⚠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

Do not open package until it is time to install the electronic board.

ESD problems are present everywhere. ESD may damage or weaken the electronic board. The new board 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 board by edges only.
- When repackaging failed electronic board in anti-static bag, observe above instructions.

DIAGNOSTIC GUIDE

Before servicing, check the following:

- Make sure there is power at the wall outlet.
- 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 of components must be made with power cord unplugged from outlet, and with wiring harness or connectors disconnected.

LESS DRY TEST

Begin with a fully assembled, empty dryer with clean lint screen. Be sure dryer is connected to a known good power source.

1. Set the following configuration:
   - Door - must be closed
   - Timer - LESS DRY
   - Fabric Care / Temperature switch - COTTON TOWELS / HIGH
   - Wrinkle Guard Switch - OFF
   - Signal switch - LOUD
2. Press the PTS (Push To Start) switch. After approximately 16 seconds, the Timer will start to advance to the OFF position. If this function does not occur, proceed to the Diagnostic Test.

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.

This test is performed with a fully assembled dryer, connected to a known good power source.

Activating the Test Mode

1. Set the following configuration:
   - Door - must be open
   - Fabric Care / Temperature switch - AIR FLUFF / NO HEAT
   - Signal switch - LOUD
   - Timer - TIMED DRY or AUTO MOISTURE SENSING selection
2. Turn the Wrinkle Guard switch from OFF to ON three times within a five second period. A single beep, pause, triple beep will sound to indicate that the factory test mode is activated.

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

Test Mode Functionality

When the control is in test mode, every input change of state will result in an audible beep (with the exception of the Signal switch). This includes:

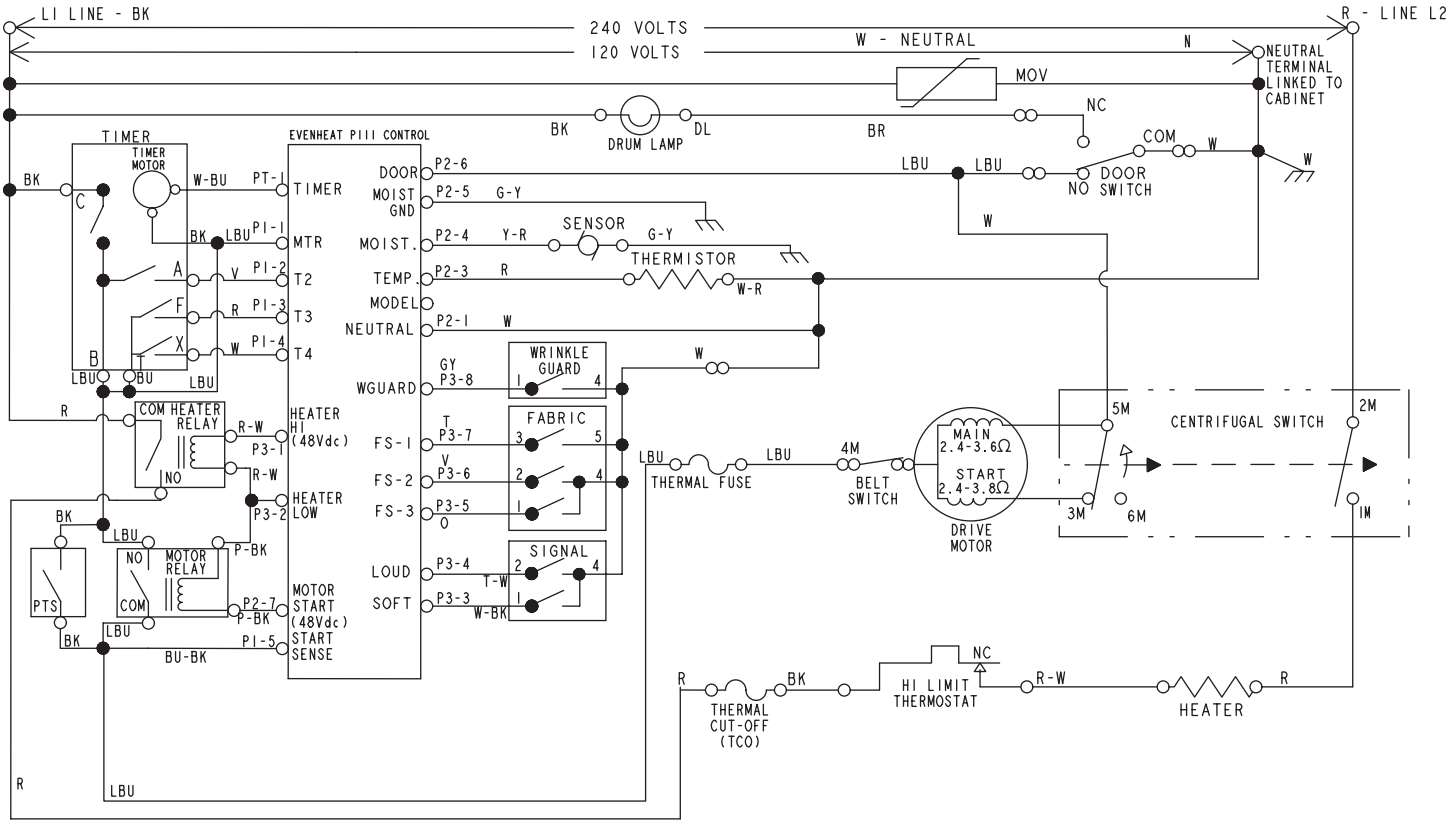
- Door switch
- Moisture Sensor (short/open Sensor will result in a beep).

