600
Service Manual

INTRODUCTION

This 600 Series Base Unit Technical Service Manual, Part #3756270, has been compiled to provide the most recent information on safety, installation, set-up, design, operation, features, troubleshooting, wiring diagrams, and repair procedures of the 600 Series, prior to Serial #1810000. This information will enable the service technician to troubleshoot and diagnose malfunctions, perform necessary repairs, and return a 600 Series unit, prior to Serial #1810000 to proper operational status.

The service technician should read the complete instructions contained in this service manual before initiating any repairs on a 600 Series unit.

IMPORTANT SAFETY INFORMATION

Below are the Product Safety Labels used in this manual. The "Signal Words" used are **WARNING** or **CAUTION**.

When reviewing this manual, please note these different Product Safety Labels placed at the beginning of certain sections of this manual. You must follow the instructions given in the boxes below the Product Safety Labels in order to avoid personal injury and/or product damage.

The sample Product Safety Labels below illustrate the precautions that should be taken when the signal word is observed.

⚠ WARNING

INDICATES THAT HAZARDOUS OR UNSAFE PRACTICES COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH

⚠ CAUTION

Indicates that hazardous or unsafe practices could result in minor personal injury or product and/or property damage

In addition, please pay attention to the signal word ***"NOTE"***, which highlights information that is especially important for the topic being covered.

TECHNICAL ASSISTANCE

If you should have any questions regarding a 600 Unit and/or this manual, please contact:

Sub-Zero Freezer Company, Inc.
ATTN: Service Department
P.O. Box 44988
Madison, WI 53744 - 4988

Customer Service & Parts / Warranty Claims
Phone #: (800) 222 - 7820

Technical Assistance
Phone #: (800) 919 - 8324

Customer Service & Technical Assistance
Facsimile #: (608) 441 - 5887

Parts / Warranty Claims
Facsimile #: (608) 441 - 5886

Service Department E-Mail Address:
customerservice@subzero.com

Office Hours:
7:00 AM to 7:00 PM Central Time
Monday through Friday

This manual is designed to be used by Authorized Service Personnel only. Sub-Zero Freezer Co., Inc. assumes no responsibility for any repairs made on Sub-Zero refrigeration units by anyone other than Authorized Service Technicians.

WARRANTY INFORMATION

This page summarizes the *2, 5 & 12 Year Warranty* supplied with every unit, as well as the two special warranties: The *Non-Residential Warranty* which applies to units installed in non-residential applications, and the *Display/Model Home Warranty* which applies to distributor or dealer's display units and units in model homes, sold three years after date of manufacture. The last entries on this page are details and notes about the warranties.

TWO, FIVE & TWELVE YEAR Warranty Summary

- Two year TOTAL PRODUCT warranty, *parts and labor.
- Five Year SEALED SYSTEM warranty, **parts and labor.
- Sixth through Twelfth year LIMITED SEALED SYSTEM warranty, sealed system **parts only.

ONE & FIVE YEAR Non-Residential Warranty Summary (Example: Office, Yacht, etc.)

- One Year TOTAL PRODUCT warranty, *parts and labor.
- Five year LIMITED SEALED SYSTEM warranty, sealed system **parts only.

ONE & FIVE YEAR Display/Model Home Warranty Summary (Display units sold three years after date of manufacture)

- One Year TOTAL PRODUCT warranty, *parts and labor.
- Five year LIMITED SEALED SYSTEM warranty, sealed system **parts only.

Warranty Details:

- ** Total Product Parts includes, but is not limited to the following:*

  Electronic Control System Components, Fan & Light Switches, Fan Motors & Blades, Defrost & Drain Heaters, Defrost Terminators, Drain Pans, Drain Tubes, Wiring, Light sockets & bulbs, Icemakers, Water Valves, Door hinges, Door closers & Cams, Compressor Electricals, etc. . .

- *** Sealed System Parts include the following:*

  Compressors, Condensers, Evaporators, Filter-Driers, Heat-exchangers, All Tubing That Carries the Freon.

  NOTE: *Condenser Fan Motors, Freon, Solder and compressor electricals are NOT considered sealed system parts.*

Warranty Notes:

- *All warranties begin at the time of the unit's initial installation.*
- *All Warranty and Service information collected by Sub-Zero is arranged and stored under the unit serial number. This information is now also stored under the customer's last name.*

  NOTE: *Sub-Zero still requests that you have the model and serial number available whenever contacting the factory or parts distributor.*
- The serial number tag for the SIDE-BY-SIDE models is located by the top door hinge of the freezer section.
- The serial number tag for the OVER-AND-UNDER models is located by the top door hinge of the refrigerator section.
- The serial number tag for the ALL-REFRIGERATOR and ALL-FREEZER models is located by the top door hinge of the refrigeration compartment.
- "M"-Preceding the Serial # = Madison Production
- "P"-Preceding the Serial # = Phoenix Production.

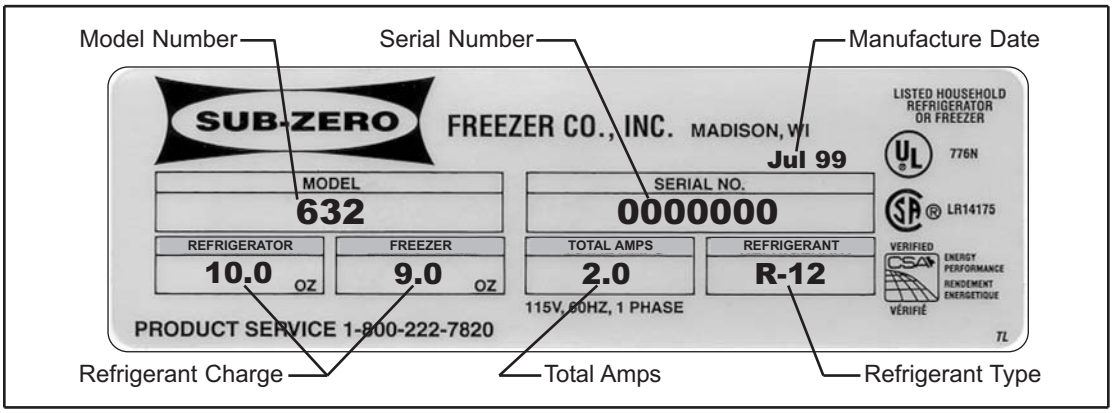


Figure 1-1. Serial Tag Layout (Layout Reference Only)

MODEL DESCRIPTIONS

This section briefly describes the models covered in this 600 Series Service Manual. Though there are twenty models, there are only seven basic model configurations (Models 601R, 601F, 611, 632, 642, 650, 690). The reason for twenty different model numbers is the three esthetic variations to the exterior components. The letter after the backward slash in the alpha-numeric model number indicates the exterior cosmetic variation. ("/F" indicates a **Framed** look with the door trim visible, "/O" indicates that it is intended for the unit's door panels to **Overlay** the door trim, and "/S" indicates that the unit is **Stainless Steel**.)

NOTE: *Functional parts are common to each model configuration, meaning the models 601R/F, 601R/O and 601R/S will utilize common functional parts, just as the models 601F/F, 601F/O and 601F/S will utilize common functional parts, and so on... For this reason, the backward slash and letter at the end of the alpha-numeric model number will be used in this manual only when necessary.*

Listed below are the twenty model numbers with a brief description of that model.

MODEL	DESCRIPTION
601R/F	36" Wide, All-Refrigerator, Framed Door with handle, Louver Grille
601R/O	36" Wide, All-Refrigerator, Overlay Door Trim without handle, Louver Grille
601R/S	36" Wide, All-Refrigerator, Stainless Steel Door and Grille
601F/F	36" Wide, All-Freezer, Framed Door Trim with handle, Louver Grille
601F/O	36" Wide, All-Freezer, Overlay Door Trim without handle, Louver Grille
601F/S	36" Wide, All-Freezer, Stainless Steel Door and Grille
611/F	30" Wide, Over-and-Under, Framed Door Trim with handle, Louver Grille (Standard)
611/O	30" Wide, Over-and-Under, Overlay Door Trim without handle, Panel Grille (Standard)
611/S	30" Wide, Over-and-Under, Stainless Steel Doors and Grille
632/F	48" Wide, Side-by-Side, Framed Door Trim with handle, Louver Grille (Standard)
632/O	48" Wide, Side-by-Side, Overlay Door Trim without handle, Panel Grille (Standard)
632/S	48" Wide, Side-by-Side, Stainless Steel Doors and Grille
642/F	42" Wide, Side-by-Side, Framed Door Trim with handle, Louver Grille (Standard)
642/O	42" Wide, Side-by-Side, Overlay Door Trim without handle, Panel Grille (Standard)
642/S	42" Wide, Side-by-Side, Stainless Steel Doors and Grille
650/F	36" Wide, Over-and-Under, Framed Door Trim with handle, Louver Grille (Standard)
650/O	36" Wide, Over-and-Under, Overlay Door Trim without handle, Panel Grille (Standard)
650/S	36" Wide, Over-and-Under, Stainless Steel Doors and Grille
690/F	48" Wide, Side-by-Side, Ice & Water Dispenser, Framed Door Trim with handle, Louver Grille, (Standard)
690/S	48" Wide, Side-by-Side with Ice & Water Dispenser, Stainless Steel Doors and Grille
	NOTE: *There is no overlay variation for the model 690, but an optional panel grille is available.*

INSTALLATION CONSIDERATIONS

This section covers common installation issues seen by Service Technicians. Improper installation, though not a valid service issue, has the potential to lead to a call for service. Installation related complaints could include, but are not limited to: Unit leveling, unit movement, door misalignment, improper door and drawer sealing, internal frost or condensation, exterior condensation, warm compartment temperatures, etc.

NOTE: *If additional installation information is needed, refer to the complete Installation Manual, or contact Sub-Zero Service Department.*

⚠ WARNING

UNIT COULD TIP UNDER CERTAIN LOAD CONDITIONS. FAILURE TO INSTALL ANTI-TIP COMPONENTS AND EXTEND LEVELERS TO FLOOR ACCORDING TO INSTALLATION MANUAL COULD RESULT IN SERIOUS INJURY OR DEATH.

Unit Leveling (All Models)

NOTE: *Unit must be installed before leveling (See WARNING above). If unit is anchored to cabinets, remove anchor screws before leveling, reinstalled after.*

To level a unit, first remove kickplate (See Figure 2-1). Then, to raise unit front, turn front leveler legs counterclockwise, clockwise to lower (See Figure 2-2).
At front of unit base is an adjusting screw that reaches to rear leveler/roller assembly. To raise unit rear, use 5/16" socket wrench to turn adjusting screw clockwise to raise, counterclockwise to lower (See Figure 2-2).

NOTE: *Level is best checked at top & side mainframe.*

Door Adjustment (All Models)

NOTE: *Unit must be level before adjusting doors.*

If unit is properly installed, blocked and leveled, it may still be necessary to adjust door(s) left to right and/or in and out. Adjustments are performed at top and/or bottom door hinge(s). Two small Phillips head shipping screws in each door hinge must be removed and discarded before attempting adjustments. Then, working on only one hinge at a time, loosen and re-snug door hinge mounting screws, allowing door adjustment (See Figure 2-3). After adjusting door, tighten door hinge mounting screws and check for proper door seal.

NOTE: *If one door on a side-by-side unit sits higher than the other, bottom hinge spacer (part #0183100) is available. To install spacer, remove shipping screws from bottom door hinge, then loosen hinge mounting screws. Insert spacer(s) between bottom door hinge and bottom door trim. Adjust door accordingly and retighten door hinge screws. (See Figure 2-4.)*

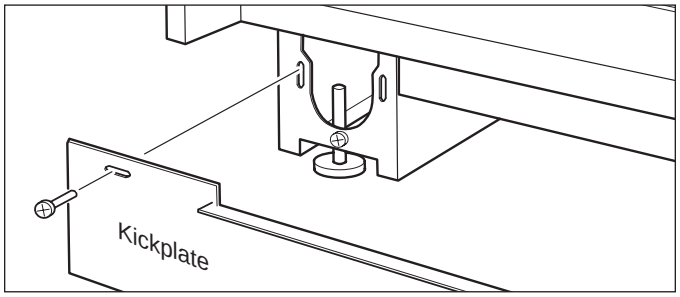


Figure 2-1. Kickplate Removal

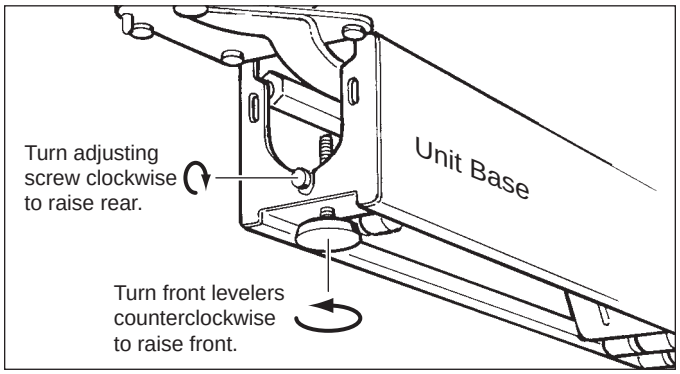


Figure 2-2. Unit Leveling

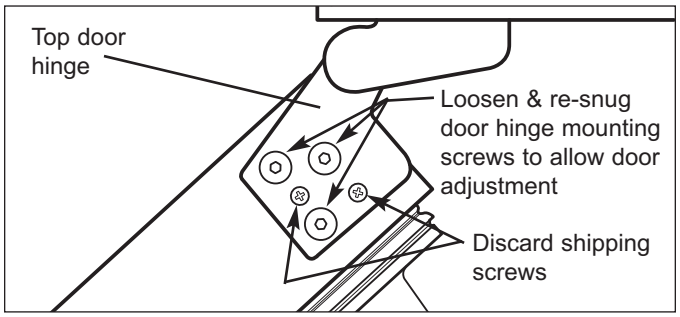


Figure 2-3. Top Door Hinge & Screws

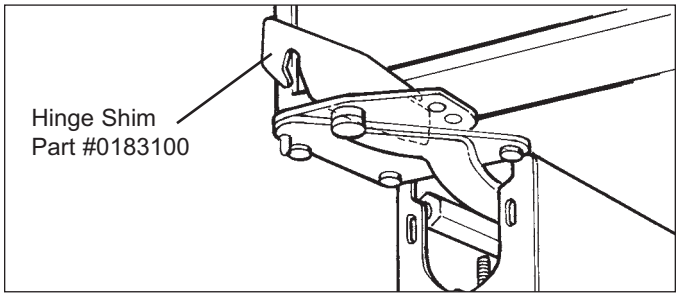


Figure 2-4. Bottom Hinge Shim Installation

Special Side-by-Side Door Adjustment

Occasionally after a side-by-side unit is properly installed, blocked and leveled, the refrigerator door top may stick out farther then the freezer door top, even though the bottom of each door is flush. The adjustment procedure listed below explains how to correct this. (For video showing this procedure, order part #3756530)

NOTE: *Unit must be level before adjusting doors.*

Special Side-by-Side Door Adjustment Procedure*:*

1. *First - Adjust Refrigerator Door Bottom Hinge OUT:*

   a. Extract shipping screws from refrigerator door bottom hinge. Then, loosen & re-snug bottom hinge mounting screws.

   b. Pull refrigerator door bottom hinge corner out to outer most limit & tighten hinge mounting screws.

      NOTE: *Check door gasket seal by refrigerator door bottom hinge. If gasket is not sealing, loosen & re-snug mounting screws, and push refrigerator door bottom hinge corner in slightly until gasket seals.*

   c. Check door alignment. If refrigerator door top still sticks out farther then freezer door, perform second adjustment.

2. *Second - Adjust Refrigerator Door Top Hinge IN:*

   a. With a pencil, trace location of refrigerator door top hinge for reference. Extract shipping screws from refrigerator door top hinge, then loosen & re-snug top door hinge mounting screws.

   b. Push refrigerator door top hinge corner in to inner most limit & tighten hinge mounting screws.

      NOTE: *Check door gasket seal around refrigerator door. If gasket is not sealing, adjust accordingly.*

   c. Check door alignment. If refrigerator door top still sticks out farther then freezer door, perform third adjustment.

3. *Third - Adjust Freezer Door Top Hinge OUT:*

   a With a pencil, trace location of freezer door top hinge for reference. Extract shipping screws from freezer door top hinge, then loosen & re-snug top door hinge mounting screws.

   b. Pull freezer door top hinge corner out to outer most limit & tighten hinge mounting screws.

      NOTE: *Check door gasket seal by freezer door top hinge. If gasket is not sealing, loosen & re-snug mounting screws, and push freezer door top hinge corner in slightly until gasket seals.*

   c. Check door alignment. If refrigerator door top still sticks out farther then freezer door, perform fourth adjustment.

4. *Fourth - Adjust Freezer Door Bottom Hinge IN:*

   a. Extract Phillips head shipping screws from freezer door bottom hinge. Then, loosen & re-snug bottom door hinge mounting screws.

   b. Push freezer door bottom hinge corner in to inner most limit & tighten hinge mounting screws.

      NOTE: *Check door gasket seal around freezer door. If gasket is not sealing, adjust accordingly.*

   c. Check door alignment. Minor adjustments may still be needed at this point, adjust accordingly.

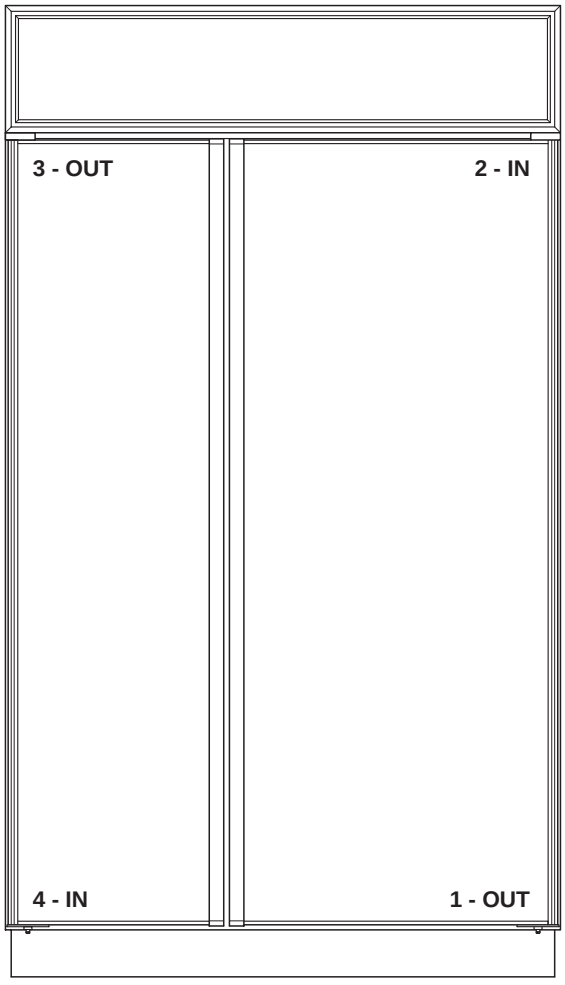


Figure 2-5. Special Side-by-Side Door Adjustment

Freezer Drawer Adjustments (Models 611 & 650)

NOTE: *Before attempting freezer drawer adjustment, remove freezer drawer assembly. Pull drawer assembly out, then lift at front while holding upper freezer basket in place. (See Figure 2-6)*

Vertical Freezer Drawer Adjustment:

a. Loosen two screws towards rear of each cabinet drawer slide, and extract screw at slide front. (See Figure 2-7)

b. Relocate front screw to desired position in drawer slide insulator grommet (See Figure 2-7).

c. After adjustment, tighten all screws, reinstall drawer assembly, then check door seal for proper gasket seating.

Freezer Drawer Front Pitch Adjustment:

a. Remove two 3/4" white plastic plugs from each side of plastic drawer liner. (See Figure 2-8)

b. With 3/8" socket, loosen bolts, then adjust drawer front pitch accordingly. (See Figure 2-8).

c. After adjustment, tighten bolts and check door seal for proper gasket seating.

NOTE: *If freezer drawer assembly has too much play from side-to-side, freezer drawer slide shims (part # 0232300 - front, part # 0232310 - rear) are available.*

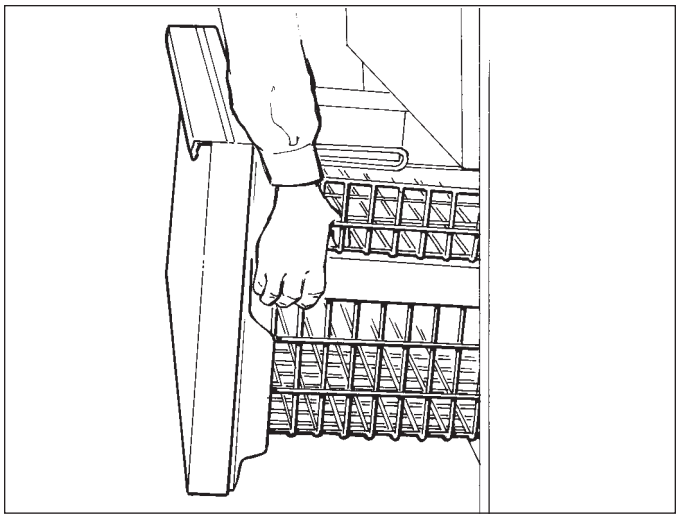


Figure 2-6. Drawer Assembly Removal

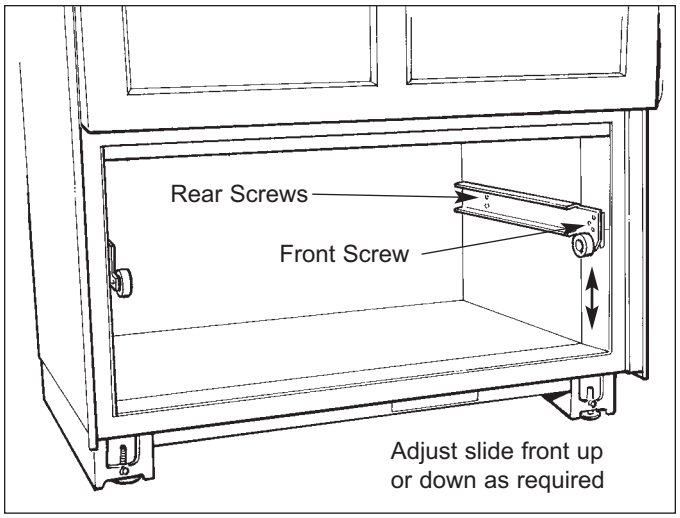


Figure 2-7. Vertical Freezer Drawer Adjustment

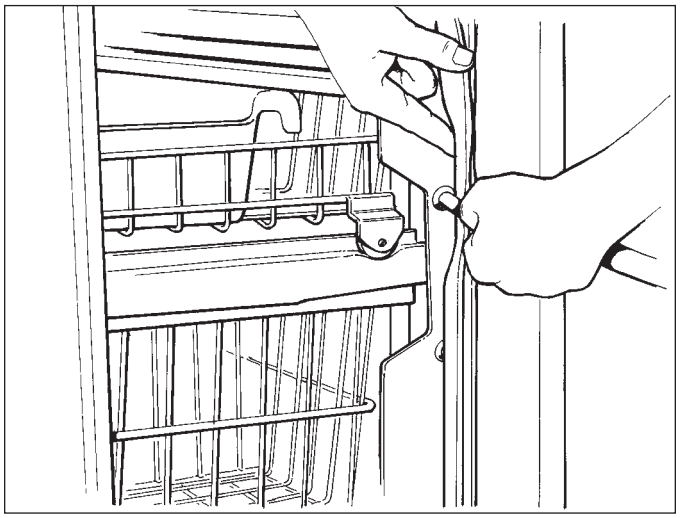


Figure 2-8. Drawer Front Pitch Adjustment

Door Panel Installation (All Models)

a. Using piece of tape stuck to magnetic trim molding center, pull trim molding out at midpoint to expose handle/trim mounting screws (See Figure 2-9).

b. Extract mounting screws and handle/trim from door (See Figure 2-10).

c. Slide door panel into door frame (See Figure 2-11), then reinstalling handle/trim and magnetic trim molding.

NOTE: *If door panel is less than 1/4" thick, a filler panel must be installed behind door panel.*

NOTE: *On Model 690, the handle inserts, trim fillers, vertical trim strip and glass well bezel will need to also be removed from door before sliding door panel into door frame.*

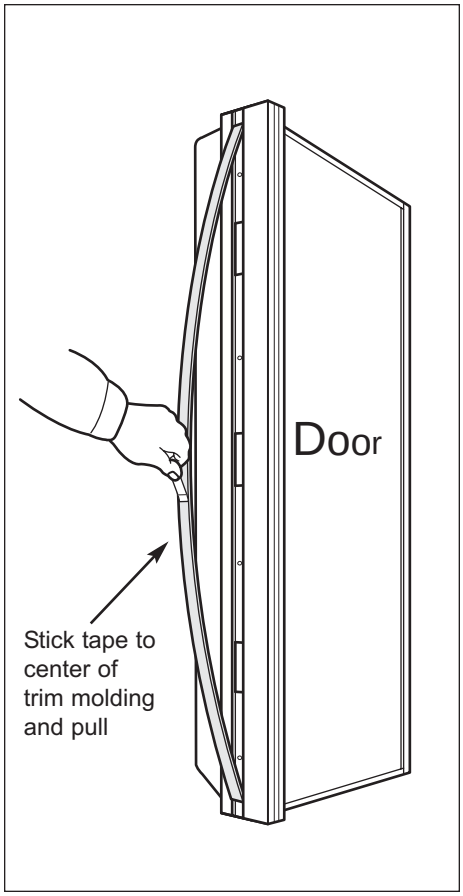


Figure 2-9. Molding Removal

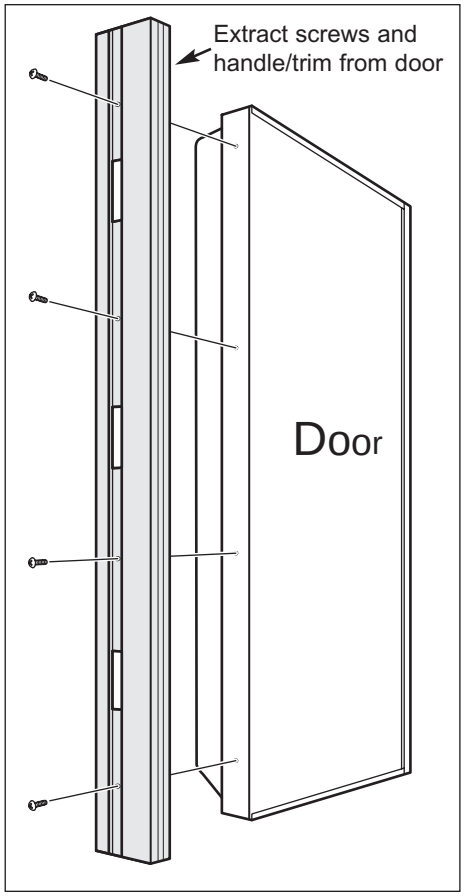


Figure 2-10. Handle/Trim Removal

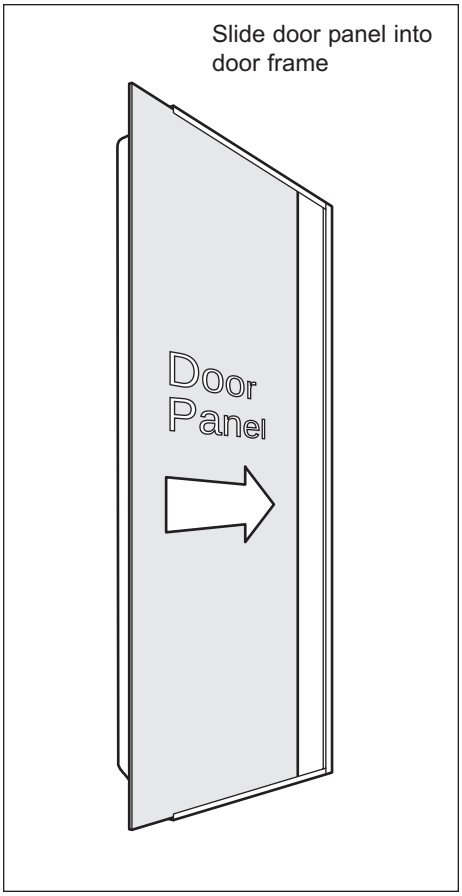


Figure 2-11. Door Panel Install

90° Door Stop Cam Installation (Models 632, 642, 690)

Optional 90° door stop cam (part # DS90) and 105° door stop cam (part # DS105) are available at no charge from Authorized Parts Distributors and Product Distributors. To install (See Figure 2-12):

a With door closed, place door stop cam up over hinge pin, making sure stub on cam fits into hole in lower cabinet hinge.

b. Secure door stop cam by pushing E-ring into groove at end of hinge pin.

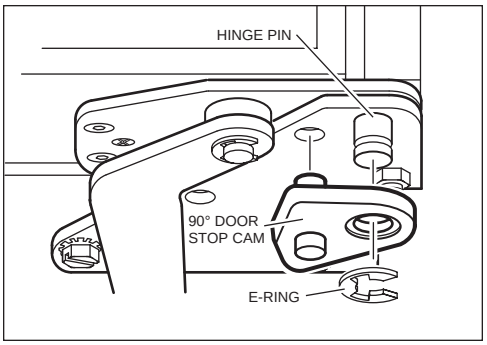


Figure 2-12. 90° Stop Cam

90° Door Stop Cam Installation (Models 601R, 601F)

Optional 90° door stop cam (part # DS90) and 105° door stop cam (part # DS105) are available at no charge from Authorized Parts Distributors and Product Distributors. To install (See Figure 2-13):

a With door closed, extract bolts, stiffener plate and bushing from lower cabinet hinge.

b. Place door stop cam up over hinge pin, making sure stub on cam fits into hole in lower cabinet hinge.

c. Reinstall bushing, stiffener plate and bolts onto lower cabinet hinge.

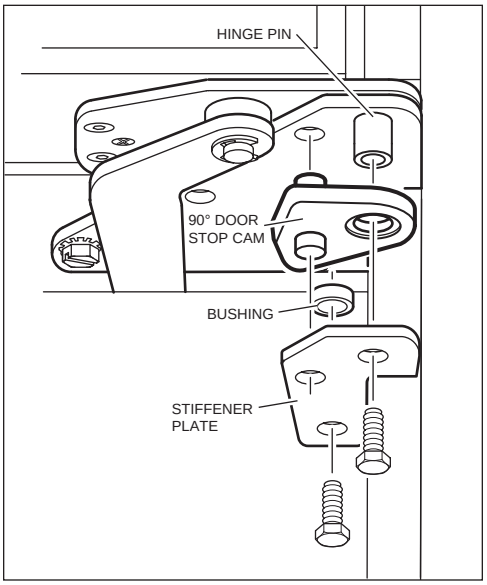


Figure 2-13. 90° Stop Cam

ELECTRONIC CONTROL TERMINOLOGY & COMPONENT DESCRIPTIONS

All 600 Series units utilize an electronic control system. The electronic control system monitors, regulates and controls a variety of functions, as well as displaying temperatures and possible problems with the unit. In this section, some basic electronic control system terminology is defined, and electronic control components described. An understanding of the following information is needed in order to comprehend the electronic control system.

TERM / COMPONENT	DEFINITION / DESCRIPTION
Control Board	The electronic board which contains the microprocessor, relays, electrical connections and LCD. The electrical hub of the electronic control system. ***NOTE:*** *See "Control Board Summary / Layout" in following section.*
Microprocessor	An electrical component on the control board which receives electrical signals from other components in the electronic control system, processes that information, and then sends an electrical signal to the relays instructing them to open or close, and other electronic components to switch on or off.
Relay	The electrical components on the control board which, when closed, allow power to the appropriate components.
LCD (Liquid Crystal Display)	That part of the control board seen at the control panel which displays compartment temperatures, service indicators, etc...
Control Panel	The information input and read-out area of the electronic control system. The LCD is visible through a window on the control panel.
Membrane Switch	That part of the upper control panel where all input functions are performed.
Keys	Buttons on the Membrane switch used for input functions.
Indicators	The words that are displayed on the LCD.
Set-Point	The desired compartment temperature. This is the approximate average of the high offset and the low offset.
High Offset	The maximum compartment air temperature the electronic control system will allow. When the high offset is reached, power is supplied to the compressor to run.
Low Offset	The minimum compartment air temperature the electronic control system will allow. When the Low Offset is reached, power to the compressor is interrupted.
Offset Temperature Range	The difference between the low offset and the high offset.
Thermistor (Temperature Sensor)	A resistor with which resistance changes as the temperature around it changes. For electronic control system purposes, the microprocessor deciphers this resistance signal as temperature.

BASIC ELECTRONIC CONTROL SYSTEM

Input operations for the electronic control system are performed at the control panel, with monitoring, regulating and controlling functions taking place at the control board. Temperatures and possible problems with the unit are illuminated on the LCD. This page illustrates a basic electronic control system (See Figure 3-1).

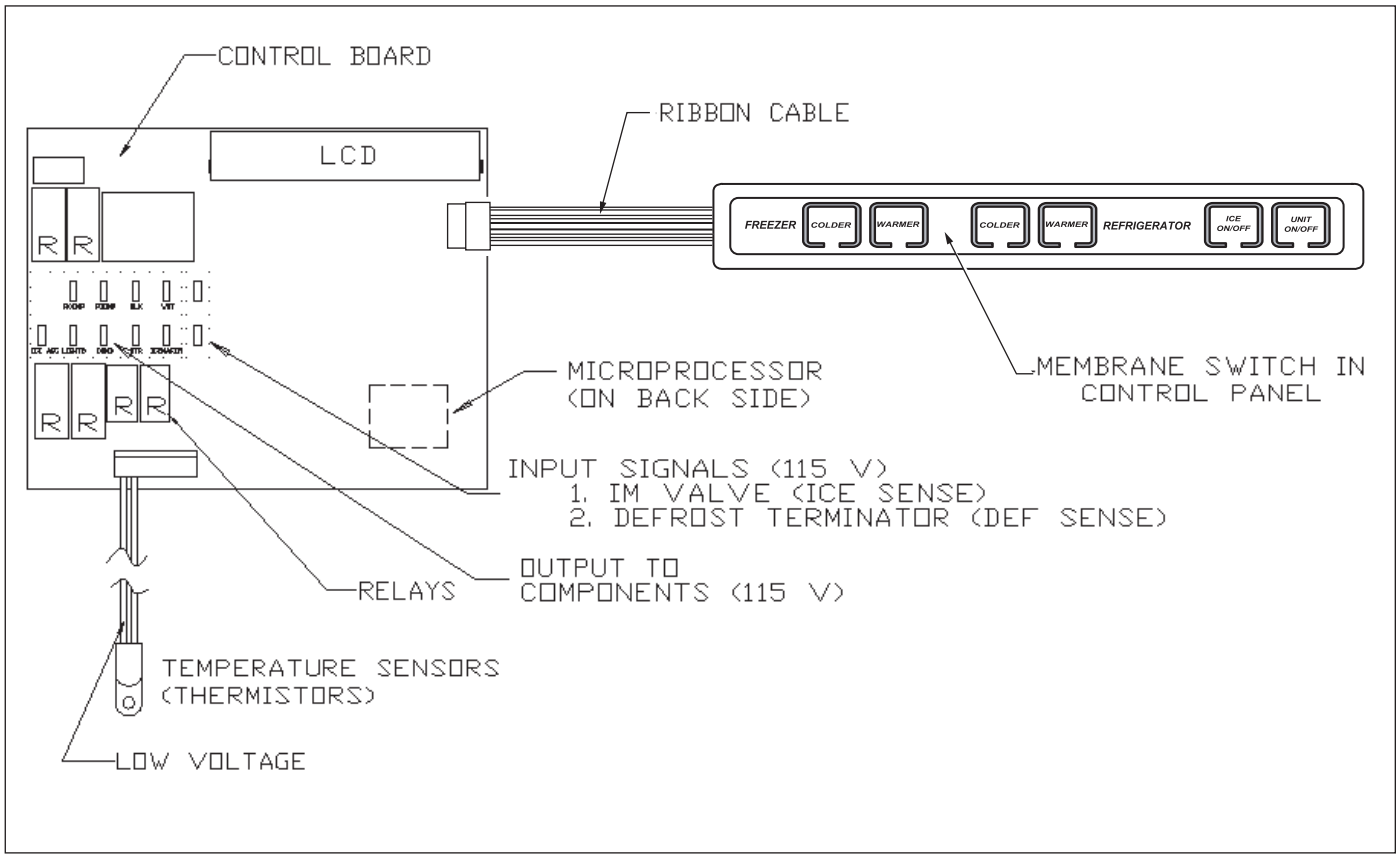


Figure 3-1. Basic Electronic Control System

Control Board Summary / Layout

The electrical connection points on the control board are labeled, indicating which components are connected at which connection points. Below is a layout diagram of the control board, followed by a summary table.

NOTE: *All components on the control board are non-replaceable.*

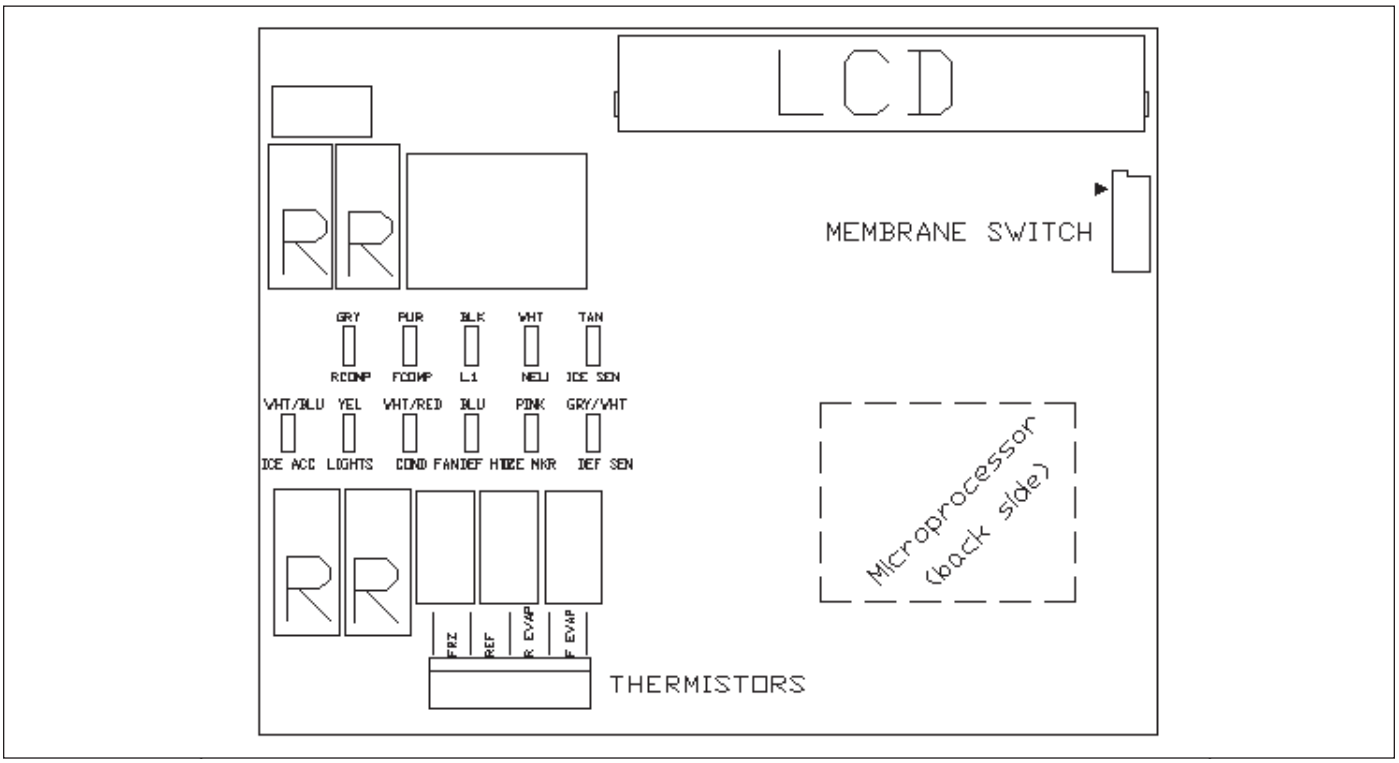


Figure 3-2. Control Board Diagram

CIRCUIT	DESCRIPTION	FUNCTION	COLOR
	120 VOLT CIRCUITS		
RCOMP	REFRIGERATOR COMPRESSOR	POWERS REFRIG. COMPRESSOR	GRAY
FCOMP	FREEZER COMPRESSOR	POWERS FREEZER COMPRESSOR	PURPLE
L1	POWER IN	POWER INTO BOARD	BLACK
NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
ICE SEN	ICE MAKER VALVE	SENSES WATER VALVE ACTIVATION	TAN
ICE ACC	ICE MAKER ACCESSORIES (FILL TUBE)	POWERS FILL TUBE AND ACCESSORIES	WHITE / BLUE
LIGHTS	LIGHTS	POWERS LIGHTS	YELLOW
COND FAN	CONDENSER FAN	POWERS CONDENSER FAN	WHITE / RED
DEF HTR	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
ICE MKR	ICEMAKER	POWERS ICEMAKER	PINK
DEF SEN	DEFROST SENSE - TERMINATOR	SENSES WHEN HEATER SHUTS OFF	GRAY / WHITE
	THERMISTOR CIRCUITS		
FRZ	FREEZER COMPARTMENT	INPUT TO BOARD FOR TEMP. CONTROL	BLU / BLK
REF	REFRIGERATOR COMPARTMENT	INPUT TO BOARD FOR TEMP. CONTROL	BLU / WHT
R EVAP	REFRIGERATOR EVAPORATOR	CONTROLS OFF-CYCLE DEFROST	BLU / YEL
F EVAP	FREEZER EVAPORATOR	SERVICE DIAGNOSTICS ONLY	BLU / RED

Figure 3-3. Control Board Summary Table

Basic Input Operations

This section illustrates the basic input operations performed at the control panel. Switching the unit on & off, temperature adjustment, and switching the icemaker system on & off will be explained.

POWER ON/OFF

All 600 Series units arrive in Off Mode, and "OFF" is visible on the LCD. By pressing the UNIT ON/OFF key at this time (See Figure 3-4.), "OFF" disappears from the LCD as power is allowed past the control board to the rest of the unit, and the compartment temperatures are displayed.

NOTE: *Whenever the last stroke of the UNIT ON/OFF key is off, "OFF" will be visible on the LCD.*

⚠ WARNING

When in OFF mode, 115 Volts are still present at the control board.

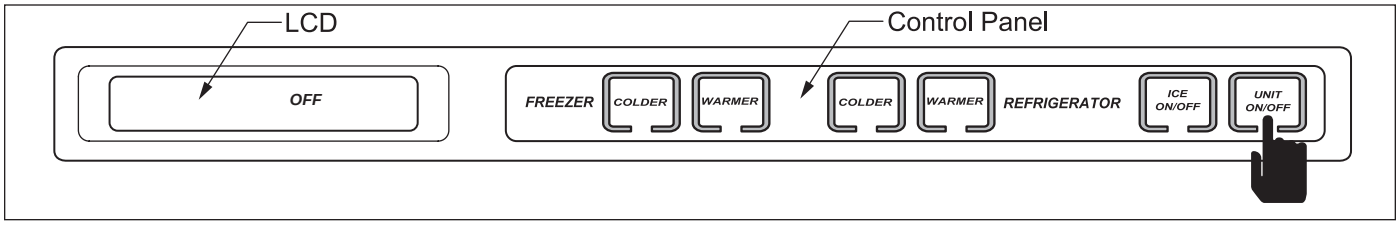


Figure 3-4. Unit Power ON/OFF

TEMPERATURE ADJUSTMENT (ADJUSTING SET-POINT)

To adjust the compartment temperature, press the WARMER or COLDER keys on the control panel in multiple key strokes until the desired set-point is achieved. One key stroke equals a 1° F change. (See Figure 3-5.)

NOTE: ***Freezer*** *temperature range is -5° F to +5° F, with an initial Set Point of 0° F; Refrigerator temperature range is 34° F to 45° F, with an initial Set Point of 38° F.*

NOTE: *Set-point will be displayed for 10 seconds after the last WARMER or COLDER key stroke, then the compartment temperature will appear. As the compartment temperature changes, the temperature displayed on the LCD will change, by no more than 1° F per minute.*

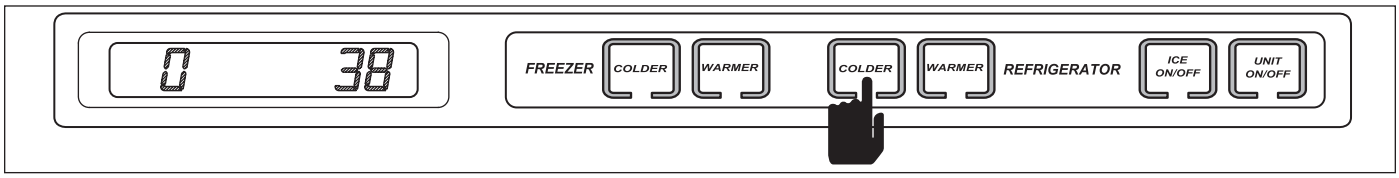


Figure 3-5. Temperature Adjustment

Icemaker System ON/OFF

All 600 Series units arrive with the icemaker system off. By pressing the ICE ON/OFF key at this time, power is allowed to the icemaker system, and "ICE" is displayed on the LCD. (See Figure 3-6.)

NOTE: *Also see "Sabbath Mode" in UNIQUE INPUT OPERATIONS section.*

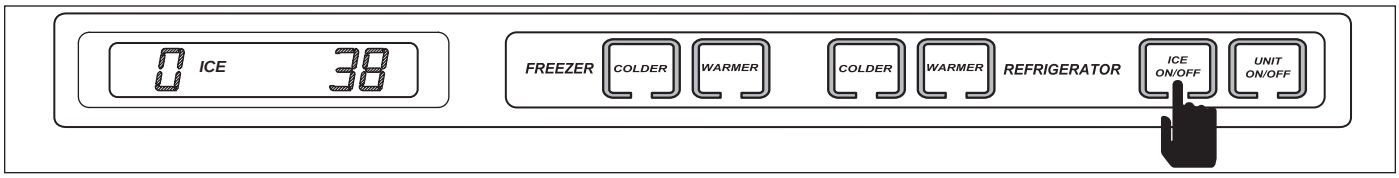


Figure 3-6. Icemaker System ON/OFF

UNIQUE INPUT OPERATIONS

This section illustrates electronic control input operations not associated with typical unit function.

Show Room Mode

Showroom Mode was incorporated into the electronic control system so these appliances could be displayed in a showroom setting. With power to the unit, initiate showroom mode by pressing the UNIT ON/OFF key so that “OFF” is appears on the LCD. With “OFF” displayed, press and hold the WARMER, COLDER keys, then the UNIT ON/OFF key (See Figure 3-7). This disables all but the lighting system. To return to normal operating condition, repeat the above steps.

NOTE: *Always recheck set-points after returning unit to normal operating condition.*

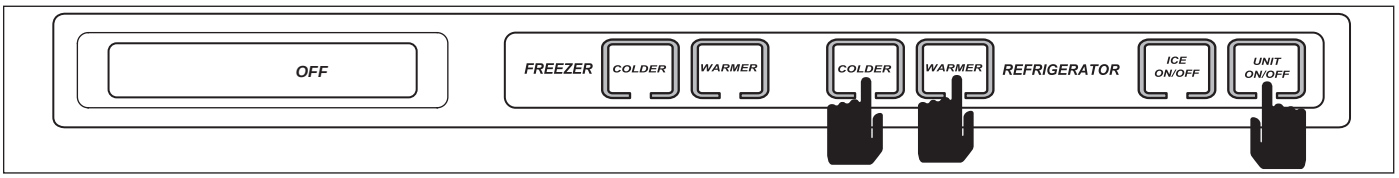


Figure 3-7. Show Room Mode - Press UNIT ON/OFF Key.
Then, Press and Hold WARMER, COLDER Keys, then Press the UNIT ON/OFF Key.

Sabbath Mode

Sabbath Mode was incorporated into the electronic control sysyem for the observence of certain religeous days. Sabbath Mode disables the lights and icemaker switches. With the unit on, initiate Sabbath Mode by pressing the UNIT ON/OFF key so that OFF is displayed on the LCD. Then press and hold the UNIT ON/OFF key for 10 seconds (See Figure 3-8). To return unit to normal operating condition, press and release the UNIT ON/OFF key.

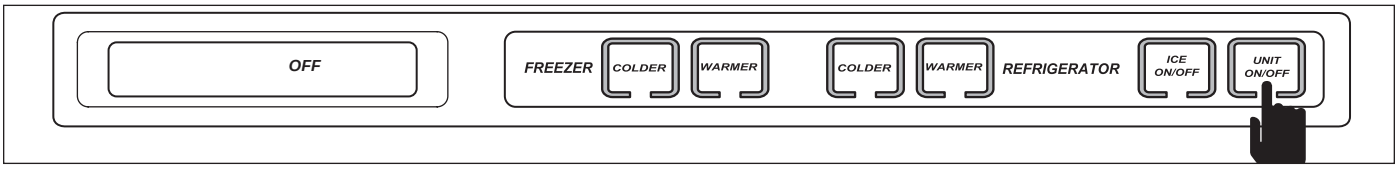


Figure 3-8. Sabbath Mode - Press and Hold for 10 Seconds

FUNCTIONS OF ELECTRONIC CONTROL SYSTEM

This section covers the monitoring, regulating and controlling functions of the electronic control system.

NOTE: *All electronic control system functions described in this section are normal operation only. Malfunctions will be covered in later sections.*

Supply Power to the Lighting System

115 Volts is supplied to the lighting system through the control board. (See Figure 3-9)

NOTE: *Disabling the lighting system (Sabbath Mode) is covered in the UNIQUE INPUT OPERATIONS section.*

⚠ WARNING

When in OFF mode, 115 Volts are still present at the control board.

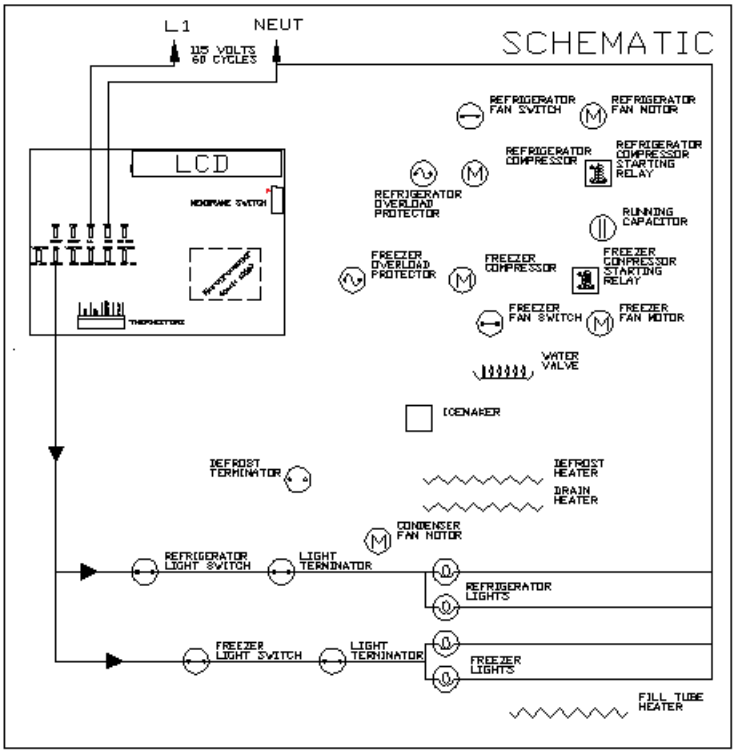


Figure 3-9. Lighting System Signal Trace

Control Condenser Fan Operation (Models 611, 632, 642, 650, 690)

NOTE: *Power to the condenser fan on models 601R and 601F is supplied direct from the compressor.*
The microprocessor senses the 115 volt output supplied to both compressors. If either compressor is running, a signal is sent to the condenser fan relay on the control board to close, supplying power to the condenser fan. If both compressors are off, the condenser fan is off. (See Figure 3-10)

NOTE: *The condenser fan will run 100% if the VACUUM CONDENSER indicator is activated, This will be discussed in MONITORS COMPRESSOR RUN DURATION.*

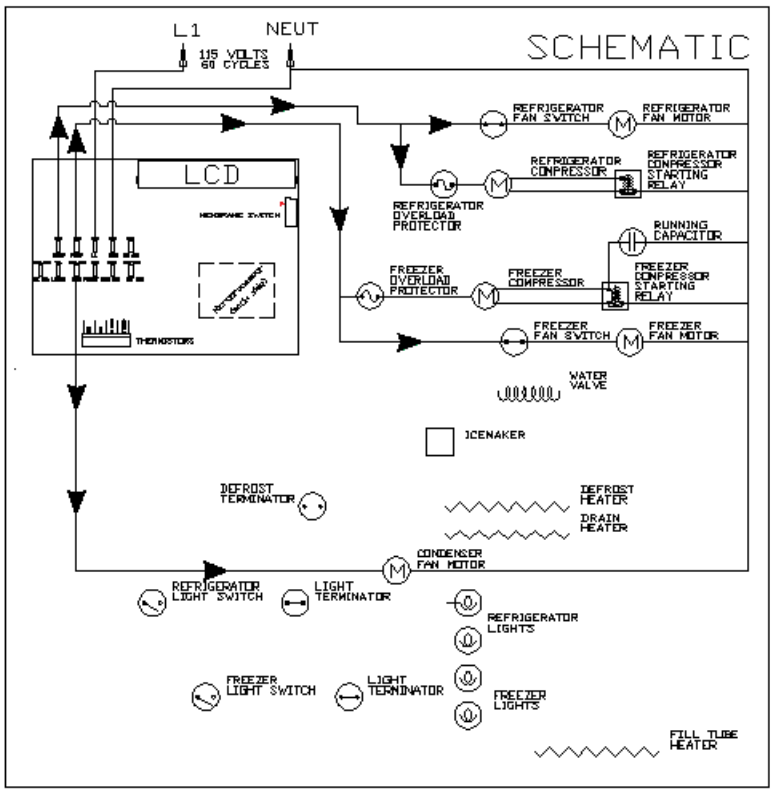


Figure 3-10. Condenser Fan Power Signal Trace

Monitor, Display and Regulate Temperatures

The temperature signal from the thermistor in the refrigerator and/or freezer compartment is monitored by the microprocessor, and displayed on the LCD. Though the compartment air temperature does fluctuate, the LCD displays the average temperature. (See Figure 3-11) When the compartment temperature reaches high offset, the signal is sent to the compressor relay on the control board to close. This allows power to be supplied to the compressor and evaporator fan, which cycle on. (See Figure 3-12) As the compressor and evaporator fan run, the compartment temperature drops. When the compartment temperature reaches low offset, the signal is sent to the compressor relay on the control board to open. This interrupts power to the compressor and evaporator fan, cycling them off.

