

⚠ WARNING**Electrical Shock Hazard**

Disconnect power before servicing.

Replace all parts and 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.

DISPLAY FAULT/ERROR CODES

DISPLAY	DESCRIPTION	EXPLANATION AND RECOMMENDED PROCEDURE
PF	POWER FAILURE	"PF" flashes after a power failure while the dryer is running. Press START to continue the cycle, or press STOP/CANCEL to clear the display.
E1	THERMISTOR OPEN	"E1" flashes if the thermistor is open. See TEST #3a, page 5.
E2	THERMISTOR SHORTED	"E2" flashes if the thermistor has shorted. See TEST #3a, page 5.
E3	USER INTERFACE OR SOFTWARE MISMATCH	"E3" flashes when there is a keyswitch or software mismatch. This error code will ONLY appear when in the Diagnostic Test mode. See TEST #5, page 6.

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, 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.
- Resistance checks **must** be made with power cord **unplugged** from outlet.

DIAGNOSTIC TEST

This test allows factory/service personnel to test and verify all inputs to the electronic control. 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. Unit must be in Standby (unit plugged in, display off).
2. Alternately press the **More Time** \wedge , **Less Time** \vee 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.

NOTES:

If a flashing E1 or E2 appears in the display, proceed to the thermistor test (TEST #3a), page 5.

If a flashing E3 appears in the display, check the component part numbers of the control panel/touchpad assembly and the electronic control assembly to see if they match the part numbers in the chart, page 3. Replace either component if they are incorrect.

If the component part numbers are correct, proceed with the following Console Switches and Indicators Test. The display will always display the "E3". The indicator LEDs should go off as the touchpads are pressed. If the LEDs do not turn off, replace the touchpad assembly. If all LEDs function properly, proceed to TEST #5, page 6.

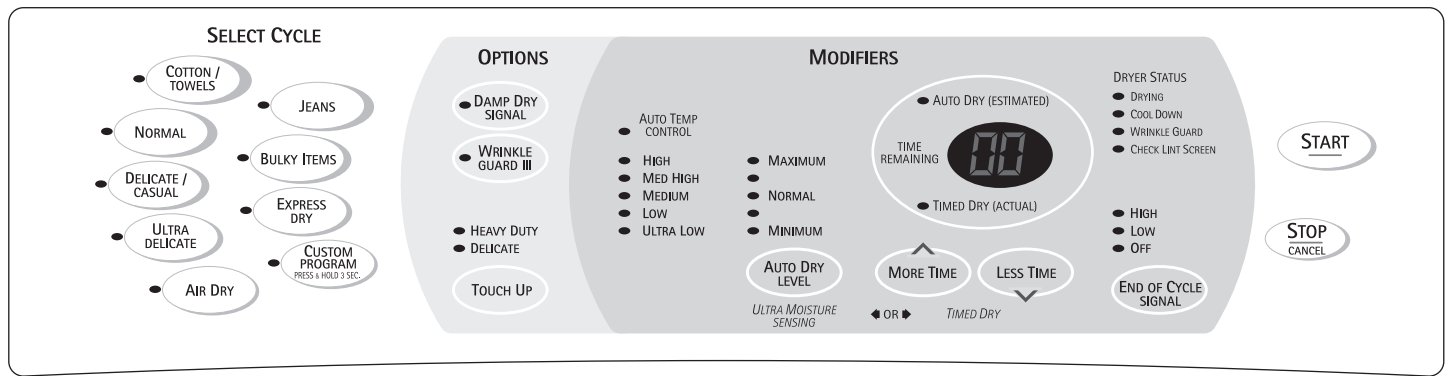
Test Mode Functionality

When the control is in the **Diagnostic Test** mode, every input change of state will result in a beep, including the Door Switch, and the 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.