  NOTE: A moistened finger or damp cloth may also be used.
- Fabric Care / Temperature switch
- Push To Start (PTS) switch (with the door switch closed)
- Wrinkle Guard Switch
- Timer (any cam input change will result in a beep)

  NOTE: Timer will advance during test.

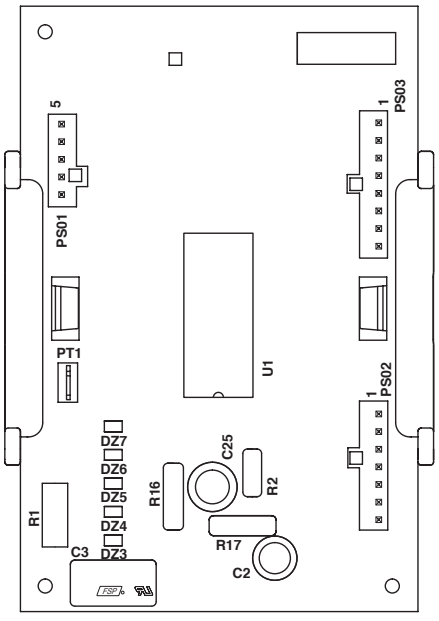
If any of the inputs do not result in a beep, proceed to the corresponding component tests on page 4.

Electric Dryer Wiring Diagram



Drum Size:
7.5 cubic feet

Drum Speed:
51.5 ± 3 RPM CW

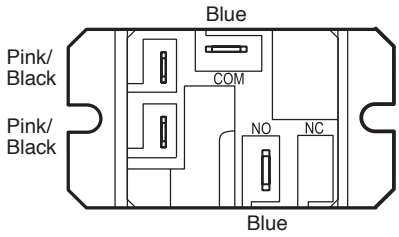


Electronic Control Assembly

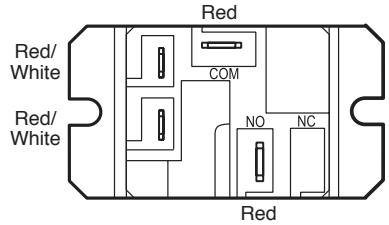
Function	Contacts 1M	2M	3M	5M	6M
Start			●	●	
Run	●	●		●	

● = *Contacts closed*

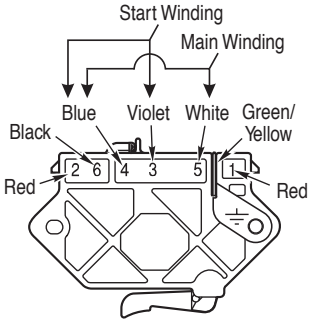
Centrifugal Switch (Motor)