NOTE: *If the compartment temperature should ever exceed either the high offset or low offset (for example: when a door is left open), the temperature displayed on the LCD will change by one degree per minute.*

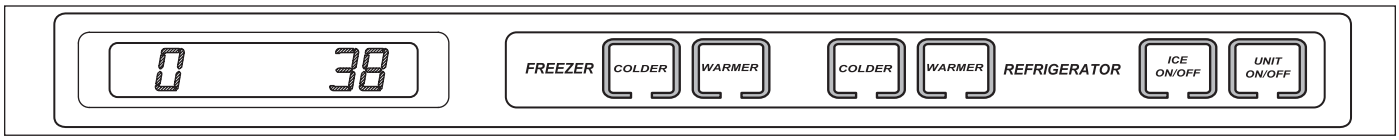


Figure 3-11. Temperature Display

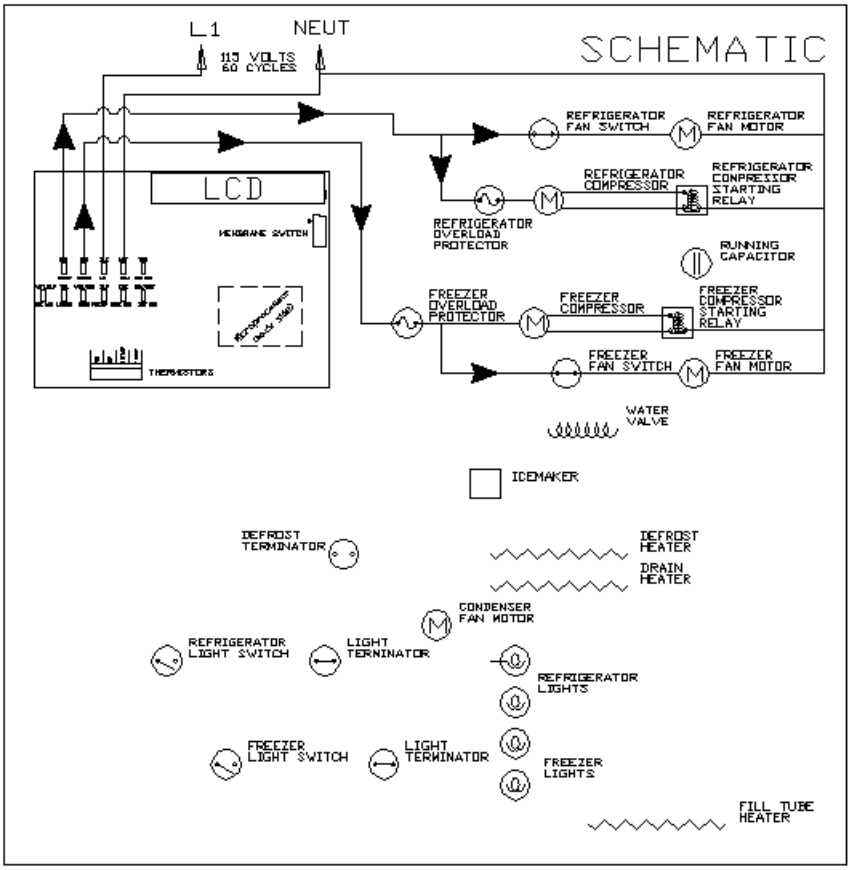


Figure 3-12. Compressor Power Signal Trace

Monitor and Control Rerigerator Off-cycle Defrost

Temperature signals from the refrigerator compartment thermistor and evaporator thermistor are monitored by the microprocessor. If the compartment temperature reaches high offset before the evaporator rises to 38°F, the command to start the compressor will wait, allowing the evaporator to fully defrost before the compressor is energized. (See Figure 3-13)

Monitor and Control Freezer "Adaptive Defrost"

Initially the freezer compressor in a 600 Series unit will cycle-run for 12 hours, after which the microprocessor sends the signal to the defrost relay on the control board to close. This supplies power to the defrost heater, and the compressor is switched off. (See Figure 3-14) With the "Adaptive Defrost" technique, the length of time that the heater actually stays on to defrost the evaporator and satisfy the defrost terminator is observed by the microprocessor. The microprocessor then determines the number of hours before the next defrost. If the heater stays on for a shorter time than specified, the microprocessor increases the next defrost interval. If the heater stays on longer than specified, the electronic control decreases the next defrost interval. This is an ongoing process whereby the defrost time and the defrost interval will vary by unit use.

NOTE: *A five (5) minute delay/dwell follows all defrosts.*

NOTE: *Minimum defrost interval = six (6) hours; Maximum defrost duration = twenty-five (25) minutes.*

Initiating Freezer Manual Defrost

To manually initiate freezer evaporator defrost, press and hold the ICE key at the control panel for ten seconds. (See Figure 3-15).

NOTE: *To observe the initiation of manual defrost, "ICE" must be displayed on the LCD. Then press and hold the ICE key for ten seconds. At first, "ICE" will disappear. After ten seconds of holding the ICE key, "ICE" will appear again, indicating manual defrost has begun.*

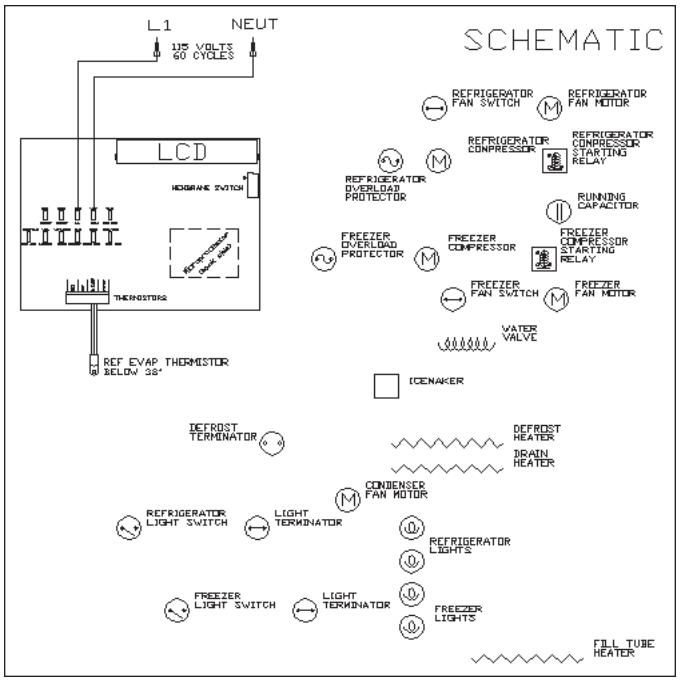


Figure 3-13. Refrigerator Compressor OFF

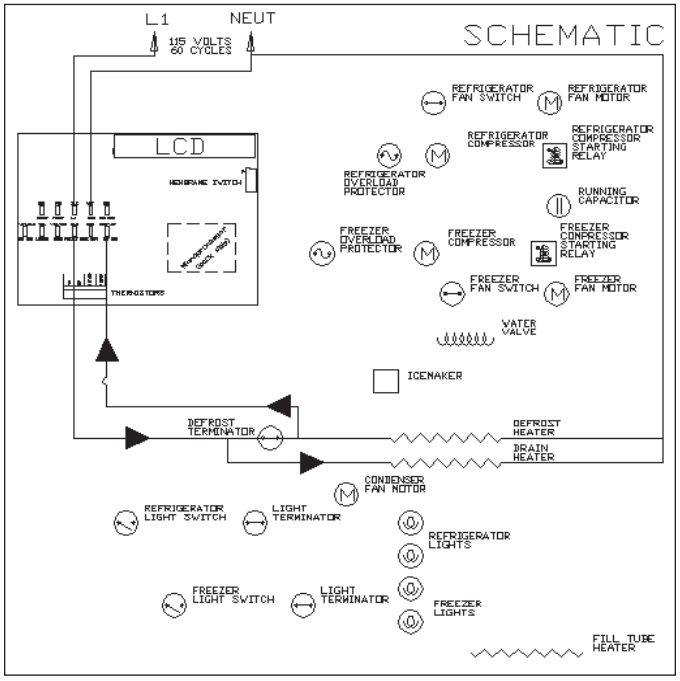


Figure 3-14. Defrost Heater Signal Trace

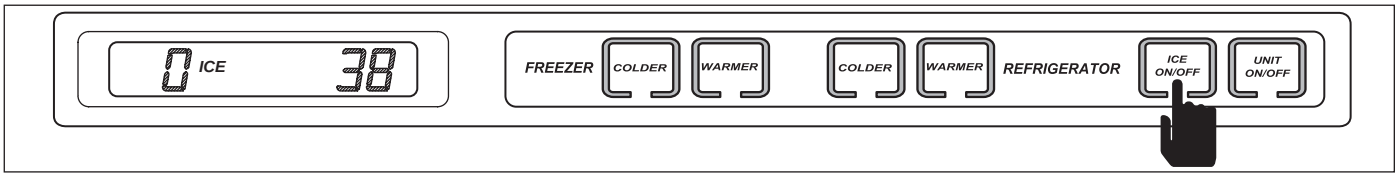


Figure 3-15. Push and Hold ICE Key for 10 Seconds to initiate Manual Defrost

Monitor Icemaker System and Display If Service Is Needed.

The microprocessor monitors the voltage supplied to the icemaker water valve (See Figure 3-16). If the water valve is energized for more than fifteen (15) seconds, power to the icemaker system is interupted, and a signal is sent to the SERVICE and ICE indicators on the LCD to flash (See Figure 3-17).

NOTE: *To allow ice to freeze fully and reduce effects of low water pressure, the electronic control system disables the icemaker system for 45 minutes after each ice harvest.*

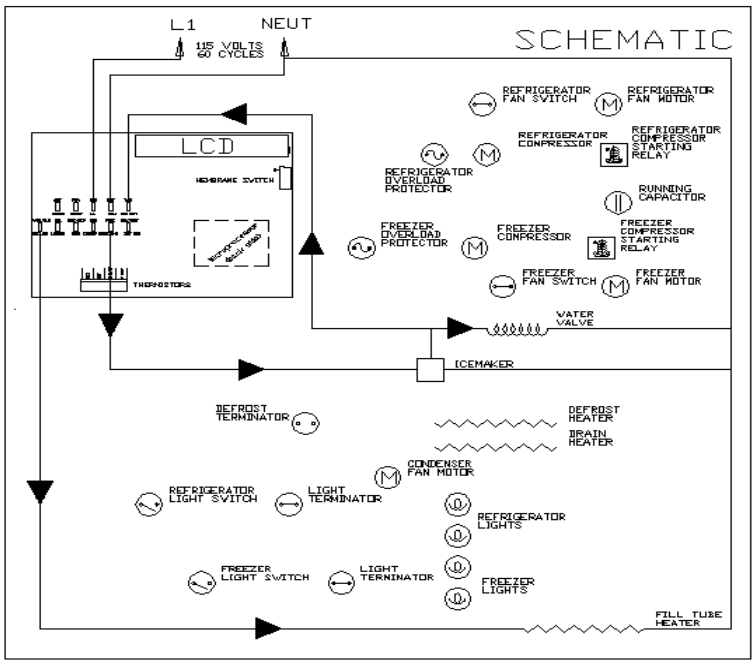


Figure 3-16. Water Valve Monitored.

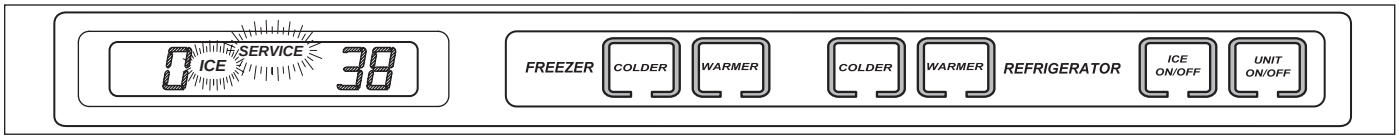


Figure 3-17. ICE and SERVICE Indicators Flashing = Water Valve Energized Too Long

Monitor Compressor Run Duration, Displays If Service, or Condenser Cleaning Is Needed

The microprocessor senses the 115 volt output supplied to both compressors, monitoring the length of compressor run time (See Figure 3-18).

If several excessive compressor run periods occur, the microprocessor closes the condenser fan relay on the control board, allowing the condenser fan to run 100%. A signal is then sent to the VACUUM CONDENSER indicator on the LCD to flash (See Figure 3-19).

NOTE: *Please keep in mind that a flashing VACUUM CONDENSER indicator is caused by excessive compressor run, which could be related to problems other than a dirty condenser. This will be covered in the TROUBLESHOOTING GUIDE.*

NOTE: *After correcting the cause of the error, the unit must be switched OFF, and back ON to clear the error indicator.*

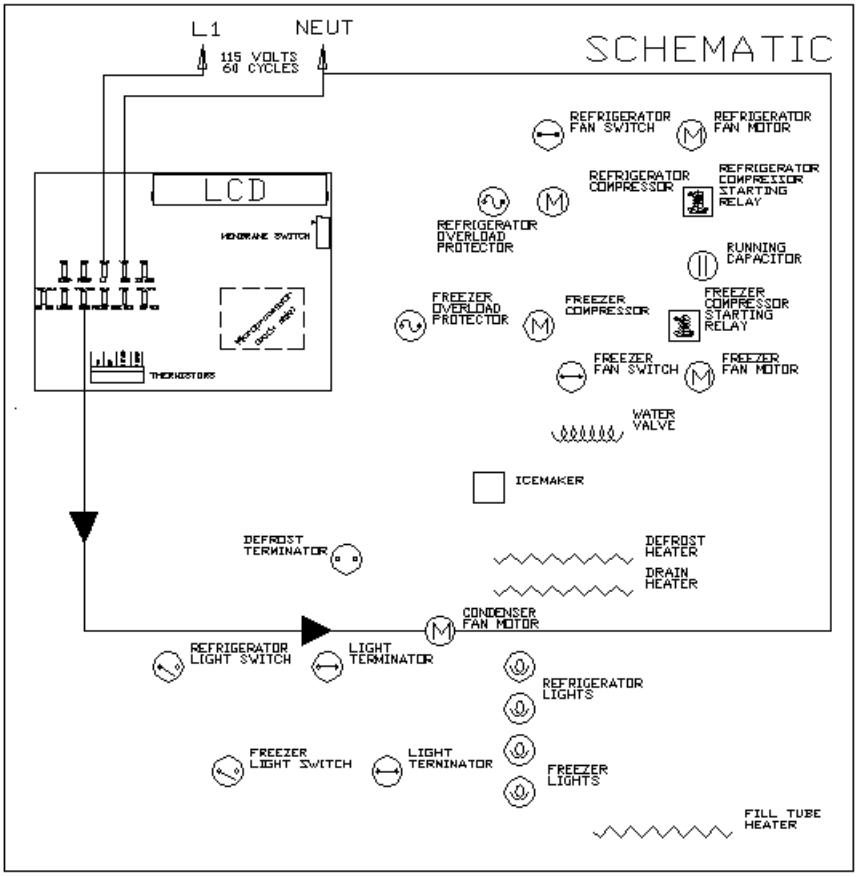


Figure 3-18. Compressor Run-Time Sensed

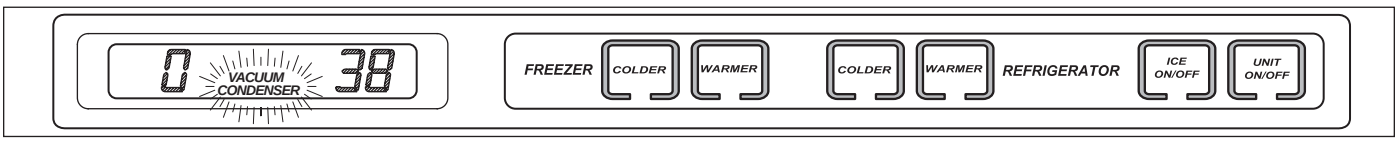


Figure 3-19. VACUUM CONDENSER Indicator Flashing = Excessive Compressor Run

POSSIBLE ERROR DISPLAYS

The diagrams below illustrate what a customer may see on the LCD if there is a problem/error with the unit. Below each diagram is a description of what could be causing the error indicator. (See Figures 3-20 through 3-24.)

NOTE: *"EE" indicates a thermistor error.*

NOTE: *To clear an error display, the cause must be corrected, then the unit switched off and back on with the UNIT ON/OFF key.*

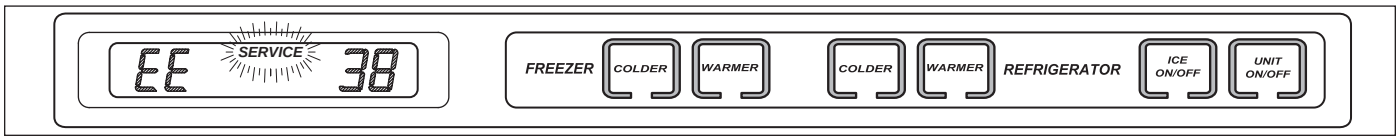


Figure 3-20. "EE" Displayed for Freezer Temp. with "SERVICE" Flashing = Freezer Compartment Thermistor Faulty

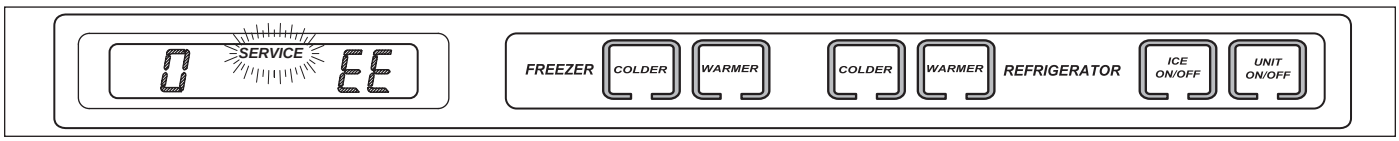


Figure 3-21. "EE" Displayed for Refrigerator Temp. with "SERVICE" Flashing = Refrigerator Compartment Thermistor Faulty

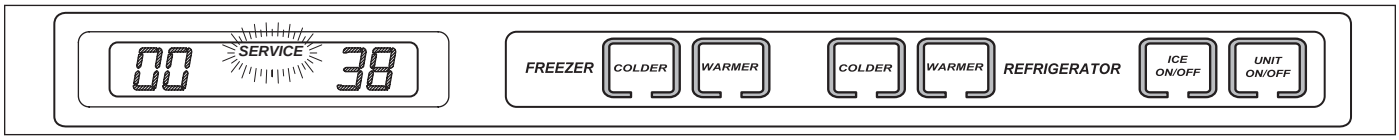


Figure 3-22. Freezer and Refrigerator Temps OK with "SERVICE" Flashing = Refrigerator Evaporator Thermistor Faulty or Line Separated

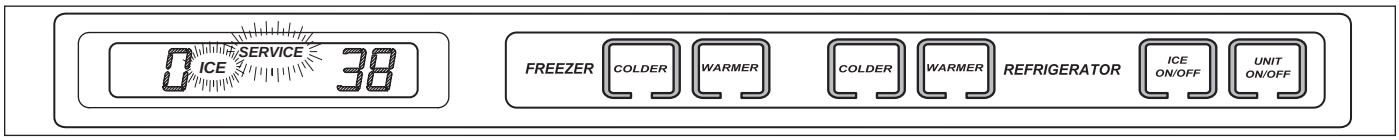


Figure 3-23. Freezer and Refrigerator Temps OK with "SERVICE" and "ICE" Flashing = Water Valve Energized Too Long

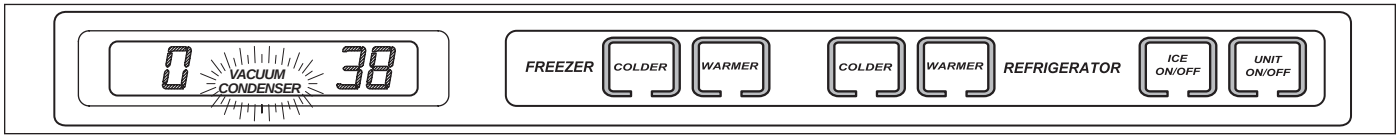


Figure 3-24. "VACUUM CONDENSER" Flashing = Excessive Compressor Run, Possible Condenser Cleaning Needed, but Could Be a Result of Other Problems Which Cause Excessive Compressor Run

NOTE: *To clear error indicators, the cause must be corrected and the unit must be switched off, then back on using the UNIT ON/OFF key.*

DIAGNOSTIC MODE PROCEDURES

Diagnostic Mode was incorporated into the electronic control system to help troubleshoot various electrical, mechanical and sealed system components. This section explains Diagnostic Mode and illustrates the operations performed at the control panel for troubleshooting purposes.

Follow the steps below to initiate and use the Diagnostic Mode.

1. To initiate diagnostic mode, press and hold either COLDER key, then press the UNIT ON/OFF key. All indicators on the LCD will light-up, indicating diagnostic mode is now active. Thehe first reading on the LCD will be the freezer compartment temperature (See Figure 3-25).

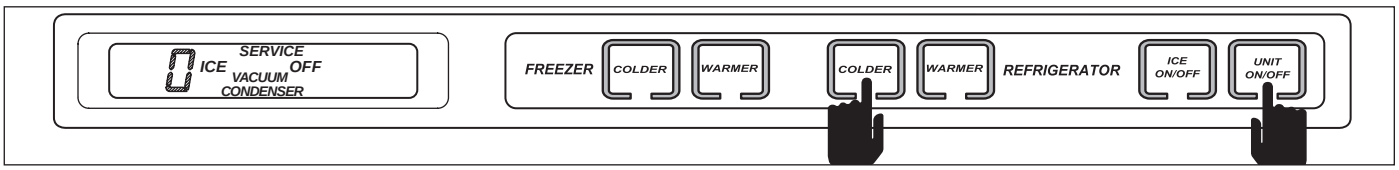


Figure 3-25. Initiating Diagnostic Mode - Press Either COLDER Key and UNIT ON/OFF Key simultaneously

2. Press the UNIT ON/OFF key at this time to display the location of the thermistor being read, “F” represents the freezer compartment (See Figure 3-26).

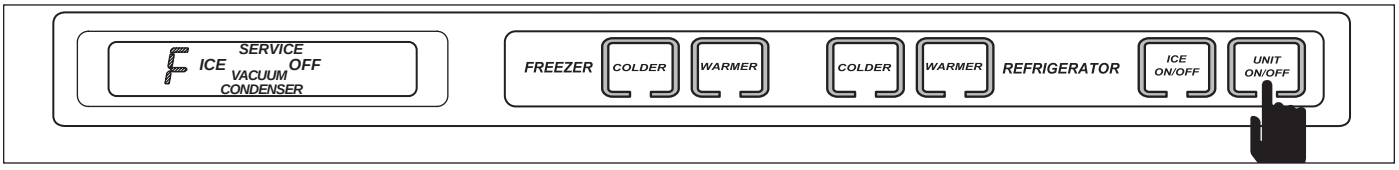


Figure 3-26. Press UNIT ON/OFF Key to Display Location of Thermistor

3. Press the COLDER key now to display the second reading, the refrigerator compartment temperature (See Figure 3-27).

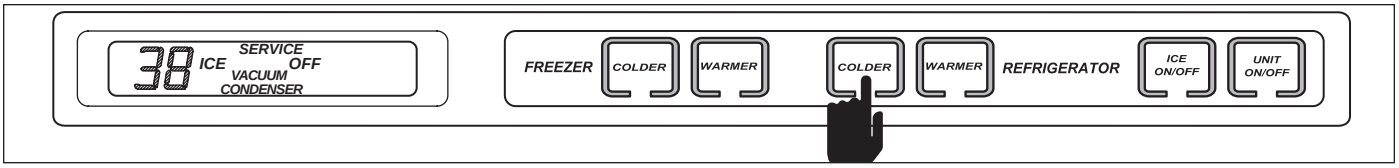


Figure 3-27. Press COLDER Key to Display Temperature Reading

4. Press the UNIT ON/OFF key at this time to display the location of the thermistor being read, “r” represents the refrigerator compartment (See Figure 3-28).

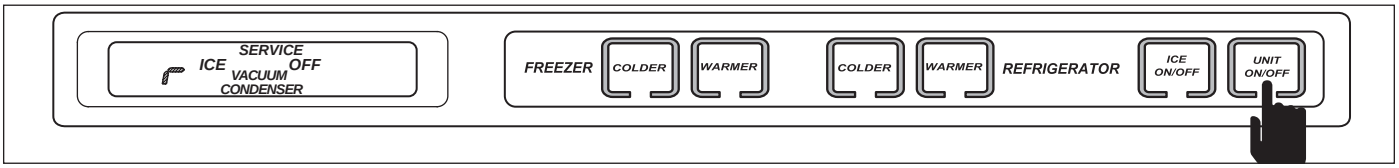


Figure 3-28. Press UNIT ON/OFF Key to Display Location of Thermistor

5. Press the COLDER key now to display the third reading, which will be the refrigerator evaporator temperature (See Figure 3-31).

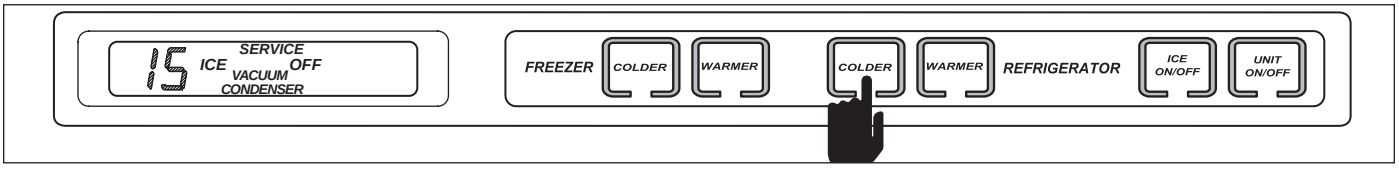


Figure 3-29. Press COLDER Key to Display Temperature Reading

6. Press the UNIT ON/OFF key at this time to display the location of the thermistor being read, “rE” represents the refrigerator evaporator temperature (See Figure 3-30).

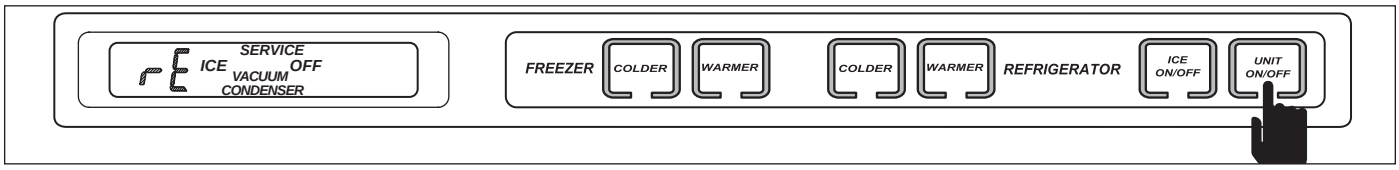


Figure 3-30. Press UNIT ON/OFF Key to Display Location of Thermistor

7. Press the COLDER key now to display the fourth reading, which will be the freezer evaporator temperature (See Figure 3-31).

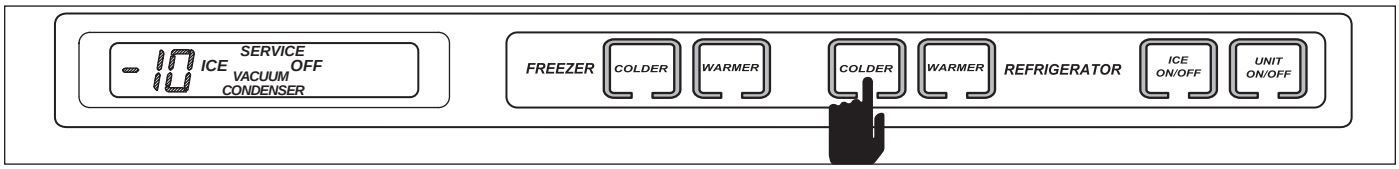


Figure 3-31. Press COLDER Key to Display Temperature Reading

8. Press the UNIT ON/OFF key at this time to display the location of the thermistor being read, “FE” represents the freezer evaporator (See Figure 3-32).

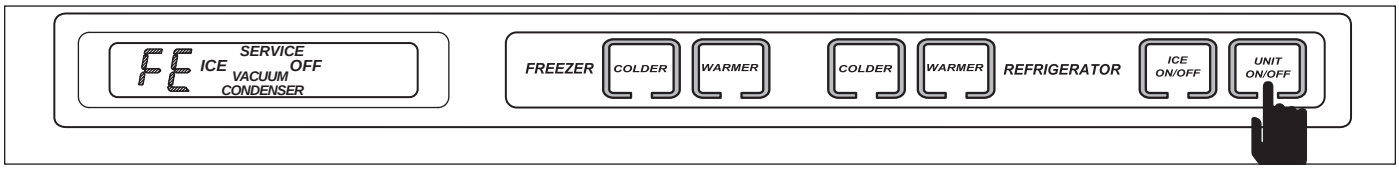


Figure 3-32. Press UNIT ON/OFF Key to Display Location of Thermistor

9. Press the COLDER key now to display the fifth reading. This fifth reading should be “00” because it is inactive. This area of the electronic control system is intended for possible future use (See Figure 3-33).

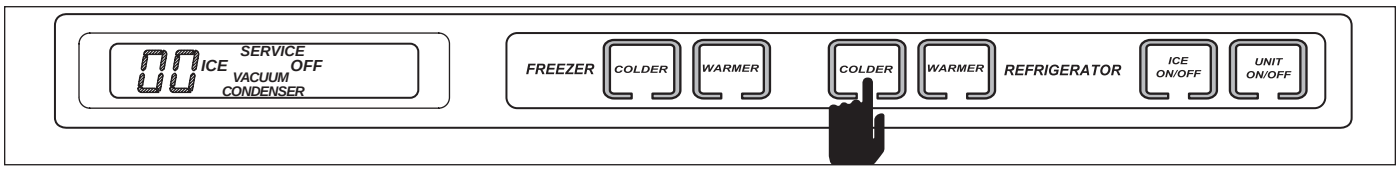


Figure 3-33. Press COLDER Key to Display Last Reading

10. Pressing the UNIT ON/OFF key at this time should display “IL” representing the inactive line (See Figure 3-34).

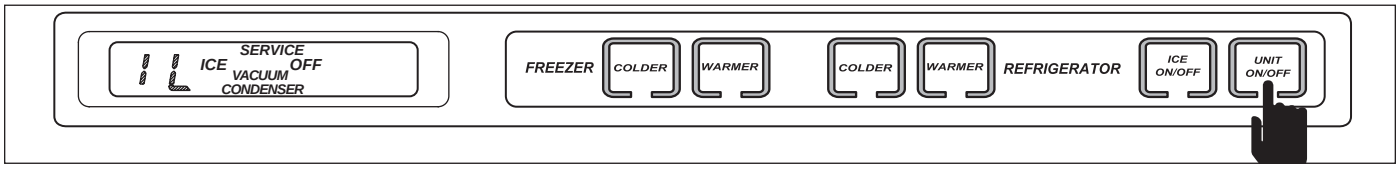


Figure 3-34. Press UNIT ON/OFF Key to Display Inactive Line

Thermistor Error Indicator

1. While in diagnostic mode, If “EE” is displayed in place of a temperature reading, the thermistor in that location is either faulty or the electrical line is separated. (In this example, the refrigerator evaporator thermistor is faulty.) (See Figure 3-35)
2. Press the UNIT ON/OFF key at this time to determine which thermistor is faulty or line separated. *(In this example, the refrigerator evaporator thermistor is faulty.)* (See Figure 3-36)

NOTE: *The electronic control will exit diagnostic mode ten (10) seconds after the last key stroke.*

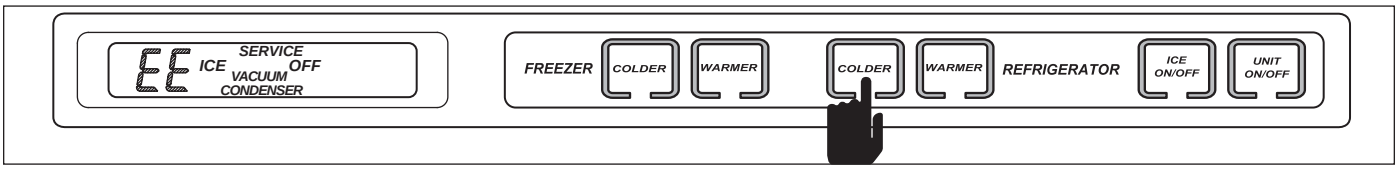


Figure 3-35. While in Diagnostic Mode Press COLDER Key

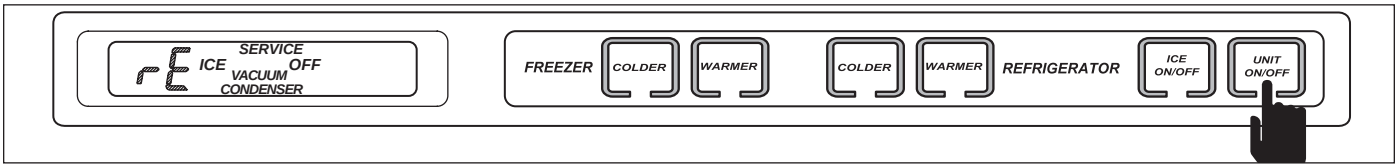


Figure 3-36. Press UNIT ON/OFF Key to Display Location of Thermistor

DIAGNOSTIC MODE SEQUENCE

For the models 611, 632, 642, 650 and 690, the diagnostic mode sequence is:

First: *(“F”) Freezer Compartment*
Second: *(“r”) Refrigerator Compartment*
Third: *(“rE”) Refrigerator Evaporator*
Fourth: *(“FE”) Freezer Evaporator*
Fifth: *(“IL”) Inactive Line*

For the model 601R, the diagnostic mode sequence is:

First: *(“r”) Refrigerator Compartment*
Second: *(“rE”) Refrigerator Evaporator*

For the model 601F, the diagnostic mode sequence is:

First: *(“F”) Freezer Compartment*
Second: *(“FE”) Freezer Evaporator*
Third: *(“IL”) Inactive Line*

Keeping these sequences in mind, it is not necessary to press the UNIT ON/OFF key to display the location each time after a COLDER key stroke. Pressing the COLDER key successively will display the readings in sequence, bypassing location display. Then, if location is unknown, press the UNIT ON/OFF key.

NOTE: *The electronic control will exit diagnostic mode ten seconds after the last key stroke.*

NOTE: *Always recheck set-points after performing diagnostic mode procedures.*

Using Temperatures To Troubleshoot Sealed System

To give the 600 Series a true “Sealed System”, the compressor process stub is soldered shut at the factory after the sealed system is charged. Troubleshooting the sealed system is possible without a process valve because of the 600 Series Electronic Control System. Since the evaporator temperature, compartment air temperature and sealed system pressure fluctuate harmoniously around the set-point during normal cycle of operation, troubleshooting the sealed system is accomplished by observing the evaporator temperature reading in Diagnostic Mode.

Following is a chart illustrating how evaporator temperature and compartment air temperature fluctuate harmoniously around the set-point during normal cycle of operation. Using temperatures to diagnose sealed system problems will be detailed in the *TROUBLESHOOTING GUIDE.*

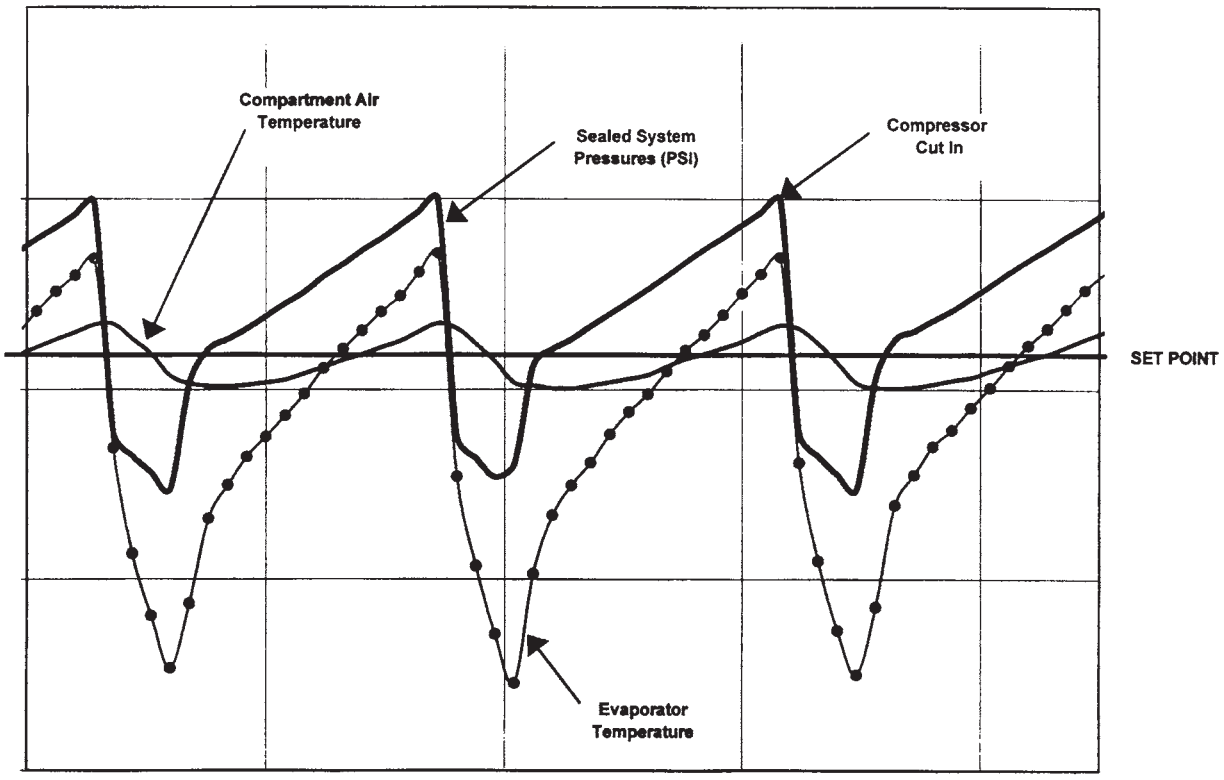


Figure 3-37. Evaporator Temp, Compartment Air Temp. and Sealed System Pressure vs. Temp. set-point During Normal Cycle of Operation

HFC-134a REFRIGERANT SERVICE INFORMATION

The 600 Series sealed systems contain HFC-134a refrigerant. This section provides general rules for working with 134a, and explains procedures to be followed while servicing the sealed system. This is followed by diagrams which illustrate sealed system operation, then model-specific refrigerant flow diagrams.

⚠ CAUTION

134a refrigerant requires Synthetic Ester oil in the compressor, and does not tolerate contamination from other refrigerants, moisture, petroleum-based lubricants, silicone lubricants, cleaning compounds, rust inhibitors, leak detection dyes, or any other type of additive.

General Rules for Working with 134a Refrigerant

- Use equipment dedicated to 134a sealed system service only.
- Use only 134a refrigerant for back-flushing and sweep charging.
- Always replace the filter-drier when servicing the sealed system.
- The filter-drier must be cut from the sealed system. Never un-braze the drier as the heat will drive moisture back into the sealed system.
- Do not leave sealed system nor replacement compressor open to the atmosphere for more than 10 minutes.
- When the rubber plugs are pulled from the service compressor, a release of pressure should be heard. If no release of pressure is heard, do not use the compressor.
- Use ONLY virgin 134a refrigerant when recharging the sealed system.

600 SERIES SEALED SYSTEM REPAIR PROCEDURES	
Problem	**Service Procedures**
Non-Operating, Inefficient, Noisy Compressor	a. Capture refrigerant b. Replace Compressor c. Replace filter-drier d. Evacuate or sweep charge system e. Recharge system with Virgin 134a refrigerant. ***NOTE**: To check for a non-operating compressor, a hard start kit can be used.*
High Side leak	a. Capture refrigerant. b. Repair leak. c. Replace filter-drier. d. Evacuate or sweep charge system. e. Recharge system with Virgin 134a refrigerant.
Low Side Leak	a. Capture refrigerant. b. Repair leak (if at solder joint) or replace part. c. Back flush high side of sealed system. d. If all refrigerant has escaped & system is in vacuum, replace compressor e. Replace filter-drier. f. Evacuate or sweep charge system. g. Recharge system with Virgin 134a refrigerant.
Contaminated Sealed System *Examples:* > *Burned out compressor* > *Excessive moisture from leak in condensate loop or in low side* > *Plugged capillary tube*	a. Capture refrigerant. b. Repair leak (if at solder joint) or replace part. c. Back flush high side of sealed system. d. Replace compressor. e. Replace filter-drier. f. Replace heat exchanger if cap tube is clogged. g. Install a low side drier on suction line. h. Evacuate or sweep charge sealed system. i. Recharge with Virgin 134a refrigerant.
Restriction ***NOTE**: If restriction is due to sealed system being contaminated, see Contaminated Sealed System above.*	a. Capture refrigerant. b. Locate and remove restriction or locate and replace part. c. Back flush high side of sealed system. d. Replace filter-drier. e. Evacuate or sweep charge system. f Recharge system with Virgin 134a refrigerant.
Overcharge	a. Capture refrigerant. b. Replace filter-drier. c. Evacuate or sweep charge system. d. Recharge system with Virgin 134a refrigerant.

SEALED SYSTEM OPERATION

The following six diagrams illustrate a basic sealed system. The components are listed in order of refrigerant flow, with an explanation of their fundamental role as part of a sealed system. ***NOTE:*** *These illustrations do not represent any specific 600 Series sealed system.*

Compressor (Figure 4-1)
The compressor creates a high side and low side pressure difference in the sealed system by compressing the refrigerant gas, thus raising the pressure and temperature. The compressor pushes this high-pressure/high-heat gas through the door gasket seat heater loop to prevent sweating (on most units the gas also travels through drain pan heater tubing to help evaporate water in the drain pan). The high-pressure/high-heat gas then travels to the condenser.

Condenser (Figure 4-2)
The high-pressure/high-heat gas travels through the condenser, where the heat is dissipated by cooler air being drawn over the condenser tubing by the condenser fan. This changes the gas into a high-pressure/warm liquid that then enters the high-side filter-drier.

High-Side Filter-Drier (Figure 4-3)
The high-pressure/warm liquid travels through the high-side filter-drier, which removes moisture from the refrigerant before it enters the capillary tube.

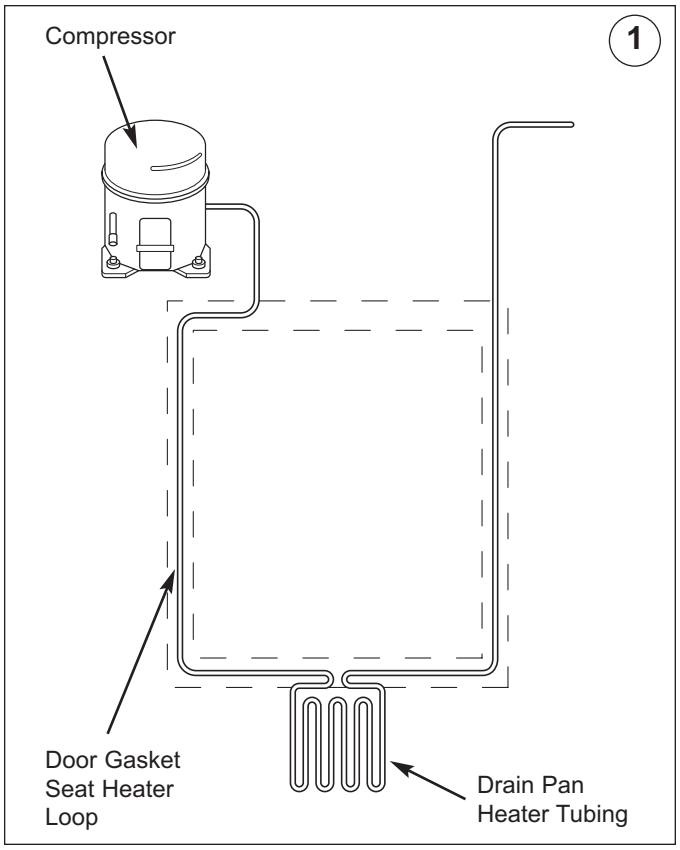


Figure 4-1. Compressor

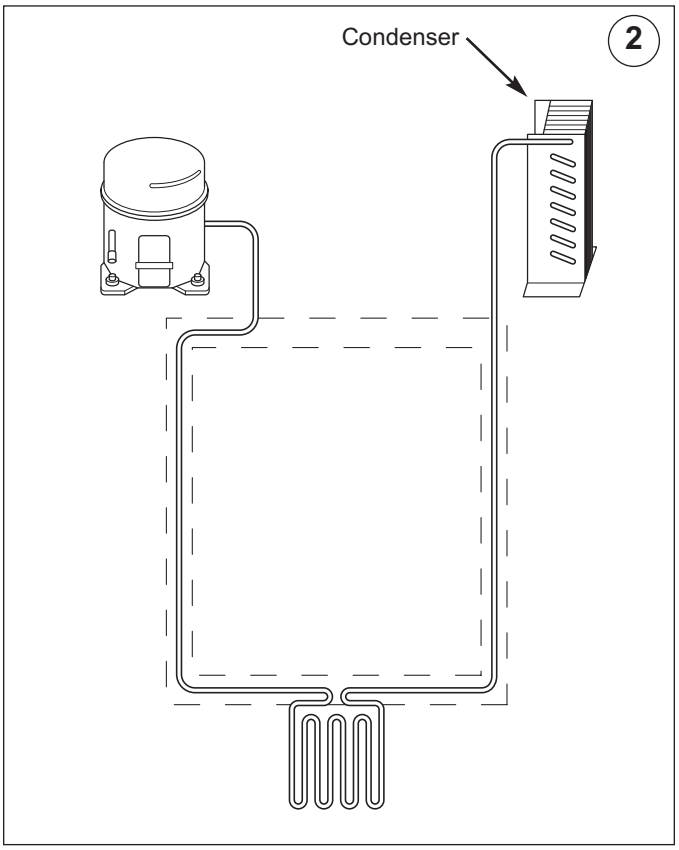


Figure 4-2. Condenser

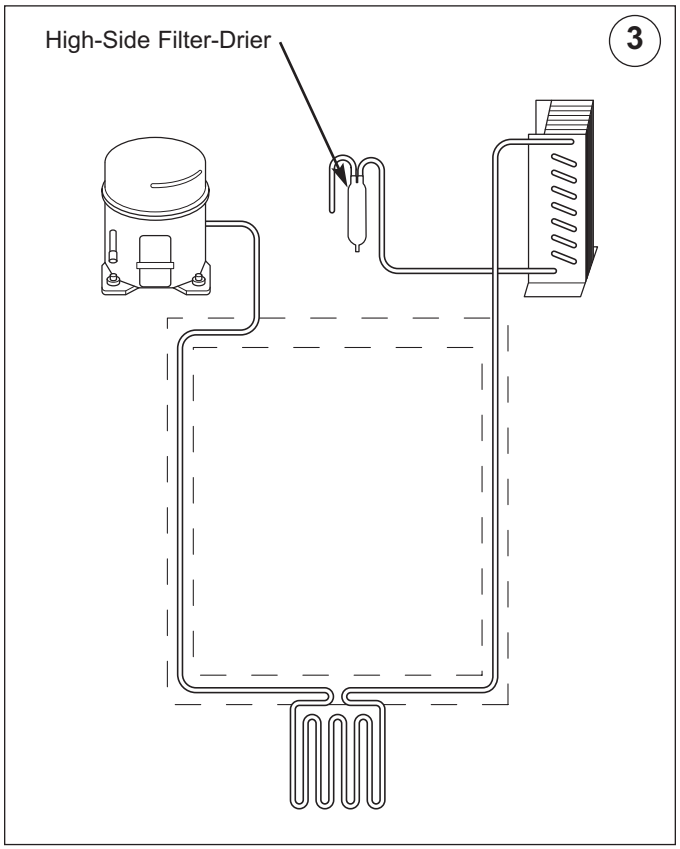


Figure 4-3. High-Side Filter-Drier

Capillary Tube (Part of Heat Exchanger) (Figure 4-4)
The high-pressure/warm liquid refrigerant travels through the long skinny capillary tube which is attached to the suction line. (These two tubes soldered together create the heat exchanger.) As the high-pressure/warm liquid refrigerant travels through the capillary tube it gives up heat to the cool refrigerant gas traveling through the suction line and the pressure drops, so it is a low-pressure/cool liquid before it enters the evaporator.

Evaporator (Figure 4-5)
As the low-pressure/cool liquid refrigerant enters the evaporator, it vaporizes. This is caused by a dramatic pressure change which occurs when the refrigerant enters the larger diameter evaporator tubing from the smaller diameter capillary tubing. This vapor travels through the evaporator absorbing heat from the compartment, gradually converting it to a cool gas. This cool gas then enters the suction line.

Suction Line (& Heat Exchanger) (Figure 4-6)
The cool gas travels through the suction line which is attached to the capillary tube. (As mentioned earlier, these two tubes soldered together create the heat exchanger.) As this cool refrigerant gas travels through the suction line it absorbs heat from the warm liquid refrigerant traveling through the capillary tube, making it a luke warm gas. The lukewarm refrigerant gas returns to the compressor where the process begins again.

