

⚠ WARNING



Electrical Shock Hazard

**Disconnect power before servicing.
Replace all panels before operating.
Failure to do so can result in death or electrical shock.**

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?
- Is dryer vent properly installed and clear of lint or obstructions?
- 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, defective 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	DESCRIPTION	EXPLANATION AND RECOMMENDED PROCEDURE
PF	POWER FAILURE	"PF" flashes when the dryer is plugged in for the first time or after a power failure. Press STOP/CANCEL to clear display.
E1	THERMISTOR OPEN	"E1" flashes if the thermistor is open. (see TEST #3).
E2	THERMISTOR SHORTED	"E2" flashes if the thermistor has shorted. (see TEST #3).

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 TEST

This test allows factory/service personnel to test and verify all inputs to the control board. The basic operation of this test is to notify the operator with an audible beep every time the status of an input to the control changes state.

Activating the Diagnostic Test Mode

1. Set the following configuration:
 - Door - must be open
 - Unit in Standby
2. Alternately press the MORE TIME (^), LESS TIME (v) touchpads two times. All LED's should light and the display should show **88**.

If any of these initial conditions are not satisfied, the control will not enter the test mode.

NOTE: If a flashing E1 or E2 appears in the display, proceed to the thermistor test (Test #3C).

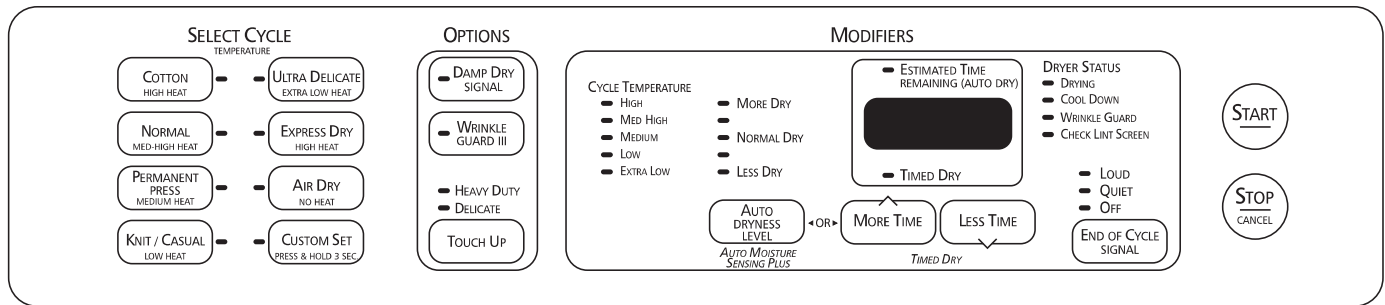
Test Mode Functionality

When the control is in the Diagnostic Test mode, every input change of state will result in a beep. This includes:

- Door switch
- Moisture Sensor (short/open Sensor will result in a beep) **NOTE:** A moistened finger or damp cloth may also be used.

Refer to table on next page to test console touchpad assembly.

