



CONSUMER SERVICES TECHNICAL  
EDUCATION GROUP PRESENTS

L-64

# *AccuWash* Automatic Temperature Control System

JOB AID  
Part No. 4322334



# GOALS AND OBJECTIVES

The goal of this Job Aid is to provide detailed information that will enable the service technician to properly diagnose malfunctions and repair the *AccuWash* Automatic Temperature Control System.

Objectives of the Job Aid are:

The service technician will -

- Understand proper safety precautions.
- Successfully troubleshoot and diagnose malfunctions.
- Successfully perform necessary repairs.
- Successfully return the washer to proper operational status.

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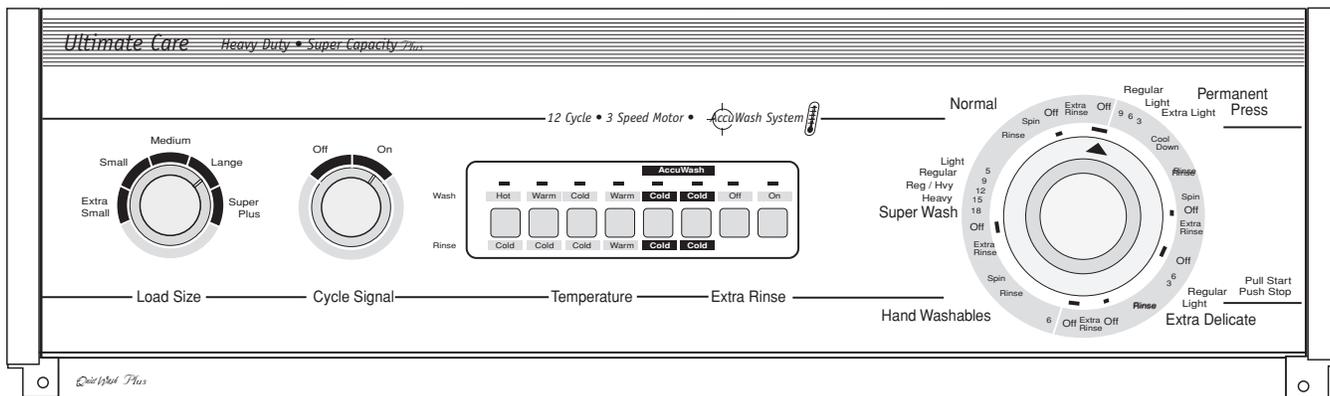
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**WHIRLPOOL CORPORATION assumes no responsibility for any repair made on our products by anyone other than Authorized Factory Service Technicians.**