Motor Relay

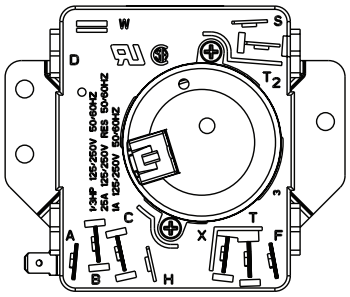


Heater Relay



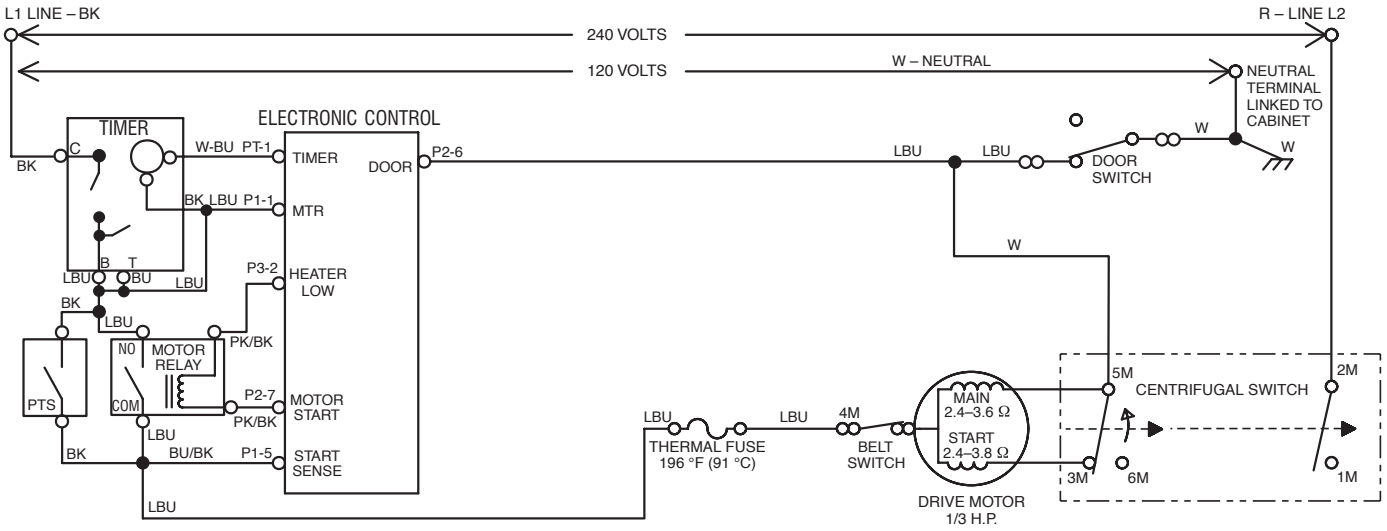
Pluggable Drive Motor Switch

Timer	A	B	C	X	T	F
Wire Colors	Violet	Lt Blue	Black	White	Blue	Red

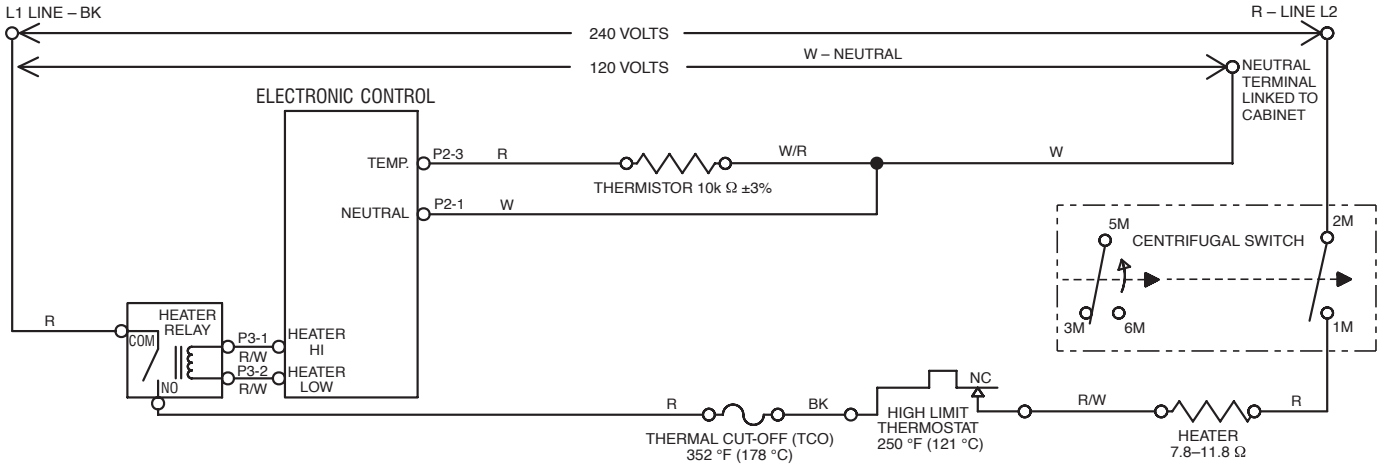


Timer

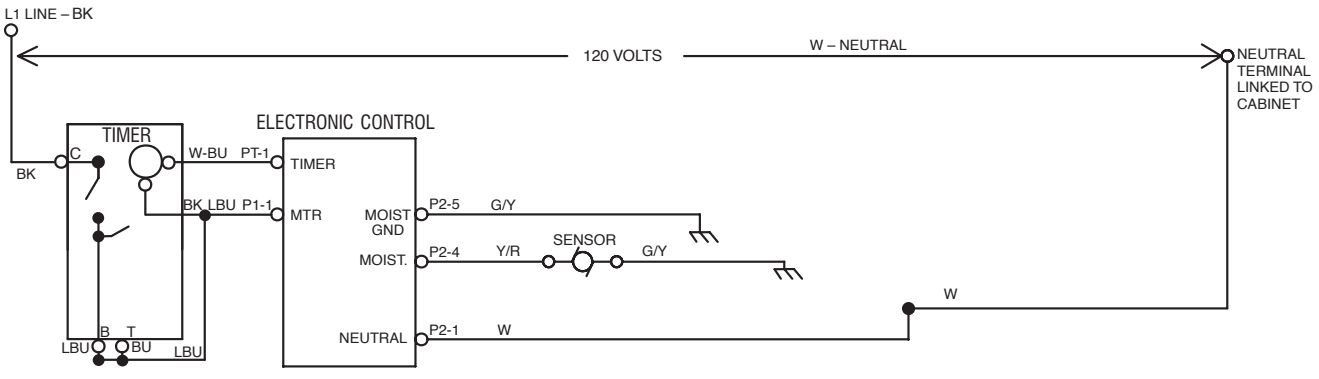
MOTOR STRIP CIRCUIT



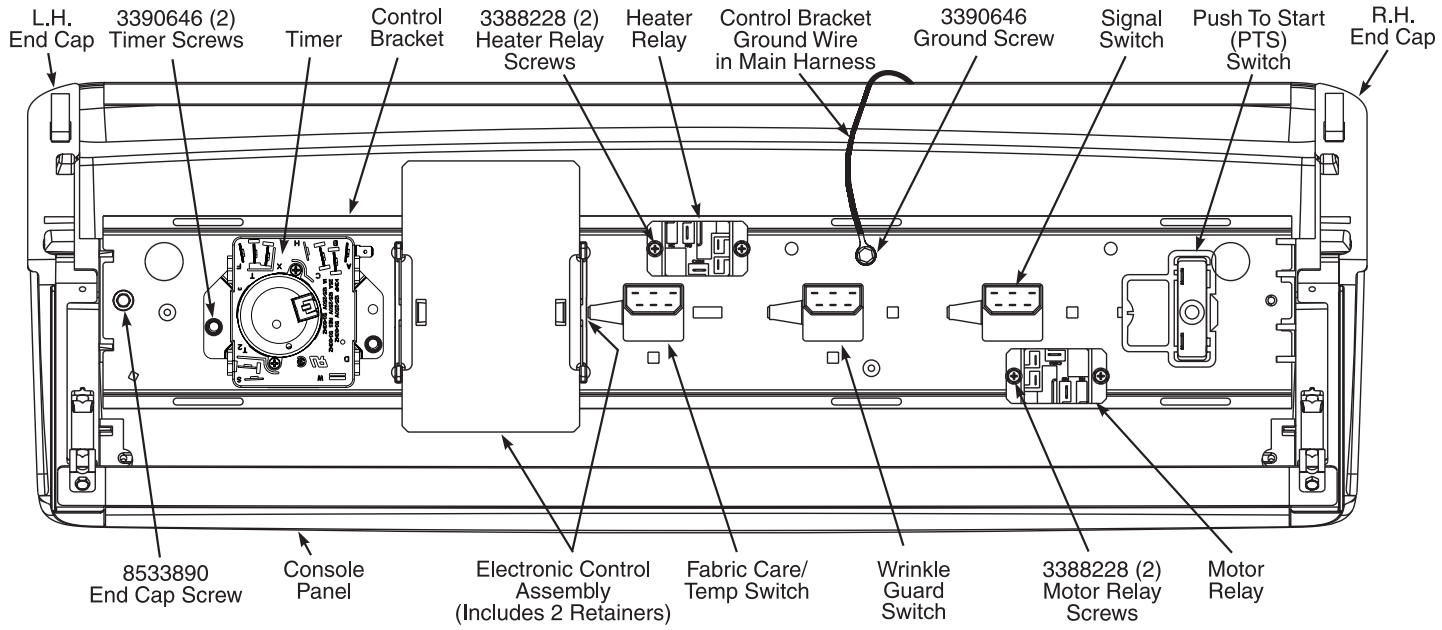
HEATER STRIP CIRCUIT



MOISTURE SENSOR STRIP CIRCUIT



Component Location

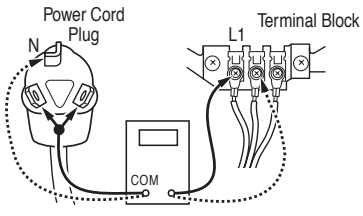


COMPONENT TESTS

Supply Connections Test

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. Unplug dryer or disconnect 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 illustration below.



Plug-to-terminal connections for electric dryer.

