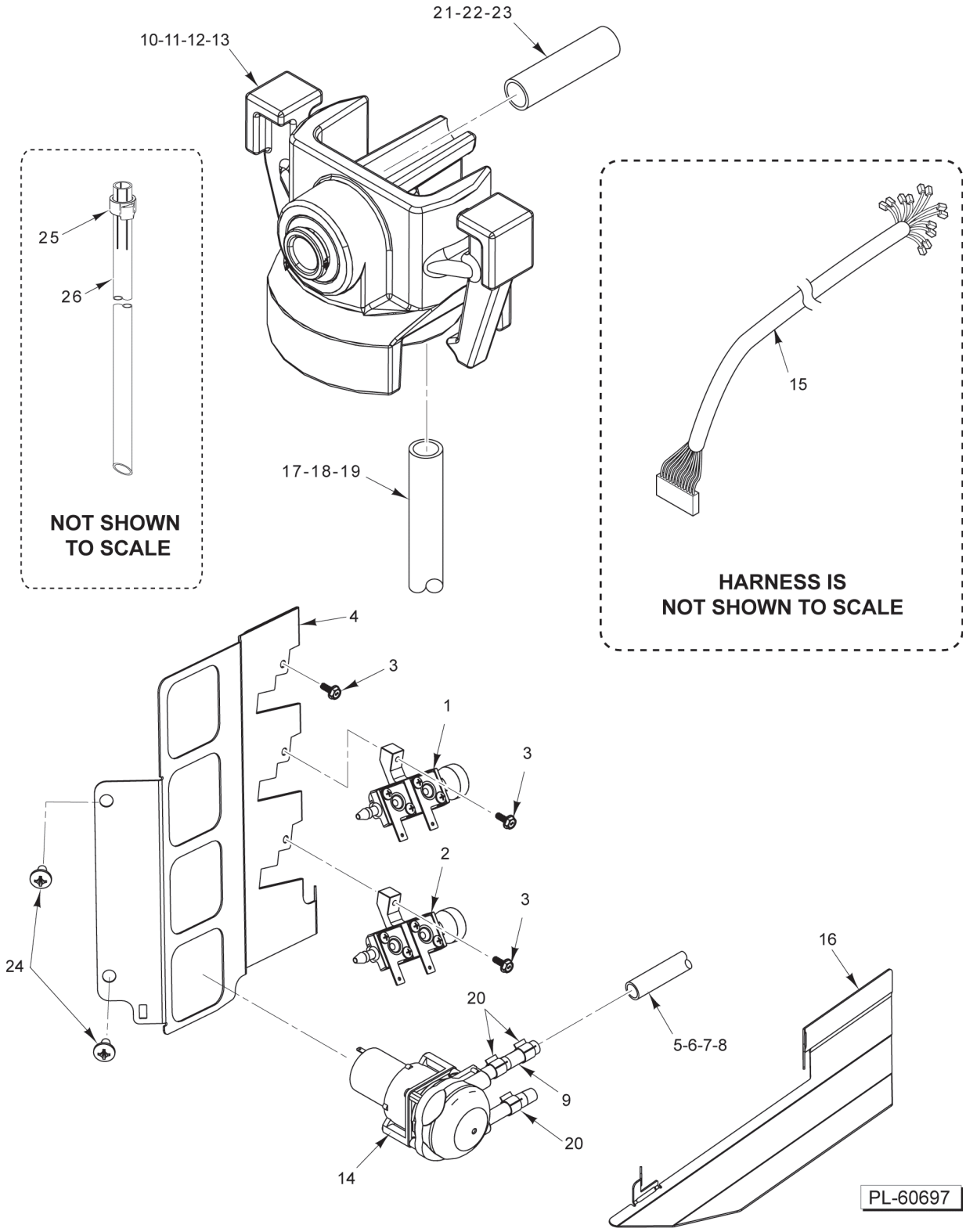
ILLUS. PL-60704	PART NO.	NAME OF PART	AMT.
1	0A-108547	Ring	1
2	0P-578485	Gasket - Wash Pump	1
3	0A-108549	Nut	1
4	0A-108544	Strainer - Sieve (Fine)	1
5	0A-108383	Clamp - Hose	1
6	0P-688389	Tee - Check Valve	1
7	0P-688437	Hose - Drain (SU-H & SU-L)	1
8	0A-108455	Bolt - Damper Carriage	1
9	0A-108546	Damper - Vibration	1
10	0A-108384	Clamp - Hose	1
11	0P-678170	Washer (SST)	1
12	NS-047-82	Stop Nut 1/4-20 Hex (SST)	1
13	0P-418494	Capacitor (120 V., 60 Hz., 1 Ph.)	1
14	0P-418493	Capacitor (208-240 V., 50/60 Hz., 1 Ph.)	1
15	0P-418491	Pump - Drain (60 Hz.)	1
16	0P-418492	Pump - Drain (50 Hz.)	1
17	0P-418486	Pump Assy. (Wash) (120 V., 60 Hz., 1 Ph.) (Incls. Items 1, 2, 3, 13, & 15)	1
18	0P-418487	Pump Assy. (Wash) (208-240 V., 60 Hz., 1 Ph.) (Incls. Items 1, 2, 3, 14, & 15)	1
19	0P-418488	Pump Assy. (Wash) (208-240 V., 50 Hz., 1 Ph.)	1
20	0A-108383	Clamp - Hose	1
21	0P-688375	Hose - Drain (84 In.)	1
22	0P-608382	Spring - Drain Hose	1
23	0P-458478	Harness - Wire (Pump)	1
24	0P-688522	Hose - Drain (SG)	1



