



GE Appliances

TECHNICIAN MANUAL

**Arctica Side-by-Side
Dual Evaporator Refrigerators with
Electronic Touch Controls
G LINE**



**MODEL SERIES:
PHG25PGT**



IMPORTANT SAFETY NOTICE

The information in this service guide is intended for use by individuals possessing adequate backgrounds of electrical, electronic, and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

WARNING

To avoid personal injury, disconnect power before servicing this product. If electrical power is required for diagnosis or test purposes, disconnect the power immediately after performing the necessary checks.

RECONNECT ALL GROUNDING DEVICES

If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

GE Consumer & Industrial
Technical Service Guide
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Introduction

This new Arctica dual evaporator refrigerator has the following features:

- Separate freezer and fresh food evaporators with independent cooling.
- No damper/air inlet assembly in the fresh food section creates more usable space on the top shelf.
- Greater fresh food humidity to keep food fresher, longer.
- 20% less freezer defrost for better food preservation.
- 3-Way valve to direct refrigerant flow.
- Nearly silent, only 30 dBA.

The 3-speed compressor is controlled by an inverter that receives input from the low voltage DC side of the main control board. The inverter always has 240 VAC applied when the refrigerator is connected to power. The main control board still makes compressor decisions based on the input of thermistors, door-open time, and input from the temperature control panel. The main control board also operates the condenser fan, fresh food fan, freezer fan and adaptive defrost.

The most significant difference from previous models is that the freezer and fresh food evaporators are separate. The 3-way valve

directs refrigerant flow to each evaporator as needed. The fresh food section no longer relies on the freezer evaporator for cooling. The evaporators are controlled separately by the main control board through the 3-way valve.



Technical Data

DISCONNECT POWER CORD BEFORE SERVICING IMPORTANT - RECONNECT ALL GROUNDING DEVICES

All parts of this appliance capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

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ELECTRICAL SPECIFICATIONS

Thermistor: kilo-Ohm resistance	@-18°C	62.79
	@ 3°C	24.48
	@25°C	10.00
Defrost Control	60hrs @ 45 min	
	w/ no door openings	
Overtemperature Thermostat	60-43°C	
Defrost Thermistor	18.3°C	
Maximum Current Leakage	0.75 mA	
Maximum Ground Path Resistance	0.14 Ohms	

INSTALLATION

Minimum clearance required for air circulation:

TOP	2.54	cm
SIDES	0.32	cm
REAR	1.27	cm

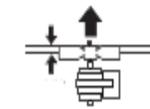
NO LOAD PERFORMANCE

Control Position MID/MID		
and Ambient of:	18°C	32°C
Fresh Food, °C	1-4	1-4
Frozen Food, °C	-19/-16	-19/-16
Run Time, %	<80	=100

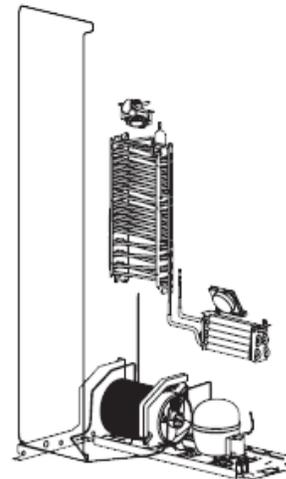
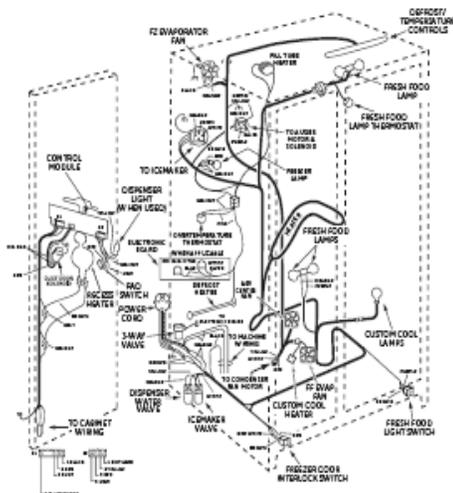
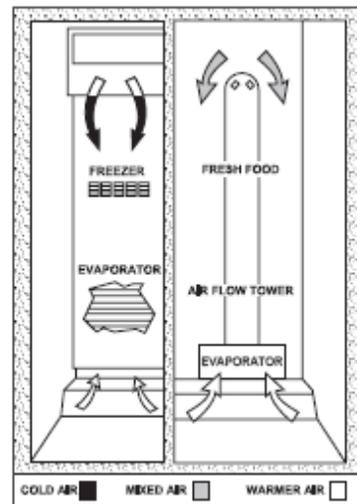
REFRIGERATION SYSTEM

Refrigerant Charge (R134a)	0.184 kg
Compressor	214.8 W, 733 BTU/hr @ 3000 RPM
Minimum Compressor Capacity	22 inches Hg
	74.5 kPa
	0.745 bar
Minimum Equalized Pressure	
@ 21°C	290 to 310 kPa
@ 32°C	352 to 372 kPa

AIR FLOW



0.85cm



Nomenclature

P H G 25 P G T WW

Brand/Product

T - GE
P - Profile

Configuration

F - Side by Side
P - 60 cm
H - Inverter Compressor

Power

G - 220-240V 50 Hz
J - 100V 50-60 Hz
K - 220V 60 Hz
T - 115V 60 Hz

Capacity

(cubic feet) AHAM Rated Volume

Interior Features/Shelves

J - Glass
P - General Electric Profile
Z - Deluxe Glass
B - General Electric Profile
Built-in Style

Exterior Color

WW - White on White
BB - Black on Black
CC - Bisque on Bisque
SV - Stainless Visor

Model Year

R - 2004
S - 2005
T - 2006

Icemaker/Exterior

A - IM Ready
E - Electronic Cubed/Crushed & Water
F - Refreshment Center Electronic Cubed/Crushed & Water
G - Water Filter/Cubed/Crushed & Water
R - Cubed/Crushed/Water
I - Factory Installed Icemaker

The nomenclature plate is located on the upper right wall of the fresh food compartment. It contains the following information:



Nomenclature

Mini-Manual Location

- Model and Serial Number
- Minimum Installation Clearances
- Electrical Voltage, Frequency
- Maximum Amperage Rating
- Refrigerant Charge and Type

Serial Number

The first two numbers of the serial number identify the month and year of manufacture.

Example: **AG123456S** = January, 2004

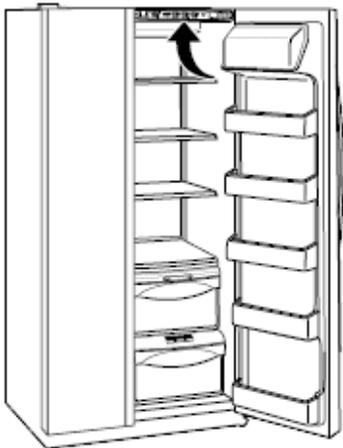
A - JAN	2005 - H
D - FEB	2004 - G
F - MAR	2003 - F
G - APR	2002 - D
H - MAY	2001 - A
L - JUN	2000 - Z
M - JUL	1999 - V
R - AUG	1998 - T
S - SEP	1997 - S
T - OCT	1996 - R
V - NOV	1995 - M
Z - DEC	1994 - L

The letter designating the year repeats every 12 years.

Example:

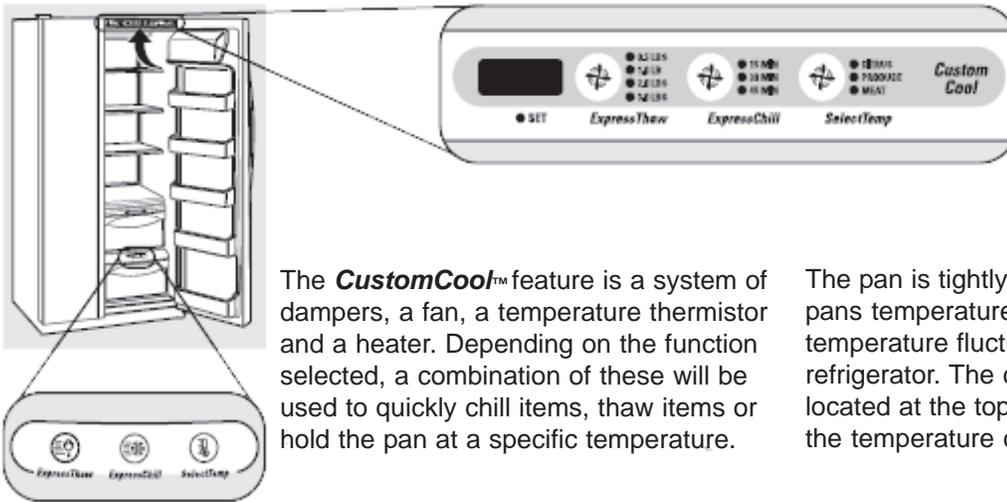
T - 1974
T - 1986
T - 1998

Control Features



- The temperature controls are preset in the factory at 2°C for the refrigerator compartment and (-17)°C for the freezer compartment.
 - Allow 24 hours for the temperature to stabilize to the preset recommended settings.
 - The temperature controls can display both the SET temperature as well as the actual temperature in the refrigerator and freezer.
 - The actual temperature may vary slightly from the SET temperature based on usage and operating environment.
 - Setting either or both controls to OFF stops cooling in both the freezer and refrigerator compartments, but does not shut off electrical power to the refrigerator.
-
- To change the temperature, press and release the WARMER or COLDER pad. The SET light will come on and the display will show the set temperature.
 - To change the temperature, tap either the WARMER or COLDER pad until the desired temperature is displayed.
 - Refrigerator temperatures can be adjusted between 1°C and 6°C and the freezer temperatures can be adjusted between (-21)°C and (-14)°C.
 - Once the desired temperature has been set, the temperature display will return to the actual refrigerator and freezer temperatures after 5 seconds. Several adjustments may be required. Each time you adjust controls, allow 24 hours for the refrigerator to reach the temperature you have set.
 - To turn the cooling system off, tap the WARMER pad for either the refrigerator or the freezer until the display shows OFF. To turn the unit back on, press the COLDER pad for either the refrigerator or freezer. The SET light will illuminate on the side you selected. Then press the COLDER pad again (on the side where the SET light is illuminated) and it will go to the preset points of (-17)°C for the freezer and 2°C for the refrigerator.
 - Setting either or both controls to OFF stops cooling in both the freezer and refrigerator compartments, but does not shut off electrical power to the refrigerator.

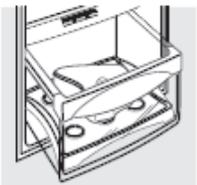
About CustomCool™



The **CustomCool™** feature is a system of dampers, a fan, a temperature thermistor and a heater. Depending on the function selected, a combination of these will be used to quickly chill items, thaw items or hold the pan at a specific temperature.

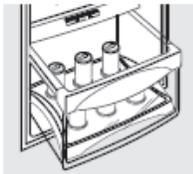
The pan is tightly sealed to prevent the pan's temperature from causing temperature fluctuations in the rest of the refrigerator. The controls for this pan are located at the top of the refrigerator with the temperature controls.

How to Use



ExpressThaw™

- 1 Empty the pan. Place the Chill/Thaw tray in the pan. Place the items on the tray and close the pan completely.
- 2 Select the **ExpressThaw™**, **ExpressChill™** or **SelectTemp™** pad. The display and **SET** light will come on. Tap the pad until the light appears next to the desired setting. Use the chart to determine the best setting to use.



ExpressChill™

- To stop a feature before it is finished, tap that feature's pad until no options are selected and the display is off.
- During **ExpressThaw™** and **ExpressChill™**, the display on the controls will count down the time in the cycle.

- After the **ExpressThaw™** cycle is complete, the pan will reset to the **MEAT** setting (0°C) to help preserve thawed items until they are used.
- The displayed actual temperature of the **CustomCool** pan may vary slightly from the **SET** temperature based on usage and operating environment.

NOTE: For food safety reasons, it is recommended that foods be wrapped in plastic wrap when using **ExpressThaw™**. This will help contain meat juices and improve thawing performance.

About TurboCool.™



How it Works

TurboCool rapidly cools the refrigerator compartment in order to more quickly cool foods. Use **TurboCool** when adding a large amount of food to the refrigerator compartment, putting away foods after they have been sitting out at room temperature or when putting away warm leftovers. It can also be used if the refrigerator has been without power for an extended period. Once activated, the compressor will turn on immediately and the fans will cycle on and off at high speed as needed for eight hours. The compressor will continue to run until the refrigerator compartment cools to approximately (1°C), then it will cycle on and off to maintain this setting. After 8 hours, or if **TurboCool** is pressed again, the refrigerator compartment will return to the original setting.

How to Use

Press **TurboCool**. The refrigerator temperature display will show **TC**. After **TurboCool** is complete, the refrigerator compartment will return to the original setting.

NOTES: The refrigerator temperature cannot be changed during **TurboCool**.

The freezer temperature is not affected during **TurboCool**. When opening the refrigerator door during **TurboCool**, the fans will continue to run if they have cycled on.

About the ice and water dispenser. (on some models)



Spill Shelf

To Use the Dispenser

Select **CUBED ICE**  **CRUSHED ICE**  or **WATER** 

Press the glass gently against the top of the dispenser cradle.

The spill shelf is not self-draining.

To reduce water spotting, the shelf and its grille should be cleaned regularly.

If no water is dispensed when the refrigerator is first installed, there may be air in the water line system. Press the dispenser arm for at least two minutes to remove trapped air from the water line and to fill the water system. To flush out impurities in the water line, throw away the first six glassfuls of water.

CAUTION: Never put fingers or any other objects into the ice crusher discharge opening.

Locking the Dispenser



Press the **LOCK CONTROL** pad for 3 seconds to lock the dispenser and control panel. To unlock, press and hold the pad again for 3 seconds.

Dispenser Light



This pad turns the **night light** in the dispenser on and off. The light also comes on when the dispenser cradle is pressed. If this light burns out, it should be replaced with a 6 watt 12V maximum bulb.

Quick Ice



When you need ice in a hurry, press this pad to speed up ice production. This will increase ice production for the following 48 hours or until you press the pad again.

Door Alarm



To set the alarm, press this pad until the indicator light comes on. This alarm will sound if either door is open for more than 3 minutes. The light goes out and the beeping stops when you close the door.

Dispenser Light

The LIGHT pad turns the dispenser light on and off. When the light is turned off, it will fade out. The dispenser light will come on automatically when the dispenser cradle is depressed and will fade out 5 seconds after it is released. The LIGHT pad will not turn off the light during dispensing.

Dispensing Functions

The water, crushed ice, and cubed ice functions are controlled by the main control board. To select a function, press the appropriate pad on the dispenser. The LED will light to identify the selection.

To dispense ice cubes or crushed ice, choose the appropriate pad and depress the dispenser cradle. The solenoid and linkage assembly will open the ice chute duct door to dispense the ice. If cubed ice is selected, a solenoid located behind the ice bucket will lift a rod along the side of the bucket. This rod pulls a flapper away from the cutter blades, allowing cubes to bypass the ice crusher. The dispenser duct door will remain open for 3 seconds after dispensing to allow all ice to clear the chute.

The dispenser light will come on automatically when the dispenser cradle is depressed and will fade out 5 seconds after it is released.

Dispenser Lock

When the dispenser system is locked, no dispenser command will be accepted. This includes the dispenser cradle and will prevent accidental dispensing that may be caused by children or pets. If a pad or the cradle is depressed with the system locked, it will be acknowledged with three pulses of the LOCK LED accompanied by an audible tone.