- ➔ 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 illustration above.
   - ➔ 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 4) and BK (black wire) terminal on the timer.
   - ➔ 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, replace or repair the main wire harness and test the dryer.
7. Check for continuity between the neutral (N) terminal of the plug and P2-1 (white wire) on the electronic control.
   - ➔ If there is continuity, go to the Timer Test.
   - ➔ If there is no continuity and the mechanical connections of the wire are secure, replace or repair the main wire harness.

Timer Test

Perform the diagnostic test on page 1 to determine that the timer motor advances (should run continuously). If the timer does not advance or fails the diagnostic test:

1. Unplug dryer or disconnect power.
2. Remove the wires from timer terminals.
3. Check the timer motor resistance and timer switching. The resistance should be 3 k ohms (± 2). Use the timer encoding table below for switching conductivity, and refer to timer illustration on page 2.

Reference contact continuity to timer - BK.

Timer Encoding Table

TIMED DRY MODE				
TIMER CONTACTS	TIMED DRY	COOL DOWN	WRINKLE GUARD	OFF
X	O	O	O	O
F	X	X	O	O
A	O	X	X	O
B	X	X	X	O
C	X	X	X	O

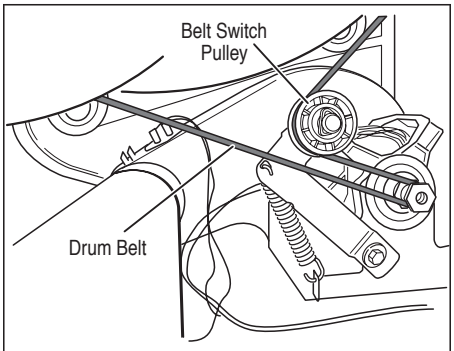
AUTO MOISTURE SENSING MODE					
TIMER CONTACTS	MORE DRY	NORMAL DRY	LESS DRY	WRINKLE GUARD	OFF
X	X	X	O	O	O
F	O	O	O	O	O
A	X	O	O	X	O
B	X	X	X	X	O
C	X	X	X	X	O
O = OPEN X = CLOSED					

Motor Test

1. Unplug dryer or disconnect power.
2. Open the dryer door.
3. Measure resistance between the motor relay common (COM) terminal and the P2-6 terminal on the electronic control. 1 to 6 ohms should be measured.
   - ➔ If resistance measurements are outside 1 to 6 ohms, perform the Thermal Fuse, Door Switch, and Belt Switch Tests, and check harness continuity. If they test good, replace the motor.
4. Measure resistance between the motor relay common (COM) terminal and ground. A high resistance (open) should be measured.
   - ➔ If it does not, perform the Thermal Fuse, Door Switch, and Belt Switch Tests and check harness continuity. If they test good, replace the motor.

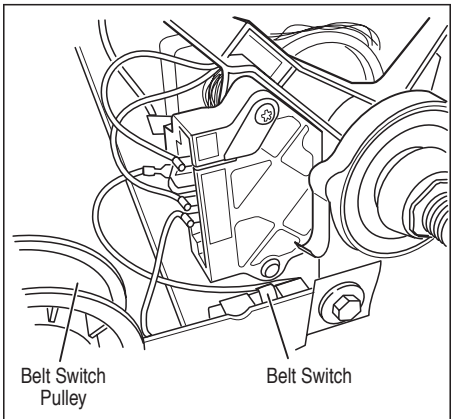
Belt Switch Test

1. Unplug dryer or disconnect power.
2. Disconnect belt switch from harness and check belt switch continuity.
   - ➔ With the belt switch in the proper run position, it should measure closed (motor test measurement can be done to verify the belt switch). See illustration below.



Belt switch in proper run position.

   - ➔ With the belt loose, infinity (open) should be measured. See illustration below.

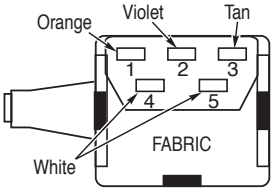


Belt loose position.

Door Switch Test

1. Unplug dryer or disconnect power.
2. Check door switch continuity. Neutral to P2-6 on the electronic control should read closed with the door closed, and open with the door open.
3. Otherwise, verify harness continuity.
   - ➔ If no continuity, repair or replace the harness.
   - ➔ If harness is good, replace the door switch.

Fabric Care / Temperature Switch Test

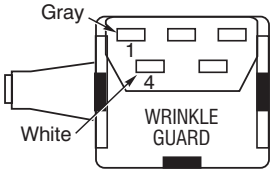


1. Unplug dryer or disconnect power.
2. Remove the wires from the switch to complete this test.
3. Reference contact continuity with Pins 1 and 2 to Pin 4 (White).
4. Reference contact continuity with Pin 3 to Pin 5.

