600
Service Manual

SECTION 1

GENERAL INFORMATION

For units starting with serial #1810000

NOTE: *Installation Information (Section 2),*
Sealed System Information (Section 4).
Air Flow and Fan Blade Spacing (Section 5),
Icemaker Information (Section 6),
and Parts Lists Section (Section 8)
in this addendum manual apply regardless of serial number

INTRODUCTION

This 600 Series Technical Service/Training Manual Addendum has been compiled to provide the most recent information on safety, installation, set-up, design, operation, features, troubleshooting, wiring diagrams, and repair procedures of 600 Series units, starting with serial #1810000. This information will enable the service technician to troubleshoot and diagnose malfunctions, perform necessary repairs, and return a 600 Series unit to proper operational status.

The service technician should read the complete instructions contained in this addendum before initiating any repairs on a 600 Series unit, starting with serial #1810000.

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 the 600 Series 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 contains a summary of the *2, 5 & 12 Year Warranty* that is supplied with every 600 Series unit. This is followed by a summary of 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 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 Terminator, Drain Pan, Drain Tubes, Wiring, Light sockets & bulbs, Icemaker, Water Valve, Door hinges, Door closers & Cams, Compressor Electricals, etc. . .
- ** *"Sealed System Parts" includes the following:*

  Compressors, Condenser, 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. Sub-Zero requests that you have the model and serial number available whenever contacting the factory or parts distributor.*
- *The serial number tag on SIDE-BY-SIDE models is located by the top door hinge in the freezer compartment.*
- *The serial number tag on OVER-AND-UNDER models is located by the top door hinge in the refrigerator compartment.*
- *The serial number tag on ALL-REFRIGERATOR and ALL-FREEZER models is located by the top door hinge in the refrigeration compartment.*

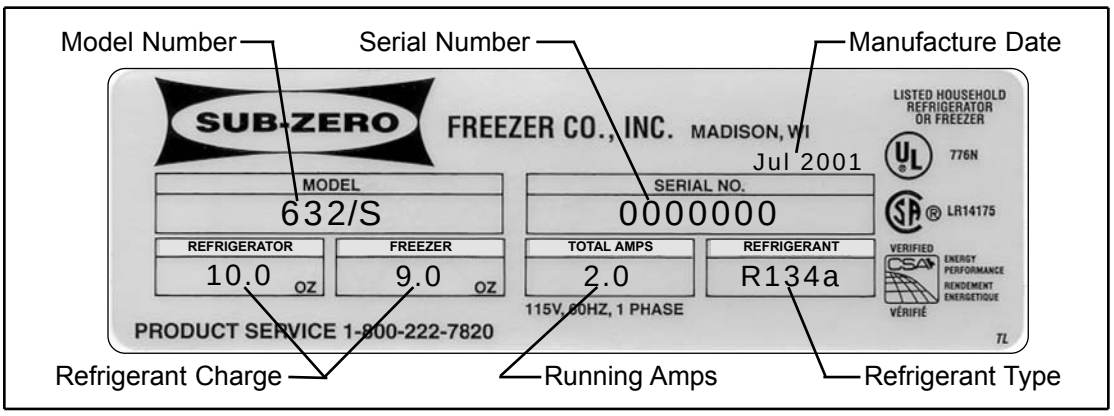


Figure 1-1. Serial Tag Layout

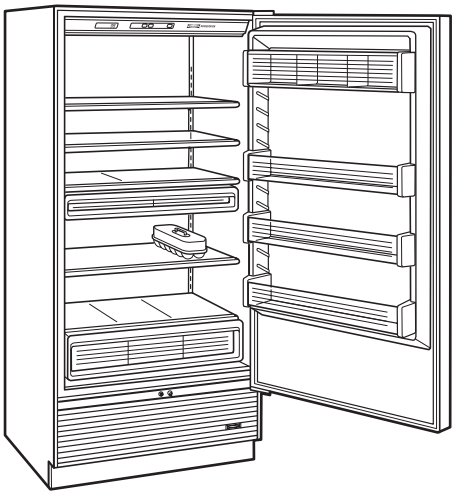
MODEL DESCRIPTIONS

These pages briefly describe the 600 Series. The 600 Series line consists of eleven basic model configurations *(Models 601R, 601RG, 601F, 611, 611G, 632, 642, 650, 650G, 680, 690)*. There are three exterior esthetic variations in the 600 Series. The letter after the backward slash in the alpha-numeric model number indicates the exterior esthetic variation. ("**/F**" indicates a **Framed** look with the door trim visible, "**/O**" indicates that it is intended for the door panels to **Overlay** the door trim, and "**/S**" indicates that the unit is **Stainless Steel**.) There is also one model (model 601RG) which has a glass door.

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 model number will be used in this manual only when necessary.*

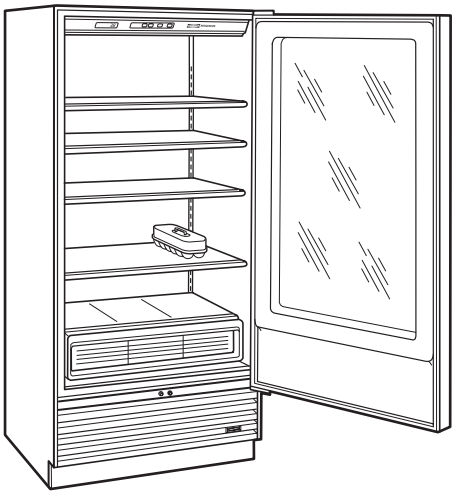
The following lists contain the model numbers of the 600 Series with a brief description of each model. A diagram of the basic model configuration accompanies each list.

MODEL	DESCRIPTION
601R/F	36" Wide, All-Refrigerator, Framed Door Trim 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



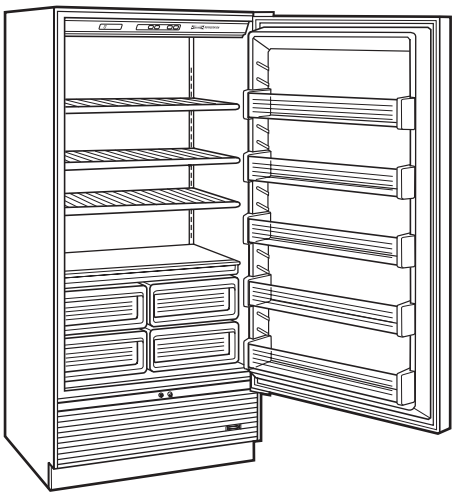
Model 601R

MODEL	DESCRIPTION
601RG/F	36" Wide, All-Refrigerator, Glass Door, Framed Door trim with Handle, Louver Grille
601RHAG/F	*(Same as above with High Altitude Glass)*
601RG/O	36" Wide, All-Refrigerator, Glass Door, Overlay Door Trim w/o handle, Louver Grille
601RHAG/O	*(Same as above with High Altitude Glass)*
601RG/S	36" Wide, All-Refrigerator, Glass Door, Stainless Steel Door Wrap and Grille
601RHAG/S	*(Same as above with High Altitude Glass)*



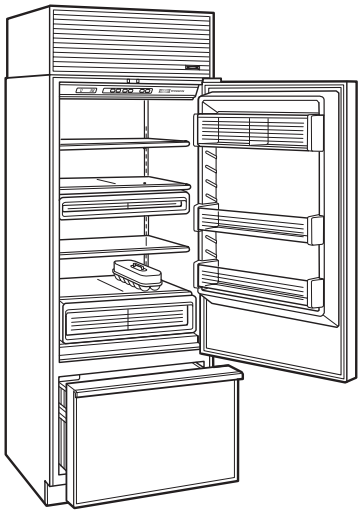
Model 601RG

MODEL	DESCRIPTION
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



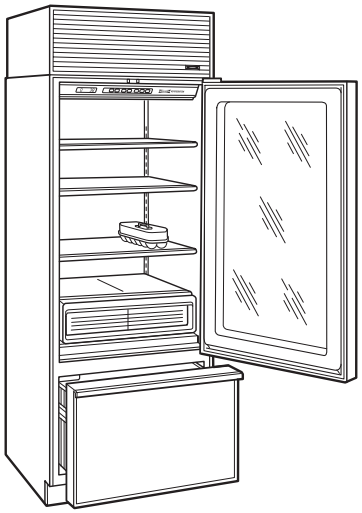
Model 601F

MODEL	DESCRIPTION
611/F	30” Wide, Over/Under, Framed Door Trim with handle, Louver Grille (Standard)
611/O	30” Wide, Over/Under, Overlay Door Trim without handle, Panel Grille (Standard)
611/S	30” Wide, Over/Under, Stainless Steel Doors and Grille



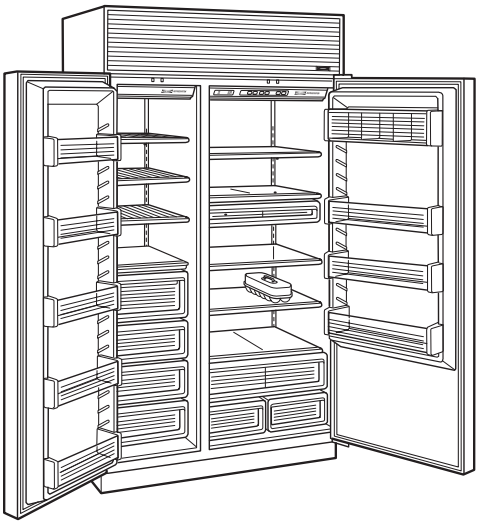
Model 611

MODEL	DESCRIPTION
611G/F	30” Wide, Over/Under, Glass Door, Framed Trim with handle, Louver Grille (Standard)
611HAG/F	*(Same as above with High Altitude Glass)*
611G/O	30” Wide, Over/Under, Glass Door, Overlay Trim without handle, Panel Grille (Standard)
611HAG/O	*(Same as above with High Altitude Glass)*
611G/S	30” Wide, Over/Under, Glass Door, Stainless Steel Doors and Grille
611HAG/S	*(Same as above with High Altitude Glass)*



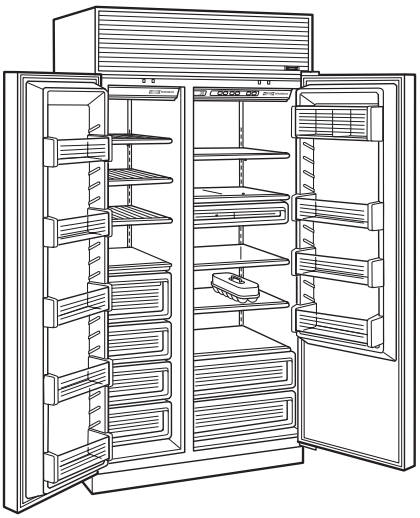
Model 611G

MODEL	DESCRIPTION
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



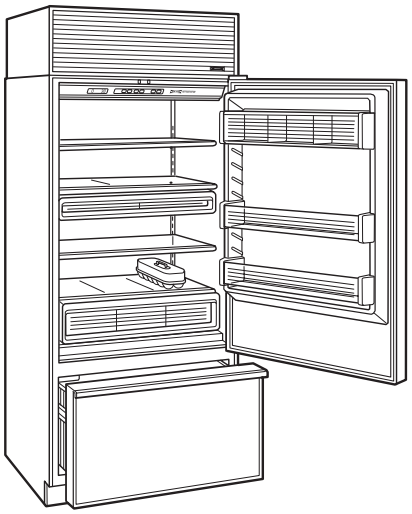
Model 632

MODEL	DESCRIPTION
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



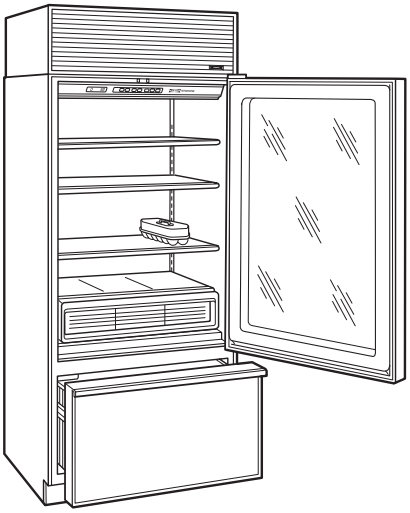
Model 642

MODEL	DESCRIPTION
650/F	36” Wide, Over/Under, Framed Door Trim with handle, Louver Grille (Standard)
650/O	36” Wide, Over/Under, Overlay Door Trim without handle, Panel Grille (Standard)
650/S	36” Wide, Over/Under, Stainless Steel Doors and Grille



Model 650

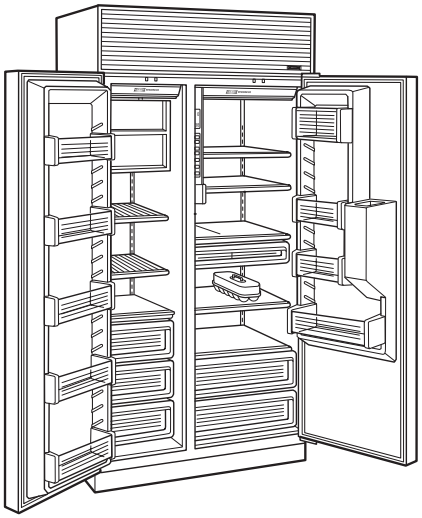
MODEL	DESCRIPTION
650G/F	36” Wide, Over/Under, Glass Door, Framed Trim with handle, Louver Grille (Standard)
650HAG/F	*(Same as above with High Altitude Glass)*
650G/O	36” Wide, Over/Under, Glass Door, Overlay Trim without handle, Panel Grille (Standard)
650HAG/O	*(Same as above with High Altitude Glass)*
650G/S	36” Wide, Over/Under, Glass Door, Stainless Steel Doors and Grille
650HAG/S	*(Same as above with High Altitude Glass)*



Model 650G

MODEL	DESCRIPTION
680/F	42” Wide, Side-by-Side, Ice & Water Dispenser, Framed Door Trim with handle, Louver Grille, (Standard)
680/S	42” Wide, Side-by-Side with Ice & Water Dispenser, Stainless Steel Doors and Grille

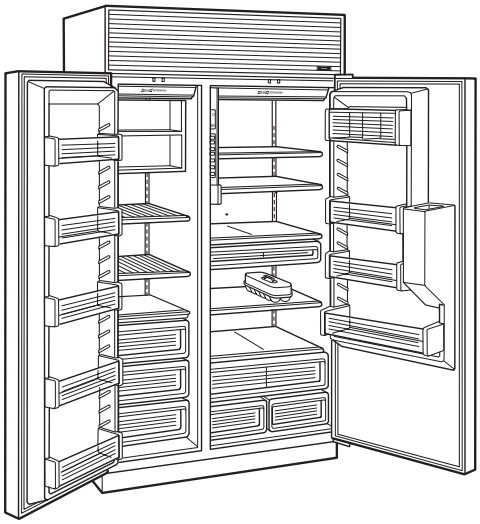
NOTE: *There is no overlay variation for the model 680, but an optional panel grille is available.*



Model 680

MODEL	DESCRIPTION
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.*



Model 690

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.)*

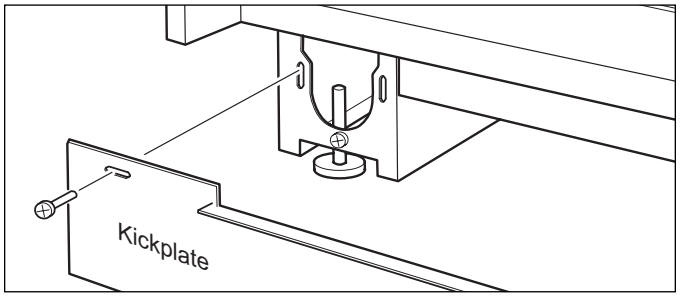


Figure 2-1. Kickplate Removal

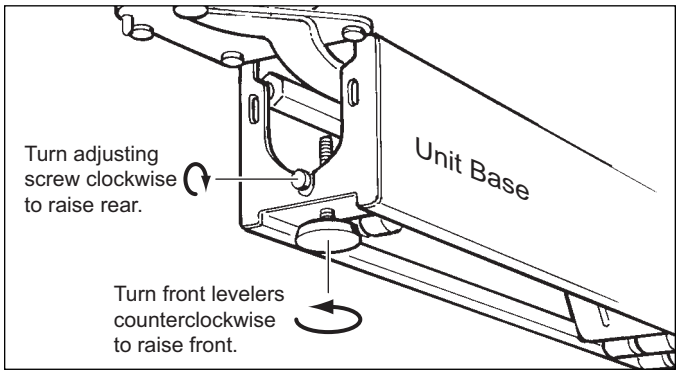


Figure 2-2. Unit Leveling

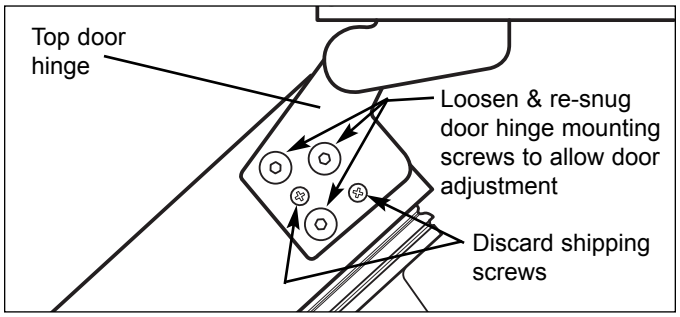


Figure 2-3. Top Door Hinge & Screws

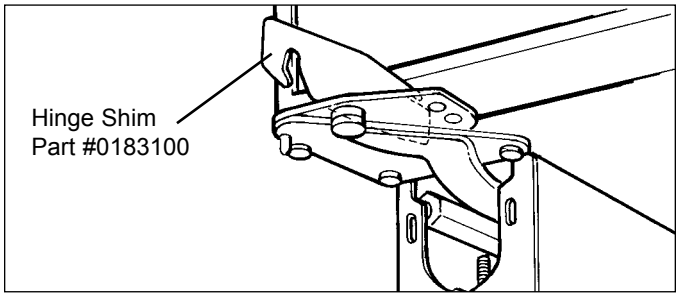


Figure 2-4. Bottom Hinge Shim Installation

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.

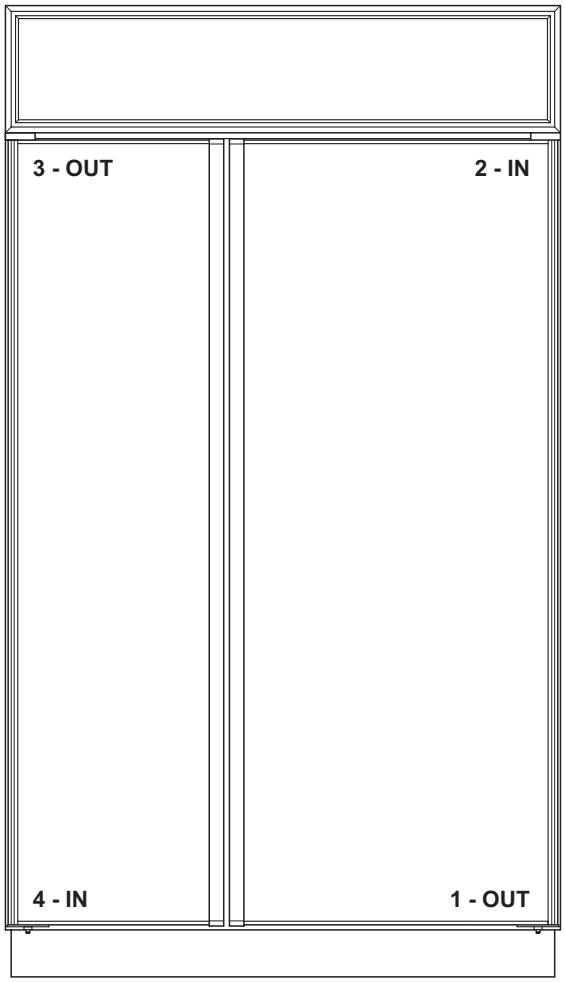


Figure 2-5. Special Side-by-Side Door Adjustment

Freezer Drawer Adjustments
(Models 611/611G & 650/650G)

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.*

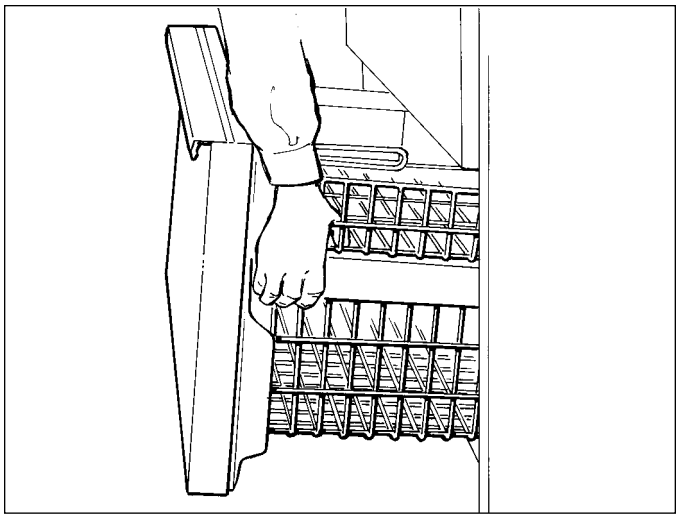


Figure 2-6. Drawer Assembly Removal

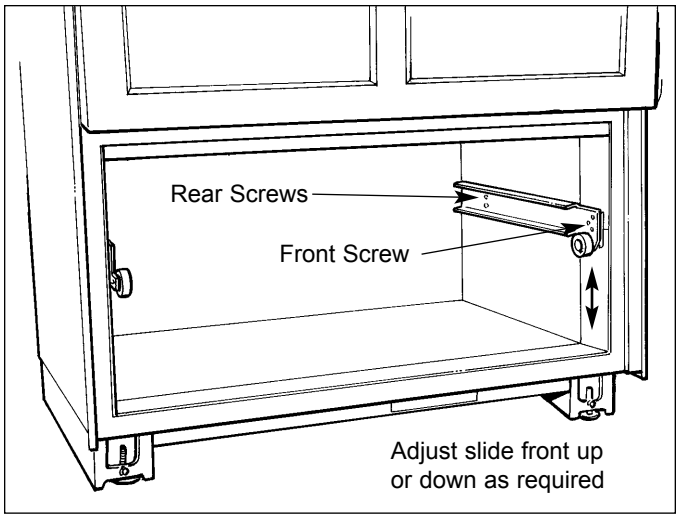


Figure 2-7. Vertical Freezer Drawer Adjustment

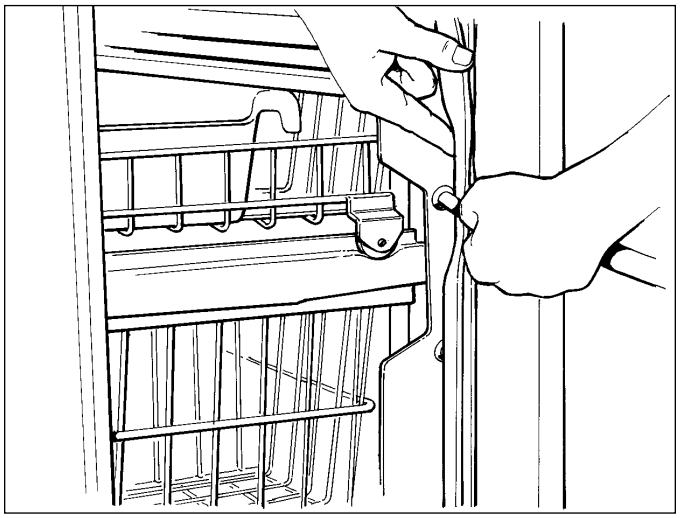


Figure 2-8. Drawer Front Pitch Adjustment

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 Models 680 & 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.*

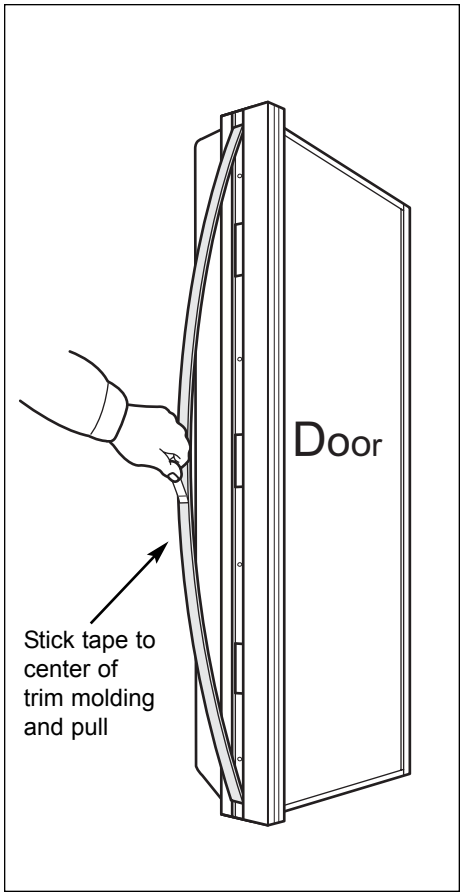


Figure 2-9. Molding Removal

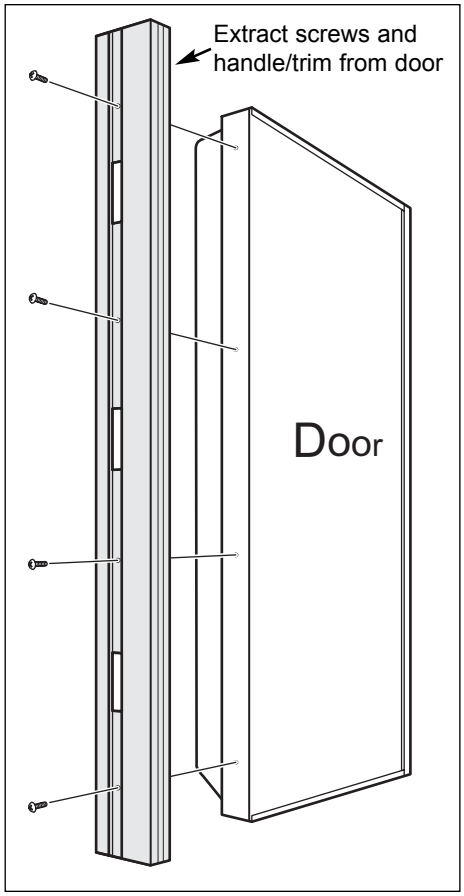


Figure 2-10. Handle/Trim Removal

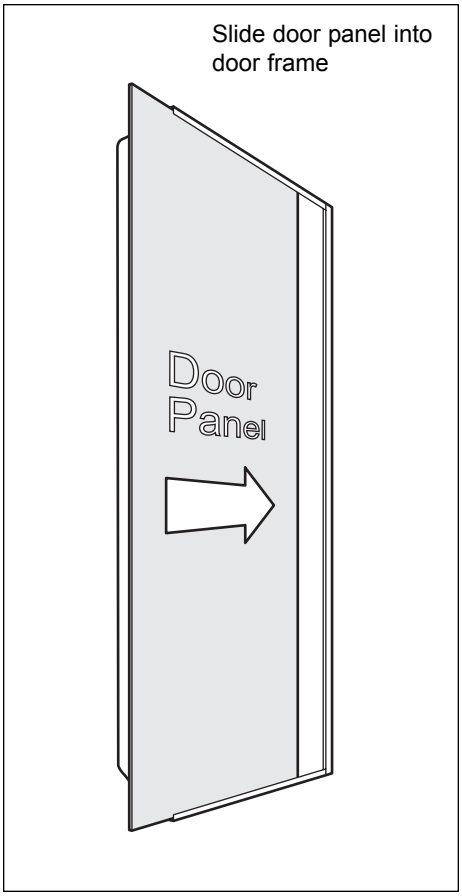


Figure 2-11. Door Panel Install

90° Door Stop Pin Installation (Models 611, 650)

Part #3550770, 90° Door Stop Pin, is supplied with models 611 and 650. To install:

a Remove unit grille.

b. With door closed, insert door stop pin down into threaded hole in top cabinet hinge and tighten (See Figure 2-12). Then, reinstall unit grille.

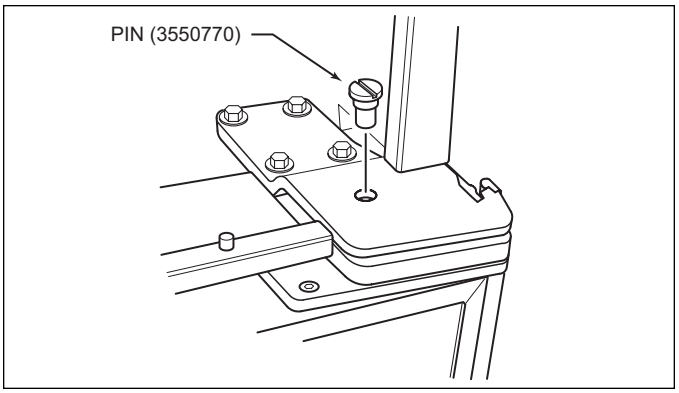


Figure 2-12. 90° Stop Pin (611, 650)

90° Door Stop Pin Installation (Models 611G, 650G)

Part #3550770, 90° Door Stop Pin, is supplied with models 611G and 650G. To install:

a Open freezer drawer.

b. Insert door stop pin up into threaded hole in lower cabinet hinge and tighten (See Figure 2-13).

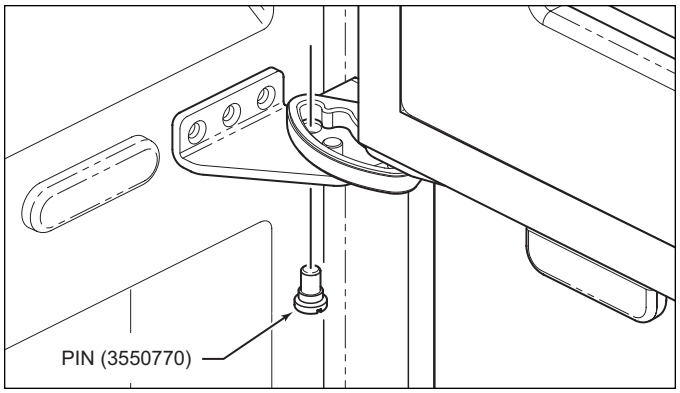


Figure 2-13. 90° Stop Pin (611G, 6501G)

90° Door Stop Cam Installation (Models 632, 642, 680, 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:

a With door closed, place door stop cam up over hinge pin, making sure stub on cam fits into hole in lower cabinet hinge (See Figure 2-14).

b. Secure door stop cam by pushing E-ring into groove at end of hinge pin (See Figure 2-14).

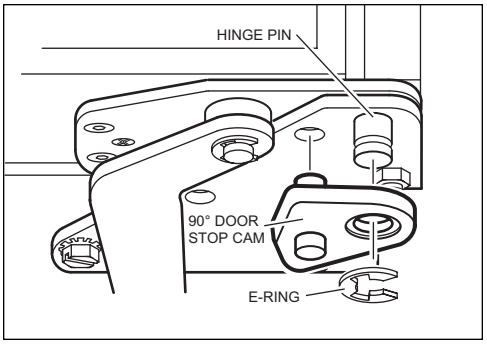


Figure 2-14. 90° Stop Cam

90° Door Stop Cam Installation (Models 601R, 601RG, 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:

a With door closed, extract bolts, stiffener plate and bushing from lower cabinet hinge (See Figure 2-15).

b. Place door stop cam up over hinge pin, making sure stub on cam fits into hole in lower cabinet hinge (See Figure 2-15).

c. Reinstall bushing, stiffener plate and bolts onto lower cabinet hinge (See Figure 2-15).

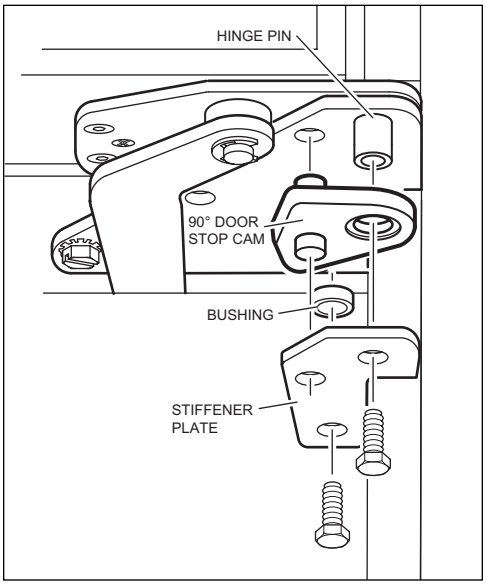


Figure 2-15. 90° Stop Cam

SECTION 3

ELECTRONIC CONTROL SYSTEM INFORMATION

For units starting with serial #1810000

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. The electronic control system also displays temperature readings, ice maker system operation, possible problems with the unit and door ajar alarm status. The table below defines some basic electronic control system terminology and describes some of the electronic control system components. An understanding of the following information is needed in order to comprehend the input operations and functions of the electronic control system.

Term/Component	Definition / Description
Control Board	The printed-circuit board (PC Board) containing the microprocessor, relays and electrical connections which control and monitor all functions and operations of the unit.
Microprocessor	An electrical component on the control board which receives electrical signals from other components, processes that information, then sends an electrical signal to the relays on the board to open or close, and other electronic components in the unit to switch ON or OFF.
Relay	The electrical components on the control board that switch other components in the unit ON and OFF when instructed to do so by the microprocessor.
LCD (Liquid Crystal Display)	That part of the control board seen at the control panel which displays compartment temperatures, service annunciators, error codes, etc. . .
Control Panel Assembly	The information input and read-out area of the electronic control system, located at the top of the refrigerator or freezer compartment.
Membrane Switch	An integral part of the control panel assembly, which consists of the function keys used for all input operations to the electronic control system.
Keys (Function Keys)	The buttons on the membrane switch used for input operations. The keys are: UNIT ON/OFF, DOOR AJAR ALARM BELL ON/OFF, ICE ON/OFF, WARMER, COLDER an on models 680 and 690 only there is a BULK ICE key.
Annunciators	The words and numbers that are displayed on the LCD. Such as: Temperature displays, door ajar alarm bell indicator, SERVICE indicator, ICE system indicator and error codes.
Error Codes	The code numbers accompanied by the letters “EC” that appear on the LCD during diagnostic mode if the unit experienced specific problems related to electrical signals supplied by electrical components.
Display Units of Measure	Temperatures displayed at the LCD may be in fahrenheit units of measure (°F) or celsius units of measure (°C). A series of key strokes allows the temperature display units of measure to be switched to read as either °F or °C.
Set-Point	The desired compartment temperature, established by pressing the COLDER or WARMER keys.
High Offset (Cut-in)	As the compartment air temperature cycles up and down, the high offset is the maximum compartment temperature that the electronic control system will allow before calling for cooling.
Low Offset (Cut-out)	As the compartment air temperature cycles up and down, the low offset is the minimum compartment air temperature that the electronic control system will allow before interrupting cooling.
Thermistor (Temperature Sensor)	A resistor with which resistance changes as the temperature around it changes. For electronic control system purposes, the microprocessor measures this resistance and displays it as a temperature reading at the LCD.

BASIC 600 SERIES ELECTRONIC CONTROL SYSTEM

This page illustrates a basic 600 Series electronic control system (See Figure 3-1). Input operations for the electronic control system are performed at the membrane switch on the control panel, with monitoring, regulating and controlling functions taking place at the control board (located directly behind the control panel). Temperatures and possible problems with the unit are displayed at the control panel on the LCD. The entire electronic control system is described in greater detail on the following pages.