To lock or unlock communication between the dispenser and main control board, press the LOCK pad and hold it for 3 seconds. The LOCK LED will flash while the LOCK pad is pressed. When the communication is locked, the LOCK LED will be illuminated.

The status of other functions selected prior to the initiation of the lock feature will be displayed. If the lock is engaged while a mode is active, the LED will remain on until that mode times out.

If the lock is engaged when the filter timer expires, the LED will come on but cannot be reset until the lock is turned off.

The lock feature will be restored in the event of a power disruption.

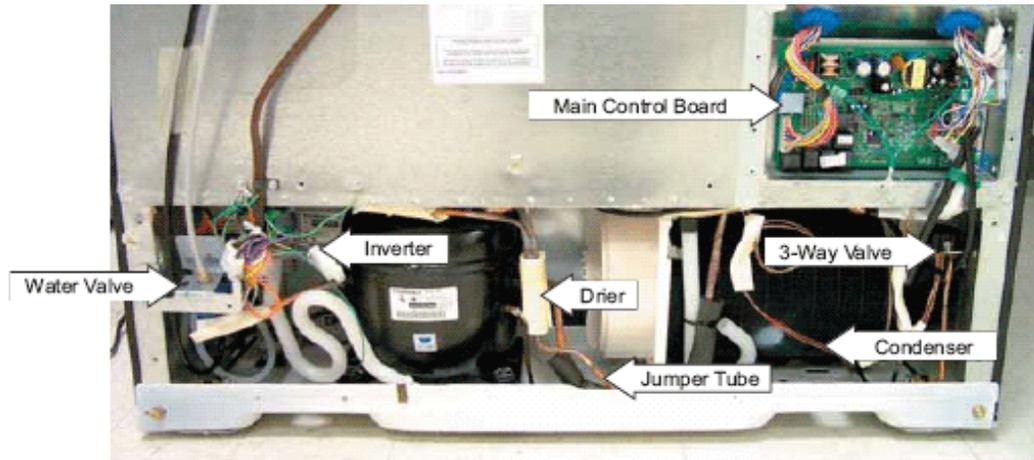
Liner Protection Mode

The dual evaporator model has separate liner protection modes for each section. The specific evaporator fan (freezer or fresh food) will start and run on high speed if the door has been open for 3 minutes.

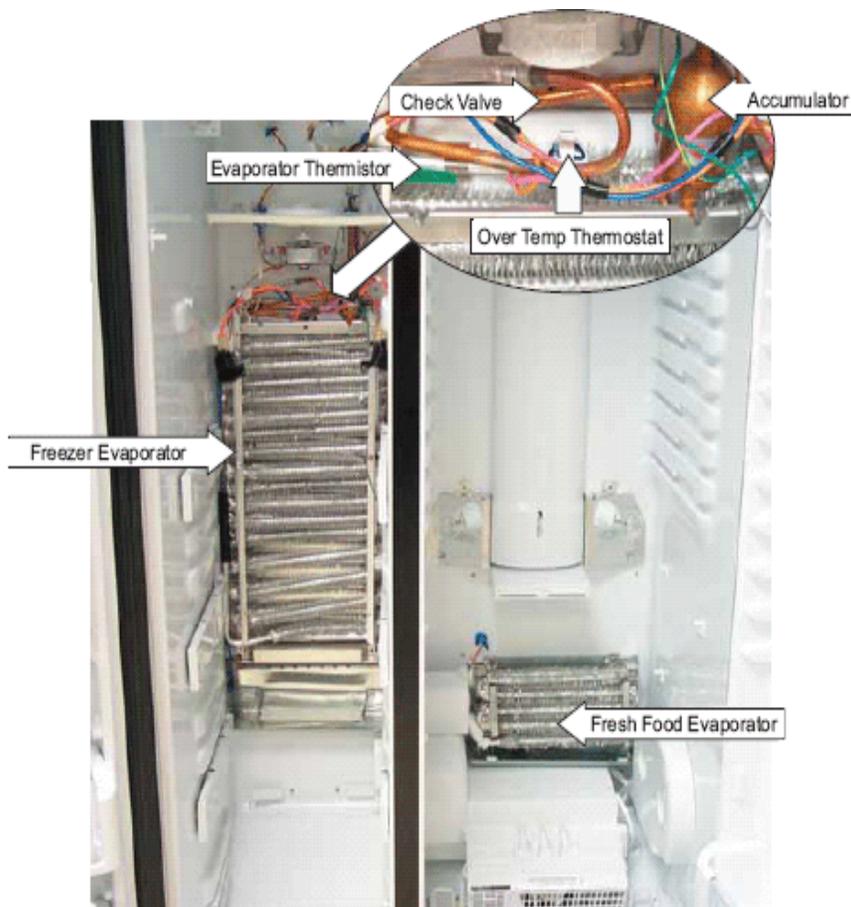
This mode is controlled by 2 timers. Timer #1 monitors door-open time. A 3-minute door-open count begins when the door is opened. If 3 minutes elapse before the door is closed, the liner protection mode will become active. Once the door is closed, timer #1 resets and liner protection mode goes into standby. In standby, normal fan operation resumes and timer #2 begins a 3-minute door-closed count. If 3 minutes elapse without a door opening, liner protection mode will completely deactivate. If a door is opened within the timer #2 door-closed count, the remaining time in the door-closed count will be deducted from the timer #1 door-open count.

Components Locator Views

Rear View



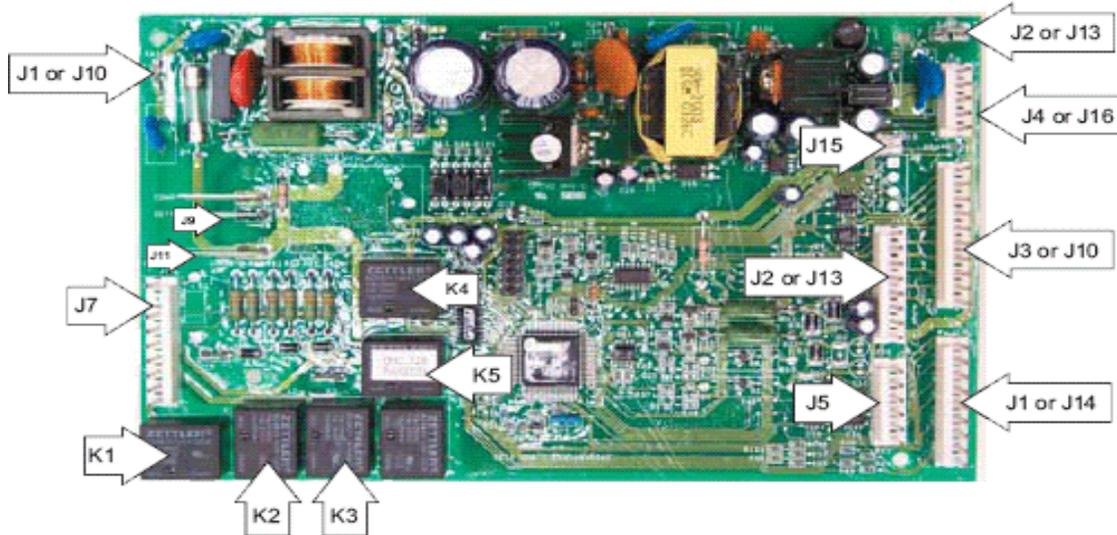
Front View



Note: The check valve and accumulator are part of the freezer evaporator and are not available separately.

Control Board Connector Locator

Main Control Board



J1 or J10 - Earth (Ground)

J2 or J13 - Earth (Ground)

J5 - Custom Cool

J7 - Neutral, Door Switches, Custom Cool Heater, Water Valve, Crusher Solenoid, Auger Motor

J9 - Defrost Heater

J3 or J10 - 3-Way Valve

J11 - Line (L1)

J2 or J13 - Model Selector, Fan Common, Evaporator Fan, Condenser Fan, Fresh Food Fan, Custom Cool Fan

J1 or J14 - Fresh Food Thermistor, Freezer Thermistor, Fresh Food Evaporator Thermistor, Freezer Evaporator Thermistor, Model Selector

J15 - Inverter

J4 or J16 - Temperature Control Board

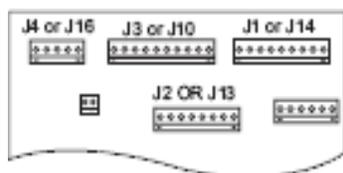
K1 - Auger

K2 - Crusher

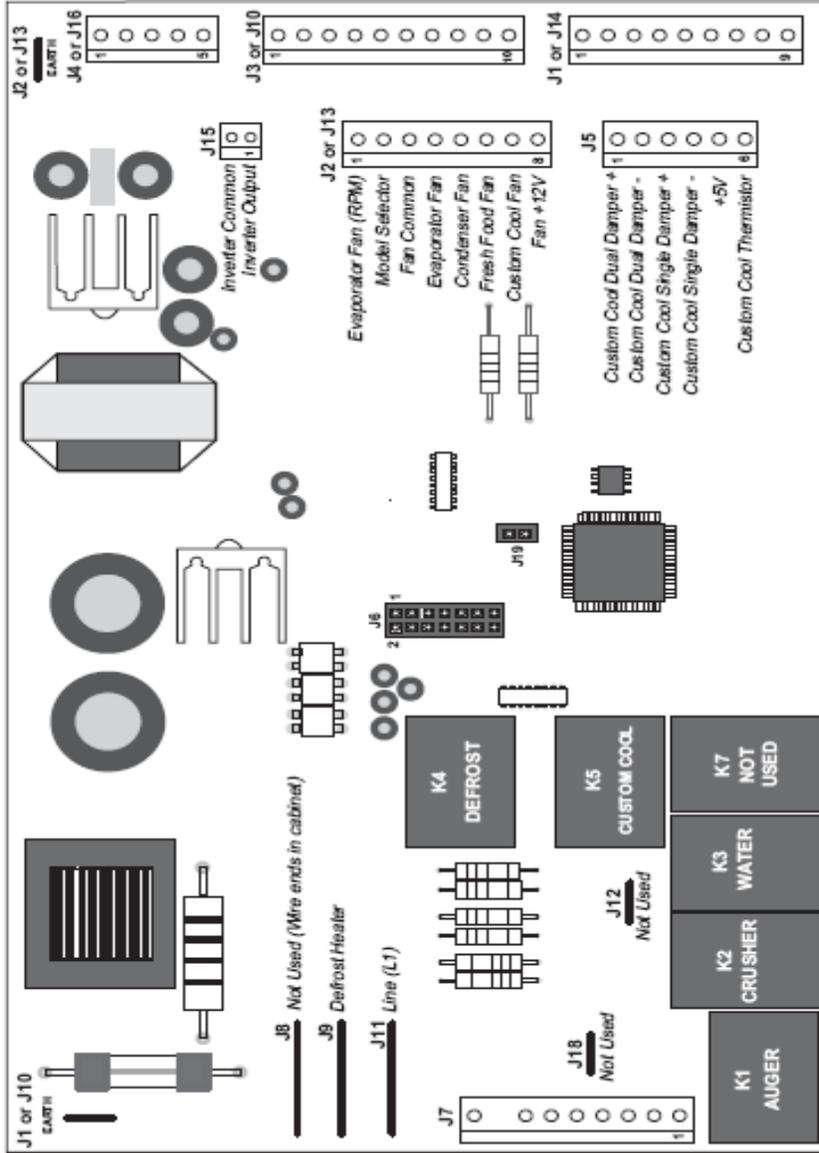
K3 - Water

K4 - Defrost

K5 - Custom Cool



Some of the low voltage DC connector labeling on this model may differ from other models. The function and diagnostics for these connectors are identical for all models.



J1 or J10
EARTH

J2 or J13
EARTH

J4 or J16

J3 or J10

J1 or J14

J5

J15
Inverter Common
Inverter Output

J2 or J13
Evaporator Fan (RPM)
Model Selector
Fan Common
Evaporator Fan
Condenser Fan
Fresh Food Fan
Custom Cool Fan
Fan +12V

J5
Custom Cool Dual Damper +
Custom Cool Dual Damper -
Custom Cool Single Damper +
Custom Cool Single Damper -
+5V
Custom Cool Thermistor

J18
Not Used

J19

J6
1
2

J8
Not Used (Wire ends in cabinet)

J9
Defrost Heater

J11
Line (L1)

J7

J12
Not Used

K1
AUGER

K2
CRUSHER

K3
WATER

K4
DEFROST

K5
CUSTOM COOL

K6
NOT USED

K7
NOT USED

Comm. 2-Way Digital
Comm. +12V
Comm. Common

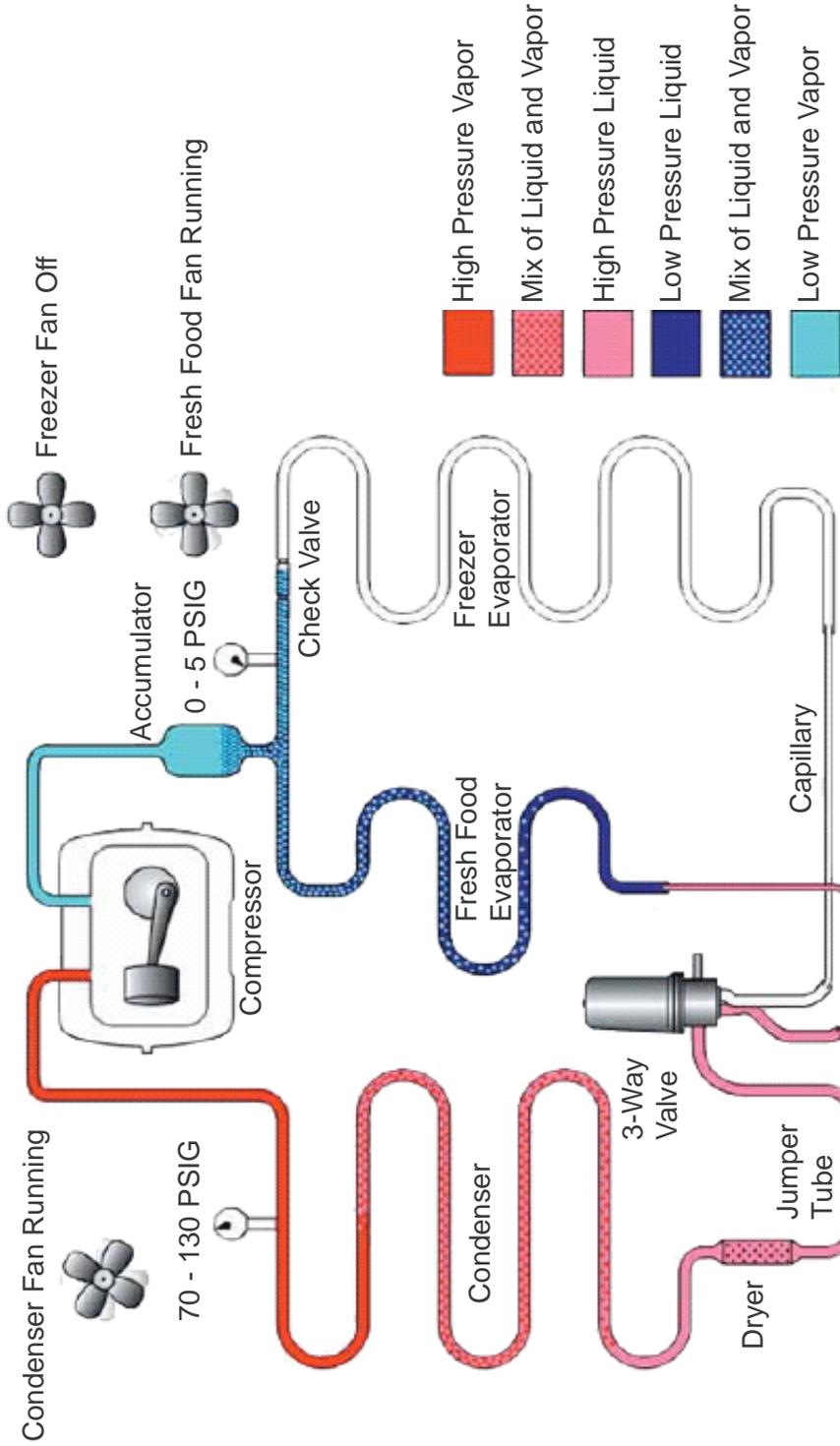
3-Way valve - Gray & White
3-Way valve - Black
3-Way valve - Orange
3-Way valve - Red
3-Way valve - Yellow

