⚠WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all panels before operating.

Failure to do so can result in death or electrical shock.

IMPORTANT

Electrostatic Discharge (ESD) Sensitive Electronics

ESD problems are present everywhere. ESD may damage or weaken the electronic control assembly. The new control assembly may appear to work well after repair is finished, but failure may occur at a later date due to ESD stress.

- Use an anti-static wrist strap. Connect wrist strap to green ground connection point or unpainted metal in the appliance

  -OR-

  Touch your finger repeatedly to a green ground connection point or unpainted metal in the appliance.
- Before removing the part from its package, touch the anti-static bag to a green ground connection point or unpainted metal in the appliance.
- Avoid touching electronic parts or terminal contacts; handle electronic control assembly by edges only.
- When repackaging failed electronic control assembly in anti-static bag, observe above instructions.

DIAGNOSTIC GUIDE

Before servicing, check the following:

- Is the power cord firmly plugged into a live circuit with proper voltage?
- Has a household fuse blown or circuit breaker tripped? Time delay fuse?
- Are both hot and cold water faucets open and water supply hoses unobstructed?
- All tests/checks should be made with a VOM or DVM having a sensitivity of 20,000 ohms per volt DC or greater.
- Check all connections before replacing components. Look for broken or loose wires, failed terminals, or wires not pressed into connectors far enough.
- The most common cause for control failure is corrosion on connectors. Therefore, disconnecting and reconnecting wires will be necessary throughout test procedures.
- Connectors: Look at top of connector. Check for broken or loose wires. Check for wires not pressed into connector far enough to engage metal barbs.
- Voltage checks **must** be made with all connectors **attached** to the boards.
- Resistance checks **must** be made with power cord unplugged from outlet, and with wiring harness or connectors **disconnected**.

DISPLAY FAULT/ERROR CODES

DISPLAY	EXPLANATION AND RECOMMENDED PROCEDURE

PF (PF) POWER FAILURE

"PF" flashes if the washer loses power during a running cycle. The washer does not flash PF when it is first plugged in.

- Press START to continue the cycle from the moment that power was lost, - OR -
- Press STOP/CANCEL to clear the display and completely cancel the cycle.

FL (FL) OVERFILL CONDITION

"FL" flashes if an over fill condition occurs. This condition occurs when excessive water in the tub causes the flood switch to trip. The control must realize that the trip was due to an over fill instead of a suds lock condition in order for FL to be displayed.

With an over fill condition, the beeper repeats a warning beep every 10 seconds with no timeout. The pump is cycled in drain mode for a half minute on, half minute off until the flood switch resets or power is discontinued to the unit.

- Press STOP/CANCEL to clear the display.

Er (Er) PROCESSOR RESET ERROR

This error code is displayed if the control failed to save cycle information during a power failure. This does not generate an error code beep.

- Press STOP/CANCEL to clear the display.

LF (LF) LONG FILL

If the water fill time exceeds 10 minutes, the water valves are turned off and "LF" is flashed.

- Press STOP/CANCEL to clear the display.

DISPLAY FAULT/ERROR CODES (cont.)

DISPLAY	EXPLANATION AND RECOMMENDED PROCEDURE

CE (CE) COMMUNICATIONS ERROR

If there is any breakdown in communication between the machine controller and the motor controller, “CE” flashes and the unit beeps once. Units with repeated CE errors may be diagnosed as follows:

SERIAL COMMUNICATION CHECKS

1. Check for contamination on P4 of the machine controller and P2 of the motor controller. If contaminants exist, disconnect power to the unit and gently scrape any contaminant off the pins.
2. Check the resistance values between the serial communication pins with the connectors in place (resistance reading should be less than 10 ohms). Make sure the harness is connected properly.
3. After ensuring integrity of this connection, run the unit again to see if problem still exists. If so, continue with CONTROL CHECKS.

CONTROL CHECKS

1. Check motor winding resistance at P6 of the motor controller (in the console). If an open circuit is found, this is an indication of problems with connections to the drive motor or the motor itself. See DRIVE MOTOR CHECKS.
2. If winding resistance is correct, check motor controller fuse; if open, replace motor controller.

DRIVE MOTOR CHECKS

1. Check connection of the lower harness to the drive motor and pump motor.
2. Check if the drive motor thermal protector has opened.

Ld (Ld) LONG DRAIN

“Ld” flashes if it takes longer than 5 minutes to pump out water to a point where the operating pressure switch resets.

- Press STOP/CANCEL to clear the display.

CA / CI (CA) AVERAGE CURRENT LIMIT or (CI) INSTANTANEOUS CURRENT LIMIT

If a status signal comes back from the motor controller that a current limit has been breached, the unit will return to standby mode and display either “CA” for average current limit trip, or “CI” for instantaneous current limit trip.

Average current trip occurs if there is a 2-second average of current draw greater than 5.55 Amps at the motor windings.

Instantaneous current trip occurs if there is a spike of 26 Amps instantly at the motor windings.

- → This may signify problems with the drive motor, thermal protector, or motor controller.
- → Overloading the unit may cause this problem.

- Press STOP/CANCEL to clear the display.

ob (ob) OFF BALANCE

If the motor controller detects an unrecoverable off-balance condition, the machine controller will shut down and display an “ob” for off balance.

The lid switch **must be opened** at least once before restarting the cycle if this condition occurs. Opening the lid will allow the customer to view and redistribute the load.

- Press STOP/CANCEL to clear the display.

Sr (Sr) or (5r) STUCK RELAY

“Sr” signifies a failure of the relay in the closed position. With this failure, power to the motor controller cannot be turned off by the machine controller. The machine control board may have a bad relay and may need to be replaced.

- → Check pins 1 & 5 of P16 of the machine controller and pins 1 & 2 of P1 of the motor controller. This should have AC line voltage when the motor controller is powered.

- Press STOP/CANCEL to clear the display.

LS (LS) or (L5) LID SWITCH ERROR

The control should flash this error code if the following conditions occur:

- → The control cannot detect the lid switch opening and closing properly.
- → There is a disagreement between the motor and machine controllers on the state of the lid switch (the control should not allow the unit to run in this condition).
- → The user presses the START key while the lid is open.
- → The user presses the START key without opening the lid between cycles.

- Open the lid or press STOP/CANCEL to clear the display.