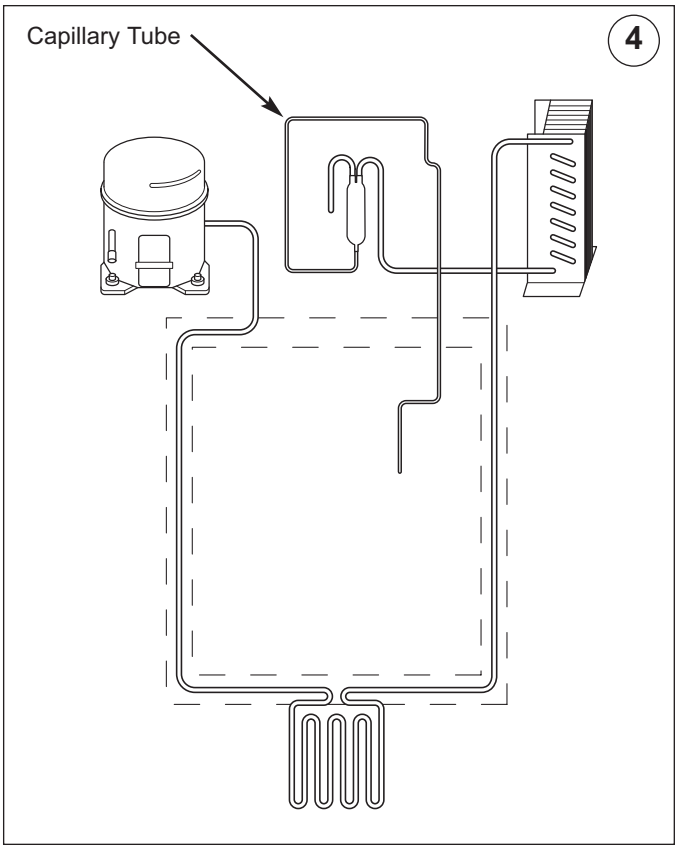


Figure 4-4. Capillary Tube (Part of Heat Exchanger)

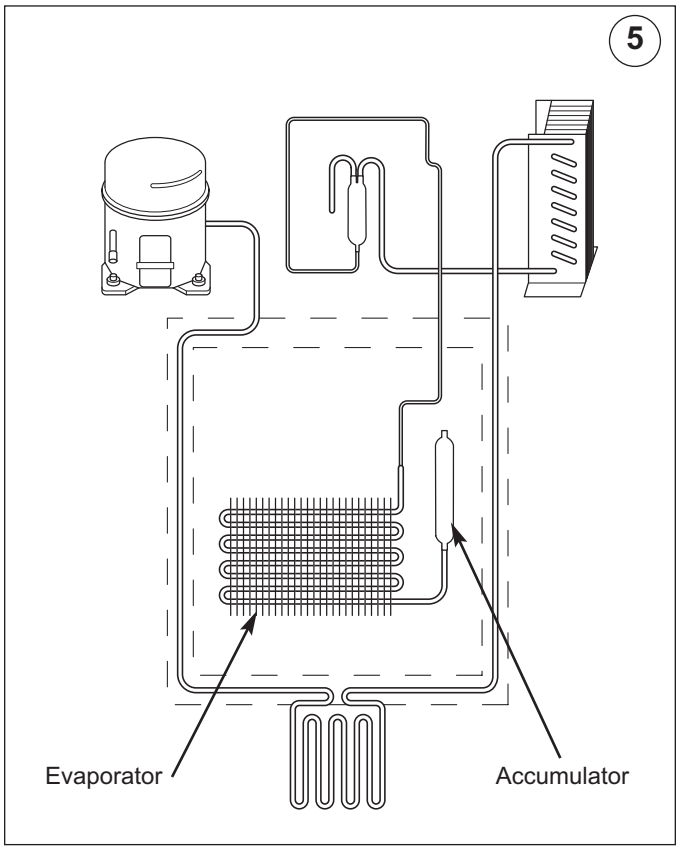


Figure 4-5. Evaporator

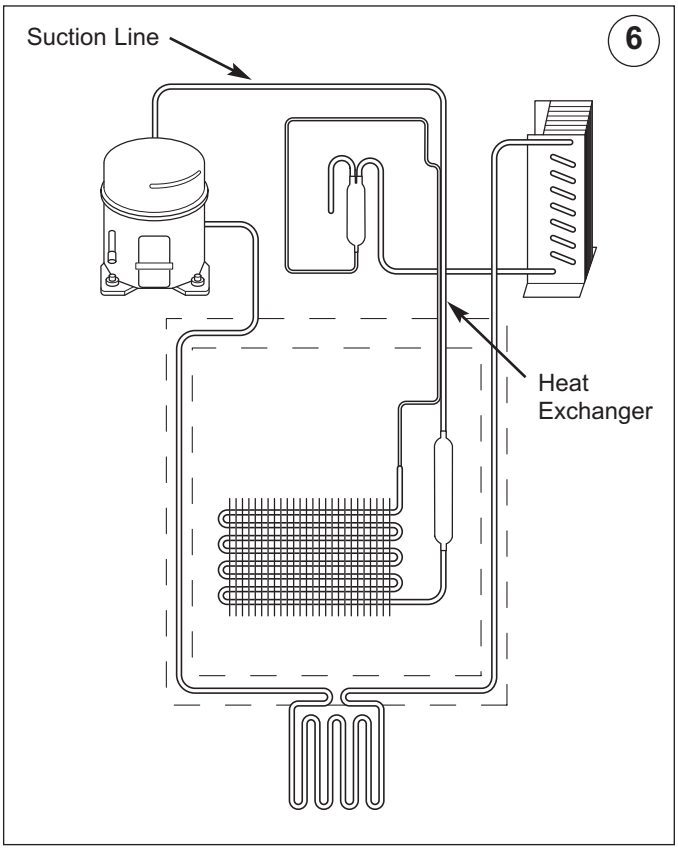


Figure 4-6. Suction Line (Part of Heat Exchanger)

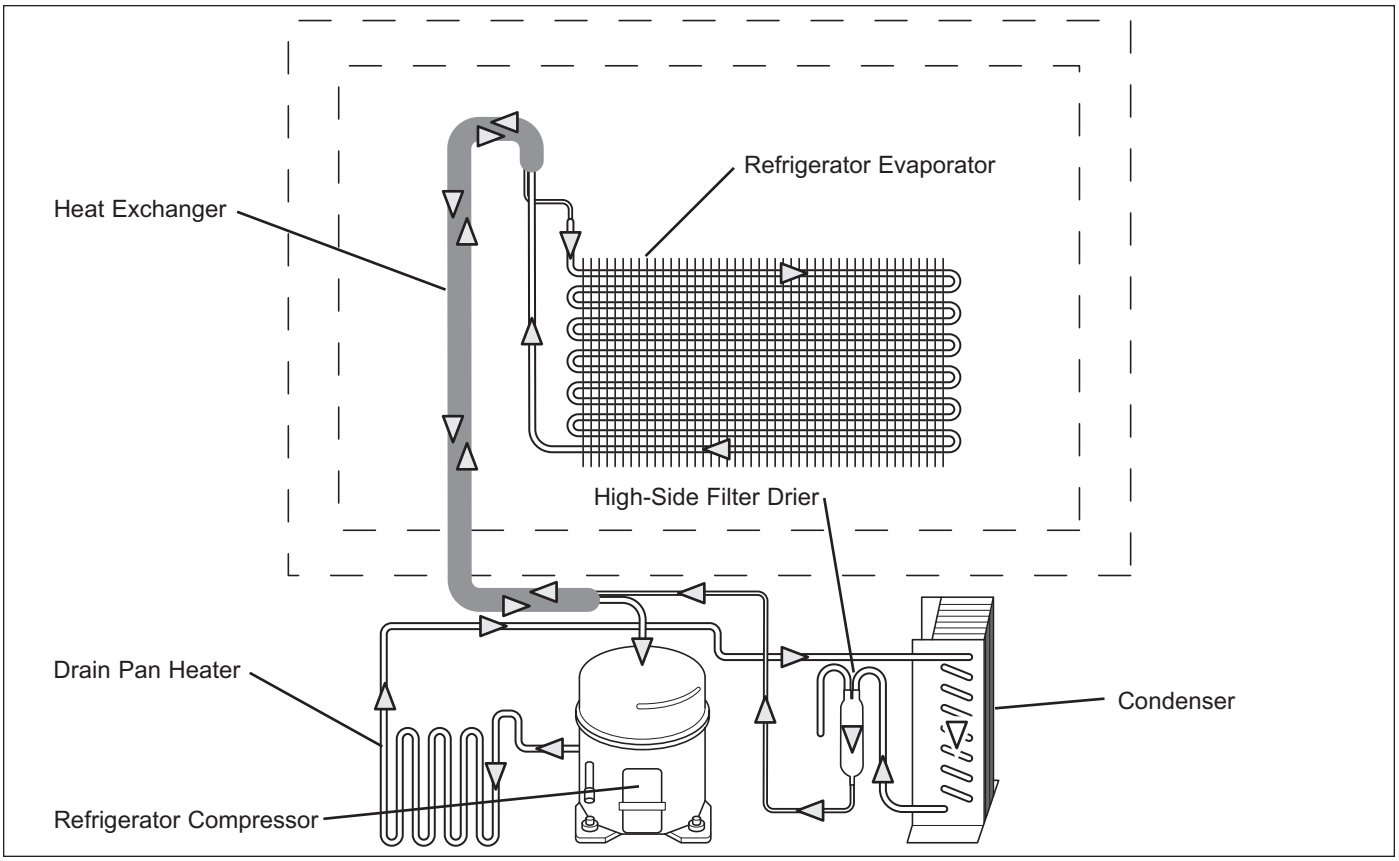


Figure 4-7. Models 601R Refrigerant Flow

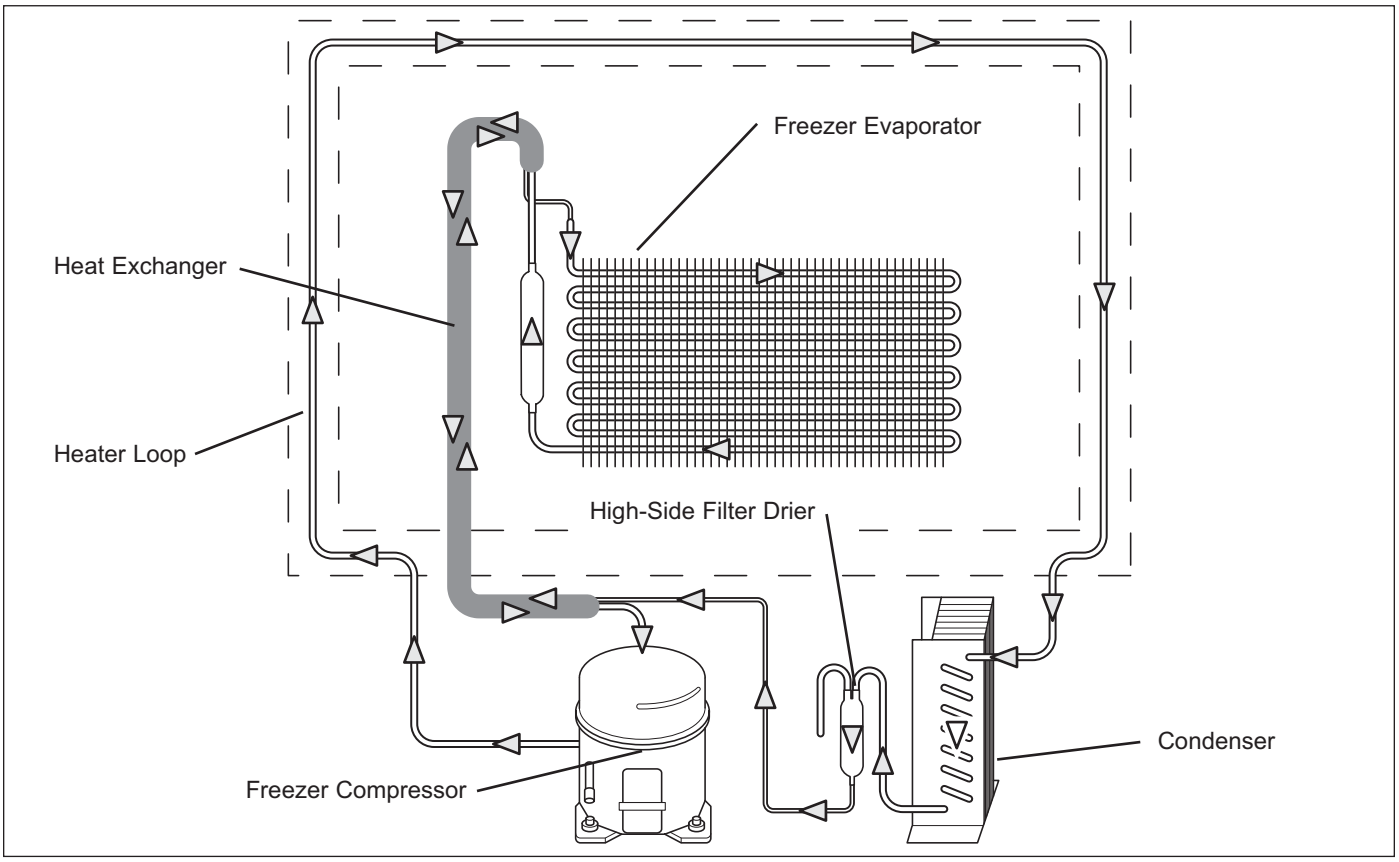


Figure 4-8. Model 601F Refrigerant Flow

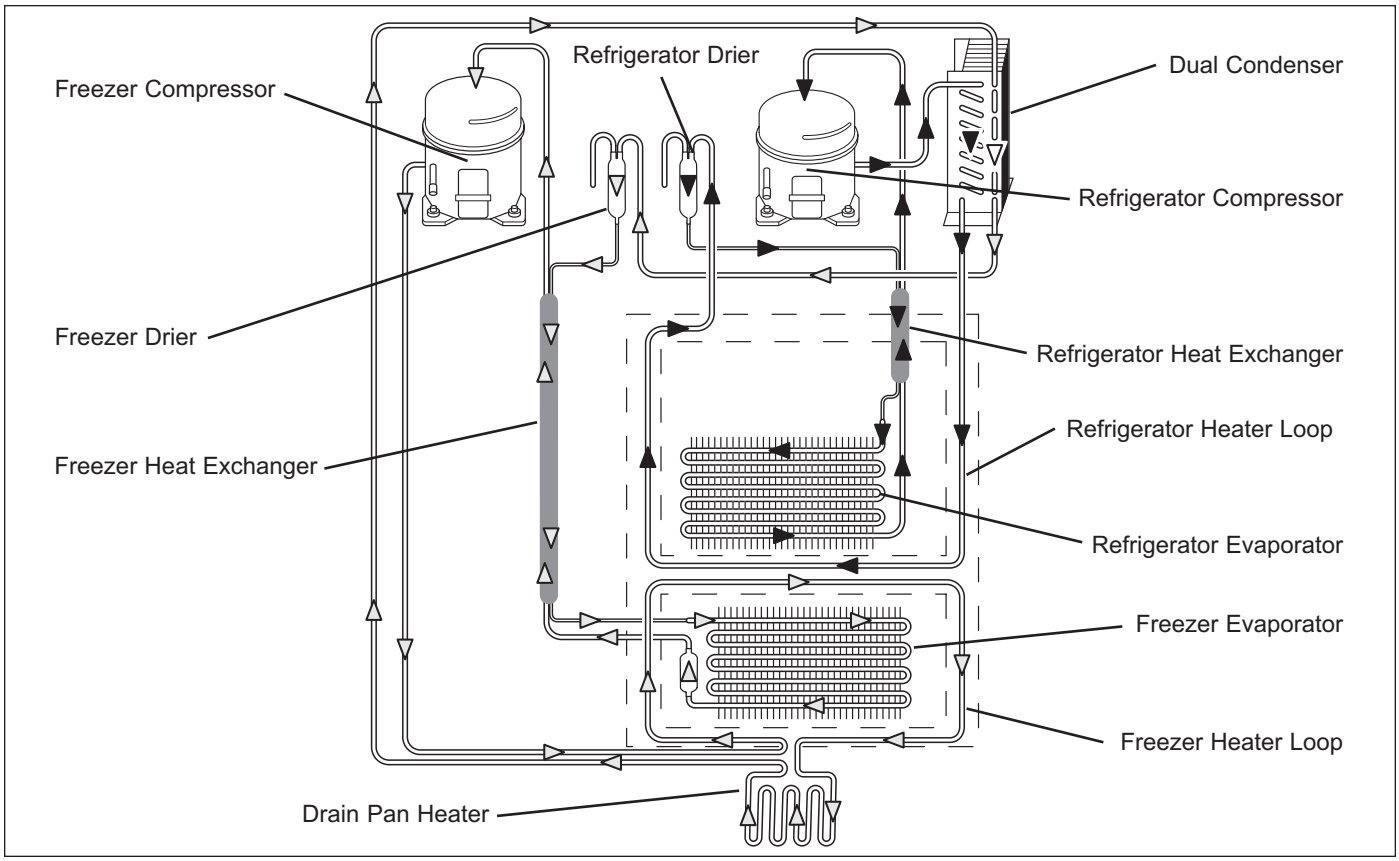


Figure 4-9. Models 611, 650 Refrigerant Flow

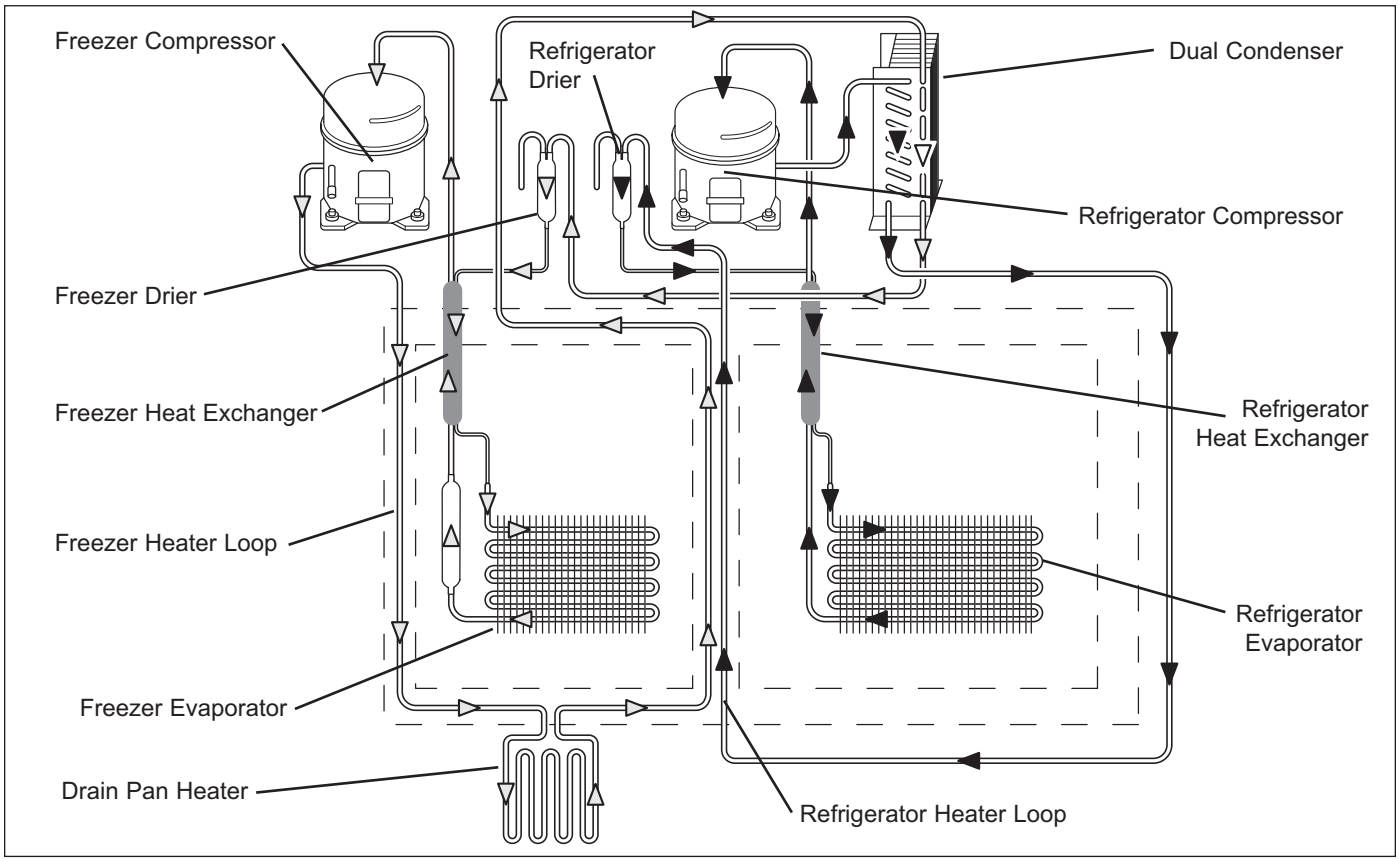


Figure 4-10. Models 632, 642, 690 Refrigerant Flow

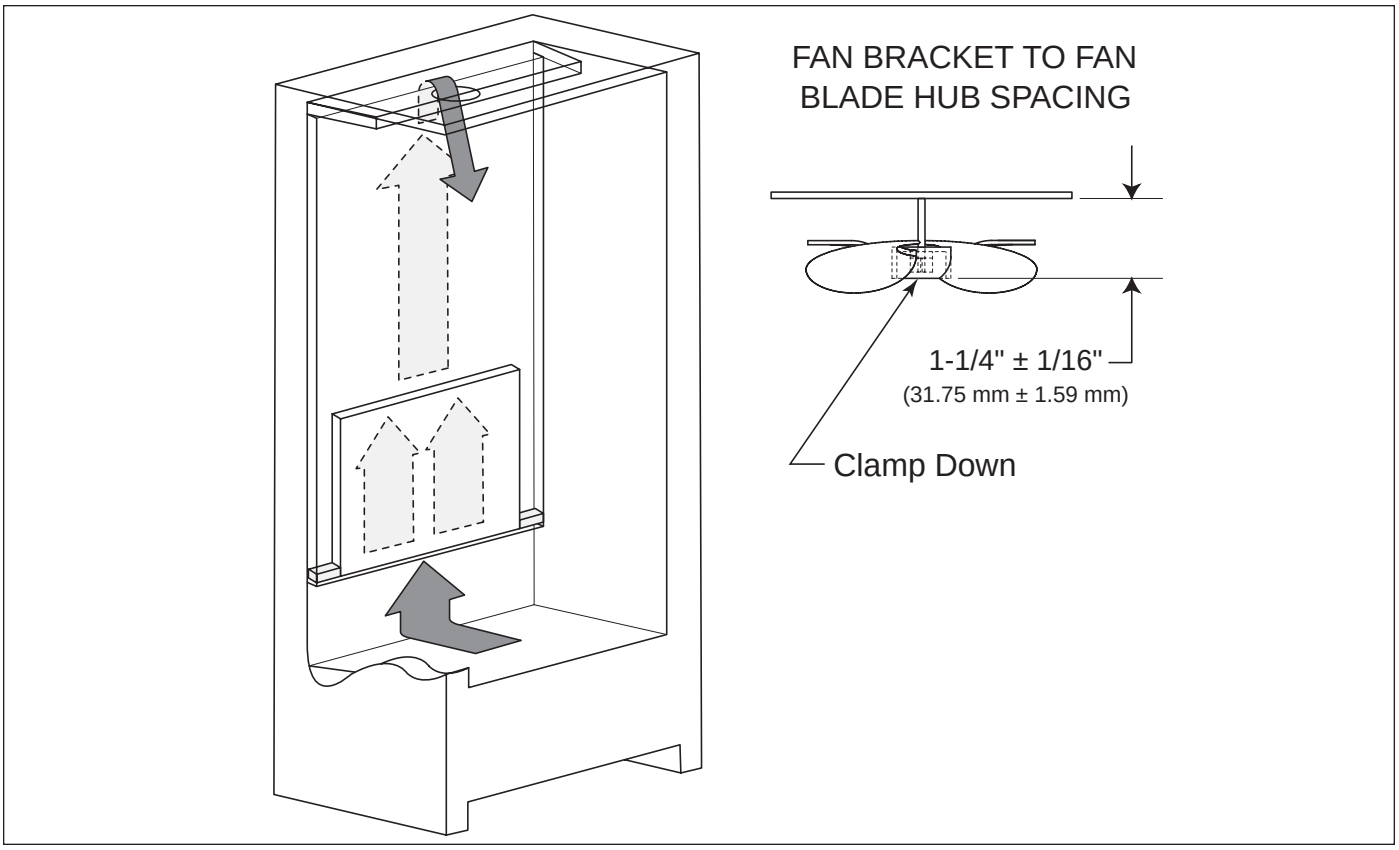


Figure 5-1. Air Flow and Fan Blade Spacing, Models 601R

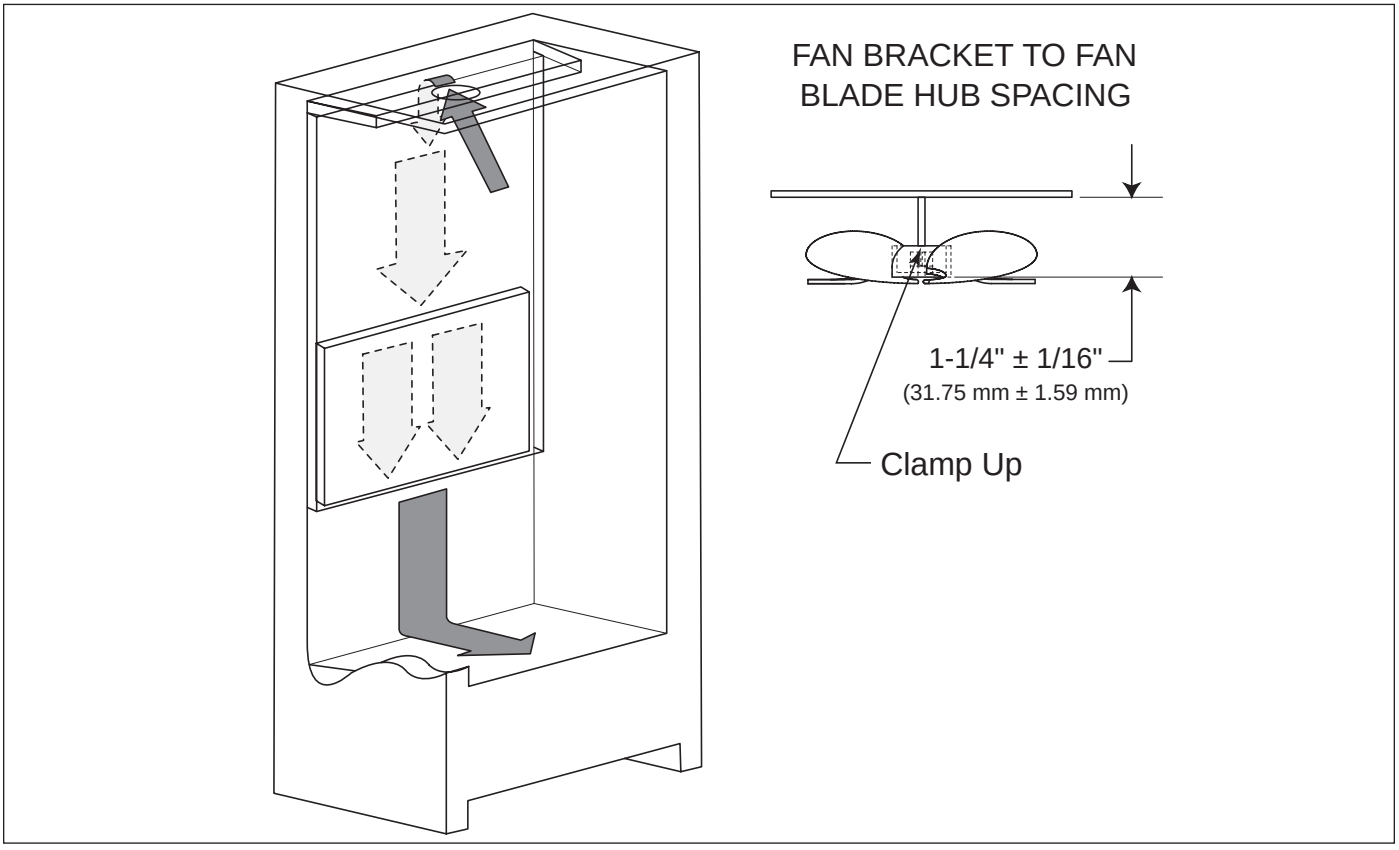


Figure 5-3. Air Flow and Fan Blade Spacing, Model 601F

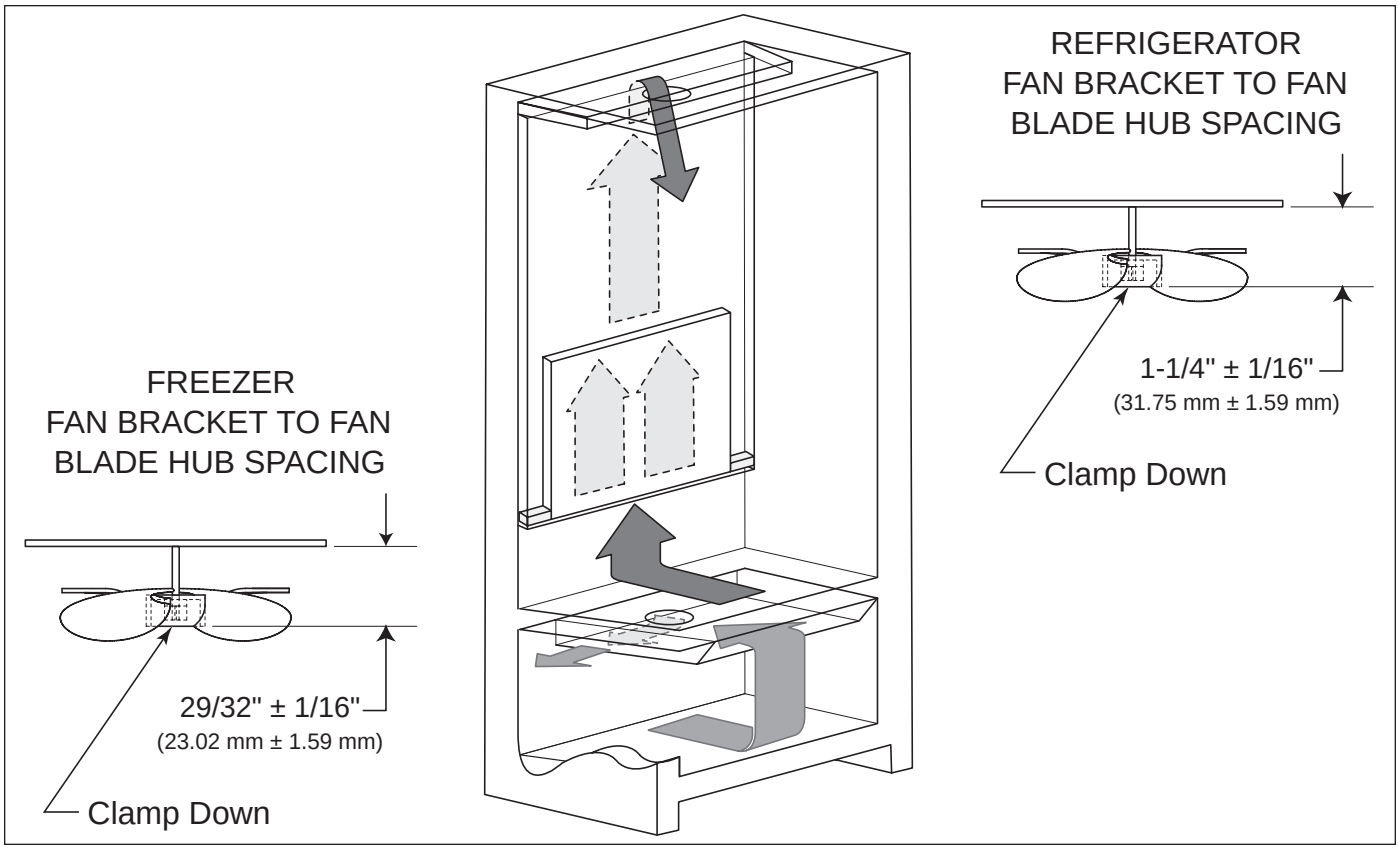


Figure 5-4. Air Flow and Fan Blade Spacing, Models 611, 650

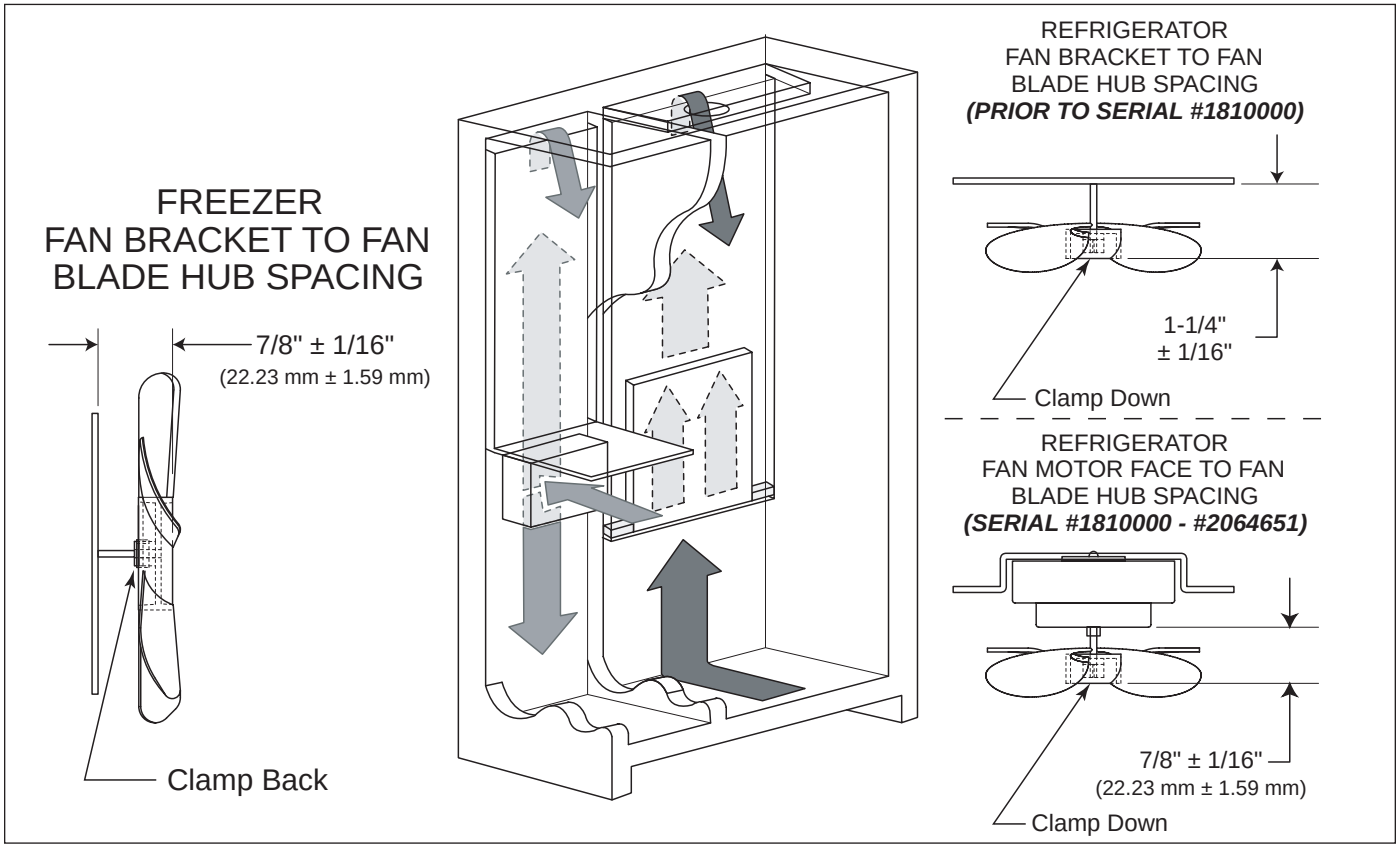


Figure 5-6. Air Flow and Fan Blade Spacing, Models 632 and 642

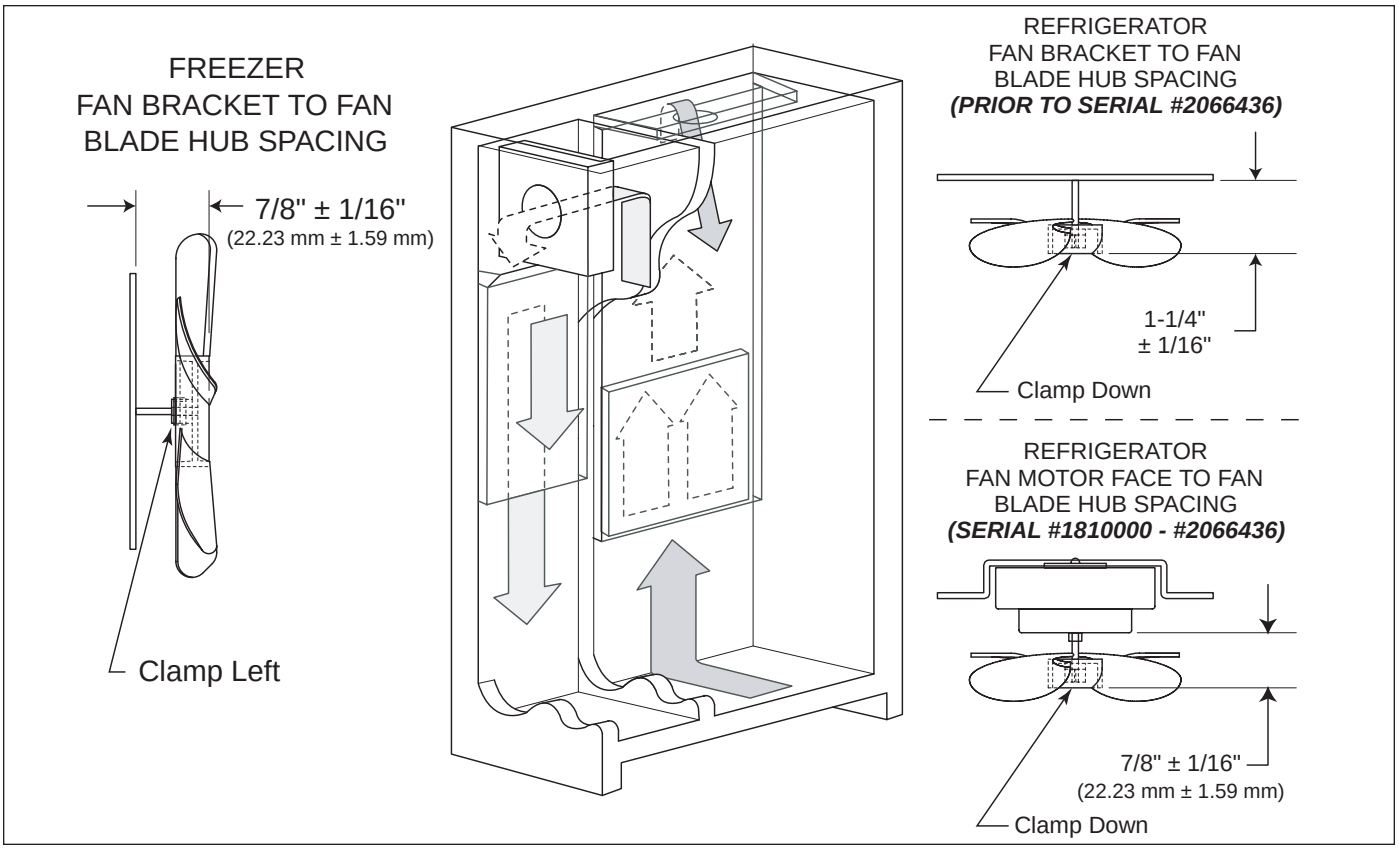


Figure 5-8. Air Flow and Fan Blade Spacing, Model 690

ICEMAKER SYSTEM INFORMATION

All 600 series units utilize a MidSouth icemaker. An Icemaker's operation is not complex, but understanding its components and its operation cycle is necessary for a Service Technician to understand in order to make a proper diagnosis.

⚠ WARNING

TO AVOID ELECTRIC SHOCK, ALWAYS DISCONNECT ELECTRICAL POWER TO UNIT WHEN SERVICING ICEMAKER.

NOTE: *The ICE ON/OFF key at the control panel activates the icemaker system. If "ICE" is not displayed on the LCD, the icemaker system will not function.*

NOTE: *To allow ice to freeze fully and reduce effects of low water pressure, the electronic control disables the icemaker system for 45 minutes after each ice harvest.*

NOTE: *The ice bucket in models 601F, 611 and 650, have a tab at the left rear corner that activates a switch when the ice bucket is in place. The ice bucket in the models 680 and 690 also activates a switch when in place. If the ice bucket is not in proper position on any model, ice production will stop.*

NOTE: *The icemaker relay on the control board also controls the fill tube heater and water valve.*

ICEMAKER COMPONENTS

Following are descriptions that explain the function of each icemaker component. The components are diagramed in Figure 6-1 on the next page.

Support - The support is the housing around the electrical components and wire connections. The support is attached to the ice mold.

Mounting Plate - The drive motor, holding switch, water valve solenoid switch, timing gear, timing cam and water fill adjusting screw are attached to the metal mounting plate. The mounting plate is then attached to the support.

Drive Motor - 115 volts AC supplied to the drive motor causes the motor to operate. The motor has a single output shaft with a small gear. The motor gear drives/spins the timing gear.

Timing Gear - The timing gear is driven/spun by the drive motor gear and is attached to the timing cam.

Timing Cam - The timing cam is attached to the timing gear and the ice ejector is inserted into the center of the timing cam. As the timing cam rotates, high and low spots on the cam operate the water valve solenoid switch and the holding switch. The timing cam also moves the lever arm side to side and rotates the ice ejector.

Ice Mold - The ice mold is where the eight crescent shaped ice cubes are formed.

Mold Heater - The mold heater uses 175 watts to thaw the ice free from the mold.

Ice Ejector - The drive end of the ice ejector is "D" shaped to fit into the "D" shaped hole in the timing cam. It has eight blades which rotate and sweep the ice from the mold cavities during the ejection phase of the cycle.

Ice Stripper - The stripper is attached to the dumping side of the mold, serving as a decorative side cover and it also prevents ice from falling back into the mold.

Bearing / Inlet - The bearing / inlet is attached to the ice mold, opposite the support. Water enters the bearing / inlet and is directed to the ice mold. The bearing/inlet also supports the ice ejector at the end opposite the timing cam.

Thermostat - The thermostat is a single-pole, single-throw, bi-metal switch. At 15°F/± 3°F it closes, starting the ice ejection phase.

Thermal-Mastic - A substance similar in appearance to grease that is applied between the thermostat and the ice mold. Its purpose is to increase thermal conductivity between the mold and the thermostat.

Lever Arm and Shut-off Arm - The lever arm is moved side to side by two revolutions of the timing cam. As it moves, it raises and lowers the shut-off arm and operates the shut-off switch to control the quantity of ice production. If the shut-off arm comes to rest on top of the ice in the storage bin during either revolution, the shut-off switch will remain open, stopping ice production at the end of that revolution.

Water Valve Solenoid Switch - A single-pole, double-throw type switch that allows electricity to the water valve solenoid, opening the valve, during the fill cycle.

Holding Switch - A single-pole, double-throw type switch that assures completion of a revolution once the icemaker has been energized.

Shut-off Switch - A single-pole, double-throw type switch that stops ice production when the ice bin is full.

TCO (Thermal Cut Out) - The TCO is thermal protection device in the wire harness that would open in the event of mechanical failure, thus protecting against over heating. (The TCO is not shown in diagram.)

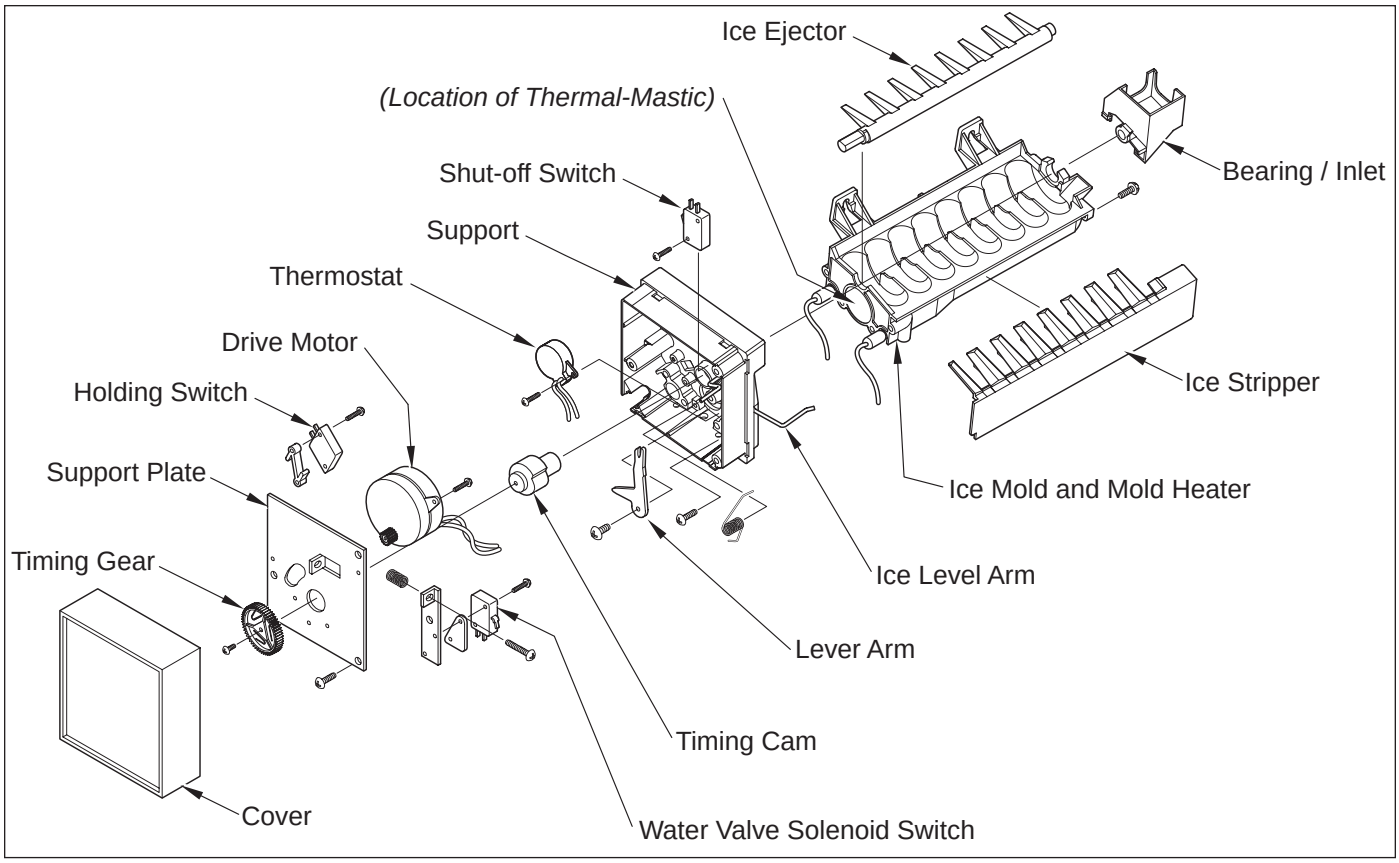


Figure 6-1. Diagram of Icemaker Components

ICEMAKER OPERATION

The following series of electrical schematics illustrate a typical icemaker cycle of operation. Below each schematic is a diagram indicating the approximate location of the ice ejector and ice level arm during the phase the schematic indicates.

Freeze Phase of Ice Making Cycle (See Figure 6-2)

- The ice mold is filled with water.
- The thermostat is open.
- No icemaker components are energized.

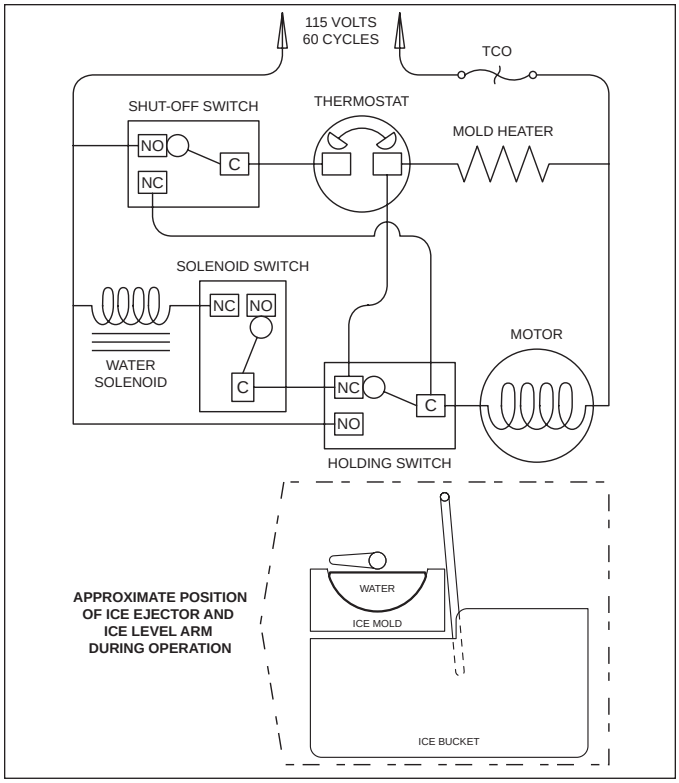


Figure 6-2. The Freeze Phase

Start of the First Revolution (See Figure 6-3)

- The water in the ice mold has turned to ice.
- At 15°F/± 3°F the thermostat closes.
- The mold heater is energized through the thermostat.
- The drive motor is started through the thermostat and “normally closed” terminal of the holding switch.
- The ice ejector begins to turn and the shut-off arm begins to rise.

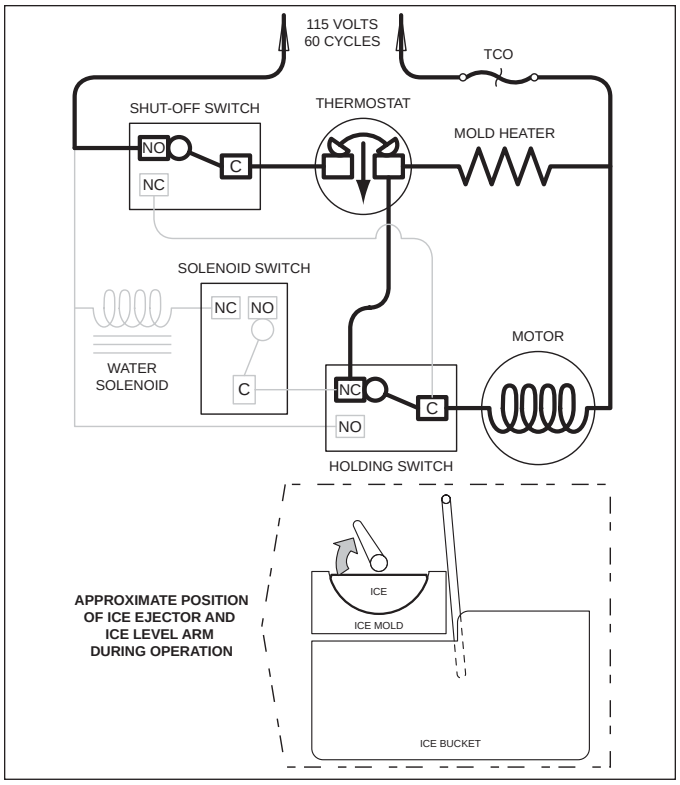


Figure 6-3. Start of First Revolution

First Revolution Continued (See Figure 6-4)

- The holding switch is tripped by the timing cam to “normally open” thus holding power to the motor.
- The mold heater remains energized through the thermostat.
- The shut-off arm begins to rise.

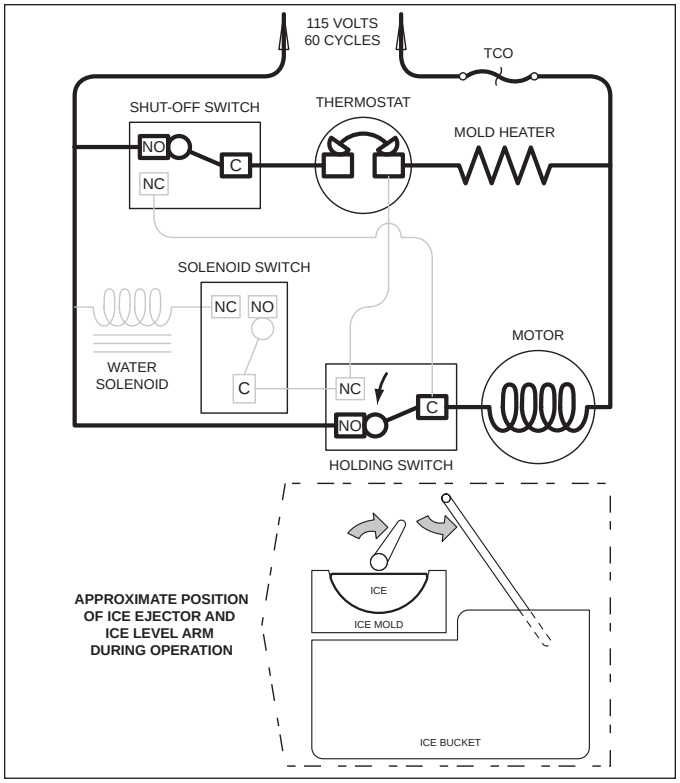


Figure 6-4. First Revolution Continued

First Revolution Continued (See Figure 6-5)

- The ice ejector reach the ice in the mold.
- The ice releases from the mold as the ejector blades begin to rotate the cubes out.
- The drive motor remains energized through the holding switch.
- The mold heater remains energized through the thermostat.
- As the shut-off arm rises, the shut off switch is tripped to “normally closed”, and then the shut-off arm begins to lower.

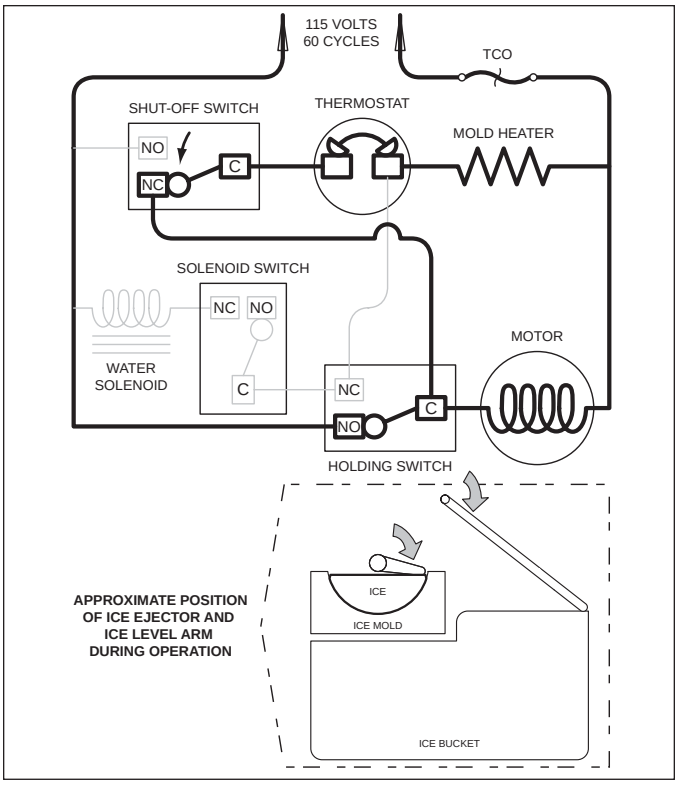


Figure 6-5. First Revolution Continued

First Revolution Continued (See Figure 6-6)

- The ice has released from the mold.
- The motor remains energized through the holding switch.
- The shut-off arm is lowered and the shut off switch is tripped to “normally open”.
- The water valve solenoid switch is tripped by the timing cam, but the solenoid is not energized because the thermostat is still closed and energizing the mold heater. (Electric current follows the path of least resistance.)