Fabric Care / Temp Switch Table

SWITCH POSITION	CONTACTS			FUNCTION
	3–5	2–4	1–4	
9 o'clock	O	O	O	NO HEAT
10 o'clock	O	O	X	EXTRA LOW
12 o'clock	O	X	O	MEDIUM
2 o'clock	O	X	X	MEDIUM HIGH
3 o'clock	X	O	O	HIGH
O = OPEN X = CLOSED				

Wrinkle Guard Switch (On/Off) Test

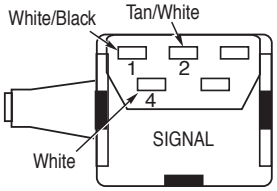


1. Unplug dryer or disconnect power.
2. Remove the wires from the switch to complete this test.
3. Reference contact continuity with Pin 1 to Pin 4 (White).

Wrinkle Guard Switch Table

SWITCH POSITION	CONTACTS	FUNCTION
11 o'clock	Open	Wrinkle Guard OFF
1 o'clock	Closed	Wrinkle Guard ON

"End of Cycle" Signal Switch Test



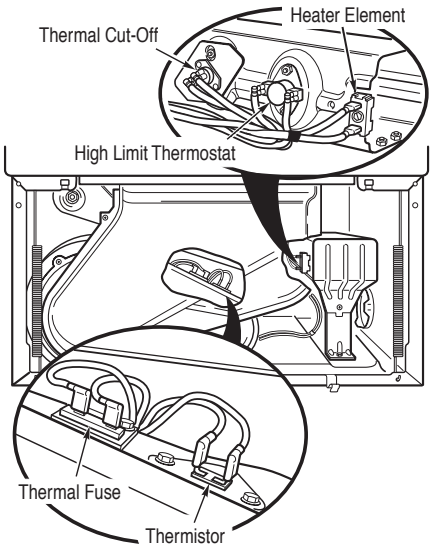
1. Unplug dryer or disconnect power.
2. Remove the wires from the switch to complete this test.
3. Reference contact continuity with Pins 1 and 2 to Pin 4 (White).

Signal Switch Table

SWITCH POSITION	CONTACTS		FUNCTION
	1–4	2–4	
10 o'clock	O	O	OFF
12 o'clock	X	O	SOFT End of Cycle Signal
2 o'clock	O	X	LOUD End of Cycle Signal
O = OPEN X = CLOSED			

High Limit Thermostat Test

1. Unplug dryer or disconnect power.
2. Remove the high limit thermostat and check continuity. Refer to the Thermal Components illustration below.
   - ➔ If open, replace the high limit thermostat.
   - ➔ If closed, apply heat. It should open at about 250°F (121°C). Otherwise, replace the high limit thermostat.



Thermal Components.

Thermal Cut-Off

This dryer is equipped with a "one-shot" thermal cut-off. See Thermal Components illustration below left. If the dryer does not heat with power supplied:

1. Unplug dryer or disconnect power.
2. Check the thermal cut-off for continuity.
   - ➔ If continuity is open, thermal cut-off has failed and must be replaced.

NOTE: If the thermal cut-off has failed, replace the cut-off and high limit thermostat. In addition, check for failed heater element, or blocked or improper exhaust system.

Thermal Fuse Test

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

1. Unplug dryer or disconnect power.
2. Check continuity of thermal fuse.
3. Once the thermal fuse has opened, it must be replaced. Check for failed thermistor, shorted heat element, or other causes of failure. Replace failed parts. See Thermal Components illustration at left.

Thermistor Test or Dryer Beeps 3 Times when Push To Start (PTS) Pressed

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

Procedure

Begin with a fully assembled, empty dryer and a clean lint screen.

1. Set the following configuration:
   - ■ Door - must be closed
   - ■ Timer dial - TIMED DRY
   - ■ Fabric Care / Temperature switch - COTTON TOWELS / HIGH
   - ■ Signal switch - LOUD
2. Press the Push To Start switch.
   - ➔ If you hear three short beeps and the dryer shuts off after several seconds, the thermistor or wire harness is either shorted or open.
     - ■ Unplug dryer or disconnect power.
     - ■ Check wire connections at the electronic control and thermistor.
     - ■ If wiring is functional, replace the thermistor. Refer to Thermal Components illustration on this page.
   - ➔ If the dryer appears to operate correctly, proceed to step 3.
3. Remove exhaust vent and start the dryer.
   - ➔ Turn Fabric Care / Temperature switch to desired temperature to be tested, and select 20 minutes on the TIMED DRY dial. Hold a glass bulb thermometer capable of reading from 90°F to 180°F (32°C to 82°C) 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 TOWELS / HIGH	150° ± 10°F (66° ± 6°C)	10°–15°F (6°–8°C) below heat off
NORMAL / MEDIUM HIGH	140° ± 10°F (60° ± 6°C)	
PERM PRESS CASUAL / MEDIUM	125° ± 10°F (52° ± 6°C)	
ULTRA DELICATE / EXTRA LOW	115° ± 10°F (46° ± 6°C)	

   - ➔ If the exhaust temperature is not within specified limits:
     - ■ Unplug dryer or disconnect power.
     - ■ Check the resistance of the thermistor.