TOTAL CARE SYSTEM with EVEN HEAT



Heavy Duty • KING Size Capacity • Ultra Quiet Pak • 9 Monitored Cycles

CONSOLE SWITCHES AND INDICATORS TEST

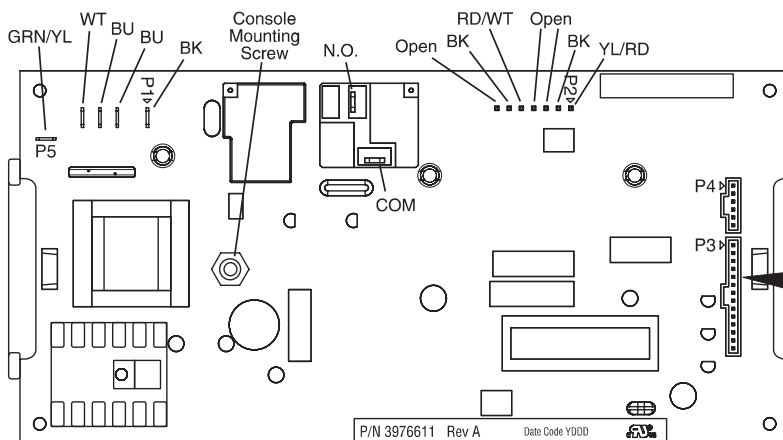
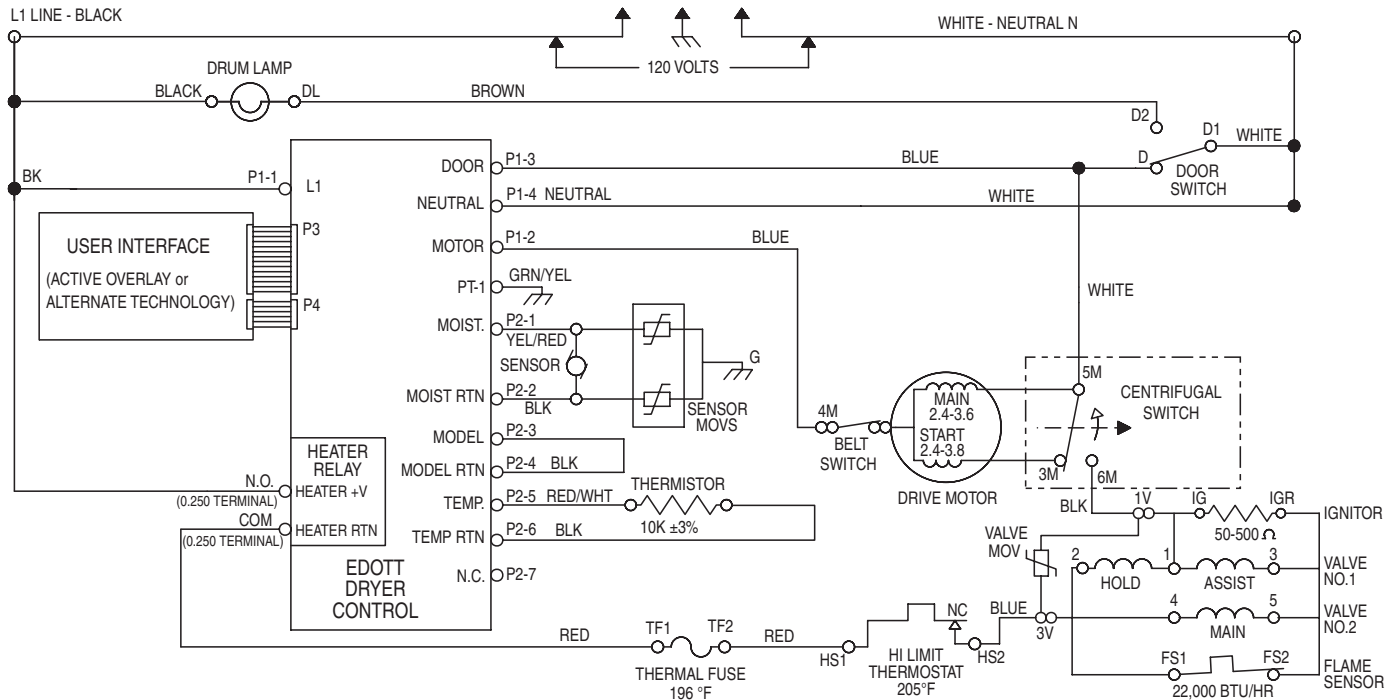
PRESS TOUCHPAD	DISPLAY	CONTROL ACTION
NOTE: After pressing the START touchpad, the test does not have to follow the sequence as it is listed below.		
COTTON	88	Beep sound. "Cotton" LED is turned off .
repeat	88	Beep sound. "Cotton" LED is turned on .
NORMAL	88	Beep sound. "Normal" LED is turned off .
repeat	88	Beep sound. "Normal" LED is turned on .
PERMANENT PRESS	88	Beep sound. "Permanent Press" LED is turned off .
repeat	88	Beep sound. "Permanent Press" LED is turned on .
KNIT / CASUAL	88	Beep sound. "Knit / Casual" LED is turned off .
repeat	88	Beep sound. "Knit / Casual" LED is turned on .
ULTRA DELICATE	88	Beep sound. "Ultra Delicate" LED is turned off .
repeat	88	Beep sound. "Ultra Delicate" LED is turned on .
EXPRESS DRY	88	Beep sound. "Express Dry" LED is turned off .
repeat	88	Beep sound. "Express Dry" LED is turned on .
AIR DRY	88	Beep sound. "Air Dry" LED is turned off .
repeat	88	Beep sound. "Air Dry" LED is turned on .
CUSTOM SET	88	Beep sound. "Custom Set" LED is turned off .
repeat	88	Beep sound. "Custom Set" LED is turned on .
TOUCH UP	88	Beep sound. LEDs for "Heavy Duty" and "Delicate" are turned off .
repeat	88	Beep sound. LEDs for "Heavy Duty" and "Delicate" are turned on .
WRINKLE GUARD III	88	Beep sound. "Wrinkle Guard III" LED is turned off .
repeat	88	Beep sound. "Wrinkle Guard III" LED is turned on .
DAMP DRY	88	Beep sound. "Damp Dry" LED is turned off .
repeat	88	Beep sound. "Damp Dry" LED is turned on .
AUTO DRYNESS LEVEL	88	Beep sound. Five (5) associated LEDs, and Five (5) "Cycle Temperature" LEDs are turned off .
repeat	88	Beep sound. Five (5) associated LEDs, and Five (5) "Cycle Temperature" LEDs are turned on .
MORE TIME	88	Beep sound. Left digit of "88" display is turned off .
repeat	88	Beep sound. Left digit of "88" display reappears.
LESS TIME	88	Beep sound. Right digit of "88" display is turned off .
repeat	88	Beep sound. Right digit of "88" display reappears.
END OF CYCLE SIGNAL	88	Beep sound. LEDs for "Loud", "Quiet", "Off", "Estimated Time Remaining", and "Timed Dry" are turned off .
repeat	88	Beep sound. LEDs for "Loud", "Quiet", "Off", "Estimated Time Remaining", and "Timed Dry" are turned on .
START	88	Beep sound. Four (4) associated "Dryer Status" LEDs are turned off .
repeat	88	Beep sound. Four (4) associated "Dryer Status" LEDs are turned on .
STOP	88	Beep sound. All LEDs are turned off .

