



TECHNICAL SERVICE GUIDE

LTMNF 22 and 25 Cubic Foot
GE/Hotpoint/Profile
Arctica Refrigerators with Electronic
Controls

MODEL SERIES:

ETS22
GTS22
HTS22
PTS22
PTS25
STS22





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 Home Services Training
Technical Service Guide
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**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.

IMPORTANT SAFETY NOTICE

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ELECTRICAL SPECIFICATIONS

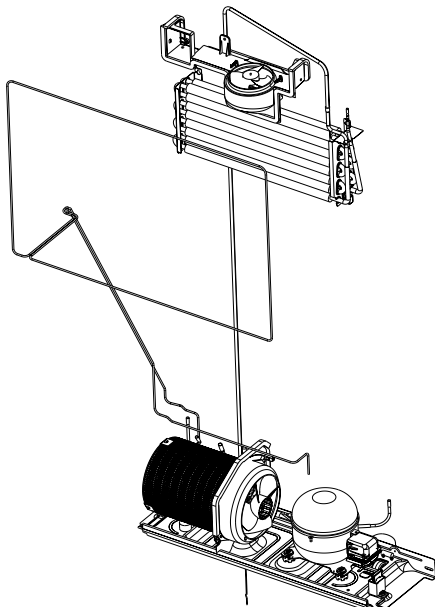
| | |
|---|---------------------------------------|
| Temperature Control (Position 5) | 7-(-11) °F |
| Defrost Control | 60hrs @ 45 min w/ no door openings |
| Overtemperature Thermostat | 140-110°F |
| Defrost Thermistor | 65°F |
| Electrical Rating: 115V. AC 60 Hz | 11.6 Amp |
| Maximum Current Leakage | 0.75 mA. |
| Maximum Ground Path Resistance | 0.14 Ohms |
| Energy Consumption | 40 KWH/mo. |

NO LOAD PERFORMANCE

| | | |
|---|--------|--------|
| Control Position MID/MID and Ambient of: | 70°F | 90°F |
| Fresh Food, °F | 34-40 | 34-40 |
| Frozen Food, °F | (-3) 3 | (-3) 3 |
| Run Time, % | <45% | <70% |

REFRIGERATION SYSTEM

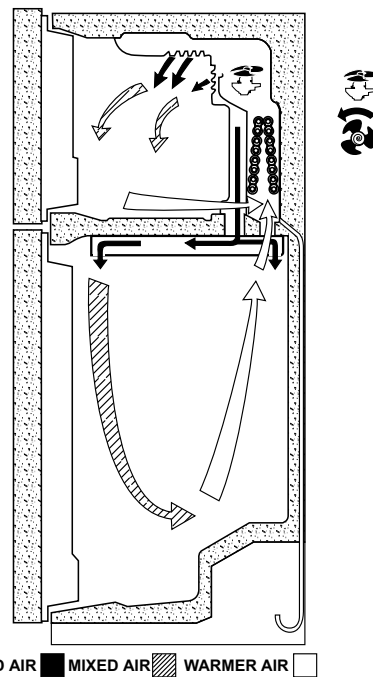
| | |
|-----------------------------------|------------|
| Refrigerant Charge (R134a) | 4.5 ounces |
| Compressor | 762 BTU/hr |
| Minimum Compressor Capacity | 22 inches |
| Minimum Equalized Pressure | |
| @ 70°F | 30 PSIG |
| @ 90°F | 38.5 PSIG |



INSTALLATION

Clearance must be provided for air circulation
 AT TOP 1"
 AT SIDES 1/8"
 AT REAR 1"

AIR FLOW

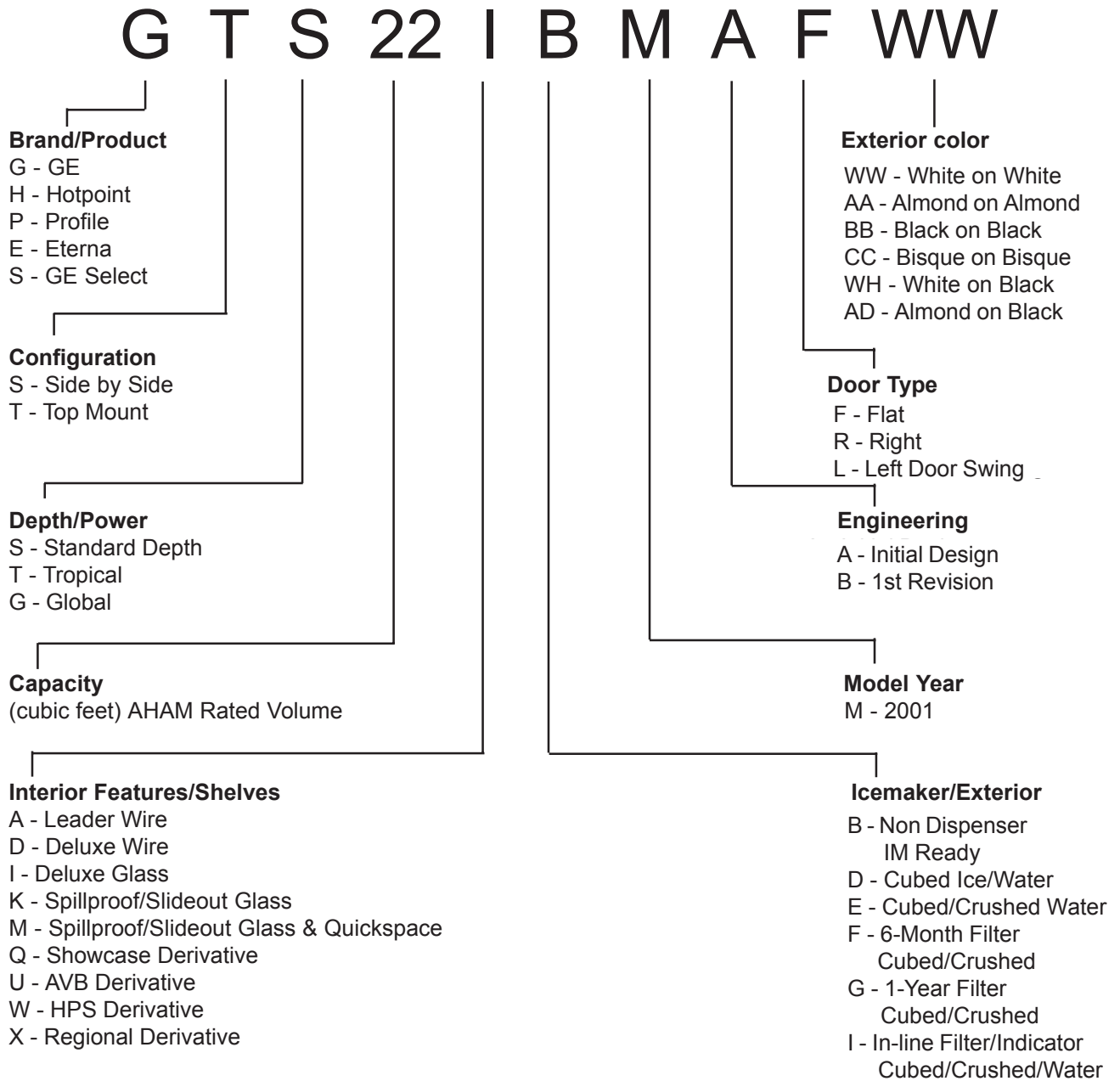


REPLACEMENT PARTS

| | |
|--------------------------------------|------------|
| Board Asm. Temperature Control | wr55x10085 |
| Relay (PTCR) | wr07x0240 |
| Overload | wr08x10015 |
| Run Capacitor (15 uF) | wr62x10079 |
| Defrost Thermostat | wr50x10015 |
| Defrost Heater Asm. | wr51x10038 |
| Condenser Fan Motor | wr60x10053 |
| Evaporator Fan Motor | wr60x10043 |
| Board Asm. Main Control | wr55x10086 |
| Thermistor (FF) | wr55x10087 |
| Thermistor (FZ) | wr55x10088 |
| Thermistor (Evap.) | wr55x10089 |

MODEL NOMENCLATURE

Model series ETS, GTS, HTS, and STS 22-cubic foot refrigerators, and PTS 22-and 25-cubic foot refrigerators are energy-efficient refrigerators that will provide the consumer with a quiet-operating, fully featured product.



SERIAL NUMBERS

The serial numbers for General Electric, Hotpoint, Profile, and Arctica refrigerators consists of two letters, followed by six numerals. The two prefix letters of the serial number indicate the month and year the product was manufactured. The year of manufacture does not correspond with the model year of the model number.

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2000 | AZ | DZ | FZ | GZ | HZ | LZ | MZ | RZ | SZ | TZ | VZ | ZZ |
| 2001 | AA | DA | FA | GA | HA | LA | MA | RA | SA | TA | VA | ZA |
| 2002 | AD | DD | FD | GD | HD | LD | MD | RD | SD | TD | VD | ZD |
| 2003 | AF | DF | FF | GF | HF | LF | MF | RF | SF | TF | VF | ZF |
| 2004 | AG | DG | FG | GG | HG | LG | MG | RG | SG | TG | VG | ZG |
| 2005 | AH | DH | FH | GH | HH | LH | MH | RH | SH | TH | VH | ZH |
| 2006 | AL | DL | FL | GL | HL | LL | ML | RL | SL | TL | VL | ZL |
| 2007 | AM | DM | FM | GM | HM | LM | MM | RM | SM | TM | VM | ZM |
| 2008 | AR | DR | FR | GR | HR | LR | MR | RR | SR | TR | VR | ZR |
| 2009 | AS | DS | FD | GS | HS | LS | MS | RS | SS | TS | VS | ZS |
| 2010 | AS | DS | FD | GS | HS | LS | MS | RS | SS | TS | VS | ZS |
| 2011 | AT | DT | FT | GT | HT | LT | MT | RT | ST | TT | VT | ZT |
| 2012 | AV | DV | FV | GV | HV | LV | MV | RV | SV | TV | VV | ZV |
| 2013 | AZ | DZ | FZ | GZ | HZ | LZ | MZ | RZ | SZ | TZ | VZ | ZZ |
| 2014 | AA | DA | FA | GA | HA | LA | MA | RA | SA | TA | VA | ZA |
| 2015 | AD | DD | FD | GD | HD | LD | MD | RD | SD | TD | VD | ZD |
| 2016 | AF | DF | FF | GF | HF | LF | MF | RF | SF | TF | VF | ZF |
| 2017 | AG | DG | FG | GG | HG | LG | MG | RG | SG | TG | VG | ZG |
| 2018 | AH | DH | FH | GH | HH | LH | MH | RH | SH | TH | VH | ZH |
| 2019 | AL | DL | FL | GL | HL | LL | ML | RL | SL | TL | VL | ZL |
| 2020 | AM | DM | FM | GM | HM | LM | MM | RM | SM | TM | VM | ZM |
| 2021 | AR | DR | FR | GR | HR | LR | MR | RR | SR | TR | VR | ZR |
| 2022 | AS | DS | FD | GS | HS | LS | MS | RS | SS | TS | VS | ZS |

Refrigerators using a number four (4) as the first digit of the serial number are designated as Celya production.

Refrigerator Warranty. *(For customers in the United States)*



All warranty service provided by our Factory Service Centers, or an authorized Customer Care® technician. To schedule service, on-line, 24 hours a day, contact us at www.GEAppliances.com, or call 800-GE-CARES.

Staple your receipt here. Proof of the original purchase date is needed to obtain service under the warranty.

| For The Period Of: | GE Will Replace: |
|---|--|
| <p>One Year From the date of the original purchase</p> | <p>Any part of the refrigerator (excluding water filter cartridge) which fails due to a defect in materials or workmanship. During this full one-year warranty, GE will also provide, free of charge, all labor and in-home service to replace the defective part.</p> |
| <p>Five Years From the date of the original purchase</p> | <p>Any part of the sealed refrigerating system (the compressor, condenser, evaporator and all connecting tubing) which fails due to a defect in materials or workmanship. During this five-year warranty, GE will also provide, free of charge, all labor and in-home service to replace the defective part in the sealed refrigerating system.</p> |

What GE Will Not Cover:

- Service trips to your home to teach you how to use the product.
- Improper installation.
- Failure of the product if it is abused, misused, or used for other than the intended purpose or used commercially.
- Loss of food due to spoilage.
- Replacement of house fuses or resetting of circuit breakers.
- Damage to the product caused by accident, fire, floods or acts of God.
- Incidental or consequential damage caused by possible defects with this appliance.

This warranty is extended to the original purchaser and any succeeding owner for products purchased for home use within the USA. In Alaska, the warranty excludes the cost of shipping or service calls to your home.

Some states do not allow the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. To know what your legal rights are, consult your local or state consumer affairs office or your state's Attorney General.

Warrantor: General Electric Company. Louisville, KY 40225

RATING PLATE

The rating plate, located inside the refrigerator on the upper left-hand side, contains the model and serial numbers. Additionally, the rating plate specifies the minimum installation clearances, electrical voltage, frequency, maximum amperage rating, and refrigerant charge and type.

MINI-MANUAL

The mini-manual, located behind the base grille, is secured to the underside of the cabinet for shipping with a piece of tape. After referencing the mini-manual, return it to its original location for future use.

DOOR REVERSAL

Torx head (T-20) screws are used to mount the top, center, and bottom hinges to the cabinet. Mounting holes in the hinges are not elongated, and the hinges are not adjustable. When reinstalling the hinges, tighten screws firmly but avoid overtightening to prevent stripping.

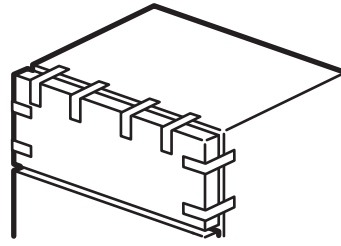
Note:

- When reversing the door swing, read all instructions thoroughly before starting.
- When handling parts, use caution to avoid scratching paint.
- Sort screws to correspond with related parts and be certain to use the proper screw with each part.
- Place doors on a protected surface to prevent damage.
- Once the door reversal procedure has been initiated, do not move the cabinet until the procedure is complete.
- Unplug the refrigerator from its electrical outlet.
- Empty all door shelves, including the dairy compartment.

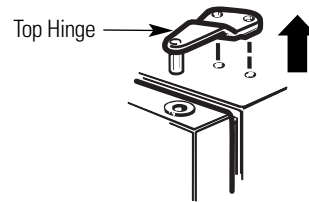


Freezer Door

1. Tape freezer door shut with masking tape. Remove the hinge cover from the freezer door hinge (some models).

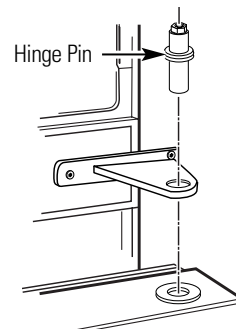


2. Remove 2 (T-20) Torx head screws and the top hinge.
3. Remove the tape and tilt the door away from the cabinet. Lift the door off the center hinge pin and place on a protected surface.



Fresh Food Door

1. Tape the fresh food door shut with masking tape.
2. Remove the center hinge pin with a 3/4-in. socket.
3. Remove the tape and tilt the door away from the cabinet. Lift the door straight up and off the bottom hinge and place on a protected surface.



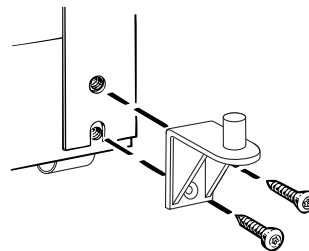
Note: If the washer is not on the bottom hinge, check to see if it is stuck to the bottom of the door.

Reversing the Doors

1. Install the top hinge and screws on the opposite side of the cabinet. Do not tighten the screws at this time.
2. Remove the base grille by pulling it straight out from the unit.

Note : If the washer is not on the bottom hinge, check to see if it is stuck to the bottom of the door.

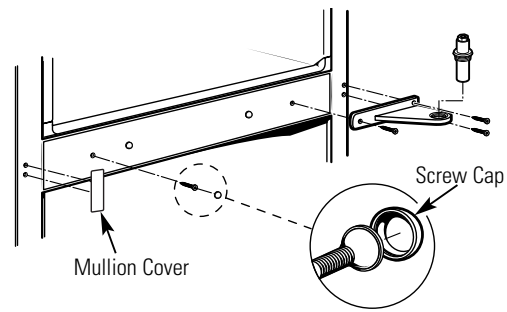
3. Using a Torx driver, remove the screws and bottom hinge from the cabinet and install on the opposite side of the cabinet.



- Cover the blade of a putty knife or small flat screwdriver (to avoid scratching the paint) and use the edge to gently pry the color-matched screw cap off the screw heads.

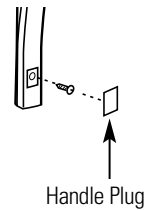
Note: Keep the screws with the center hinge. These are longer screws and will be used when installing the center hinge on the opposite side of the cabinet.

- Remove 3 Torx head screws and the center hinge.
- Remove the mullion cover using the putty knife or screwdriver. Install the cover on the opposite side of the cabinet.
- Install the center hinge with the three long screws on the opposite side of the cabinet. Replace the color-matched cap.
- Move the metal door stop and any associated screws to the opposite side of the door.

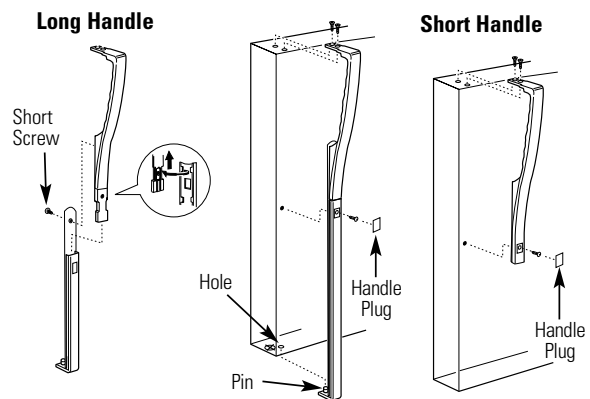


Fresh Food Door Handles

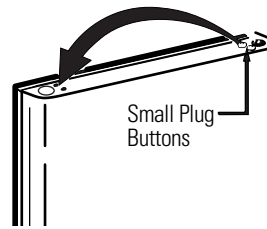
- Remove the plug button by carefully prying underneath the edge with a small, flat blade. Remove the screw that fastens the bottom of the handle to the door. Remove the lower part of the long handle (some models).



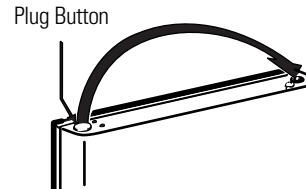
- Remove the 2 screws and the handle from the top of the door.



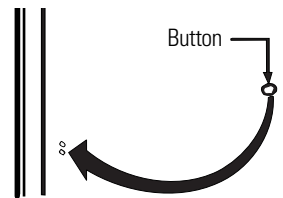
3. After the handle has been removed, move the small plug buttons to the opposite side of the door and install in the screw holes.



4. Move the large plug button to the opposite side of the door and install in the thimble hole.



5. Move the front door plug button to the opposite side of the door and install in the screw hole.

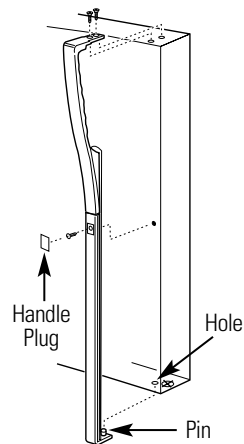


6. Install the handle to the opposite side of the door with 3 screws.

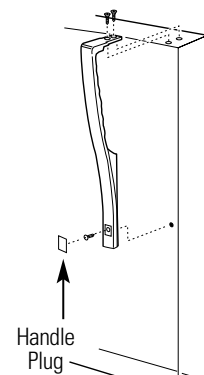
Note: If equipped with long handle, ensure that pin in the lower part of the handle is installed in bottom of the door.