RINSE PUMP

RINSE PUMP

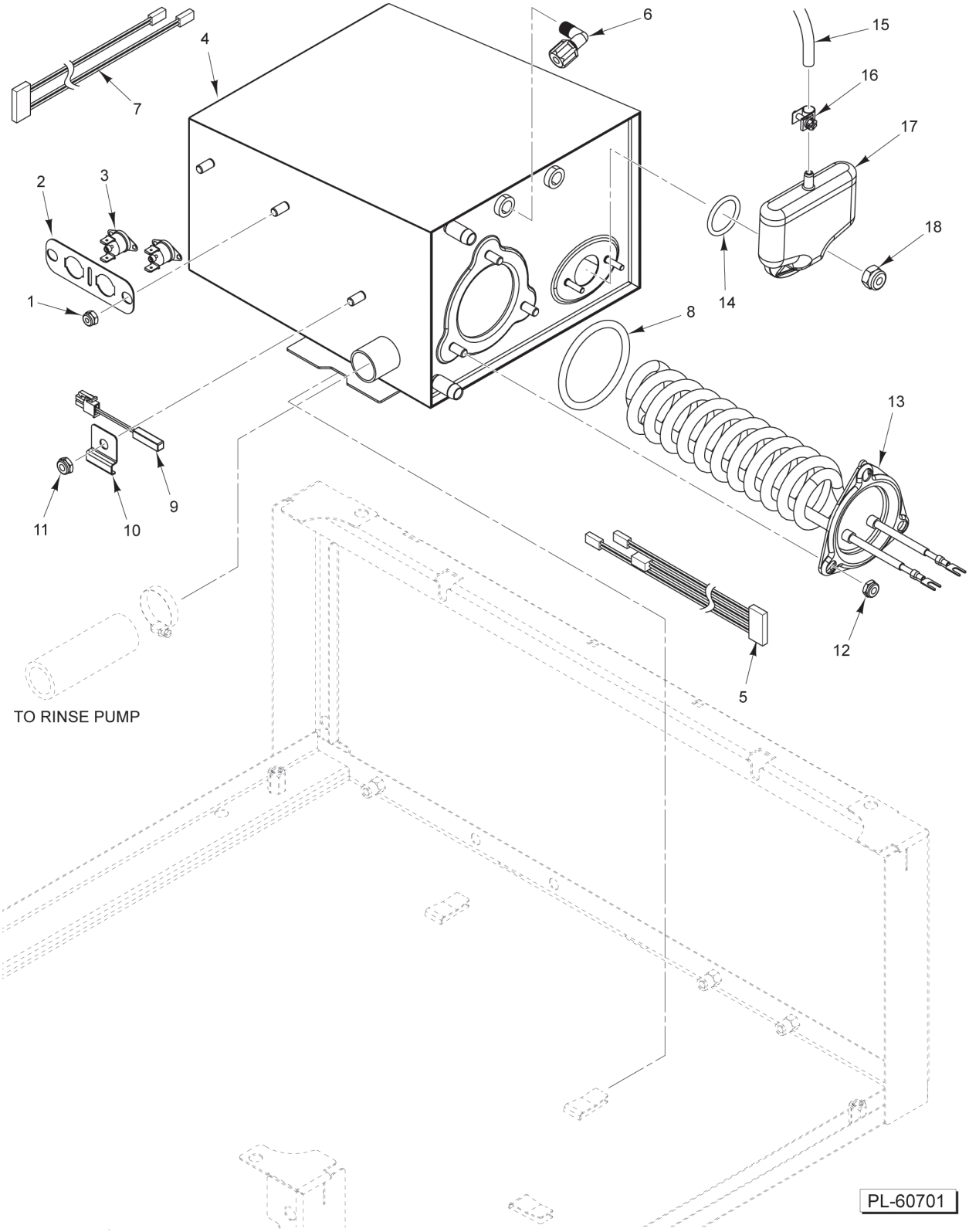
ILLUS. PL-60696	PART NO.	NAME OF PART	AMT.
1	0A-108384	Clamp - Hose	1
2	0P-688420	Hose - Inlet (4 In.)	1
3	0A-108384	Clamp - Hose	1
4	0A-108384	Clamp - Hose	1
5	0P-688419	Hose - Outlet (1-3/4 In.)	1
6	0A-108384	Clamp - Hose	1
7	0P-628456	Valve (Deltrol)	1
8	0P-678159	Self-Tapping Screw 6-20 x 3/8 Phil. Bndg. Hd., Type B	2
9	0P-678348	Self-Tapping Screw 1/4-20 x 3/8 Phil. Pan Hd., Type TT	2
10	0A-108434	Bracket - Pump (Rinse)	1
11	0P-678569	Cap Screw M6 x 1.0 x 18mm Hex Hd. (SST)	2
12	0A-108452	Mount - Fill Valve	1
13	0P-418489	Pump - Rinse (120 V.)	1
14	0P-418490	Pump - Rinse (208-240 V., 60 Hz.)	1
15	0P-428532	Cover - Mylar (Rinse Pump)	1
16	0P-688376	Hose - Fill (74 In.)	1
17	0P-418496	Capacitor (120 V.) (Incls. Hardware)	1
18	0P-418495	Capacitor (208-240 V.) (Incls. Hardware)	1