# SECTION 1

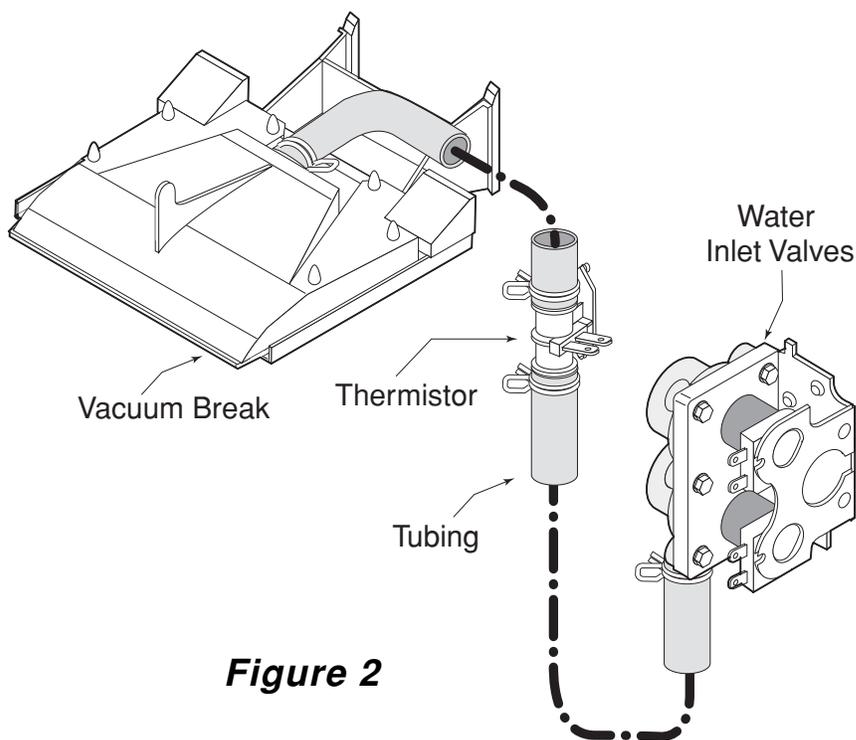
## THEORY OF OPERATION

### CONSOLE



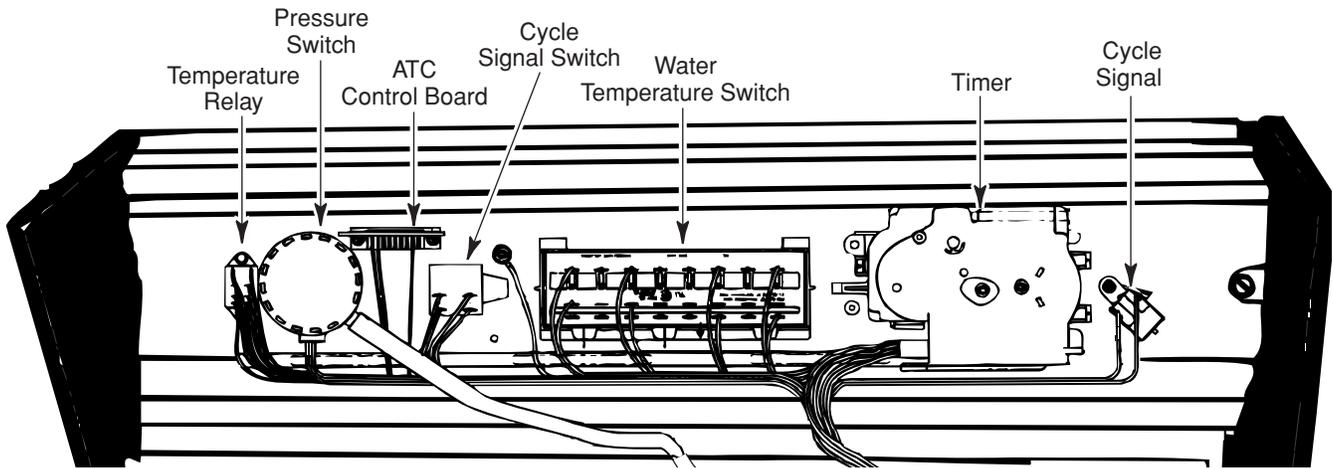
**Figure 1**

The front panel controls for the *AccuWash Automatic Temperature Control System (ATC)* are shown in Figure 1. The ATC System controls the incoming water supply to provide an accurate setting for the water temperature in the washer tub. The ATC System uses a thermistor, located in the water supply tubing between the water inlet valve and the vacuum break (see Figure 2). The thermistor senses the incoming water temperature, and provides input to the ATC control board.