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

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

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE / TEST
DRYER WILL NOT RUN.	Refer to Motor Strip Circuit, page 3. – LINE VOLTAGE – HARNESS/CONNECTION – MOTOR RELAY – PUSH TO START (PTS) SWITCH – THERMAL FUSE – BELT/BELT SWITCH – MOTOR – DOOR SWITCH – ELECTRONIC CONTROL For more details, see Troubleshooting section at right.
DRYER WILL NOT HEAT.	Refer to Heater Strip Circuit, page 3. – LINE VOLTAGE – HARNESS/CONNECTION – HEATER RELAY – THERMAL CUT-OFF – HIGH LIMIT THERMOSTAT – HEATER – CENTRIFUGAL SWITCH – THERMISTOR – ELECTRONIC CONTROL For more details, see Troubleshooting section at right.
DRYER HEATS DURING AIR FLUFF/NO HEAT CYCLE.	Refer to Heater Strip Circuit, page 3. – HARNESS/CONNECTION – HEATER RELAY – FABRIC CARE / TEMP SWITCH – ELECTRONIC CONTROL For more details, see Troubleshooting section at right.
DRYER WON'T SHUT OFF.	Refer to Motor and Moisture Sensor Strip Circuits, page 3. – PUSH TO START (PTS) SWITCH – HARNESS/CONNECTION – MOTOR RELAY – MOISTURE SENSOR – ELECTRONIC CONTROL For more details, see Troubleshooting section, page 8.
DRYER SHUTS OFF BEFORE CLOTHES ARE DRY.	Refer to Thermistor Test, page 6; and Moisture Sensor Strip Circuit, page 3. – HARNESS/CONNECTION – MOISTURE SENSOR – THERMISTOR – ELECTRONIC CONTROL – MAY NEED TO CHANGE TIMER SETTING TO A MORE DRY SETTING For more details, see Troubleshooting section, page 8.
TIMER CONTINUOUSLY ADVANCES.	Refer to Timer Drawing, page 2, and Motor Strip Circuit, page 3. – HARNESS/CONNECTION – TIMER For more details, see Troubleshooting section, page 8.
WRINKLE GUARD DOES NOT RUN.	Refer to Wrinkle Guard Switch (On/Off) Test, page 5.

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

TROUBLESHOOTING

PROBLEM: Dryer Will Not Run

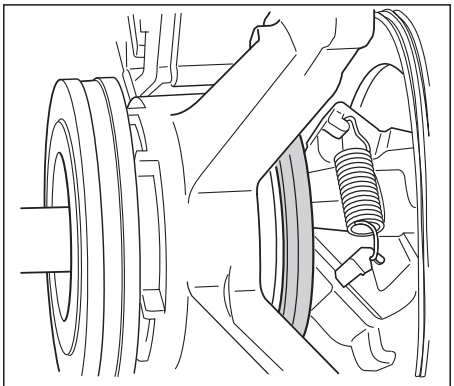
(Refer to Motor Strip Circuit, page 3; and Troubleshooting Guide, this page.)

1. Unplug dryer or disconnect power.
2. Check connector pins in P2 connector of the electronic control to verify they are making good connections.
3. Check the PTS (Push To Start) switch continuity when pressed. It should show continuity while pushed in. If not, replace the PTS switch.
4. Perform Thermal Fuse Test, page 6.
5. Perform Door Switch Test, page 5.
6. Perform Belt Switch Test, page 5.
7. If the motor started but did not continue to run, and components checked in steps 2 through 6 were OK, replace the electronic control assembly.
8. If motor did not start and components checked in steps 2 through 6 were OK, replace the motor.

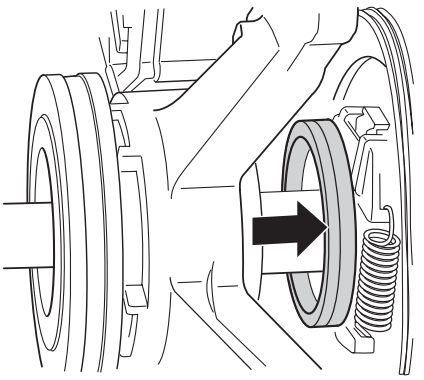
PROBLEM: Dryer Will Not Heat

(Refer to Heater Strip Circuit, page 3; and Troubleshooting Guide, this page.)