If pressing any of the above touchpads does not result in the correct action, refer to Troubleshooting Test #5.

GAS DRYER WIRING DIAGRAM

CAUTION: Label all wires prior to disconnection when servicing controls.
Wiring errors can cause improper and dangerous operation.

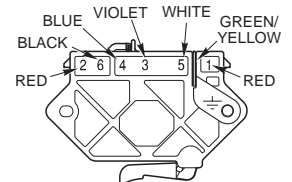
Verify proper operation after servicing.



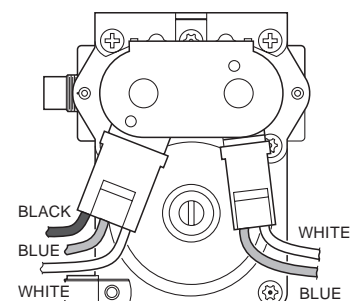
Dryer Control Board

**VOLTAGE CHECKS
ARE MADE WITH
WIRES CONNECTED**

Drum Size:	Drum Speed:
7.2 cubic feet	51.5 ± 3 RPM CW



**Pluggable Drive
Motor Switch**



Gas Valve

**Centrifugal
Switch
(Motor)**

FUNCTION	CONTACTS		
	3M	5M	6M
START	●	●	
RUN		●	●

● = CONTACTS CLOSED

COMPONENT	PART NUMBER
Console Panel/Touchpad Assembly for White Models:	70052 8282540 70072 8282543 70092 8282546
for Graphite Models:	70056 8282542 70096 8282548
for Almond Model:	70097 8282547
Control Board Assembly	3976611
Main Harness	3403727

COMPONENT	PART NUMBER
Door Switch	3392266
Belt Switch	3394881
Thermal Fuse	3390719
Gas Burner Assembly	3402851
High Limit Thermostat	3403140
Drive Motor	3395654
Thermistor - NTC 10K Ohms	3976615
Sensor MOVs	3406653