**Figure 2**

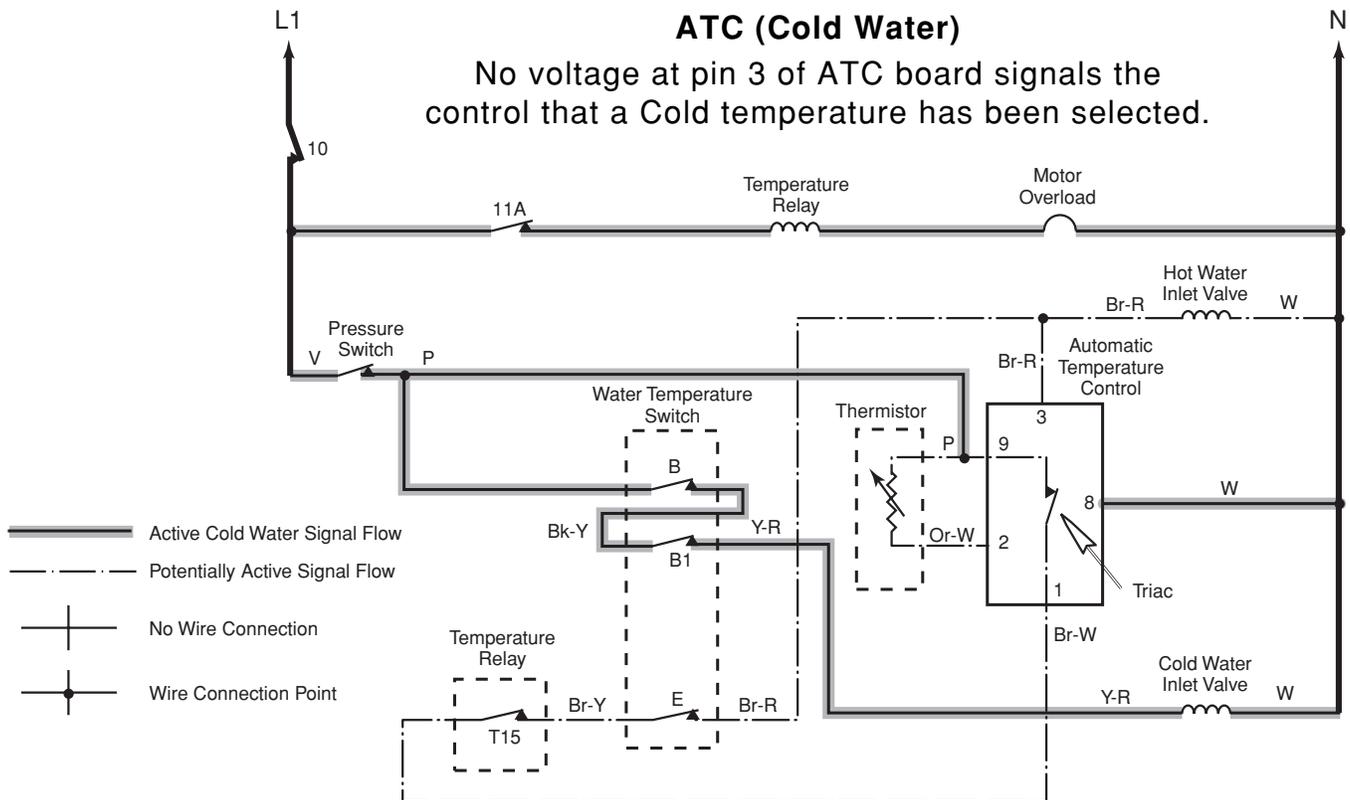
The ATC board uses the input from the thermistor to cycle the hot and cold water solenoids on the water inlet valves to achieve the desired water temperature setting. A triac, located on the control board, cycles the hot and cold water solenoids through the temperature relay and the water temperature switch (see Figure 3).