FF Evaporator Thermistor
FF Thermistor
FZ Thermistor
FZ Evaporator Thermistor
+5V
Model Selector
Model Selector

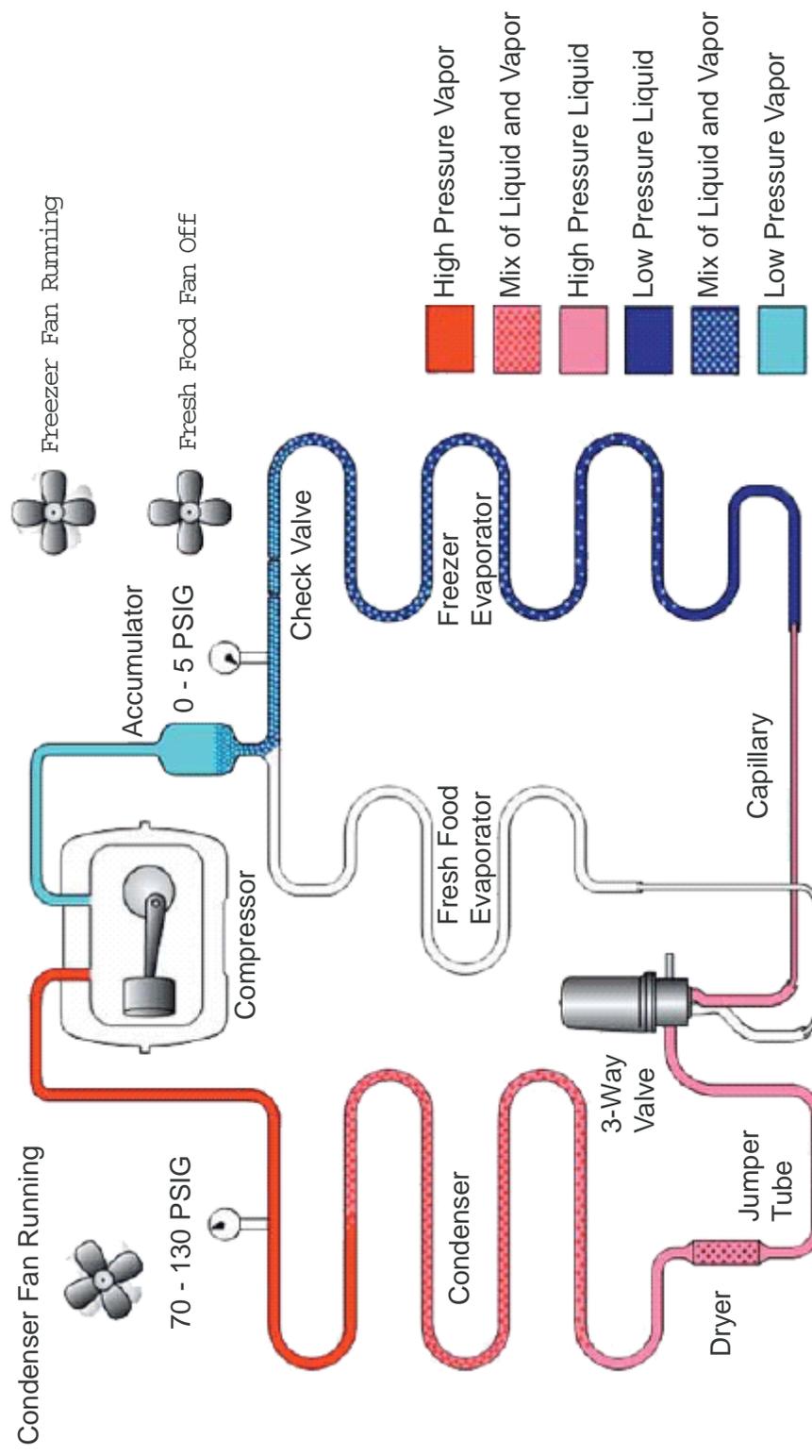
Neutral
FZ Door Switch
FF Door Switch
Custom Cool Heater
Auger Motor Interlock
Water Valve
Crusher Solenoid
Auger Motor

Refrigeration System

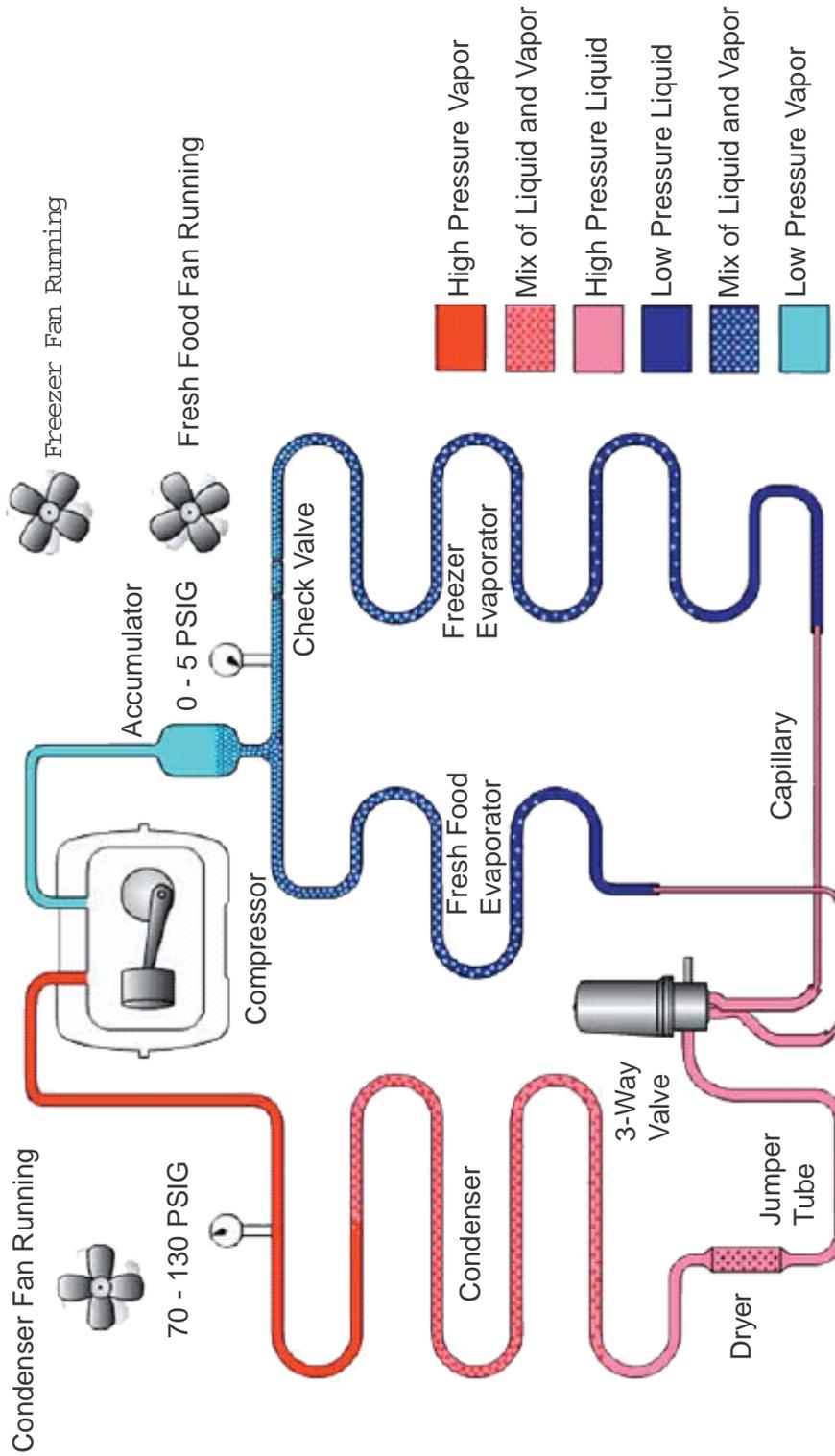
Fresh Food Section Cooling



Freezer Section Cooling



Fresh Food and Freezer Section Cooling



Evacuation and Charging Procedure

WARNING:

- Before cutting or using a torch on refrigerant tubes, recover the refrigerant from the system using approved recovery equipment.
 - Never charge new refrigerant through the purge valve. This valve is always located on the high pressure side of the system.
 - Never apply heat from any source to a container of refrigerant. Such action will cause excessive pressure in the container.
 - Always wear goggles when working with refrigerants and nitrogen holding charge in some replacement parts. Contact with these gases may cause injury.
1. Attach the hose from the R-134a charging cylinder to the process tube port on the compressor.
 2. Evacuate the system to a minimum 20-in. vacuum using the refrigerator compressor and recovery pump, which is attached to the new drier assembly.
 3. Turn off the recovery pump. Close the ball valve on the hose connected to the high-side port connection. Add 3 ounces of R-134a refrigerant to the system. Let the refrigerator operate and circulate the refrigerant for 5 minutes.
 4. Open the ball valve. Recover the purge/sweep charge using the recovery pump and the refrigerator compressor until a 20-in. vacuum is attained. Close the ball valve and remove the recovery hose.
 5. Charge the system with the exact amount of R-134a refrigerant specified.
 6. Disconnect the power cord to the refrigerator. This allows the pressure to equalize. After 3 to 5 minutes, the low side pressure will be positive and then the hose-to-charging port can be disconnected.
 7. Using an electronic leak detector, check all brazed joints and both schrader ports. Reinstall caps to schrader.

Components

Thermistors

Thermistor Resistance		
Temperature (°F)	Temperature (°C)	Resistance in Kilo-Ohms
-40	-40	166.8 k
-31	-35	120.5 k
-22	-30	88 k
-13	-25	65 k
-4	-20	48.4 k
5	-15	36.4 k
14	-10	27.6 k
23	-5	21 k
32	0	16.3 k
41	5	12.7 k
50	10	10 k
59	15	7.8 k
68	20	6.2 k
77	25	5 k
86	30	4 k
95	35	3.2 k
104	40	2.6 k
113	45	2.2 k
122	50	1.8 k
131	55	1.5 k
140	60	1.2 k

Note: To accurately test a thermistor, place the thermistor in a glass of ice water (approximately 0°C) for several minutes and check for approximately 16K-Ohms.

Fresh Food and Freezer Thermistors

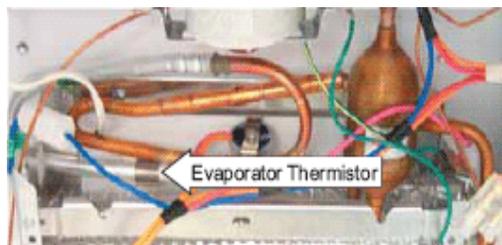
The fresh food and freezer thermistors (part # WR55X10025) are located in the mullion dividing the fresh food and freezer compartments.

Note: The fresh food and freezer thermistors are removed in the same manner. To remove the thermistor cover, insert a flat-blade screwdriver under the front of the cover and gently lift at the bottom edge until it releases from the compartment wall.



Freezer Evaporator Thermistor

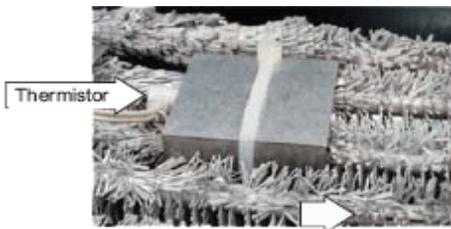
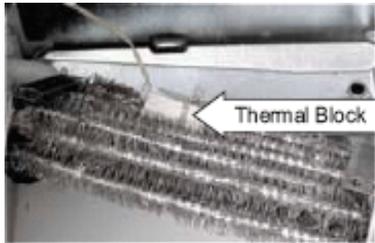
The freezer evaporator thermistor (part # WR55X10025) is clipped to the top coil of the freezer evaporator. See **Freezer Evaporator** for accessing instructions.



Fresh Food Evaporator Thermistor

The fresh food evaporator thermistor (part # WR55X10025) is located in an aluminum thermal block on the back of the evaporator. It is attached to the fresh food evaporator by a wire tie. See *Fresh Food Evaporator* for accessing instructions.

If the fresh food evaporator thermistor is either open or shorted, the main control board defaults to a fixed defrost cycle of 1 hour at high speed fan.



Barbs on the molded housing hold the thermistor in the thermal block.



Replacement

Should the evaporator thermistor require replacement, splice a new thermistor into the harness using plastic bell connectors (part # WR01X10466). Fill the connector with RTV102 silicone as shown in the illustration.

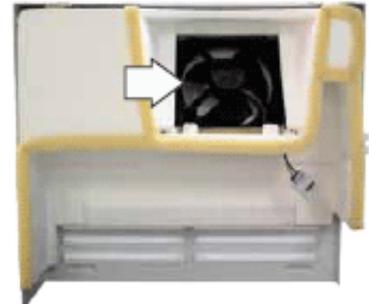


Insert the new thermistor into the thermal block. Add RTV102 silicone to hold the thermistor in place. Make certain to wire tie the thermal block back to the evaporator.



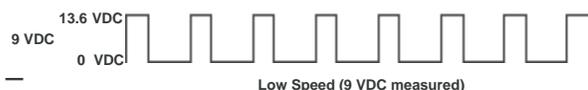
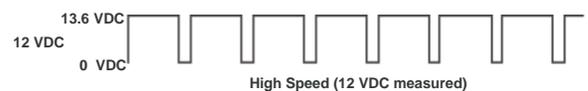
Fresh Food Evaporator Fan

A variable speed 12 VDC motor is mounted in front of the fresh food evaporator. The fan and evaporator cover are replaced as a complete assembly.



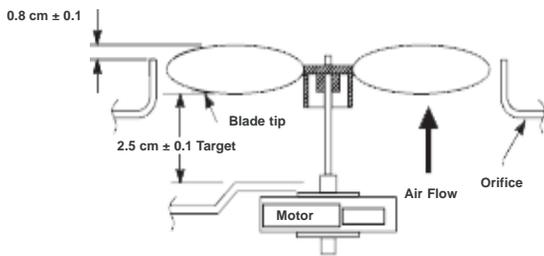
When activated, the fresh food evaporator fan recirculates the air in the fresh food compartment, providing cooling independent of the freezer evaporator fan.

The main control board gathers information from the fresh food thermistors to determine when, and at what speed, fan operation should occur. A constant 13.6 VDC is provided to the fan from the main control board and switching occurs on the neutral side. Speed is regulated by pulse width modulation on the common side of the fan. When operating, the common side of the circuit is pulsed open and closed. This pulsing produces effective voltage being received at the motor, which is equivalent to a reduction in voltage. Fan speed is selected and maintained by the main control board regulating the length and frequency of the 13.6 VDC pulse.



