

All About

Servicing

Side by Side
Refrigerator

FRIGIDAIRE™

W White-Westinghouse

Gibson

Kelvinator 

TAPPAN

Electrolux Major Appliances; North America
250 Bobby Jones Expwy
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Section 1 - Basic Information

Safe Servicing Practices

Avoid personal injury and/or property damage by observing important Safe Servicing Practices. Following are some limited examples of safe practices:

1. **DO NOT** attempt a product repair if you have any doubts as to your ability to complete the repair in a safe and satisfactory manner.
2. Always Use The Correct Replacement Parts as indicated in the parts documentation. Substitutions may defeat compliance with Safety Standards Set For Home Appliances.
3. Before servicing or moving an appliance:
 - Remove power cord from the electrical outlet, trip circuit breaker to OFF position, or remove fuse.
 - Turn off water supply if needed.
 - Turn off gas supply for gas dryers.
4. Never interfere with the proper operation of any safety device.
5. **Use ONLY REPLACEMENT PARTS CATALOGED FOR THIS APPLIANCE. Substitutions may defeat compliance with Safety Standards Set For Home Appliances.**
6. **GROUNDING:** The standard color coding for safety ground wires is **GREEN**, or **GREEN** with **YELLOW STRIPES**. Ground leads are not to be used as current carrying conductors. It is **EXTREMELY** important that the service technician reestablish all safety grounds prior to completion of service. Failure to do so will create a hazard.
7. Prior to returning the product to service, ensure that:
 - All electrical connections are correct and secure.
 - All electrical leads are properly dressed and secured away from sharp edges, high temperature components, and moving parts.
 - All non-insulated electrical terminals, connectors, heaters, etc. are adequately spaced away from all metal parts and panels.
 - All safety grounds (both internal and external) are correctly and securely connected.
 - All panels are properly and securely reassembled.
 - Gas and water supplies are turned ON if shut off prior to service.

ATTENTION!!!

This service manual is intended for use by persons having electrical and mechanical training and a level of knowledge of these subjects generally considered acceptable in the appliance repair trade. Electrolux Home Products, Inc. cannot be responsible, nor assume any liability, for injury or damage of any kind arising from the use of this manual.

Section 1 - Basic Information

Section 1 - Basic Information

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Important Safety Instructions


WARNING

Please read all instructions before using this refrigerator.

For your Safety

- DO NOT store or use gasoline, or other flammable liquids in the vicinity of this or any other appliance. Read product labels for warnings regarding flammability and other hazards.
- DO NOT operate the refrigerator in the presence of explosive fumes.
- Avoid contact with any moving parts of automatic ice maker.
- Remove all staples from the carton. Staples can cause severe cuts, and also destroy finishes if they come in contact with other appliances or furniture.

Definitions

 This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

IMPORTANT

IMPORTANT indicates installation, operation or maintenance information which is important but not hazard-related.

Installation Checklist

Doors

- Handles are secure and tight
- Door seals completely to cabinet on all sides
- Freezer door is level across the top

Leveling

- Refrigerator is level, side-to-side and tilted 1/4" (6mm) front-to-back
- Toe grille is properly attached to refrigerator
- Cabinet is setting solid on all corners

Electrical Power

- House power turned on
- Refrigerator plugged in

Ice Maker

- House water supply connected to refrigerator
- No water leaks present at all connections - recheck in 24 hours
- Ice maker is turned ON
- Ice & water dispenser operates correctly
- Front filter must be flush with filter housing (select models)

Final Checks

- Shipping material removed
- Fresh food and freezer temperatures set
- Crisper humidity controls set
- Registration card sent in

Important Safety Instructions

Child Safety

Destroy or recycle the carton, plastic bags, and any exterior wrapping material immediately after the refrigerator is unpacked. Children should **NEVER** use these items to play. Cartons covered with rugs, bedspreads, plastic sheets or stretch wrap may become airtight chambers, and can quickly cause suffocation.

Proper Disposal of your Refrigerator or Freezer

Risk of child entrapment

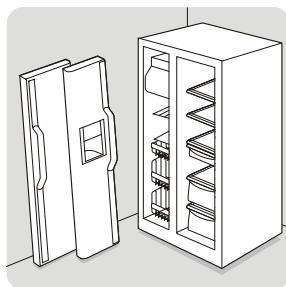
Child entrapment and suffocation are not problems of the past. Junked or abandoned refrigerators or freezers are still dangerous – even if they will sit for “just a few days”. If you are getting rid of your old refrigerator or freezer, please follow the instructions below to help prevent accidents.

Proper Disposal of Refrigerators/Freezers

We strongly encourage responsible appliance recycling/disposal methods. Check with your utility company or visit www.recyclemyoldfridge.com for more information on recycling your old refrigerator.

Before you throw away your old refrigerator/freezer:

- Remove doors.
- Leave shelves in place so children may not easily climb inside.
- Have refrigerator



WARNING

These guidelines must be followed to ensure that safety mechanisms in this refrigerator will operate properly.

Electrical information

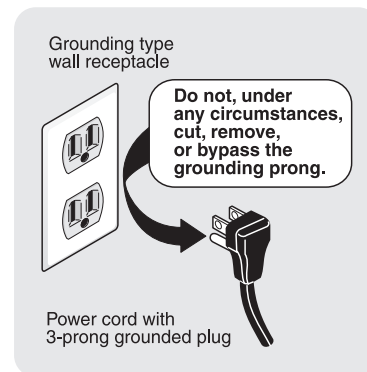
- **The refrigerator must be plugged into its own dedicated 115 Volt, 60 Hz., 15 Amp, AC only electrical outlet.** The power cord of the appliance is equipped with a three-prong grounding plug for your protection against electrical shock hazards. It must be plugged directly into a properly grounded three prong receptacle. The receptacle must be installed in accordance with local codes and ordinances. Consult a qualified electrician. Avoid connecting refrigerator to a Ground

Fault Interrupter (GFI) circuit. **Do not use an extension cord or adapter plug.**

- If the power cord is damaged, it should be replaced by an authorized service technician to prevent any risk.
- Never unplug the refrigerator by pulling on the power cord. Always grip the plug firmly, and pull straight out from the receptacle to prevent damaging the power cord.
- Unplug the refrigerator before cleaning and before replacing a light bulb to avoid electrical shock.
- Performance may be affected if the voltage varies by 10% or more. Operating the refrigerator with insufficient power can damage the compressor. Such damage is not covered under your warranty.
- Do not plug the unit into an electrical outlet controlled by a wall switch or pull cord to prevent the refrigerator from being turned off accidentally.

IMPORTANT

Pressing and holding the **On/Off** button for 3 seconds, located on the left side of the temperature control panel (Electronic controls), or turning the Freezer and Fresh Food controls to “0” (Mechanical controls) will disable your refrigerator’s cooling system, but does not disconnect the power to the light bulb and other electrical components. To turn off power to your refrigerator you must unplug the power cord from the electrical outlet.

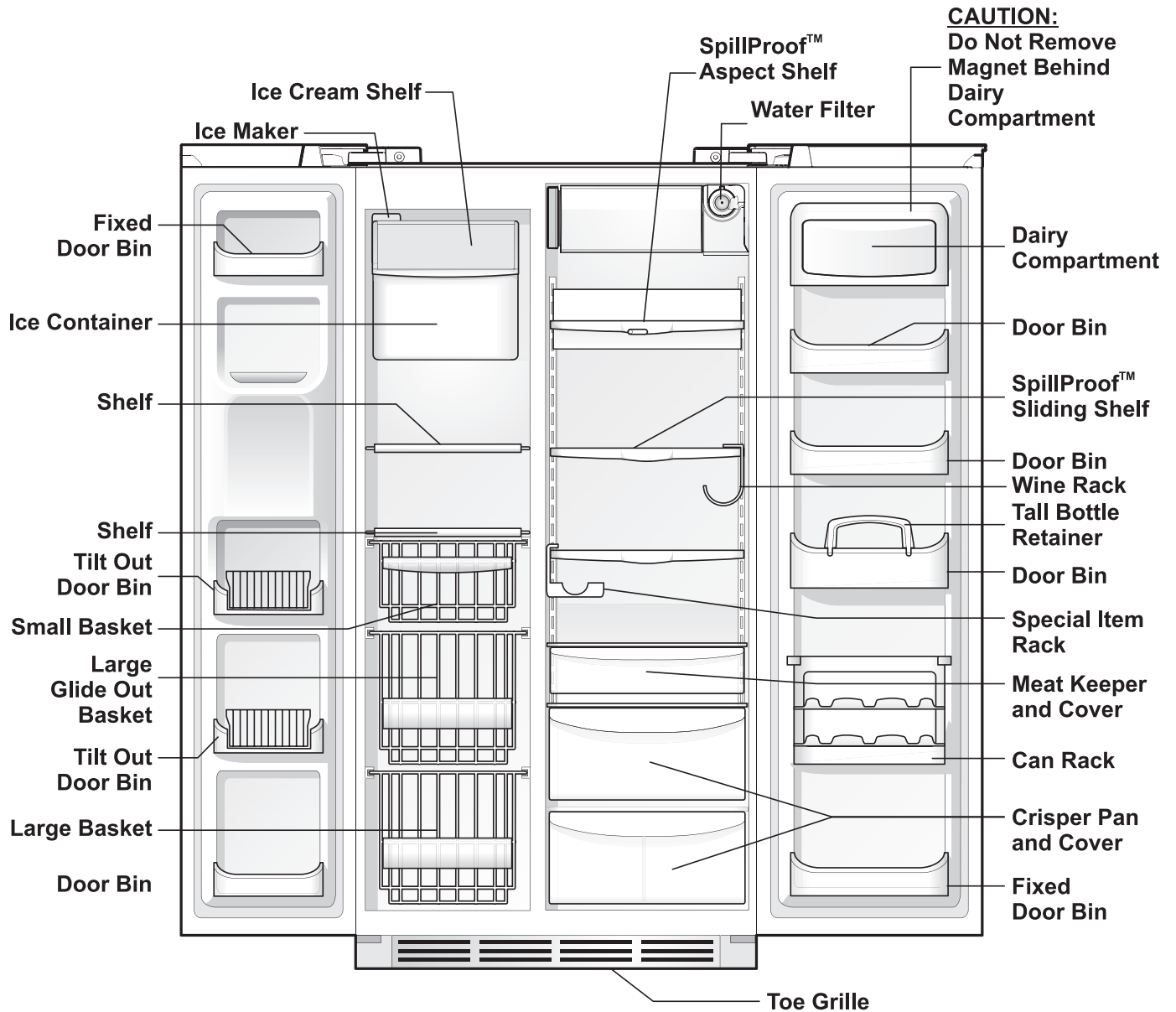


CAUTION

To avoid personal injury or property damage, handle tempered glass shelves carefully. Shelves may break suddenly if nicked, scratched, or exposed to sudden temperature change.

Features At A Glance

Features may vary according to model



Installation

This Use & Care Guide provides general operating instructions for your model. Use the refrigerator only as instructed in this Use & Care Guide. **Before starting the refrigerator, follow these important first steps.**

Location

- Choose a place that is near a grounded electrical outlet. **Do Not** use an extension cord or an adapter plug.
- If possible, place the refrigerator out of direct sunlight and away from the range, dishwasher or other heat sources.
- The refrigerator must be installed on a floor that is level and strong enough to support a fully loaded refrigerator.
- Consider water supply availability for models equipped with an automatic ice maker. If you do not hook up water to the refrigerator, remember to turn the ice maker off.

CAUTION

Do Not install the refrigerator where the temperature will drop below 55°F (13°C) or rise above 110°F (43°C). The compressor will not be able to maintain proper temperatures inside the refrigerator.

Do Not block the toe grille on the lower front of your refrigerator. Sufficient air circulation is essential for the proper operation of your refrigerator.

Installation

Installation clearances

- Allow the following clearances for ease of installation, proper air circulation, and plumbing and electrical connections:

Sides & Top	$\frac{3}{8}$ inch
Back	1 inch

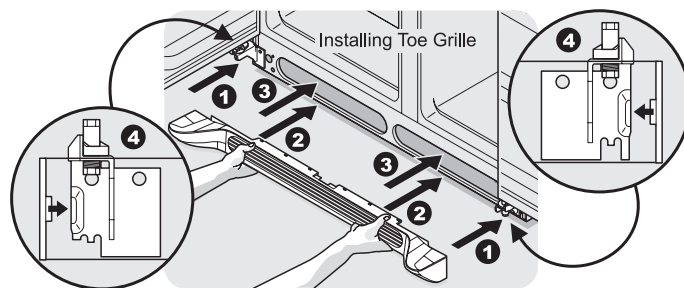
NOTE

If your refrigerator is placed with the door hinge side against a wall, you may have to allow additional space so the door can be opened wider.

Toe Grille Installation and Removal

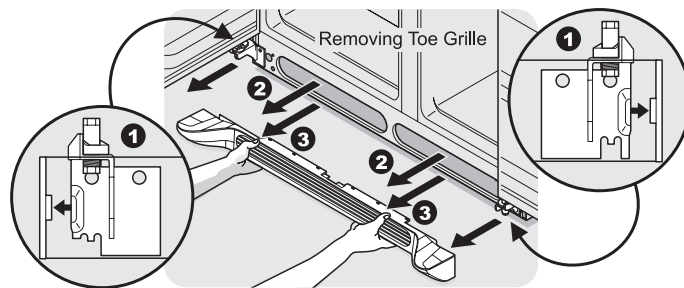
To install toe grille

- 1 Open both doors. Slide left and right sides of toe grille over lower hinges of refrigerator.
- 2 While pushing toe grille firmly against cabinet, fasten bottom clips of toe grille to cabinet.
- 3 Fasten top clips to cabinet.
- 4 Close the doors. Fasten right and left side clips into groove of bottom hinge.



To remove toe grille

- 1 With both doors closed, unfasten right and left side clips of toe grille from bottom hinge groove.
- 2 Open both doors. Press firmly on top of toe grille until top of toe grille pops off.
- 3 Pull toe grille outward toward your body and off of lower hinges.



Installation

Door Opening

NOTE

The refrigerator doors are designed to shut by themselves within a 20 degree opening.

Your refrigerator should be positioned to allow easy access to a counter or table when removing food. For best use of drawers and freezer baskets, the refrigerator should be in a position where both the refrigerator and freezer doors can be fully opened.

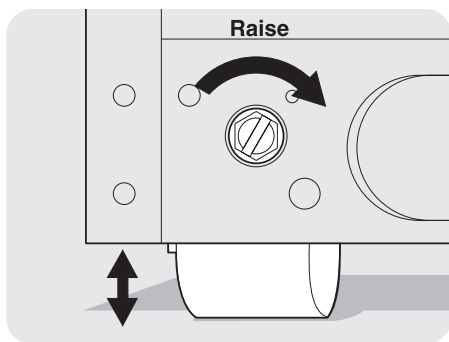
Guidelines for final positioning of your refrigerator:

- All four corners of the cabinet must rest firmly on the floor.
- The cabinet should be level at the front and rear.
- The sides should tilt $\frac{1}{4}$ inch (6 mm) from front to back (to ensure that doors close and seal properly).
- Doors should align with each other and be level.

All of these conditions can be met by raising or lowering the adjustable front rollers.

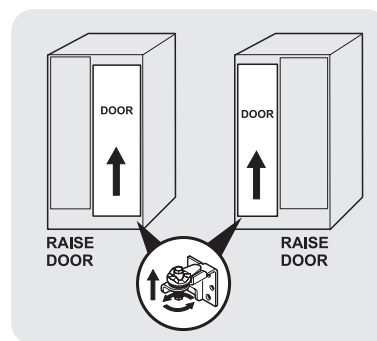
To level the cabinet using the front rollers:

- 1 Open both doors and remove the toe grille (see "Toe Grille Installation and Removal" in the "Installation" section).
- 2 Close the doors and use a flat-blade screwdriver or $\frac{3}{8}$ inch socket wrench to raise or lower the front rollers.
- 3 Ensure both doors are bind-free with their seals touching the cabinet on all four sides.

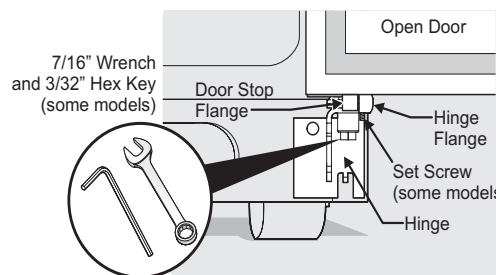


To level the doors using the adjustable lower hinge (some models):

- 1 Before leveling either door, remove set screw that locks door height into position. (The door cannot be adjusted without set screw removed).
- 2 If the refrigerator door is lower than the freezer door, raise the refrigerator door by turning the adjustment screw clockwise using a $\frac{7}{16}$ inch wrench. (See illustration.)
- 3 If the freezer door is lower than the refrigerator door, raise the freezer door by turning the adjustment screw clockwise using a $\frac{7}{16}$ inch wrench. (See illustration.)

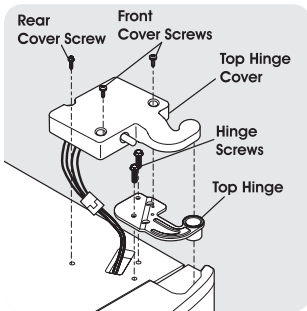
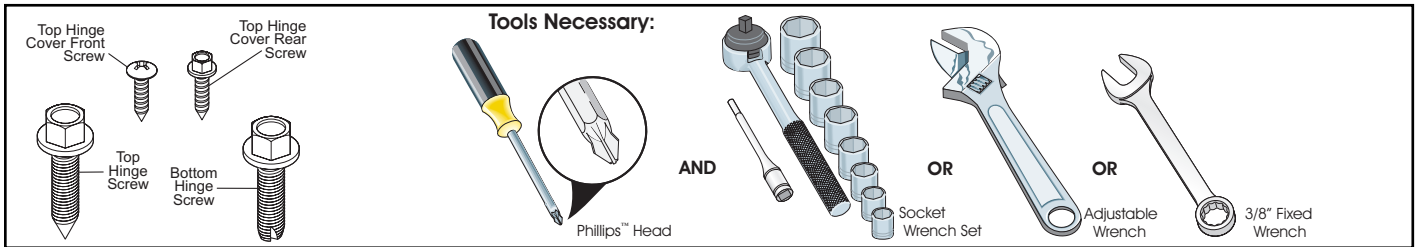


- 4 After leveling, verify door stop contacts lower hinge and top of door does not contact upper hinge through full movement of door (from fully closed to fully open).
- 5 Reinstall set screw, locking the door height.



- 6 Replace the toe grille by fitting it into place (see "Toe Grille Installation and Removal" in the "Installation" section).

Door Removal Instructions



To prepare for removing the doors:

- 1 Make sure the electrical power cord is unplugged from the wall outlet.
- 2 Open both doors and remove the toe grille (as explained in the Installation Instructions that came with your appliance).
- 3 Remove any food from the door shelves.
- 4 Close the doors.

To remove the refrigerator top hinge cover:

- 1 Remove the three screws from each cover over the top door hinges.
- 2 Lift hinge cover straight up and off.

To remove the refrigerator door:

- 1 Trace lightly around the door's top hinge with a pencil. This makes reinstallation easier.
- 2 Remove the two screws from the top hinge. Lift the door off of the bottom hinge and set it aside.
- 3 Remove the two bottom hinge screws and hinge if necessary.

To reinstall the refrigerator door, reverse the above steps.

To remove the freezer top hinge cover:

- 1 Remove the two screws from each cover over the top door hinges.
- 2 Lift hinge cover straight up and off.

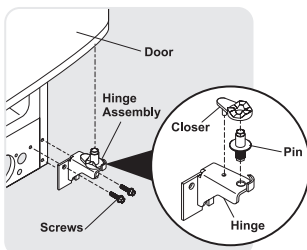
CAUTION

Be sure doors are set aside in a secure position where they cannot fall and cause personal injury.

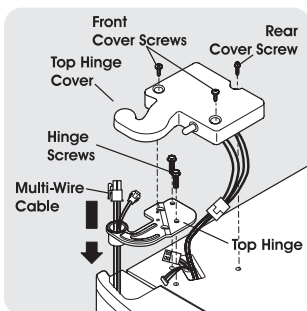
To remove the freezer door:

- 1 Detach the multi-wire cable connector located above the top hinge. Grasp both sides of the connector firmly and pull apart.
- 2 Trace lightly around the hinge with a pencil. This makes reinstallation easier.
- 3 Detach the water tube from the connector located below the freezer door. The connector releases when you press its outer sleeve inward.
- 4 Remove the screws from the top hinge and pull the multi-wire cable through it. Lift the door off of the bottom hinge.
- 5 Remove the two bottom hinge screws and hinge if necessary.
- 6 Lay the door on its side to avoid damage to the water tube extending from the bottom hinge.

To reinstall the freezer door, reverse the above steps.



Adjustable Hinge



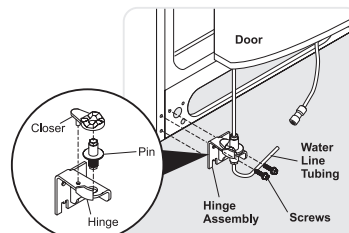
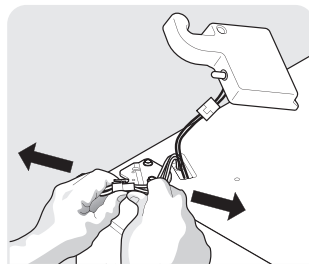
TO DISCONNECT

1. Press outer ring against face of fitting

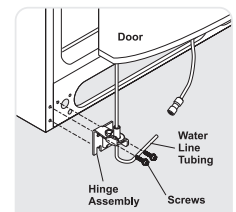
2. Pull to remove tube

TO CONNECT

1. Insert tube and push until mark touches face of fitting



Adjustable Hinge (some models)



Non-Adjusting Hinge (some models)

Connecting the Water Supply

About your Refrigerator's Water Supply

The automatic ice & water dispenser on your refrigerator requires a permanent water supply to function correctly. During installation, you (or a service professional) establish this water supply by connecting a copper tube from your household water system to a valve at the rear of the refrigerator.

You may have already followed the directions in the Installation Instructions to connect the water supply. This information is repeated here for future reference if you need to relocate your refrigerator.

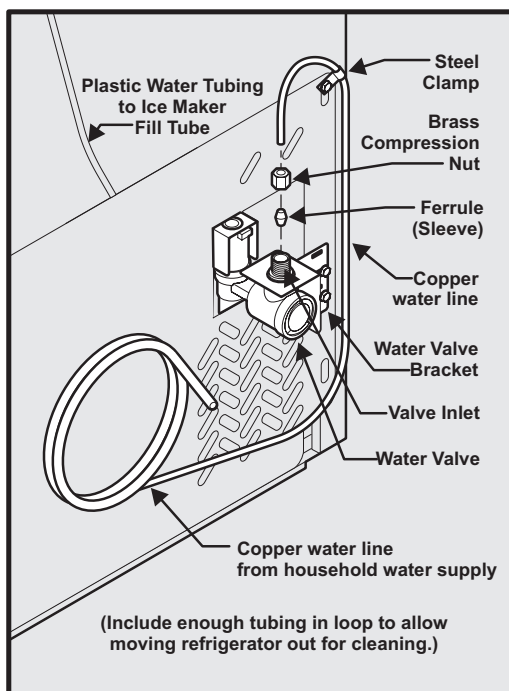
CAUTION

To avoid property damage:

- Use copper tubing for the water supply line (plastic tubing is more likely to leak). Manufacturer is not responsible for any damage if plastic tubing is used for supply line.
- Ensure water supply and installation comply with state and local laws and regulations.
- For proper dispenser operation, recommended water supply pressure should fall between 30 psi and 100 psi. Excessive pressure may cause water filter to malfunction.

What you will need:

- A cold water line with pressure of 30-100 psi. (System is to be supplied with cold water only.)
- Copper tubing with ¼ inch (6.4mm) Outside Diameter (OD). Length for this tubing is the distance from the rear of the refrigerator to your household water supply line plus seven feet (2.1 meters).
- A shut-off valve for the connection between your household water line and the refrigerator supply line. Do not use a self-piercing shut-off valve.
- A compression nut and ferrule (sleeve) for the water supply connection at the rear of your refrigerator.



NOTE

A kit is available from your dealer that provides all materials for a water supply installation, including 25 feet of copper tubing and full instructions.

To connect the water supply to the rear of your refrigerator:

- 1 Ensure that the refrigerator is not plugged in.
- 2 Flush the supply line until water is clear by placing the end of the copper tube in a sink or bucket and opening the shut-off valve.
- 3 Remove the plastic cap from the water valve inlet at the rear of your refrigerator. Discard the cap.
- 4 Slide the brass compression nut, then the ferrule (sleeve) onto copper tube.
- 5 Push the copper tube into the water valve inlet as far as it will go (¼ inch).
- 6 Slide the ferrule (sleeve) into the valve and finger-tighten the compression nut onto valve. Tighten another half turn with a wrench. Do not over-tighten.
- 7 Secure the copper tube to your refrigerator's rear panel with a steel clamp and screw (see illustration).
- 8 Coil the excess copper tubing (about 2½ turns) behind your refrigerator as shown. Arrange coiled tubing to avoid vibration or wear against other surfaces.
- 9 Open water supply shut-off valve and tighten any connections that leak.

NOTE

After connecting the water supply, refer to "How to Prime the Water Supply System" for important information about priming an empty water supply system.

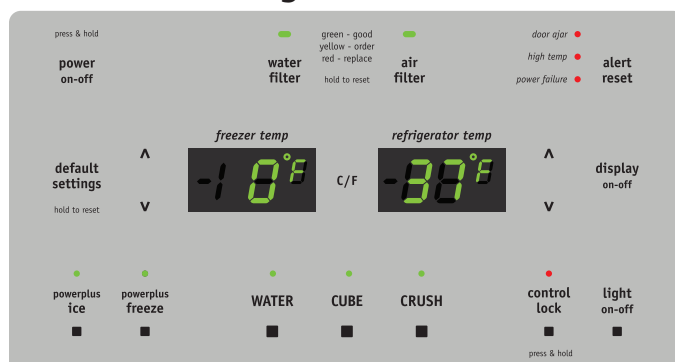
Your refrigerator's water supply system includes several tubing lines, a water filter, a water valve and a water tank. To ensure that your water dispenser works properly, this system must be completely filled with water when your refrigerator is first connected to the household water supply line.

Controls

Frigidaire Gallery



Frigidaire Pro



User Interface

Your refrigerator is equipped with a user interface display. It is only necessary to touch the glass. There is no need to press with force.

Touch an icon to activate the desired dispenser mode. The active dispenser mode is more brightly illuminated.

quick ice (Gallery only)	Increases the production of ice
quick freeze (Gallery only)	Activates a faster rate for freezing food
power plus ice (Pro only)	Increases the production of ice
power plus freeze (Pro only)	Activates a faster rate for freezing food
light on-off	On / Off
control lock	Press and hold for three seconds to activate and deactivate. This restricts undesired changes to the refrigerators settings and prevents use of the ice and water dispenser.

User Variable Options

Touching the options icon displays the following options:

water filter	Touch to display filter condition status. Press and hold for three seconds to reset.
air filter	Touch to display filter status. Press and hold for three seconds to reset.
display on-off	When active, it allows the display of the freezer and fridge temps.
C/F	Touch to toggle display from Fahrenheit to Celsius.
default settings	Resets all refrigerator settings such as temp, temp display, and alarm tones to their factory default settings.
power on-off	Press and hold for three seconds to turn off the cooling system to clean the refrigerator. It also turns off all dispenser functions. The temperature display will read OFF.

➔ IMPORTANT

Pressing the **power off** icon does not turn off power to your refrigerator. You must unplug the power cord from the wall outlet.

Setting Cooling Temperatures

Press the ^ or v indicator to adjust the temperature to the desired setting.

The temperature display will begin to blink with the first touch. After five (5) seconds of inactivity, the display will beep to accept the new temperature.

Alarms

Door Ajar If the door has been left open for an extended period of time greater than 5 minutes, an alarm will sound and the door ajar indicator will display in the middle. The alarm is turned off by closing the door. The alarm off key will illuminate to prompt the reset of any pending alarms. Press this key to reset any system Alarms.

High Temp In the event of a high temperature condition, the temperature display will display "HI". After 20 minutes, the high temp alert will be displayed and the alarm off icon will illuminate until pressed, acknowledging the alarm, at which time the highest temperature reached will be displayed and the refrigerator will resume normal operation. All other modes are turned off until the alarm is acknowledged.

Power Fail In the event of a power failure, the power fail alert will be displayed and the alarm off key will be illuminated and you will hear an audible alarm until the alarm off icon is pressed, acknowledging the alarm. Other modes may be turned off until the alarm is acknowledged. When the power fail alert is turned off, the refrigerator will resume normal operation. The high temp alarm may also be illuminated until a safe operating range temperature has been reached.

Controls

Sabbath Mode

The Sabbath Mode is a feature that disables portions of the refrigerator and its controls in accordance with observance of the weekly Sabbath and religious holidays within the Orthodox Jewish community.

Sabbath Mode is turned ON and OFF by pressing and holding "v" on freezer temp and "^" on refrigerator temp for five seconds. The display shows "Sb" while in Sabbath mode.

In the Sabbath Mode, the High Temp alarm is active for health reasons. If a high temperature alarm is activated during this time, for example due to a door left ajar, the alarm will sound intermittently for about 10 minutes. The alarm will then silence on its own and a red high temperature icon will display. The high temp icon will continue to display, even if the door is closed, until the Sabbath mode is exited and the icon reset. The refrigerator will function normally once the door is closed, without any violation of the Sabbath/Holidays.



For further assistance, guidelines for proper usage and a complete list of models with the Sabbath feature, please visit the web at

NOTE

Although you have entered the Sabbath mode, the ice maker will complete the cycle it had already initiated. The ice cube compartment will remain cold and new ice cubes can be made with standard trays.

Storage Features



CAUTION

To avoid personal injury or property damage, handle tempered glass shelves carefully. Shelves may break suddenly if nicked, scratched, or exposed to sudden temperature change. See "Glass Shelves" in Care & Cleaning Chart.

Cantilever Shelf Adjustment

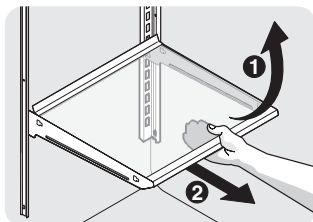
Refrigerator shelves are easily adjusted to suit individual needs. Before adjusting the shelves, remove all food. Cantilever shelves are supported at the back of the refrigerator.

To adjust cantilever shelves:

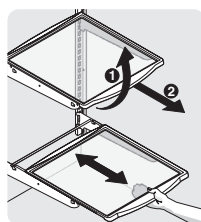
-  Lift front edge up.
-  Pull shelf out.

Replace the shelf by inserting the hooks at rear of the shelf into the wall bracket. Lower the shelf into the desired slots and lock into position.

SpillSafe™ glass shelves (some models) catch and hold accidental spills. In some models, the SpillSafe™ shelves slide out for easy access to food and for fast cleaning. The shelves slide out independently of their mounting brackets. Just pull the front of the shelf forward. Shelves can be extended as far as the stopper will allow but are



Cantilever Glass Shelf



Cantilever Sliding Glass Shelf

Door storage

Door bins and shelves are provided for convenient storage of jars, bottles, and cans. Frequently used items can be quickly selected.

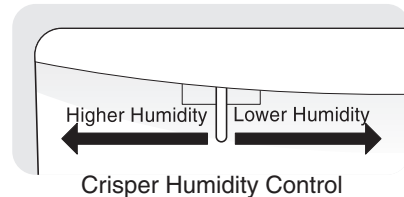
Some models have door bins that can accommodate gallon-sized plastic drink containers and economy-sized jars and containers. Some bins are adjustable for maximum storage capacity.

The dairy compartment, which is warmer than the general food storage section, is intended for short term storage of cheese, spreads, or butter.

Fresh Drawers with Humidity Control (some models)

The fresh drawers, located under the bottom refrigerator shelf, are designed for storing fruits, vegetables, and other fresh produce. The fresh drawers feature humidity control

which allows you to adjust the humidity within the drawer. This can extend the life of fresh vegetables that keep best in high humidity. Wash items in clear water and remove excess water before placing them in the crispers. Items with strong odors or high moisture content should be wrapped before storing.



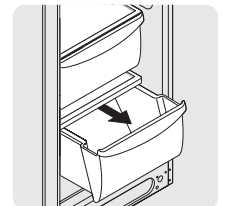
Crisper Humidity Control

NOTE

Leafy vegetables keep best when stored with the humidity control set on **Higher Humidity**, or in a drawer without a Humidity Control. This keeps incoming air to a minimum and maintains maximum moisture content.

Crispers

Crispers allow you the flexibility to store any manner of items including fruits, vegetables, nuts, etc. Crispers do not feature humidity controls.



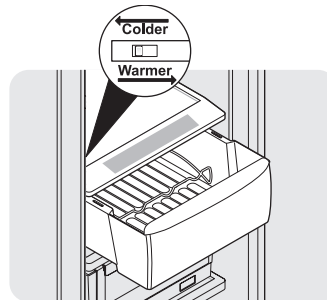
Crisper Drawer

Cool Drawer (some models)

Some models are equipped with a Cool Drawer for storage of luncheon meats, spreads, cheeses, and other deli items. This drawer does not have a separate temperature control

Chill Drawer (some models)

Some models are equipped with a Chill Drawer. Chill Drawer temperatures can be adjusted by sliding the Chill Drawer Temperature Control in either direction. Use this pan for short term storage of bulk meat items. If meats are to be kept longer than one or two days, they should be frozen. The Chill Drawer is fixed and cannot be moved up or down. If fruits or vegetables are to be stored in the Chill Drawer, set the Chill Drawer Temperature Control to a warmer setting to prevent freezing.



Chill Drawer with Temperature Control

Automatic Ice & Water Dispenser

Priming the Water Supply System

Your refrigerator's water supply system includes several tubing lines, an advanced water filter, a distribution valve bank, and a reserve tank to ensure ample supply to the ice and water dispenser at all times. This system needs to be completely filled with water when first connected to an external supply line.

CAUTION

For proper dispenser operation, recommended water supply pressure should fall between 30 psi and 100 psi. Excessive pressure may cause water filter to malfunction.

To prime the water supply system:

- 1 Begin filling the tank by pressing and holding a drinking glass against the water dispenser paddle.
- 2 Keep the glass in this position until water comes out of the dispenser. **It may take about 1½ minutes.**
- 3 Continue dispensing water for about three minutes to flush the system and plumbing connections of any impurities (stopping to empty the glass as necessary).

NOTE

The water dispenser has a built-in device that shuts off the water flow after three minutes of continuous use. To reset this shutoff device, simply release the dispenser paddle.

Ice Maker Operation & Care

The ice maker, ice bin, and dispenser feeding mechanism are located in the top of the freezer compartment. After the refrigerator is installed properly and has cooled for several hours, the ice maker can produce ice within 24 hours. It can completely fill an ice bin in about two days.

The ice maker produces four to six pounds of ice every 24 hours depending on usage conditions. Ice is produced at a rate of eight cubes every 75 to 90 minutes.

Using the Ice Maker after Installation

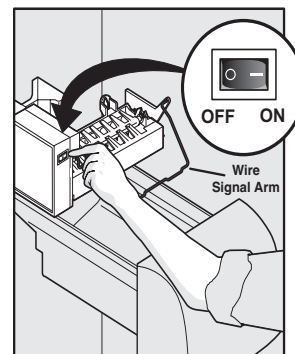
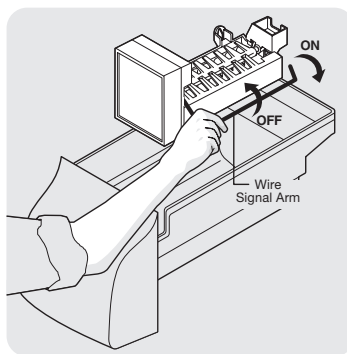
Before making ice for the first time, be sure to prime the water supply system. Air in new plumbing lines can result in two or three empty ice maker cycles. Furthermore, if the system is not flushed, the first ice cubes may be discolored or have an odd flavor.

IMPORTANT

Your ice maker is turned on at the factory so it can work as soon as you install your refrigerator. If you cannot connect a water supply, turn the ice maker's On/Off switch to Off. Otherwise, the ice maker's fill valve may make a loud chattering noise when it attempts to operate without water.

Turning the Ice Maker On and Off

Ice production is controlled by the ice maker's **On/Off** power switch. To gain access to the ice maker, pull the extra shelf out (some models). Press the switch to the "O" position to turn it Off and press to the "I" position to turn it On.



NOTE

The ice maker also has a built-in wire signal arm, that automatically stops ice production when the ice bin is full. This signal arm should not be used to manually stop the ice maker.

IMPORTANT

Small ice cubes or ice chips jamming in the ice maker may be a sign that your water filter needs changing. If you have a side mounted ice maker you may also experience hollow cubes partially frozen cubes with water inside. When these cubes are harvested, they break open and spill water over the other ice cubes in the ice container, forming a solid mass of ice. As the water filter nears the end of its useful life and becomes clogged with particles, less water is delivered to the ice maker during each cycle. The ice maker can't fill every cube in the ice maker mold, leading to small cubes or chips that can get caught between the ice ejector blades and the stripper. Remember, if your ice maker is jamming with small ice cubes or it's been six months or longer since you last changed your water filter replace the water filter with a new one. Poor quality household water may require the filter to be changed more frequently.

Automatic Ice & Water Dispenser (Continued)

Ice Maker/Dispenser Tips

- Ice cubes stored too long may develop an odd flavor. Empty the ice container as explained below.
- Occasionally shake the ice container to keep ice separated.
- If your refrigerator is not connected to a water supply or the water supply is turned off, turn off the ice maker by pressing the **On/Off** switch.
- If you need a large quantity of ice at one time, it is best to get cubes directly from the ice container.
- The following sounds are normal when the ice maker is operating:
 - Motor running
 - Ice dropping into ice container
 - Water valve opening or closing
 - Ice loosening from tray
 - Running water
- When dispensing ice, you will hear a snapping or clicking sound when the ice chute opens and closes.
- Turn off the ice maker when cleaning the freezer and during vacations.
 - If you turn off the ice maker for a long period of time, you should also turn off the water supply valve.

CAUTION

Chemicals from a malfunctioning water softener can damage the ice maker. If the water supply to your refrigerator is softened, be sure the softener is maintained to work properly.

Cleaning the Ice Maker

Clean the ice maker and ice bin at regular intervals, particularly before you take a vacation or move.

To clean the ice maker:

- 1 Turn off ice production by pressing the ice maker's **Off/On** switch.
- 2 Remove the ice bin by lifting up and out.
- 3 Empty and carefully clean the ice bin with mild detergent. Rinse with clear water. Do not use harsh or abrasive cleaners.
- 4 Allow the ice bin to dry completely before replacing in the freezer.
- 5 Remove ice chips and clean the ice bin shelf and the freezer door chute.

- 6 Replace the ice bin. Press the ice maker's **Off/On** switch to resume ice production.

Remove and empty the ice storage bin if:

- An extended power failure (one hour or longer) causes ice cubes in the ice storage bin to melt and freeze together, jamming the dispenser mechanism.
- You do not use the ice dispenser frequently. Ice cubes will freeze together in the bin, jamming the dispenser mechanism.

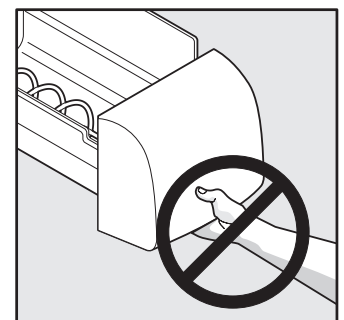
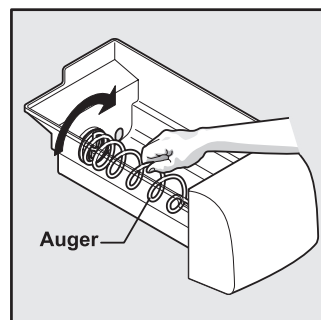
Remove the ice storage bin and shake to loosen the cubes or clean as explained above.

CAUTION

NEVER use an ice pick or similar sharp instrument to break up the ice. This could damage the ice storage bin and dispenser mechanism.

IMPORTANT

When removing or replacing the ice bin, **DO NOT** rotate the auger in the ice bin. If the auger is accidentally rotated, you must realign the auger by turning it in 90 degree turns (see below) until the ice bin fits into place with the drive mechanism. **If the auger is not** properly aligned when replacing the ice bin, the refrigerator will only dispense Crushed Ice. The freezer door may also not close properly causing warm air to leak into the freezer.



CHANGING THE FILTER

Locating the Filters

Your refrigerator is equipped with separate water and air filtering systems. The water filter system filters all dispensed drinking water, as well as the water used to produce ice. The air filter reduces odors from the refrigerator compartment.

Water Filter

The water filter is located at the top right side of the fresh food compartment.

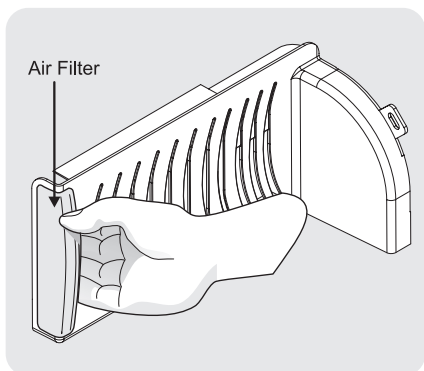
Air Filter

The air filter is located at the top of the fresh food compartment next to the water filter.

Replacing the Air Filter

In general, you should change the air filter every six months (the filter status light on the control panel prompts you to replace the filter after six months) to ensure optimal filtering of refrigerator odors. You may want to adjust this time period depending on the types and amounts of food you typically store in your refrigerator. To replace your **PureSource Ultra™** air filter:

- 1 Pull the air filter housing straight out.
- 2 Remove the old filter and discard it.
- 3 Unpack the new filter and place it inside the housing.
- 4 Slide the housing back into position.
- 5 Press and hold the **Air Filter Reset** button on the electronic control panel for three seconds. When the display changes from "**Replace**" to "**Good**," the status has been reset.
- 6 The **Air Filter Reset** will turn itself off after a few seconds.



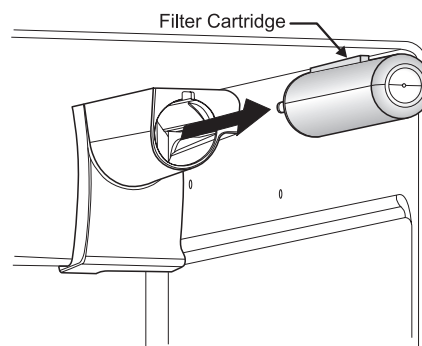
NOTE

The control panel, located on the freezer door, includes controls to monitor the status of your air filter. See the Controls section for more information.

Replacing the Water Filter

In general, you should change the water filter every six months to ensure the highest possible water quality. The **Water Filter Status** light on the Touch Panel prompts you to replace the filter after a standard amount of water (200 gallons/757 liters for **PureSource Ultra™**) has flowed through the system.

If your refrigerator has not been used for a period of time (during moving for example), change the filter before reinstalling the refrigerator.



Ordering Replacement Filters

Order new filters by calling toll-free, 877/808-4195, visiting www.frigidaire.com store, or seeing the dealer where you bought your refrigerator. Electrolux recommends that you order extra filters when you first install your refrigerator, and that you replace your filters at least once every six months.

Here is the product number to request when ordering:

PureSource Ultra™
Water Filter and Air Filter
Part # **ULTRAWF**
Airfilter is PureAir Ultra part # PAULTRA

CHANGING THE FILTER

More about your Advanced Water Filter



The **PureSource Ultra™** ice and water filter system is tested and certified by NSF International, the nationally respected, not-for-profit certification organization for public health safety. The **PureSource**

Ultra™ ice and water filter system is tested and certified to ANSI/NSF Standards 42 and 53 for the reduction of claims specified on the performance data sheet.

Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. Systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

Test & certification results:

- Rated Capacity - 200 gallons/757 liters for **PureSource Ultra™** ice and water filter
- Rated service flow - .50 gallons per minute
- Operating Temp.: Min. 33°F, Max. 100°F
- Maximum Rated Pressure - 100 pounds per square inch
- Recommended Minimum Operating Pressure: 30 pounds per square inch

To replace your PureSource Ultra™ water filter:

It is not necessary to turn the water supply off to change the filter. Be ready to wipe up any small amounts of water released during the filter replacement.

- 1** Turn **Off** the ice maker power switch.
- 2** Remove the filter by pushing on the end/face of the filter.
- 3** Slide the old water filter cartridge straight out of the housing and discard it.
- 4** Unpackage the new filter cartridge. Using the alignment guide, slide it gently into the filter housing until it stops against the snap-in connector at the back of the housing.
- 5** **Push firmly until the cartridge snaps into place (you should hear a click as the cartridge engages the snap-in connector).**
- 6** Press a drinking glass against the water dispenser while checking for any leaks at the filter housing. Any spurts and sputters that occur as the system purges air out of the dispenser system are normal.

- 7** After filling one glass of water, continue flushing the system for about **three minutes**.
- 8** Turn **On** the ice maker.
- 9** Press and hold the **Filter Status** button on the Ice & Water Dispenser control panel for three seconds. When the display changes from "**Replace**" to "**Good**," the status has been reset.

Normal Operating Sounds and sights

Understanding the Sounds you may Hear

Your new, high-efficiency refrigerator may introduce unfamiliar sounds. These sounds normally indicate your refrigerator is operating correctly. Some surfaces on floors, walls, and kitchen cabinets may make these sounds more noticeable.

Following is a list of major components in your refrigerator and the sounds they can cause:

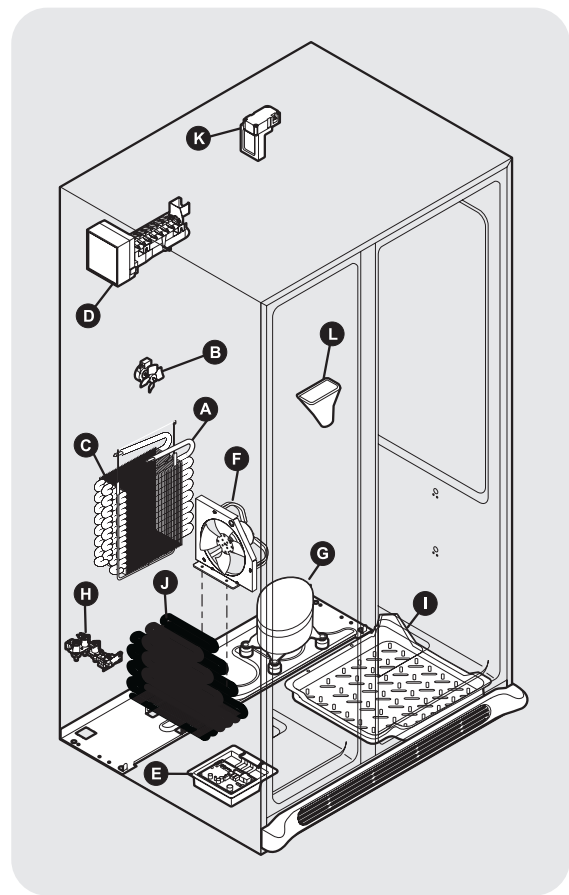
- A Evaporator** Refrigerant through the evaporator may create a boiling or gurgling sound.
- B Evaporator fan** You may hear air being forced through the refrigerator by the evaporator fan.
- C Defrost heater** During defrost cycles, water dripping onto the defrost heater may cause a hissing or sizzling sound. After defrosting, a popping sound may occur.
- D Automatic ice maker** When ice has been produced, you will hear ice cubes falling into the ice bin.
- E Electronic control & automatic defrost control** These parts can produce a snapping or clicking sound when turning the cooling system on and off.
- F Condenser fan** You may hear air being forced through the condenser.
- G Compressor** Modern, high-efficiency compressors run much faster than in the past. The compressor may have a high-pitched hum or pulsating sound.
- H Water valve** Makes a buzzing sound each time it opens to fill the ice maker.
- I Drain pan** (not removable) You may hear water dripping into the drain pan during the defrost cycle.
- J Condenser** May create minimal sounds from forced air.
- K Motorized damper** May produce a light humming during operation.
- L Ice dispensing paddle** When dispensing ice, you will hear a snapping or clicking sound when the solenoid opens and closes the ice chute.