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE / TEST
NOTE: Possible Cause/Tests MUST be performed in the sequence shown for each problem.	
WON'T POWER UP. (“PF” not displayed when first plugged in, or touchpads do not respond when pressed.)	1. 120V electrical supply. See TEST #1. 2. Check harness connections. 3. Touchpad/LED assembly. See TEST #5.
WON'T START CYCLE.	1. See TEST #1. 2. Check harness connections.
WON'T SHUT OFF.	1. Check STOP/CANCEL touchpad. See TEST #5. 2. Touchpad/LED assembly. See TEST #5. 3. Moisture Sensor. See TEST #6.
CONTROL WON'T ACCEPT SELECTIONS.	1. Touchpad/LED assembly. See TEST #5.
WON'T RUN.	1. Motor. See TEST #2. 2. Check harness connections.
WON'T HEAT.	1. Heater. See TEST #3. 2. Check harness connections. 3. Check installation.
HEATS IN AIR CYCLE.	1. Thermistor. See TEST #3c.
SHUTS OFF BEFORE CLOTHES ARE DRY.	1. Moisture Sensor. See TEST #4.

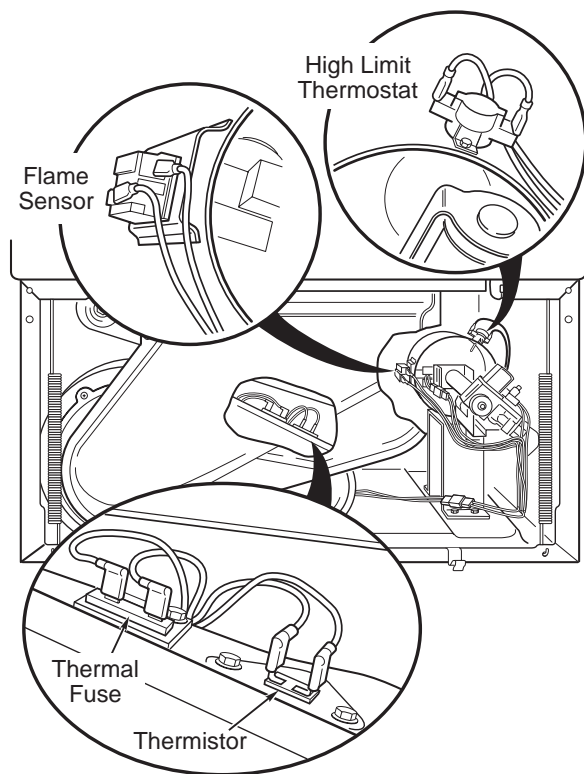


Figure 1

TROUBLESHOOTING TESTS

TEST #1

120 VAC Electrical Supply

Check for 110-125 VAC to the control board. With the dryer off but connected to the AC outlet, measure the AC voltage between Pins 4 and 1 at connector P1. Refer to the control board illustration on page 3.

- ➔ If 110-125 VAC is present, continue with the remaining **Troubleshooting Tests** as needed.
- ➔ If voltage is not present, check circuit breaker or fuse box, power cord connection at outlet and dryer.

TEST #2

Motor Test

This test will check the wiring to the motor and the motor itself. The following items are part of this system:

- Line voltage
- Harness connection
- Thermal fuse
- Belt/belt switch
- Motor
- Door switch
- Control board (See ESD information, page 1)

1. Set the following configuration:
 - ➔ Door - must be closed
 - ➔ Select Cycle touchpad - AIR DRY NO HEAT
 - ➔ Press START touchpad.
2. Open the console and measure the voltage across P1-1 (L1) and P1-4 (Neutral) of the control board. You should get a reading of 110-125 VAC across these points. If so, go to step 3.
 - ➔ If 110-125 VAC is not measured across these points, check the power cord and wiring.
3. Measure the voltage across P1-2 (motor) and P1-3 (door). You should get a reading of 110-125 VAC across these points. If so, go to step 4.
 - ➔ If 110-125 VAC is not measured across these points, replace the control board (see page 8).
4. Unplug dryer. Check the resistance of the Main and Start winding coils. Check for resistance values shown below.

NOTE: Main and Start winding coils must be checked at the motor.

WINDING	RESISTANCE	CONTACTS MEASURED
MAIN	2.4 Ω - 3.6 Ω	BU to 5M at Centrifugal Switch
START	2.4 Ω - 3.8 Ω	BU to 3M at Centrifugal Switch

- ➔ If the resistance at the motor is correct and there is an open circuit between the motor and control

board, check for failed belt switch and replace if needed.