Freezer Evaporator Fan

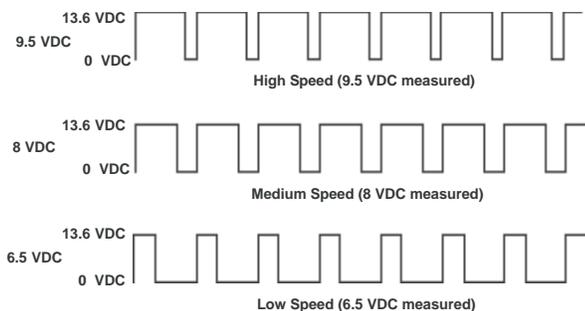
The position of the fan blade in relation to the shroud is important.



The evaporator fan is the same fan used on previous models; however, a significant difference is that the main control board neither requires nor receives input from the fan feedback/rpm (blue) wire. The fan utilizes a permanent magnet, 4 pole, DC motor that operates at three different speeds: high, medium, and low.

The speed of the fan is controlled by the voltage output from the main control board. Voltage output from the main control board to the fan is 13.6 VDC; however, to regulate the speed of the fan, the main control board uses pulse width modulation (PWM).

When operating, voltage is sent in pulses (much like a duty cycle) as opposed to an uninterrupted flow. This pulsing of 13.6 VDC produces effective voltage being received at the motor, which is equivalent to a reduction in voltage.



Fan speed is selected and maintained by the main control board regulating the length and frequency of the 13.6 VDC pulse. Temperature can cause some fan speed variation. Fan speed can vary +/- 5%, depending on the temperature, with higher temperatures causing slightly higher speeds.

The evaporator fan has a 4-wire connection:

White Wire (DC Common)

The white wire is the DC common wire used for testing. During repairs, DC polarity must be observed. Reversing the DC polarity causes a shorted motor and/or board.

Red Wire (Supply)

Each motor uses an internal electronic controller to operate the motor. Supply voltage from the main control board remains at a constant 13.6 VDC.

Blue Wire (Feedback/RPM)

On previous Arctica models, the blue wire reported rpm (speed) information to the main control board for speed control purposes. On this model, the board does not require or read any feedback information from the fan motor.

Yellow Wire (Signal)

The yellow wire is the input wire from the main control board. The main control board provides 6.5 VDC effective voltage for low speed, 8 VDC effective voltage for medium speed, and 9.5 VDC effective voltage for high speed. The fan operates in low speed only when the fresh food thermistor is satisfied.

Note: When testing these motors:

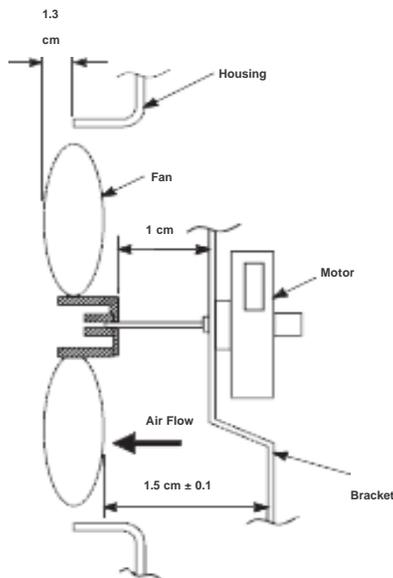
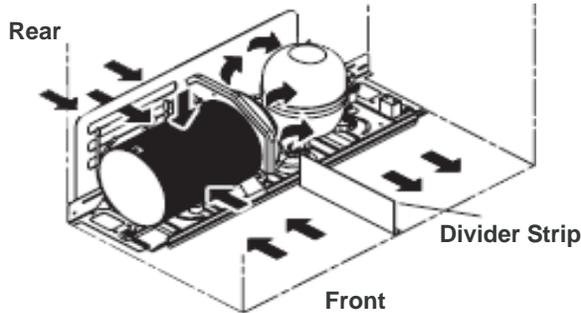
- You cannot test with an ohmmeter.
- DC common is not AC common.
- Verify 2 voltage potentials:
 - a. Red to white - power for internal controller
 - b. Yellow to white - power for fan
- Observe circuit polarity.
- Motors can be run for short periods using a 9 volt battery. Connect the white wire to the negative (-) battery terminal only. Connect the red and yellow wires to the positive (+) battery terminal.

Condenser Fan

The fan is mounted in the machine compartment with the no-clean condenser. The fan and fan shroud are mounted on one end of the condenser, and the other end of the condenser is blocked.

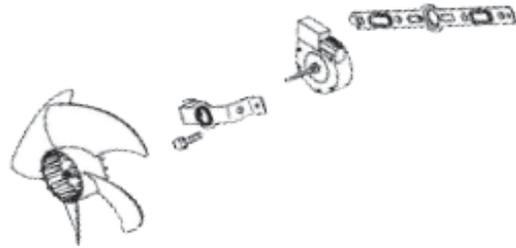
When the fan is operating, air is pulled from the center of the condenser, drawing air in through the coils. The air is then exhausted over the compressor and out the right side of the refrigerator.

Inlet air is available through the left front and left rear of the machine compartment. A rubber divider strip underneath the refrigerator divides the inlet and outlet sides of the machine compartment.



The rear access cover must be tightly fitted to prevent air from being exhausted directly out of the rear of the machine compartment, bypassing the compressor.

The condenser fan is mounted with screws to a fan shroud and mounting bracket that is attached to the condenser.

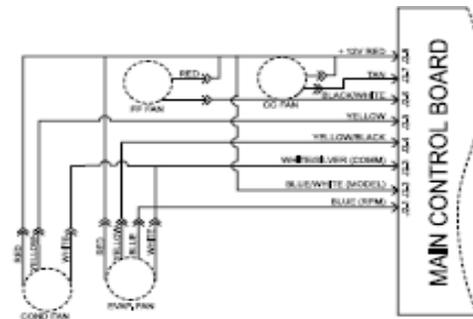


Condenser fan speed corresponds with compressor speed (low, medium, high) to minimize pressure variations in the sealed system except when the freezer temperature is 6°C above the set point. If this condition exists (such as during initial startup), the condenser fan operates at super high speed while the compressor operates at medium speed.

The speed of the fan is controlled by the voltage output from the main control board. Voltage output from the control board to the fan is 13.6 VDC; however, to regulate the speed of the fan, the main control board uses pulse width modulation (PWM).

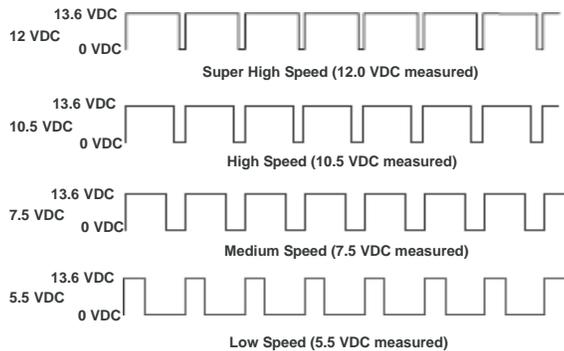
When operating, voltage is sent in pulses (much like a duty cycle) as opposed to an uninterrupted flow. This pulsing of 13.6 VDC produces effective voltage being received at the motor, which is equivalent to a reduction in voltage.

Fan speed is selected and maintained by the main control board regulating the length and frequency of the 13.6 VDC pulse.



Temperature can cause some fan speed variation. Fan speed can vary +/- 5%, depending on the temperature, with higher temperatures causing slightly higher speeds.

Condenser fan speed is controlled by Pulse Width Modulation (PWM), the same method used to control fan speeds for the evaporators.



Defrost Cycles

Fresh Food Evaporator Defrost Cycle

The refrigerator utilizes a forced air cycle defrost method (no electric heater) to remove frost from the fresh food evaporator. Fresh food air that is above freezing temperature circulates thru the coil and melts any accumulated frost. Note that during fresh food defrost, the compressor may still be running, cooling only the freezer section.



Fresh Food Normal Defrost

The fresh food section cools until the fresh food thermistor is satisfied.



If both freezer and fresh food thermistors are satisfied, the compressor cycles off. If the freezer still requires cooling, the main control board rotates the 3-way valve to stop refrigerant flow to the fresh food evaporator. Even though refrigerant flow has stopped in the fresh food evaporator, the fresh food fan continues to run at low speed.

The system is designed to run the fan until the fresh food evaporator thermistor reaches 1°C.

Once this temperature is reached, the fan continues to run for an additional 5 minutes. Under normal conditions, the defrost time takes approximately 30 minutes. The maximum time the fan runs in low speed is 60 minutes. If the evaporator thermistor has not reached 1°C after 60 minutes, the control switches to extended defrost #1.

Fresh Food Extended Defrost #1

Occasionally there may be excessive frost on the evaporator coil. This can be attributed to numerous door openings, extremely high humidity, poor door gasket seal, etc. If the normal defrost fan time exceeds 60 minutes, the fan switches to high speed. The control continues to monitor the fresh food evaporator thermistor for 1°C. When 1°C is reached, the fan runs for an additional 5 minutes at high speed. The fan can run up to an additional 30 minutes at high speed, trying to reach 1°C. After 90 total minutes of fan time (60 at low speed and 30 at high speed), if the fresh food evaporator is still below 35°F, the control will switch to extended defrost #2.

Fresh Food Extended Defrost #2

If the fresh food fan has been operating for 90 minutes, the main control searches for a fresh food thermistor temperature above 11°C. If the fresh food thermistor is above 11°C, the main control board assumes there is a problem reading the fresh food evaporator thermistor, ends the defrost cycle and returns to normal cooling.

If the fresh food thermistor is less than 11°C, the main control board assumes there is refrigerant leaking through the 3-way valve, keeping the fresh food evaporator cold during the defrost process while the freezer evaporator is cooling. The main control board shuts off the compressor and runs the fresh food fan at high speed until two conditions are met: the evaporator thermistor reaches 1°C and the fresh food thermistor is 1°C above the set point. As in the other cycles, the fan continues to run for an additional 5 minutes after the 35°F evaporator temperature is reached.

Fresh Food Forced Defrost

If the main control board senses the fresh food section has been cooling for 45 minutes, it immediately stops the refrigerant flow through the fresh food evaporator. The main control board changes the position of the 3-way valve if cooling is still required in the freezer, or turns the compressor off if the freezer is satisfied. The fresh food fan operates on high speed until the evaporator reaches 1°C, plus an additional 5 minutes after the evaporator reaches 1°C.

To prevent the refrigerator from going into forced defrost when first installed or after a power failure, the control will disregard the 45 minute time limit if the freezer temperature is above (-6)°C.

Note: If the fresh food evaporator thermistor is either open or shorted and the 1°C cutoff cannot be determined, the main control board defaults to a fixed defrost cycle of 1 hour at high-speed fan.

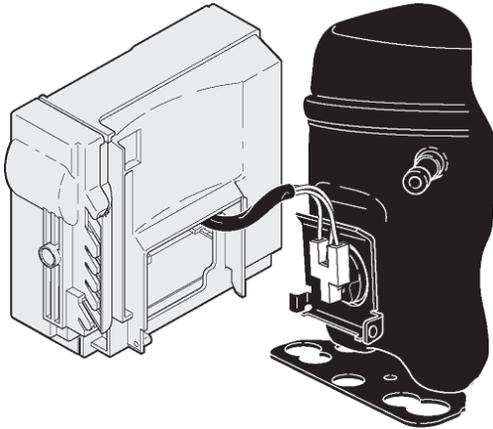
Freezer Defrost Cycle

The freezer evaporator utilizes a defrost heater to remove frost from the coil. The control board determines the length of time the heater is energized. It does this by monitoring the freezer evaporator thermistor. Once the temperature of the thermistor reaches 23°C, the control cycles the defrost heater off. A bi-metal safety thermostat provides a backup in the event the evaporator thermistor fails. The safety thermostat prevents the temperature from exceeding 60°C.

Note: During the freezer defrost cycle, the compressor does not operate, even if the fresh food section is above the set point.

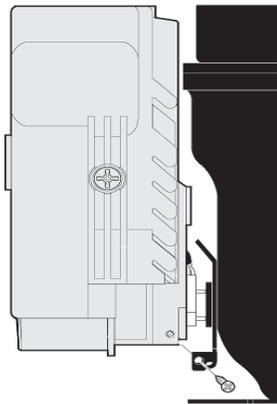
Inverter

- The inverter is accessed from the back of the refrigerator.
- It is mounted directly on the left side of the compressor.
- The water valve must be removed to access the inverter.

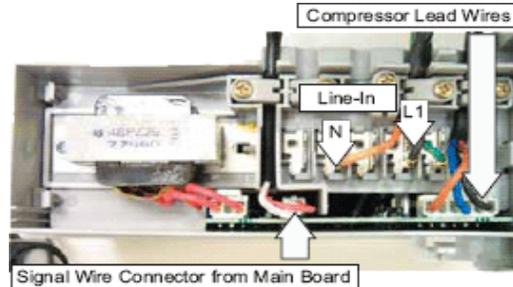


To remove the Inverter

1. To remove the inverter, remove the single Phillips screw on the lower right side. Lift the inverter up and off the compressor bracket.



Caution: It may be necessary to bend the process tube in order to remove the inverter. If it is necessary to bend the process tube, use extreme caution.



WARNING: When the refrigerator is plugged in, 240 VAC is always present at the inverter.

Note: Certain voltmeters will not be able to read voltage output from the inverter. If no voltage or erratic voltage is measured, it does not necessarily indicate a faulty inverter.

The inverter receives 240 VAC line-in from the power supply. The inverter converts this single phase, 50 Hz, 240 VAC into 3-phase, 230 VAC, with frequency variations between 57 Hz and 104 Hz. This voltage is delivered to the compressor through 3 lead wires. Each wire will carry identical voltage and frequency.

Note: The compressor leads must be connected to measure voltage output. If the compressor wires are not connected, or if an open occurs in one of the 3 lead wires or in the compressor, the inverter will stop voltage output.

When checking inverter voltage output, connect the test-meter leads to any 2 of the 3 compressor lead wires at the inverter plug (plug should be connected). The same reading should be measured between any 2 of the 3 wires.

The inverter controls compressor speed by frequency variation and by Pulse Width Modulation (PWM). Changing frequency and PWM will cause an effective voltage between 80 and 230 VAC to be received at the compressor.

- Low speed (1710 rpm) - 57 Hz
- Medium speed (2100 rpm) - 70 Hz
- High speed (3120 rpm) - 104 Hz

The inverter receives commands from the main control board. The main control board will send a PWM run signal from the J15 connector of between 4-6 VDC effective voltage to the inverter (all wires must be connected). The inverter will select compressor speed (voltage output) based on this signal.

The main control board will only send a run signal to the inverter when the compressor should be on.

Note: When measuring signal voltage (from the main control board) at the inverter, a reading of 4-6 VDC will be measured with all wires connected. If the inverter wiring is disconnected, the board output will measure between 10-12 VDC.

The inverter will monitor compressor operation and if the compressor fails to start or excessive current draw (4 amps maximum) is detected, the inverter will briefly stop voltage output. The inverter will then make 12 consecutive compressor start attempts (once every 12 seconds). After 12 attempts, if the compressor has not started, an 8-minute count will initiate. After the 8-minute count, the inverter will attempt to start the compressor again. If the compressor starts, normal operation will resume. If the compressor fails to start, this process will be repeated. Removing power to the unit will reset the inverter count. When power is restored, the inverter will attempt to start the compressor within 8 seconds.

The inverter has a built-in circuit protection to guard against damage from a failed or shorted compressor. However, if a failed compressor is diagnosed, order a new compressor and inverter.

If the compressor fails to start after replacement, replace the inverter.

Inverter Compressor

Caution: Do not attempt to direct-start the compressor. The compressor operates on a 3-phase power supply. Applying 240 VAC to the compressor will permanently damage the unit. It is not possible to start the compressor without an inverter.