Flashing Display Time OPEN LID

If lid opens while the unit is in running mode, time remaining will be flashed on the display.

- Close the lid and press START to continue the cycle.

SL (SL) or (5L) SUDS LOCK

The motor controller senses a suds lock condition by analyzing the current draw on the drive motor. If a potential suds lock is detected, the control tries up to 3 times to clean out the unit with a mini-cycle. See Use & Care Guide for more information.

“SL” is displayed if suds are detected but the unit is unable to clean out suds. This may signify:

- → a failed pump
- → an extra heavy load
- → excessive detergent
- → excessive suds.

- Press STOP/CANCEL to clear the display.

DIAGNOSTIC TESTS

Each diagnostic test is activated by performing a "Key Dance"; pressing certain touchpads in sequence. A key dance must be completed within 5 seconds in order for a test to remain active. After performing a Key Dance, the Diagnostic Test Indicator dt will be displayed to verify that the test has been activated.

- The control must be in the OFF state before pressing the touchpad sequence to start each test.

Any **Diagnostic Tests** can be stopped by pressing the STOP/CANCEL touchpad. Tests will self-terminate after running for about 3 minutes or less.

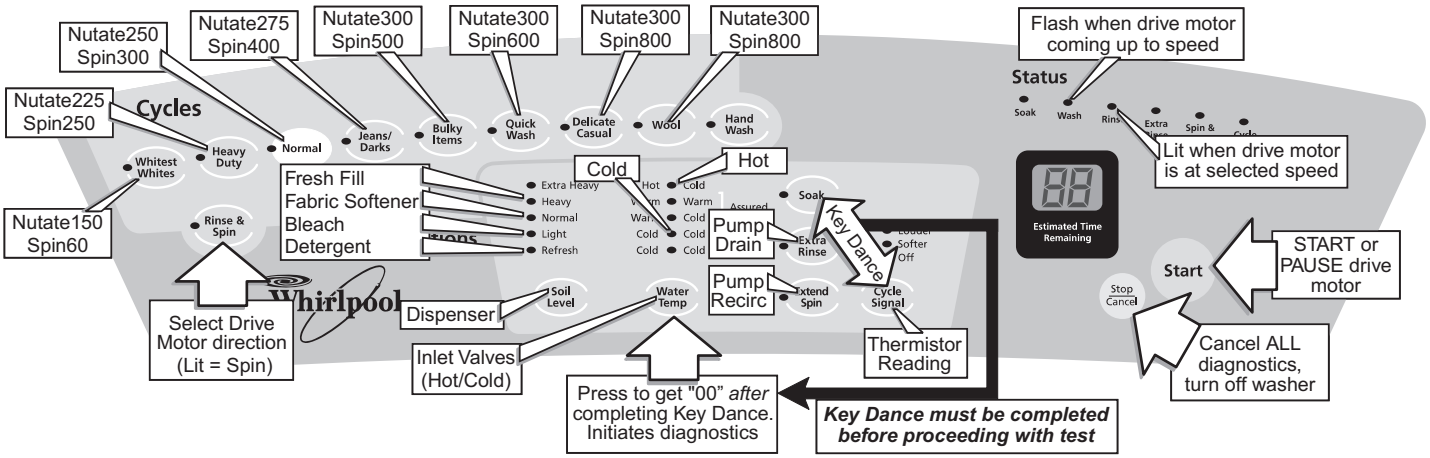


Figure 1: Manual Diagnostics Description

WATER INLET AND DISPENSER VALVE OPERATING PS TEST

Refer to Figure 1. If Operating Pressure Switch trips at any time, all water valves should turn off. Press EXTRA RINSE after step 2 below to start draining. Press EXTRA RINSE again to turn off the pump.

STEP #	PRESS TOUCHPAD	DISPLAY	CONTROL ACTION
1	Key Dance: **SOAK ⇒ CYCLE SIGNAL ⇒ SOAK ⇒ CYCLE SIGNAL**	dt DIAGNOSTIC TEST INDICATOR	The Water Inlet and Dispenser Valve Operating Pressure Switch Test is activated. Key Dance must be completed within 5 seconds to be valid.
2	WATER TEMP	00	"00" on the display
3	repeat	00	Cold Water Inlet Valve and Fabric Softener dispenser valve on. Cold/Cold and Normal (above SOIL LEVEL) LEDs will turn on.
4	SOIL LEVEL	00	Normal LED will turn off and Heavy LED will turn on. Fabric softener valve will shut off and Fresh water valve will turn on.
5	repeat	00	Heavy LED will turn off and Refresh will turn on. Fresh water valve will turn off and Detergent dispenser valve will turn on.
6	repeat	00	Refresh LED will turn off and Light LED will turn on. Detergent valve will turn off and Bleach valve will turn on.
7	repeat	00	This key press turns off the Bleach and turns on the Fabric Softener.
8	WATER TEMP	00	Cold/Cold LED turns off and Hot/Cold LED turns on. Cold inlet valve turns off and Hot inlet valve turns on.
9	repeat	00	Both hot and cold inlet valves turn on.
10	repeat	00	All valves turn off.
11	STOP/CANCEL	All LEDs off	Cancel all diagnostics, go back to Off mode.

If Operating Pressure Switch trips at any time, all water valves should turn off. To start draining:

1. Press STOP/CANCEL to turn unit off.
2. Repeat steps 1 and 2 of this test.
3. Press EXTRA RINSE.
4. Press EXTRA RINSE again to turn off the pump.

NUTATE AND RECIRCULATE TEST

Refer to Figure 1. This test sequence assumes the control is off. The test will self-terminate after 3 minutes.