7. Install handle plug.

Long Handle

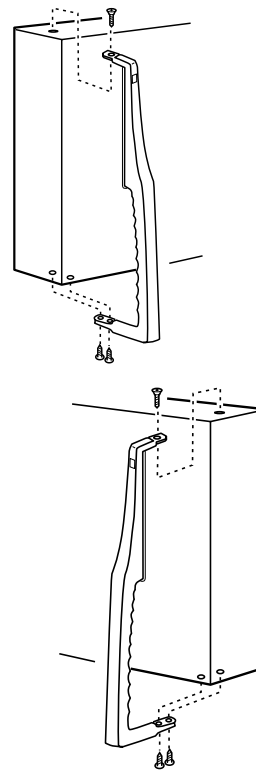


Short Handle



Freezer Door Handles

1. Remove the screws and handle from the freezer door.
2. Move the plug button to the opposite side of the door and install in the handle screw hole.
3. Install the handle to the opposite side of the door using the holes closest to the edge of the door.

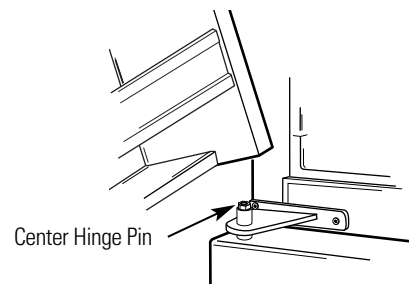
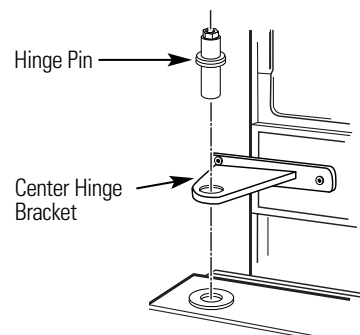
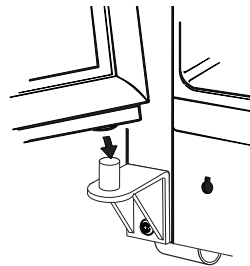


Rehanging The Doors

1. Lower the fresh food door onto the bottom hinge pin.

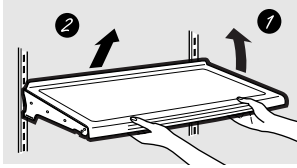
Note: Ensure that the washer is on bottom hinge pin.

2. Line up the fresh food door with the center hinge bracket. Install the hinge pin in the center hinge bracket and door with a 3/4-in. socket. Tighten the hinge pin in the center hinge bracket.
3. Install the freezer door onto the center hinge pin and upper hinge (screws loose). Support the door on the handle side and make sure the door is straight and the gap between the doors is even across the front. While holding the door straight, tighten the top hinge screws.

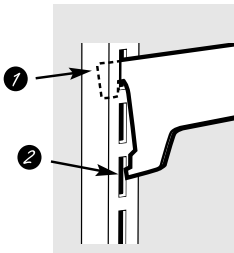


SHELVES and BINS

Note: Not all features are on all models.



Some models have wire shelves that can be adjusted in the same manner.



Refrigerator Compartment

To remove:

- 1 Tilt the shelf up at the front.
- 2 Lift the shelf up at the back and bring the shelf out.

To replace:

- 1 While tilting the shelf up, insert the top hook at the back of the shelf in a slot on the track.
- 2 Lower the front of the shelf until the bottom of the shelf locks into place.

Freezer Compartment

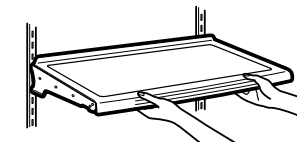
To remove:

- 1 Lift up the left side of the shelf and slide it left into the center of the shelf supports.
- 2 Rotate the right side of the shelf up and out of the shelf supports.

To replace:

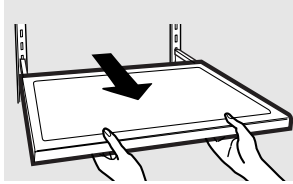
- 1 Holding the shelf diagonally, insert the left end of the shelf into the center of the shelf supports on the side wall at the desired level.
- 2 Insert the right end of the shelf into the shelf supports at the same level. Rest each end of the shelf on the bottom of the shelf supports.

NOTE: For models with an automatic icemaker, the freezer shelf must be in the lower position for the ice cube bucket to catch the cubes.



Spillproof Shelves (on some models)

Spillproof shelves have special edges to help prevent spills from dripping to lower shelves. To remove or replace the shelves, see *Rearranging the Shelves*.



Slide-Out Spillproof Shelf (on some models)

The slide-out spillproof shelf allows you to reach items stored behind others. The special edges are designed to help prevent spills from dripping to lower shelves.

To remove:

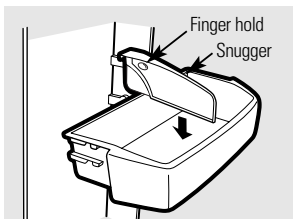
- 1 Remove all items from shelf.
- 2 Slide the shelf out until it stops.
- 3 Lift the front edge of the shelf until the central tabs are above the front bar.
- 4 Continue pulling the shelf forward until it can be removed.

To replace:

- 1 Place the rear shelf tabs just in front of the central notches on the shelf frame.
- 2 Slide the shelf in until the central tabs are slightly behind the front bar.
- 3 Lower the shelf into place until it is horizontal and slide the shelf in.

Make sure that the shelf sits flat after reinstallation and doesn't move freely from side to side.

Make sure you push the shelves all the way in before you close the door.



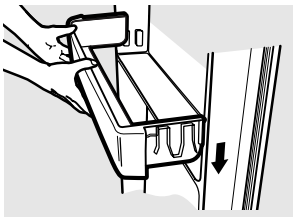
Adjustable Bins on the Door

Adjustable bins can easily be carried from refrigerator to work area.

To remove: Lift bin straight up, then pull out.

To replace or relocate: Engage the bin in the molded supports of the door, and push in. Bin will lock in place.

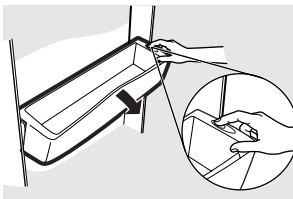
The snugger helps prevent tipping, spilling or sliding of small items stored on the door shelf. Grip the finger hold near the rear of the snugger and move it to fit your needs.



Non-Adjustable Shelves on the Door

To remove: Lift the shelf straight up then pull out.

To replace: Engage the shelf in the molded supports on the door and push down. It will lock in place.



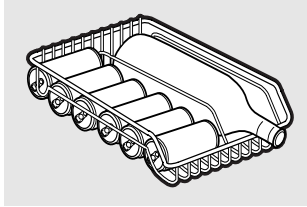
Freezer Tilt Out Bin (on some models)

Push the button as you tilt out the bin.

To remove: Hold the sides of the bin and lift it straight up, then pull out.

To replace: Engage the ends of the bin in the molded supports on the door and push down. It will lock in place.

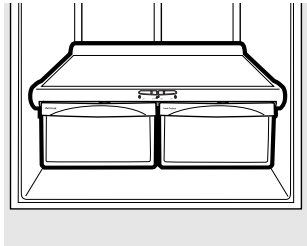
NOTE: Do not overload the bin.



Shelf Saver Rack (on some models)

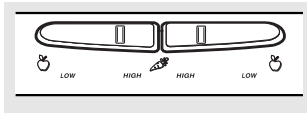
Slide-out beverage rack holds twelve cans of soda or two wine/water bottles (lengthwise). It can be removed for cleaning.

To remove, slide the rack out to the **stop** position, lift the rack up and past the **stop** position and lift it out.



Fruit and Vegetable Crisper

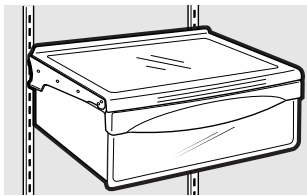
Excess water that may accumulate in the bottom of the drawers or under the drawers should be wiped dry.



Adjustable Humidity Crisper (on some models)

Slide the control all the way to the **HIGH** setting to provide high humidity recommended for most vegetables.

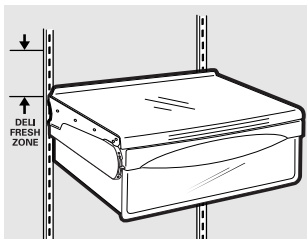
Slide the control all the way to the **LOW** setting to provide lower humidity levels recommended for most fruits.



Snack Pan (on some models)

This pan can be moved to the most useful location for your family's needs.

To remove, slide the pan out to the **stop** position, lift the pan up and past the **stop** position and lift it out.



Adjustable Temperature Deli Pan (on some models)

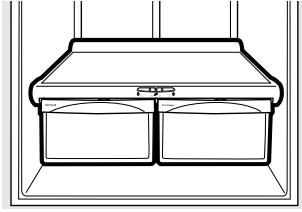
When the pan is placed in the top 6 slots on the left side and the lever is set at **COLDEST**, air from the freezer is forced around the pan to keep it very cold.

You can move the pan to any location if you don't want the extra cold storage.

The settings can be adjusted anywhere between cold ❄️ and coldest ❄️❄️.

When set at cold, the pan will stay at the normal refrigerator temperature.

The coldest setting provides the coldest storage area.



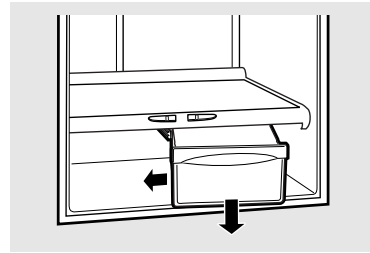
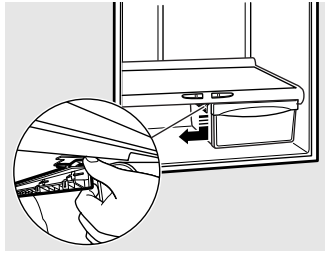
Crisper Removal

To Remove:

These drawers can be removed easily by lifting up slightly while pulling the drawer past the **stop** location.

When the door cannot be fully opened,

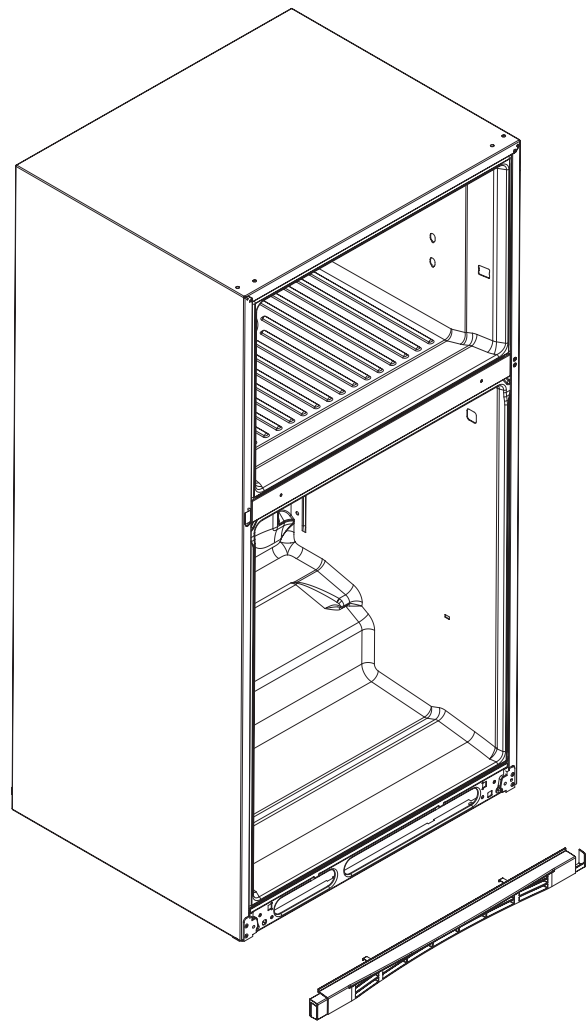
remove the drawer farthest from the door first. Make sure the drawer closest to the door is fully closed. There is a latch at the front of the center slide rail, to which the drawer is attached, away from the door. Remove the drawer.



CABINET CONSTRUCTION

Cabinet

The outer case is made of prepainted steel with a textured finish. The fresh food and freezer liners are made of plastic with a smooth finish. Individual compartments provide separation and enhanced individual control between the compartments. The plastic liner provides a thermal break between the interior of the refrigerator and freezer compartments and reduces the transfer of heat from the room into the fresh food and freezer compartments. The liner is not removable or replaceable.



GEA01144

GEA0145

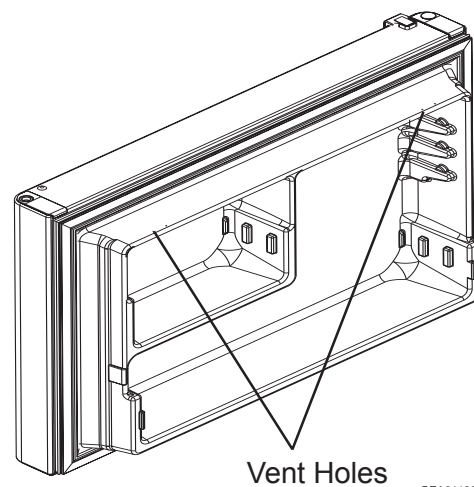
Base Grille

The base grille is attached to the cabinet with two steel spring retainers that clip into elongated openings in the base channel. To remove the grille, pull it straight forward.

Doors

The doors are of one-piece construction with foam insulation. One-piece construction provides superior thermal performance and reduces air infiltration. During manufacturing, the doors are filled with hot foam insulation. This may cause slight distortion or ripples in the inner door liner. This is a normal condition and is the result of the insulating process. This process requires doors to be equipped with vent holes that allow air to escape when the door is filled with foam. A small amount of foam may be visible around the vent holes.

The inner door panels and outer door panels cannot be separated and must be replaced as an assembly.



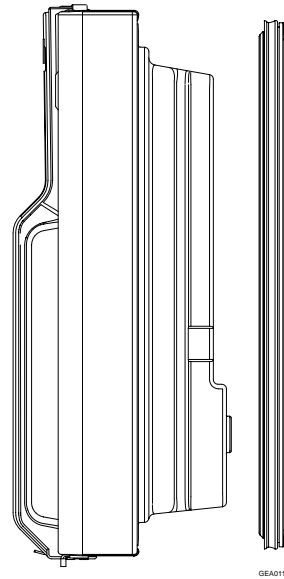
Vent Holes

GEA01138

Door Gaskets

The fresh food and freezer doors have magnetic gaskets that create a positive seal to the front of the steel cabinet. The magnetic door gaskets are secured to the fresh food and freezer doors by a barbed edge that locks into a retainer channel.

1. Starting at any corner, pull the old gasket out of the retainer channel.
2. Soak the new gasket in warm water to make it pliable.
3. Push the barbed edge of the gasket into the retainer channel.

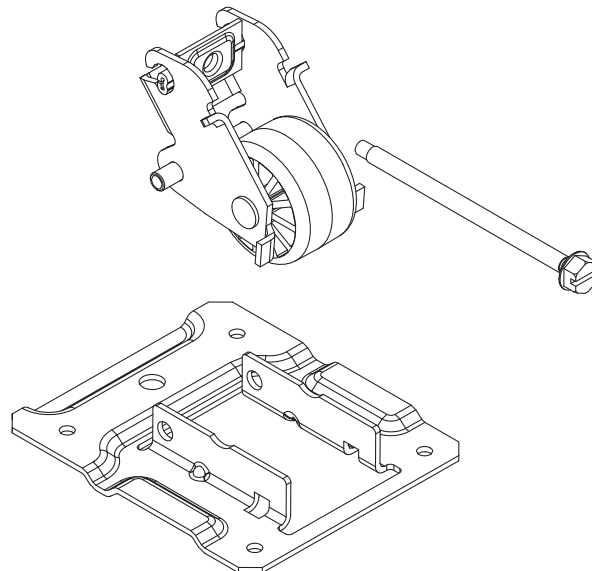


Rollers

Rollers at the base of the cabinet enable the customer to easily move the refrigerator. Cabinet leveling is done by adjusting the front rollers. To adjust the front rollers, use a 3/8-in. socket or a large flat head screwdriver to turn the roller adjustment screws located behind the base grille. The rear rollers are not adjustable.

To remove a front roller assembly from the base of the cabinet:

1. Tilt the cabinet back and place a 3-in. block under the side of the unit.
2. Remove 3 hex head 1/4-in. screws from the roller assembly.
3. Loosen the adjustment screw until it disengages from the assembly and remove the assembly from the cabinet.
4. Remove the E-ring to remove the adjustment screw from the base channel.

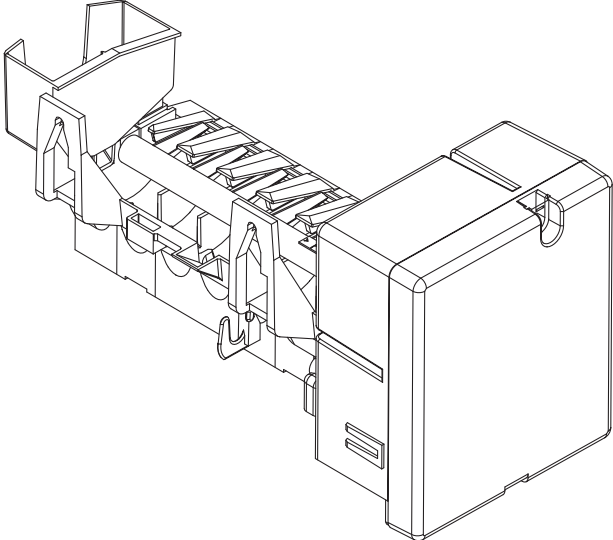


GEA01147

Note: When reinstalling the roller assembly, position the nut with the flared thread toward the rear of the unit.

ICEMAKER

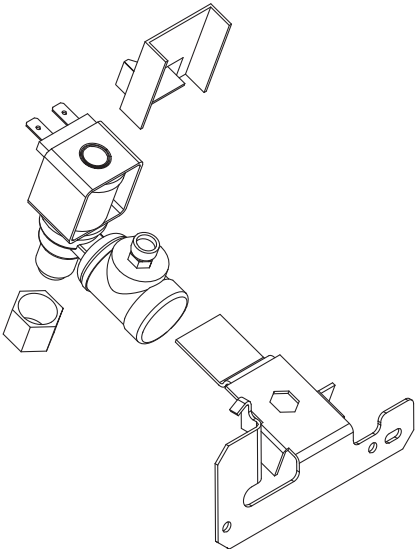
The 2001 LTMNF refrigerators use an electronic icemaker. Refer to Pub. #31-9063 for service information.



GEA01142

Water Valve

A single-coil, 120-VAC valve is secured to the rear of the cabinet, inside the machine compartment, on the left-hand side.



GEA01137

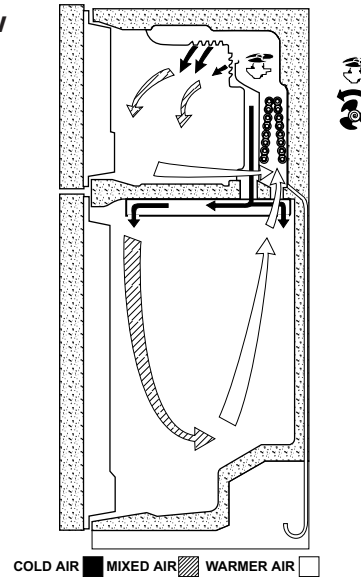
AIRFLOW

Freezer Compartment

Cold air from the evaporator is forced up against the top of the freezer and the back of the evaporator cover. It is then discharged through slots along the air tower at the rear of the freezer compartment.

Air is circulated by the evaporator fan throughout the freezer compartment, where it picks up heat and moisture. The evaporator fan then draws the warmer, moisture-laden air through return louvers in the bottom of the evaporator cover. The air is then drawn through the evaporator where heat is removed and moisture is deposited as frost.

