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TECHNIQUES

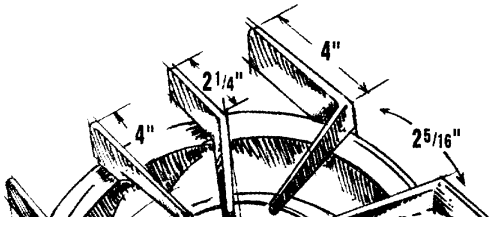
BY

Viking Preferred Service

TECH – NOTES

VCSB360 / 420 / 480

REFRIGERATORS



VIKING®
Preferred Service

R134a REFRIGERANT
SERVICE INFORMATION

This product uses R134a refrigerant. This refrigerant requires synthetic Ester Oil in the compressor. This cooling system does not tolerate contamination from any of the following:

- Other Refrigerants
- Moisture
- Petroleum-based Lubricants
- Silicone Lubricants
- Cleaning Compounds
- Rust Inhibitors
- Leak Detection Dyes
- Any Other Type of Additive

As a result the following precautions should be observed

- Use equipment dedicated to R134a sealed system only.
- Do not leave a replacement compressor open to the atmosphere for more than 10 minutes.
- Always replace the filter-drier when performing any repairs on the sealed system.
- **Use only 134a refrigerant for back flushing and sweep procedures.**
- If the rubber plugs on the service replacement compressor appear to have been tampered with or removed, **DO NOT USE THE COMPRESSOR**. Get another one.
- The filter-drier MUST be cut from the sealed system. Never un-braze the filter-drier from system tubing. Applying heat will drive moisture back into the sealed system.

HEALTH AND SAFETY HANDLING	**134a**
Allowable Overall Exposure Limit	1,000 ppm
Vapor Exposure to Skin	No Effect
Liquid Exposure to Skin	Can Cause Frostbite
Vapor Exposure to Eyes	Very Slight Irritation
Liquid Exposure to Eyes	Can Cause Frostbite
Above Minimum Exposure Limit	Can Cause Asphyxiation. Tachycardia and Cardiac arrhythmias.
Safety and Handling	Wear appropriate Skin and Eye protection. Use adequate Ventilation.
Spill Management	Remove or Extinguish Ignition or Combustion Sources. Evacuate or Ventilate Area.
Fire and Explosion Hazards	May Decompose if contact with Flames and Heating elements. Container May Explode IF Heated Due to Pressure Rise. Combustion Products are Toxic.
Storage Conditions	The Procedures/Rules for R12 also Apply to 134a.
Disposal Procedure	Reclaim

COMPONENT LOCATION

Cabinet Components

- Freezer thermostat
- Evaporator
- Evaporator Fan
- Freezer Side Panel Heater
- Bimetal
- Defrost Heater
- Electronic Temperature Control Board
- Thermistor
- Motorized Air Door
- Water Valves
- Upper Grille
- Power ON/OFF Switch

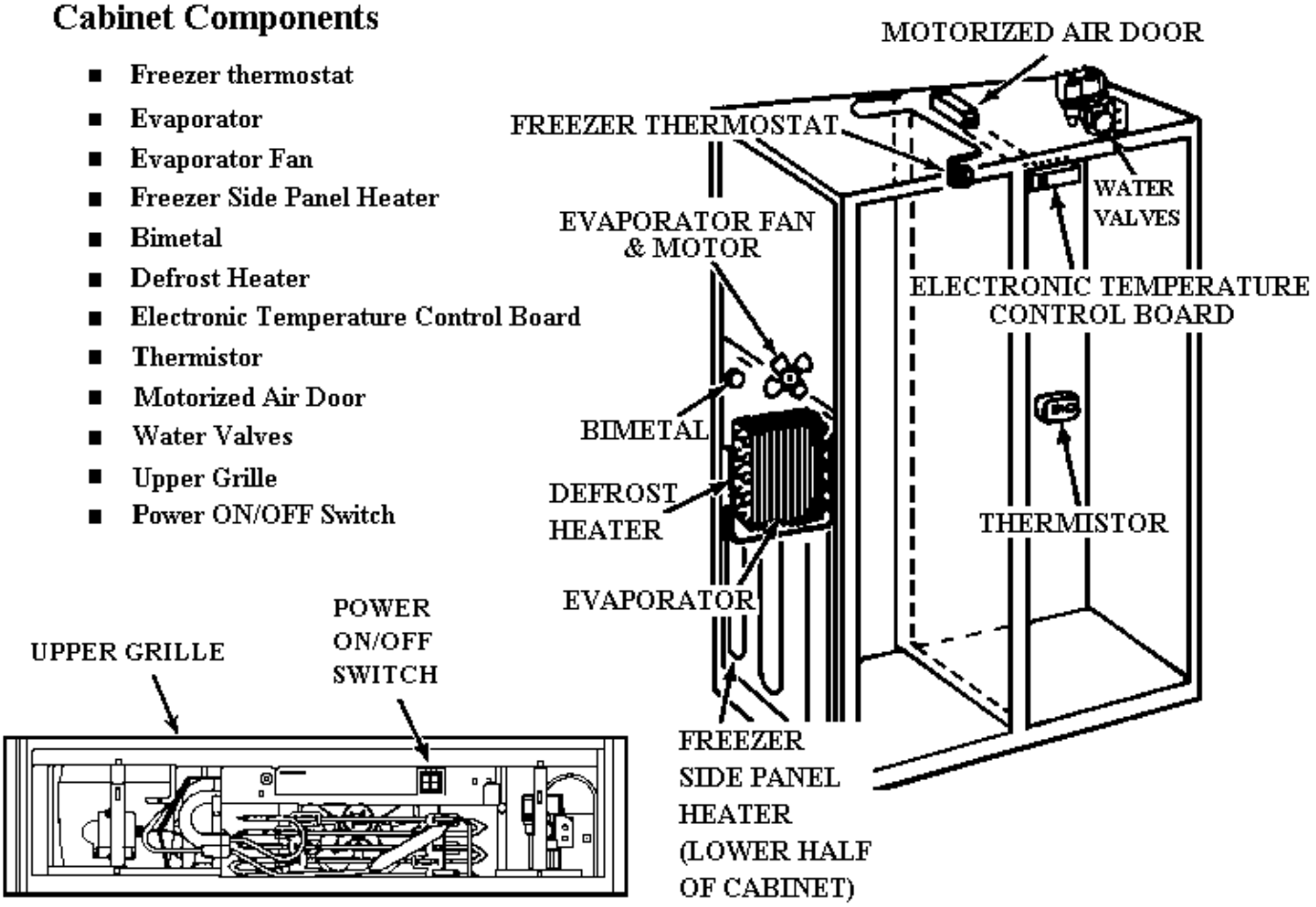
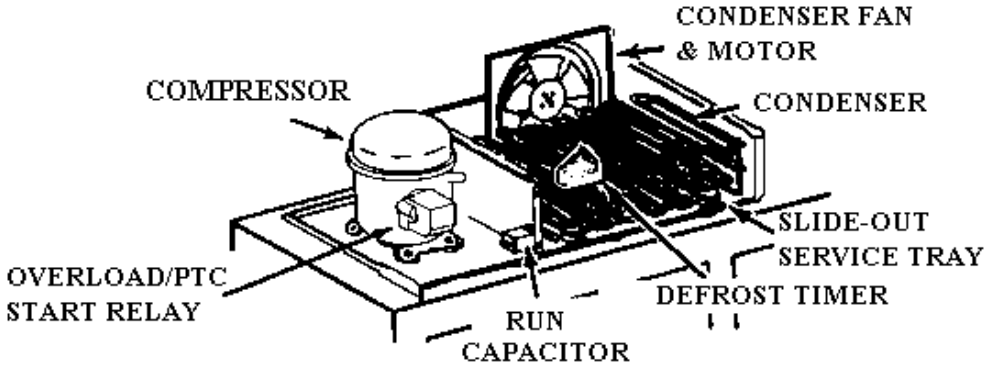


Fig. 1

Unit Compartment Components



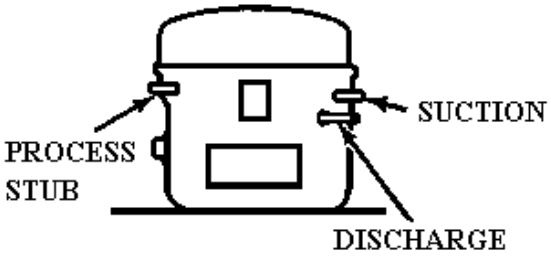
- Compressor
- Overload
- PTC Start Relay
- Run Capacitor
- Condenser
- Condenser Fan
- Defrost Timer

Fig. 2

Sealed System Components

- **Compressor**
- **Condenser**
- **Drier**
- **Heat Exchanger**
- **Discharge Line**
- **Evaporator**
- **Condenser Pan Heat Loop**
- **Mullion Heat Loop**