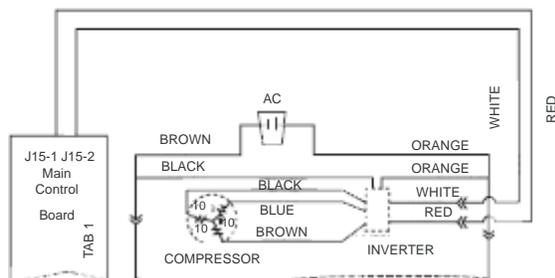
The compressor is a reciprocating, variable speed, 4-pole type. It operates on 3-phase, 80 to 230 VAC within a range of 57 to 104 Hz.

Note: Certain voltmeters will not be able to read voltage output or frequency from the inverter.

Compressor wattages at various speeds are:

- LOW - 65 watts
- MED - 100 watts
- HIGH - 150 watts

The compressor is controlled by the inverter, which receives its signal from the main control board. Varying the frequency to the inverter changes the compressor speed.



Compressor speed is based on the temperature set point in conjunction with the specific cabinet temperature. Speeds are selected according to the following cabinet temperatures, with freezer temperature being the primary:

- 4°C to 11°C above freezer set point = high speed.
- 2°C to 4°C above freezer set point = medium speed.
- 0°C to 2°C above freezer set point = low speed.
- 0°C to 2.5°F above refrigerator set point = low speed.

- 0°C to 1°C above refrigerator set point - medium speed.
- 1°C to 1°C above refrigerator set point - high speed.

Note: The compressor will run at medium speed if the freezer temperature is 10°C or more above the setpoint.

The use of 3-phase power eliminates the need for the PTCR relay, capacitor, and individual start and run windings; therefore, the start, run and common pins found on conventional compressors are not applicable on this 3-phase model. Compressor pin functions are identical and compressor lead wire configuration is of no importance. A resistance of 9 ohms to 11 ohms should be read between any 2 of the 3 pins. Should an open occur in the compressor winding or should one of the compressor lead wires become open or disconnected, the inverter will stop voltage output to the compressor.

High compressor torque enables the compressor to start against high pressure in the sealed system. When power has been disconnected from an operating unit, the high torque will enable the compressor to start immediately upon power restoration.

Compressor and sealed system operation is extremely smooth and cool. The compressor exterior may be room temperature while operating; therefore, a running unit may be difficult to detect.

To verify that the compressor is running:

Disconnect power from the unit and place a hand on the compressor. Reconnect power and feel for a vibration when the compressor tries to start. It may take up to 8 seconds before the compressor attempts to start.

Note:

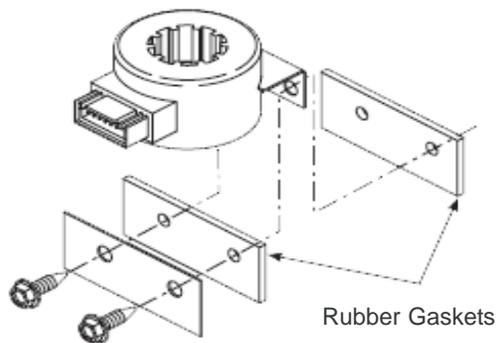
When ordering a replacement compressor, order both the compressor and inverter. Replace the compressor first. If, after compressor installation, the compressor fails to start, replace the inverter.

When servicing the compressor, it is important to dress the wiring to keep low voltage DC wiring and 240 VAC wiring separate.

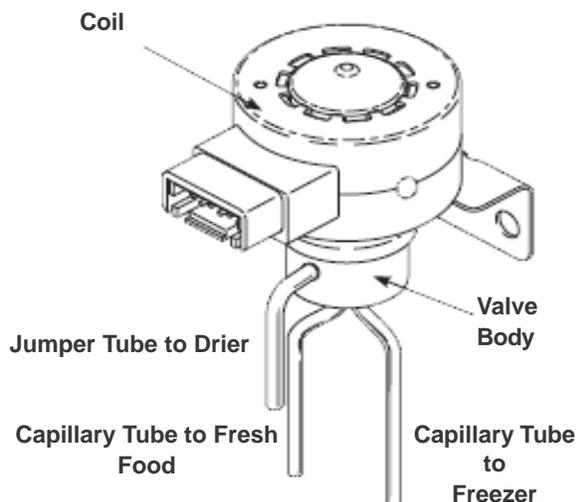
3-Way Valve

The 3-way valve is located beneath the main control board in the machine compartment and is accessed from the back of the refrigerator. It is composed of a magnetic coil and a valve body. Two ¼-in. hex-head screws mount the valve to the cabinet.

- Make certain that rubber gaskets are installed on mounting bracket to reduce vibration.



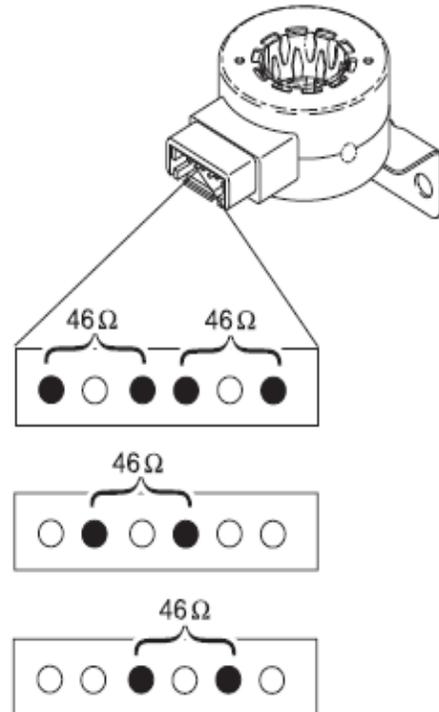
- Three copper tubes connect to the 3-way valve.
- One jumper tube connects from the drier to the inlet on the valve.
- A freezer capillary and a fresh food capillary connect to the other two tubes on the valve.



3-Way Valve Coil

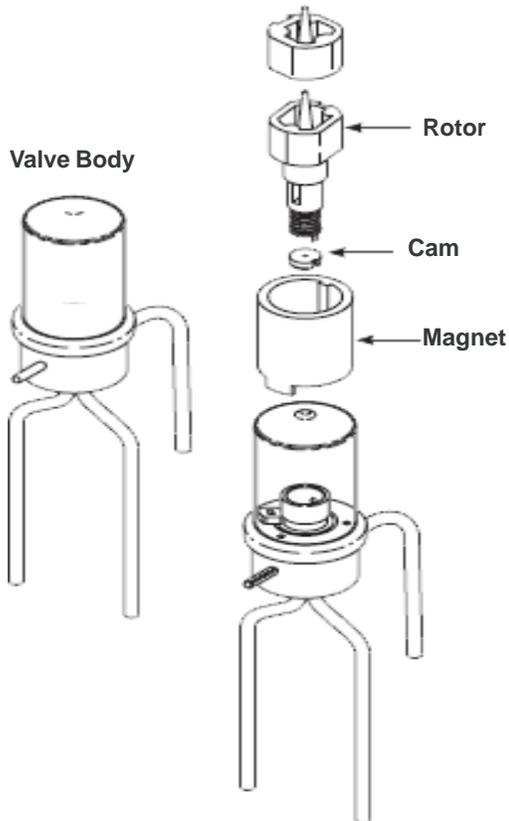
The 3-way valve coil receives 12 VDC pulses from the main board to change the position of the valve. The pulses come too quickly to measure with a volt meter.

The 3-way valve coil has a resistance value of approximately 46 ohms that can be measured between the coil pins.



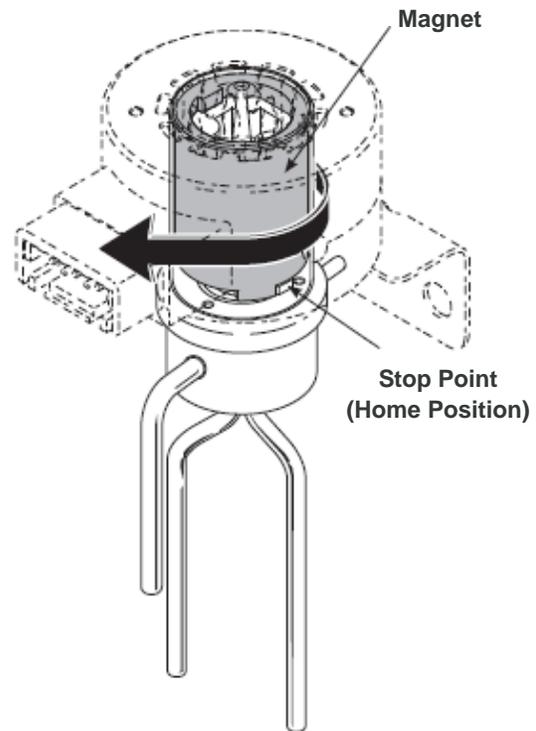
3-Way Valve Body

- The valve body contains a cam, rotor and magnet.
- The rotor and cam are grooved to rotate with the magnet.
- The entire valve body has refrigerant flowing through it when the compressor is operating.
- Use care not to damage the top of the valve body when installing the coil on the valve.
- A locating pin is used to correctly align the valve body in the valve coil.
- Failure to fully seat the valve in the coil or to align it correctly with the pin can cause the system to stop cooling.

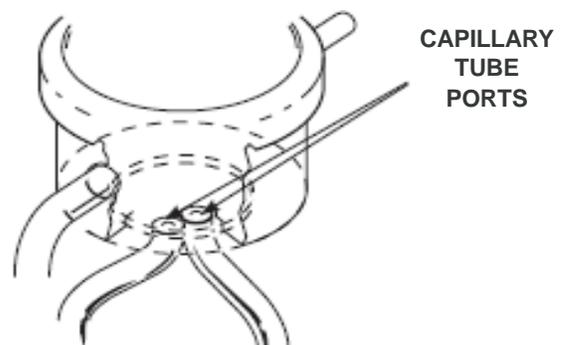


Valve Rotation

- The pulses of the valve coil cause the magnet to rotate inside the valve body.
- As the magnet rotates, it moves the cam at the bottom of the valve.



The cam opens or covers the ports to the capillary tubes.



Note: The 3-way valve comes only as a complete assembly. Exploded view is for reference only.

Testing the 3-Way Valve

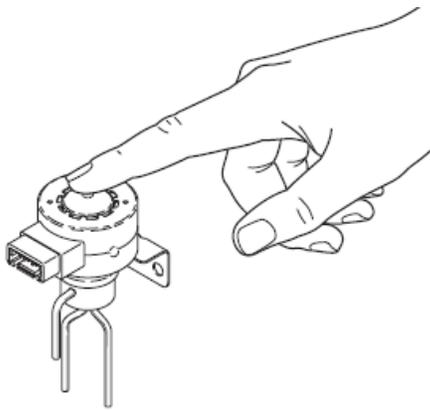
The valve returns to “home” at the end of every freezer defrost cycle and whenever the refrigerator is reconnected to power.

To test the valve, disconnect the refrigerator from power for at least 10 seconds, place a finger on top of the valve and reconnect power.

The main control overdrives the valve to the “home” position.

You should be able to feel the valve move as it returns to the home position .

If movement is present, the main board and valve coil are operating correctly.

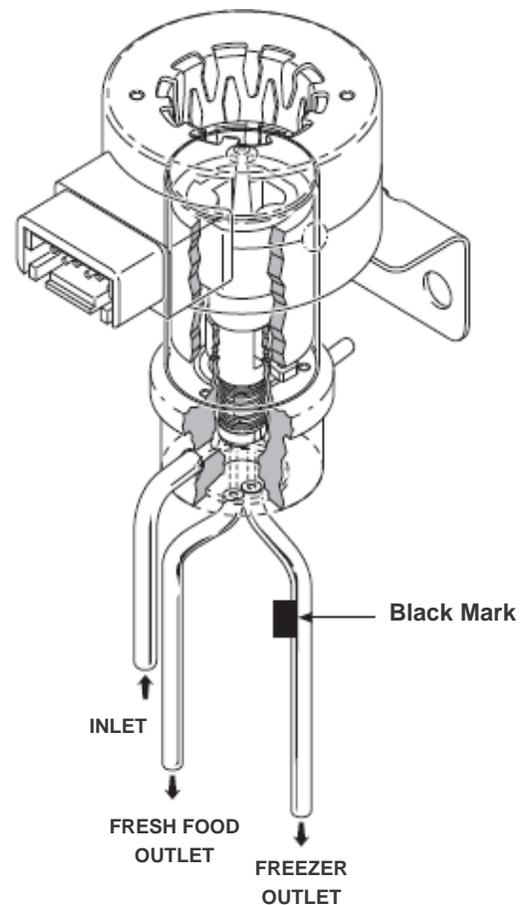


Replacing the 3-Way Valve

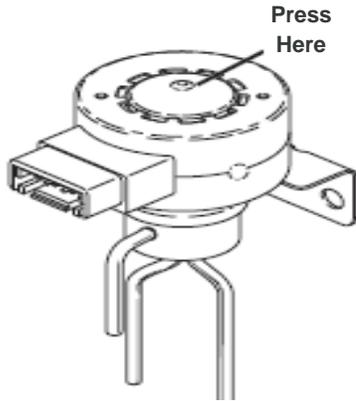
Parts Needed:

- 3-Way Valve (part # WR57X10053)
- Thermal Paste (part # WX5X8927)
- Drier Assembly (part # WR86X93)
- Process valve (part # WJ56X61)

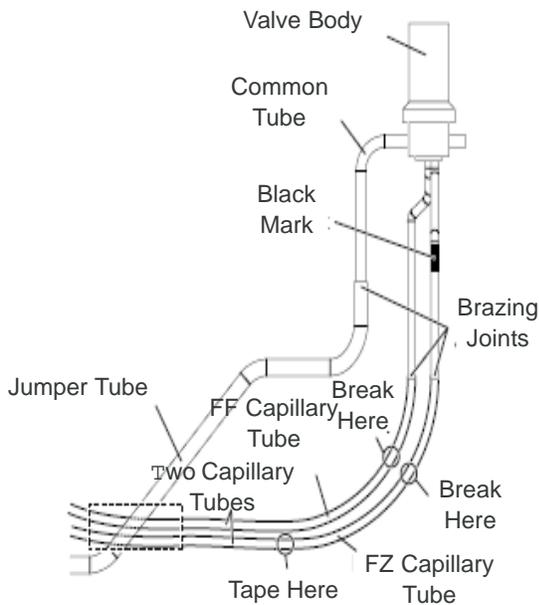
When replacing a 3-way valve, note the black mark on the freezer outlet tube. Make certain to mark the freezer capillary by placing a piece of tape on the capillary, 6-8 inches from the valve. This will aid in installing the capillaries in the correct outlet tubes.



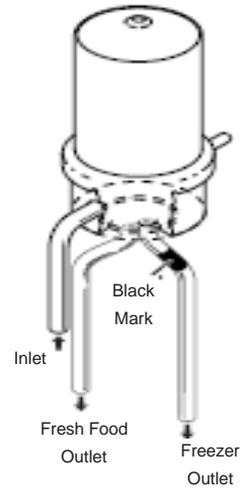
1. Unplug the refrigerator.
2. Remove the rear access cover and evacuate the sealed system. (See **Evacuation and Charging Procedure.**)
3. Remove the valve body from the valve coil by carefully pressing down on top of the valve body.