EVENHEAT with AUTO TEMP CONTROL



Heavy Duty • KING Size Capacity Plus • Ultra Quiet Pak

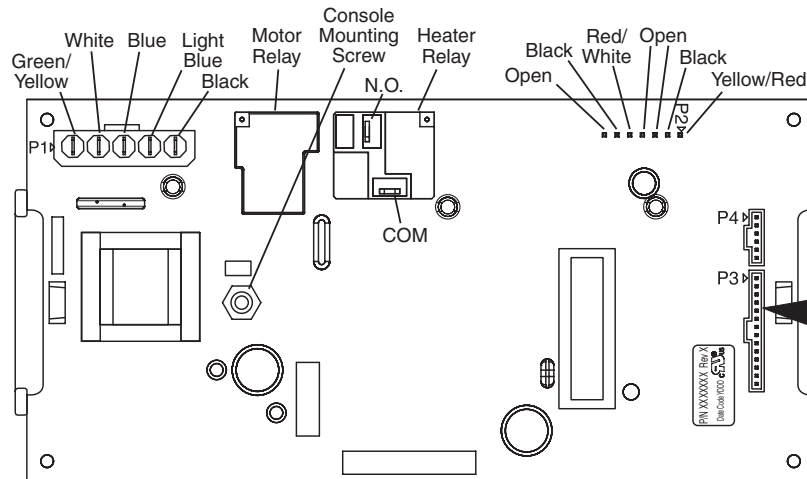
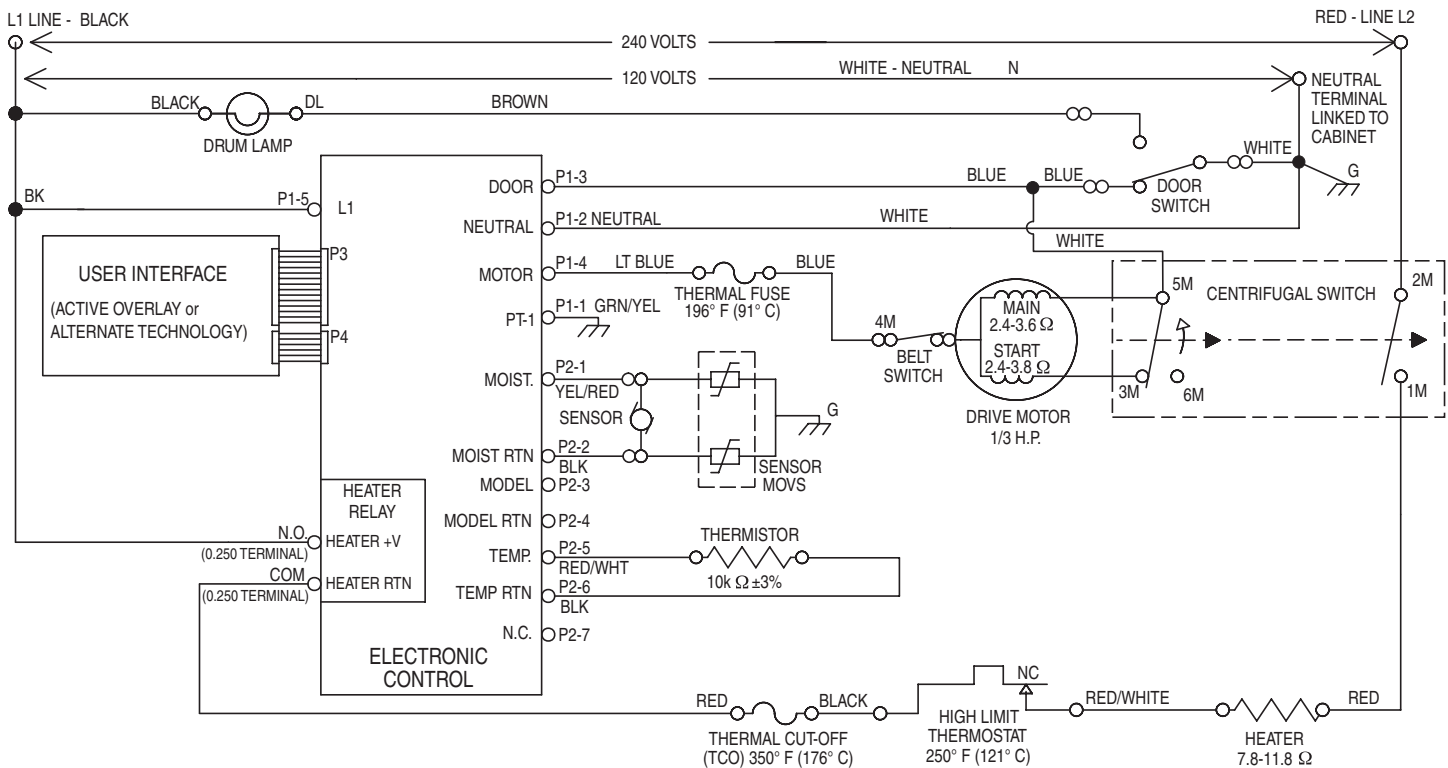
CONSOLE SWITCHES AND INDICATORS TEST