NOTE

Energy efficient foam in your refrigerator is not a sound insulator.

NOTE

During automatic defrost cycle, a red glow in the back wall vents of your freezer compartment is normal.



Care & Cleaning

Protecting your investment

Keeping your refrigerator clean maintains appearance and prevents odor build-up. Wipe up any spills immediately and clean the freezer and fresh food compartments at least twice a year. When cleaning, take the following precautions:

- Never use CHLORIDE or cleaners with bleach to clean stainless steel.
- Do not wash any removable parts in a dishwasher.
- Always unplug the electrical power cord from the wall outlet before cleaning.
- Remove adhesive labels by hand. Do not use razor blades or other sharp instruments which can scratch the appliance surface.
- Do not remove the serial plate.

Do not use abrasive cleaners such as window sprays, scouring cleansers, brushes, flammable fluids, cleaning waxes, concentrated detergents, bleaches or cleansers containing petroleum products on plastic parts, interior doors, gaskets or cabinet liners. Do not use paper towels, metallic scouring pads, or other abrasive cleaning materials or strong alkaline solutions.

NOTE

If you set your temperature controls to turn off cooling, power to lights and other electrical components will continue until you unplug the power cord from the wall outlet.

CAUTION

- **Pull the refrigerator straight out to move it. Shifting it from side to side may damage flooring. Be careful not to move the refrigerator beyond the plumbing connections.**
- **Damp objects stick to cold metal surfaces. Do not touch refrigerated surfaces with wet or damp hands.**

IMPORTANT

If you store or move your refrigerator in freezing temperatures, be sure to completely drain the water supply system. Failure to do so could result in water leaks when the refrigerator is put back into service. Contact a service representative to perform this operation.

Care & Cleaning Tips

Part	What To Use	Tips and Precautions
Interior & Door Liners	<ul style="list-style-type: none"> • Soap and water • Baking soda and water 	Use 2 tablespoons of baking soda in 1 quart of warm water. Be sure to wring excess water out of sponge or cloth before cleaning around controls, light bulb or any electrical part.
Door Gaskets	<ul style="list-style-type: none"> • Soap and water 	Wipe gaskets with a clean soft cloth.
Drawers & Bins	<ul style="list-style-type: none"> • Soap and water 	Use a soft cloth to clean drawer runners and tracks.
Glass Shelves	<ul style="list-style-type: none"> • Soap and water • Glass cleaner • Mild liquid sprays 	Allow glass to warm to room temperature before immersing in warm water.
Toe Grille	<ul style="list-style-type: none"> • Soap and water • Mild liquid sprays • Vacuum attachment 	Vacuum dust from front of toe grille. Remove toe grille (see Installation Instructions). Vacuum backside, wipe with sudsy cloth or sponge. Rinse and dry.
Exterior & Handles	<ul style="list-style-type: none"> • Soap and water • Non Abrasive Glass Cleaner 	Do not use commercial household cleaners containing ammonia, bleach or alcohol to clean handles. Use a soft cloth to clean smooth handles. DO NOT use a dry cloth to clean smooth doors.
Exterior & Handles (Stainless Steel Models Only)	<ul style="list-style-type: none"> • Soap and water • Stainless Steel Cleaners 	<p>Never use CHLORIDE or cleaners with bleach to clean stainless steel.</p> <p>Clean stainless steel front and handles with non-abrasive soapy water and a dishcloth. Rinse with clean water and a soft cloth. Use a non-abrasive stainless steel cleaner. These cleaners can be purchased at most home improvement or major department stores. Always follow manufacturer's instructions. Do not use household cleaners containing ammonia or bleach.</p> <p>NOTE: Always clean, wipe and dry with the grain to prevent scratching. Wash the rest of the cabinet with warm water and mild liquid detergent. Rinse well, and wipe dry with a clean soft cloth.</p>
Replacing Light Bulbs	<ul style="list-style-type: none"> • Unplug refrigerator • Wear gloves • Remove light cover • Replace old bulb • Replace light cover • Plug in the refrigerator 	<p>CAUTION: Wear gloves when replacing light bulbs to avoid getting cut.</p> <p>Use same wattage when replacing bulb</p>

Before You Call

1-800-944-9044 (United States)

1-800-265-8352 (Canada)

Visit our web site at

www.frigidaire.com.

PROBLEM	CAUSE	CORRECTION
AUTOMATIC ICE MAKER		
Ice maker is not making any ice.	<ul style="list-style-type: none"> Ice maker wire signal arm is in the "up" or OFF position. Ice maker power switch is Off. Ice maker has small cube caught in mechanism. Saddle valve on cold water pipe is clogged or restricted by foreign material. 	<ul style="list-style-type: none"> Move wire signal arm to the "down" or ON position. (side mounted) Turn power switch to On ("I") position. (rear mounted) Remove small cube from ice maker. The ice and water filter cartridge may be clogged. Replace filter cartridge. Turn off household water line valve. Remove valve. Ensure that valve is not a self-piercing saddle valve. Clean valve. Replace valve if necessary.
Ice maker is not making enough ice.	<ul style="list-style-type: none"> Ice maker is producing less ice than you expect. Check to see if water dispenser is dispensing slower than normal. 	<ul style="list-style-type: none"> Side mounted ice maker should produce 4 to 4.5 pounds (approximately 4 quarts) of ice every 24 hours. A rear mounted ice maker should produce 3 to 4 pounds (approximately 3½ quarts) of ice every 24 hours. Quick Ice option should produce up to 50% more ice every 24 hours. If it is, replace the ice and water filter cartridge.
Ice maker will not stop making ice.	<ul style="list-style-type: none"> Ice maker wire signal arm is being held down by some item in the freezer. 	<ul style="list-style-type: none"> Move item and release wire signal arm. Remove any ice cubes that are frozen together over the wire signal arm.
Ice cubes are freezing together.	<ul style="list-style-type: none"> Ice cubes are not being used frequently enough. Ice cubes are hollow (partially frozen cubes with water inside). Freezer control is set too warm. 	<ul style="list-style-type: none"> Remove ice container and discard ice from container. Ice maker will produce fresh supply. The ice and water filter cartridge may be clogged. Replace filter cartridge. Set freezer control to colder setting. Allow 24 hours for temperature to stabilize.
ICE DISPENSER		
Dispenser will not dispense ice.	<ul style="list-style-type: none"> Ice storage container is empty. Freezer temperature is set too warm. Household water line valve is not open. Ice dispensing arm has been held in for more than 4-5 minutes. 	<ul style="list-style-type: none"> When the first supply of ice is dropped into the container, the dispenser should operate. Turn freezer control to a higher setting so that ice cubes will be made. When first supply of ice is made, dispenser should operate. Open household water line valve. Allow sufficient time for the ice to be made. When ice is made, the dispenser should operate. Motor is overloaded. Motor over load protector will reset in approximately 3 minutes. Ice can then be dispensed.
Ice dispenser is jammed.	<ul style="list-style-type: none"> Ice has melted and frozen around auger due to infrequent use, temperature fluctuations, and/or power outages. Ice cubes are jammed between ice maker and back of ice container. 	<ul style="list-style-type: none"> Remove ice container, thaw, and empty the contents. Clean container, wipe dry, and replace in proper position. When new ice is made, dispenser should operate. Remove ice cubes that are jamming the dispenser.
OPENING/CLOSING OF DOORS/DRAWERS		
Door(s) will not close.	<ul style="list-style-type: none"> Door was closed too hard, causing other door to open slightly. Refrigerator is not level. It rocks on the floor when moved slightly. Refrigerator is touching a wall or cabinet. 	<ul style="list-style-type: none"> Close both doors gently. Ensure floor is level and solid, and can adequately support the refrigerator. Contact a carpenter to correct a sagging or sloping floor. Ensure floor is level and solid, and can adequately support the refrigerator. Contact a carpenter to correct a sagging or sloping floor.
Drawers are difficult to move.	<ul style="list-style-type: none"> Food is touching shelf on top of drawer. Track that drawers slide on is dirty. 	<ul style="list-style-type: none"> Remove top layer of items in drawer. Ensure drawer is properly installed on track. Clean drawer, rollers, and track. See Care & Cleaning.

Before You Call (continued)

PROBLEM	CAUSE	CORRECTION
RUNNING OF REFRIGERATOR		
Compressor does not run.	<ul style="list-style-type: none"> Freezer control is set to "OF" or "0". Refrigerator is in defrost cycle. Plug at electrical outlet is disconnected. House fuse blown or tripped circuit breaker. Power outage. 	<ul style="list-style-type: none"> Set freezer control. This is normal for a fully automatic defrost refrigerator. The defrost cycle occurs periodically, lasting about 30 minutes. Ensure plug is tightly pushed into outlet. Check/replace fuse with a 15 amp time-delay fuse. Reset circuit breaker. Check house lights. Call local electric company.
Refrigerator runs too much or too long.	<ul style="list-style-type: none"> Room or outside weather is hot. Doors are opened too frequently or too long. Fresh Food/freezer door may be slightly open. Freezer control is set too cold. Fresh Food/freezer gasket is dirty, worn, cracked, or poorly fitted. Condenser is dirty. 	<ul style="list-style-type: none"> It's normal for the refrigerator to work longer under these conditions. Warm air entering the refrigerator causes it to run more. Open doors less often. Ensure refrigerator is level. Keep food and contains from blocking door. See PROBLEM column OPENING/CLOSING OF DOORS/DRAWERS. Set Fresh Food control to warmer setting until refrigerator temperature is satisfactory. Allow 24 hours for temperature to stabilize. Clean or change gasket. Leaks in door seal will cause refrigerator to run longer in order to maintain desired temperatures. Clean condenser. See Care & Cleaning.
Compressor goes off and on frequently.	<ul style="list-style-type: none"> Thermostat keeps the refrigerator at a constant temperature. 	<ul style="list-style-type: none"> This is normal. Refrigerator goes on and off to keep temperature constant.
DIGITAL TEMPERATURE DISPLAY		
Digital temperature displays are flashing.	<ul style="list-style-type: none"> Electronic control system has detected a performance problem. 	<ul style="list-style-type: none"> Call your Frigidaire service representative, who can interpret any messages or number codes flashing on the digital displays.
WATER DISPENSER		
Dispenser will not dispense water.	<ul style="list-style-type: none"> Household water line valve is not open. Ice and water filter cartridge is clogged. Filter not fully installed. 	<ul style="list-style-type: none"> Open household water line valve. See PROBLEM column AUTOMATIC ICE MAKER. Replace filter cartridge. Push filter in until you hear a "click".
Water has an odd taste and/or odor.	<ul style="list-style-type: none"> Water has been in the tank for a period of time. Unit not properly connected to cold water line. 	<ul style="list-style-type: none"> Draw and discard 10-12 glasses of water to freshen the supply and completely rinse out the tank. Connect unit to cold water line that supplies water to the kitchen faucet.
Water pressure is extremely low.	<ul style="list-style-type: none"> Cut-off and cut-on pressures are too low (well systems only). Reverse osmosis system is in regenerative phase. 	<ul style="list-style-type: none"> Have someone turn up the cut-off and cut-on pressure on the water pump system (well systems only). It is normal for a reverse osmosis system to be below 20 psi during the regenerative phase.
WATER/MOISTURE/FROST INSIDE REFRIGERATOR		
Moisture collects on inside of refrigerator walls.	<ul style="list-style-type: none"> Weather is hot and humid. Door is slightly open. 	<ul style="list-style-type: none"> The rate of frost buildup and internal sweating increases. See PROBLEM column OPENING/CLOSING OF DOORS/DRAWERS.
Water collects on bottom side of drawer cover.	<ul style="list-style-type: none"> Vegetables contain and give off moisture. 	<ul style="list-style-type: none"> It is not unusual to have moisture on the bottom side of the cover. Move humidity control (some models) to lower setting.
Water collects in bottom of drawer.	<ul style="list-style-type: none"> Washed vegetables and fruit drain while in the drawer. 	<ul style="list-style-type: none"> Dry items before putting them in the drawer. Water collecting in bottom of drawer is normal.
WATER/MOISTURE/FROST OUTSIDE REFRIGERATOR		
Moisture collects on outside of refrigerator or between doors.	<ul style="list-style-type: none"> Weather is humid. Door is slightly open, causing cold air from inside refrigerator to meet warm air from outside. 	<ul style="list-style-type: none"> This is normal in humid weather. When humidity is lower, the moisture should disappear. See PROBLEM column OPENING/CLOSING OF DOORS/DRAWERS.

Section 4 - Electrical Components

Electrical Grounding

All refrigerators are equipped with a power supply cord incorporating a three-prong grounding plug and a ground wire which is attached to the refrigerator cabinet for protection against shock hazard. Each electrical component is either cabinet mounted or connected through a ground wire to the cabinet to complete the ground. Certain components, such as defrost timers, may be double insulated and do not require a ground wire.

Ensure the electrical wall receptacle is of the three prong type and is properly grounded in accordance with the National Electrical Code and/or local codes.

Compressor Electrical Components and Circuits on Models with Standard Compressor

The new series of very high efficiency compressor is equipped with all new electrical components consisting of a solid state PTC relay with a thermally operated overload protector, and a run capacitor.

Solid State Relay

The solid state relay has no moving parts. It consists of a PTC resistor mounted in a plastic case with appropriate terminals. PTC (Positive Temperature Coefficient) simply denotes a resistor which increases in resistance as its temperature is increased. The self-heating PTC resistor used in the solid state relay has the unique characteristic of changing from low to very high resistance very abruptly, thus serving as an on-off switch. (See Figure C1.)

The solid state relay plugs directly onto the compressor start and run terminals. Relay terminals 1, 2, and 5 are connected within the relay, as are terminals 3 and 6.

A run capacitor is connected to relay terminals 2 and 3, so it is connected in parallel with the PTC resistor. One side of the 120 VAC power is connected to relay terminal 1. The other side of line is connected to the overload protector. (See figure C1.)

To Check/Replace Relay

1. Disconnect electrical supply to refrigerator.
2. Remove bale wire holding relay to compressor.
3. Remove relay assembly from compressor.
(See Figure C2.)

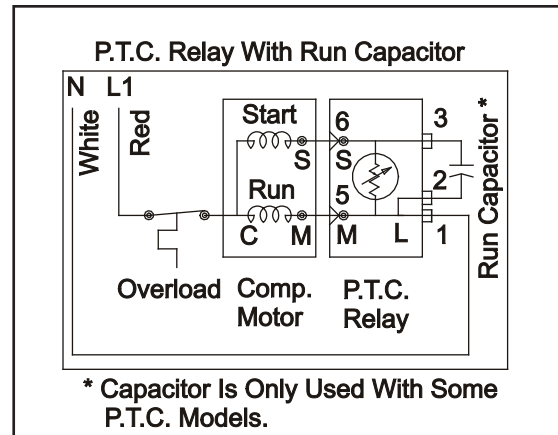


Figure C1

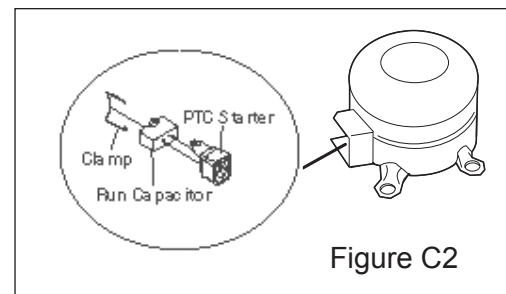


Figure C2

4. Use small, flat-bladed screwdriver to disconnect leads to relay assembly.
5. Use flat headed screwdriver to gently pry capacitor from relay assembly.
6. Use ohmmeter to check resistance between terminals 5 and 6. Resistance should be 3 to 12 ohms at normal room temperature. Shorted relay will read 0 ohms. Open relay will read very high or infinite resistance.
7. If ohm readings are out of range, replace relay.
8. Reverse this procedure to re-assemble.

NOTE

When replacing leads to the PTC relay, ensure locking tabs snap into terminal.

Overload Protector

The overload protector is completely thermally operated. It will open from excessive heat or current. Unlike prior overloads, the internal bi-metal is not self-heating, and is not a part of the electrical circuit. The overload has a small built-in coil heater that is in series with the compressor start and run windings (See Figure C1).

Section 4 - Electrical Components

To Check/Replace The Overload Protector

1. Disconnect electrical supply to refrigerator.
2. Remove bale wire holding relay to compressor.
3. Remove relay assembly from compressor.
4. Use flat headed screwdriver to gently pry capacitor from relay assembly.
5. Use small, flat-bladed screwdriver to disconnect leads to relay assembly. (Note: On some models you will have to remove bale wire and cover, to gain access to relay and overload protector.)
6. Use ohmmeter to check resistance between tab terminal and female pin terminal. Overload protector should have less than 1 ohm of resistance at normal room temperature.
7. If ohm readings are out of range, install new Starter/Overload Assembly.
8. Reverse this procedure to re-assemble.

Run Capacitor

The run capacitor has permanently attached terminals which are connected to relay terminals 2 and 3.

NOTE

The Overload Protector is built into the Starter Overload Assembly.

To Check/Replace The Run Capacitor

NOTE

When replacing leads to the PTC Relay, ensure the locking tabs snap back into the terminal.

1. Disconnect electrical supply to refrigerator.
2. Remove bale wire holding relay to compressor.
2. Use small, flat-bladed screwdriver to disconnect leads to relay assembly.

NOTE

Some models are not equipped with a Run capacitor.

3. Use flat-bladed screwdriver to gently pry capacitor from relay assembly.
4. Discharge capacitor by shorting across terminals with 500K (1 watt) resistor for one minute.
5. Use ohmmeter set on the **"Ohms times 1000"** scale (if available), to check resistance across capacitor wire terminals.

- The needle should jump towards zero ohms and quickly move back to infinity.
 - If the needle does not move, the capacitor is open.
 - If the needle reads a constant value at or near zero ohms, the capacitor is shorted out.
 - If the needle jumps toward zero and then moves back to constant high resistance (not infinity), the capacitor has a high resistance leak.
6. If ohm readings are out of range, replace capacitor.
 7. Reverse procedures to re-assemble.

Compressor Start Circuit

When the compressor circuit is first energized, the solid state relay has low resistance (3-12 ohms), and both the run and start windings are energized to start the compressor. The run capacitor is being bypassed by the relay, and it has a minor function during compressor starting (See Figure C3).

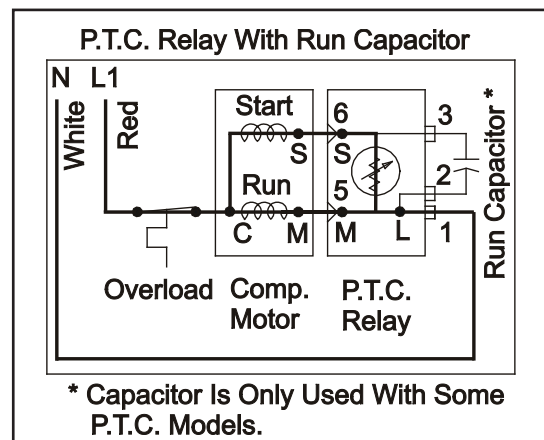


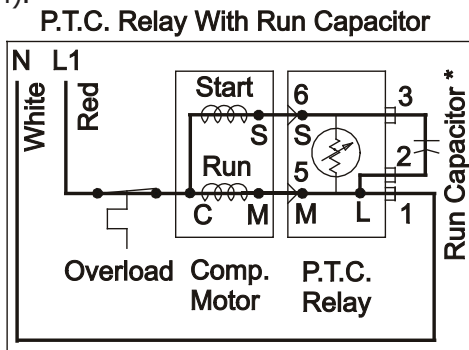
Figure C3

Section 4 - Electrical Components

Compressor Run Circuit

When the self-heating solid state relay has reached sufficient temperature, it will abruptly change from low resistance (3-12 ohms) to very high resistance (10-20K ohms) and, in effect, switches off the start windings.

The relay no longer shunts the run capacitor. The run capacitor is now in series with the start windings. The only purpose of the run capacitor is to improve compressor operating efficiency, which it does by correcting the power factor of the compressor motor (See Figure C4).



* Capacitor Is Only Used With Some P.T.C. Models.

Figure C4

Compressor Operating Characteristics

- When the compressor electrical circuit is energized, the start winding current causes the relay to heat and switch off the start winding circuit.
- The overload protector is designed and calibrated to open the compressor electrical circuit with locked rotor run winding current on.

NOTE

The relay will switch off the start winding circuit even though the compressor has not started (as when attempting to re-start after momentary power interruption).

- With an open relay, the compressor will not start since there is little or no current to the start windings. The overload protector will open due to high locked rotor run winding current.

- With a shorted relay or capacitor, the compressor will start, and the overload protector will open.
- With an open or weak capacitor, the compressor will start and run. The compressor, however, will be operating at reduced efficiency of energy usage.

Compressor Electrical Check

If the compressor will not run, make a voltage check across the power lead terminals on the PTC Relay. (See Figure C4.)

The voltmeter should show line voltage if the thermostat knob is in normal operating position and not in the OFF position. If this check does not show a live circuit, the control thermostat and defrost timer wiring should be checked for loose and/or broken connections.

A control thermostat check can be made by using a piece of wire as a temporary bridge across two thermostat terminals. If the compressor starts and runs with the bridge, the control thermostat is at fault and should be replaced.

If the voltage check shows power supply at the PTC Relay terminals, use a test cord to check the compressor.

If the compressor does not start and run with the test cord, check the line voltage to see if there is more than 10% variation from the rated voltage. If voltage is correct and the compressor will not start and run, replace the compressor.

If the compressor starts and runs with the test cord, replace the PTC Relay.

Compressor Electrical Components and Circuits for Models with Variable Capacity Compressor

The new series of very high efficiency compressor is equipped with a new electrical power input electronic control to replace the standard start package.

Section 4 - Electrical Components

The Power Input Electronic Control (Inverter)

The solid state power input electronic control contains:

1. Low voltage power supply.
2. EMI Filter and Voltage Suppressor Circuit.
3. AC-DC Converter
4. Three-phase Inverter Bridge
5. Serial communication.
6. Microcontroller or DSP Controller Protection.
7. Voltage Sensor



Inverter

The Inverter replaces the Solid State Relay, the Overload Protector and the Run Capacitor. The Inverter has 115 Volt AC current to it all the time the refrigerator is connected to line voltage. It picks up 115 Volts directly

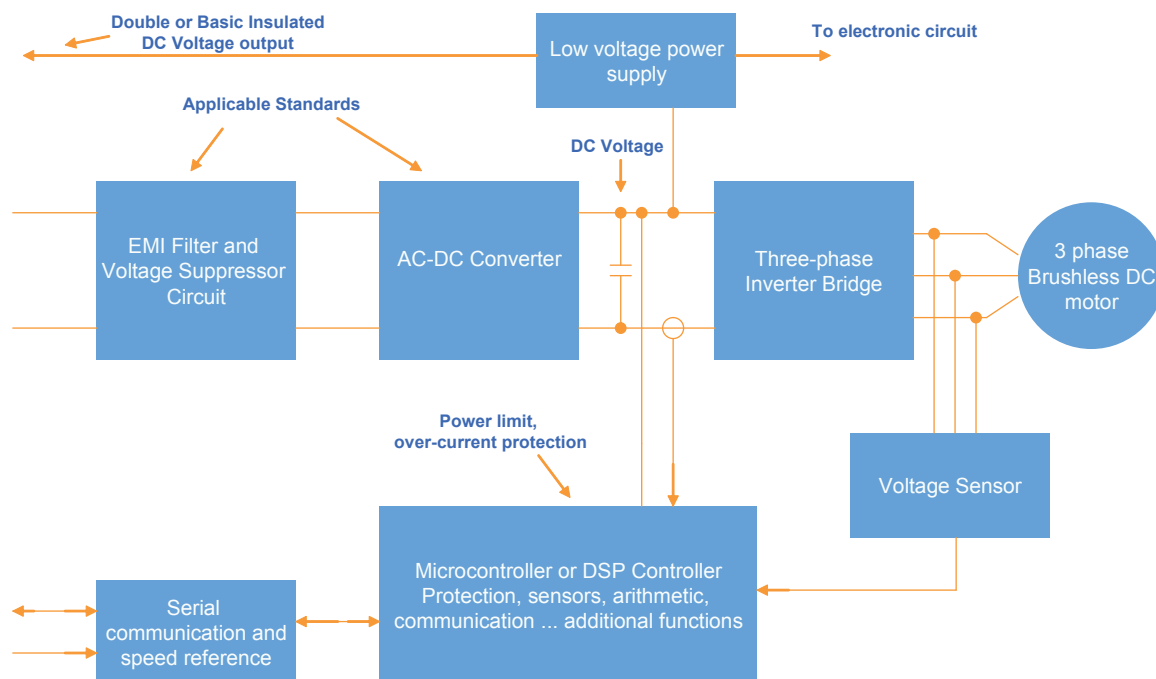
from the service cord. It receives a 2 to 5 volt DC signal from the main control board located under the refrigerator in the left front opening behind the bottom grill.

To Check/Replace the Inverter

1. Use your Multimeter or a good volt meter set on 300 volt AC to test the voltage going into the inverter from the product service cord. Do not disconnect the moxex connector. Slide the probes from your meter along side the wires until you connect with the terminal itself. You should read 115 Volt AC + or - 10%. If less check service cord and supply voltage.
2. Set your meter to DC on a scale as close to 10 Volt as available. Do not disconnect the moxex connector. Slide the probes from your meter along side the wires until you connect with the terminal itself. You should read between 2 and 5 Volt DC. If voltage is outside the 2 to 5 Volt DC range replace the main control board.



VCC Control Block Diagram



Section 4 - Electrical Components

- If the voltage checks good remove the inverter from the compressor by removing one screw at the bottom of the inverter that goes through the bracket welded to the compressor. Pull the inverter away from compressor. Use a small flat-bladed screwdriver to remove the plug from the compressor terminals. Using an ohmmeter, check the resistance between the compressor terminals (See testing compressor). If the compressor checks good replace the Inverter.

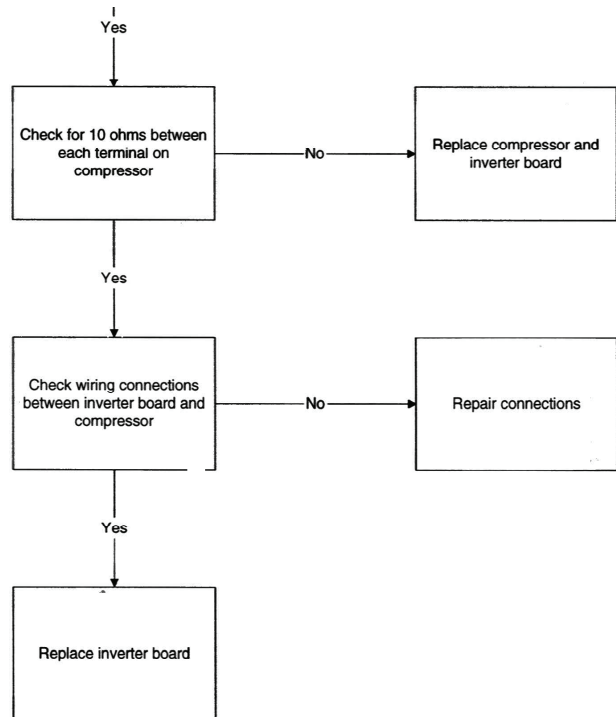
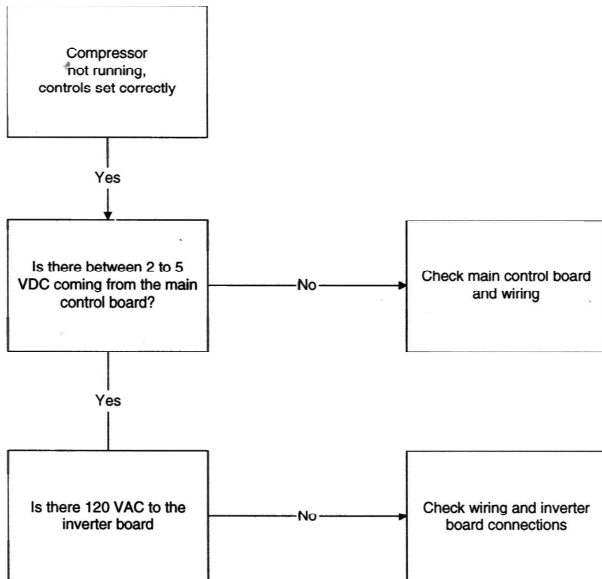
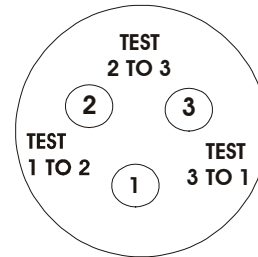
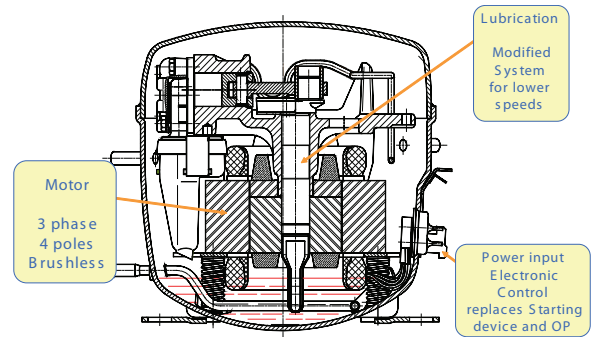


Remove screw

COMPRESSOR

The compressor has a 3 phase, 4 pole Brushless DC motor.

To test the compressor using your Ohmmeter, check the resistance between the terminals. Check should read 10 ohm + or - 10 % using drawing to test.



Section 4 - Electrical Components

Perimeter and Mullion Hot Tube

To reduce the possibility of condensation forming on the exterior of the cabinet in high humidity areas, units are equipped with a one piece perimeter and mullion hot tube which is part of the refrigeration system. No electric heaters are used. Refer to the Refrigeration Section for more information.

Evaporator Fan & Motor Assembly

The fan and motor assembly is located behind the freezer compartment air duct directly above the evaporator in the freezer compartment.

The fan is a 12 V DC suction type, pulling air up through the evaporator and blowing it through the refrigerator compartment fan grille. The fan will change from high to low speed when the freezer door is opened.

On current production models, the fan blade is not adjustable and is designed to be pressed onto the motor shaft until it bottoms out against the stop at the front of the fan blade.

To Remove Evaporator Fan Motor

1. Disconnect refrigerator from electrical supply.
2. Remove freezer section bottom shelves and baskets.
3. Remove four screws from evaporator cover and remove cover.
4. Remove 2 bottom screws on evaporator air duct cover. This will allow you to pick cover up to gain access to fan assembly.
5. Disconnect connector. Evaporator fan motor assembly can now be pulled free.
6. Remove back bracket holding fan motor by pushing in and releasing tabs.
7. Remove fan blade and slinger washer.
8. Pull evaporator fan motor free.
9. Remove rubber bushings from each end of motor and transfer to the new motor.
10. Reverse procedure to complete repairs.

NOTE

The Slinger washer on the fan motor shaft must be adjusted to within 1/16" to 1/8" from motor to prevent water from entering motor bearing.

NOTE

When replacing the fan blade, press the blade onto the motor shaft until the blade bottoms out on the shaft.



Evaporator Fan Motor Assembly



Figure C5

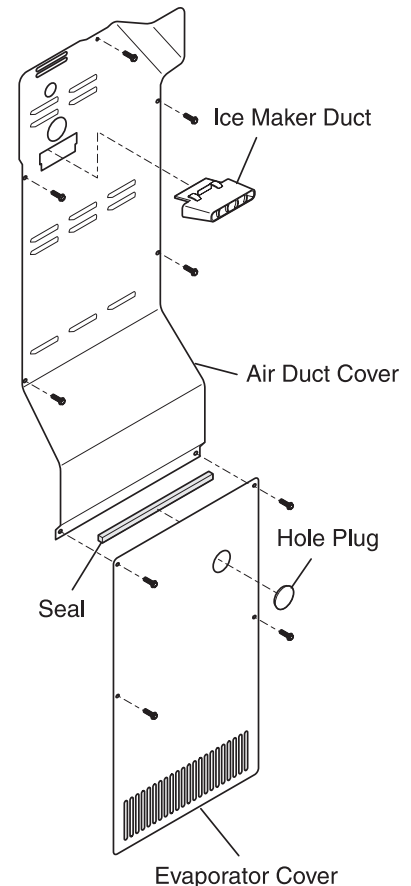


Figure C6

Section 4 - Electrical Components

Defrost Thermostat

The defrost thermostat is a temperature sensing device. Wired in series with the defrost timer and the evaporator defrost heater, it senses the rise in evaporator temperature during a defrost cycle and cycles the defrost heater off after all frost is melted. It is calibrated to permit a defrost cycle only when the temperature is below a preset temperature. The contacts in the defrost thermostat are set to open at 47°F and close at 25°F.

To Test The Defrost Thermostat

1. Measure resistance across two thermostat leads at connector plug. At room temperature, resistance should be infinity. Contacts are open.
2. Place a couple ice cubes on sides of thermostat. After a few seconds, thermostat should reset.
3. Measure resistance again. This time, reading should be 0. Contacts have closed.
4. If resistance readings is not "0", replace defrost thermostat. Contacts are probably burnt.

To Remove The Defrost Thermostat

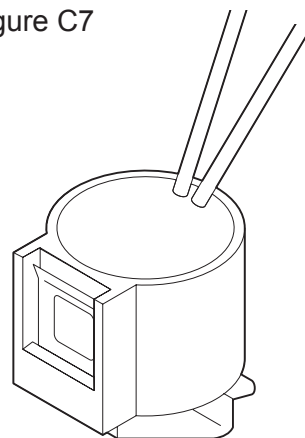
1. Disconnect refrigerator from electrical supply.
2. Remove freezer section bottom shelves and baskets.
3. Remove ice container and rail assembly. The multiconnector at back of rail assembly must be disconnected before rail assembly will come free.
4. Loosen 2 screws holding ice maker to right side of compartment, just enough to lift ice maker free. The multiconnector must be disconnected before ice maker will come free from compartment.
5. Remove two rail assembly supports. (two screws on each one).
6. Remove four screws from evaporator cover.
7. Remove five screws on evaporator air duct cover.
8. Cut the two leads coming from thermostat close to the base. You must leave enough wire coming from connector to allow for splicing tin new thermostat.
9. Remove faulty thermostat.
10. Crimp two solderless connectors to the two leads on the new thermostat.
11. Slip two pieces of heat shrink onto the two leads coming from the connector plug.
12. Crimp two solderless connectors to the two leads coming from the connector plug.

NOTE

The Defrost Thermostat Replacement Kit comes with a new thermostat, 2 solderless connectors and two pieces of heat shrink to allow for splicing the new thermostat to the connector plug.

13. Slip heat shrink over the solderless connectors and heat that area with a heat gun until the heat shrink is tight around the solderless connectors.
14. Hook thermostat back on the evaporator near or at the same place it was before.
15. Reverse Steps 1 - 7 to complete repairs.

Figure C7



Defrost
Thermostat

Defrost Heater

The defrost heater is a radiant "U" shaped resistance heater, rated at 450 watts. The defrost heater is energized during that period of the cycle when the defrost thermostat contacts are closed.

The length of time the heater is energized depends on the amount of frost accumulation on the evaporator.

How To Remove The Defrost Heater

1. Disconnect refrigerator from electrical supply.
2. Remove freezer section bottom shelves and baskets.
3. Remove ice container and rail assembly. The multiconnector at back of rail assembly must be disconnected before rail assembly will come free.
4. Loosen the 2 screws holding ice maker to right side of compartment just enough to lift ice maker free. The multiconnector must be disconnected before ice maker will come free from compartment.

Section 4 - Electrical Components

- Remove two rail assembly supports. (two screws on each one).
- Remove four screws from evaporator cover.
- Remove five screws on evaporator air duct cover.
- Disconnect two leads to defrost heater.

! CAUTION

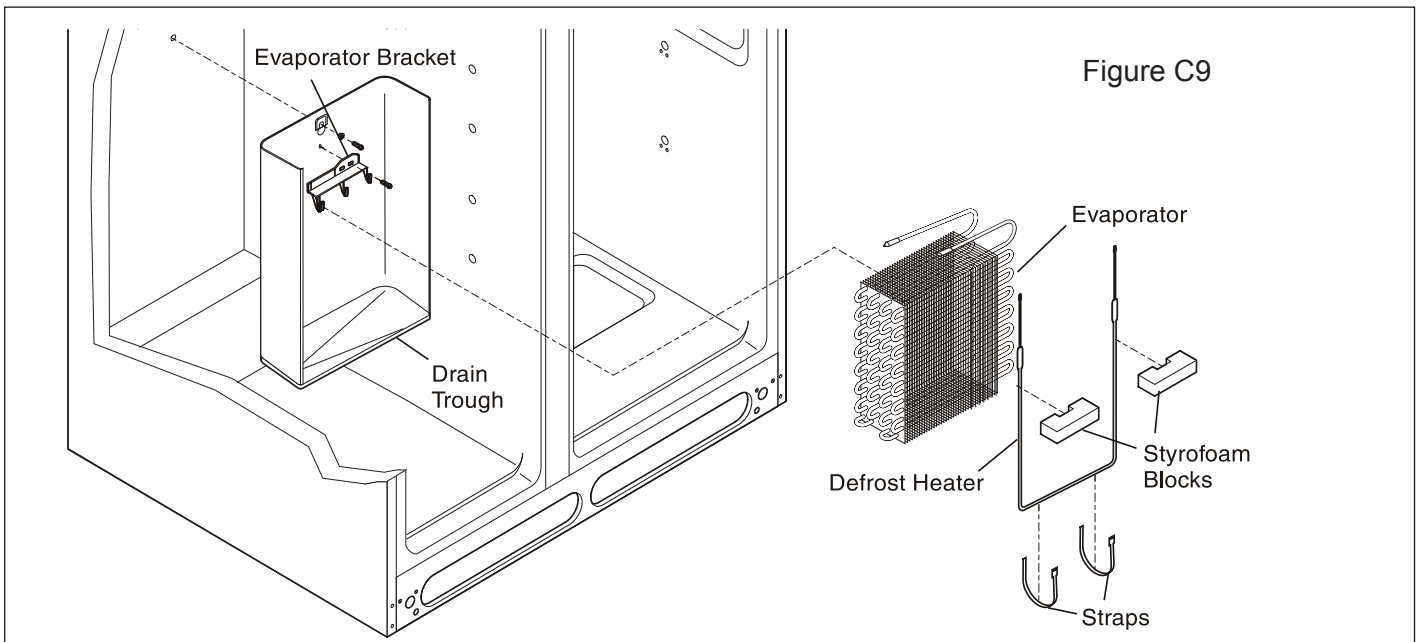
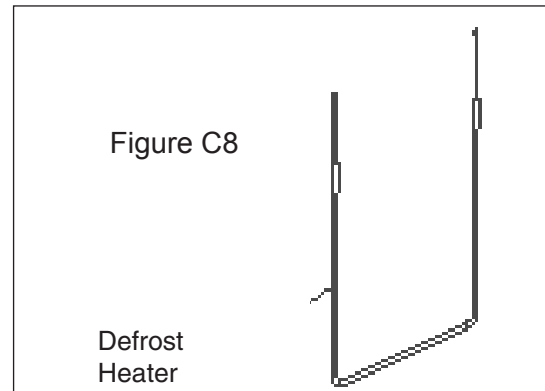
This is a good time to test the heater. Check resistance of defrost heater using a multimeter. Resistance should be very close to 30 ohms. Replace defrost heater if resistance readings are out of range.

- Unclip ground wire hooked to drain trough.
- Remove screw holding evaporator bracket through drain trough to cabinet.
- Remove rivet holding bracket to trough and set bracket aside for reuse.
- Remove screw holding drain trough to cabinet .
- Lift up and pull evaporator and drain trough out at bottom.
- Slide drain trough off evaporator.
- Remove retainer clamp from bottom of evaporator that holds heater in place.
- Grab heater from bottom and pull free of evaporator. It's very snug so you'll need to use a little force.

- Replace with new defrost heater.
- Re-assemble in reverse order.

! CAUTION

Use caution not to damage suction line or cap tube.

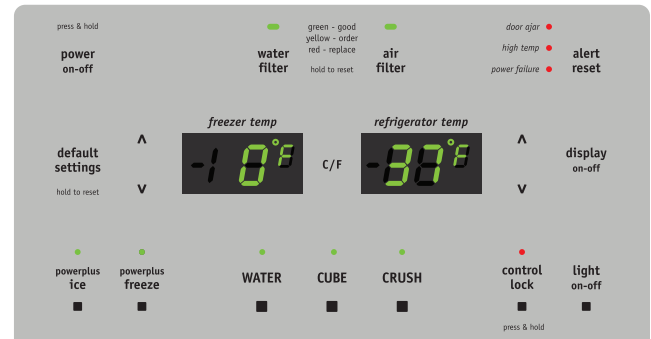


Section 4 - Electrical Components

Frigidaire Gallery



Frigidaire Pro



Description

Damper Assembly

Motorized door (+12VDC) located between the freezer section and the fresh food section of the refrigerator. Door opens to a certain position when there are refrigeration requirements in the fresh food section. The damper motor, which positions the door, is a 12 VDC, 2-phase, bipolar stepper motor.

Freezer Temperature Control

Electronic thermostat regulating the temperature of the frozen food section. A Negative Temperature Coefficient Thermistor monitors freezer compartment temperature. Loads controlled are the compressor, condenser fan and evaporator fan motor enabling and speed.

Fresh Food Temperature Control

Electronic thermostat regulating the temperature of the fresh food section. A Negative Temperature Coefficient Thermistor monitors fresh food compartment temperature. Loads controlled are the damper motor (position) and evaporator fan motor enabling and speed.

Defrost Heater

450 watt heating element (115VAC) locate in the evaporator assembly to melt frost during the defrost cycle. The defrost heater is connected to the NO contact of a relay. Defrost heater operation is detected and internally monitored by the microprocessor. See Diagram A.

Defrost Termination Thermostat (DTT)

Bi-metal disc thermostat attached via a clamp to the evaporator tubing. During the defrost cycle, the device is a closed circuit between the defrost heater and Neutral. The DTT is designed to open at a predeter mined temperature ending the defrost cycle.

Standard Compressor

Motorized pump (115VAC) that creates the high and low

pressures required for heat exchange. The Standard Compressor is controlled by a relay.

Evaporator Fan

Motorized Fan (12 VDC) that circulates freezer and fresh food section air. The evaporator fan motor speed is controlled via a +12 VDC circuit.

Condenser Fan

NOTE

The fan motor will run at variable speed (2000 to 2700RPM) except when the freezer door is open. When the freezer door is open the fan motor will run at slow speed (2000 RPM).

Motorized Fan (115VAC) that circulates air through the condenser coils. Either a Relay or Triac depending on compressor used controls condenser Fan Motor.

Air Filter

Sensors

Negative Temperature Coefficient Thermistor. The air filter is located in the top right side of the food compartment. Air is circulated through the filter by the evaporator fan motor.

Fresh Food Lights

Fresh food lights are enabled and disabled depending on the fresh food door light switch state. Light stays on maximum of 15 minutes.

Alarm

Audible Transducer (Piezo)

NOTE

Interior lights will shur off if food door is left open for over 15 Minutes. Close and re-open door to reset.

Section 4 - Electrical Components

Control, Main Board

Power Supply

AC Input Voltage – 115 V AC @ 60 Hz.

Control, User Interface

Power Supply - Input - 5VDC (from Main Board)

Numeric Display

Version A (Example 1)

The alarm settings are between the temperature display's and the wording will light up. The function display's are across the top, the dispenser displays are across the bottom. The Display will light up when activated.

Version B (Example 2)

The alarm settings are in the top right corner. A LED will light up in from of the alarm that is sounding. The displays across the top and bottom have a LED above the display that lights when activated.

Show Room Setting

Active Function

Displays

Freezer/Fresh Food Temperature Keys

Fresh Food Lights

Alarm Key - Key Tone ONLY

Air Filter Key Key Tone and green LED toggles on and off.

All other functions are disabled including alarm(s) enabling.

NOTE

Interior lights will shut off if food door is left open for over 10 Minutes. To reset control, close door and then open door.

Temp Mode/Temp Display

Allows customer to change temperature readings form Fahrenheit to Centigrade and back.

NOTE

The term "Power On Reset" (POR) will appear many times in the alarm and service test sections. Power On Reset simply means you unplug the product at the household electrical outlet, wait 2 minutes and plug the product back into the outlet.

Alarms and Signals

Temperature Alarm

Enabling is automatic and started at the time the product is plugged in (POR) but is delayed until actual Freezer temperature = Freezer temperature set point and actual Fresh Food temperature = Fresh Food temperature set point. Once set points are reached, alarm LED (Green) will come ON, steady state, indicating alarm is active.

Alarm Condition

Alarm is enabled and active. Temperature parameters are within tolerances. Alarm LED (Green) is ON and steady state.

Reset Button

Press once to reset any Alarm condition. Alarm LED (steady green) Press and hold reset 3 seconds. You will hear one beep. This will turn OFF all alarm functions.

Press and hold reset 3 seconds. You will hear one beep. This will turn ON all alarm functions.

Default at POR is On.