NOTE: *The diagram below is not an exact electrical representation of the electronic control system. For more detailed electrical diagrams refer to the wiring diagram and schematic supplied with the unit.*

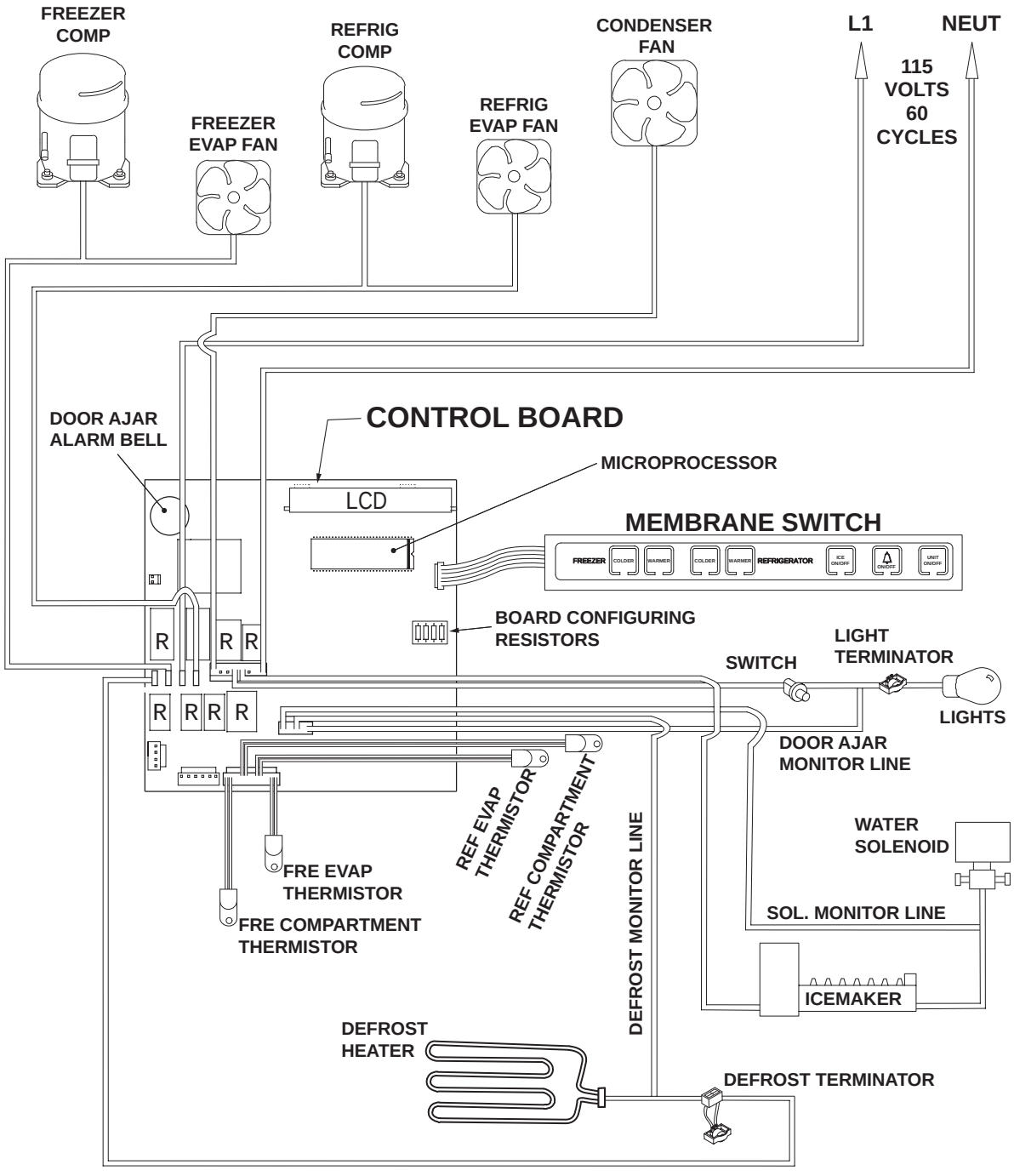


Figure 3-1. Basic 600 Series Electronic Control System Diagram

600 SERIES CONTROL BOARD LAYOUT AND SUMMARY TABLE

The electrical connection points on the control board are labeled alphanumerically. These labels correspond with the alphanumeric control board summary table, located on the wiring diagrams. By referencing the summary table, it is possible to identify which components are connected at which connection points on the control board. Below is a layout diagram of the control board and a copy of a summary table (See Figures 3-2 & 3-3).

NOTE: *All components on the control board are non-replaceable. If problems with the control board are identified, the complete control board must be replaced.*

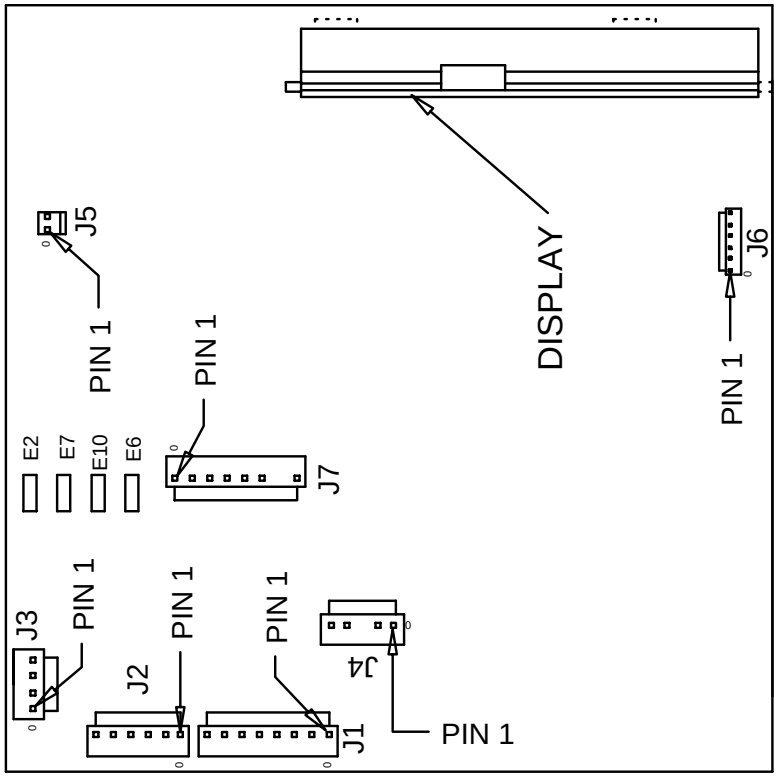


Figure 3-2. Control Board Layout

CONTROL BOARD SUMMARY

	CIRCUIT	DESCRIPTION	FUNCTION	COLOR
120 VOLT CIRCUITS				
E2	DEF HTR	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
E7	FCOMP	FRZ COMPRESSOR	POWERS FRZ COMPRESSOR	PURPLE
E10	L1	POWER IN	POWER INTO BOARD	BLACK
E6	RCOMP	REF COMPRESSOR	POWERS REF COMPRESSOR	GRAY
J7-1	C FAN	CONDENSER FAN	POWERS CONDENSER FAN	WHITE/RED
J7-2	E FAN	NOT USED		
J7-3	I ACC	ICE MAKER ACC (FILL TUBE)	POWERS FILL TUBE HEATER AND ACCESSORIES	WHITE/BLUE
J7-4	LITE	LIGHTS	POWERS LIGHTS	YELLOW
J7-5	ICE	ICE MAKER	POWERS ICE MAKER	PINK
J7-6		NOT USED		
J7-7		NOT USED(NO PIN)		
J7-8	NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
J4-1	F DR	FRZ DOOR LIGHT SENSE	SENSES IF FRZ DOOR OPEN	BROWN
J4-2	R DR	REF DOOR LIGHT SENSE	SENSES IF REF DOOR OPEN	ORANGE
J4-3		NOT USED(NO PIN)		
J4-4		DEF SENSOR	SENSES WHEN DEF HEATER SHUTS OFF	GRAY/WHITE
J4-5		ICE MAKER VALVE SENSOR	SENSES WATER VALVE ACTIVATION	TAN
LOW VOLTAGE THERMISTOR CIRCUITS				
J1-1	EVAP FRZ	FRZ EVAP	SENSES FRZ EVAP TEMP	ORANGE/RED
J1-2	EVAP FRZ	FRZ EVAP	SENSES FRZ EVAP TEMP	BLUE/RED
J1-3	EVAP REF	REF EVAP	SENSES REF EVAP TEMP	ORANGE/YELLOW
J1-4	EVAP REF	REF EVAP	SENSES REF EVAP TEMP	BLUE/YELLOW
J1-5	REF	REF COMPARTMENT	SENSES REF CABINET	BLUE/WHITE
J1-6	REF	REF COMPARTMENT	SENSES REF CABINET	BLUE/WHITE
J1-7	FRZ	FRZ COMPARTMENT	SENSES FRZ CABINET TEMP	BLUE/BLACK
J1-8	FRZ	FRZ COMPARTMENT	SENSES FRZ CABINET TEMP	BLUE/BLACK

Figure 3-3. Control Board Summary Table (632/642 Summary Table Shown)

600 SERIES CONTROL PANEL LAYOUT

NOTES:

- *The illustration below is of a 632 control panel (See Figure 3-4).*
- *The control panels in models 601R, 601RG and 601F lack the obvious keys and annunciators illustrated below.*
- *The control panels in models 601G, 611G and 650G will include a LIGHTS ON/OFF key, not shown in this illustration.*
- *The control panels in models 680 and 690 are mounted vertically and include a BULK ICE key.*

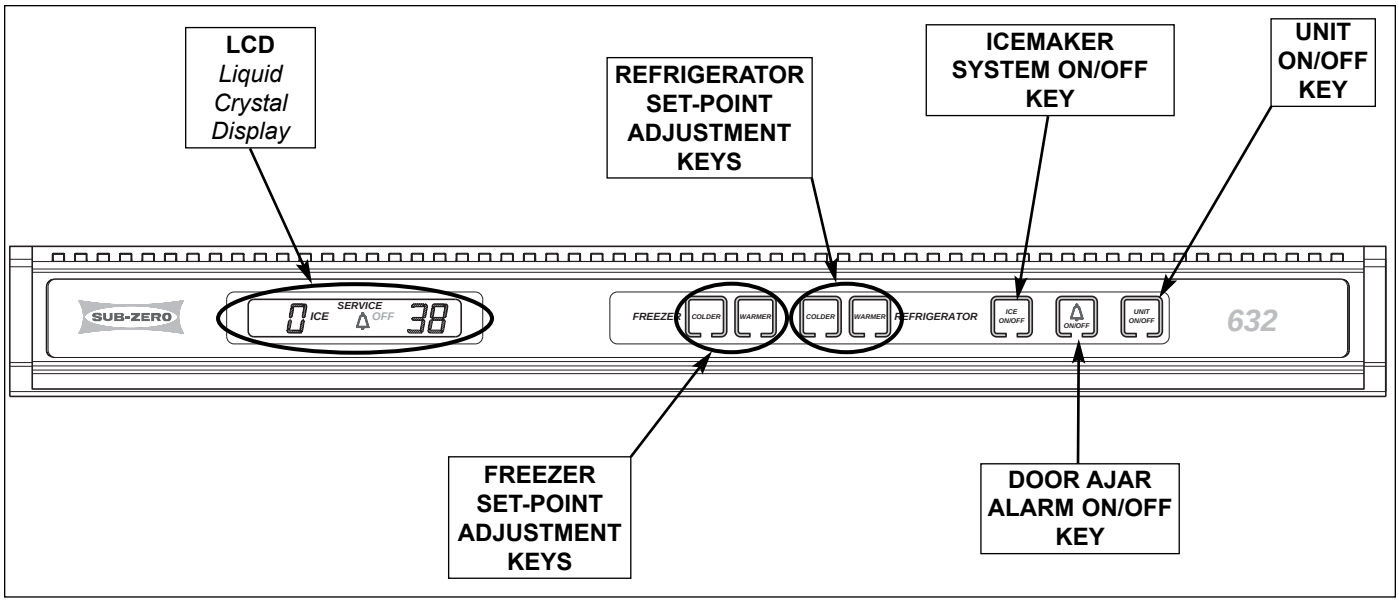


Figure 3-4. 600 Series Control Panel Layout *(Model 632 Control Panel Shown)*

BASIC ELECTRONIC CONTROL INPUT OPERATIONS

The following pages describe the basic input operations performed at a 600 Series control panel. The subjects covered are: switching the unit ON and OFF; adjusting the set-point (temperature adjustment); switching the ice maker system ON and OFF; enabling and disabling the door ajar alarm feature, and in a model 601RG, 611G and 650G only, accent lighting system ON and OFF.

Unit ON/OFF

All 600 Series units are shipped in the OFF Mode. When power is supplied to the unit, a trace of the word “OFF” is visible on the LCD. By pressing and releasing the UNIT ON/OFF key (See Figure 3-5), power is allowed past the control board to the rest of the unit. This will be indicated by the unit’s lights energizing and LCD at the control panel illuminating with temperature readings.

NOTE: *Whenever the unit is switched OFF using the UNIT ON/OFF key, a trace of the word “OFF” will be visible on the LCD as long as there is power to the unit.*

⚠ WARNING

WHEN IN “OFF” MODE, 115 VOLTS AC IS STILL PRESENT AT CONTROL BOARD.

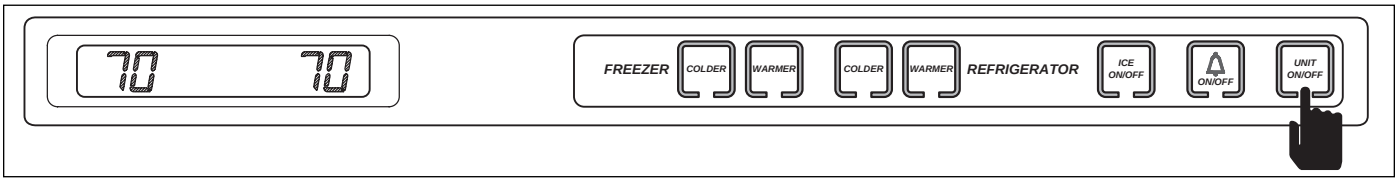


Figure 3-5. 600 Series Unit ON/OFF, Press UNIT ON/OFF Key

Adjusting Set-Point (Temperature Adjustment)

To adjust the set-points, press the appropriate compartment WARMER or COLDER key on the control panel in multiple key strokes until the desired set-point is achieved (See Figure 3-6). One key stroke equals a one degree (Fahrenheit or Celsius) change.

NOTE: *The temperature range in a freezer compartment is -5°F (-21°C) to +5°F (-15°C). The temperature range in a refrigerator compartment is +34°F (+1°C) to +45°F (+7°C).*

NOTE: *When checking set-points, remember that the initial key stroke of the WARMER or COLDER key will change the previous set-point by one degree (Fahrenheit or Celsius).*

NOTE: *The set-point will be displayed on the LCD for 10 seconds after the last WARMER or COLDER key stroke. After the 10 second delay, the compartment temperature will be displayed. As the compartment temperature changes, the temperature displayed on the LCD will change by no more than one degree per minute.*

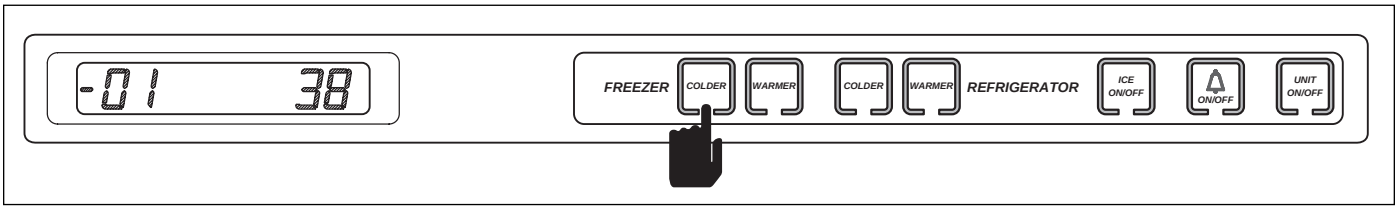


Figure 3-6. Adjusting the Set-Point - Press WARMER or COLDER Key In Multiple Key Strokes

Icemaker System ON/OFF

All 600 Series units with freezer compartments are equipped with an icemaker. When the unit first arrives in a home, the icemaker system is off. By pressing and releasing the ICE ON/OFF key on the control panel, power is allowed to the icemaker system and “ICE” is displayed on the LCD (See Figure 3-7). To deactivate the icemaker system, press and release the ICE ON/OFF key again and the “ICE” annunciator will disappear from the LCD, indicating the icemaker system is off.

NOTE: *When the unit is in “Sabbath Mode,” the icemaker system is automatically deactivated. Sabbath Mode will be explained later in this section.*

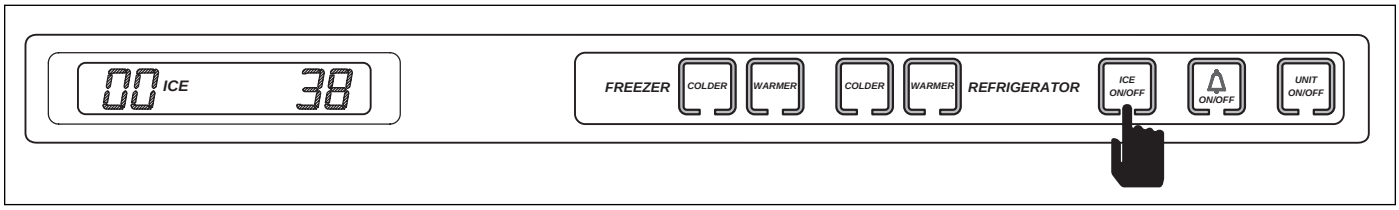


Figure 3-7. Icemaker System ON/OFF - Press ICE ON/OFF Key

Door Ajar Alarm Feature ( ) ON/OFF

All 600 Series units are equipped with a door ajar alarm feature. To enable the door ajar alarm, press and release the bell ON/OFF key on the control panel (See Figure 3-8). The bell annunciator will illuminate on the LCD indicating the alarm feature is active. With the alarm enabled, the bell annunciator will flash and the audible alarm will beep whenever the door is left open for more then thirty seconds. To disable the door ajar alarm, press the bell ON/OFF key again and the bell annunciator on the LCD will disappear, indicating the alarm feature is inactive.

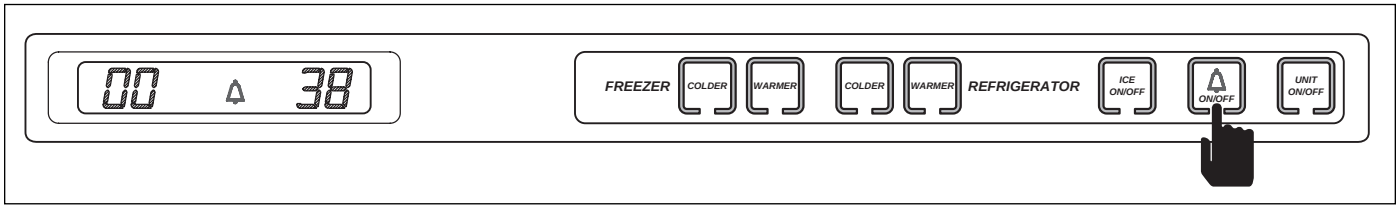


Figure 3-8. Door Ajar Alarm ON/OFF, Press Alarm Bell ON/OFF Key

Accent Lighting System ON/OFF (Models 601RG, 611G and 650G Only)

The models 601RG, 611G and 650G are equipped with an accent lighting system. To energize the accent lighting system, press the LIGHTS ON/OFF key (See Figure 3-9). With the accent lighting system energized, three low intensity light strips (15 Watts each), will stay illuminated when the door is closed. To disable the accent lights, press the LIGHTS ON/OFF key again.

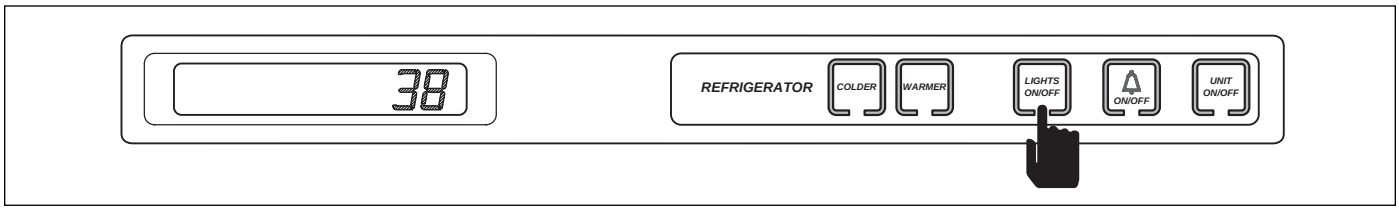


Figure 3-9. Model 601RG, 611G and 650G Accent Lighting System ON/OFF - Press LIGHTS ON/OFF Key

FUNCTIONS OF THE ELECTRONIC CONTROL SYSTEM

The following pages explain the monitoring, regulating and controlling functions of the electronic control system. In most cases signal traces on a model 632 wiring schematic are used to show electric current flow for the function being explained.

NOTE: *Only normal operating functions are explained. Possible malfunctions are addressed in the Troubleshooting Guide.*

Supply Power to the Lighting System

115 Volts are supplied to the lighting system through the control board when the unit is switched ON by pressing the UNIT ON/OFF key (See Figure 3-10).

NOTE: *Disabling the lighting system (Sabbath Mode) is explained later in this section.*

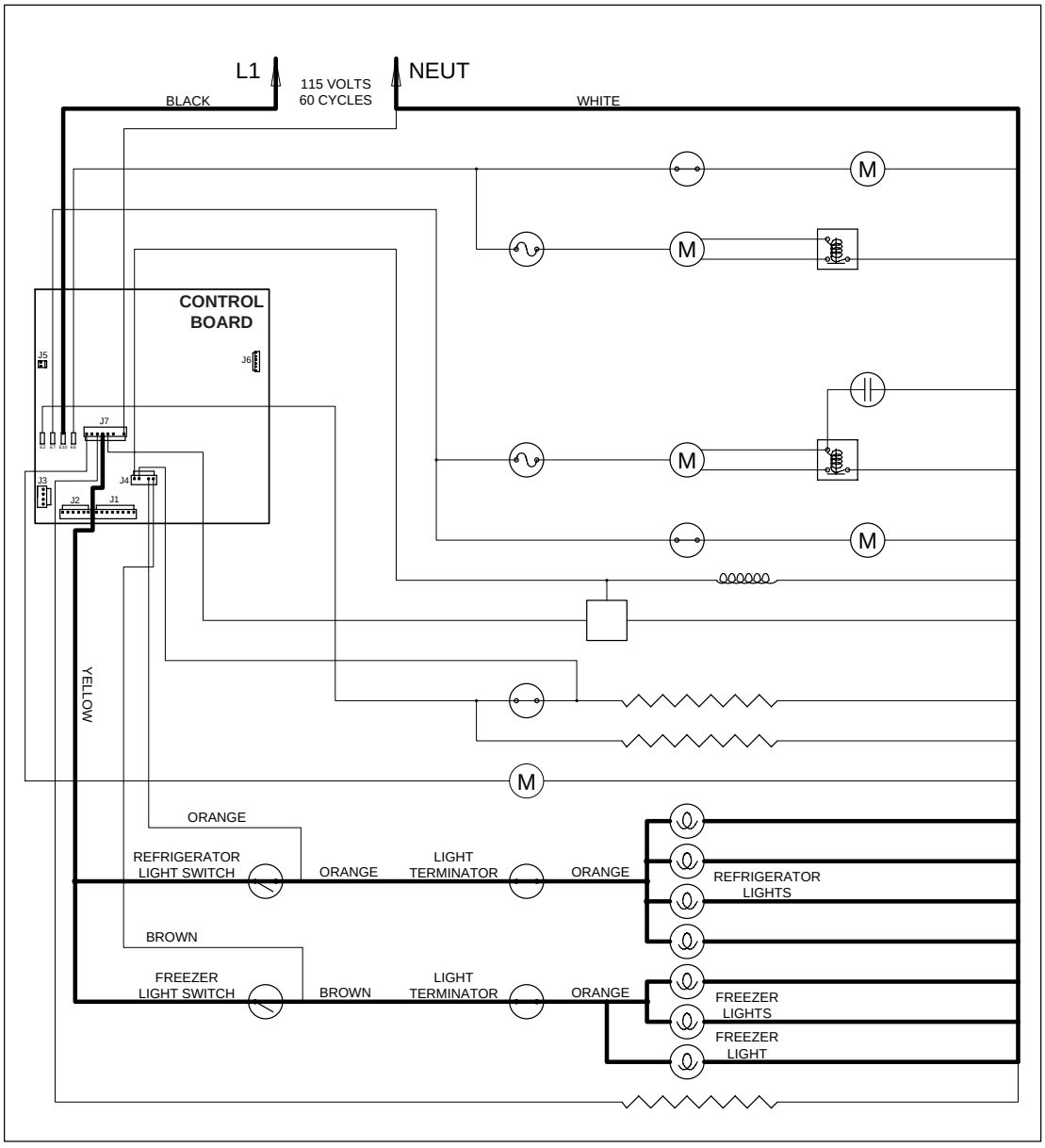


Figure 3-10. Signal Trace Schematic of Lighting System

Monitor, Regulate and Display Compartment 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 slightly, the LCD displays the average temperature (See Figure 3-11). When the compartment reaches high offset temperature, the microprocessor supplies power to the compressor and evaporator fan. (See Figure 3-12). As the compressor and evaporator fan run, the compartment temperature drops. When the compartment reaches low offset temperature, the microprocessor 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 (Example: when a door is left open), the temperature displayed on the LCD will change by one degree per minute.*

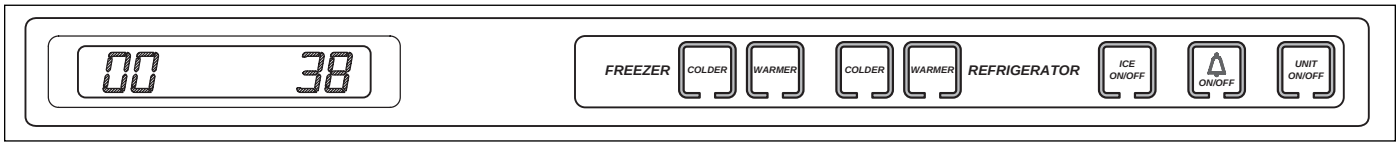


Figure 3-11. Average Compartment Temperature Displayed

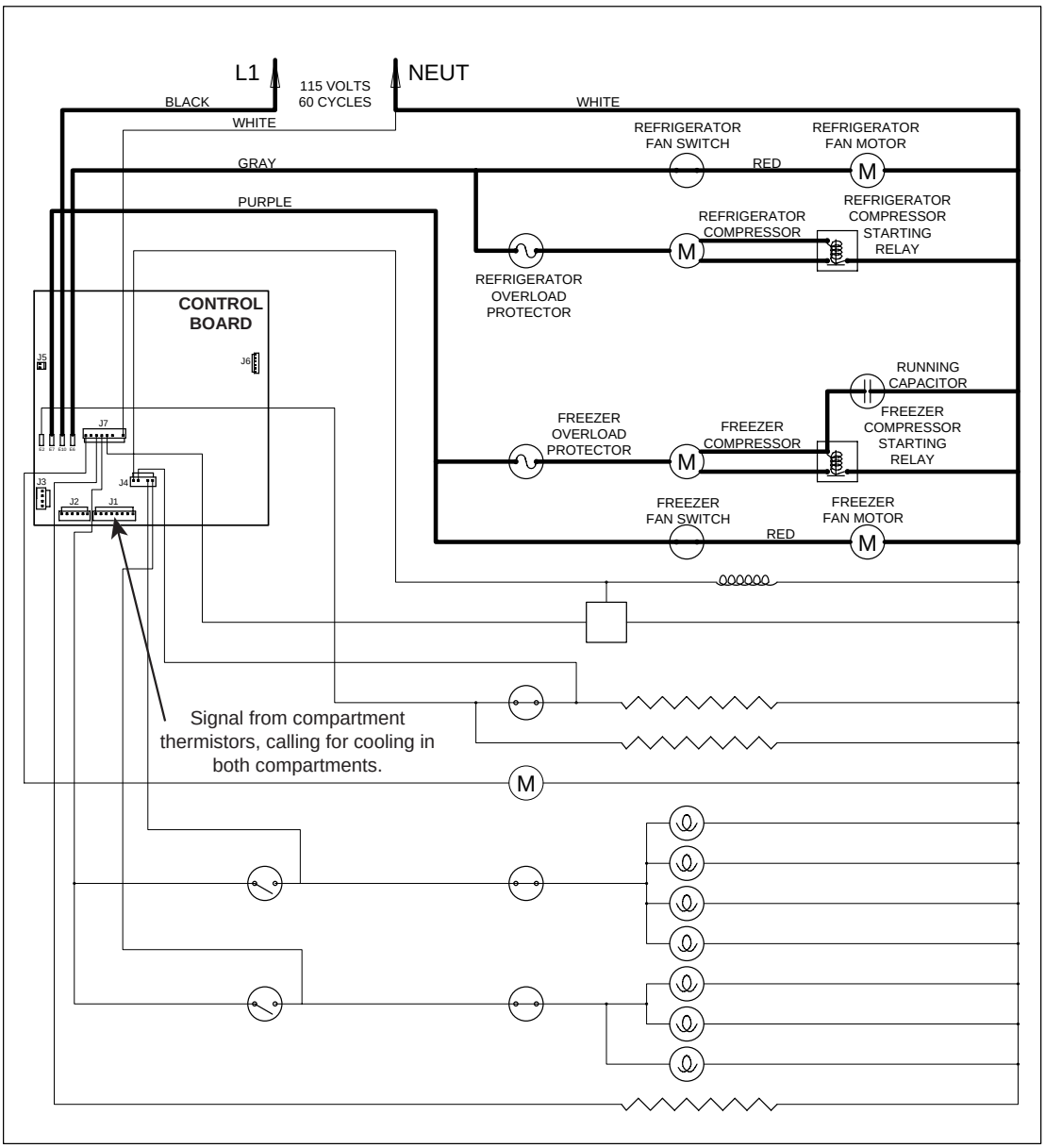


Figure 3-12. Signal Trace Schematic (High Voltage only) of Regulating Temperatures

Control Condenser Fan Run

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 (See Figure 3-13). If both compressors are off, the condenser fan will also be off.

NOTE: *In the single compressor models (601R, 601RG and 601F), power to the condenser fan is supplied by the compressor circuit. The white/red wire from the control board will not be present in those models.*

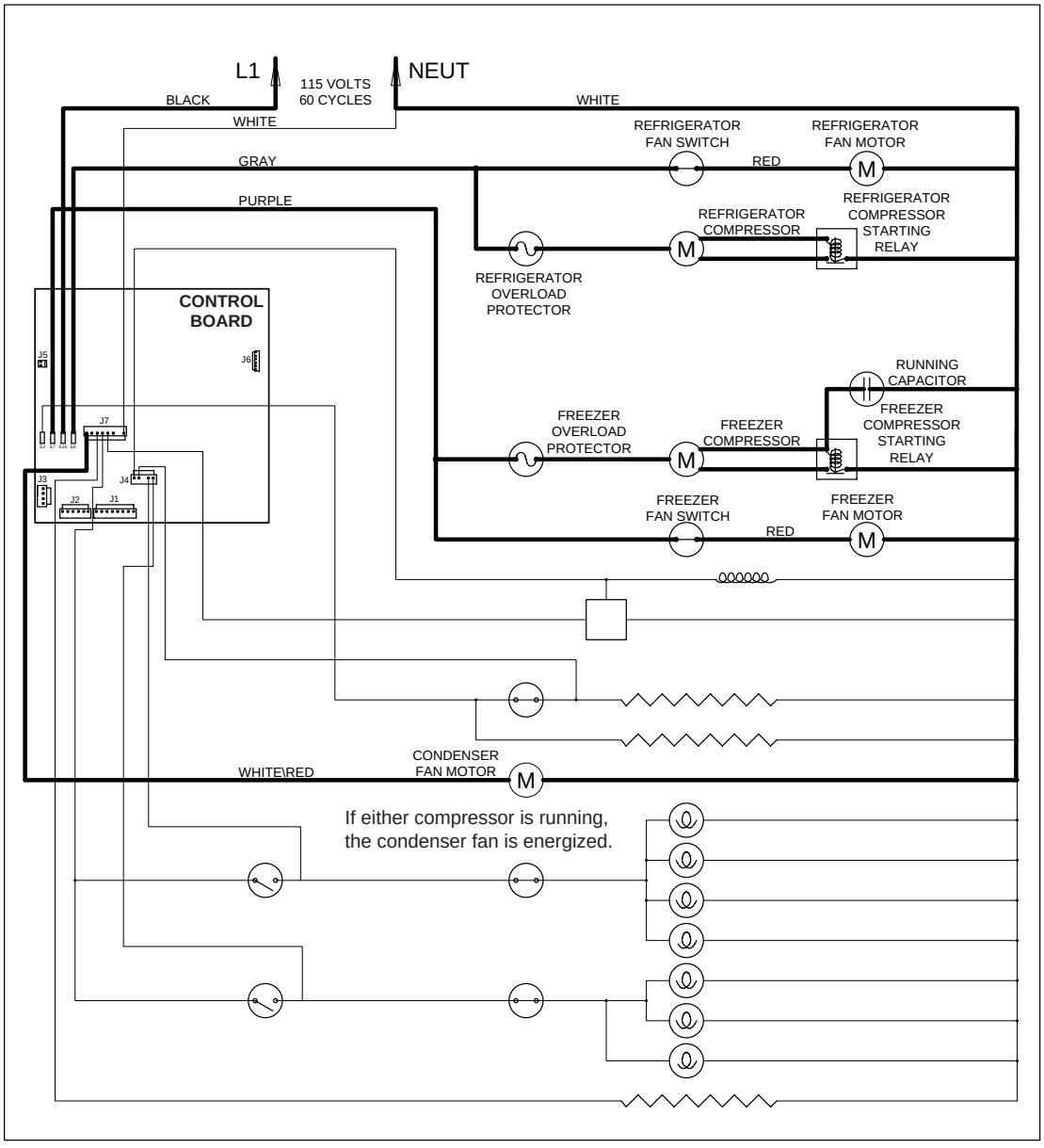


Figure 3-13. Signal Trace Schematic of Condenser Fan Operation

Minimize Condensation on Refrigerator Door Glass (Models 601RG, 611G and 650G Only)

The refrigerator door on models 601RG, 611G and 650G are equipped with a 5 watt braided wire heater around the perimeter of the door glass. When the unit is ON, the heater is energized 100% of the time to minimize condensation formation on the glass. To further help minimize condensation on the glass, the microprocessor senses every time the door is opened and closed by the signal from the light switch. When the door closes the evaporator fan is energized for five minutes to draw any warmer moist air away from the door glass. (See Figure 3-14)

NOTE: *The evaporator fan in models 601RG, 611G and 650G also cycles with the compressor.*

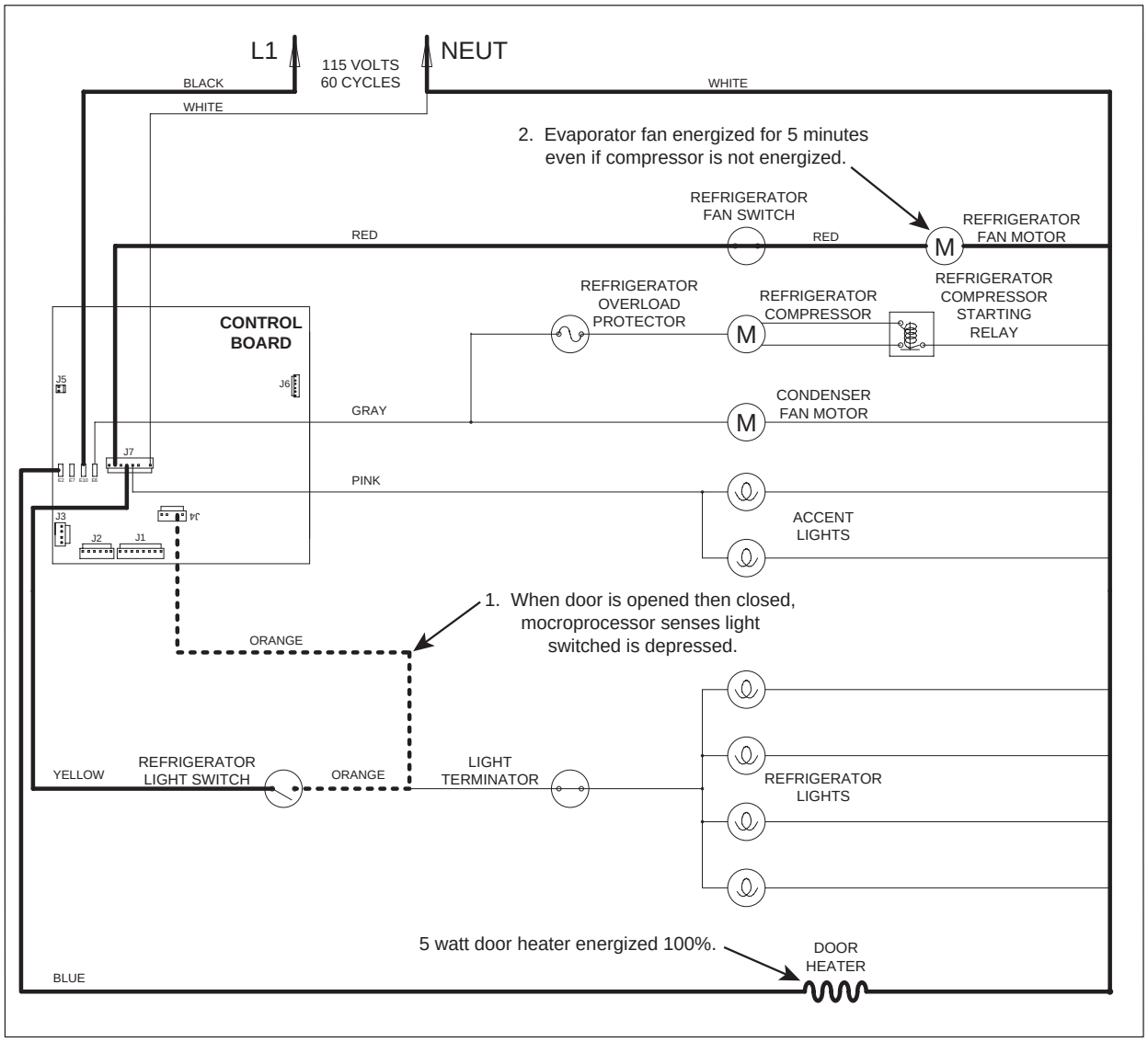


Figure 3-14. Signal Trace Schematic of 601RG Evaporator Fan Operation

Monitor and Control Refrigerator Off-Cycle Defrost

The temperature signals from the refrigerator compartment thermistor and refrigerator evaporator thermistor are monitored by the microprocessor. During off cycle defrost, if the compartment temperature reaches high offset before the evaporator has risen to 38°F (3°C), the signal to run the compressor and evaporator fan will wait, allowing the refrigerator evaporator to fully defrost before the compressor is energized (See Figure 3-15).