PRESS TOUCHPAD	DISPLAY	CONTROL ACTION
COTTON/TOWELS	88	Beep sound. "Cotton/Towels" LED is turned off .
repeat	88	Beep sound. "Cotton/Towels" LED is turned on .
NORMAL	88	Beep sound. "Normal" LED is turned off .
repeat	88	Beep sound. "Normal" LED is turned on .
DELICATE/CASUAL	88	Beep sound. "Delicate/Casual" LED is turned off .
repeat	88	Beep sound. "Delicate/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 .
AIR DRY	88	Beep sound. "Air Dry" LED is turned off .
repeat	88	Beep sound. "Air Dry" LED is turned on .
JEANS	88	Beep sound. "Jeans" LED is turned off .
repeat	88	Beep sound. "Jeans" LED is turned on .
BULKY ITEMS	88	Beep sound. "Bulky Items" LED is turned off .
repeat	88	Beep sound. "Bulky Items" 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 .
CUSTOM PROGRAM	88	Beep sound. "Custom Program" LED is turned off .
repeat	88	Beep sound. "Custom Program" LED is turned on .
DAMP DRY SIGNAL	88	Beep sound. "Damp Dry Signal" LED is turned off .
repeat	88	Beep sound. "Damp Dry Signal" LED is 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 .
TOUCH UP	88	Beep sound. LEDs for "Touch Up" are turned off .
repeat	88	Beep sound. LEDs for "Touch Up" are turned on .
AUTO DRY LEVEL	88	Beep sound. Five (5) dryness level LEDs, five (5) cycle temperature LEDs and "Auto Temp Control" LED are turned off .
repeat	88	Beep sound. Five (5) dryness level LEDs, five (5) cycle temperature LEDs and "Auto Temp Control" LED are turned on .
MORE TIME	8	Beep sound. Left digit of "88" display is turned off .
repeat	88	Beep sound. Left digit of "88" display reappears.
LESS TIME	8	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 "High", "Low", "Off", "Timed Dry (Actual)" and "Auto Dry (Estimated)" are turned off .
repeat	88	Beep sound. LEDs for "High", "Low", "Off", "Timed Dry (Actual)" and "Auto Dry (Estimated)" are turned on .
START	03 or 05	Beep sound. Four (4) associated "Dryer Status" LEDs are turned off and relays are activated.
repeat	88	Beep sound. Four (4) associated "Dryer Status" LEDs are turned on and relays are deactivated.
STOP/CANCEL	88	Beep sound. All LEDs are turned off .

If pressing any of the above touchpads does not result in the correct action, refer to TEST #5, page 6.