Compressor Hook Up



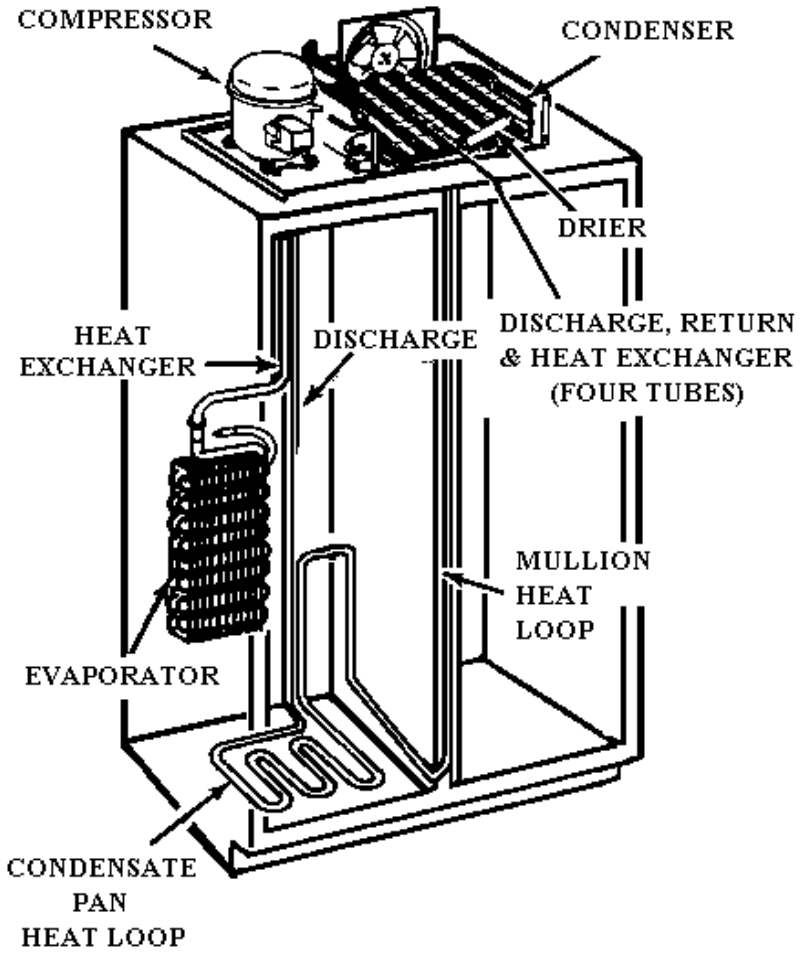


Fig. 3

TEMPERATURE CONTROL

Temperature control in both the refrigerator and freezer compartments is accomplished by circulating air through each compartment. The air picks up heat as it moves throughout the unit. as the air is drawn past the evaperator, the heat is removed by the refrigeration system, which then moves the heat to the outside of the unit.

Air Circulation In The Freezer And Refrigerator Compartments

Components related to air circulation in the refrigerator and freezer sections are:

1. Evaporator Fan
2. Freezer Air Duct
3. Air Diffuser
4. Evaporator
5. Motorized Air Door
6. Air Return Duct
7. Air Passsage
8. Cabinet Separator
9. Ice Maker Air Diffuser
10. Meat Savor Air Duct
11. Meat Savor Control
12. Round Port

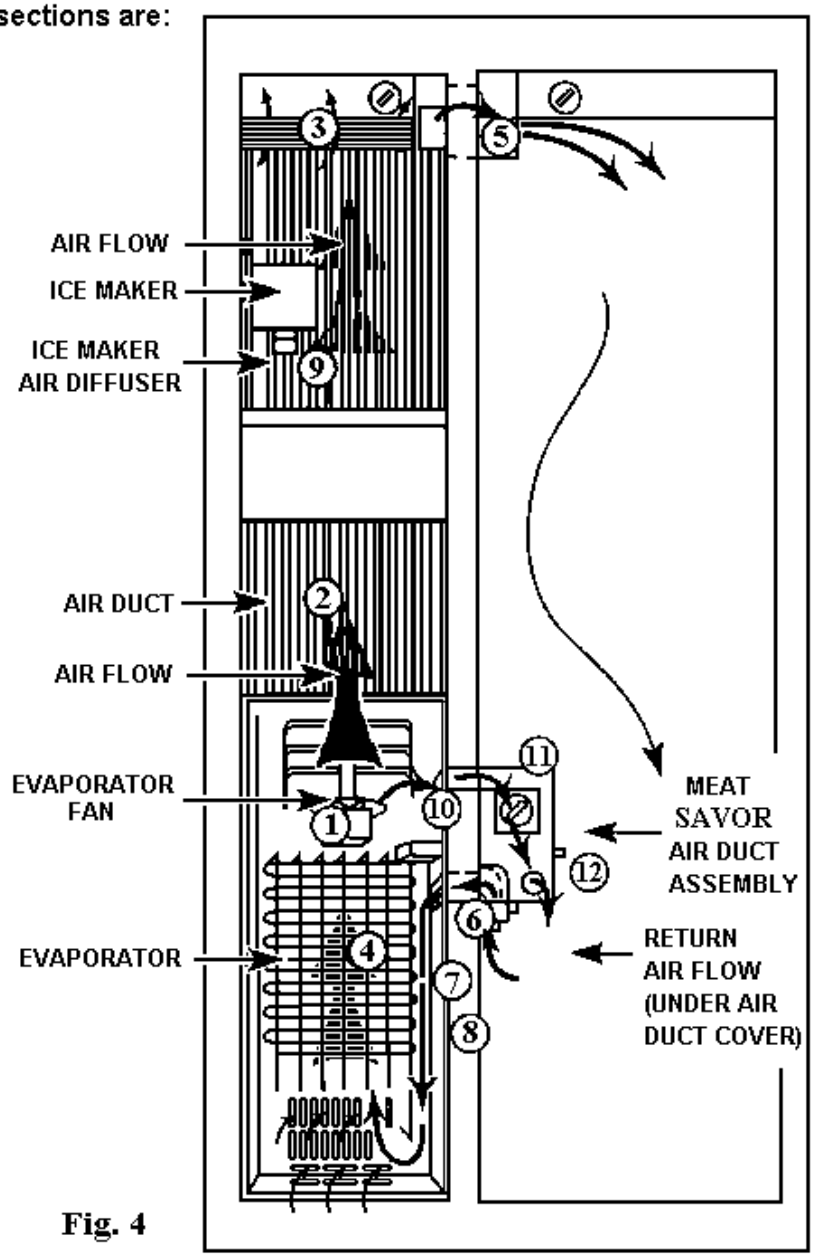


Fig. 4

Figure 4 illustrates all of the components used in the circulating air through the freezer and refrigerator compartments.

The Freezer Compartment

The evaporator fan (1) draws air over the evaporator coils (4) located in the lower portion of the freezer compartment. As the air passes over the evaporator, heat is extracted and the cold air travels up the back of the freezer compartment through an air duct (2) to the top of the unit.

An air diffuser (3) at the top of the freezer compartment allows the cold air to circulate into the freezer area and drop to the bottom of the compartment where it is drawn over the evaporator again.

Air traveling up the freezer air duct is also directed out the small diffuser (9) just below the ice maker. The air travels along the bottom of the ice maker to the front of the freezer and down toward the bottom of the compartment and then up through the evaporator coils (4).

The Refrigerator Compartment

An air duct regulated by a motorized air door (5) located at the top of the freezer section allows cold air to pass through the separator wall (8) into the refrigerator section. Air then circulates throughout the refrigerator section, generally flowing from top to bottom. As it reaches the bottom of the refrigerator section it is drawn through a return air duct (6) in the separator (8) wall located just below the meat savor drawer. This return air is drawn to the bottom of the freezer compartment through a passage between the side of the evaporator (7) and the separator wall (8) and then up past the evaporator coils (4).

Cold air from the freezer section also enters the meat savor drawer through a small air duct (10) in the separator wall (8). Air travels through the meat savor control (11). If the baffle in the meat savor control is open, the air travels out the round port (12) into the back of the meat savor drawer. The air exits the meat savor drawer and returns to the freezer through the return duct (6) The air then travels down between the side of the evaporator (7) and the separator wall (8) and then up through the evaporator coils (4).

Air Circulation In The Component Compartment

A second air circulation system in the component compartment at the top of the unit dissipates the heat picked up by the refrigeration system (Fig. 5). The condenser fan, located at the back of the compartment draws room air across the condenser, absorbing the heat in the refrigerant. This warmed air is then exhausted through a grille located at the left of the compartment behind the decorative grille assembly.

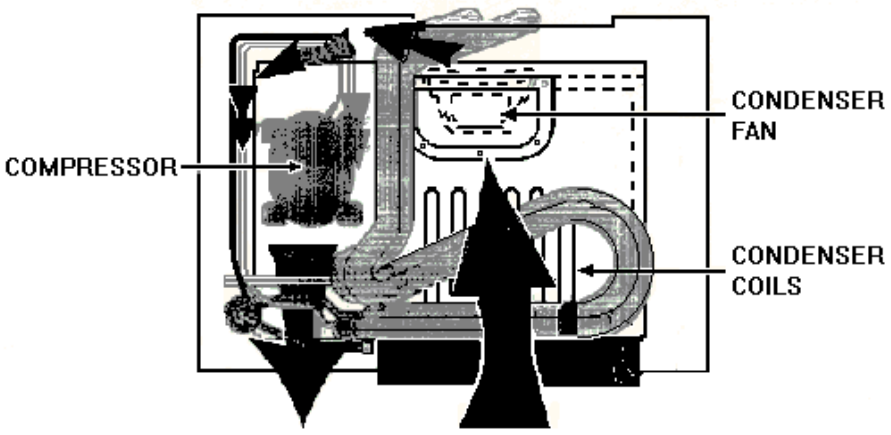


FIG.5

Motorized Air Operation

A motorized air door regulates the air flow coming from the freezer. The operation of the motorized air door is determined by the following components:

- The temperature sensor (thermistor) located on the back wall of the refrigerator cover.
- The electronic control board located inside the refrigerator section control cover.