STEP #	PRESS TOUCHPAD	DISPLAY	CONTROL ACTION
1	Key Dance: **SOAK ⇒ CYCLE SIGNAL ⇒ SOAK ⇒ CYCLE SIGNAL**	dt DIAGNOSTIC TEST INDICATOR	The Nutate And Recirculate Test is activated. Key dance must be completed within 5 seconds to be valid.
2	**WATER TEMP**	00	"00" on the display
3	**repeat**	00	Cold Water Inlet Valve and Fabric Softener dispenser valve on. Cold/Cold and Normal (above SOIL LEVEL) LEDs will turn on.
4	**SOIL LEVEL**	00	Normal LED will turn off and Heavy LED will turn on. Fabric softener valve will shut off and Fresh water valve will turn on.
5	**WATER TEMP**	00	Cold/Cold LED turns off and Hot/Cold LED turns on. Cold inlet valve turns off and Hot inlet valve turns on.
6	**repeat**	00	Both hot and cold inlet valves turn on.
7	**none**	**none**	Wait about 10 seconds until enough water is in tub.
8	**WATER TEMP**	00	All valves turn off.
9	**WHITEST WHITES**	Whitest Whites LED on	Unit is now set to 150 RPM nutate speed. Motor doesn't start until START is pressed..
10	**START**	Wash LED flashes, then Rinse LED turns on	Wash plate begins nutating at 150 RPM.
11	**HEAVY DUTY, NORMAL, JEANS/DARKS, BULKY ITEMS**	Wash LED flashes, then Rinse LED turns on	These keys can increase the nutate speed if necessary (optional).
12	**EXTEND SPIN**	Extend Spin LED on	Pump should turn on in recirculate mode. Press EXTEND SPIN again to turn off pump.
13	**STOP/CANCEL**	All LEDs Off	Cancel all diagnostics, go back to Off mode. You may want to spin and drain out the water in the unit after this test.

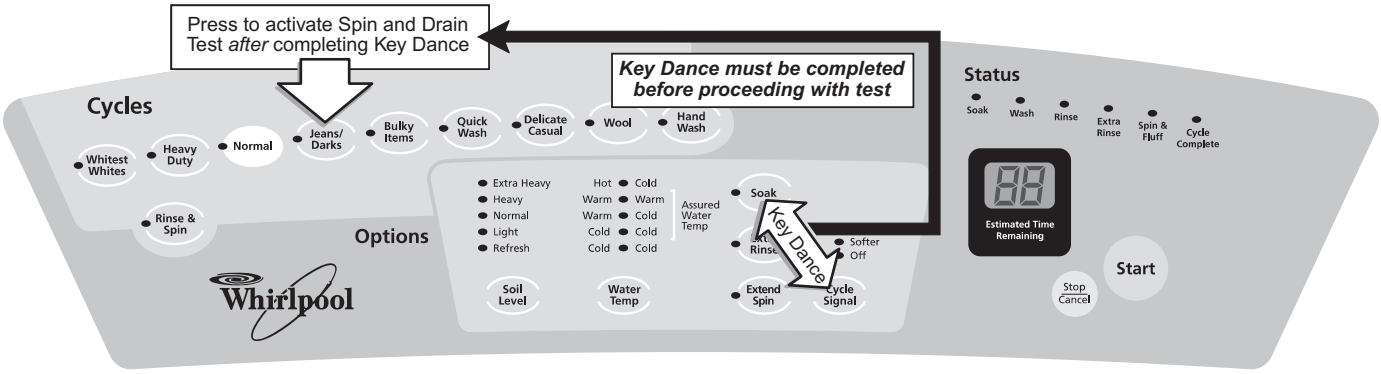


Figure 2: Key Dance for Spin/Drain Test

SPIN AND DRAIN TEST

Refer to Figure 2. This test sequence assumes the control is off. Water should be present in unit before this test is started. Note: you may use this test or just select EXTEND SPIN and START to use the stand-alone EXTEND SPIN cycle.

STEP #	PRESS TOUCHPAD	DISPLAY	CONTROL ACTION
1	Key Dance: **SOAK ⇒ CYCLE SIGNAL ⇒ SOAK ⇒ CYCLE SIGNAL**	dt DIAGNOSTIC TEST INDICATOR	The Spin and Drain Test is activated. Key dance must be completed within 5 seconds to be valid.
2	**JEANS/DARKS**	t4	Activates 60-rpm spin and drain test. Shuts off automatically after 40 seconds.

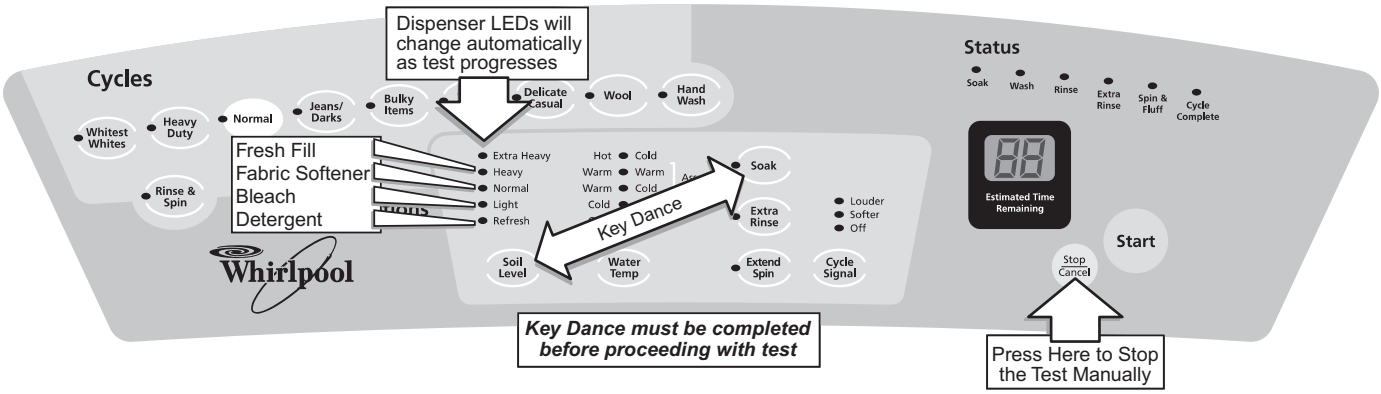


Figure 3: Automatic Service Diagnostics

AUTOMATIC SERVICE DIAGNOSTICS

Refer to Figure 3. The test sequence will check: drive motor (nutate and spin), fill valves (all), pump motor (recirculate and drain). The control must be in the OFF state before pressing the touchpad sequence below to start the test. Any diagnostic test can be stopped by pressing STOP/CANCEL touchpad. This test will self-terminate after approximately 2 minutes.