CHEMICAL PUMPS AND SENSORS

CHEMICAL PUMPS AND SENSORS

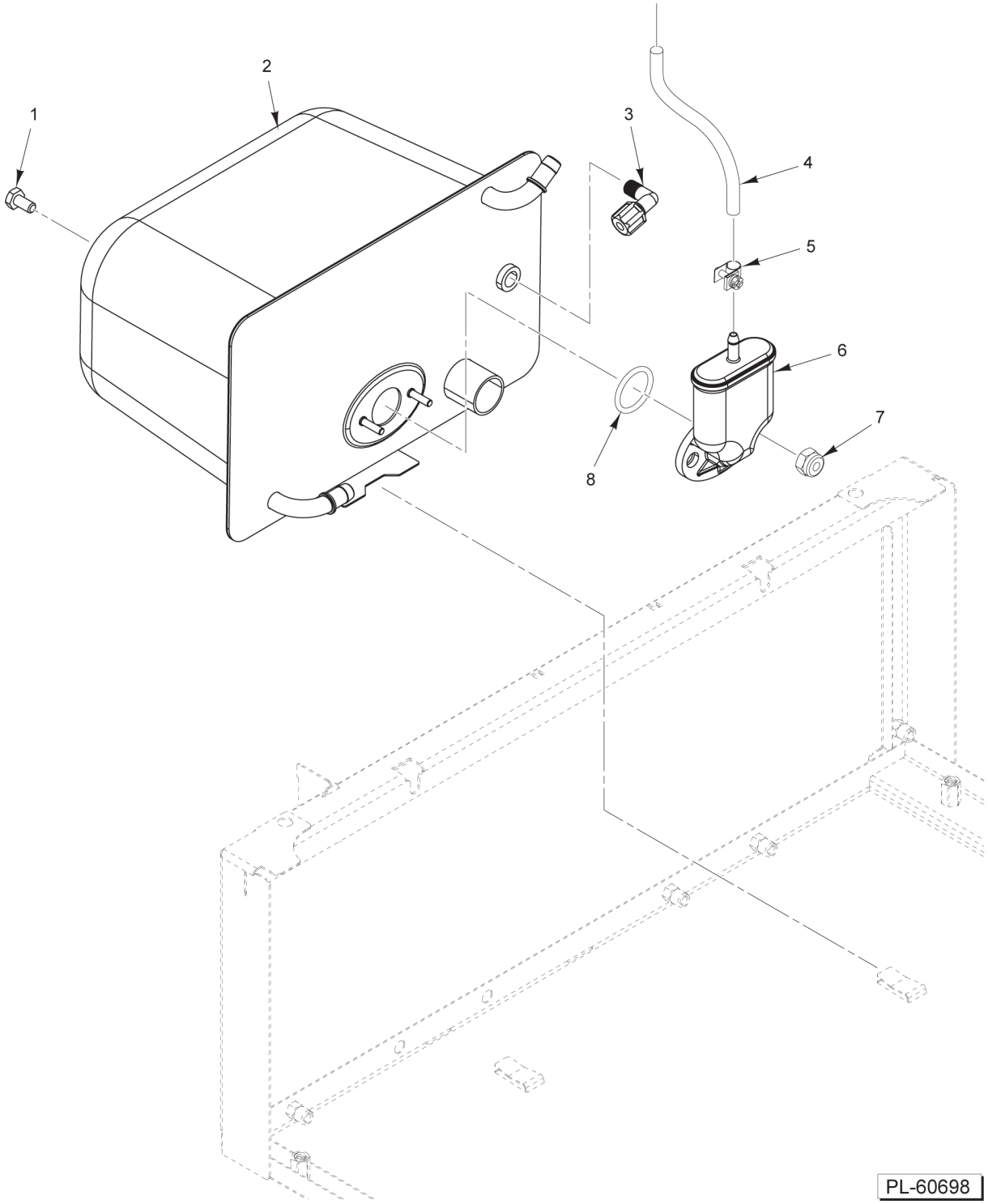
ILLUS. PL-60697	PART NO.	NAME OF PART	AMT.
1	0P-658541	Sensor (Chemical) (Detergent/Sanitizer)	1
2	0P-658542	Sensor (Chemical) (Rinse Aid)	1
3	0P-678388	Self-Tapping Screw	3
4	0A-108427	Bracket - Chemical Pump	1
5	0P-688365	Tubing (Clear) (9.5 In.) (Pump to Sanitizer)	AR
6	0P-688366	Tubing (Clear) (12.5 In.) (Pump to R/A Cold)	AR
7	0P-688367	Tubing (Clear) (15 In.) (Pump to R/A Hot)	AR
8	0P-688368	Tubing (Clear) (30 In.) (Pump to Delime Cold)	AR
9	0P-688531	Tubing (Used on Welco Pumps Only)	AR
10	0A-108515	Cap - Chemical Bottle	AR
11	0A-108533	Cap Assy. - Chemical Bottle (Detergent) (Incls. Items 10, 17, & 21)	AR
12	0A-108534	Cap Assy. - Chemical Bottle (Rinse Aid) (Incls. Items 10, 18, & 22)	AR
13	0A-108535	Cap Assy. - Chemical Bottle (Sanitizer) (Incls. Items 10, 14, & 20)	AR
14	0P-418406	Pump - Chemical (Blue) (Incls. Item 9)	AR
15	0P-458469	Harness - Wire (Chemical Pumps & Sensors)	1
16	0A-108540	Drip Pan	1
17	0P-688369	Tubing (Red) (12.25 In.)	AR
18	0P-688371	Tubing (Blue) (12.25 In.)	AR
19	0P-688370	Tubing (Clear) (12.25 In.)	AR
20	0P-688362	Clamp - Spring Action Hose	3
21	0P-688372	Tubing (Red) (1 In.)	AR
22	0P-688374	Tubing (Blue) (1 In.)	AR
23	0P-688373	Tubing (Clear) (1 In.)	AR
24	0P-678348	Self-Tapping Screw 1/4-20 x 3/8 Phil. Pan Hd., Type TT	2
25	0P-688032	Clamp - Hose 7/16	1
26	0A-108033	Stand Pipe 20-1/2 Lg	1