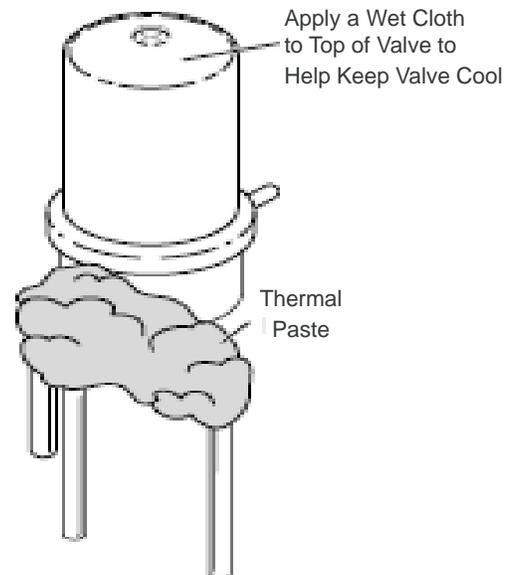
4. Tape the freezer capillary tube 6 inches below the brazing joint. Score and break the two capillary tubes below the brazing joints.



5. Connect the new jumper tube to the inlet tube of the new 3-way valve.
6. Prepare the taped capillary tube, and insert it into the 3-way valve freezer outlet port (identified with black mark or tape).
7. Prepare the remaining capillary tube and insert it into the 3-way valve fresh food outlet port.

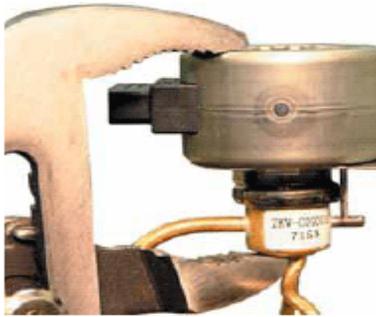


8. Apply a liberal amount of thermal paste to the base of the three tubes on the new valve. Apply a wet cloth to the top of the valve to help keep the valve cool.



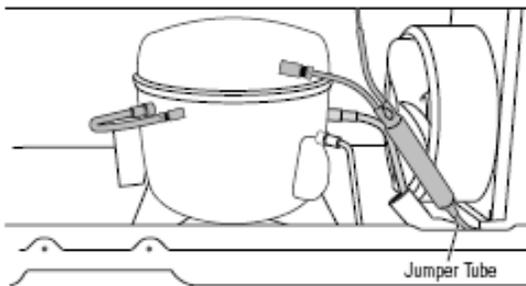
9. Angle the torch so the flame is not directed towards the valve body when brazing the three joints.
10. Remove the thermal paste residue and dry the valve body thoroughly. Install the valve body into the coil.

Note: If necessary, use an adjustable pliers to carefully install the valve body into the coil. DO NOT depress on the top of the valve body. See photo.



11. Remove the old drier by un-brazing or cutting the condenser loop (halo) as close as possible to the drier. Install the new drier assembly (part # WR86X93).

Note: If necessary, use the condenser loop extension tubing (part # WR97X238).



12. Install the process valve (part # WJ56X61). Clean and inspect all joints.
13. Evacuate and charge the system. Use original factory charge quantity of R-134a. (See **Evacuation and Charging Procedure.**)
14. Reinstall the rear access cover.

Freezer Evaporator

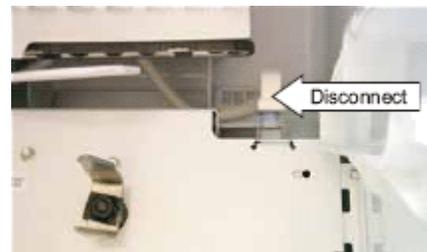
The following components must be removed in the appropriate order to access the freezer evaporator:

1. Remove the ice bucket, shelves, and drawers.
2. Slide the air duct panel upward to remove.

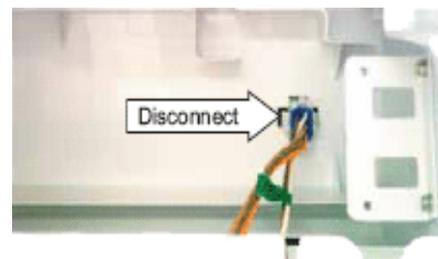


3. Remove the light bulb cover and light bulbs.
4. Remove the four 1/4-in. hex-head screws that hold the auger assembly in place.
5. The auger motor wiring is connected in two places:

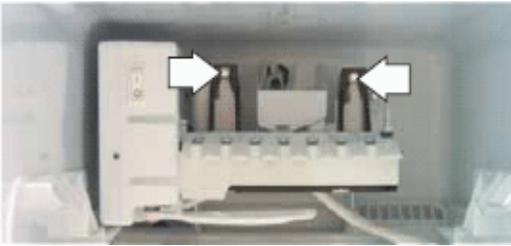
- a. Disconnect the top connector.



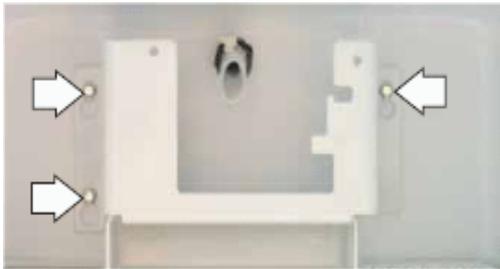
- b. Pull the auger motor assembly forward and disconnect the second connector.



6. Loosen the 2 screws that hold the icemaker assembly in place and slide it out of the freezer compartment.



7. Loosen the 3 screws on the icemaker bracket, and slide it out of the freezer compartment.



8. Unclip the light bulb sockets from their mounting holes and disconnect the sockets.



9. Remove the 4 hex-head screws that hold the freezer evaporator cover in place. Carefully pull the evaporator cover out of the freezer compartment.

10. Remove the 4 hex-head screws that hold the evaporator fan shroud in place (Fig. 1 and Fig. 2).

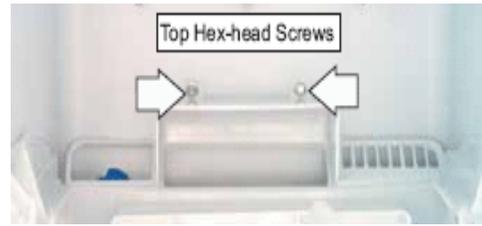


Fig. 1

Note: The bottom hex-head screws are hidden under the bottom of the evaporator fan shroud.

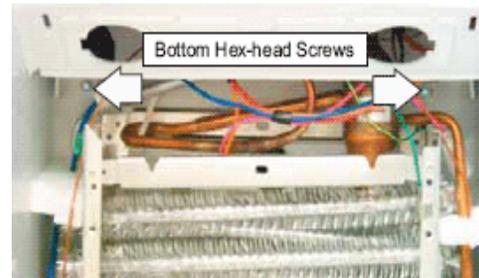
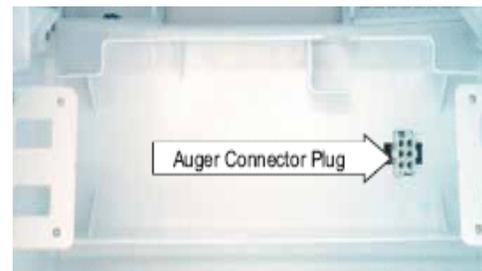
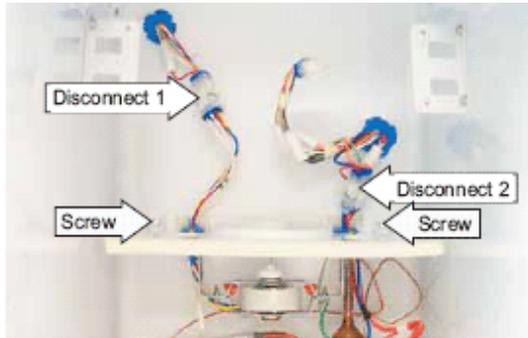


Fig. 2

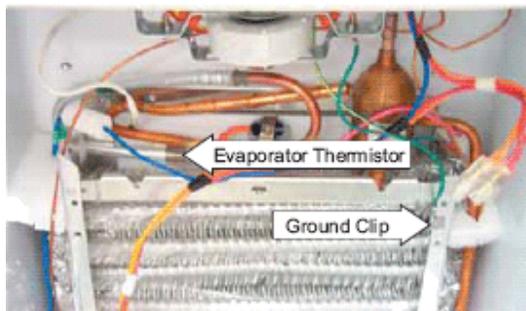
11. Unclip the auger connector plug from the evaporator fan shroud. Slide the evaporator fan shroud down and out of the freezer compartment.



12. Disconnect the fan wiring harness (Disconnect 1). Disconnect the over temperature thermostat/light bulb wiring harness (Disconnect 2).
13. Remove the 2 hex-head screws that hold the fan bracket in place.



14. Remove the ground clip from the evaporator frame.
15. Unclip the evaporator thermistor.
16. Slide the over-temperature thermostat/light bulb wiring harness out of the fan bracket.
17. Remove the fan bracket.



Note: When replacing the evaporator thermistor, cut the thermistor wires and splice the new thermistor using bell connectors. Always use RTV102 silicone to seal the end of the connector from moisture.



Freezer Evaporator

Parts Needed:

- Freezer Evaporator (part # WR85X10061)
- Drier Assembly (part # WR86X93)
- Access Tube (part # WJ56X61)
- Heat Shield Kit (part # WX5X8926)

Caution: A heat shield kit is required for this procedure to prevent damage to the plastic interior (liner) of the freezer compartment.

Note: If it is determined that the epoxy joints (the transition joint between the aluminum and copper jumper) on the freezer evaporator assembly are defective, then LOKRING connectors can be used to repair the joints. Refer to Pub. No. 31-9067 for more LOKRING information.

1. Unplug the refrigerator.
2. Remove the rear access cover and evacuate the sealed system.
3. Remove components necessary to expose the evaporator. (See *Freezer Evaporator*.)
4. Remove the ice bucket, icemaker, auger assembly, fan motor housing, and fan motor.
5. Note the location of thermistor and thermostat on top of old evaporator and remove.
6. Remove heater from bottom of evaporator and discard. Bundle remaining wires and tape high on the back wall of freezer.
7. Apply a liberal amount of thermal paste to suction line where it enters the rear wall of freezer.
8. Insert the brazing shield behind the joint of the accumulator top and suction line to protect the liner.
9. Use torch to heat the joint of the accumulator top, separate the suction line and accumulator top and clean the suction line surface (Fig. 1 and 2).
10. Using the tubing cutter, cut fresh food evaporator jumper (right side) tube about 2 inches from the joint outlet end of the fresh food evaporator. Score and break the capillary tube about 2 inches from the end of freezer evaporator inlet jumper (left side) (Fig. 1 and 2).

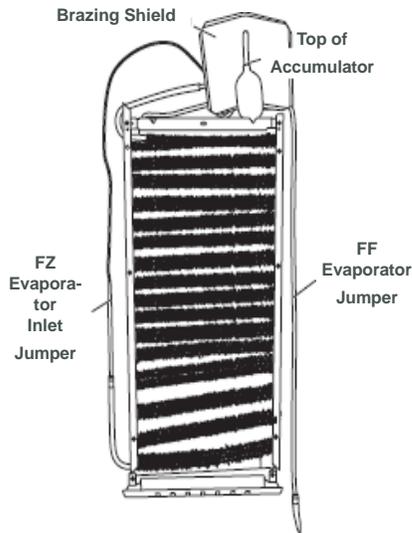


Fig. 1

- Loosen the hex-head screws that hold the evaporator in place. Note locations of the foam blocks at sides of old evaporator. These are needed for proper airflow. Remove the foam blocks and save for new evaporator installation. Remove old evaporator.

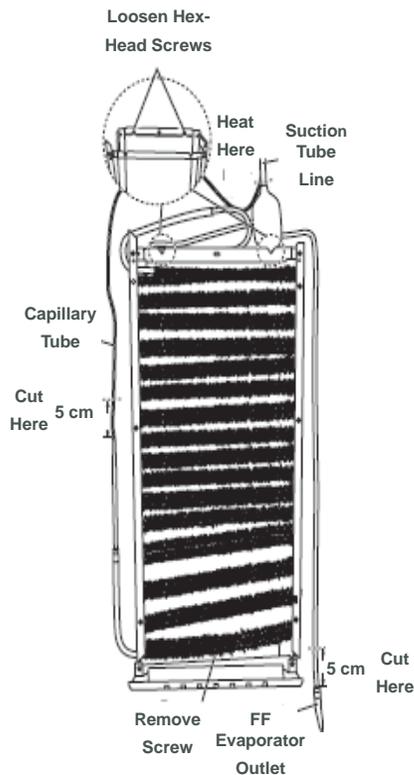
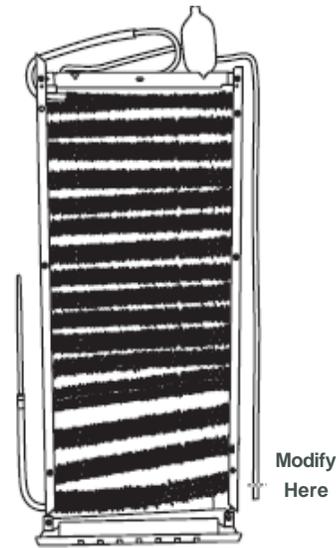


Fig. 2

- Modify replacement evaporator to accept the $\frac{5}{16}$ -in. fresh food evaporator jumper.



- Install the new evaporator and tighten all mounting screws.
- Connect tubes between top of accumulator and suction line. Connect tubes between fresh food evaporator and freezer evaporator (right side). Insert the capillary tube.
- Check that the thermal paste is still on the suction line where it enters the rear wall of the freezer. If not, apply paste. In addition, apply thermal paste around epoxy joints on the new evaporator to prevent the heat from damaging joint integrity.
- Protect the freezer floor from molten solder during brazing. Braze suction line to accumulator on new evaporator. Angle torch so that flame is directed away from rear wall when brazing.
- Move the brazing shield behind the capillary joint and braze the capillary tube.

18. Move the brazing shield behind the fresh food jumper to the freezer evaporator. Braze the jumper tube joint. Remove the brazing shield. Clean and inspect all joints.
19. Remove the old drier by cutting the halo loop as close as possible to the drier. Install the new drier assembly (part # WR86X93) making sure that there is sufficient space between the tubing.
20. Install the access tube. Clean and inspect joints.
21. Replace the heater supplied with the evaporator. Reinstall foam blocks, thermostat and thermistors. Dress wiring.
22. Evacuate and charge the system. Use original factory charge quantity of R-134a. (See *Evacuation and Charging Procedure*.)
23. Replace all component parts in the freezer.
24. Reinstall the rear access cover.

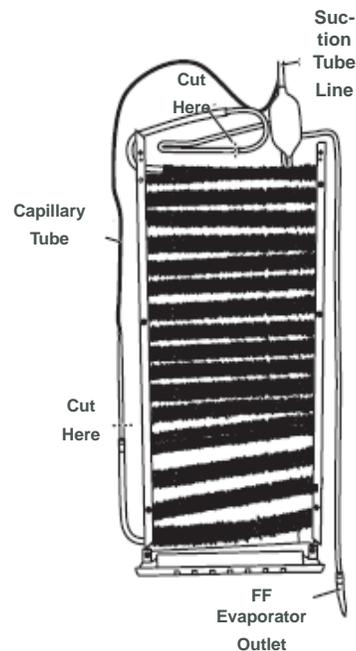
Replacing the Freezer Evaporator Using the LOKRING Method

Parts Needed:

- Freezer Evaporator (part # WR85X10061)
- Drier Assembly (part # WR86X93)
- Access Tube (part # WJ56X61).
- LOKRING Connectors (part # WR97X10021)

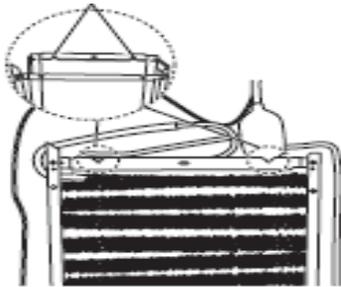
Note: If it is determined that the epoxy joints (the transition joint between the aluminum and copper jumper) on the freezer evaporator assembly are defective, then LOKRING connectors can be used to repair the joints. Refer to Pub. No. 31-9067 for more LOKRING information.