PRESS TOUCHPAD	DISPLAY	CONTROL ACTION
Key Dance: **SOAK ⇒ SOIL LEVEL ⇒ SOAK ⇒ SOIL LEVEL**		
	99 **DIAGNOSTIC TEST COUNTDOWN INDICATOR**	The Automatic Service Diagnostics Test is activated. Key Dance must be completed within 5 seconds to be valid.

During the Automatic Service Diagnostics test, the control follows the sequence below. Countdown indicator counts down from the total test time in seconds. Lighted dispenser LEDs show which dispenser is active and will change automatically as test progresses.

STEP #	DESCRIPTION OF SEQUENCE	DISPLAY (In Seconds)	INLET VALVE (Hot or Cold)	DISPENSER	SOIL LEVEL LED LIT	PUMP MOTOR ACTION	DRIVE MOTOR ACTION	DRIVE MOTOR SPEED
1	NUTATE + FILL	99 - 81	COLD	FRESH	HEAVY	OFF	NUTATE	300
2	NUTATE + RECIRCULATE	80 - 61	COLD	FAB SOFT	NORMAL	RECIRCULATE	NUTATE	275
3	NUTATE + FILL + DRAIN	60 - 41	BOTH	BLEACH	LIGHT	DRAIN	NUTATE	250
4	NUTATE + FILL + DRAIN	40 - 21	HOT	DETERGENT	REFRESH	DRAIN	NUTATE	225
5	SPIN + DRAIN	20 - 01	NONE	OFF	OFF	DRAIN	SPIN	500
	RETURN TO STANDBY	0	OFF	OFF		OFF	OFF	

DRIVE MOTOR	
Motor Winding	**Resistance at Motor**
RD to WH	3.1 Ohms
YL to WH	2.8 Ohms
RD to YL	5.9 Ohms

PUMP MOTOR	
Motor Winding	**Resistance at Motor**
RD to WH	11.1 Ohms
YL to WH	11.1 Ohms
RD to YL	22.2 Ohms

THERMISTOR RESISTANCE	
Temperature (° F)	**Resistance (Ohms)**
40	126k – 125k
50	97k – 102k
60	75k – 78k
70	58k – 61k
80	46k – 47k
90	36k – 37k
100	28k – 30k
110	23k – 24k
120	18k – 19k
130	15k – 16k
140	12k – 13k
150	10k –11k

ELECTRONIC COMPONENTS PART NUMBER KEY	
8299603	KEYSWITCH WHITE
8299571	KEYSWITCH BISCUIT
8318468	KEYSWITCH SILVER
8054766	OPERATING PRESSURE SWITCH
8054767	FLOOD SWITCH
8299818	HARNESS - UPPER
8299814	HARNESS - LOWER
8318209	POWER CORD
8272124	SWITCH - LID
661640	UNIVERSAL MACHINE CONTROLLER ASM.
661646	MOTOR CONTROLLER & MOUNT ASM.
8300022	INTERLOCK SWITCH
9724754	LOG VALVE
8055146	LINE FILTER