**Figure 3**

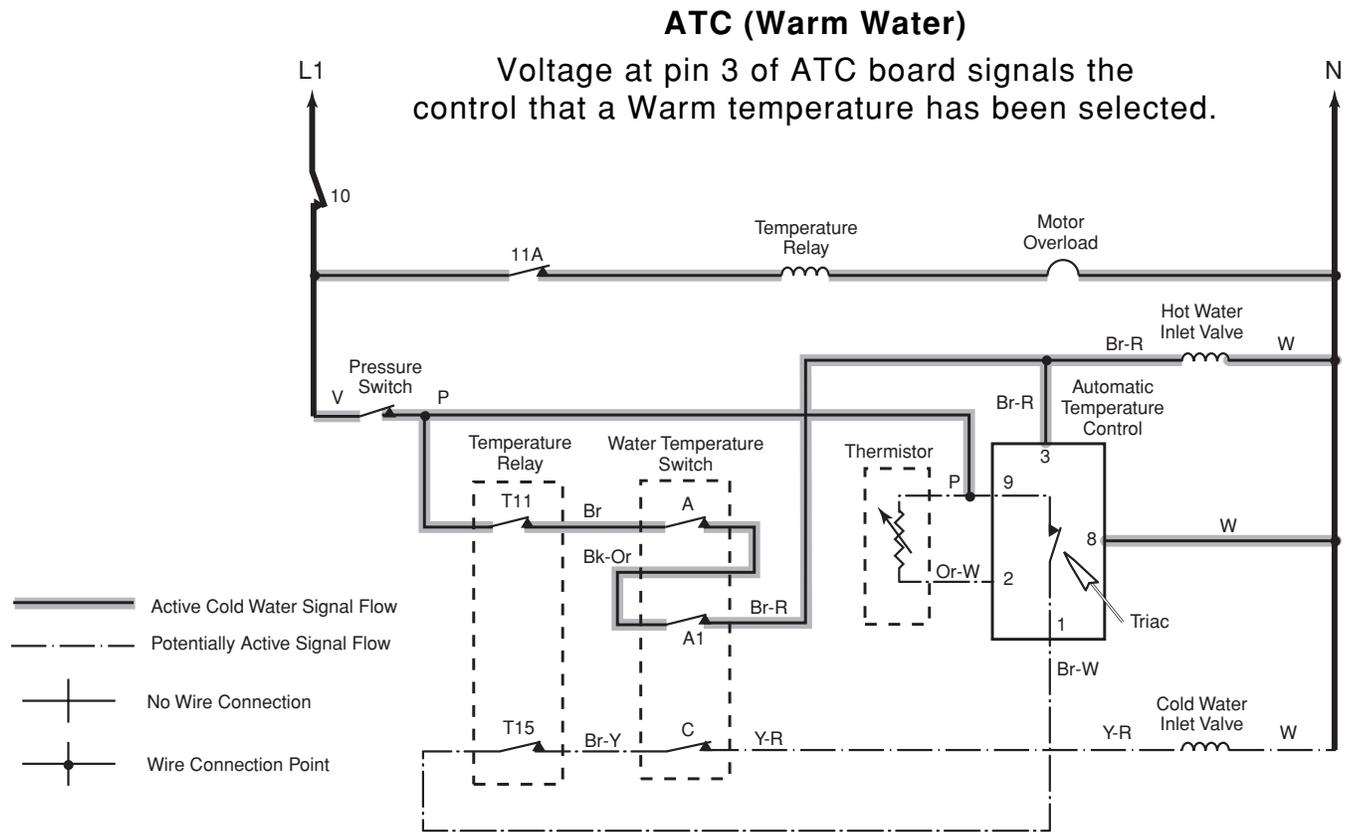
The ATC System will provide  $75^{\circ}\text{F} \pm 5^{\circ}$  for the *Cold* setting, and  $100^{\circ}\text{F} \pm 10^{\circ}$  for the *Warm* setting. The final water temperature is measured inside the tub.

In the *Cold* setting, the cold water solenoid is energized 100% of the time and the hot water solenoid is cycled off and on (see Figure 4).



**Figure 4**

In the *Warm* setting, the hot water solenoid is energized 100% of the time and the cold water solenoid is cycled off and on (see Figure 5). **NOTE: During the warm water fill, both solenoids are energized for 55-seconds. After 55-seconds, the hot water inlet valve stays on and the cold inlet water valve cycles.**



**Figure 5**

In the current application, the ATC is active only during the wash fill and only when the water temperature switch is used to select an *AccuWash* option. A temperature relay is used to switch from ATC activation in the wash cycle, and non-ATC in the rinse cycle. The temperature relay is controlled by the timer contact 11A, which applies voltage to the temperature relay coil at terminals W-R and W-Bk.

Whether the ATC option is selected or not, the timer contact 11A closes to energize the temperature relay coil in the *Wash* portion of the cycle. Normally-open contacts within the temperature relay are closed, and normally-closed contacts are opened. Depending on the water temperature switch selection, the ATC may be used to regulate either a warm or cold wash. In the non-ATC mode, the washer fill will proceed as usual.

# SECTION 2

## COMPONENT ACCESS

### CONSOLE CONTROLS

# ! SAFETY WARNING



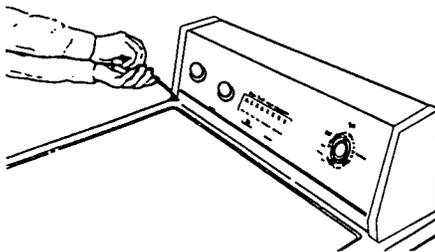
#### ELECTRIC SHOCK HAZARD

Disconnect the electrical power before servicing any components. Failure to do so can result in death or electrical shock.