When the temperature sensor calls for cooling in the refrigerator section, the electronic control energizes the air door motor and opens the baffle (Fig 6-A). from the "closed" position, the baffle rotates clockwise 270°. During this rotation it opens, closes and then parks in the "open" position. The OPEN MICRO-SWITCH shuts the door motor off when the baffle is fully open.

When the temperature sensor is satisfied, the electronic control again energizes the air door motor and closes the baffle (Fig 6-B). from the "open" position, the door rotates clockwise 90° and parks in the "closed" position. The CLOSED MICRO SWITCH shuts off the door motor when the baffle is fully closed.

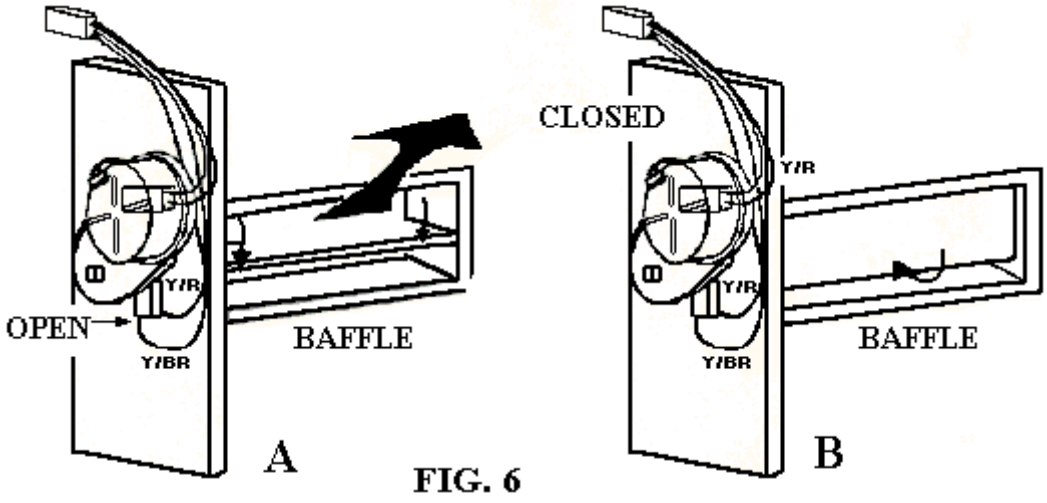


FIG. 6

Air Circulation in the Meat Savor Drawer

The Meat Savor drawer in the refrigerator compartment is provided with a separate controlled flow of cold air from the freezer compartment. Air enters the Meat Savor drawer through an air passage through the center divider wall into the upper part of the Meat Savor drawer control. If the control knob is rotated fully counterclockwise the control knob arrow is pointing to "COLD" (Fig 7A). In this position the cold air is blocked by the baffle and will not enter the Meat Savor drawer.

As the control knob is turned clockwise (toward the "COLDEST" setting), cold air will be able to pass around the baffle into the lower part of the Meat Savor control it can flow through the round port into the Meat Savor drawer. Air then leaves the drawer and joins the normal air circulation in the refrigerator compartment and return to the freezer compartment through the return air ducts in the center divider wall.

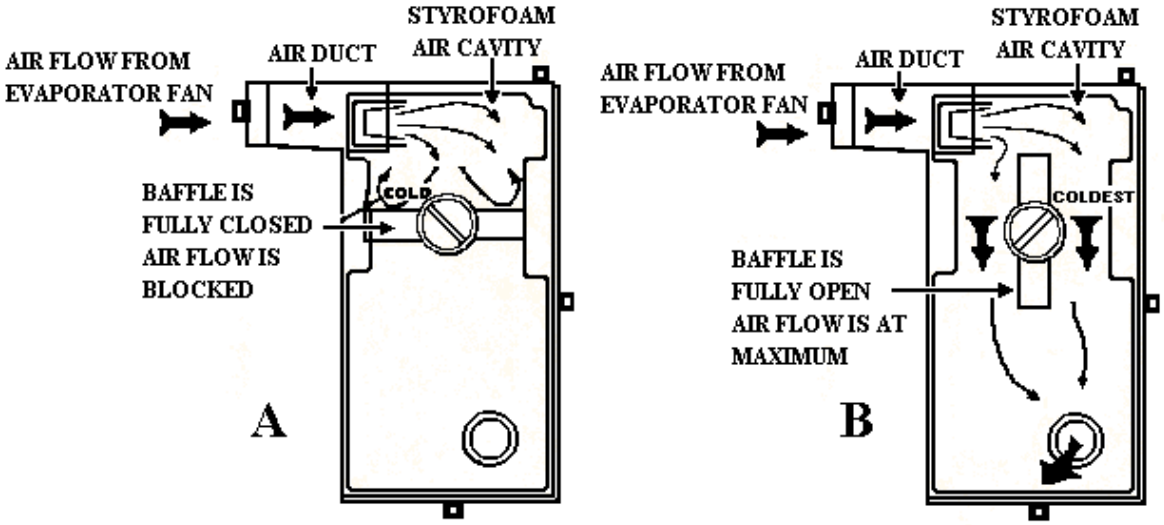


FIG. 7

Control and Operation

The temperature controls in the built-in refrigerator/freezer are designed to regulate temperature more accurately and operate the product more efficiently than freestanding side-by-side refrigerator/freezers.

Freezer Thermostat Control

The freezer thermostat controls the temperature of the freezer compartment be sensing cold air coming from the cold air duct on the back wall of the freezer liner. The thermostat's sensing tube is located in the upper right side and upper back of the freezer compartment and is covered by plastic wiring covers

When the thermostat calls for cooling, the following components are energized:

- Compressor
- Condenser
- Defrost Timer Motor
- Freezer Side Panel Heater

In addition, the thermostat sends a signal to the electronic control board indicating that the compressor is running. The electronic control board then energizes the evaporator fan motor. Although the evaporator fan motor is energized independently through the electronic control board, it always runs when the compressor is operating. This insures air circulation across the evaporator coils and through the freezer compartment during the compressor "on" cycle.

Refrigerator Electronic Temperature Control

The refrigerator electronic temperature control system consists of a thermistor and an electronic control board. The flexibility of the electronic control enables the refrigerator to operate with greater efficiency by activating the motorized air door and the evaporator fan motor independently of the compressor circuit.

- The electronic control board continuously sends a flow of voltage, or signal current, through the thermistor. The thermistor is sensitive to temperature fluctuations and changes resistance accordingly. When the temperature rises in the refrigerator compartment:

  - The thermistor resistance decreases, altering the signal going to the electronic control board.

  - The electronic control board, sensing the change in the signal current:

    a) Energizes the motorized air door to open.
    b) Energizes the evaporator fan motor (if it is not already running during a compressor "on" cycle).

When the refrigerator compartment temperature decreases:

- The thermistor resistance increases, altering the signal current to the electronic control board.

- The electronic control board sensing the change in the signal current:

  a) Closes the air door.
  b) Cycles the evaporator fan motor off (if the compressor is not running).

The electronic control board is operated by a variable resistor, or potentiometer, which sets the desired refrigerator compartment temperature. Adjusting the potentiometer changes the sensitivity of the electronic control board to the signal current from the thermistor. Varying the sensitivity raises or lowers the regulated temperature.

The refrigerator thermistor and the electronic control board directly affect the operation of the evaporator fan motor and the motorized air door. Evaporator fan motor and motorized air door cycling may occur one or more times before the freezer calls for a cooling cycle.

Control Interaction

The following information explains how the freezer thermostat and the refrigerator electronic temperature control system interact.

When the freezer thermostat closes (calling for cooling):

- The cycle is initiated.

- A voltage signal is sent to the electronic control board.

- The electronic control board energizes the evaporator fan motor.

- If the thermistor is satisfied, the motorized air door remains closed.

- If the thermistor is calling for cooling, the motorized air door opens.

When the freezer thermostat opens (is satisfied):

- The cooling cycle is terminated.

- The voltage signal to the electronic control board is terminated.

- If the thermistor is satisfied, the motorized air door is closed and the evaporator fon motor is turned off.

- If the thermistor is calling for cooling, the motorized air door opens and the evaporator fan motor runs.

Defrost System

As air circulates through the refrigerator/freezer, moisture from food and outside air that enters whenever the doors are opened condenses and freezes onto the evaporator coils and fins to form a layer of frost. Periodically the frost must be cleared from the coils so that the air flow is not blocked. An automatic defrost function accomplishes this task with the use of a defrost timer, defrost heater and bimetal.