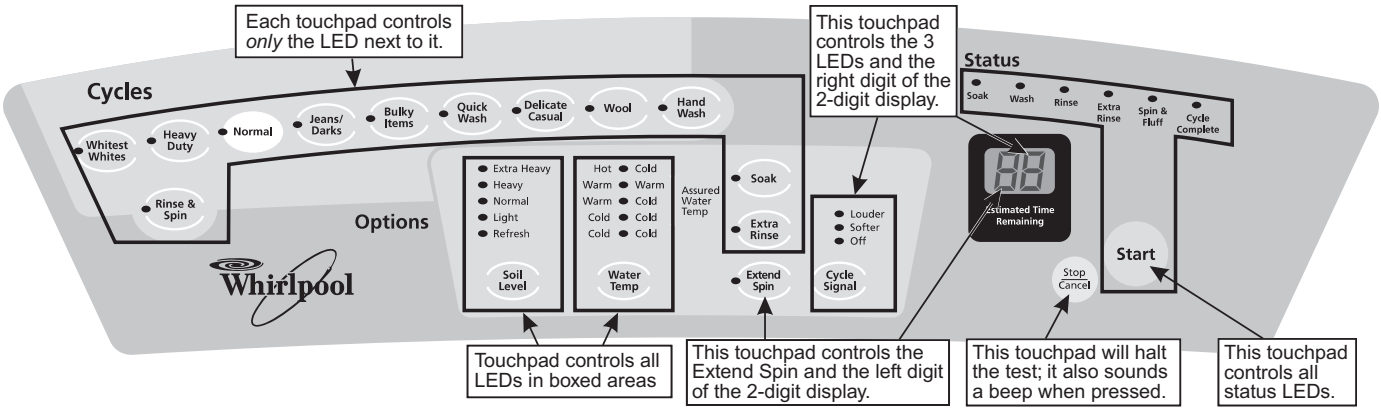


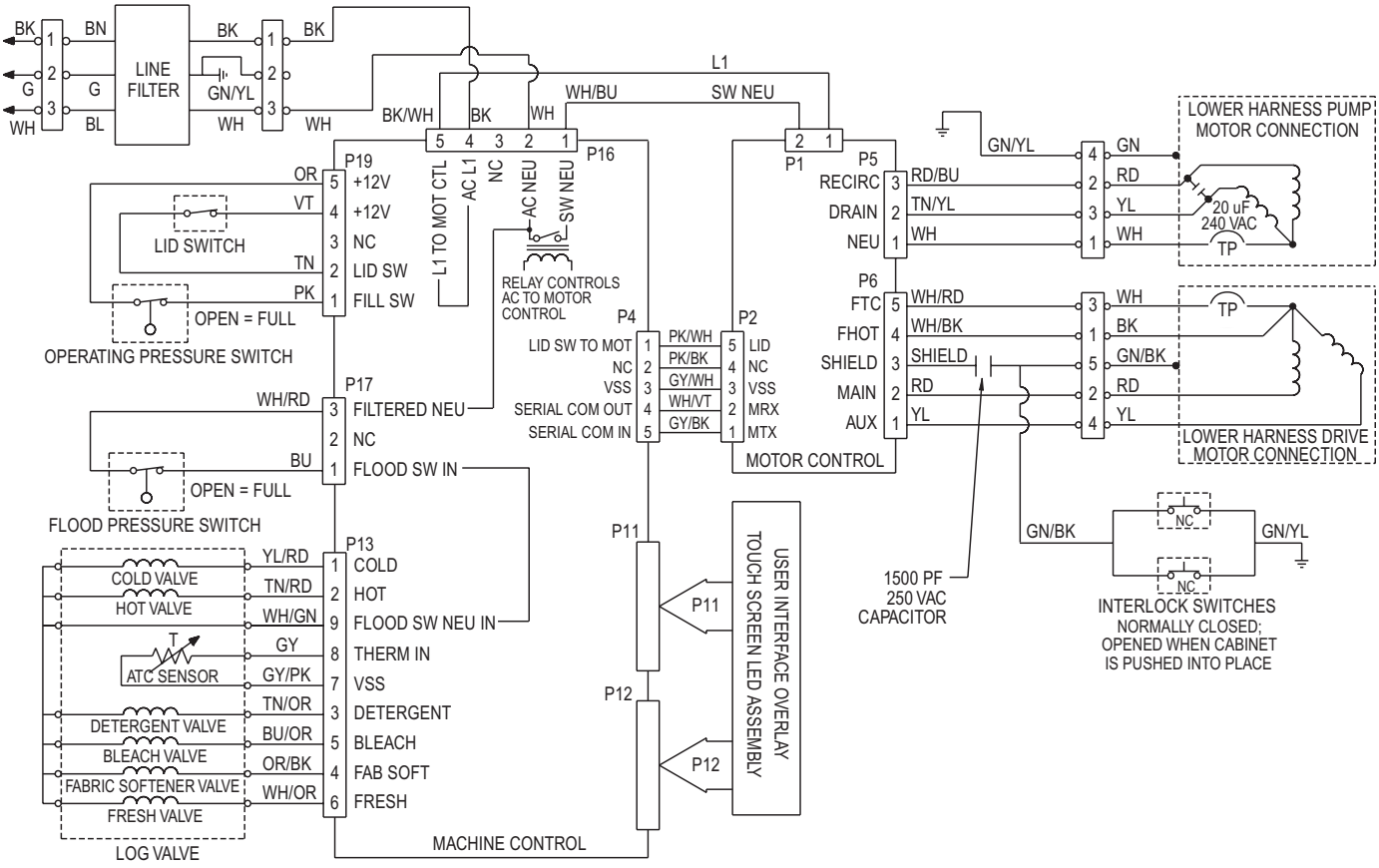
Figure 4: Keypad and LED Test

CONSOLE SWITCHES AND INDICATORS TEST

Refer to Figure 4. This test sequence assumes the control is off. Pressing each touchapd should cause a "beep" sound. Each keypad controls one or more LEDs as shown in Figure 4. The test will self-terminate after 3 minutes.

STEP #	PRESS TOUCHPAD	DISPLAY	CONTROL ACTION
1	Key Dance: **SOAK ⇒ CYCLE SIGNAL ⇒ SOAK ⇒ CYCLE SIGNAL**		The Keypad and LED Test is activated. Key dance must be completed within 5 seconds to be valid.
2	**START**	All LEDs light up	All LEDs light up.

WIRING DIAGRAM



TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE/TEST
NOTE: *Possible Cause/Test MUST be performed in the sequence shown for each problem.*	
WON'T POWER UP (Touchpads do not respond when pressed)	1. 120V electrical supply. See Test #1. 2. Check harness connections. 3. Check touchpad/LED assembly. See Test #4.
WON'T START CYCLE	1. See Test #1. 2. If "LS" is flashing, open lid to clear it and restart cycle. 3. Check harness connections. 4. Check START touchpad. See Test #4.
WON'T SHUT OFF	1. Check STOP/CANCEL touchpad. See Test #4. 2. Check Lid Switch component.
CONTROL WON'T ACCEPT SELECTIONS	1. Touchpad/LED assembly. See Test #4. 2. Check harness connections.
WON'T DISPENSE	1. Dispense valves. See Test #2. 2. Check harness connections. 3. Check water connections to the unit and within the unit. Check for plugged screen in water source.
WON'T FILL	1. Fill valves. See Test #2. 2. Check harness connections. 3. Check installation. 4. Check water connections to the unit and within the unit. Check for plugged screen in water source.
OVER FILLS	1. Operating Pressure Switch. See Test #6. 2. Flood Pressure Switch. See Test #6. 3. Check pressure hose. 4. Check pump drain system - an over fill could indicate a failure to drain.
WON'T NUTATE AT ANY SPEED	1. Check harness connections. 2. Drive motor. See Test #3. 3. Drive mechanism failure.
WON'T SPIN AT ANY SPEED	1. Check harness connections. 2. Drive motor. See Test #3. 3. Drive mechanism failure.
MOTOR OVERHEATS	1. Drive motor. See Test #3.
WON'T DRAIN	1. Check pump. See "Spin and Drain Test" in Diagnostic Tests section. 2. Check pump motor. 3. Check for foreign objects in the pump and sump areas.
MACHINE VIBRATES	1. Check installation. 2. Check leveling feet.
INCORRECT WATER TEMPERATURE	1. Auto Temp (ATC). See Test #5.
ALL HOT FILLS	1. Temperature sensor. See Test #5.
WON'T RECIRCULATE RINSE WATER	1. Check pump. See "Nutate and Recirculate Test" in Diagnostic Tests section. 2. Check pump motor. 3. Check for leaks in the recirculation system.
DISPLAY IS FLASHING	1. See "Display Fault/Error Codes" on page 1.

TROUBLESHOOTING TESTS

TEST #1
120 VAC Electrical Supply

1. Check for 110-125 VAC at electrical outlet. If voltage is not present, call a qualified electrician.

2. Check for 110-125 VAC on the power cord connection to the line filter. If no AC power is present, replace the power cord.

3. Check for 110-125 VAC on the Line Filter connection to the machine controller. If no AC power is present, replace the line filter.

4. Check for 110-125 VAC to the control board. With the washer off but connected to the AC outlet, measure the

AC voltage between Pins 4 and 2 at connector P16. Refer to Figure 5: Machine Controller Connections.

→ If 110-125 VAC is present, continue with the remaining **Troubleshooting Tests** as needed.

TEST #2
Water Inlet and Dispenser Solenoid Valve Test

This test checks for 110-125 VAC to these valves, the electrical connections to the valves, and the valves themselves.