1. Perform Supply Connections Test, page 4.
2. Perform Thermal Cut-Off Test, page 6.
3. Perform High Limit Thermostat Test, page 6.
4. Unplug dryer or disconnect power.
5. Check continuity of heater. Each element should be about 10 ohms and should be open to ground, chassis, and neutral.
   - ➔ If either element fails these tests in step 5, replace the heat element assembly.
6. Unplug dryer or disconnect power.
7. Check continuity of motor centrifugal switch:
   - ➔ 1M to 2M terminals should be open in the off condition. Manually operating the switch should close 1M to 2M. This can be done by pushing the actuator from the off condition to the run position. See the illustration above.
   - ➔ If these conditions are not true, replace the motor.



Actuator in off condition.



Actuator in run position.

PROBLEM: Dryer Heats During Air Fluff / No Heat Cycle

(Refer to Heater Strip Circuit, page 3; and Troubleshooting Guide, this page.)

1. Perform Fabric Care / Temperature Switch Test, page 5.
2. Unplug dryer or disconnect power.
3. Check continuity of heater relay contacts. COM to NO should be open. If not, replace the heater relay.
4. With dryer fully assembled, plug in dryer or reconnect power.
5. Set to AIR FLUFF / NO HEAT. If the dryer still heats:
   - ➔ Unplug dryer or disconnect power.
   - ➔ Replace the electronic control assembly.

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

TROUBLESHOOTING (cont.)

PROBLEM: Dryer Won't Shut Off

(Refer to Motor and Moisture Sensor Strip Circuits, page 3; and Troubleshooting Guide, page 7.)

1. With the dryer fully assembled, set the timer to OFF. If the dryer starts running as soon as it is plugged in:
   - ➔ Unplug dryer or disconnect power.
   - ➔ Replace the timer.
2. Set the following configuration:
   - ■ Dryer - power cord plugged in
   - ■ Door - must be closed
   - ■ Fabric Care / Temperature switch - COTTON TOWELS / HIGH
   - ■ Timer - TIMED DRY for less than 10 minutes
3. If the dryer starts running before the Push to Start (PTS) switch is pressed:
   - ➔ Unplug dryer or disconnect power.
   - ➔ Replace the PTS switch.
   - ➔ If, after replacing the PTS switch, the dryer still starts before the PTS switch is pressed:
   - ➔ Unplug dryer or disconnect power.
   - ➔ Replace the motor relay.
4. If the dryer does not stop after the set time elapses:
   - ➔ Unplug dryer or disconnect power.
   - ➔ Check the motor relay. Continuity of relay should be open from COM to NO.
5. If the dryer will not terminate its cycle when set to AUTO MOISTURE SENSING:
   - ➔ Unplug dryer or disconnect power.
   - ➔ Check the moisture sensor.
   - ➔ If there is continuity to Ground for 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 electronic control.
   - ➔ If the sensor and Y/R wire are good, replace the electronic control assembly.

PROBLEM: Dryer Shuts Off Before Clothes Are Dry

(Refer to Moisture Sensor Strip Circuit, page 3; Thermistor Test, page 6; and Troubleshooting Guide, page 7.)

1. Test the moisture sensor by following the procedure outlined in the Diagnostic Test, page 1. If the moisture sensor fails the Diagnostic Test (does not produce a beep sound):
   - ➔ Unplug dryer or disconnect power.
   - ➔ Check the moisture sensor.
   - ➔ If there is continuity to Ground for 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 electronic control.
   - ➔ If the Sensor and Y/R wire are good, replace the electronic control assembly.
2. If Diagnostic Test is passed, verify thermistor by performing test procedures outlined in Thermistor Test, page 6.
3. If problem persists after replacing moisture sensor and thermistor:
   - ➔ Unplug dryer or disconnect power.
   - ➔ Replace the electronic control assembly.

PROBLEM: Timer Continuously Advances

(Refer to Timer Drawing, page 2; Motor Strip Circuit, page 3; and Troubleshooting Guide, page 7.)

1. Unplug dryer or disconnect power.
2. Verify the Blue wire and the Black L1 wires are in the correct positions. See timer illustration on page 2.
3. Test the timer by following the procedure outlined in the Diagnostic Test, page 1.
4. If the timer continues to advance past OFF, then replace the timer.

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

4,669,200	4,899,464	5,809,828	D314,261
4,700,495	4,908,959	6,020,698	D314,262
4,754,556	4,989,347	6,047,486	D457,991
4,840,285	5,066,050	6,199,300	D457,992
4,865,366	5,560,120	6,446,357	