BOOSTER ASSEMBLY
(HOT) (SU-H)

BOOSTER ASSEMBLY (HOT) (SU-H)

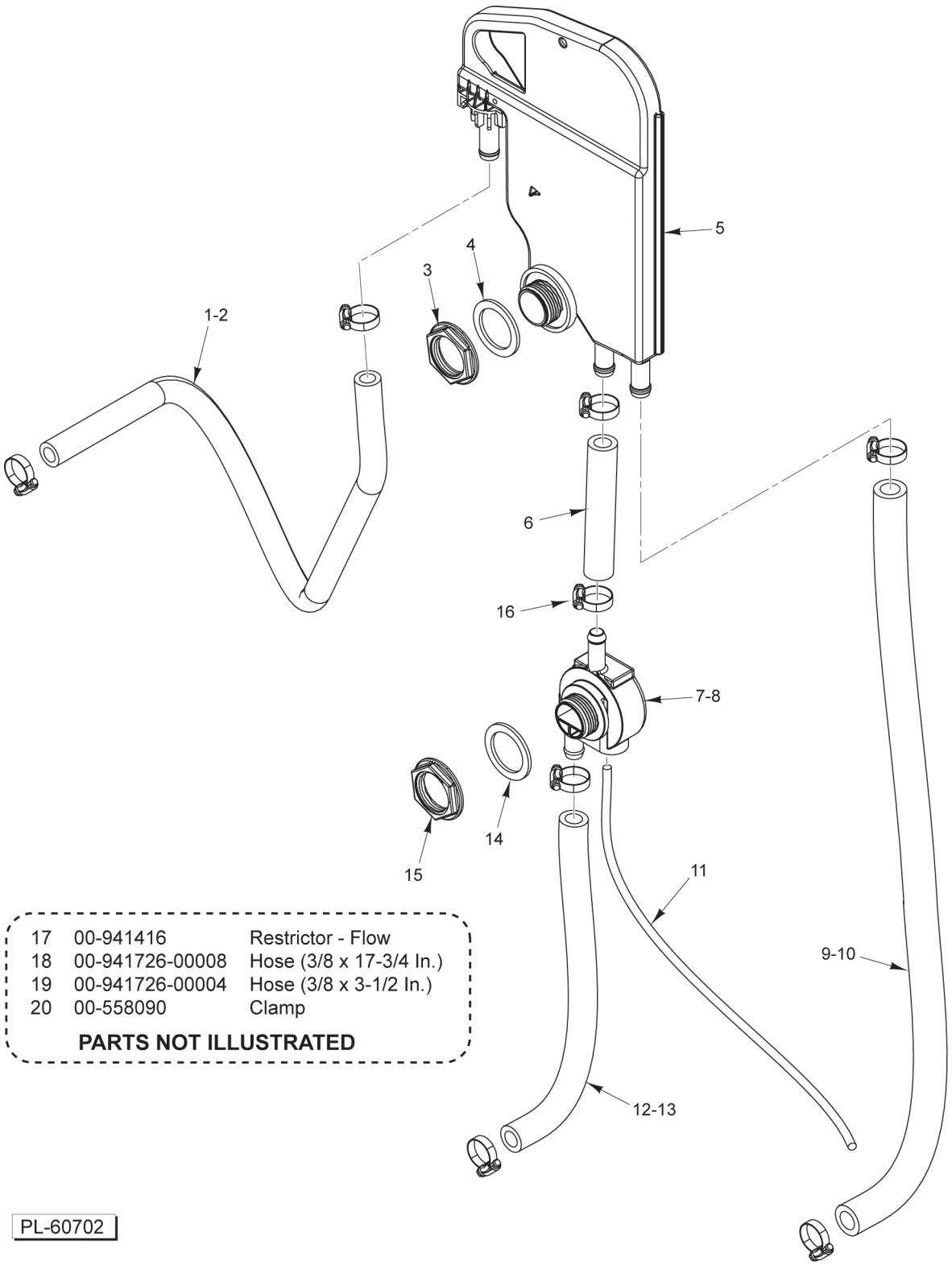
ILLUS. PL-60701	PART NO.	NAME OF PART	AMT.
1	0P-678143	Stop Nut 1/4-20 Hex (SST)	2
2	0A-108402	Bracket - High Limit	1
3	0P-658504	Protector - High Limit	2
4	0P-648438	Booster	1
5	0P-458471	Harness - Wire (Temperature Probes)	1
6	0P-678562	Fitting - Tube 1/4	1
7	0P-458470	Harness - Wire (High Limit)	1
8	0P-578174	O-Ring	1
9	0P-658423	Thermistor	1
10	0A-108451	Back - Thermistor	1
11	0P-678143	Stop Nut 1/4-20 Hex (SST)	1
12	0P-678143	Stop Nut 1/4-20 Hex (SST)	3
13	0P-558433	Element - Heater (208-240 V., 1 Ph.)	1
14	0P-578564	O-Ring	1
15	0P-688537	Kit - Tubing (Incls. Item 16) (Cut to 28 In.)	1
16	0P-688362	Clamp - Spring Action Hose	2
17	0A-108501	Trap - Air	1
18	0P-678143	Stop Nut 1/4-20 Hex (SST)	2