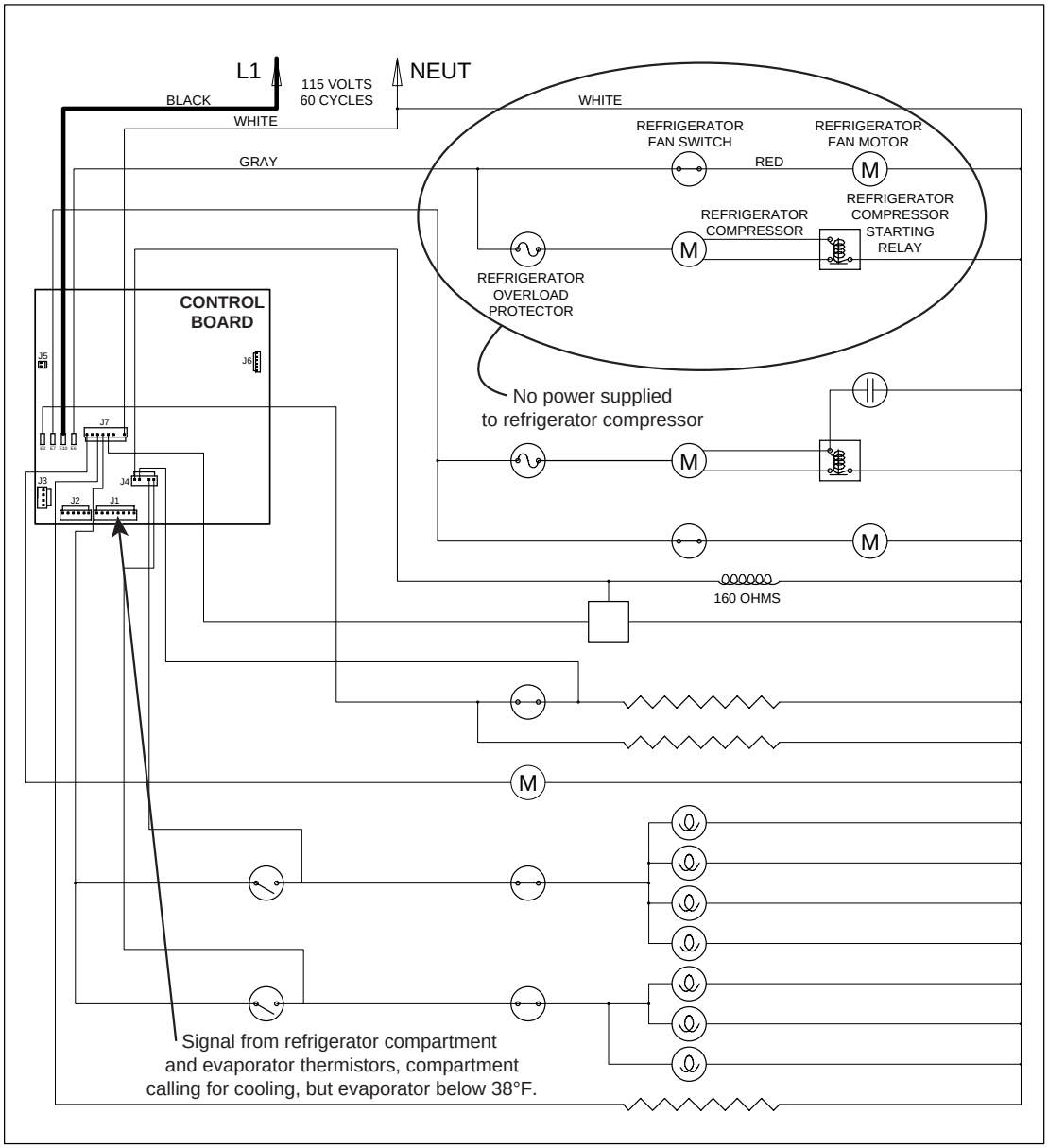


Figure 3-15. Signal Trace Schematic (High Voltage only) of Refrigerator Off-Cycle Defrost

Monitor and Control "Adaptive Defrost" of Freezer Evaporator

Initially the freezer compressor will cycle-run for twelve hours, after which the compressor is switched off and power is supplied to the defrost heater (See Figure 3-16). With the "Adaptive Defrost" technique, the length of time that the heater 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 time interval before the next defrost. If the heater stays on longer than specified, the electronic control decreases the time interval before the next defrost. This is an ongoing process whereby the defrost time and the defrost interval will vary by unit use.

NOTE: *A five minute time delay/dwell follows all defrosts before the compressor is energized. The freezer drain trough heater is energized during defrost and remains energized during this five minute dwell.*

NOTE: *The minimum defrost interval is six hours. The maximum defrost interval is eighty hours. The maximum defrost duration is twenty-five minutes.*

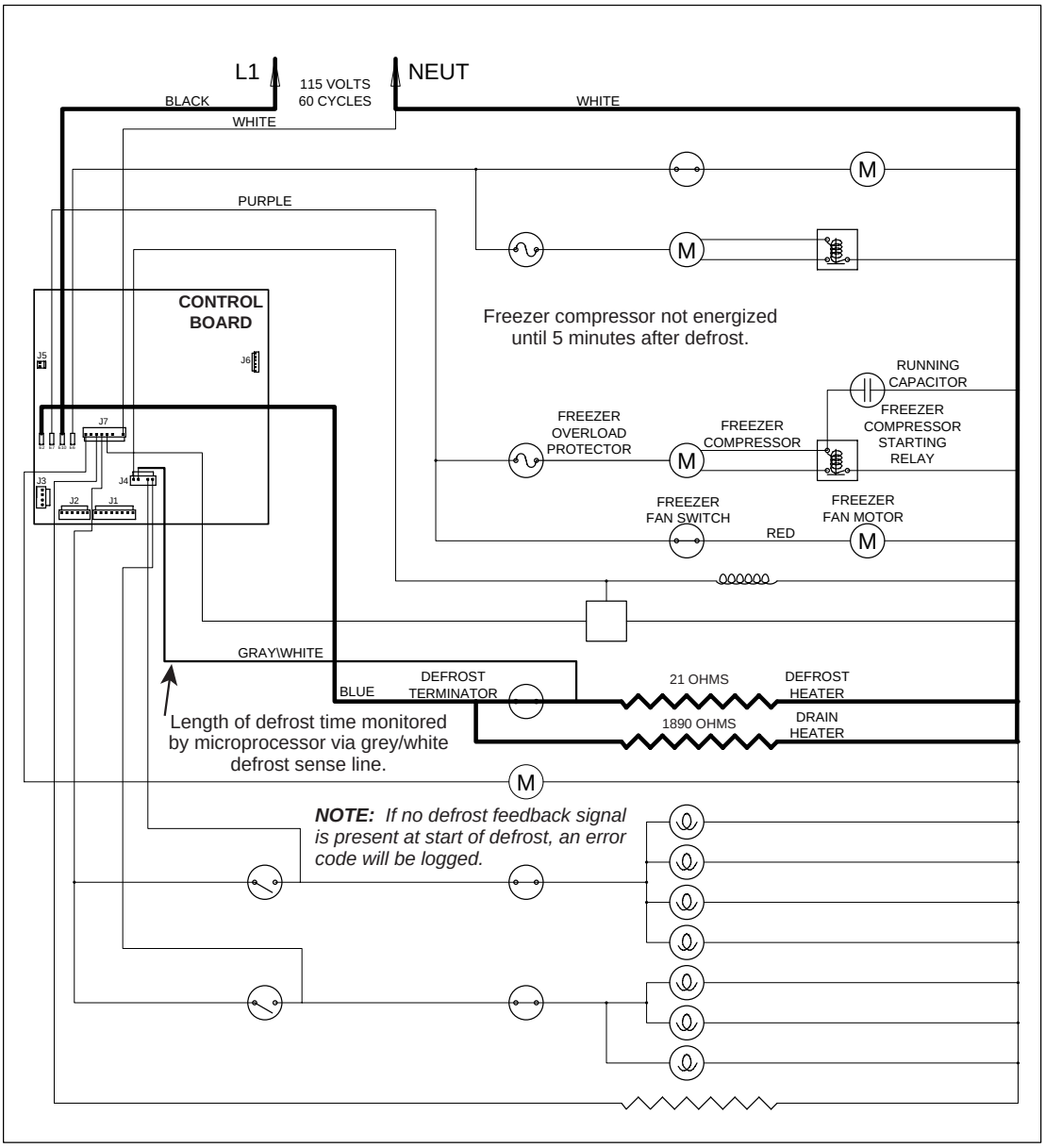


Figure 3-16. Signal Trace Schematic of Freezer Adaptive Defrost

Monitor Compressor Run Duration, Displays If Service may be Needed

The microprocessor senses the 115 volts supplied to each compressor, monitoring the length of compressor run time (See Figure 3-17). If either compressor experiences several excessive run periods (possibly due to a dirty condenser), a signal is sent to the "SERVICE" annunciator on the LCD to flash (See Figure 3-18).

NOTE: *SERVICE flashing alone can indicate excessive compressor run or a faulty refrigerator evaporator thermistor. To narrow the search for the cause, Diagnostic Mode (covered later in this section) should be initiated.*

NOTE: *If Diagnostic Mode is initiated and there are "Error Codes" (also covered later in this section), a non-flashing SERVICE annunciator will be observed. To clear a non-flashing SERVICE annunciator, the problem must be corrected, then the Bell ON/OFF key must be pressed and held for fifteen seconds.*

NOTE: *If the unit is ever switched OFF then back ON, the compressors will not energize for at least three minutes because of a three minute minimum OFF time built into the electronic control system to protect the compressor and its electricals. There is also a three minute minimum ON time for this same purpose.*

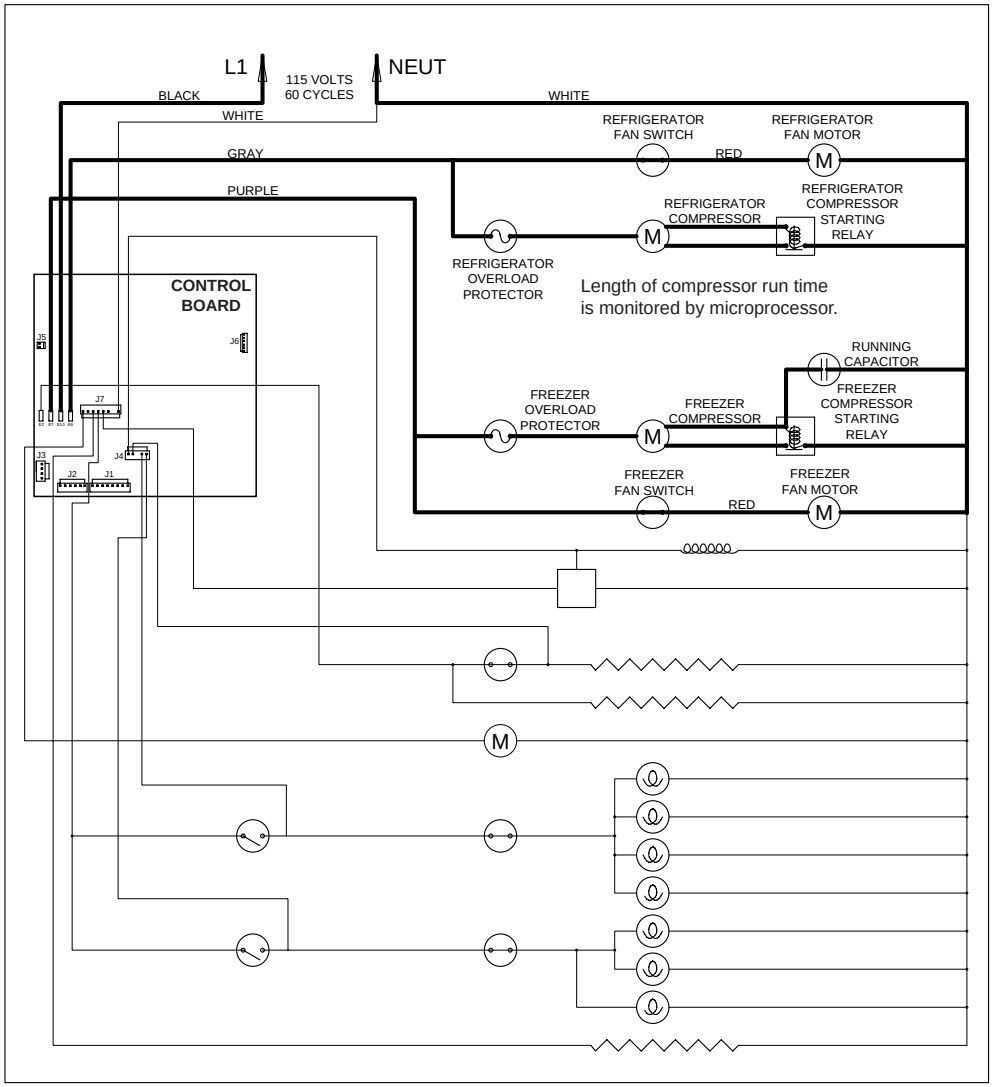


Figure 3-17. Signal Trace Schematic of Compressor Electrical System

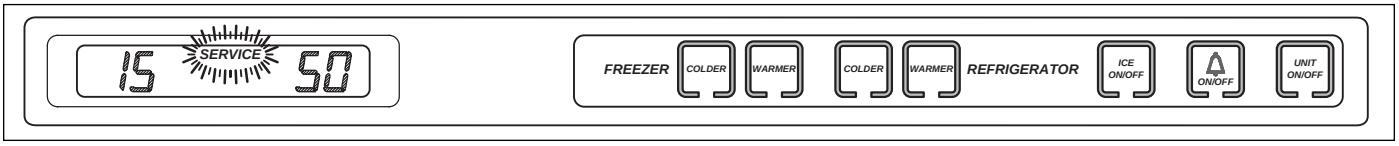


Figure 3-18. SERVICE Flashing Alone Possibly Because of Several Excessive Compressor Run Periods

Monitor Icemaker System and Display If Service Is Needed

The microprocessor monitors the 115 volts supplied to the icemaker water valve solenoid (See Figure 3-19). If the solenoid is energized longer than fifteen seconds, the microprocessor cuts power to the icemaker system and sends a signal to the ICE and SERVICE annunciators on the LCD to flash (See Figure 3-20).

NOTE: *To clear flashing ICE and SERVICE annunciators, the problem must be corrected, then the unit must be switched OFF and back ON.*

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

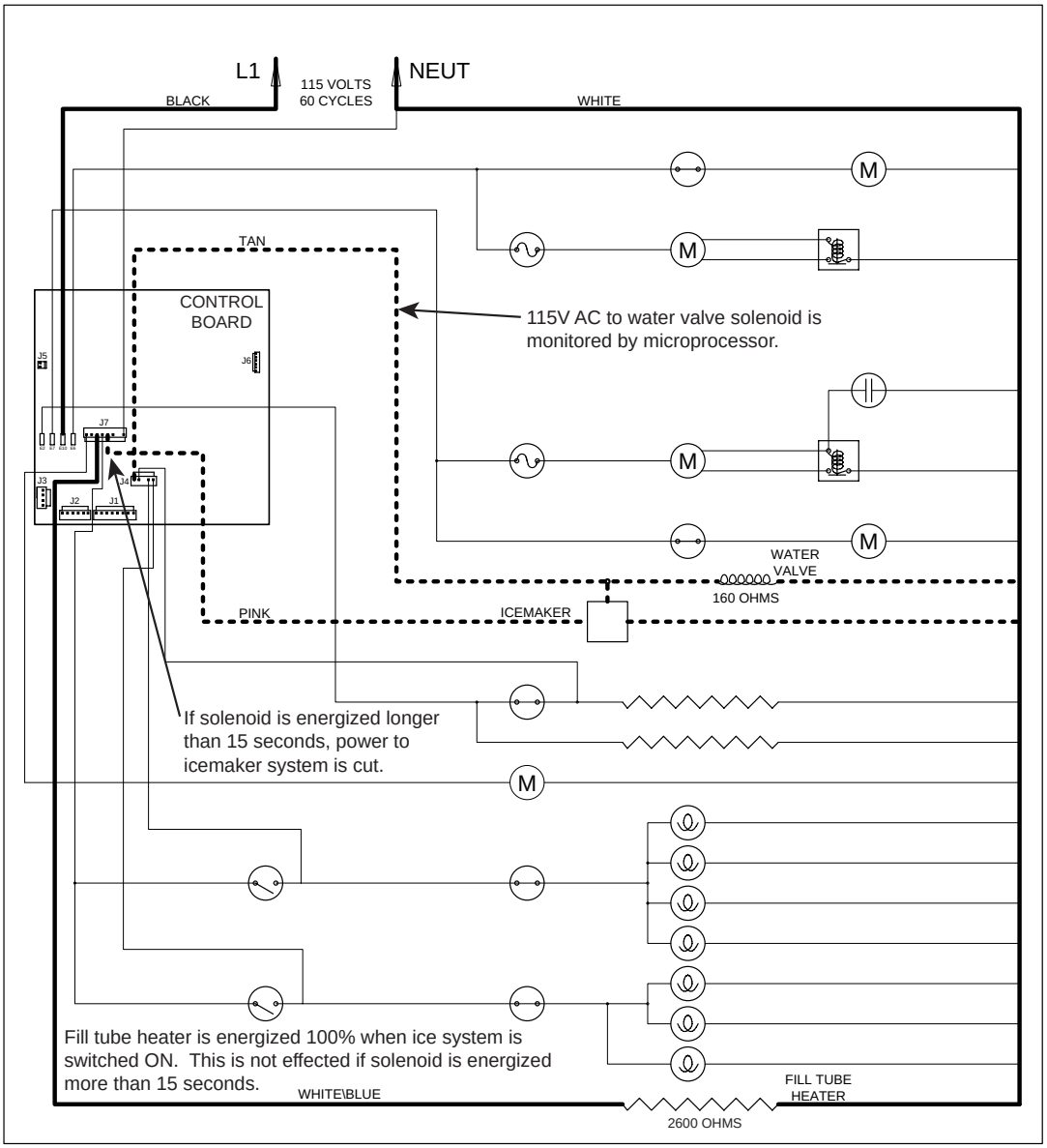


Figure 3-19. Signal Trace Schematic of Icemaker Electrical System

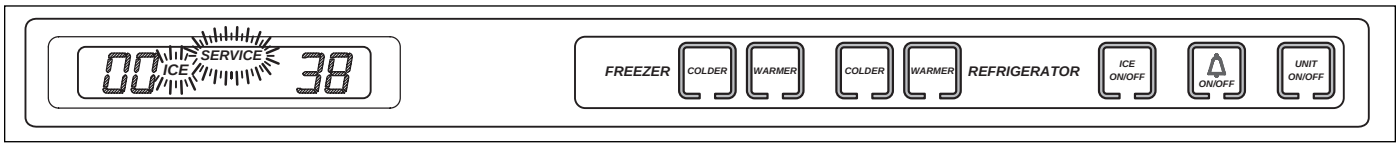


Figure 3-20. ICE & SERVICE Flashing = Water Valve Solenoid Energized Longer Than 15 Seconds and Icemaker System Disabled

UNIQUE ELECTRONIC CONTROL INPUT OPERATIONS

The following few pages illustrate unique electronic control input operations performed at the control panel that you would not expect a customer to perform every day. The input operations described are: Temperature Unit Selection Mode, Sabbath Mode, Showroom Mode, Manual Compartment Disable Mode and Manual Freezer Evaporator Defrost.

Temperature Units Selection Mode *(Selecting Degrees Fahrenheit or Degrees Celsius Display)*

The electronic control is initially set to display temperature in Fahrenheit (°F) units of measure. However, the temperature units displayed can be converted from °F to °C (Celsius), and/or back again. This operation is called Temperature Units Selection.

NOTE: *Temperature Units Selection must be performed within the first minute after switching the unit ON.*

To convert the temperature units of measure from Fahrenheit (°F) readings to Celsius (°C) readings, press and hold the door ajar alarm bell key and the UNIT ON/OFF key simultaneously for approximately five seconds, then release both keys (See Figure 3-21). "°C" will appear on the LCD indicating that temperatures will now be displayed in Celsius units of measure. To convert back to Fahrenheit units of measure, repeat pressing the alarm bell key then the UNIT ON/OFF key simultaneously. (See Figure 3-22)

NOTE: *Temperature Units Selection Mode will end 10 seconds after the last key stroke.*

NOTE: *Do <u>not</u> press and hold the UNIT ON/OFF key first, that will simply switch the unit OFF.*

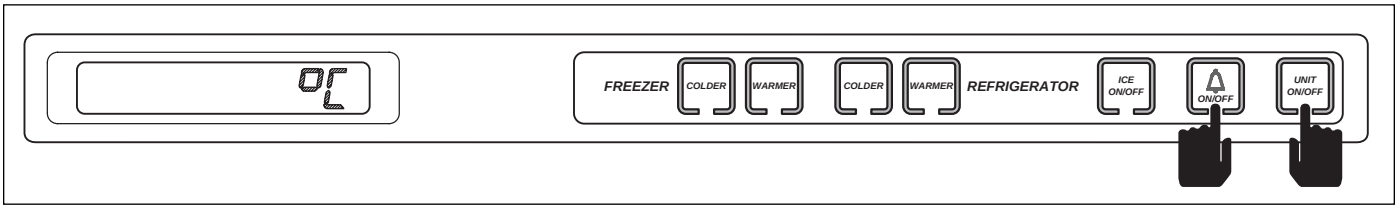


Figure 3-21. Converting to from Fahrenheit to Celsius Units of Measure
(within first minute after switching unit ON)
Press and Hold Door Ajar Alarm Bell Key and UNIT ON/OFF Key for 5 Seconds

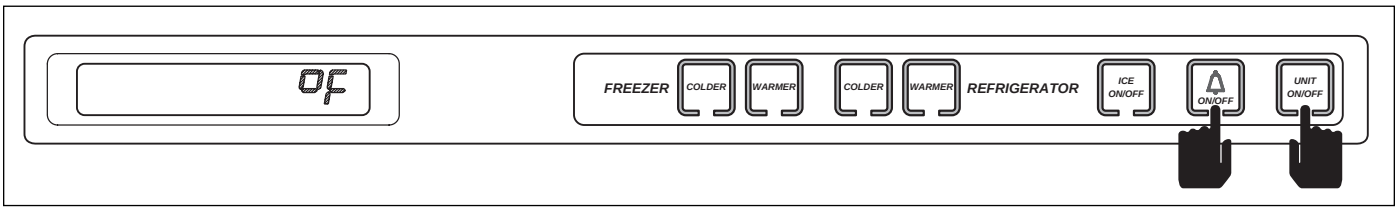


Figure 3-22. Converting Back to Fahrenheit Units of Measure
(within 10 seconds of previous key stroke and/or within first minute after switching unit ON)
Press and Hold Door Ajar Alarm Bell Key and UNIT ON/OFF Key

Sabbath Mode

Sabbath Mode was incorporated into the electronic control system for the observance of certain religious days. Initiating Sabbath Mode disables the light switches, the circuits to the ice making system and the door ajar alarm.

To initiate Sabbath Mode, the unit must first be switched OFF using the UNIT ON/OFF key (See Figure 3-23). With the unit switched OFF, press and hold the UNIT ON/OFF key for ten seconds, then release (See Figure 3-24).

To return to normal lighting operation, press and release the UNIT ON/OFF key.

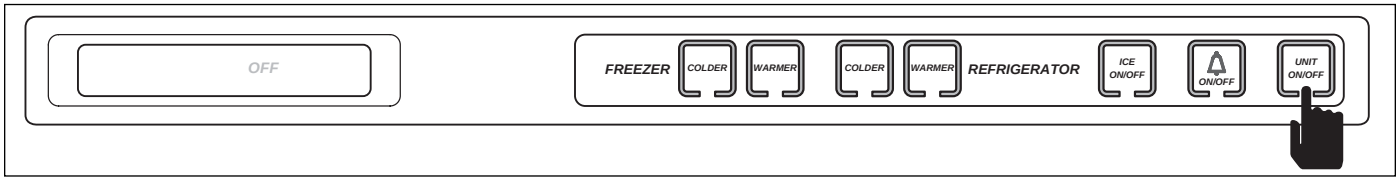


Figure 3-23. To Enter Sabbath Mode, Switch Unit OFF First

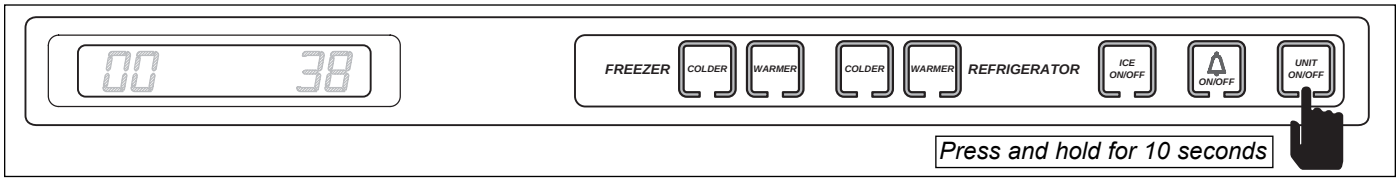


Figure 3-24. After Unit is Switched OFF, Press and Hold the UNIT ON/OFF Key for 10 Seconds

Showroom Mode

Showroom Mode was incorporated into the electronic control system to allow for Sub-Zero appliances to be displayed in a showroom setting. When in Showroom Mode, all cooling functions are disabled, but the lighting system remains active.

To initiate Showroom Mode, the unit must first be switched OFF using the UNIT ON/OFF key (See Figure 3-25). With the unit switched OFF, press and hold either pair of WARMER and COLDER keys, then press the UNIT ON/OFF key, then release all three keys (See Figure 3-26).

To return the unit to normal operating condition, repeat the steps above.

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

NOTE: *It is possible to determine if a unit is in Showroom Mode by initiating Diagnostic Mode. If "Sr" is observed in the left temperature display area during Diagnostic Mode, the unit is in Showroom mode. Initiating Diagnostic Mode is covered later in this section.*

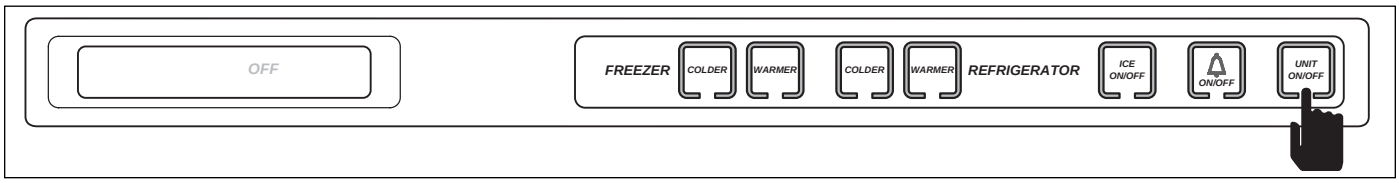


Figure 3-25. To Enter (or Exit) Showroom Mode, Switch Unit OFF First

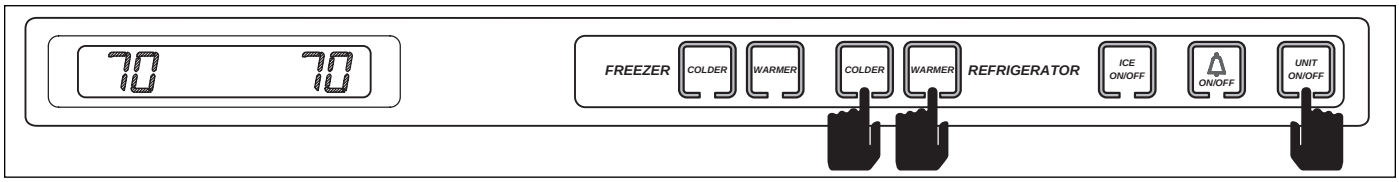


Figure 3-26. After Unit is Switched OFF, Press and Hold the WARMER and COLDER Keys, Then Press the UNIT ON/OFF Key

Manual Compartment Disable Mode

Manual Compartment Disable Mode allows a customer or Service Technician to switch one compartment off for interior cleaning, defrosting or diagnostic purposes, while allowing the other compartment to continue cooling.

To initiate Manual Compartment Disable Mode, the unit must first be switched OFF using the UNIT ON/OFF key (See Figure 3-27). With the unit switched OFF, press and hold the WARMER key for the compartment being disabled, then press the UNIT ON/OFF key, then release both keys (See Figure 3-28). The LCD will display "- -" (double dashes) in place of temperature readings for the compartment chosen, indicating that all cooling functions for that compartment are disabled.

To return the unit to normal operating condition, repeat the steps above.

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

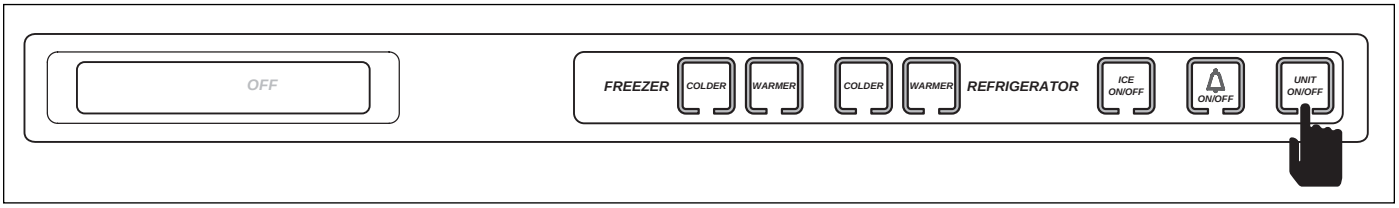


Figure 3-27. To Enter (or Exit) Manual Compartment Disable Mode, Switch Unit OFF First

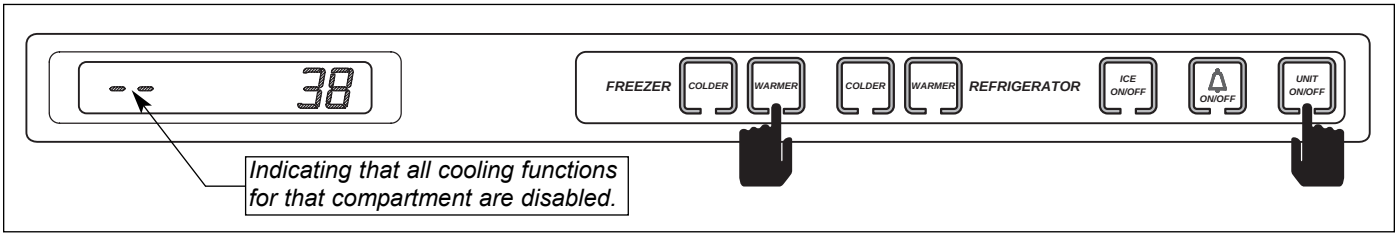


Figure 3-28. After Unit is Switched OFF, Press and Hold the WARMER Key for the Compartment Being Disabled, Then Press the UNIT ON/OFF Key.

Manual Freezer Evaporator Defrost

Manual Freezer Evaporator Defrost was incorporated into the electronic control to assist in servicing and diagnostics.

To initiate manual freezer evaporator defrost, press and hold the ICE key for five seconds, then release the key. (See Figure 3-29).

NOTE: *Manual Freezer Evaporator Defrost will not operate if unit is in Sabbath Mode.*

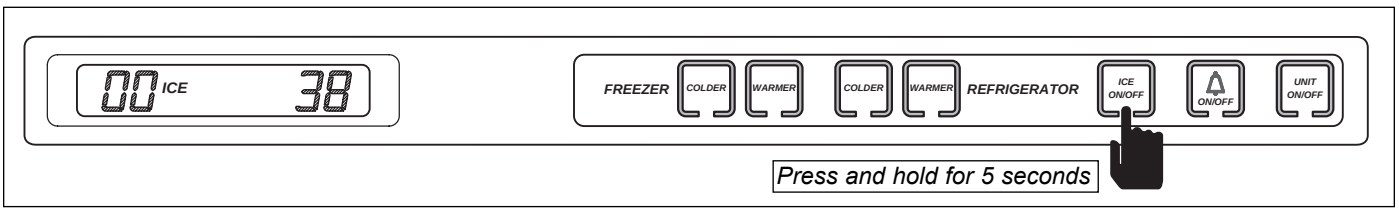


Figure 3-29. Initiate Manual Freezer Evaporator Defrost - Press and Hold the ICE key for 5 Seconds

POSSIBLE ERROR INDICATORS

These pages contain diagrams which illustrate what a customer may see on the LCD if there is a problem/error with the unit.