The defrost system is designed to initiate the defrost function following 10 hours of accumulated compressor run time. The defrost timer motor runs during a cooling cycle when the compressor runs and stops running when the compressor cycles off. The timer motor also runs during the defrost cycle when the refrigeration system is shut down.

Once initiated, the defrost cycle lasts 21 minutes. The defrost heater is energized and melts off any frost accumulation. When the evaporator area reaches approximately 50° F, the bimetal opens and turns off the defrost heater. This usually occurs 10 to 15 minutes after the defrost cycle begins. The defrost timer motor continues the defrost cycle for the full 21 minutes duration and then the cooling cycles resume.

During the defrost cycle the following occurs:

- The thermostat is bypassed and has no controlling function.
- The compressor run signal current, from the thermostat to the electronic control board, is interrupted. The electronic control board will not sense or regulate the temperature.
- Voltage is interrupted from the thermostat to the electronic control board.
    a) The evaporator fan motor does not run.
    b) The motorized air door does not operate. The air door stays in its present position (either open or closed) until the defrost cycle is over.

The Mullion and Condensate Pan Heat Loop

The mullion and condensate pan heat loop (Fig.8 A) enters the separator wall through a grommet in the back of the cabinet (Fig.8 B) where it travels inside the separator wall to the front. It then bends 90° (1) and travels along the entire length of the separator (2) to the bottom of the cabinet. Finally, the loop bends 90° (3) and travels along the bottom of the separator and exits through a grommet at the back of the cabinet.

The loop then makes a 180° trap and travels down underneath the cabinet and forms a coil over the condensate pan. The loop then travels up the back of the cabinet to the condenser.

The Freezer Side Panel Heater

The freezer side panel heater element (4) is affixed to an adhesive sheet on the left inside wall of the outer cabinet and is foamed in place during manufacture. The element covers the bottom half of the wall and is energized whenever the freezer thermostat initiates a cooling cycle and the compressor runs. The plug (5) for the freezer side heater is located near the top left corner of the cabinet.

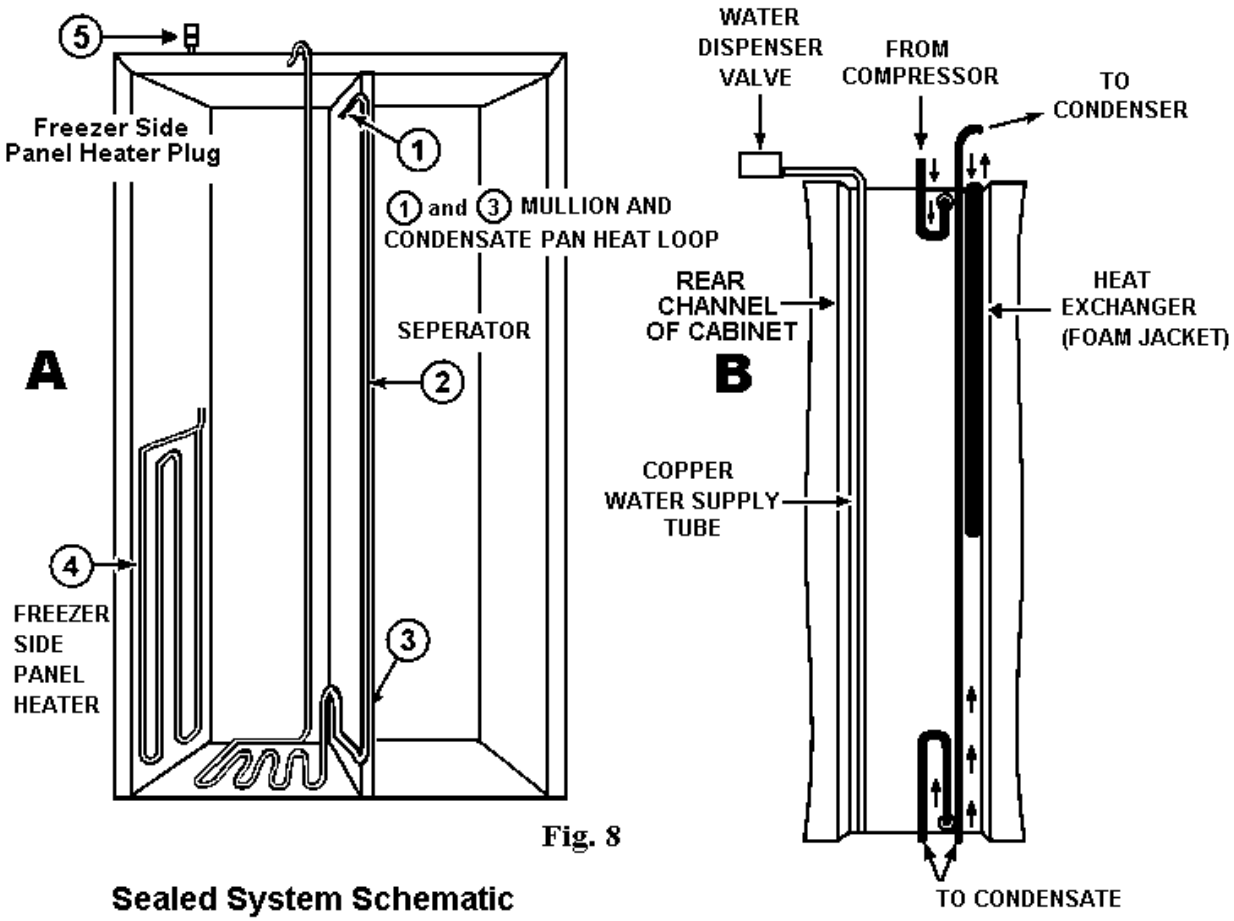

5
Freezer Side
Panel Heater Plug
1
1 and 3 MULLION AND
CONDENSATE PAN HEAT LOOP
SEPERATOR
2
A
4
FREEZER
SIDE
PANEL
HEATER
3
WATER
DISPENSER
VALVE
FROM
COMPRESSOR
TO
CONDENSER
REAR
CHANNEL
OF CABINET
HEAT
EXCHANGER
(FOAM JACKET)
B
COPPER
WATER SUPPLY
TUBE
TO CONDENSATE

Fig. 8

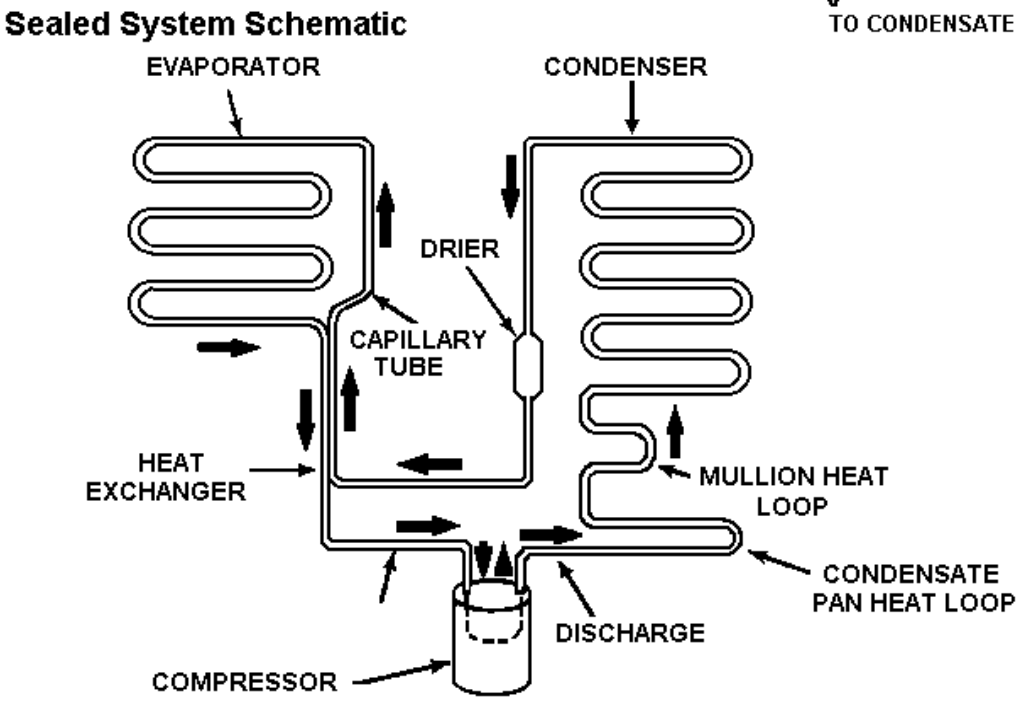

Sealed System Schematic
EVAPORATOR
CONDENSER
DRIER
CAPILLARY
TUBE
HEAT
EXCHANGER
MULLION HEAT
LOOP
CONDENSATE
PAN HEAT LOOP
DISCHARGE
COMPRESSOR

Fig. 9

PROBLEM	POSSIBLE CAUSE	TEST PROCEDURE-TEST
Door will not close or will Not seal	Gasket binding	Adjust hinges, add shims if necessary. Lubricate face of gasket on hinge side With parawax.
	Door warped	Loosen retainer screws and rack door To fit cabinet.
	Cabinet racked	Level cabinet; make sure cabinet is setting solidly at all four corners.