- If the belt switch is okay and there is still an open circuit, check and repair the wiring harness.
- If the Start winding is in question and the resistance is much larger than 4 Ω s, replace the motor.

TEST #3 Heater Test

This test checks the components making up the heating circuit. The following items are part of this system:

- Gas supply
- Line voltage (120V)
- Harness/connection
- Heater relay
- Thermal fuse
- High limit thermostat
- Gas burner assembly
- Centrifugal switch
- Thermistor
- Control board (See ESD information, page 1)

This test is performed when either of the following situations occur:

- ✓ **Dryer doesn't heat**
- ✓ **Heat won't shut off**

Dryer does not heat:

1. Set the following configuration:
 - Door - must be closed
 - Select Cycle touchpad - TOUCH UP (HEAVY DUTY)
 - Press START touchpad.
2. Open the console and measure the voltage across P1-1 (L1) and P1-4 (Neutral) of the control board. You should get a reading of 110-125 VAC across these points. If so, go to step 3.
 - If 110-125 VAC is not measured across these points, check the power cord and wiring.
3. Perform **Troubleshooting Tests #3a, #3b, #3c, and #3d** in sequence.
4. If the thermistor, thermostats and gas valve are okay, measure the voltage across the N.O. (Normally Open) and Com (Common) terminals of the heater relay.
 - If a reading of 110-125 VAC is measured across these points, replace the control board (see page 8).

Heat will not shut off:

1. Set the following configuration:
 - Door - must be closed
 - Select Cycle touchpad - AIR DRY
 - Press START touchpad.

2. Open the console and measure the voltage across P1-1 (L1) and P1-4 (Neutral) of the control board. You should get a reading of 110-125 VAC across these points. If so, go to step 3.
 - If 110-125 VAC is not measured across these points, check the power cord and wiring.
3. Perform the Thermistor Test (see **Troubleshooting Test #3c**) and Gas Valve Test (see **Troubleshooting Test #3d**).
4. If the thermistor and gas valve are okay, measure the voltage across the N.O. (Normally Open) and Com (Common) terminals of the heater relay.
 - If a reading of 110-125 VAC is not measured across these points, replace the control board (see page 8).

TEST #3a Heater Box High Limit Thermostat Test

Remove the thermistor from the fan housing and plug the hole. See Figure 1. Protect the thermistor and leads from grounding against any metal parts. Completely block the exhaust outlet. Turn dryer on and allow the high limit thermostat to cycle once, then measure the time elapsed until the high limit thermostat trips. It should trip between 21 and 38 seconds.

IMPORTANT: Be sure to reinstall the thermistor after testing the thermostat.

TEST #3b Thermal Fuse Test

A thermal fuse is used on this model. The thermal fuse is wired in series with the gas valve. If the thermal fuse opens, power is shut off to the gas valve. (Centrifugal switch in motor also opens heater circuit.)

Once the thermal fuse has opened, it must be replaced. Check for failed thermistor or other cause of failure. Replace failed parts. See Figure 1.

TEST #3c Thermistor Test

An electronic temperature sensor called a thermistor is used in this model in place of an operating thermostat. The control board monitors the exhaust temperature using the thermistor and cycles the heater relay on and off to maintain the desired temperature.

Begin with an empty dryer and a clean lint screen.

1. Set the following configuration:
 - Select Cycle - COTTON HIGH HEAT
 - TIMED DRY cycle (press More Time or Less Time)
 - End of Cycle Signal - LOUD
 - Door - must be closed
 - Press the Start touchpad.

2. If after 60 seconds, E1 or E2 flashes in the display and the dryer shuts off, the thermistor or wire harness is either shorted or open.

- ➔ Check wire connections at the control board and thermistor.
- ➔ If wiring is correct, replace the thermistor: Unplug the dryer and remove the front toe panel. Remove the two wires and replace the thermistor as shown in Figure 1.