Airflow

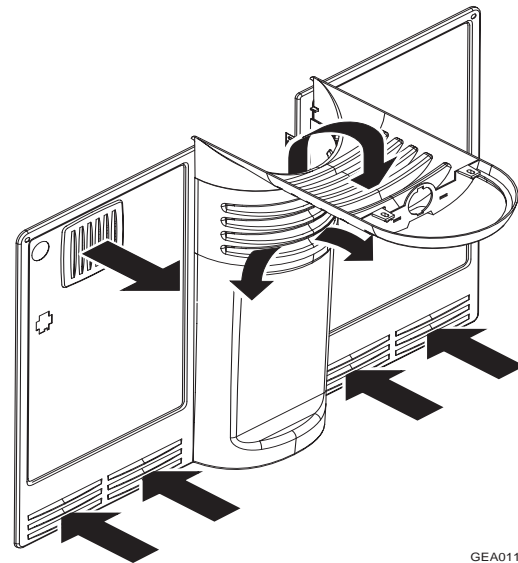


Fresh Food Compartment

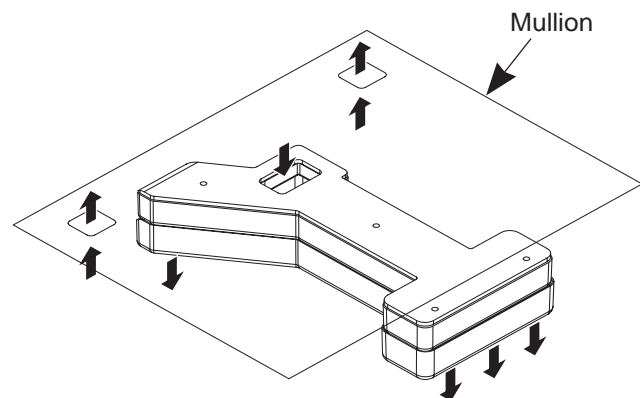
Some of the cold air that is being forced against the top of the freezer and back of the evaporator cover is diverted through the lower portion of the freezer air tower and is pushed through the mullion hole into the fresh food compartment air channel. The air then exits the air channel in the front of the fresh food compartment, creating a curtain of cold air along the front of the shelves. The fresh food air channel also has a rear discharge to maintain deli drawer temperatures.

Air circulates throughout the fresh food compartment, picking up heat and moisture. The air is then returned to the evaporator through the return air ducts located at the top right and left of the fresh food compartment.

Note: These refrigerators do NOT use damper assemblies to regulate the flow of air to the fresh food compartment. Airflow is regulated by a three-speed evaporator fan and a sized air duct system that provide predictable, consistent air exchange rates for each level of fan speed.



GEA01143



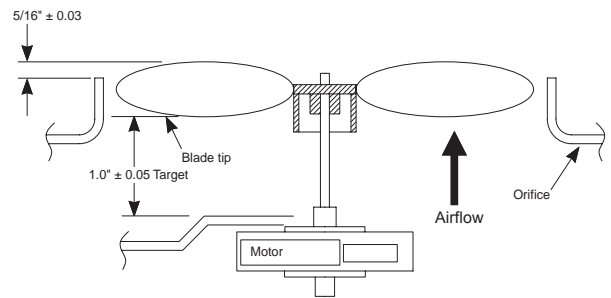
GEA01135

Evaporator Fan

The position of the fan blade in relation to the shroud is critical. Refer to graphic for specifications.

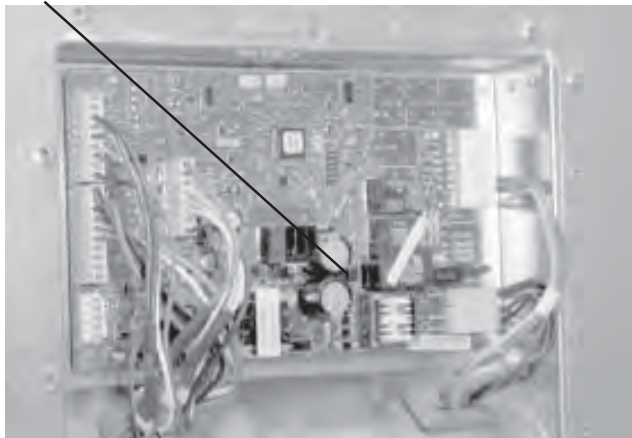
If the fan shorts, it will damage the main control board. If the resistor on the main control board is burnt, you must replace the fan and the board (see photo).

Evaporator Fan Adjustment

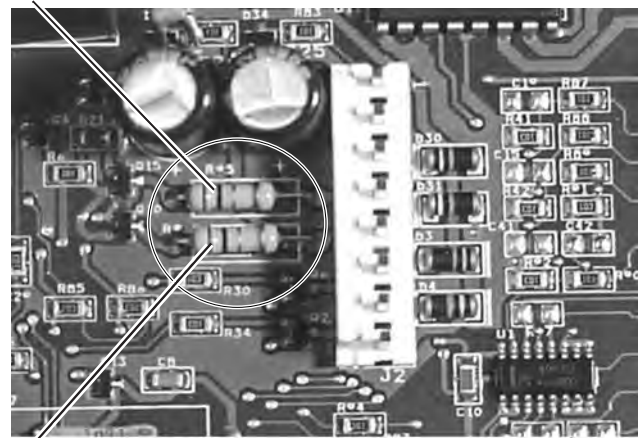


GEA01149

Evaporator and Condenser Fan Resistors

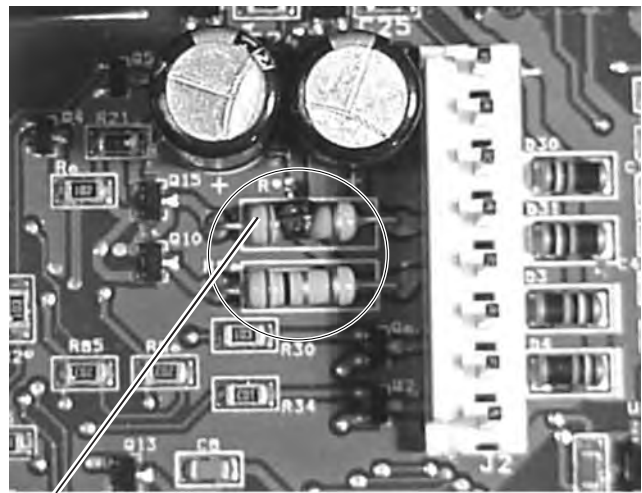


Evaporator Fan Resistor



GEA01140

Condenser Fan Resistor

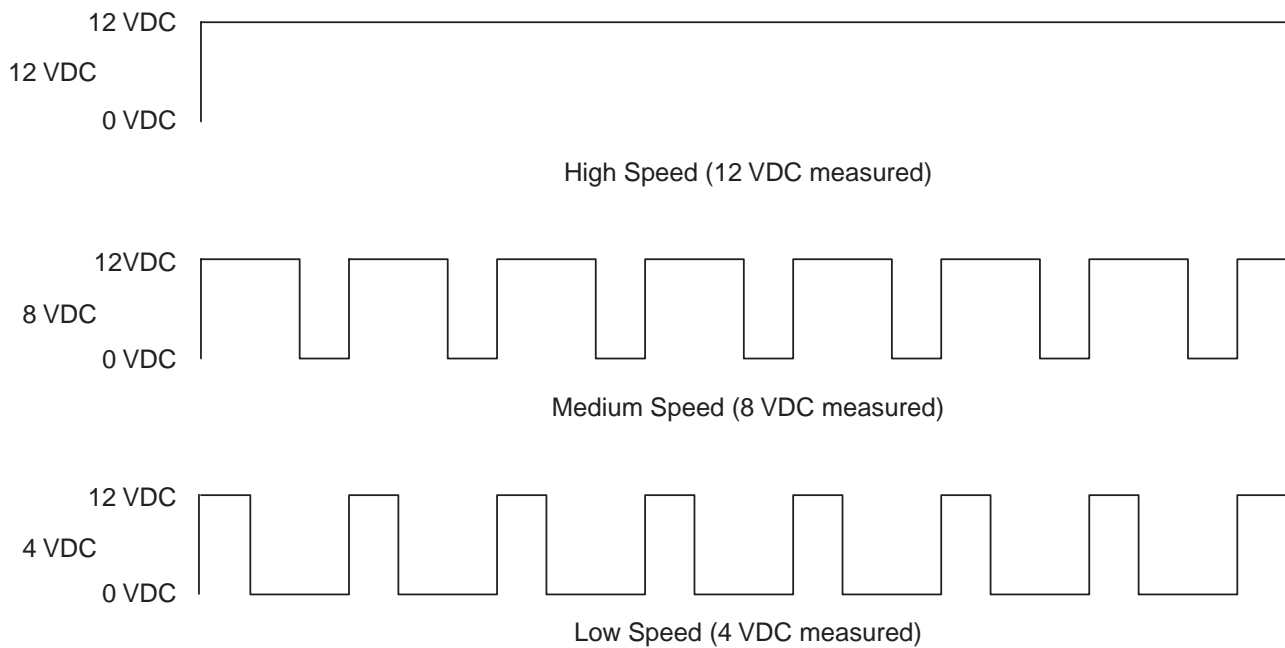


GEA01141

Bad Evaporator Fan Resistor

The evaporator 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 primary control board. Voltage output from the control board to the fan is 12.6 VDC; however, in order to regulate the speed of the fan, the control board uses pulse width modulation (PWM) during low speed and medium speed operation. When operating in low and medium speed, voltage is sent in pulses (much like a duty cycle) as opposed to an uninterrupted flow. This pulsing of 12.6 VDC produces effective voltage being received at the motor, which is the equivalent to a reduction in voltage. Fan speed will be selected and maintained by the control board regulating the length and frequency of the 12.6-VDC pulse.

One complete revolution of the motor is comprised of all 4 poles. To determine the rpm of the fan: Measure the frequency being applied to the motor. Multiply this number by 15 (60 seconds divided by 4 poles). For example, a frequency measurement of 200 Hz multiplied by 15 would show a fan speed of 3000 rpm ($15 \times 200 = 3000$). Temperature may cause some fan speed variation. Fan speed may vary +/- 5%, depending on the temperature, with higher temperatures causing slightly higher speeds.



EVAPORATOR FAN SPEEDS

GEA01139

The evaporator fan motor uses a 4-wire connection, utilizing a common wire (white), feedback/rpm wire (blue), supply wire (red), and a signal wire (yellow).

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 will cause 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 12 VDC.

Blue Wire (Feedback/RPM)

The blue wire feeds rpm (speed) information to the main control board, allowing the board to maintain consistent fan speeds. Loss of feedback from the blue wire will result in the fan accelerating to maximum speed. Measure the fan rpm using the frequency between the blue and white wires.

High speed - 195 to 200 Hz

Medium speed - 145 to 160 Hz

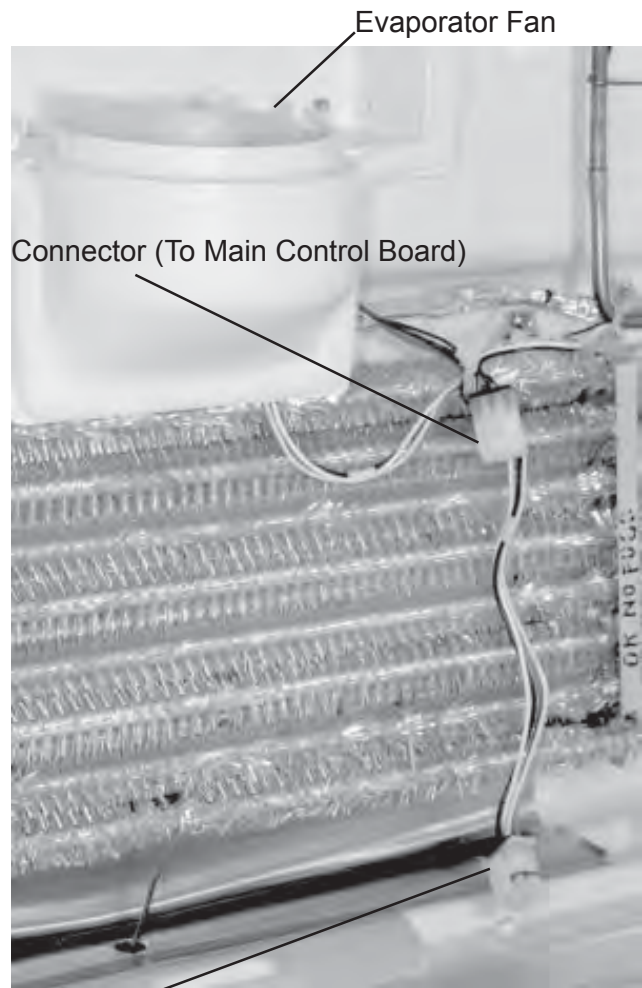
Low speed - 70 to 85 Hz

Yellow Wire (Signal)

The yellow wire is the input wire from the main control board. The main control board provides 4.6 VDC effective voltage for low speed, 8.1 VDC effective voltage for medium speed, and 12.6 VDC for high speed. The fan will operate in low speed only when the fresh food thermistor is satisfied.

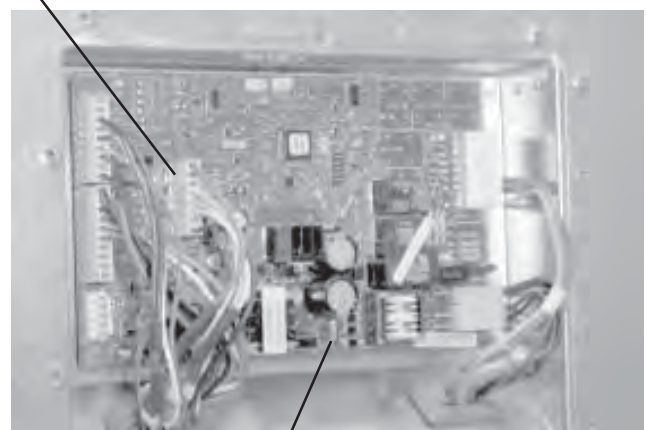
Note: When testing these motors:

- 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.



Evaporator Fan Connector

J2 (To Evaporator Fan and Condenser Fan)



Main Control Board

Condenser Fan

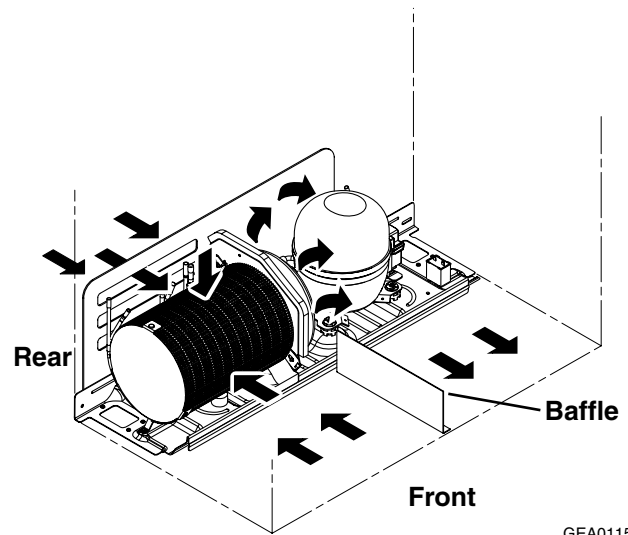
The condenser fan utilizes a DC motor that operates on a single speed and is mounted in the machine compartment with the No-Clean condenser. The fan and fan shroud are mounted on one end of the condenser, the other end of the condenser is blocked. When the fan is operating, air is pulled from the center 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.

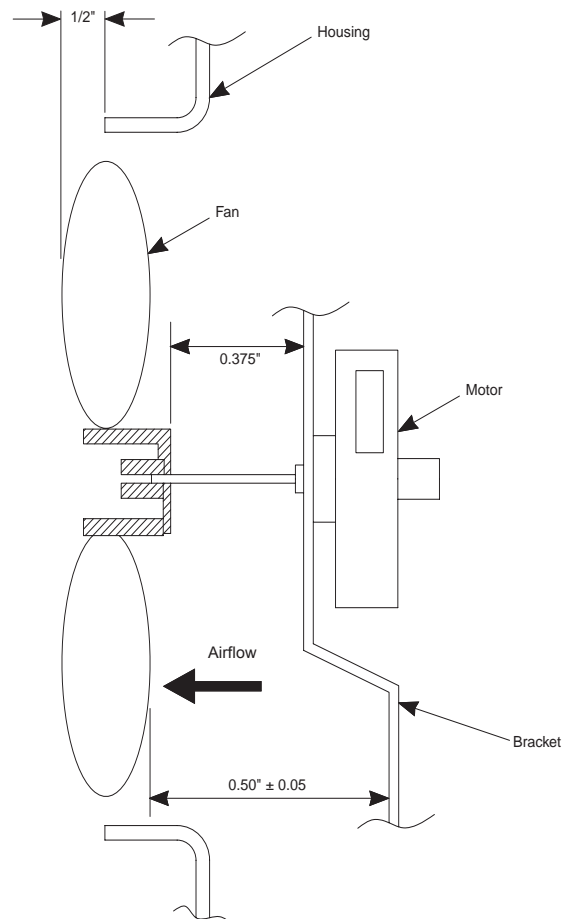
The condenser fan is mounted with screws to a fan shroud and mounting bracket that is attached to the condenser. To remove the fan:

1. Remove the rear access cover.
2. Remove 1 screw from the condenser fan mounting bracket.
3. Remove 2 screws from the condenser fan cover.
4. Pull the fan out and disconnect the electrical connector.



GEA01152

Condenser Fan Adjustment



GEA01148

DEFROST SYSTEM

Adaptive Defrost

Adaptive Defrost can be described as a defrost system that adapts to a refrigerator's surrounding environment and household usage.

Unlike conventional defrost systems that use electromechanical timers with a fixed defrost cycle time, Adaptive Defrost utilizes an intelligent, electronic control to determine when the defrost cycle is necessary. In order to accomplish the correct defrost cycle time, the main control board monitors the following refrigerator operations:

- Length of time the refrigerator doors were open since the last defrost cycle
- Length of time the compressor has run since the last defrost cycle
- Amount of time the defrost heaters were on in the last defrost cycle

Adaptive Defrost is divided into 5 separate cycles. Those operations are:

- Cooling Operation
- Pre-Chill Operation
- Defrost Heater Operation
- Dwell Period
- Post Dwell

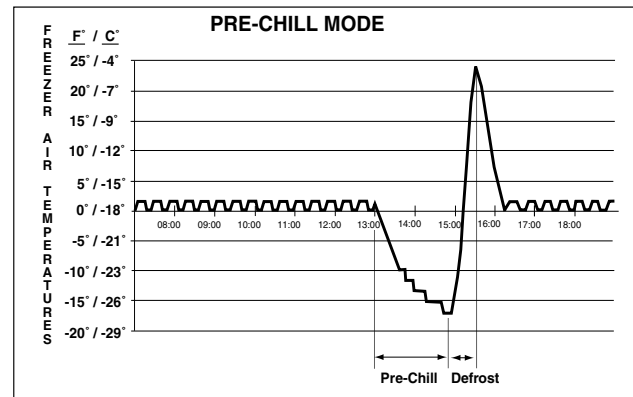
(See Pub. #31-9062 for more information on Adaptive Defrost.)

Adaptive Defrost (Cooling Operation)

During the cooling operation, the main control board monitors door opening (fresh food and freezer doors) and compressor run times. The board counts the time the doors are open. It reduces the length between defrosts by 210 seconds (multiplication factor) for each second that each door is open (if both doors are open, it reduces it by twice the amount). The multiplication factor reduces compressor run time. If the doors are not opened, the compressor will run up to 60 hours between

defrosts. If the doors are opened frequently and/or for long periods of time, the compressor run time between defrosts will be reduced to as little as 8 hours.