THE MOTORIZED AIR DOOR

The electronic control board, located inside the refrigerator control cover, controls the operation of the motorized air door, the thermistor and the evaporator fan motor.

120 volts AC is supplied to the electronic control board through the BK wire and operates the circuit as follows:

1. To open the baffle: 120 volts AC is supplied to the baffle motor through the Y/R wire and switch SW1 (Fig.31-C). The motor rotates 270* from the "closed" position (Fig.31-A) to the open" position where it contacts SW1 which opens and parks the motor.
2. To close the baffle: 120 volts AC is supplied to the baffle motor through the W/BR wire and Switch SW2 (Fig.31-C). The motor rotates 90* from the "open" position (Fig.31-B) to the "closed" position where it contacts SW2 which opens and parks the motor.
3. 120 volts AC is supplied through the OR/W wire to the electronic control board which energizes the evaporator fan motor and supplies low voltage to the thermistor.

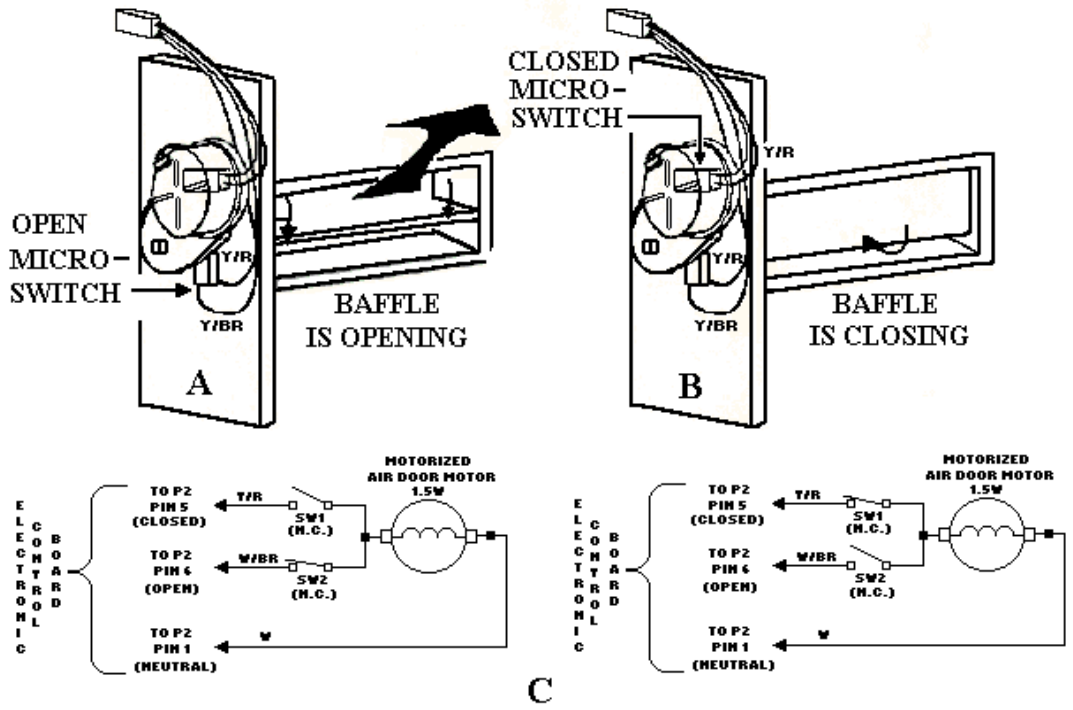


FIG. 31

CHECKING CONTINUITY

To make component or wiring measurements, set an ohmmeter's RANGE switch at R x 1 (unless directed otherwise.) For all "ground" measurements, set the RANGE switch to R x 10k. Insert the ohmmeter probes into the plug pins or against the component terminals as directed in the procedure.

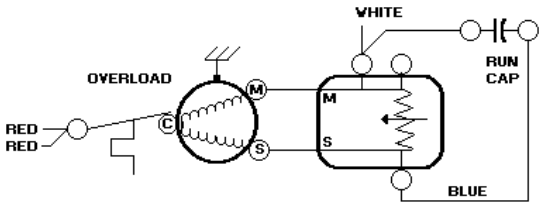
COMPONENT	TEST PROCEDURE	METER READINGS
THERMISTOR	The thermistor can be tested by measuring the resistance between The GY wires at the thermistor connector or at the DC connector of the electronic control board. Making the test at the board is an easy way to check out the thermistor wiring harness. The "Meter Readings" show the thermistor resistance over a range of temperatures.	Temperature (*F) = Resistance(Ohms) 35*F = 8240 - 8926 65*F = 3628 - 3930 40*F = 7143 - 7739 70*F = 3189 - 3455 45*F = 6209 - 6727 75*F = 2810 - 3044 50*F = 5410 - 5860 80*F = 2480 - 2687 55*F = 4724 - 5118 85*F = 2194 - 2376 60*F = 4235 - 4479 90*F = 1945 - 2107
DEFROST HEATER	Disconnect the defrost heaters wire connector from the wiring harness. Touch the ohmmeter probes to the Connector pins.	The ohmmeter should indicate approximately 19 ohms to 20 ohms.
	Ground Test: Touch one probe to the chassis and the other to each connector pin.	Should indicate an "open' circuit for both pins. Any resistance indicates a short circuit.
BIMETAL	Make sure that the freezer is cold Enough to close the bimetal contacts. The bimetal contacts close At approximately 20*F +/- 8*F and open at approximately 50*F +/- 8*F.	
	Disconnect the 2-pin bimetal connector (PX and BR wires) from the wiring harness. Touch the ohmmeter Probes to the pins on the ends to the Wires.	Continuity if the evaporator temperature is below 12*F. No continuity if the evaporator temperature is above 56*F.
EVAPORATOR FAN MOTOR	Disconnect the wire terminals from the motor. Touch the ohmmeter probes to the motor terminals.	The ohmmeter should indicate between 40 ohms and 80 ohms.
	Ground Test: Touch one probe to the chassis and the other to each wiring connector.	Should indicate an "open" circuit. Any resistance indicates a short circuit

COMPONENT	TEST PROCEDURE	METER READING
MOTORIZED AIR DOOR	Disconnect the wire terminals from the motor and touch the ohmmeter probes to the connector pins as follows: 1. Y/BR and W wires 2. Y/ R and W wires	Approximately 8800 ohms between the W/BR and W wires OR the Y/R and W wires.
ICE MAKER FILL VALVE	Disconnect the solenoid wiring connector. Touch the ohmmeter probes to the solenoid terminals.	The ohmmeter should indicate approximately 270 ohms.
	Ground Test: Touch one probe to the chassis and the other to each solenoid terminal.	Should indicate an "open" circuit for both terminals. Any resistance indicates a short circuit.
CONDENSER FAN MOTOR	Disconnect the condenser fan motor connector from the wiring harness. Touch the ohmmeter probes to the motor wire connector pins.	The ohmmeter should indicate between 115 ohms and 450 ohms.
	Ground Test: Touch one probe to the chassis and the other to each motor wiring connector.	Should indicate an "open" circuit for each connector. Any resistance indicates a short circuit.
THERMOSTAT	Disconnect the thermostat wiring connector. Touch the ohmmeter probes to the thermostat connector pins.	With the thermostat turned fully clockwise, the ohmmeter should show "continuity." Fully counter clockwise rotation should show "no continuity."
COMPRESSOR	Touch the ohmmeter probes to the S and C connector pins.	The ohmmeter should indicate between 4 ohms and 22 ohms.
	Touch the ohmmeter probes to the M and C connector pins.	The ohmmeter should indicate between 1 ohm and 4 ohms.
	Ground Test: Touch one probe to the chassis and the other probe to the S, M and C connectors.	Each connector should indicate an "open" circuit. Any resistance indicates a shorted winding.
OVERLOAD PROTECTOR	Touch the ohmmeter probes to the two terminals.	The switch is normally closed (N.C.), so the ohmmeter should show continuity (0 ohms).

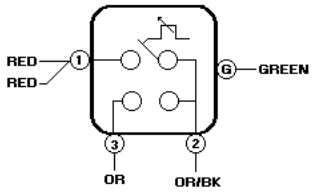
COMPONENT	TEST PROCEDURE	METER READING
PTC START RELAY	The PTC Start Relay cannot be tested. To determine its reliability, use the following procedure: 1. Measure the R and W wires at The compressor for 120 volts AC. 2. Check the overload relay to make sure there is continuity through It. (Use the previous test procedure.) 3. Test the run capacitor. (Use the following test procedure.) 4. Use a test cord and start the compressor. If it starts, and the preceding checks are okay, the relay Is defective.	
RUN CAPACITOR	Disconnect the wires and touch the ohmmeter probes to the two terminals.	The ohmmeter reading should peak and then drop. Reverse the test probes on the terminals and the Same results should occur.
TIMER **NOTE:** The production timer (Paragon) has a 10 hour cumulative run time with a 21 minute Defrost duration. The service replacement timer (Mallory) has an 8 hour cumulative run time with a 21 minute defrost duration.	To test the timer, perform the following steps: 1. Use a screwdriver and manually turn the time clockwise until you hear a "click." This will place the timer in the "defrost" position if the refrigerator was running, the compressor and fans will turn off. 2. Unplug the unit. 3. Disconnect the 4 wire connector from the timer. 4. Set the ohmmeter to the Rx10k. Checking the Motor: 1a. Paragon Timer: The motor windings have a capacitor connected In series. Use the same procedure that you would use for checking a capacitor. Momentarily touch the probes to terminals PK and R, then reverse the probes and touch the terminals again.	Paragon Timer - When you first touch the terminals the meter should momentarily deflect and show continuity.