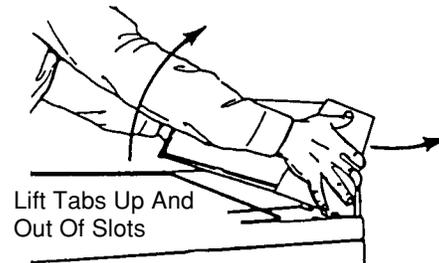
**CAUTION: Potential floor damage.** Slide the washer onto a piece of cardboard or hardboard before moving it across the floor. Failure to do so may damage the floor covering.

### REMOVING THE CONSOLE

1. Remove the two screws at the base of the console (see Figure 6).
2. Grip the ends of the console and lift it to remove the bottom tabs from the slots in the console, (see Figure 7), then pull the console towards you and remove it.



*Figure 6*



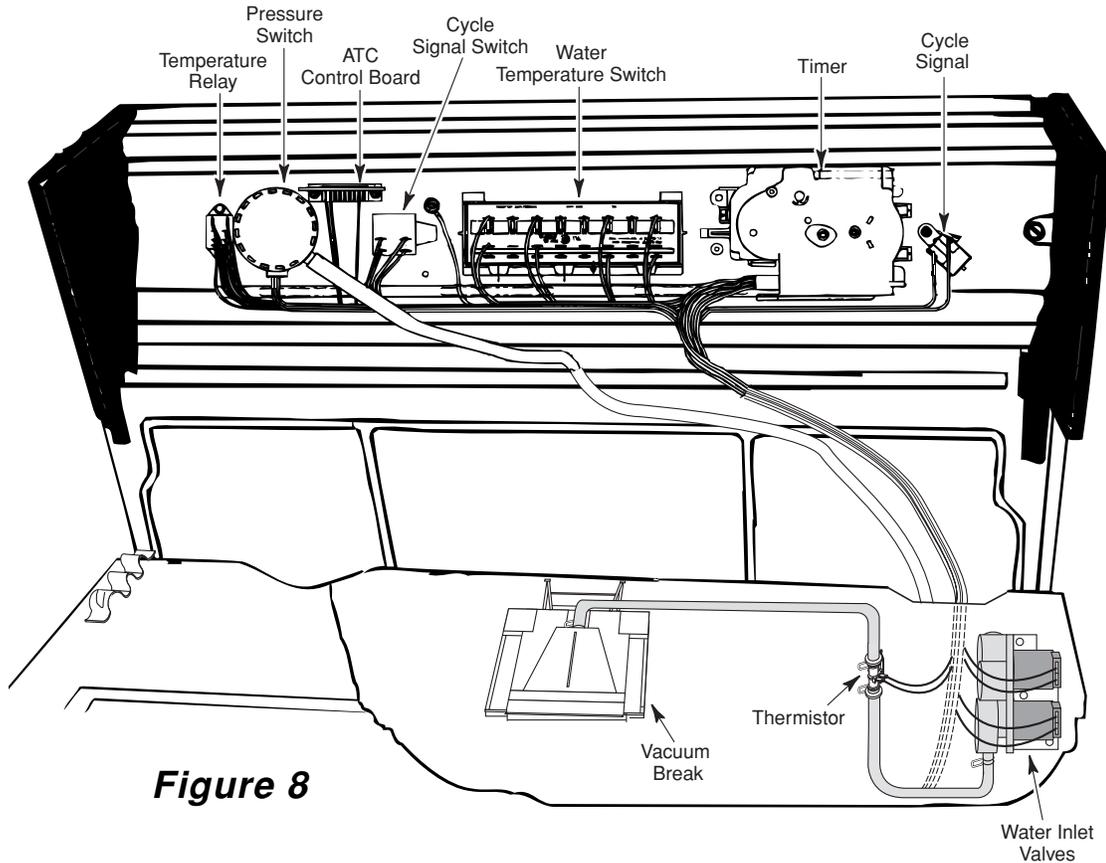
*Figure 7*

3. Carefully rotate the console so that the back faces you. **NOTE: Do not lay the console against a wall without a protective cover or you may scratch it.**