Adaptive Defrost (Pre-chill Operation)



When the main control board determines that defrost is necessary, it will force the refrigerator into a continuous cool mode (pre-chill). During pre-chill, the freezer temperature may be driven below the set point. However, the fresh food temperature will be regulated by the evaporator fan running at low speed. Pre-chill will last for 2 hours. These models do not have a defrost holdoff.

Adaptive Defrost (Defrost Heater Operation)

After 2 hours of pre-chill operation, the main control board turns off the compressor, condenser fan, and evaporator fan.

During defrost operation, the main control board monitors the evaporator temperature using evaporator thermistor inputs. Typically, the evaporator thermistor will sense a temperature of 65°F within 25 minutes. When the thermistor senses 65°F, the main control board will terminate defrost heater operation. Maximum defrost cycle (heater on) time is 45 minutes (main control board time out).

The defrost system is protected by a defrost termination thermostat (switch). The thermostat opens when the evaporator temperature raises to 140°F and closes when the evaporator temperature lowers to 110°F.

Adaptive Defrost (Dwell Period)

After defrost heater operation has been terminated by the main control board, a 5-minute dwell period occurs. During this period, the compressor, condenser fan, and the evaporator fan remain off. The remaining frost melting from the evaporator will continue to drip and drain so that prior to the cooling operation, the evaporator will be totally clear of any moisture. After the 5-minute dwell period, the unit goes into post dwell.

Adaptive Defrost (Post Dwell)

The post dwell period is designed to cool the evaporator before circulating air within the refrigerator. This prevents any residual heat on the evaporator from being distributed in the freezer. During this period, the compressor is on and the condenser fan is on, but the evaporator fan is off. Post dwell will last 15 minutes or until the evaporator temperature reaches 30°F on these models.

Normal Operating Characteristics That Are Different from Previous Models

- Evaporator fan running without compressor or condenser fan.
- Post Dwell (Adaptive Defrost), compressor, and condenser fan on with evaporator fan off after defrost cycle.
- Liner Protection Mode, fan comes on when the doors are open for 3 minutes.
- Evaporator fan and compressor can run continuously for 2 hours (Adaptive Defrost).
- Different sound levels can be heard when the fan changes speed.
- Response time for drastic temperature change is 2 to 10 minutes. The main control board will only respond to 8 degrees (Fahrenheit) of temperature change per minute as determined by resistance of sensor.

Abnormal Operating Characteristics (Incorrect Operation)

- Rapid fan speed changes, fan takes at least 1 minute to change speeds.
- Compressor running without the condenser fan. The compressor and condenser fan should always run at the same time.

Liner Protection Mode

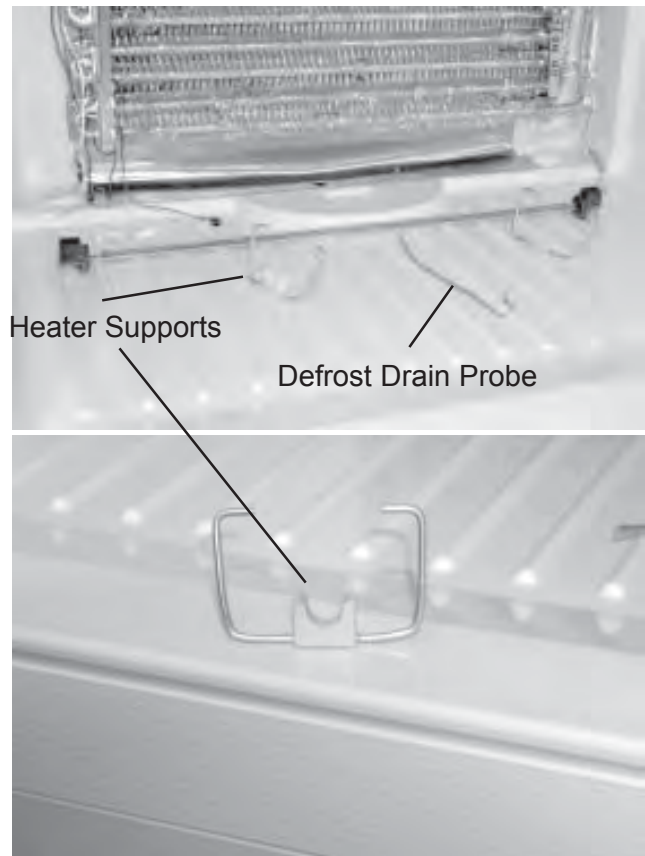
The liner protection mode will activate if either of the doors have been open for 3 minutes. This mode will start the evaporator fan on high speed.

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 and damper operations resume 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.

Defrost Heater

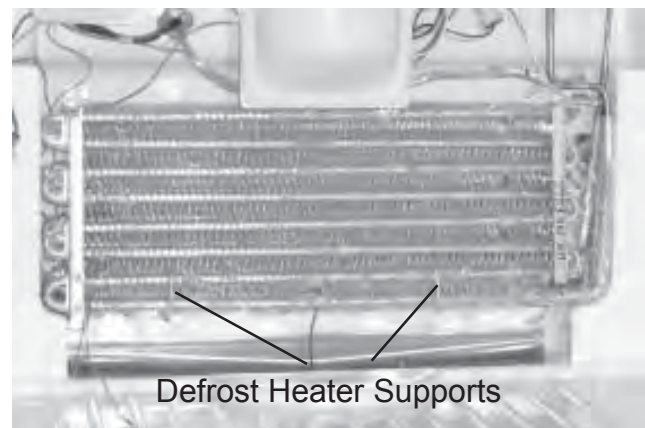
The defrost heater is a single-tube, radiant heater. It is held in place by 2 tabs on the evaporator (1 on each side) and by 2 ceramic and wire supports.

The ceramic and wire supports prevent the heater from sagging and touching the metal drain pan if the glass is broken.



Evaporator Thermistor

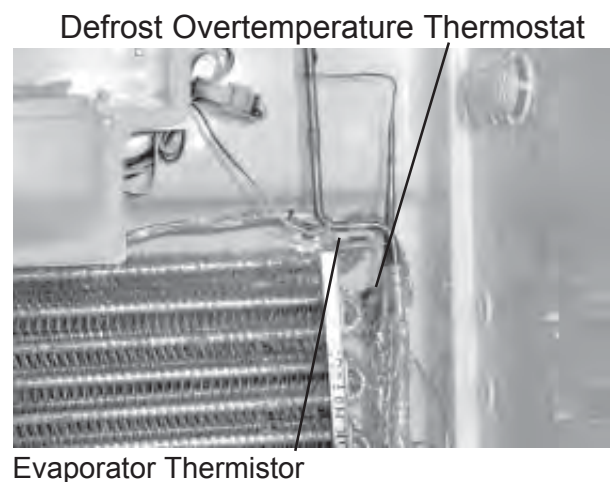
The evaporator thermistor is mounted on the upper right side of the evaporator. The defrost cycle will terminate when the main control board detects 65°F from the evaporator thermistor. The main control board must sense 65°F in less than 45 minutes, or the defrost cycle will time out. Normal defrost time is 25 minutes or less, not including the 5-minute dwell or post dwell periods.



Defrost Overtemperature Thermostat

The defrost overtemperature thermostat (bimetal switch) is mounted on the evaporator and provides overtemperature protection during defrost. This thermostat will open at 140°F and will close at 110°F.

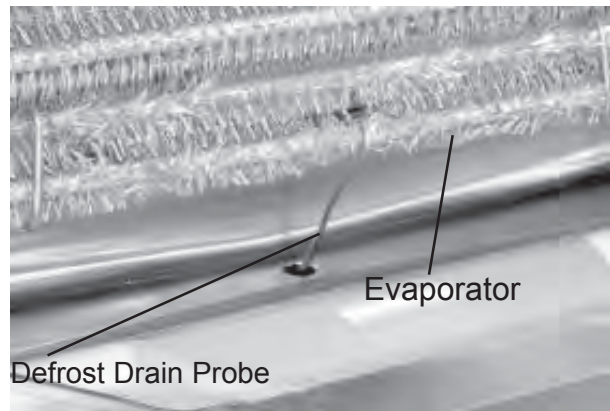
Note: The main control board will not know if the heater does not come on due to a broken heater, open defrost overtemperature thermostat, or an open wiring harness. The defrost heater is controlled by maximum time on the main control board or temperature at the evaporator thermistor.



Defrost Probes

A defrost drain probe is attached to the evaporator and extends into the drain opening. This probe transfers heat to the drain opening during defrost.

Two additional defrost probes are attached to the sides of the evaporator. These probes extend upward between the freezer wall and evaporator sides to assist the defrosting process.

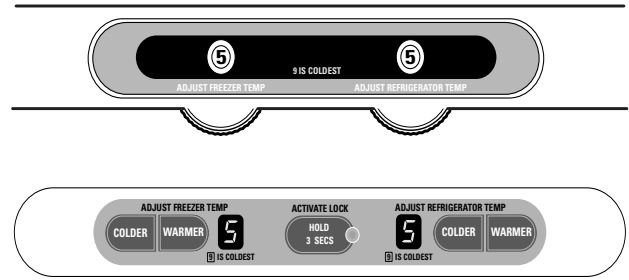


CONTROL SYSTEM

Control Console

The control console, located at the top front of the fresh food compartment, contains an encoder (knob version) or a touch panel.

Remove the control console by removing 4 (1/4-in.) hex head screws. Use care when disconnecting the wire connectors from the encoder or touch panel.



Temperature Encoder

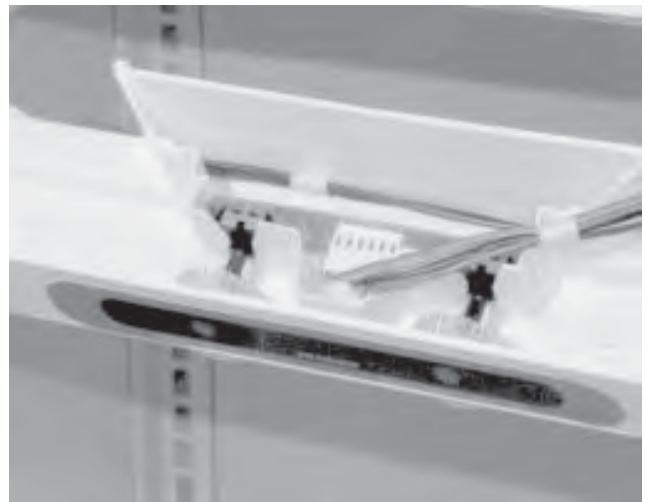
The temperature encoder (knob version) receives switched DC voltage from the main control board. There are two possible failure modes - both are open circuits.

An open circuit from the supply side results in the refrigerator defaulting to midpoint. The supply side consists of pins 1 and 2.

An open circuit from the return side results in inconsistent run mode. The return side consists of pins 3 and 6.

Failure of the fresh-food-only side results in the fresh food defaulting to midpoint.

Failure of the freezer side results in the freezer defaulting to midpoint.



Temperature Touch Panel

The temperature touch panel receives switched DC voltage from the main control board.

Failure of input results in default to most recent setting. Input consists of pins 2 to 3.

Failure of output results in erratic control. Output consists of pin 1.



Control Board

The main control board, located behind a panel at the rear of the refrigerator, manages the operation of the refrigerator by calculating response from various inputs.

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|--|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J1 | 1 | VDC | | Feedback of fresh food thermistor value. Thermistor is NTC, when temperature drops, resistance value increases, causing return voltage reduction. This value is used to cycle fresh food fan (when used), evaporator fan, compressor, and condensor fan. Feedback is filtered to respond to 8 degrees of change per minute. |
| J1 | 2 | VDC | | Feedback of second fresh food thermistor value (when used). Thermistor is NTC, when temperature drops, resistance value increases, causing return voltage reduction. This value is used to cycle fresh food fan (when used), evaporator fan, compressor, and condensor fan. Feedback is filtered to respond to 8 degrees of change per minute. |
| J1 | 3 | VDC | | Feedback of freezer thermistor value. Thermistor is NTC, when temperature drops, resistance value increases, causing return voltage reduction. This value is used to cycle evaporator fan, compressor, and condensor fan, and will not cycle fresh food fan (when used). Feedback is filtered to respond to 8 degrees of change per minute. |
| J1 | 4 | VDC | | Feedback of evaporator thermistor value. Thermistor is NTC, when temperature drops, resistance value increases, causing return voltage reduction. This thermistor value is used to cycle the heater on during defrost when temperature is below defrost value and off when the temperature is above defrost value. This value is also read during power-up to determine if refrigerator goes into pulldown mode or cycle continuation. Feedback is unfiltered, responds immediately. |
| J1 | 5 | | VDC | Provides 5 VDC for thermistors and personality pins on J1. |
| J1 | 6 | VDC | | Selection pin that, when connected in combination with other personality pins, determines model and programming used. Reads combination on power-up only. |
| J1 | 7 | VDC | | Selection pin that, when connected in combination with other personality pins, determines model and programming used. Reads combination on power-up only. |
| J1 | 8 | VDC | | Selection pin that, when connected in combination with other personality pins, determines model and programming used. Reads combination on power-up only. |
| J1 | 9 | VDC | | Selection pin that, when connected in combination with other personality pins, determines model and programming used. Reads combination on power-up only. |

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|---|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J2 | 1 | Hz | | Feedback from evaporator fan. This feedback frequency is used to control the PWM for fan speeds. |
| J2 | 2 | VDC | | Selection pin that, when connected in combination with other personality pins, determines model and programming used. |
| J2 | 3 | | VDC | Fan common - VDC ground |
| J2 | 4 | | VDC | Output to evaporator fan for motor operation. Effective voltage is determined by PWM. |
| J2 | 5 | | VDC | Output to condensor fan for motor operation. Effective voltage is determined by PWM, speed set in EEPROM. |
| J2 | 6 | | VDC | Output to fresh food fan (when used) for motor operation. There is no feedback for PWM used on fresh food fan. |
| J2 | 7 | | VDC | Output to CustomCool fan (when used) for motor operation. There is no feedback for PWM used on QuickChill fan. |
| J2 | 8 | | VDC | Provides 12 VDC supply voltage to all fans, constant voltage. |

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|---|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J3 | 1 | | VDC | Damper (when used). |
| J3 | 2 | | VDC | Damper (when used). |
| J3 | 3 | | VDC | Damper (when used). |
| J3 | 4 | | VDC | Damper (when used). |
| J3 | 5 | | VDC | Fresh food output to temperature encoder. Loss of output causes fresh food compartment to operate at midpoint setting. Energized every 50 milliseconds, then energizes pin 6. Reads pattern on pins 7 - 10 to see what position fresh food encoder is in. No signal from pins 7 - 10 results in erratic fresh food and freezer operation. |
| J3 | 6 | | VDC | Freezer output to temperature encoder. Loss of output causes freezer compartment to operate at midpoint setting. Energized every 50 milliseconds after pin 5 is energized. Reads pattern on pins 7 - 10 to see what position freezer encoder is in. No signal from pins 7 - 10 results in erratic fresh food and freezer operation. |
| J3 | 7 | VDC | | Input from temperature encoder. Loss of input results in erratic operation. |
| J3 | 8 | VDC | | Input from temperature encoder. Loss of input results in erratic operation. |
| J3 | 9 | VDC | | Input from temperature encoder. Loss of input results in erratic operation. |
| J3 | 10 | VDC | | Input from temperature encoder. Loss of input results in erratic operation. |

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-----------------------|-----------------------|--|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J4 | 1 | Digital Communication | Digital Communication | Two-way digital communication between control and control board. |
| J4 | 2 | | VDC | 12-VDC supply. |
| J4 | 3 | | VDC | DC common. |
| J4 | 4 | VDC | | Used on some dispenser models to activate water, cubed and/or crushed ice. |
| J4 | 5 | VDC | | Used on some dispenser models to activate water, cubed and/or crushed ice. |
| | | | | No signal on pin 4 and no signal on pin 5 is off position. No signal on pin 4 with signal on pin 5 is crushed selection. Signal on pin 4 and no signal on pin 5 is cubed selection. Signal on pin 4 and signal on pin 5 is water selection. |

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|--|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J5 | 1 | | VDC | CustomCool damper (when used). |
| J5 | 2 | | VDC | CustomCool damper (when used). |
| J5 | 3 | | VDC | CustomCool damper (when used). |
| J5 | 4 | | VDC | CustomCool damper (when used). |
| J5 | 5 | | VDC | Input voltage to J5 pin connections: + 5 VDC. |
| J5 | 6 | | VDC | Feedback of CustomCool thermistor value. Thermistor is NTC, when temperature drops, resistance value increases, causing a reduction in return voltage. This value is used to cycle CustomCool fan (when used). |

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|---|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J7 | 1 | | VAC | Output to auger motor circuit on models equipped with dispenser. Will not provide output when no input is present at pin 4. |
| J7 | 2 | | VAC | Output to cube solenoid circuit on models equipped with dispenser. Will not provide output when no input is present at pin 4. |
| J7 | 3 | | VAC | Output to water valve solenoid circuit on models equipped with water dispenser. Will not provide output when no input is present at pin 7. |
| J7 | 4 | VAC | | Interlock circuit. Receives input from freezer door switch when door is closed (switch closed). Will not allow output to pins 1 or 2 when input present. |
| J7 | 5 | | VAC | L1 output to CustomCool heater when equipped. |
| J7 | 6 | VAC | | Receives L1 input from fresh food door switch when switch closes (door open). This input is used for fan power door control, liner protection mode calculations, door alarm calculations, and adaptive defrost calculations. |
| J7 | 7 | VAC | | Receives L1 input from freezer door switch when switch closes (door open). This input is used for fan power door control, liner protection mode calculations, adaptive defrost calculations, door alarm calculations, and some door interlock functions. Switch must be closed in door closed position (switch depressed) for dispenser light and duct door magnet to energize. |
| J7 | 8 | | | |
| J7 | 9 | VAC | | AC neutral in |

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|---|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J8 | 1 | | VAC | Switched L1 output to compressor circuit. A timer counts how long circuit is energized and uses this information to determine when the next defrost will occur. |

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|--|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J9 | 1 | | VAC | Switched L1 voltage to the defrost circuit - 120 VAC. A timer counts how long this circuit is energized and uses this information to determine if the next defrost cycle is adaptive or nonadaptive. |

| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|--|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J11 | 1 | VAC | | Constant L1 voltage to control board circuits - 120 VAC input potential for switched L1 terminals. |