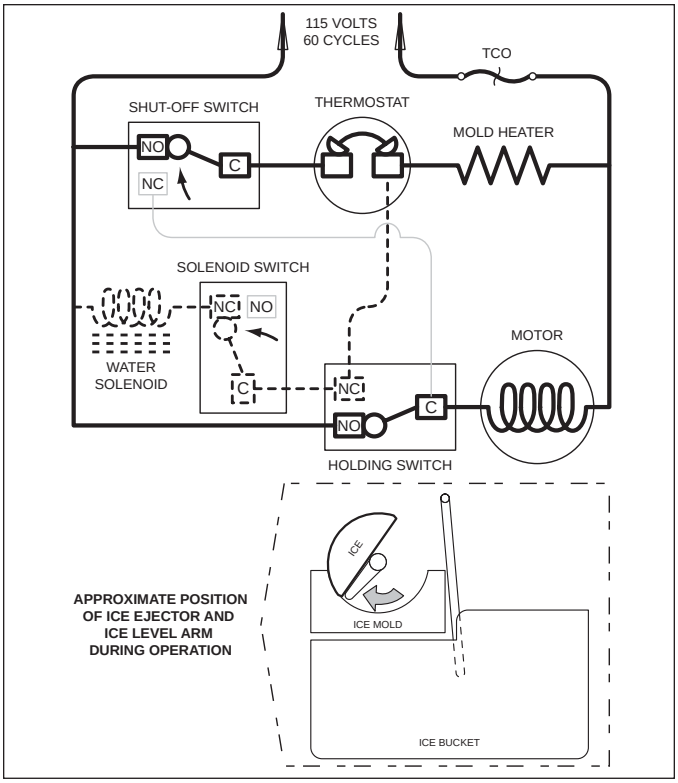


Figure 6-6. First Revolution Continued

End of First Revolution (See Figure 6-7)

- The water valve solenoid switch is tripped by the timing cam back to “normally open.”
- The timing cam trips the holding switch to “normally close,” which ends the first revolution, but the thermostat is still closed, so the motor is again started.
- The mold heater remains energized through the thermostat.

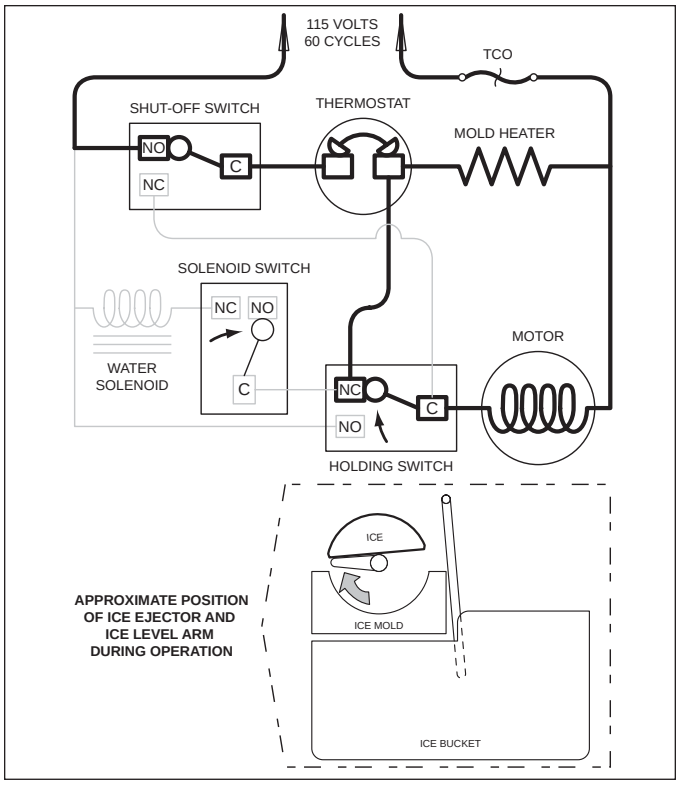


Figure 6-7. End of First Revolution

Start of Second Revolution:(See Figure 6-8)

- The water valve solenoid switch is tripped by the timing cam back to “normally open.”
- The timing cam trips the holding switch to “normally close,” which ends the first revolution, but the thermostat is still closed, so the motor is again started.
- The mold heater remains energized through the thermostat.

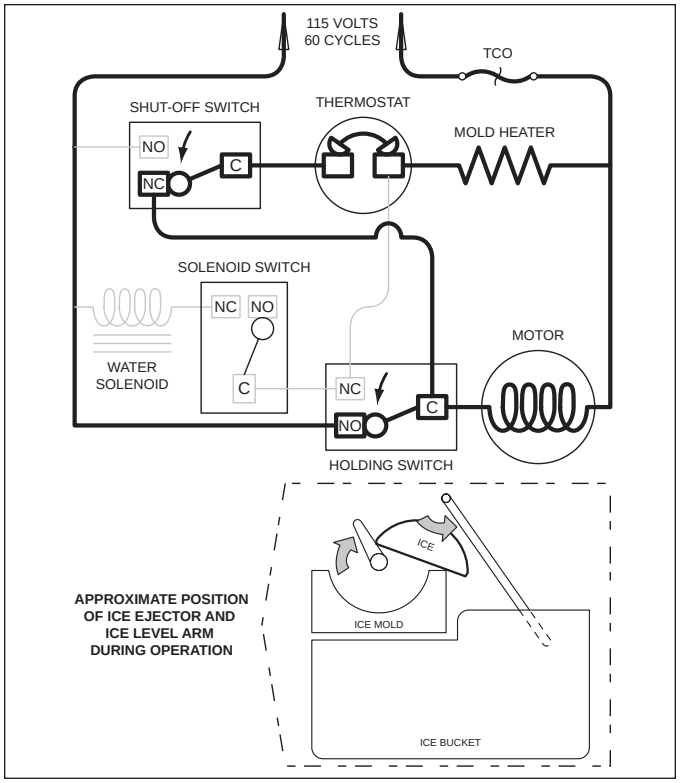


Figure 6-8. Start of Second Revolution

Second Revolution Continued (See Figure 6-9)

- The mold heater has warmed the thermostat, so the thermostat opens, and the mold heater is de-energized.
- If the shut-off arm comes to rest on top of the ice in the storage bin (as illustrated), so the shut-off switch will remain in the “normally closed” position.
- The motor remains energized through the holding switch.

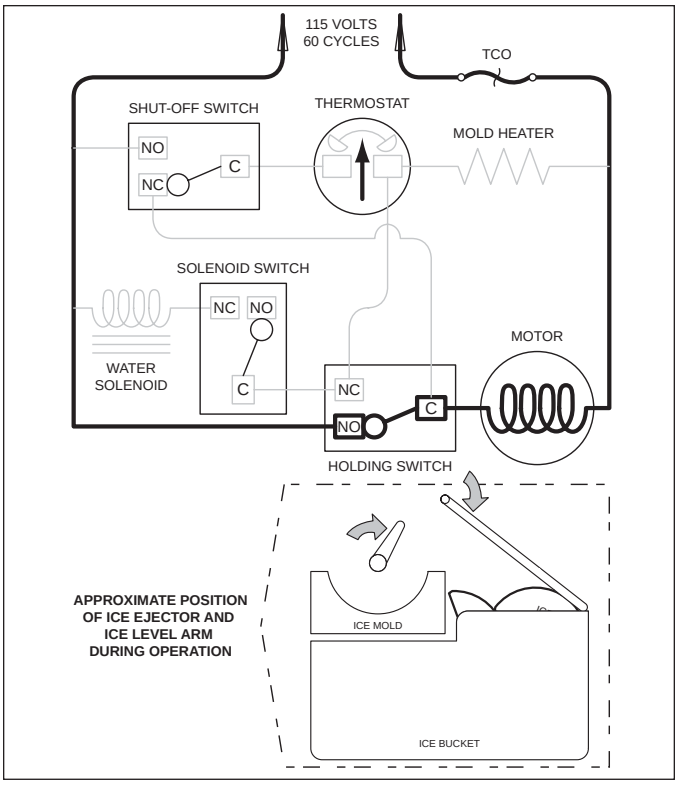


Figure 6-9. Second Revolution Continued

Second Revolution Continued (See Figure 6-10)

- The water valve solenoid switch is tripped by the timing cam. This time the solenoid is energized because the thermostat is open. The water solenoid is open for approximately seven seconds, filling the ice mold with water.
- the mold heater is energized through the solenoid switch and holding switch.

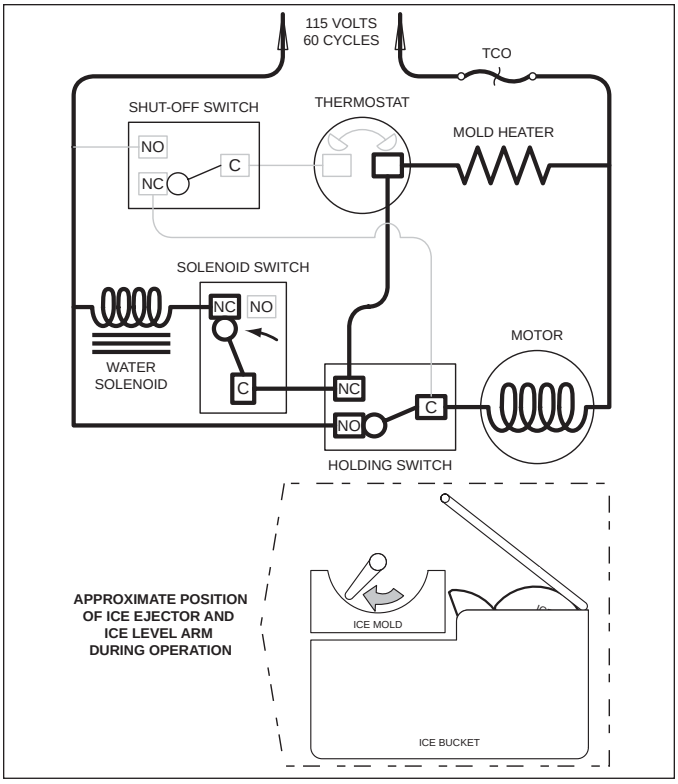


Figure 6-10. Second Revolution Continued

End of Ice making Cycle (See Figure 6-11)

- The water valve solenoid switch is tripped by the timing cam back to “normally open” ending the water fill.
- The timing cam trips the holding switch to “normally close,” which ends the second revolution.
- The thermostat is still open, so it does not start the drive motor.
- If the shut-off arm has come to rest on top of the ice in the storage bin (as illustrated), the shut-off switch remains in the “normally closed” position. This interrupts power from reaching the thermostat, until sufficient ice has been removed from the storage bin allowing the shut-off arm to lower.

NOTE: To allow ice to freeze fully and reduce effects of low water pressure, the electronic control system disables the icemaker system for 45 minutes after each ice harvest.

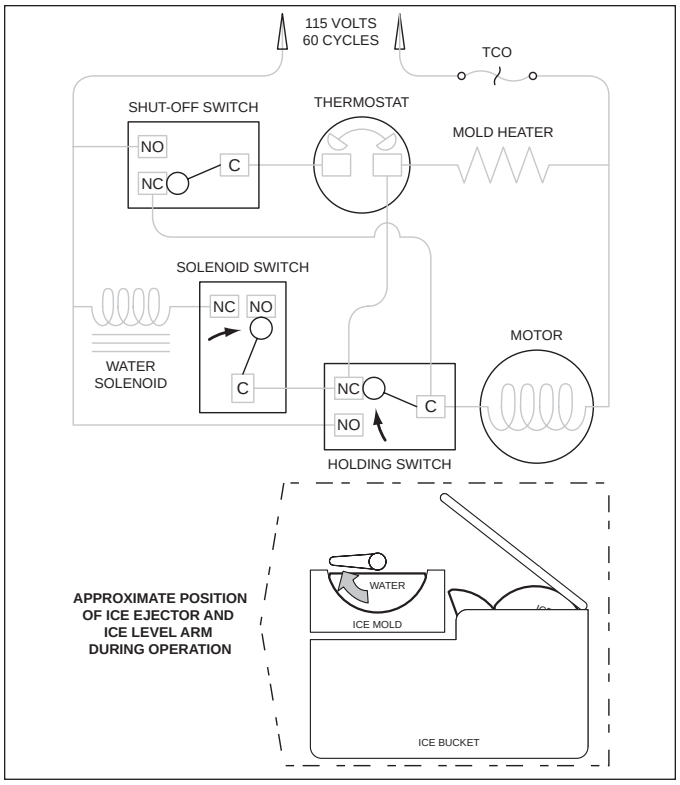


Figure 6-11. End of Ice Making Cycle

MANUALLY STOPPING ICE PRODUCTION

Ice production can be manually stopped four ways:

1. Press the ICE ON/OFF key on the control panel so that “ICE” is not displayed on the LCD.
2. In model 632 and 642, trip the icemaker switch above the ice bucket to the OFF position.
3. In models 601F, 611, 650, 680 and 690, remove the ice bucket so that the icemaker switch at the back of the freezer is not being depressed. Also, make sure no food product is coming in contact with the icemaker switch.
4. In models 611, 650, 680 and 690, lift the ice level arm up to lock it in the OFF position (See Figure 6-12).

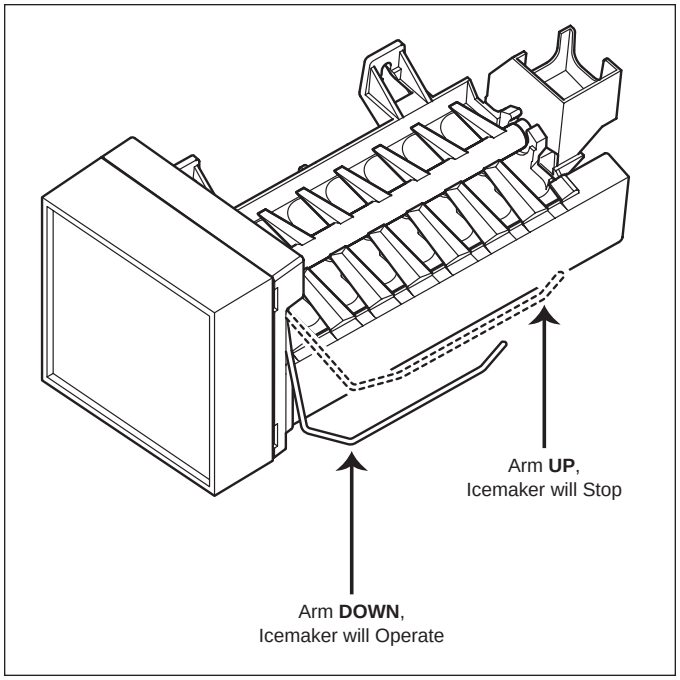


Figure 6-12. Stopping Icemaker

MANUALLY STARTING THE ICEMAKER

NOTE: *To allow ice to freeze fully and reduce effects of low water pressure, the electronic control disables the icemaker system for 45 minutes after each ice harvest. To bypass this 45 minute dwell for service purposes, press the the ICE ON/OFF key or the UNIT ON/OFF key at the control panel.*

Manual Start Procedure

1. Pry the icemaker front cover from the support using a flat-blade screwdriver or coin.
2. With a flat-blade screwdriver, turn the drive gear counterclockwise until the holding switch is activated, completing the circuit to the drive motor (this will be about a 1/8 turn). (See Figure 6-13) The icemaker will then complete its cycle automatically.

   NOTE: *If after 1/4 turn the icemaker is not running on its own, it may be in the 45 minute dwell period or there is an electrical or mechanical problem.*

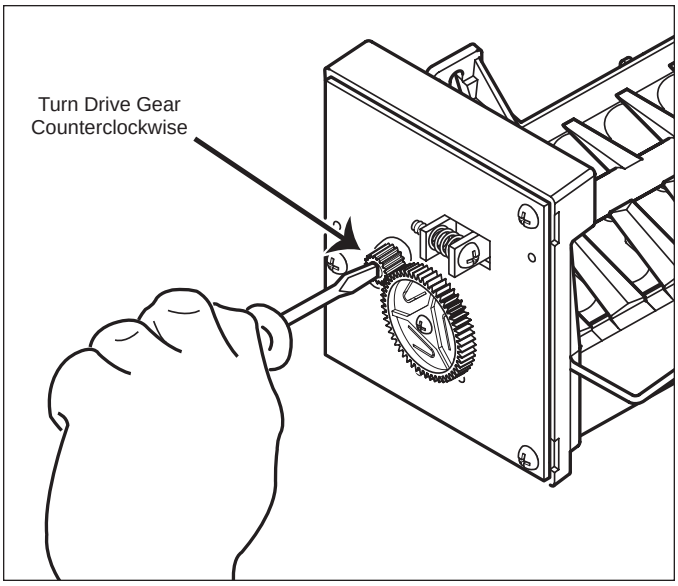


Figure 6-13. Manually Start Icemaker

ADJUSTING ICEMAKER WATER FILL LEVEL

Proper water fill level for a MidSouth icemaker is 100 - 110 cc's (3.5 - 3.75 oz). If the fill level is checked and needs to be adjusted, turn the water fill adjusting screw clockwise to reduce fill level, or counterclockwise to increase fill level. One full turn of the screw equals 15 cc's. (See Figure 6-14)

NOTE: *Always check fill level before making any adjustments of the water fill adjusting screw.*

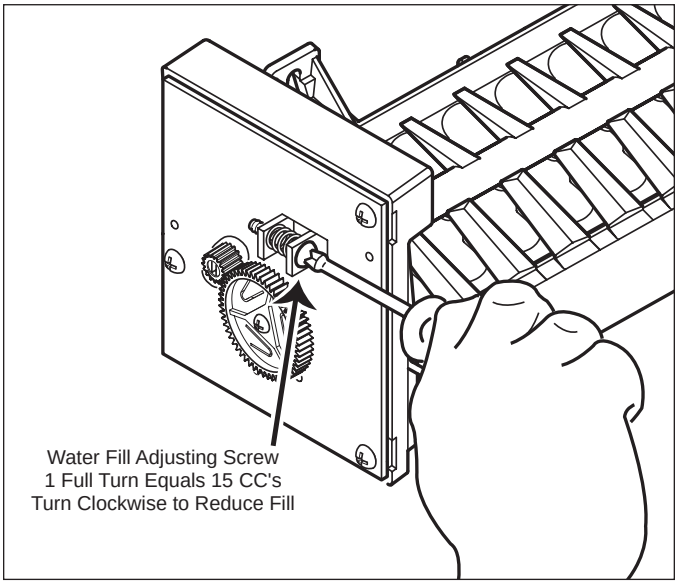


Figure 6-14. Adjust Water Fill Level

COMPONENT ACCESS AND REMOVAL

This section explains how to adjust, access and remove components. If different models have similar procedures, they are grouped together under the appropriate heading. The models covered in the procedures are listed between brackets after the heading.

This section is arranged as follows: ..... ***Page:***

An attempt has been made to arrange these procedures in such a way as to simulate which components would need to be removed first in order to gain access to other components. When following a component removal procedure, it may be necessary to reference another component removal procedure earlier in this section.

NOTE: *Before continuing, please take note of the WARNINGS and CAUTIONS below.*

⚠ WARNING

- **IF IT IS NECESSARY TO REMOVE A UNIT FROM ITS INSTALLATION, REMEMBER THAT THE UNIT COULD TIP FORWARD WHEN PULLED FORWARD BEYOND THE ANTI-TIP COMPONENTS, RESULTING IN SERIOUS INJURY OR DEATH. PULLING A UNIT FROM ITS INSTALLATION SHOULD ONLY BE PERFORMED BY AN AUTHORIZED SERVICE TECHNICIAN OR INSTALLER.**
- **TO AVOID ELECTRIC SHOCK, POWER TO THE UNIT MUST BE DISCONNECTED WHENEVER ACCESSING AND/OR REMOVING COMPONENTS POWERED BY ELECTRICITY OR COMPONENTS NEAR OTHER ELECTRICAL COMPONENTS. IF THE UNIT IS PLUGGED IN, BUT HAS NOT BEEN SWITCHED ON BY PRESSING THE UNIT ON/OFF KEY, 115 VOLTS AC IS STILL PRESENT AT THE CONTROL BOARD.**
- **IF REMOVING A DOOR OR DRAWER FROM A UNIT, REMEMBER THAT DOORS AND DRAWERS ARE HEAVY. IF THEY WERE TO FALL, THEY COULD CAUSE SERIOUS PERSONAL INJURY.**

⚠ WARNING

- **If removing or disconnecting door closer assemblies, remember they are spring loaded and could recoil quickly when released.**
- **If working in the compressor area, remember that compressor and tubing may be hot.**
- **If working on or around an evaporator or condenser, remember that evaporator and condenser fins are sharp.**

PRIMARY PARTS

This section explains how to remove and adjust the primary 600 Series parts (upper light diffuser, door shelves, cabinet shelves, etc.). In most cases, removal of these parts is necessary in order to gain access to the more functional components during a service call. When possible, units with similar primary part removal procedures are grouped together under the appropriate heading. The units covered will be listed between brackets after the heading.

Upper Light Diffuser (All models)

The side frames of the light diffuser have four inverted "T" shaped slots (two each side) which slide up over pegs protruding from the side walls. For safety purposes, retaining clips by the rear slots secure the light diffuser to the rear studs. (See Figure 7-1)

To remove the light diffuser, slide a finger over the top of the retaining clips and rotate down. With the clips open, lift diffuser up and slide it towards the rear of the unit until the center of the "T" slots line up with the pegs. Then lower the light diffuser and remove from unit. (See Figure 7-2)

Light Bulb (All Models)

⚠ WARNING

ELECTRIC SHOCK HAZARD. IF BULB SHOULD SEPARATE FROM BASE. DISCONNECT POWER TO UNIT BEFORE ATTEMPTING TO REMOVE BASE FROM SOCKET.

⚠ WARNING

Light bulbs are hot and could cause minor personal injury.

The light diffuser will need to be removed to access the light bulbs. Screw bulb counter clockwise to remove, clockwise to install.

Door Shelf & Dairy Compartment Assemblies (All Models)

Removal and adjustment of door shelves and dairy compartment assemblies is achieved by sliding the grooves in the end caps over the molded retaining ribs of the door liner. Lift up and out to remove, push in and down to install. (See Figure 7-3)

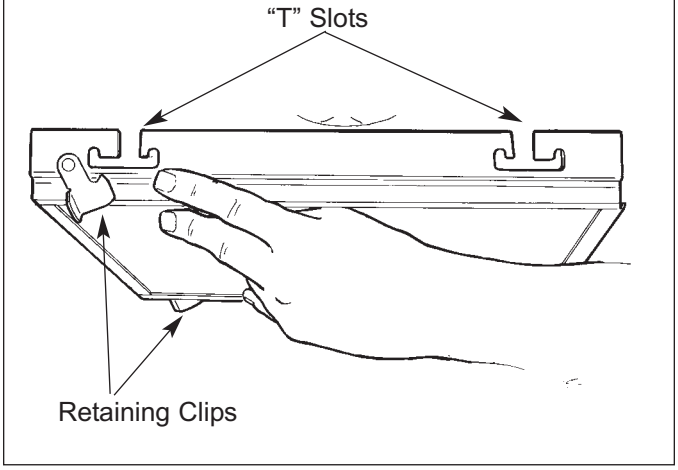


Figure 7-1. Slots & Retaining Clips

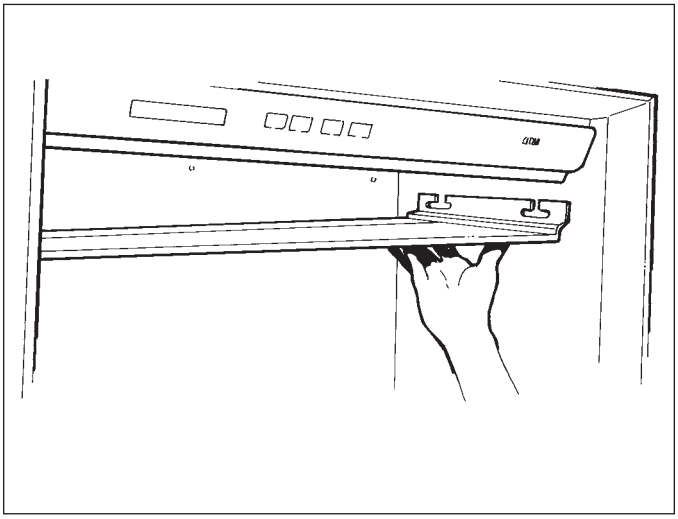


Figure 7-2. Light Diffuser Removal

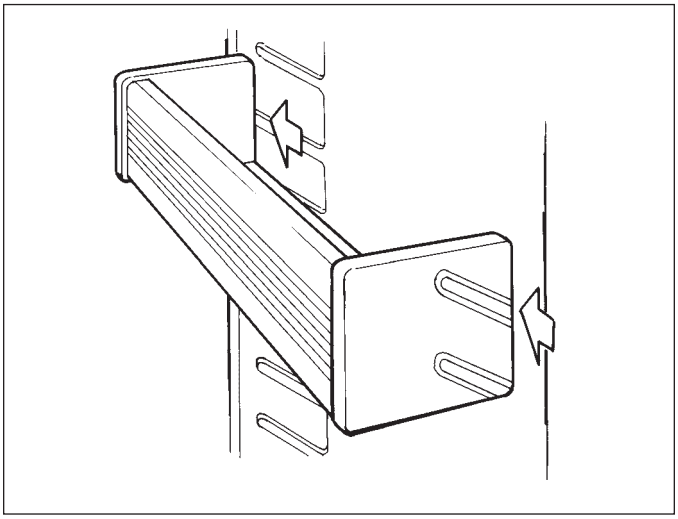


Figure 7-3. Door Shelf Removal

Refrigerator & Freezer Compartment Shelves (All Models)

Remove and adjust shelf by tilting up at front while lifting the back up and out of the shelf ladders. (See Figure 7-4)

To reinstall, tilt front of shelf up and align hooks at back corners with slots in shelf ladders, then insert hooks into slots and lower front of shelf.

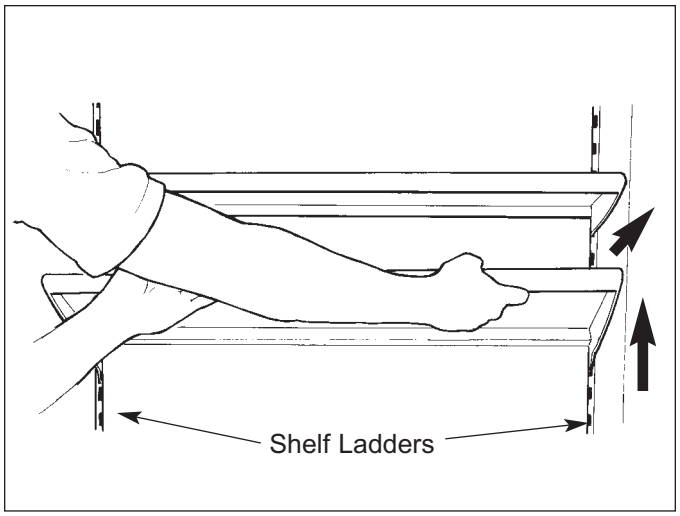


Figure 7-4. Shelf Removal

Utility Basket (Models 601R, 611, 632, 642, 650, 690)

Remove the utility basket from under the shelf assembly by pulling the basket out and lifting at the front. Reverse to reinstall. (See Figure 7-5)

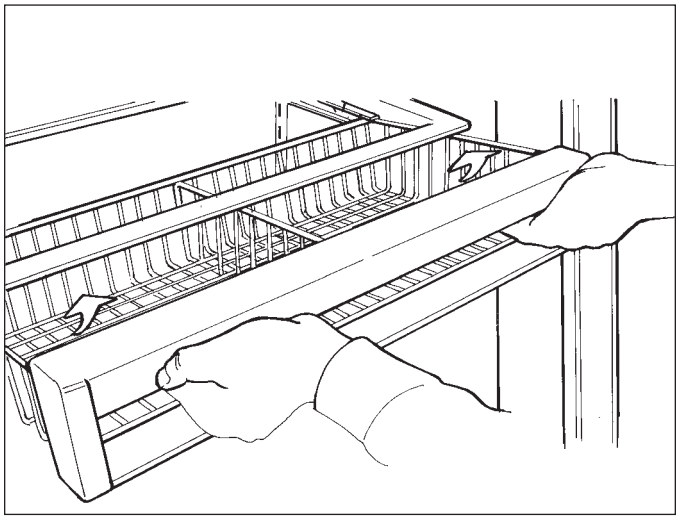


Figure 7-5. Utility Basket Removal

Crisper Glass Shelf (Models 601R, 611, 632, 642, 650, 690)

Remove crisper glass shelf assembly by opening top drawer and lifting assembly off of crisper glass supports.

Large High Humidity Drawer (Models 601R, 611, 632, 642, 650, 690)

Remove high humidity drawer assembly by pulling open until drawer stops, then lift front of drawer while pulling out. (See Figure 7-6)

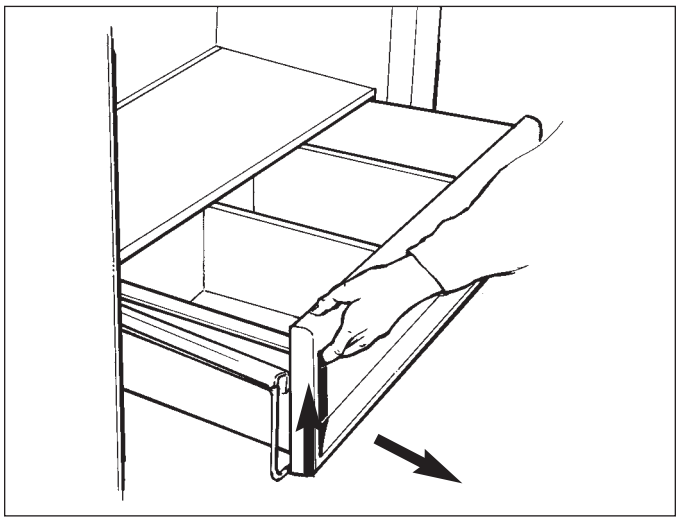


Figure 7-6. High Humidity Drawer Removal

Humidity Drawer Carriage Assembly (Models 601R, 611, 632, 642, 650, 690)

After removing the crisper glass shelf and high humidity drawer, lift carriage assembly up at front to disengage from the tab on slide assemblies. Then pull carriage assembly forward to disengage from hooks at rear of slide assemblies. (See Figure 7-7)

NOTE: *The silicone seal between carriage and slide arm may need to be broken with a knife.*

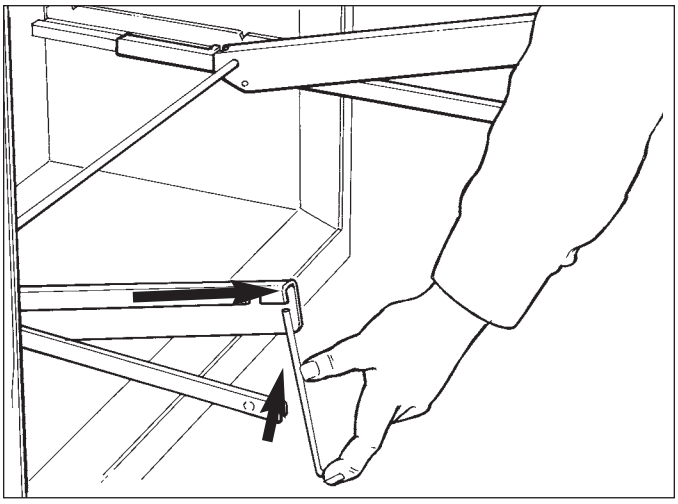


Figure 7-7. Drawer Carriage Assembly Removal

Small Storage Drawer (Models 632, 642, 690)

Remove the small storage drawer assemblies by pulling open until drawer stops (1). Raise front of drawer (2) while pulling out further to bypass stop (3), then drop front of drawer down while lifting rear drawer rollers out of the roller/slide assemblies (4). (See Figure 7-8)

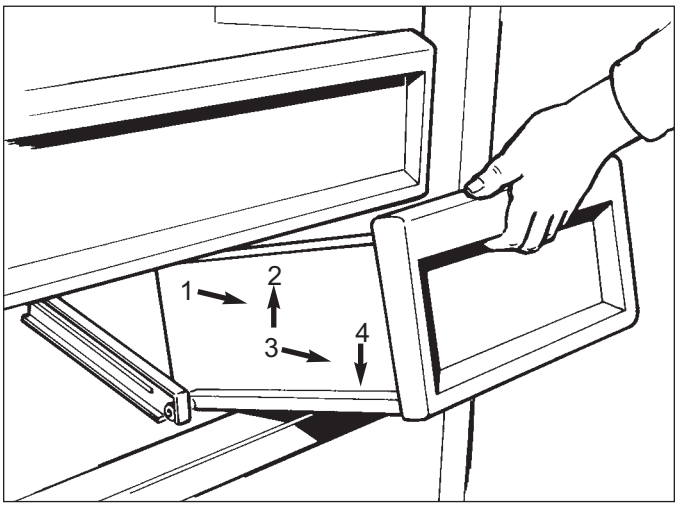


Figure 7-8. Small Storage Drawer Removal

Freezer Basket (Models 601F, 632, 642, 690)

Remove freezer baskets by pulling open until basket stops, then lift up at the front and pull out. (See Figure 7-9)

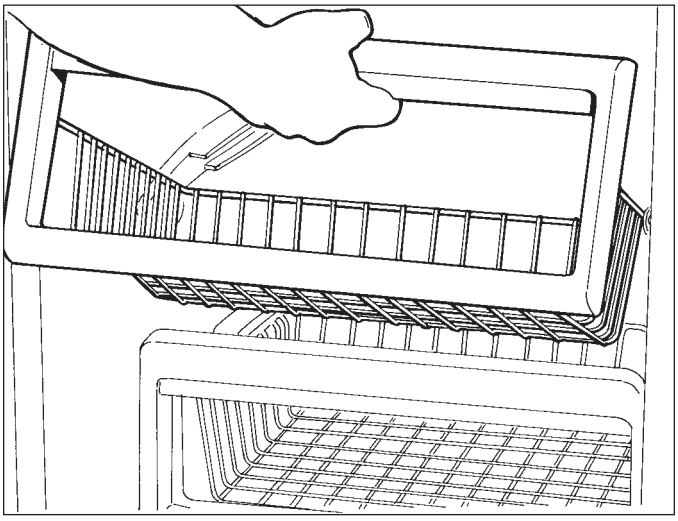


Figure 7-9. Freezer Basket Removal

Freezer Glass Shelf (Model 601F)

The glass shelf is secured to the side walls by screws through the side frames. To remove the freezer glass shelf, the two top freezer baskets will first need to be removed. Now, from underneath the glass shelf, remove the two front mounting screws, and loosen the two rear screws. (The rear screws fit into slots, so they do not need to be fully removed.) Then pull shelf forward slightly and lift up and out. (See Figure 7-10)

NOTE: *When reinstalling freezer glass shelf, be sure that the flange at top of freezer basket center slide support sets into the channel in the freezer glass shelf front. (See Figure 7-10)*

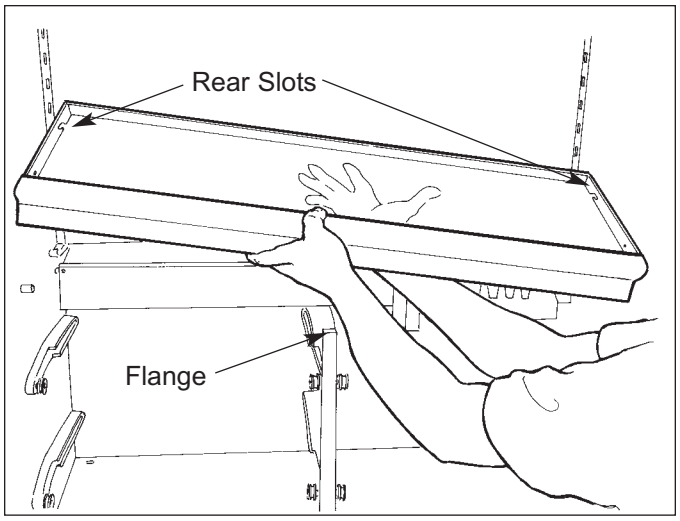


Figure 7-10. Model 601F Freezer Glass Shelf Removal

Ice Bucket (Model 601F)

Remove ice bucket by lifting out of top right freezer basket.

Ice Bucket (Model 611 and 650)

Remove ice bucket by lifting out of left rear corner of upper freezer basket.

Ice Bucket Assembly (Model 632 and 642)

Remove ice bucket assembly by pulling ice bucket open until it stops, then lift up and pull forward. (See Figure 7-11) When reinstalling, the ice bucket carriage assembly must be pulled fully forward, then hook rear flange of ice bucket over carriage assembly and push ice bucket assembly in.

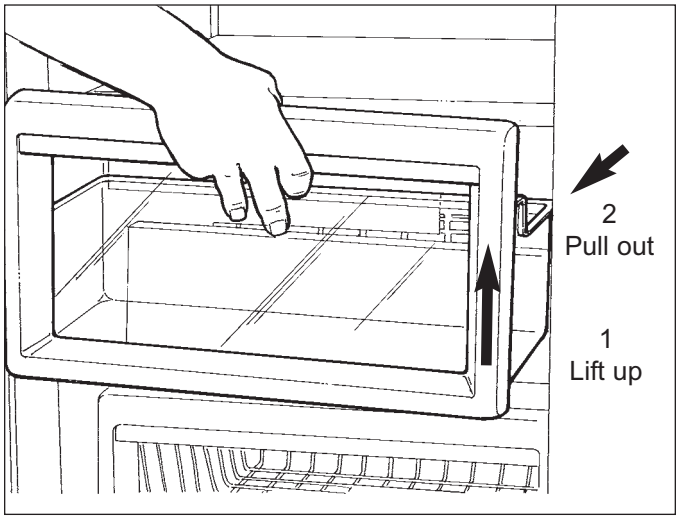


Figure 7-11. Model 632, 642 Ice Bucket Removal

Juice Can Rack Removal (Model 690)

Remove juice can rack by lifting up and pulling out. (See Figure 7-12)

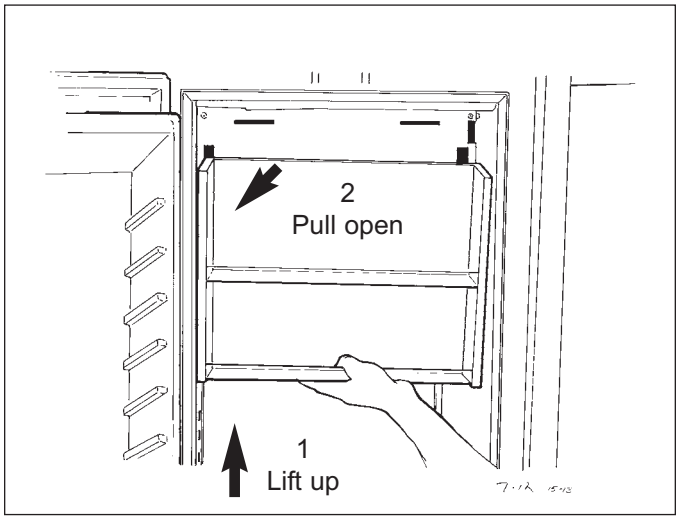


Figure 7-12. Model 690 Juice Can Rack Removal

Ice Bucket Assembly (Model 690)

To remove the ice bucket assembly, the juice can rack must first be removed. Then lift ice bucket assembly up and pull out. (See Figure 7-13)

NOTE: When reinstalling ice bucket, the drive yoke of the auger motor must engage ice bucket auger correctly so that ice bucket assembly can be fully installed.

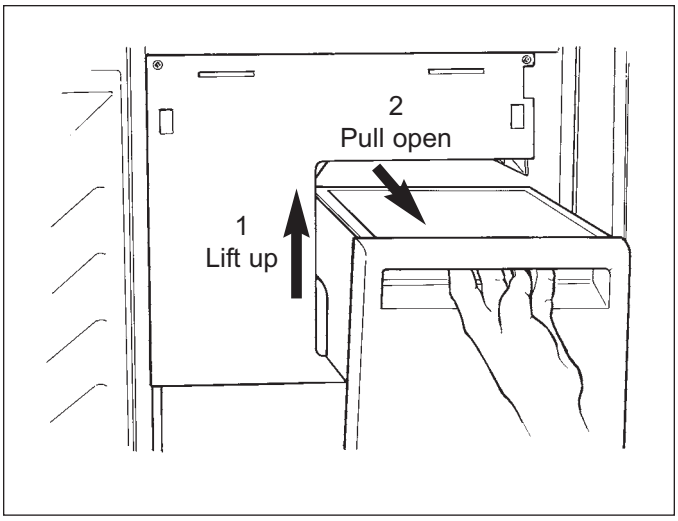


Figure 7-13. Model 690 Ice Bucket Removal

Standard Louvered Grille (Models 601R/F, 601R/O, 601F/F, 601F/O)

The standard louvered grille on models 601R & 601F consists of an upper grille section and a lower grille section. To remove the lower grille section, extract the screws at the bottom left and right corners. Then, tilt the bottom of lower grille section out and up to release it from the upper grille section. (See Figure 7-14)
To remove the upper grille section, open cabinet door and extract the screws at the top left and right corners. Pull upper grille section forward slightly and disconnect fan and light switches electrical leads. (See Figure 7-14)

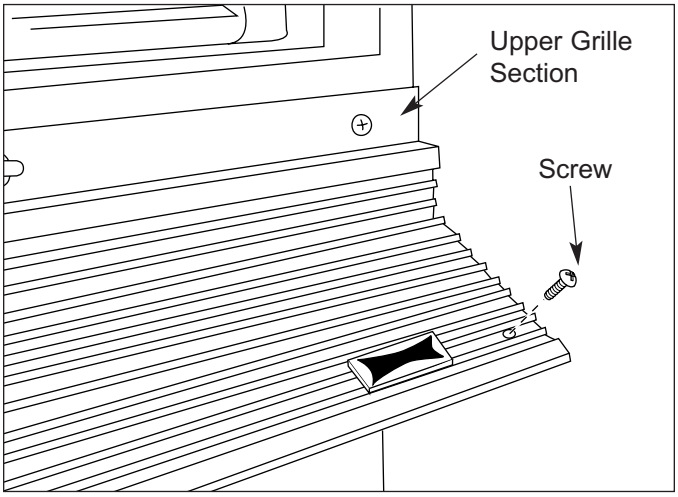


Figure 7-14. Model 601R, 601F Standard Louvered Grille

Stainless Steel Grille (Models 601R/S, 601F/S)

⚠ WARNING

THE UPPER GRILLE SECTION HOLDS THE FAN AND LIGHT SWITCH. TO AVOID ELECTRICAL SHOCK, DISCONNECT POWER TO UNIT BEFORE ATTEMPTING TO REMOVE UPPER GRILLE SECTION.

The stainless steel grille on models 601R/S & 601F/S consists of an upper grille section and a lower grille section. The lower grille section is secured at the bottom by a “catch and strike” retention system. To remove the lower grille section, grasp bottom of grille and tilt out and up to release it from the catch and strike at the bottom. Continue to tilt out and up to release it from the upper grille section. (See Figure 7-15)

To remove the upper grille section, open cabinet door and extract the screws at the top left and right corners. Pull upper grille section forward slightly and disconnect fan and light switches electrical leads. (See Figure 7-15)

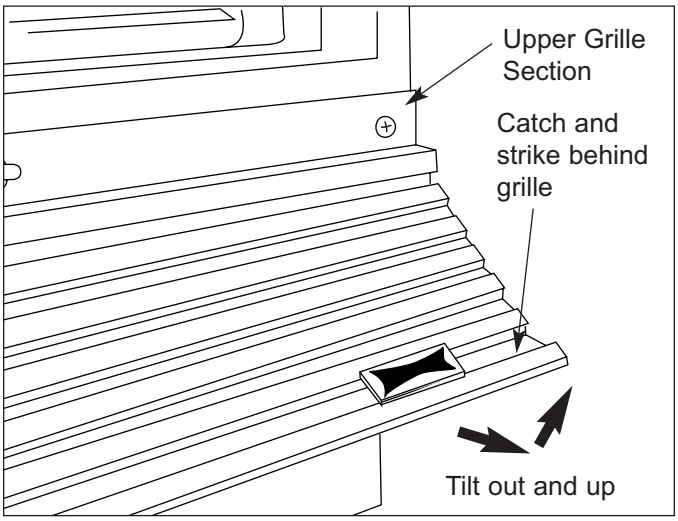


Figure 7-15. Model 601R, 601F Stainless Steel Grille

Drain Pan
(Models 601R, 601F)

To access the drain pan, the kickplate and lower grille section must first be removed. Then push the drain pan up and out from underneath. (See Figure 7-16)

⚠ WARNING

When reinstalling drain pan be sure drain pan is secure and level. Failure to reinstall drain pan properly could result in drain pan overflowing.

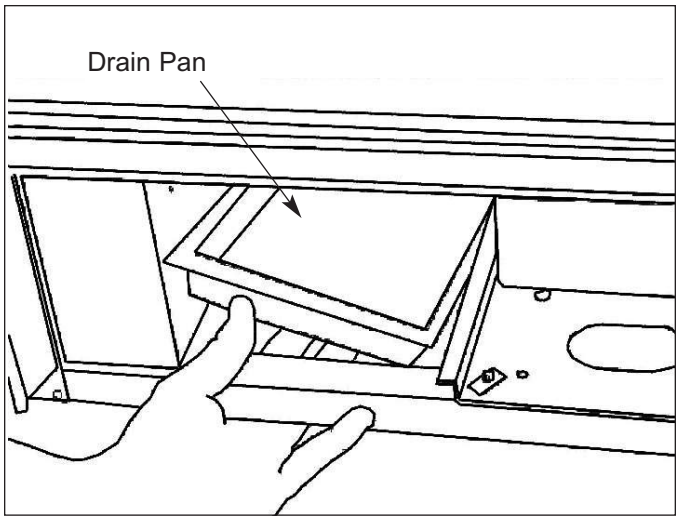


Figure 7-16. Model 601R, 601F Drain Pan Removal

Louvered Grille and Stainless Steel Grille Assembly
(Models 611/F, 611/S, 632/F, 632/S, 642/F, 642/S, 650/F, 650/S, 690/F, 690/S)

Removal procedures for the standard louvered grille and stainless steel grille are the same. To remove the louvered grille assembly, open unit door(s) and extract the grille screws which pass up through the top main-frame extrusion into brackets at bottom rear of grille assembly. Now, tilt the top of grille forward and release the grille springs from the grille hooks at the back side of the grille. Then lift grille assembly off. (See Figure 7-17)

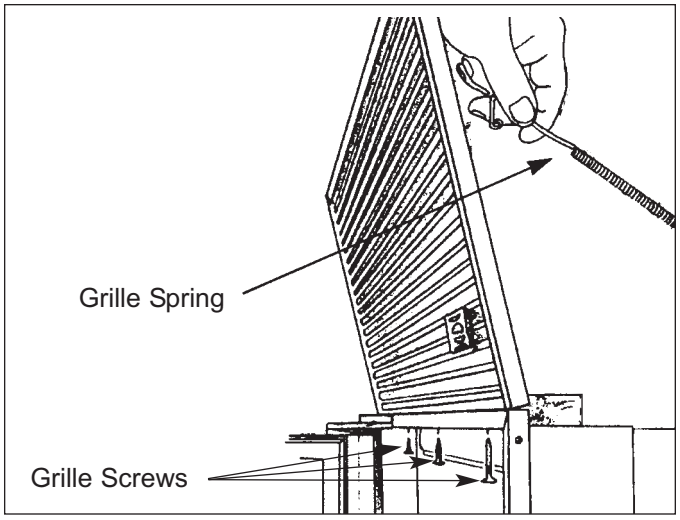


Figure 7-17. Grille Removal

Panel Grille Assembly
(Models 611/O, 632/O, 642/O, 650/O)

The panel grille assembly consists of an outer and an inner grille frame. The outer grille frame attaches to the unit, while the inner grille frame(which accepts a deco-rative panel) is easily removable for condenser cleaning purposes. There are pegs on the back side of the inner grille frame which fit in key-hole slots in the outer grille frame. To remove the inner grille frame, lift assembly up (1) and pull out of key-hole slots at the bottom (2). Then, pull down and out of key-hole slots at the top (3). (See Figure 7-18)

To remove the outer grille frame, remove the inner grille frame first. Now, opening unit door(s) and extract the grille screws which pass up through the top mainframe extrusion into bottom extrusion of outer grille frame. Now, extract the screws at the top front of outer grille frame and lift frame off.

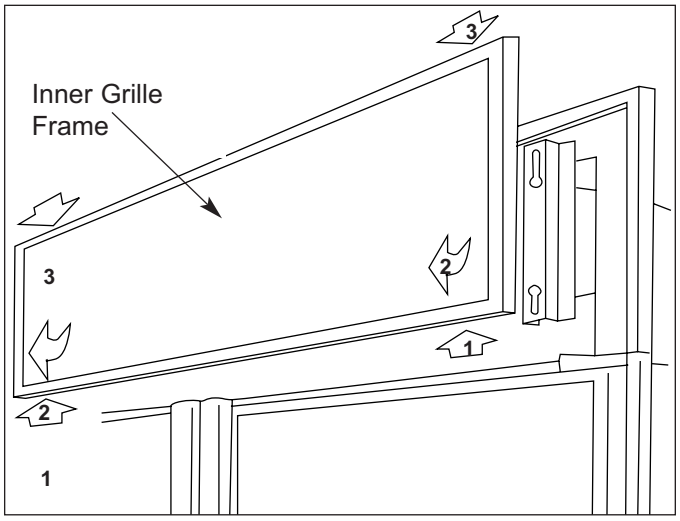


Figure 7-18. Inner Grille Frame Removal

Kickplate Removal

To remove the kickplate, extract the retaining screws near each upper corner, then pull the kickplate forward. (See Figure 7-19)

Drain Pan Access and Removal (Models 611, 632, 642, 650, 690)

To access the drain pan, the kickplate must first be removed. Now push the front of the drain pan back and down. (This flexes the drain pan slightly, releasing the top flange from the tab in the kickplate support.) Then, pull the drain pan forward. (See Figure 7-20)

When reinstalling, the tapered end of drain pan must be inserted on top of the drain pan holder at rear. Then push the front of the drain pan up until the top front flange engages the tab in the kickplate support. Also, make sure the drain hoses are over the drain pan, and the foam air seals which direct air over drain pan are in position and in good shape. (See Figure 7-20)

⚠ WARNING

When reinstalling drain pan be sure drain pan is secure and level. Failure to reinstall drain pan properly could result in drain pan overflowing.

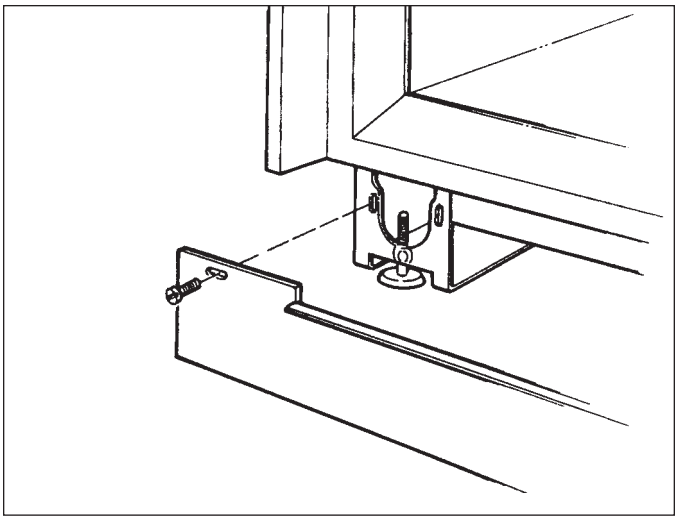


Figure 7-19. Kickplate Removal

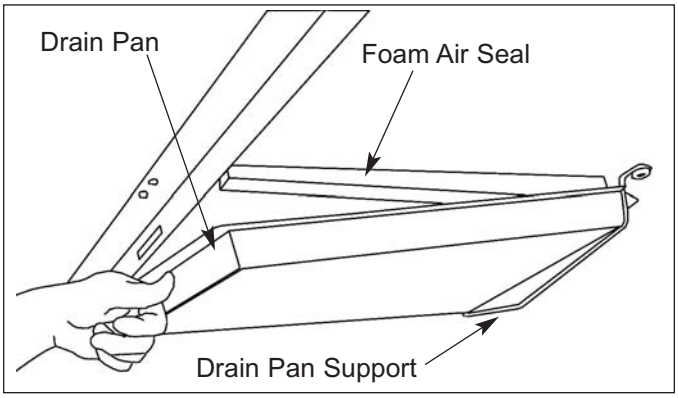


Figure 7-20. Model 611, 632, 642, 650, 690 Drain Pan Removal

REFRIGERATOR MECHANICAL AND ELECTRICAL COMPONENTS

Control Board (Models 601R, 611, 632, 642, 650)

NOTE: *Model 690 control board access and removal is covered later in this section.*

The control board is held in position by two sets of tabs behind the left side of the control panel. The two forward tabs position the LCD in the control panel window, while the other two tabs secure the middle of the control board. The control board is then shielded by a control enclosure, and concealed by the light diffuser.
To access and remove the control board, the light diffuser must first be removed. Now extract the screws securing the control enclosure to the ceiling of the compartment. Then, lower the back of the enclosure while pulling it toward the rear of the unit. Disconnect all electrical leads attached to the control board, including the membrane switch ribbon cable. Expand the two tabs at the middle of the control board outward while pulling the back of the board down slightly. Then, expand the two forward tabs outward that hold the LCD in position, and pull the control board down and toward the rear of the unit. (See Figures 7-21 & 7-22)

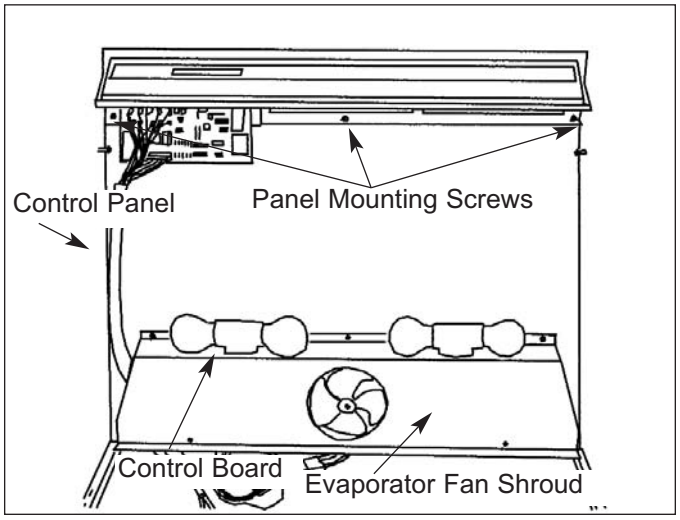


Figure 7-21. Upper Refrigerator Compartment Area

Control Panel (Models 601R, 611, 632, 642, 650)

NOTE: *Model 690 vertical control panel access and removal is covered later in this section.*

The control panel, which houses the membrane switch, is secured to the ceiling of the compartment by two rows of screws. The front row of screws are through keyhole slots in the assembly. To access and remove the control panel, the light diffuser and control enclosure must be removed first.