ELECTRIC DRYER WIRING DIAGRAM

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

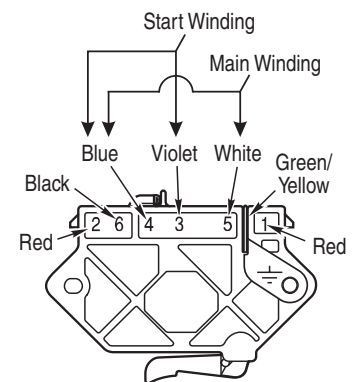


Electronic Control

COMPONENT	PART NUMBER
Console Panel/Touchpad Assembly for White Models:	62062
	3979050
	64082
for Bisque Models:	62064
	3979051
	64084
for Graphite Models:	62066
	3979052
	64086
	3979055
Electronic Control Assembly	3978916 or 3980061
Main Harness	8529981
Door Switch	3406107

COMPONENT	PART NUMBER
Belt Switch	8066134
Thermal Cut-Off	3977394
Thermal Fuse	3392519
Heat Element Assembly	3392661
High Limit Thermostat	3390291
Drive Motor	8538263
Thermistor - NTC 10k Ohms	3976615
Wire Harness, Moisture Sensor (w/MOVs)	3406653

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



Pluggable Drive Motor Switch

Contacts	1M	2M	3M	5M	6M
Start			●	●	
Run	●	●			

● = Contacts closed

Centrifugal Switch (Motor)

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE / TEST
NOTE: Possible Cause/Tests MUST be performed in the sequence shown for each problem.	
WON'T POWER UP. (No response when touchpads are pressed.)	1. Supply connections. See TEST #1 below. 2. Check harness connections. 3. Touchpad/LED assembly. See TEST #5, page 6.
WON'T START CYCLE.	1. See TEST #1 below. 2. Check harness connections.
WON'T SHUT OFF.	1. Check STOP/CANCEL touchpad. See TEST #5, page 6. 2. Touchpad/LED assembly. See TEST #5, page 6. 3. Moisture Sensor. See TEST #4, page 6.
CONTROL WON'T ACCEPT SELECTIONS.	Touchpad/LED assembly. See TEST #5, page 6.
WON'T RUN.	1. Motor. See TEST #2 below. 2. Check harness connections.
WON'T HEAT.	1. Heater. See TEST #3, page 5. 2. Check harness connections. 3. Check installation.
HEATS IN AIR CYCLE.	Thermistor. See TEST #3c, page 6.
SHUTS OFF BEFORE CLOTHES ARE DRY.	Moisture Sensor. See TEST #4, page 6.

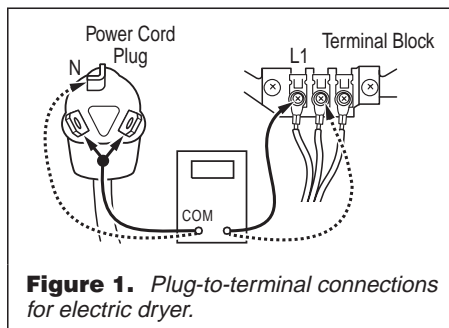
TROUBLESHOOTING TESTS

TEST #1

Supply Connections

This test assumes that proper voltage is present at the outlet, and visual inspection indicates that the power cord is securely fastened to the terminal block.

1. Disconnect dryer from power.
2. Remove the cover plate from the back of the dryer.
3. With an ohmmeter, check for continuity between the neutral (N) terminal of the plug and the center contact on the terminal block. See figure 1.



- ➔ If there is no continuity, replace the power cord and test the dryer.
- ➔ If there is continuity, go to step 4.

4. In a similar way, check which terminal of the plug is connected to the left-most contact on the terminal block and make a note of it. This will be L1 (black wire) in the wiring diagram. See figure 1.

- ➔ When this is found, go to step 5.
- ➔ If neither of the plug terminals have continuity with the left-most contact of the terminal block, replace the power cord and test the dryer.