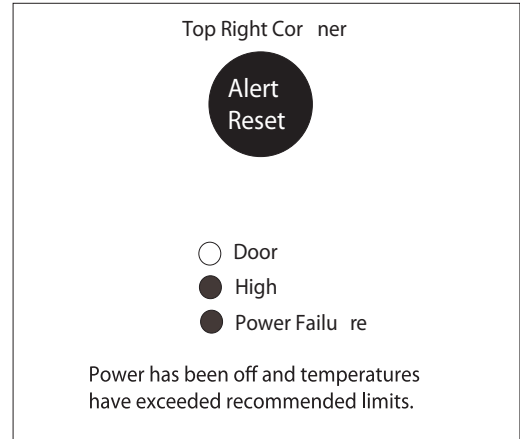
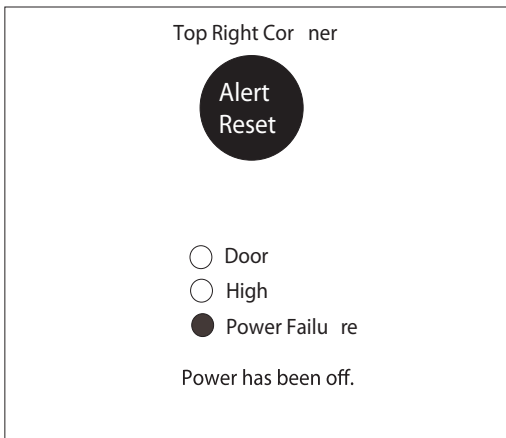
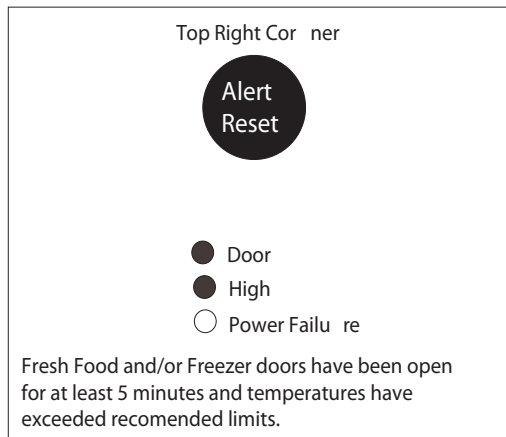
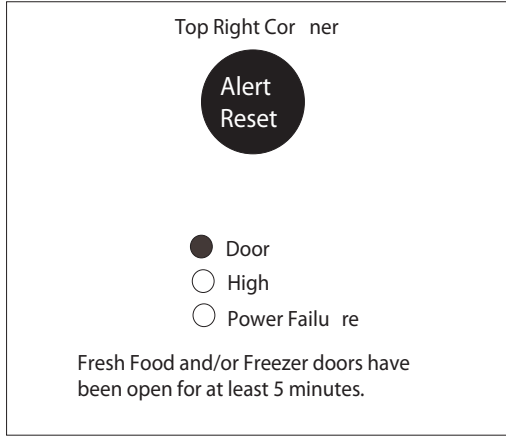
NOTE

At POR the alarms are delayed (180 minutes max.) until set points temperatures are reached.

Section 4 - Electrical Components

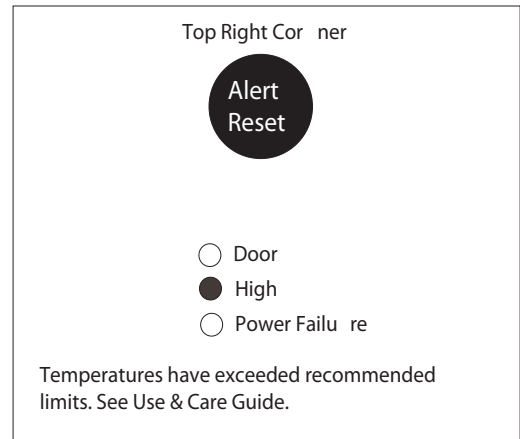
Door Ajar LED (Flashing Green)

Either door is open for five minutes. LED blinks and the control beeps. Condition is reset if the door is closed or the Reset button is pressed.



NOTE

If the user unplugs the unit and the setpoints have been reached, the "Power Off" indicator will be ON when the unit is plugged back in (POR). If the user has the unit unplugged long enough to cause an unsafe temperature condition, the High Temp" indicator will also be ON when the unit is plugged back in.



Section 4 - Electrical Components

Show Room Setting

Activation

Press and hold Fresh Food Temperature UP (WARMER) Key while pressing the fresh food temperature DOWN (COLDER) key 3 times within 5 seconds. Both displays will flash "0" for 10 seconds. While the displays are flashing, press the Freezer Temperature UP key to confirm activation

Deactivation

Mode automatically deactivates at a POR.

Active Function

Displays

Freezer/Fresh Food Temperature Keys

Fresh Food Lights

Alarm Key - Key Tone ONLY

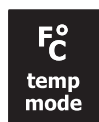
Air Filter Key - Key Tone and green LED toggles on & off. All other functions are disabled including alarm(s) enabling.

NOTE

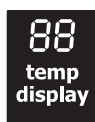
The "Show Room" mode, which during activation doesn't recognize Alarm/Power Off conditions.

Change Between Fahrenheit and Centigrade

To change from Fahrenheit to Centigrade on example 1 Press the temp mode key. On example 2 press and hold the temp display key.



Example 1



Example 2

Advance Into Defrost Cycle Manually.

Activation

Press and hold Fresh Food +/UP key while pressing the Fresh Food -/DOWN key for 6 seconds. This will advance the processor into defrost cycle.

Deactivation

Press and hold Fresh Food +/UP key while pressing the Fresh Food -/DOWN key for 6 seconds. This will advance the processor out of defrost cycle. Or just leave the refrigerator alone and it will go through a normal defrost cycle and start running after the defrost limit switch has turned off the heater and the controller has allowed for a normal drip time.

Section 4 - Electrical Components

Frigidaire Gallery



User Interface

Your refrigerator is equipped with a user interface display. It is only necessary to touch the glass. There is no need to press with force.

Touch an icon to activate the desired dispenser mode. The active dispenser mode is more brightly illuminated.

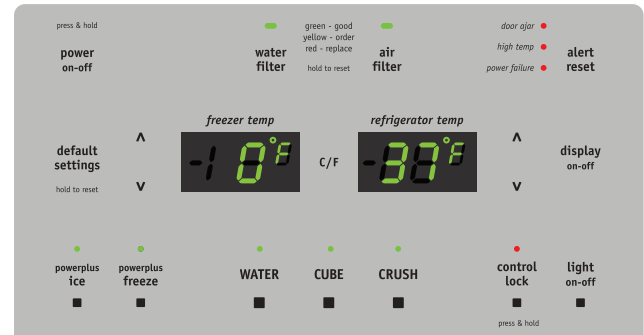
quick ice	Increases the production of ice (Gallery only)
quick freeze	Activates a faster rate for freezing food (Gallery only)
power plus ice	Increases the production of ice (Pro only)
power plus freeze	Activates a faster rate for freezing food (Pro only)
light on-off	On / Off
control lock	Press and hold for three seconds to activate and deactivate. This restricts undesired changes to the refrigerators settings and prevents use of the ice and water dispenser.

User Variable Options

Touching the options icon displays the following options:

water filter	Touch to display filter condition status. Press and hold for three seconds to reset.
air filter	Touch to display filter status. Press and hold for three seconds to reset.
display on-off	When active, it allows the display of the freezer and fridge temps.
C/F	Touch to toggle display from Fahrenheit to Celsius.
default settings	Resets all refrigerator settings such as temp, temp display, and alarm tones to their factory default settings.
power on-off	Press and hold for three seconds to turn off the cooling system to clean the refrigerator. It also turns off all dispenser functions. The temperature display will read OFF.

Frigidaire Pro



➔ IMPORTANT

Pressing the **power off** icon does not turn off power to your refrigerator. You must unplug the power cord from the wall outlet.

Setting Cooling Temperatures

Press the ^ or v indicator to adjust the temperature to the desired setting.

The temperature display will begin to blink with the first touch. After five (5) seconds of inactivity, the display will beep to accept the new temperature.

Alarms

Door Ajar
If the door has been left open for an extended period of time greater than 5 minutes, an alarm will sound and the door ajar indicator will display in the middle. The alarm is turned off by closing the door. The alarm off key will illuminate to prompt the reset of any pending alarms. Press this key to reset any system Alarms.

High Temp
In the event of a high temperature condition, the temperature display will display "HI". After 20 minutes, the high temp alert will be displayed and the alarm off icon will illuminate until pressed, acknowledging the alarm, at which time the highest temperature reached will be displayed and the refrigerator will resume normal operation. All other modes are turned off until the alarm is acknowledged.

Power Fail
In the event of a power failure, the power fail alert will be displayed and the alarm off key will be illuminated and you will hear an audible alarm until the alarm off icon is pressed, acknowledging the alarm. Other modes may be turned off until the alarm is acknowledged. When the power fail alert is turned off, the refrigerator will resume normal operation. The high temp alarm may also be illuminated until a safe operating range temperature has been reached.

Section 4 - Electrical Components

“Sabbath Mode” (some models)



The Sabbath Mode is a feature that disables portions of the refrigerator and its controls for both Wave-Touch™ and IQ-Touch™, in accordance with observance of the weekly

Sabbath and religious holidays within the Orthodox Jewish community.

Sabbath Mode is turned ON and OFF by pressing and holding both Freezer down and the fresh food up indicators at the same time for five seconds for both the Wave-Touch™ and IQ-Touch™ modes. The display shows “Sb” while in Sabbath mode.

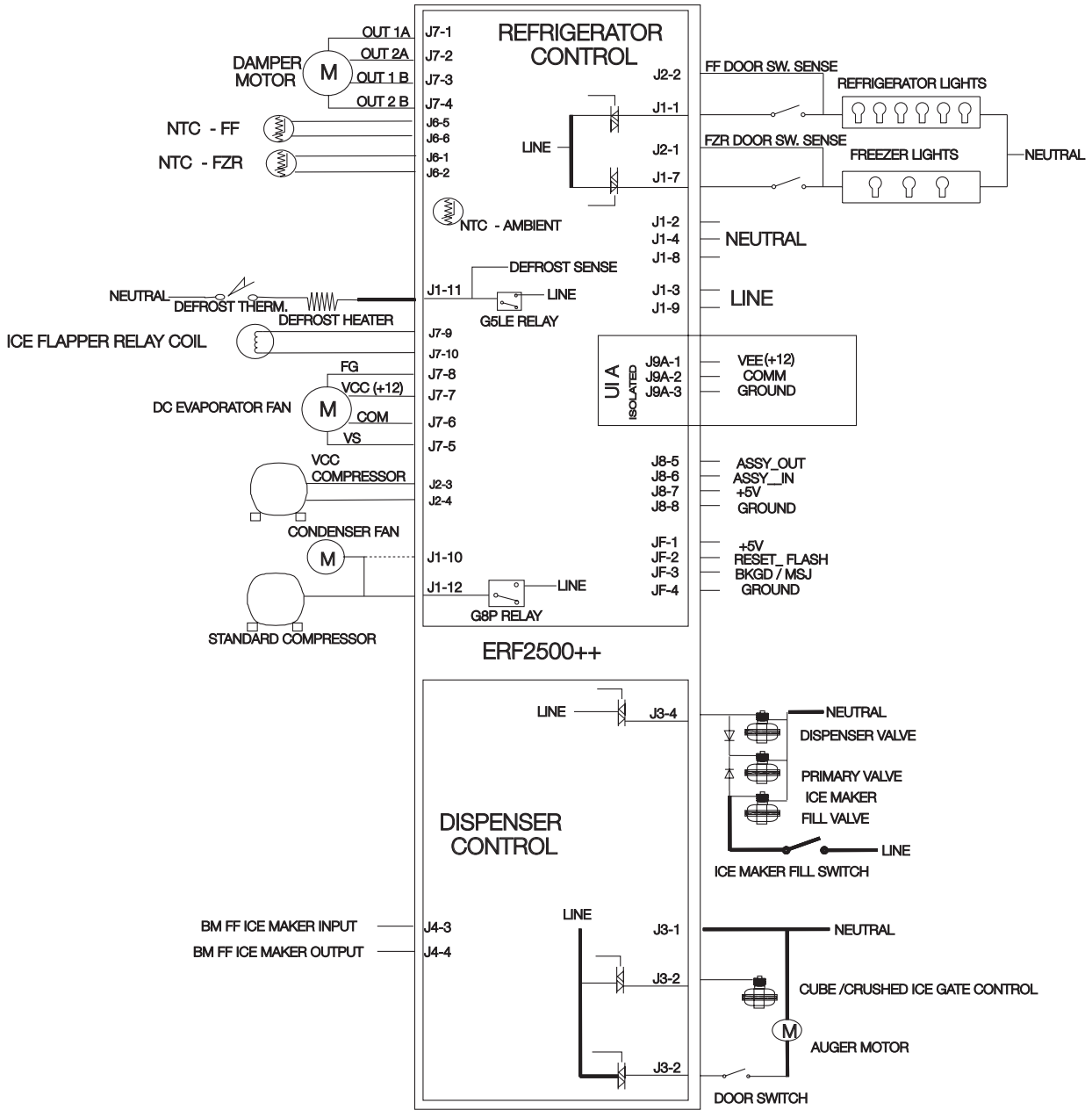
In the Sabbath Mode, the High Temp alarm is active for health reasons. If a high temperature alarm is activated during this time, for example due to a door left ajar, the alarm will sound intermittently for about 10 minutes. The alarm will then silence on its own and a red high temperature icon will display. The high temp icon will continue to display, even if the door is closed, until the Sabbath mode is exited and the icon reset. The refrigerator will function normally once the door is closed, without any violation of the Sabbath/Holidays.

For further assistance, guidelines for proper usage and a complete list of models with the Sabbath feature, please visit the web at <http://www.star-k.org>.

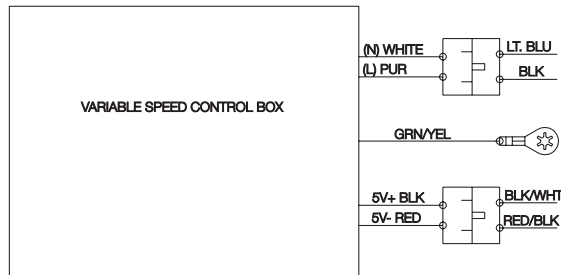
Section 4 - Electrical Components

PERFORMANCE DATA NO LOAD & NO DOOR OPENINGS AT MID-POINT CONTROL SETTING				
Type A with Run/Start Capacitor	65°F (18°C) Ambient		90°F (32°C) Ambient	
	Variable Speed	Standard	Variable Speed	Standard
Operating Time	74 to 84%	32 to 40%	100%	55 to 65%
Freezer Temperature	-2° to 2° F -19° to -17° C	0° to 4° F -18° to -16° C	-1° to 3° F -18° to -16° C	-1° to 3° F -18° to -16° C
Refrigerator Temperature	34° to 39° F 1° to 4° C	34° to 39° F 1° to 4° C	34° to 39° F 1° to 4° C	34° to 39° F 1° to 4° C
Low Side Pressure (cut-in)	5 to 12 psig 43 to 83 kPa	5 to 12 psig 43 to 83 kPa	N/A	5 to 12 psig 43 to 83 kPa
Low Side Pressure (cut-out)	-2 to 2 psig -14 to 14 kPa	-2 to 2 psig -14 to 14 kPa	-2 to 2 psig -14 to 14 kPa	-2 to 2 psig -14 to 14 kPa
High Side Pressure (last 1/3 cycle)	90 to 105 psig 621 to 724 kPa	90 to 115 psig 621 to 793 kPa	120 to 135 psig 827 to 931 kPa	130 to 155 psig 896 to 1069 kPa
Wattage (last 1/3 cycle)	60 to 65	120 to 150	65 to 80	130 to 160
Amps (running)	.7 to 1.1	1.0 to 1.4	.9 to 1.3	1.1 to 1.5
Base Voltage	115 vac (127 vac max)			
DEFROST SPECIFICATIONS				
Cabinet Size	Thermostat		Heater	
	Cut-in	Cut-out	Watts	Ohms
23', 23' CD, 26'	25° F (-4° C)	47° F (8° C)	450	30
Electrtonic Timer - (ADC) Defrost 24 minutes every 6-96 hours of compressor run time.				
CONDENSER FAN MOTOR				
Watts	RPM		Amps	
3.1	1100 CW Opposite Shaft		0.03 Running	
ICE MAKER SPECIFICATIONS				
Electrical	115 vac (127 vac max)			
Thermostat	Opens at 48° F (9° C), Closes at 15° F (-9° C)			
Heater Voltage	85 vac			
ICE MAKER CONNECTOR PLUG CONNECTIONS				
Wire Number	Wire Color	Connects to:		
1	Green/Yellow	Ground		
2	Yellow	Water Valve		
3	Black	Line		
4	Light Blue	Neutral		

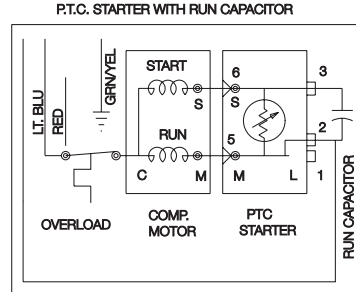
Section 4 - Electrical Components



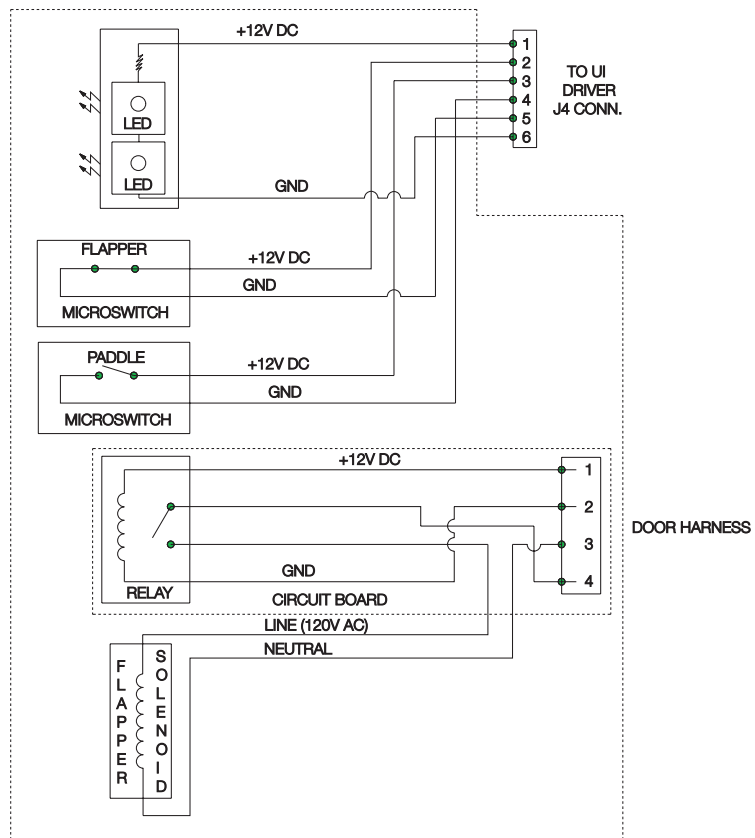
Section 4 - Electrical Components



VARIABLE SPEED COMPRESSOR

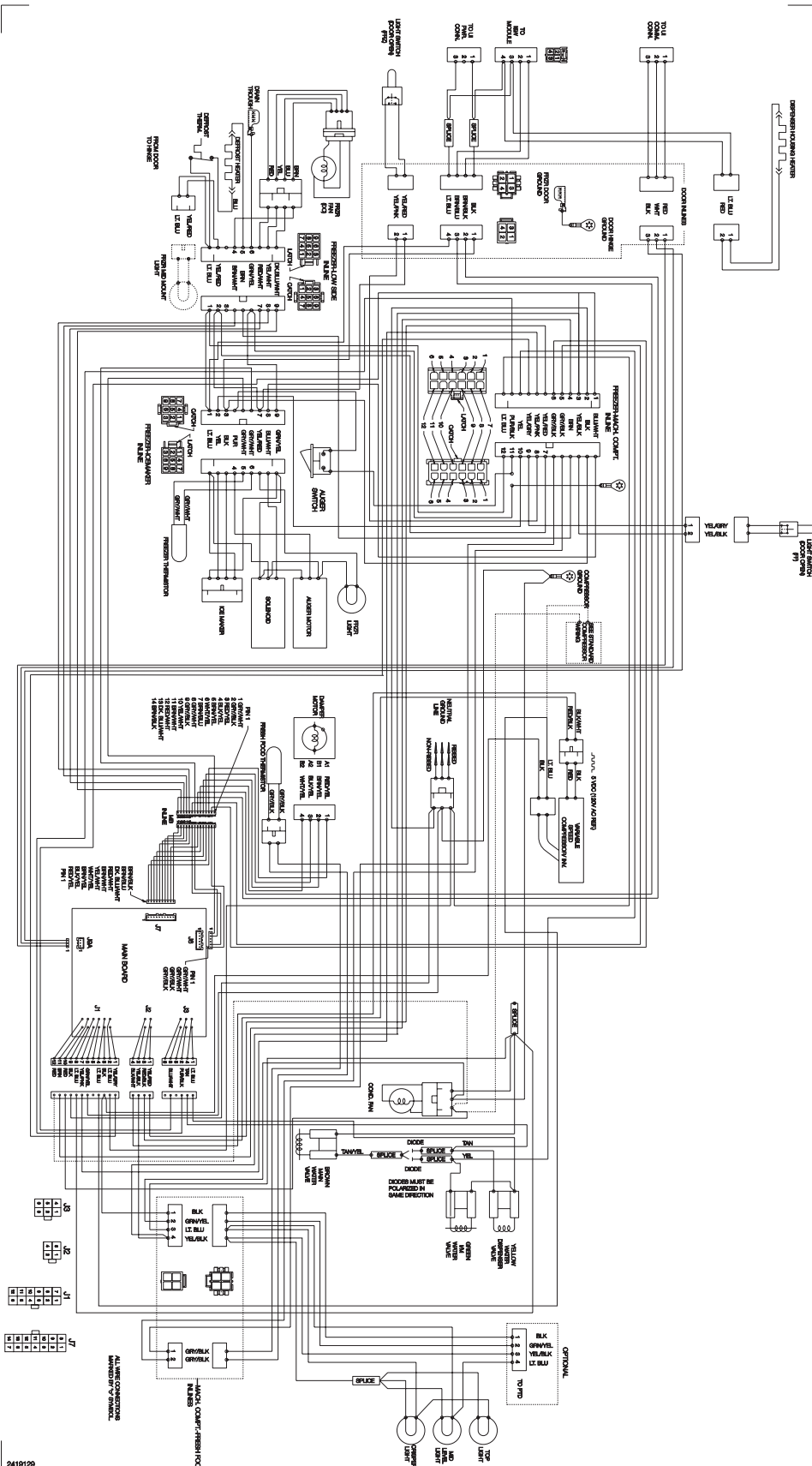


*CAPACITOR IS ONLY USED WITH SOME P.T.C. MODELS
STANDARD AC COMPRESSOR



ICE & WATER DISPENSER MODULE

Section 4 - Electrical Components



2418129

Section 4 - Electrical Components

Service Diagnostics Mode

With a series of key presses, a service technician will be able to view data, via the display and exercise loads to help troubleshoot the product. Following is a list of capabilities.

View

Firmware Version (What version of software)

Check door sensors

Check Defrost Limit Switch

Check dispenser paddle

Operate the ice door

Test

Manually test the freezer, fresh food and ambient thermistors.

Run evaporator fan at high and low speeds.

Operate damper to full open, full close

Turn defrost heater on.

Turn compressor on.

Test Auger motor.

Test Cube/Crush Solenoid.

Test Freezer and food compartment lighting system.

Test the water valve in the water dispense mode.

Test ice door operation

Activation

To enter the test mode press and hold the Freezer up and down temperature pads at the same time for 5 seconds.

Deactivation

Press and hold the Fresh Food (FF) Temperature "UP" key for 5 seconds the control will beep and service mode is deactivated.



Operation

To actuate a load (turn on or off), use the ON/OFF key present on the User Interface Board.

NOTE

Mode automatically deactivates after 5 minutes of no key entry.

To step to the next test, use the FF "UP" key.

Startup Procedure

On activation, all LEDs on the display will illuminate.

First FF UP press small LEDs come on

Second FF UP LEDs off and Display on

Third FF UP LEDs and Display Off

Fourth FF UP starts Tests AC Load Testing

Test 1 - Standard Compressor test.

Push the ON/OFF pad and the compressor will run. Push the ON/OFF pad again and it will stop running.

NOTE

The test number will appear in the FF display. When the ON/OFF pad is pressed the part being tested will appear in the FZ display.

Test 2 - Defrost Heater Test.

Push the ON/OFF pad and the heater will come on. Push the ON/OFF pad again and the heater will go off.

NOTE

Will not show when product has a VCC Compressor.

Section 4 - Electrical Components

Test 3 - Fresh Food Compartment lighting test.

Push the ON/OFF pad then open the food door and the food compartment lights will come on low and ramp up Push the ON/OFF pad again to cancel test.

Test 8 - Water Valve , Water Dispenser Only.

Push the ON/OFF pad activate. Push the ON/OFF pad again to deactivate. **NOTE:** Both valves operate.

Test 9 - Freezer Compartment Lighting Test.

Push the ON/OFF pad then open the food door and the food compartment lights will come on low and ramp up Push the ON/OFF pad again to cancel test.

Test 10 -Auger Motor

Push the ON/OFF pad activate. Push the ON/OFF pad again to deactivate.

Test 11 - Cube/Crush Solenoid

Push the ON/OFF pad activate. Push the ON/OFF pad again to deactivate.

Test 12 - VCC Condenser Fan

Push the ON/OFF pad and the fan motor will run at full speed. Push the ON/OFF pad again and it will stop running.

DC Load Testing

Test 38 - VCC Compressor

Push the ON/OFF pad and the Compressor will run at full speed. Push the ON/OFF pad again and it will stop running.

NOTE

Only used with VCC Compressor.

Test 15 - Evaporator Fan

Push the ON/OFF pad and the fan will run at low speed. (LOW will show in freezer display) Push the ON/OFF pad and the fan will run at full speed. (HI will show in freezer display) Push the ON/OFF pad again and the fan will stop running. (Off will show in the display)

NOTE

Only used with VCC Compressor.

Test 22 - Damper Test

Push the ON/OFF pad and the damper will open. (OP will show in freezer display) Push the ON/OFF pad and the damper will close. (CL will show in freezer display)

Digital Input Test

Test 23 - Fresh Food Door

Freezer Display will show OP open when door is open and CL when door is closed.

Test 24 - Freezer Door

Freezer Display will show OP open when door is open and CL when door is closed.

Test 26 - DTT (Defrost Limit Switch)

Display will show OP open when switch is open and CL when door is closed.

Test 28 - Dispenser paddle test.

Push the paddle with freezer door closed to test.

Test 36 - Ice door test

Push the ON/OFF switch and the solenoid should activate. The Freezer display should show the ice door is closed.

Test 29 - Fresh Food Thermistor

29 Comes up with the Temp only and Good light comes on. Depression of on/off changes it to Celsius.

If the thermistor is open a OP shows in the display. If the thermistor is shorted a SH shows in the display

Test 30 - Freezer Thermistor

30 Comes up with the Temp only and Good light comes on. Depression of on/off changes it to Celsius.

If the thermistor is open a OP shows in the display. If the thermistor is shorted a SH shows in the display

Test 33 - Ambient Thermistor

33 Comes up with the Temp only and Good light comes on. Depression of on/off changes it to Celsius.

If the thermistor is open a OP shows in the display. If the thermistor is shorted a SH shows in the display

Test 41 - PTD (If equipped)

Turns the PTD on and off

Section 4 - Electrical Components

NOTE

The Ambient Thermistor is mounted on and part of the lower control board.

Firmware Versions

Test 34 - What software is on the control boards.

NOTE

34 is the last test. 34 will not show in the display.

- 1 - System Parameters
Example of what will show in display one letter at a time: JFE000112
- 2 - Cofirming the lower control board
Example of what will show in display one letter at a time: 00004049
- 3 - The software on the lower control board
Example of what will show in display one letter at a time: JFE401N (N looks like an H in the display)
- 4 - Confirming the upper control board (UI user inner face board)
Example of what will show in display one letter at a time: EFAC000N (N looks like an H in the display)
- 5 - The software on the UI board
Example of what will show in display one letter at a time: EF_C0009E

NOTE

It is normal for the control to count up in seconds after testing is completed until the test model is canceled.

Power Failure light will come on after testing is canceled, this is normal.

Manual Defrost

To enter the manual defrost mode press and hold the FF up and FF down at the same time for 6 seconds this will advance the control into a normal defrost cycle.

Show Room Mode

To enter the Show Room Mode press and hold the Fresh Food down and the Freezer up pad at the same time for 6 seconds. A power on reset (POR) will be necessary to exit the Show Room Mode.

NOTE

A POR means you unplug the product for three minutes and then plug it back in again.

If the service mode is activated while the product is in the show room mode this will cancel the Show Room Mode and the product will enter Service Mode. After exiting Service Model the product will go in to normal operation mode not back in to Show Room Mode.

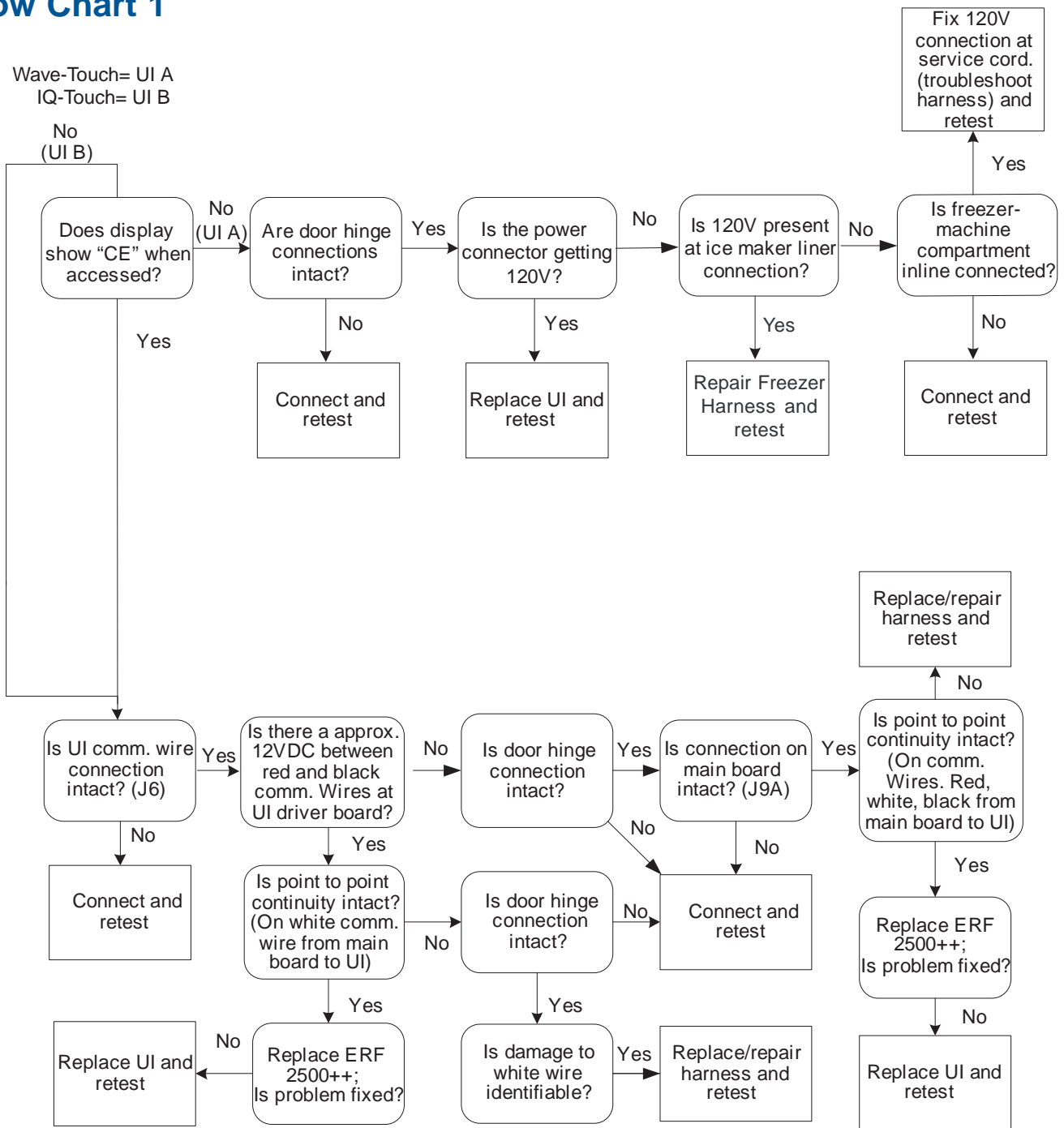
If the Manual Defrost is activated while the product is in the show room mode the displays will work as normal but the heater will not turn on.

NOTE

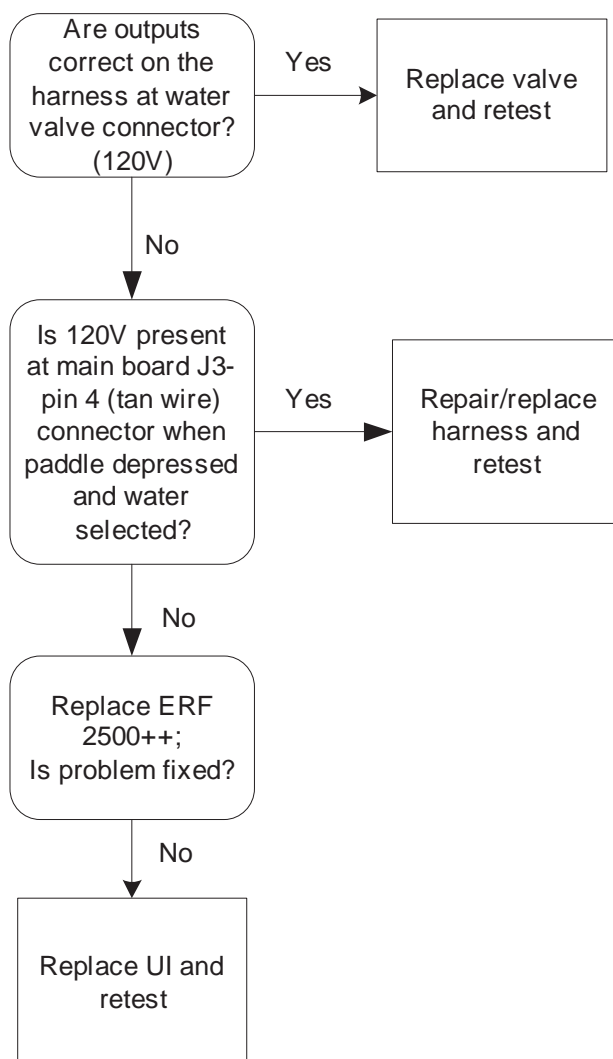
Error codes for Side by Side Control at start up or during normal operation.

Error Codes Displayed	
Freezer Sensor OPEN	“OP” (Freezer Display)
Freezer Sensor SHORTED	“SH” (Freezer Display)
FF Sensor OPEN	“OP” (Food Display)
FF Sensor SHORTED	“SH” (Food Display)
Evaporator Fan Circuit	“SY EF”
Communication failure at POR	“SY CF”
Communication failure after POR	“SY CE”