NOTE: *It is recommended, but not necessary, to remove the control board in order to remove the control panel. If leaving the control board secured to the control panel, all electrical leads attached to the control board must be disconnected.*

Now, extract the back row of screws at the back of the control panel. Push the panel back to release it from the front row of screws, then lower the panel down and pull out. (See Figure 7-21)

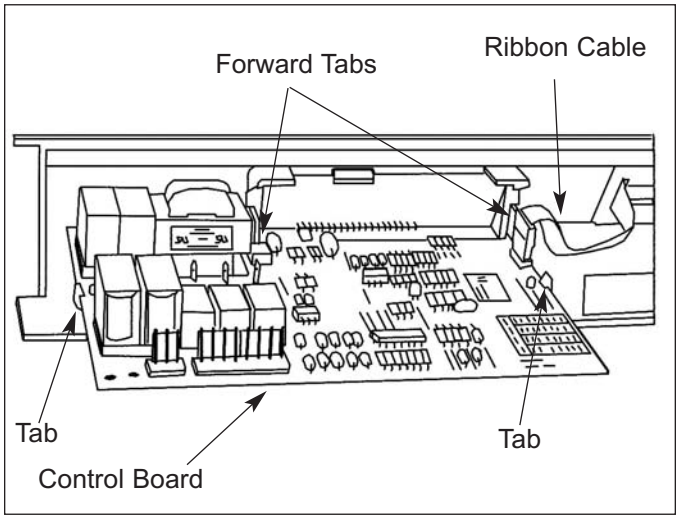


Figure 7-22. Control Board Removal

Refrigerator Evaporator Cover (Models 601R, 611, 632, 642, 650)

The bottom of the refrigerator evaporator cover is secured by slots in the side flanges fitting over pegs at the bottom of each shelf ladder. At the top, screws hold the evaporator cover to the evaporator fan shroud. To access and remove the evaporator cover, the light diffuser must first be removed. Then extract the screws at the top of the evaporator cover, tilt it forward and lift out. (See Figure 7-23)

Refrigerator Evaporator Cover (Model 690)

The bottom of the refrigerator evaporator cover is secured by slots in the side flanges fitting over pegs at the bottom of each shelf ladder. Below the water reservoir area is a screw holding the evaporator cover to a bracket at the back wall. And, at the top, screws hold the evaporator cover to the evaporator fan shroud. (See Figure 7-23)

To access and remove the evaporator cover, the light diffuser must first be removed. Now extract the screws at the top of the evaporator cover and below the water reservoir area. Then, tilt the evaporator cover forward and lift out.

Refrigerator Evaporator Fan Shroud (Models 601R, 611, 632, 642, 650, 690)

To access the evaporator fan shroud assembly, the light diffuser and evaporator cover will need to be removed first. Now extract the mounting screws which secure the fan shroud assembly to the ceiling of the refrigerator compartment. Then lower the assembly and disconnect the wiring for the lights from the wire harness. (See Figure 7-21 and 7-24)

Refrigerator Evaporator Fan Assembly (Models 601R, 611, 632, 642, 650, 690)

To access the evaporator fan assembly, the light diffuser, evaporator cover, and evaporator fan shroud assembly will need to be removed. Now, disconnect the fan motor wire leads from the wire harness, and extract the mounting screws which secure the fan assembly to the ceiling. (See Figure 7-25)

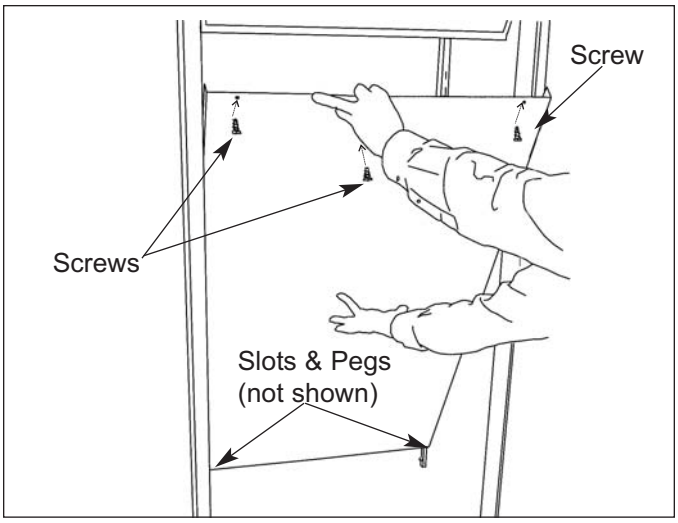


Figure 7-23. Evaporator Cover Removal

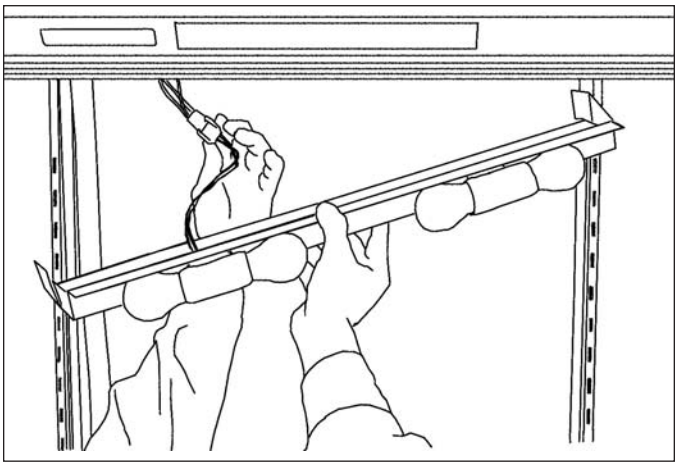


Figure 7-24. Fan Shroud Assembly Removal

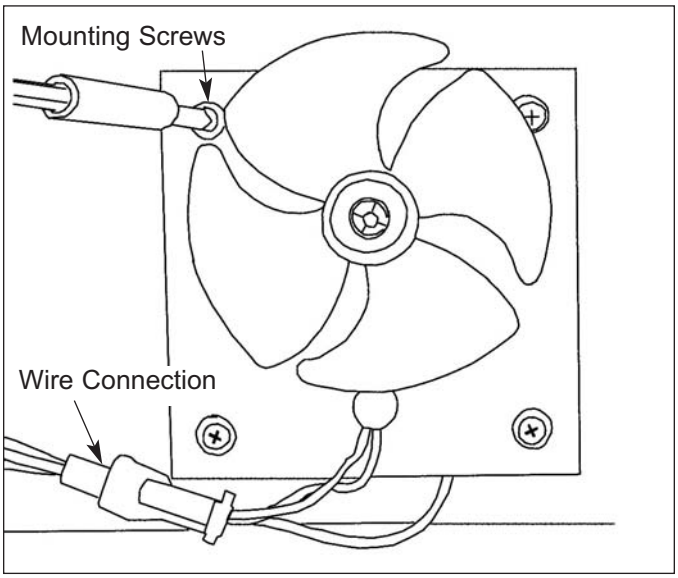


Figure 7-25. Refrigerator Evaporator Fan Removal

Refrigerator Compartment Thermistor (Models 601R, 611, 632, 642, 650, 690)

The refrigerator compartment thermistor is located behind the evaporator cover, and attached to the wall just above the evaporator. To access and remove the refrigerator compartment thermistor, the light diffuser and evaporator cover must be removed first. Now disconnect the thermistor wire leads from the wire harness, and extract the screw which secures the thermistor to the rear wall. (See Figure 7-26)

Refrigerator Evaporator Thermistor (Models 601R, 611, 632, 642, 650, 690)

NOTE: *Evaporator fins are sharp and could cause minor personal injury.*

The refrigerator evaporator thermistor is attached to the center of the right evaporator bracket. To access and remove the refrigerator evaporator thermistor, the light diffuser and evaporator cover must be removed first. Now disconnect the thermistor wire leads from the wire harness, and extract the screw which secures the thermistor to the right evaporator bracket. (See Figure 7-26)

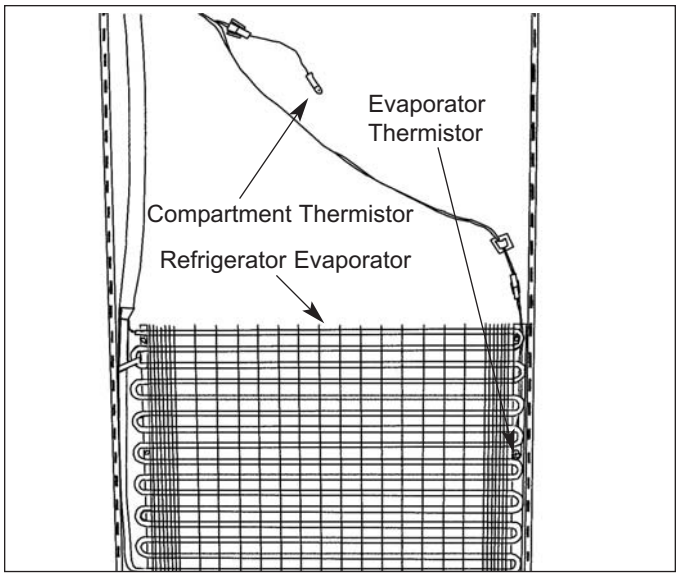


Figure 7-26. Refrigerator Thermistors

Water Reservoir Tank Cover (Model 690)

To remove the water reservoir tank cover, the light diffuser and upper front panel must be removed first.

NOTE: *The procedure for removing the upper front panel in a model 690 is the same as removing an upper control panel.*

Now, extract the retaining screw at the bottom rear of vertical control panel, and the retaining screw at top center of the tank cover. Then, grasp the bottom of the reservoir tank cover and slide it backwards to depress the mounting springs. Swing the front edge out and pull forward. (See Figure 7-27)

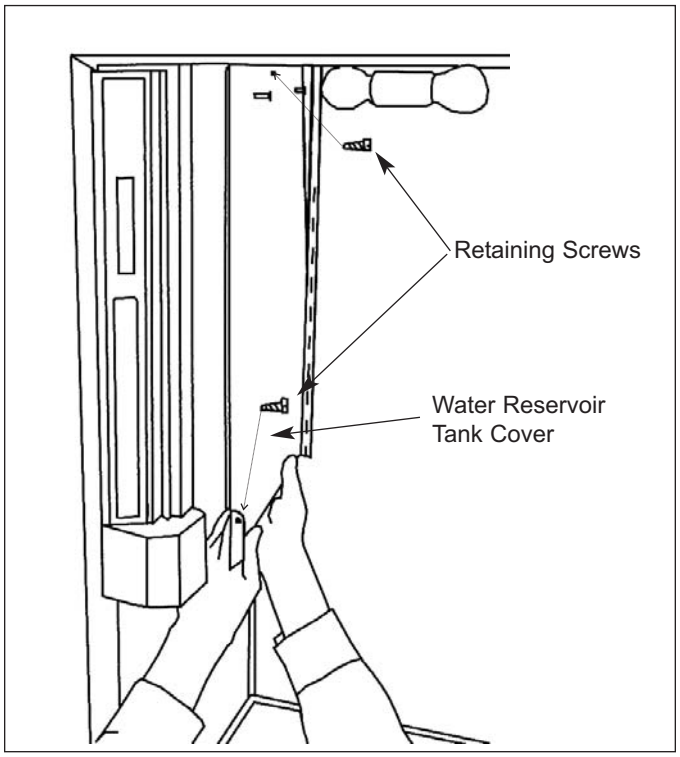


Figure 7-27. Water Tank Cover Removal

Control Board (Model 690)

The control board is held in position by two sets of tabs behind the control panel. The two forward tabs position the LCD in the control panel window, while the other two tabs secure the middle of the control board. The control board is then shielded by a control enclosure, and concealed by the water reservoir tank cover.
To access and remove the control board, the light diffuser, upper front panel and water reservoir tank cover must first be removed. Now extract the screws securing the control enclosure to the mullion wall of the compartment. Then, pull the back of the enclosure out and toward the rear of the unit. Disconnect all electrical leads attached to the control board, including the membrane switch ribbon cable. Expand the two tabs at the middle of the control board outward while pulling the back of the board out slightly. Then, expand the two forward tabs outward that hold the LCD in position, and pull the control board out and toward the rear of the unit. (See Figure 7-28)

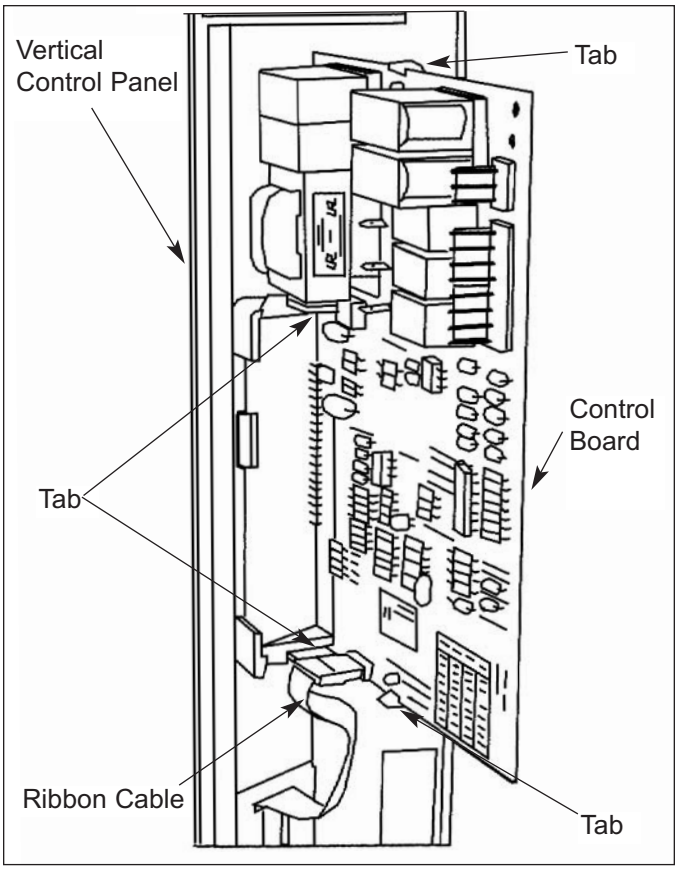


Figure 7-28. Control Board Removal

Vertical Control Panel (Model 690)

The control panel, which houses the membrane switch, is secured to the mullion wall by screws and a sheet metal retainer. To access and remove the control panel, the light diffuser, upper front panel, water reservoir tank cover and control enclosure must be removed first.

NOTE: *It is recommended, but not necessary, to remove the control board in order to remove the control panel. If leaving the control board secured to the control panel, all electrical leads attached to the control board must be disconnected.*

Now, extract the screws at the back of the control panel and pull panel forward from sheet metal retainer. (See Figure 7-29)

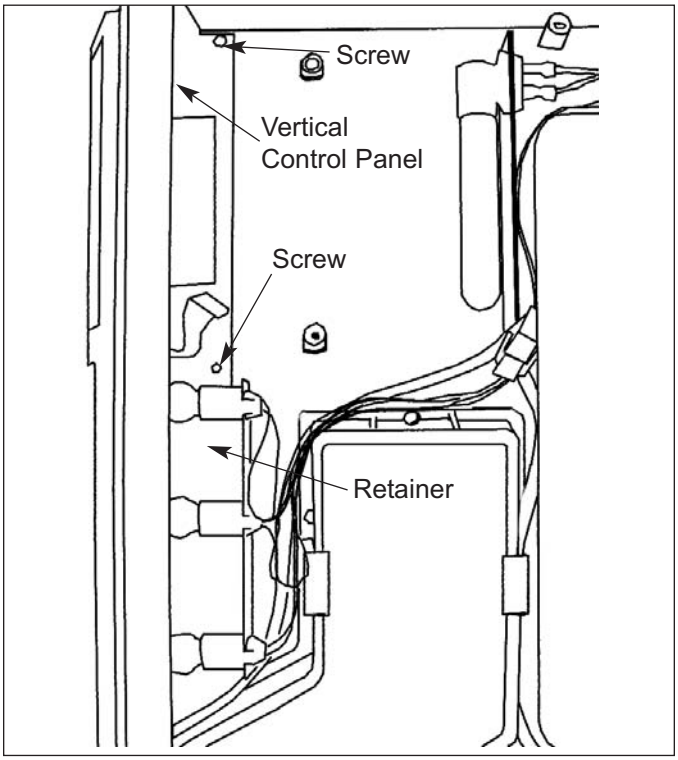


Figure 7-29. Vertical Control Panel Removal

Water Reservoir Tank (Model 690)

To access and remove the water reservoir tank, the light diffuser, upper front panel and water reservoir tank cover will need to be removed first. Now disconnect the compression fittings at the inlet and outlet of the water reservoir tank. Then remove the mounting screws and lift out. (See Figure 7-30)

⚠ WARNING

Water in reservoir tank will drain from lower inlet when compression fitting is removed. A container with a volume of at least 1/2 gallon should be used to catch the draining water.

NOTE: *After reinstalling a water reservoir tank, the WATER button at the door dispenser must be depressed for approximately two minutes to refill the tank.*

Ice Chute Components (Model 690)

To access the ice chute, the light diffuser, upper front panel and water reservoir tank cover will need to be removed. The ice chute cover is removed by depressing the tabs at the sides and pulling the cover out and back. (See Figure 7-30)

NOTE: *The ice chute door in the mullion wall is accessible at this point.*

To remove the ice chute/water nozzle assembly, disconnect the water line from the water nozzle, then extract the mounting screws and pull the assembly out and back. (See Figure 7-30)

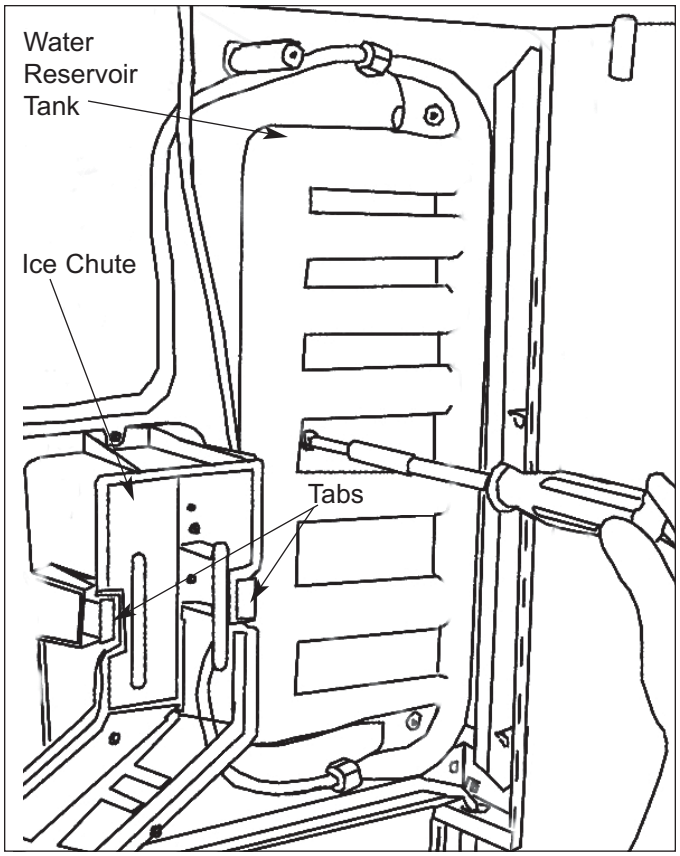


Figure 7-30. Water Tank & Ice Chute Removal

FREEZER MECHANICAL AND ELECTRICAL COMPONENT REMOVAL

Control Board (Model 601F)

⚠ WARNING

DISCONNECT POWER TO UNIT TO AVOID ELECTRICAL SHOCK BEFORE ATTEMPTING TO REMOVE CONTROL BOARD.

The control board is held in position by two sets of tabs behind the left side of the control panel. The two forward tabs position the LCD in the control panel window, while the other two tabs secure the middle of the control board. The control board is then shielded by a control enclosure, and concealed by the light diffuser.
To access and remove the control board, the light diffuser must first be removed. Now extract the screws securing the control enclosure to the ceiling of the compartment. Then, lower the back of the enclosure while pulling it toward the rear of the unit. Disconnect all electrical leads attached to the control board, including the membrane switch wire harness. Expand the two tabs at the middle of the control board outward while pulling the back of the board down slightly. Then, expand the two forward tabs outward that hold the LCD in position, and pull the control board down and toward the rear of the unit. (See Figures 7-31 & 7-32)

Control Panel (Model 601F)

The control panel, which houses the membrane switch, is secured to the ceiling of the compartment by two rows of screws. The front row of screws are through keyhole slots in the assembly. To access and remove the control panel, the light diffuser and control enclosure must be removed first.

NOTE: *It is recommended, but not necessary, to remove the control board in order to remove the control panel. If leaving the control board secured to the control panel, all electrical leads attached to the control board must be disconnected. (See Figure 7-32)*

Now, extract the screws at the back of the control panel. Then, loosen the screws in the keyhole slots toward the front of the control panel. Push the panel back, then lower the panel down and out. (See Figure 7-31)

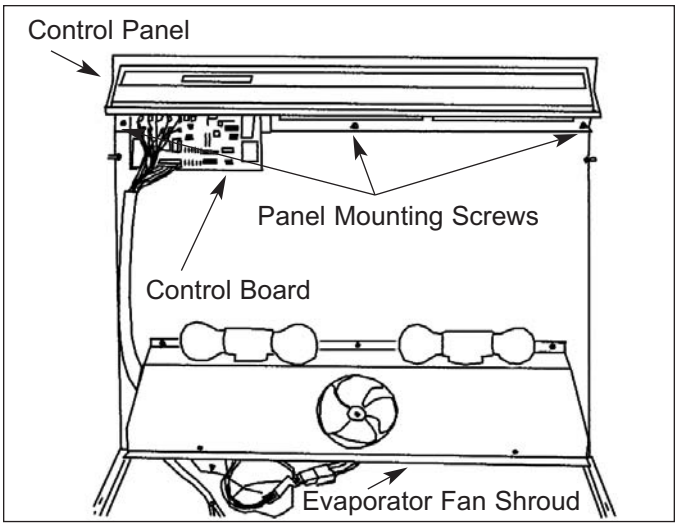


Figure 7-31. Upper Freezer Compartment Area

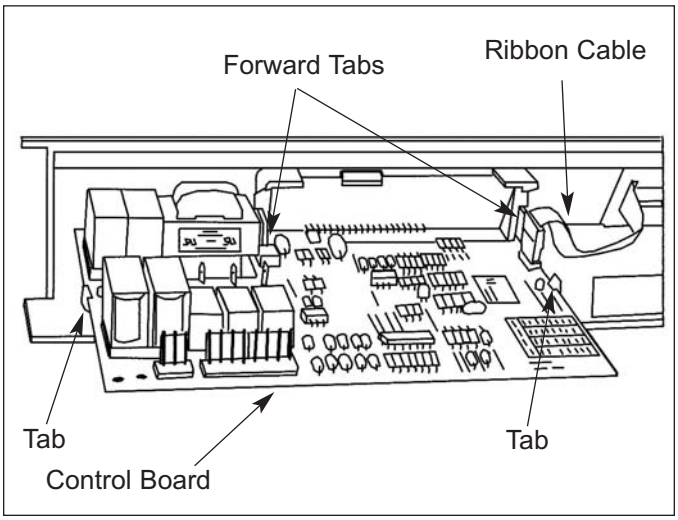


Figure 7-32. Control Board Removal

⚠ WARNING

When re-connecting membrane switch ribbon cable to control board, be sure label on ribbon cable terminal housing is oriented toward arrow on control board connection. Also, care should be taken to not kink the ribbon cable.

Freezer Evaporator Cover (Model 601F)

The bottom of the freezer evaporator cover is secured by slots in the side flanges fitting over pegs at the bottom of each shelf ladder. At the top, screws hold the evaporator cover to the evaporator fan shroud. To access and remove the evaporator cover, the light diffuser and freezer glass shelf must first be removed. Then extract the screws at the top of the evaporator cover, tilt it forward and lift out. (See Figure 7-33)

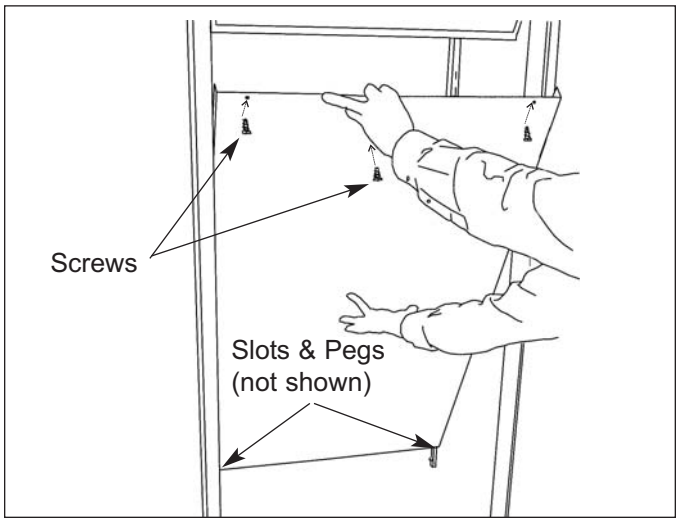


Figure 7-33. Evaporator Cover Removal

Freezer Evaporator Fan Shroud Assembly (Model 601F)

To access and remove the evaporator fan shroud assembly, the light diffuser and evaporator cover will need to be removed first. Now extract the mounting screws which secure the fan shroud assembly to the ceiling of the refrigerator compartment. Then lower the assembly and disconnect the wiring for the lights from the wire harness. (See Figure 7-34)

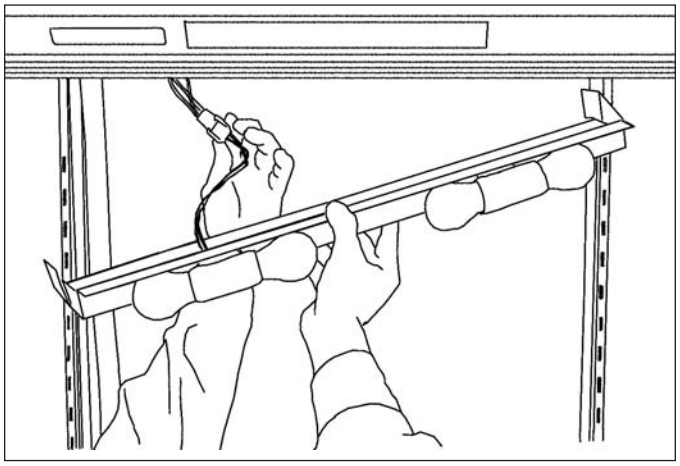


Figure 7-34. Model 601F Fan Shroud Removal

Freezer Evaporator Fan Assembly Access and Removal (Model 601F)

To access the evaporator fan assembly, the light diffuser, evaporator cover, and evaporator fan shroud assembly will need to be removed. Now, disconnect the fan motor wire leads from the wire harness, and extract the mounting screws which secure the fan assembly to the ceiling. (See Figure 7-35)

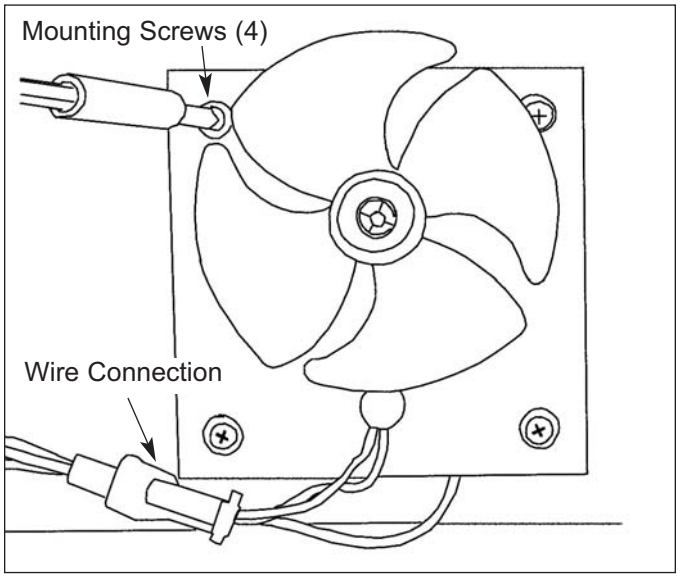


Figure 7-35. Model 601F Evaporator Fan Removal

Freezer Evaporator Thermistor (Model 601F)

The freezer evaporator thermistor is attached to the left evaporator bracket. To access and remove the freezer evaporator thermistor, the light diffuser and evaporator cover must be removed first. Now disconnect the thermistor wire leads from the wire harness, and extract the screw which secures the thermistor to the left evaporator bracket. (See Figure 7-36)

Defrost Terminator (Model 601F)

The defrost terminator is attached to the top center pass of the evaporator. To access and remove the defrost terminator, the light diffuser and evaporator cover must be removed first. Now disconnect the defrost terminator wire leads from the wire harness, and pull the terminator off of the evaporator tubing. (See Figure 7-36)

Defrost Heater (Model 601F)

To access and remove the freezer evaporator defrost heater, the light diffuser and evaporator cover will need to be removed first. The heater clips which secure the heater to the evaporator now need to be removed. Dislodge the heater clips by pulling the tab of the clip down and out. Then disconnect the heater wires from the wire harness, and gently pull the heater from the fins of the evaporator. (Figure 7-36)

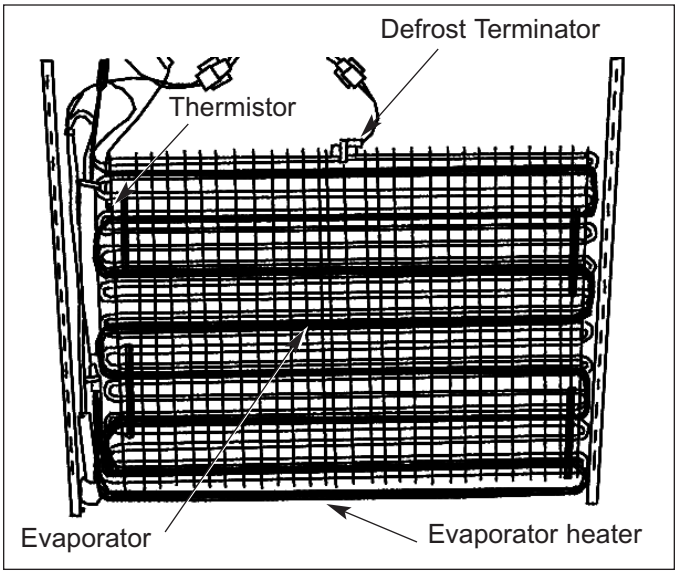


Figure 7-36. Model 601F Evaporator Area

⚠ WARNING

Evaporator fins are sharp and could cause minor personal injury.

Icemaker Assembly (Model 601F)

The icemaker assembly is located behind the top right freezer basket, just below the glass shelf. (See Figure 7-37) To access and remove the icemaker assembly, remove the top right freezer basket which contains the ice bucket first. The ice level mechanism now needs to be detached from the icemaker. This is done by sliding the connecting rod to the right, off of the icemaker shut-off arm, allowing the ice level arm to drop out of the way. Now remove the mounting screw at the bottom left of the icemaker which secures the icemaker bracket to the drain trough enclosure. Extract the two mounting screws at the top rear, above the icemaker mold; pull the icemaker assembly forward and disconnect the electrical leads from the icemaker. (See Figure 7-38)

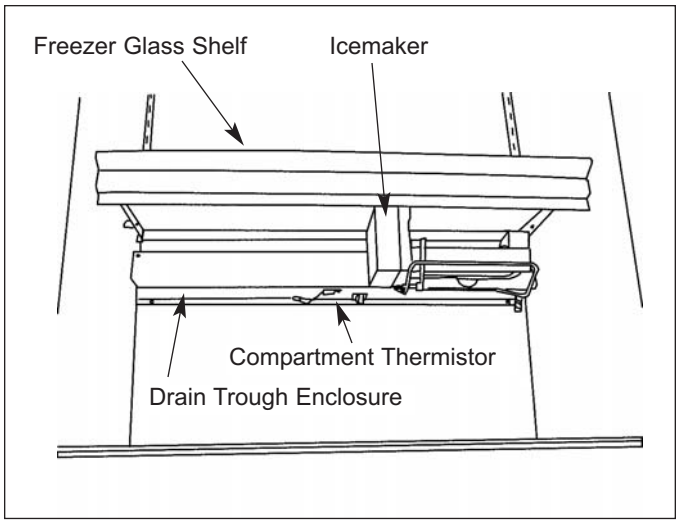


Figure 7-37. Model 601F Icemaker/Drain Trough Area

Fill Tube Heater (Model 601F)

The icemaker fill tube and fill tube heater are located at top right of icemaker, just below the freezer glass shelf and above the drain trough enclosure. (See Figure 7-38) The icemaker fill tube heater plugs into the wire harness behind the drain trough enclosure.

NOTE: *To access the fill tube heater it is recommended, but not necessary, to remove the freezer glass shelf.*

To remove the fill tube heater, first remove the drain trough enclosure. Disconnect the fill tube heater from the wire harness and pull the fill tube and heater out as one. Then, cut the cable tie which holds the heater to the fill tube.

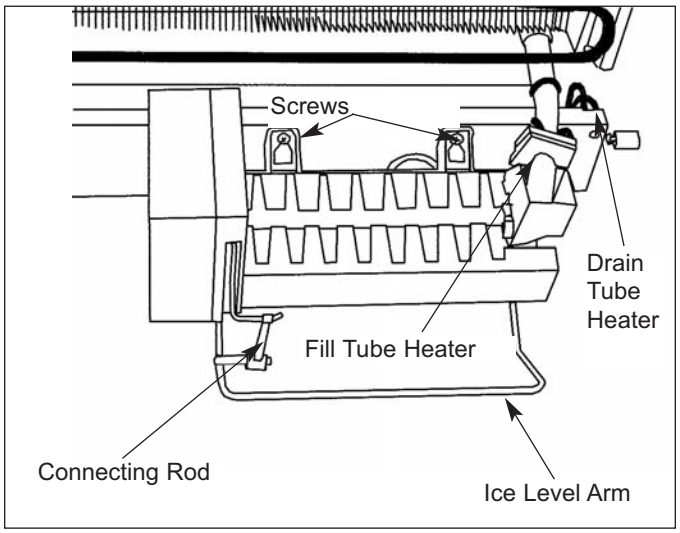


Figure 7-38. Model 601F Icemaker Area

Drain Trough Enclosure (Model 601F)

The drain trough enclosure is located at the rear of the compartment, just below the freezer glass shelf. (See Figure 7-37)

NOTE: *To access the drain trough enclosure it is recommended, but not necessary, to remove the freezer glass shelf.*

To remove the drain trough enclosure, extract the mounting screw at the top of each corner and the mounting screws along the bottom. Then, pull enclosure forward.

NOTE: *It is not necessary to remove the icemaker nor freezer compartment thermistor in order to detach the drain trough enclosure from the rear wall. But, the icemaker wire harness and thermistor electrical leads behind the drain trough enclosure will need to be disconnected in order to remove enclosure completely.*

Freezer Compartment Thermistor (Model 601F)

The freezer compartment thermistor is attached to the bottom center of the drain trough enclosure, just above the top center freezer basket slide. (See Figure 7-37) The thermistor wire leads attach to the wire harness behind the drain trough enclosure. To access and remove freezer compartment thermistor, the drain trough enclosure must first be detached from the back wall. Now, disconnect the thermistor wire leads from the wire harness. Then extract the screw which secures the thermistor to the drain trough enclosure.

Drain Tube Heater (Model 601F)

The braided wire drain tube heater is connected to the wire harness behind the drain trough enclosure. To access and remove the drain tube heater, the drain trough enclosure will need to be removed first. Now, disconnect the heater from the wire harness, remove the clamp which holds the heater in place, and pull the drain tube heater from the drain tube. (See Figures 7-38 & 7-39)

NOTE: *When replacing the drain tube heater, it is necessary to insert it a minimum of 3" into the drain tube.*

Drain Trough Heater (Model 601F)

The drain trough heater consists of a braided wire heater between two strips of aluminum foil, one of which has adhesive on the outside. This adhesive side holds the drain trough heater to the bottom of the drain trough. To access and remove the drain trough heater, the drain trough enclosure will need to be removed first. Now, disconnect the heater wires from the wire harness, and peel the heater from the bottom of the drain trough. (See Figure 7-39)

NOTE: *When replacing the drain trough heater, the bottom of the drain trough must be dry in order for the heater to stick properly.*

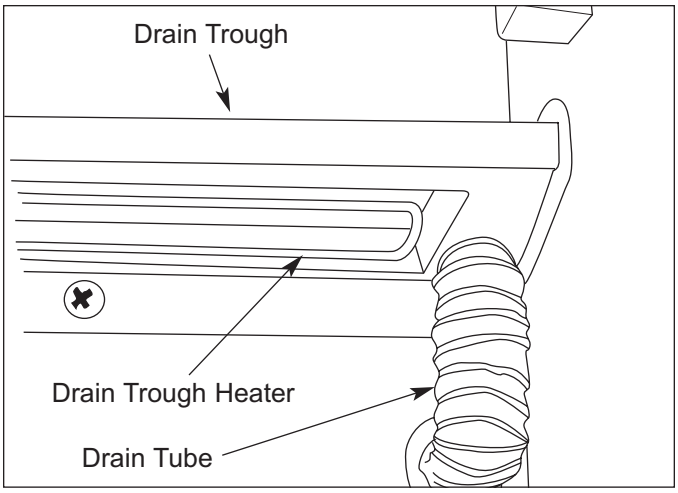


Figure 7-39. Model 601F Freezer Drain Area

Freezer Light Bulb Access (Models 611, 650)

⚠ WARNING

ELECTRIC SHOCK HAZARD. IF BULB SHOULD SEPARATE FROM BASE, DISCONNECT POWER TO UNIT BEFORE ATTEMPTING TO REMOVE BASE FROM SOCKET.

⚠ WARNING

Light bulbs are hot and could cause minor personal injury.

There is no light diffuser in the freezer of these models. The light bulbs are located directly behind the top breaker strip. (See Figure 7-40)

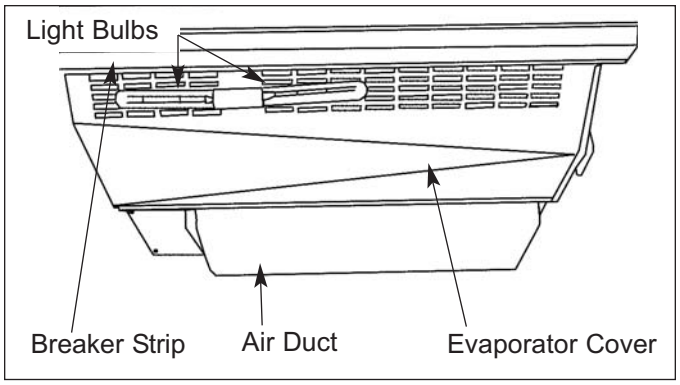


Figure 7-40. Model 611, 650 Freezer Lighting

Icemaker Assembly Removal (Models 611, 650)

To remove the icemaker, extract the mounting screw at the bottom of the icemaker which secures the icemaker bracket to the left side wall. Then extract the two mounting screws at the top, above the icemaker mold. Pull the icemaker assembly down, disconnect the electrical leads from the the icemaker, and remove the ice level arm from the bracket. (See Figure 7-41)

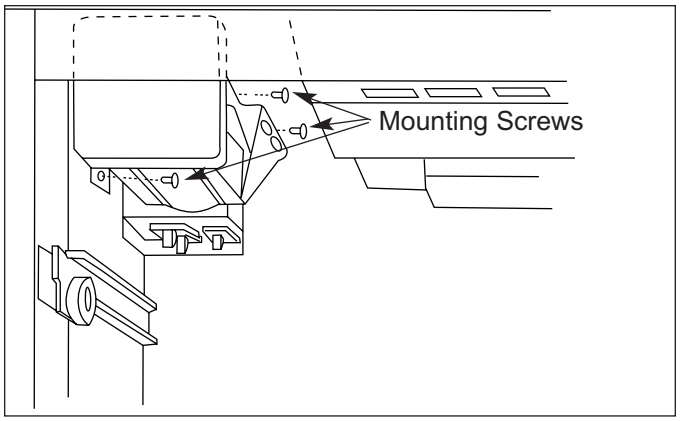


Figure 7-41. Models 611, 650 Icemaker

Icemaker Fill Tube Heater (Models 611, 650)

The icemaker fill tube and fill tube heater are located at the top left rear corner of the freezer compartment, just above the switch enclosure. The fill tube heater plugs into the right side of the switch enclosure. To access the fill tube heater, first remove the icemaker. Then, disconnect the fill tube heater from the switch enclosure and pull the fill tube and heater out as one. (See Figure 7-42)

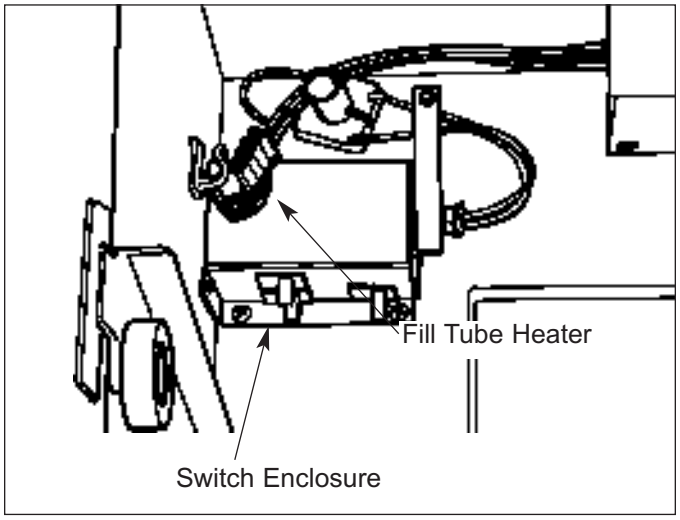


Figure 7-42. Model 611, 650 Icemaker Fill Tube/Heater & Switch Enclosure

Freezer Light, Fan and Icemaker Switches (Models 611, 650)

The freezer light, fan and icemaker switches are located inside the switch enclosure at the top left rear corner of the freezer compartment. (See Figure 7-41.) To access and remove a freezer light, fan and/or icemaker switch, the icemaker should first be removed. Now extract the screws securing the switch enclosure to the top left rear corner of the freezer compartment. Then, lower the enclosure and disconnect the wire leads from the switch being removed. Depress the tabs on the side of the switch and push the switch out of the enclosure. (See Figures 7-42 and 7-43)

Freezer Compartment Thermistor (Models 611, 650)

The freezer compartment thermistor is located inside the switch enclosure at the top left rear corner of the freezer compartment. (See Figure 7-41) To access and remove the freezer compartment thermistor, the icemaker should first be removed. Now extract the screws securing the switch enclosure to the top left rear corner of the freezer compartment. Then, lower the enclosure and disconnect the thermistor wire leads from the wire harness, and extract the screw which secures the thermistor to the inside of the enclosure. (See Figures 7-42 & 7-43)

Freezer Air Duct Removal (Models 611, 650)

The freezer air duct is located at the top rear of the freezer compartment, directly behind the evaporator cover. To remove the air duct, extract the two mounting screws at the front flange; pull the front down and forward.

NOTE: *When reinstalling freezer air duct, the rear flange of air duct must sit on top of two lower white pegs in the rear wall.*

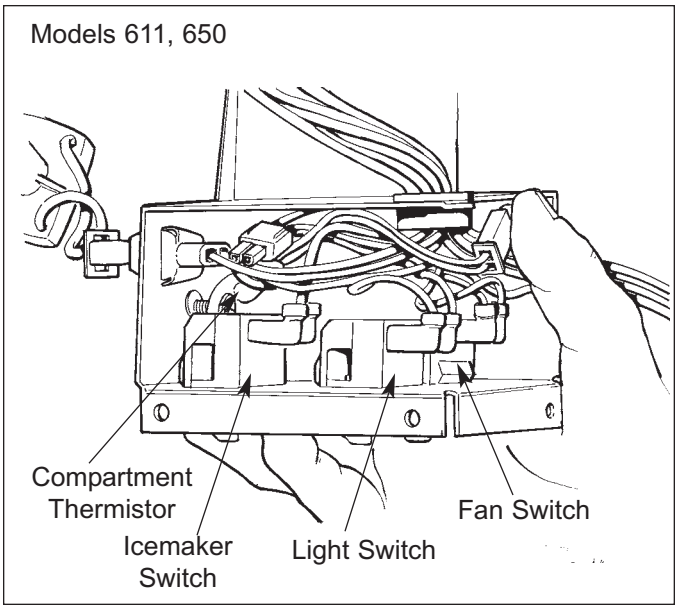


Figure 7-43. Model 611, 650 Switch Enclosure

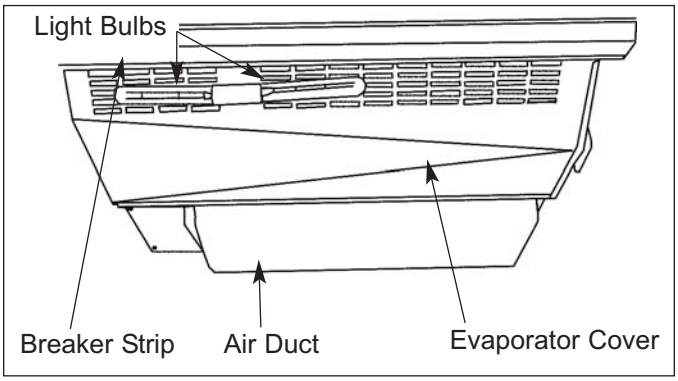


Figure 7-44. Model 611, 650 Freezer Compartment, Top

Freezer Evaporator Cover (Models 611, 650)

The freezer evaporator cover is located at the top of the freezer compartment, and the right side is sealed to the right wall with silicone. (See Figures 7-44 & 7-45)
To remove the freezer evaporator cover, the freezer air duct will first need to be removed. Now, cut the silicone seal at the right side with a knife. Then, extract the mounting screws from the back and front of the evaporator cover. Pull the left side of the evaporator cover down and disconnect the electrical leads to the lights. Continue to pull the evaporator cover down and to the left.

NOTE: *When replacing the evaporator cover it is important to reseal the right side with silicone. Failure to seal the right side could cause an icing situation in the freezer compartment.* (See Figure 7-45)

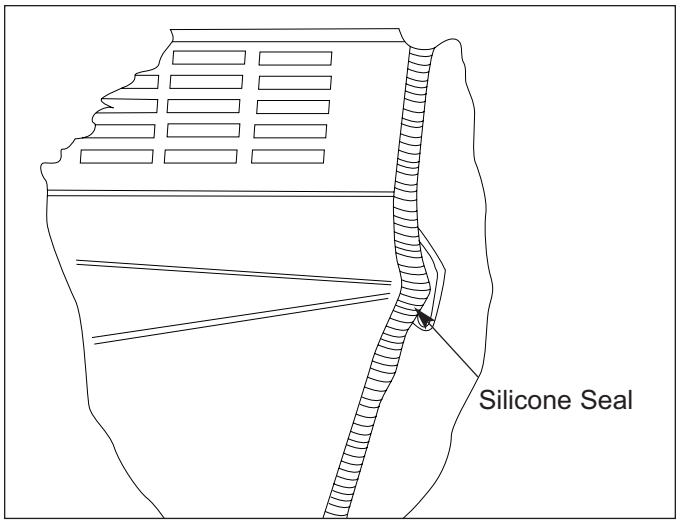


Figure 7-45. Model 611, 650 Silicone Seal

Freezer Evaporator Fan Assembly (Models 611, 650)

To access and remove the evaporator fan assembly, the freezer air duct and evaporator cover will need to be removed first. Now, remove the mounting screws at the left side of the fan shroud. Tilt the front edge of the assembly down and disconnect the fan motor wiring from the wire harness. (See Figure 7-46) Continue to tilt the assembly forward and pull out. The freezer evaporator fan can now be removed from the fan shroud.