5. Access the electronic control without disconnecting any wiring to it.
6. With an ohmmeter, check for continuity between the L1 terminal of the plug (found in step 3) and P1-5 (black wire) on the electronic control.
 - ➔ If there is continuity, go to step 7.
 - ➔ If there is no continuity, check that wires to the terminal block are mechanically secure. If so, repair or replace the main wire harness and test the dryer.
7. Check for continuity between the neutral (N) terminal of the plug and P1-2 (white wire) on the electronic control.
 - ➔ If there is continuity, go to step 8.
 - ➔ If there is no continuity and the mechanical connections of the wire are secure, repair or replace the main wire harness.

8. Replace the electronic control.
9. If the dryer still does not operate, replace the console panel/touchpad assembly.

TEST #2

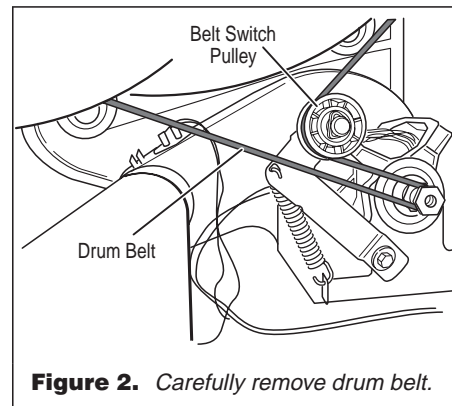
Motor Circuit Test

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

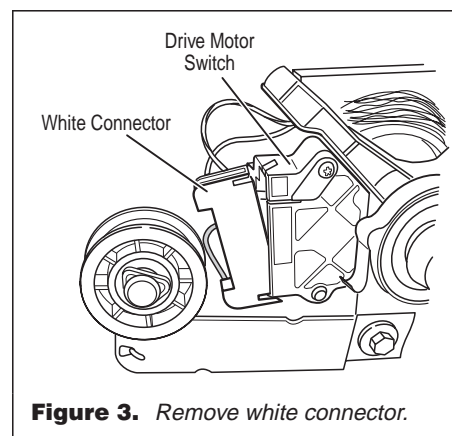
- Harness connection
- Thermal fuse
- Belt/belt switch
- Motor
- Door switch
- Electronic control (See ESD information, page 1)

1. Disconnect dryer from power.
2. Access the electronic control and measure the resistance across P1-3 and P1-4.
 - ➔ If resistance across P1-3 and P1-4 is in the range of 2 to 4 ohms, replace the electronic control.
 - ➔ Otherwise, go to step 3.
3. Check the wiring and components in the path between these measurement points by referring to the wiring diagram.
 - ➔ Check the thermal fuse. See TEST #3b, page 6.

- ➔ Access and check the belt switch and motor. Carefully remove the drum belt from the spring-loaded belt switch pulley, gently letting the belt switch pulley down. See figure 2.



- ➔ Remove the white connector from the drive motor switch. See figure 3.



- ➔ If motor and harness connections appear good, remove the white connector from the drive motor switch and check resistance of motor's Main and Start winding coils as shown on page 3 and in the table below.

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

WINDING	RESISTANCE (Ω)	CONTACT POINTS OF MEASUREMENT
MAIN	2.4 Ω - 3.6 Ω	4 to 5
START	2.4 Ω - 3.8 Ω	4 to 3

- ➔ If the resistance at the motor is correct, there is an open circuit between the motor and electronic control. Check for failed belt switch.
4. Check the belt switch by measuring resistance between the belt switch wires, as shown in figure 4, while pushing up the belt switch pulley.
 - ➔ If the resistance reading goes from infinity to a few ohms as pulley arm closes the switch, belt switch is OK. If not, replace the belt switch.

- If belt switch is OK and there is still an open circuit, check and repair the wiring harness.