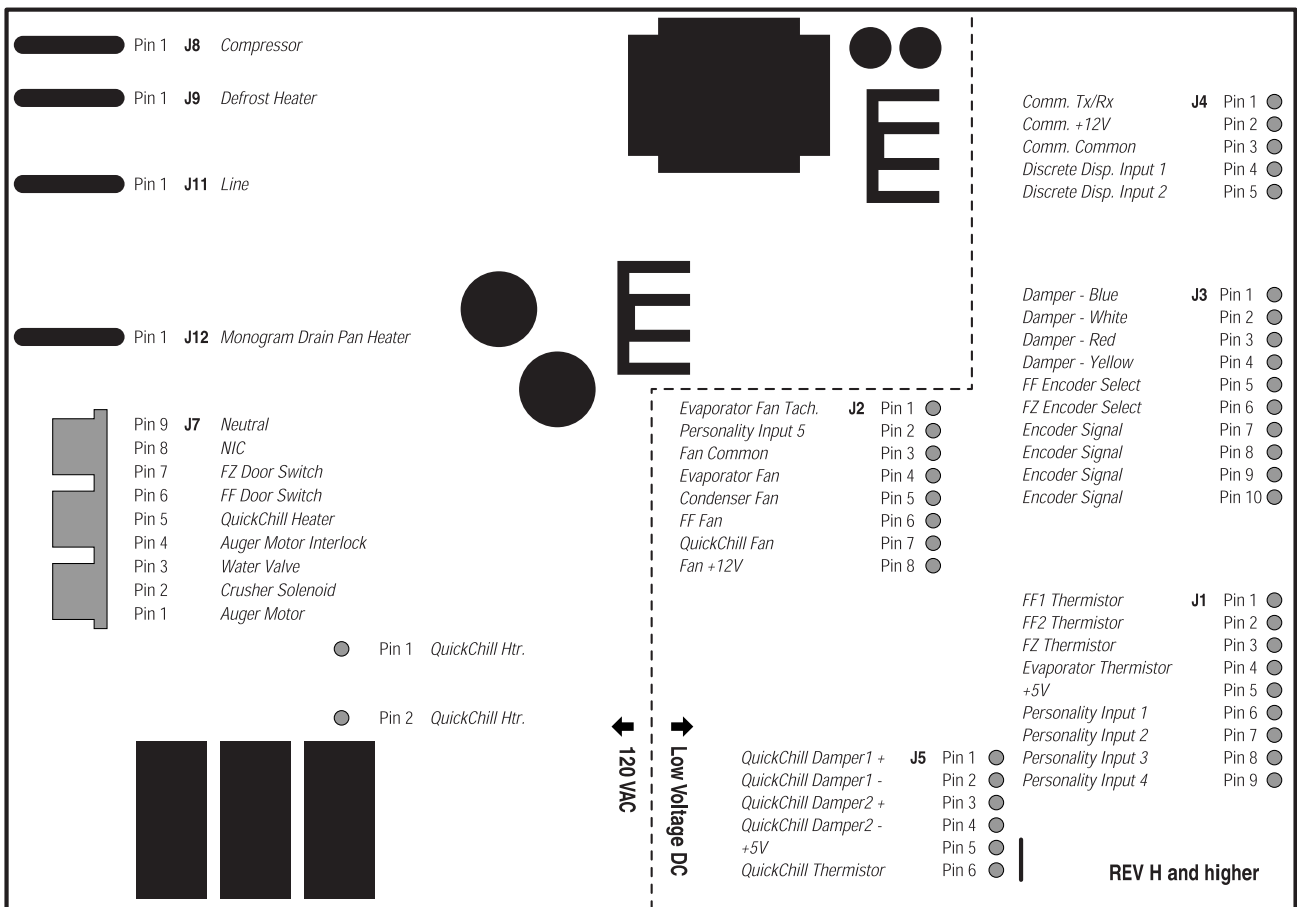
| CONTROL BOARD PIN DEFINITIONS | | | | |
|-------------------------------|-----|-------|--------|--|
| CONNECTOR | PIN | INPUT | OUTPUT | FUNCTION |
| J12 | 1 | | VAC | Switched L1 voltage to the drain pan heater for Monogram models (when used). |

| Main Control Board Locator Table J1 Connector (Low-Voltage Side) | | | | |
|---|-------------------|-----------------------------------|---------------------|------------------------------------|
| Pin | Wire Color | Component Termination | Input/Output | Pin-to-Pin Voltage Reading |
| 1 | Blue/Red | Fresh food thermistor | Input | J1 pin 1 to pin 5 = 2.8 to 3.5 VDC |
| 2 | Not used | Not used | Not used | Not used |
| 3 | Red/White | Freezer thermistor | Input | J1 pin 3 to pin 5 = 2.8 to 3.5 VDC |
| 4 | White | Evaporator thermistor | Input | J1 pin 4 to pin 5 = 2.8 to 3.5 VDC |
| 5 | Blue | Thermistor supply voltage (5 VDC) | Output | J1 pin 5 to J7 pin 9 = 5 VDC |
| 6 | Not used | Not used | Not used | Not used |
| 7 | Blue | Thermistor supply voltage (5 VDC) | Output | J1 pin 7 to J7 pin 9 = 5 VDC |

| Main Control Board J2 Connector (Low-Voltage Side) | | | | |
|---|-------------------|------------------------------|---------------------|--|
| Pin | Wire Color | Component Termination | Input/Output | Pin-to-Pin Voltage Reading |
| 1 | Blue | Evaporator fan tachometer | Input | J2 pin 1 to pin 3 = 6.3 VDC |
| 2 | Not used | Not used | Not used | Not used |
| 3 | White | Fan common | Common | J2 pin 3 to pin 8 = 12 VDC |
| 4 | Yellow/Black | Evaporator fan | Output | J2 pin 4 to pin 3 = 12.6 VDC (high), 8.1 VDC (med.), 4.6 VDC (low) |
| 5 | Yellow | Condenser fan | Output | J2 pin 5 to pin 3 = 13.4 VDC (condenser fan is single speed) |
| 6 | Not used | Not used | Not used | Not used |
| 7 | Not used | Not used | Not used | Not used |
| 8 | Red | Fan supply voltage (12 VDC) | Output | J2 pin 8 to pin 3 = 12 VDC |

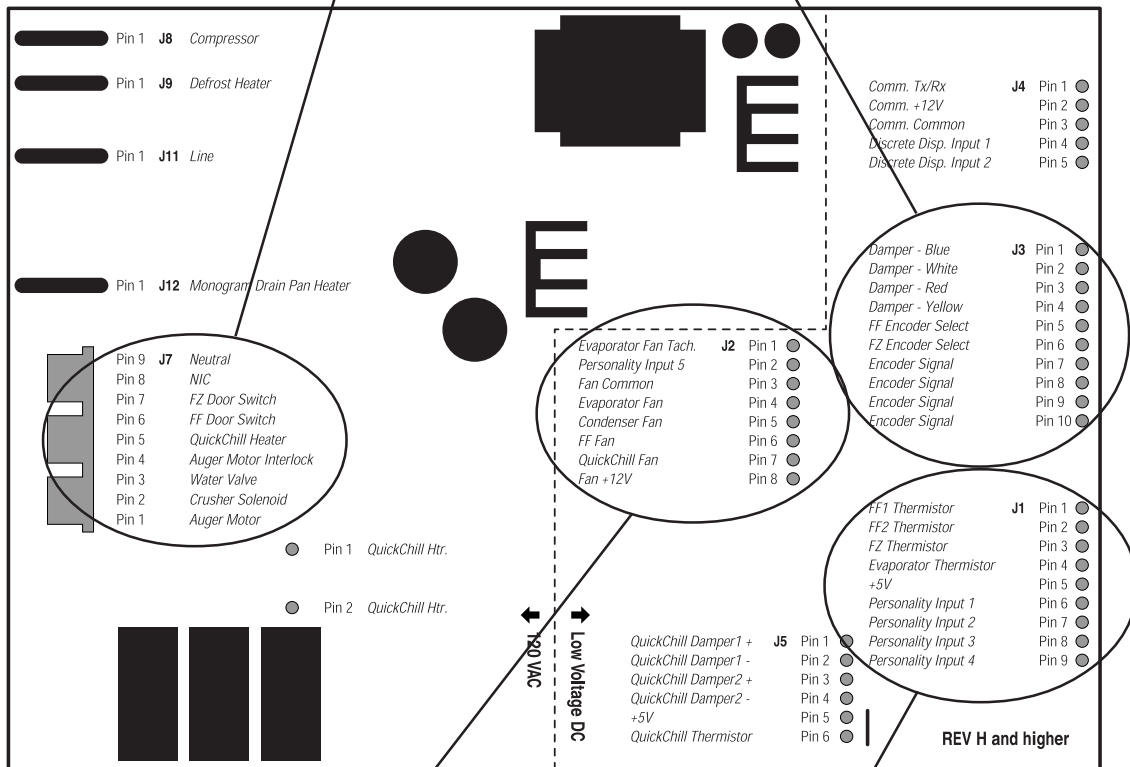
| Main Control Board J3 Connector (Low-Voltage Side) | | | | |
|---|-------------------|------------------------------|----------------------|-----------------------------------|
| Pin | Wire Color | Component Termination | Input/ Output | Pin-to-Pin Voltage Reading |
| 5 | Blue/Yellow | Temperature control panel | | |
| 6 | White/Brown | Temperature control panel | | |
| 7 | Red/Black | Temperature control panel | | |
| 8 | Black | Temperature control panel | | |
| 9 | Red | Temperature control panel | | |
| 10 | Red | Temperature control panel | | |

| Main Control Board J7 Connector (Low-Voltage Side) | | | | |
|---|-------------------|------------------------------|----------------------|---|
| Pin | Wire Color | Component Termination | Input/ Output | Pin-to-Pin Voltage Reading |
| 6 | Purple | Fresh food door light switch | Input | J7 pin 6 to J7 pin 9 = 120 VAC (FF door open) |
| 7 | Red | Freezer door light switch | Input | J7 pin 7 to J7 pin 9 = 120 VAC (FZ door open) |
| 8 | Not used | Not used | Not used | Not used |
| 9 | Orange | Neutral | Neutral | Neutral |



| Main Control Board J7 Connector (Low-Voltage Side) | | | | |
|---|------------|------------------------------|--------------|---|
| Pin | Wire Color | Component Termination | Input/Output | Pin-to-Pin Voltage Reading |
| 6 | Purple | Fresh food door light switch | Input | J7 pin 6 to J7 pin 9 = 120 VAC (FF door open) |
| 7 | Red | Freezer door light switch | Input | J7 pin 7 to J7 pin 9 = 120 VAC (FZ door open) |
| 8 | Not used | Not used | Not used | Not used |
| 9 | Orange | Neutral | Neutral | Neutral |

| Main Control Board J3 Connector (Low-Voltage Side) | | | | |
|---|-------------|---------------------------|--------------|----------------------------|
| Pin | Wire Color | Component Termination | Input/Output | Pin-to-Pin Voltage Reading |
| 5 | Blue/Yellow | Temperature control panel | | |
| 6 | White/Brown | Temperature control panel | | |
| 7 | Red/Black | Temperature control panel | | |
| 8 | Black | Temperature control panel | | |
| 9 | Red | Temperature control panel | | |
| 10 | Red | Temperature control panel | | |



| Main Control Board J2 Connector (Low-Voltage Side) | | | | |
|---|--------------|-----------------------------|--------------|--|
| Pin | Wire Color | Component Termination | Input/Output | Pin-to-Pin Voltage Reading |
| 1 | Blue | Evaporator fan tachometer | Input | J2 pin 1 to pin 3 = 6.3 VDC |
| 2 | Not used | Not used | Not used | Not used |
| 3 | White | Fan common | Common | J2 pin 3 to pin 8 = 12 VDC |
| 4 | Yellow/Black | Evaporator fan | Output | J2 pin 4 to pin 3 = 12.6 VDC (high), 8.1 VDC (med.), 4.6 VDC (low) |
| 5 | Yellow | Condenser fan | Output | J2 pin 5 to pin 3 = 13.4 VDC (condenser fan is single speed) |
| 6 | Not used | Not used | Not used | Not used |
| 7 | Not used | Not used | Not used | Not used |
| 8 | Red | Fan supply voltage (12 VDC) | Output | J2 pin 8 to pin 3 = 12 VDC |

| Main Control Board Locator Table J1 Connector (Low-Voltage Side) | | | | |
|---|------------|-----------------------------------|--------------|------------------------------------|
| Pin | Wire Color | Component Termination | Input/Output | Pin-to-Pin Voltage Reading |
| 1 | Blue/Red | Fresh food thermistor | Input | J1 pin 1 to pin 5 = 2.8 to 3.5 VDC |
| 2 | Not used | Not used | Not used | Not used |
| 3 | Red/White | Freezer thermistor | Input | J1 pin 3 to pin 5 = 2.8 to 3.5 VDC |
| 4 | White | Evaporator thermistor | Input | J1 pin 4 to pin 5 = 2.8 to 3.5 VDC |
| 5 | Blue | Thermistor supply voltage (5 VDC) | Output | J1 pin 5 to J7 pin 9 = 5 VDC |
| 6 | Not used | Not used | Not used | Not used |
| 7 | Blue | Thermistor supply voltage (5 VDC) | Output | J1 pin 7 to J7 pin 9 = 5 VDC |

Thermistors

This main control board uses input from 3 thermistors. These thermistors are located in the fresh food section, the freezer section, and on the evaporator. The main control board monitors the thermistors to determine the temperature in these areas of the unit and determines which components to run and when to run them, based on this information.

| Thermistor Values | | |
|-------------------------|-------------------------|-------------------------|
| Temperature Degrees (C) | Temperature Degrees (F) | Resistance in Kilo-ohms |
| -40 | -40 | 166.8 kΩ |
| -30 | -22 | 88 kΩ |
| -20 | -4 | 48.4 kΩ |
| -10 | 14 | 27.6 kΩ |
| 0 | 32 | 16.3 kΩ |
| 10 | 50 | 10 kΩ |
| 20 | 68 | 6.2 kΩ |
| 30 | 86 | 4 kΩ |
| 40 | 104 | 2.6 kΩ |
| 50 | 122 | 1.8 kΩ |
| 60 | 140 | 1.2 kΩ |

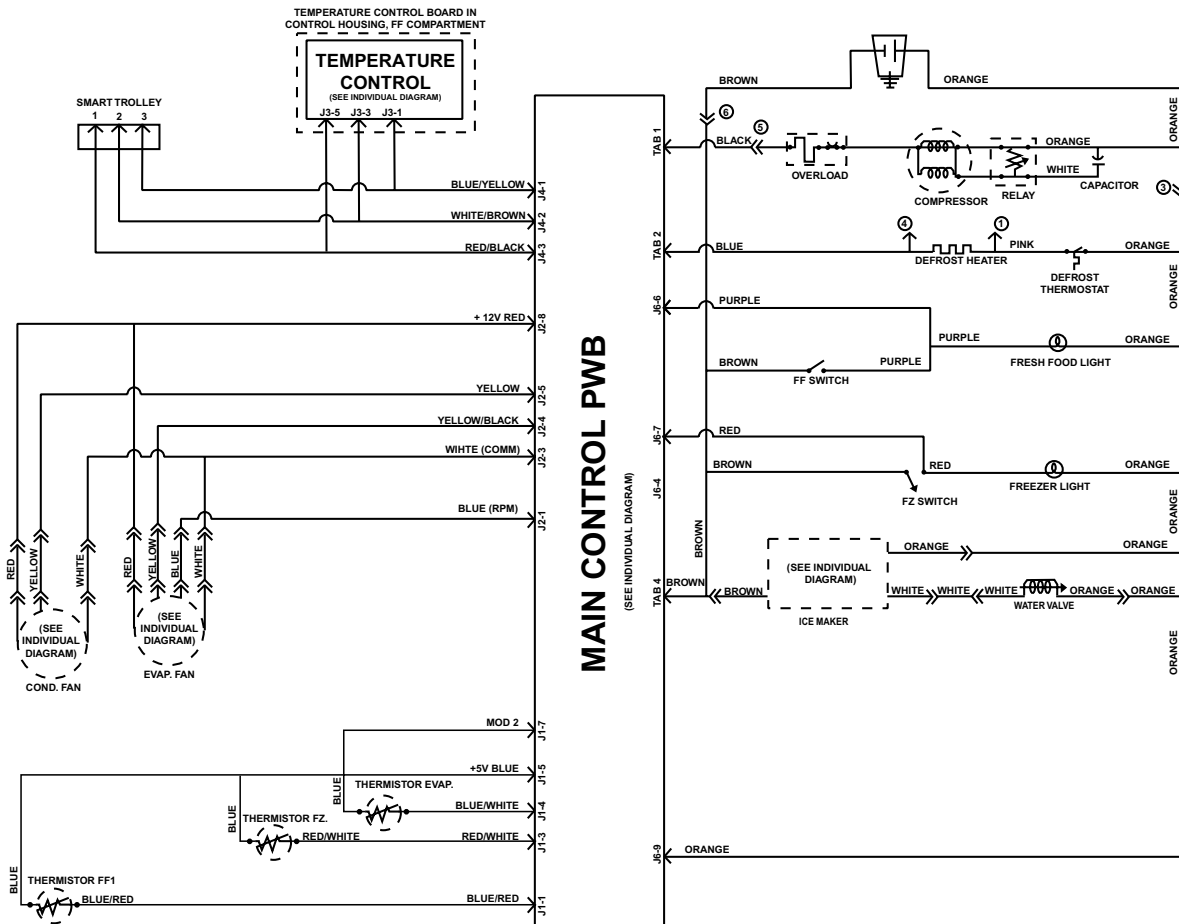
| Temperature Set Point Chart | | | | | | |
|-----------------------------|------------------------|---------------------|---|---------|--------------------------------------|---------|
| Control Setting | Fresh Food Compartment | Freezer Compartment | Fresh Food Thermistor Temperature Range | | Freezer Thermistor Temperature Range | |
| | | | Minimum | Maximum | Minimum | Maximum |
| 0 | Off | Off | | | | |
| 1 | 44°F | 6°F | 43°F | 45°F | 1°F | 11°F |
| 2 | 40°F | 4°F | 39°F | 41°F | -1°F | 9°F |
| 3 | 39°F | 3°F | 38°F | 40°F | -2°F | 8°F |
| 4 | 38°F | 1°F | 37°F | 39°F | -4°F | 6°F |
| 5 | 37°F | 0°F | 36°F | 38°F | -5°F | 5°F |
| 6 | 36°F | -1°F | 35°F | 37°F | -6°F | 4°F |
| 7 | 35°F | -3°F | 34°F | 36°F | -8°F | 2°F |
| 8 | 35°F | -4°F | 34°F | 36°F | -9°F | 1°F |
| 9 | 34°F | -6°F | 33°F | 35°F | -11°F | -1°F |

ELECTRICAL SYSTEM

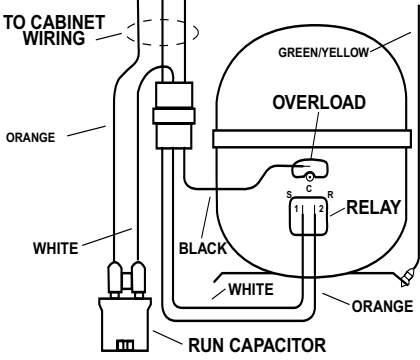
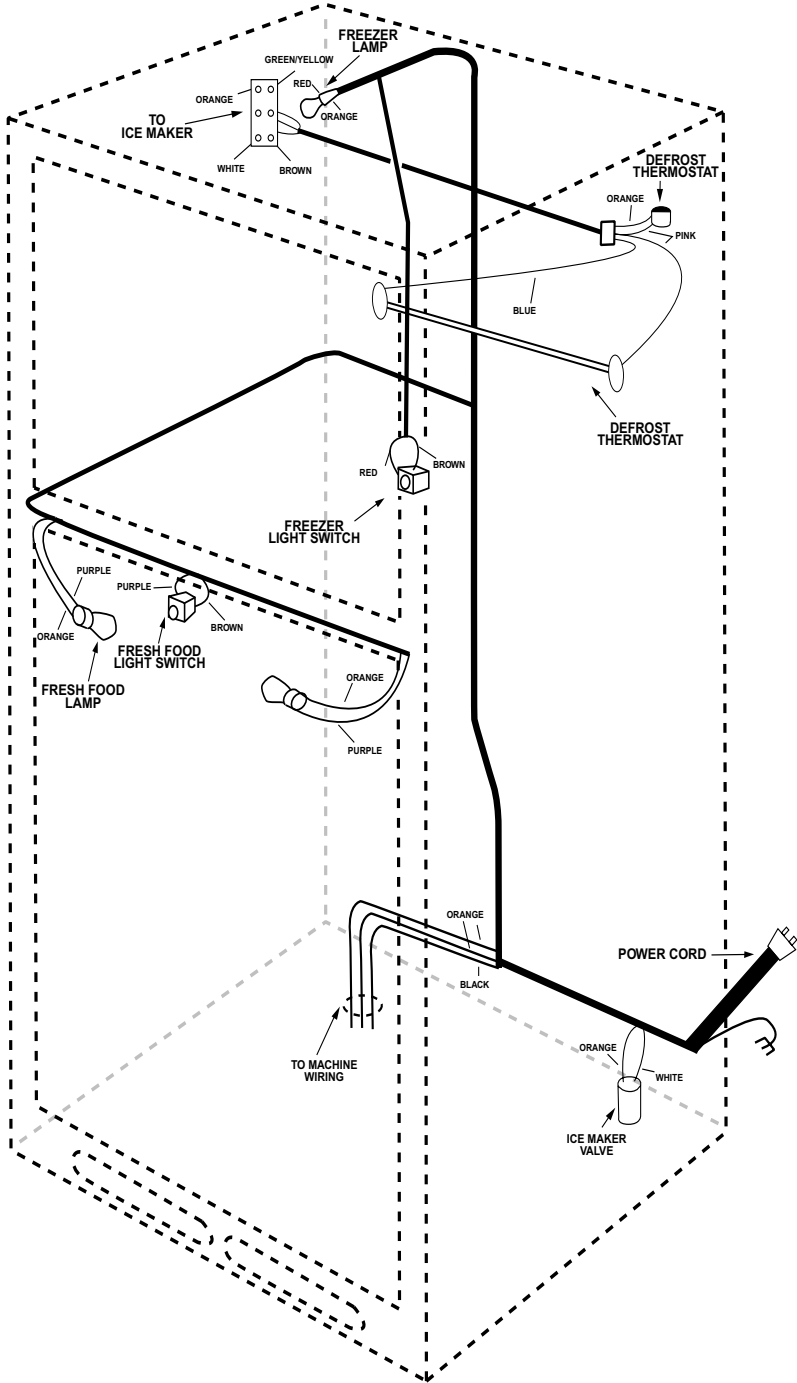
Door Switches

The door switch (fresh food or freezer) closes when the door is open. When the door switch is closed, L1 is provided to the compartment light(s). The main control board receives L1 input on pin 6, J7 when the fresh food door switch is closed (door open). The main control board receives L1 input on pin 4, J7 when the freezer door switch is closed (door open).