NOTE: *When reinstalling freezer evaporator fan assembly , the oblong holes in the rear flange of the fan shroud must be placed over the two upper white pegs in the rear wall.*

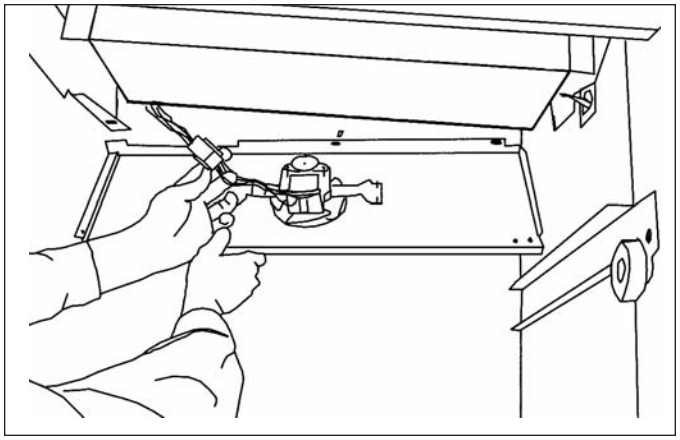


Figure 7-46. Model 611, 650 Freezer Evaporator Fan and Shroud

Freezer Evaporator Thermistor (Models 611, 650)

The freezer evaporator thermistor is attached to the left evaporator bracket. To access and remove the freezer evaporator thermistor, the freezer air duct, evaporator cover and evaporator fan motor/fan shroud assembly will need to be removed first. Now, disconnect the thermistor wire leads from the wire harness, and extract the screw which secures the thermistor to the left evaporator bracket. (See Figure 7-47)

Defrost Terminator (Models 611, 650)

The defrost terminator is attached to the evaporator outlet, after the accumulator. To access and remove the defrost terminator, the freezer air duct, evaporator cover and evaporator fan motor/fan shroud assembly will need to be removed first. Now, disconnect the defrost terminator wire leads from the wire harness, and pull the terminator off of the tubing. (See Figure 7-47)

Evaporator Defrost Heater Access and Removal (Models 611, 650)

NOTE: *Evaporator fins are sharp and could cause minor personal injury.*

To access and remove the freezer evaporator defrost heater, the freezer air duct, evaporator cover and evaporator fan motor/fan shroud assembly will need to be removed first. The heater clips which secure the heater to the evaporator now need to be removed. Dislodge the heater clips by pulling the tab of the clip down and out. Then disconnect the heater wires from the wire harness and gently pull the heater down and to the left from the fins of the evaporator. (See Figure 7-47)

NOTE: *There is a heater strap in the drain cup that is wrapped around the defrost heater. This heater strap conducts heat into the drain cup during defrost to avoid a frozen drain cup situation. This strap must be reinstalled when replacing the defrost heater. (See Figure 7-47)*

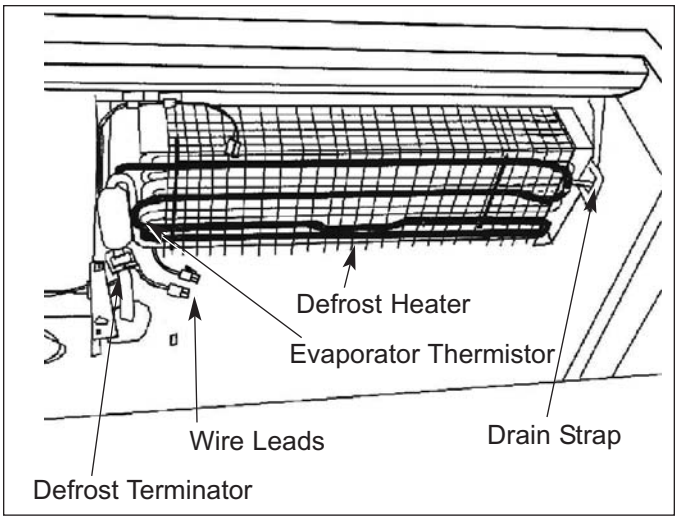


Figure 7-47. Model 611, 650 Freezer Evaporator Area

Freezer Lower Light Diffuser (Models 632, 642)

To access and remove the lower light diffuser, the top freezer basket needs to be removed first. Push top of diffuser down, causing it to flex from top to bottom. This will release the top of the diffuser from the top channel of the diffuser retainer. Then, pull diffuser forward. (See Figure 7-48)

NOTE: *To reinstall, place bottom of diffuser in bottom channel of diffuser retainer; flex diffuser from top to bottom while lining up top of diffuser in top channel of retainer.*

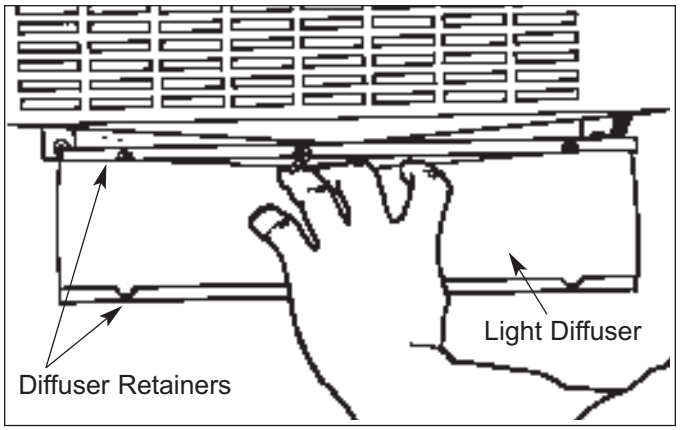


Figure 7-48. Model 632, 642 Lower Light Diffuser

Freezer Compartment Thermistor (Models 632, 642)

The freezer compartment thermistor is attached to the left side wall in the icemaker area. (See Figure 7-49 & 7-50)

NOTE: *To access and remove the freezer compartment thermistor it is recommended, but not necessary, to remove the icemaker, as long as an offset screwdriver is used.*

To access and remove the freezer compartment thermistor, the ice bucket must be removed first, and the ice bucket carriage assembly slid back out of the way. Then, disconnect the thermistor wire leads from the wire harness, and extract the screw which secures the thermistor to left side wall. (See Figures 7-49 & 7-50)

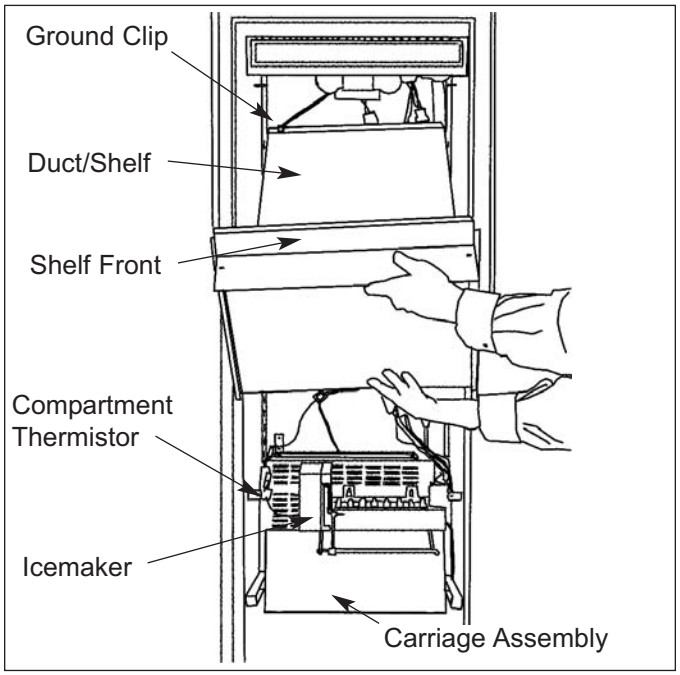


Figure 7-49. Model 632, 642 Freezer Compartment

Freezer Duct/Shelf Assembly (Models 632, 642)

NOTE: *It is recommended, but not necessary, to remove the light diffuser in order to remove the air duct/shelf.*

The freezer duct/shelf assembly is secured at the top by slots in the side flanges fitting over pegs at the top of each shelf ladder. Screws at the shelf front hold the duct/shelf to supports in the side walls. To remove the duct/shelf, the ice bucket must first be removed. Now, extract the screws at left and right of shelf front, and pull the duct/shelf forward and down slightly. Then, pull the grounding clip terminal from the top flange of the duct/shelf and pull duct/shelf out. (See Figure 7-49)

NOTE: *When reinstalling freezer duct/shelf, be sure to reattach grounding clip terminal to top flange. (See Figure 7-49)*

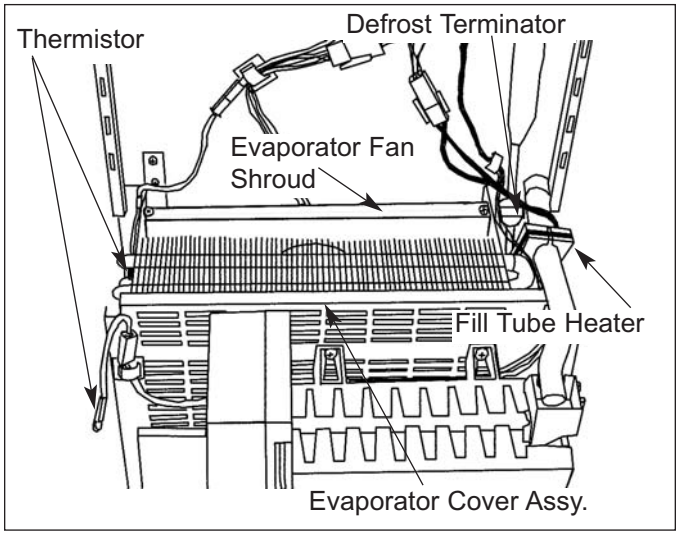


Figure 7-50. Model 632, 642 Evaporator Area

Icemaker (Models 632, 642)

NOTE: *It is recommended, but not necessary, to remove the air duct/shelf in order to remove the icemaker.*

To remove the icemaker, the ice level mechanism needs to be detached from the icemaker. This is done by sliding the connecting rod to the right, off of the icemaker shut-off arm, allowing the ice level arm to drop out of the way. Now remove the mounting screw at the bottom left of the icemaker which secures the icemaker bracket to the evaporator cover assembly. Then extract the two mounting screws at the top rear, above the icemaker mold. Pull the icemaker assembly forward and disconnect the electrical leads from the icemaker. (See Figures 7-50 & 7-51)

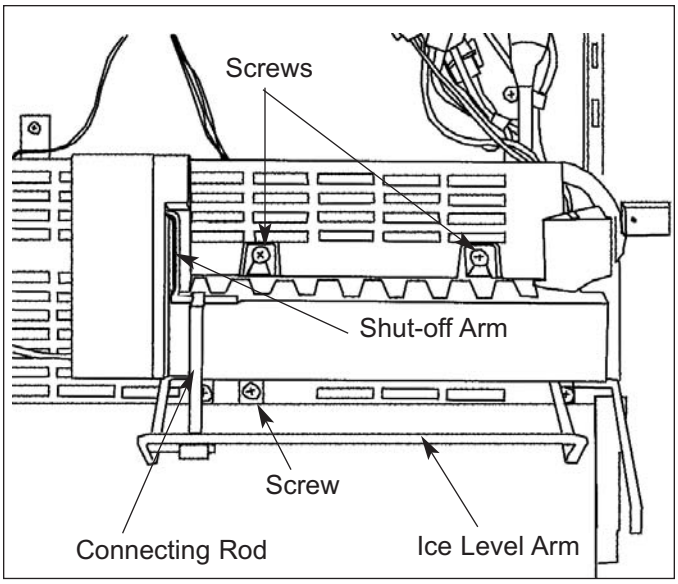


Figure 7-51. Model 632, 642 Icemaker

Fill Tube Heater (Models 632, 642)

To access and remove the icemaker fill tube heater, first remove the air duct/shelf. Now disconnect the heater wire leads from the wire harness and pull the fill tube and heater out as one. Then, cut the cable tie which holds the heater to the fill tube. (See Figure 7-50)

Freezer Evaporator Fan Assembly (Models 632, 642)

To access and remove the freezer evaporator fan assembly, first remove the air duct/shelf. Now disconnect the fan motor wire leads from the wire harness. Then, extract the two retaining screws which secure the evaporator fan shroud to the evaporator brackets; pull the fan assembly up, slightly forward, and out. (See Figure 7-49 & 7-50)

Defrost Terminator (Models 632, 642)

The defrost terminator is attached to the evaporator outlet, after the accumulator.

To access and remove the freezer defrost terminator, first remove the air duct/shelf. Now, disconnect the defrost terminator wire leads from the wire harness, and pull the terminator off of the tubing. See Figures 7-50 & 7-52)

Ice Bucket Carriage Assembly (Models 632, 642)

The rollers of the ice bucket carriage assembly are captivated by the ice bucket slides attached to each side wall. To remove the carriage assembly, push it as far back as possible so that the screws in the ice bucket slides are accessible. Extract the two front most screws from each ice bucket slide. Then, pull the slides and carriage assembly forward and out.

NOTE: *It is not necessary to completely remove the ice bucket slides rear retaining screws. They fit into slots at the top rear of each slide.*

Freezer Evaporator Cover (Models 632, 642)

NOTE: *Depending on the purpose for gaining access to this area, it is recommended, but not necessary, to remove the air duct/shelf assembly first, in order to remove the evaporator cover assembly.*

A grounding screw secures the evaporator cover to a bracket at the front of the evaporator. The evaporator cover also bends back underneath the evaporator to act as the drain trough.

To access and remove the evaporator cover, the ice bucket carriage assembly and icemaker will need to be removed first. Now disconnect the ice level mechanism and extract the ground screw at front center of the evaporator cover. Then, tilt the evaporator cover forward to gain access to the drain tube heater. Pull the drain tube heater from the drain tube. Then, pull the evaporator cover forward while pulling the drain tube off of the drain spout. (See Figures 7-51 & 7-52)

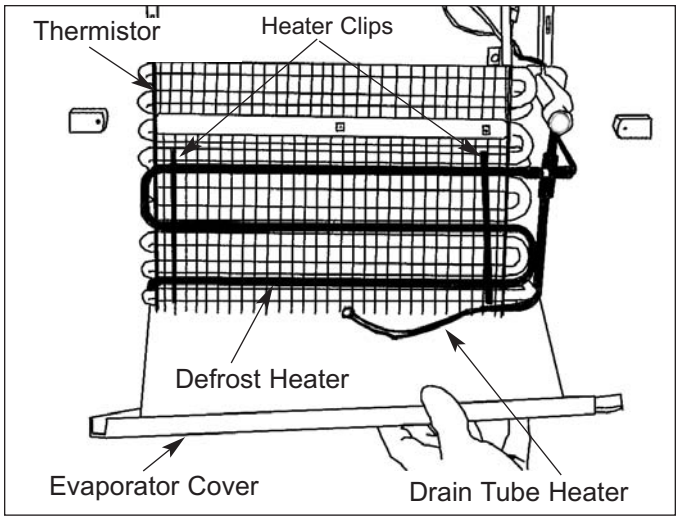


Figure 7-52. Model 632, 642 Evaporator Access

Defrost Heater (Models 632, 642)

To access and remove the evaporator defrost heater, the air duct/shelf assembly, ice bucket carriage assembly, icemaker and evaporator cover will need to be removed first. Now, disconnect the heater wire leads from the wire harness. Then, dislodge the heater clips by pulling the tab of the heater clips down and out. Gently pull the heater from the fins of the evaporator. (See Figure 7-52.)

Freezer Drain Tube Heater (Models 632, 642)

To access and remove the drain tube heater, the air duct/shelf assembly, ice bucket carriage assembly, icemaker and evaporator cover will need to be removed first. Now, disconnect the drain tube heater wire leads from the wire harness. Then, extract the screws which secure the evaporator to the rear wall of the freezer compartment. Pull the bottom of the evaporator up while rotating to the left to gain access to the clamp holding the heater at the bottom right rear of the evaporator. Extract the screw holding the clamp and pull heater up. (See Figure 7-52.)

Freezer Evaporator Thermistor (Models 632, 642)

NOTE: *Evaporator fins are sharp and could cause minor personal injury.*

The freezer evaporator thermistor is attached at the top of the left evaporator bracket. To access and remove the evaporator thermistor, the air duct/shelf assembly, ice bucket carriage assembly, icemaker and evaporator cover will need to be removed first. Now, disconnect the thermistor wire leads from the wire harness. Then, extract the screws which secure the evaporator to the rear wall of the freezer compartment and pull the bottom of the evaporator up while rotating to the right. Extract the screw which secures the thermistor to the top of the left evaporator bracket. (See Figure 7-52)

Light Bulb Access (Model 690)

NOTE: *Light bulbs are hot and could cause minor personal injury.*

There is no upper light diffuser in the freezer of this model. The light bulbs are located directly behind the upper front panel. (See Figure 7-53)

NOTE: *See Upper Front Panel Removal procedure below.*

Upper Front Panel (Model 690)

The upper front panel is secured to the ceiling of the compartment by two rows of screws. The front row of screws are accessed through keyhole slots in the assembly. To remove the upper front panel, extract the rear row of screws at the back of the panel. Push the panel back to release it from the front row of screws, then lower the panel down and pull out.

Ice Auger Motor Assembly Access and Removal (Model 690)

The ice auger motor assembly is attached to the rear wall, directly behind the ice bucket assembly. To access and remove the ice auger motor assembly, the juice can rack, and ice bucket will need to be removed first. Now, extract the four screws securing the ice auger motor assembly to the rear wall. Then, disconnect the auger motor and ice bucket switch electrical leads and pull assembly out. (See Figure 7-53)

NOTE: *The ice bucket switches may be removed at this time by depressing the tab on the side of the switch while pushing the switch out of the opening.*

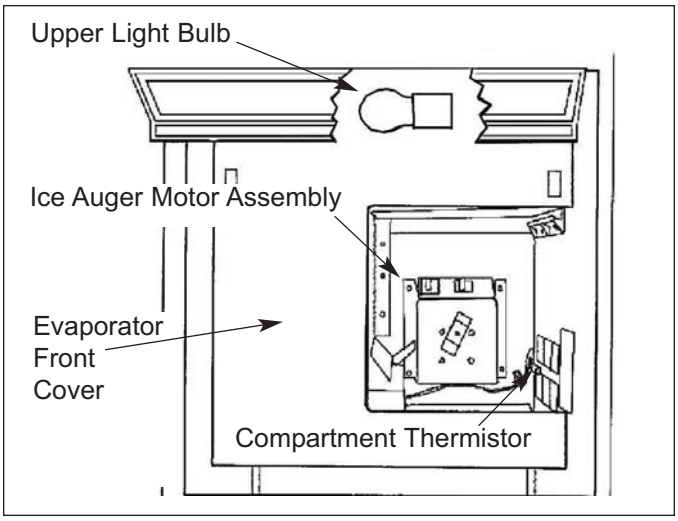


Figure 7-53. Model 690 Upper Freezer Area

Freezer Evaporator Front Cover (Model 690)

The freezer evaporator front cover is held in place by two screws at the top corners, and two screws through the bottom flange into the lower evaporator cover assembly. To access and remove the freezer evaporator front cover, the juice can rack and upper front panel first need to be removed.

NOTE: *The procedure for removing the upper front panel is the same as removing an upper control panel.*

Now, extract the two screws at the top front of the front cover and two screws at the bottom flange of the front cover, and pull front cover out. (See Figure 7-53)

Freezer Evaporator Fan Assembly (Model 690)

The rear flange of the freezer evaporator fan assembly fits into a slot in the rear evaporator bracket. The front of the evaporator fan assembly is secured by two screws through the front flange into the front evaporator bracket. (See Figure 7-49)

To access and remove the freezer evaporator fan assembly, the juice can rack, upper front panel and evaporator front cover will first need to be removed. Now, extract the two screws which secure the fan bracket to the front evaporator bracket. Then, pull the assembly out of the slot at the rear evaporator bracket and disconnect the fan motor electrical leads. (See Figure 7-54)

Freezer Compartment Thermistor (Model 690)

The freezer compartment thermistor is located on the mullion wall by the icemaker. To access and remove the freezer compartment thermistor, the juice can rack, upper front panel and evaporator front cover will first need to be removed. Now disconnect the thermistor wire leads from the wire harness, and extract the screw which secures the thermistor to the wall. (See Figure 7-54)

Freezer Evaporator Thermistor (Model 690)

The freezer evaporator thermistor is attached to the front evaporator bracket. To access and remove the freezer evaporator thermistor, the juice can rack, upper front panel and evaporator front cover will first need to be removed. Now disconnect the thermistor wire leads from the wire harness, and extract the screw which secures the thermistor to the front evaporator bracket. (See Figure 7-54)

Freezer Lower Light Diffuser (Model 690)

The lower light diffuser slides into a channel in the lower evaporator cover assembly. To access and remove the lower light diffuser, the juice can rack, upper front panel and evaporator front cover will need to be removed first. Then, slide the diffuser glass forward and out. (See Figure 7-54)

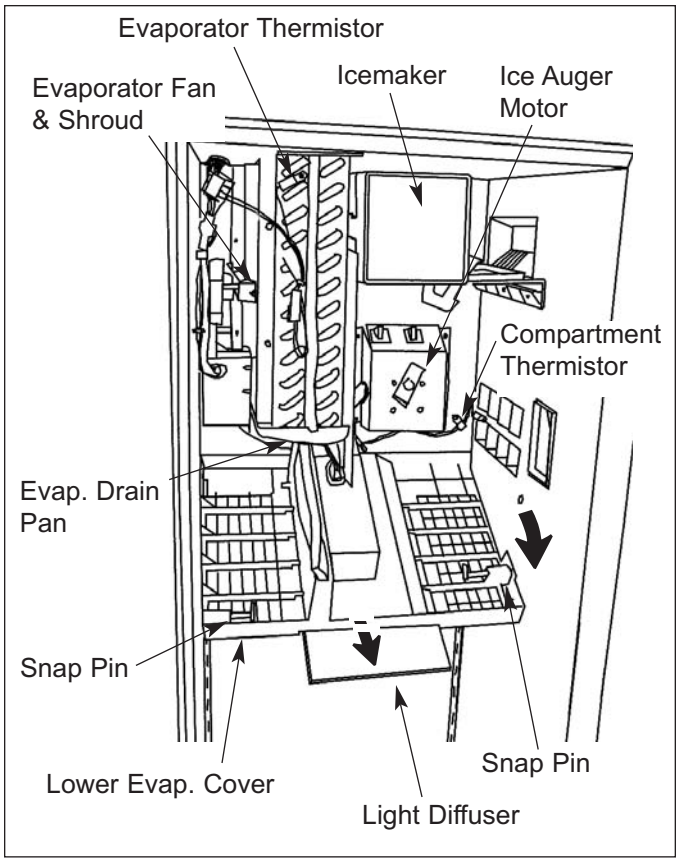


Figure 7-54. Model 690 Freezer Evaporator Area

Freezer Rear Duct (Model 690)

The bottom of the freezer rear duct is secured by slots in the side flanges fitting over pegs at the bottom of each shelf ladder. At the top, screws hold the rear duct to the lower evaporator cover assembly. To remove the rear duct, extract the screws at the top, tilt the duct forward and lift out. (See Figure 7-55)

Freezer Lower Evaporator Cover (Model 690)

The lower evaporator cover assembly has two pegs at the rear which fit into pockets in the rear wall. Snap pins toward the front sides of the cover slide into pockets in the side wall.

To access and remove the lower evaporator cover assembly, the juice can rack, upper front panel, evaporator front cover and rear duct will need to be removed first. Now, pull the snap pins out of the pockets in the side walls and lean the evaporator cover down. Then, disconnect the electrical leads to the lighting and pull the assembly forward. (See Figure 7-55)

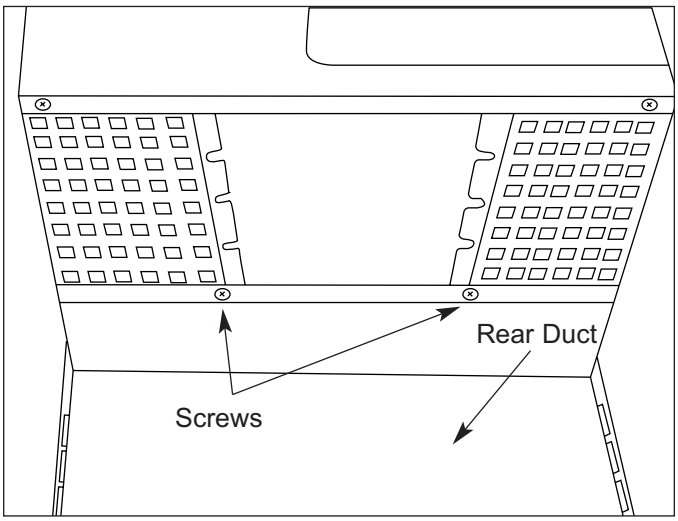


Figure 7-55. Model 690 Rear Duct Removal

Icemaker Carriage Assembly (Model 690)

The icemaker carriage assembly is secured to the side wall by three screws, and three screws at the rear wall. To access and remove the icemaker carriage assembly, the juice can rack, upper front cover, evaporator front cover, rear duct and lower evaporator cover assembly will need to be removed first. Now, extract the mounting screws from the rear and side walls. Then, pull the carriage assembly down slightly and disconnect the electrical leads to the icemaker. (See Figure 7-56)

Icemaker (Model 690)

The icemaker is attached to the icemaker carriage assembly. To access and remove the icemaker, the juice can rack, upper front panel, evaporator front cover, rear duct, lower evaporator cover assembly and icemaker carriage assembly will need to be removed first. Then, extract the mounting screw which secure the icemaker to the carriage assembly. (See Figure 7-56)

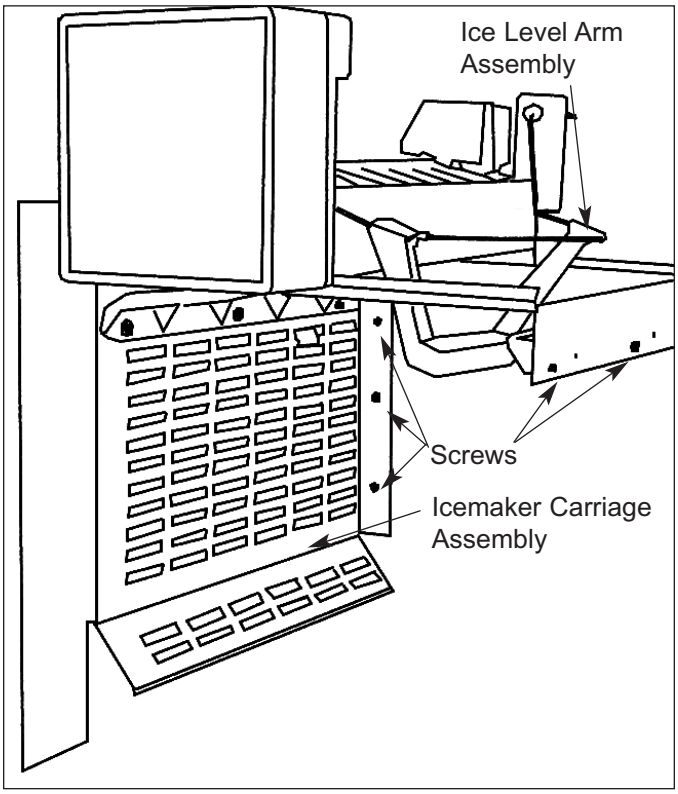


Figure 7-56. Model 690 Icemaker and Carriage Assembly

Fill Tube Heater (Model 690)

To access and remove the icemaker fill tube heater, the, juice can rack, upper front panel, evaporator front cover, rear duct, lower evaporator cover assembly and icemaker carriage assembly will need to be removed first. Then, disconnect the heater electrical leads, extract the retaining screw and clamp, and pull the heater and aluminum fill tube extension out as one. (See Figure 7-57)

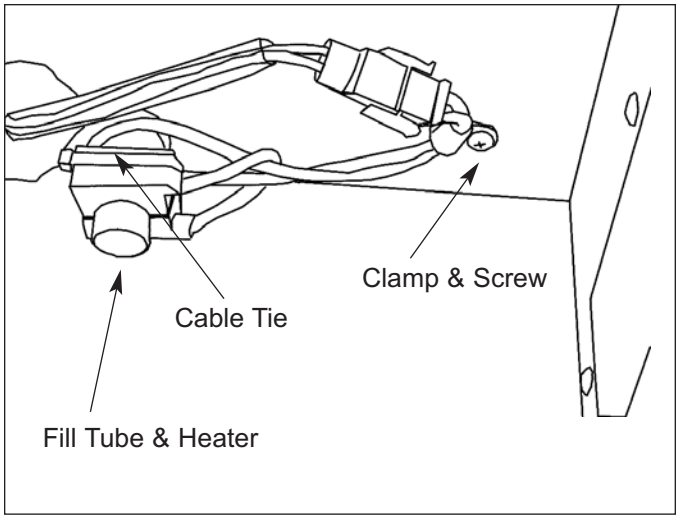


Figure 7-57. Model 690 Fill Tube Heater Removal

Freezer Drain Tube Heater (Model 690)

To access and remove the drain tube heater, the juice can rack, upper front panel, evaporator front cover, rear duct, lower evaporator cover assembly and icemaker carriage assembly will need to be removed first. Now, extract the screws at the right side of the freezer evaporator drain pan, lower the front of the drain pan down and pull the drain tube heater from the drain tube. Then, extract the screws which secure the evaporator front bracket to the ceiling of the freezer. Pull evaporator down and rotate it to the right to gain access to the rear. Then, disconnect the freezer drain tube heater electrical leads from the wire harness. (See Figures 7-58 & 7-59)

NOTE: *When replacing the drain tube heater, it is necessary to insert it a minimum of 3" into the drain tube.*

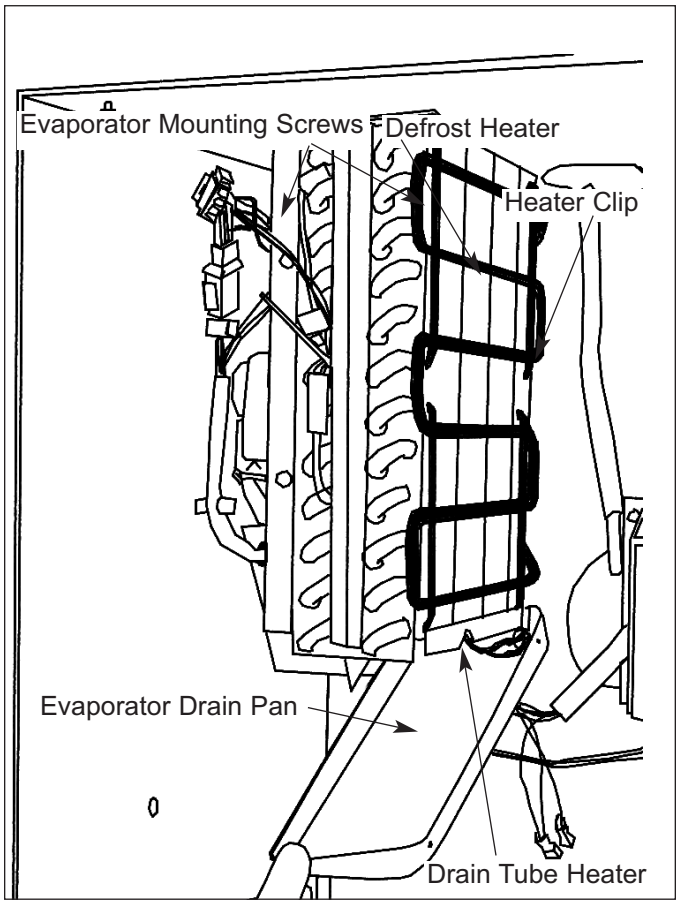


Figure 7-58. Model 690 Freezer Evaporator, Front

Evaporator Defrost Heater (Model 690)

NOTE: *Evaporator fins are sharp and could cause minor personal injury.*

To access and remove the freezer evaporator defrost heater, the juice can rack, upper front panel, evaporator front cover, rear duct, lower evaporator cover assembly and icemaker carriage assembly will need to be removed first. The heater clips which secure the heater to the evaporator now need to be removed. Dislodge the heater clips by pulling the tab of the clip down and out. Then, extract the screws which secure the evaporator front bracket to the ceiling of the freezer. Pull evaporator down and rotate it to the right to gain access to the rear. Then, disconnect the heater electrical leads from the wire harness and gently pull the defrost heater from the fins of the evaporator. (See Figure 7-58 & 7-59)

Defrost Terminator (Model 690)

The defrost terminator is attached to the evaporator outlet, after the accumulator, at the back side of the evaporator. To access and remove the defrost terminator, first remove the juice can rack, upper front panel, evaporator front cover, rear duct, lower evaporator cover assembly and icemaker carriage assembly. Now, extract the screws which secure the evaporator front bracket to the ceiling of the freezer. Pull evaporator down and rotate it to the right to gain access to the rear. Then, disconnect the defrost terminator wire leads from the wire harness, and pull the terminator off of the tubing. (See Figure 7-59)

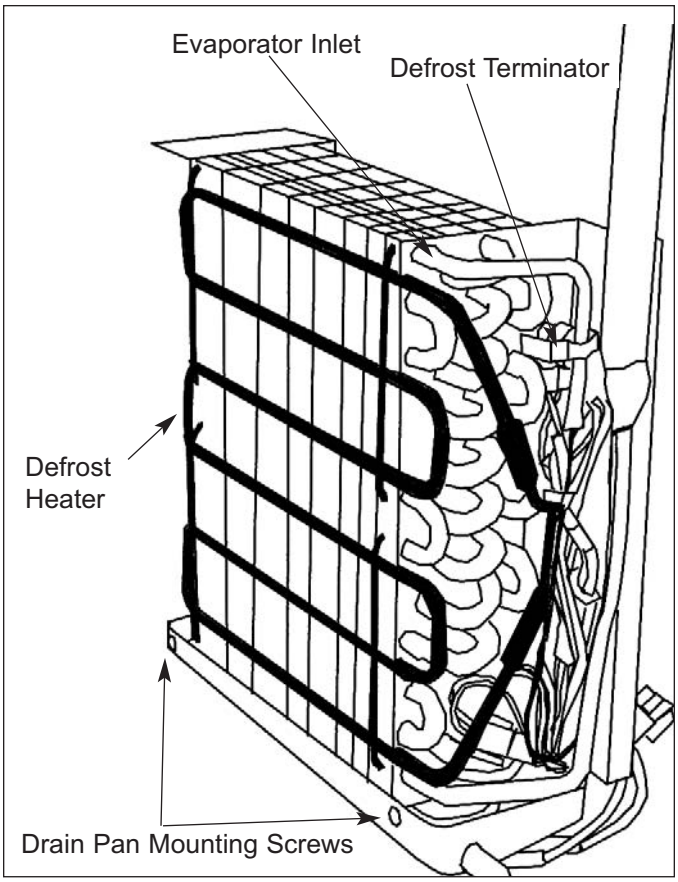


Figure 7-59. Model 690 Freezer Evaporator, Rear

LOWER COMPRESSOR AREA MECHANICAL AND ELECTRICAL COMPONENTS

This section covers the Models 601R and 601F, explaining how to access and remove mechanical and electrical components in the lower compressor area. This will include access and removal of the light and fan switches, water valve and condenser fan motor.

Light and Fan Switch (Models 601R, 601F)

The light and fan switches are mounted to the top section of the unit grille. To access and remove the light and/or fan switches, the lower section of unit grille will need to be removed first. Now, open cabinet door and extract the screws at the top left and right corners. Pull upper grille assembly forward slightly and disconnect the electrical leads from the switch being removed. Depress the tabs on each side of the switch while pushing the switch out of the opening in the grille top section. (See Figure 7-60)

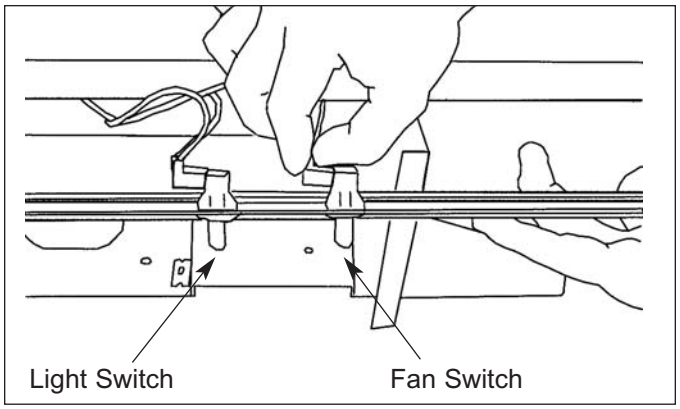


Figure 7-60. Model 601F Light Fan & Switches

Water Valve (Model 601F)

NOTE: *To avoid water damage, shut off water supply to unit before attempting to remove water valve.*

NOTE: *To access the water valve it is recommended, but not necessary, to remove the top section of the unit grille assembly after removing the bottom section.*

The water valve is mounted to a bracket at the right hand side of the compressor area. To access and remove the water valve, first remove the lower section of the unit grille. (See note above.) Now disconnect the water inlet compression fitting. Loosen the mounting screw which secures the valve to the bracket, and push the bracket up until the screw head aligns with the larger section of the keyhole slot. Push valve back until the screw head clears the hole, then pull the valve out. Disconnect the electrical leads from the solenoid, and the plastic water line from the valve outlet. (See Figure 7-61)

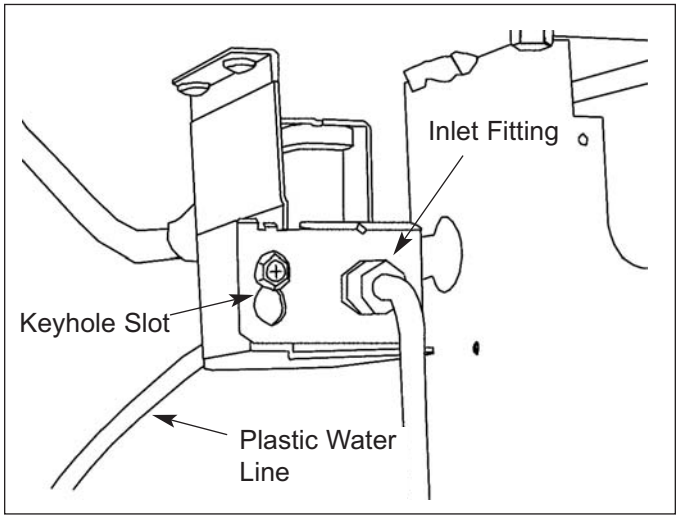


Figure 7-61. Model 601F Water Valve Removal

Condenser Fan (Models 601R, 601F)

The condenser fan motor is attached to a three legged condenser fan bracket by screws. The rear leg of the condenser fan bracket hooks over a spacer toward the back of the fan shroud. The two front legs of the bracket are secured to the fan shroud by screws into wellnuts. To access and remove the condenser fan assembly, first remove the lower and upper sections of the unit grille, and remove the compressor baffle. Now, disconnect the fan motor electrical leads from the compressor. Extract the screws from the two front legs of the fan bracket. Then, unhook the rear leg by pushing the condenser fan assembly back slightly, then lift up and pull forward. The condenser fan motor can now be removed from the bracket by extracting the screws in the back side of the fan motor. (See Figure 7-62)

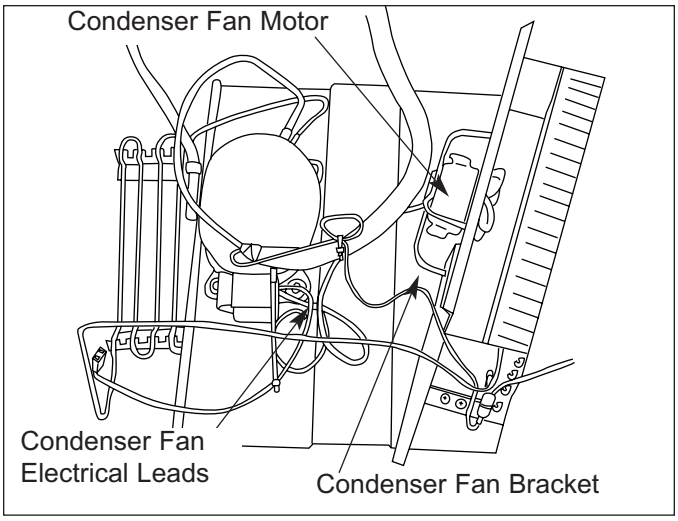


Figure 7-62. Model 601R, 601F Condenser Fan Removal

UPPER COMPRESSOR AREA MECHANICAL AND ELECTRICAL COMPONENTS

This section covers the Models 611, 632, 642, 650 and 690, explaining how to access and remove mechanical and electrical components from the upper compressor area. This will include access and removal of the light and fan switches, dual water valve (Model 690 only) and condenser fan motors.

Light and Fan Switches (Models 611, 632, 642, 650, 690)

The light and fan switches are mounted to the top mainframe. To access and remove the light and/or fan switches, the unit grille will need to be removed first. Now, remove the switch enclosure directly behind the top mainframe extrusion by extracting the retaining screw, tilt the back of the switch enclosure forward and lift up. Now unplug the wires from the switch being removed. Open the refrigerator or freezer below the switch being removed. Depress the tab on the side of the switch while pushing the switch down, out of the opening in the mainframe extrusion. (See Figure 7-63)

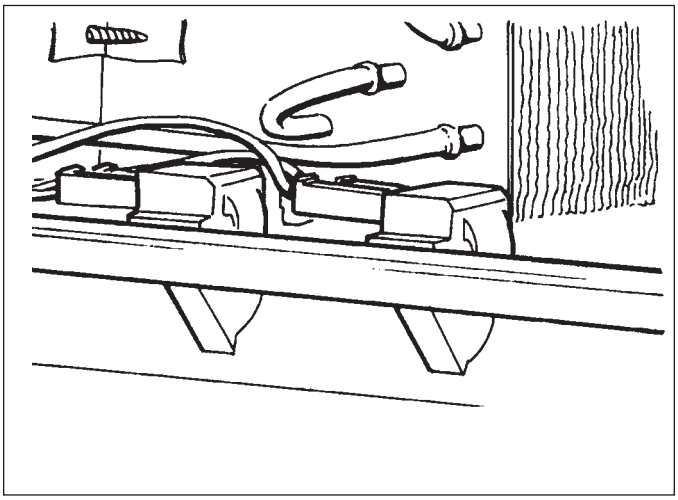


Figure 7-63. Model 611, 632, 642, 650, 690 Light & Fan Switches

Dual Water Valve Removal (Model 690)

NOTE: *To avoid water damage, shut off water supply to unit before attempting to remove water valve.*

NOTE: *Though the water valve on the model 690 is at the top of the unit, the water line inlet connection for hooking up the house water supply is located in the drain pan area. A copper tube leads from this connection beneath the unit, up the rear wall to the dual water valve.*

To access and remove the dual water valve, the unit grille and compressor baffle must first be removed. Now, disconnect the wire leads from both solenoids. Slide the spray cover off of the inlet compression fitting and disconnect the inlet water line from the dual water valve. Then, disconnect the outlet water lines. Remove the screw which holds the valve to the bracket and lift the valve up and out. (See Figure 7-64)

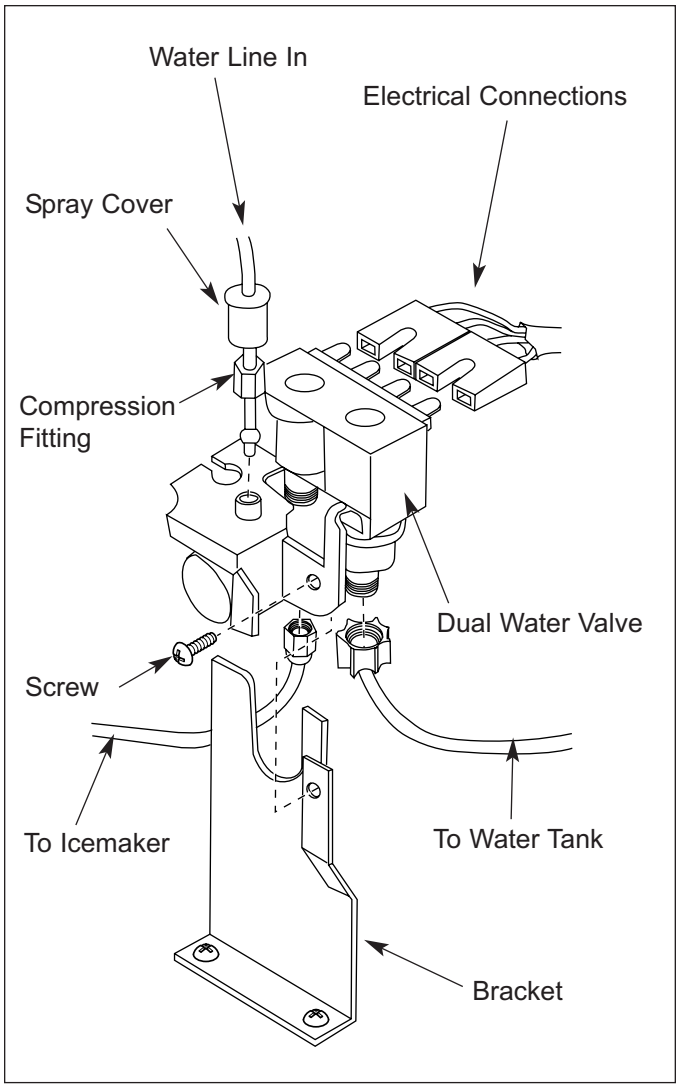


Figure 7-64. Model 690 Dual Water Valve

Condenser Fan Access and Removal (Models 611, 632, 642, 650, 690)

The condenser fan motor is attached to a three legged condenser fan bracket by screws. The rear leg of the condenser fan bracket hooks over a spacer towards the back of the fan shroud. The two front legs of the bracket are secured to the fan shroud by screws into wellnuts. To access and remove the condenser fan motor, the unit grille and compressor baffle must first be removed. Now, disconnect the fan motor electrical leads from the wire harness. Then, extract the screws from the two front legs of the fan bracket. Unhook the rear leg by pushing the condenser fan assembly back slightly, then lift up and pull forward. The condenser fan motor can now be removed from the bracket by extracting the screws in the back side of the fan motor. (See Figure 7-65)

NOTE: *Compressor and tubing may be hot and could cause minor personal injury.*

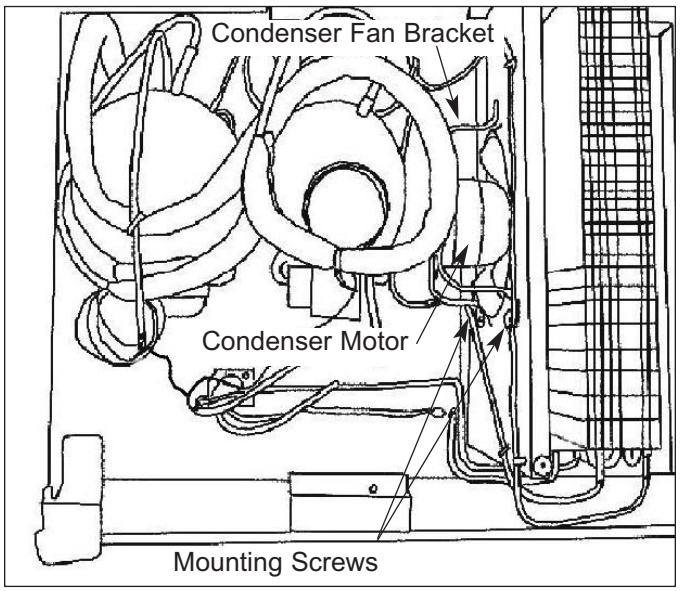


Figure 7-65. Model 611, 632, 642, 650, 690 Condenser Fan

DRAIN PAN AREA

Water Valve (Models 611, 632, 642, 650)

This section covers the Models 611, 632, 642 and 650, explaining how to access and remove the water valve from the drain pan area.

NOTE: *To avoid water damage, shut off water supply to unit before attempting to remove water valve.*

The water valve is mounted to a bracket at the left hand side of the drain pan area. To access and remove the water valve, first remove the kickplate. Now, loosen the mounting screw which secures the valve to the bracket, and push the valve up until the screw head aligns with the larger section of the keyhole slot. Push valve back until the screw head clears the hole, then pull forward. Then, disconnect the water inlet compression fitting from valve. Disconnect the electrical leads from the solenoid, and the plastic water line from the valve outlet. (See Figure 7-66)

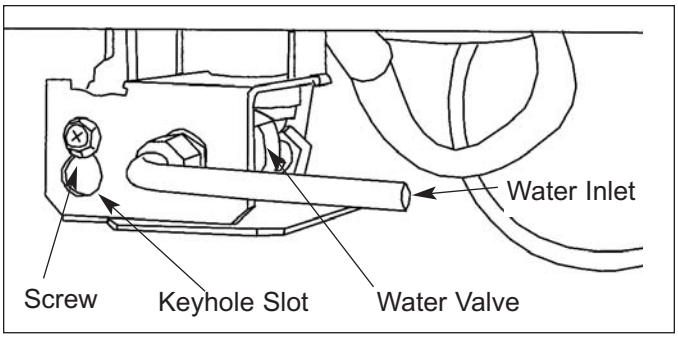


Figure 7-66. Model 611, 632, 642, 650, 690 Water Valve Removal

SEALED SYSTEM COMPONENTS

This section explains how to remove sealed system components during a sealed system repair. In most cases it is necessary to remove primary parts, and in some cases mechanical & electrical components, in order to gain access to these components. The manner in which this section was written assumes that the PRIMARY PART REMOVAL and MECHANICAL & ELECTRICAL COMPONENT REMOVAL sections have been studied and understood. If necessary, refer to these sections in this manual before attempting to remove sealed system components.

When possible, units with similar component removal procedures were grouped together under the appropriate heading. The units covered will be listed between brackets after the heading.

NOTE: *600 Series units are produced without process valves on the compressor and filter-driers. Solder-on process valves must be installed in order to service the sealed system. Sub-Zero does not authorize the use of bolt-on saddle valves.*

Filter-Drier (Models 601R, 601F)

NOTE: *Compressor and tubing may be hot and could cause minor personal injury.*

NOTE: *To access the filter-drier it is recommended, but not necessary, to remove the top section of the unit grille assembly after removing the bottom section.*

The filter-drier is attached to the condenser outlet. (See Figure 7-67) To remove a filter-drier, first remove the lower sections of the unit grille. Then, after capturing the refrigerant from the sealed system, use a file to score a line around the capillary tube approximately one inch from the filter-drier outlet. Fatigue the capillary tube at this line until it separates. Then, with a tube cutter, cut the filter-drier inlet tube.

NOTE: *Check the end of the remaining capillary tube for internal burrs. If burrs exist or tubing has been pinched closed while fatiguing, re-score capillary tube approximately one inch from the end. Then, fatigue the capillary tube at this new line until it separates, and recheck.*

NOTE: *When installing the replacement filter-drier, insert capillary tube until it touches the screen. Then, pull capillary tube out away from the screen approximately 3/8" before brazing.*

NOTE: *The filter-drier outlet must be facing downward in order to function properly (See Figure 7-67).*

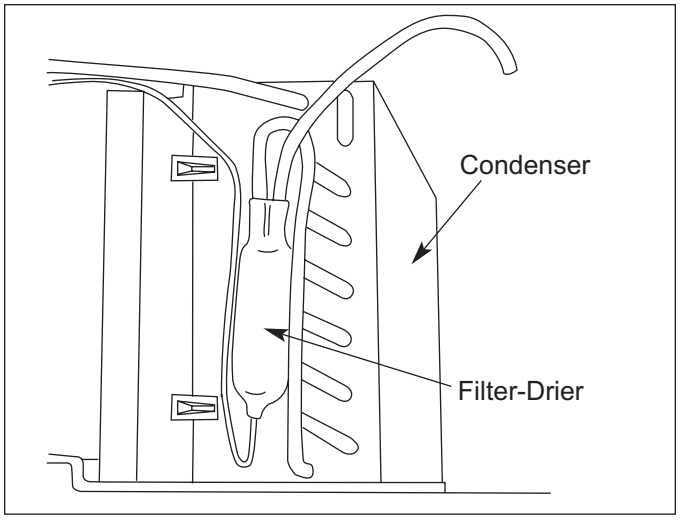


Figure 7-67. Model 601R, 601F Filter-Drier Location & Position

Compressor (Models 601R, 601F)

NOTE: *When replacing compressor, the filter-drier must also be replaced.*

NOTE: *Compressor and tubing may be hot and could cause minor personal injury.*

The compressor is secured to the unit tray by bolts into grommets. To remove the compressor, the upper and lower section of the unit grille along with the compressor baffle must be removed first. Then, after capturing the refrigerant from the sealed system, remove the compressor electrical cover and disconnect the electricals from the compressor. Now, remove the bolts from the grommets at each corner of the compressor base, and pull compressor forward and rotate to the right to gain access to the suction and discharge lines. Using a tube cutter, cut the suction and discharge lines approximately one inch from the compressor, then pull compressor out. (See Figure 7-68)

Drain Pan Condensate Heater Loop (Model 601R)

NOTE: *When replacing the condensate heater loop, the filter-drier must also be replaced.*

NOTE: *It is recommended that a suction line drier be added to the sealed system when replacing the condensate heater loop.*

On the model 601R, the drain pan condensate heater loop is located in the compressor area, and sits in the drain pan. To remove condensate heater loop, the upper and lower section of the unit grille along with the compressor baffle must be removed first. Then, after capturing the refrigerant from the sealed system, remove the bolts from the grommets at each corner of the compressor base and pull compressor forward and rotate to the right. Un-braze or cut the condensate loop inlet and outlet, and pull condensate loop out. (See Figure 7-68)

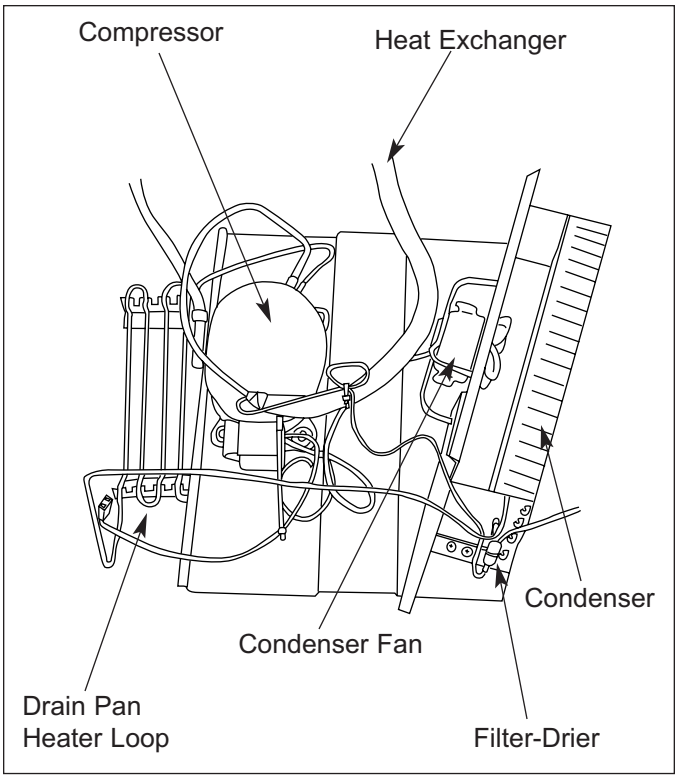


Figure 7-68. Model 601R Compressor Area Layout

Condenser (Models 601R, 601F)

NOTE: *When replacing condenser, the filter-drier must also be replaced.*

To remove the condenser, the upper and lower section of the unit grille along with the compressor baffle must be removed first. Then, after capturing the refrigerant from the sealed system, remove the screws which secure the condenser fan shroud to the condenser. Now, un-braze or cut the condenser inlet and outlet tubing. Extract the mounting screws which secure the condenser side brackets to the unit tray. Slide the condenser to the right, then pull forward. (See Figure 7-68)

NOTE: *The 601F compressor layout is basically the same,minus the drain pan condensate heater loop.*

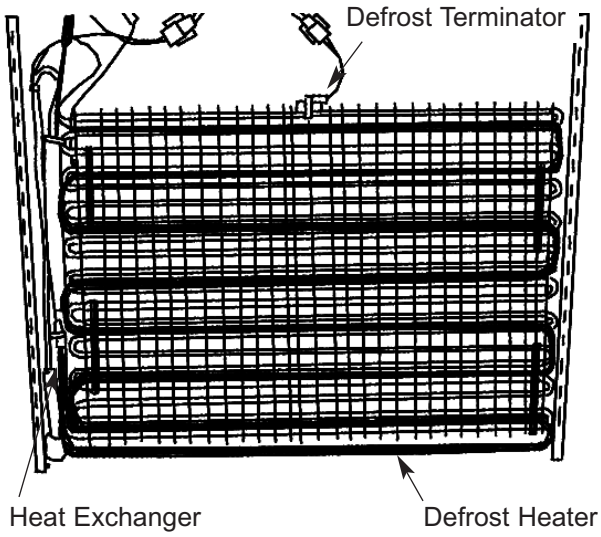
Evaporator (Models 601R, 601F)

NOTE: *Evaporator fins are sharp and could cause minor personal injury.*

NOTE: *When replacing the evaporator, the filter-drier must also be replaced.*

NOTE: *When removing the evaporator from a model 601F, the defrost heater and defrost terminator must be removed first.*

The evaporator is attached to the rear wall, behind the evaporator cover. After capturing the refrigerant from the sealed system, remove the screws which secure the evaporator to the rear wall. Pull the bottom of the evaporator up while rotating the heat exchanger out. Now, un-braze or cut the evaporator inlet and outlet tubing, and pull evaporator from compartment. (See Figure 7-69)



NOTE: *601R is same, minus heater and terminator.*

Figure 7-69. Model 601R, 601F Evaporator Area

Heat Exchanger (Models 601R, 601F)

⚠ WARNING

One end of heat exchanger is connected to evaporator. Evaporator fins are sharp. One end of heat exchanger is connected to compressor and filter drier. Compressor and tubing may be hot.