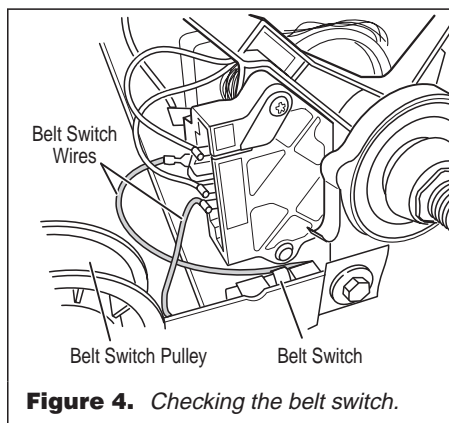


Figure 4. Checking the belt switch.

- If the Start winding is in question and the resistance is much greater than 4 Ω , replace the motor.

- Door Switch problems can be uncovered in the Test Mode Functionality section, page 1. If this was not done, the following can be done without applying power to the dryer. Connect an ohmmeter across P1-2 (neutral, white wire) and P1-3 (door, blue wire). With the door properly closed, the ohmmeter should indicate a closed circuit (0-2 ohms). If not, replace the door switch assembly.

TEST #3

Heater Test

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

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

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

- Harness/connection
- Heater relay
- Thermal cut-off
- High limit thermostat
- Heat element assembly
- Centrifugal switch
- Thermistor
- Console panel/touchpad assembly
- Electronic control (See ESD information, page 1)

Dryer does not heat:

Remove the toe panel to access the thermal components. See figure 5.

1. Disconnect dryer from power.

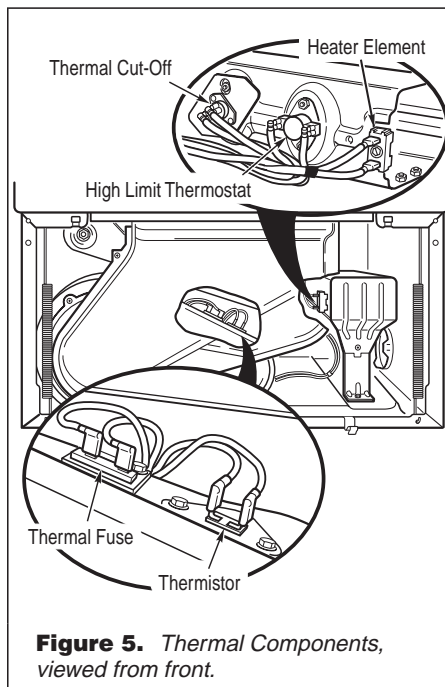


Figure 5. Thermal Components, viewed from front.

- Using an ohmmeter and referring to the wiring diagram, measure the resistance from the red wire at the heater relay to the red wire at the heater.
 - If the resistance is about 10 ohms, go to step 4.
 - If an open circuit is detected, go to step 3.
- Visually check the wire connections to the thermal cut-off, high limit thermostat, and heater. If connections look good, check for continuity across each of these components. Replace the one that is electrically open.
- If no open circuit is detected, measure the resistance between P2-5 (red/white wire) and P2-6 (black wire) at the electronic control.
 - If 6-7 k ohms are measured, replace the electronic control.
 - If the resistance is less than 1 k ohm, replace the thermistor.

Heat will not shut off:

1. Disconnect dryer from power.
2. Access the electronic control, and measure the resistance between P2-5 (red/white wire) and P2-6 (black wire). See Electronic Control illustration, page 3.
 - If 6-7 k ohms are measured, replace the electronic control.
 - If the resistance is much greater than 7 k ohms, replace the thermistor.

TEST #3a

Thermistor Test

NOTE: This test is started with the machine completely assembled.

The electronic control 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. Plug in the dryer and set the following configuration:
 - Door - must be firmly closed.
 - Press **COTTON/TOWELS**.
 - Press **MORE TIME** \wedge or **LESS TIME** \vee to select a timed cycle.
 - Press **END OF CYCLE SIGNAL (HIGH)**.
 - Press **START**.
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.
 - Disconnect dryer from power.
 - Check wire connections at the electronic control and thermistor. If wire connections are good, remove the two wires from the thermistor and check the thermistor.
3. Check the resistance of the thermistor.