Schematic



Wiring Diagram



REFRIGERATION SYSTEM

The major components of the refrigeration system are a reciprocating-type compressor, condenser, condenser loop, dryer, and a spine-fin evaporator. These components, except for the condenser loop, are all replaceable separately.

Compressor

The compressor is a reciprocating type. Refer to the mini-manual for the BTU/hour rating and the compressor capacity test specification. A 1/4-in. O.D. copper process tube is provided for access to the low-pressure side of the refrigeration system.

The channel that the compressor is mounted in must be disengaged from the cabinet to remove the compressor.

Note: Capillary tube must be clipped to compressor suction line near the dryer. If capillary tube is not clipped to suction line, a knocking noise may occur during compressor operation.

Refer to the compressor replacement instructions included with the replacement compressor.

No-Clean Condenser

The Condenser is a **No-Clean**, “jelly roll” style condenser made of 3/16-in. O.D. steel tubing. The outlet of the condenser is connected to a copper jumper tube that is connected to the inlet of the condenser loop. The No-Clean condenser is accessed from the rear of the cabinet and is designed to be more tolerant of lint buildup than previous condensers. The consumer, in normal operating conditions, will never have to clean the condenser. If necessary, only an ordinary appliance brush is used. Air is drawn in from the outside diameter of the condenser. A condenser fan baffle is located at the rear to direct airflow through the condenser. Functionally, the condenser does the same job as previous models. Air is drawn into the condenser from the front left and rear left of the cabinet. Air exits only from the right side of the cabinet.

Condenser Loop

The condenser loop, made of 5/32-in. O.D. copper tubing, is foamed in place behind the breaker frame and across the mullion. It is not accessible for replacement. The tubing is routed from the rear of the machine compartment forward to the mullion, across the mullion, across the right side of the freezer compartment, across the top of the freezer compartment, down the right side of the freezer, and back to the rear of the machine compartment. The outlet of the condenser loop is connected to the dryer inlet.

Dryer

The dryer is positioned vertically in the center of the machine compartment. A 1/4-in. O.D. copper process tube, connected to the inlet of the dryer, provides access to the high-pressure side of the refrigeration system. The capillary is connected to the outlet of the dryer. Replacement of filter dryer requires additional refrigerant when installed (0.5 oz).

Note: The dryer is wrapped in mastic as a sound reducer and foam tape for shipping purposes. When replacing the dryer, the mastic must be reinstalled to reduce sound. It is not necessary to reinstall the foam tape.

Evaporator

The spine-fin evaporator, made of aluminum tubing and formed into hairpin spirals, is located below the evaporator fan housing at the back of the freezer compartment. The replacement evaporator is furnished without a heat exchange.

Evaporator (Soldering Method)

1. Recover the refrigerant.
2. Remove the evaporator cover.
3. Remove the defrost thermostat.
4. Remove the defrost heater.
5. Disconnect the ground wire from the evaporator and position all wiring to allow for evaporator removal.

6. Remove the 2 screws that hold the evaporator to the cabinet.

Caution:

- **If desoldering the evaporator, heat shield, P/N WR49X10025, must be used to prevent damage to freezer liner.**
- **Protect wiring from heat during desoldering and resoldering.**
- **To prevent damage to the capillary tube, the capillary tube must be desoldered first.**

7. Desolder the capillary tube from the evaporator.
8. Desolder the suction line. Use a pair of pliers to hold the evaporator.
9. Remove the evaporator.
10. Using a file, score the capillary tube just above the old solder and break the solder-covered section off. This will help prevent the capillary tube from becoming plugged when resoldering.
11. Position the new evaporator in the cabinet. Insert the suction line and capillary tube into the evaporator.
12. Solder the suction line to the evaporator using silfos.
13. Solder the capillary tube to the evaporator using silfos.

Note: Heat probe assists in defrosting drain. During assembly, probe must be installed on evaporator and in drain to prevent drain from freezing closed.

14. Install a replacement dryer.
15. Evacuate and recharge the system using currently accepted procedures.

Evaporator (LOKRING Method)

1. Recover the refrigerant.
2. Remove the evaporator cover.
3. Remove the defrost thermostat.

4. Remove the defrost heater.
5. Disconnect the ground wire from the evaporator and position all wiring to allow for evaporator removal.
6. Remove the 2 screws that hold the evaporator to the cabinet.

Caution: Tubing must be clean and free from burrs when using LOKRING.

Note: LOKRING connector, **P/N WR97X10021** must be used. Two LOKRING connectors **P/N WR97X10021** are required.

7. Replace the evaporator using the LOKRING method (see Pub #31-9067).
 - Cut the copper lines of the old evaporator as close as possible to the aluminum evaporator tubes.
 - Cut the copper lines of the new evaporator 1-1/8 in. from the edge of the aluminum evaporator tubes.
 - Defrost thermostat can be moved from the horizontal part of the copper line to the vertical part, just above the bend.

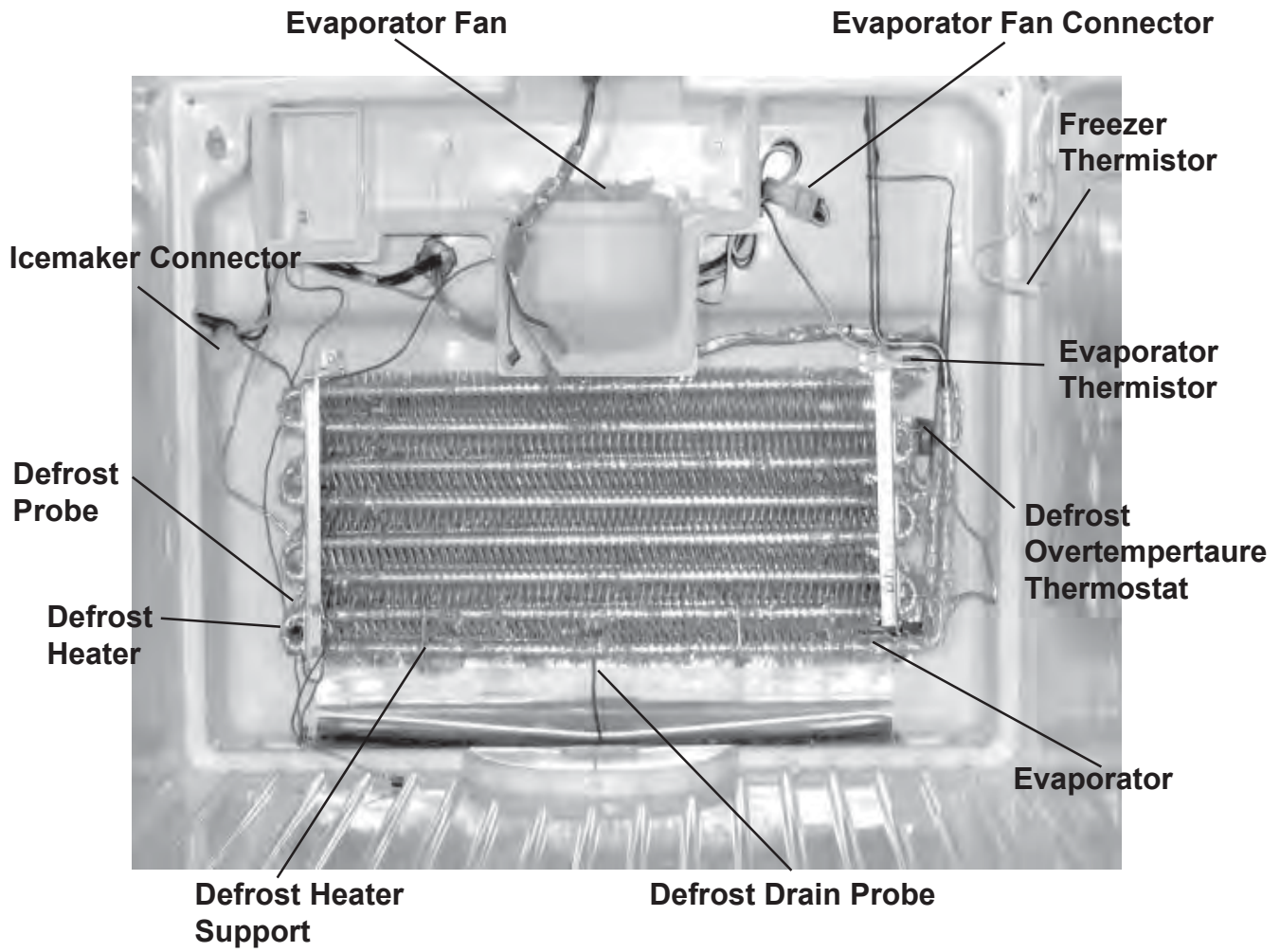
Note: Heat probe assists in defrosting drain. During assembly, probe must be installed on evaporator and in drain to prevent drain from freezing closed.

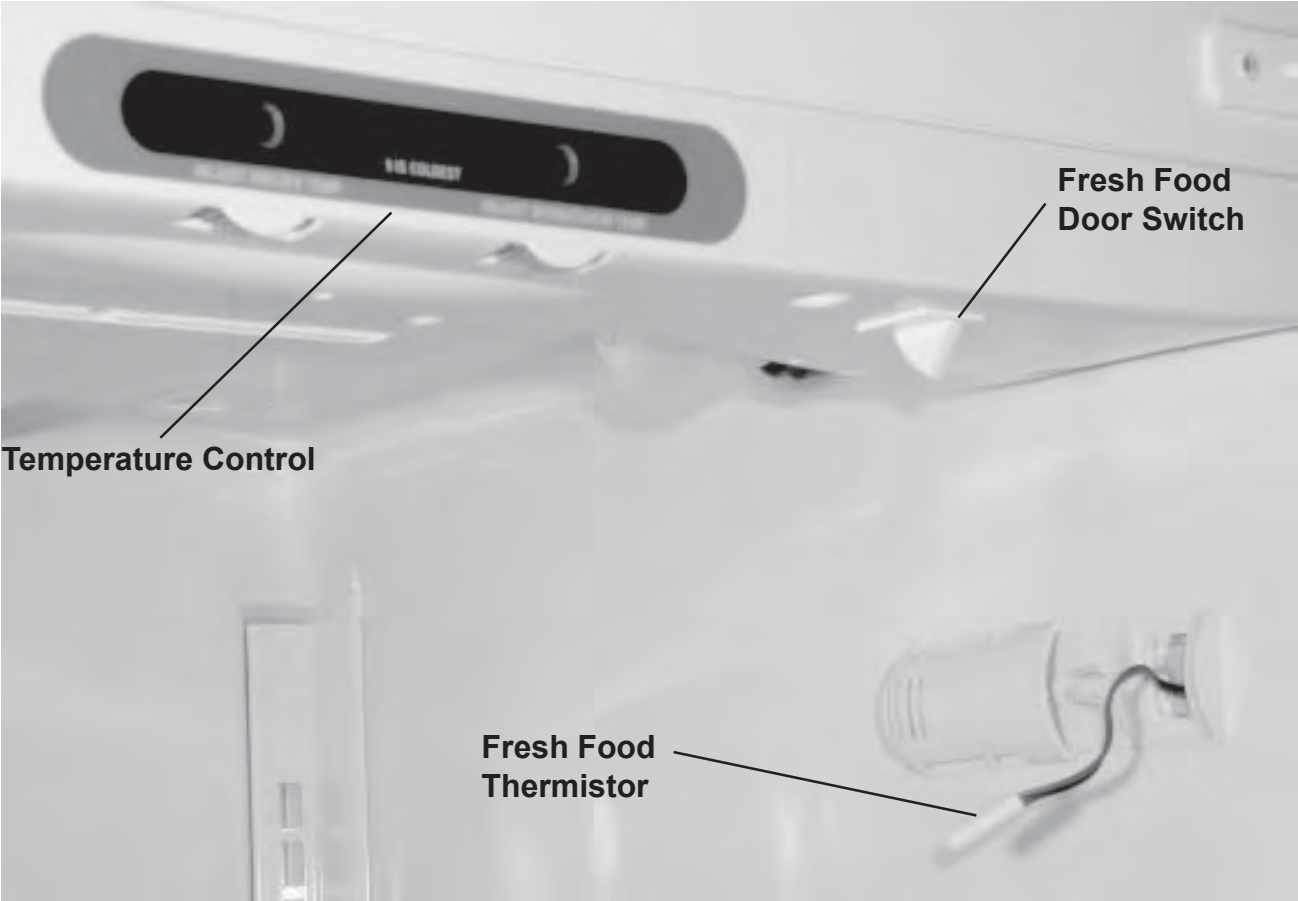
8. Install a replacement dryer.
9. Evacuate and recharge the system using currently accepted procedures.

Refrigerant Charge

The refrigerant used in this model is type R134a. Refer to the mini-manual or model tag for the exact refrigerant charge quantity.

COMPONENT AND CONNECTOR LOCATOR VIEWS





Temperature Control

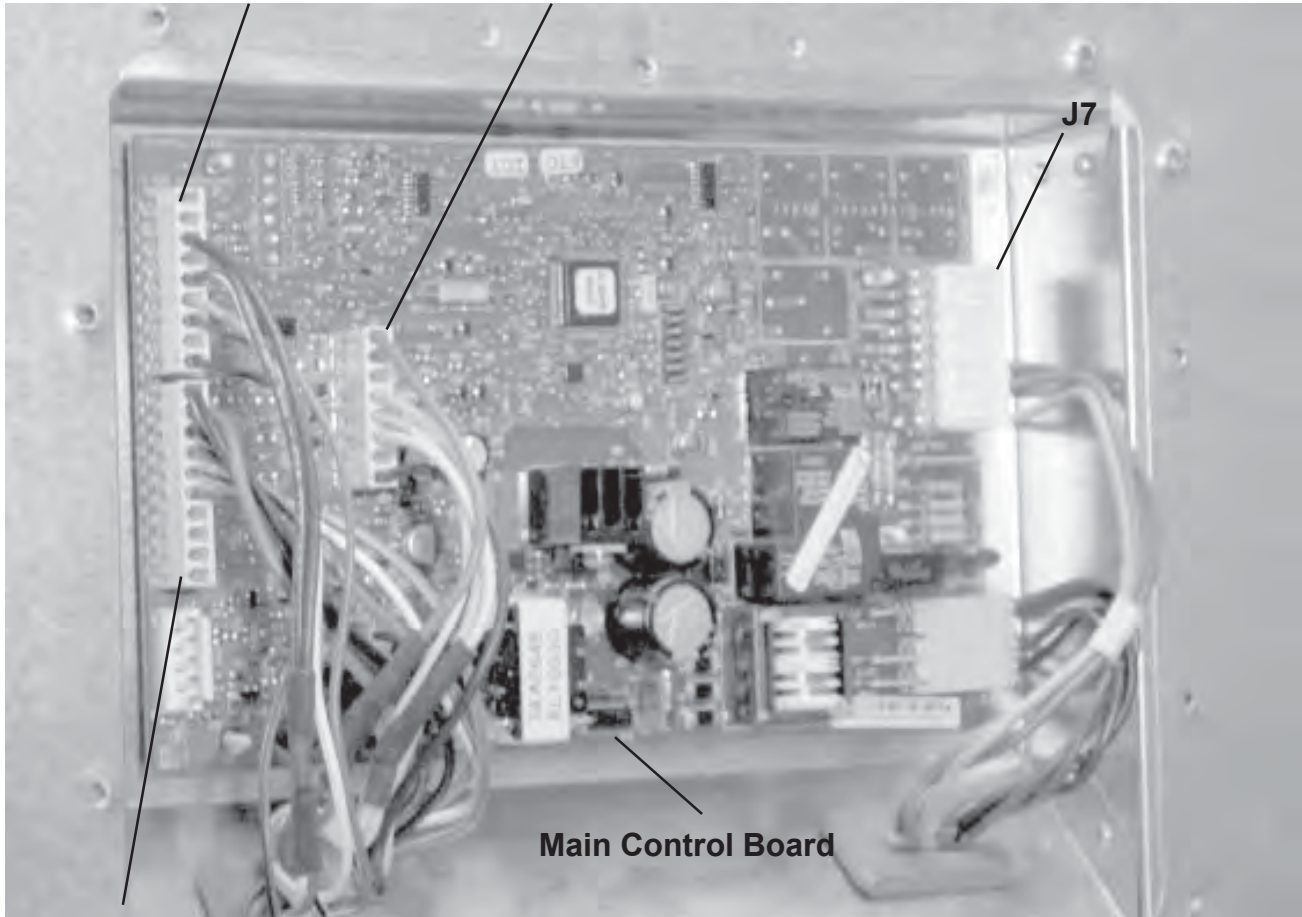
Fresh Food Door Switch

Fresh Food Thermistor

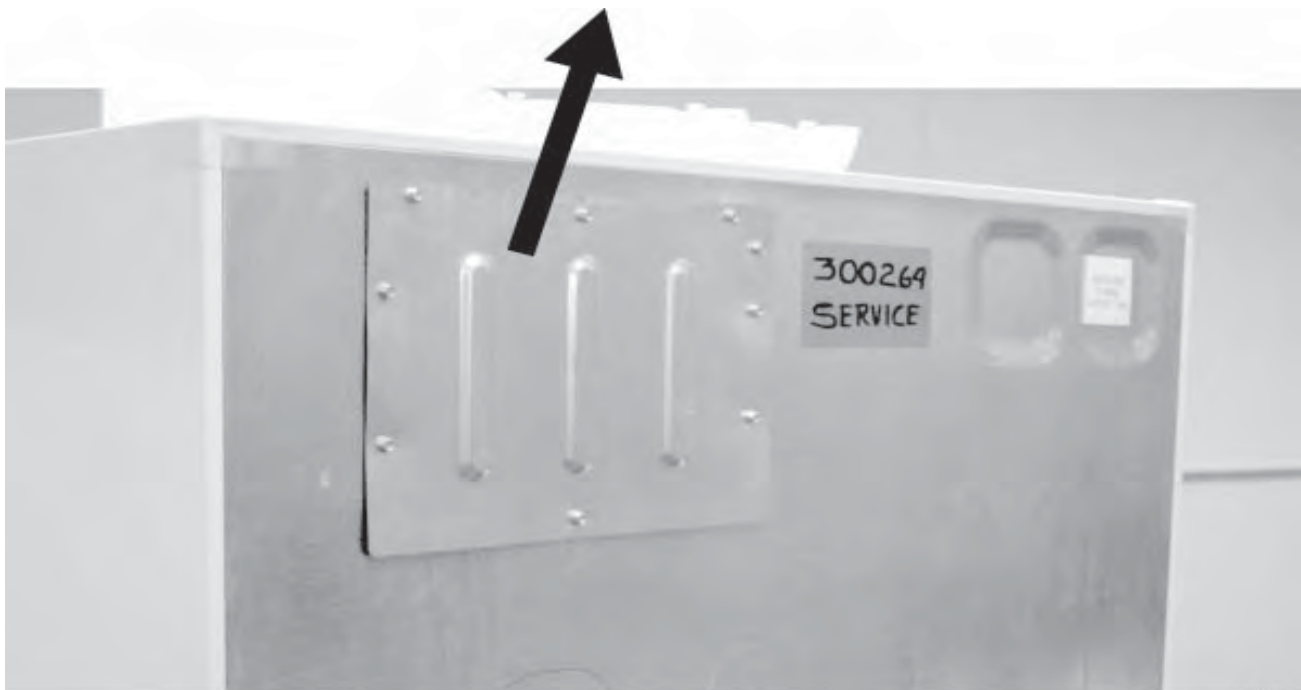
Fresh Food Compartment

J1 (To Thermistors)