"EE" Displayed at Left and "SERVICE" Flashing - If "EE" is displayed in place of freezer compartment temperature and "SERVICE" is flashing, then the freezer compartment thermistor is faulty or there is a break in the thermistor's wiring (See Figure 3-30). To clear this error indicator, the problem must be corrected.

NOTE: *To check the thermistor, submerse it in a glass of ice water for two to five minutes, then check for 30,000 to 33,000 ohms.*

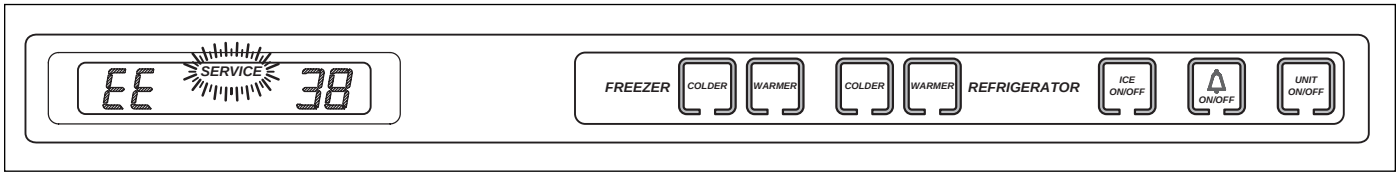


Figure 3-30. "EE" at Left and "SERVICE" Flashing = Freezer Compartment Thermistor (or its Wiring) Fault

"SERVICE" Flashing and "EE" Displayed at Right - If "EE" is displayed in place of refrigerator compartment temperature and "SERVICE" is flashing, then the refrigerator compartment thermistor is faulty or there is a break in the thermistor's wiring (See Figure 3-31). To clear this error indicator, the problem must be corrected.

NOTE: *To check the thermistor, submerse it in a glass of ice water for two to five minutes, then check for 30,000 to 33,000 ohms.*

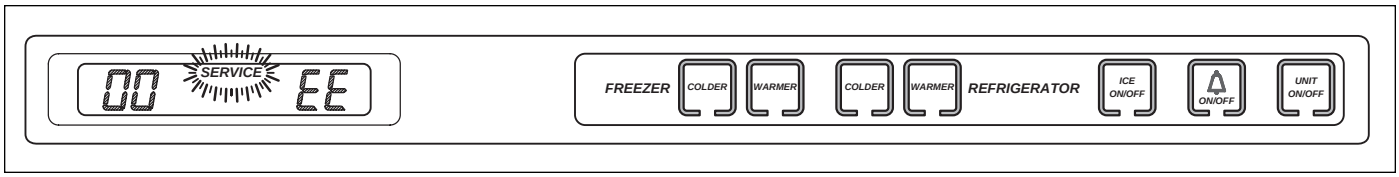


Figure 3-31. "SERVICE" Flashing and "EE" at right = Refrig. Compartment Thermistor (or its wiring) Fault

"ICE" and "SERVICE" Flashing - If "ICE" and "SERVICE" are flashing, then the icemaker water valve solenoid energized longer then fifteen seconds (possibly caused by a jammed ice cube), and the icemaker system is disabled (See Figure 3-32). To clear this error indicator, the problem must be corrected, then the unit must be switched OFF then back ON.

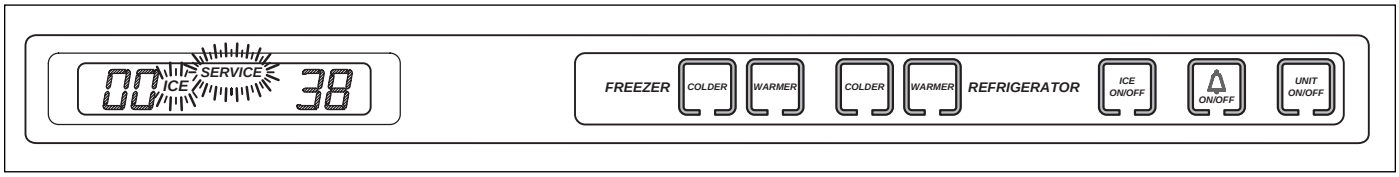


Figure 3-32. "ICE" & "SERVICE" Flashing = Valve Solenoid energized 15 Sec., Icemaker System Disabled

"SERVICE" Alone Flashing - If "SERVICE" is flashing (without "EE" displayed or "ICE" flashing), then one of two things is wrong, either the refrigerator evaporator thermistor (or its wiring) is faulty or the unit experienced excessive compressor run. If it is a refrigerator thermistor fault, there may be normal freezer temperatures and warm or normal refrigerator temperatures (See Figure 3-33). If it is an excessive compressor run problem, there may be warm or normal freezer temperatures and warm or normal refrigerator temperatures (See Figure 3-34). To narrow the search for the problem, Diagnostic Mode (covered later in this section) should be initiated.

To clear this error indicator, the problem must be corrected, then the unit must be switched OFF and back ON.

NOTE: *To check the evaporator thermistor, submerse it in a glass of ice water for two to five minutes, then check for 30,000 to 33,000 ohms.*

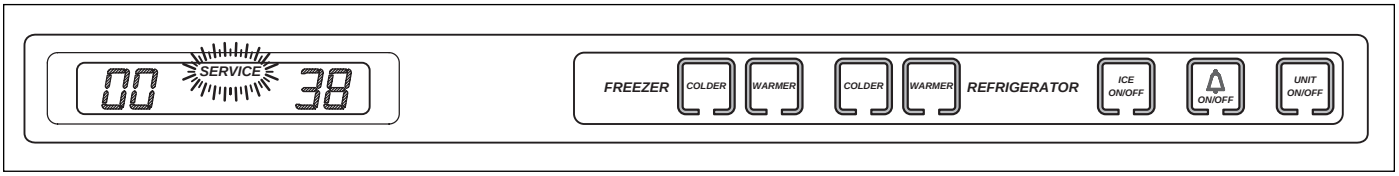


Figure 3-33. "SERVICE" Flashing *(possible warm ref. temp.)* = Refrig. Evap. Thermistor (or its Wiring) Fault

NOTE: *To help identify the problem, Diagnostic Mode (Covered later in this section) should be initiated.*

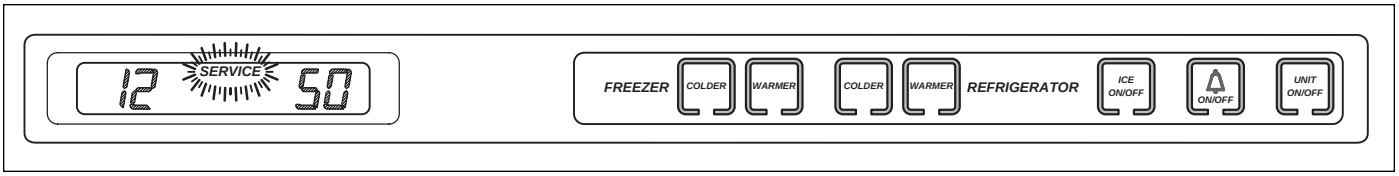


Figure 3-34. "SERVICE" Flashing *(possible warm refrig &/or fre. temp.)* = Excessive Compressor Run

NOTE: *To help identify the problem, Diagnostic Mode (Covered later in this section) should be initiated.*

"SERVICE" Flashing and "EC" Displayed - If "SERVICE" is flashing and "EC" is displayed at the right, then the unit experienced excessive compressor run and there are "Error Codes" registered (See Figure 3-35). (Error Codes are covered later in this section.)

NOTE: *If error codes were registered during an excessive compressor run condition, the error indicated may or may not be the cause of the excessive compressor run condition. A thorough troubleshooting must be performed.*

NOTE: *Whenever Error Codes are observed, they must be cleared from electronic control memory. To clear Error Codes, the problem must be corrected, then the Bell ON/OFF key must be pressed and held for 15 seconds.*

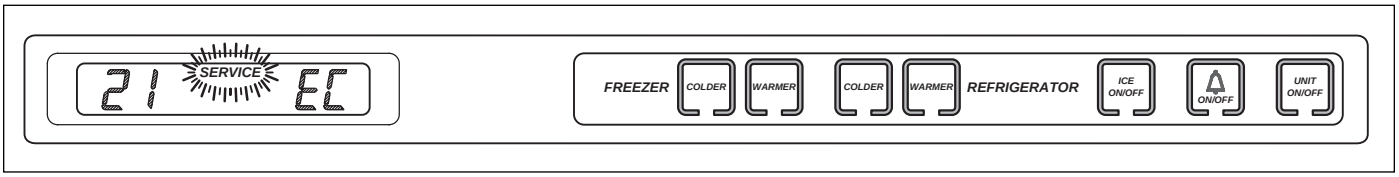


Figure 3-35. "EC" at Right and "SERVICE" Flashing = Excessive Comp. Run with Error Codes Registered

TROUBLESHOOTING INPUT OPERATIONS

These pages explain troubleshooting input operations performed at the control panel. The input operations described are Diagnostic Mode, Manual Component Activation Mode and Temperature Log Recall.

Diagnostic Mode

Initiating Diagnostic Mode allows the Service Technician to observe real-time temperature readings from all thermistors without temperature averaging. If errors were registered by the thermistors or the defrost system, “Error Codes” will also be displayed during diagnostic mode (this is explained later).

To initiate Diagnostic Mode, the unit must be ON. With the unit ON, press and hold either COLDER key, then press the UNIT ON/OFF key, then release both keys (See Figure 3-36). If no error codes are registered, the left display area will show the real-time temperature of the thermistor being read, the right display area will show the thermistor location code, and all annunciators will illuminate on the LCD indicating the unit is in Diagnostic Mode (See Figure 3-35). Pressing either COLDER key or either WARMER key while in Diagnostic Mode will toggle to the next or previous thermistor location, respectively. (See Figure 3-37, 3-38 and 3-39)

NOTE: *Diagnostic Mode will end 20 seconds after the last key stroke.*

NOTE: *If the COLDER and UNIT ON/OFF keys are pressed and held for 10 seconds, Manual Component Activation Mode will be initiated (this is covered later in the section).*

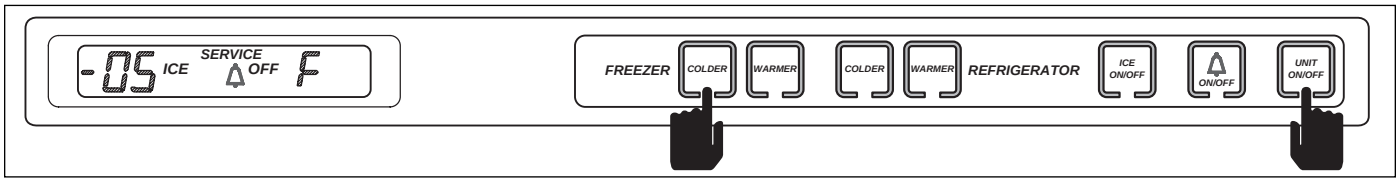


Figure 3-36. Initiate Diagnostic Mode - Press and Hold Either COLDER Key, Then the UNIT ON/OFF Key (“F” Indicates Freezer Compartment)

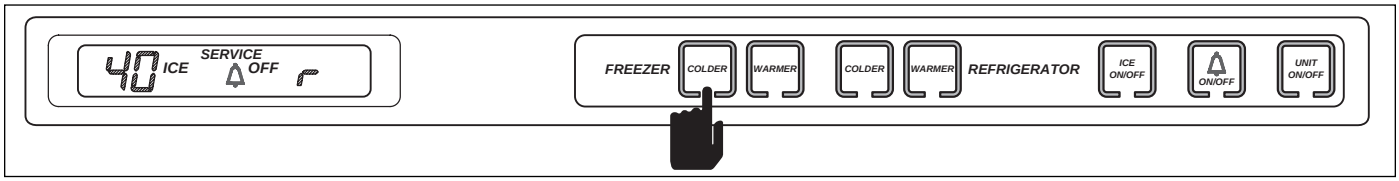


Figure 3-37. Toggle Through Temperature Readings - Press Either COLDER Key or Either WARMER Key (“r” Indicates Refrigerator Compartment)

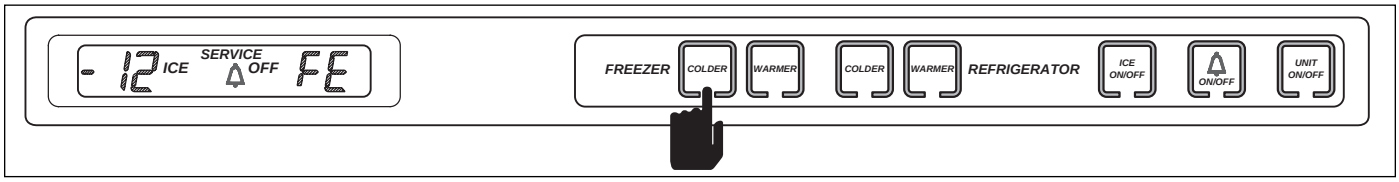


Figure 3-38. Toggle Through Temperature Readings - Press Either COLDER Key or Either WARMER Key (“FE” Indicates Freezer Evaporator)

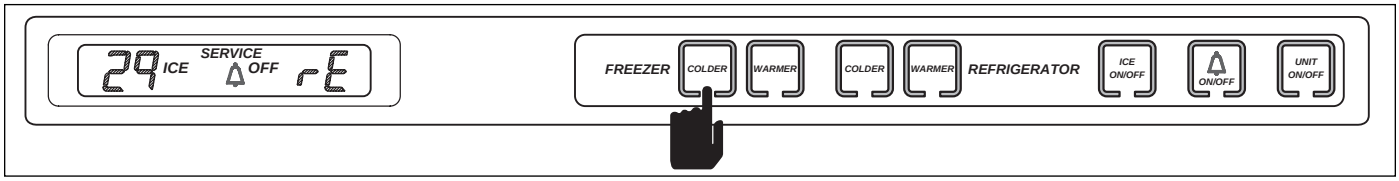


Figure 3-39. Toggle Through Temperature Readings - Press Either COLDER Key or Either WARMER Key (“rE” Indicates Refrigerator Evaporator)

If “EE” is observed in the left display area during Diagnostic Mode, the thermistor in that location is open or shorted, or there is a break in that thermistor’s wiring (See Figure 3-40).

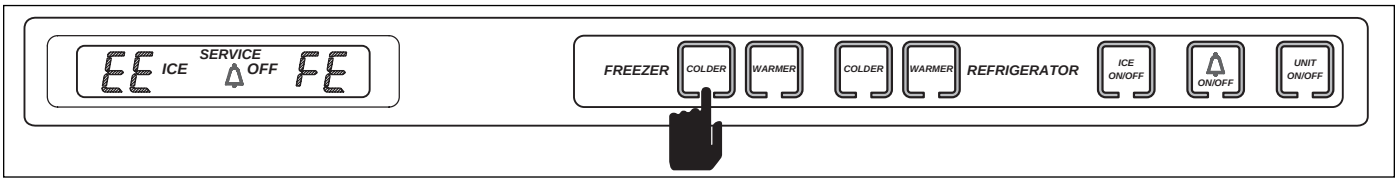


Figure 3-40. “EE” Observed in Diagnostic Mode = Thermistor (or its wiring) Fault in Location Indicated

If “Sr” is observed in the left display area when Diagnostic Mode is initiated, the unit is in Showroom Mode, which was explained earlier in this section (See Figure 3-41).

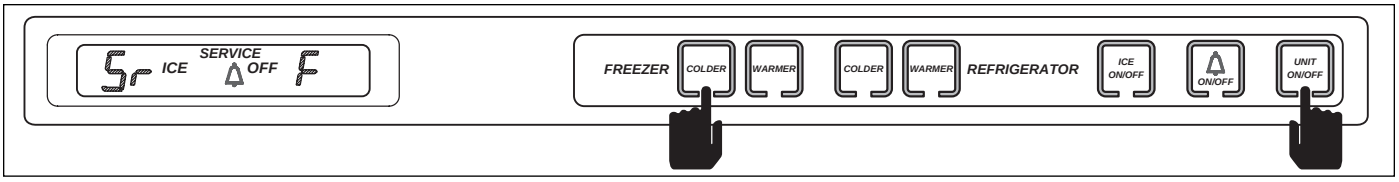


Figure 3-41. “Sr” Observed While in Diagnostic Mode = Unit is in Showroom Mode

When initiating Diagnostic Mode, numbers may appear in the left display area with “EC” in the right display area. “EC” indicates the numbers at left are an “Error Code” (See Figure 3-42 and the Error Code Table below). Error Codes indicate problems registered by specific components. If error codes are registered, they will appear before temperature readings and can be toggled through with the temperature readings as described on the previous page.

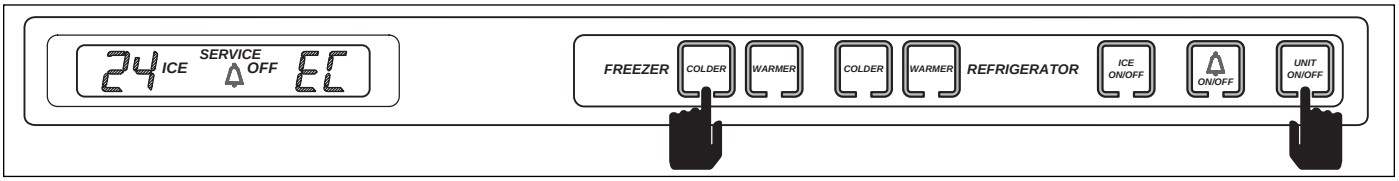


Figure 3-42. Numbers at Left with “EC” at Right = Error Code (See Table on Following Page)

Error Code Table	
CODE	**INDICATION**
05	***Refrig. Cabinet Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp’s***
06	***Refrig. Evaporator Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp’s***
07	***Freezer Cabinet Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp’s***
08	***Freezer Evaporator Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp’s***
20	***Defrost Under-heat with No Voltage Feedback Through Gray/White Wire at Defrost Start***
21	***Defrost Overheat***
22	***No Voltage Feedback Through Gray/White Wire at Defrost Start***
23	***Defrost Overheat with No Voltage Feedback through Gray/White Wire at Defrost Start***
24	***Defrost Under-heat***

NOTE: *Currently, Error Codes are registered because of thermistor or defrost system errors only. The table above will be updated through addendums when subsequent software and electrical changes occur and more error codes are added.*

If error codes are observed in diagnostic mode, a non-flashing SERVICE annunciator will appear on the LCD when Diagnostic Mode ends, indicating error codes are still registered (See Figure 3-43). To clear a non-flashing SERVICE annunciator and the error codes, the problem must be corrected and the unit must be ON. Then, the Bell ON/OFF key must be pressed and held for fifteen seconds. The control will emit a short “beep” when the SERVICE annunciator and error codes are cleared. (See Figure 3-44)

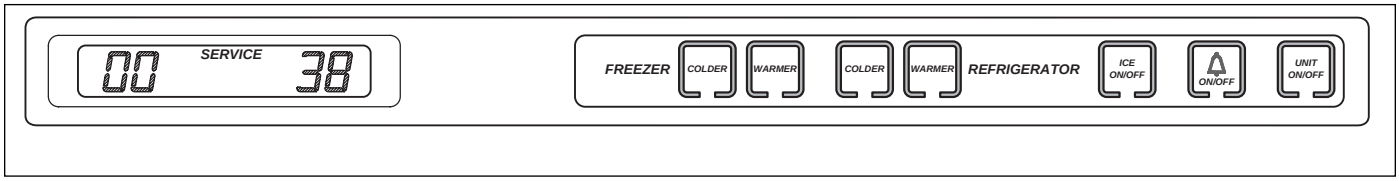


Figure 3-43. Non-flashing SERVICE Annunciator after Diagnostic Mode = Error Codes were Registered

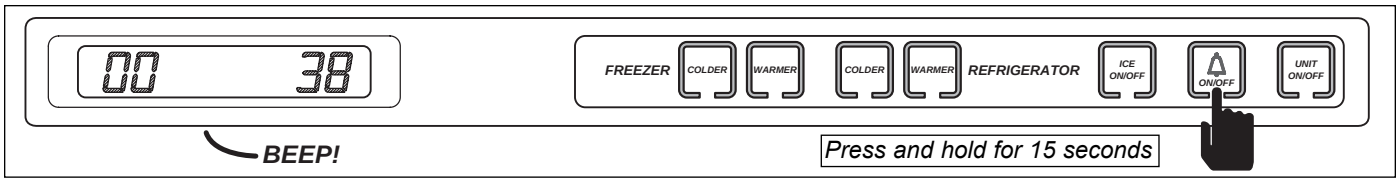


Figure 3-44. Clear Non-flashing SERVICE Annunciator - Press & Hold Bell ON/OFF Key for 15 Seconds

Manual Component Activation Mode

Manual Component Activation Mode allows a Service Technician to energize a cooling system for five minutes. When activated, the chosen compartment’s compressor and evaporator fan are energized along with the condenser fan. While in Component Activation Mode, the evaporator temperatures for that compartment are displayed on the LCD. This also allows the Service Technician to check for proper voltage readings at the activated components without having to wait for the compartment to call for cooling.

To initiate Manual Component Activation Mode, the unit must be ON. With the unit ON, press and hold the desired compartment COLDER key and the UNIT ON/OFF key for ten seconds (See Figure 3-45). The evaporator temperature for that compartment will be displayed in the left display area of the LCD and the right display area will show the thermistor location.

NOTE: *If the COLDER and UNIT ON/OFF keys are pressed and held for less then 10 seconds, Diagnostic Mode will be initiated. This was covered earlier in the section.*

NOTE: *It is possible to toggle through the the other temperature readings as in Diagnostic Mode, but in this case the temperature readings will last for five minutes rather than twenty seconds.*

NOTE: *The compressor overload could prevent the compressor from energizing.*

NOTE: *Manual Component Activation Mode will end five minutes after it is initiated. It is possible to end this five minute run time and return to normal operation by switching the unit OFF then back ON. If this is done, note that the electronic control will observe a three minute minimum compressor OFF time when the unit is switched back ON. This is to protect the compressor and its electricals.*

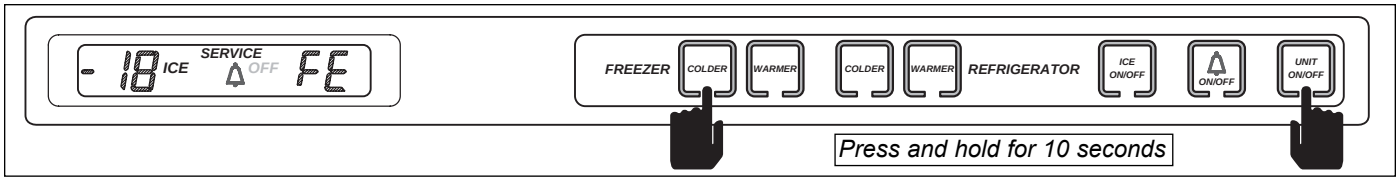


Figure 3-45. Initiate Manual Component Activation Mode - Press and Hold Desired COLDER Key and UNIT ON/OFF Key for 10 Seconds

Temperature Log Recall Mode

The electronic control system is equipped with a temperature history data storage system. This system logs/stores the average temperature of each individual thermistor every two hours (rounded to the nearest two degrees), along with any event indicators (explained later in this section), that may have occurred. These two-hour periods are referred to as *"indexes".* Up to 168 indexes can be stored for each compartment, making it possible to observe the preceding fourteen days of the unit's temperature history *(each index equals 2 hour temperature average; 2 hours X 168 indexes = 14 days).* After 168 indexes are stored, each new index will bump the oldest index. Index number "1" being the most recent two-hour temperature average and index number "168" being the oldest. Accessing this temperature history data so it can be viewed on the LCD is accomplished by initiating Temperature Log Recall Mode.

There are two ways to initiate Temperature Log Recall Mode. One allows viewing of compartment temperature history only (see below), the other allows viewing of compartment temperature history and evaporator temperature history (see following page).

Initiate Temperature Log Recall Mode To View Compartment Temperature History Only - Begin with the unit ON. Now, press and hold the desired compartment WARMER key, then press the UNIT ON/OFF key, then release both keys (See Figure 3-46). The left display area on the LCD will show average compartment thermistor temperature and in the right display area will be the index number. The first index number will be "1", indicating the most recent two-hour temperature average. The right display area will also flash the thermistor location code at three second intervals (See Figure 3-47).

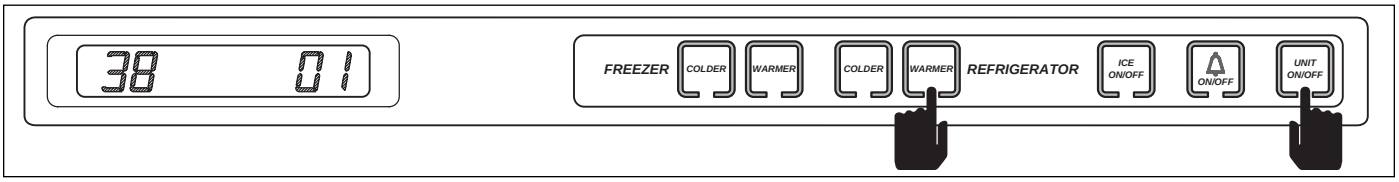


Figure 3-46. Initiate Temperature Log Recall Mode To View Compartment Temperature History Only - Press and Hold Desired WARMER Key, Then Press UNIT ON/OFF Key

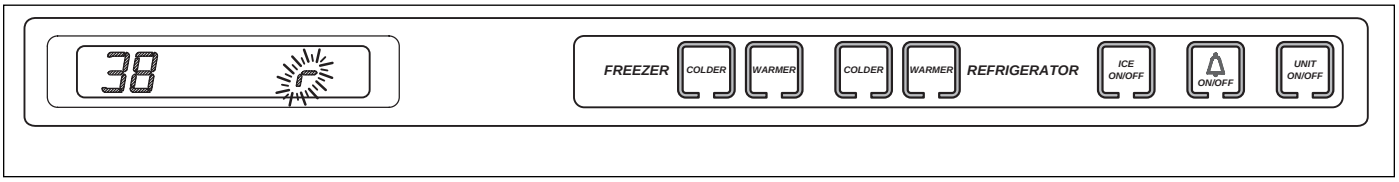


Figure 3-47. Thermistor Location Code Flashes Every Three Seconds

To toggle up through the indexes (from 1 to 168), press the same WARMER key in multiple key strokes (See Figure 3-48). To toggle down through the indexes (from 168 to 1), press the corresponding COLDER key in multiple key strokes (See Figure 3-49).

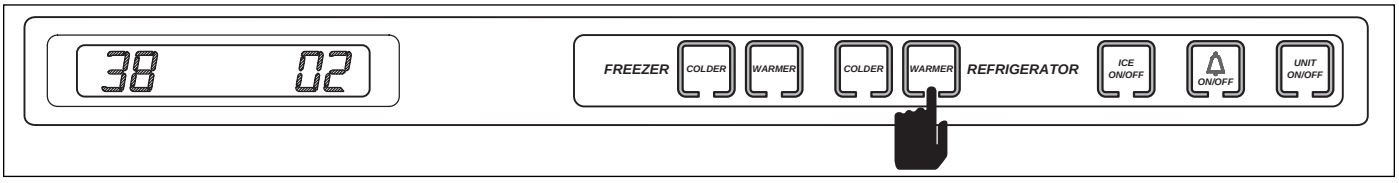


Figure 3-48. Toggle Up Through Indexes - Press WARMER Key in Consecutive Key Strokes

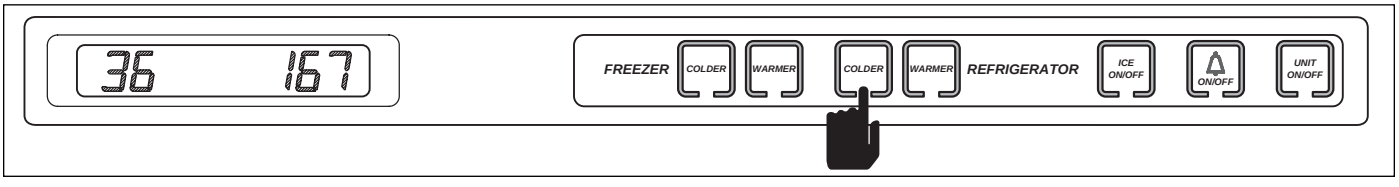


Figure 3-49. Toggle Down Through Indexes - Press COLDER Key in Consecutive Key Strokes

Initiate Temperature Log Recall Mode To View Compartment and Evaporator Temperature History - Begin with the unit ON and in Diagnostic Mode (See Figure 3-50). While in Diagnostic Mode, toggle through the readings until the desired thermistor temperature is displayed on the LCD (See Figure 3-51). Now, press the WARMER key for that compartment and the UNIT ON/OFF key simultaneously (See Figure 3-52). The left display area on the LCD will show average thermistor temperature and in the right display area will be the index number "1" indicating the most recent two-hour temperature average (See Figure 3-52). The right display area will also flash the thermistor location code at three second intervals (See Figure 3-53).

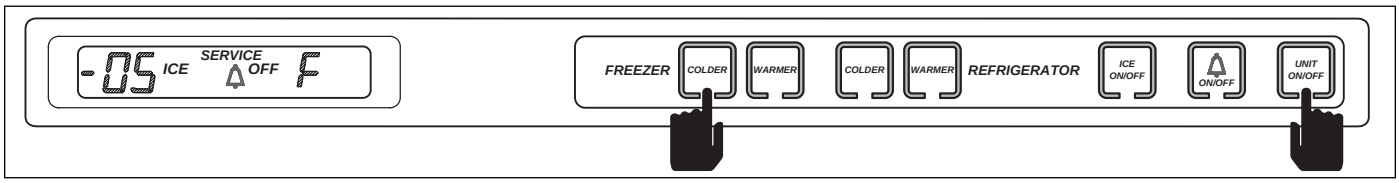


Figure 3-50. Initiate Diagnostic Mode - Press and Hold Either COLDER Key, then the UNIT ON/OFF Key

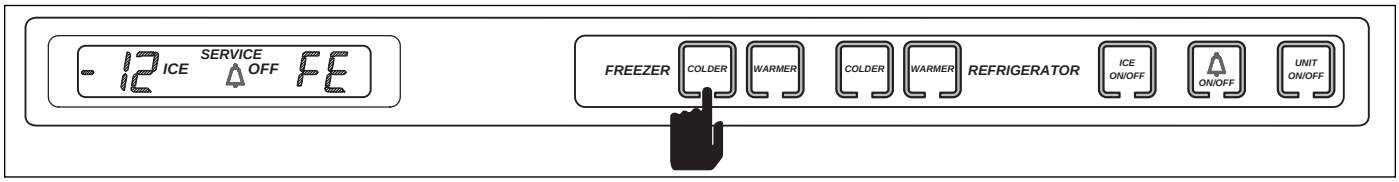


Figure 3-51. Toggle Through Temperature Readings - Press Either COLDER Key or Either WARMER Key Until Desired Thermistor Temperature is Displayed

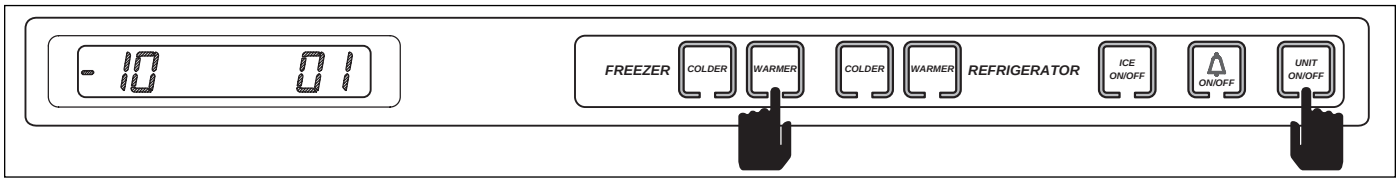


Figure 3-52. Initiate Temperature Log Recall Mode To View Temperature History - Press and Hold Desired WARMER Key and UNIT ON/OFF Key

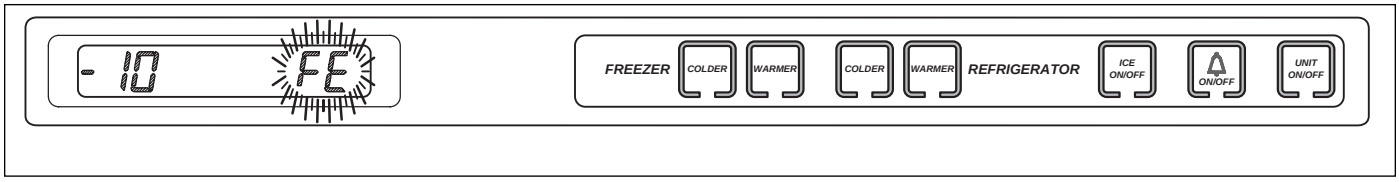


Figure 3-53. Thermistor Location Code Flashes Every Three Seconds

To toggle up through the indexes (from 1 to 168), press the same WARMER key in multiple key strokes (See Figure 3-54). To toggle down through the indexes (from 168 to 1), press the corresponding COLDER key in multiple key strokes (See Figure 3-55).