NOTE: All thermistor resistance measurements must be made while dryer is disconnected from power.

 - A hair dryer may be used to heat the thermistor. The table below gives the resistance values that should be observed for the various temperatures.

THERMISTOR RESISTANCE			
TEMP. °F (°C)	RES. k Ω	TEMP. °F (°C)	RES. k Ω
50° (10°)	19.9	110° (43°)	4.7
60° (16°)	15.3	120° (49°)	3.7
70° (21°)	11.9	130° (54°)	3.1
80° (27°)	9.2	140° (60°)	2.5
90° (32°)	7.4	150° (66°)	2.1
100° (38°)	5.7	160° (71°)	1.7

- If the thermistor resistance does not agree with table, replace the thermistor.
- If the thermistor resistance checks within normal limits, replace the electronic control.

TEST #3b**Thermal Fuse Test**

1. Disconnect dryer from power.
2. Access the thermal fuse by removing the toe panel. The thermal fuse is wired in series with the dryer drive motor.
 - ➔ If the thermal fuse is open, replace it. Check for failed thermistor, shorted heat element, blocked vent or other cause of failure. See Thermal Components illustration, page 5.

TEST #3c**Thermal Cut-Off Test**

If the dryer does not heat, check the status of the thermal cut-off.

1. Disconnect dryer from power.
2. Access the thermal cut-off by first removing the toe panel.
3. Using an ohmmeter, check the continuity across the thermal cut-off. See figure 5, page 5 for location.
 - ➔ If the thermal cut-off is open, replace the thermal cut-off and high limit thermostat. In addition, check for failed heat element, or blocked or improper exhaust system.

TEST #4**Moisture Sensor Test**

NOTE: This test is started with the machine completely assembled.

This test is performed when an automatic cycle stops too soon, or runs much longer than expected.

NOTE: Dryer will shut down automatically after 2½ hours.

The following items are part of this system:

- Harness/connection
- Metal sensor strips
- Electronic control (See ESD information, page 1)

1. Enter the **Diagnostic Test** mode. See procedure, page 1.
2. Open the dryer door. If a beep tone is heard and a software revision number is displayed on the console as soon as the door is opened, a short circuit exists in the moisture sensor system.
 - ➔ If this doesn't happen, go to step 3.
 - ➔ Otherwise, go to step 4.

NOTE: Over-drying may be caused by a short circuit in the sensor system.

3. Locate the two metal sensor strips on the face of the lint screen housing. Bridge these strips with a wet cloth or finger.

- ➔ If a beep is heard and a software revision number is displayed on the console, the sensor passes the test. Go to step 4.
- ➔ If not, **disconnect dryer from power.** Access the moisture sensor wires by removing the toe panel and disconnecting the sensor wires from the harness. See figure 6. Go to step 7.

4. Disconnect dryer from power. Access the electronic control and remove the connector P2. Measure the resistance across terminals 1 (yellow/red wire) and 2 (black wire).

- ➔ If the ohmmeter does not indicate (infinity) open circuit, go to step 5.
- ➔ Otherwise, measure the resistance between pins 1 and 2 of connector P2 on the electronic control. If a resistance less than 1 MΩ is measured, inspect the control board for any debris bridging these pins. If no debris, replace the electronic control.