1. Follow steps 1 through 6 under *Replacing Freezer Evaporator Using the Brazing Method*.
2. Using the tubing cutter, cut the freezer evaporator jumper of the check-valve assembly (top) as close as possible to the joint of the copper jumper. Cut the jumper tube (left side) on the inlet of the freezer evaporator (capillary joint) as close as possible to the epoxy joint.



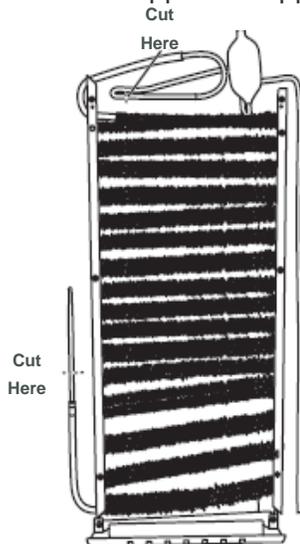
3. Loosen the hex-head screws that hold the evaporator in place. Note locations of the foam blocks at sides of old evaporator. These are needed for proper airflow. Remove the foam blocks and save for new evaporator installation. Remove old evaporator.

Loosen Hex-Head Screws



4. Modify replacement evaporator to use LOKRING connectors.

- a. Using the tubing cutter, cut the jumper tube (top) at the outlet end of the freezer evaporator. Leave as much of the straight tube portion as possible from the joint of the check-valve assembly. Discard the check-valve assembly.
- b. Using the tubing cutter, cut the jumper tube (left side) on the inlet end of the evaporator (capillary joint) about 3 inches from epoxy joint. Make two joints using the LOKRING connectors for $5/16$ -in. copper to copper joints.



5. Install the new evaporator and tighten all mounting screws.

6. Remove the old drier by cutting the halo loop as close as possible to the drier. Install the new drier assembly (make sure there is sufficient space between the tubing).

7. Install the access tube. Clean and inspect joints.

8. Replace the heater supplied in the kit. Reinstall foam blocks, thermostat and thermistors. Dress the wiring.

9. Evacuate and charge the system. Use original factory charge quantity of R-134a. (See ***Evacuation and Charging Procedure.***)

10. Replace all component parts in the freezer.

11. Reinstall the rear access cover.

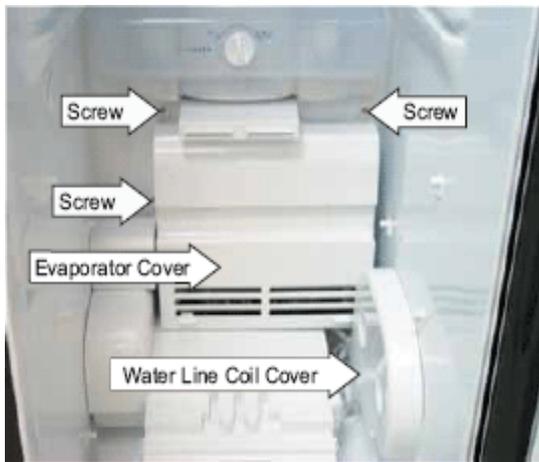
Fresh Food Evaporator

1. Remove the custom cool drawer and necessary drawers and covers above the custom cool drawer, to expose the evaporator cover housing.

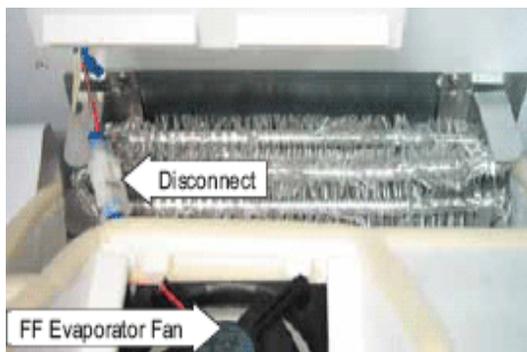
2. Remove the water line coil cover.

Note: The water line coil cover is slotted. To remove it, slide the water line coil cover toward the door opening.

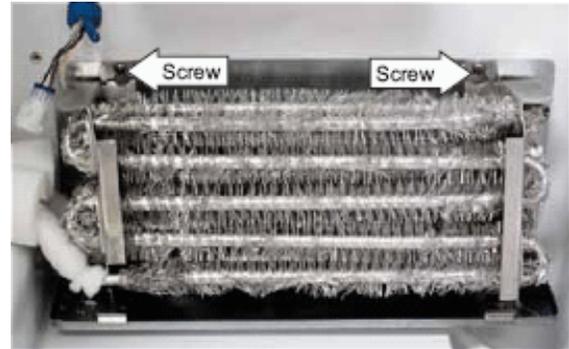
3 Remove the 3 Philips-head screws that hold the fresh food evaporator fan cover in place.



4. Carefully pull the cover forward, then disconnect the fresh food evaporator fan.



5. Loosen the 2 Phillips-head screws that hold the fresh food evaporator in place.



6. Carefully lift and pull the fresh food evaporator forward. Cut the tie strap that holds the thermistor block in place.

7. Remove the evaporator thermistor and block from the evaporator.

Replacing the Fresh Food Evaporator Using the Brazing Method

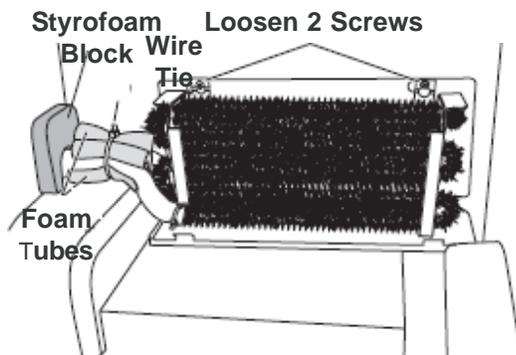
Parts Needed:

- Fresh Food Evaporator (part # WR85X10060)
- Drier Assembly (part # WR86X93)
- Access Tube (part # WJ56X61)
- Heat Shield Kit (part # WX5X8926)

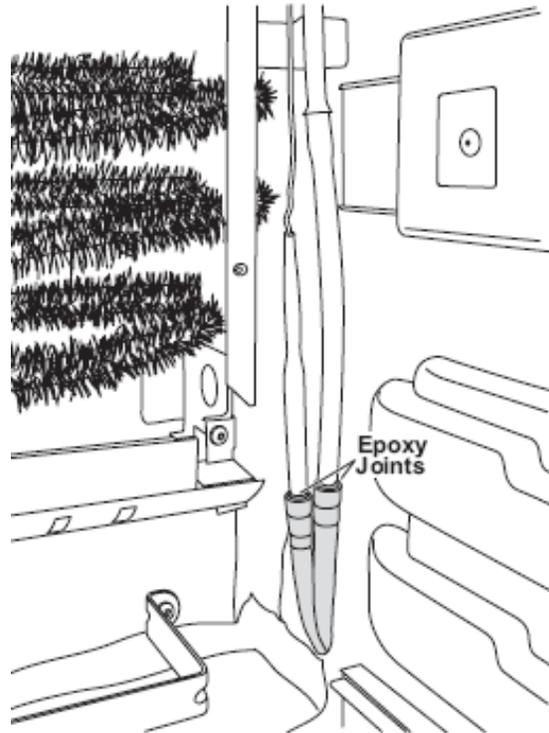
Caution: A heat shield kit is required for this procedure to prevent damage to the plastic interior (liner) of the freezer compartment.

Note: If it is determined that the epoxy joints (the transition joint between the aluminum and copper jumper) on the freezer evaporator assembly are defective, then LOKRING connectors can be used to repair the joints. Refer to Pub. No. 31-9067 for more LOKRING information.

1. Unplug the refrigerator.
2. Remove the rear access cover and evacuate the sealed system. (See *Evacuation and Charging Procedure*.)
3. Remove components necessary to expose both the freezer and fresh food evaporators. (See *Freezer Evaporator* and *Fresh Food Evaporator*.)
4. Remove the 2 foam tubes that are wire tied to the inlet and outlet tubes of the fresh food evaporator.
5. Remove the Styrofoam block that is inserted into the opening in the mullion wall and discard. A replacement is provided.
6. Loosen the 2 screws that attach the fresh food evaporator to the liner.



7. Pull the evaporator away from the liner and remove the thermistor from the aluminum block attached to the rear of the evaporator.
8. Look into the freezer compartment and locate the epoxy joints on the tubes leading to the fresh food evaporator. (These joints will be located on the right hand side of the freezer evaporator.)



9. To allow easier access to the epoxy joints, pull them away from the side of the freezer evaporator into the freezer compartment.
10. Using the tube cutter, cut the $\frac{5}{16}$ -in. OD copper tube as close to the epoxy joint as possible. Score and break the capillary tube as close to the braze joint as possible.
11. Remove the fresh food evaporator.
12. Install new fresh food evaporator.

13. Connect the capillary tube to the inlet tube of the evaporator. Connect the $\frac{5}{16}$ -in. OD copper tube to the outlet tube of the evaporator (remove any excess length as required to obtain the correct fit).
14. Apply a liberal amount of thermal paste around both epoxy joints to prevent heat from damaging joint integrity.
15. Install a metal brazing shield between the joints and the plastic liner.
16. Protect the freezer floor from molten solder during brazing.
17. Angle torch so that the flame is directed away from the plastic liner. Braze both joints. Clean and inspect joints. Remove the brazing shield.
18. Clean thermal paste off the joints. Dress the joints to the right of the freezer evaporator so the freezer evaporator cover can be reinstalled without interference.
19. Reinsert the thermistor into the aluminum block on the rear of the new fresh food evaporator.
20. Attach the evaporator to the fresh food liner using the original screws. Ensure that the drain pan is properly positioned. Install a new Styrofoam block into the hole of the mullion. Attach foam tubes to evaporator inlet/outlet tubes using wire tie provided.
21. Remove the old drier by cutting the condenser loop as close as possible to the drier. Install the new drier assembly, making sure that there is sufficient space between the tubing. Install the access tube on the compressor.
22. Evacuate and charge the system. Use original factory charge quantity of R-134a. (See **Evacuation and Charging Procedure**.)
23. Replace all component parts in both the freezer and the fresh food compartments.
24. Reinstall the rear access cover.

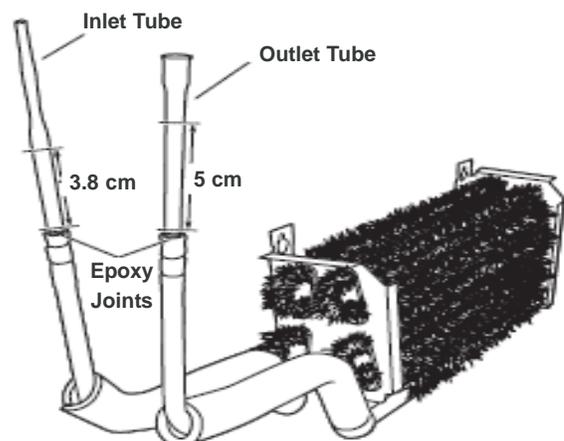
Replacing the Fresh Food Evaporator Using the LOKRING Method

Parts Needed:

- Drier Assembly (part # WR86X93)
- Process Tube (part # WJ56X61)
- LOKRING Connectors (part # WR97X10021)

Note: If it is determined that the epoxy joints (transition joint between the aluminum and copper jumper) on the freezer evaporator assembly are defective, then LOKRING connectors can be used to repair the joints. Refer to Pub. No. 31-9067 for more LOKRING information.

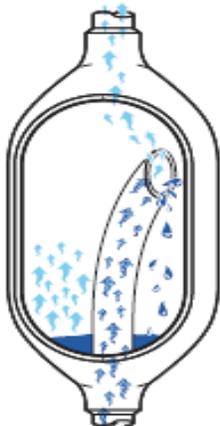
1. Follow steps 1 through 9 under **Replacing Fresh Food Evaporator Using the Brazing Method**.
2. Using the tube cutter, cut both copper tubes as close to the epoxy joint as possible. Leave as much $\frac{5}{16}$ -in. tubing as possible for a good LOKRING connection.
3. Remove the fresh food evaporator.
4. Modify replacement evaporator to use LOKRING connectors.
 - a. Using the tubing cutter, cut the jumper tube at the outlet end of the evaporator 5 cm from the epoxy joint.
 - b. Cut the jumper tube on the inlet end of the evaporator (capillary joint) 3.8 cm from the epoxy joint. Make two joints using the LOKRING connectors for $\frac{5}{16}$ -in. copper to copper joints.



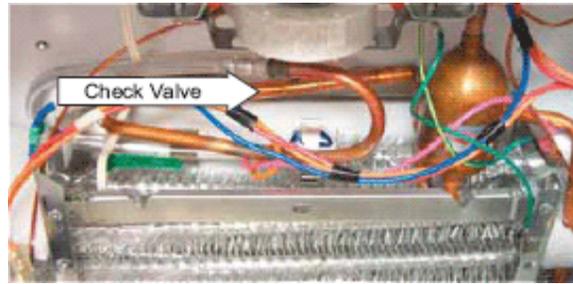
5. Reinsert the thermistor into the aluminum block on the rear of the new fresh food evaporator.
6. Attach the evaporator to the fresh food liner using the original screws. Ensure that drain pan is properly positioned. Install a new Styrofoam block into the hole of the mullion. Attach foam tubes to the evaporator inlet/outlet tubes using wire tie provided.
7. Remove the old drier by cutting the condenser loop as close as possible to the drier. Install the new drier assembly (make sure there is sufficient space between the tubing). Install the process tube on the compressor.
8. Evacuate and charge the system. Use original factory charge quantity of R-134a. (See **Evacuation and Charging Procedure.**)
9. Replace all component parts in both the freezer and the fresh food compartments.
10. Reinstall the rear access cover.

Accumulator

- The accumulator collects any liquid refrigerant left in the evaporator before it enters the suction line.
- The liquid refrigerant pools in the bottom of the accumulator until it is drawn into the compressor as a vapor.
- The accumulator comes as a part of the freezer evaporator. It is not available separately.

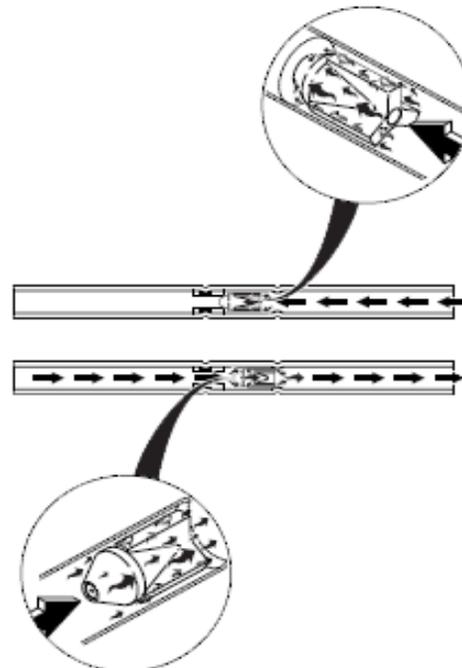


Check Valve



- A nylon piston inside the check valve floats back and forth, depending upon refrigerant flow.
- The check valve prevents refrigerant from flowing back into the freezer evaporator.
- When the main control rotates the 3-way valve for fresh food only cooling, the check valve will prevent refrigerant from flowing in the freezer evaporator (refrigerant will naturally flow to the coldest area).
- The check valve is only available with a new freezer evaporator.