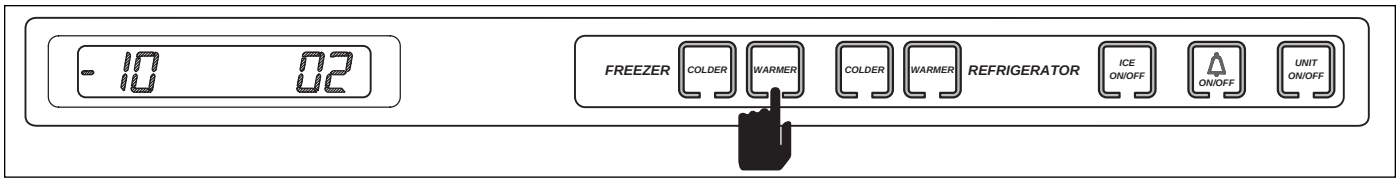


Figure 3-54. Toggle Up Through Indexes - Press WARMER Key in Consecutive Key Strokes

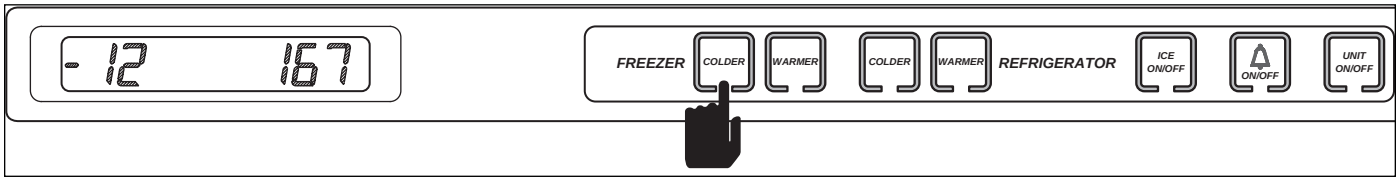


Figure 3-55. Toggle Down Through Indexes - Press COLDER Key in Consecutive Key Strokes

Possible Event Indicators During Temperature Log Recall Mode(s)

The diagrams below illustrate possible event indicators that may be observed while in Temperature Log Recall Mode. (See Figures 3-56 through 3-59)

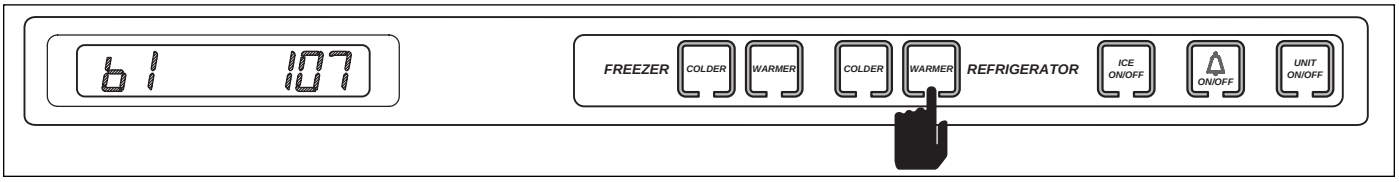


Figure 3-56. *"bl"* Indicates Index is "blank" - No Temperature has Been Logged Yet
(Only possible within first 14 days of unit operation, or after new control board is installed during service)

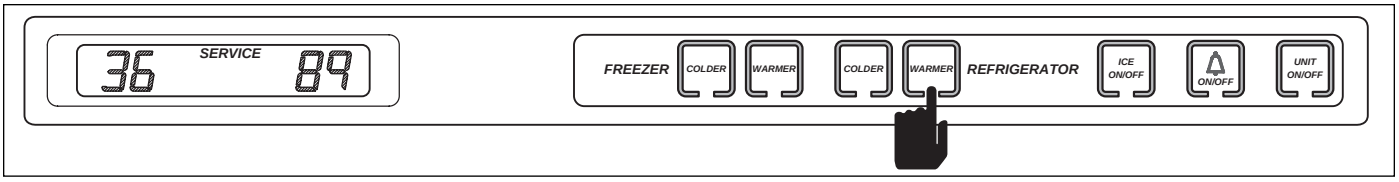


Figure 3-57. SERVICE Annunciator Illuminates - Indicates Unit was switched OFF During that Index Period by Pressing UNIT ON/OFF Key

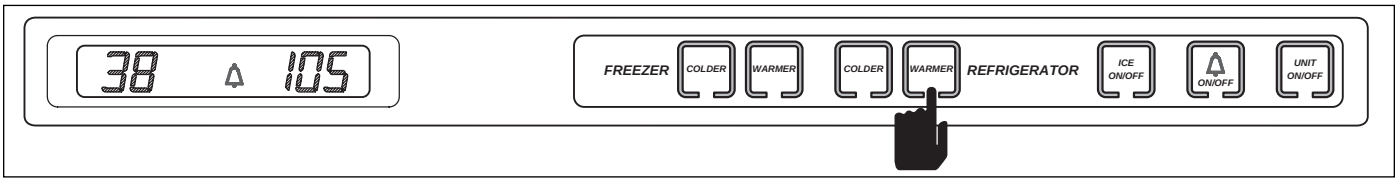


Figure 3-58. Bell Illuminates - Indicates Power Failure / Interruption During that Index Period

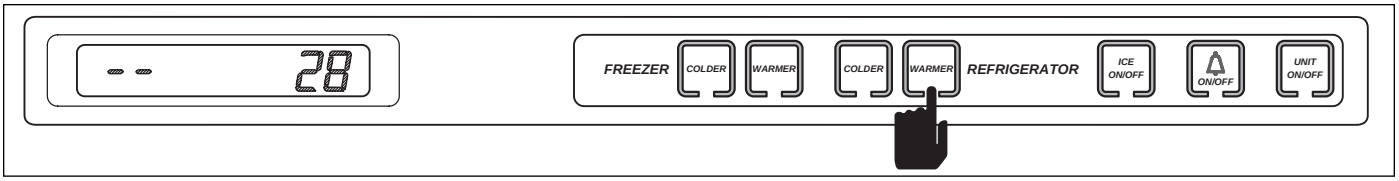


Figure 3-59. Double Dashes (- -) Displayed Instead of Temperature for Several Consecutive Index Periods - Indicates Bad EEPROM on Control Board. Board Must be Replaced

NOTE: *Double dashes will also be observed when in Manual Compartment Disable Mode. Only when double dashes are observed in Temperature Log Recall Mode for several consecutive indexes should the control board be replaced.*

NOTE: *If Manual Compartment Disable Mode has been activated during any of the 168 indexes, average temperatures will continue to be logged. No event indicator will appear with these temperatures.*

NOTE: *If the unit was in Showroom Mode during any of the 168 indexes, average temperatures will continue to be logged. No event indicator will appear with these temperatures.*

NOTE: *If the unit was switched OFF by pressing the UNIT ON/OFF key during any of the 168 indexes and there was still 115V AC supplied to the control board, the average temperatures will continue to be logged. This means temperatures would be expected to rise and the SERVICE annunciator would be present in all indexes in which the unit was switched OFF.*

NOTE: *Temperature Log Recall Mode will end 20 seconds after the last key stroke.*

Temperature Log Index Chart

NOTE : *The chart below applies to the hours in which the control has power. Temperature history data will only be stored when the control has 115V AC supplied to it. If power to the unit is interrupted by switching the unit OFF at the UNIT ON/OFF key or due to a power failure, the average temperatures for that time period are stored with the event indicator. The temperature history data is stored in a non-volatile memory, so the data is not erased if power is interrupted.*

TEMPERATURE LOG INDEX CHART

Index= Hours Past	Index= Hours Past	Index= Hours Past	Index= Hours Past
1 = 2 Hrs	43 = 86 Hrs	85 = 170 Hrs	127 = 254 Hrs
2 = 4 Hrs	44 = 88 Hrs	86 = 172 Hrs	128 = 256 Hrs
3 = 6 Hrs	45 = 90 Hrs	87 = 174 Hrs	129 = 258 Hrs
4 = 8Hrs	46 = 92 Hrs	88 = 176 Hrs	130 = 260 Hrs
5 = 10Hrs	47 = 94 Hrs	89 = 178 Hrs	131 = 262 Hrs
6 = 12 Hrs	48 = 96 Hrs *(4 Days)*	90 = 180 Hrs	132 = 264 Hrs *(11 Days)*
7 = 14 Hrs	49 = 98 Hrs	91 = 182 Hrs	133 = 266 Hrs
8 = 16 Hrs	50 = 100 Hrs	92 = 184 Hrs	134 = 268 Hrs
9 = 18 Hrs	51 = 102 Hrs	93 = 186 Hrs	135 = 270 hrs
10 = 20 Hrs	52 = 104 Hrs	94 = 188 Hrs	136 = 272 Hrs
11 = 22 Hrs	53 = 106 Hrs	95 = 190 Hrs	137 = 274 Hrs
12 = 24 Hrs *(1 Day)*	54 = 108 Hrs	96 = 192 Hrs *(8 Days)*	138 = 276 Hrs
13 = 26 Hrs	55 = 110 Hrs	97 = 194 Hrs	139 = 278 Hrs
14 = 28 Hrs	56 = 112 Hrs	98 = 196 Hrs	140 = 280 Hrs
15 = 30 Hrs	57 = 114 Hrs	99 = 198 Hrs	141 = 282 Hrs
16 = 32 Hrs	58 = 116 Hrs	100 = 200 Hrs	142 = 284 Hrs
17 = 34 Hrs	59 = 118 Hrs	101 = 202 Hrs	143 = 286 Hrs
18 = 36 Hrs	60 = 120 Hrs *(5 Days)*	102 = 204 Hrs	144 = 288 Hrs *(12 Days)*
19 = 38 Hrs	61 = 122 Hrs	103 = 206 Hrs	145 = 290 Hrs
20 = 40 Hrs	62 = 124 Hrs	104 = 208 Hrs	146 = 292 Hrs
21 = 42 Hrs	63 = 126 Hrs	105 = 210 Hrs	147 = 294 Hrs
22 = 44 Hrs	64 = 128 Hrs	106 = 202 Hrs	148 = 296 Hrs
23 = 46 Hrs	65 = 130 Hrs	107 = 214 Hrs	149 = 298 Hrs
24 = 48 Hrs *(2 Days)*	66 = 132 Hrs	108 = 216 Hrs *(9 Days)*	150 = 300 Hrs
25 = 50 Hrs	67 = 134 Hrs	109 = 218 Hrs	151 = 302 Hrs
26 = 52 Hrs	68 = 136 Hrs	110 = 220 Hrs	152 = 304 Hrs
27 = 54 Hrs	69 = 138 Hrs	111 = 222 Hrs	153 = 306 Hrs
28 = 56 Hrs	70 = 140 Hrs	112 = 224 Hrs	154 = 308 Hrs
29 = 58 Hrs	71 = 142 Hrs	113 = 226 Hrs	155 = 310 Hrs
30 = 60 Hrs	72 = 144 Hrs *(6 Days)*	114 = 228 Hrs	156 = 312 Hrs *(13 Days)*
31 = 62 Hrs	73 = 146 Hrs	115 = 230 Hrs	157 = 314 Hrs
32 = 64 Hrs	74 = 148 Hrs	116 = 232 Hrs	158 = 316 Hrs
33 = 66 Hrs	75 = 150 Hrs	117 = 234 Hrs	159 = 318 Hrs
34 = 68 Hrs	76 = 152 Hrs	118 = 236 Hrs	160 = 320 Hrs
35 = 70 Hrs	77 = 154 Hrs	119 = 238 hrs	161 = 322 Hrs
36 = 72 Hrs *(3 Days)*	78 = 156 Hrs	120 = 240 Hrs *(10 Days)*	162 = 324 Hrs
37 = 74 Hrs	79 = 158 Hrs	121 = 242 Hrs	163 = 326 hrs
38 = 76 Hrs	80 = 160 Hrs	122 = 244 Hrs	164 = 328 Hrs
39 = 78 Hrs	81 = 162 Hrs	123 = 246 Hrs	165 = 330 Hrs
40 = 80 Hrs	82 = 164 Hrs	124 = 248 Hrs	166 = 332 Hrs
41 = 82 Hrs	83 = 166 Hrs	125 = 250 Hrs	167 = 334 Hrs
42 = 84 Hrs	84 = 168 Hrs *(7 Days)*	126 = 252 Hrs	168 = 336 Hrs *(14 Days)*

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. 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.

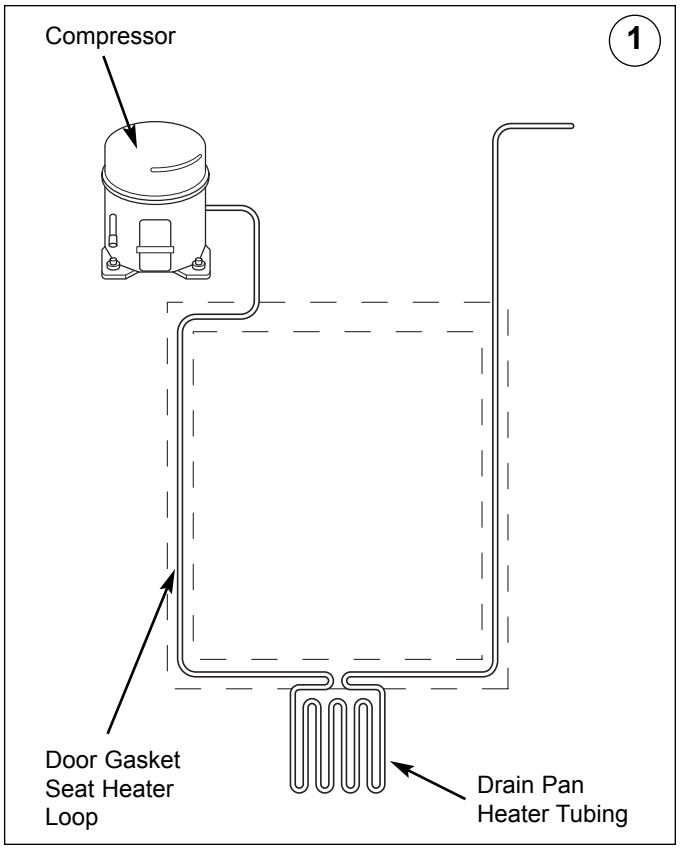


Figure 4-1. Compressor

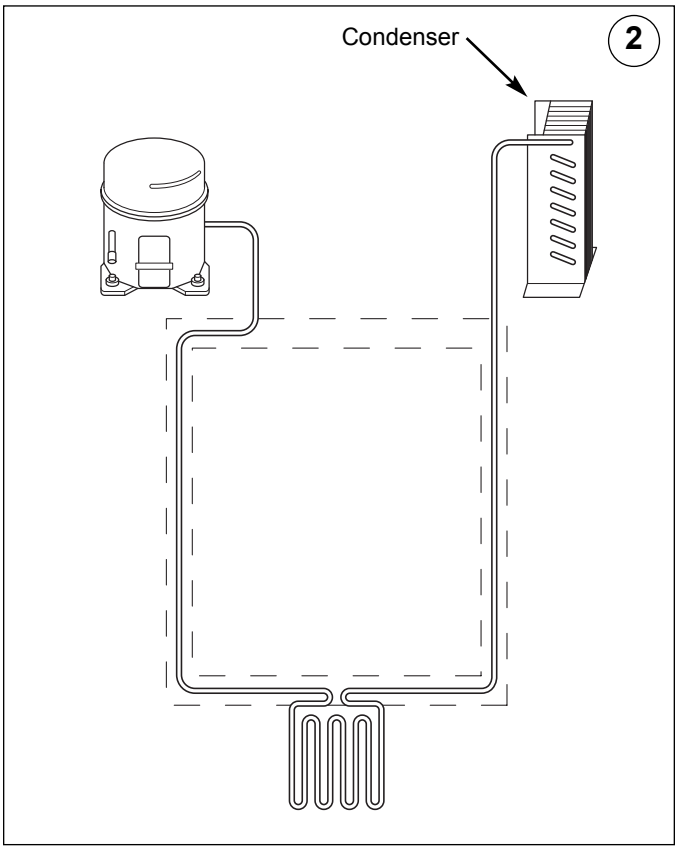


Figure 4-2. Condenser

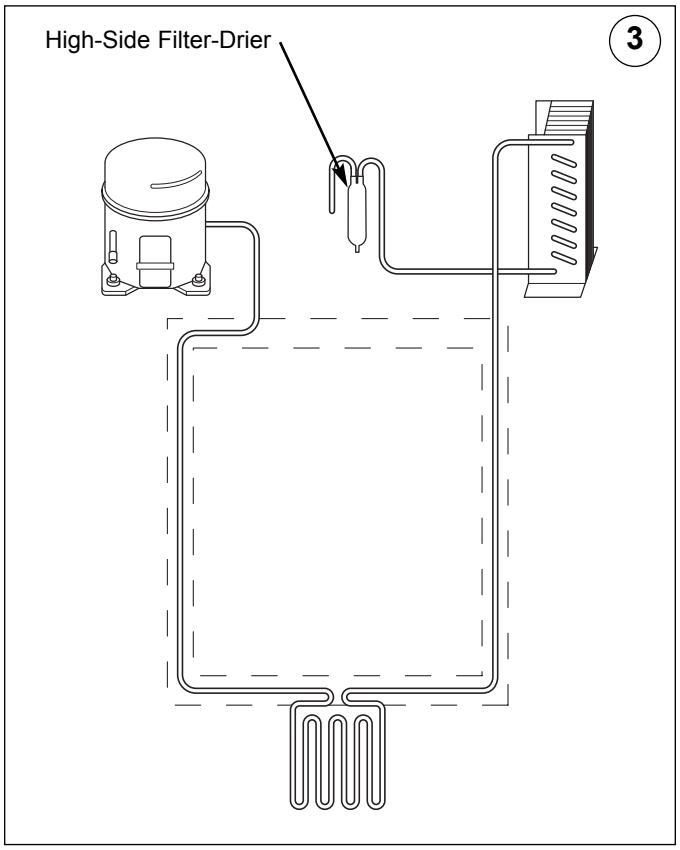


Figure 4-3. High-Side Filter-Drier

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.

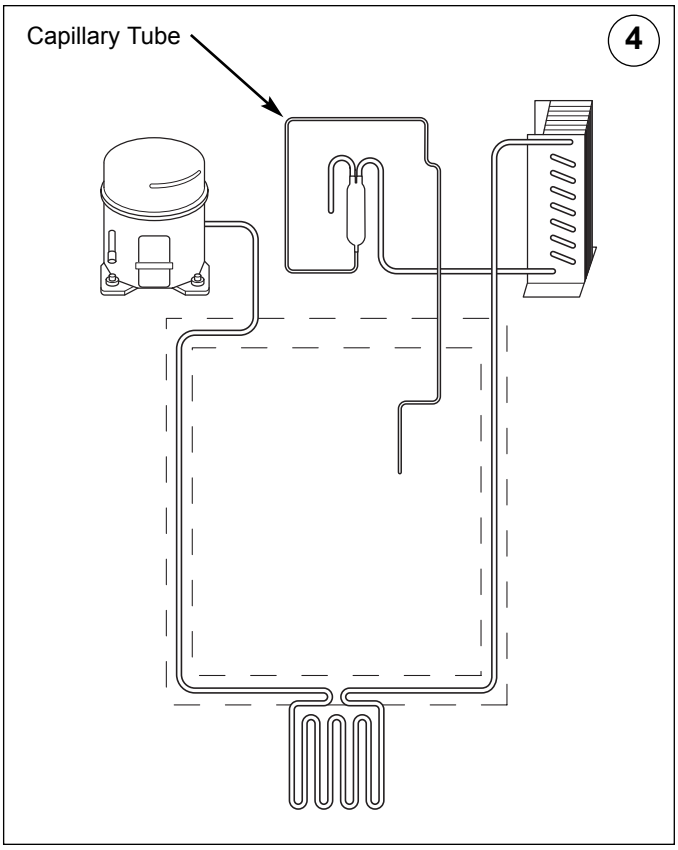


Figure 4-4. Capillary Tube (Part of Heat Exchanger)

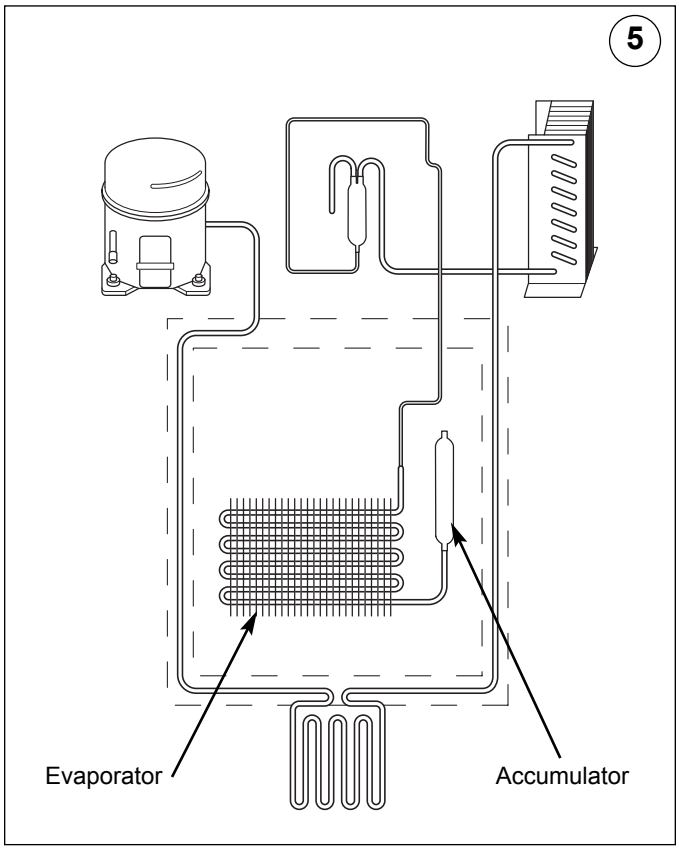


Figure 4-5. Evaporator

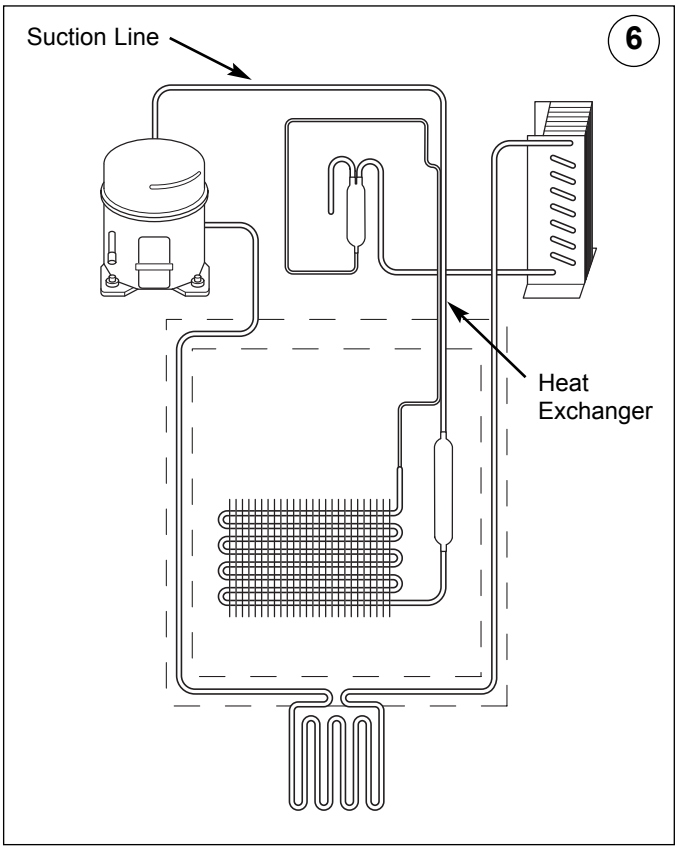


Figure 4-6. Suction Line (Part of Heat Exchanger)