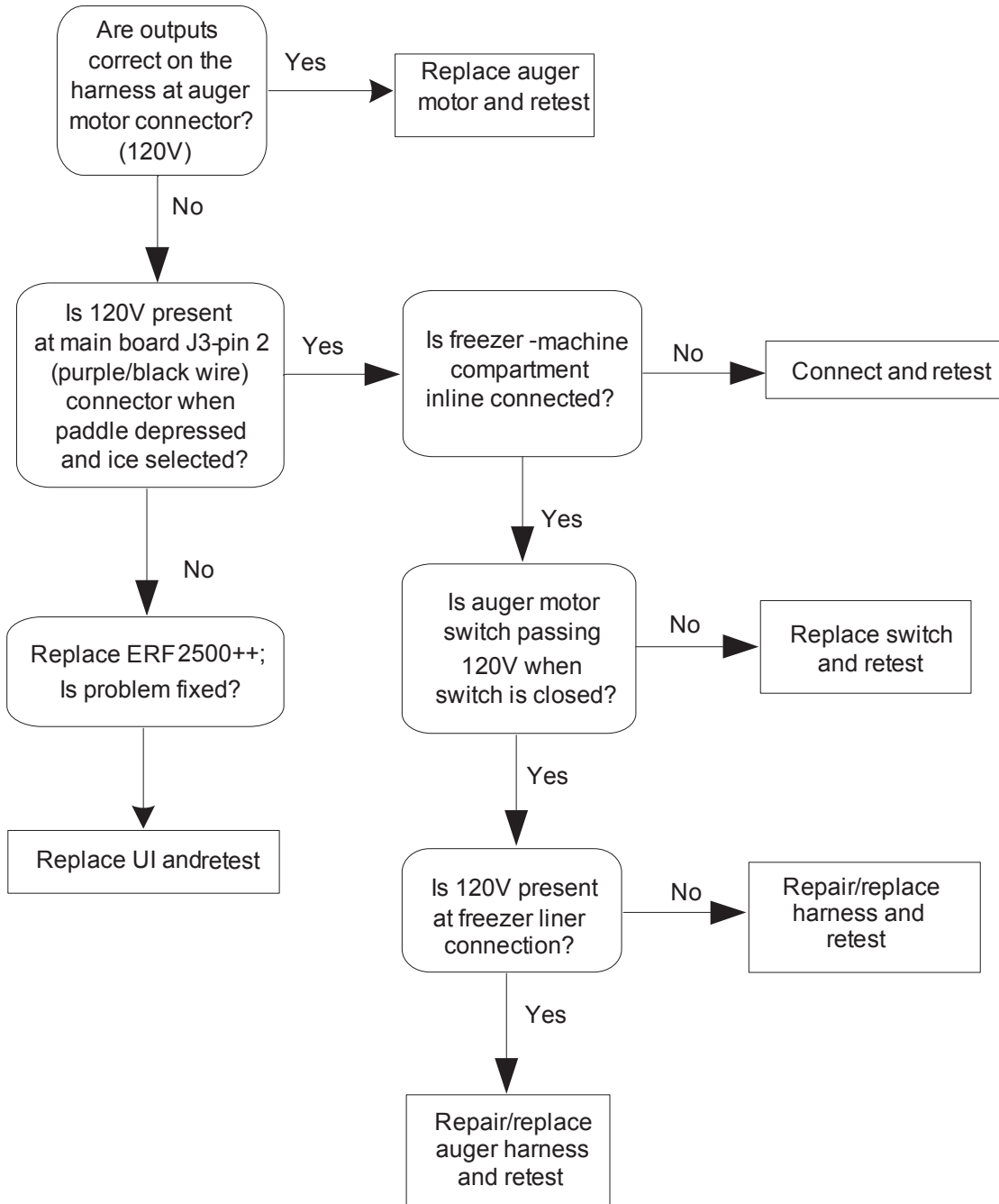
Flow Chart 1



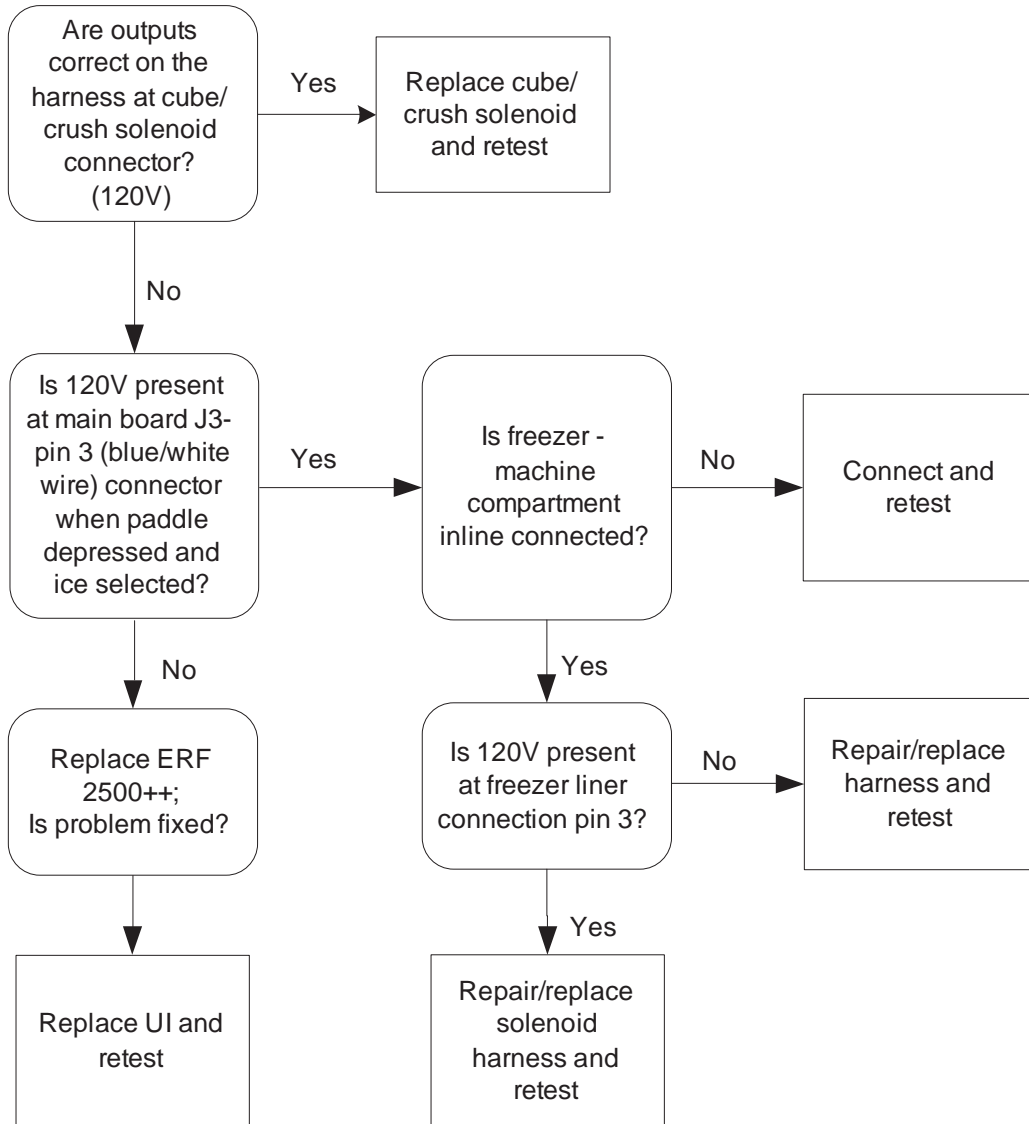
Flow Chart 2



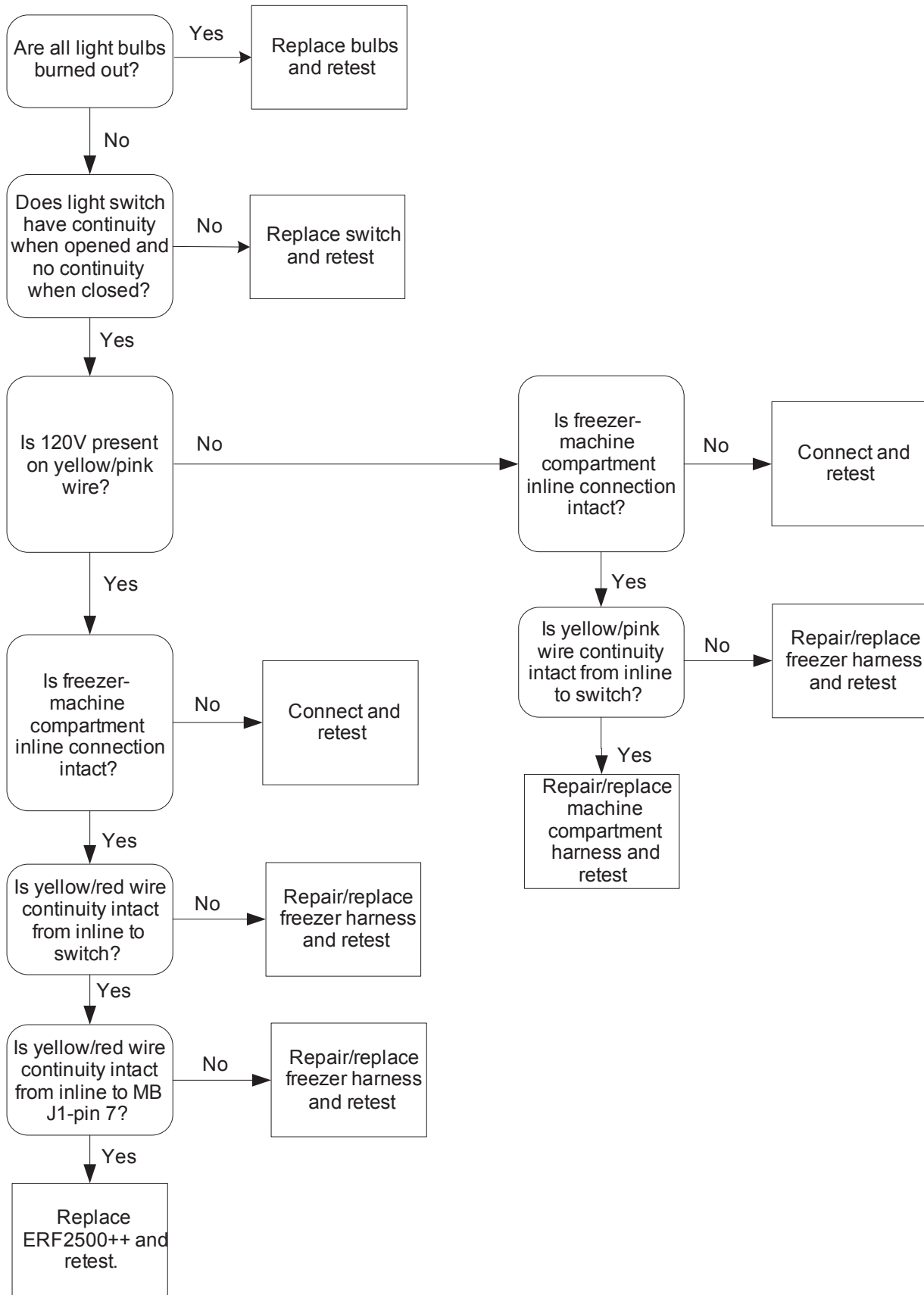
Flow Chart 3



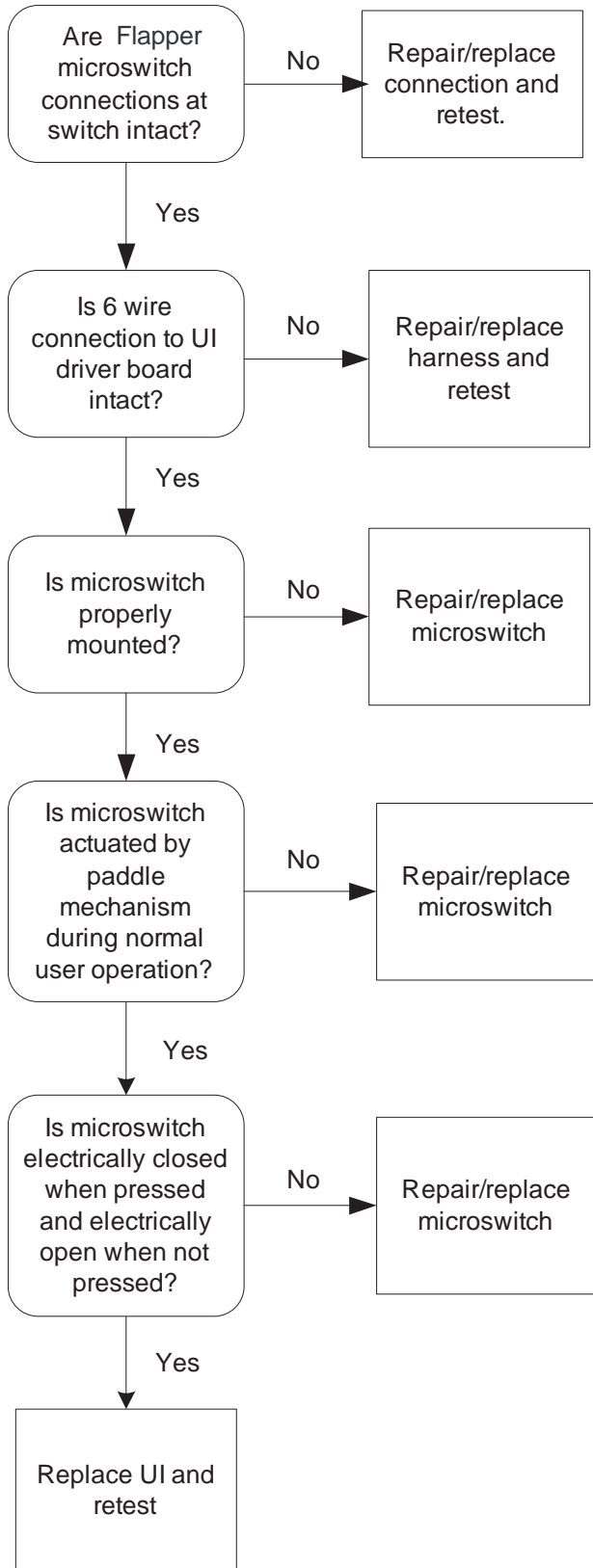
Flow Chart 4



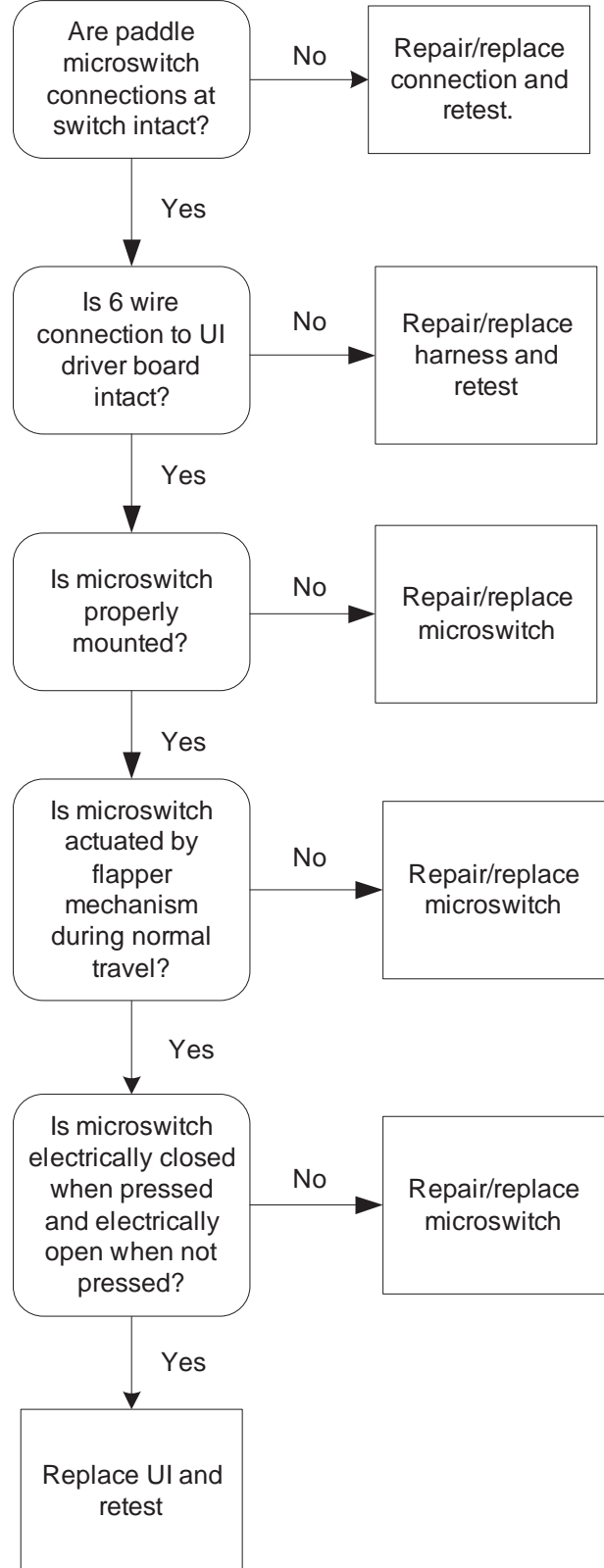
Flow Chart 5



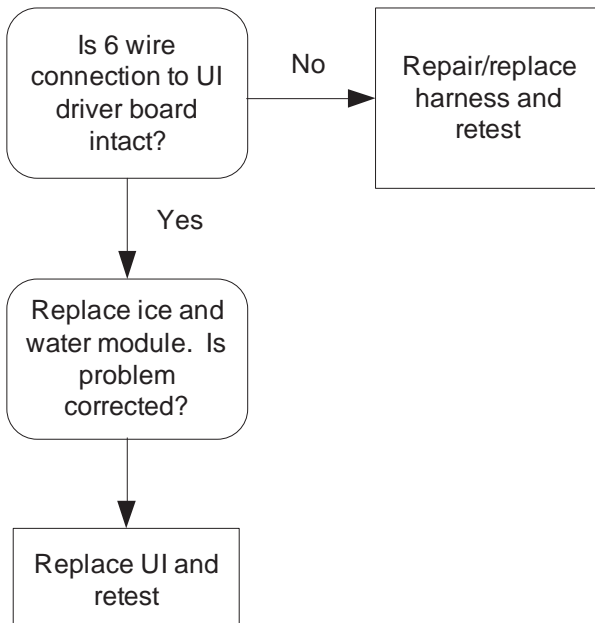
Flow Chart 6



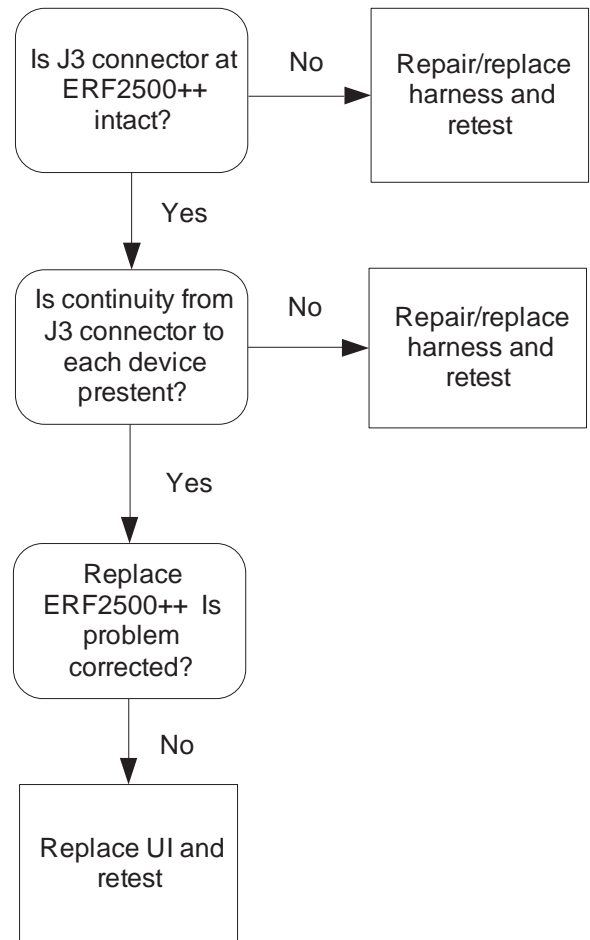
Flow Chart 7



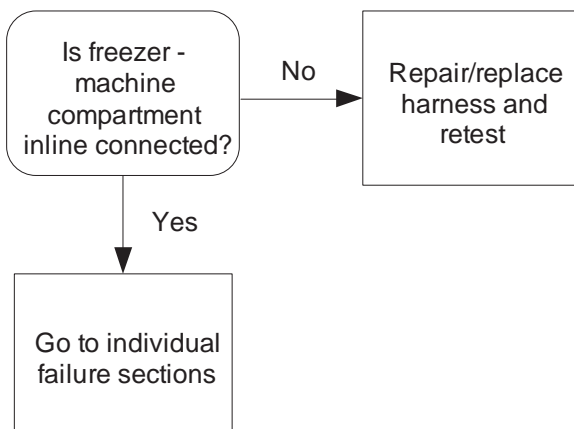
Flow Chart 8



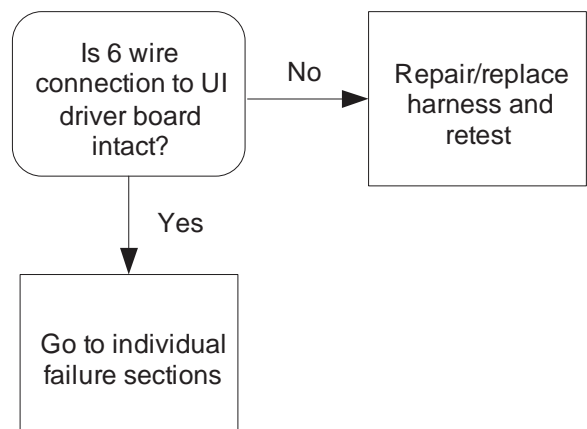
Flow Chart 9



Flow Chart 10



Flow Chart 11



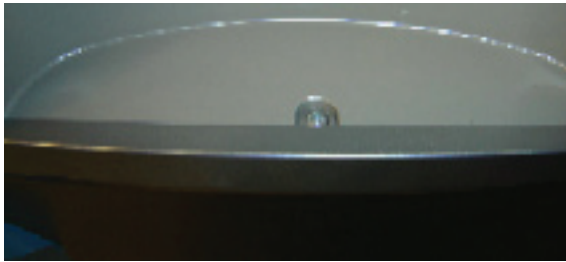
Section 4 - Electrical Components

Control Removal and Installation

CAUTION

Before servicing any part of the control system the product must be unplugged, the fuse pulled or circuit breaker turned off to prevent damage to the product the control system or personal injury to the servicer.

To service the control board you must remove the screw to the fascade under the drip tray. The fascade can now be removed by pulling straight out at the top corner and working your way around the frame pulling it out of the groove in the door.



Then remove the screws two screws at the top of the control. Now you can lift up on the control assembly while you tip it out at the top. This will allow you to remove the control assembly from the door.



With the control out you can disconnect the molex plugs from the dispenser housing to the control assembly. This will allow for complete removal of the control.



With the control removed you can remove the power supply board from the back of the control by removing the 4 screws and disconnecting the wiring harness connector for the power board to the control.

NOTE

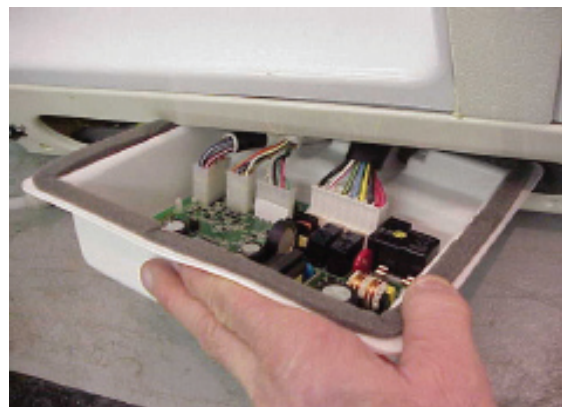
When handling and or replacing a control board it is important that a technician have a wrist ground strap on and connected to the cabinet or another grounding position to prevent static electricity from damaging the board.

Push the new control board down into place using caution not to damage the board on the retainer. With the board snapped all the way down in place reinstall the control box in the top of the food compartment in reverse order from the removal instructions.

To service the power board (main power supply), open the food and freezer door. Remove the kick plate from the bottom of the cabinet. Looking through the opening at the bottom of the cabinet, on the left side you can see the plastic box containing the power board.

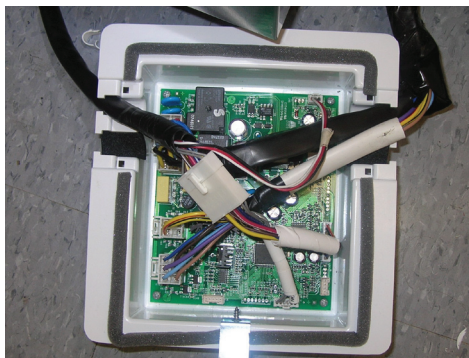


One screw in the middle of the front of the box holds the control box. Remove the screw and slide the control box forward. The back of the control box sits on a rail. Now the control box can be pulled out from the front of the refrigerator.



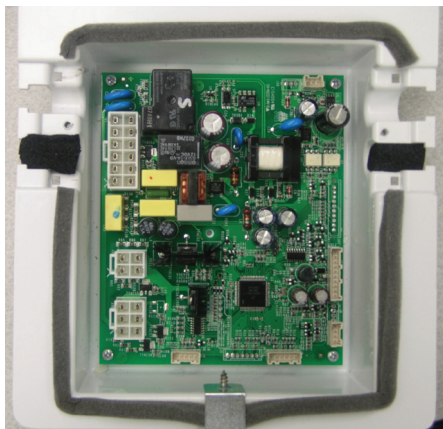
Section 4 - Electrical Components

This will give you access to the wiring connectors so you can disconnect the power board and pull the control box out from the front of the refrigerator.



The new power board will come installed in the plastic box. This will prevent shipping damage and help with the installation.

Start the control box into the opening and reconnect the wiring using caution to make sure the wires are all the way plugged in. Now you can push the control box back in place and reinstall the screw. There is a 3 amp fuse mounted on the control board that is used to protect the board from voltage surges.



To replace the damper remove the cover lifting up the light shield and removing the screw in the back section of the cover holding it to the back of the food compartment liner.



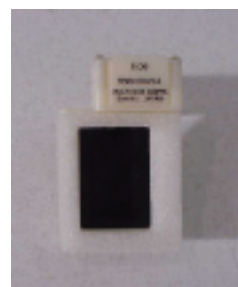
With the cover removed, you can reach down the right side of the damper control from the top and feel a release tab. Push out on the tab and tip the damper out from the top.



With the damper tipped out release the tab in the center of the electrical connector and unplug the wire harness from the damper.



Now the damper can be removed from the product.



NOTE

Stepper motors require alternating polarities of DC current to operate. This is accomplished with a circuit on the main board. Applying straight 12 V DC to the damper motor will not make the motor run and it could damage the motor windings. Only test the damper motor through the refrigerator control system.

Section 4 - Electrical Components

To reinstall the damper, make sure the damper door is closed all the way. Then follow the removal instructions in reverse order. Use caution to make sure you get the wiring connector pushed all the way in. Make sure the seal on the damper connects with the liner and the cover seal so there are no air leaks when the damper door is closed.

To test, set the control system into service test mode 2 (evaporator fan motor test) and allow the fan to run on high speed. Pass a feather or small ribbon around all sides of the damper cover and look for movement indicating an air leak. If an air leak is present, you will need to remove and recheck the seals and reinstall the damper.

The food compartment temperature sensor is located next to the right hand shelf support bracket in about the middle of the back wall.



The cover over the temperature sensor can be removed by pulling straight out. This allows access to the sensor snapped into the bracket on the back wall. Pull the sensor out of the bracket and unplug it from the connector coming out of the back of the liner.

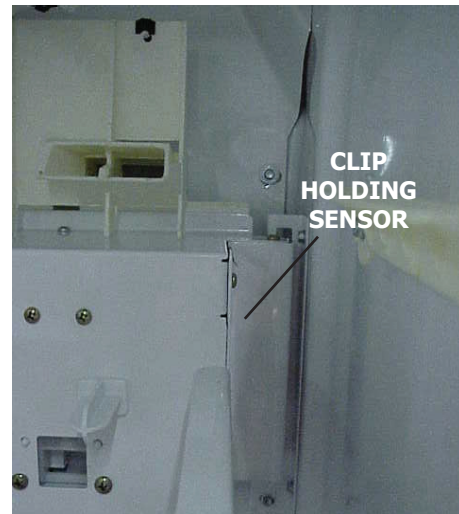
Snap the new sensor into the bracket, plug it into the



connector, then push the bracket straight back into the holes in the liner.



The freezer compartment temperature sensor is located inside the housing that supports the ice bucket. The auger motor and solenoid are mounted into the back compartment of the housing.



To replace the sensor, remove the ice bucket, then remove the two screws at the bottom of the housing that hold the housing assembly to the rails attached to the liner. With the screws removed, lift the housing up about 1/2 inch and pull forward. Holding the housing assembly in one hand, reach over the assembly and unplug the wiring harness from the connector coming out of the back of the liner. Turn the assembly around. The sensor is in the top corner, next to the cube ice solenoid.

Remove the sensor from under the clip, disconnect from the connector, plug and replace. Reassemble in reverse order.



Section 4 - Electrical Components

NOTE

To test the thermistors, check the temperature in the location of the thermistor. Use the chart on page C28 to test the thermistor for proper resistance at the temperature you are making your test at .

Food Compartment Light Switch

The food compartment light switch is installed in the top hinge cover. To remove the screws holding the hinge cover in place and lift the cover up. You can now remove the wires from the old switch and remove the switch from the cover. Reinstall in reverse order.

Freezer Compartment Light Switch

The freezer compartment light switch is installed in the top hinge cover. To remove the screws holding the hinge cover in place and lift the cover up. You can now remove the wires from the old switch and remove the switch from the cover. Reinstall in reverse order.



NOTE

This light switch is only controlling the freezer lighting. The dispenser switch is located in the freezer compartment on the left side and is controlled by the inner door panel on the freezer door contacting the actuator on the switch.

Lighting Control

This lighting control allows the lights to ramp up to full intensity whenever a door is opened and ramp down when the door is closed. The lighting control is part of the power board located under the freezer compartment behind the bottom grill.

Section 4 - Electrical Components

Temperature Resistance Chart for Negative Temperature Coefficient Thermistors ($\pm 2\%$)

Temperature F	Ohms	Temperature F	Ohms
-20	163,823	11	60,352
-19	158,343	12	58,545
-18	153,066	13	56,798
-17	147,984	14	55,109
-16	143,088	15	53,476
-15	138,372	16	51,897
-14	133,828	17	50,369
-13	129,449	18	48,892
-12	125,229	19	47,462
-11	121,161	20	46,076
-10	117,240	21	44,741
-9	113,460	22	43,447
-8	109,814	23	42,193
-7	106,298	24	40,981
-6	102,908	25	39,806
-5	99,637	26	38,670
-4	96,481	27	37,569
-3	93,436	28	36,503
-2	90,498	29	35,471
-1	87,662	30	34,472
0	84,925	31	33,504
1	82,283	32	32,566
2	79,732	33	31,658
3	77,268	34	30,778
4	74,890	35	29,926
5	72,592	36	29,100
6	70,373	37	28,300
7	68,229	38	27,524
8	66,158	39	26,773
9	64,156	40	26,044
10	62,222	41	25,338

Section 4 - Electrical Components

Temperature F	Ohms	Temperature F	Ohms
42	24,653	75	10,500
43	23,989	76	10,246
44	23,346	77	10,000
45	22,721	78	9,760
46	22,116	79	9,527
47	21,528	80	9,300
48	20,958	81	9,079
49	20,405	82	8,864
50	19,869	83	8,655
51	19,348	84	8,451
52	18,843	85	8,253
53	18,352	86	8,060
54	17,876	87	7,872
55	17,414	88	7,689
56	16,965	89	7,511
57	16,529	90	7,338
58	16,106		
59	15,695		
60	15,296		
61	14,909		
62	14,532		
63	14,166		
64	13,811		
65	13,465		
66	13,130		
67	12,803		
68	12,486		
69	12,178		
70	11,878		
71	11,587		
72	11,304		
73	11,028		
74	10,760		

Section 5 - Air Circulation

Automatic Defrost Models

Principals Of Automatic Defrost Operation

Automatic defrost refrigerators operate on the principle that moisture or frost transfers or migrates to the coldest surfaces (evaporator) in the freezer compartment. For example, a small amount of water spilled in the freezer compartment will freeze immediately. However, this ice in time will evaporate and transfer to the colder surfaces of the freezer evaporator coil.

Air Circulation Patterns

Automatic defrost models have a single evaporator in the freezer compartment, and have forced air cooling in the freezer and refrigerator compartments.

The "fin and tube" aluminum type evaporator is located behind the lower back wall of the freezer compartment. A circulating fan (suction type) pulls air from the freezer compartment through the grill in the bottom of the freezer and from the refrigerator compartment through a duct located in the separating wall in the bottom rear left hand corner of the cabinet interior. The air is then drawn up through the fin and tubes of the evaporator surface. The cold air is forced into a fan cover and discharged into the top of the freezer and out the air discharge under the ice maker. Figure D1. The air circulating fan operates any time the thermistors sense the temperature of the food compartment or the freezer compartment are above the upper control limit and send the information to the lower control board. If the food compartment is calling for cooling the automatic damper in the top of the food compartment will open and allow cold air to enter the food compartment. If the food compartment calls for cooling but the fan is not running, the fan will start as soon as the damper is open and will continue to run as long as the food compartment and/or the freezer compartment call for cooling.

The air circulating fan a 12 V DC fan motor operates any time the food compartment or the freezer compartment call for cooling. During the defrost period, the compressor and circulating fan do not operate. The power board located under the freezer behind the grill opens the electrical circuit to the fan motor and compressor for the defrost cycle. The lower control board also closes the damper door that is controlled by a 12 V DC stepper motor and keeps the damper door closed during the complete defrost cycle.

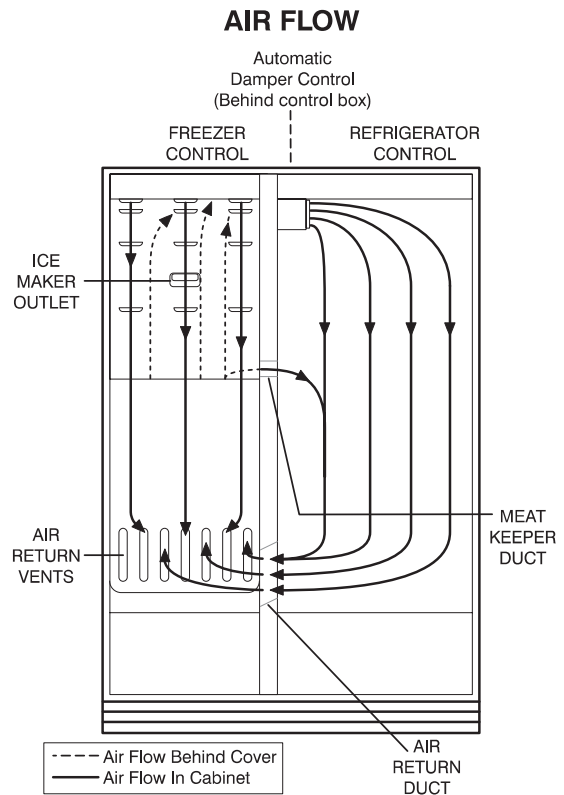


Figure D1

Section 6 - Refrigeration System

NOTICE

Instructions given here are furnished as a guide. Persons attempting to use these instructions to make repairs to the sealed refrigeration system should have a working knowledge of refrigeration and previous training on sealed system repair, and an EPA certification for servicing refrigeration systems.

IMPORTANT NOTICE

Effective July 1, 1992, the United States clean air act governs the disposal of refrigerants such as R-134a. Therefore, when discharging or purging the sealed system use an epa approved refrigerant recovery system as outlined in the final rule on the protection of stratospheric ozone and refrigerant recycling, which was published in the Federal Register May 14, 1993.

NOTE

Frigidaire does not permit the use of recovered refrigerant in the servicing of our products for in-warranty and out-of-warranty repairs or for products covered by service contracts. Therefore, only new refrigerant or refrigerant that has been reclaimed back to new specifications by a refrigerant manufacturer is to be used.

Definitions

Recovery:

To remove refrigerant in any condition from a system and store it in an external container without necessarily testing or processing it in any way.

Recycling:

To clean refrigerant for reuse by oil separation and single or multiple passes through devices, such as replaceable core filter-driers, which reduce moisture, acidity and particulate matter. This term usually applies to procedures implemented at the field job site or at a local service shop.

Reclaim:

To reprocess refrigerant to new product specifications by means which may include distillation. Will require chemical analysis of the refrigerant to determine that appropriate product specifications are met. This term usually implies the use of processes or procedures available only at a reprocessing or manufacturing facility.

Safety Warnings

Compressor Testing

Whenever testing a compressor, extreme caution should be used to prevent damaging the terminals. A compressor with a damaged terminal or a grounded winding can expel a terminal from its insulated housing when the compressor is energized. If this happens, a mixture of refrigerant and oil will be released that could be ignited by an external heat source (open flame, heater, etc.). Also, if there is air in the system when this happens, a spark at the compressor shell could ignite the refrigerant and oil mixture.

Charging Sealed Systems

Overcharging a refrigeration system with refrigerant can be dangerous. If the overcharge is sufficient to immerse the major parts of the motor and compressor in liquid refrigerant, a situation has been created which, when followed by a sequence of circumstances can lead to the compressor shell seam separating.

A hydraulic block occurs, preventing the compressor from starting. This condition is known as locked rotor. Electric current continues to flow through the compressor motor windings which become, in effect, electric resistance heaters. The heat produced begins to vaporize the excess refrigerant liquid causing a rapid increase in system pressure. If the compressor protective devices fail, the pressure within the system may rise to extremes far in excess of the design limits. Under these conditions, the weld seam around the compressor shell can separate with explosive force, spewing oil and refrigerant vapor which could ignite.

To eliminate this exceedingly rare but potential hazard, never add refrigerant to a sealed system. If refrigerant is required, evacuate the existing charge and recharge with the correct measured amount of the refrigerant specified for the system.

Section 6 - Refrigeration System

Soldering

WARNING

Wear approved safety glasses when working with or on any pressurized system or equipment. Have an approved dry type fire extinguisher handy when using any type of gas operated torch.

1. All joints to be soldered must have proper fit. Clearance between tubes to be soldered should be from .001" to .006". It is not practical to actually measure this; however, you do not want a dry fit or loose fit. Tubing joints should overlap about the distance of their diameter except for restrictor tubes, which should be inserted 1.25".
2. Clean all joint areas with fine steel wool or preferably an abrasive cloth, such as grit cloth No. 23 or Scotch-Brite.
3. Apply a thin film of liquid flux recommended for silver soldering to surfaces to be joined and to surfaces immediately adjacent to joint.
4. Align tubing so no stress is on joint. Do not move tubing while solder is solidifying or leaks will result.

CAUTION

During application of heat, use wet cloths to prevent heat from conducting to areas other than the soldered joint. Use a sheet of metal or torch guard pad as a heat deflector to keep flame away from inflammable materials and painted surfaces.

5. Use a torch of adequate capacity so joint can be quickly heated with a minimum of heat travel to other points. Use a good grade of silver solder.
6. Solder connections. If tubing is properly cleaned and fluxed, solder will flow readily. Use only enough solder to make a good bond.
7. Allow joint to cool, then wash exterior with water to remove flux.

Basic Components

The basic components of a refrigerator are a compressor, condenser, evaporator, heat exchanger (capillary tube and suction line), drier and perimeter hot tube.

Perimeter Hot Tube

To reduce the possibility of condensation forming on the exterior of the cabinet in high humidity areas, a

perimeter hot tube (refrigerant tube) has been installed in the unit. The perimeter tube extends up the left side, across the top of the freezer and down the center mullion and into the filter drier. When the compressor operates, warm refrigerant flows through the primary condenser, then into the primary hot tube, warming the cabinet front exterior.

The perimeter hot tube is not replaceable. In the unlikely event of a leak in the hot tube, a kit is available to bypass the hot tube in the sealed system. A electrical heater wire must be installed within the tubing. Refer to the appropriate parts list of the model being serviced for the correct kit part number.

Refrigerant Cycle

The refrigerant cycle is a continuous cycle that occurs whenever the compressor is in operation. Liquid refrigerant is evaporated in the evaporator by the heat that enters the cabinet through the insulated walls and by the heat from product load and door openings. The refrigerant vapor is then drawn from the evaporator, through the suction line to the compressor. Compression raises the pressure and temperature of the vapor in the compressor and the vapor is then forced through the discharge valve into the discharge line and into the condenser. Air passing over the condenser surface removes heat from the high pressure vapor which then condenses to a liquid. The liquid refrigerant then flows from the condenser to the evaporator through the small diameter liquid line (capillary tube). Before it enters the evaporator, the liquid refrigerant is sub-cooled in the heat exchanger by the low temperature suction vapor in the suction line.

Low/High Side Leak or Undercharge

A loss of refrigerant can result in any of the following:

1. Excessive or continuous compressor operation.
2. Above normal freezer and /or food compartment temperature.
3. A partially frosted evaporator (depending on amount of refrigerant loss).
4. Low suction pressure (vacuum).
5. Low wattage.

The condenser will be "warm to cool", depending on the amount of refrigerant lost.

When refrigerant is added, the frost pattern will improve, the suction and discharge pressures will rise, the condenser will become hot and the wattage will increase.

Section 6 - Refrigeration System

In the case of a low side refrigerant leak resulting in complete loss of refrigerant, the compressor will run but will not refrigerate. Suction pressure will drop below atmospheric pressure and air and moisture will be drawn into the system saturating the filter drier.

If there is reason to believe the system has operated for a considerable length of time with no refrigerant and the leak occurred in the low side of the system, excessive amounts of moisture may have entered the system. In such cases the two stage service Dryer Filter part number 5303918288 and vacuum procedure listed under Refrigerant Leaks on page E 15 need to be followed to prevent repetitive service.

If a slight undercharge of refrigerant is indicated and no leak can be found after a thorough leak test, the charge can be corrected without changing the compressor.

If a high side leak is located and some refrigerant remains in the system it is not necessary to change the compressor.

Testing for Refrigerant Leaks

If the system is diagnosed as short of refrigerant and the system has not been recently opened, there is probably a leak in the system. Adding refrigerant without first locating and repairing the leak or replacing the component will not permanently correct the difficulty. The leak must be found. Sufficient refrigerant may have escaped to make it impossible to leak test effectively. In such cases, add a 1/4" line piercing valve to the compressor process tube. Add sufficient refrigerant vapor to increase the pressure to 40 to 50 lb. per sq. in. Check the low side for leaks. Run the compressor 2 or 3 minutes and check the high side for leaks. Recover refrigerant using an EPA approved recovery system.

NOTE

The line piercing valve (clamp-on type) should be used for test purposes only. It must be removed from system after it has served its purpose.

Checking for Internal (Hot Tube) Leaks

Before checking for internal leaks, check all accessible system components and joints for leaks.

If an internal hot tube leak is suspected, it must be confirmed. Use the following procedure:

1. Recover refrigerant by using EPA approved recovery system.
2. After system refrigerant is completely recovered,

disconnect drier from hot tube. Pinch off and solder end of hot tube closed.

3. Cut line from condenser to hot tube and solder a 1/4" charging hose fitting to open end of hot tube or put compression fitting on tube.
4. Connect pressure gauge and access valve to hot tube and pressurize to 250 psig using dry nitrogen or carbon dioxide.



WARNING

Never pressurize with oxygen. never open a high pressure tank unless it is equipped with a pressure regulator. never put high pressure on dome of compressor – it could explode. make sure gauge, HOSES, AND ALL fittings are in good condition and do not leak.

5. Leave pressure on hot tube for 24 hours. Any drop in pressure is indication of leak.

If dry nitrogen or carbon dioxide is not available, follow steps 1 through 3 above, then steps 4 and 5 below:

4. Connect gauges to charging hose fittings. Pull vacuum on hot tube.
5. Leave vacuum on each side of system for 24 hours. Any loss of vacuum indicates leak.

Section 6 - Refrigeration System

Compressor Replacement

CAUTION

NEVER install a new compressor without first checking for possible system contamination.

To check for contamination, obtain oil sample from old compressor.

- If the oil has burned odor, but no color change or residue — follow instructions in section “Installing A New Compressor”.
- If oil has a burned odor and a sugar or gritty feel as well as showing signs of contamination (dark color) — follow instructions in next section, To Flush The System. Remove as much of contamination as possible from system before installing new compressor and filter-drier.

To Flush The System

NOTE

It is recommended that system be flushed with dry Nitrogen. However, if refrigerant is used to flush the system you must look at the serial plate to see what type of refrigerant is used in the system. This is the only refrigerant that can be used to flush the system and it must be recovered.

CAUTION

Use extreme care when using Dry Nitrogen to flush systems. Pressure in nitrogen cylinder could be as high as 2000 psi. Nitrogen cylinder must be equipped with approved pressure regulator and pressure relief valve. Ensure that your hoses have adequate ratings for pressure involved and that all of your equipment is in good condition.

The end of the flushing hose on this tank regulator must be equipped with a hand shut-off valve (Robinair No. 40380). Close hand shut-off valve and adjust nitrogen regulator to correct pressure before proceeding with flushing procedure.

To Use Dry Nitrogen To Flush The System:

1. Remove compressor and filter-drier. Connect process coupling to outlet tube of condenser.
2. Fasten cloth over other end of coil to prevent old oil

from spraying over room.

3. Connect hand shut-off valve on flushing hose to process coupling.
4. Slowly open hand shut-off valve and allow nitrogen to flow through condenser until discharge is clear.

CAUTION

DO NOT exceed 300 PSIG.

5. Disconnect cap tube from evaporator. Flush evaporator in same manner as condenser.

CAUTION

DO NOT exceed 300 PSIG.

6. Flush cap tube. This is only possible if you have proper service valve adaptor.

CAUTION

DO NOT exceed 300 PSIG.

7. Reassemble system.

To Use Refrigerant To Flush The System:

CAUTION

Refrigerant used for flushing must be recovered into a recovery system. Meter amount of refrigerant used for flushing with your charging cylinder. DO NOT OVERFILL THE SYSTEM.

1. Disconnect the suction and discharge lines from the compressor and remove the filter-drier. Connect process coupling to outlet and inlet tube of condenser.
2. Connect hose to outlet process coupling and charging cylinder. Connect another hose to inlet coupling and recovery system.
3. Open charging cylinder and allow refrigerant to flow through condenser until discharge into bag is clear.

NOTE

To flush evaporator and heat exchanger you must remove evaporator from inside product to disconnect cap tube.

Section 6 - Refrigeration System

4. Disconnect capillary tube from evaporator. Flush evaporator in same manner as condenser.
5. Flush cap tube. This is only possible if you have proper service valve adaptor.
6. Reassemble system.

Installing a New Compressor

NOTE

Entirely new compressors have been developed for use with R-134a and Ester oil refrigeration systems. Both compressor and electric motor have been modified. Old compressors intended for R-12 refrigerant must not be used for new systems charged with R-134a.

Replacement of compressor and installation of filter-drier must be done in a continuous sequence so system is exposed to atmosphere no longer than necessary.

All replacement compressors are shipped with rubber plugs in the suction, discharge and process tubes and contain the correct oil charge and a holding charge of inert gas. Compressors have a low-side process tube attached to the compressor shell. A high-side process tube is attached to the filter-drier.

WARNING

Do not operate reciprocating compressor when charging liquid refrigerant into system through its process tube.

Replacement compressors for refrigerator may have an oil cooler even if the original compressor did not. If the product is not equipped for an oil cooler, leave the plastic caps in place and install the compressor connecting only to the suction and discharge lines of the new compressor.

Before installing the replacement compressor remove the discharge plug and check for the pop sound of the inert gas leaving the compressor.

CAUTION

DO NOT use compressor if you do not hear this sound.

If the compressor checks OK, reinstall the plug. Do not remove any of the plugs again until the compressor is in position and you are ready to braze the lines.

CAUTION

On R-134a systems, compressor must NOT be left open to atmosphere for more than 10 minutes to prevent moisture contamination of oil.

A new compressor which is cold (e.g. after having been kept in a cold service van) should be left to warm to the surrounding temperature before the plugs on the compressor connections are removed. This will help prevent condensation from forming in the oil and the compressor. Also, avoid opening the system when any of the components or lines are cold.

NOTE

Release holding charge (release slowly to avoid oil discharge) on new compressor to ensure there is no leak in seam or tubing. Reinstall rubber plug.

1. Disconnect electrical supply to refrigerator.
2. Remove compressor access panel.
3. Recover refrigerant by using EPA approved recovery system.
4. Remove condenser fan mounting screws.
5. Unplug fan motor harness located in back of fan motor.
6. Remove fan motor and fan blade.
7. Remove leads from compressor motor terminals.
8. Remove mounting clips and washers.

Section 6 - Refrigeration System

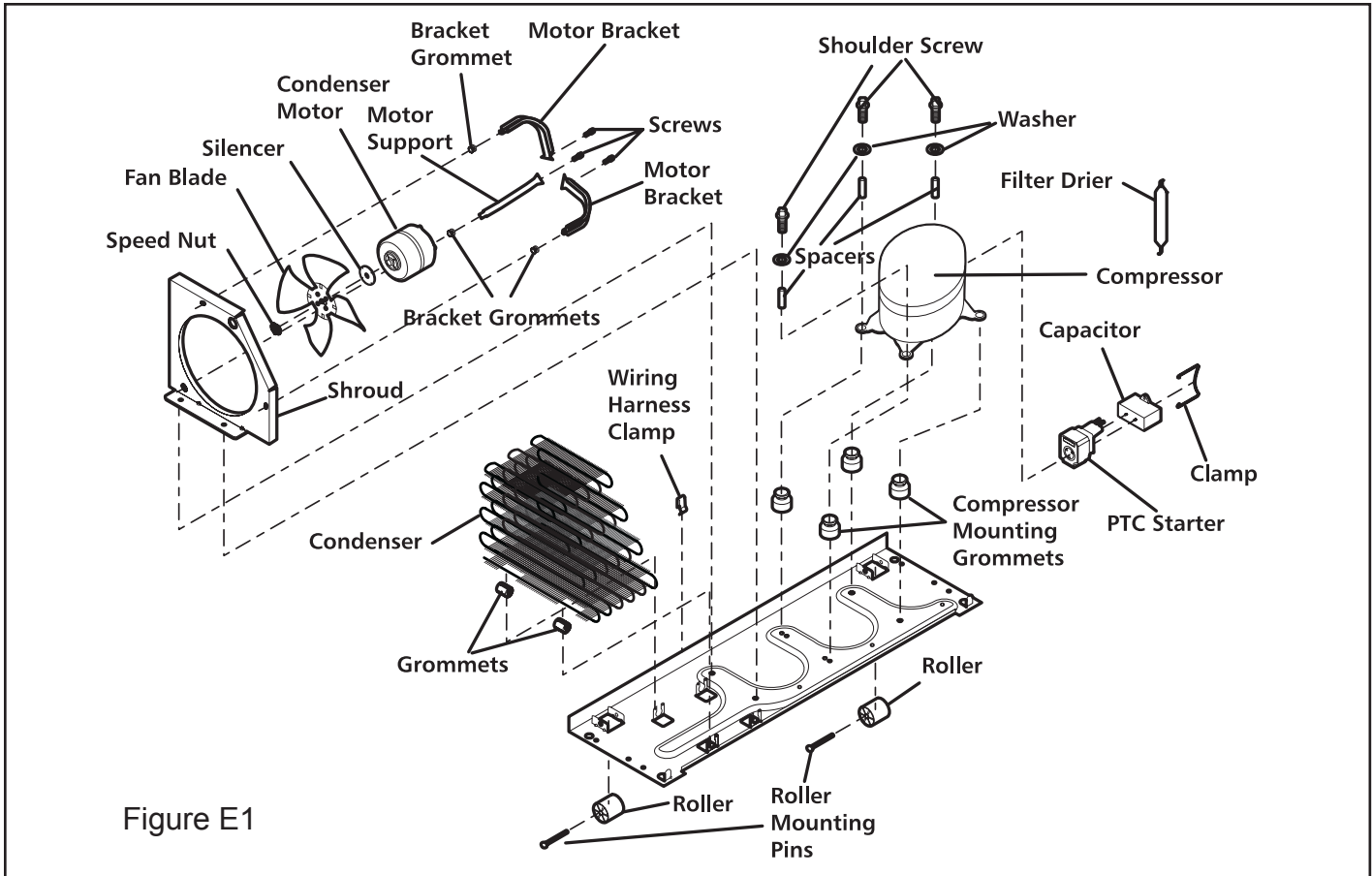


Figure E1

9. After refrigerant is completely recovered, cut suction and discharge lines as close to compressor as possible. Leave only enough tubing to pinch off and seal defective compressor. Plug or tape any open system tubing to avoid entrance of moisture and air into system. Remove inoperable compressor and transfer mounting parts to new compressor.
10. Install new compressor in exact same manner as original compressor.
11. Reform both suction and discharge lines to align with new compressor. If they are too short, use additional lengths of tubing. Joints should overlap 0.5" to provide sufficient area for good solder joint. Clean and mark area where tubing should be cut. Cut tubing with tubing cutter. Work as quickly as possible to avoid letting moisture and air into system.

NOTE

If low-side process tube is too short, silver solder four inch piece of tubing onto process tube at this time.

12. Solder all connections according to soldering procedure.
13. Remove original filter-drier.

CAUTION

DO NOT unbrazed old filter-drier from system. This will vaporize and drive moisture from desiccant back into system. The old filter-drier should be cut out of system.

14. Install new filter-drier at condenser outlet.
15. Evacuate and charge system using recommended procedure described under Evacuating and Recharging.
16. Reconnect compressor terminal leads in accordance with refrigerator wiring diagram.
17. Reassemble unit.

Section 6 - Refrigeration System

Evaporator Replacement

CAUTION

Always use the TORCH GUARD heat shield part number 5304418872, behind evaporator before attempting to solder. The excessive heat from soldering will warp the plastic liner.

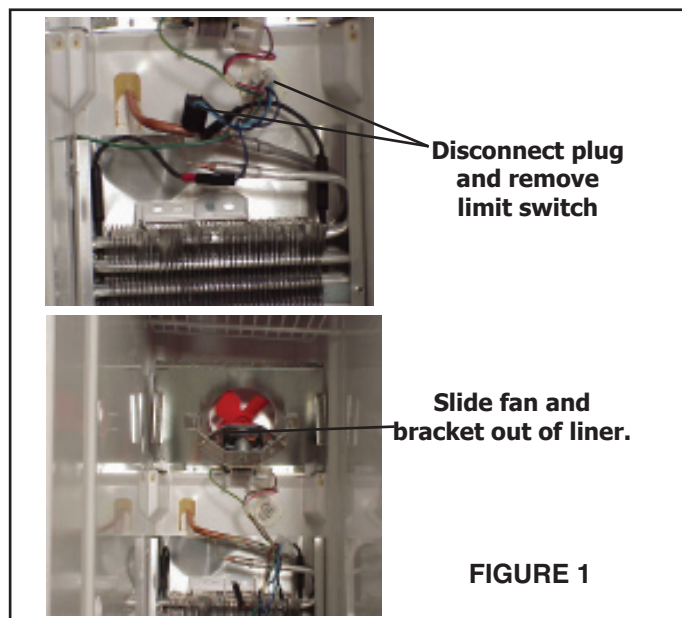
The evaporator is located in the lower section of the freezer and is secured to the drain pan by a bracket at the top. Styrofoam blocks are located on each side, directly across from each other to ensure proper air flow through the evaporator.

The heat exchanger on this style of refrigerator is in the insulation between the food liner and the cabinet back. You will not be able to remove the heat exchanger with the evaporator. Because of this, all line welds will be made inside the freezer. The evaporator kit contains a heat shield to protect the liner from damage when brazing.

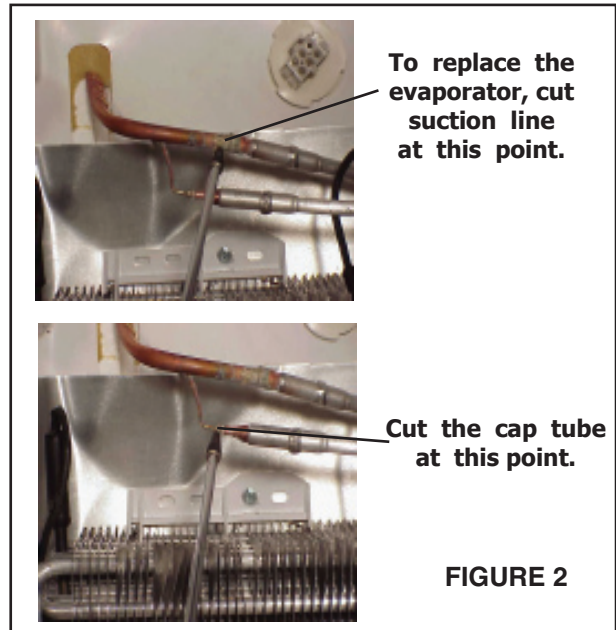
Evaporator Kit Contents

1 Evaporator	1 Heat Shield
1 Drier-Filter	1 Instruction Sheet

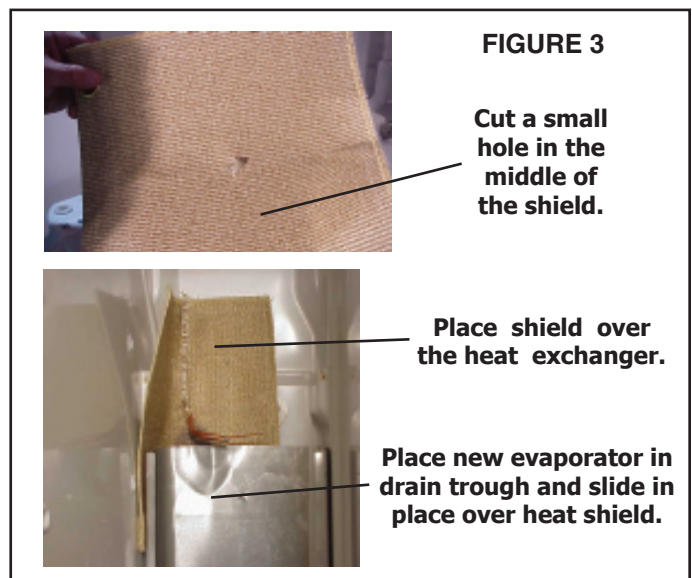
1. Disconnect refrigerator from electrical supply.
2. Remove all freezer section shelves and baskets.
3. Remove bottom evaporator cover.
4. Disconnect wiring harness at liner plug. Remove defrost limiter and disconnect defrost heater. (See Figure 1)



5. Cut suction line in front of weld at evaporator. Using a file, score and break the cap tube just in front of the weld. (See Figure 2.)



6. Remove drain trough and evaporator from inside the freezer.
7. Clean end of suction line and cap tube. Straighten line and slightly bend toward front of cabinet to aid in installing shield.
8. Cut a small "X" in heat shield, then slide cap tube and suction line through hole. Pack heat shield in back corner of liner. (See Figure 3.) **Note:** You may need to use a small pair of vise-grips on the suction line to help hold the heat shield in place.