- Check the electrical connections to the valves. Do the **Diagnostic Tests** section and perform the "Water Inlet and Dispenser Valve Test". Each step in the test activates a group of valves.
- For the valve in question, measure the voltage across the pins shown in Table 1. The voltage should be equal to the line AC power voltage (110 VAC to 125 VAC).

TABLE 1

P13 PIN #	P13 PIN #	FUNCTION
1	9	Cold water valve
2		Hot water valve
3		Detergent dispense valve
4		Fabric softener dispense valve
5		Bleach dispense valve
6		Fresh water valve

- If no line voltage is present at any of these test points and voltage at the wall outlet is 110–125 VAC (see **Troubleshooting Test #1**), the control board has a faulty valve driver. Replace the machine control board.
- If the voltage measurements are correct, check the individual solenoid valves. Unplug the washer and disconnect connector P13 from the control board.
- Check the resistance at contacts shown in the following Table 2. If resistance is outside of range, replace the entire log valve assembly.

TABLE 2

SOLENOID TESTED	RESISTANCE RANGE FOR 120 VAC	CONTACTS MEASURED	
Cold water valve	800 - 1200 Ohms	P13-1 (YL/RD)	P13-9 (WH/GN)
Hot water valve		P13-2 (TN/RD)	
Detergent dispense valve		P13-3 (TN/OR)	
Fabric softener valve		P13-4 (OR/BK)	
Bleach dispense valve		P13-5 (BU/OR)	
Fresh water valve		P13-6 (WH/OR)	

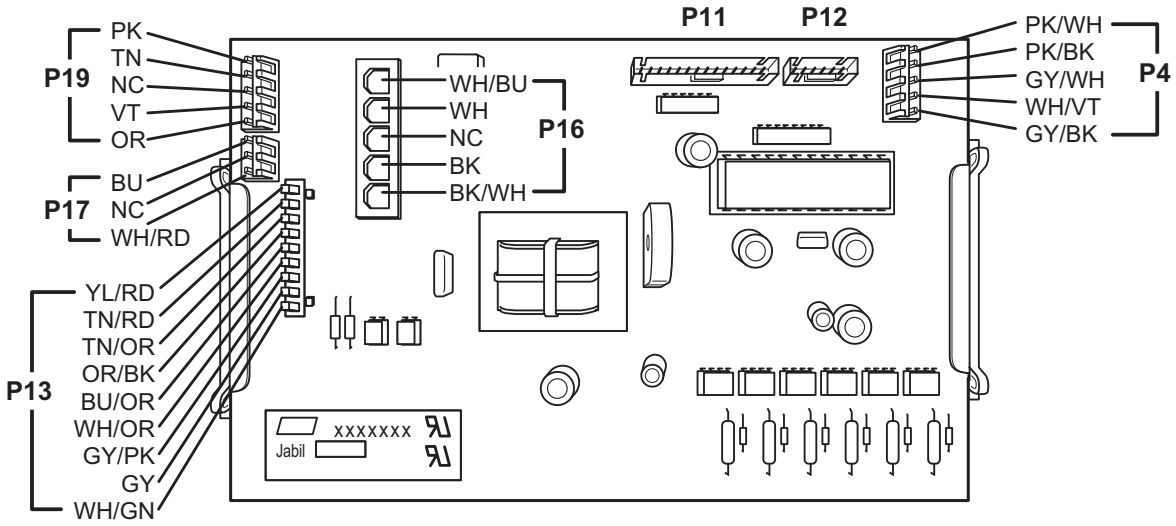
TEST #3
Motor and Motor Control System Test

These tests check the machine controller power to the motor controller, the motor controller board, the wiring connections between the control board and drive motor, and the drive motor itself.

3a. Machine Control Relay

- Confirm that power is applied to the machine controller (see Test #1 on preceding page).
- Set probes between P16-5 (BK/WH) and P16-1 (WH/BU) on the machine controller. Start washer by pressing HEAVY DUTY and then START. Confirm that 120 VAC is present when relay clicks closed. Press STOP/CANCEL twice to stop the cycle.
- Set probes between P1-1 (BK/WH) and P1-2 (WH/BU) on the motor controller. Start washer by pressing HEAVY DUTY and then START. Confirm that 120 VAC is present when relay clicks closed. Press STOP/CANCEL twice to stop the cycle.

Figure 5: Machine Controller Connections



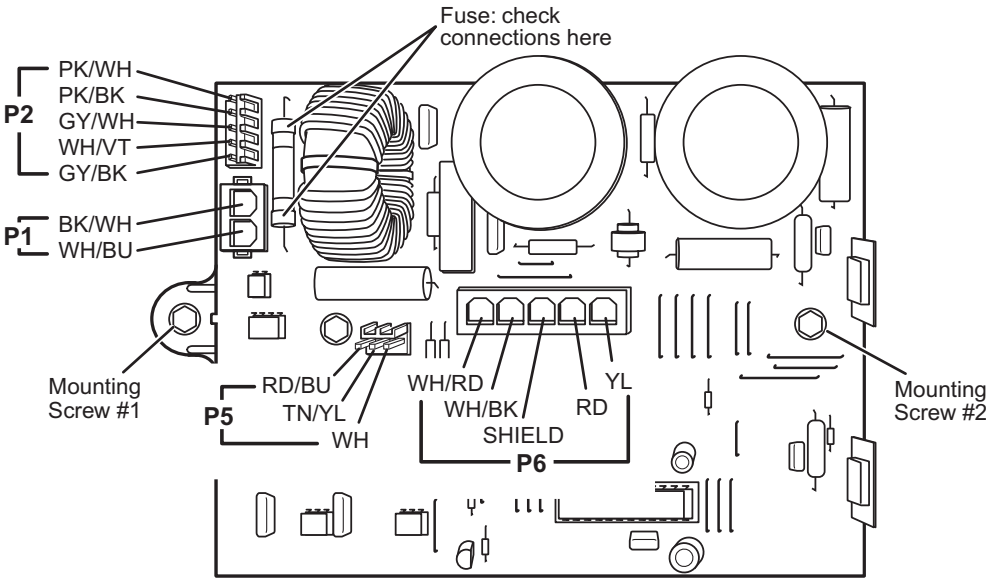


Figure 6: Motor Controller and Mount Assembly (Heat Sink on right)

3b. Motor Controller

- Check power to motor controller board:
  - → P1 of the motor control board should have 120 VAC across its two terminals **when the motor controller is powered**. See Test #3. Replace the motor control board if connector is broken.
- Check link between machine controller and motor controller:
  - → **With the power disconnected**, check connectivity between P4 of the machine controller and P2 of the motor controller. Replace upper harness if necessary. Replace control board if connector is broken.
- Check fuse:
  - → With the power disconnected, check for an open fuse. You may have to scratch away conformal coating from the bare metal of the fuse before checking for continuity.
  - → If there is a problem with any component of the motor control board, replace the entire board.