NOTE: *When replacing a heat exchanger, the filter-drier must also be replaced.*

NOTE: *It is not necessary to pull the unit from its installation in order to replace the heat exchanger. The heat exchanger travels through a tubing channel which is foamed into the rear wall of the unit.*

To remove the heat exchanger, the compressor area and evaporator area will need to be accessed, and the refrigerant captured from the sealed system. Now, extract the screws which secure the evaporator to the rear wall, and pull the left side of the evaporator up and out. Un-braze or cut the evaporator inlet and outlet tubing, and pull evaporator from compartment. Now, pull the armaflex from the heat exchanger in the compressor area, and cut the heat exchanger in the compressor area as close as possible to the tubing channel. cut the suction line from the compressor suction extension, and the capillary tube from the drier. Then, pull the remaining heat exchanger up and out of the tubing channel. (See Figures 7-68 and 7-69)

NOTE: *When replacing the heat exchanger, it is recommended to attach it at the evaporator end first, then feed the heat exchanger down through the tubing channel.*

Filter-Drier (Models 611, 632, 642, 650, 690)

Filter-driers are secured to a bracket in the compressor area by a cable tie. (See Figures 7-70 & 7-71) To remove a filter-drier, after capturing the refrigerant from the sealed system, use a file to score a line around the capillary tube approximately one inch from the drier outlet. Fatigue the capillary tube at this line until it separates. Then, with a tube cutter, cut the drier inlet tube.

NOTE: *Check the end of the remaining capillary tube for internal burrs. If burrs exist, re-score capillary tube approximately one inch from end. Then, fatigue capillary tube at this new line until it separates, and recheck.*

NOTE: *When installing the replacement filter-drier, insert capillary tube until it touches the screen. Then, pull capillary tube away from the screen approximately 3/8" before brazing.*

NOTE: *The filter-drier outlet must be facing downward in order to function properly. (See Figure 7-70)*

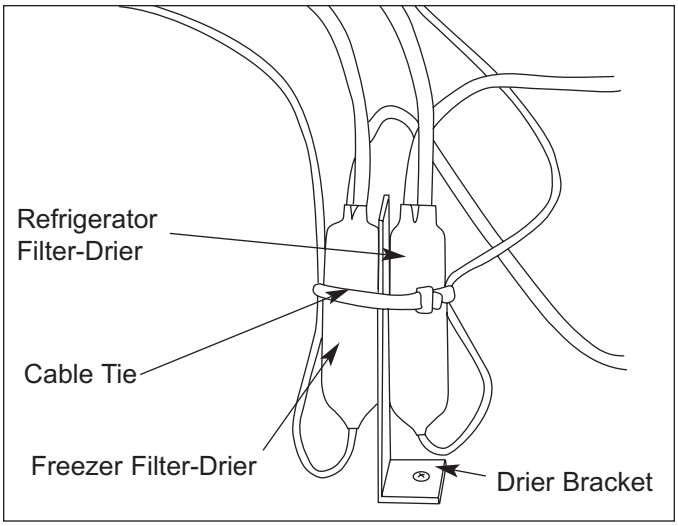


Figure 7-70. Models 611, 632, 642, 650, 690 Filter-Drier Location & Position

Compressor (Models 611, 632, 642, 650, 690)

NOTE: *When replacing a compressor, the filter-drier must be replaced.*

NOTE: *Compressor and tubing may be hot and could cause minor personal injury.*

The compressors are secured to the top of the unit with nuts over stud-bolts. The left compressor is the freezer compressor, and the right is the refrigerator compressor. (See Figure 7-71) To remove a compressor, the unit grille and compressor baffle must first be removed. Then, remove the screws which secures the drier bracket to the top of the unit so that the bracket may be easily shifted during compressor removal. After capturing the refrigerant from the sealed system, remove the compressor electrical cover and disconnect the electricals from the compressor. Now, remove the nuts from the stud-bolts at each corner of the compressor base. Lift the compressor until it clears the stud-bolts and pull it forward slightly to gain better access to the suction and discharge lines. Using a tube cutter, cut the suction and discharge lines approximately one inch from the compressor, then pull compressor out.

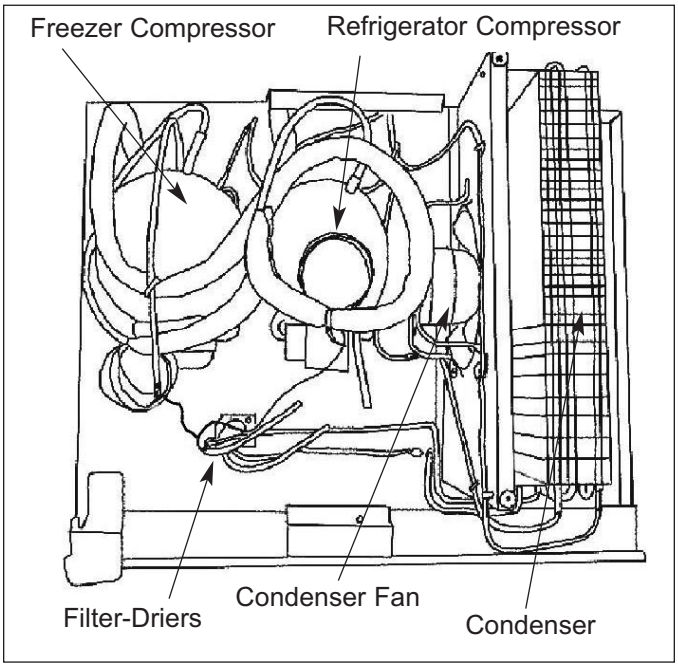


Figure 7-71. Models 611, 632, 642, 650, 690 Upper Compressor Area

Condenser Removal (Models 611, 632, 642, 650, 690)

NOTE: *When replacing the condenser, both filter-driers must be replaced.*

NOTE: *Evaporator fins are sharp and could cause minor personal injury.*

To remove a condenser, the unit grille and compressor baffle must be removed first. Then, after capturing the refrigerant from the sealed system, pull the unit from its installation (see **WARNING** above), and remove the unit shroud. Now, remove the screws which secure the condenser fan shroud to the condenser, and un-braze or cut the condenser inlet and outlet tubing. Then, extract the mounting screws which secure the condenser side brackets to the top of the unit, and lift condenser off. (See Figure 7-71)

Refrigerator Evaporator
(Models 611, 632, 642, 650, 690)

NOTE: *When replacing the evaporator, the filter-drier must also be replaced.*

NOTE: *Evaporator fins are sharp and could cause minor personal injury.*

The refrigerator evaporator is attached to the rear wall, behind the evaporator cover. After capturing the refrigerant from the sealed system, remove the screws which secure the evaporator to the rear wall. Pull the bottom of the evaporator up while rotating the heat exchanger out. Now, un-braze or cut the evaporator inlet and outlet tubing, and pull evaporator from compartment. (See Figure 7-72)

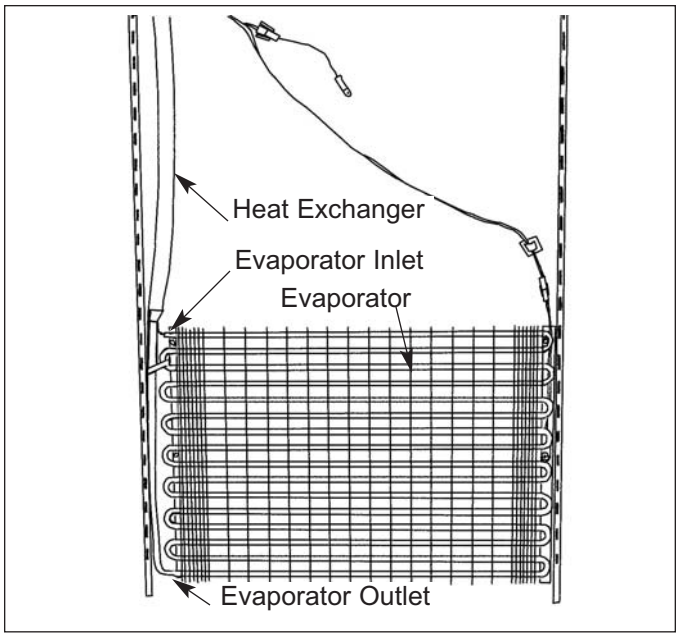


Figure 7-72. Model 611, 632, 642, 650, 690 Refrigerator Evaporator Area

Refrigerator Heat Exchanger
(Models 611, 632, 642, 650, 690)

⚠ WARNING

One end of heat exchanger is connected to evaporator. Evaporator fins are sharp. One end of heat exchanger is connected to compressor and filter drier. Compressor and tubing may be hot.

NOTE: *When replacing a heat exchanger, the filter-drier must also be replaced.*

NOTE: *It is not necessary to pull the unit from its installation in order to replace the heat exchanger. The heat exchanger travels through the compartment ceiling to the compressor area.*

To remove the heat exchanger, the compressor area and evaporator area will need to be accessed, and the refrigerant captured from the sealed system. Now, extract the screws which secure the evaporator to the rear wall, and pull the bottom of the evaporator up while rotating the heat exchanger out. Un-braze or cut the evaporator inlet and outlet tubing, and pull evaporator from compartment. Then, cut the suction line from the compressor, and the capillary tube from the drier. Clear any permagum from inside and outside of the heat exchanger hole. Now, pull the heat exchanger down and out of the heat exchanger hole. (See Figures 7-71 and 7-72)

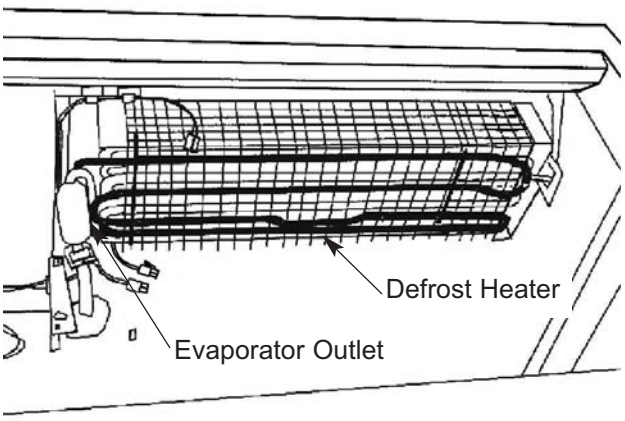
NOTE: *When replacing the heat exchanger, it is recommended to attach it at the evaporator end first, then feed the heat exchanger up through the heat exchanger hole.*

Freezer Evaporator (Models 611, 650)

NOTE: *When replacing the evaporator, the filter-drier must also be replaced.*

NOTE: *Evaporator fins are sharp and could cause minor personal injury.*

The freezer evaporator is attached at the ceiling of the freezer compartment. (See Figure 7-73) After capturing the refrigerant from the sealed system, remove the defrost heater from the evaporator. Now, extract the screws which secure the evaporator to the ceiling of the freezer compartment. Pull the evaporator down, un-braze or cut the evaporator inlet and outlet tubing, and pull evaporator from compartment.



Evaporator Inlet Extension
(not shown, behind evaporator)

Figure 7-73. Model 611, 650 Freezer Evaporator Area

Freezer Heat Exchanger (Models 611, 650)

⚠ WARNING

One end of heat exchanger is connected to evaporator. Evaporator fins are sharp. One end of heat exchanger is connected to compressor and filter drier. Compressor and tubing may be hot.

NOTE: *When replacing a heat exchanger, the filter-drier must also be replaced.*

NOTE: *When moving unit, floor must be covered to protect against damaging the floor.*

To remove the heat exchanger, the compressor area and evaporator area will need to be accessed. Then, after capturing the refrigerant from the sealed system, pull the unit from its installation (see previous **WARNING**). Now, remove the unit shroud and rear duct. Then, disconnect the defrost heater electrical leads and extract the screws which secure the evaporator to the ceiling of the freezer compartment. Pull the evaporator down, un-braze or cut the heat exchanger from the evaporator inlet and outlet, and pull evaporator from compartment. Then, cut the suction line from the compressor, and the capillary tube from the drier. Clear any permagum from inside and outside of the heat exchanger hole. Now, pull the heat exchanger out of the heat exchanger hole. (See Figures 7-71 & 7-73)

NOTE: *When replacing the heat exchanger, it is recommended to attach it at the evaporator end first, then feed the heat exchanger out through the heat exchanger hole.*

Freezer Evaporator (Models 632, 642)

NOTE: When replacing the evaporator, the filter-drier must also be replaced.

The freezer evaporator is attached to the rear wall, located below the air duct/shelf, behind the ice bucket area. After capturing the refrigerant from the sealed system, remove the evaporator fan assembly and defrost heater from the evaporator. Then remove the lower light diffuser and the diffuser retainer. Now, extract the screws which secure the evaporator to the rear wall of the freezer compartment. Pull the bottom of the evaporator up while rotating the heat exchanger out, then remove the drain tube heater. Un-braze or cut the evaporator inlet and outlet tubing, and pull evaporator from compartment. (See Figures 7-74)

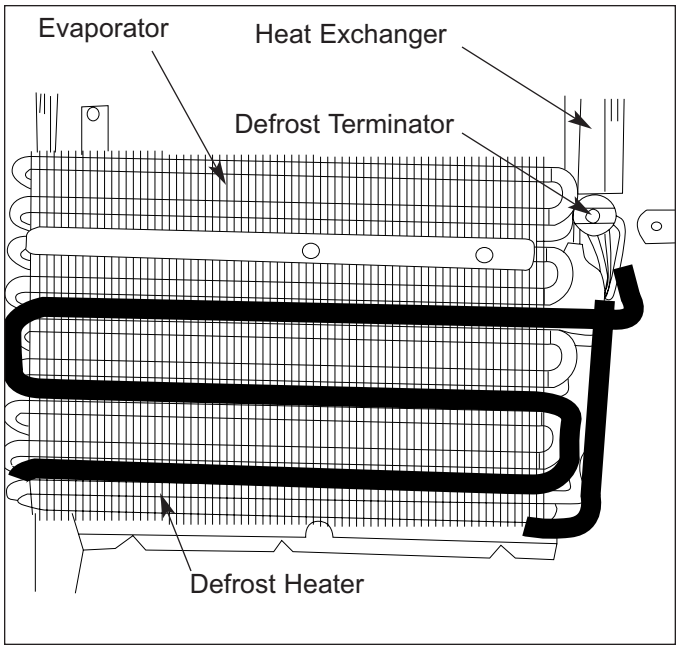


Figure 7-74. Model 632, 642 Freezer Evaporator Area

Freezer Heat Exchanger (Models 632, 642)

⚠ WARNING

One end of heat exchanger is connected to evaporator. Evaporator fins are sharp. One end of heat exchanger is connected to compressor and filter drier. Compressor and tubing may be hot.

NOTE: When replacing a heat exchanger, the filter-drier must also be replaced.

NOTE: Evaporator fins are sharp and could cause minor personal injury.

NOTE: It is not necessary to pull the unit from its installation in order to replace the heat exchanger. The heat exchanger travels through the compartment ceiling to the compressor area.

To remove the heat exchanger, the compressor area and evaporator area will need to be accessed, and the refrigerant captured from the sealed system. Then, extract the screws which secure the evaporator to the rear wall of the freezer compartment. Now, disconnect all electrical leads above the evaporator. Pull the bottom of the evaporator up while rotating the heat exchanger out, un-braze or cut the heat exchanger from the evaporator inlet and outlet, and pull evaporator from compartment. Now, cut the suction line from the compressor, and the capillary tube from the drier. Clear any permagum from inside and outside of the heat exchanger hole. Then, pull the heat exchanger down out of the heat exchanger hole. (See Figures 7-71 and 7-74)

NOTE: When replacing the heat exchanger, it is recommended to attach it at the evaporator end first, then feed the heat exchanger up through the heat exchanger hole.

Freezer Evaporator (Model 690)

NOTE: *When replacing the evaporator, the filter-drier must also be replaced.*

After capturing the refrigerant from the sealed system, remove the evaporator fan assembly and extract the two evaporator retaining screws at top front of evaporator bracket. Pull evaporator down and rotate it to the right to gain access to the rear. Disconnect all electrical leads at back of evaporator. Then, un-braze or cut the evaporator inlet and outlet tubing, and pull evaporator from compartment. (See Figure 7-75)

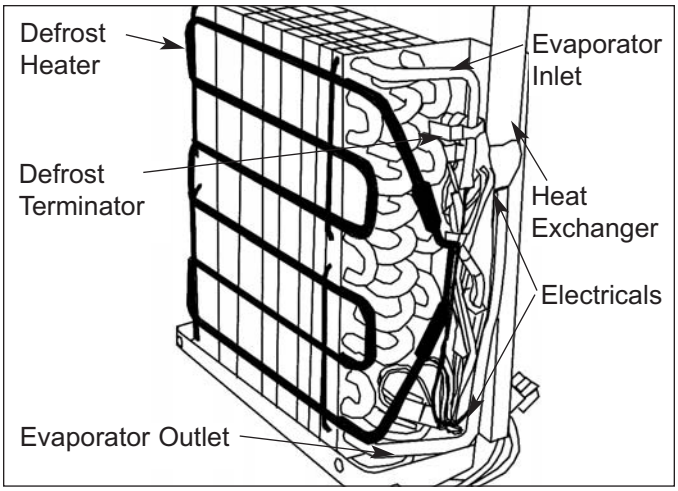


Figure 7-75. Model 690 Freezer Evaporator (Rear View)

Freezer Heat Exchanger (Model 690)

⚠ WARNING

One end of heat exchanger is connected to evaporator. Evaporator fins are sharp. One end of heat exchanger is connected to compressor and filter drier. Compressor and tubing may be hot.

NOTE: *When replacing a heat exchanger, the filter-drier must also be replaced.*

NOTE: *It is not necessary to pull the unit from its installation in order to replace the heat exchanger. The heat exchanger travels through the compartment ceiling to the compressor area.*

To remove the heat exchanger, the compressor area and evaporator area will need to be accessed, and the refrigerant captured from the sealed system. Now, remove the evaporator fan assembly and extract the two evaporator retaining screws at top front of evaporator bracket. Pull evaporator down and rotate it to the right to gain access to the rear. Disconnect all electrical leads at back of evaporator. Then, un-braze or cut the evaporator inlet and outlet tubing, and pull evaporator from compartment. Now, un-braze or cut the suction line from the compressor, and the capillary tube from the drier. Clear any permagum from inside and outside of the heat exchanger hole and pull the heat exchanger out of the heat exchanger hole. (See Figures 7-71 and 7-75)

NOTE: *When replacing the heat exchanger, it is recommended to attach it at the evaporator end first, then feed the heat exchanger up through the heat exchanger hole.*

GENERAL TROUBLESHOOTING GUIDE TABLE OF CONTENTS

HOW TO USE THE GENERAL TROUBLESHOOTING GUIDE

The General Troubleshooting Guide Table of Contents (above) indicates how the Trouble Shooting Guide is arranged. Match the description of the problem the unit is experiencing with those in the table. To the left of the problem description is a letter. Locate that letter in the left column of the Troubleshooting Guide. Information in the center column identifies possible causes, while information in the right column explains the tests/Actions to perform.

***NOTE:* For Problems “A” through “K,” “S” and “V”:**

1. Begin troubleshooting by observing the compartment set points.
2. If the set-points are normal, initiate Diagnostic Mode by pressing and holding either COLDER key, then press the UNIT ON/OFF key, then release both keys. (See Thermistor Location Code Tables below.)
3. R*ecord the compartment and evaporator temperatures.*
   NOTE: *Verify that the compressor is operating before observing evaporator temperatures. If the problem is in the refrigerator section, the refrigerator door must be left open for 5 minutes with the compressor running.*
4. After observing the evaporator temperatures as instructed above, take note of the *“Pointers”* in the first column of the troubleshooting guide under problems “A” through “D”. The *“Pointers”* list what possible causes to check based on the evaporator temperatures observed.

Thermistor Location Code Tables

MODEL 611, 632, 642, 650, 690	
THERMISTOR LOCATION	CODE
Freezer Compartment	*F*
Refrigerator Compartment	*r*
Freezer Evaporator	*FE*
Refrigerator Evaporator	*rE*
Inactive Line	*IL*

MODEL 601R	
THERMISTOR LOCATION	CODE
Refrigerator Compartment	*r*
Refrigerator Evaporator	*rE*

MODEL 601F	
THERMISTOR LOCATION	CODE
Freezer Compartment	*F*
Freezer Evaporator	*FE*
Inactive Line	*IL*

NOTE: *Before beginning, see page 8-2, and the "Pointers" in PROBLEM column.*

Problem	Possible Cause	Test/Action
A. <u>Warm Freezer</u> Temperatures w/ "VACUUM CONDENSER" flashing *(**NOTE:** To clear error indicator after repairs, power OFF, then back ON.)* Pointers: *(**NOTE:** w/Freezer Comp. Running)* 1. Evap. temp -20°F or lower see: • Door ajar • Evaporator fan fault • Evaporator heavily frosted • Faulty light switch • Sealed system problem, leak or partial restriction 2. Evap. Temp. between -19°F & 0°F see: • Condenser Air Flow • Sealed System problem, leak 3. Evap. Temp. 0°F or higher see: *(**NOTE:** Verify freezer comp is running & not in defrost)* • Power to Compressor Fault • Sealed System problem, leak, restriction or inefficient compressor	**Door ajar** a. Food product obstruction b. Door out of adjustment c. Door or cabinet hinge problem	 a. Move obstruction. b. Adjust door. c. Replace hinge or component.
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed c. Condenser fan motor disconnected or defective d. No power from control board (excluding 601F) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction. c. Check electrical connections, reconnect/repair. Check power to motor, replace motor if defective. d. Check COND FAN terminal at control board for 115V (w/comp. running). Replace board if defective.
	Faulty light switch/Light stays on	Check light switch, lights off when depressed. Replace if defective.
	Evaporator Fan fault a. Fan blade obstructed b. Faulty fan switch c. Evap. fan motor disconnected or faulty	 a. Move obstruction. b. Check power to and from fan switch. Replace if defective. c. Check wiring to, and power at, fan motor. Repair wiring or replace motor if defective.

Problem	Possible Cause	Test/Action
(Continued - see Pointers on previous page) **A. <u>Warm Freezer</u> Temperatures w/ "VACUUM CONDENSER" flashing**	**Evaporator heavily frosted** *(**NOTE:** To manually initiate defrost, press and hold the ICE key for approximately ten seconds)*	
	a. Evaporator fan malfunction	a. See Evaporator Fan Fault above.
	b. Defrost heater disconnected or faulty	b. Check electrical connections for 20 Ohms, reconnect or replace if defective.
	c. Defrost terminator disconnected or faulty.	c. Check electrical connections, reconnect/repair or replace if defective.
	d. Defrost sense line disconnected.	d. Check DEF SEN electrical connection at control board for 115V. Repair connection.
	e. No power from control board	e. Check DEF HTR terminal at control board for 115V. Replace board if defective.
	Power To Compressor fault	
	a. Compressor wiring disconnected	a. Check wiring at compressor, reconnect or repair.
	b. Compressor electricals disconnected or faulty	b. Check compressor electricals. Replace if defective.
	c. No power from control board	c. Check F COMP terminal on control board for 115V. If no power, replace board.
	• **Sealed System Leak** • **Sealed System Restriction** • **Inefficient Compressor**	

Problem	Possible Cause	Test/Action
B. <u>Warm Freezer</u> Temperatures <u>w/o</u> "VACUUM CONDENSER" illuminated. Pointers: *(**NOTE:** w/Freezer Comp. Running)* 1. Evap. temp -20°F or lower see: • Door ajar • Evaporator fan fault • Evaporator heavily frosted • Faulty light switch • Sealed system problem, leak or partial restriction 2. Evap. Temp. between -19°F & 0°F see: • Control set too high • Warm food load • High ambient • Door ajar • Condenser air flow • Sealed system problem, leak 3. Evap. Temp. 0°F or higher see: *(**NOTE:** Verify freezer comp is running & not in defrost)* • Unit in Show Room mode • Power To Compressor fault • Sealed system problem, leak restriction or inefficient compressor 4. "EE" displayed in place of temperature reading, see: • Thermistor malfunction	**No power to unit**	Check power to unit, plug unit in or trip supply circuit breaker ON.
	Unit switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT-ON/OFF key to ON.
	Unit in Show Room mode	If lights are on, listen for unit functioning. If not running, press UNIT ON/OFF key. Now press and hold WARMER& COLDER keys, and press UNIT ON/OFF key.
	Control set too high	Check set-point. If high, adjust.
	Warm food load	Check contents of freezer for warm food load. Instruct customer.
	High room ambient	Instruct customer.
	Door ajar a. Food product obstruction b. Door out of adjustment c. Door or cabinet hinge problem	 a. Move obstruction. b. Adjust door. c. Replace hinge or component.
	Condenser air flow a. Dirty condenser b. Condenser fan blade obstructed. c. Condenser fan motor disconnected or defective d. No power from control board (excluding 601F) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction. c. Check electrical connections, reconnect/repair. Check power to motor, replace if defective. d. Check COND FAN terminal at control board for 115V. (w/ a comp. running). Replace board if defective.
	Faulty light switch/Light stays on	Check light switch, lights off when depressed. Replace if defective.
	Evaporator Fan fault a. Fan blade obstructed b. Faulty fan switch c. Evap. fan motor disconnected or faulty	 a. Move obstruction. b. Check power to and from fan switch. Replace if defective. c. Check wiring to, and power at, fan motor. Repair wiring or replace motor if defective.

Problem	Possible Cause	Test/Action
(Continued - see Pointers on previous page) **B. <u>Warm Freezer</u> Temperatures <u>w/o</u> "VACUUM CONDENSER" illuminated.**	**Evaporator heavily frosted** *(**NOTE:** To manually initiate defrost, press and hold the ICE key for approximately 10 seconds)* a. Evaporator fan malfunction b. Defrost heater disconnected or faulty c. Defrost terminator disconnected or faulty d. Defrost Sense line disconnected e. No power from control board	 a. See Evaporator Fault on previous page. b. Check electrical connections and heater = 20 Ohms. Reconnect or replace if defective. c. Check electrical connections, reconnect/repair or replace if defective. d. With unit in defrost, check DEF SEN electrical connection at control board for 115V. Reconnect or repair connection if defective. e. With unit in defrost, check DEF HTR terminal at control board for 115V. Replace board if defective.
	Thermistor Malfunction	Check thermistor connection and thermistor Ohms = 32,500 at 32°F and 10,000 at 77°F. Repair connection or replace thermistor if defective.
	Power To Compressor fault a. Compressor wiring disconnected. b. Compressor electricals disconnected or faulty c. No power from control board	 a. Check wiring at compressor, reconnect or repair. b. Check compressor electricals. Replace if defective. c. Check F COMP terminal on control board for 115V. If no power, replace board.
	• **Sealed System leak** • **Sealed System restriction** • **Inefficient compressor** • **Non-operating compressor**	• **See following SEALED SYSTEM TROUBLESHOOTING GUIDE**
C. Warm Refrigerator Temperatures w/ "VACUUM CONDENSER" flashing *(**NOTE:** To clear error indicator after repairs, power OFF, then back ON)* See Pointers on next page	**Door ajar** a. Gallon door shelf obstruction b. Food product obstruction c. Door out of adjustment d. Door or cabinet hinge problem	 a. Relocate shelf(s). b. Move obstruction c. Adjust door. d. Replace hinge or component,

Problem	Possible Cause	Test/Action
(Continued) **C. <u>Warm Refrigerator</u> Temperatures w/ "VACUUM CONDENSER" flashing** Pointers: *(**NOTE:** w/Refrigerator Comp. running for 5 minutes)* 1. Evap. temp 15°F or lower within 5 minutes w/door open, see: • Door ajar • Faulty light switch • Evaporator Fan fault • Evaporator heavily frosted • Evaporator thermistor mal function • Sealed System problem, leak or partial restriction 2. Evap. Temp. cannot pull below 30°F within 5 minutes w/door open, see: • Condenser Air Flow • Evaporator thermistor mal function • Sealed System problem, leak or inefficient compressor 3. Evap. Temp. 35°F or higher within 5 minutes w/door open, see: • Condenser Air Flow • Power To Compressor fault • Sealed System problem, leak, restriction or inefficient compressor 4. "EE" displayed in place of temperature reading, see: • Thermistor Malfunction	**Condenser Air Flow** a. Dirty condenser b. Condenser fan blade obstructed c. Condenser fan motor disconnected or defective d. No power from control board (excluding 601R) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction. c. Check electrical connections, reconnect/repair. Check power to motor, replace motor if defective. d. Check COND FAN terminal on control board for 115V. (w/comp. running). Replace board if defective.
	Faulty light switch/Lights stay on	Check light switch, lights off when depressed. Replace if defective.
	Evaporator Fan fault a. Fan blade obstructed b. Faulty fan switch c. Evap. fan motor disconnected or faulty	 a. Move obstruction b. Check power to and from fan switch, replace if defective. c. Check wiring to, and power at, fan motor. Repair wiring or replace motor if defective.
	Evaporator heavily frosted a. Evaporator fan malfunction b. Evaporator thermistor malfunction	 a. See Evaporator Fan Fault above. b. See Evaporator Thermistor Malfunction below.
	Evaporator thermistor malfunction	Check evaporator thermistor connection and thermistor Ohms = 32,500 at 32°F and 10,000 = 77°F. Repair connection or replace thermistor if defective.
	Power To Compressor fault a. Compressor wiring disconnected b. Compressor electricals disconnected or faulty c. No power from control board	 a. Check wiring at compressor, reconnect or repair. b. Check compressor electricals, replace if defective. c. Check R COMP terminal on control board for 115V. If no power, replace board.
	• **Sealed System leak** • **Sealed System restricted** • **Inefficient compressor** • **Non-operating compressor**	• **See following SEALED SYSTEM TROUBLESHOOTING GUIDE.**

Problem	Possible Cause	Test/Action
D. <u>Warm Refrigerator</u> Temperature <u>w/o</u> "VACUUM CONDENSER" illuminated Pointers: *(**NOTE:** W/refrigerator comp. running for 5 minutes and refrigerator door open)* 1. Evap. temp 15°F or lower within 5 minutes w/door open, see: • Door ajar • Faulty light switch • Evaporator Fan fault • Evaporator heavily frosted • Evaporator thermistor mal function • Sealed System problem, leak or partial restriction 2. Evap. Temp. cannot pull below 30°F within 5 minutes w/door open, see: • Condenser Air Flow • Evaporator thermistor mal function • Sealed System problem, leak or inefficient compres sor 3. Evap. Temp. 35°F or higher within 5 minutes w/door open, see: • Condenser Air Flow • Power To Compressor fault • Sealed System problem, leak, restriction or inefficient compressor 4. "EE" displayed in place of temperature reading, see: • Thermistor malfunction	**No power to unit**	Check power to unit, plug unit in or trip supply circuit breaker to ON.
	Unit switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT ON/OFF key to ON.
	Unit in Show Room mode	If lights are on, listen for unit functioning. If not running, press and hold WARMER & COLDER keys, then press UNIT ON/OFF key.
	Control set too high	Check set-points. If high, adjust.
	Warm food load	Check contents of refrigerator for warm food load. Instruct customer.
	High room ambient	Instruct customer.
	Door ajar a. Gallon door shelf obstruction b. Food product obstruction c. Door out of adjustment d. Door or cabinet hinge problem	 a. Relocate shelf(s). b. Move obstruction. c. Adjust door. d. Replace hinge or component.
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed c. Condenser fan motor disconnected or defective d. No power from control board (excluding 601R) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction. c. Check electrical connections, reconnect/repair. Check power to motor, replace if defective. d. Check COND FAN terminal at control board for 115V. (w/ comp. running). Replace board if defective.
	Faulty light switch/Lights stay on	Check light switch, lights off when depressed. Replace if defective.
	Evaporator thermistor malfunction	Check thermistor connection and thermistor Ohms = 32,500 at 32°F and 10,000 at 77°F. Repair connection or replace thermistor if defective.
	Power To Compressor fault a. Compressor wiring disconnected b. Compressor electricals disconnected or faulty c. No power from control board	 a. Check wiring at compressor, reconnect or repair. b. Check compressor electricals. Replace if defective. c. Check R COMP terminal on control board for 115V. If no power, replace board.

Problem	Possible Cause	Test/Action
(Continued - see Pointers on previous page) **D. Warm Refrigerator Temperature w/o "VACUUM CONDENSER" illuminated**	• **Sealed System leak** • **Sealed System restriction** • **Inefficient compressor**	**See following SEALED SYSTEM TROUBLESHOOTING GUIDE**
E. Warm Freezer and Refrigerator Temperatures w/ "VACUUM CONDENSER" flashing *(NOTE: To clear error indicator after repairs, power OFF then back ON)*	**High room ambient**	**Instruct customer.**
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed c. Condenser fan motor disconnected or defective d. No power from control board (excluding 601R and 601F) *(NOTE: A compressor must be running)*	a. Clean condenser. b. Remove obstruction. c. Check electrical connections, reconnect/repair. Check power to motor, replace motor if defective. d. Check COND FAN terminal on control board for 115V. (w/comp. running). Replace board if defective. *(NOTE: If problem persists, see PROBLEM A & C).*
F. Warm Freezer and Refrigerator Temperatures w/o "VACUUM CONDENSER" illuminated	**No power to unit**	Check power to unit, plug unit in or trip supply circuit breaker ON.
	Unit switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT ON/OFF key to ON.
	Unit in Show Room mode	If lights are on, listen for unit functioning. If not running, press UNIT ON/OFF key. Now press and hold WARMER& COLDER keys, and press UNIT ON/OFF key.
	Control set too high	Check set-points. If high, adjust.
	Warm food load	Check contents of freezer for warm food load. Instruct customer.
	High room ambient	Instruct customer.
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed c. Condenser fan motor disconnected or defective d. No power from control board (excluding 601R and 601F) *(NOTE: A compressor must be running)*	a. Clean condenser. b. Remove obstruction. c. Check electrical connections, reconnect/repair. Check power to motor, replace motor if defective. d. Check COND FAN terminal on control board for 115V. (w/comp. running). Replace board if defective. *(NOTE: If problem persists, see PROBLEM B & D).*

Problem	Possible Cause	Test/Action
G. Compartment Temperatures Normal w/ "VACUUM CONDENSER" flashing *(**NOTE:** To clear error indicator after repairs, power OFF then back ON)*	**Condenser Air Flow** a. Dirty condenser b. Condenser fan blade obstructed c. Condenser fan motor disconnected or defective d. No power from control board (excluding 601R and 601F) *(**NOTE:** A compressor must be running)*	a. Clean condenser. b. Remove obstruction. c. Check electrical connections, reconnect/repair. Check power to motor, replace motor if defective. d. Check COND FAN terminal on control board for 115V. (w/comp. running). Replace board if defective.
	Possible early signs of Sealed System leak	• **See following SEALED SYSTEM TROUBLESHOOTING GUIDE**
H. Compartment Temperatures Normal w/ "SERVICE" flashing *(**NOTE:** To clear error indicator after repairs, power OFF then back ON)*	**Refrigerator evaporator thermistor malfunction**	Check refrigerator evaporator thermistor connection and thermistor Ohms = 32,500 at 32°F and 10,000 at 77°F. Repair connection or replace thermistor if defective.
I. Warm or Normal Freezer Temp. w/ "EE" displayed for freezer temp. and "SERVICE" flashing *(**NOTE:** To clear error indicator after repairs, power OFF then back ON)*	**Freezer compartment thermistor malfunction**	Check freezer evaporator thermistor connection and thermistor Ohms = 32,500 at 32°F and 10,000 at 77°F. Repair connection or replace thermistor if defective.
J. Warm or Normal Refrig. Temp. w/ "EE" displayed for refrigerator temp. and "SERVICE" flashing *(**NOTE:** To clear error indicator after repairs, power OFF then back ON)*	**Refrigerator compartment thermistor malfunction**	Check refrigerator evaporator thermistor connection and thermistor Ohms = 32,500 at 32°F and 10,000 at 77°F. Repair connection or replace thermistor if defective.
K. Freezer and/or Refrigerator Compartment too cold	**Control set too low**	Check set-points. If low, adjust.
	Thermistor malfunction	If "EE" is displayed in place of temperature during diagnostic mode, thermistor is disconnected or faulty. Check thermistor connection and Ohms = 32,500 at 32°F and 10,000 at 77°F. Repair connection or replace thermistor if defective.
L. Membrane switch on control board malfunctioning	**Ribbon cable to control board incorrectly attached to control board or ribbon cable broken**	Check ribbon cable at control board. Label on cable terminal housing must be oriented toward arrow on control board. If connected properly, check for breaks in cable. Replace control panel if cable is defective.
	Defective Membrane Switch	See MEMBRANE SWITCH/RIBBON CABLE TEST at end of troubleshooting guides.

Problem	Possible Cause	Test/Action
M. No lights	**No power to unit**	Check power to unit, plug unit in or trip supply circuit breaker ON.
	Unit switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT ON/OFF key to ON.
	Unit in Holiday mode	Press UNIT ON/OFF key. Lights should illuminate if unit was in Holiday mode.
	Defective or loose light bulb(s)	Install a known good light bulb, if it illuminates, replace defective bulb.
	Light terminator interrupt	Check for proper door closing. If door is ajar too long, lighting system is interrupted by the terminator. Clear obstruction or adjust door and allow bulbs to cool.
	Light switch disconnected or defective	Check wire connections at light switch. Reconnect/repair. Check power to and from light switch. Replace if defective.
	Light system wiring disconnected	After verifying power to light switch and the light switch is good, signal trace the lighting system after switch. Repair wiring if disconnected.
	No power from control board	Check LIGHTS terminal at control board for 115V. Replace board if defective.
N. Lights stay ON when door is closed	**Door ajar** a. Gallon door shelf obstruction b. Food product obstruction c. Door out of adjustment d. Door or cabinet hinge problem	 a. Relocate shelf(s). b. Move obstruction. c. Adjust door. d. Replace hinge or component.
	Faulty light switch	Check light switch, lights off when depressed. Replace if defective.
O. Noise (buzz/hum - intermittent)	**Water Valve** a. No water supply hook-up b. Defective water valve	a. Check water valve for water hookup. If none, press ICE key to de-energize icemaker system and instruct customer. b. Check water valve for"excessive" operating noise, replace if defective.
	Sealed System tubing contact	Check compressor area for sealed system tubing touching other tubing or other components, then adjust tubing.
P. Noise (rattle/clank/clatter/click/buzz/hum/whir/squeak/clang/clunk - constant or intermittent	**Fan blade obstruction or defect**	Check condenser and evaporator fan blade positions, adjust if needed; check for fan blade obstructions, clear obstruction if needed; check for fan blade defects (unbalanced), replace if defective.
	Fan motor defect	Check condenser and evaporator fan motors for "excessive" operating noise, replace if defective.
	Compressor defect	Check compressor for "excessive" operating noise, replace if defective.

Problem	Possible Cause	Test/Action
Q. Doors uneven or not level	**Unit not level or doors out of adjustment**	See UNIT LEVELING (ALL MODELS) and DOOR ADJUSTMENT (ALL MODELS) in Installation Information section of Service/Training manual.
R. No ice, Ice not displayed	**Icemaker system not energized**	Press ICE key.
S. No ice w/ "ICE" displayed *(**NOTE:** Icemaker is disabled for 45 minutes after each ice harvest. To bypass for cycling icemaker, press ICE key OFF, then ON)*	**Unit has not been running long enough**	Freezer must be 10°F for icemaker to operate, approximately twenty-four hours after unit installation. Instruct customer.
	Unit in Show Room mode	If lights are on, listen for unit functioning. If not running, press and hold WARMER & COLDER keys, then press UNIT ON/OFF key.
	Warm freezer temperatures *(**NOTE**: Freezer must be 10°F for icemaker to function)*	See PROBLEM A, B, E & F earlier in Troubleshooting Guide.
	Shut-off arm stuck in Up/Off position	Check shut-off arm, and lower it if its stuck in the up/off position.
	Disconnected or Defective water valve	Check electrical connections at water valve, connect or repair. Water valve Ohms = 260.
	No water supply	Check water valve for water hook-up, if none, instruct customer. Loosen inlet connection to verify water to valve. If water supply is turned off/closed, turn on/open.
	IceMaker System *(**NOTE**: For models 601F, 611, 650 and 690, the icemaker switch which is normally activated by the ice bucket must be depressed in order to complete the icemaker circuit.)* a. Disconnected or damaged electrical connections at icemaker or water valve. b. Defective icemaker c. Defective icemaker d. Disconnected or damaged electrical connections at icemaker e. Icemaker switch disconnected or faulty (Models 601F, 611, 650 690 only. See **NOTE** above.) f. Electrical connection at control board or control board defect	Manually start icemaker by rotating the ejector blades clockwise by hand, while turning the drive gear counterclockwise with a flat blade screwdriver. 1. If icemaker motor starts and finishes cycle: a. Check for 115V at water valve during fill mode. If no power, visually inspect electrical connections at icemaker and water valve. Reconnect, repair or replace connection. b. Check for 115V from icemaker during fill mode. If no power, replace icemaker. 2. If icemaker motor starts but does not finish cycle: c. Replace icemaker. 3. If icemaker motor does NOT start: d. Check for 115V to icemaker. If power, repair electrical connection. e. Check power to and from icemaker switch. Reconnect or repair connection. Replace switch if defective. f. Check ICE MKR terminal at control board for 115V. If power is present, check and repair connection. If no power, replace control board.

Problem	Possible Cause	Test/Action
(Continued) **S. No ice w/ "ICE" displayed** *(**NOTE:** Icemaker is disabled for 45 minutes after each ice harvest. To bypass for cycling icemaker, press ICE key OFF, then ON)*	**Frozen fill tube** a. Water supply problem b. Disconnected or defective fill tube heater c. Electrical connection at control board or control board defect	 a. Check water supply to unit. Pressure MUST be constant 20 psi to 100 psi. If not, instruct customer. b. Check electrical connections at fill tube heater,reconnect or repair as needed. Check fill tube heater Ohms = 2,600. Replace if defective. c. Check ICE ACC at control board for 115V. If power, connect or repair wiring. If no power, replace board.
T. No ice w/ "ICE" and "SERVICE" flashing *(**NOTE:** To clear error indicator after repairs, power OFF then back ON)*	**Water valve energized too long**	Check icemaker area for jammed ice cube, clear jam if present. Check levelness of icemaker; level if needed. Check water supply pressure; must be constant 20-100 PSI. Also, check water valve for defects, replace if defective.
U. Too much ice	**Ice level arm/linkage bent or broken**	Inspect ice level arm, shut-off arm and linkage. Replace defective parts.
	Icemaker faulty	With the ice level arm in the UP/OFF position, manually start icemaker by rotating the ejector blades clockwise by hand while turning the drive gear counterclockwise with a flat blade screwdriver. If icemaker motor starts with arm in the UP/OFF position, replace icemaker.
V. Icemaker produces small cubes	**Icemaker not level**	Adjust icemaker.
	Low fill adjustment on icemaker	Increase fill level by turning adjusting screw counterclockwise.
W. Icemaker produces hollow cubes	**Warm freezer temperature**	See Problems A, B, E, F & I earlier in Troubleshooting Guide.
	Icemaker faulty	Replace icemaker.
X. Water from icemaker in ice bucket	**Icemaker not level**	Adjust icemaker.
	High fill adjustment on icemaker	Decrease fill level by turning adjusting screw clockwise.
	Water valve energized too long	Check icemaker area for jammed ice cube, clear jam if present and check water supply pressure. Check water valve for defects, replace if defective.

SEALED SYSTEM TROUBLESHOOTING INFORMATION

NOTE: *Before troubleshooting the sealed system, be sure to see Page 8-2 and go through the preceding General Troubleshooting Guide.*

NOTE: *Whenever entering the sealed system, always use solder-on process valves.*

NOTE: *Whenever servicing the sealed system, the filter-drier must be replaced.*

Normal Operating Pressures

MODEL		NORMAL LOW SIDE PRESSURE	NORMAL HIGH SIDE PRESSURE
601R		18 psi to 39 psi	90 psi to 100 psi
601F		1 psi to 14 psi	90 psi to 100 psi
611	Refrig.	16 psi to 36 psi	90 psi to 100 psi
	Freezer	1 psi to 15 psi	90 psi to 100 psi
632	Refrig.	9 psi to 35 psi	90 psi to 100 psi
	Freezer	1" Vac to 8 psi	90 psi to 100 psi
642	Refrig.	9 psi to 35 psi	90 psi to 100 psi
	Freezer	1" Vac to 8 psi	90 psi to 100 psi
650	Refrig.	6 psi to 34 psi	90 psi to 100 psi
	Freezer	2" Vac to 9 psi	90 psi to 100 psi
690	Refrig.	16 psi to 36 psi	90 psi to 100 psi
	Freezer	2 psi to 10 psi	90 psi to 100 psi

Pressure Indications

IF LOW SIDE PRESSURE IS	& HIGH SIDE PRESSURE IS	POSSIBLE PROBLEM IS
NORMAL	NORMAL	MECHANICAL (See General Troubleshooting Guide)
LOW	LOW	Leak
LOW	HIGH	Restriction
HIGH	LOW	Inefficient Compressor
HIGH	HIGH	Over Charge

SEALED SYSTEM REPAIR PROCEDURES

Problem	What To Do
Non-Operating, Inefficient, Noisy Compressor *(**NOTE:** To check for a non-operating compressor, a hard start kit can be used.)*	a. Capture refrigerant. b. Replace compressor. c. Replace filter-drier. d. Evacuate or sweep charge system. e. Recharge system with Virgin 134a refrigerant.
High Side Leak	a. Capture refrigerant. b. Repair leak. c. Replace filter-drier. d. Evacuate or sweep charge system. e. Recharge system with Virgin 134a refrigerant.
Low Side Leak	a. Capture refrigerant. b. Repair leak (if at solder joint) or replace part. c. Back flush high side of sealed system. d. Replace compressor. e. Replace filter-drier. f. Evacuate or sweep charge system. g. Recharge system with Virgin 134a refrigerant.
Contaminated Sealed System Example: • Burned out compressor • Excessive moisture from leak at condensate loop • Excessive moisture from leak in low side • Plugged capillary tube, etc...	a. Capture refrigerant. b. Repair leak (if at solder joint) or replace part. c. Back flush high side of sealed system. d. Replace compressor. e. Replace filter-drier. f. Replace heat exchanger if cap tube is clogged. g. Install a low side drier on suction line. h. Evacuate or sweep charge sealed system. i. Recharge with Virgin 134a refrigerant.
Restriction *(**NOTE:** If restriction is due to contaminated sealed system, see Contaminated Sealed System above.)*	a. Capture refrigerant. b. Locate and remove restriction or locate and replace part. c. Back flush high side of sealed system. d. Replace filter-drier. e. Evacuate or sweep charge system. d. Recharge system with Virgin 134a refrigerant.
Overcharge	a. Capture refrigerant. b. Replace filter-drier. c. Evacuate or sweep charge system. d. Recharge system with Virgin 134a refrigerant.

MEMBRANE SWITCH/RIBBON CABLE TESTS

Below is the procedure to follow if the integrity of the membrane switch on the control panel is suspect. To perform these tests, the ribbon cable terminal housing must be disconnected from the control board.

NOTE: *The wires of the ribbon cable are exposed at the back side of the terminal housing. With an Ohm Meter, check for continuity at these exposed points/pins. Pin #1 is at the top of the terminal housing, closest to the arrow on the housing (see Figure 9-1).*

1. Without pressing any of the keys on the membrane switch, check for continuity across all pin combinations. With no keys pressed, there should be no continuity.
2. With the UNIT ON/OFF key depressed, there should be continuity across pins #1 & #5 only.
3. With the Freezer COLDER key depressed, there should be continuity across pins #1 & #2 only.
4. With the Freezer WARMER key depressed, there should be continuity across pins #2 & #3 only.
5. With the Refrigerator COLDER key depressed, there should be continuity across pins #1 & #3 only.
6. With the Refrigerator WARMER key depressed, there should be continuity across pins #3 & #4 only.
7. With the ICE ON/OFF key depressed, there should be continuity across pins #1 & #4 only.