5. Access the moisture sensor by removing the toe panel. Disconnect the sensor from the wire harness. See figure 6.

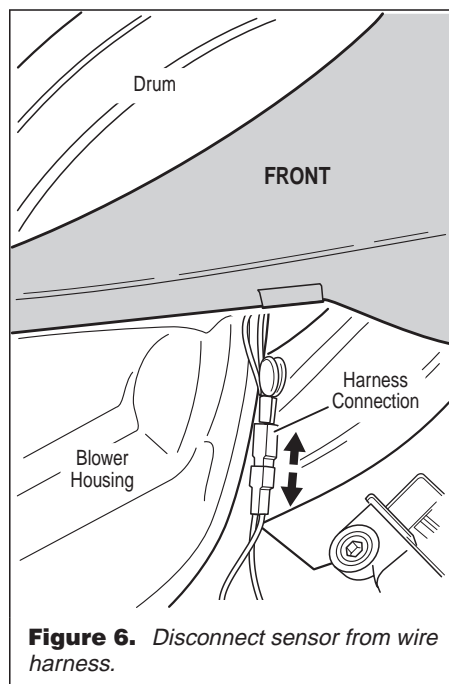
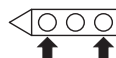
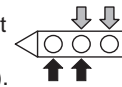


Figure 6. Disconnect sensor from wire harness.

Measure the resistance across the outermost contacts of the cable that includes the two red MOVs.



- ➔ If a small resistance is measured, replace this component (Wire Harness, Moisture Sensor).
 - ➔ Otherwise go to step 6.
6. Measure the resistance across the pins of the mating connector. If a small resistance is measured here, replace this harness (Main Wire Harness).
 7. Measure the resistance across each of the outermost contacts and the center terminal (ground connection).
 - ➔ If a resistance less than infinity is measured, replace this component (Wire Harness, Moisture Sensor).
 8. If moisture sensor diagnostic test passes, check the thermistor: Perform TEST #3a, page 5.
 - ➔ If the problem persists after replacing the moisture sensor and thermistor, replace the electronic control.

**TEST #5****Touchpad and LED Test**

Refer to the **Diagnostic Test**, page 1 and activate the **Diagnostic Test** mode. 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
- ✓ E3 error code is displayed

None of the LEDs light up:

1. See **Diagnostic Guide** section, page 1.
2. Visually check that connectors P3 and P4 are inserted all the way into the electronic control. If these connections are good, perform the checks described in Checking Touchpad Functioning Box, page 7.

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.

CHECKING TOUCHPAD FUNCTION

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

- Disconnect the power cord from the outlet.
- Remove connectors P3 and P4 from the electronic control (see electronic control illustration, page 3).
- Using the table at right, measure the resistance across the switch when the touchpad is pressed.

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

- ➔ If the meter responds to the touchpad being pressed, it indicates the touchpad is operating. The touchpad is a momentary connection, so the meter can respond only while the touchpad is being pressed.
- ➔ If any switches fail this test, replace the console panel/touchpad assembly.
- ➔ If all switches test OK, replace the electronic control (see below).

TOUCHPAD	+ LEAD	- LEAD
COTTON/TOWELS	P3-14	P3-11
JEANS	P3-14	P3-9
NORMAL	P3-13	P3-11
BULKY ITEMS	P3-12	P3-8
DELICATE/CASUAL	P3-12	P3-11
ULTRA DELICATE	P3-14	P3-10
EXPRESS DRY	P3-13	P3-10
AIR DRY	P3-12	P3-10
CUSTOM PROGRAM	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 DRY 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

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, page 7) before replacing the electronic control.

No dryer function is activated when a particular touchpad is pressed:

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

E3 error code is displayed:

If the E3 error code is displayed, there is a user interface or software mismatch. It is possible that a component on the keyswitch or the electronic control has failed. Check

touchpad functioning (see box above) before replacing the electronic control.

ELECTRONIC CONTROL REMOVAL OR REPLACEMENT

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

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

To remove electronic control:

1. Disconnect dryer from power.

2. Remove all connectors from the electronic control.

3. Remove the console mounting screw, located near the transformer. See electronic control illustration, page 3.

4. Push the mounting legs on both sides of the electronic control toward each other. Lift the electronic control away from the bracket.

To replace electronic control:

1. Attach electronic control mounting legs to the bracket.
2. Insert the console mounting screw into the hole near the transformer. See electronic control illustration, page 3.

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