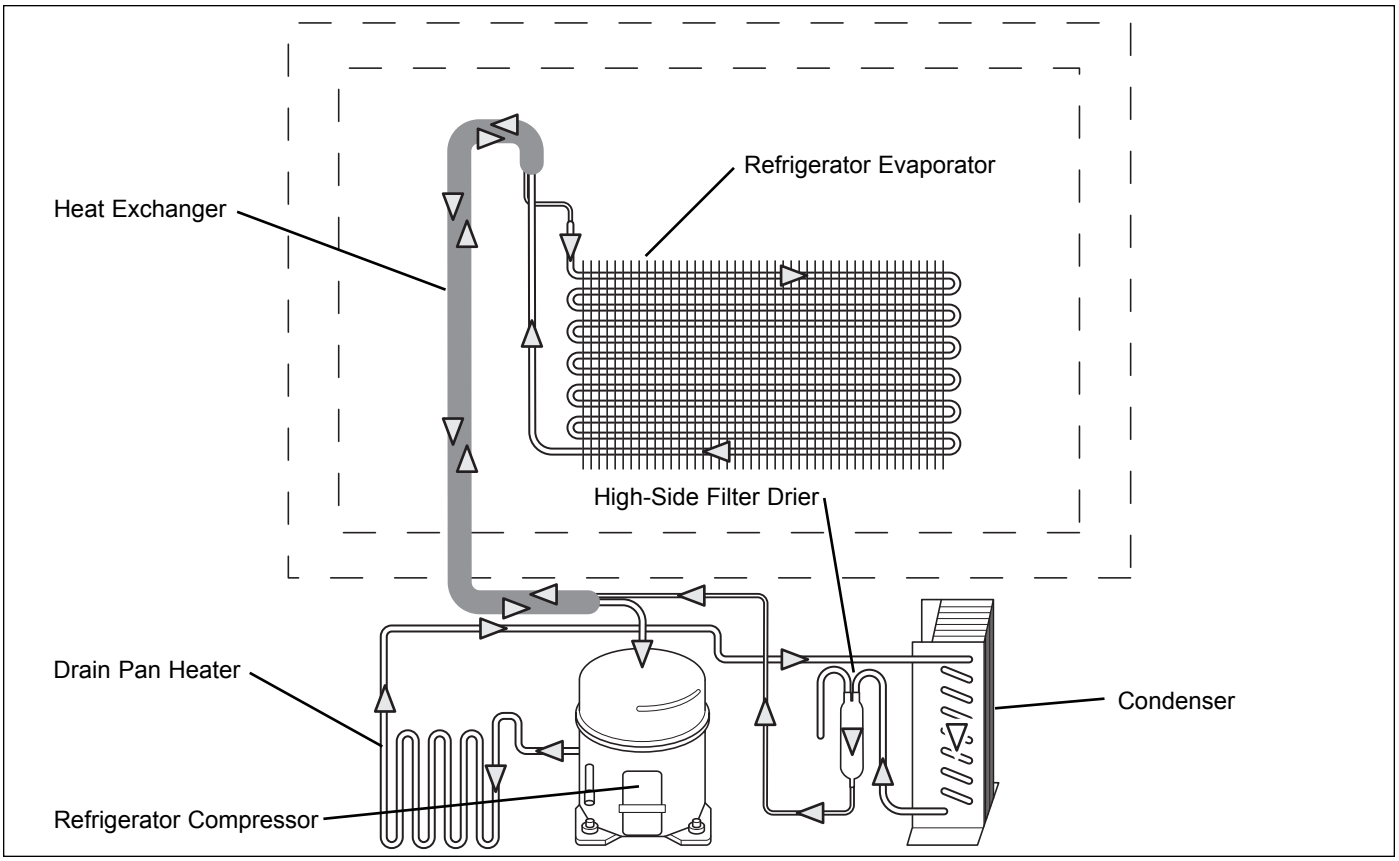


Figure 4-7. Models 601R, 601RG Refrigerant Flow

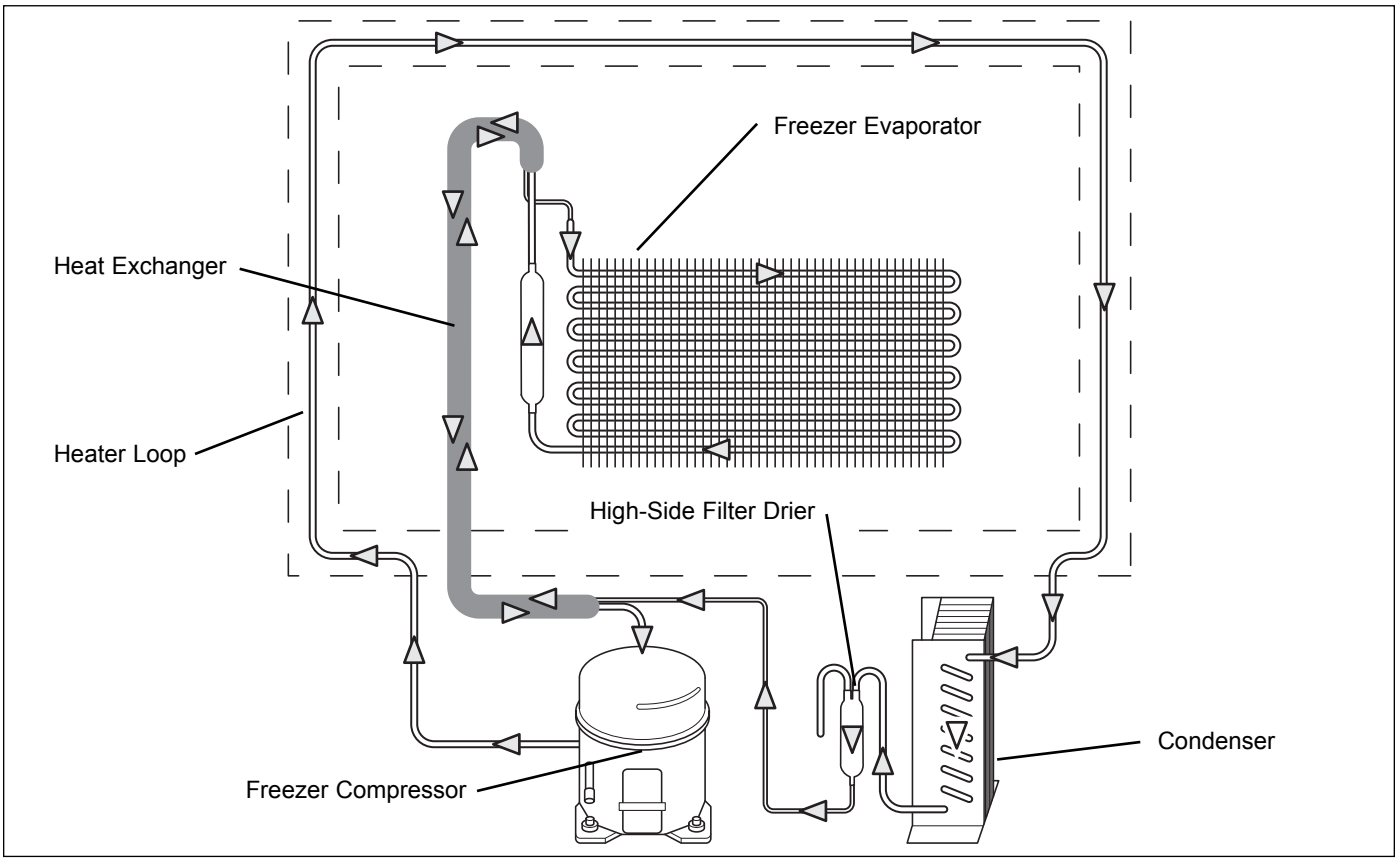


Figure 4-8. Model 601F Refrigerant Flow

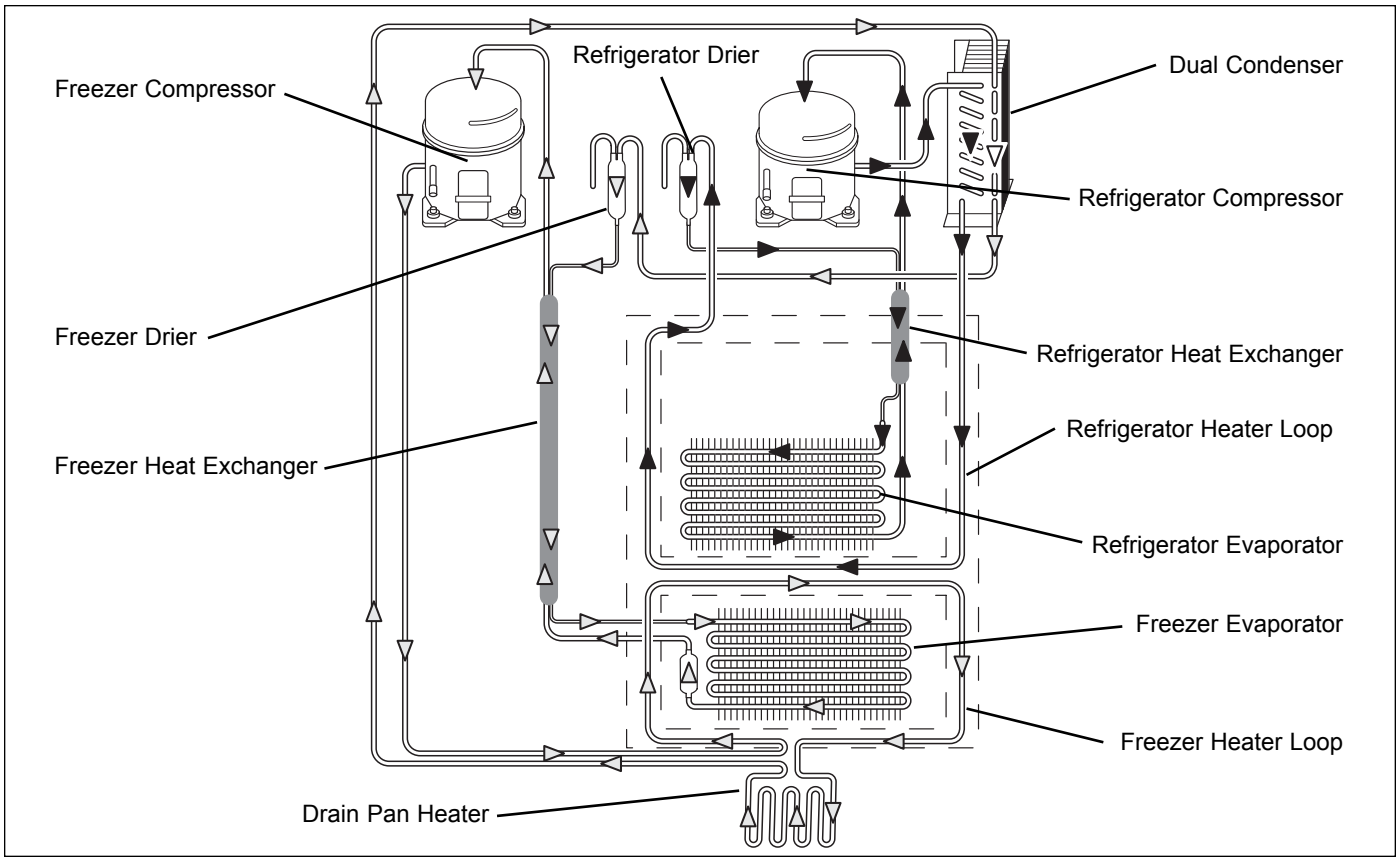


Figure 4-9. Models 611, 611G, 650, 650G Refrigerant Flow

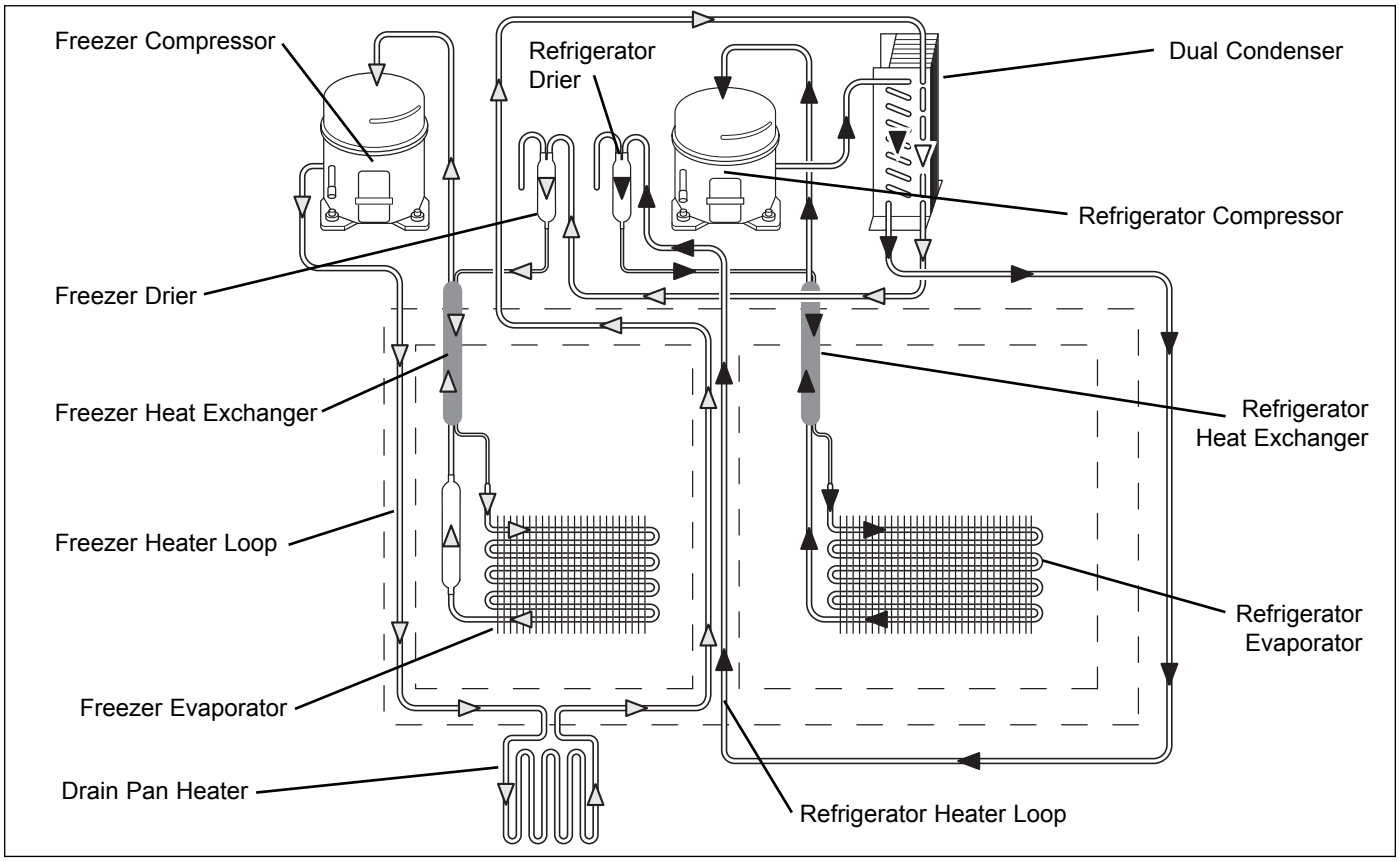


Figure 4-10. Models 632, 642, 680, 690 Refrigerant Flow

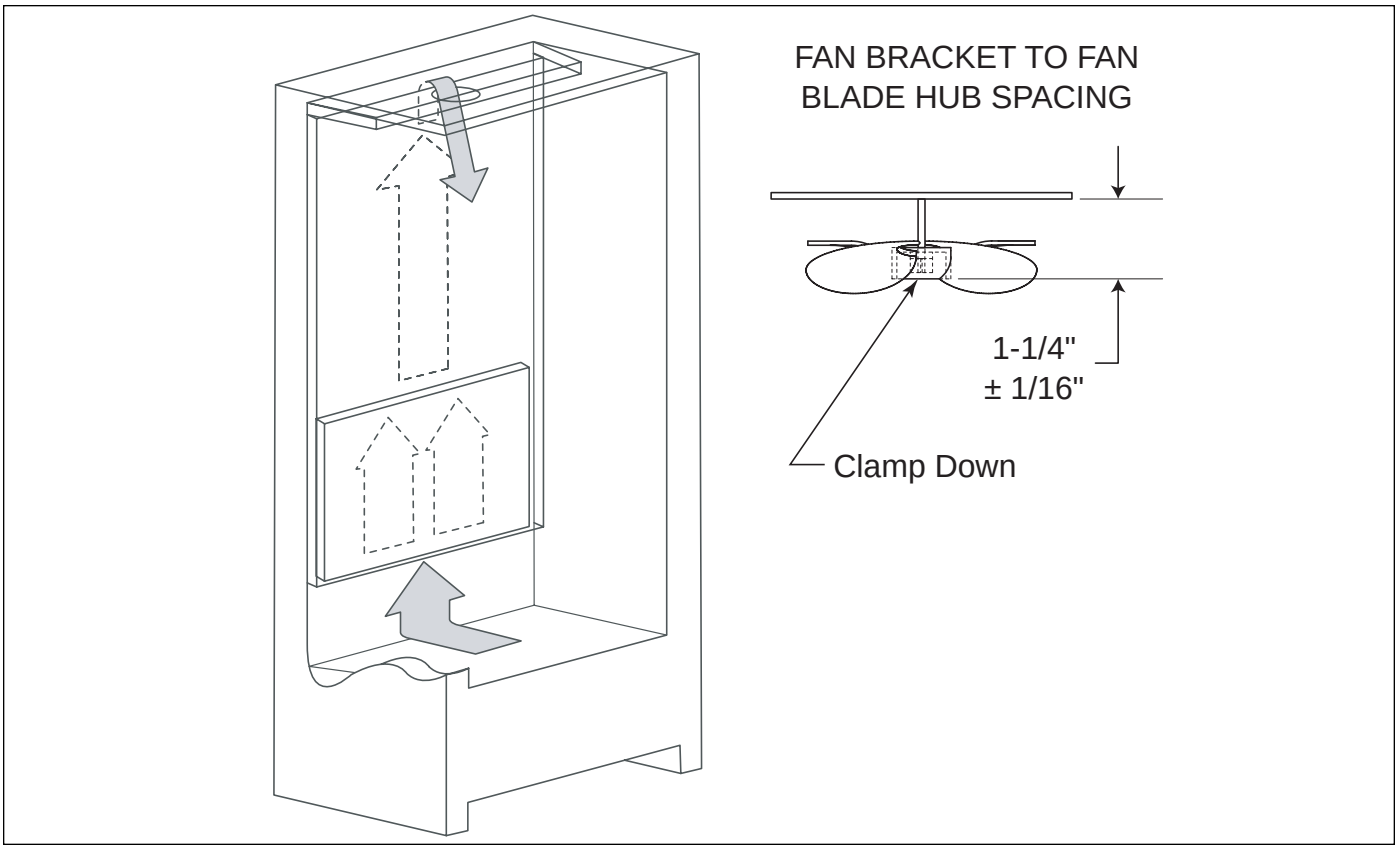


Figure 5-1. Air Flow and Fan Blade Spacing, Models 601R and 601RG

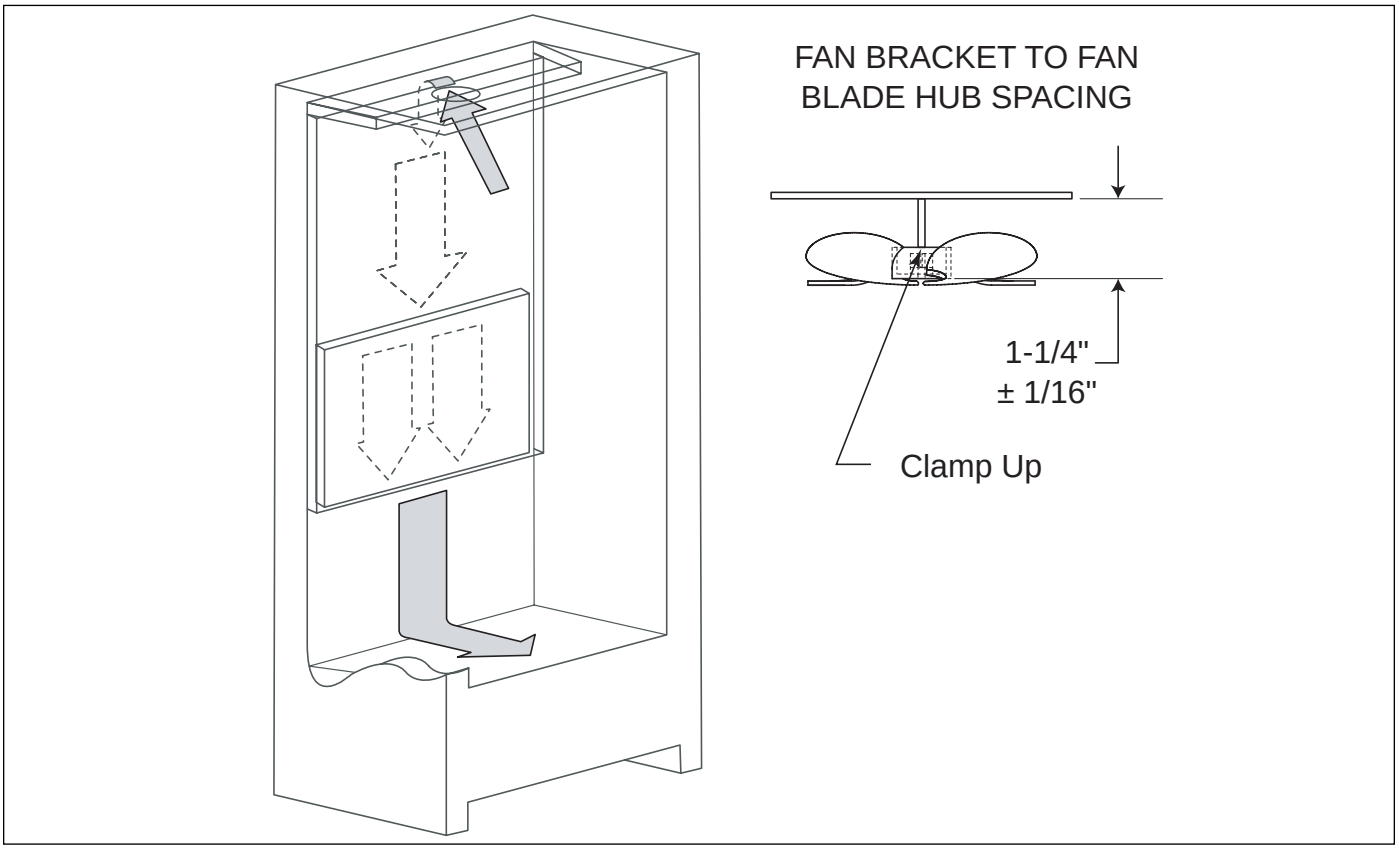


Figure 5-2. Air Flow and Fan Blade Spacing, Model 601F

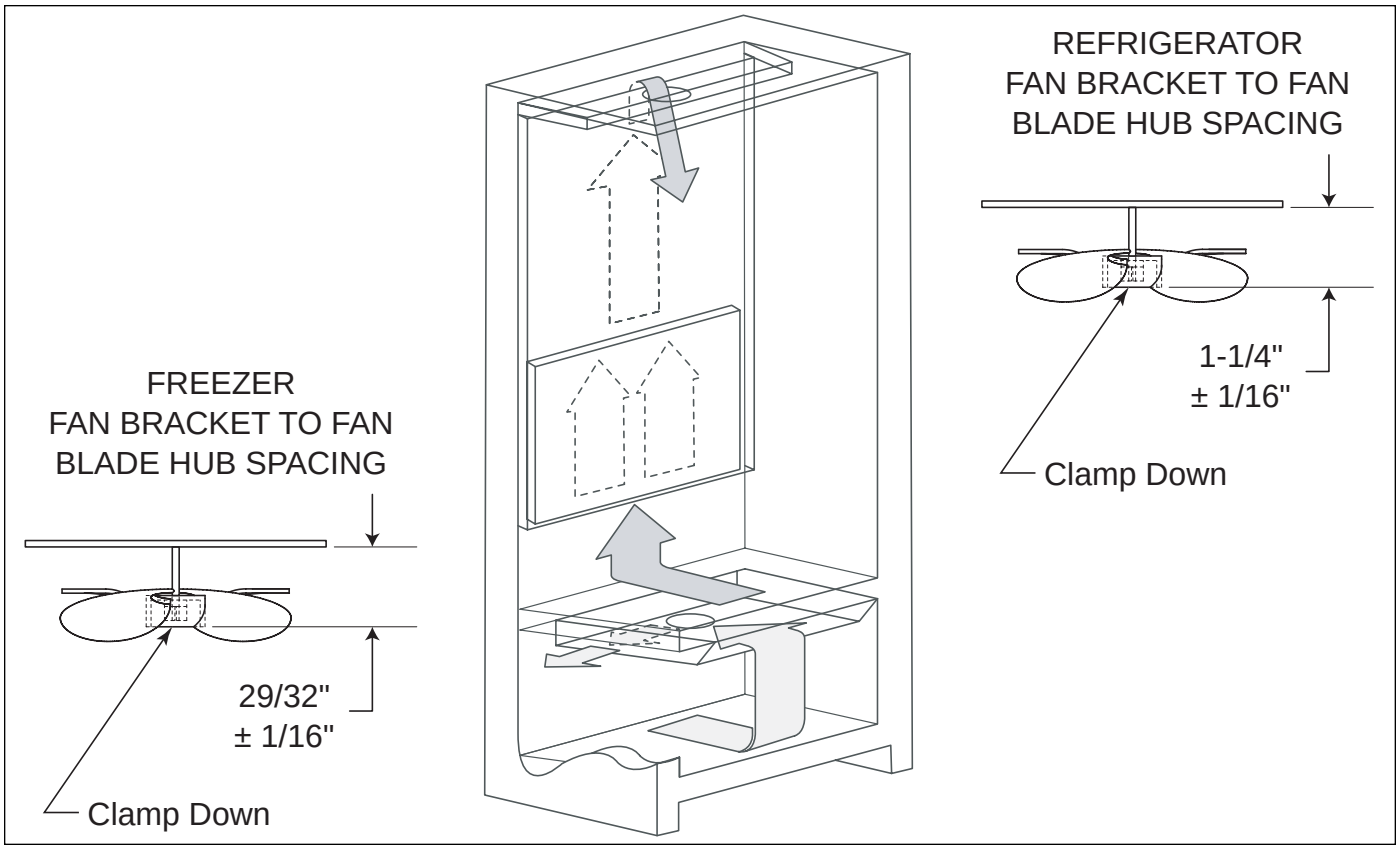


Figure 5-3. Air Flow and Fan Blade Spacing, Models 611, 611G, 650 and 650G

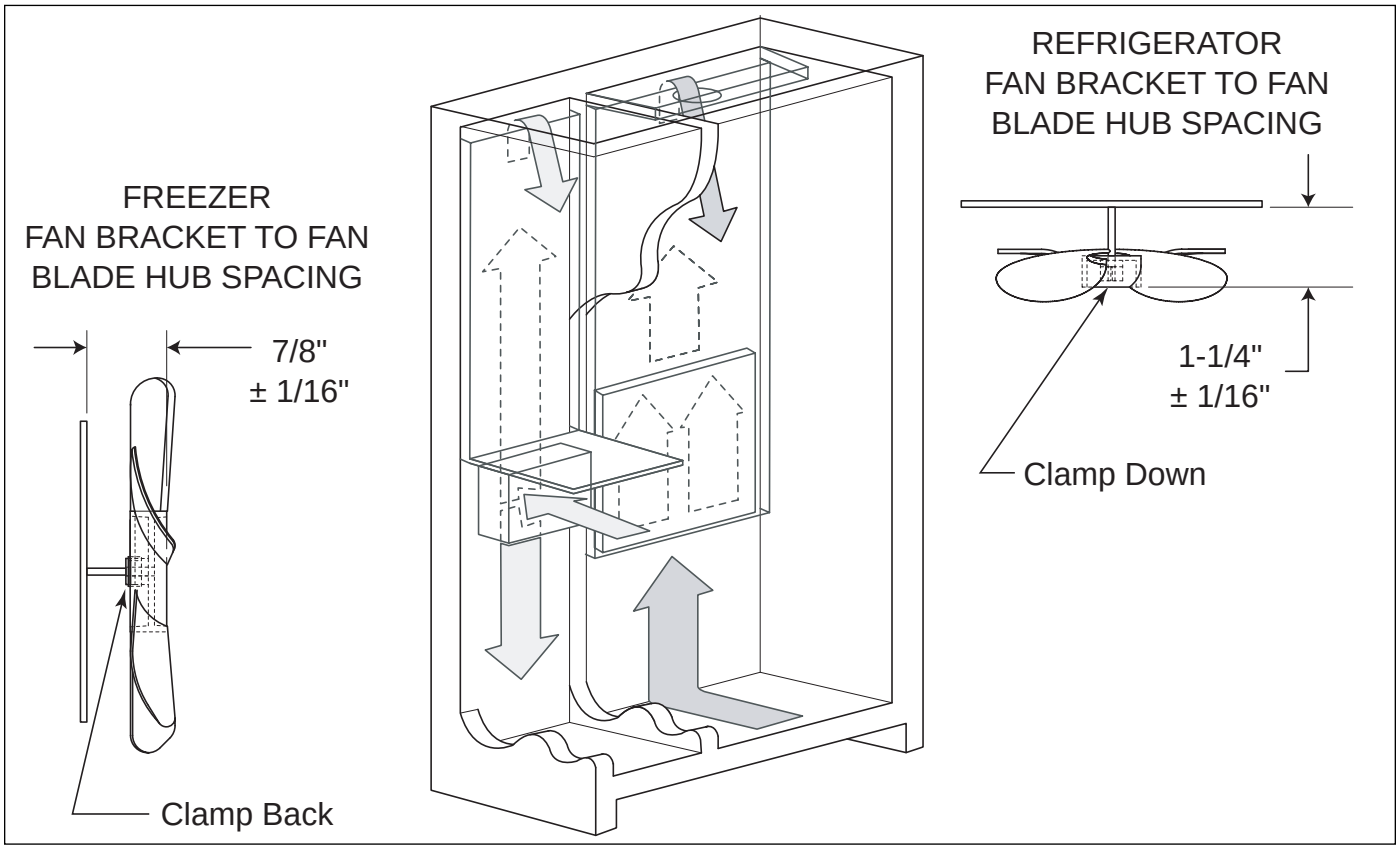


Figure 5-4. Air Flow and Fan Blade Spacing, Models 632 and 642

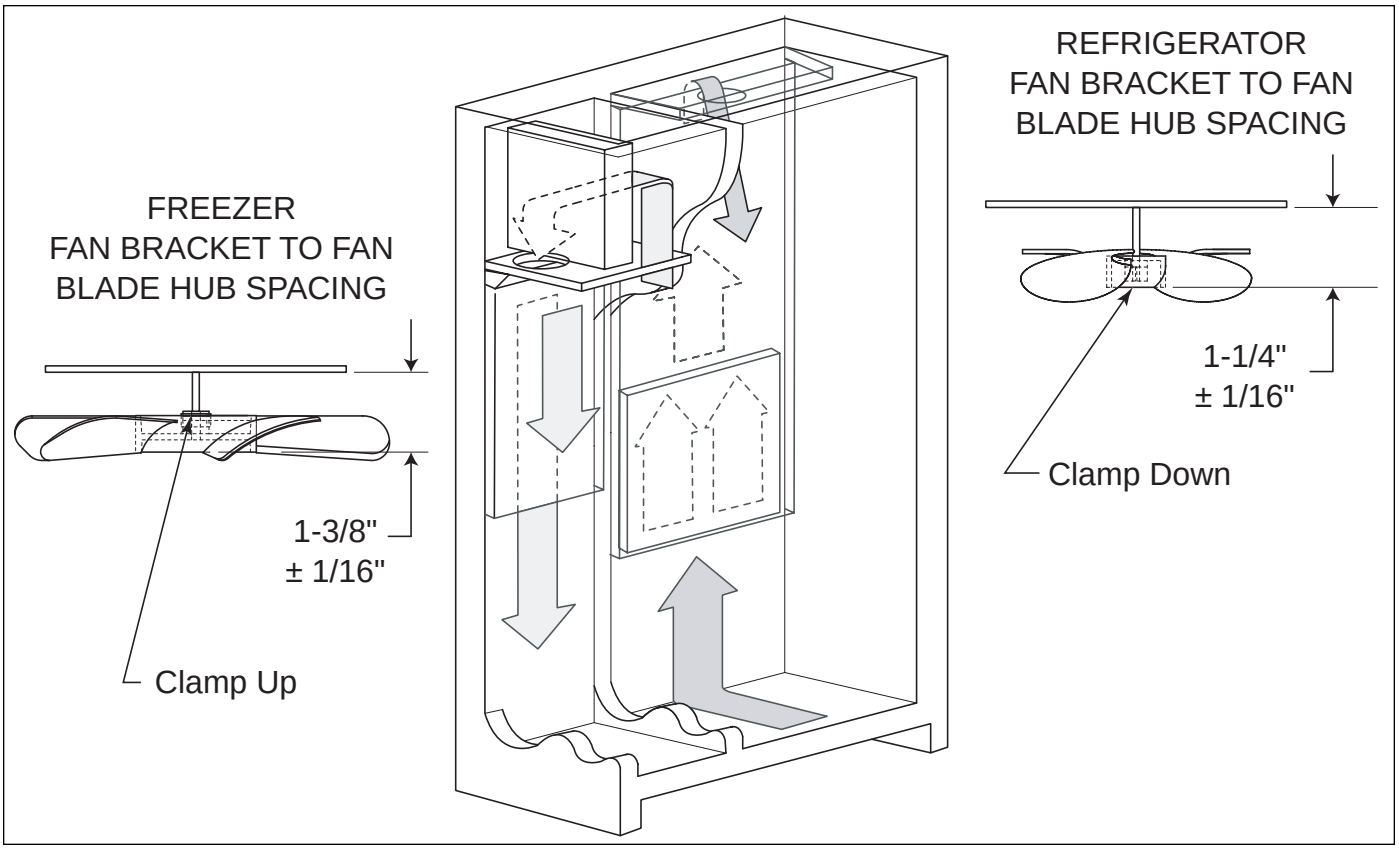


Figure 5-5. Air Flow and Fan Blade Spacing, Model 680

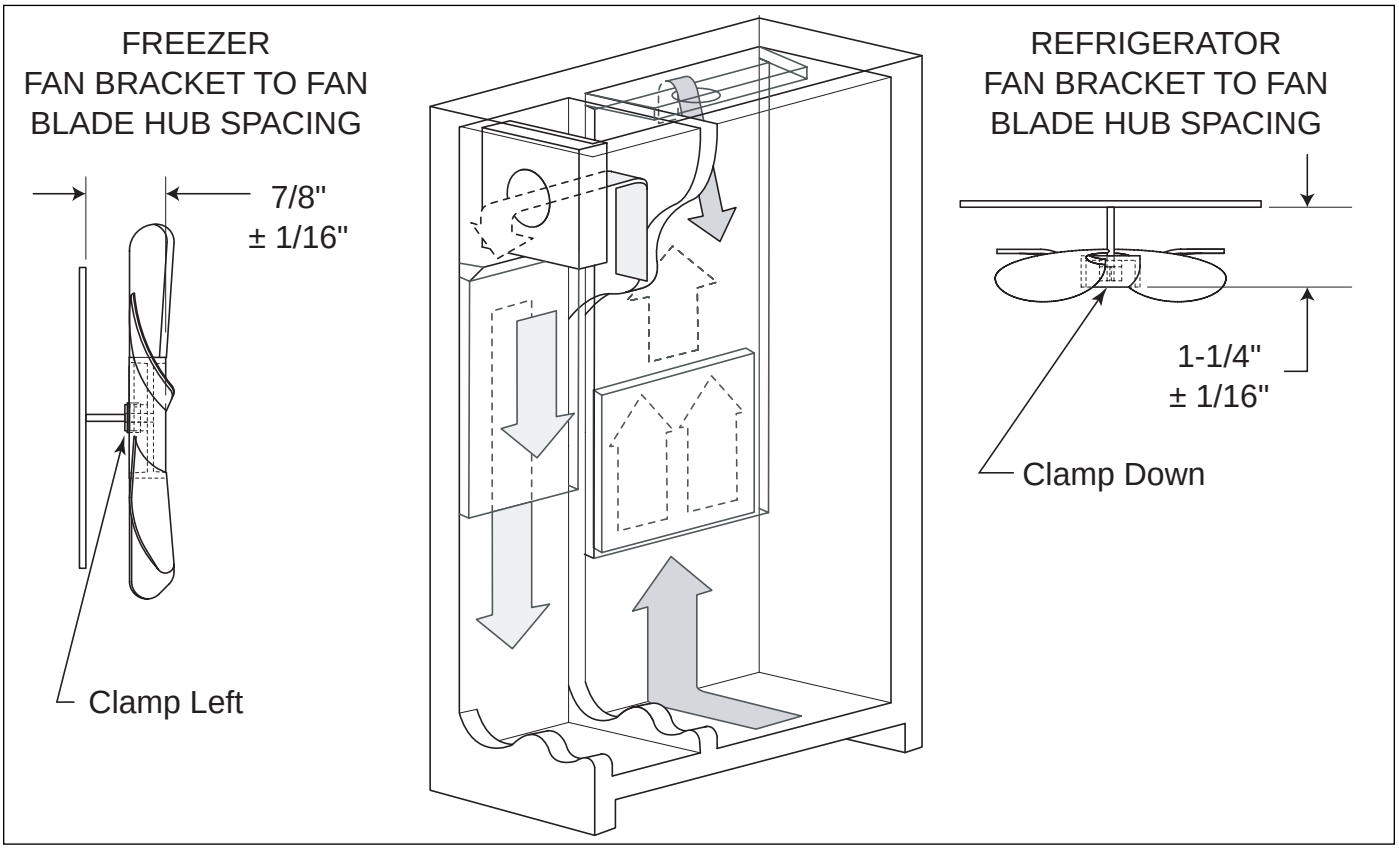


Figure 5-6. Air Flow and Fan Blade Spacing, Model 690

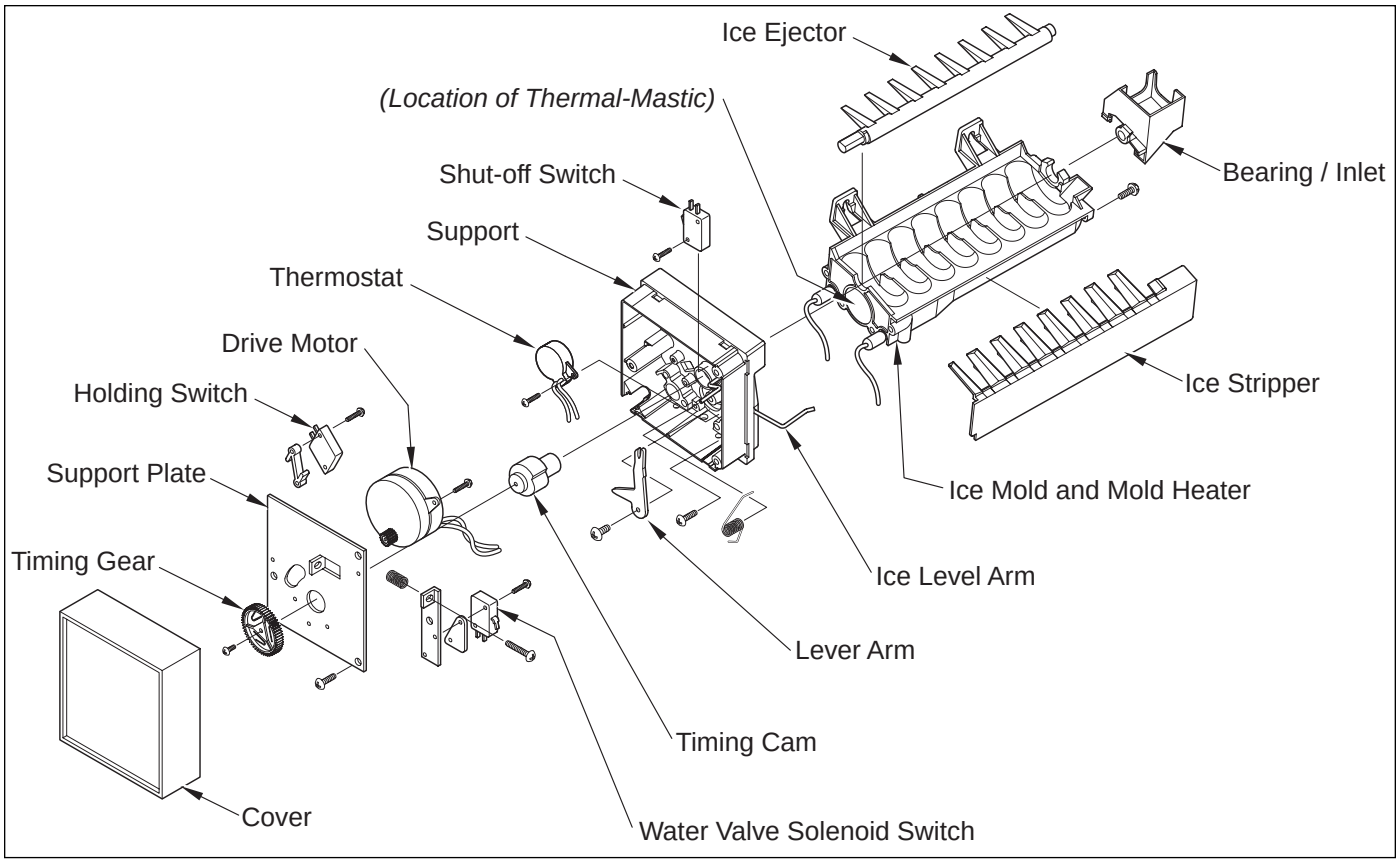


Figure 6-1. Diagram of Icemaker Components

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.

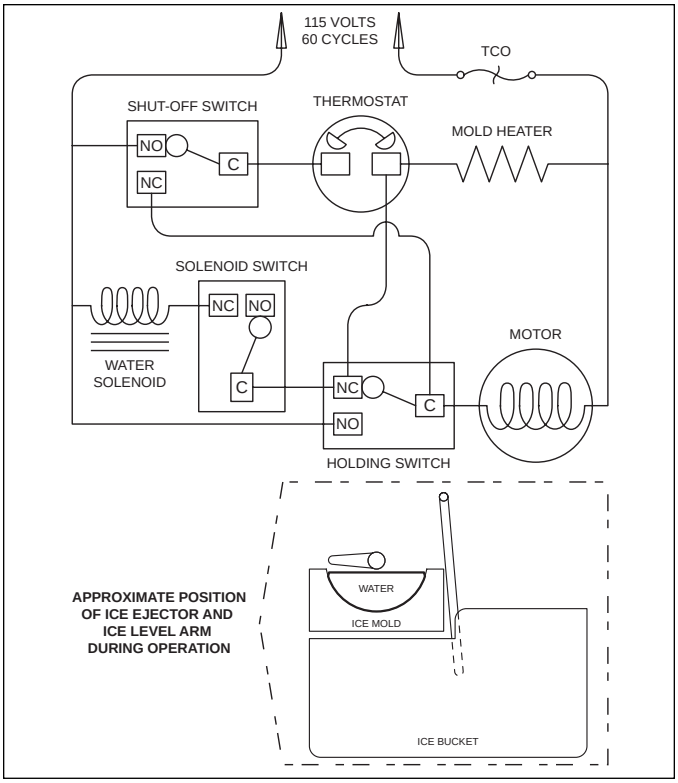


Figure 6-2. The Freeze Phase

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.)

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.

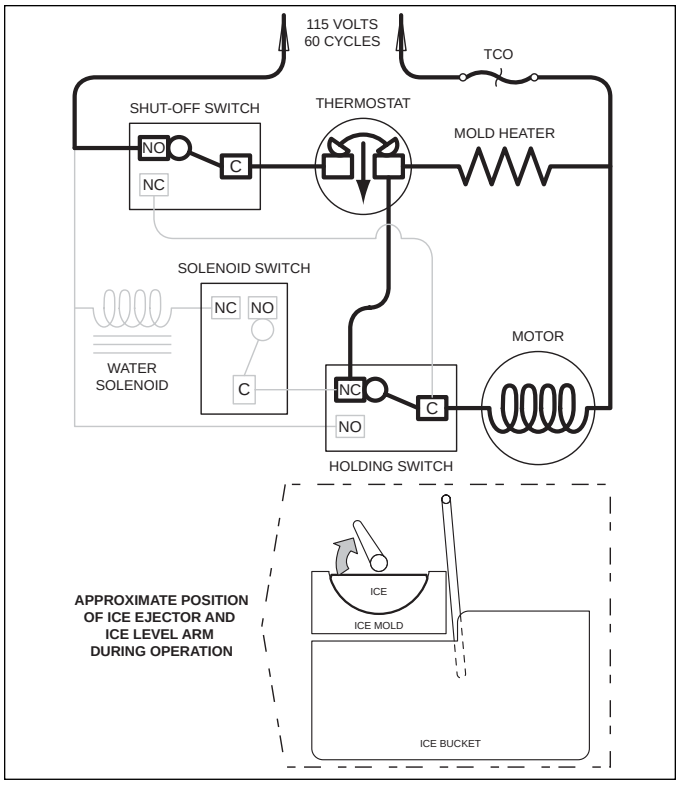


Figure 6-3. Start of First Revolution

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.

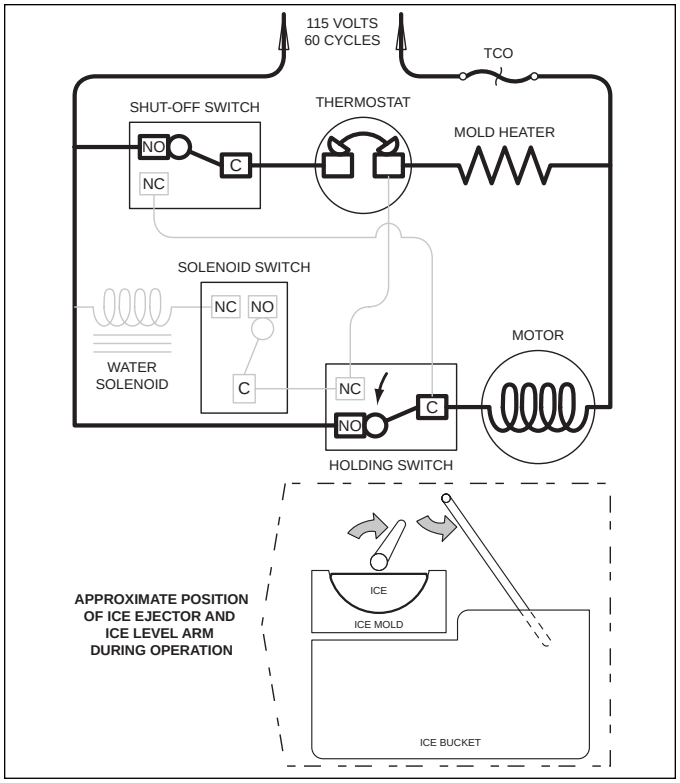


Figure 6-4. First Revolution Continued

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.

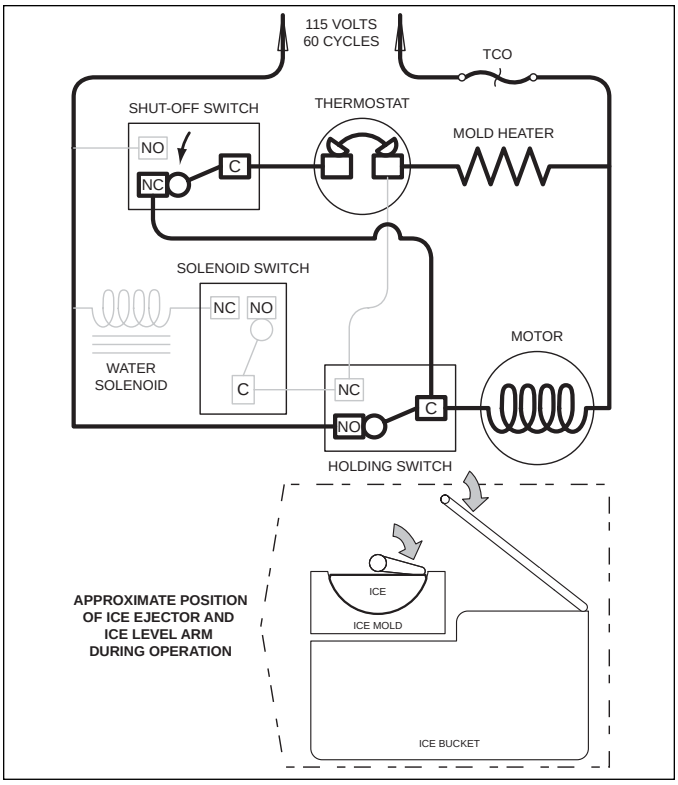


Figure 6-5. First Revolution Continued

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.)

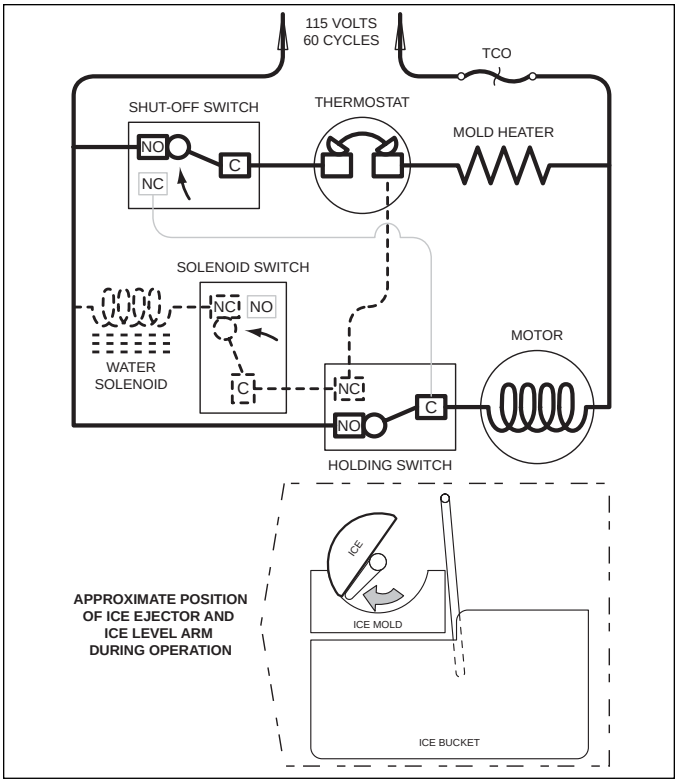


Figure 6-6. First Revolution Continued

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.