## SERVICING THE COMPONENTS

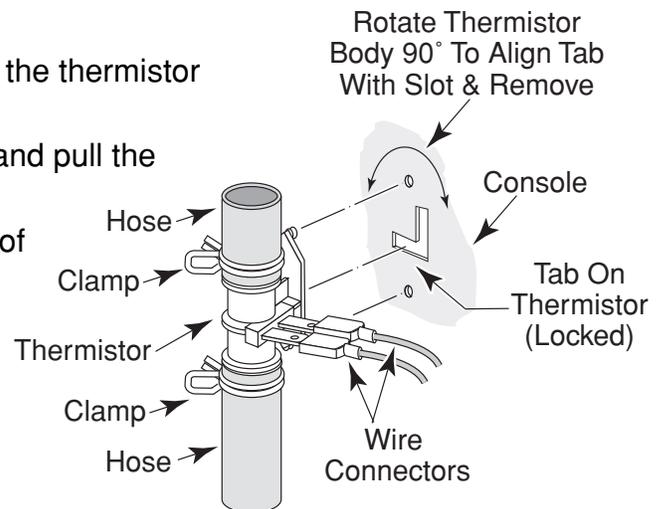
Refer to Figure 8 for the component locations.

1. To remove the Temperature Relay, unplug the connector from the relay terminals and remove the two screws.
2. To remove the ATC Control Board, grip the sides of the board and pull it straight out of the connector.



**Figure 8**

3. To remove the Thermistor (see Figure 9):
  - a) Disconnect the two wire connectors from the thermistor terminals.
  - b) Remove the two clamps from the hoses and pull the hoses off the connectors.
  - c) Pry the pins at the top and at the bottom of the thermistor out of their console holes and twist the body 90° in either direction. Pull the tab out of the console slot and remove the thermistor.



**Figure 9**

# SECTION 3

## DIAGNOSTICS

### TEST 1—NON-ATC WASH FILLS

The Non-ATC System must function properly before testing the ATC System. To perform the tests, use the following steps.

1. Set the Timer for the *Wash* cycle, start the washer, and the tub will begin filling with water.
2. Push the Water Temperature Switch to each of the non-ATC positions and note the temperature of the water entering the washer at each position.
3. Turn the Timer to *Rinse Fill*.
4. Push the Water Temperature Switch to each of the four non-ATC positions and note the water temperatures. There will be both warm and cold rinse fills.

**NOTE: If the temperatures are not correct, or if the washer is not filling, check the following switches for the proper operation and function:**

- Timer switch 11A (V to W-R) should be closed during the *Wash/Fill* cycle.
- Water level switch contacts V to P.
- Water temperature switch contacts, (see the “Temperature Switch Chart”).
- Wiring harness and connectors.
- Temperature relay contacts (see the “Temperature Relay Chart”).

Temperature Switch Chart						
Switch	ATC		NON-ATC			
	CC	WC	HC	WC	CC	WW
A	X	X	X	X		X
A1		X	X	X	X	X
B	X	X		X	X	X
B1	X		X	X	X	X
C		X				
D						X
E	X					

Temperature Relay Chart		
Switch	ATC Coil Energized	Non-ATC Coil Not Energized
P to Br	X	
Br-W to T-Bk		X
Br-W to Br-Y	X	
P to Y-R		X

- Water flow rates through the hot and cold water inlet valves. The flow rates should be similar. If not, check for blocked valve screens, supply water valve opening, or kinked hoses.

## TEST 2—ATC WASH FILLS

The following steps test the ATC portion of the system. **NOTE: A properly operating ATC system will provide the following water temperatures in the washer after the *Wash/Fill* cycle is completed.**

Cold = 75°F ±5°

Warm= 100° ±10°

The hot wash and rinse fills are not ATC-controlled.

1. Set the Water Temperature Switch to ATC-controlled Warm/Cold.
2. Set the Timer in the *Wash* cycle, start the washer, and the tub will begin filling with water.

Both the hot and cold water inlet valves will operate continuously for approximately 55-seconds. After the time has elapsed, the cold water inlet valve should cycle on and off, while the hot water inlet valve remains on continuously.

If the cold water inlet valve is not working properly:

- Disconnect the washer from the electrical supply.
- Check the ATC Control Board for proper installation in the connector.
- Make sure that the harness wires are in the proper location in the connector.
- Remove the ATC Control Board from the connector.
- Using an ohmmeter, measure the thermistor at connector harness wires 2 (Or - W), and 9 (P). Compare the readings to the following “Thermistor Resistance Chart.”