RECOVERY TANK ASSEMBLY
(COLD)
(SU-L & SG)

RECOVERY TANK ASSEMBLY
(COLD)
(SU-L & SG)

ILLUS. PL-60698	PART NO.	NAME OF PART	AMT.
1	0P-678568	Cap Screw 1/4-20 x 1/2 Hex Hd. (SST)	2
2	0P-648432	Booster - Recovery	1
3	0P-678562	Fitting - Tube 1/4	1
4	0P-688537	Kit - Tubing (Incls. Item 5) (Cut to 33 In.)	1
5	0P-688362	Clamp - Spring Action Hose	2
6	0A-108501	Trap - Air	1
7	0P-678143	Stop Nut 1/4-20 Hex (SST)	2
8	0P-578564	O-Ring	1



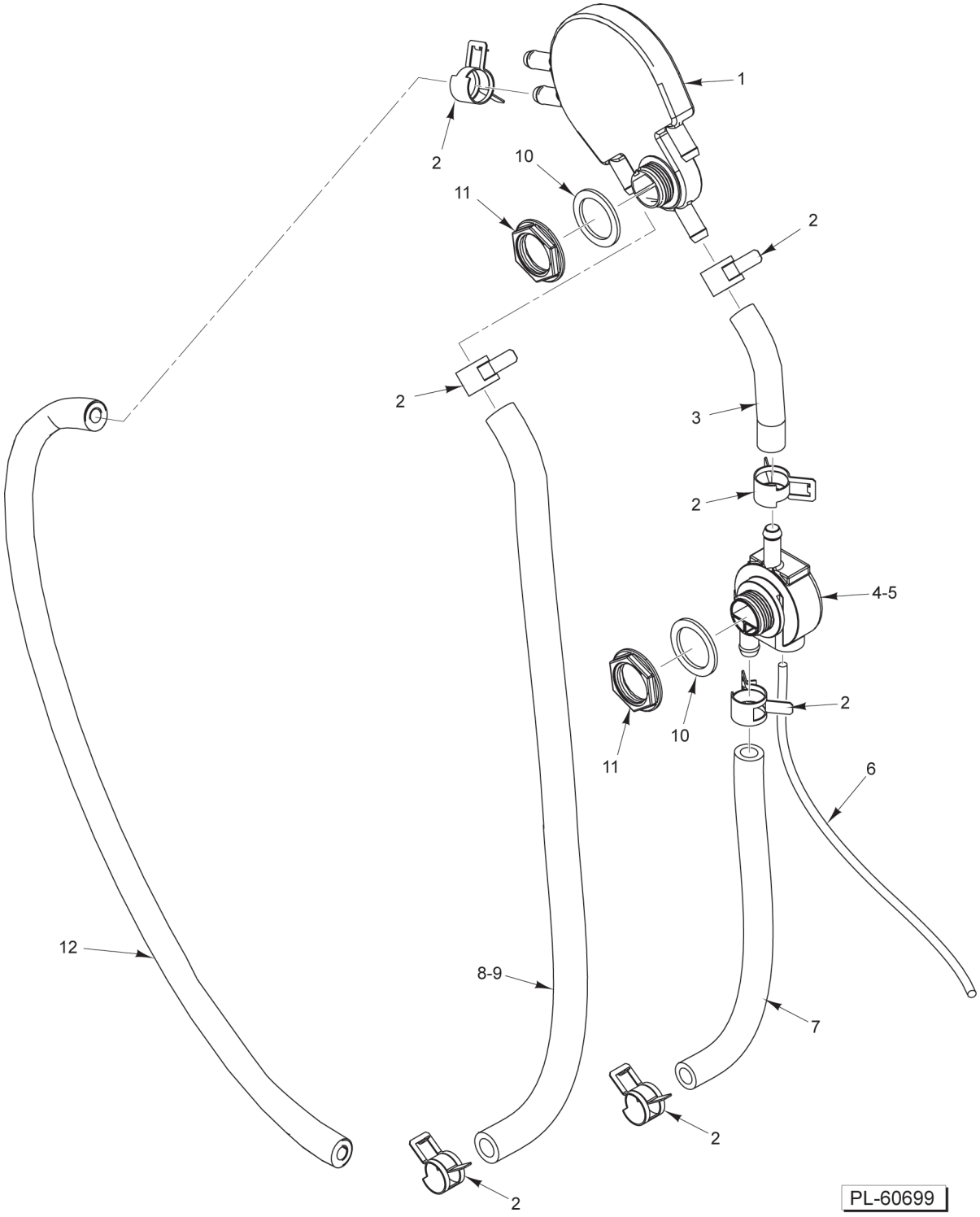
17	00-941416	Restrictor - Flow
18	00-941726-00008	Hose (3/8 x 17-3/4 In.)
19	00-941726-00004	Hose (3/8 x 3-1/2 In.)
20	00-558090	Clamp