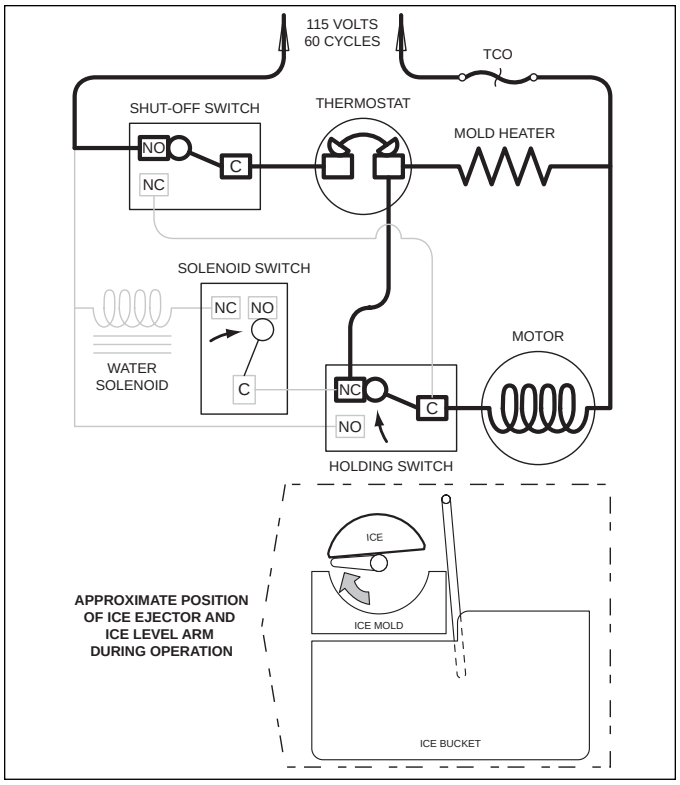


Figure 6-7. End of First Revolution

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.

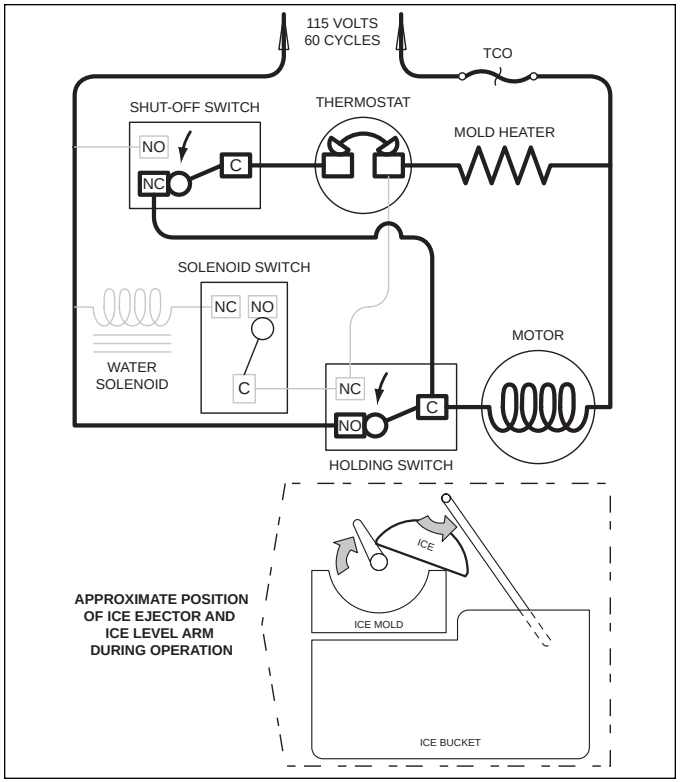


Figure 6-8. Start of Second Revolution

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.

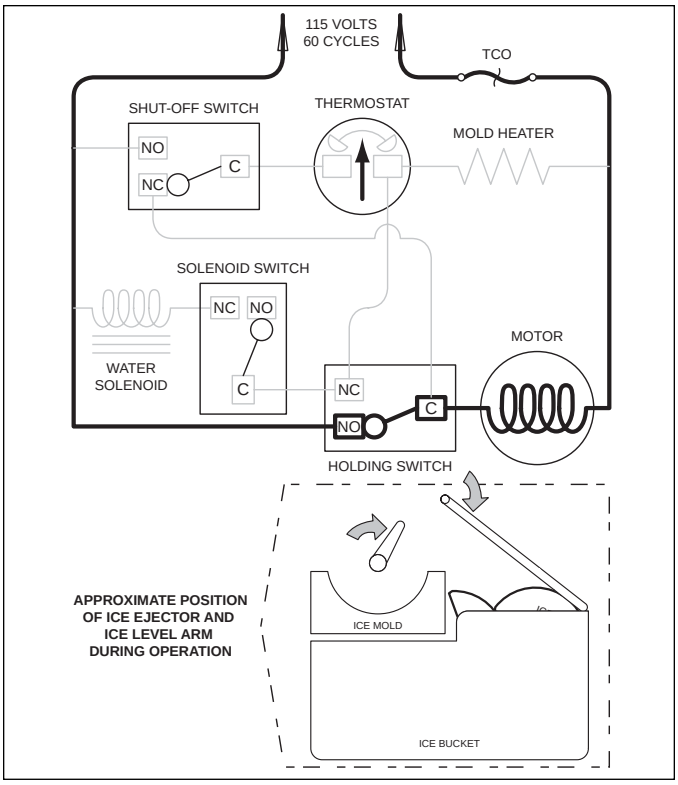


Figure 6-9. Second Revolution Continued

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.

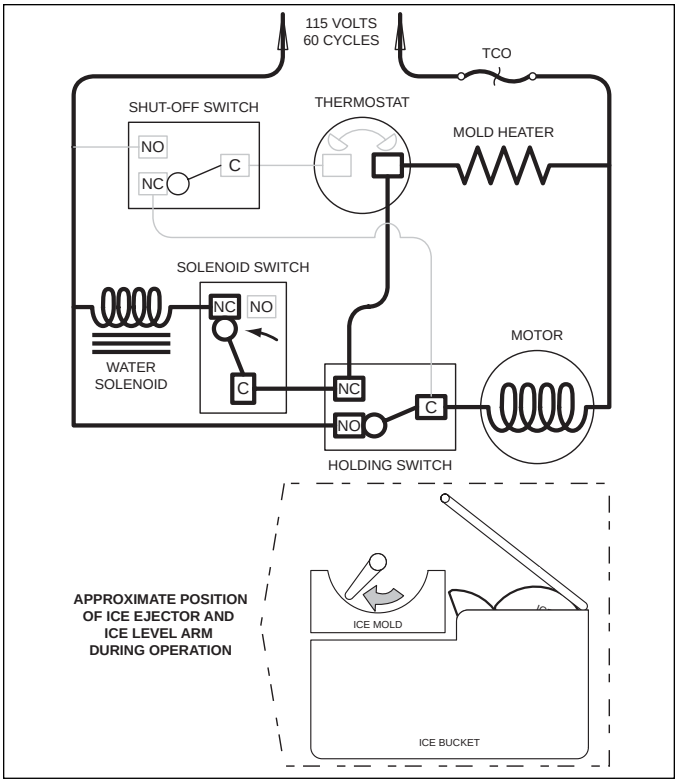


Figure 6-10. Second Revolution Continued

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.

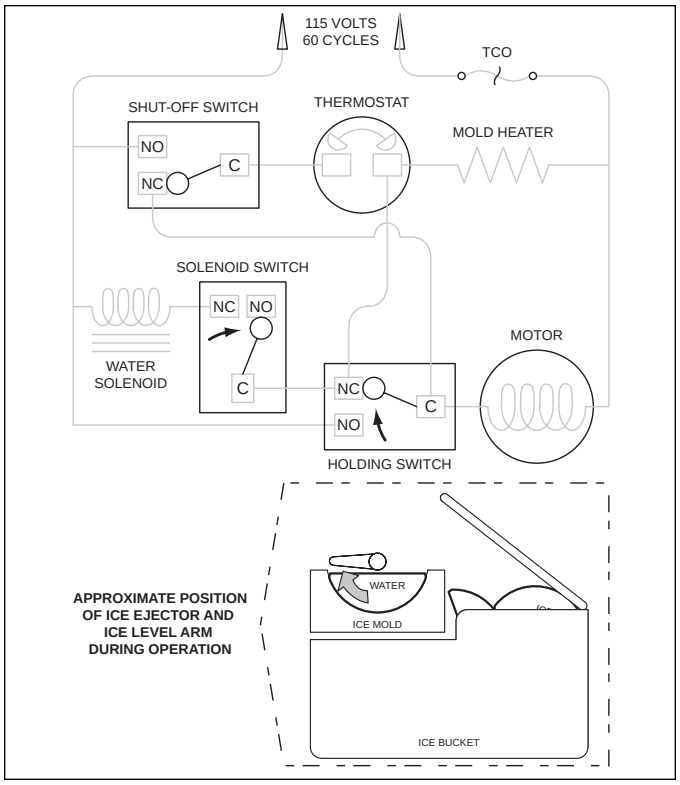


Figure 6-11. End of Ice Making Cycle

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).

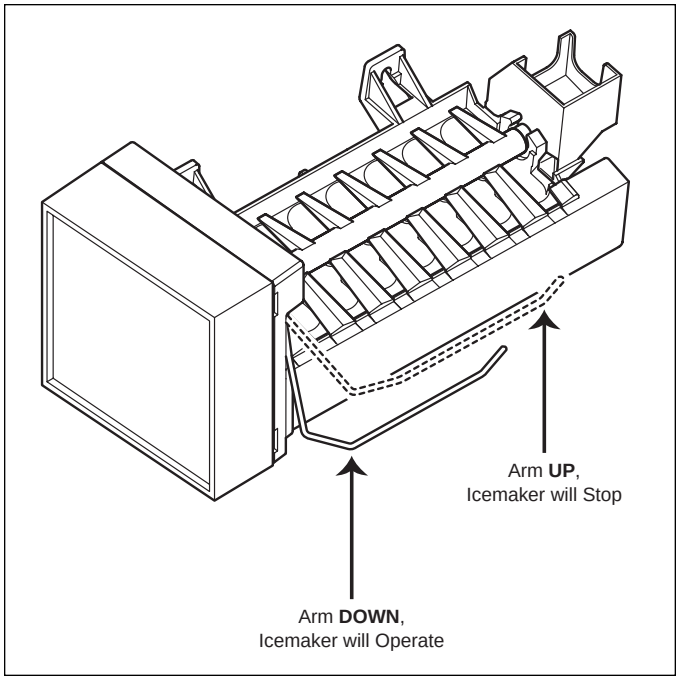


Figure 6-12. Stopping Icemaker

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.*

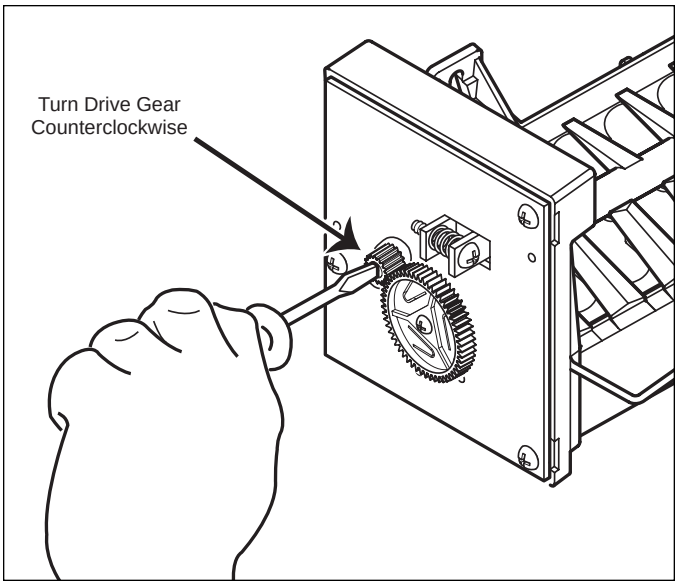


Figure 6-13. Manually Start Icemaker

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.*

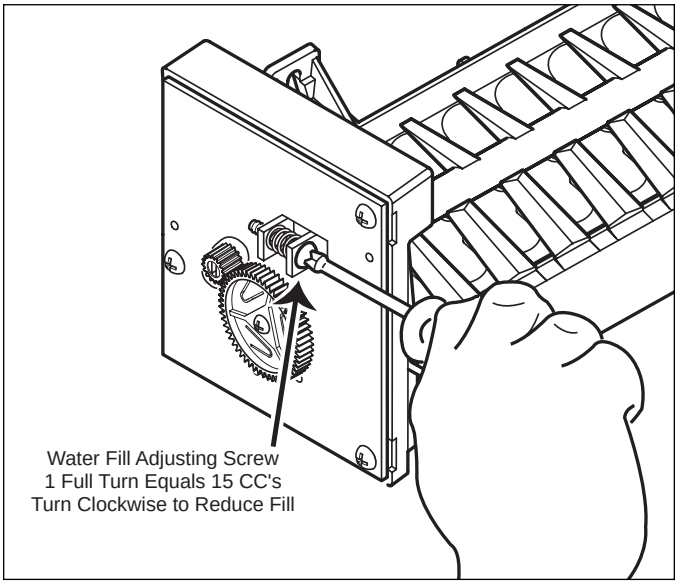


Figure 6-14. Adjust Water Fill Level

PRIMARY PARTS REMOVAL AND ADJUSTMENTS

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 Removal (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 Access and Removal (All Models)

⚠ CAUTION

Light bulbs are hot and could cause minor personal injury.

⚠ WARNING

Electric shock hazard. If bulb should separate from base. Disconnect power to unit before attempting to remove base from socket.

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 Assembly Removal and Adjustment (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.)

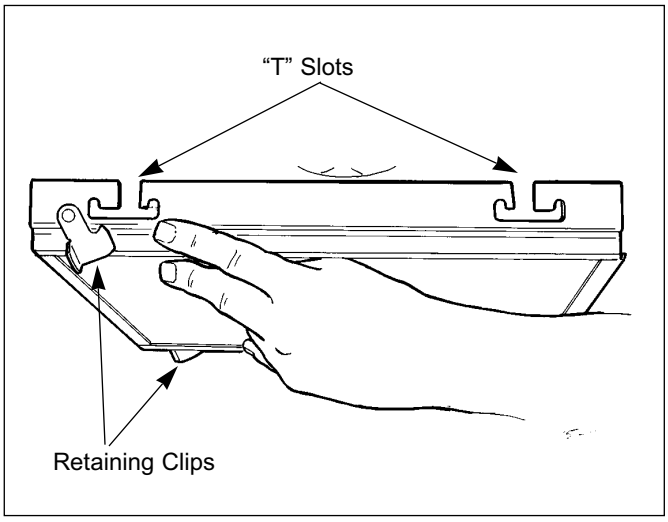


Figure 7-1. Slots & Retaining Clips

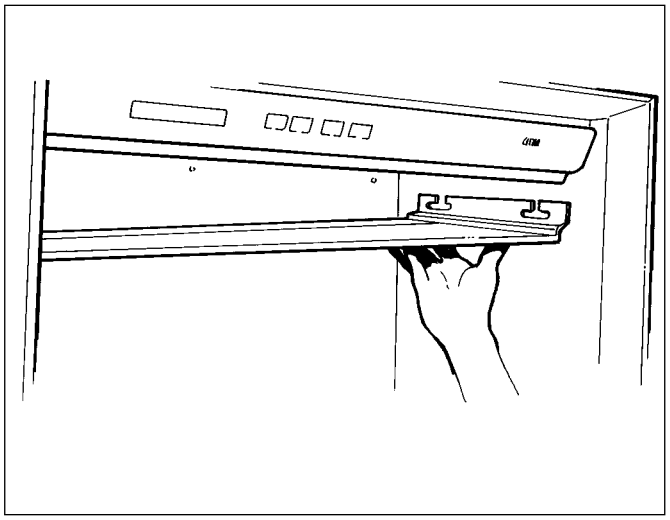


Figure 7-2. Light Diffuser Removal

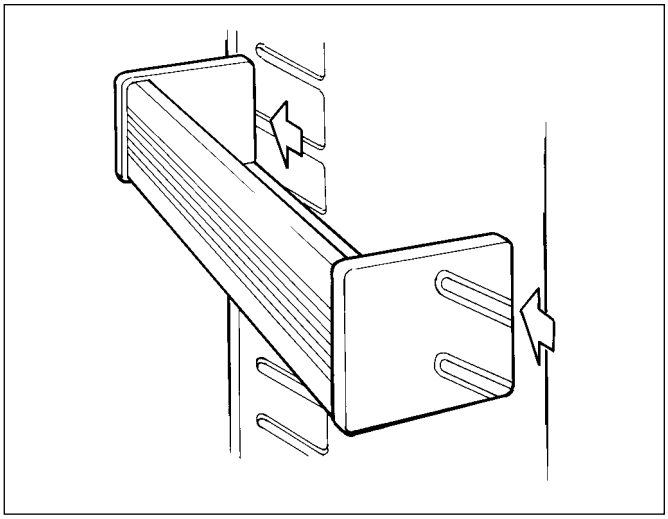


Figure 7-3. Door Shelf Removal

Refrigerator & Freezer Compartment Shelf Removal and Adjustment (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.

Utility Basket Removal (Models 601R, 611, 632, 642, 650, 680, 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.)

Crisper Glass Shelf Removal (Models 601R, 611, 632, 642, 650, 680, 690)
Remove crisper glass shelf assembly by opening top drawer and lifting assembly off of crisper glass supports.

Large High Humidity Drawer Removal (Models 601R, 611, 632, 642, 650, 680, 690)
Remove high humidity drawer assembly by pulling open until drawer stops, then lift front of drawer while pulling out. (See Figure 7-6).

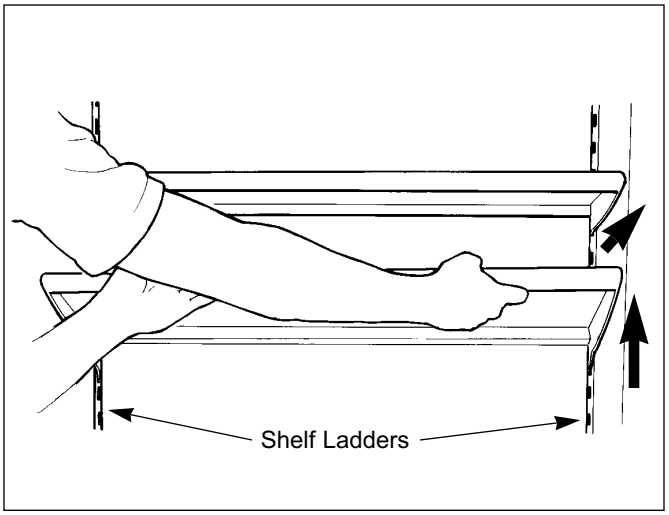


Figure 7-4. Shelf Removal

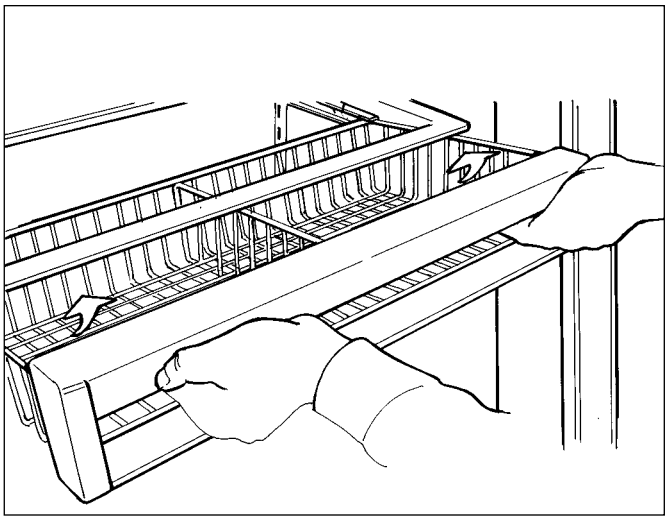


Figure 7-5. Utility Basket Removal

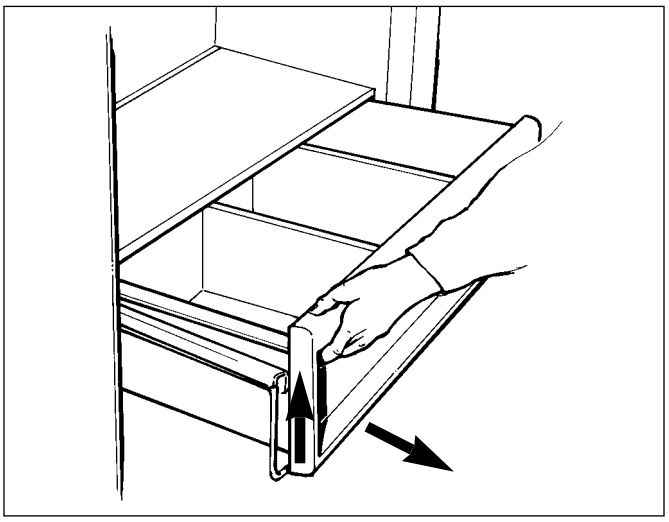


Figure 7-6. High Humidity Drawer Removal

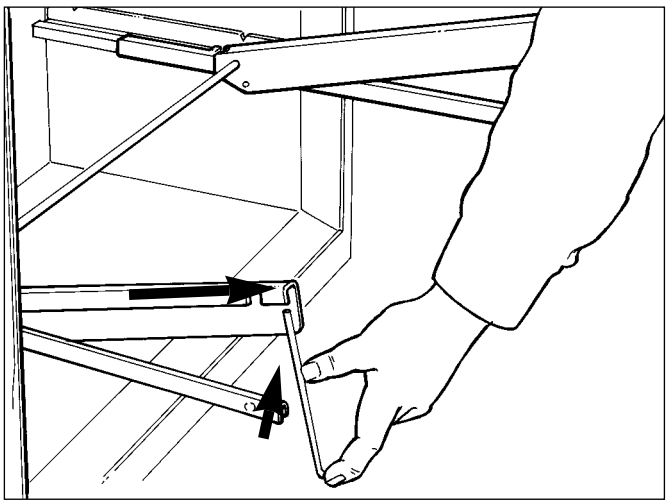


Figure 7-7. Drawer Carriage Assembly Removal

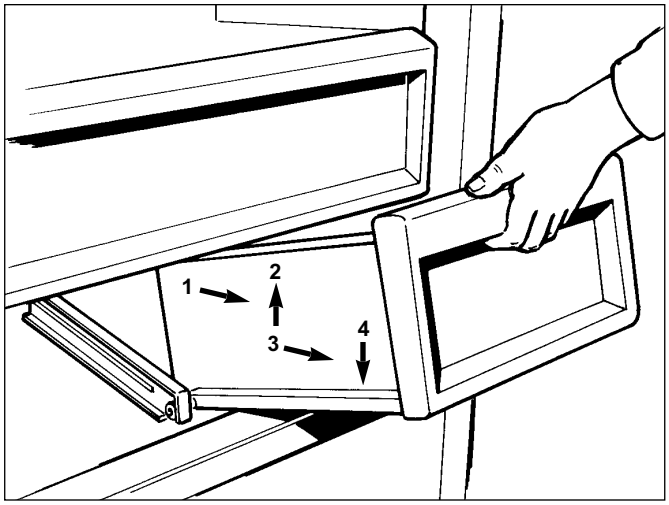


Figure 7-8. Small Storage Drawer Removal

Humidity Drawer Carriage Assembly Removal (Models 601R, 611, 632, 642, 650, 680, 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.*

Small Storage Drawer Removal (Models 632, 642, 680, 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.)

Freezer Basket Removal (Models 601F, 632, 642, 680, 690)
Remove freezer baskets by pulling open until basket stops, then lift up at the front and pull out. (See Figure 7-9.)

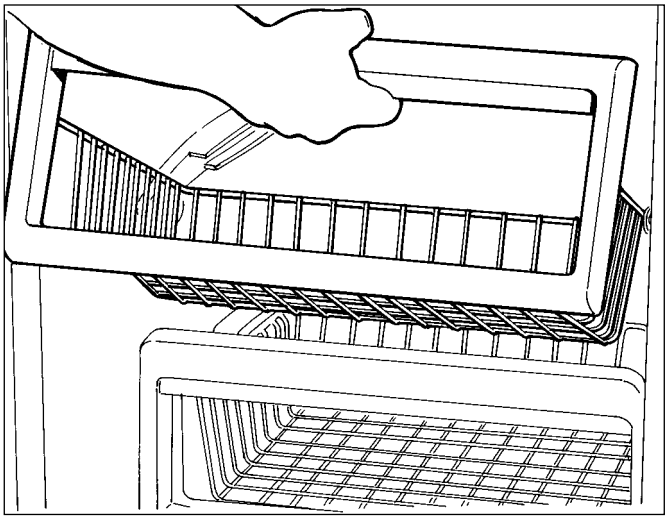


Figure 7-9. Freezer Basket Removal

Freezer Glass Shelf Removal (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).*

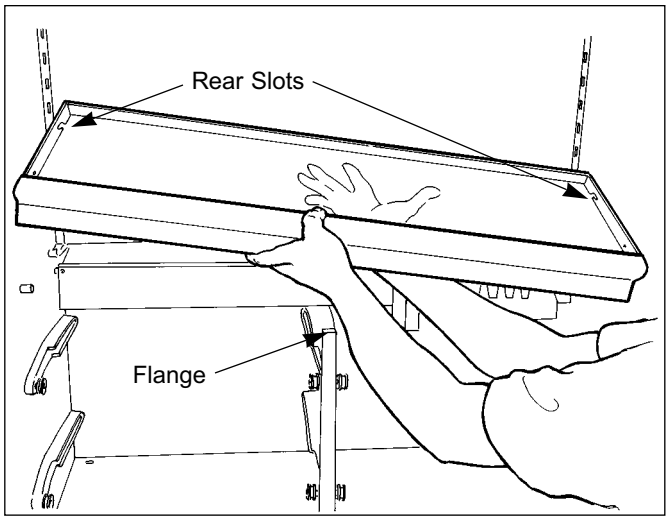


Figure 7-10. Model 601F Freezer Glass Shelf Removal

Ice Bucket Removal (Model 601F)
Remove ice bucket by lifting out of top right freezer basket.

Ice Bucket Removal (Model 611 and 650)
Remove ice bucket by lifting out of left rear corner of upper freezer basket.

Ice Bucket Assembly Removal (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.

Juice Can Rack Removal (Models 680, 690)
Remove juice can rack by lifting up and pulling out. (See Figure 7-12.)

Ice Bucket Assembly Removal (Models 680, 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.*

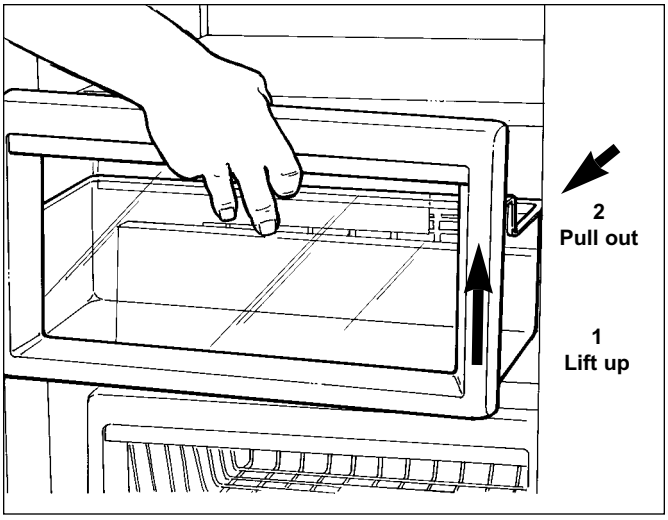


Figure 7-11. Model 632, 642 Ice Bucket Removal

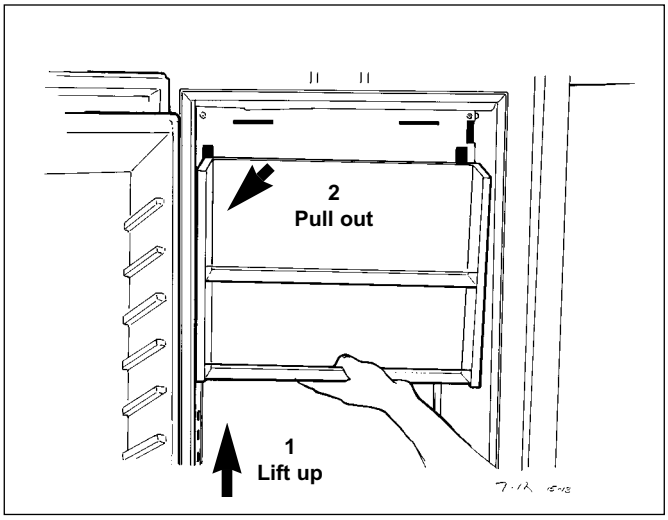


Figure 7-12. Models 680 & 690 Juice Can Rack Removal

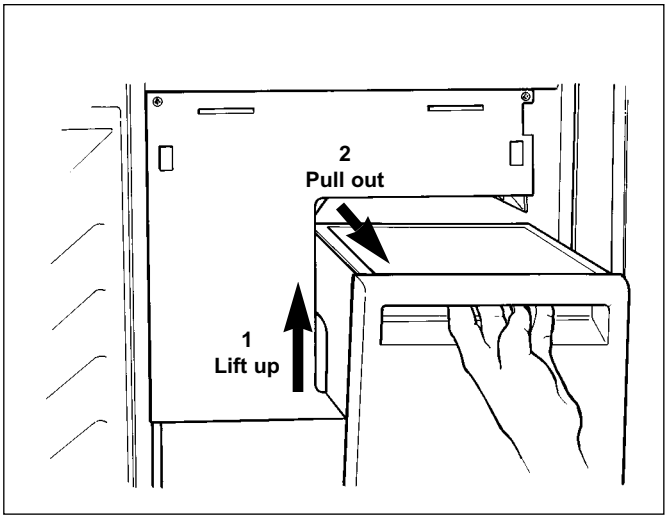


Figure 7-13. Models 680 & 690 Ice Bucket Removal

Standard Louvered Grille Removal (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.)

⚠ 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

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.)

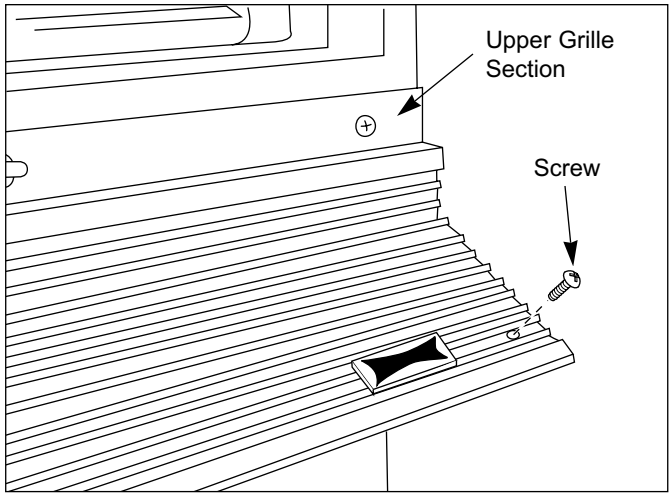


Figure 7-14. Model 601R, 601F Standard Louvered Grille

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

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.)

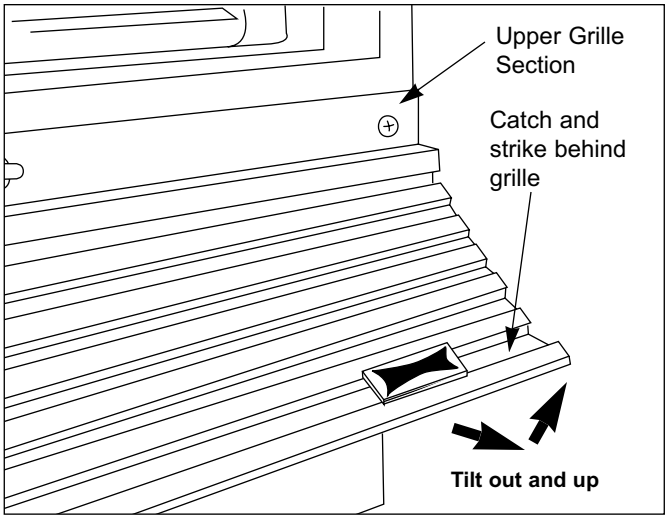


Figure 7-15. Model 601R, 601F Stainless Steel Grille

Drain Pan Access and Removal (Models 601R, 601F)

⚠ 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

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.)

⚠ CAUTION

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

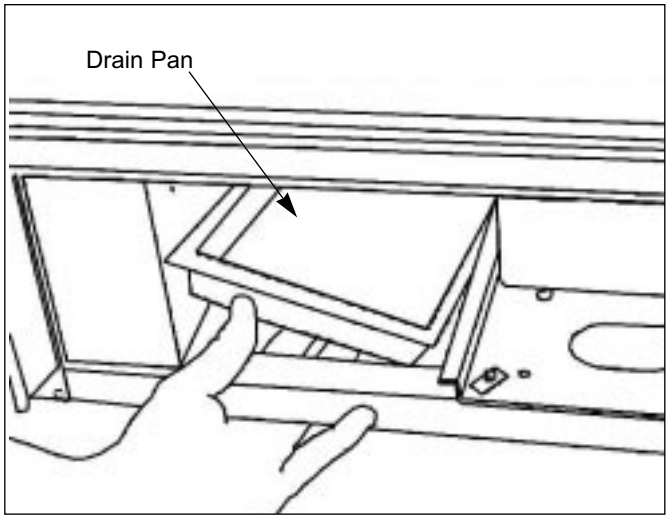


Figure 7-16. Model 601R, 601F Drain Pan Removal

Standard Louvered Grille and Stainless Steel Grille Assembly Removal
(Models 611/F, 611/S, 632/F, 632/S, 642/F, 642/S, 650/F, 650/S, 680/F, 680/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.)

Panel Grille Assembly Removal
(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 decorative 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.