COMPONENT	TEST PROCEDURE	METER READING
TIMER (Continued)	1b. Mallory Timer: Touch the meter probes to timer terminals PK and R (motor windings).	Mallory Timer - the meter should read 6000 ohms to 9000 ohms.
	The Defrost Mode 1. Set the ohmmeter to Rx1 scale and zero the meter. 2. Touch the meter probes to timer terminals PK and BK (switch contacts.) 3. Touch the meter probes terminals BK and OR (switch contacts.)	 The meter should read " zero" resistance (contacts closed.) If it reads anything else, replace the timer. The meter should read "infinity" (contacts open.) If it reads anything else, replace the timer.
	Cooling Mode 1. Use a screwdriver and Manually advance the Time 1/4 turn. 2. Touch the meter probes to timer terminals BK and OR (switch contacts.) 3. Touch the meter probe to timer terminals PK and BK (switch contacts.)	 The meter should read "zero" resistance (contacts closed.) If it reads anything else, replace the timer. The meter should read "infinity" (contacts open.) If it reads anything else replace the timer.

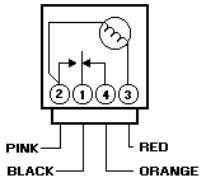
REFRIGERATOR COMPONENTS



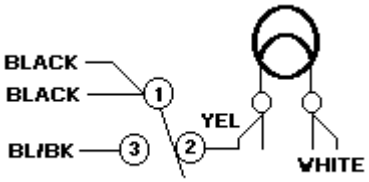
COMPRESSOR PTC RELAY



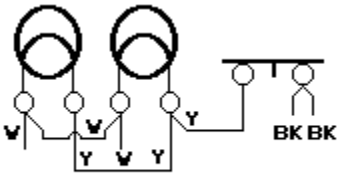
THERMOSTAT



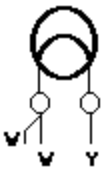
DEFROST TIMER



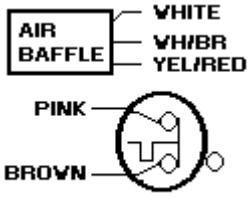
FREEZER LIGHT



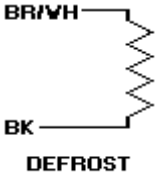
LIGHTS LIGHT SWITCH



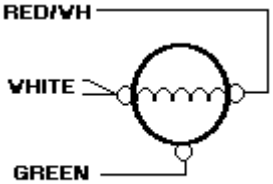
LOWER FREEZER LIGHT



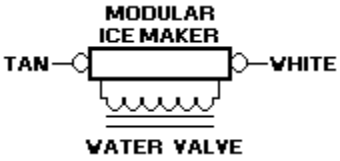
BIMETAL



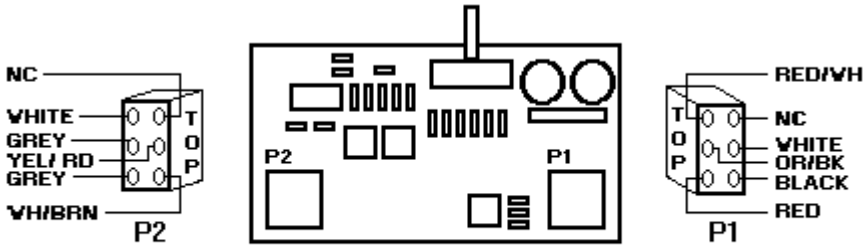
DEFROST HEATER



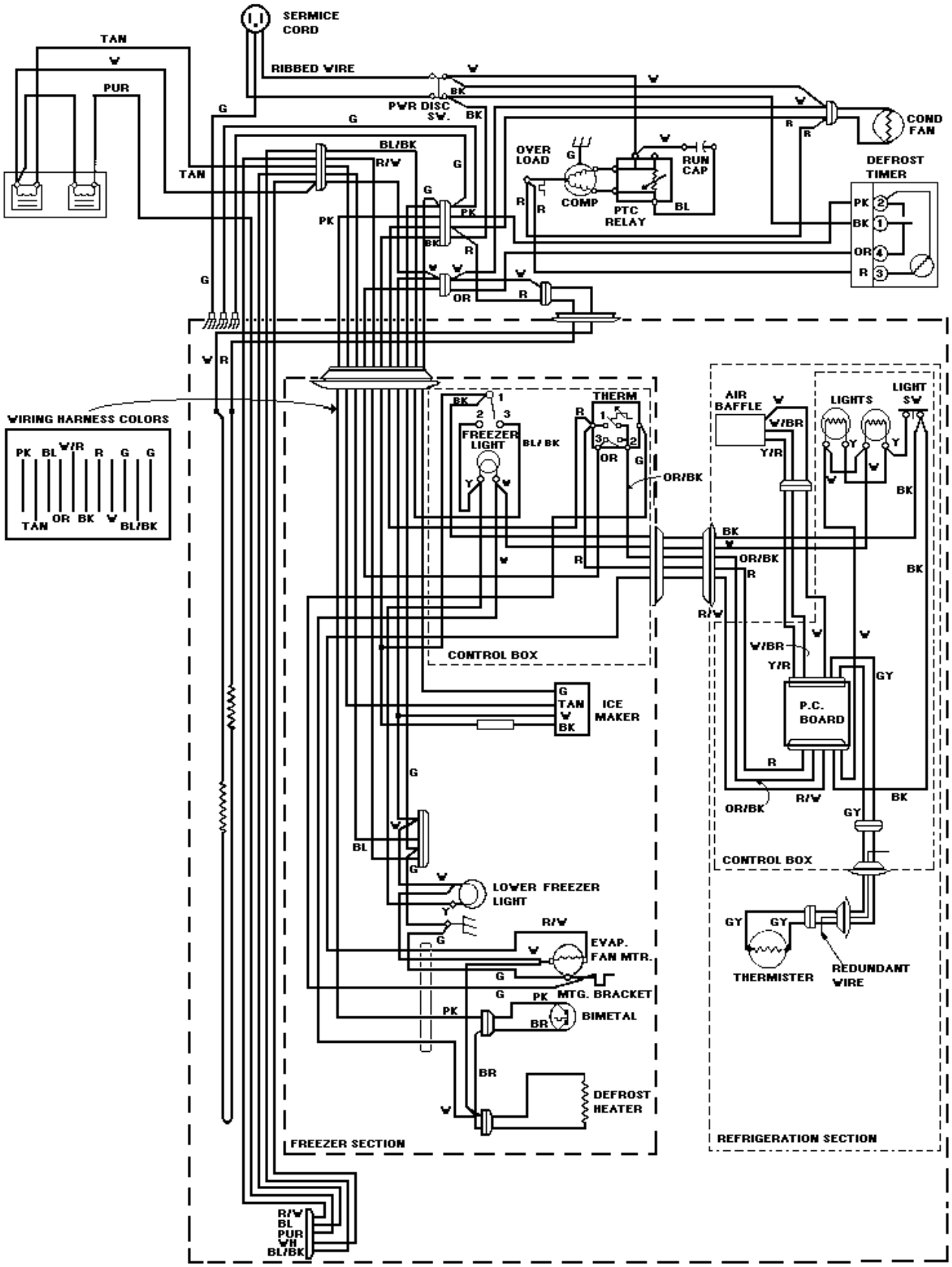