PARTS NOT ILLUSTRATED

FILL AIR GAP
(SU-H & SU-L)

FILL AIR GAP
(SU-H & SU-L)

ILLUS. PL-60702	PART NO.	NAME OF PART	AMT.
1	0P-688410	Hose 3/8 (23.62 In. Lg.)	AR
2	0P-688415	Hose 3/8 (15 In. Lg.)	AR
3	0A-108363	Nut - Adapter	2
4	0P-678482	Washer - Air Gap	2
5	0A-108548	Air Gap	1
6	0P-688413	Hose 3/8 (3.5 In. Lg.)	AR
7	0A-108435	Adapter - Chemical	1
8	0A-108436	Adapter - Chemical (SU-L)	1
9	0P-688411	Hose 3/8 (19.25 In. Lg.) Hose 3/8 (19.88 In. Lg.)	AR
10	0P-688414	Hose 3/8 (25 In. Lg.)	AR
11	0P-688364	Tubing (Clear) (17.5 In.)	AR
12	0P-688412	Hose 3/8 (9 In. Lg.) (SU-H)	AR
13	0P-688412	Hose 3/8 (9 In. Lg.) (SU-L)	AR
14	0P-678482	Washer - Air Gap	1
15	0A-108363	Nut - Adapter	1
16	0A-108385	Clamp	8
17	0A-108396	Restrictor - Flow	1
18	0P-688416	Hose 3/8 (17.75 In. Lg.)	1
19	0P-688413	Hose 3/8 (3.5 In. Lg.)	1
20	0A-108385	Clamp	1



FILL AIR GAP (SG)

FILL AIR GAP (SG)

ILLUS. PL-60699	PART NO.	NAME OF PART	AMT.
1	0A-108536	Fill - Air Assy. (Incls. Label)	1
2	0A-108385	Clamp	AR
3	0P-688417	Hose 3/8 (3.75 In. Lg.)	AR
4	0A-108435	Adapter - Chemical	1
5	0A-108436	Adapter - Chemical (Cold)	1
6	0P-688364	Tubing (Clear) (17.5 In.)	AR
7	0P-688412	Hose 3/8 (9 In. Lg.)	AR
8	0P-688411	Hose 3/8 (19.25 In. Lg.) Hose 3/8 (19.88 In. Lg.)	AR
9	0P-688418	Hose 3/8 (28 In. Lg.)	AR
10	0P-678482	Washer - Air Gap	2
11	0A-108363	Nut - Adapter	2
12	0P-688410	Hose 3/8 (23.62 In. Lg.)	AR