NOTE: *If the membrane switch fails any of the fore mentioned tests, the control panel should be replaced.*

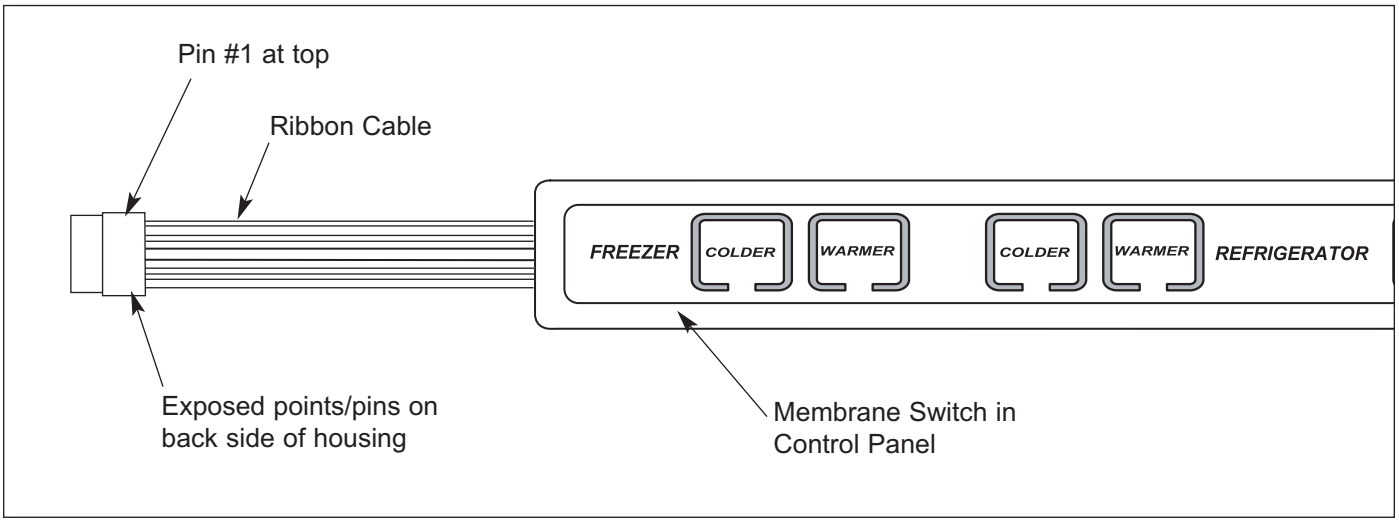


Figure 9-1. Membrane Switch

MODEL 601R		
Charge (*R-134a Refrigerant*) *(NOTE: Always check serial tag for exact charge)*		10.0 oz.
Normal Operating Pressures	Low Side High Side	10 psi to 36 psi 90 psi to 100 psi
Compressor *(NOTE: Always check Parts Price List for possible substitutions)*	Service Part No. Manufacturer Mfg Part No. Service Compressor Amps Service Compressor BTU's	4201880 Embraco EMI30HER 0.90 280
Defrost Method		"Off-cycle" (evap = 38°F before comp ON)
Defrost Terminator	Cut-in Cut-out	—— ——
Defrost Heater	Watts Amps Ohms	—— —— ——
Drain Tube Heater	Watts Amps Ohms	—— —— ——
Drain Trough Heater	Watts Amps Ohms	—— —— ——
Fill Tube Heater	Watts Amps Ohms	—— —— ——
Water Valve	Watts Amps Ohms	—— —— ——

MODEL 601F		
Charge (R-134a Refrigerant) (NOTE: Always check serial tag for exact charge)	11.0 oz.	
Normal Operating Pressures	Low Side High Side	-1” vac to 13 psi 90 psi to 100 psi
Compressor (NOTE: Always check Parts Price List for possible substitutions)	Service Part No. Manufacturer Mfg Part No. Service Compressor Amps Service Compressor BTU’s	4201870 Americold RG108 1.4 830
Defrost Method	“Adaptive” (5 min dwell follows defrost)	
Defrost Terminator	Cut-in Cut-out	30.0°F 55.0°F
Defrost Heater	Watts Amps Ohms	640 5.5 21
Drain Tube Heater	Watts Amps Ohms	7 .06 1890
Drain Trough Heater	Watts Amps Ohms	50 .40 260
Fill Tube Heater	Watts Amps Ohms	5 .04 2600
Water Valve	Watts Amps Ohms (inductive)	50 .40 160 - 360

MODEL 611			
		Refrigerator	**Freezer**
Charge (*R-134a Refrigerant*) *(NOTE: Always check serial tag for exact charge)*		10.0 oz.	8.5 0z.
Normal Operating Pressures	Low Side High Side	6 psi to 40 psi 90 psi to 100 psi	-2” vac to 14 psi 90 psi to 100 psi
Compressor *(NOTE: Always check Parts Price List for possible substitutions)*	Service Part No. Manufacturer Mfg Part No. Service Compressor Amps Service Compressor BTU’s	4201880 Embraco EMI30HER 0.90 280	4201870 Americold RG108 1.4 830
Defrost Method		“Off-cycle” (evap = 38°F before comp ON)	“Adaptive” (5 min dwell follows defrost)
Defrost Terminator	Cut-in Cut-out	—— ——	30.0°F 55.0°F
Defrost Heater	Watts Amps Ohms	—— —— ——	640 5.5 21
Drain Tube Heater	Watts Amps Ohms	—— —— ——	—— —— ——
Drain Trough Heater	Watts Amps Ohms	—— —— ——	—— —— ——
Fill Tube Heater	Watts Amps Ohms	—— —— ——	5 .04 2600
Water Valve	Watts Amps Ohms (inductive)	—— —— ——	50 .40 160 - 360

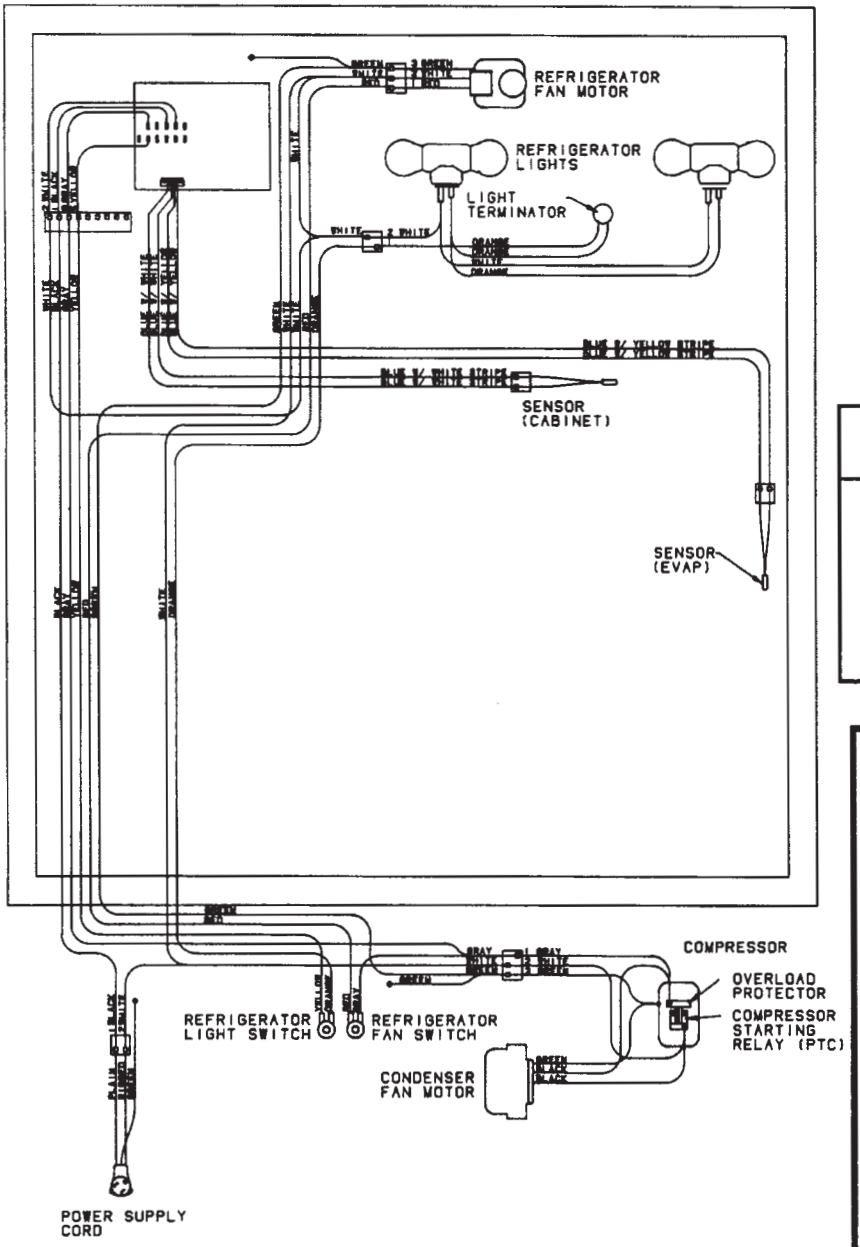
MODEL 632			
		Refrigerator	**Freezer**
Charge (*R-134a Refrigerant*) *(NOTE: Always check serial tag for exact charge)*		10.0 oz.	9.0 0z.
Normal Operating Pressures	Low Side High Side	11 psi to 38 psi 90 psi to 100 psi	-1” vac to 9 psi 90 psi to 100 psi
Compressor *(NOTE: Always check Parts Price List for possible substitutions)*	Service Part No. Manufacturer Mfg Part No. Service Compressor Amps Service Compressor BTU’s	4201880 Embraco EMI30HER 0.90 280	4201870 Americold RG108 1.4 830
Defrost Method		“Off-cycle” (evap = 38°F before comp ON)	“Adaptive” (5 min dwell follows defrost)
Defrost Terminator	Cut-in Cut-out	—— ——	30.0°F 55.0°F
Defrost Heater	Watts Amps Ohms	—— —— ——	640 5.5 21
Drain Tube Heater	Watts Amps Ohms	—— —— ——	—— —— ——
Drain Trough Heater	Watts Amps Ohms	—— —— ——	—— —— ——
Fill Tube Heater	Watts Amps Ohms	—— —— ——	5 .04 2600
Water Valve	Watts Amps Ohms (inductive)	—— —— ——	50 .40 160 - 360

MODEL 642			
		Refrigerator	**Freezer**
Charge (*R-134a Refrigerant*) *(NOTE: Always check serial tag for exact charge)*		9.0 oz.	7.5 0z.
Normal Operating Pressures	Low Side High Side	11 psi to 38 psi 90 psi to 100 psi	-1” vac to 9 psi 90 psi to 100 psi
Compressor *(NOTE: Always check Parts Price List for possible substitutions)*	Service Part No. Manufacturer Mfg Part No. Service Compressor Amps Service Compressor BTU’s	4201880 Embraco EMI30HER 0.90 280	4201870 Americold RG108 1.4 830
Defrost Method		“Off-cycle” (evap = 38°F before comp ON)	“Adaptive” (5 min dwell follows defrost)
Defrost Terminator	Cut-in Cut-out	—— ——	30.0°F 55.0°F
Defrost Heater	Watts Amps Ohms	—— —— ——	640 5.5 21
Drain Tube Heater	Watts Amps Ohms	—— —— ——	7 .06 1890
Drain Trough Heater	Watts Amps Ohms	—— —— ——	—— —— ——
Fill Tube Heater	Watts Amps Ohms	—— —— ——	5 .04 2600
Water Valve	Watts Amps Ohms (inductive)	—— —— ——	50 .40 160 - 360

MODEL 650			
		Refrigerator	**Freezer**
Charge (*R-134a Refrigerant*) *(NOTE: Always check serial tag for exact charge)*		8.0 oz.	6.0 0z.
Normal Operating Pressures	Low Side High Side	6 psi to 40 psi 90 psi to 100 psi	-2” vac to 14 psi 90 psi to 100 psi
Compressor *(NOTE: Always check Parts Price List for possible substitutions)*	Service Part No. Manufacturer Mfg Part No. Service Compressor Amps Service Compressor BTU’s	4201880 Embraco EMI30HER 0.90 280	4201870 Americold RG108 1.4 830
Defrost Method		“Off-cycle” (evap = 38°F before comp ON)	“Adaptive” (5 min dwell follows defrost)
Defrost Terminator	Cut-in Cut-out	—— ——	30.0°F 55.0°F
Defrost Heater	Watts Amps Ohms	—— —— ——	640 5.5 21
Drain Tube Heater	Watts Amps Ohms	—— —— ——	—— —— ——
Drain Trough Heater	Watts Amps Ohms	—— —— ——	—— —— ——
Fill Tube Heater	Watts Amps Ohms	—— —— ——	5 .04 2600
Water Valve	Watts Amps Ohms (inductive)	—— —— ——	50 .40 160 - 360

MODEL 690			
		Refrigerator	**Freezer**
Charge (*R-134a Refrigerant*) *(NOTE: Always check serial tag for exact charge)*		7.0 oz.	9.0 0z.
Normal Operating Pressures	Low Side High Side	16 psi to 36 psi 90 psi to 100 psi	-1” vac to 9 psi 90 psi to 100 psi
Compressor *(NOTE: Always check Parts Price List for possible substitutions)*	Service Part No. Manufacturer Mfg Part No. Service Compressor Amps Service Compressor BTU’s	4201880 Embraco EMI30HER 0.90 280	4201870 Americold RG108 1.4 830
Defrost Method		“Off-cycle” (evap = 38°F before comp ON)	“Adaptive” (5 min dwell follows defrost)
Defrost Terminator	Cut-in Cut-out	—— ——	30.0°F 55.0°F
Defrost Heater	Watts Amps Ohms	—— —— ——	640 5.5 21
Drain Tube Heater	Watts Amps Ohms	—— —— ——	7 .06 1890
Drain Trough Heater	Watts Amps Ohms	—— —— ——	15 .13 880
Fill Tube Heater	Watts Amps Ohms	—— —— ——	5 .04 2600
Water Valve	Watts Amps Ohms (inductive)	20 .18 160 - 360	50 .40 160 - 360
Mullion Chute Heater	Watts Amps Ohms	15 .13 880	—— —— ——
Glass Well Heater	Watts Amps Ohms	15 .13 2880	—— —— ——

WIRING DIAGRAM MODEL: 601R



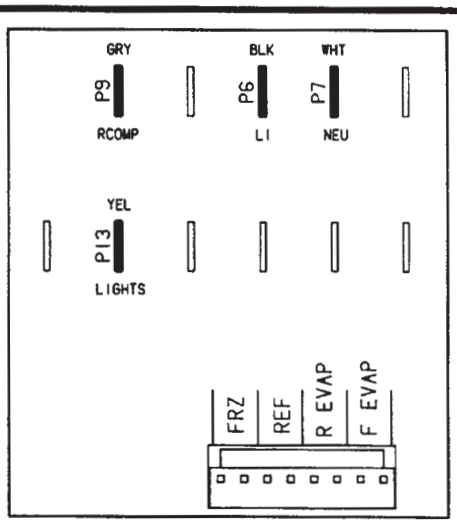
⚠ WARNING

This wiring information is provided for use by qualified service personnel only.

Disconnect appliance from electrical supply before beginning service.

Be sure all grounding devices are connected when service is completed.

Failure to observe the above warnings may result in severe electrical shock.



	600 SERIES CONTROL BOARD			
	CIRCUIT	DESCRIPTION	FUNCTION	COLOR
		120 VOLT CIRCUITS		
P9	RCOMP	REFRIGERATOR COMPRESSOR	POWERS REFRIG. COMPRESSOR	GRAY
P6	LI	POWER IN	POWER INTO BOARD	BLACK
P7	NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
P13	LIGHTS	LIGHTS	POWERS LIGHTS	YELLOW
		THERMISTOR CIRCUITS	LOW VOLTAGE	
	REF	REFRIGERATOR COMPARTMENT	SENSES REF COMPARTMENT TEMP	BLU/WHT
	R EVAP	REFRIGERATOR EVAPORATOR	SENSES REF EVAP TEMP	BLU/YEL

PART NUMBER 3756273 REV A

WIRING SCHEMATIC
MODEL: 601R

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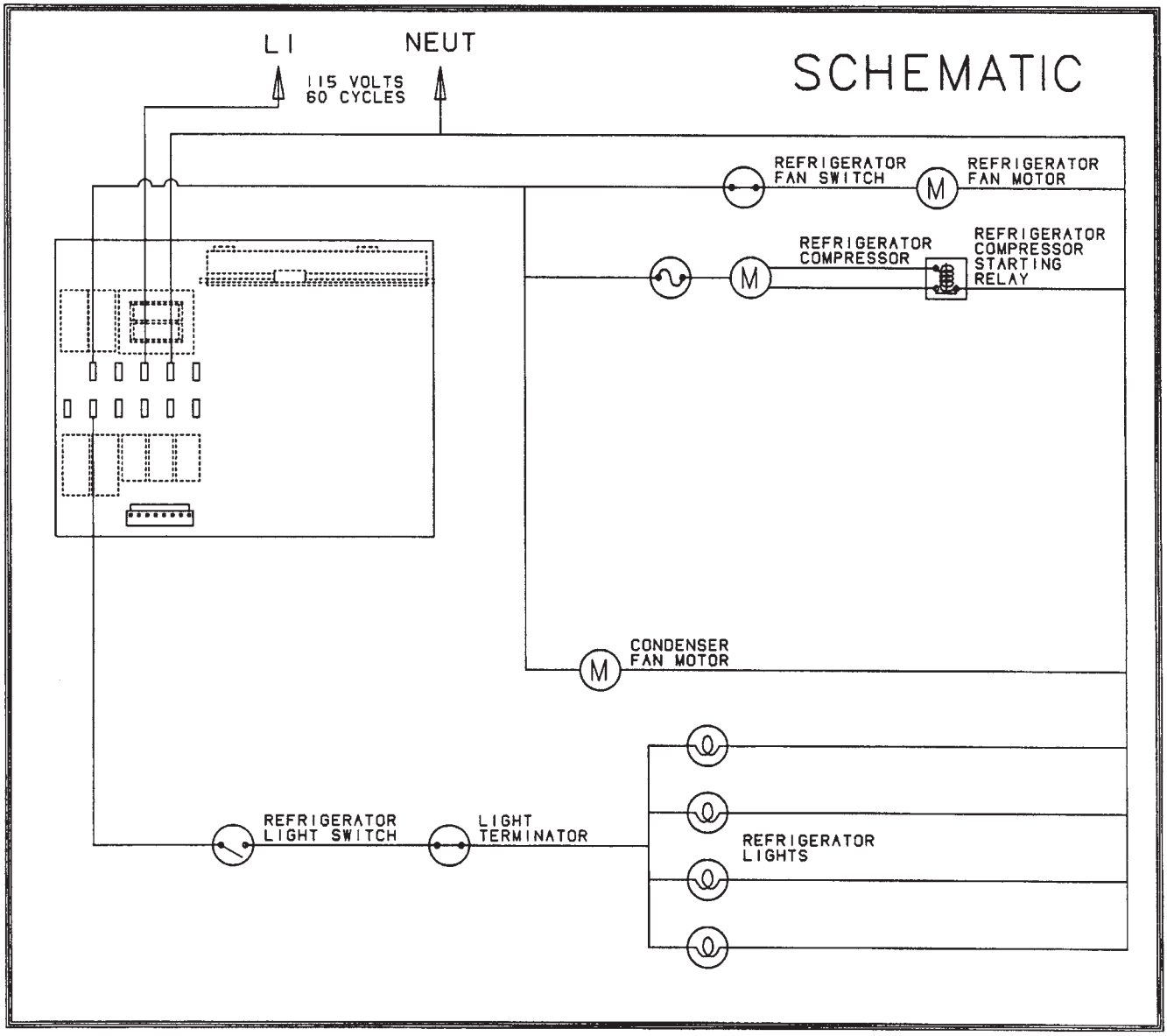
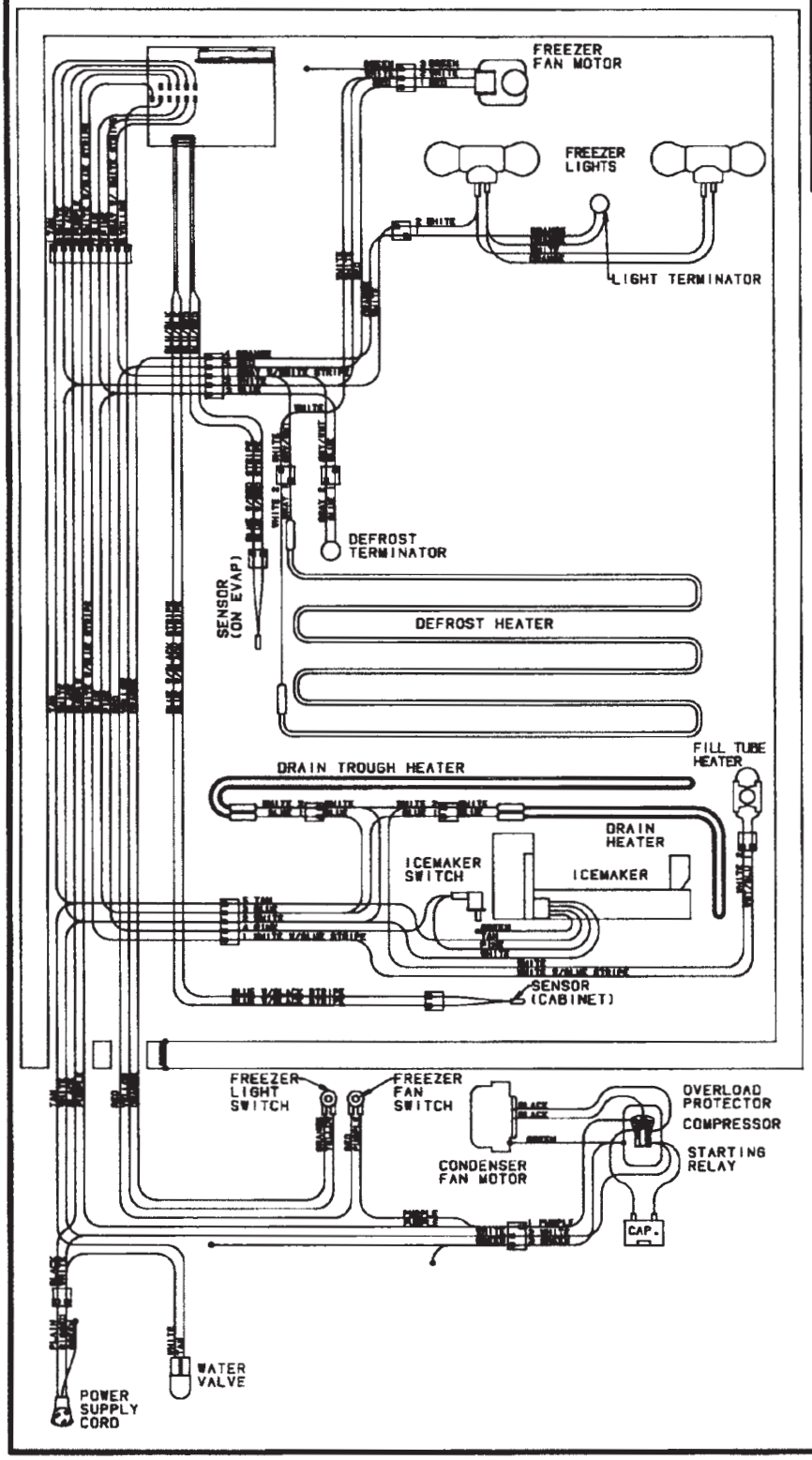


WIRING DIAGRAM : MODEL 601F



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Be sure all grounding devices are connected when service is completed.

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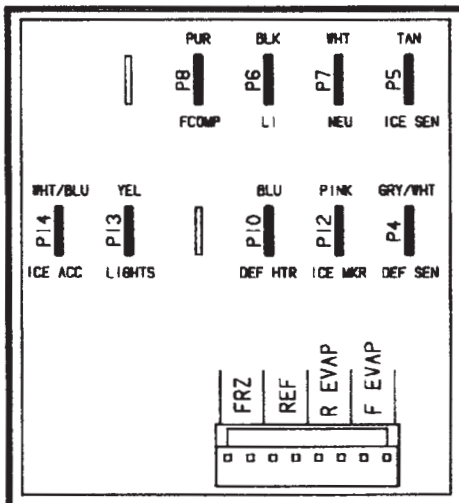


600 SERIES CONTROL BOARD			
CIRCUIT	DESCRIPTION	FUNCTION	COLOR
	120 VOLT CIRCUITS		
P8	FCOMP	POWERS FREEZER COMPRESSOR	PURPLE
P6	LI	POWER INTO BOARD	BLACK
P7	NEU	NEUTRAL INTO BOARD	WHITE
P5	ICE SEN	SENSES WATER VALVE ACTIVATION	TAN
P14	ICE ACC	POWERS FILL TUBE AND ACCESSORIES	WHT/BLUE
P13	LIGHTS	POWERS LIGHTS	YELLOW
P10	DEF HTR	POWERS DEFROST CIRCUIT	BLUE
P12	ICE MKR	POWERS ICEMAKER	PINK
P4	DEF SEN	SENSES WHEN HEATER SHUTS OFF	GRAY/WHT
		LOW VOLTAGE	
		THERMISTOR CIRCUITS	
FRZ		SENSES FREEZER COMPARTMENT TEMP	BLU/BLK
F EVAP		SENSES FREEZER EVAPORATOR	BLU/RED

PART NUMBER 3756274 REV A

WIRING SCHEMATIC
MODEL 601F

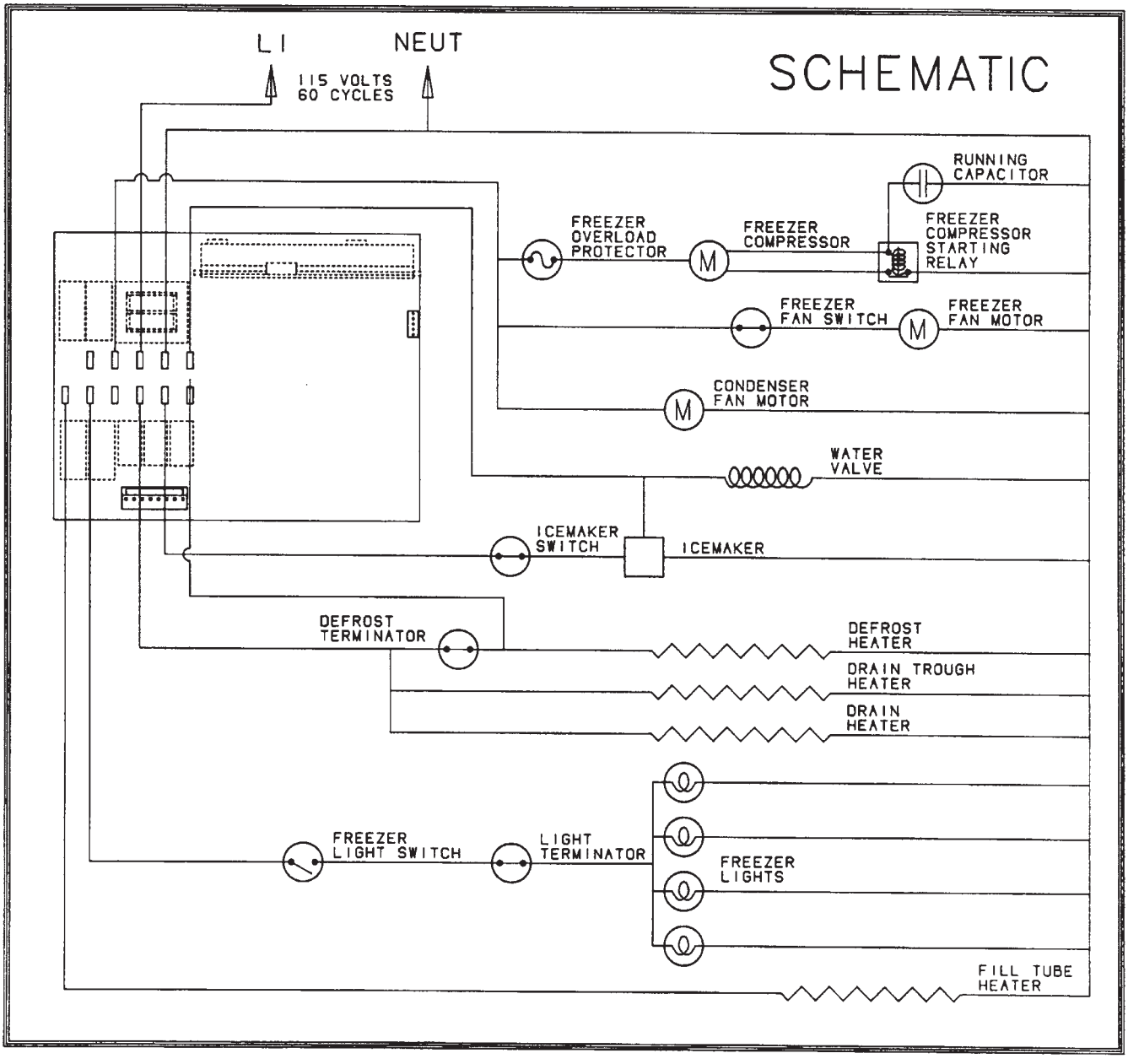
⚠ WARNING

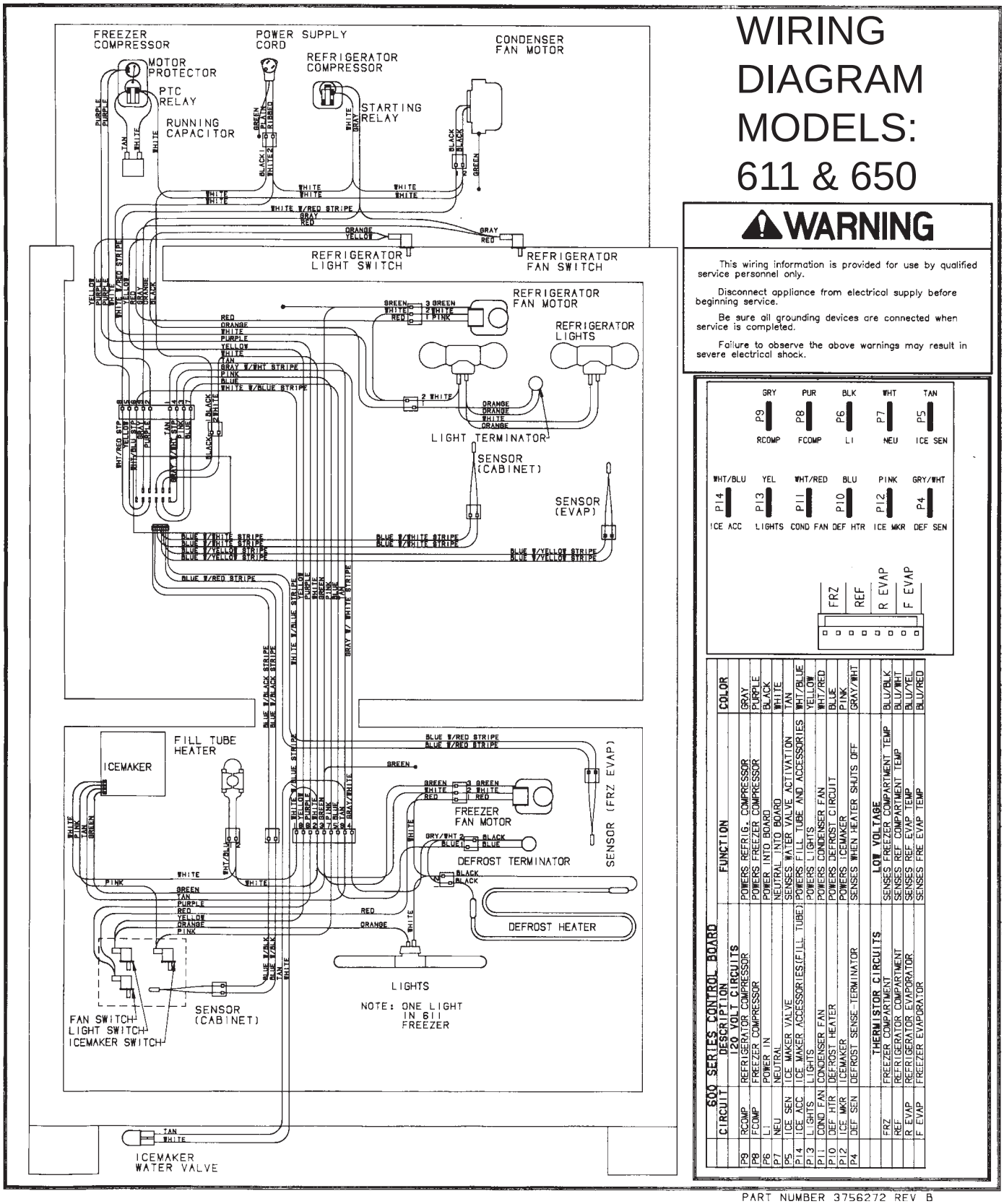
This wiring information is provided for use by qualified service personnel only.

Disconnect appliance from electrical supply before beginning service.

Be sure all grounding devices are connected when service is completed.

Failure to observe the above warnings may result in severe electrical shock.





WIRING DIAGRAM MODELS: 611 & 650

⚠ WARNING

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Disconnect appliance from electrical supply before beginning service.

Be sure all grounding devices are connected when service is completed.

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600 SERIES CONTROL BOARD			
CIRCUIT	DESCRIPTION	FUNCTION	COLOR
	120 VOLT CIRCUITS		
P9	RCOMP	POWERS REFRIG. COMPRESSOR	GRAY
P8	FCOMP	POWERS FREEZER COMPRESSOR	PURPLE
P6	LI	POWER INTO BOARD	BLACK
P7	NEU	NEUTRAL INTO BOARD	WHITE
P5	ICE SEN	SENSES WATER VALVE ACTIVATION	TAN
P14	ICE ACC	ICE MAKER ACCESSORIES(FILL TUBE)	WHT/BLUE
P13	LIGHTS	POWERS LIGHTS	YELLOW
P11	COND FAN	POWERS CONDENSER FAN	WHT/RED
P10	DEF HTR	POWERS DEFROST CIRCUIT	BLUE
P12	ICE MKR	POWERS ICEMAKER	PINK
P4	DEF SEN	SENSES WHEN HEATER SHUTS OFF	GRAY/WHT
	THERMISTOR CIRCUITS	LOW VOLTAGE	
FRZ	FREEZER COMPARTMENT	SENSES FREEZER COMPARTMENT TEMP	BLU/BLK
REF	REFRIGERATOR COMPARTMENT	SENSES REF COMPARTMENT TEMP	BLU/WHT
R EVAP	REFRIGERATOR EVAPORATOR	SENSES REF EVAP TEMP	BLU/YEL
F EVAP	FREEZER EVAPORATOR	SENSES FRE EVAP TEMP	BLU/RED

PART NUMBER 3756272 REV B

WIRING SCHEMATIC
MODELS: 611 & 650

⚠WARNING

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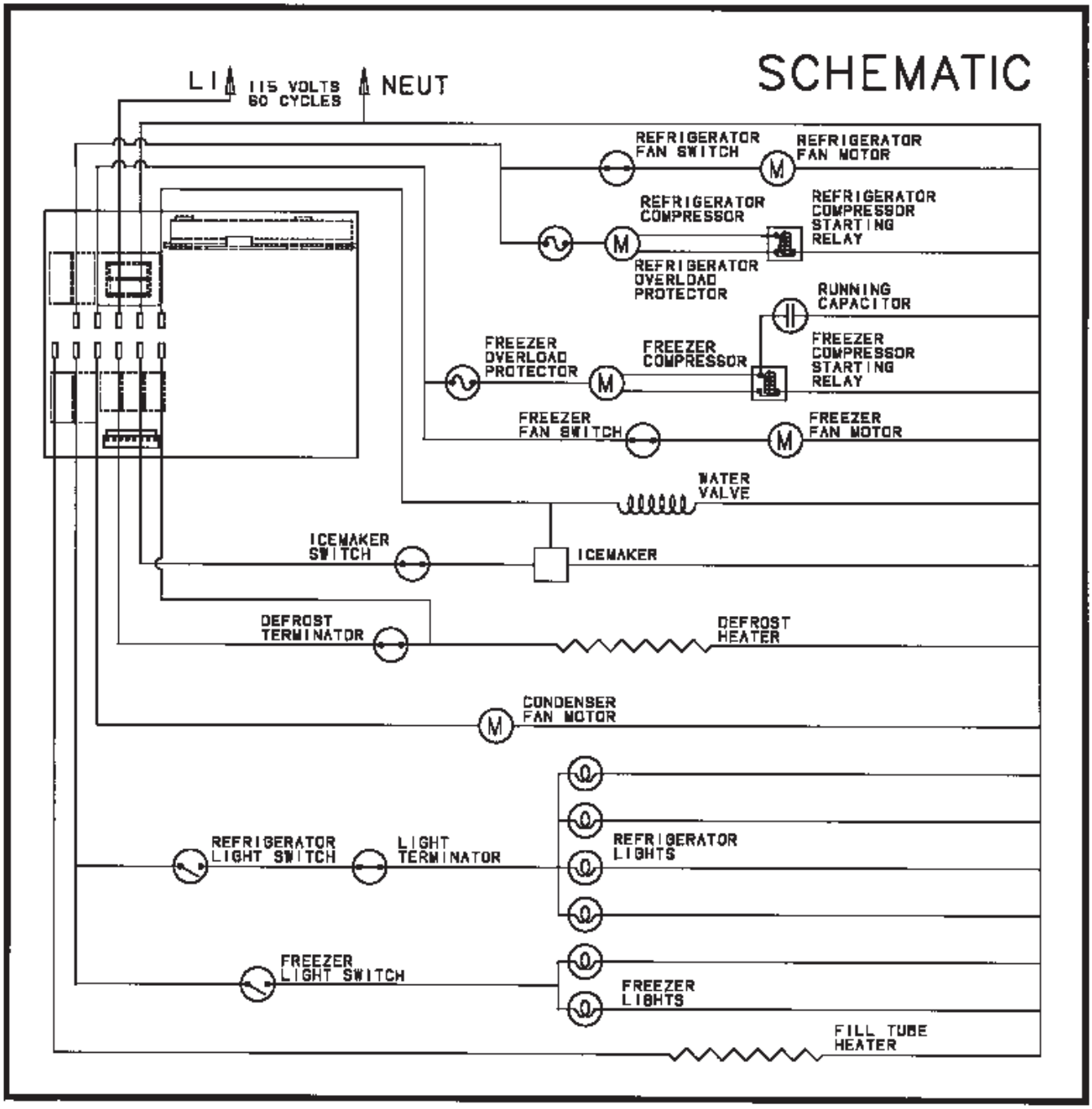
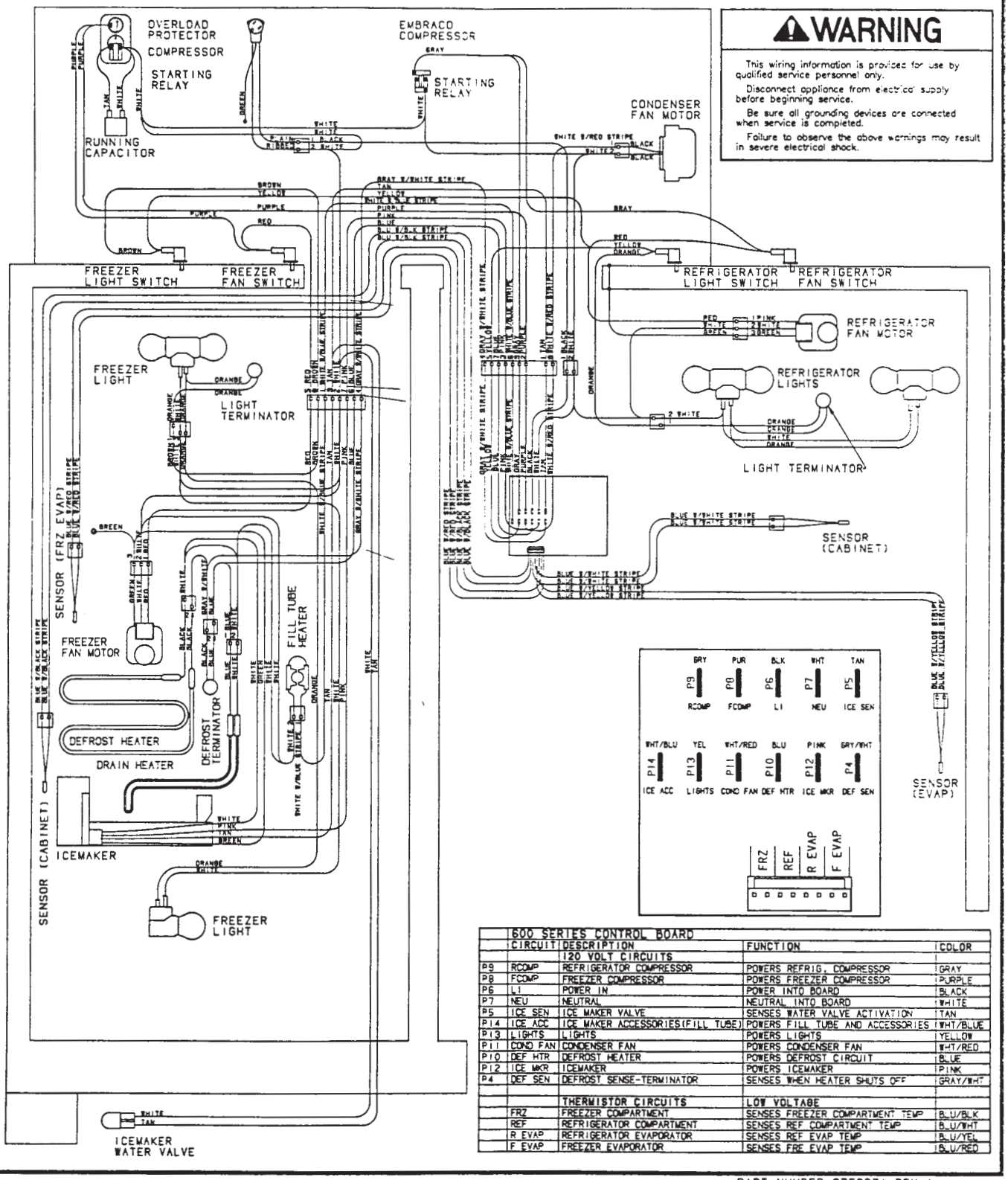


WIRING DIAGRAM MODELS: 632 & 642



600 SERIES CONTROL BOARD				
	CIRCUIT	DESCRIPTION	FUNCTION	COLOR
		120 VOLT CIRCUITS		
P9	RCOMP	REFRIGERATOR COMPRESSOR	POWERS REFRIG. COMPRESSOR	GRAY
P8	FCOMP	FREEZER COMPRESSOR	POWERS FREEZER COMPRESSOR	PURPLE
P6	LI	POWER IN	POWER INTO BOARD	BLACK
P7	NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
P5	ICE SEN	ICE MAKER VALVE	SENSES WATER VALVE ACTIVATION	TAN
P14	ICE ACC	ICE MAKER ACCESSORIES(FILL TUBE)	POWERS FILL TUBE AND ACCESSORIES	WHT/BLUE
P13	LIGHTS	LIGHTS	POWERS LIGHTS	YELLOW
P11	COND FAN	CONDENSER FAN	POWERS CONDENSER FAN	WHT/RED
P10	DEF HTR	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
P12	ICE MKR	ICEMAKER	POWERS ICEMAKER	PINK
P4	DEF SEN	DEFROST SENSE-TERMINATOR	SENSES WHEN HEATER SHUTS OFF	GRAY/WHT
		THERMISTOR CIRCUITS	LOW VOLTAGE	
	FRZ	FREEZER COMPARTMENT	SENSES FREEZER COMPARTMENT TEMP	BLU/BLK
	REF	REFRIGERATOR COMPARTMENT	SENSES REF COMPARTMENT TEMP	BLU/WHT
	R EVAP	REFRIGERATOR EVAPORATOR	SENSES REF EVAP TEMP	BLU/YEL
	F EVAP	FREEZER EVAPORATOR	SENSES FRE EVAP TEMP	BLU/RED

WIRING DIAGRAM
MODELS: 632 & 642

⚠ WARNING

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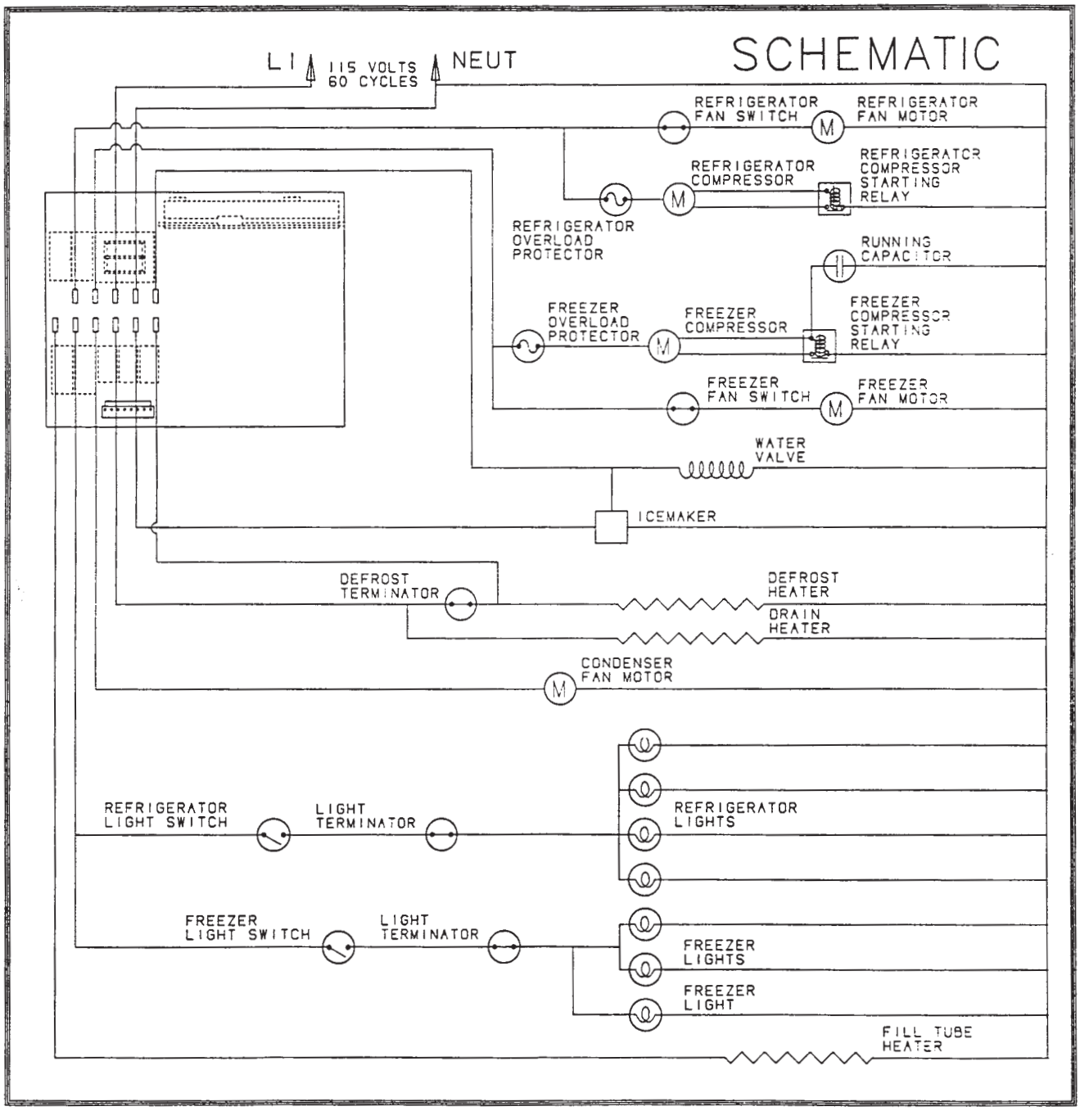
Failure to observe the above warnings may result in severe electrical shock.



WIRING DIAGRAM
MODEL: 690

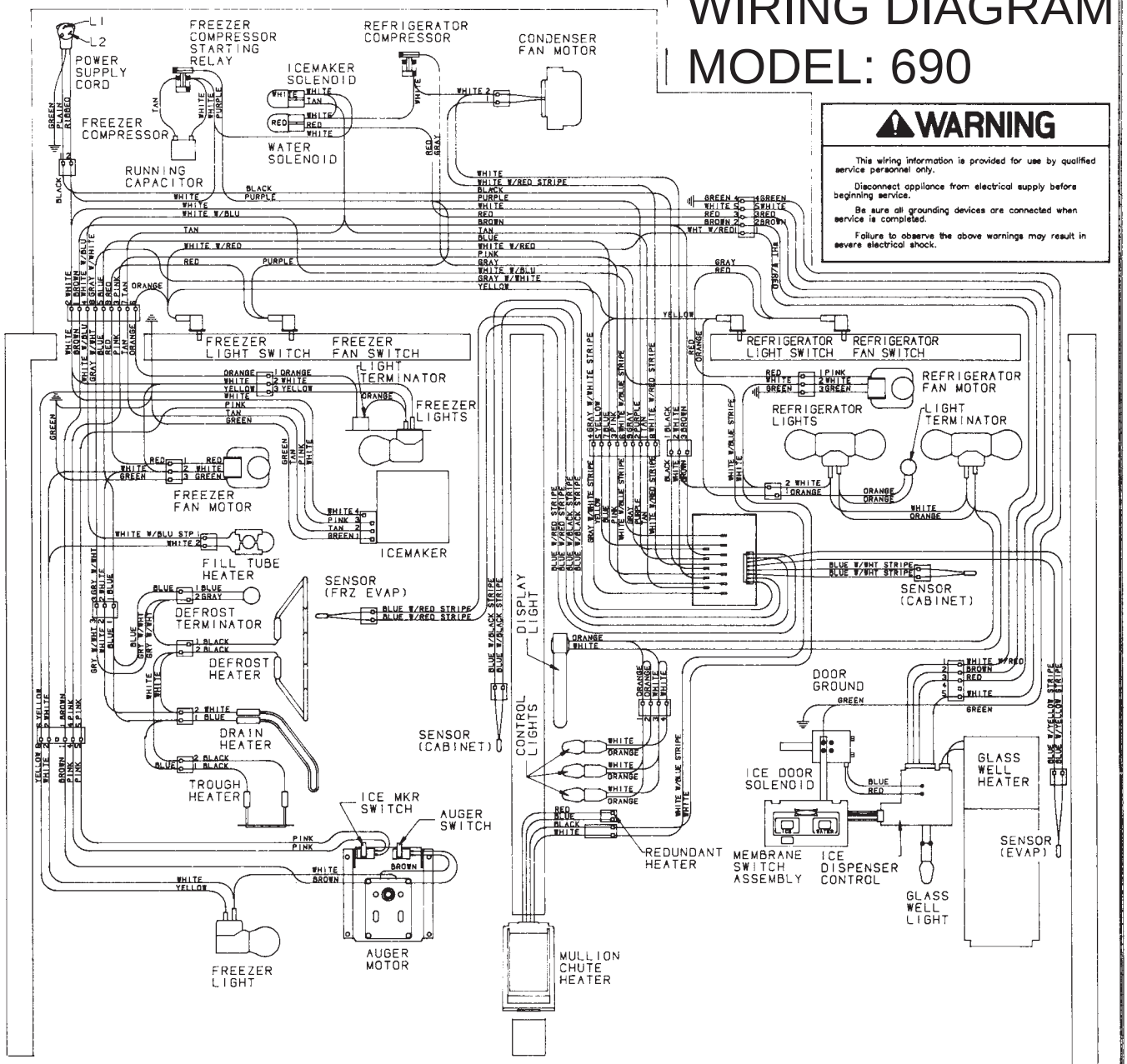
⚠WARNING

This wiring information is provided for use by qualified service personnel only.

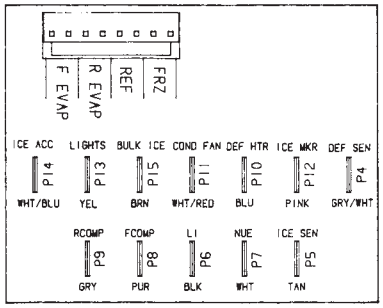
Disconnect appliance from electrical supply before beginning service.

Be sure all grounding devices are connected when service is completed.

Failure to observe the above warnings may result in severe electrical shock.

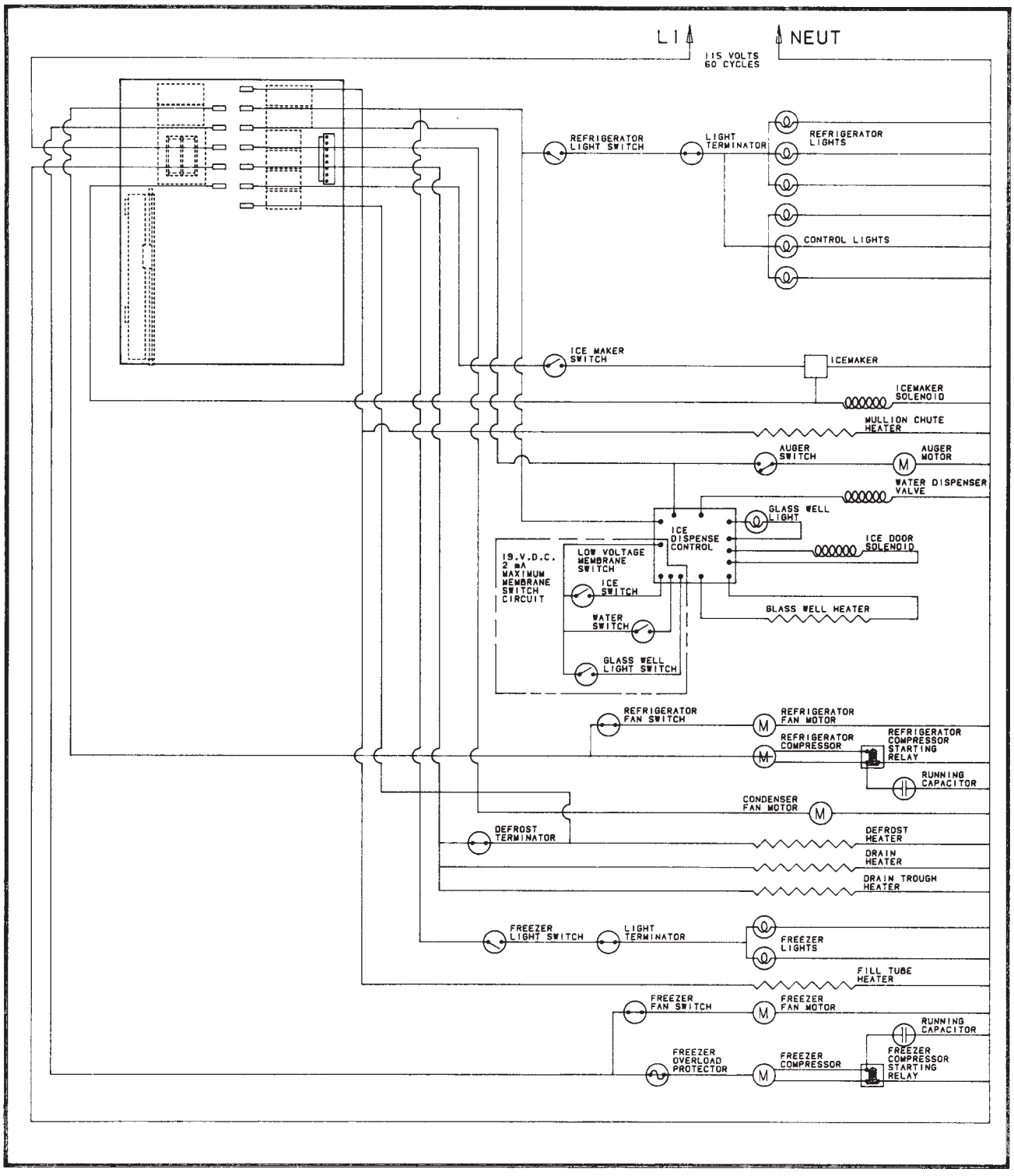


600 SERIES CONTROL BOARD				
	CIRCUIT	DESCRIPTION	FUNCTION	COLOR
		120 VOLT CIRCUITS		
P9	RCOMP	REFRIGERATOR COMPRESSOR	POWERS REFRIG. COMPRESSOR	GRAY
P8	FCOMP	FREEZER COMPRESSOR	POWERS FREEZER COMPRESSOR	PURPLE
P6	LI	POWER IN	POWER INTO BOARD	BLACK
P7	NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
P5	ICE SEN	ICE MAKER VALVE	SENSES WATER VALVE ACTIVATION	TAN
P14	ICE ACC	ICE MAKER ACCESSORIES(FILL TUBE)	POWERS FILL TUBE AND ACCESSORIES	WHT/BLUE
P13	LIGHTS	LIGHTS	POWERS LIGHTS	YELLOW
P15	BULK ICE	BULK ICE	POWERS AUGER MOTOR	BROWN
P11	COND FAN	CONDENSER FAN	POWERS CONDENSER FAN	WHT/RED
P10	DEF HTR	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
P12	ICE MKR	ICEMAKER	POWERS ICEMAKER	PINK
P4	DEF SEN	DEFROST SENSE-TERMINATOR	SENSES WHEN HEATER SHUTS OFF	GRAY/WHT
		THERMISTOR CIRCUITS	LOW VOLTAGE	
	FRZ	FREEZER COMPARTMENT	SENSES FREEZER COMPARTMENT TEMP	BLU/BLK
	REF	REFRIGERATOR COMPARTMENT	SENSES REF COMPARTMENT TEMP	BLU/WHT
	R EVAP	REFRIGERATOR EVAPORATOR	SENSES REF EVAP TEMP	BLU/YEL
	F EVAP	FREEZER EVAPORATOR	SENSES FRE EVAP TEMP	BLU/RED



PART NUMBER 3756305 REV

WIRING SCHEMATIC MODEL: 690



PART NUMBER 3756305 REV