Section 6 - Refrigeration System

9. Remove rivet in retainer at top of old evaporator. Slide evaporator out top of drain trough.
10. Transfer defrost heater from old evaporator to new evaporator, then slide evaporator into top of drain trough.
11. Slide evaporator and drain trough in place and push drain trough over heat shield. This will help hold shield in place. (See Figure 3.)
12. Place cap tube in new evaporator and weld in place.
13. Place suction line in new evaporator and weld in place.

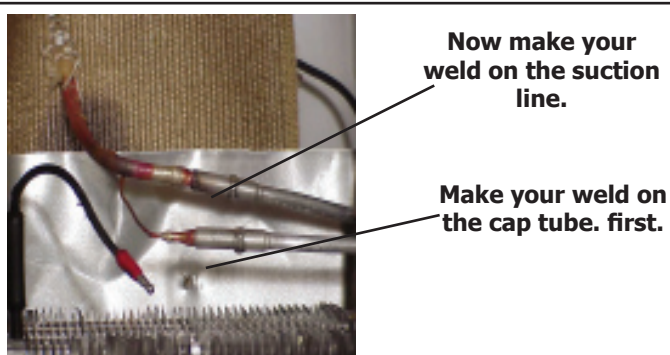
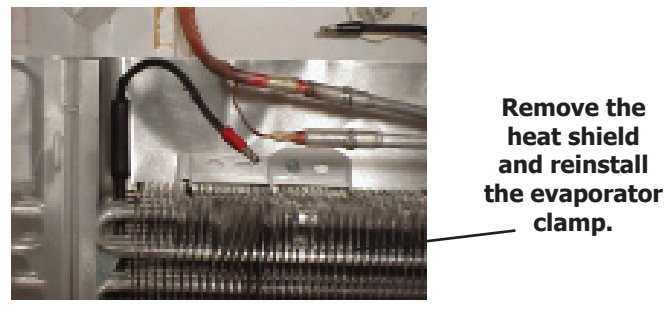


FIGURE 4



14. With a sharp knife, cut along a seam on the heat shield from center hole to edge of shield. Slide shield from between liner, drain trough and suction line assembly.
15. Push evaporator back in place and reinstall plastic clamp at top. (See Figure 4.)
16. Slide fan and bracket assembly in place and connect defrost heater. Mount limit switch on evaporator. Plug wiring harness into connector on liner.
17. Replace Drier-Filter. Pump down and recharge system.
18. Allow product to run and make sure refrigerant is circulating. Reinstall evaporator cover and machine

Heat Exchanger Replacement

CAUTION

Always use the TORCH GUARD heat shield behind evaporator before attempting to solder. The excessive heat from soldering will warp the plastic liner.

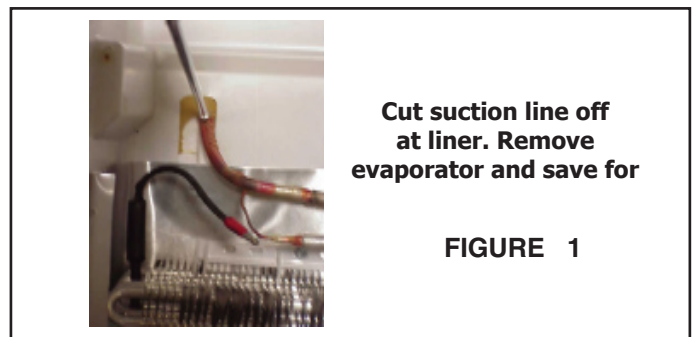
The original heat exchanger (Suction Line & Cap Tube Assembly) in this product is enclosed in the insulation between the liner and the cabinet back. Because of this, the original part can not be removed. There is a service kit to bypass the internal heat exchanger. It will be necessary to run a new heat exchanger down the back of the product and bypass the internal heat exchanger.

Heat Exchanger Kit Contents

1 Heat Exchanger	6 Screws
1 Drier-Filter	1 Cover
1 Armor Flex	1 Package Permagum
2 Tape	1 Instruction Sheet

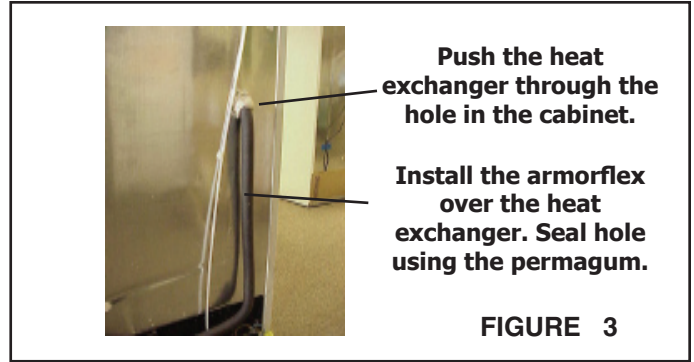
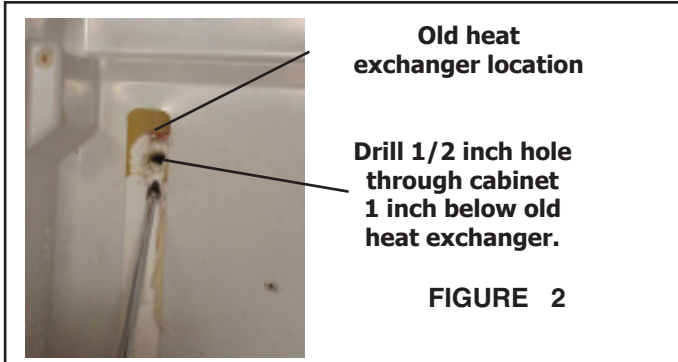
To replace the heat exchanger:

1. Recover refrigerant from sealed system.
2. Disconnect wiring harness at liner plug.
3. Remove defrost limiter and disconnect defrost heater.
4. Remove fan motor and wiring.
5. Cut heat exchanger off flush with liner. (See Figure 1.)

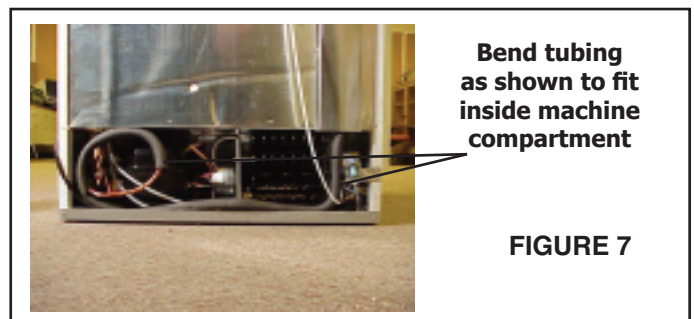
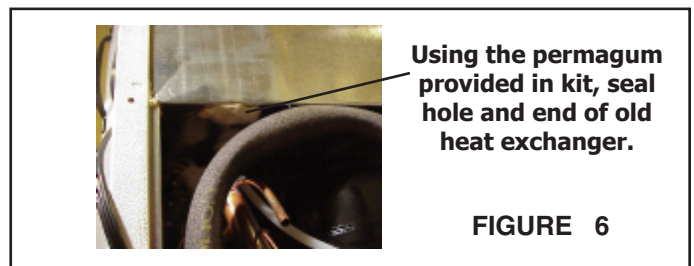
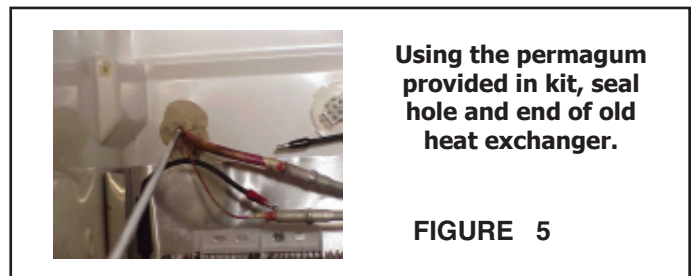
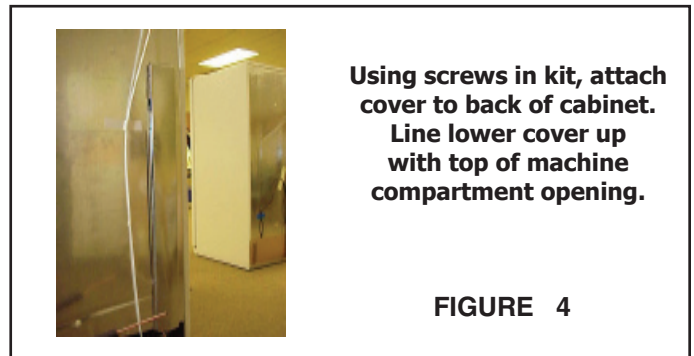


6. Remove evaporator and drain trough. **NOTE:** You do not need to remove rivet or defrost heater.
7. Using a 1/4" drill bit, drill hole through cabinet from inside at location shown in Figure 2.
8. Using a 1/2" drill bit, open hole drilled in Step 7 to 1/2" from back of product. See Figure 2.

Section 6 - Refrigeration System



9. Remove stubs of old heat exchanger from evaporator and install new heat exchanger into evaporator.
10. Push heat exchanger through hole in cabinet (See figures 3 & 5.) and set evaporator back in place.
11. Slide Armor-Flex over heat exchanger until cover is against hole at back of cabinet. The excess cap tube can be wound around the suction line.
12. Seal the hole on the inside and outside using Permagum. (See Figures 3 & 5)
13. The one piece cover can now be installed over heat exchanger. Place open end of cover with top of compressor compartment opening. Attach cover to back of cabinet using screws provided. There is no need to predrill holes as the screws are self cutting. (See Figure 4.)
14. Seal hole and end of old heat exchanger with Permagum. (See Figure 6.)
15. Replacr Drier-Filter.
16. Evacuate and recharge system.
17. Bend remaining tubing to fit into machine compartment opening, being careful not to set up any excess noise from line vibration. (See Figure 7.)
18. Run product to make sure refrigerant is circulating.
19. Reinstall evaporator and machine compartment cover.



Section 6 - Refrigeration System

Perimeter Hot Tube Repair Kit

Effective July 1, 1992, Section 608 of the **Clean Air Act** prohibits Individuals from knowingly venting ozone depleting compounds used as refrigerants into the atmosphere while maintaining, servicing, repairing, or disposing of refrigerant equipment.

A hot tube repair kit is used to bypass a leaking Perimeter Hot Tube (Yoder-Loop). The Perimeter Hot Tube must be bypassed in the sealed refrigeration system and a low wattage heater wire installed inside the tube. This heater will prevent condensation from forming on the exterior front edge of the cabinet.

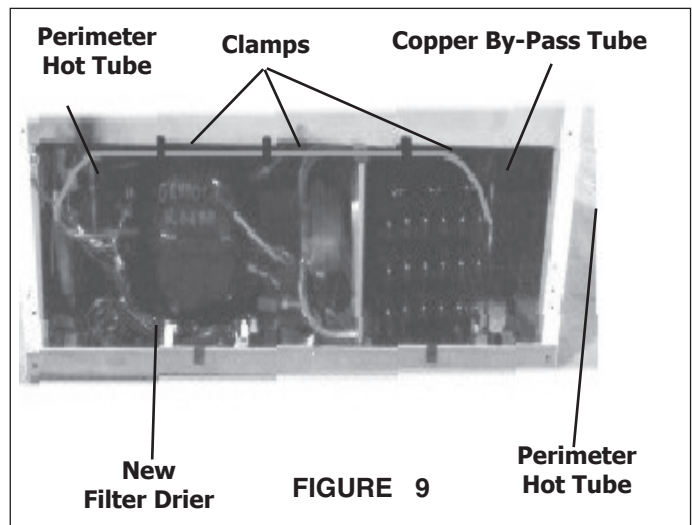
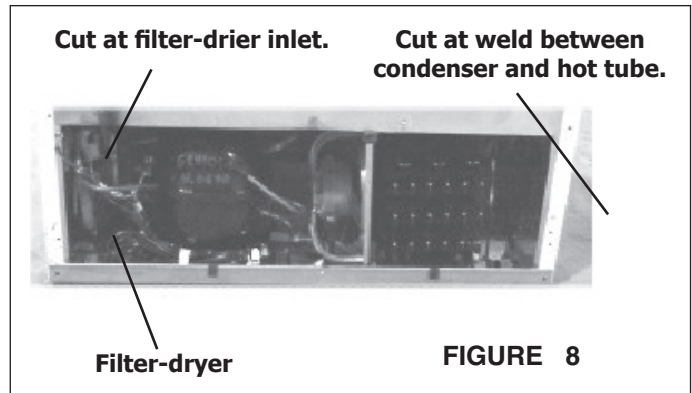
Hot Tube Kit Contents	
1 Copper Bypass Tube	1 Plastic Sleeve
1 Drier-Filter	1 Heater Wire
3 Clamps	1 Harness Adapter
3 Screws	2 Wire Connectors

Bypassing Perimeter Hot Tube - Step 1

1. Disconnect service cord from power supply.
2. Recover refrigerant from system.
3. Remove filter-drier.
4. Using tubing cutter, cut and de-burr tubing from perimeter hot tube at points shown in Figure 8
5. Install copper bypass tube and replacement filter-drier as shown in Figure 9. Use 45% silver solder for all connections.
6. Drill or pierce three holes in cabinet to hold clamps. Secure by-pass tube just below cabinet edge with three clamps and screws provided.
7. Evacuate and recharge refrigeration system. Refer to serial plate for correct charge.

NOTE

When clamped in place the by-pass tube should NOT touch any plastic lines, such as water lines for ice makers and/or filters as well as drain lines.



Installing the Heater Wire - Step 2.

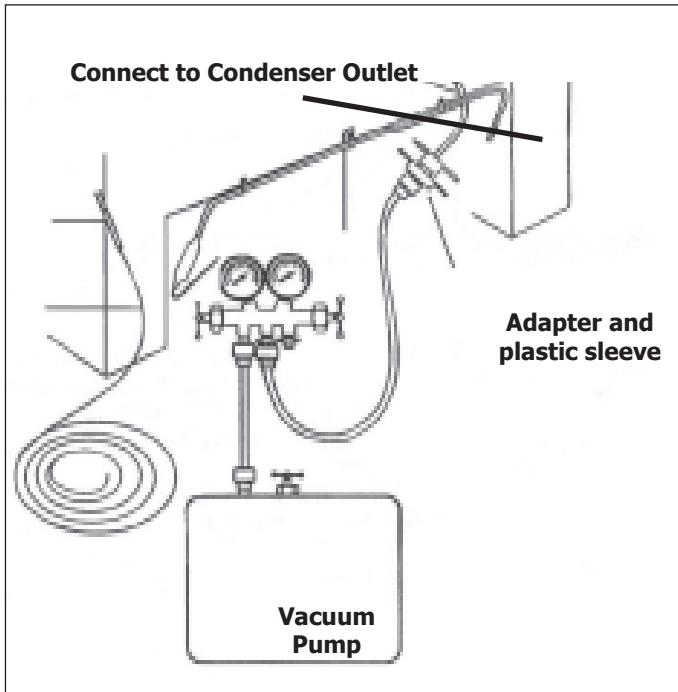
Attach Vacuum Pump and Gauge Set to one end of Perimeter Hot Tube with an Adapter and Plastic Sleeve. See illustration on next page.

2. Cutoff waxed end of Fiberglass braid that is extended past end of heater wire and make knot in end just a little smaller than inside diameter of hot tube.
3. Insert knot on end of braid into open end of Perimeter Hot Tube.
4. With braid inserted, start Vacuum Pump and place your thumb over end of tube. When good vacuum is obtained, release your thumb and begin to feed braid into Hot tube. Continue this process until string reaches Plastic Sleeve.
5. Disconnect Plastic Sleeve.
6. Pull braid out while pushing equal amount of braided heater into tube at other end until heater wire inside braid appears.

Section 6 - Refrigeration System

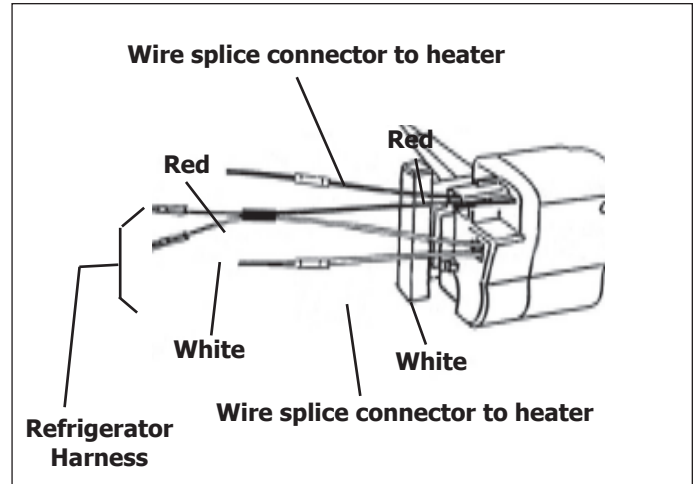
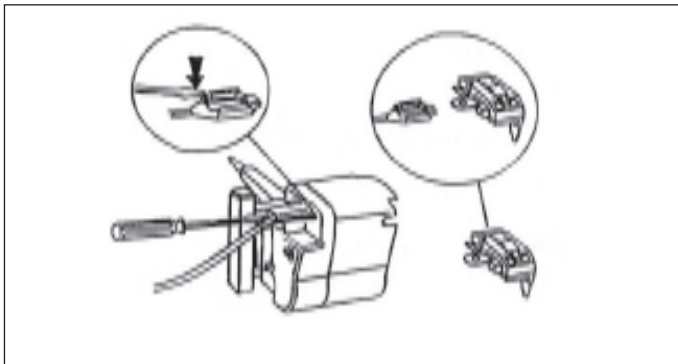
NOTE

Take the time to remove all the bends from the heater (caused from being rolled up) by pulling the heater and braid through a shop rag with a small amount of silicone on the rag and laying it in a roll at the open end of the Hot Tube. It will make heater installation go faster. Using a good two stage, 5 CFM Vacuum Pump will also make heater installation go faster.



Installing the Heater Wire - Step 3.

1. Remove wires (with terminals) from compressor starter/overload. On some models you will need to depress locking tabs located in relay housing (See Drawing below.)



3. Cut off braid at start of heater. Strip insulation back about 5/16 inch. Be careful not to damage heater resistance wire. Splice heater wire ends to loose leads of adapter harness with furnished wire connectors.
4. Dress wires away from Condenser Fan Blade and any sharp edges.
5. Secure wires with electrical tape as necessary.
6. Reinstall Back Panel for proper air flow over condenser and compressor.

Condenser Replacement

1. Disconnect electrical supply to refrigerator.
2. Remove compressor access panel.
3. Recover refrigerant by using EPA approved recovery system.
4. Remove condenser fan mounting screws.
5. Unplug fan motor harness located in back of fan motor.
6. Remove fan motor and fan blade.
7. After refrigerant is completely recovered, disconnect inlet and discharge lines from condenser.
8. Remove white condenser retainer clip from fan bracket and condenser.
9. Lift front of condenser and the two rubber gromets out of retainer in base plate.
10. Remove old condenser out the back of cabinet.
11. Install replacement condenser.
12. Remove original filter-drier.
13. Install new filter-drier at condenser outlet.

Section 6 - Refrigeration System

CAUTION

DO NOT unbrazed the old filter-drier from the system. This will vaporize and drive moisture from the desiccant back into the system. The old filter-drier should be cut out of the system.

14. Evacuate and charge the system using recommended procedure described under Evacuating and Recharging.
15. Reassemble unit.

Filter-Drier Installation

Any time the sealed system is opened and the refrigerant charge is removed, the liquid line filter-drier must be replaced and the system thoroughly evacuated before recharging.

CAUTION

DO NOT unbrazed the old filter-drier from the system. This will vaporize and drive moisture from the desiccant back into the system. The old filter-drier should be cut out of the system.

Use only a 15 gram XH9 liquid line filter-drier (part number 5303305677) when servicing refrigerator and freezer systems. This filter-drier is compatible with either R-12 or R-134a refrigerant.

1. Disconnect unit from source of power.
2. Recover refrigerant by using an EPA approved recovery system.
3. Using a 3 cornered file, score a groove around capillary tube as close to old filter-drier as possible. Break capillary tube along score mark from filter-drier.
4. Cut condenser outlet tube at filter-drier. Discard filter-drier.
5. Thoroughly clean condenser outlet tube and capillary tube.
6. Place inlet connection of filter-drier over condenser tube approximately 1/4" and solder.
7. Insert capillary tube input end into filter-drier outlet. Do not allow tube to bottom against screen. Solder carefully so that solder does not plug capillary tube.
8. Install process tube adaptor to filter-drier.
9. Evacuate and charge system using the recommended procedure described under Evacuating and Recharging.

10. Reassemble unit.

Evacuating and Recharging

CAUTION

Check the serial plate for the correct refrigerant type. It is extremely important to verify the type of refrigerant in the system before starting any sealed system repairs.

With the possible exception of the vacuum pump, all service equipment that comes in contact with R-134a during evacuation and recharging must be dedicated. Accordingly, R-134a will require a dedicated charging cylinder, manifold gauge set, process tube adaptors, and hoses. Any residual mineral oil on other tools (tubing cutter, etc.) must be thoroughly cleaned off before using on R-134a/Ester oil systems. It will be necessary to check with the manufacturer of your vacuum pump for refrigerant and oil compatibility issues.

If you use a vacuum pump with mineral oil to evacuate an R-134a system, it is ABSOLUTELY ESSENTIAL to have a shut-off valve between the pump and your manifold gauge set as shown on page Figure E2. The hand valve must be closed during all times when the vacuum pump is not operating. This will prevent the migration of mineral oil vapor into the R134a/Ester oil system. If the vacuum pump should stop during evacuation for any reason, the hand pump shut-off valve must be closed immediately.

Insure that your refrigeration hoses are specified for use with R-134a refrigerant. Research has shown that compounds in standard refrigeration hoses may enter sealed systems and ultimately restrict the cap tube in an R-134a system.

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Equipment Needed for Evacuation & Recharging:

- Heated charging cylinder
- Standard 3-port manifold gauge set:
 - 4 charging hoses
 - Tee fitting with valve core stem removed (Robinair No. 40396)
 - Hand shut-off valve (Robinair No.40380)
- Two stage vacuum pump
- Process tube adapter kit (Robinair No. 12458)
- Tubing cutter
- Pinch-off tool capable of making leak proof seal
- Complete brazing torch set
- Small 3-corner file
- Grit cloth or Scotch-Brite
- 45% silver solder and flux
- Heat Gun

Installing Evacuation and Recharging Equipment

1. Disconnect refrigerator from electrical supply.
2. If compressor was replaced, install correct sized process tube adaptor on process tube. If compressor was not replaced, cut process tube with tubing cutter leaving as much tube as possible and install correct size process tube adaptor.
3. Install correct sized process tube adaptor on high-side process tube.
4. Attach refrigeration service gauge manifold to system in following order:
 - Low-side (compound gauge) hose to suction side process tube adaptor.
 - High-side (pressure gauge) hose to high-side process tube adaptor.
 - Center port manifold hose before hand shut-off valve to charging cylinder.
 - Center port manifold hose after hand shut-off valve to vacuum pump.

Evacuating System

WARNING

R-134a systems are particularly susceptible to moisture contamination which can only be prevented by evacuating the system for a minimum of 30 minutes to attain a minimum 29.9 inch (500 micron or lower) vacuum.

To achieve the required levels of evacuation, a properly maintained two stage vacuum pump in good condition is required. It is absolutely essential to maintain your vacuum pump according to the manufacturer's instructions including required oil changes at the recommended intervals. Vacuum pump oil should always be changed after evacuating a contaminated system.

Vacuum pump performance should be checked periodically with a micron gauge.

1. Make certain that charging cylinder valve, hand shut-off valve, and manifold gauge valves are closed.
2. Start vacuum pump.
3. Open hand shut-off valve and slowly open both manifold valves, turning counterclockwise, for two full rotations.

CAUTION

If high vacuum equipment is used, just crack both manifold valves for a few minutes and then open slowly for the two full turns counterclockwise. This will prevent the compressor oil from foaming and being drawn into the vacuum pump.

4. Operate the vacuum pump for a minimum of 30 minutes to a minimum of 29.9" (500 micron) vacuum.

NOTE

On products with Low side leaks you must heat the crankcase area of the compressor though out the 30 minutes you are running your vacuum pump to pull a vacuum on the system. Every 4 to 5 minutes while you are running your vacuum pump and heating the crankcase area shake the compressor. By heating the crank- case you are heating the oil in the compressor. This will drive the moisture out of the oil. By shaking the compressor this will allow the moisture to come to the top of the oil faster so the vacuum pump can remove the moisture from the system.

Section 6 - Refrigeration System

5. Close hand shut-off valve to vacuum pump. Watch compound gauge for several minutes. If reading rises, there is a leak in the system, go to step 6. If no leak is indicated, stop vacuum pump. System is now ready for charging.
6. If a leak is indicated, stop vacuum pump and introduce a small charge of refrigerant into system by cracking valve on bottom of charging cylinder until system is pressurized to 40 or 50 lbs psig.
7. Leak test low-side. Close compound gauge. Run compressor for a few minutes and leak test high-side. When leak is found, recapture refrigerant using EPA approved recovery system Repair and go back to step 1.
7. Allow system to sit for five minutes.
8. Turn on refrigerator compressor. Run compressor for a few minutes and monitor system pressures.
9. When satisfied that the unit is operating correctly, clamp the high-side process tube with the pinch-off tool while the unit is still running.
10. Slowly open the high-side manifold gauge valve to allow the compressor to remove any refrigerant trapped in the high-side hose and the process fitting.
11. Close both of the manifold gauge valves. If the high-side gauge reading rises, the pinch-off must be corrected before proceeding.
12. Remove the high-side process tube adaptor and solder the process tube closed.
13. Clamp the low-side process tube with the pinch-off tool while the unit is running. Remove the low-side process tube adaptor and solder the process tube closed.
14. Check the process tubes for refrigerant leaks.

Charging The System

CAUTION

Check the serial plate for the correct refrigerant type. It is extremely important to verify the type of refrigerant in the system before starting any sealed system repairs.

After charging the system with liquid be certain to wait at least 5 minutes before starting the compressor to give the refrigerant a chance to disperse throughout the system. Otherwise the compressor could be damaged by attempting to pump excessive quantities of liquid.

Preparing The Charging Cylinder:

1. Make certain that hand shut-off valve to vacuum pump is closed.
2. Close high-side manifold gauge valve.
3. Set charging cylinder scale to pressure indicated on cylinder pressure gauge.
4. Observe refrigerant level in sight glass. Subtract amount to be charged into system and note shut off point.
5. Open charging cylinder valve slowly and allow proper charge to enter system.
6. As soon as refrigerant in sight glass has gone down to predetermined level, close charging cylinder valve.

WARNING

Disconnect the charging cylinder heater at this time to prevent the cylinder pressure from exceeding its maximum limits.

Final Leak Test

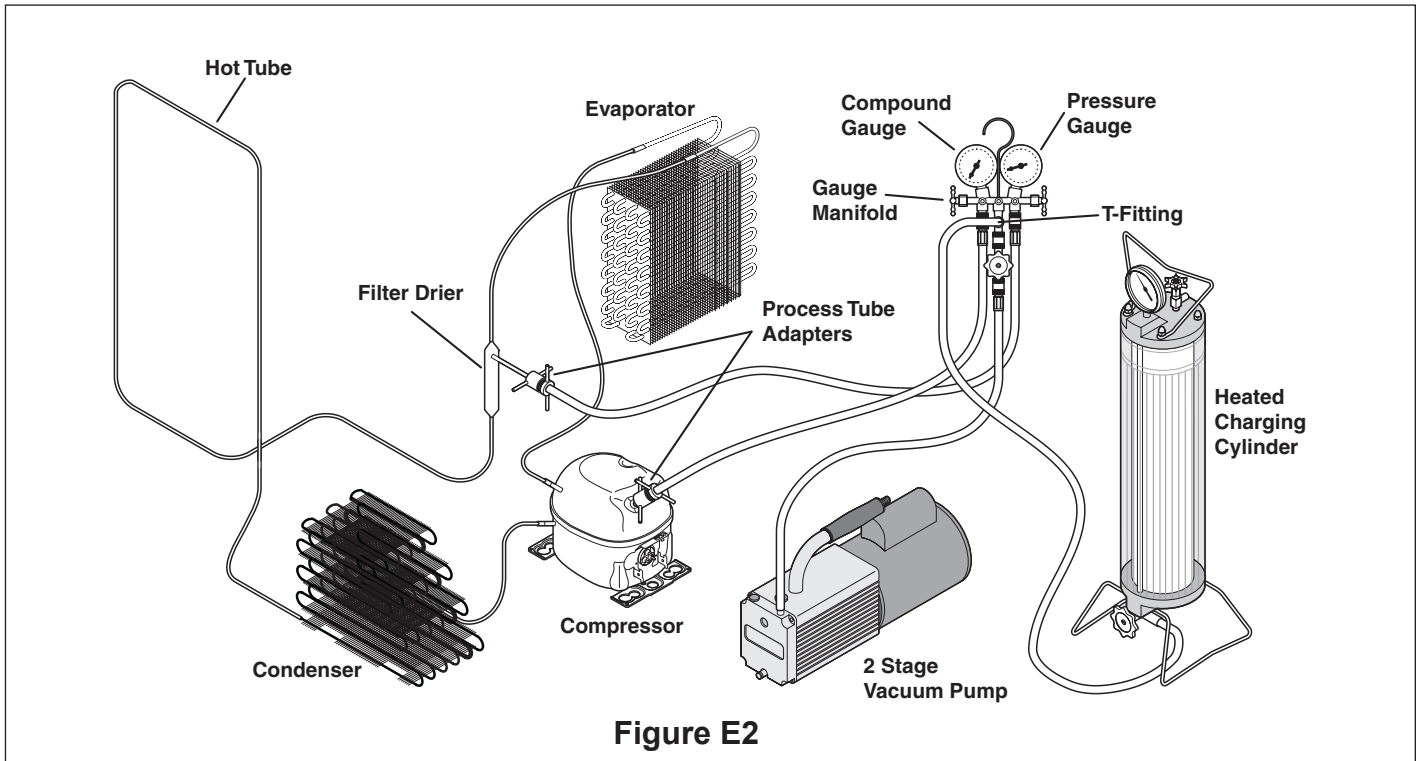
NOTE

Process valves are not to be left on the tubing in any application, except the valve on EMA Service drier part # 5303918288.

1. With the refrigerator turned OFF leak test all low-side system components.
2. Turn the unit ON and run until the condenser is warm. Leak test the high-side system components.

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Evacuating and Recharging Connections



Section 6 - Refrigeration System

NOTICE

Instructions given here are furnished as a guide. Persons attempting to use these instructions to make repairs to the sealed refrigeration system should have a working knowledge of refrigeration and previous training on sealed system repair.

Verify Refrigerant Type in the System

CAUTION

R-134a and R-12 are completely incompatible. Before starting any sealed system repair, it is extremely important to check serial plate of product to verify the type of refrigerant in the system.

Dedicated Equipment

R-134a must not be mixed with other types of refrigerants. R-134a must be recovered in dedicated and properly identified recovery bags and tanks.

It will be necessary to check with the manufacturer of your recovery equipment to determine R-134a compatibility. Some recovery equipment manufacturers have changeover instructions for switching between refrigerant types. Protect yourself and your equipment by following all manufacturer guidelines.

Also, ensure that your refrigeration hoses are specified for use with R-134a refrigerant. Research has shown that compounds in standard refrigeration hoses may enter sealed systems and ultimately restrict the cap tube in an R-134a system.

R-134a Refrigeration Systems

The sealed refrigeration system will consist of the same basic components being utilized in the R-12 systems.

There is a 10% to 15% discharge pressure increase using R-134a, with a 5% to 10% decrease in suction pressure when compared to the same product with an R-12 system operating at 90°F (32°C) ambient temperature conditions. Lower suction pressures result from the lower density of R-134a refrigerant which effects refrigerant flow rate. R-134a systems commonly operate in a 1"-2" vacuum on the suction side.

Products using R-134a refrigerant will generally have a longer capillary tube to maintain a similar flow rate and some models will have a larger condenser to reduce

the discharge pressures and lower start-up sound transmission.

Miscibility of R-134a and Ester Oil

A special synthetic oil known as Ester oil is used as a lubricant in refrigeration systems operating on R-134a. Ester oils are produced from alcohols and fatty acids and are available in several different variants. Ester oils have a pleasant aroma reminiscent of fruit.

Ester oils generally include various types of additives for improving certain properties such as viscosity, temperature sensitivity, etc. These additives are often aggressive, and skin contact with Ester oils should therefore be avoided.

One of the most important requirements made on a refrigerant system is that the oil mix with the refrigerant. Since mineral oil and ordinary synthetic oil DO NOT mix with R-134a, Ester oil is used for lubrication. Ester oil dissolves in R-134a.

Ester oil is broken down by chlorine and cannot be used with R-12 (R-12 contains chlorine) or any other compound containing chlorine. Therefore, R-134a refrigeration systems have virtually no tolerance for chlorine molecules from CFC refrigerants (R-134a is an HFC and contains no chlorine).

CAUTION

During R-134a service, it is extremely important to avoid using equipment that may contain residual amounts of mineral oil, CFC's or HCFC's which could enter and contaminate the sealed system.

For example, hoses that were used for a refrigeration system operating on R-12 may contain small quantities of mineral oil which can block the capillary tube in a system operating on R-134a. As little as one milligram may be sufficient to cause a blockage. In addition, sealed system components that have been used with CFC systems must not be used with R-134a systems. These components may contain residual amounts of refrigerant and oil which could damage an R-134a system.

At the earliest stage of development work on R-134a, tests were carried out on a different type of synthetic oil known as Poly-Alkaline Glycol (PAG). This oil is also used in certain air conditioning systems for cars. PAG and Ester oil DO NOT mix with one another. Service equipment used for R-134a / Ester oil must not come into contact with PAG.

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Water In The Refrigeration System

Even in very small quantities, water in any refrigeration system can cause the following problems:

- Ice plugs in capillary tubes.
- Copper plating in compressor.
- Reactions with organic materials in systems.
- Corrosion of metals.

R-134a and Ester oil will aggravate the problem of water in the refrigeration system. Ester oil may react with water vapor and is hydroscopic (it will absorb water if it comes in contact with humid air). Water is also more soluble in R-134a than R-12.

To minimize the water content whenever service work is performed, the refrigeration system should always be thoroughly evacuated through process tube adaptors on both the high and low sides of the system. Evacuation must be for a minimum of 30 minutes to at least a 29.9 inch (500 micron) vacuum.

VACUUM CHART		
Vacuum Inches Hg.	Microns	Boiling Point of Water °F
28.940	25000	77.9
29.530	10000	52.0
29.832	4600	32.0
29.882	1000	1.0
29.901	500	-11.2
29.915	150	-32.8
29.917	100	-38.2
29.919	50	-49.0

To achieve the required 29.9 inch (500 micron) vacuum, a properly maintained two-stage vacuum pump in good condition is required. A two stage pump can reach a deeper vacuum than a single stage because the exhaust from the first pumping stage is discharged into the second pumping stage. This means the second stage begins pumping at a lower pressure so a lower ultimate vacuum can be achieved (See 2-Stage Vacuum Pump, Figure E3).

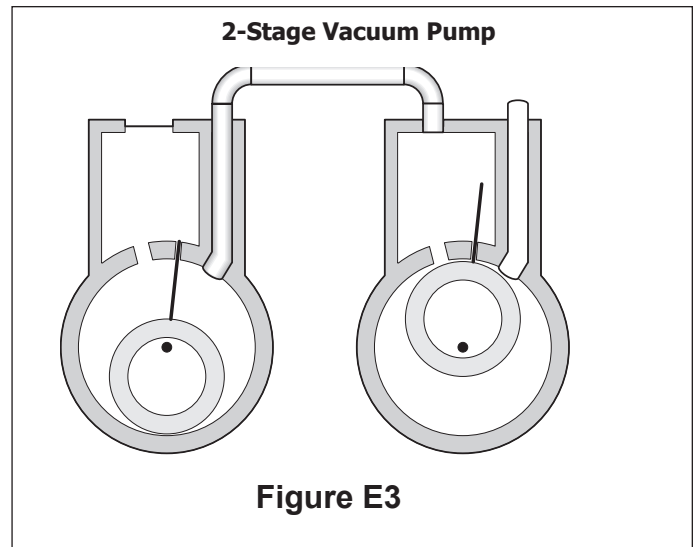


Figure E3

Vacuum Pump Maintenance

It is absolutely essential to maintain your vacuum pump according to the manufacturer's instructions including required oil changes at the recommended intervals. Vacuum pump oil should always be changed after evacuating a contaminated system. Vacuum pump performance should be checked periodically with a micron gauge.

Vacuum pump suppliers may or may not recommend changing the vacuum pump oil to the same type that's in the system being evacuated. Some manufacturers may recommend a vacuum pump that's dedicated to R-134a systems.

Robinair has stated that their current and discontinued vacuum pump models, using mineral oil currently specified for use in their vacuum pumps, can be used to evacuate R-134a/Ester oil systems. Robinair also states that it is acceptable to alternate between evacuating R-12/mineral oil and R-134a/Ester oil systems without adversely effecting the vacuum pump's performance.

For other brands of vacuum pumps, check with the manufacturer for restrictions and guidelines when using with R-134a.

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CAUTION

If you use a vacuum pump with mineral oil to evacuate an R-134a system, it is ABSOLUTELY ESSENTIAL to have a shut-off valve between pump and your manifold gauge set as shown in Figure E2. The hand valve must be closed during all times when vacuum pump is not operating. This will prevent migration of mineral oil vapor into R134a/Ester oil system. If vacuum pump should stop during evacuation for any reason, the hand pump shut-off valve must be closed immediately.

Refrigerant Leaks

A system with R-134a and Ester oil will become saturated with moisture much faster than a system with R-12 and mineral oil. If your leak was in the low side of the refrigeration system when the compressor is running the pressure in the low side will go into a vacuum. As additional refrigerant leaks out the system will go deeper into a vacuum. The system running in this vacuum will allow air and moisture to be pulled into the sealed system. The moisture pulled in can then be mixed in to the Ester oil in the compressor.

If the product has had a low side leak you will need to install the two stage service dryer filter part number 5303918288. You must heat the crankcase area of the compressor using a heat gun on the high heat setting though out the 30 minutes you are running your vacuum pump to pull a vacuum on the system. Every 4 to 5 minutes while you are running your vacuum pump and heating the crankcase area shake the compressor. By heating the crankcase you are heating the oil in the compressor. This will drive the moisture out of the oil. By shaking the compressor this will allow the moisture to come to the top of the oil faster so the vacuum pump can remove the moisture from the system.

Electrolux Home products does not approve the use of the Sweep Charge for sealed system repair.

This method of servicing sealed systems we know is often used to repair products in the field. The Sweep Charge does not adequately remove the moisture from the oil in the compressor. In a R-134a system you will need to replaced the compressor if the product has had a low side leak and you are servicing with the Sweep Charge procedure.

R-134a refrigerant molecules are smaller than R-12 molecules. This means that R-134a will pass more minor leaks and the rate of flow will be greater than for R-12. Therefore, it is now more important than ever to follow

good brazing practices. Use a good grade of silver solder. 45% silver solder is recommended.

Leak Detection

R-134a system leaks can be pinpointed by means of an electronic leak detector or by bubble solution.

Electronic leak detectors for R-134a service are currently available from several manufacturers. The least expensive models are non-selective detectors that will detect any type of emission or vapor present, regardless of its chemical composition. Some non-selective detectors designed for use with R-12 may have a much lower sensitivity when used with R-134a. However, newly designed detectors with good R-134a sensitivity are now available. Be sure to consult with the manufacturer before selecting or using a non-selective detector with R-134a.

Halogen-specific detectors use a specialized sensor that allows detection of compounds containing chlorine, fluorine, bromine, and iodine without being activated by other species. The major advantage of this type of detector is a reduction in the number of "nuisance alarms". Halogen-specific detectors are generally more expensive than non-selective detectors but feature higher sensitivity.

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HFC-134a, CFC-12 Pressure Temperature Chart

°F	°C	HFC-134a	CFC-12		°F	°C	HFC-134a	CFC-12
-60	-51.1	21.8*	19.0*		55	12.8	51.1	52.0
-55	-48.3	20.4*	17.3*		60	15.6	57.3	57.7
-50	-45.6	18.7*	15.4*		65	18.3	63.9	63.8
-45	-42.8	16.9*	13.3*		70	21.1	70.9	70.2
-40	-40.0	14.8*	11.0*		75	23.9	78.4	77.0
-35	-37.2	12.5*	8.4*		80	26.7	86.4	84.2
-30	-34.4	9.8*	5.5*		85	29.4	94.9	91.8
-25	-31.7	6.9*	2.3*		90	32.2	103.9	99.8
-20	-28.9	3.7*	0.6		95	35.0	113.5	108.3
-15	-26.1	0.0	2.4		100	37.8	123.6	117.2
-10	-23.3	1.9	4.5		105	40.6	134.3	126.6
-5	-20.6	4.1	6.7		110	43.3	145.6	136.4
0	-17.8	6.5	9.2		115	46.1	157.6	146.8
5	-15.0	9.1	11.8		120	48.9	170.3	157.7
10	-12.2	12.0	14.6		125	51.7	183.6	169.1
15	-9.4	15.0	17.7		130	54.4	197.6	181.0
20	-6.7	18.4	21.0		135	57.2	212.4	193.5
25	-3.9	22.1	24.6		140	60.0	227.9	206.6
30	-1.1	26.1	28.5		145	62.8	244.3	220.3
35	1.7	30.4	32.6		150	65.6	261.4	234.6
40	4.4	35.0	37.0		155	68.3	279.5	249.5
45	7.2	40.0	41.7		160	71.1	298.4	265.1
50	10.0	45.3	46.7		165	73.9	318.3	281.4

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Inhalation Toxicity

HFC-134a poses no acute or chronic hazard when it is handled in accordance with DuPont recommendations and when exposures are maintained at or below the DuPont Acceptable Exposure Limit (AEL) of 1,000 ppm (8 and 12 hour Time-Weighted Average or TWA).

An AEL is an airborne exposure limit established by DuPont scientists that specifies time-weighted average (TWA) airborne concentrations to which nearly all workers may be repeatedly exposed without adverse effects. The AEL for HFC-134a has the same value as the Threshold Limit Values (TLVs) established for CFC-12 and HCFC-22. TLVs are established by the American Conference of Governmental and Industrial Hygienists (ACGIH).

However, inhaling high concentrations of HFC-134a vapor may cause temporary central nervous system depression with narcosis, lethargy and anesthetic effects. Other effects that may occur include dizziness, a feeling of intoxication and a loss of coordination. Continued breathing of high concentrations of HFC-134a vapors may produce cardiac irregularities (cardiac sensitization), unconsciousness, and with gross overexposure, death. Intentional misuse or deliberate inhalation of HFC-134a may cause death without warning. This practice is **extremely dangerous**.

If you experience any of the initial symptoms, move to fresh air and seek medical attention.

Cardiac Sensitization

If vapors are inhaled at a concentration of 75,000 ppm, which is well above the AEL, the heart may become sensitized to adrenaline, leading to cardiac irregularities and, possibly, to cardiac arrest. The likelihood of these cardiac problems increases if you are under physical or emotional stress.

Medical attention must be given immediately if exposed to high concentrations of HFC-134a. **DO NOT** treat with adrenaline (epinephrine) or similar drugs. These drugs may increase the risk of cardiac arrhythmias and cardiac arrest. If the person is having difficulty breathing, administer oxygen. If breathing has stopped, give artificial respiration.

Spills or Leaks

If a large release of vapor occurs, such as from a large spill or leak, the vapors may concentrate near the floor or low spots and displace the oxygen available for breathing, causing suffocation.

Evacuate everyone until the area has been ventilated.

Use blowers or fans to circulate the air at floor level. DO NOT reenter the affected area unless you are equipped with a self-contained breathing apparatus or unless an area monitor indicates that the concentration of HFC-134a vapors in the area is below the AEL.

Always use self-contained breathing apparatus or an air-line mask when entering tanks or other areas where vapors might exist. Use the buddy system and a lifeline. Refer to the Material Safety Data Sheet (MSDS) for HFC-134a for more information.

HFC-134a vapors have a slightly sweet odor that can be difficult to detect. Therefore, frequent leak checks and the installation of permanent area monitors may be necessary in enclosed spaces. Refer to ASHRAE Standards 15 and 34 for refrigeration machinery rooms.

To ensure safety when working with HFC-134a in enclosed areas:

1. Route relief and purge vent piping (if present) outdoors, away from air intakes.
2. Make certain area is well ventilated, using auxiliary ventilation, if necessary, to move vapors.
3. Make sure area is clear of vapors prior to beginning work.
4. Install air monitoring equipment to detect leaks.

Skin and Eye Contact

At room temperature, HFC-134a vapors have little or no effect on the skin or eyes. However, in liquid form, HFC-134a can freeze skin or eyes on contact, causing frostbite. Following contact, soak the exposed area in lukewarm water, not cold or hot. If medical treatment cannot begin immediately, apply a light coat of a nonmedicated ointment, such as petroleum jelly. If the exposed area is in a location where the presence of the ointment would be awkward, such as on the eye, apply a light bandage. In all cases of frostbite, seek medical attention as soon as possible.

Always wear protective clothing when there is a risk of exposure to liquid HFC-134a. Where splashing is possible, **always** wear eye protection and a face shield.

Combustibility of HFC-134a

HFC-134a is nonflammable at ambient temperatures and atmospheric pressure. However, tests have shown HFC-134a to be combustible at pressures as low as 5.5 psig (139.3 kPa absolute) at 177°C (350°F) when mixed with air at concentrations generally greater than 60% volume air. At lower temperatures, higher pressures are required for combustibility. (HCFC-22 is also combustible at pressures above atmospheric in the presence of high

Section 6 - Refrigeration System

air concentrations). Test results and calculations have shown:

- At ambient temperature, all concentrations of HFC-134a in air are nonflammable at pressures below 15 psig (205 kPa absolute).
- Combustible mixtures of air and HFC-134a will not form when liquid HFC-134a is pumped into closed vessel if initial air pressure in vessel is limited to one atmosphere absolute and final pressure is limited to 300 psig (2,170 kPa absolute). If initial air pressure is greater than one atmosphere, combustible mixtures may form as tank is filled.

Based on above information, the following operating practices are recommended:

Leak Testing

- Equipment should **NEVER** be leak tested with a pressurized mixture of HFC-134a and air. HFC-134a may be safely pressured with dry nitrogen.

Bulk Delivery and Storage

- Tanks should normally be evacuated at start of filling, and should never be filled while under positive air pressure.
- Tank pressure should never be allowed to exceed 300 psig (2,170 kPa) when filling with HFC-134a. Relief devices on either tanks or HFC-134a supply system usually prevent this.
- Tank pressures should be monitored routinely.
- Air lines should never be connected to storage tanks.

Filling and Charging Operations

- Before evacuating cylinders or refrigeration equipment, any remaining refrigerant should be removed by recovery system.
- Vacuum pump discharge lines should be free of restrictions that could increase discharge pressures above 15 psig (205 kPa) and result in formation of combustible mixtures.
- Cylinders or refrigeration equipment should normally be evacuated at start of filling, and should never be filled while under positive air pressure.
- Final pressures should not exceed 300 psig (2,170 kPa).
- Filled cylinders should periodically be analyzed for air (nonabsorbable gas or NAG).