Temperature Degrees (F)	Resistance (Ohms)
40	126k - 135k
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

### NOTES:

- A. If the hot water temperature is below 120°F, the cold water inlet valve may turn off and stay off.**
- B. If the cold water temperature is above 70°F, the cold water inlet valve may stay on continuously.**
- C. If the thermistor is open, the cold water inlet valve will stay off. If the thermistor is shorted, the cold water inlet valve will stay on continuously.**

If the ohmmeter readings are not correct:

- Remove and replace the thermistor (see pages 6 and 7).
- Repeat steps 1 and 2 of *Test 2*.

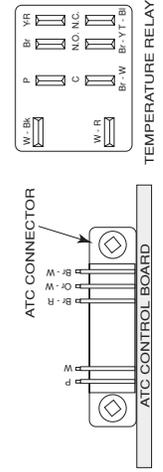
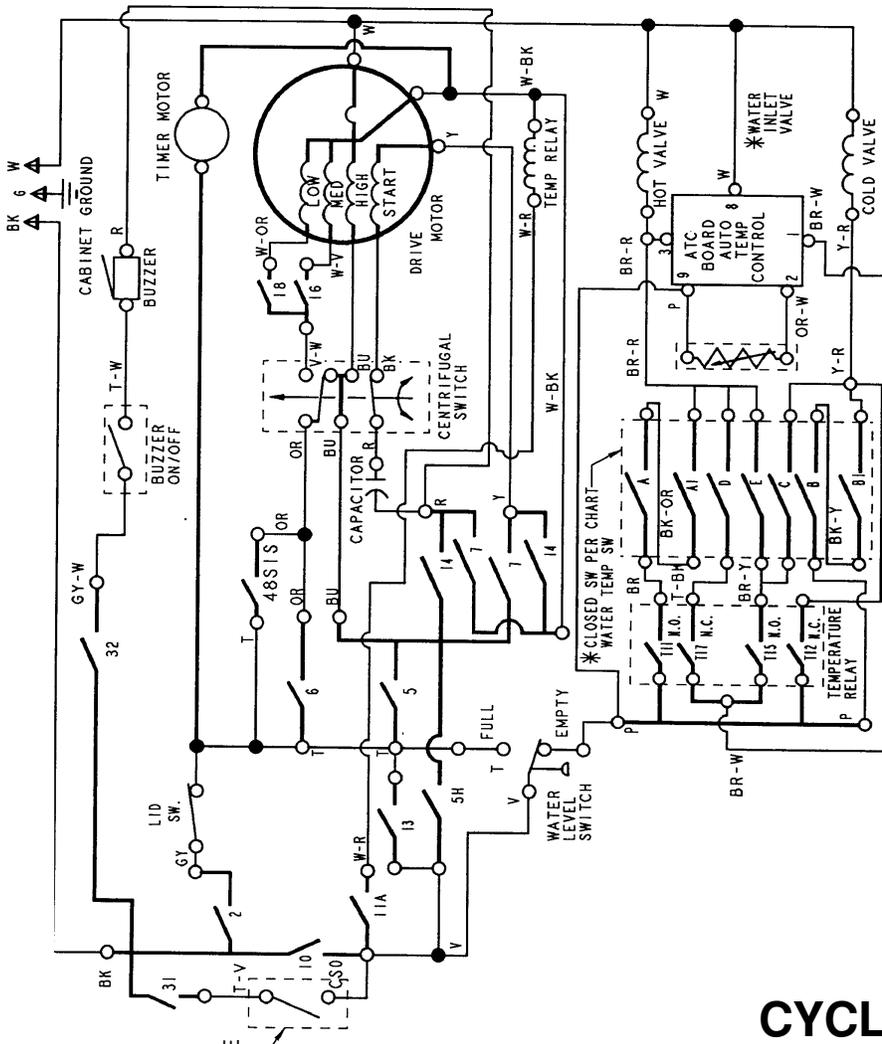
3. Set the Water Temperature Switch to ATC-Controlled Cold/Cold.
4. Set the Timer in the *Wash* cycle, start the washer, and the tub will begin to fill with water.

The hot water inlet valve should cycle on and off while the cold water inlet valve operates continuously. **NOTE: If the cold water temperature is above 65°F, the hot water inlet valve may not turn on.**

If the hot water inlet valve is not working properly, disconnect the washer from the electrical supply, replace the ATC Control board, then repeat steps 3 and 4 of *Test 2*.