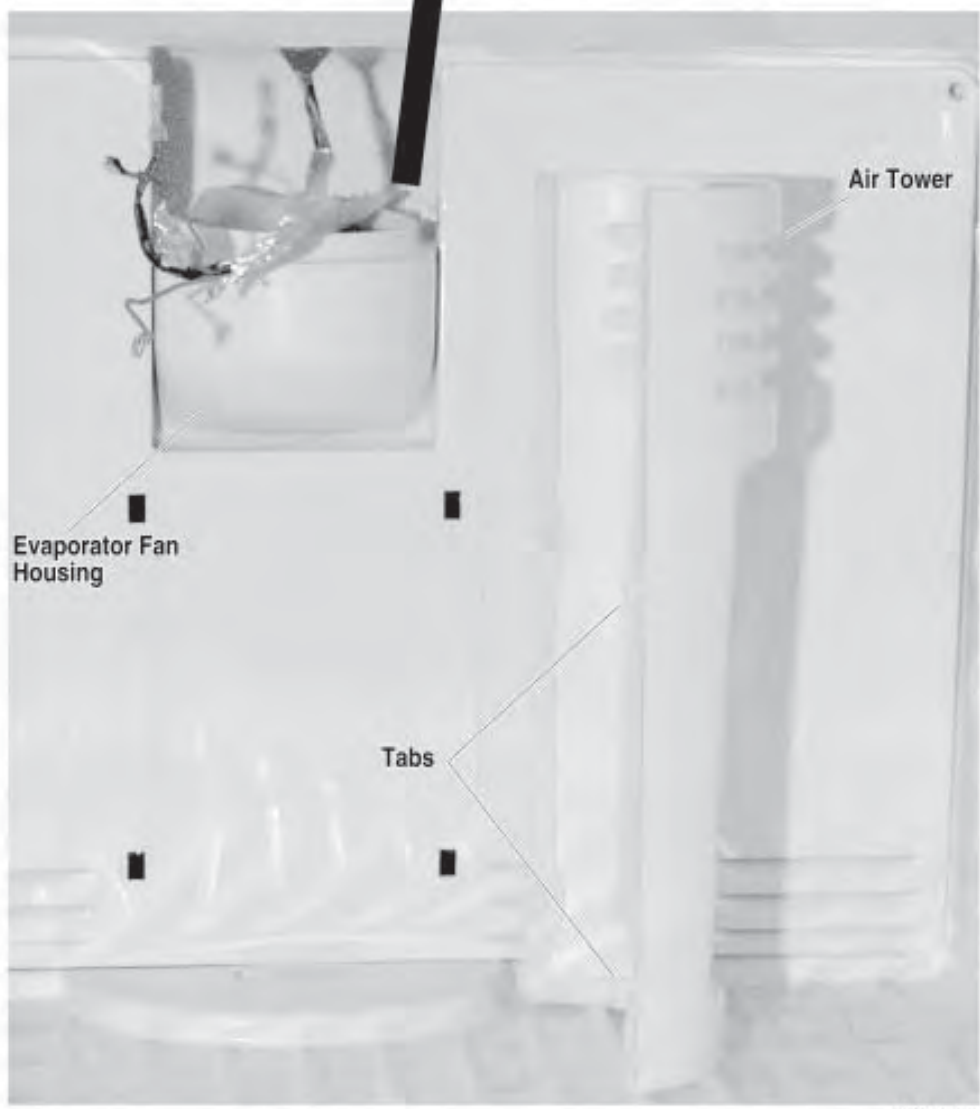
J2 (To Evaporator Fan and Condenser Fan)



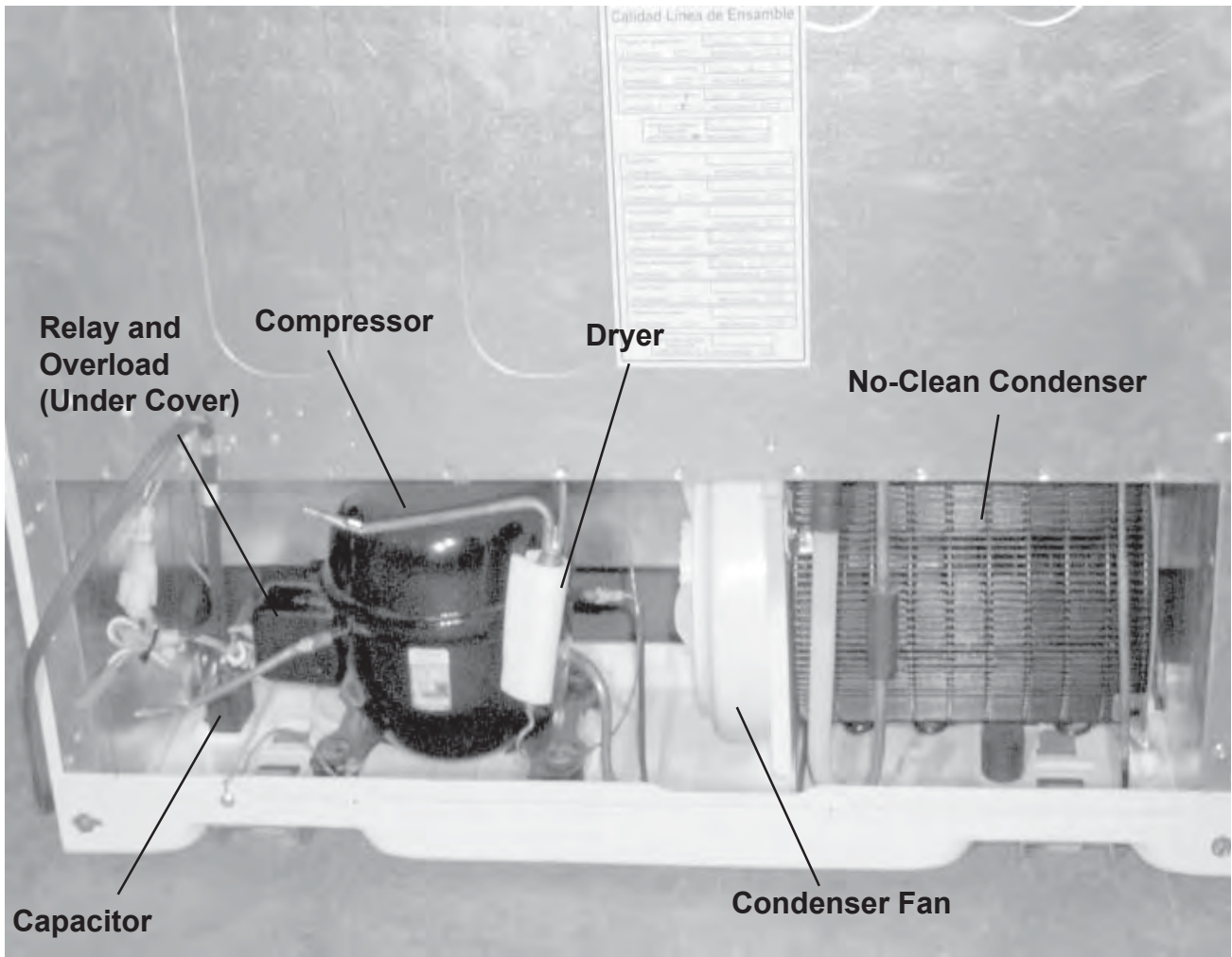
J3 (To Temperature Control Board)



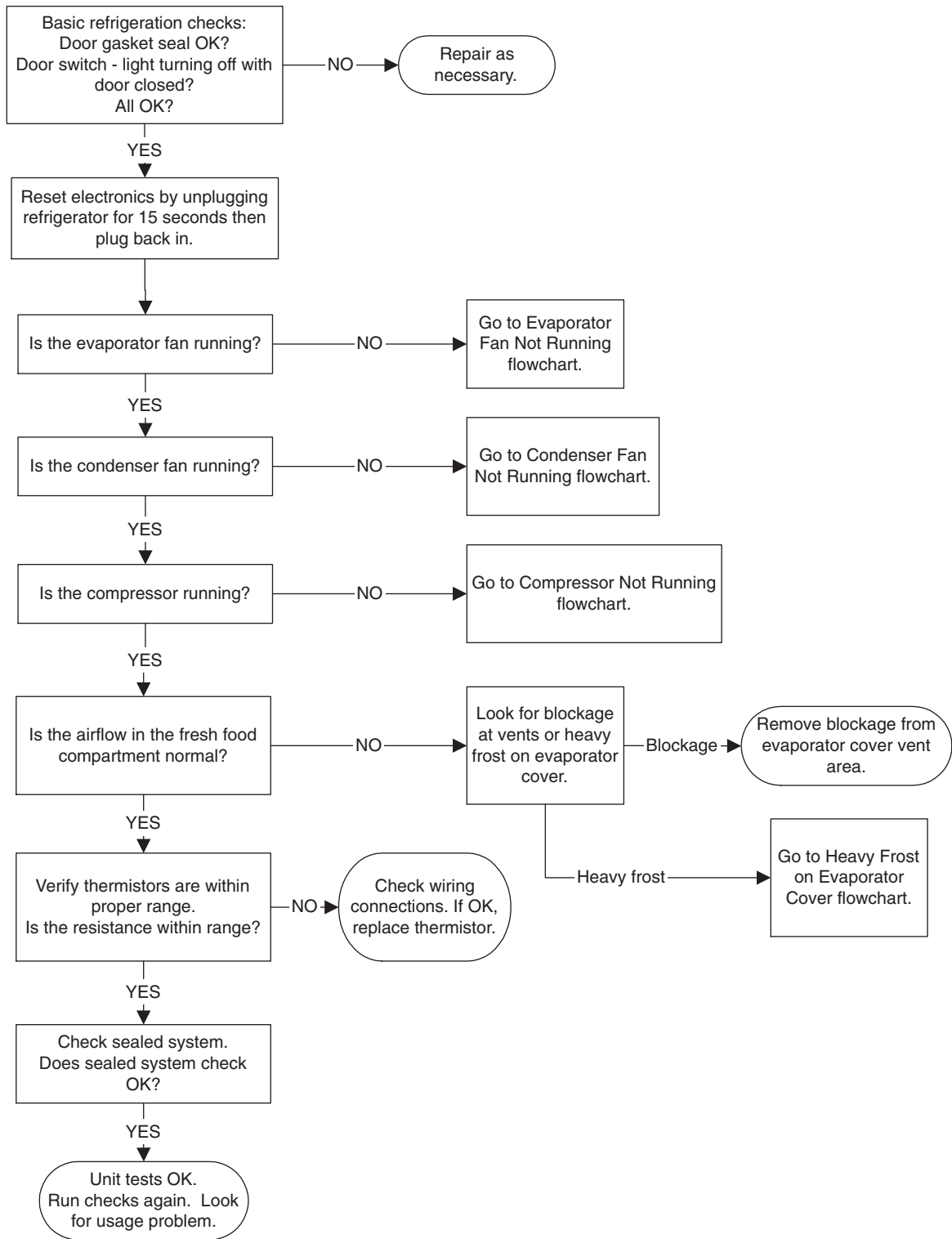
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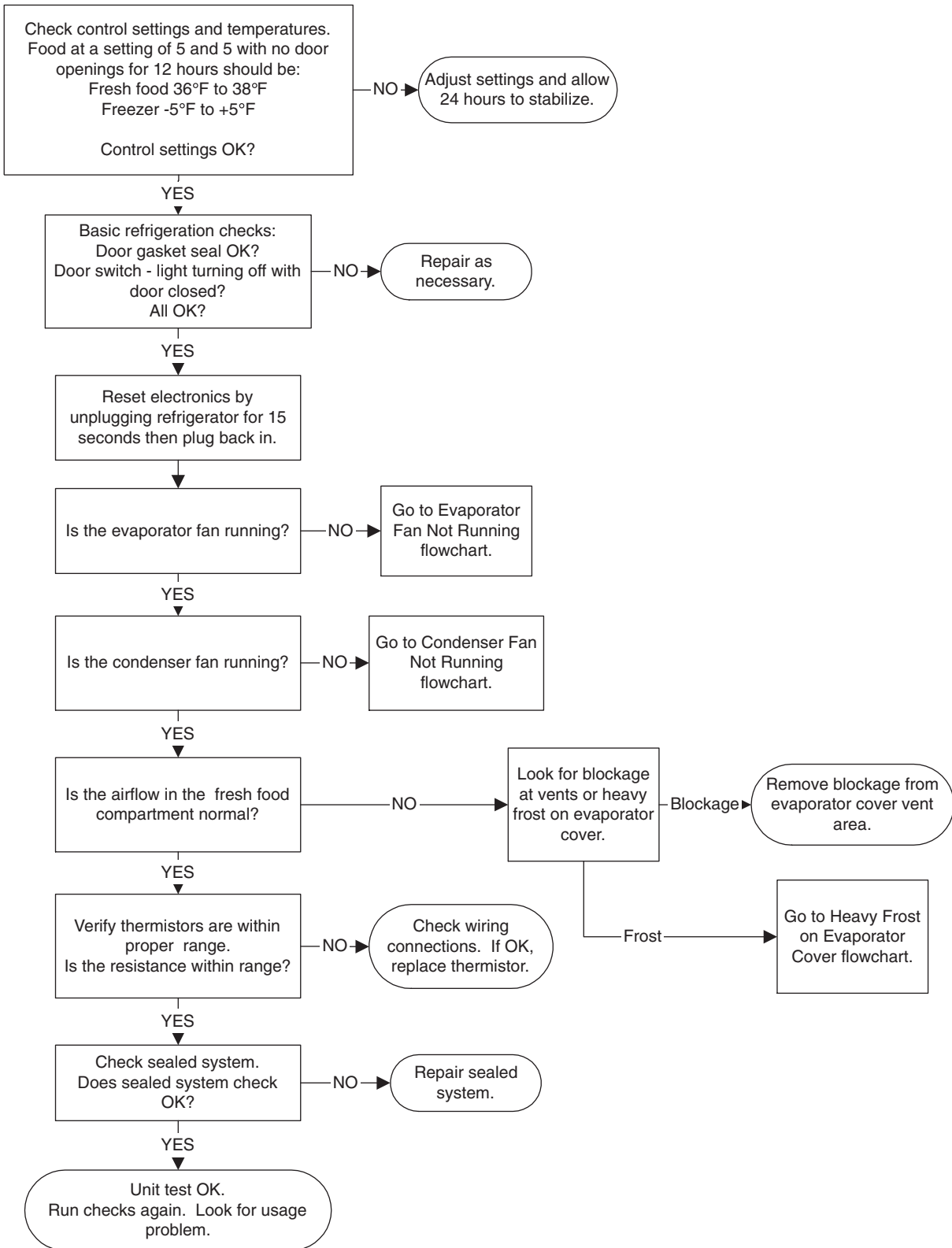
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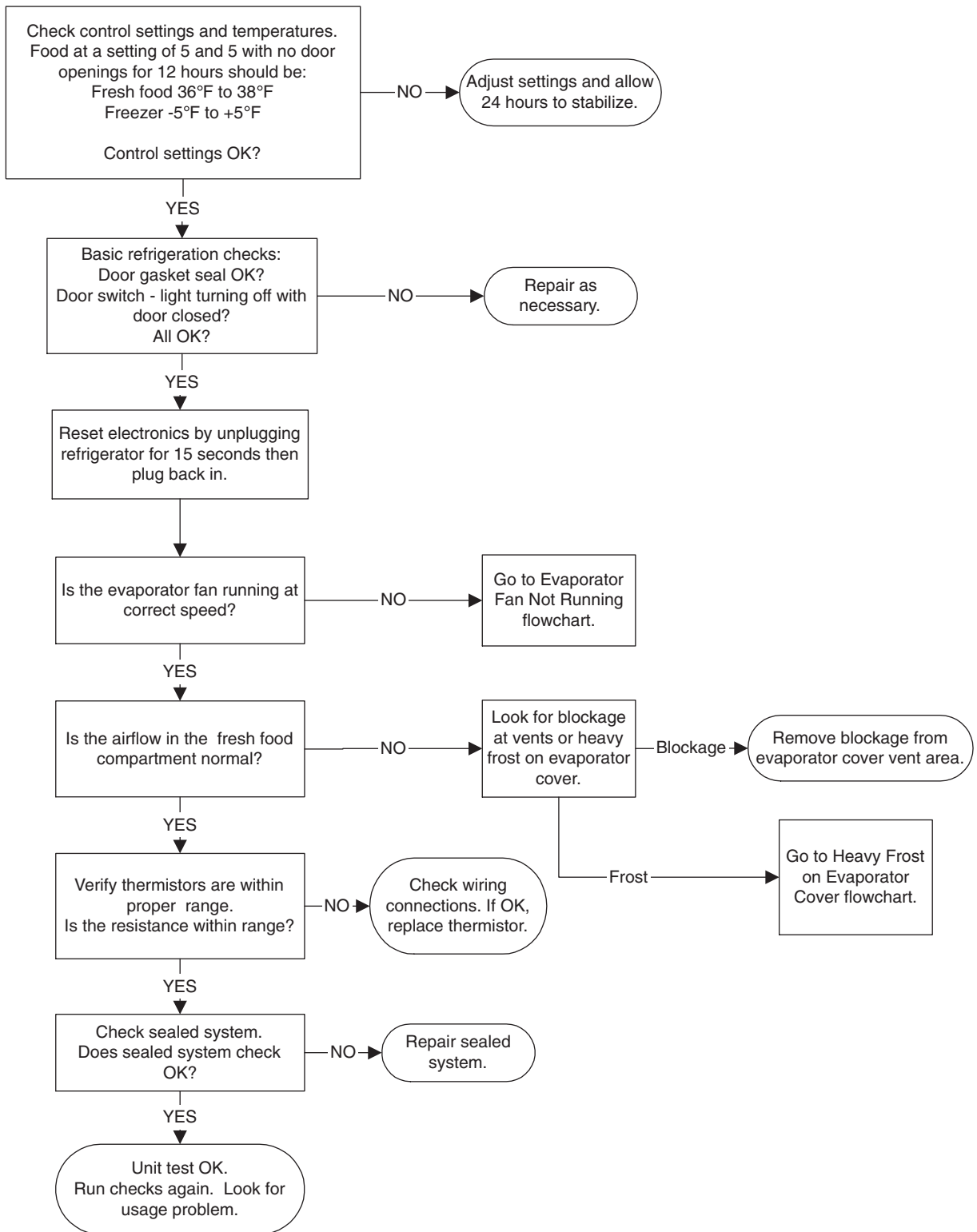
Fresh Food Warm - Freezer Warm