Refrigerant Recovery Systems

Efficient recovery of refrigerant from equipment or containers requires evacuation at the end of the recovery

cycle. Suction lines to a recovery compressor should be periodically checked for leaks to prevent compressing air into the recovery cylinder during evacuation. In addition, the recovery cylinder pressure should be monitored, and evacuation stopped in the event of a rapid pressure rise indicating the presence of noncondensable air. The recovery cylinder contents should then be analyzed for NAG, and the recovery system leak checked if air is present. **DO NOT** continue to evacuate a refrigeration system that has a major leak.

Thermal Decomposition

HFC-134a vapors will decompose when exposed to high temperatures from flames or electric resistance heaters. Decomposition may produce toxic and irritating compounds, such as hydrogen fluoride. The pungent odors released will irritate the nose and throat and generally force people to evacuate the area. Therefore, it is important to prevent decomposition by avoiding exposure to high temperatures.

Section 7 - Ice Maker

Rear Mounted Ice Maker

The automatic ice maker is mounted in the freezer compartment. It is attached to a bracket extending up from the back of the auger motor cover.

The Ice Maker is designed to produce ice automatically. The length of time between harvest cycles will vary, depending on load conditions, door openings, ambient temperature and freezer temperature and water temperature. These factors must be taken into consideration when checking the ice production rate.

With a temperature of -2°F to $+5^{\circ}\text{F}$ in the freezer, the rate of harvest will be 40 to 96 cubes per 24 hour period.

The ice maker is wired across the line and will harvest ice in the refrigeration or defrost cycles.

The water valve and solenoid assembly are both mounted in the compressor compartment.

A tube extends from the water valve up the rear wall of the refrigerator to a water inlet spout that directs the water into the fill trough. The water fill spout will twist lock into a housing in the back of the refrigerator and direct water flow into the ice maker from the side of the mold.

Front Cover (Figure F4)

A decorative front cover, made of molded plastic, encloses the operating mechanism of the ice maker, protecting it from moisture. It is essential that the cover be in place on an operating ice maker to protect against possible contact with the mechanism by the user. (See Figure F1)

Mounting Plate Front View

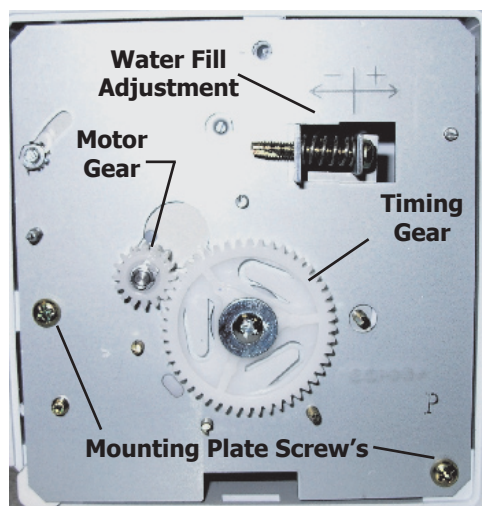


Figure F1

Ice Maker Components

Ice Mold (Figure F5)

The ice mold is die-cast aluminum with the ice maker thermostat bonded to its front surface. The mold has a semi-circular interior partitioned into equal size compartments. Water enters at the side of the mold, through a fill trough. A film of silicon grease on the top edge of the mold prevents siphoning of water by capillary action.

Mold Heater (Figure F6)

A mold heater, rated at 112 watts at 115volts, $\pm 10\%$ it is covered with an aluminum sheath and embedded in the grooved section on the underside of the Ice Mold. When the mold heater is energized, the ice contact surface within the mold is heated enough to allow harvest of the ice pieces.

The mold heater is wired in series with the Ice Maker thermostat, which acts as a safety device.

The heater is staked in place, and is replaced as part of the ice maker Mold.

A thermal mastic sealer is placed between the heater and the mold to ensure good thermal contact.

Ice Stripper (Figure F5)

An Ice Stripper is attached to the mold to prevent ice pieces from falling back into the mold. It also serves as a decorative side cover.

Ice Ejector (Figure F5)

The Ejector blades are molded from delrin, and extend from a central shaft, which turns in nylon bearings at the front and rear. Each blade sweeps an ice section out of the mold. The drive end of the Ice ejector is "D" shaped. Food Grade Silicone grease is used to lubricate the bearing surfaces.

Water Valve Assembly

The water valves are solenoid operated and when energized, releases water from the water tank in the food compartment into the Ice Mold. The amount of water released is directly proportional to the length of time the water valve Switch is energized. A flow washer, inside the water valve, maintains a constant rate of water flow over a supply line with pressure ranging from 20 to 100 psig. It will not compensate for pressures below 20 psig, or greater than 100 psig. A No. 80-mesh screen, placed ahead of the flow washer, filters out foreign materials.

Section 7 - Ice Maker

The solenoid coil draws 10 to 20 watts of power. The coil is wired in series with the mold heater, across the supply voltage.

Thermostat (Figure F6)

The thermostat is a single-pole, single throw (SPST), bimetallic, disk-type, thermal switch. It automatically starts the harvest cycle when the ice is frozen. The thermostat closes at a temperature of $9^{\circ}\text{F} \pm 2^{\circ}$. Wired in series with the mold heater, the thermostat acts as a safety device against overheating in the event of mechanical failure. A thermal mastic bond is provided where the thermostat is mounted against the mold. A gasket prevents water from leaking into the support housing.

Sensing Arm & Linkage (Figure F5 & F6)

The sensing arm is cam-driven and operates a switch that controls the quantity of ice produced. In the harvest Cycle, the arm is raised and lowered during each of the two revolutions of the timing cam. If the sensing arm comes to rest on top of ice in the storage compartment during either revolution, the switch will remain open and stop the ice maker at the end of that revolution. When sufficient ice is removed from the storage container, the sensing arm lowers and ice production resumes. To manually stop the ice maker turn the switch located on the housing at the left end of the icemaker to off. Operation is resumed when the switch is turned back to on.

Timing Switches (See Figure F2)

The three timing switches used are single-pole, double throw (SPDT). They are identical except for function, and can be used interchangeably.

1. **Hold Switch** - assures completion of a revolution once the ice maker operation has started.
2. **Water Fill Switch** - opens the water valve during the fill cycle. It is the only adjustable component in the ice maker.
3. **Shut-Off Switch** - stops ice maker operation when the storage container is full of Ice. The switch is opened after the sensing arm is raised to its most upright position. The switch is mounted to the top right wall of the ice maker support. (Not shown in Figure F6)

Mounting Plate Back View

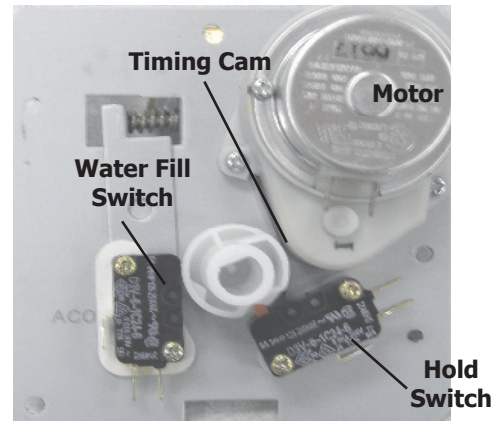


Figure F2

Thermal Cut-Out (TCO)

The thermal cut-out is a one-time limit fuse used as a safety device. It is located under the mounting plate, in the head of the ice maker, between the thermostat and wire connector.

If the thermal cut-out opens, the cause of failure must be determined and corrected prior to replacing the TCO. Normal causes of the TCO failing are a bad thermostat or a shorted coil on the water valve.

Timing Cam & Coupler

Three separate cams are combined in one molded Delrin part:

1. Inner cam operates shut-off switch lever arm.
2. Center cam operates hold switch.
3. Outer cam operates water fill switch.

One cam end is attached to a large timing gear. The other cam end is coupled to the ejector.

Timing Gear (Figure F1)

This large molded plastic gear is driven by the motor and, in turn, rotates the cam and ejector. A "D" shaped hole in the gear fits over the timing cam hub. Spacer tabs on the backside of the gear prevent the gear from binding on the mounting plate.

Motor (Figure F2)

A low wattage, stall-type motor drives the timing gear. This gear turns the timing cam and ejector blades approximately one revolution every three minute (1/3 RPM).

Section 7 - Ice Maker

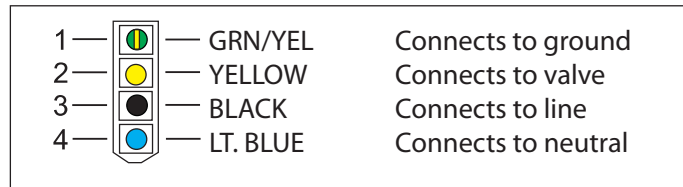
On/Off Switch (Figure F5 & 6)

A single-pole, single-throw switch is mounted on the right side of the housing at the front of the ice maker. This switch is used to turn the ice maker off. Unlike the switch on the bail arm the on/off switch will stop the ice maker as soon as it is pushed, and it will not allow the ice maker to complete the revolution.

Wiring

A four-prong plug connects the ice maker wiring to the cabinet wiring harness. (See Figure F3.) The ice maker assembly is wired across the line and will harvest in either the refrigeration or defrost cycles. A wiring diagram is located inside the front cover of the ice maker.

Ice Maker Connector Plug



Installing Water Supply Line to Ice Maker

Supply line installation must comply with all applicable plumbing codes. Refer to the **Ice Maker Installation Instructions** in appendix A.

The ¼" tubing, and any other plumbing materials required, should be obtained locally.

The ice maker should be connected to a frequently used cold water line to ensure a fresh water supply.

NOTE

A vertical cold water line should be selected for the water supply. If a vertical line is not available, a horizontal line may be used, providing the connection is on the side or top of the pipe, but **not on the bottom**. Scale and foreign material in the pipe could cause stoppage of water flow if the connection is on the bottom.

Be sure to leak test all connections after the water supply has been turned on.

Test Cycling Ice Maker (See Ice Maker Testing Procedures).

It may be necessary, on occasion, to test-cycle an ice maker to check its operation. This can be done on the repair bench or while mounted in the refrigerator.

If the ice maker is in an operating refrigerator, take precautions against the formation of condensate by allowing the cold, metal components to warm up before removing the front cover. This can be expedited by cycling the assembly with the cover in place and the water supply valve closed.

To manually cycle the ice maker, push the on off switch to the on position then push in harder against the spring loaded second set of contacts in the switch and hold in until the hold switch circuit to the motor is completed. When the motor starts, all components except the ice maker thermostat should perform normally. Once the ice maker completes its cycle, if additional testing is necessary you can you can push in on the switch again to start the icemaker into another cycle.

Water Valve Switch – Water Fill Volume

The amount of water fill is directly proportional to the length of time terminals "C-NC" of the water fill switch are closed. Closing occurs when the switch plunger drops into a cavity formed in the cam.

Different water valves have different flow rates. For this reason, anytime a water valve is replaced, the water fill must be checked and the fill switch must be adjusted if needed.

The correct water fill volume is 80 to 100 cc. To measure the fill volume, test-cycle the Ice Maker and collect the water. Measure in a container calibrated in cubic centimeters (CC) the fill time is 5.0 seconds.

The fill volume is adjusted by increasing or decreasing the length of time the water fill switch remains closed.

To adjust the water fill switch, first determine how much water is needed. The adjusting screw is calibrated so that one complete revolution changes the water fill about 18 cubic centimeters. Turning the screw clockwise decreases the fill, while turning counterclockwise increases the fill.

EXAMPLE: An ice maker is test-cycled and the water fill sample is 93 cubic centimeters. Subtracting 80 cc from 93, the adjustment needed is 13 cc. Since one turn of the adjusting screw changes the fill 18 cc, ¾ of a turn clockwise would reduce the fill about 13 cc, the desired amount. (This example is for manual models only.)

Section 7 - Ice Maker

Parts Replacement

Disconnect electrical supply to refrigerator.

To Replace Front Cover (Figure F4)

1. Remove ice maker from freezer.
2. Ensure that ice maker is at room temperature before removing Cover.
3. Remove screw at the top of the cover and tip it out until the tab at the bottom comes out of the housing.
5. Install in reverse order.

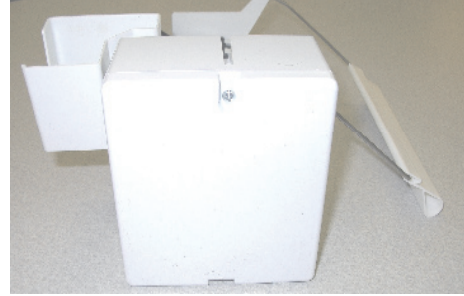


Figure F 4

To Replace Fill Trough (Figure F6)

1. Remove ice maker from Freezer.
2. Push trough retaining tab back against the mold.
3. Pull the trough up until it is clear of the mold.
4. Replace in reverse order.

To Replace Ice Stripper (Figure F5)

1. Remove ice maker from freezer.
2. Pull out on the stripper about 1 inch back from the front the ice maker till the retaining tab is away from the tab on the ice mold.
3. Pull back on ice stripper to disengage it from front of mold support housing.
4. Replace in reverse order.

To Replace Ejector Blades (Figure F5)

1. Remove ice maker from freezer.
2. Remove front cover.
3. Remove two screws holding mounting plate in place.
4. Carefully remove mounting plate, disengaging end of ice maker control arm and ejector blades from motor coupling, noting relative position of ice maker control arm spring.
5. Remove fill trough and bearing.
6. Turn blades to 12 O'clock position.
7. Slide ejector blades back and up to remove.
8. Replace in reverse order.
9. Lubricate bearing ends of ejector with silicone grease.

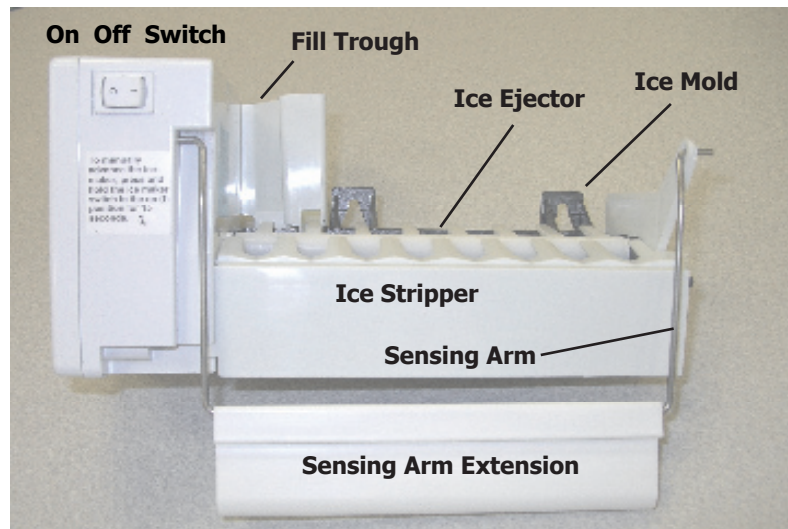


Figure F 5

Section 7 - Ice Maker

To Replace Motor and Switch Mounting Plate

1. Remove ice maker from freezer.
2. Remove front Cover.
3. Remove two screws that attach mounting plate to support housing.
4. Carefully remove mounting plate, disengaging end of sweep arm and noting relative position of sweep arm spring.
5. Transfer motor, switches, cam, gear, and water fill adjusting spring and arm to replacement mounting plate.
6. Attach new mounting plate to support housing with three screws.

NOTE

Ensure that the wiring harness is properly positioned and the sweep arm is in place.

7. Check water fill cycle and adjust as required.
8. Replace front cover.

To Replace Motor (Figure F2)

1. Remove ice maker from freezer.
2. Remove front cover.
3. Remove two screws that attach mounting plate to support housing.
4. Disconnect two motor leads.
5. Remove two motor mounting screws.
6. Replace motor in reverse order.

To Replace Water Fill Switch (Figure F2)

1. Remove ice maker from freezer.
2. Remove front Cover.
3. Remove two screws that attach mounting plate to support housing.
4. Disconnect two water fill switch wire leads.
5. Remove two switch mounting screws.
6. Remove switch.
7. Replace switch in reverse order, ensuring that switch insulator is in place.
8. Check water fill cycle and adjust as required.

To Replace Hold Switch (Figure F2)

1. Remove ice maker from freezer.
2. Remove front cover.
3. Remove two screws that attach mounting plate to support housing.

4. Disconnect six hold switch wire leads.
5. Remove two hold switch mounting screws.
6. Remove hold switch.
7. Replace in reverse order.

To Replace Ice Maker Control Arm Shut-OFF Switch

1. Remove ice maker from freezer.
2. Remove front Cover.
3. Remove two screws that attach mounting plate to support housing.
4. Disconnect three ice maker control arm shut-off switch wire leads.
5. Raise ice maker control arm lever.
6. Remove two ice maker control arm shut-off switch mounting screws.
7. Remove switch.
8. Replace switch in reverse order.

To Replace Ice Maker Thermostat (Figure F6)

1. Remove Ice Maker from Freezer.
2. Remove front Cover.
3. Remove two screws that attach mounting plate to support housing and remove plate.
4. Disconnect two thermostat wire leads and remove thermostat.
5. Remove two screws that attach mold to support Housing separate housing and ice mold.
6. Remove thermostat.
7. Apply thermal mastic sealer to sensing surface of replacement thermostat to ensure a positive bond to mold.
8. Replace thermostat in reverse order.

To Replace Thermal Cut-Out (TCO)

1. Remove Ice maker from freezer.
2. Remove front Cover.
3. Remove two screws that attach mounting plate to support housing.
4. Pull cable assembly free from support housing. It will slide out easily.
5. Loosen screw securing clamp to TCO. TCO should come free after tension from clamp is released.
6. Disconnect TCO from two wire nuts. One end is connect to the cable assembly and the other end is connected to the motor and mold heater.

Section 7 - Ice Maker

7. Replace with new TCO.
8. Reassemble in reverse order.

To Replace Ice Mold and Heater

1. Remove ice maker form freezer.
2. Remove front cover.
3. Remove ice stripper. (Refer to Section "To Replace Ice Stripper")
4. Remove two screws that attach mounting plate to support housing.
5. Remove two screws that attach mold to support Housing.
6. Disconnect the wire nut on the right holding three black leads together and separate them.

NOTE

One black lead is connected to the mold heater. Another is connected to the thermostat and the third lead goes to the hold switch.

7. Disconnect the wire nut on the left holding three black leads together and separate them.
8. Separate mold from support housing.
9. Remove hex head screw holding ice maker leveling bracket to mold.
10. Apply layer of thermal mastic sealer to the new ice mold in the location the thermostat mounts.
11. Replace parts in reverse order. Ensure that thermostat gasket is in place. Bond thermostat to mold with thermal mastic sealer.

NOTE

For best operation, the freezer temperature should be between -2°F to +4°F.

Fault Diagnosis

Complaint - Ice Maker Fails to Start

1. Check to see if ice maker control arm is locked in raised position.
2. Check terminals from cabinet wiring to ice maker for open circuit in wiring or components.
3. Check operation of the ice maker with test service cord.
4. Check mold temperature at a mounting screw. If temperature is above 15°F, freezer air temperature is not cold enough to switch ice maker thermostat to closed position. If mold is below 9°F, manually start ice maker by rotating timer gear. If motor fails to start, check motor for continuity. If motor starts, thermostat, shut-off switch, or hold switch is inoperative.
5. Check hold switch first. with ejector blades in the starting position, check terminals "C" and "NC" for continuity. Replace switch if continuity readings are open. check shut-off switch linkage. Then check terminals "NO" and "C" for continuity with ice maker control arm in lowest position. Replace switch if continuity readings are open. If hold switch and shut-off switch are operative, then replace thermostat.

Complaint-Ice Maker Fails to Complete Cycle.

1. With Ejector blades at 10 o'clock position, hold switch plunger depressed, check terminals "C" and "NO" for continuity. Replace switch if continuity readings are open.
2. With Ejector blades at 12 o'clock position, check shut-off switch terminals "C" and "NC" for continuity. Replace thermostat if continuity readings are open.
3. With ejector blades at 4 o'clock position, check mold heater and ice maker thermostat for continuity. Replace heater if continuity readings are open. If heater shows continuity, replace thermostat.
4. Check Motor operation with a test cord. Replace motor if it fails to start.

Section 7 - Ice Maker

Complaint-Ice Maker Fail to Stop at End of Cycle

With the ejector blades in the starting position, check the hold switch terminals "C" and "NO" for continuity. Replace the switch if the continuity readings are indicating a closed circuit.

Complaint-Ice Maker Continues to Eject When Container is Full.

1. Check for loose linkage to the Ice maker control arm shut-off switch. Switch should open when arm is in raised position. Adjust, if required.
2. Check shut-off switch terminals "C" and "NO" for continuity with Ice maker control arm raised. Replace switch if continuity readings are indicating a closed circuit.

Complaint-Ice Maker Produces Undersized Ice Pieces

1. Ensure that ice maker mold is level.
2. Check for partial restriction in supply line or water valve strainer.
3. Ensure that the water pressure to water valve is sufficient. (20 psi min., 120 psi max.)
4. Ensure that the water valve switch is adjusted for proper water fill, 78 to 83 cc's.
5. Check thermal bond between thermostat and mold. If necessary, rebond with thermal mastic sealer.

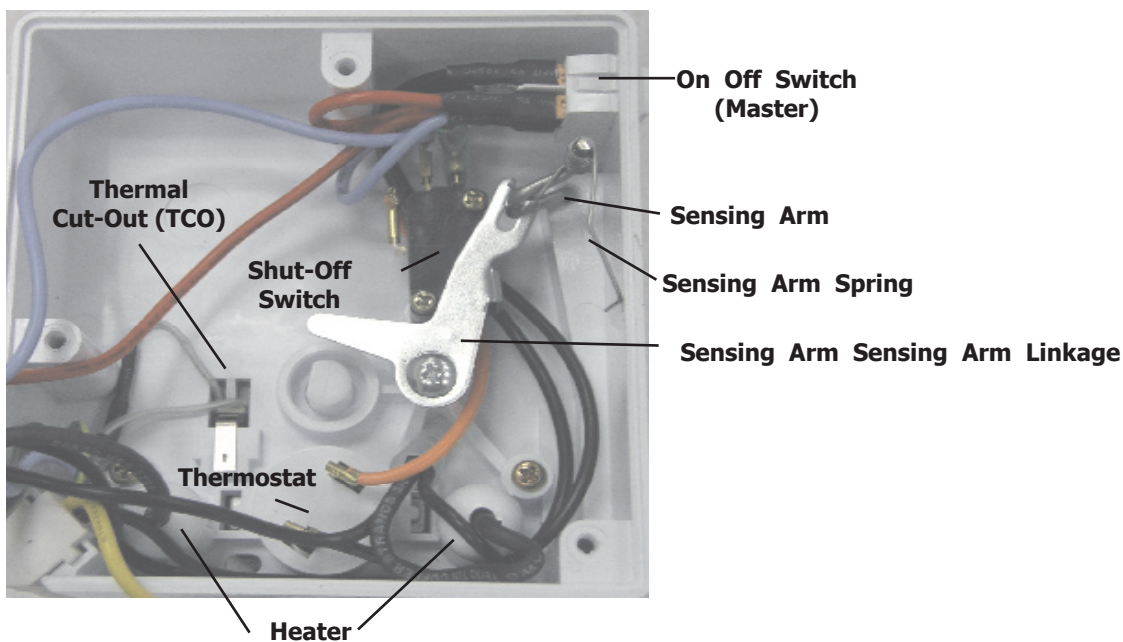


Figure F 6

Section 7 - Ice Maker

Ice Maker Testing Procedures

Operating Cycle

Operation of the ice Maker, water refilling, and controlled ice storage, require proper functioning and timing of all components.

Consider the following:

- Has refrigerator been properly installed and connected to sources of electrical power and water?
- Has freezer compartment evaporator pulled down to temperature?
- Is the ice maker turned on?
- Have several ice making cycles been completed to remove all the air form the water lines?
- Do the ejector blades make two revolutions per cycle? Is ice stored on blades after harvest?
- Is the water solenoid wired in series with the mold heater?

Operating Cycle Illustrations - Manual Cycle

To manually cycle ice maker:

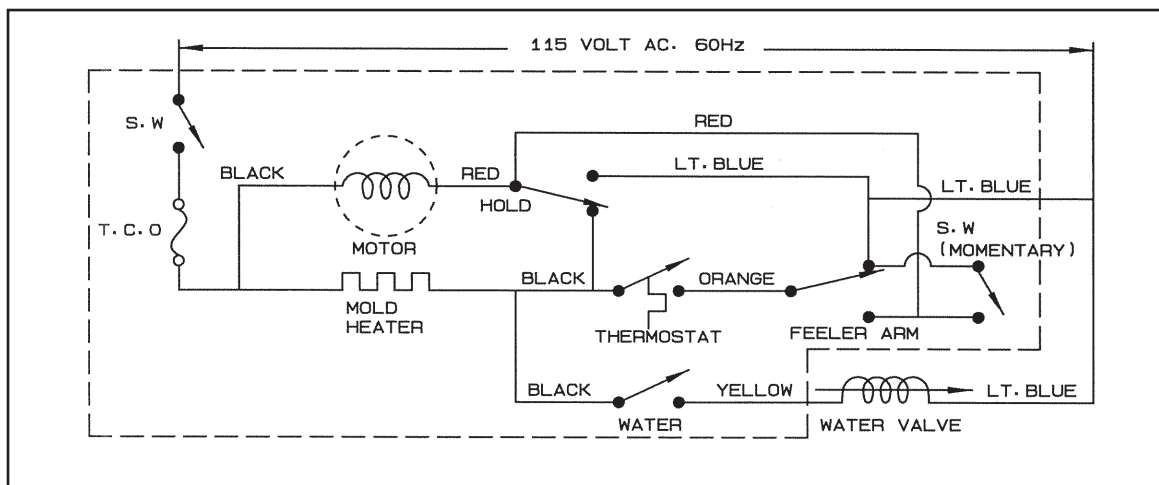
1. Turn the On Off switch to ON
2. Press in on switch holding the spring loaded contact set closed, this will allow the motor to start.
3. Hold in on the switch for 10 seconds to allow hold switch contacts to close allowing the ice maker to continue through a cycle.

Operating Cycle Illustrations - Electrical

The following wiring diagrams illustrate the electrical operation of a rear mount ice maker.

1

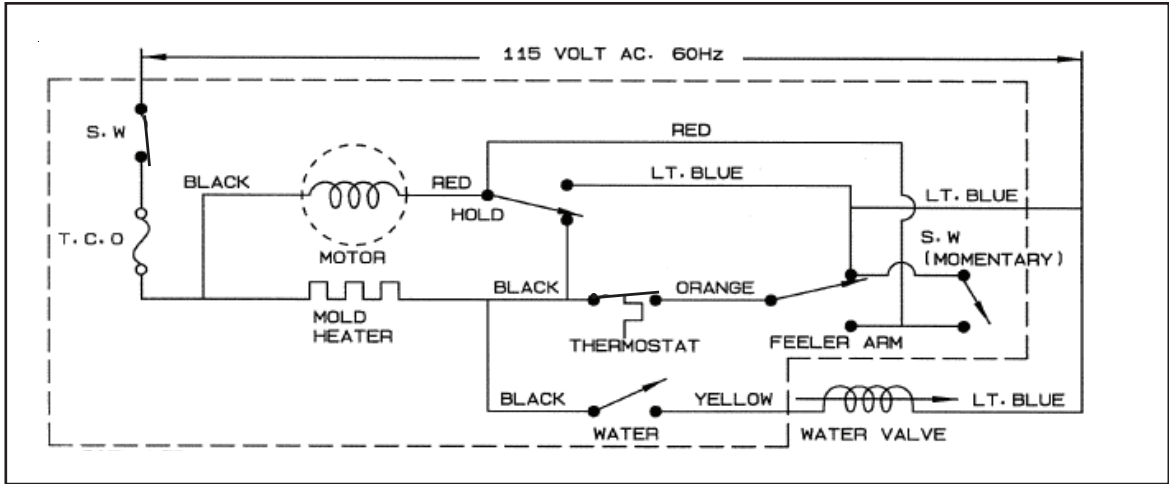
- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat open.
- Motor not rotating.
- Mold Heater off.
- Control Arm in the down position.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NC.
- Water Fill Switch open.



Section 7 - Ice Maker

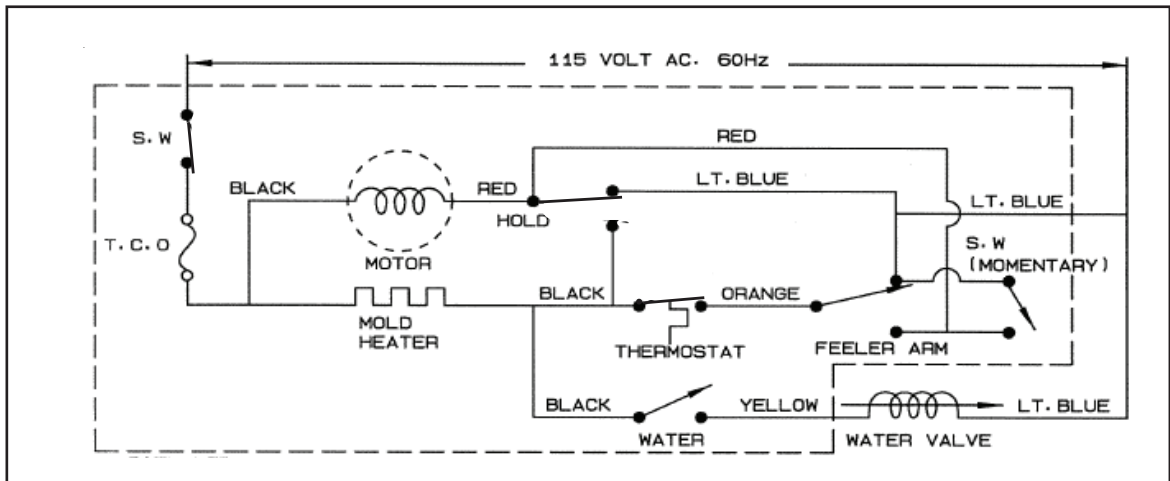
2

- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat closes.
- Motor starting.
- Mold starting to heat.
- Control Arm in the down position.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NC.
- Water Fill Switch open.



3

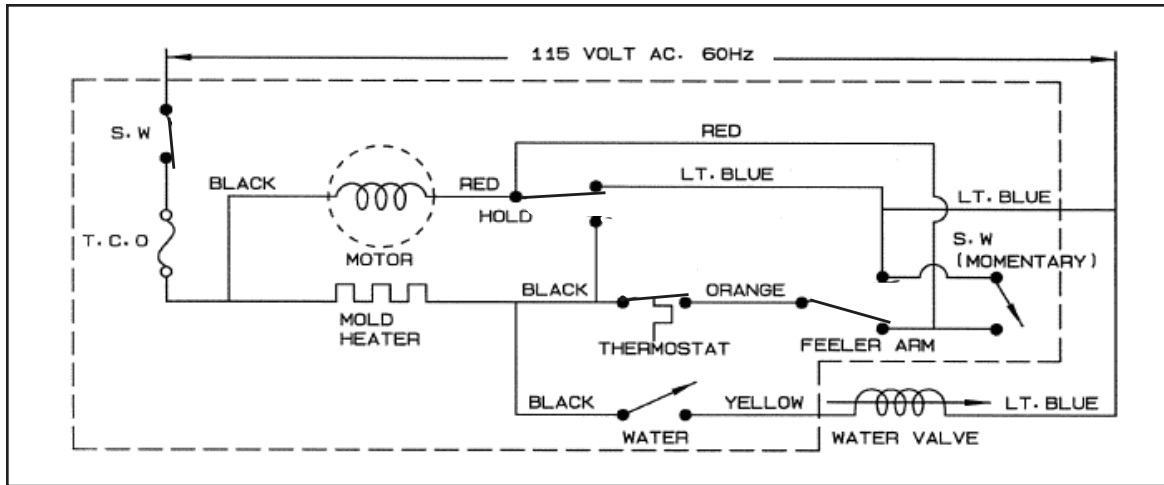
- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat closed.
- Motor starting to rotate.
- Mold starting to heat.
- Control Arm in the down position.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NC.
- Water Fill Switch open.



Section 7 - Ice Maker

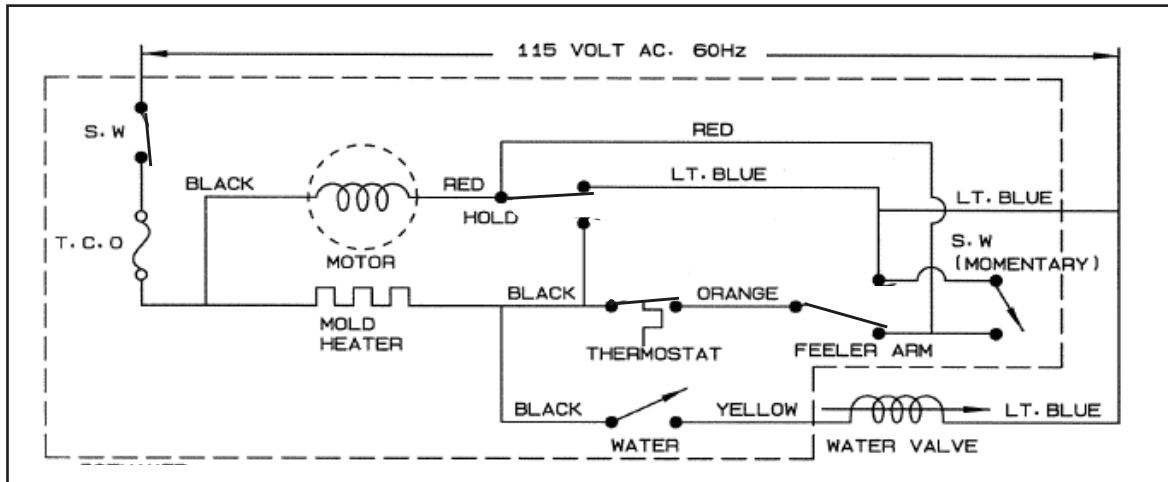
4

- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat closed.
- Motor rotating.
- Mold heating.
- Control Arm swinging up.
- Feeler Arm Switch closed C to NC.
- Hold Switch closed C to NO.
- Water Fill Switch open.



5

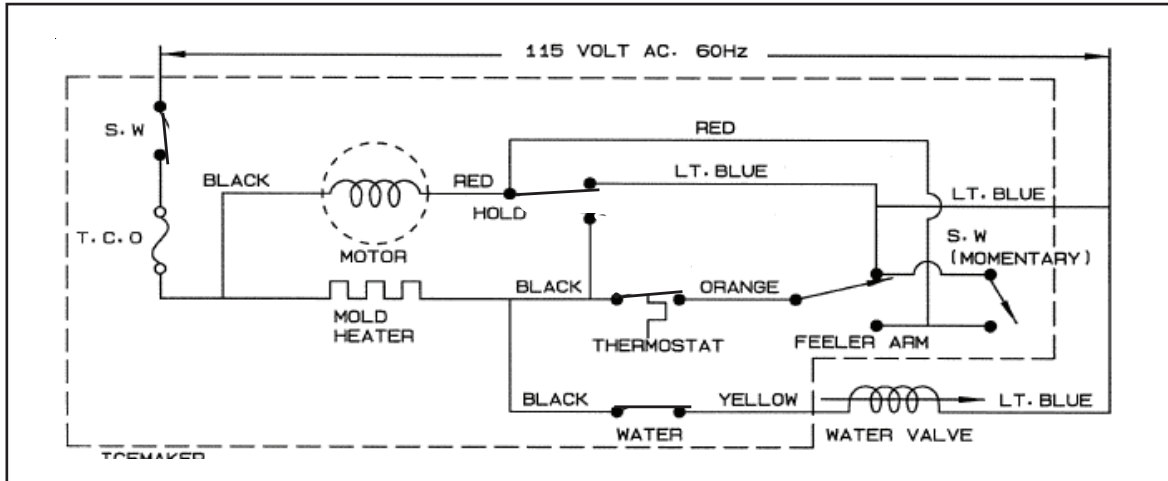
- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat closed.
- Motor stalls as ejector hits ice in mold.
- Mold heating.
- Control Arm swinging down.
- Feeler Arm Switch closed C to NC.
- Hold Switch closed C to NO.
- Water Fill Switch open.



Section 7 - Ice Maker

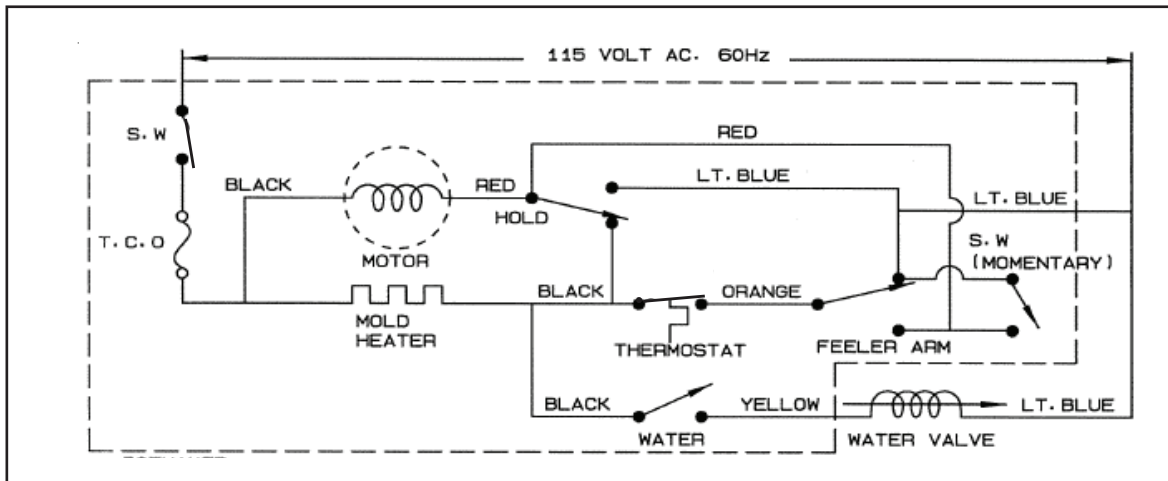
6

- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat closed.
- Motor starts to rotate as ice breaks loose.
- Mold heating.
- Control Arm is down.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NO.
- Water Fill Switch closed but shorted open by thermostat.



7

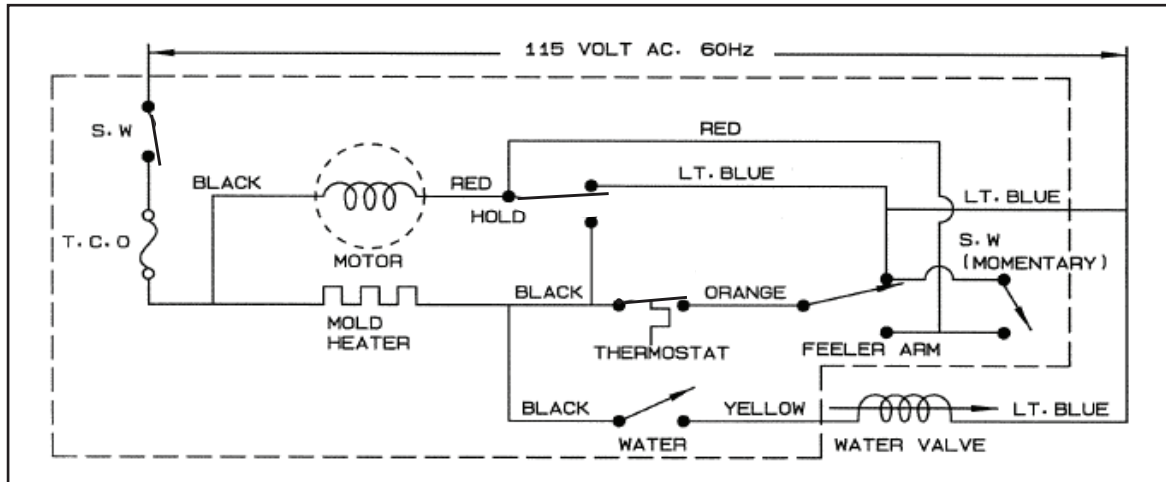
- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat closed.
- Motor is rotating.
- Mold heating.
- Control Arm is down.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NC.
- Water Fill Switch open.



Section 7 - Ice Maker

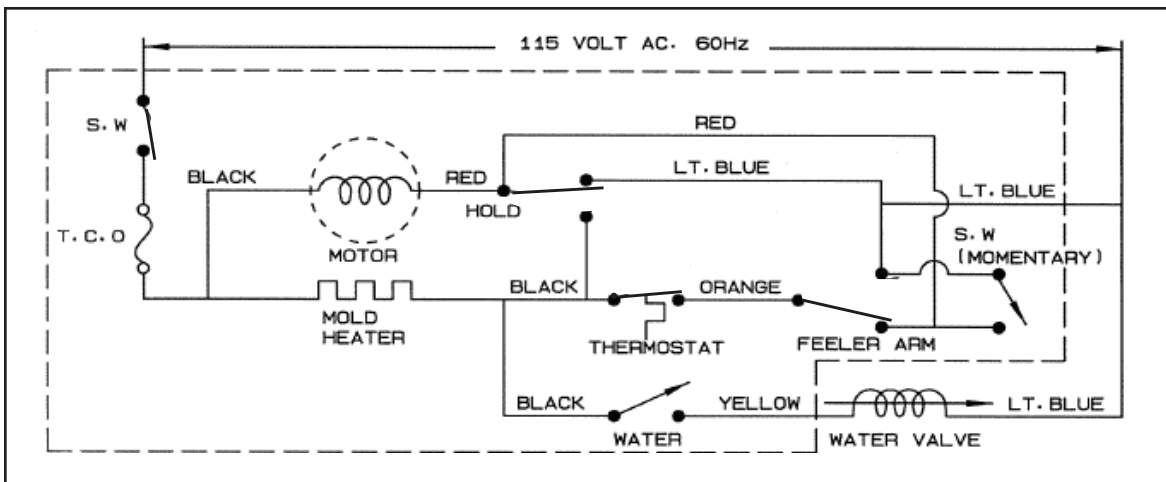
8

- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat closed.
- Motor is rotating.
- Mold heating.
- Control Arm swinging up.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NO.
- Water Fill Switch open.



9

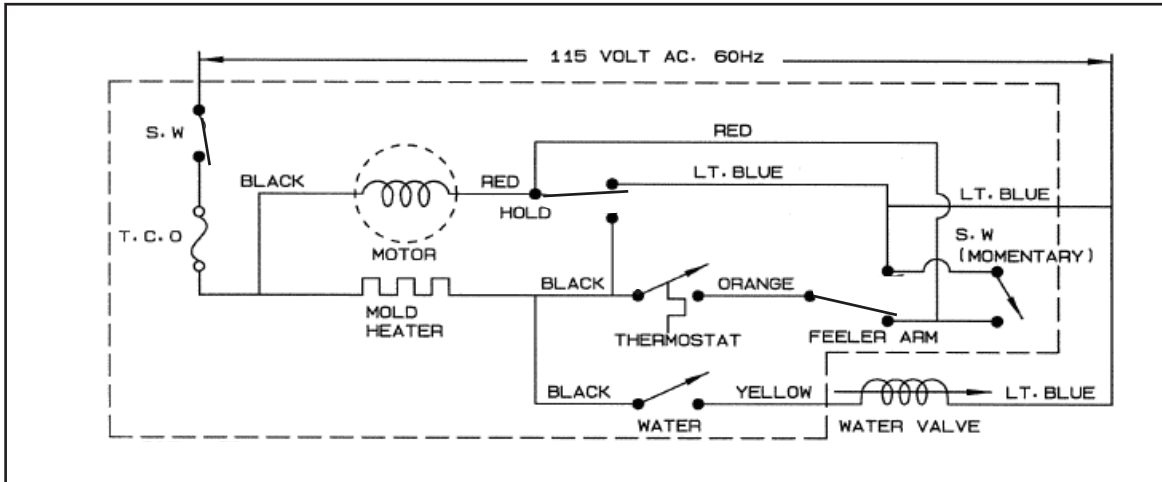
- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat closed.
- Motor is rotating.
- Mold heating.
- Control Arm swinging up.
- Feeler Arm Switch closed C to NC.
- Hold Switch closed C to NO.
- Water Fill Switch open.



Section 7 - Ice Maker

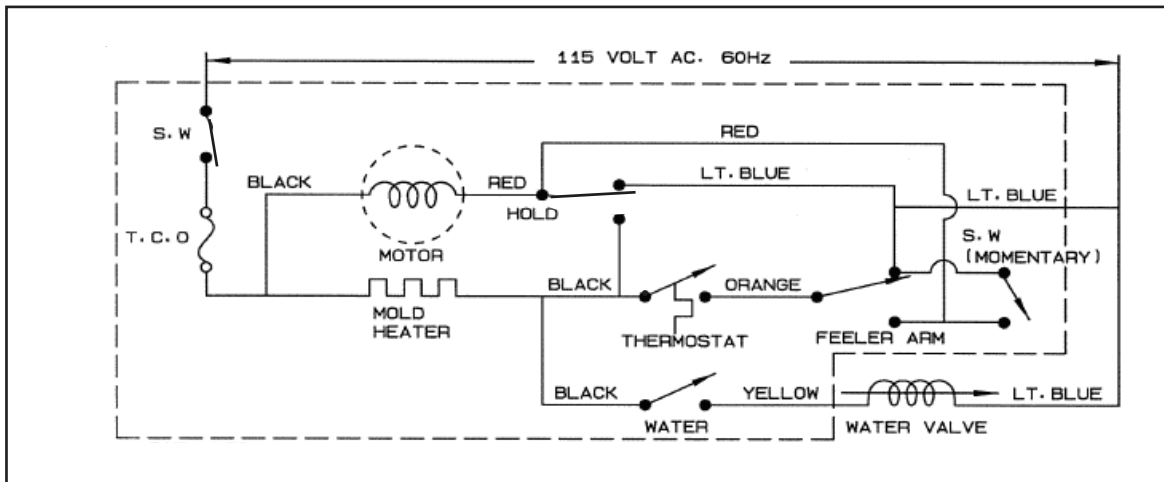
10

- Ice Maker connected to electricity.
- Mold temperature above 40°F.
- Thermostat opens.
- Motor is rotating.
- Mold heater off.
- Control Arm swinging up.
- Feeler Arm Switch closed C to NC.
- Hold Switch closed C to NO.
- Water Fill Switch open.