3. If the dryer appears to operate correctly, remove exhaust vent and start the dryer.

- ➔ Under Select Cycle, press touchpad for desired temperature cycle to be tested, and select 20 minutes of Timed Dry heat. Hold a glass bulb thermometer capable of reading from 90°F to 180°F in the center of the exhaust outlet. Measure exhaust temperatures with heater off and on. The correct exhaust temperatures are as follows:

FABRIC CARE/TEMP. SWITCH SETTING	HEAT TURNS OFF	HEAT TURNS ON
COTTON HIGH HEAT	155° ± 10°F	10 - 15°F below heat off
NORMAL MED-HIGH HEAT	145° ± 10°F	10° - 15°F below heat off
PERMANENT PRESS MEDIUM HEAT	135° ± 10°F	10° - 15°F below heat off
KNIT/CASUAL LOW HEAT	125° ± 10°F	10° - 15°F below heat off
ULTRA DELICATE EXTRA LOW HEAT	115° ± 5°F	10° - 15°F below heat off
EXPRESS DRY HIGH HEAT	155° ± 10°F	10° - 15°F below heat off
AIR DRY NO HEAT	N/A	N/A
CUSTOM SET PRESS & HOLD 3 SEC.	N/A (user defined)	N/A (user defined)

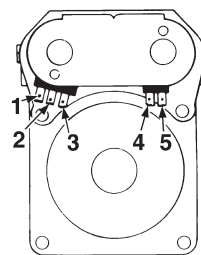
- ➔ If the exhaust temperature is not within specified limits, check the resistance of the thermistor.

THERMISTOR RESISTANCE			
TEMP. ° F	RES. K Ω	TEMP. ° F	RES. K Ω
50°	19.9	110°	4.7
60°	15.3	120°	3.7
70°	11.9	130°	3.1
80°	9.2	140°	2.5
90°	7.4	150°	2.1
100°	5.7	160°	1.7

- ➔ If the thermistor resistance checks within normal limits, replace the control board.

TEST #3d Gas Valve Test

Using an ohmmeter, it is possible to determine if either gas valve coil is defective. Remove harness plugs. Measure resistance across terminals indicated in the chart below. Readings should match those shown in chart. If not, replace coil.



IMPORTANT:

Be sure all harness wires are looped back through the strain relief after checking or replacing coils.

TERMINALS	RESISTANCE
1 to 2	1365Ω ± 25
1 to 3	560Ω ± 25
4 to 5	1220Ω ± 50

TEST #4 Moisture Sensor Test

This test is performed if the dryer shuts off too soon when set to an automatic cycle. The following items are part of this system:

- Harness/connection
- Moisture sensor
- Thermistor
- Control board

- Refer to the **Diagnostic Test** section and perform the procedure outlined there for the moisture sensor.

- ➔ If the moisture sensor fails the test (does not produce a beep sound), check the moisture sensor. If there is continuity to Ground for the Yellow/Red (Y/R) wire with no load, look for a short in the sensor or Y/R wire. Verify harness connections both at the sensor and the control board.

- ➔ If the sensor and Y/R wire are good, replace the control board.

- If the diagnostic test passes, check the thermistor: Perform **Troubleshooting Test #3c**.

- If problem persists after replacing the moisture sensor and thermistor, replace the control board.

TEST #5 Touchpad and LED Test

- Refer to the **Diagnostic Test** on page 1 and activate the Diagnostic Test Mode.

- 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 dryer function is activated when a particular touchpad is pressed

None of the LEDs light up:

- Visually check that connectors P3 and P4 are inserted all the way into the control board. If these connections are good, remove P3 and P4 from the control board while the power is still on and the control is in the diagnostic test mode.
- Place the negative (black) lead of your meter on P4-1 of the circuit board contacts. Check the DC supply voltage to the indicator and switch assembly by measuring the voltage between P4-1 and the contacts in the table at right.
- If a reading of at least 3 VDC is not measured at all of these points, replace the control board (see page 8).
- If a reading of at least 3 VDC is measured, replace the console panel/touchpad assembly.

**CONTACTS
MEASURED**

P3-1
P3-2
P3-3
P3-4
P3-5
P4-4
P4-5

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. Replace the console panel/touchpad assembly.

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. Replace the console panel/touchpad assembly.

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 dryer function is activated when a particular touchpad is pressed:

- 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.

CHECKING TOUCHPAD FUNCTIONING

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

- Disconnect the power cord from the outlet.
- Remove connectors P3 and P4 from the control board (see control board illustration, page 3).