5. Repeat *Test 2* for both the ATC-controlled water temperature switch positions (AccuWash).

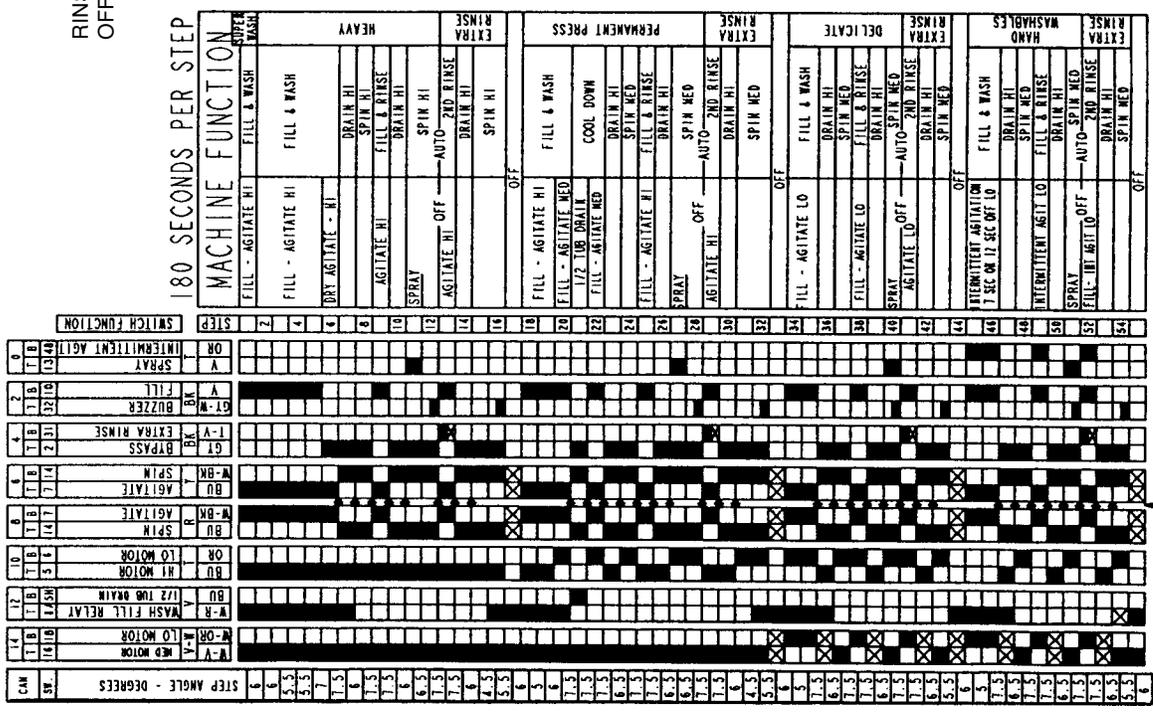
# WIRING DIAGRAM



Component	Coil Resistance (Ω)	Contacts
Hot Water Valve Solenoid	800 - 1200	W to Br-R
Cold Water Valve Solenoid	800 - 1200	W to Y-R
Temperature Relay	3800 - 5400	W-R to W-Bk

Switch	ATC		NON-ATC	
	CC	WC	HC	WC
A	X	X	X	X
AI	X	X	X	X
B	X	X	X	X
BI	X	X	X	X
C	X			
D				
E	X			

# CYCLE CHART



## **PRODUCT SPECIFICATIONS AND WARRANTY INFORMATION SOURCES**

### **IN THE UNITED STATES:**

For Product Specifications and Warranty Information, call:

**Whirlpool Products: 1-800-253-1301**

**KitchenAid Products: 1-800-422-1230**

**Roper Products: 1-800-447-6737**

For Technical Assistance while at the customer's home, call:

**The Technical Assistance Line: 1-800-253-2870**

Have your store number ready to identify you as an authorized servicer.

For Literature orders, call: **1-800-851-4605**

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### **IN CANADA:**

For Product Specifications and Warranty Information, call: **1-800-461-5681**

For Technical Assistance while at the customer's home, call:

**The Technical Assistance Line: 1-800-488-4791**

Have your store number ready to identify you as an authorized servicer.