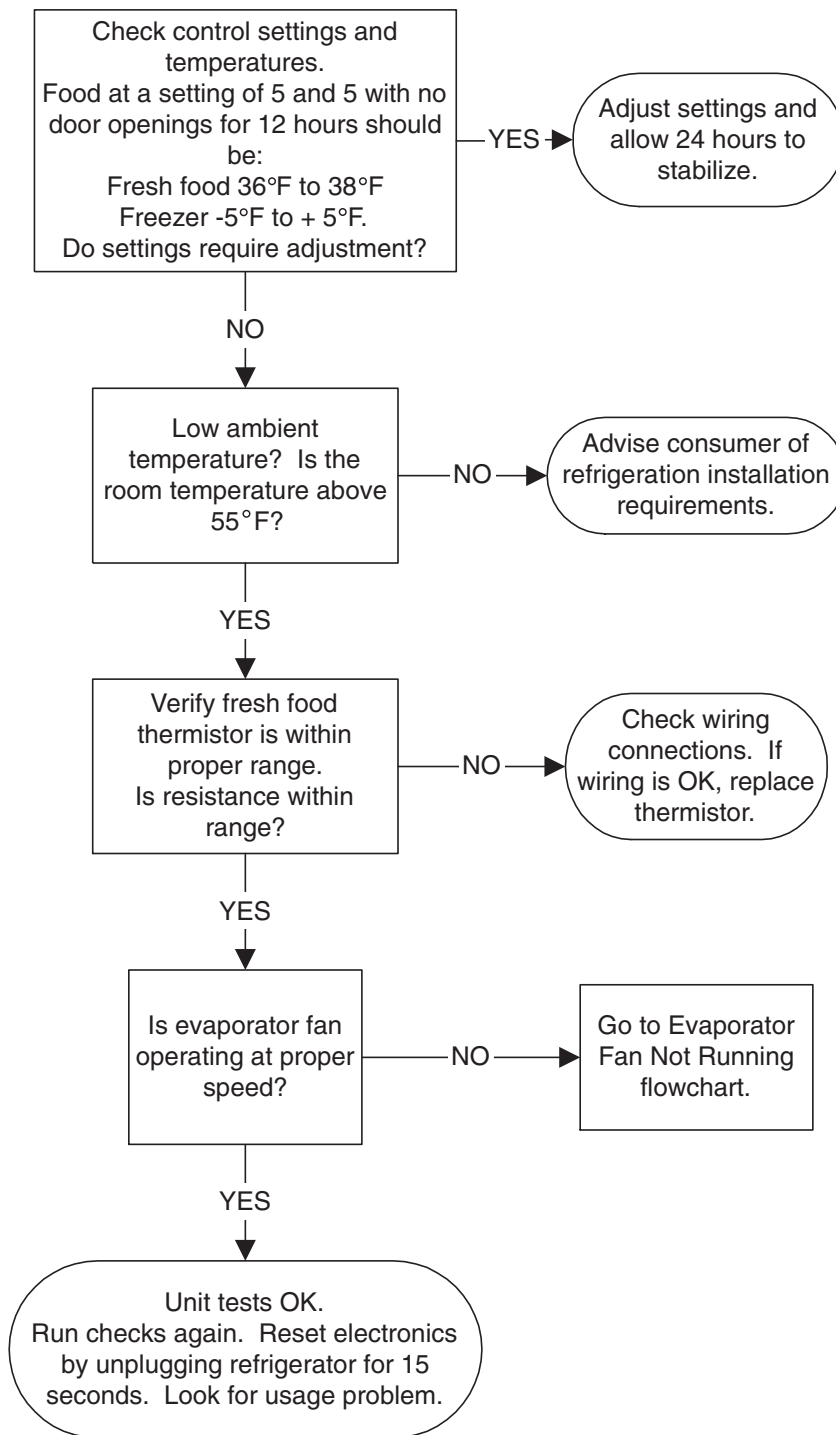
Freezer Warm - Fresh Food Normal



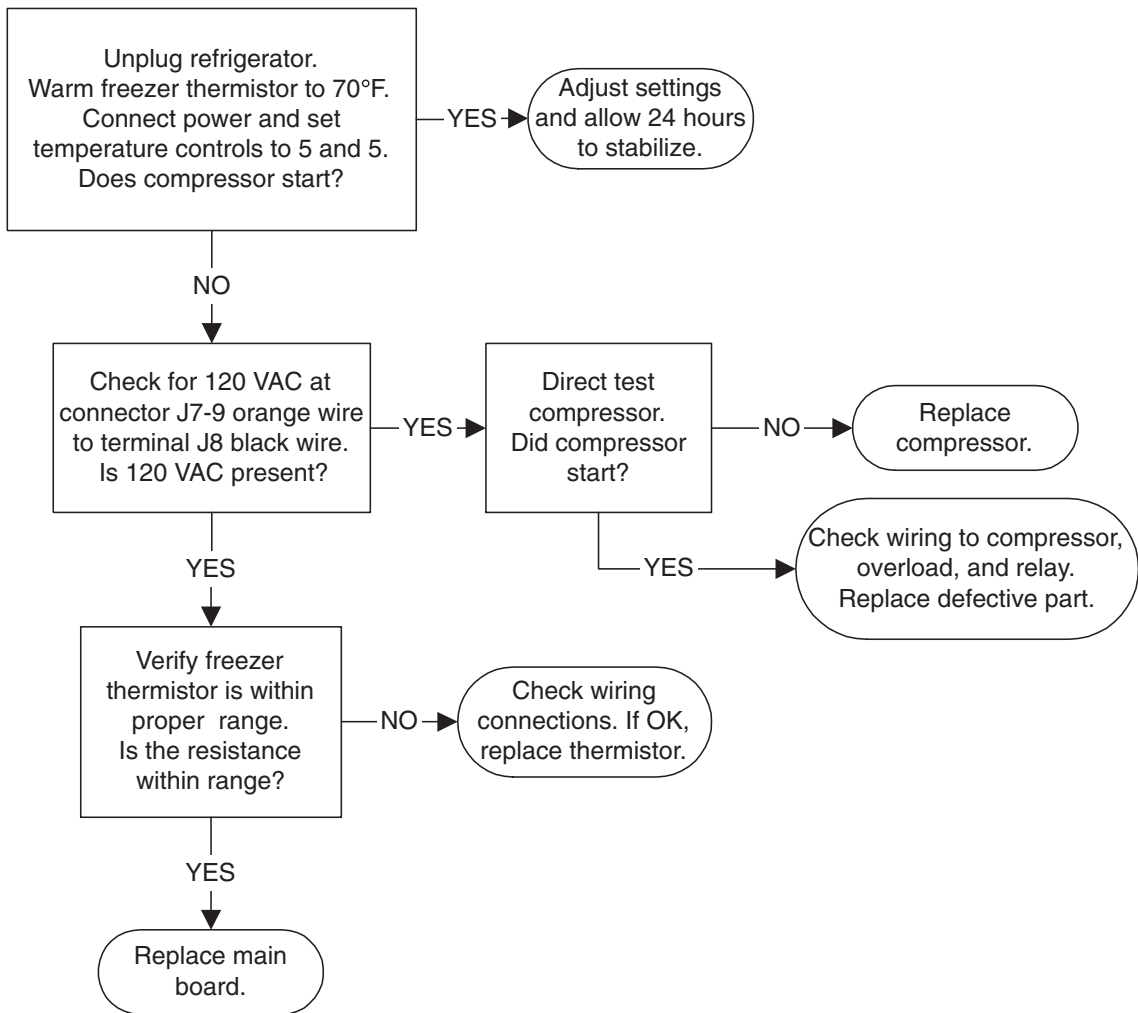
Fresh Food Warm - Freezer Normal



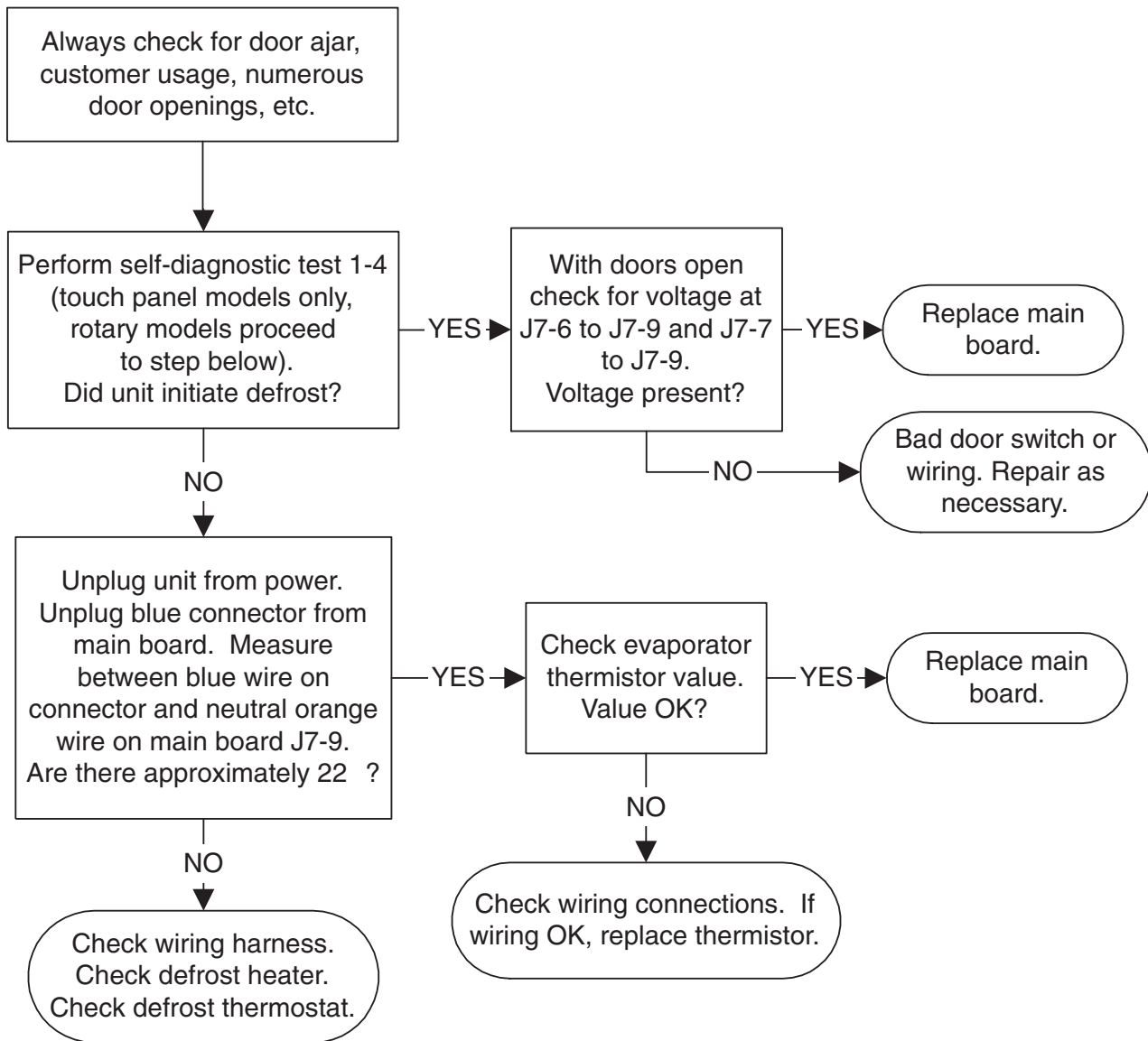
Fresh Food Too Cold - Freezer Normal



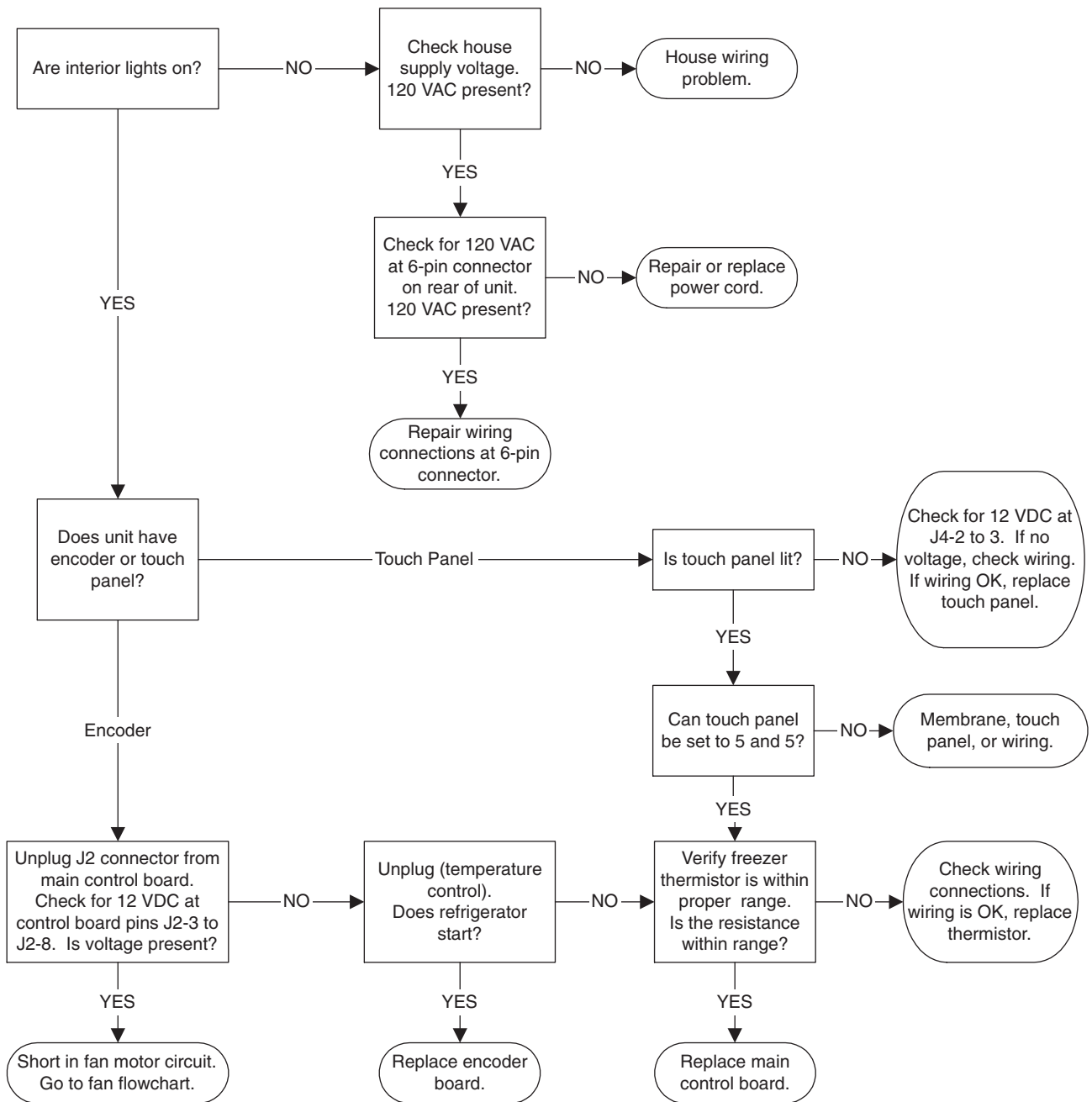
Compressor Not Running



Heavy Frost on Evaporator



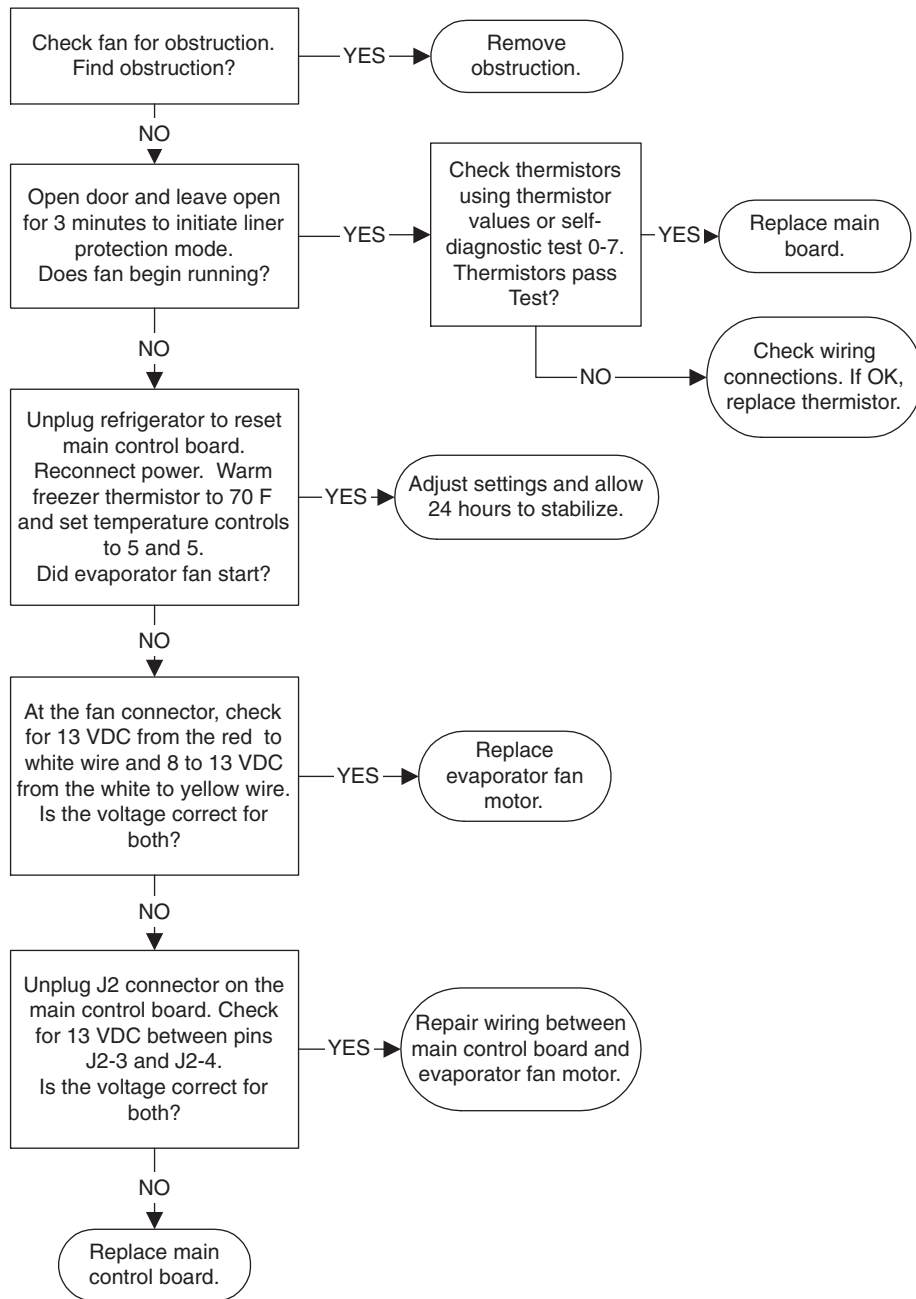
Refrigerator Not Responding



Evaporator Fan Not Running

Note:

- When no voltage at main control board, make certain to check for shorted fan motor (less than 1k ohm between white and red or white and yellow). A shorted fan motor will damage the replacement main board.
- To check fan speed, refer to evaporator fan speed information on page 20.



Condenser Fan Not Running

Note:

- Compressor and condenser fan should always operate at the same time.
- When no voltage at main control board, make certain to check for shorted fan motor (less than 1k ohm between white and red or white and yellow). A shorted fan motor will damage the replacement main board.