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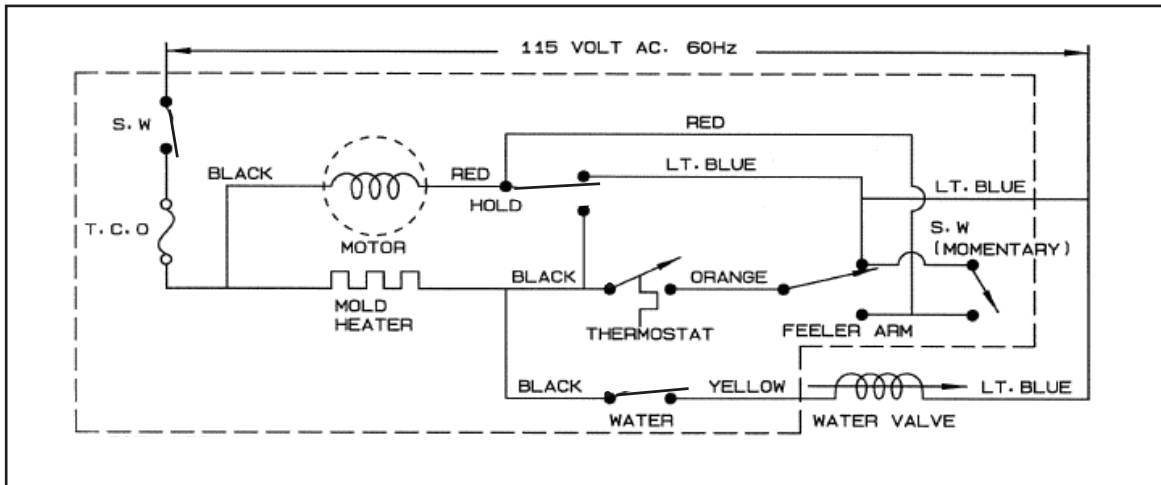
- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat open.
- Motor is rotating.
- Mold heater off.
- Control Arm swinging down.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NO.
- Water Fill Switch open.



Section 7 - Ice Maker

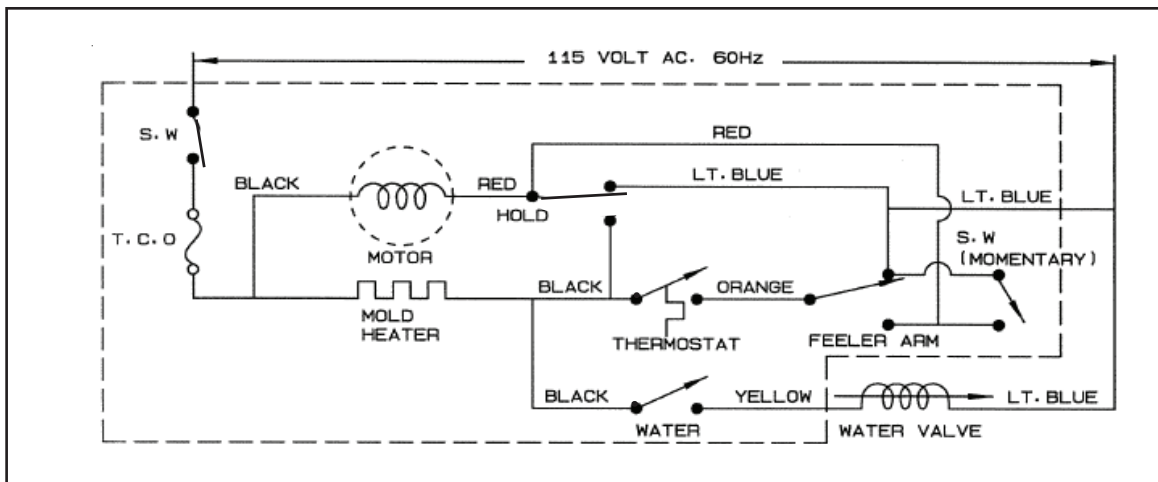
12

- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat open.
- Motor is rotating.
- Mold heater is in series with water valve.
- Control Arm swinging down.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NO.
- Water Fill Switch closed.



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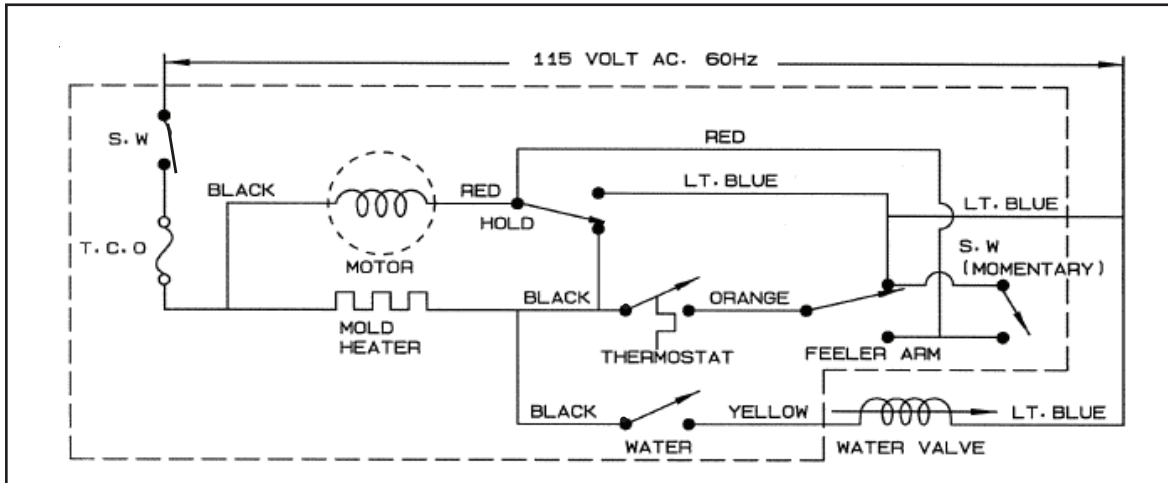
- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat open.
- Motor is rotating.
- Mold heater off.
- Control Arm swinging down.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NO.
- Water Fill Switch open.



Section 7 - Ice Maker

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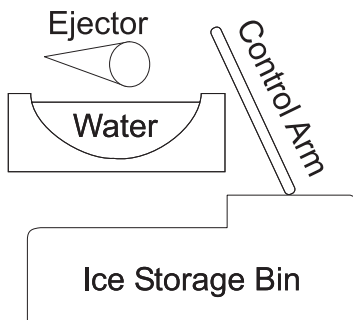
- Ice Maker connected to electricity.
- Mold temperature above 9°F.
- Thermostat open.
- Motor not rotating.
- Mold heater off.
- Control Arm down.
- Feeler Arm Switch closed C to NO.
- Hold Switch closed C to NC.
- Water Fill Switch open.



Operating Cycle Illustrations - Mechanical

The following figures illustrate the mechanical operation of an ice maker.

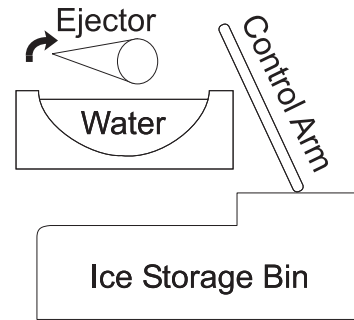
Step 1



Freezer Cycle

1. Mold is filled with water.
2. Thermostat is open.
3. All components are de-energized.

Step 2

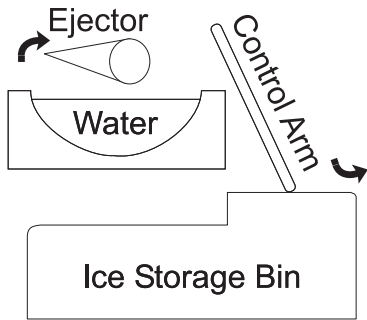


Start of Harvest Cycle

1. Thermostat closes.
2. Mold heater & Motor is energized.
3. Ejector begins to turn.

Section 7 - Ice Maker

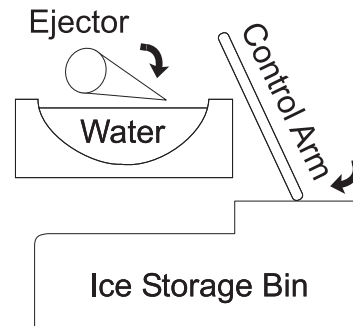
Step 3



Harvest Cycle

1. Holding Switch in normally open position.
2. Heater remains energized.
3. Control Arm is rising.

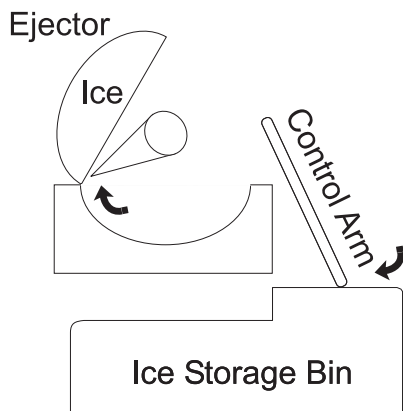
Step 4



Harvest Cycle

1. Ejector reaches ice.
2. Motor stalls until ice loosens.
3. Heater remains energized.

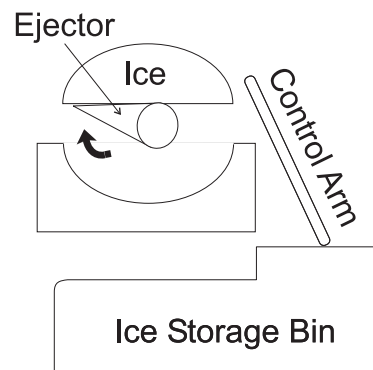
Step 5



Harvest Cycle

1. Completing 1st revolution of Ejector .
2. Water Fill Switch closes, but heater remains on, preventing water fill.

Step 6

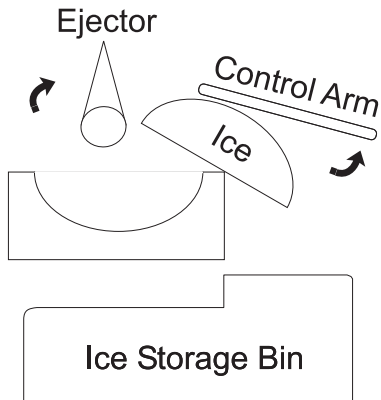


Harvest Cycle

1. End of 1st revolution.
2. Hold Switch opens.
3. Since Thermostat is still closed, 2nd revolution of Ejector begins.

Section 7 - Ice Maker

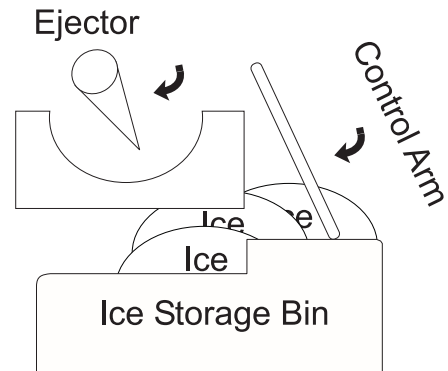
Step 7



Harvest Cycle

1. Hold Switch closes.
2. Motor energizes.
3. Mold Heater remains energized.
4. Control Arm raises and lowers.
5. Ice dumps into bin.

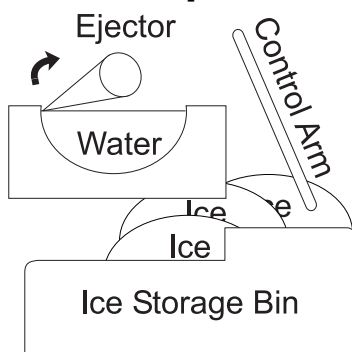
Step 8



End of Harvest Cycle

1. During end of 2nd revolution, Mold Heater resets Thermostat.
2. Mold Heater de-energized.
3. If container is full, Control Arm opens Shut Off Switch.

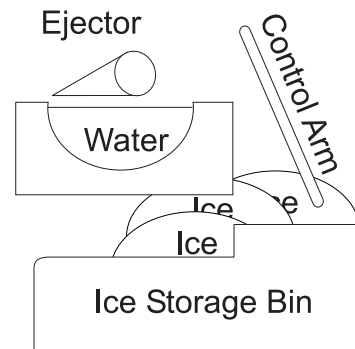
Step 9



Fill Cycle

1. Near completion of 2nd revolution of Ejector, Water Fill Switch closes and water fills mold.

Step 10

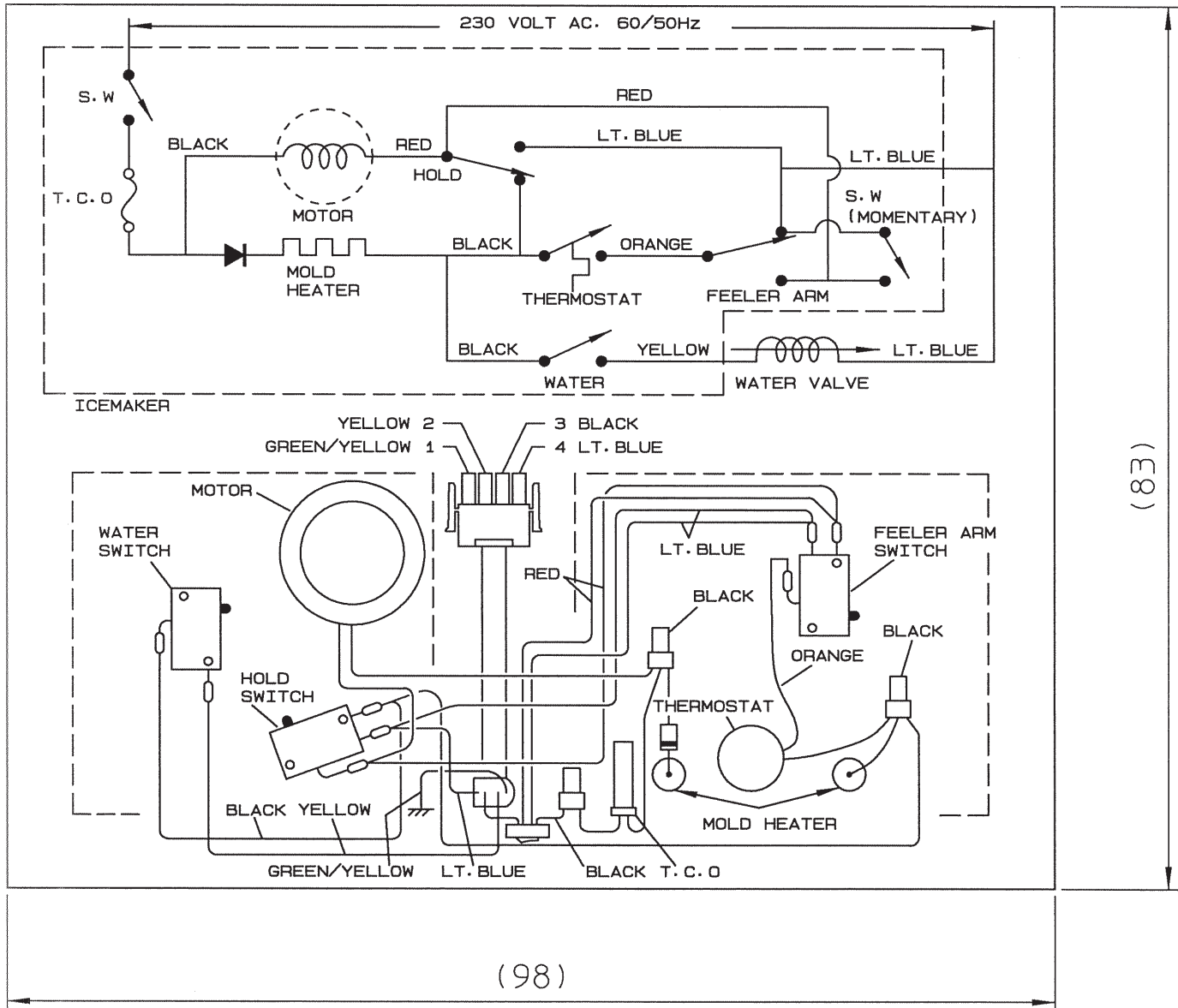


End of Fill Cycle

1. Hold Switch goes to normally closed position.
2. Water Fill Switch opens.
3. Freeze Cycle begins.

Section 7 - Ice Maker

Ice Maker Wiring Diagram (Enlarged View)



Section 8 - Ice and Water Dispenser

Ice Dispenser Container & Rail Assembly

The Ice Dispenser Container slides into the Rail Assembly mounted directly below the Ice Maker. Ice is ejected from the container by an Ice Auger connected to the Solenoid Assembly, and dispensed at the bottom front of the container where it enters through a Gate on the Crusher Housing. The Gate is opened and closed by a Control Rod that fits in the Actuator of the Solenoid Assembly. The ice is then directed into an ice chute mounted on the interior of the freezer door. The Ice Container must be properly placed on the rail assembly to assure proper dispensing. The container should be slid on top of the rails on the Rail Assembly up against the Motor Cover, with the Rotation Stop and Ice Auger protruding through the holes in the back of the Ice Container.

Dispenser Auger Motor and Solenoid Assembly (Solenoid Assembly not on all models)

The dispenser Auger Motor, Solenoid Assembly, Light Socket and Bulb (40 Watt appliance bulb), and wiring disconnects are mounted on the back on the Rail Assembly Motor Cover. The motor and solenoid mounting screws are located on the front of the Motor Cover.

To Remove Auger Motor:

1. Disconnect refrigerator from electrical supply.
2. Slide Ice Container forward and off of Rail Assembly. Remove 2 screws holding Rail Assembly to Evaporator Cover.
3. Lift up on Rail Assembly and pull forward, freeing it from mounting brackets.
4. Disconnect Molex connector located at back of Rail Assembly and pull Rail Assembly free.
5. Remove screw securing green ground wire to motor housing on back of Motor Cover. (See Figure G1)
6. Disconnect two (2) leads hooked to Auger Motor windings (Leads are purple and white - See Figure G1).
7. Rotate Drive Bar and Nut (located on front of Motor Cover) in counterclockwise position until it comes free of Auger Motor shaft. (See Figure G2)
8. Remove four (4) motor mounting screws and pull Auger Motor free from Motor Cover.
9. Replace assembly in reverse order.

To Test Auger Motor:

1. Read ohmic value of motor windings using Multimeter on resistance scale. (Put test leads on terminals where purple and white wires were disconnected from Step 6 of procedure "To Remove Auger Motor").
2. Resistance reading should be low ohms. If you get anything else, replace motor.

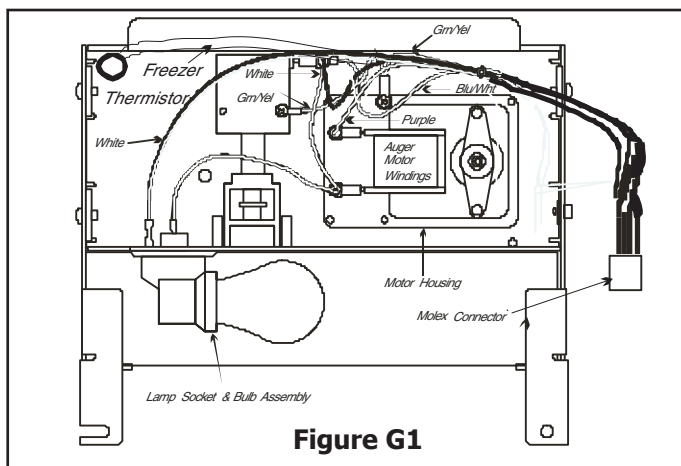


Figure G1

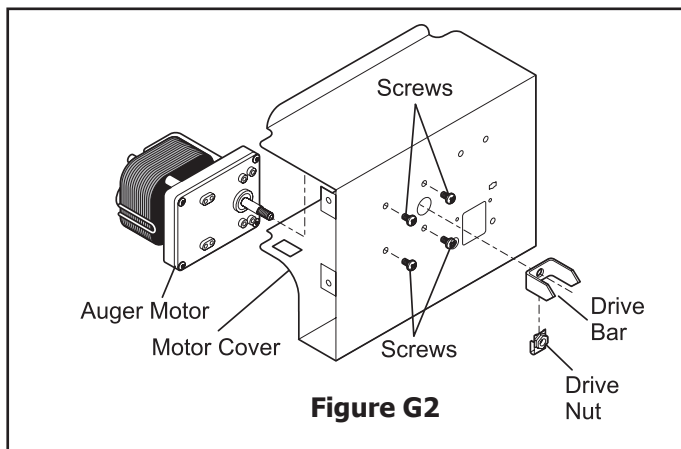


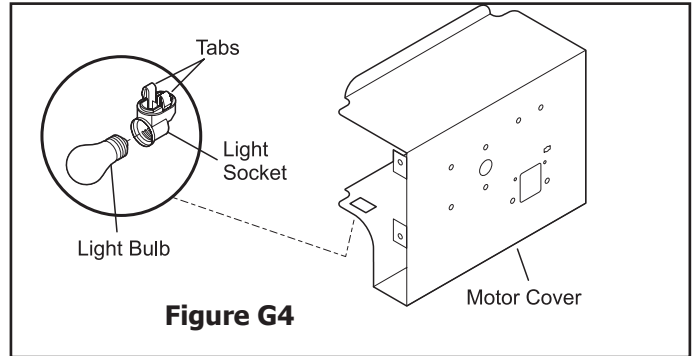
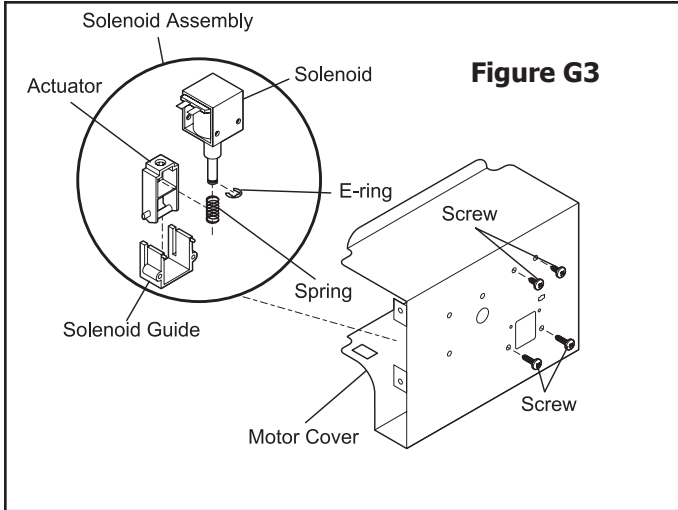
Figure G2

To Remove Solenoid Assembly:

1. Disconnect refrigerator from electrical supply.
2. Slide Ice Container forward and off Rail Assembly.
3. Lift up on Rail Assembly and pull forward, freeing it from mounting brackets.
4. Disconnect Molex connector located at back of Rail Assembly and pull Rail Assembly free.
5. Remove screw securing green ground wire to Solenoid Assembly on the back of Motor Cover. (See Figure G1)
6. Disconnect two (2) leads hooked to solenoid coil (Leads are blue with a white stripe and white - See Figure G1).

Section 8 - Ice and Water Dispenser

7. Remove four (4) mounting screws on front of Motor Cover and pull Solenoid Assembly free. (See Figure G3)
8. Replace assembly in reverse order.



Ice Auger & Crusher Assembly

To remove Ice Auger & Crusher Assembly:

1. Remove four (4) screws holding Ice Container Front to Ice Container.
2. Remove two (2) screws on underside of Ice Container, holding Crusher Housing to container.
3. Remove screw holding Control Rod to container, located on underside of container.
4. Remove three (3) Hex head screws holding Crusher Housing to Front Plate. (See Figure G5)
5. Remove E-ring and washer on front of Crusher Housing. (See Figure G5)
6. Slide Control Rod free of Crusher Housing Gate.

To replace Crusher Blades:

CAUTION

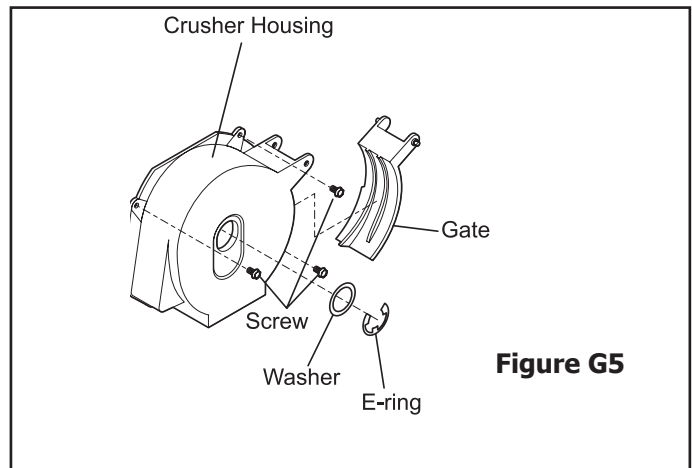
The Crusher Blades are very sharp. Use protective gloves when handling Crusher Blades.

To Test Solenoid Assembly:

1. Read ohms value of solenoid coil using Multimeter on resistance scale. (Put test leads on terminals where blue with white stripe and white wires were disconnected from Step 6 of procedure "To Remove Solenoid Assembly").
2. If resistance reading is extremely high or low, replace solenoid coil.

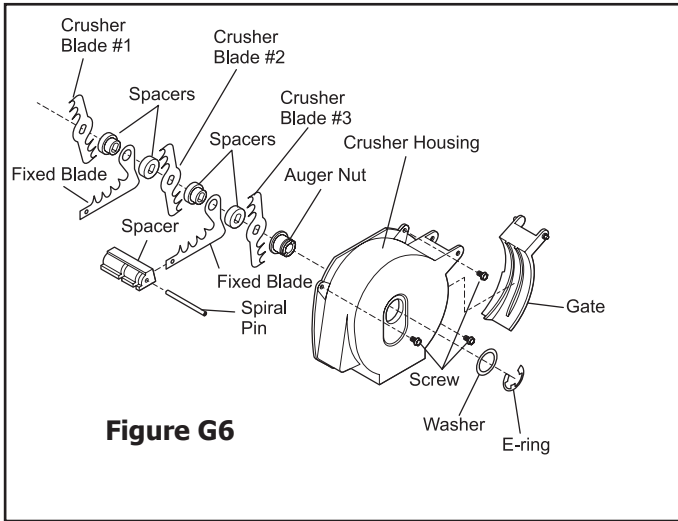
To Remove Lamp Socket and Light Bulb:

1. Disconnect refrigerator from electrical supply.
2. Slide Ice Container forward and off of Rail Assembly. Remove two (2) screws mounting the rail assembly to the Evaporator Cover.
3. Lift up on Rail Assembly and pull forward, freeing it from mounting brackets.
4. Disconnect Molex connector located at back of Rail Assembly and pull Rail Assembly free.
5. Disconnect yellow and white wires connected to lamp socket located behind Motor Cover.
6. Press in on two tabs on bottom of lamp socket base and push through mounting hole. (See Figure G4)
7. Replace lamp socket in reverse order.

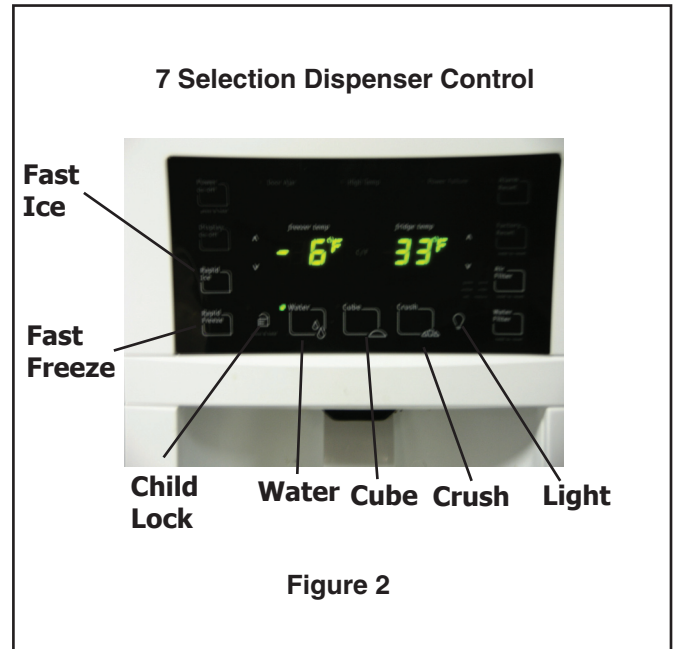


Section 8 - Ice and Water Dispenser

1. Remove Auger Nut to gain access to Crusher Blades. Each blade is separated by Spacer. (See Figure G6)
2. Remove Crusher Blades and Spacers until you get to one that needs replacement.
3. Replace assembly in reverse order.



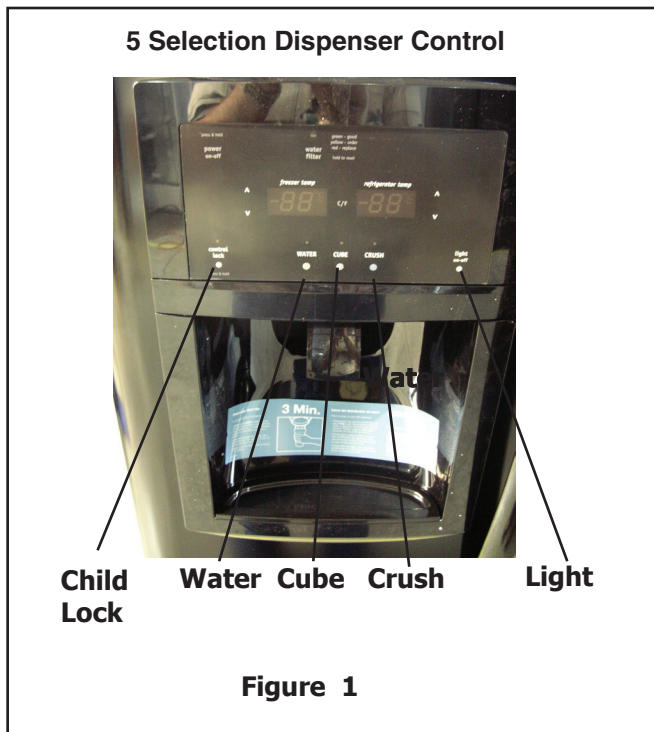
The feature layout used for the ice and water side by sides will be Five or Seven Selector Dispenser.



Ice and Water Dispenser Assembly

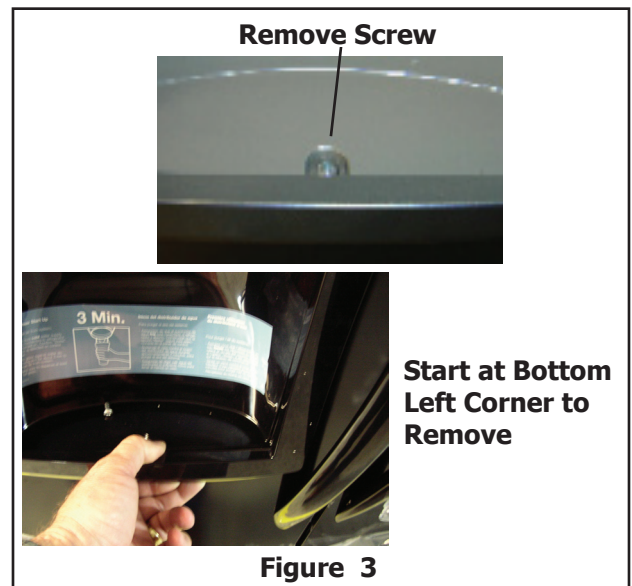
Feature Levels

The ice and water dispenser has one actuators for both water and ice.

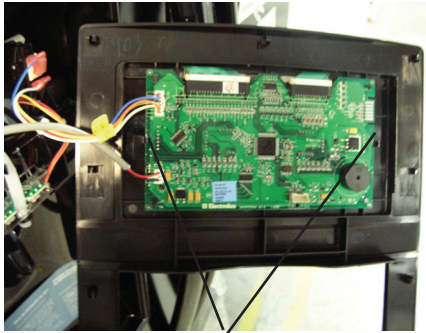


Gaining Access

To service the User Interface board you must remove the Front frame. Start by removing the screw located at the bottom center of the frame under the drip tray. (See Figure 3) Starting at the bottom right corner pull straight out on the frame and work your way across the bottom up the sides and across the top to remove the frame.



Section 8 - Ice and Water Dispenser



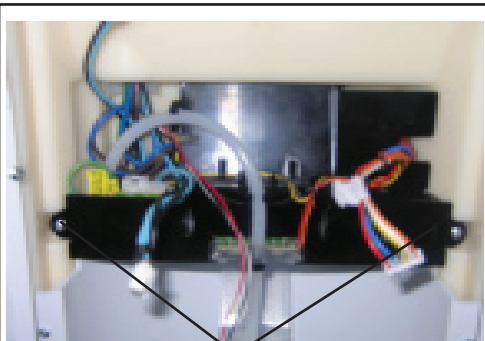
The UI Board is Held in place by two tabs one on each side. Push out on tabs and lift board off the pins.
Figure 4

With the frame removed you can turn it around and remove the molex plugs from the user interface board. The UI board can now be removed from the frame.



Disconnect Plugs
Figure 5

With the control removed you can now remove the two screws holding the dispenser in the housing. (See Figure 6)

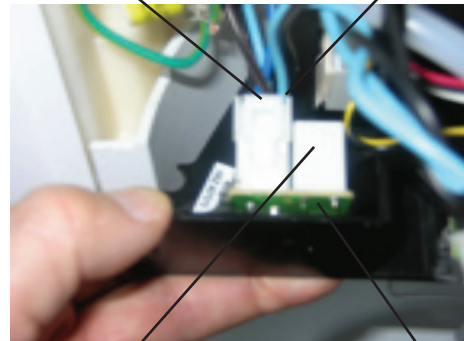


Remove screws
Figure 6

DISPENSER OPERATION

The dispenser has a user interface section in the control in the door. The auger motor, water valve and cube ice are all controlled on the lower control board. There are two connections on the back of the control one is a 115 V AC connection to supply power to operate the door opening solenoid. The other is a 12 VDC connection from the lower control board to operated the relay that controls the door solenoid. (See Figure 7)

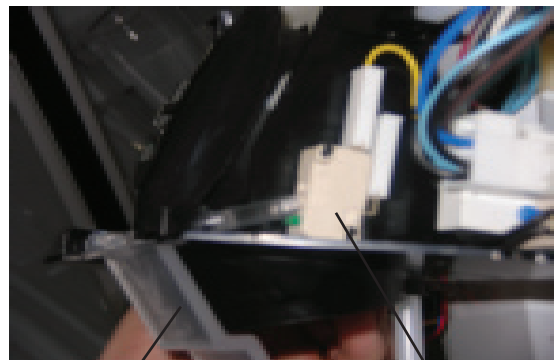
115 VAC Black & Blue 12 VDC Brown & Blue



Relay to Control Door Solenoid Control Board for Relay

Figure 7

When the actuator is pressed a low voltage signal (12VDC) is sent to the user interface on the upper control by way of the actuator switch located on the housing just behind the door solenoid relay. (See Figure 8) The upper board will send a communication to the lower board based on the customers selection of Water, cube ice or crushed ice. If water is selected the communication will open a tri-ack on the lower board for the water valve. If ice is selected it will do the same thing for the auger motor and /or cube ice solenoid.

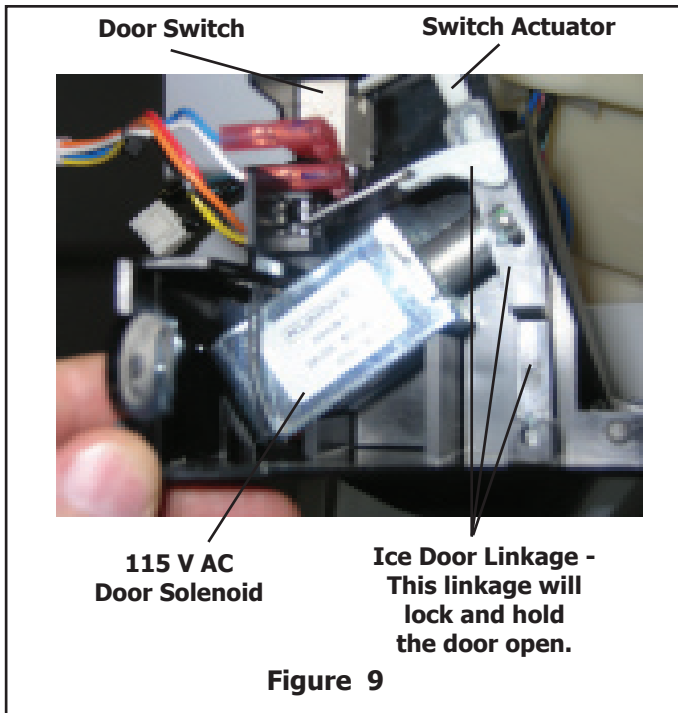


Actuator Actuator Switch
Figure 8

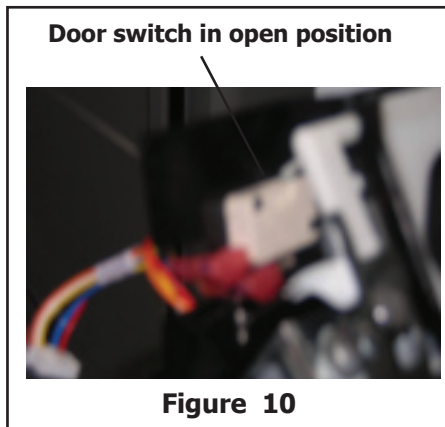
Section 8 - Ice and Water Dispenser

The lower control board will also send a 12 VDC signal to the relay board and the coil of the relay which will pull the contact set closed. This will send the 115 V AC to the solenoid for 30 mill -a-seconds to open the ice door.

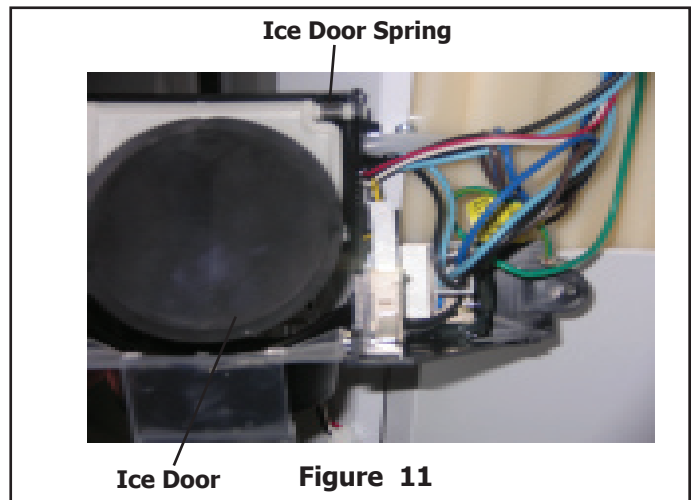
This will open the contact on the ice door switch and allow the ice door linkage to lock holding the door open door open after the 30 milliseconds has passed and the relay opens opening the 115 VAC signal to the door solenoid. (See Figure 9)



With the switch actuator lifted up and the switch open this tell the lower control board the ice door is open. (See Figure 10)

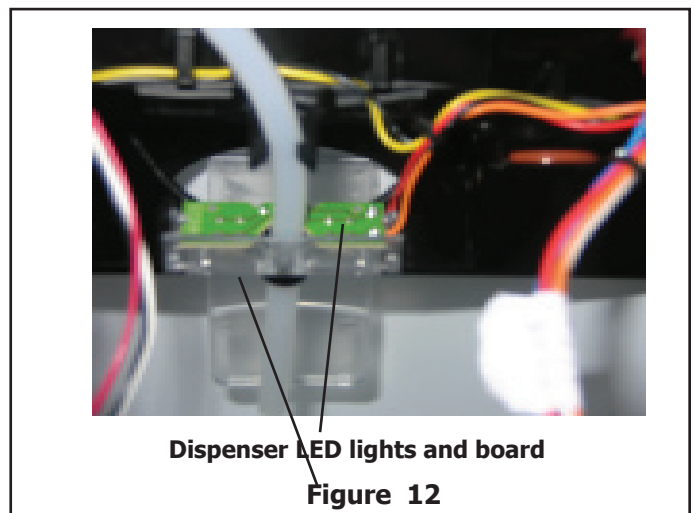


When the glass is pulled away from the actuator the Actuator switch will open the signal to the lower control board. The lower control board will send a 12 VDC signal to the relay board for 10 mill-a-seconds to unlock the door linkage allowing the ice door spring to close the ice door. (See Figure 11) This will close the contacts on the ice door switch telling the lower control board the door is closed. If the switch contacts do not close the lower control board will send a 12 VDC signal to the relay board for 10 mill-a-seconds again to unlock the door linkage allowing the ice door spring to close the ice door. The lower control board will continue to do this until the ice door is closed.



DISPENSER LIGHT

The dispenser lights are located on a light board at the outlet of the water line. (See Figure 12)



Section 8 - Ice and Water Dispenser

The lights will turn on when the actuator is pushed in or by touching the light pad on the control board in the freezer door. To replace the light assembly snap the clear plastic housing containing the lights and board out of the dispenser housing. The new light assembly will come with the wiring harness attached this will include the wires to the two switches also because they are all connected to one small connector.

Replacement of the ice door switches and solenoid will require that the dispenser be removed for the freezer door.

To replace the ice door and or door spring:

1. Open the door and spread the linkage from the solenoid apart at the top.
2. Slide the door tab out.
3. Unsnap the door shaft from the housing and remove the door and spring.

To replace the solenoid:

1. Open the door and spread the linkage from the solenoid apart at the top.
2. Slide the door tab out.
3. Unsnap the bottom of the linkage from the housing.
4. Disconnect the door latch spring
5. Pull the solenoid out of the housing

To replace the switches:

1. Disconnect the wires.
2. Push in on tab at top of the retainer post.
3. Slide the switch off the retainer post.

Section 8 - Ice and Water Dispenser

Testing the Dispenser

General Information

1. During normal operation, certain components can fail independently with no cascading effect to other ice and water related components. These components are listed below:
 - a. Water Valve
 - b. Auger Motor
 - c. Cube/crush Solenoid
2. During normal operation, other components fail with a cascading effect. These components are listed below with the related disabled components:
 - a. Freezer Door Switch – disables Auger Motor, Cube/crush solenoid, Flapper solenoid
 - b. Paddle Micro-switch – disables Water Valve, Auger Motor, Cube/crush solenoid, Flapper solenoid, automatic led illumination
 - c. Flapper Solenoid – disables Auger Motor, Cube/crush solenoid
 - d. Flapper Micro-switch – disables Auger Motor, Cube/crush solenoid
3. During normal operation, the dispenser pocket will be lit by a pair of LED's on the ice and water module. The LED's can be set to be on 100% of the time thru the UI or on when the paddle is pressed for ice or water. Verify that the LED's function properly prior to entering service mode below.
4. Definitions:
 - a. ERF2500++ – main board located under the refrigerator behind the lower front panel
 - b. UI – User interface above the dispenser pocket
 - c. Ice and Water module – single paddle sub-assembly located behind the UI.

Service Mode

5. Enter service mode by pressing and holding Freezer Down "-" and Freezer Up "+" keys simultaneously
6. If service mode cannot be accessed, go to Section 1 of the troubleshooting flowchart.
7. Press Fresh Food "+" to advance thru the menu options; press "ON/OFF" to actuate function

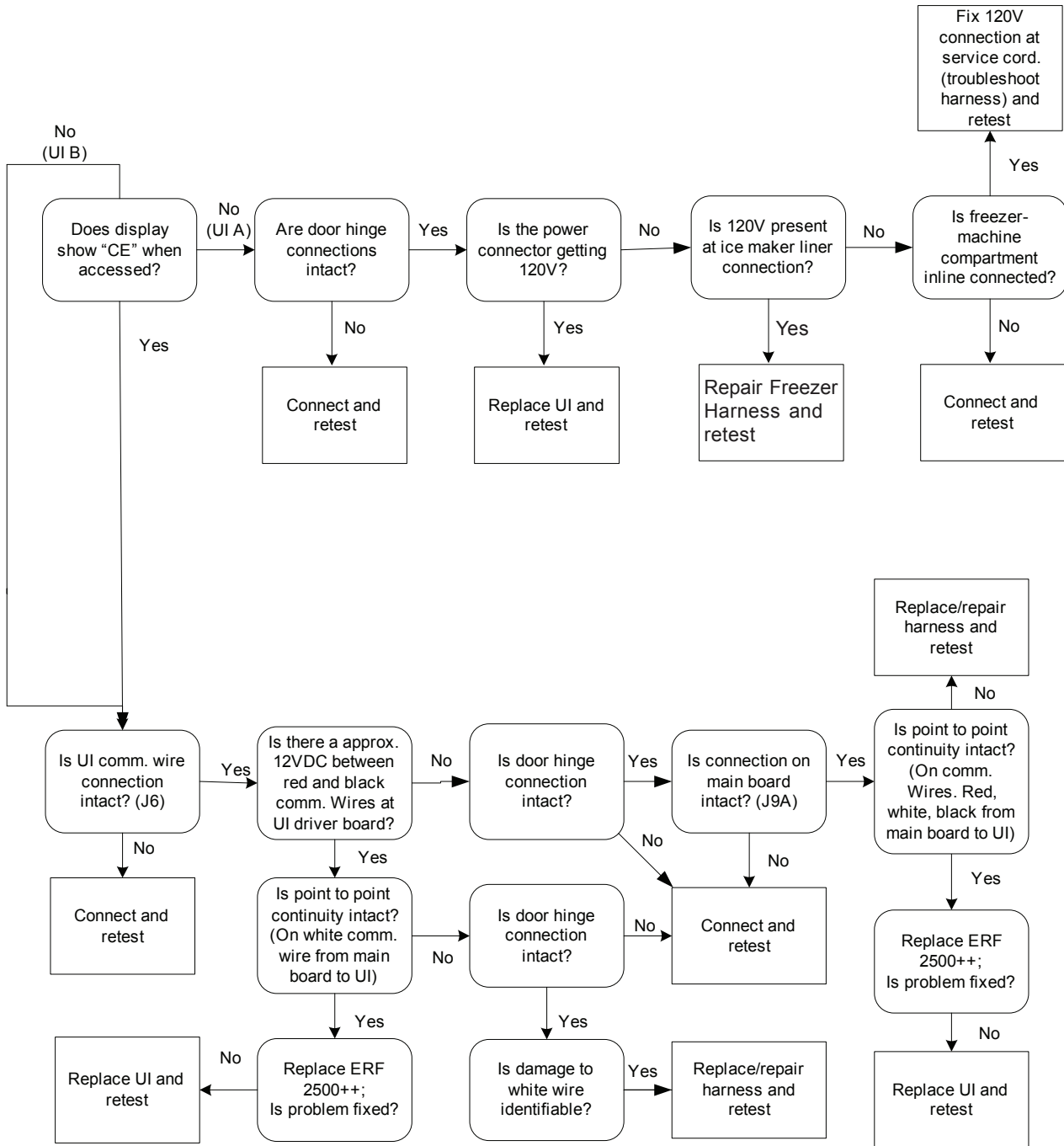
8. Perform the following tests;

Test		Passing Result
8	Water Valve	Valve actuates.
10	Auger Motor	Auger runs with freezer door closed.
10a	Auger Motor Switch Closed	Auger stops when freezer door switch is held closed and auger motor switch is allowed to open.
11	Cube/Crush Solenoid	Solenoid pulls in (requires ice bucket to release).
24	Freezer Door Switch	Displays "OP" for open and "CL" for closed.
28	Paddle Microswitch	Displays "ON" when pressed and "OFF" when released.
36a	Flapper microswitch	Displays "OP" when flapper is opened manually.
36b	Flapper solenoid and microswitch	Flapper actuates, latches and displays "OP".