EVAP. FAN MOTOR



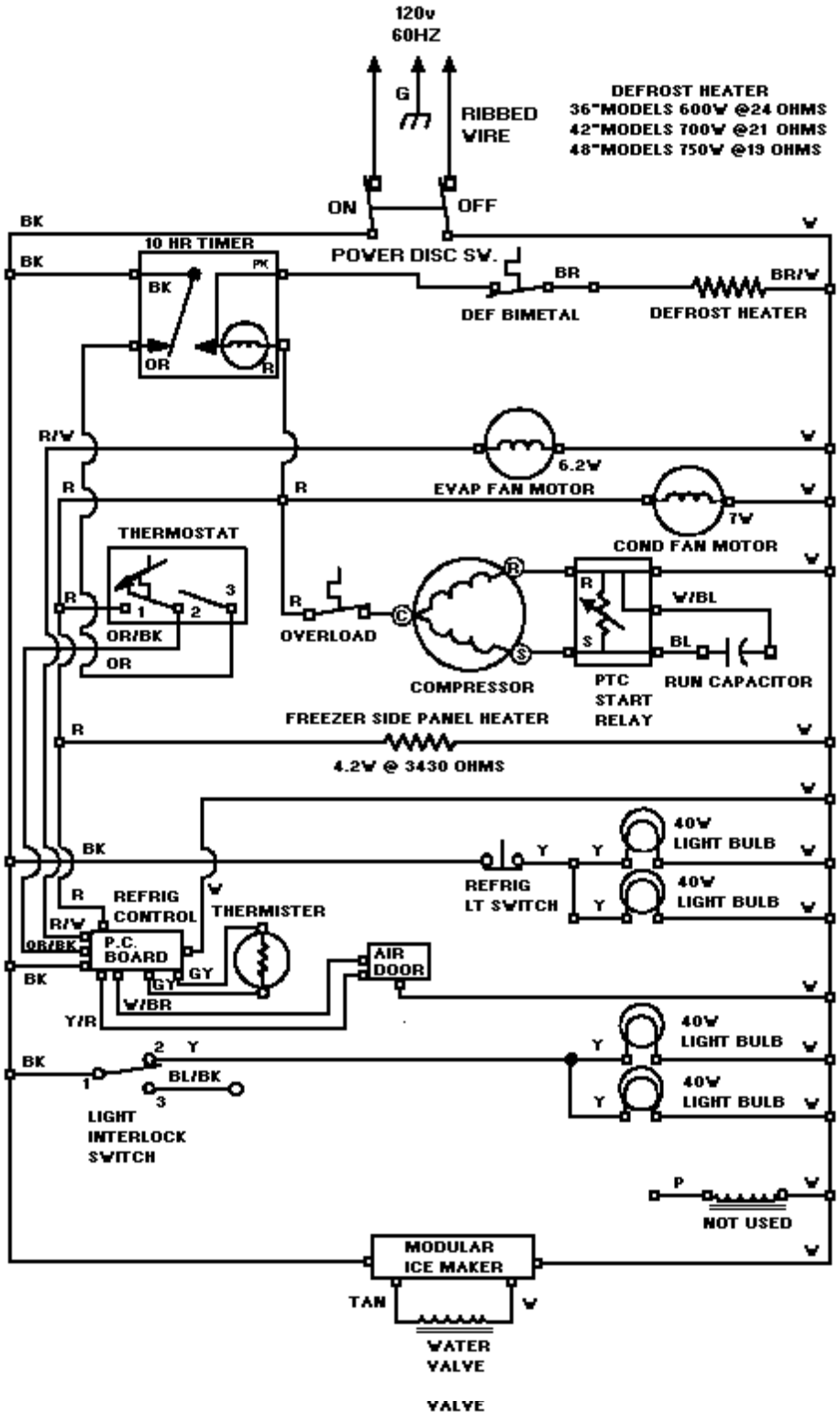
WATER VALVE



BK --- BLACK	BL/OR --- BLUE/ORANGE TRACER
BL --- BLUE	W/BL ----- WHITE/BLUE TRACER
BR --- BROWN	W/BR ---- WHITE/BROWN TRACER
GY --- GRAY	Y/BK ----- YELLOW/BLACK TRACER
OR --- ORANGE	Y/O ------ YELLOW/ORANGE TRACER
PK --- PINK	Y/R ------ YELLOW/RED TRACER
PUR - PURPLE	BR/W ---- BROWN/WHITE TRACER
R ----- RED	OR/BK -- ORANGE/BLACK TRACER
TAN - TAN	R/W ------ RED/WHITE TRACER
W ----- WHITE	G/Y ------ GRAY/WHITE TRACER
Y ----- YELLOW	G -------- GREEN OR GREEN/YELLOW TRACER
	BK/Y ---- BLACK/YELLOW TRACER
	BLBK --- BLUE/BLACK TRACER

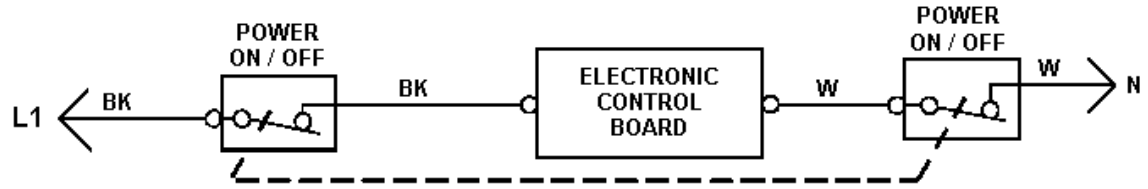

SERMICE CORD
TAN
PUR
RIBBED WIRE
PWR DISC SW.
BL/BK
R/W
OVER LOAD
COMP
PTC RELAY
RUN CAP
COND FAN
DEFROST TIMER
PK
BK
OR
R
G
BL
WIRING HARNESS COLORS
PK BL W/R R G G
TAN OR BK W BL/BK
FREEZER LIGHT
THERM
OR/BK
CONTROL BOX
ICE MAKER
G TAN W BK
LOWER FREEZER LIGHT
EVAP. FAN MTR.
MTG. BRACKET
BIMETAL
DEFROST HEATER
FREEZER SECTION
AIR BAFFLE
W/BR
Y/R
LIGHTS
LIGHT SW
P.C. BOARD
GY
THERMISTER
REDUNDANT WIRE
REFRIGERATION SECTION
R/W
BL
PUR
W
BL/BK

WIRING DIAGRAM

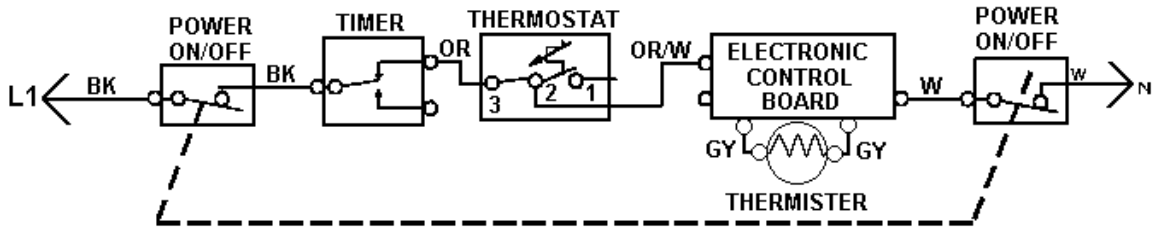


The Cooling Cycle

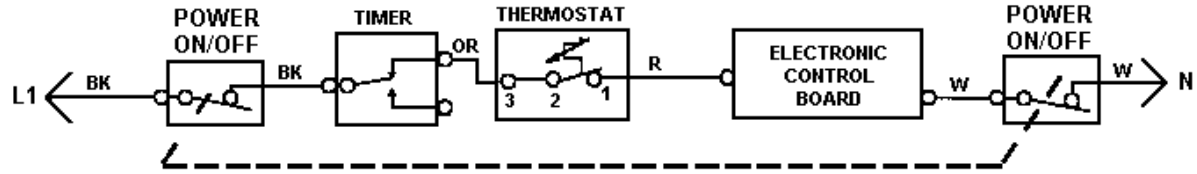
1. Unit Plugged in, Electronic Control Board Energized (Also During Defrost).



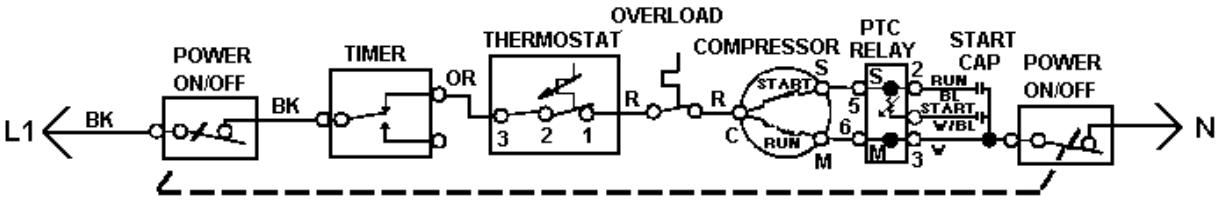
2. Freezer Thermostat Turned On. But Satisfied -- Low Voltage To Thermiste



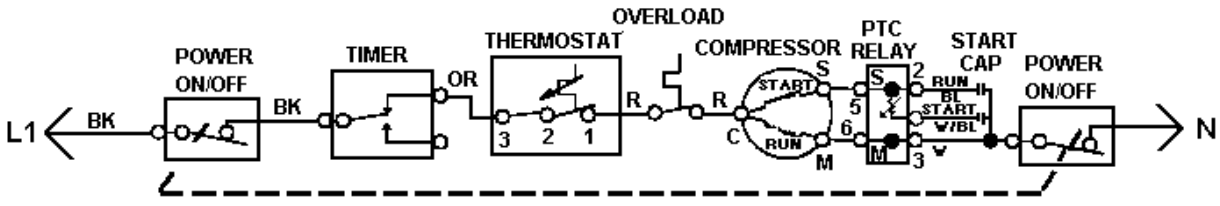
3. Freezer Thermostat Turned On And Calling For Cooling –



4. **Freezer Thermostat Calling For Cooling-- Compressor Circuit At Instant Start**