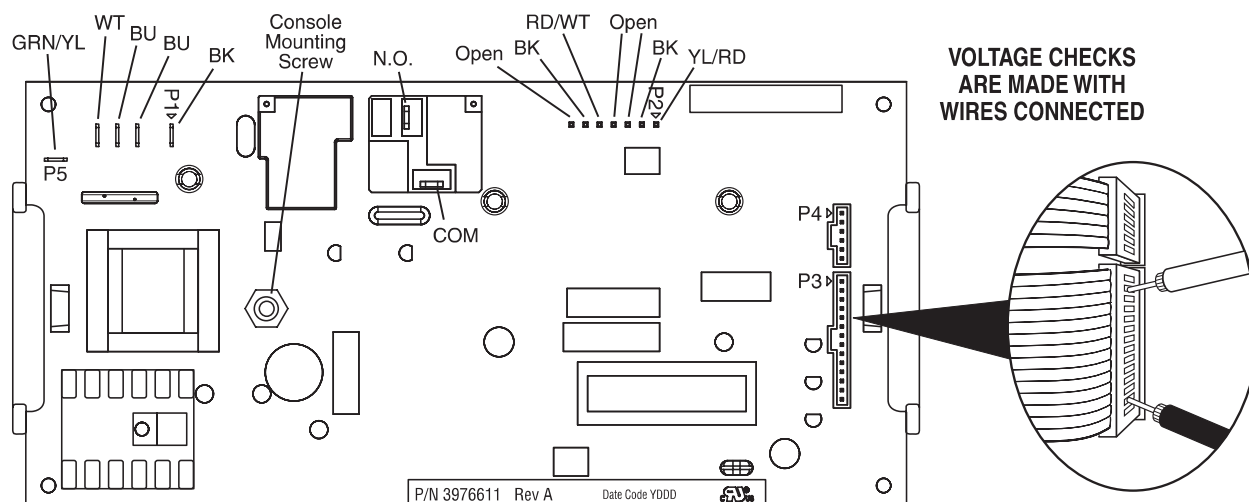
Using the table below, measure the resistance across the switch when the touchpad is pressed.

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 about 10 or 20 Ω .
- **If using a digital readout meter:**
the resistance reading should go from infinity down to about 2 M Ω - 4 M Ω (megohms). 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.

TOUCHPAD	+ LEAD	- LEAD
Cotton	P3-11	P3-14
Normal	P3-11	P3-13
Permanent Press	P3-11	P3-12
Knit/Casual	P3-9	P3-14
Ultra Delicate	P3-10	P3-14
Express Dry	P3-13	P3-10
Air Dry	P3-10	P3-12
Custom Set	P3-13	P3-9
Damp Dry Signal	P3-14	P3-8
Wrinkle Guard III	P3-13	P3-8
Touch Up	P3-12	P3-9
Auto Dryness Level	P3-14	P3-7
More Time	P3-13	P3-7
Less Time	P3-12	P3-7
End of Cycle Signal	P3-12	P4-2
Start	P3-14	P4-2
Stop/Cancel	P3-13	P4-2

- If any switches fail this test, replace the console panel/touchpad assembly.
- If all switches test OK, replace the control board (see page 8).



CONTROL BOARD REMOVAL OR REPLACEMENT

NOTE: Be sure to perform the Diagnostic Test before replacing the control board.

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

To remove control board:

1. Remove all connectors and ground terminal (P5) from the control board.
2. Remove the console mounting screw, located near the transformer.
3. Push the mounting legs on both sides of control board toward each other. Lift control board away from bracket.

To replace control board:

1. Attach control board mounting legs to bracket.
2. Insert the console mounting screw into the hole near the transformer.
3. Plug all connectors and ground terminal (P5) into the control board.

MANUFACTURED UNDER ONE OR
MORE OF THE FOLLOWING U.S. PATENTS:

4,385,452	4,720,925	4,899,264	5,560,120
4,430,809	4,754,556	4,899,464	5,636,453
4,663,861	4,821,535	4,908,959	5,651,188
4,669,200	4,840,285	5,066,050	5,664,339
4,700,495	4,865,366	5,243,771	D314,261

D314,262

PART NO. 3977701

NOTE: This sheet contains important
Technical Service Data

**FOR SERVICE TECHNICIAN ONLY
DO NOT REMOVE OR DESTROY**