9. Follow the direction given below for individual failures:
 - a. Fail Test 8 only, go to Section 2.
 - b. Fail Test 10 only, go to Section 3.
 - c. Fail Test 11 only, go to Section 4.
 - d. Fail Test 24 only, go to Section 5.
 - e. Fail Test 28 only, go to Section 6.
 - f. Fail Test 36a only, go to Section 7.
 - g. Fail Test 36b only, go to Section 8.
 - h. Fail led function only, go to Section 9.
10. Follow the direction given below for multiple failures:
 - a. Fail Tests 8, 10 and 11, go to Section 10.
 - b. Fail Tests 10, 11 and 24, go to Section 11.
 - c. Fail Tests 28, 36a and led function, go to Section 12.

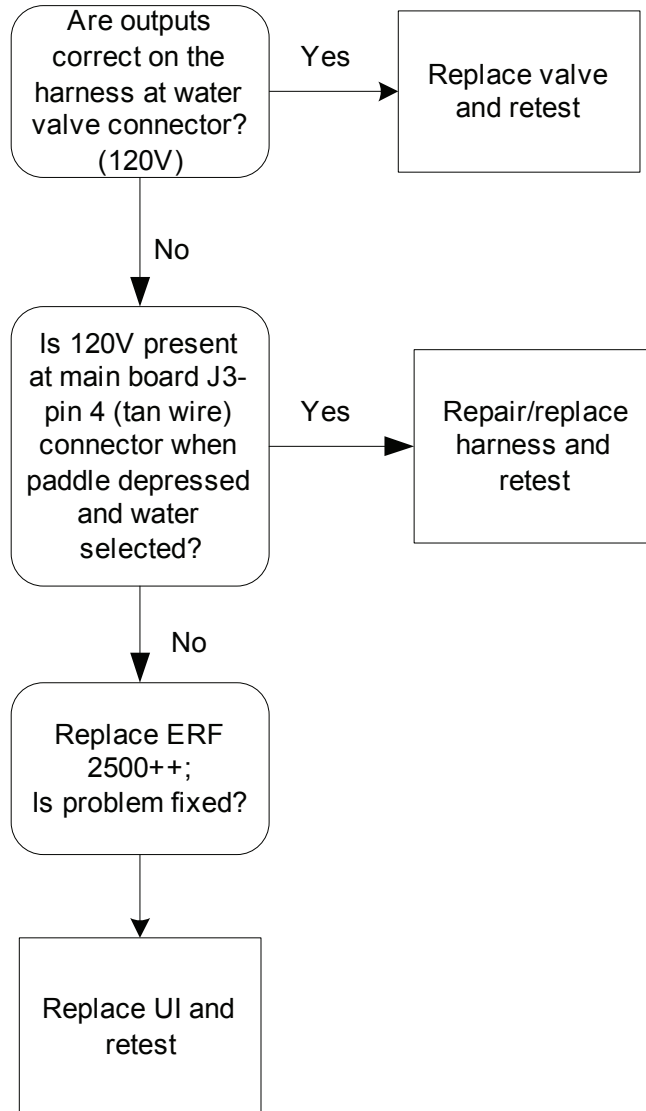
Section 8 - Ice and Water Dispenser

Section 1



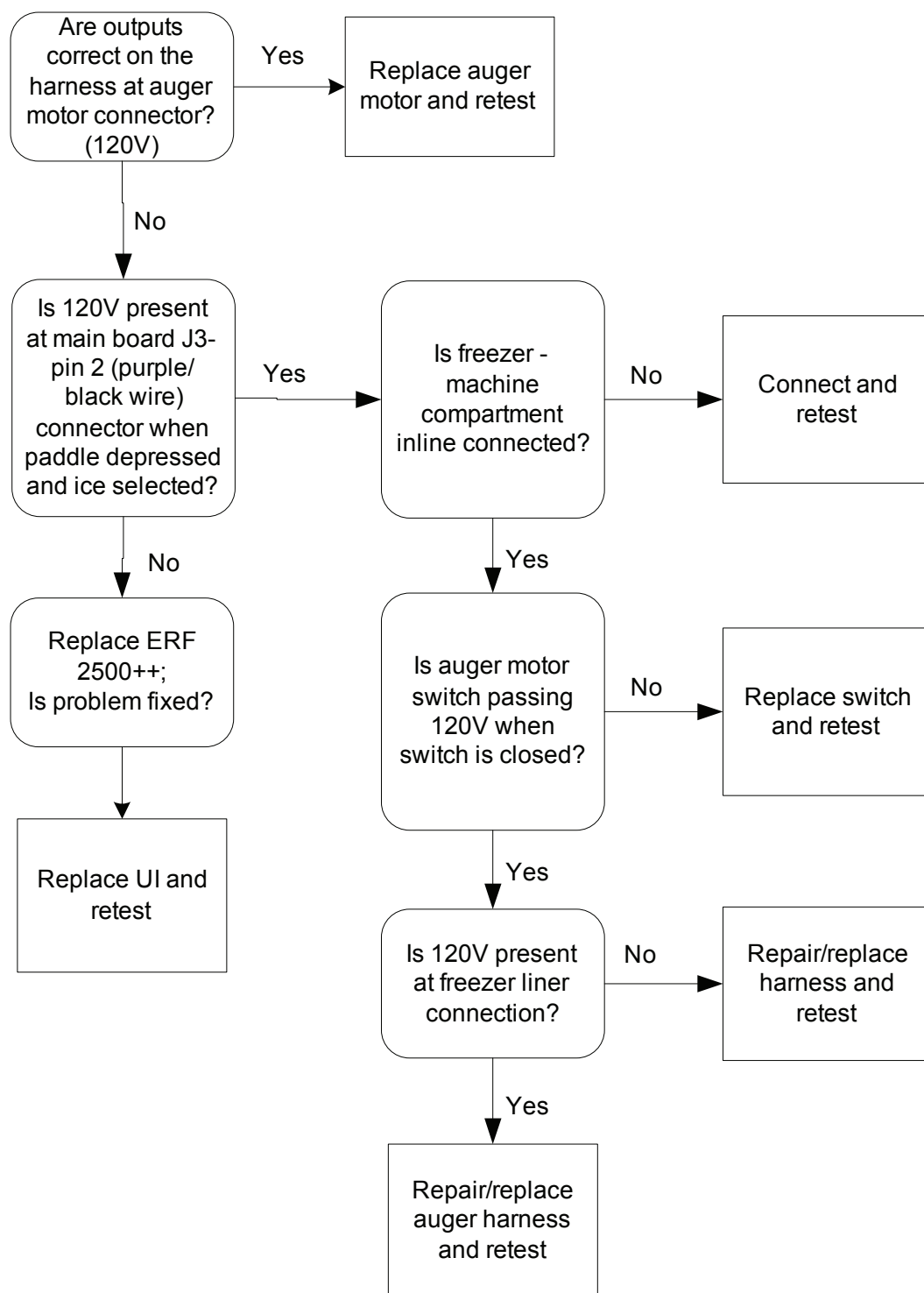
Section 8 - Ice and Water Dispenser

Section 2



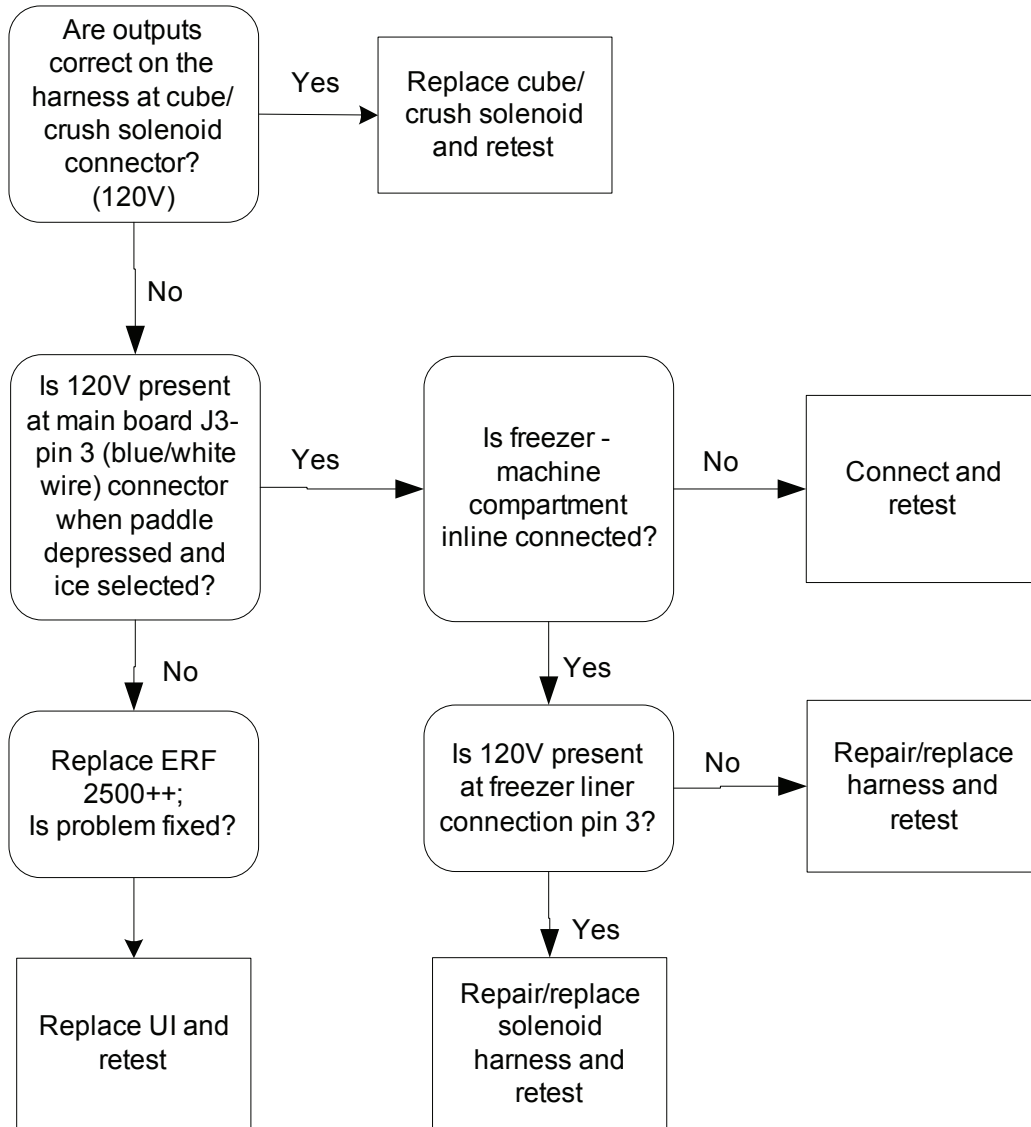
Section 8 - Ice and Water Dispenser

Section 3



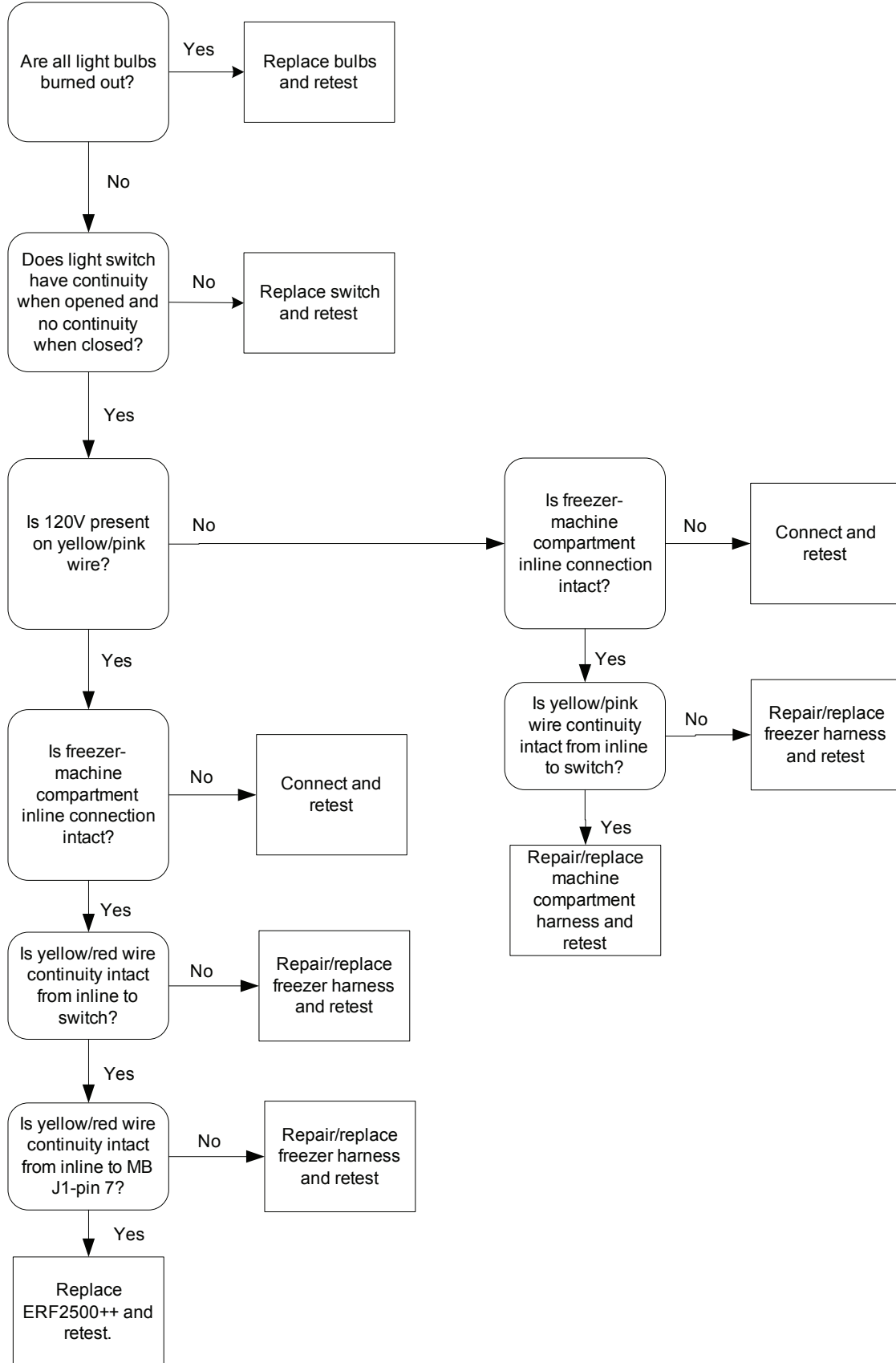
Section 8 - Ice and Water Dispenser

Section 4



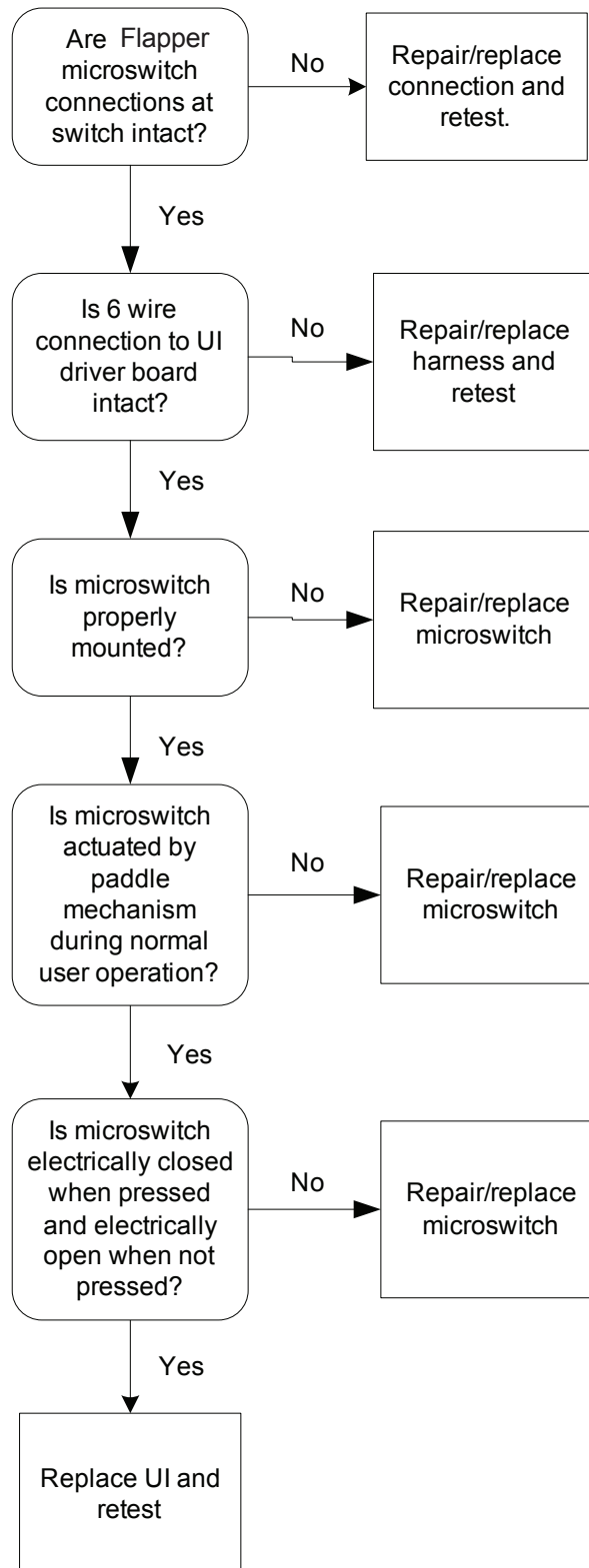
Section 8 - Ice and Water Dispenser

Section 5



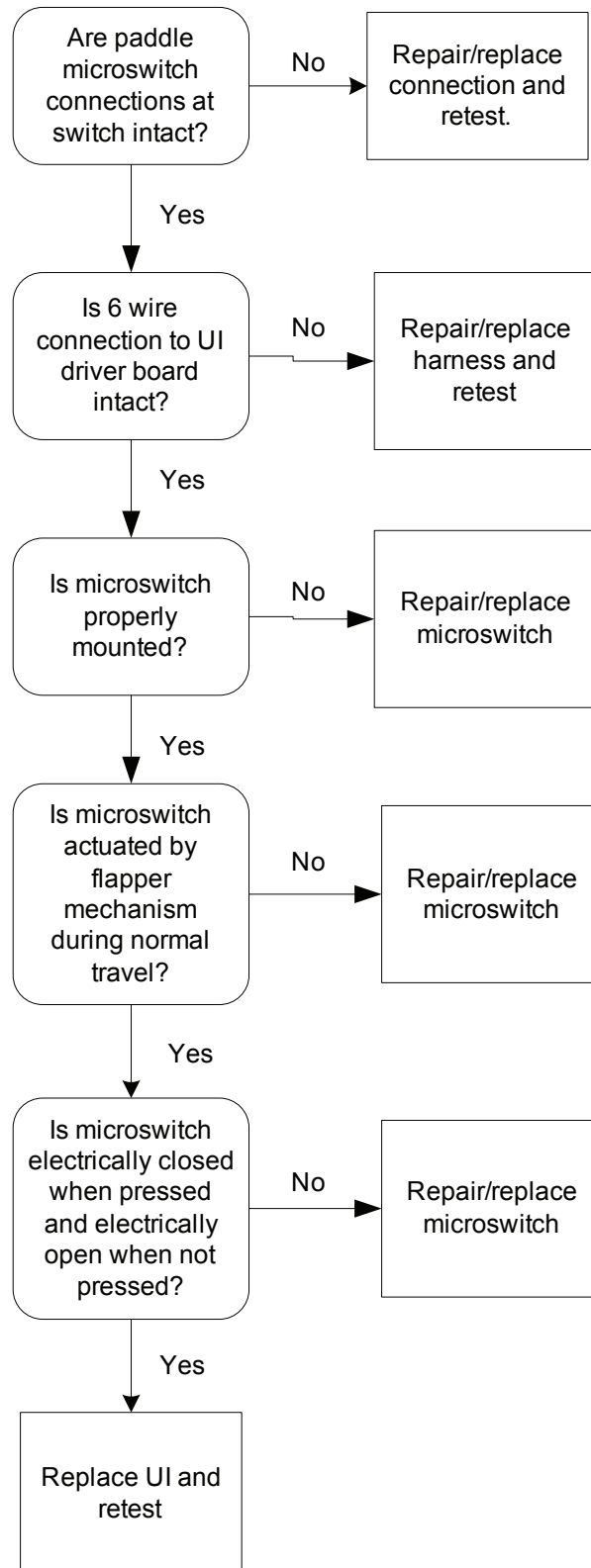
Section 8 - Ice and Water Dispenser

Section 6



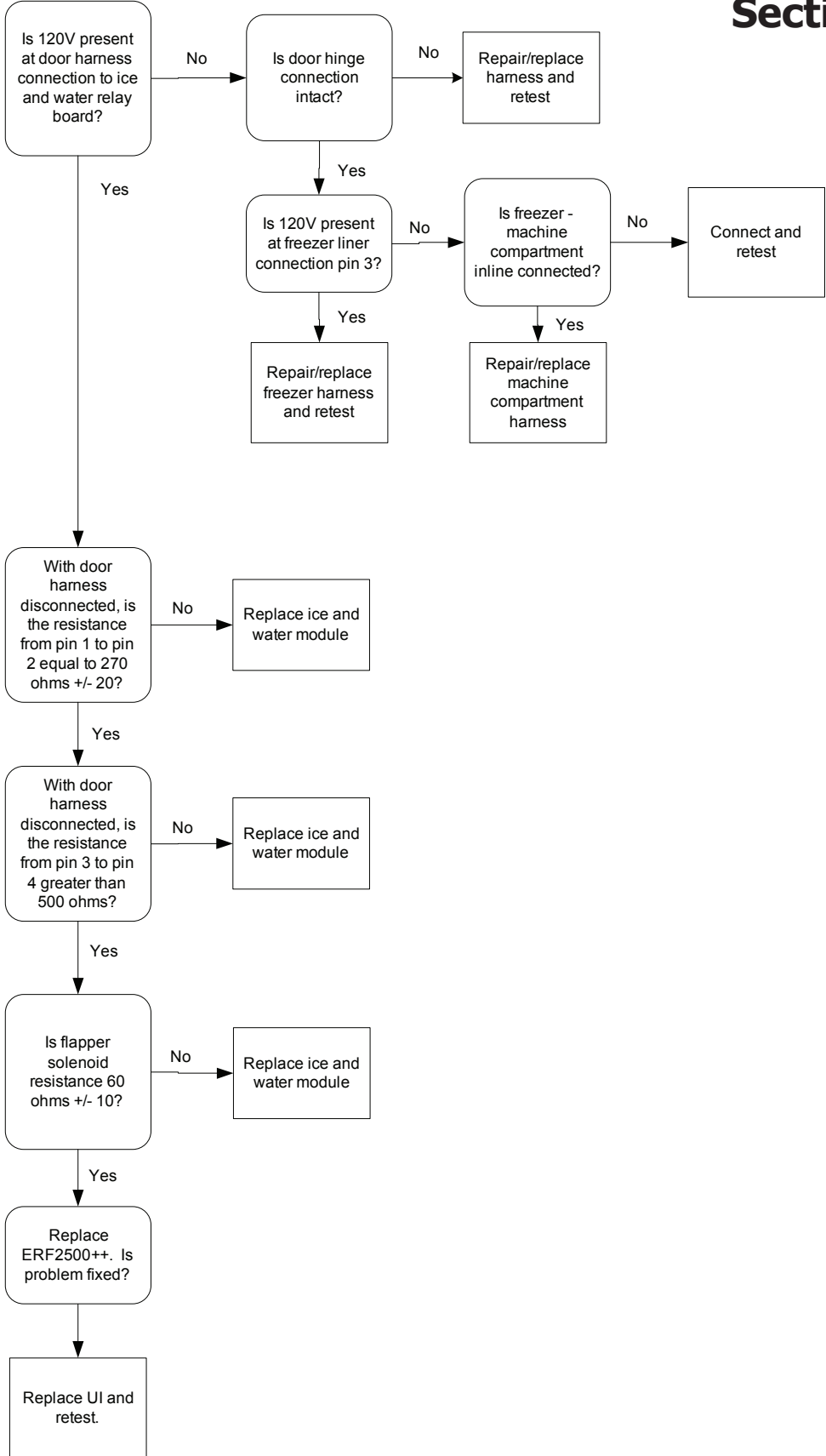
Section 8 - Ice and Water Dispenser

Section 7



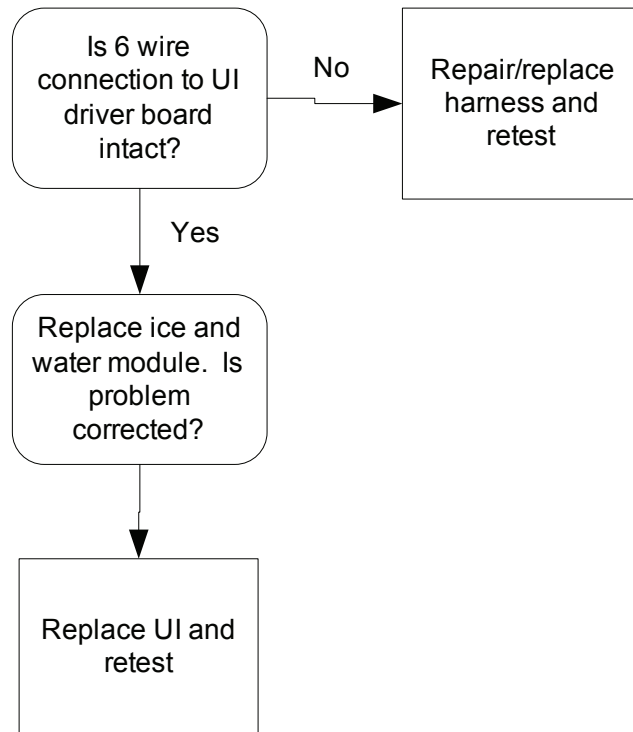
Section 8 - Ice and Water Dispenser

Section 8



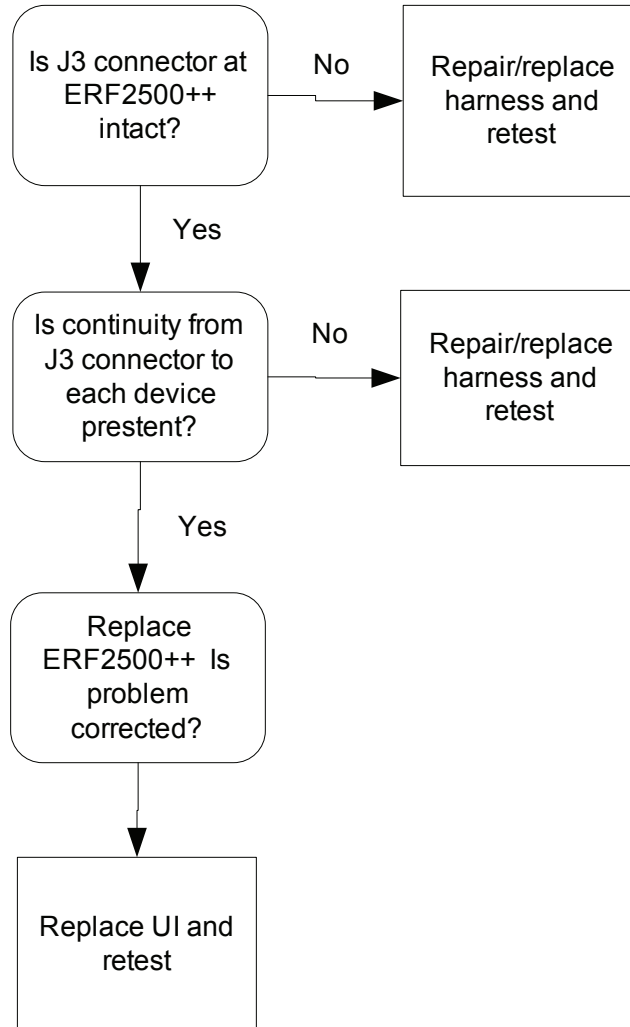
Section 8 - Ice and Water Dispenser

Section 9



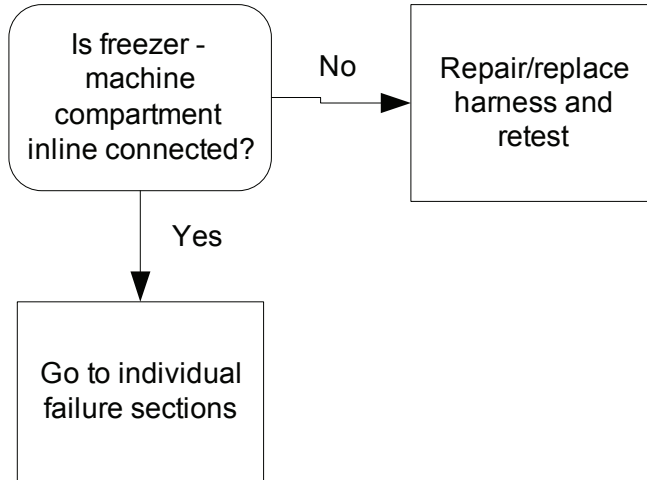
Section 8 - Ice and Water Dispenser

Section 10

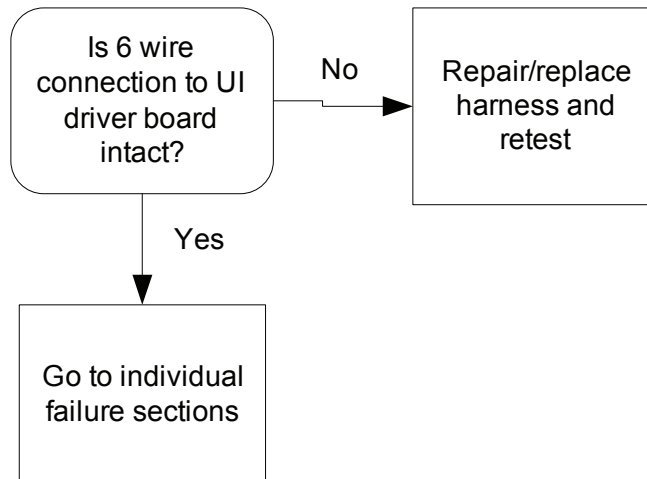


Section 8 - Ice and Water Dispenser

Section 11



Section 12



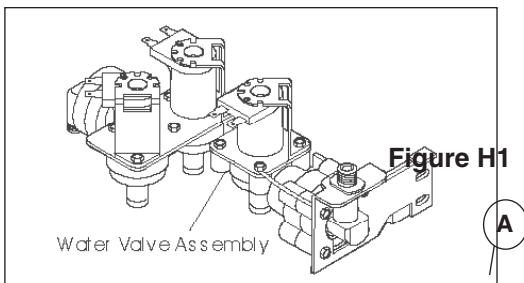
Section 9 - Water System

Water Systems

Water for the ice maker and water dispenser is controlled by a dual coil valve and a single coil valve joined together as one. It's mounted just to the right of the condenser on the cabinet. Plastic tubing connects the water valve/valves to the ice maker fill tube, the water dispenser, and water filter (on models so equipped).

Water Valve

Counter Depth models have 1 dual coil valve and 1 single coil valve (see figure H1). The green coil on a dual coil valve is for the ice maker and the yellow coil is for the water dispenser. The beige coil on the single coil valve is energized for both water for the ice maker and dispenser. Plastic tubing connects the primary water valve to the filter, water tank, and to the secondary valve.



On models with a single coil valve for a primary, you have 2 diodes in the wiring harness connecting the coil of the single coil valve to the 2 coils of the dual coil valve. The diodes are used to prevent current leakage from opening both coils on the dual coil valve every time the single coil valve is energized.

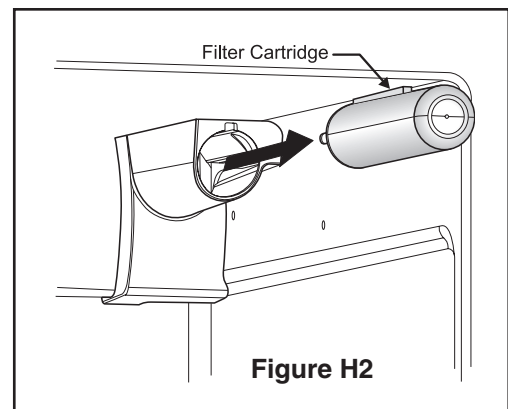
If a diode is shorted, when the single coil valve opens, current leakage through the shorted diode will cause both coils on the secondary valve to open and you'll have water going into the ice maker and coming out the door at the same time. If the diode fails in the open position, the coil on your secondary valve will open, but the coil on the primary valve will not. As a result, you will not get water to the ice maker or dispenser. Both diodes can be checked with an ohmmeter to see if they are opened or shorted.

The coils on all water valves can be checked with an ohmmeter to see if the coils are opened or shorted. If the coil checks bad, replace the coil. If the coils check good and water pressure is between 20-120 psi, and the valve will not allow water to flow through, replace the valve. It is not necessary to replace the whole valve assembly if one coil is bad. The two valves can be separated by inserting a screwdriver at point A in Figure H1.

PureSource Water Filters

For models with a Front Filter (see Figure H2). The water filter must be changed at a minimum of twice a year. But, under certain water conditions, such as large concentrations of calcium, alkali, or other particulate matter in the water, a filter may require changing more frequently. A good way to judge whether the filter needs to be replaced is when the water flow to the dispenser starts slowing down and there has been no change to the water pressure to the product. Operating water pressure should be a minimum of 20-100 psi.

NOTE:



NOTE

The condition of the water filter also has a large affect on the operation of the ice maker. When the filter slows down flow to the door, it is also slowing down flow the ice maker. This can reduce the number of ice cubes made per cycle as well as producing small cubes that can jam the ice maker by getting caught between the ejector and the stripper.

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Water Tanks

Counter Depth refrigerators will have a roll tube tank assembly as shown in Figure H4.

The water line from the primary water valve (single coil valve) goes behind the trim, located on the right side of the inside food compartment liner, to the water filter. From the water filter, the line goes to the water tank, then to the secondary water valve (two coil valve). The two coil valve dispenses water to the ice maker and to the dispenser in the door. By filling the ice maker for the water tank, you will get chilled water to the ice maker helping to increase ice production. See Figure H5 for water system flow diagrams.



Figure H4

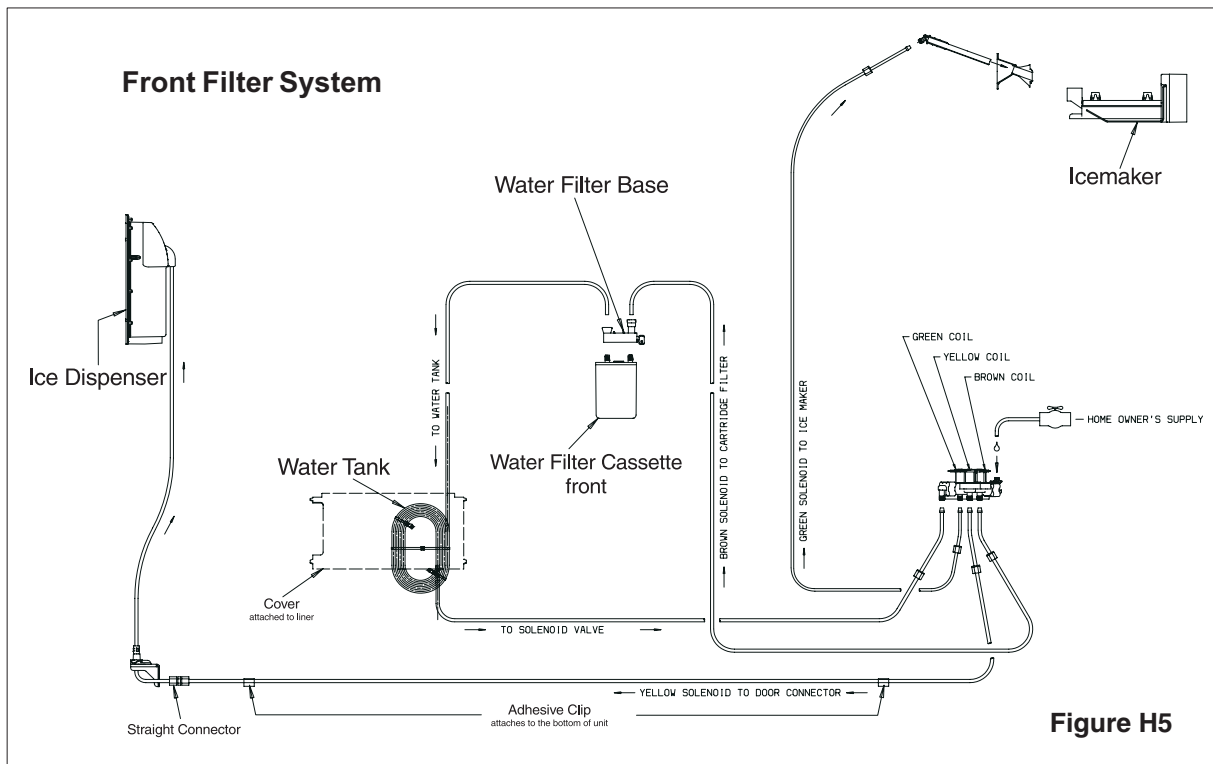


Figure H5

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To Test The Water Fill System

The wiring harness has two diodes in the line between the fill switch on the ice maker and the green coil of the secondary water valve, as well as between the water switch or relay on the freezer door and the secondary valve. The diodes are part of the wiring harness. (See wiring diagram, Figure G10).

If the diodes fail open, the primary valve will not open for ice and/or water depending on what diode is open. The open diode will not affect the coil on the secondary valve. The secondary valve will open but if the primary valve does not open, you will not supply water to the secondary valve.

Resistance Check

To test the diodes you can use an ohm meter with at least a 10K ohm or higher scale. Take a reading across the diode, then reverse your leads and take another reading. The diode should check 10 times higher in one direction than the other.

Voltage Check

You can also use a volt meter to check the circuit. Connect a volt meter to the valve coil of the primary valve, and connect a second volt meter to the green coil of the secondary valve. If the problem is with the ice maker, or the yellow coil of the secondary valve if the problem is with the water dispenser.

Digital Meter

If you are using a good meter you will read between 0-10 volts with an open diode on the primary valve, and over 90 volts at the secondary.

Voltage Drop From Heater

In checking the voltage on an ice maker fill, you must keep in mind that the coils of the water valves are in series with the heater on the ice maker. The resistance of the heater will cause a drop in voltage. Example: If you have 110-120 volts at the outlet with the product running, then 92-101 volts will be present at the green coil of the secondary valve.

Valve Coil

The production valves use a 20 watt coil to open the valve. This should open the valve down to about 90 volts at the green coil of the secondary valve. If the voltage is lower than 90 but above 80, you can install a 50 watt service coil (Part Number 5304401081). Keep in mind, you must replace the coil on the primary and the green coil on the secondary valve to resolve the problem.

Voltage Readings are Different Between Primary and Secondary Valve Coils

If you are getting 10 volts or less at the primary valve, but you are getting 85-100 at the secondary, you have a bad diode. If you are getting 48-58 volts at the primary valve and 90 or higher at the secondary, this is normal. With the current flowing to the primary valve coil through the diode, you are getting 30 cycle instead of 60 cycle current at the coil of the primary valve. Because of this, your meter will only read about 1/2 the voltage that is going to the coil.

No Water at Door

If the ice maker is operating but you cannot get water out the door, the test and operation of the diode is the same as for the ice maker, except for the voltage readings. On the water side, you should read the same voltage at the coil of the secondary valve as you have at the outlet. On the primary valve, the voltage should read 60-70 vac. If the voltage is low at the primary but good at the secondary, you have a bad diode. If the voltage is low at both the primary and secondary, you have a bad connection or a bad switch in the door dispenser.

Diode Kit

If you have a problem with the diodes, order the diode kit (part number 5303918287. See Figure H8.) The diodes are part of the wiring harness for the machine compartment.

Checking Water

If you do your voltage checks and find you have the correct voltage at the coils and the valve is not letting water through, replace the valve. To see which valve is bad, disconnect the water line from the filter to the inlet of the secondary valve. Place the line in a bucket.

Ice Maker Valve

Run the ice maker through a fill cycle and see if water will pass through the valve (**Green Coil**) and the filter into a bucket. If it does, replace the secondary valve. If it does not, remove the primary valve, disconnect the outlet line from the primary valve and run the ice maker through a fill cycle. If there is still no water, replace the primary valve. If water is coming through, replace the water filter.

Chilled Water Valve

Place a glass against the actuator and push in to see if water will pass through the valve (**Yellow Coil**) and the filter into a bucket. If it does, replace the secondary valve. If it does not, remove the primary valve, disconnect the outlet line from the primary valve, then

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place a glass against the actuator and push. If there is still no water, replace the primary valve. If water is coming through, replace the water filter.

Low/No Voltage At Coil(s)

One point we need to cover in our testing is good connections at all points in the ice and water wiring. There are a number of connections in the wiring of a refrigerator. On the ice maker, the wiring runs through the plug by the condenser fan motor up to the ice maker,

back down to the same plug and into the diode harness. On the water dispenser, the wiring runs from the plug by the condenser fan motor to the plug at the bottom of the freezer door, up to the dispenser, and back down through the same plugs to the diode harness. A bad connection at any of the plugs or wire terminals can stop the valves from operating. One of the problems we have found is that the connector on the water valve coils is pushed on with the valve terminal over the top of the terminal in the plug. (See Figure H9.)

Diode Replacement Kit 5303918287 For Ice & Water Model Side by Sides With A Water Filter



Figure H8

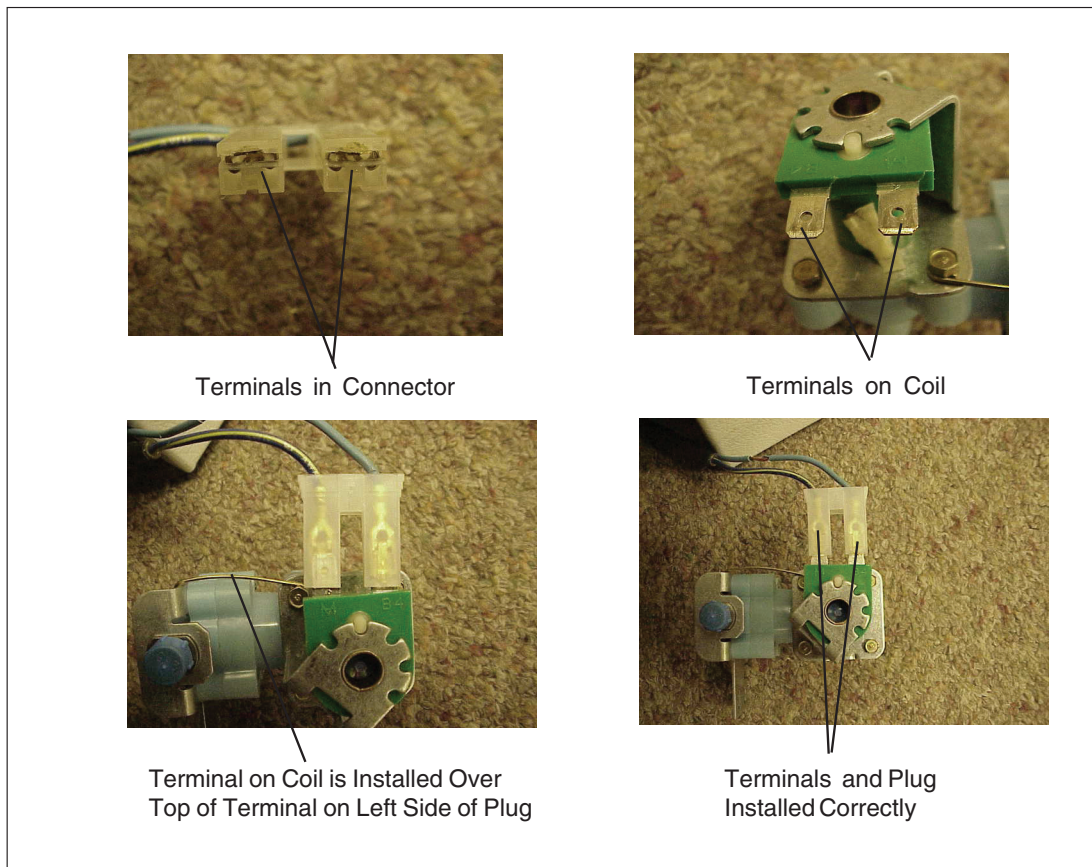
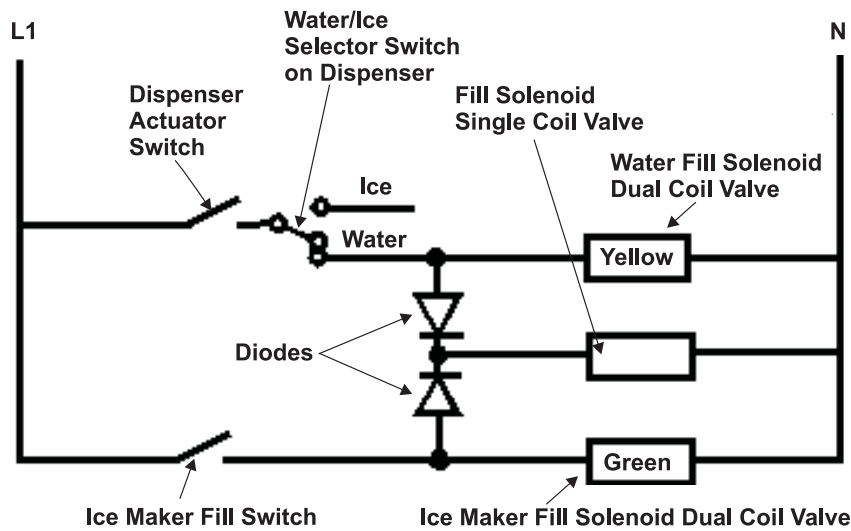


Figure H9

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VOLTAGE READINGS AT GREEN COIL OF SECONDARY VALVE

When Ice Maker is Filling:

Voltage at Outlet	Voltage at Coil	
120 VAC	100 ± 10% VAC	Normal
100 VAC	85 ± 10% VAC	Normal at 105 VAC (Will require use of 50 watt coil)
100 - 120 VAC	20 - 76 VAC	Bad connection, Fill Switch, or Heater in Ice Maker.

VOLTAGE READING AT YELLOW COIL OF SECONDARY VALVE

When Filling A Glass With Water:

Voltage at Outlet	Voltage at Coil	
120 VAC	119 ± 10% VAC	Normal
100 VAC	99 ± 10% VAC	Normal
100 - 120 VAC	0 - 90 VAC	Bad connection or bad Fill Switch

VOLTAGE READING AT COIL OF PRIMARY VALVE

When Ice Maker is filling:

Voltage at Outlet	Voltage at Coil	
120 VAC	56 ± 10% VAC	Normal
100 VAC	48 ± 10% VAC	Normal
100 - 120 VAC	10 - 43 VAC	Bad connection, Fill Switch, or Heater in Ice Maker
100 - 120 VAC	0 VAC	Open Diode (if current is normal at secondary coil)

NOTE: You must remember that with the current flowing to the Primary Valve Coil through the Diode, you are getting 30 cycle instead of 60 cycle current at the coil of the Primary Valve. Because of this, your volt meter will only read about 1/2 the voltage that is going to the coil. The change in the cycle of current does not effect the efficiency of an electromagnetic coil.

Figure H10