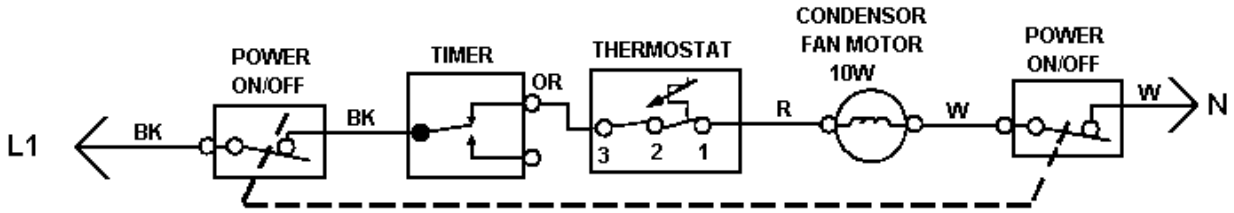


5. **Freezer Thermostat Turned On And Calling For Cooling -- Compressor Circuit During Run**

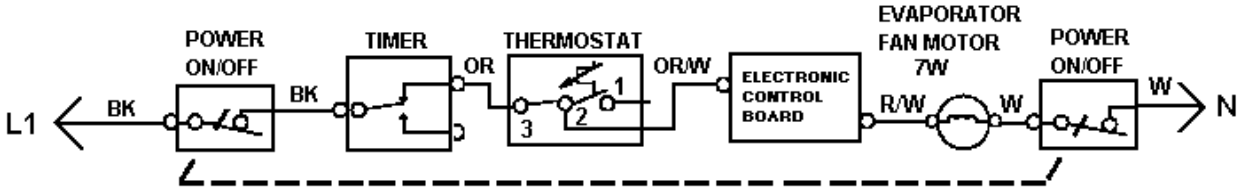


The Cooling Cycle

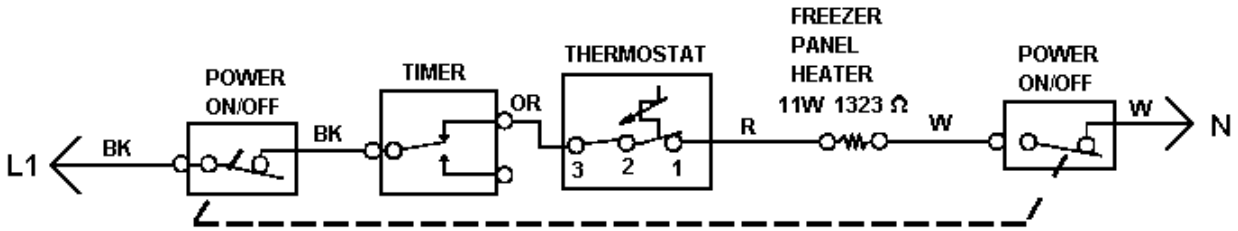
6. Freezer Thermostat Calling For Cooling – Condenser Fan Motor Circuit



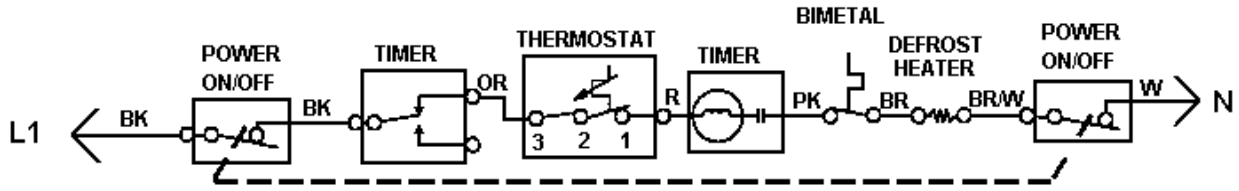
7. Freezer Thermostat Turned On And Calling For Cooling -- Defrost Timer Running



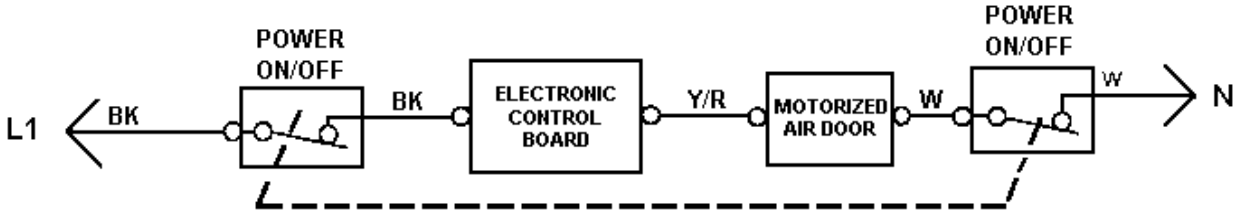
8. Freezer Thermostat Turned On And Calling For Cooling -- Evaporator Fan Motor



9. Freezer Thermostat Calling For Cooling -- Freezer Side Panel Heater Circuit

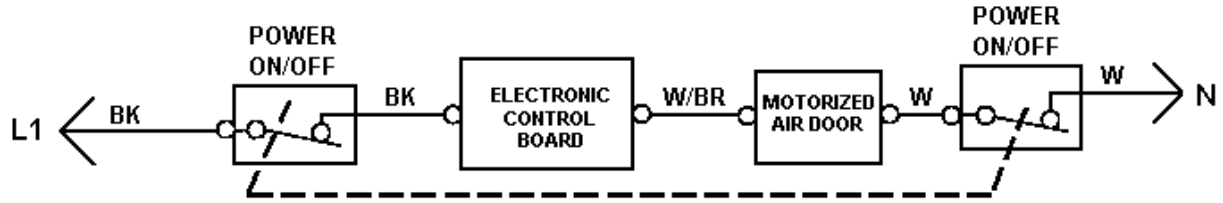


10. Refrigerator Control Calling For Cooling -- Motorized Air Door Opening

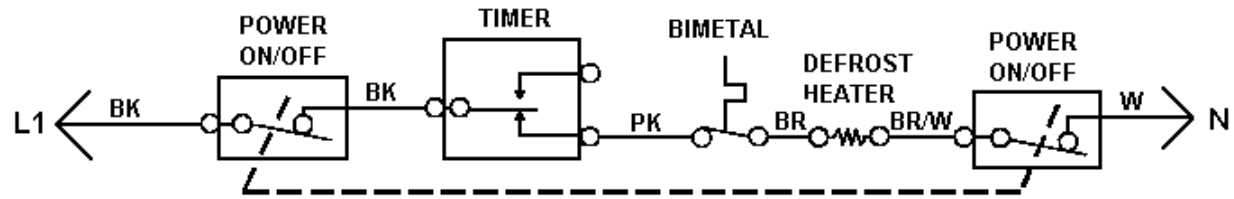


The Cooling Cycle

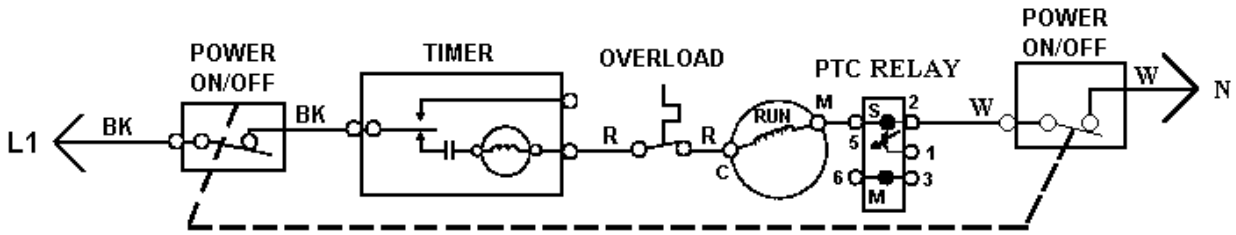
11. Refrigerator Control Satisfied -- Motorized Air Door Closing



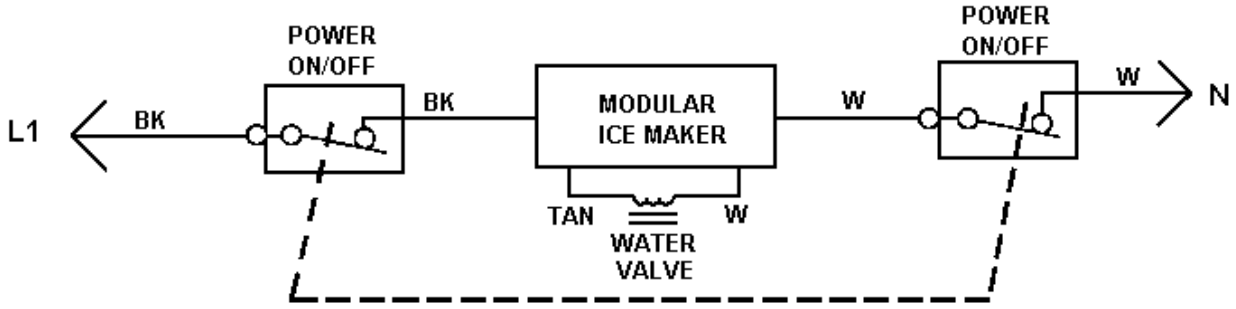
12 Defrost Heater Circuit



13. Defrost Timer Motor Running



14. Modular Ice Maker Circuit



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