3c. Wiring and Drive Motor

- Check the drive motor windings by removing connectors P6 from the motor controller board. Check for the resistance values shown in Table 3. For ground contact, use a ground screw attached to the top.
- If the winding measurements are much higher (tens of Ohms to infinity) than shown in Table 3, a problem exists in the motor winding or in the connection between the control board and the motor. Check the resistance at the drive motor. Remove the connector at the motor, and take measurements as shown in Table 4.

TABLE 3

WINDING	RESISTANCE	CONTACTS MEASURED	
MAIN to FHOT	3.1 Ohms	P6-2 (RD)	P6-4 (WH/BK)
AUX to FHOT	2.8 Ohms	P6-1 (YL)	P6-4 (WH/BK)
MAIN to AUX	5.9 Ohms	P6-2 (RD)	P6-1 (YL)
FTC to FHOT	< 0.5 Ohms (short)	P6-5 (WH/RD)	P6-4 (WH/BK)
MAIN to Ground	> 1M Ohms (open)	P6-2 (RD)	Ground screw in top
AUX to Ground	> 1M Ohms (open)	P6-1 (YL)	Ground screw in top

TABLE 4

WINDING	RESISTANCE	MOTOR WINDINGS*	
MAIN to FHOT	3.1 Ohms	RD	BK
AUX to FHOT	2.8 Ohms	YL	BK
MAIN to AUX	5.9 Ohms	RD	YL
FTC to FHOT	< 0.5 Ohms (short)	WH	BK
MAIN to Ground	> 1M Ohms (open)	RD	GN/BK
AUX to Ground	> 1M Ohms (open)	YL	GN/BK

* Measure resistance directly across the motor windings where these colored wires enter the motor.

- If the resistance is much higher (tens of Ohms to infinity) than shown in Table 4, replace the drive motor.
- If the resistance at the drive motor is correct, there is an open circuit in the wiring between the motor and control board. Repair or replace the lower wiring harness.

TEST #4
Touchpad and LED Test

- Refer to the **Diagnostic Tests** section and perform the "Console Switches and Indicators Test".
- Start the test by pressing the START touchpad. Check for the following situations:
  - ✔ **None of the LEDs light up.**
  - ✔ **A particular group of LEDs does not light up.**
  - ✔ **A single LED does not light up.**
  - ✔ **No beep sound is heard.**
  - ✔ **No washer function is activated when a particular touchpad is pressed.**

None of the LEDs light up:

- Visually check that connectors P11 and P12 are inserted all the way into the machine controller.

A particular group of LEDs does not light up:

- A group or combination of LEDs share a common electronic connection. If this connection is open, all of the LEDs in the group will be disabled. Visually check that there is no contamination on P11 and P12 of the machine controller. Replace the console panel/ touchpad assembly or machine controller as needed.

A single LED does not light up:

- Press the touchpad associated with the LED several times. If the LED does not light up, the LED has failed. Visually check that there is no contamination on P11 and P12 of the machine controller. Replace the console panel/ touchpad assembly or machine controller as needed.

No beep sound is heard:

- If the associated LEDs do light up, it is possible that the beeper circuit has failed. Check touchpad functioning (see box at right) before replacing control board.

No washer function is activated when a particular touchpad is pressed (from OFF mode):

- If the associated LEDs do light up, it is possible that the control board has failed. Check touchpad functioning (see box at right) before replacing control board.

TEST #5
Automatic Temperature Control Test

This test checks the water inlet relays, the temperature sensor, and the control board.

- Check that the hot and cold water fill valves are working. Perform **Troubleshooting Test #2**.

NOTE: *This test MUST be done with the Automatic Temperature Control (ATC) de-selected.*

- If fill valves are working properly, test the temperature sensor as follows:
  - → Press NORMAL or HEAVY DUTY cycle.
  - → Use the WASH/RINSE TEMP selector to set the Wash water temperature to WARM.

CHECKING TOUCHPAD FUNCTIONING

Before replacing the control board, check for proper touchpad functioning as follows:

- Disconnect the power cord from the outlet.
- Remove connectors P11 and P12 from the control board.

Using Table 6 below, measure the resistance across the switch when the touchpad is pressed.

NOTE: *The meter must be connected with the proper polarity.*

- **If using an analog readout meter:**
  - → The resistance reading should go from infinity (open circuit) down to a readable ohm level. The level may be different depending on your meter since there is a diode in the circuit.
- **If using a digital readout meter:**
  - → The resistance reading should go from infinity down to a readable ohm level. The level may be different depending on your meter since there is a diode in the circuit. If available, you could use the "diode test" function of a digital meter, which will give a voltage of about 1.2 VDC during the test.

TABLE 6

TOUCHPAD	+ LEAD	- LEAD
Whitest Whites	P11-2	P11-4
Heavy Duty	P11-3	P11-4
Normal	P11-1	P11-5
Jeans/Darks	P11-2	P11-5
Bulky Items	P11-3	P11-5
Quick Wash	P11-1	P11-4
Delicate Casual	P11-1	P11-6
Wool	P11-2	P11-6
Hand Wash	P11-3	P11-6
Rinse & Spin	P11-1	P11-7
Soil Level	P11-2	P11-7
Water Temp.	P11-3	P11-7
Soak	P11-1	P11-8
Extra Rinse	P11-2	P11-8
Extend Spin	P11-3	P11-5
Cycle Signal	P11-3	P12-8
Stop/Cancel	P11-2	P12-5
Start	P11-1	P12-5

- If any switches fail this test, replace the console panel/touchpad assembly.
- If all switches test OK, replace the machine control board.