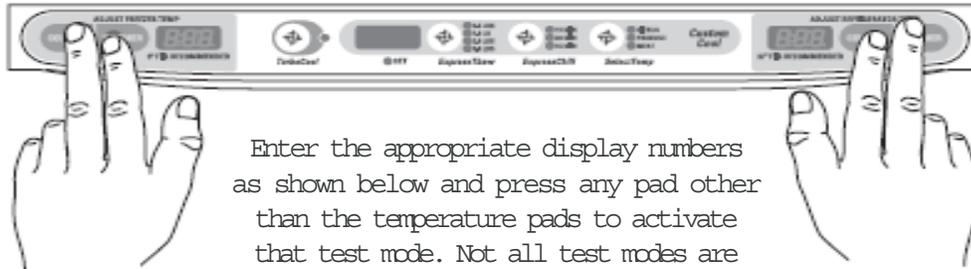
Caution: Do not attempt to replace only the check valve. The nylon piston in the check valve is extremely heat sensitive.



Troubleshooting

Control Diagnostics

Enter the diagnostic mode by pressing both the freezer temperature (COLDER and WARMER) pads and the refrigerator temperature (COLDER and WARMER) pads simultaneously. All four pads must be held for approximately 3 seconds. Blinking “0”s in both displays indicate the refrigerator has entered the test mode.



Enter the appropriate display numbers as shown below and press any pad other than the temperature pads to activate that test mode. Not all test modes are available on all models.

Freezer Display	Fresh Food Display	Diagnostics	Results	Comments
0	2	Communication check between Temperature Control and Main Control	P on freezer display if OK. F if problem is found.	
0	4	Communication check between Dispenser Control and Main Control	P on freezer display if OK. F if problem is found.	
0	6	Temperature Control LED Test	All LEDs light. Pressing the corresponding pad turns off the LED.	See Note 3.
0	7	Control and Sensor System Test	Checks each thermistor and displays P for pass and 0 for fail.	See Note 1.
0	8	Duct Door Test	Opens dispenser duct door for 10 secs, then closes.	Test can be made with door open.

Freezer Display	Fresh Food Display	Diagnostics	Results	Comments
1	0	Dampers Test	Double damper will open, close after 10 seconds, pause briefly, then single damper will open for 10 seconds.	Test will not start for 20 seconds after pad is depressed.
1	1	Fan Test	Cycles through each fan for 5 seconds.	
1	2	100% Run Time	Sealed system on 100% of the time. Times out after 1 hour.	
1	3	Prechill Test	Starts Prechill mode. Unit returns to normal on its own.	G Models do not use prechill
1	4	Defrost Test	Toggles on the defrost cycle. See Note 2.	Must press again to turn heaters off. See Note 2.
1	5	Main Control Reset	Causes a system reset .	
1	6	Exit Diagnostics Mode	Causes a temperature control board reset.	

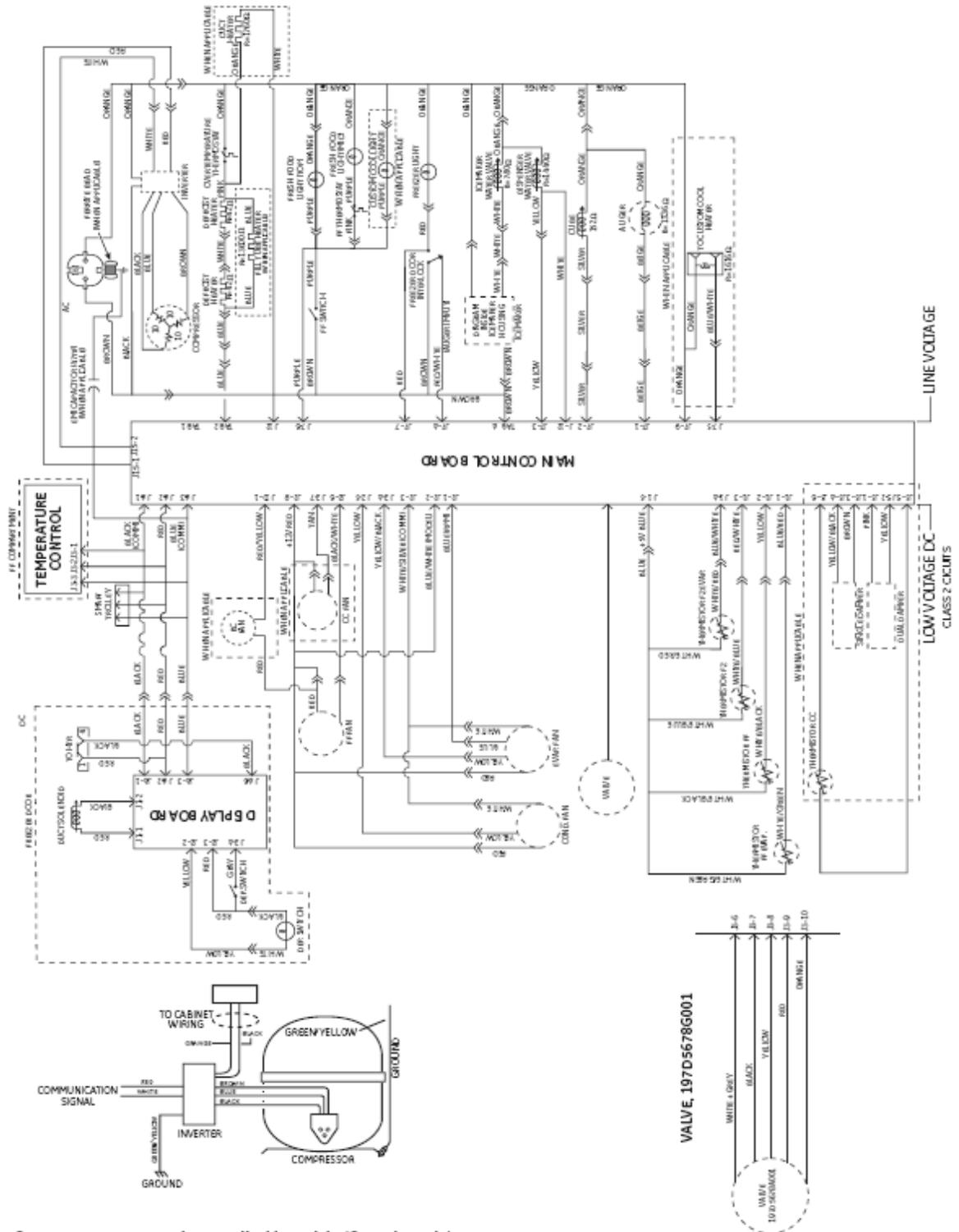
Note 1: Display order is #1 = Fresh Food Evaporator Thermistor, #2 = Fresh Food Thermistor, #3 = Custom Cool Thermistor, #4 = Freezer Evaporator Thermistor, #5 = Freezer Thermistor.

Thermistor test results are: P = Pass, 0 = Fail, S = Short to 5 VDC, B = Bad amplifier (replace main control).

Note 2: You **must** enter the defrost test again to toggle the defrost heater off at the end of the test. The heater will not come on if the evaporator thermistor is above 70°F.

Note 3: To exit the Temperature Control LED Test, press both refrigerator temperature pads (COLDER and WARMER) simultaneously for 3 seconds.

Schematic



DISCONNECT POWER CORD BEFORE SERVICING
IMPORTANT - RECONNECT ALL GROUNDING DEVICES
 All parts of this appliance capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

ELECTRICAL SPECIFICATIONS

Thermistor: kilo-Ohm resistance.....	@-18°C.....	62.79
.....	@ 3°C.....	24.48
.....	@25°C.....	10.00
Defrost Control	60hrs @ 45 min	
	w/ no door openings	
Overtemperature Thermostat	60-43°C	
Defrost Thermistor	18.3°C	
Maximum Current Leakage.....	0.75 mA	
Maximum Ground Path Resistance	0.14 Ohms	

NO LOAD PERFORMANCE

Control Position MID/MID		
and Ambient of:	18°C	32°C
Fresh Food, °C	1-4	1-4
Frozen Food, °C	-19/-16	-19/-16
Run Time, %	<80	=100

REFRIGERATION SYSTEM

Refrigerant Charge (R134a).....	0.184 kg
Compressor	214.8 W, 733 BTU/hr @ 3000 RPM
Minimum Compressor Capacity	22 inches Hg
.....	74.5 kPa
.....	0.745 bar
Minimum Equalized Pressure	
@ 21°C	290 to 310 kPa
@ 32°C	352 to 372 kPa

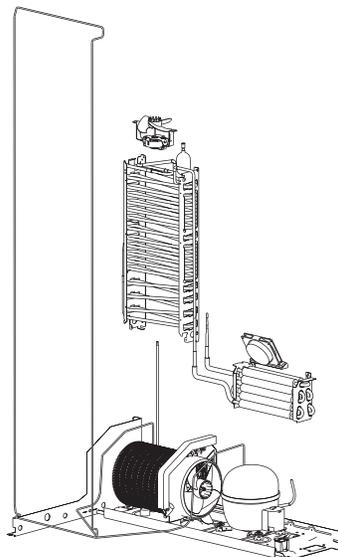
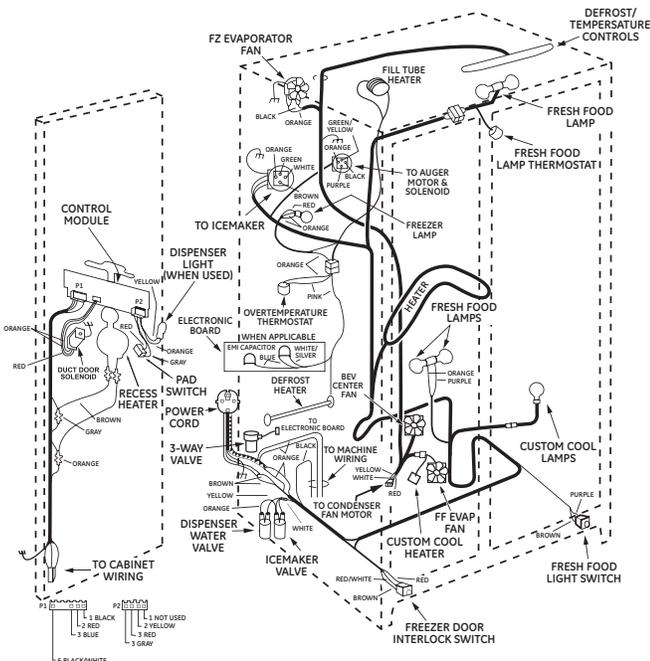
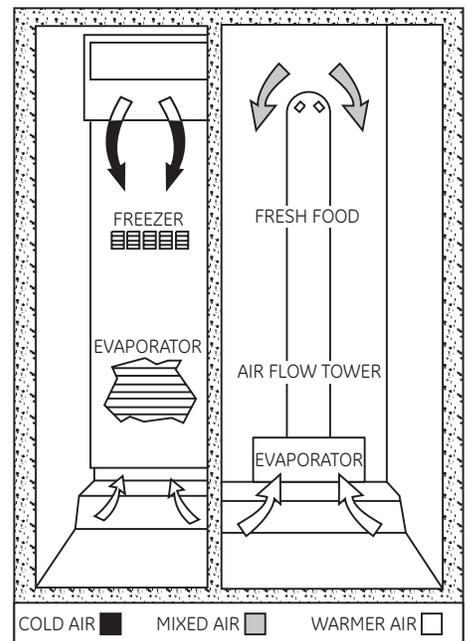
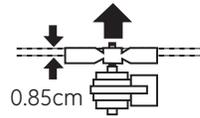
IMPORTANT SAFETY NOTICE

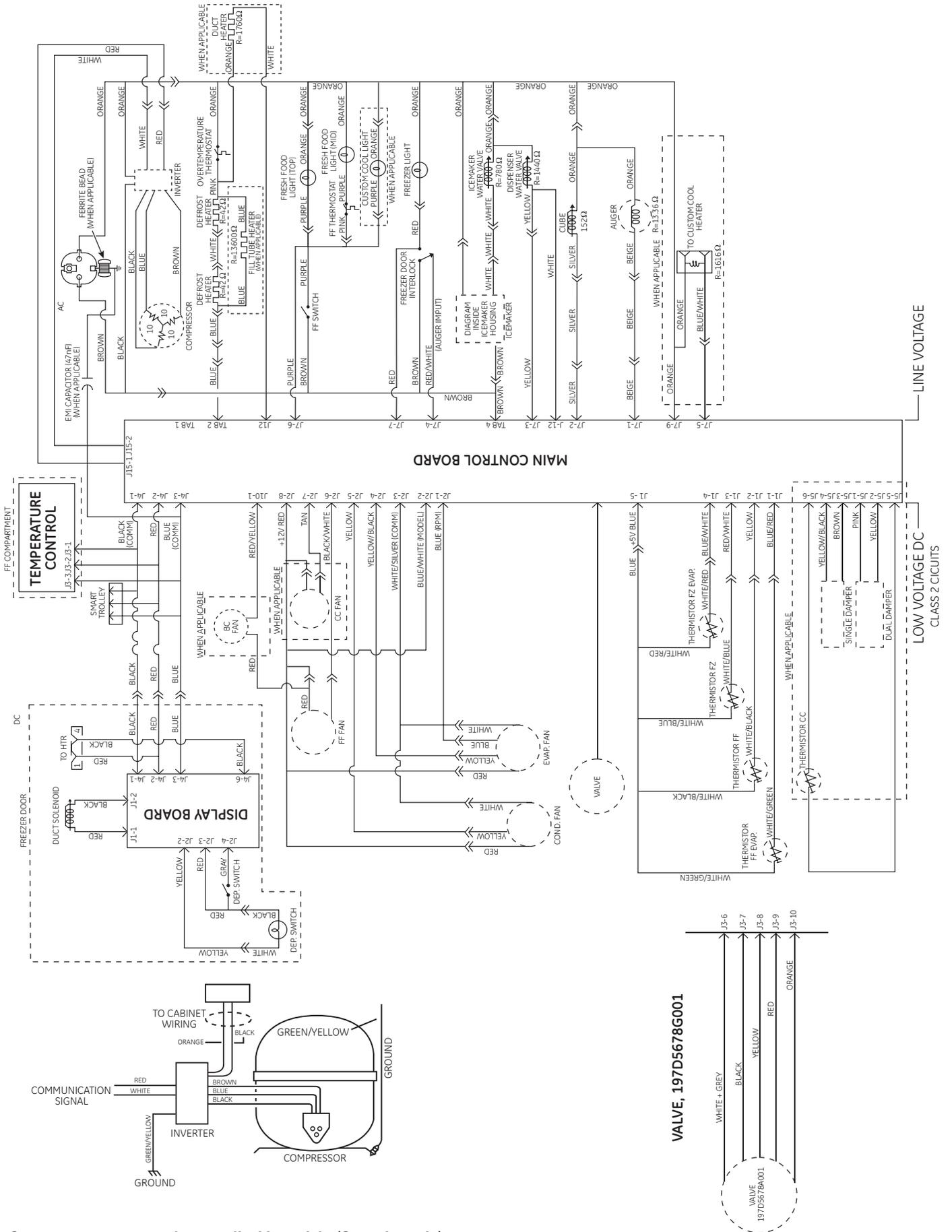
This information is intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

INSTALLATION

Minimum clearance required for air circulation:	
TOP	2.54 cm
SIDES	0.32 cm
REAR	1.27 cm

AIR FLOW





Some components are only on applicable models. (See schematic).