- → Press START.
- → After the tub fills, press STOP/CANCEL once.
- → NOTE: Ensure proper hose connections and household's hot water presence.
- → Measure the water temperature. At the WARM setting, a temperature range of 90° - 110° F indicates proper operation.

- If the temperature is not within this range, check the Automatic Temperature Control sensor as follows:
  - → Remove connector P13 from the control board.
  - → Measure the resistance between P13-7 and P13-8 at the wire harness connector. The resistance should be between 74 kΩ and 24 kΩ.
  - → If resistance is not within this range, check for continuity between the connector and sensor. If continuity is good, replace the log valve assembly.
- If fill valves and temperature sensor are functioning properly, replace the machine control board.

TEST #6
Operating and Flood Pressure Switch Test

- Check the hose connections between each pressure switch in the console and the pressure dome attached to the tub.
- If hose connections are good, check the Operating Pressure Switch as follows:
  - → Press HEAVY DUTY then START to start a cycle. Let the unit fill and see if the operating pressure switch turns off the water.
  - → Check the voltage across pins P and V of the Operating Pressure Switch. If 12 VDC is present, the water level pressure has opened the switch. See Figure 7.

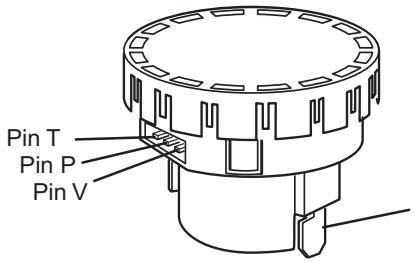


Figure 7

  - → If no voltage is present and the water has filled the tub to a visible level (above the nutate plate), stop the cycle and replace the Operating Pressure Switch.
- To check the Flood Pressure Switch:
  IMPORTANT – PERFORM THE FOLLOWING STEPS IN THIS ORDER:
  - → Pull the hose off of the Operating Pressure Switch so that the washer can fill beyond the Operating Switch trip point.
  - → Press HEAVY DUTY then START to start a cycle. Let the unit fill and see if Flood Pressure Switch will trip.
  - → Check the voltage across pins P and V of the Flood Pressure Switch. If 120 VAC is present, the water level pressure has opened the switch. This should also shut off the water inlet valves and give an FL indication on the 7-segment display.
  - → If no voltage is present and the water has filled the tub to an over fill level, stop the cycle and replace the Flood Pressure Switch.
  - → Reconnect the pressure switch hoses and drain out the water by starting an EXTEND SPIN cycle.

TEST #7
Drain/Recirculation Test

Perform the following checks if unit fails to drain or recirculate.

- Check power to the unit per Test #1.
- Refer to Test #3 and check the pump connection (P5) to the motor controller.
- Check pump motor windings by removing connector P5 from the motor controller board. Check for resistance values shown in Table 7.

TABLE 7

WINDING	RESISTANCE	CONTACTS MEASURED	
RECIRCULATE to NEU	11.1 Ohms	P5-3 (RD/BU)	P5-1 (WH)
DRAIN to NEU	11.1 Ohms	P5-2 (TN/YL)	P5-1 (WH)
RECIRCULATE to DRAIN	22.2 Ohms	P5-3 (RD/BU)	P5-2 (TN/YL)

- If the winding measurements are much higher (tens of Ohms to infinity) than shown in Table 7, a problem exists in the motor winding or in the connection between the control board and the motor. Check the resistance at the pump motor. Remove the connector at the motor, and take measurements as shown in Table 8.

TABLE 8

WINDING	RESISTANCE	CONTACTS MEASURED	
RECIRCULATE to NEU	11.1 Ohms	RD	WH
DRAIN to NEU	11.1 Ohms	YL	WH
RECIRCULATE to DRAIN	22.2 Ohms	RD	YL

- If the winding measurements are much higher (tens of Ohms to infinity) than shown in Table 8, replace the pump motor.
- If the resistance at the pump motor is correct, there is an open circuit in the wiring between the motor and control board. Repair or replace the lower wiring harness.
- If pump motor windings and motor control board check OK, repair or replace the pump. Be sure to check the pump and tub sump for foreign objects before replacing pump.

CONTROL BOARD REMOVAL OR REPLACEMENT

IMPORTANT: Electrostatic (static electricity) discharge may cause damage to electronic control assemblies. See page 1 for details.

NOTE: *Be sure to perform the Diagnostic Tests before replacing the control board. Disconnect power before replacing control board.*

To remove machine control board:

- Remove all connectors from the control board. Remove both mounting screws from control board.
- Push the mounting legs on both sides of control board toward each other. Lift control board away from bracket.
- Pinch and remove cable tie snap from bottom of board.

To replace machine control board:

- Attach control board mounting legs to bracket. Replace both mounting screws into control board and secure to control bracket.
- Plug all connectors into the control board. Reconnect ribbon connectors so that the ribbon is wrapped around the two-wire (GY/WH and BK/WH) leads.
- Plug wire harness snap tie into top of board.

To remove motor control board:

- Remove all connectors from the control board.
- Remove lock down screw from plastic bracket (mounting screw #1, see Figure 6). This is the screw on the motor control that is closest to the machine control. Also remove screw near heat sink (mounting screw #2, see Figure 6) from motor control board.
- Rotate entire assembly away from control mounting bracket, lift and remove motor control board.

To replace motor control board:

- Insert plastic tabs into slots on metal control bracket. Rotate entire assembly toward the control mounting bracket so that the screw hole in the plastic mount lines up with the hole in the metal control bracket.
- Insert both mounting screws and secure into metal control bracket.
- Plug all connectors into the control board.

To remove line filter:

- Disconnect the two filter connectors from the wiring harness and power cord.
- Remove the grounding screw which secures the grounding ring to the top.
- Remove the line filter mounting screw. Tilt away from screw mounting end and remove line filter component.

To replace line filter:

- Insert line filter tab into slot on top, secure line filter with mounting screw.
- Secure grounding ring with grounding screw to the top.
- Reconnect the two filter connectors to the wire harness and power cord.

PART NO. 8522206

NOTE: This sheet contains important Technical Service Data

FOR SERVICE TECHNICIAN ONLY
DO NOT REMOVE OR DESTROY