Kickplate Removal

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

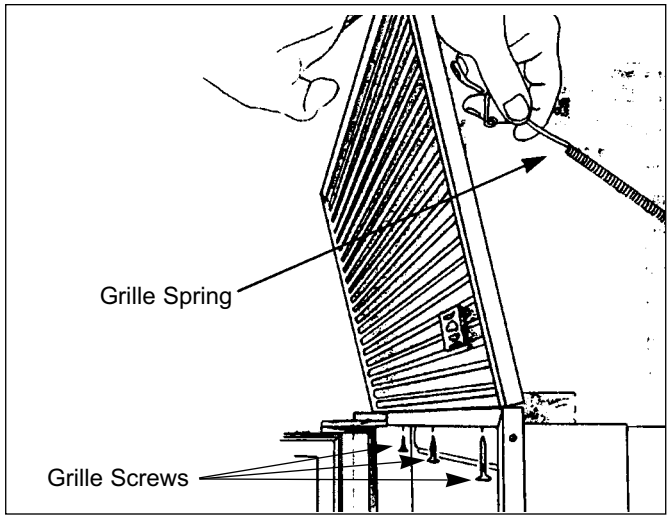


Figure 7-17. Grille Removal

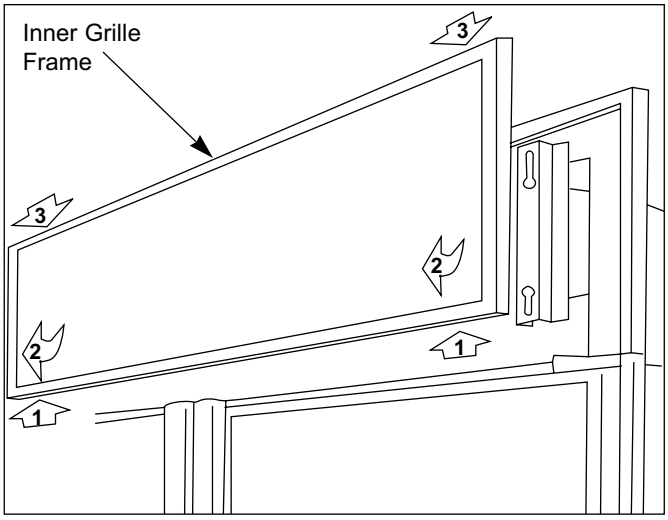


Figure 7-18. Inner Grille Frame Removal

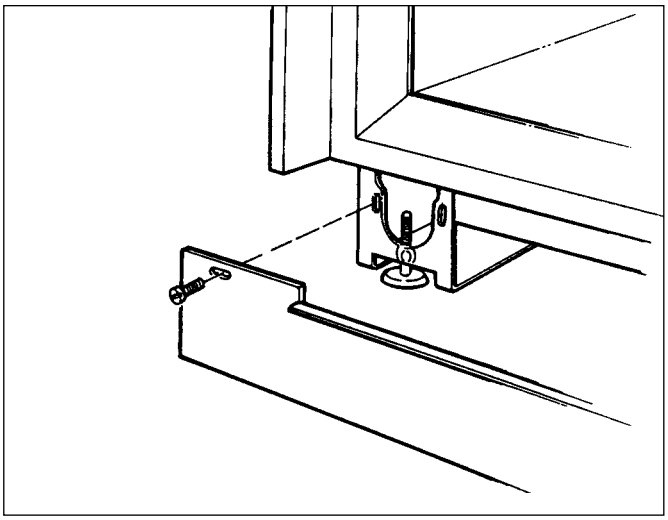


Figure 7-19. Kickplate Removal

Drain Pan Access and Removal (Models 611, 632, 642, 650, 680, 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.)

⚠ CAUTION

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

REFRIGERATOR COMPARTMENT MECHANICAL AND ELECTRICAL COMPONENT REMOVAL

This section explains how to access and remove mechanical and electrical components from refrigerator sections of 600 Series units. In most cases it is necessary to remove primary parts in order to gain access to these components. The manner in which this section was written assumes that the Primary Part Removal section has been studied and understood. If necessary, refer to the Primary Part Removal section before attempting to remove mechanical and/or electrical 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.

⚠ WARNING

Whenever accessing or removing electrical components, disconnect power to unit to avoid electrical shock. When unit is in OFF mode, 115 Volts are still present at control board.

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

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

⚠ WARNING

Disconnect power to unit to avoid electrical shock before attempting to remove control board.

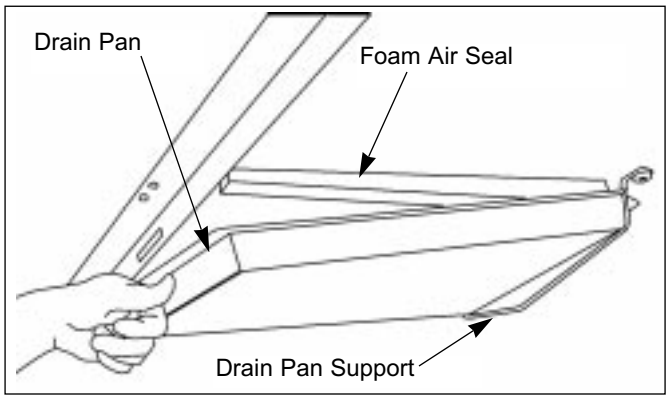


Figure 7-20. Model 611, 632, 642, 650, 680, 690 Drain Pan Removal

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.)

⚠ WARNING

When reconnecting membrane switch ribbon cable to control board, be sure label on ribbon cable terminal housing is oriented toward arrow on control board connection. (See Figure 7-22)

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

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

⚠ WARNING

Disconnect power to unit to avoid electrical shock before attempting to remove control board.

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 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.)

Refrigerator Evaporator Cover Access and Removal (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 Access and Removal (Models 680 & 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 Access and Removal (Models 601R, 611, 632, 642, 650, 680, 690)

> **⚠ WARNING**
>
> **Disconnect power to unit to avoid electrical shock before attempting to remove evaporator fan shroud assembly.**

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).

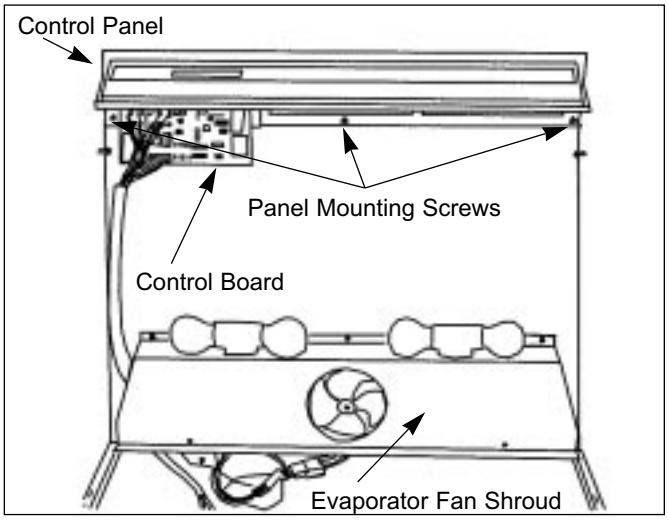


Figure 7-21. Upper Refrigerator Compartment Area

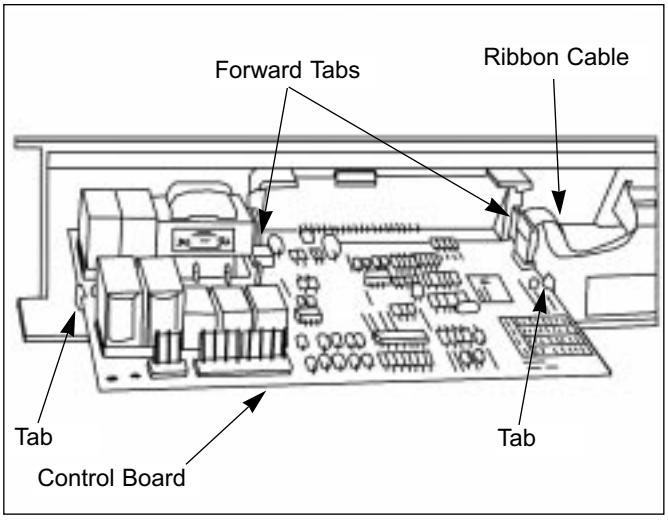


Figure 7-22. Control Board Removal

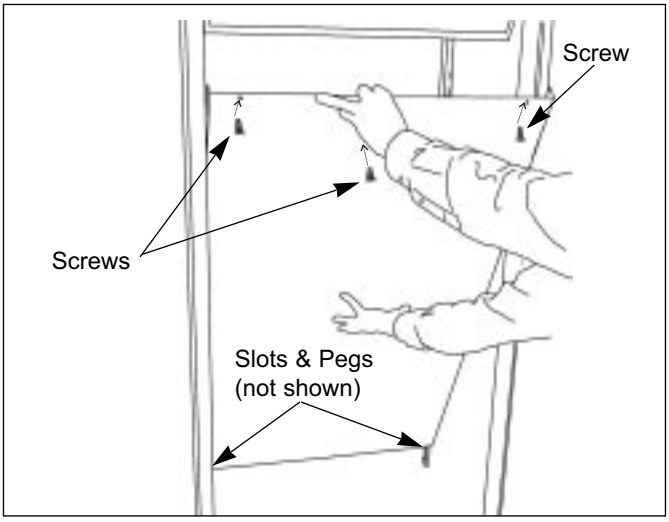


Figure 7-23. Evaporator Cover Removal

Refrigerator Evaporator Fan Assembly Access and Removal (Models 601R, 611, 632, 642, 650, 680, 690)

> **⚠ WARNING**
>
> **Disconnect power to unit to avoid electrical shock before attempting to remove evaporator fan shroud assembly.**

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.)

Refrigerator Compartment Thermistor (Models 601R, 611, 632, 642, 650, 680, 690)

> **⚠ WARNING**
>
> **Disconnect power to unit to avoid electrical shock before attempting to remove thermistor.**

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, 680, 690)

> **⚠ WARNING**
>
> **Disconnect power to unit to avoid electrical shock before attempting to remove thermistor.**

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.)

> **⚠ CAUTION**
>
> **Evaporator fins are sharp and could cause minor personal injury.**

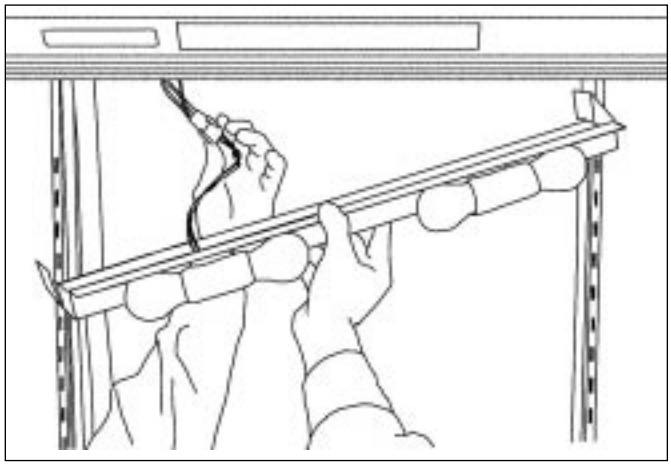


Figure 7-24. Fan Shroud Assembly Removal

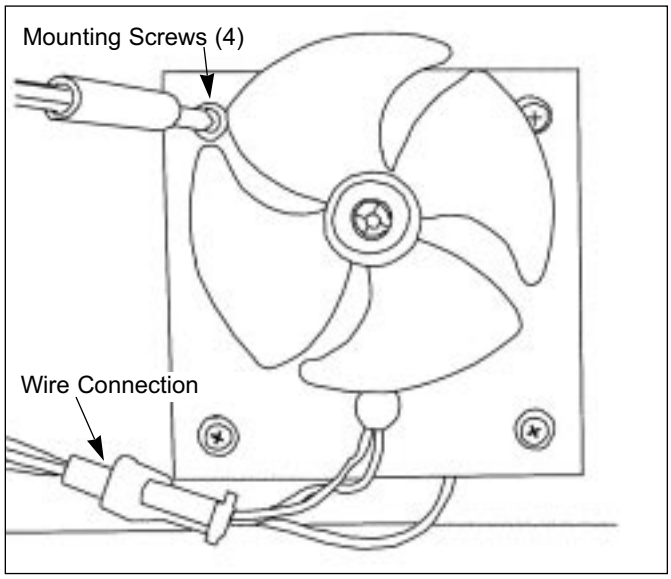


Figure 7-25. Refrigerator Evaporator Fan Removal

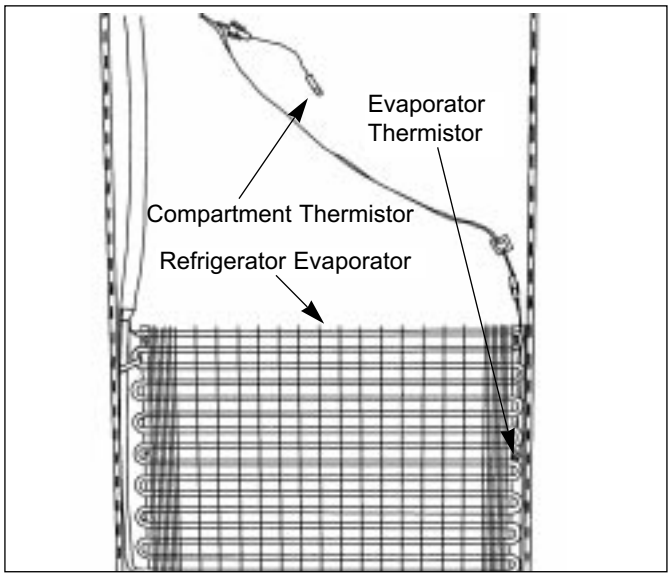


Figure 7-26. Refrigerator Thermistors

Water Reservoir Tank Cover Removal (Models 680 & 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 680 or 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.)

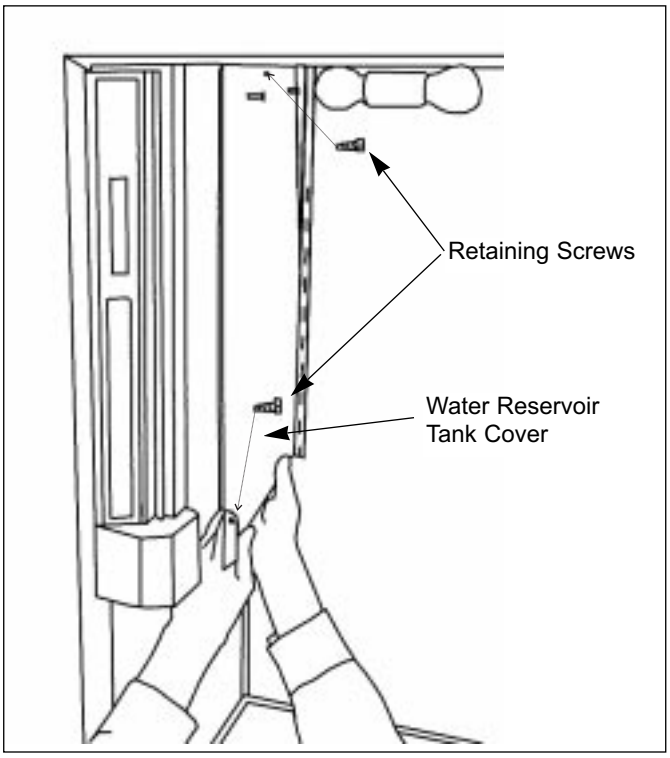


Figure 7-27. Water Tank Cover Removal

Control Board Access and Removal (Models 680, 690)

⚠ WARNING

Disconnect power to unit to avoid electrical shock before attempting to remove the control board.

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.)

⚠ CAUTION

When reconnecting 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.

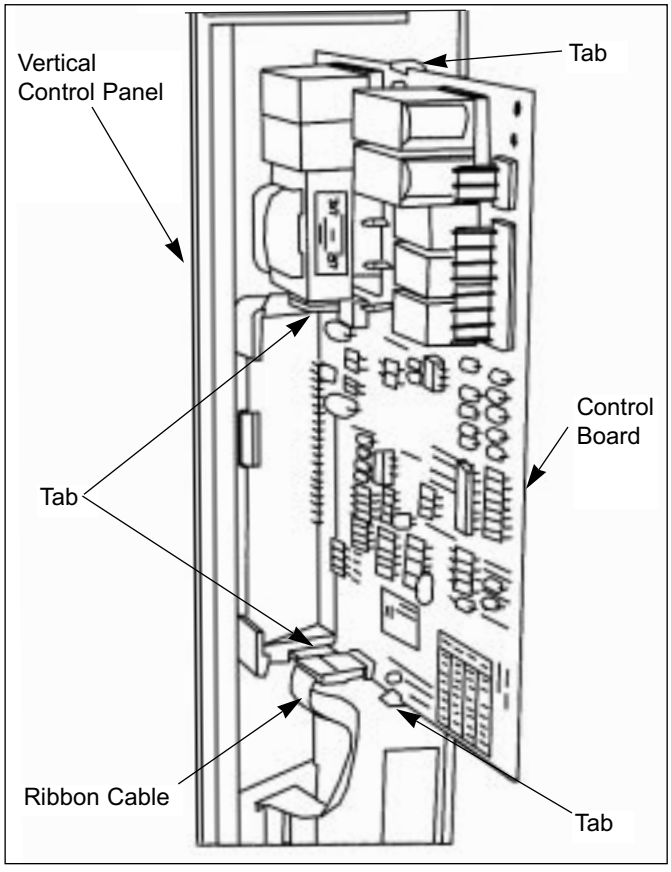


Figure 7-28. Control Board Removal

Vertical Control Panel Access and Removal (Models 680 & 690)

⚠ WARNING

Disconnect power to unit to avoid electrical shock before attempting to remove the control panel.

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.)

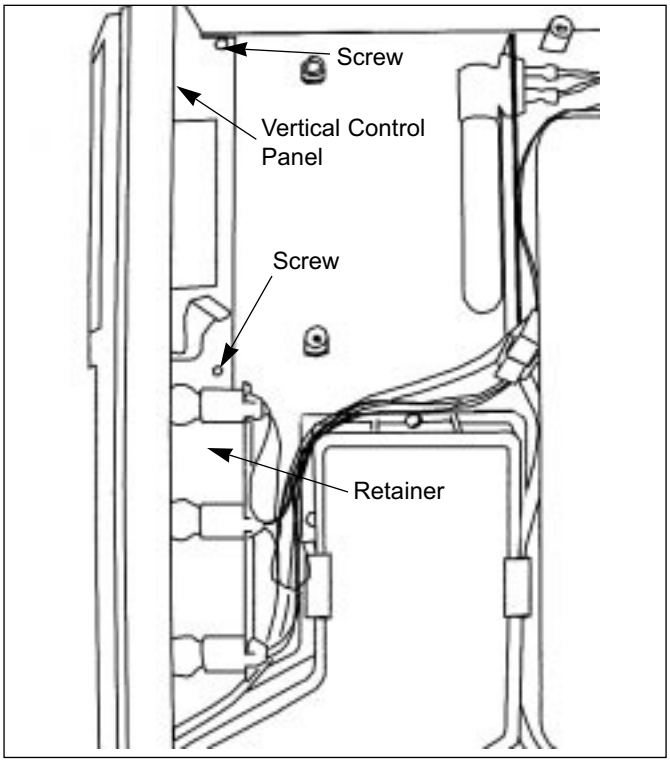


Figure 7-29. Vertical Control Panel Removal

Water Reservoir Tank Access and Removal (Models 680 & 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.)

⚠ CAUTION

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 Component Access and Removal (Models 680 & 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.*

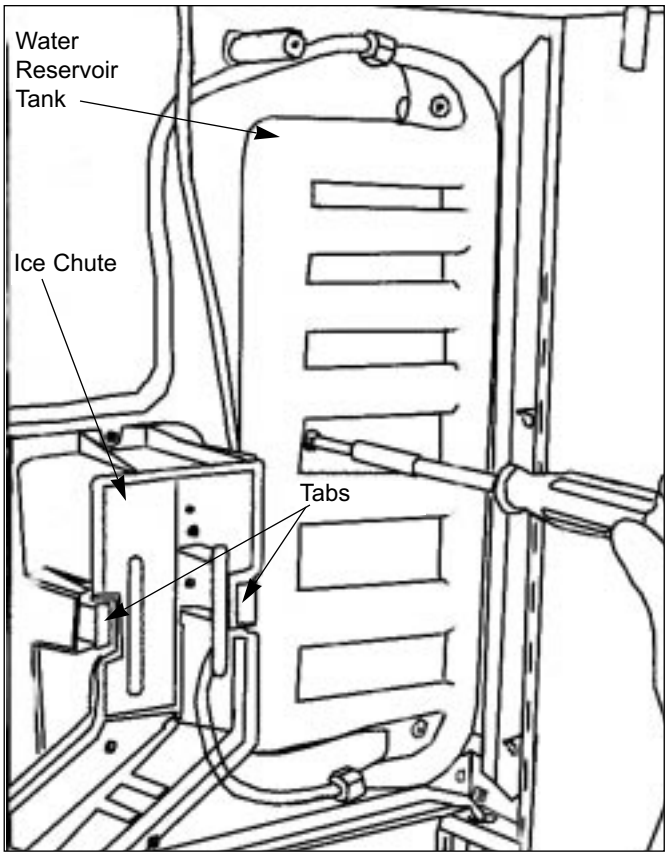


Figure 7-30. Water Tank & Ice Chute Removal

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.)

FREEZER COMPARTMENT MECHANICAL AND ELECTRICAL COMPONENT REMOVAL

This section explains how to access and remove mechanical and electrical components from freezer sections of 600 Series units. In most cases it is necessary to remove primary parts in order to gain access to these components. The manner in which this section was written assumes that the Primary Part Removal section has been studied and understood. If necessary, refer to the Primary Part Removal section before attempting to remove mechanical and/or electrical 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.

Control Board Access and Removal (Model 601F)

⚠ WARNING

Whenever accessing or removing electrical components, disconnect power to unit to avoid electrical shock. When unit is in OFF mode, 115 Volts are still present at 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.

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove control board.

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.).

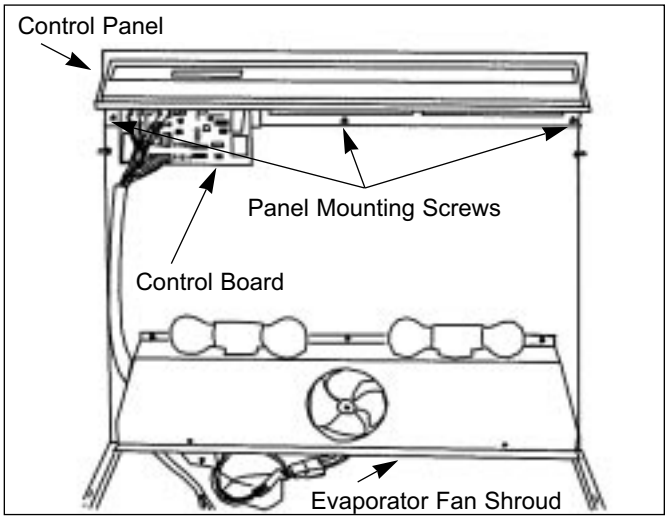


Figure 7-31. Upper Freezer Compartment Area

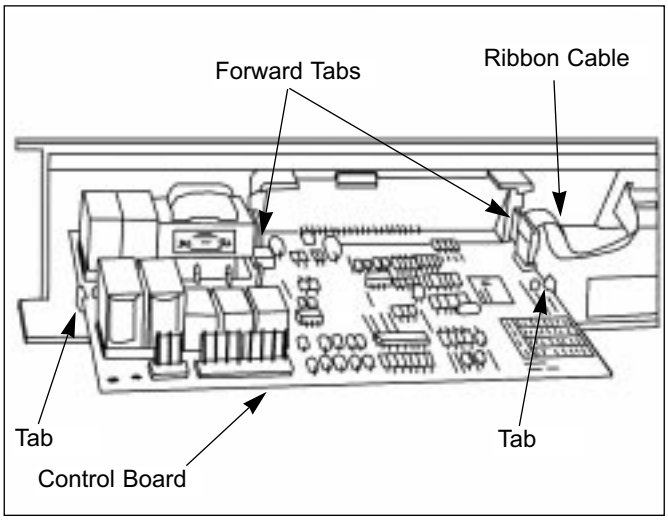


Figure 7-32. Control Board Removal

⚠ CAUTION

When reconnecting 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.

Control Panel Access and Removal (Model 601F)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove control panel.

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.)

Freezer Evaporator Cover Access and Removal (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.)

Freezer Evaporator Fan Shroud Assembly Access and Removal (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.)

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

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove evaporator fan assembly.

To access the evaporator fan assembly, the light diffuser, evaporator cover, and evaporator fan shroud

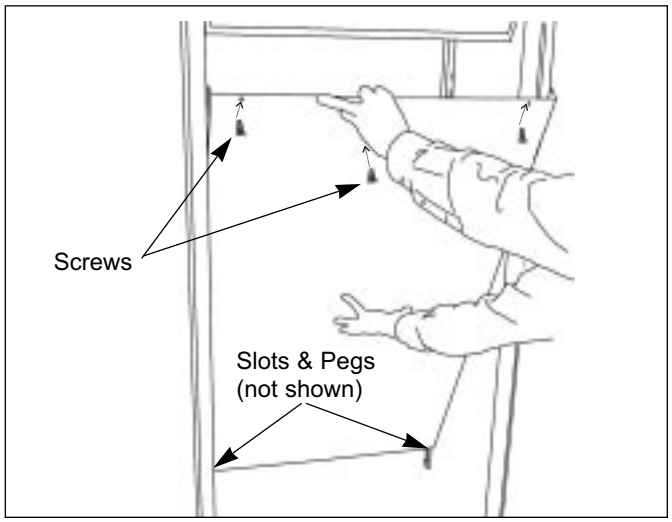


Figure 7-33. Evaporator Cover Removal

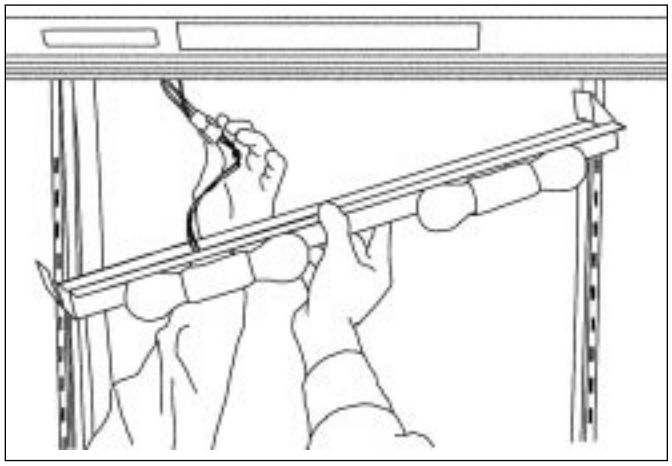


Figure 7-34. Model 601F Fan Shroud Removal

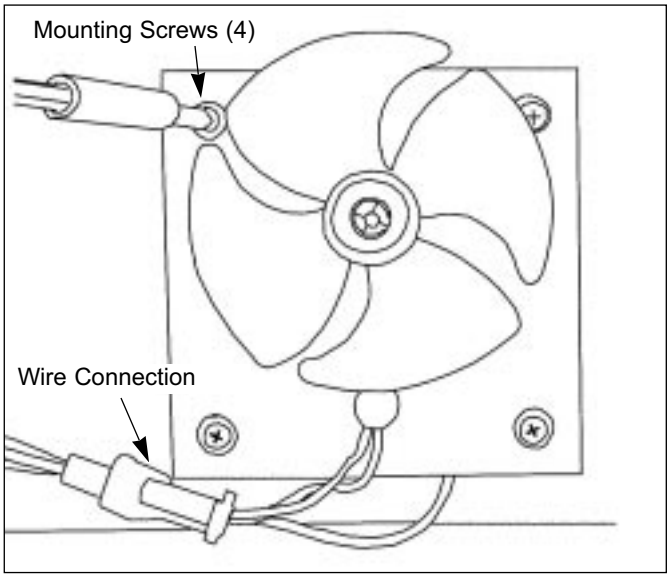


Figure 7-35. Model 601F Evaporator Fan Removal

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.)

Freezer Evaporator Thermistor (Model 601F).

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove thermistor.

⚠ CAUTION

Evaporator fins are sharp and could cause minor personal injury

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)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove defrost terminator.

⚠ CAUTION

Evaporator fins are sharp and could cause minor personal injury

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.)

Evaporator Defrost Heater Access and Removal (Model 601F)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove defrost heater.

⚠ CAUTION

Evaporator fins are sharp and could cause minor personal injury

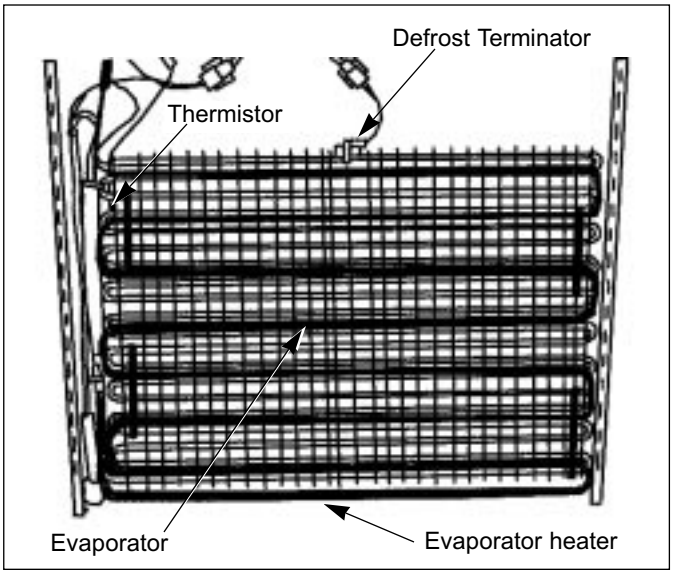


Figure 7-36. Model 601F Evaporator Area

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.)

Icemaker Assembly Access and Removal (Model 601F)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove icemaker.

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.)

Drain Trough Enclosure Access and Removal (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.*

Icemaker Fill Tube Heater Access and Removal (Model 601F)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove icemaker fill tube heater.

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.

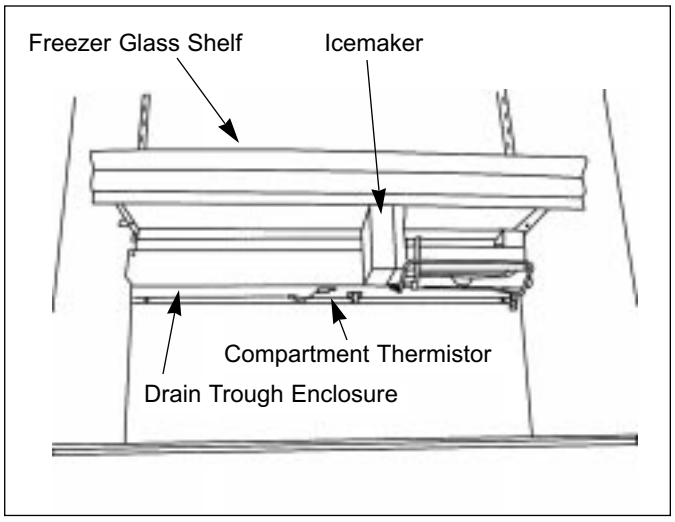


Figure 7-37. Model 601F Icemaker/Drain Trough Area

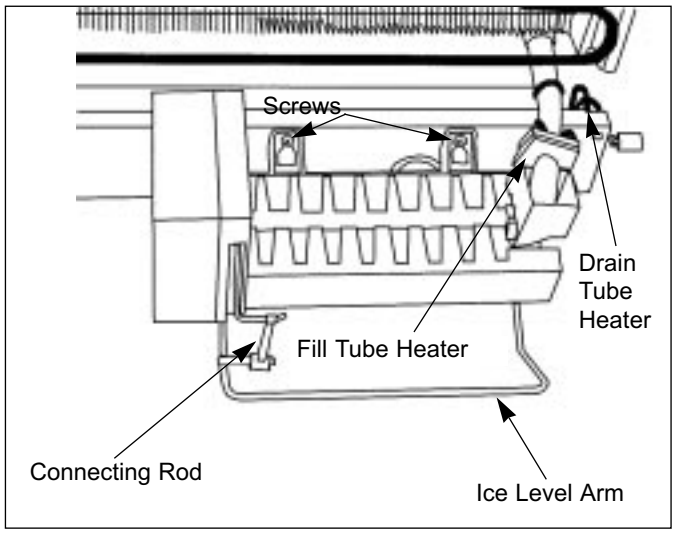


Figure 7-38. Model 601F Icemaker Area

Freezer Compartment Thermistor (Model 601F)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove thermistor.

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 Access and Removal (Model 601F)

> **⚠ WARNING**
>
> **To avoid electrical shock, disconnect power to unit before attempting to remove drain tube heater.**

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 Access and Removal (Model 601F)

> **⚠ WARNING**
>
> **To avoid electrical shock, disconnect power to unit before attempting to remove drain trough heater.**

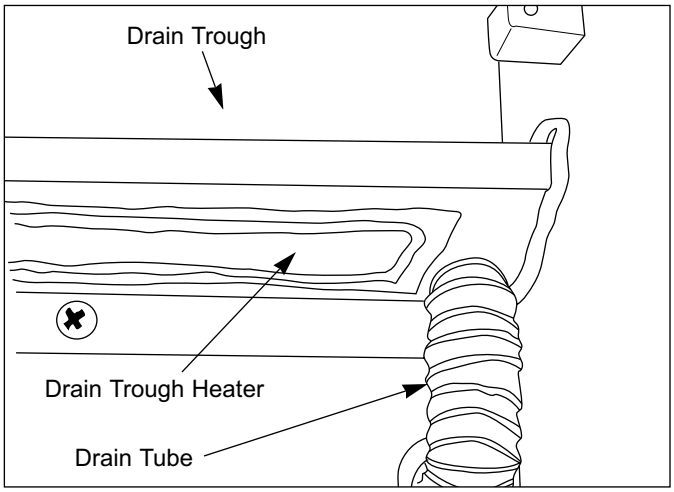


Figure 7-39. Model 601F Freezer Drain Area

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.*

Freezer Light Bulb Access (Models 611, 650)

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.)

⚠ CAUTION

Light bulbs are hot and could cause minor personal injury.

⚠ WARNING

Electric shock hazard. If bulb should separate from base, disconnect power to unit before attempting to remove base from socket.

Icemaker Assembly Removal (Models 611, 650)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove icemaker.

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.)

Icemaker Fill Tube Heater Access and Removal (Models 611, 650)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove icemaker fill tube.

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.)

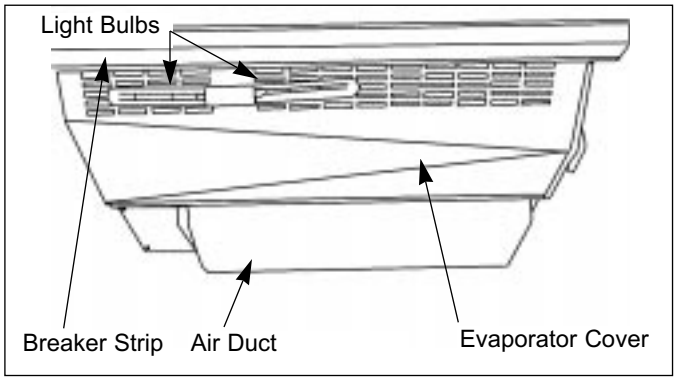


Figure 7-40. Model 611, 650 Freezer Lighting

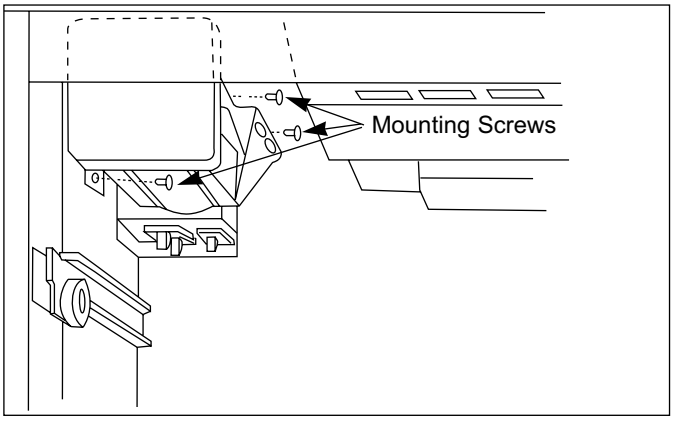


Figure 7-41. Models 611, 650 Icemaker

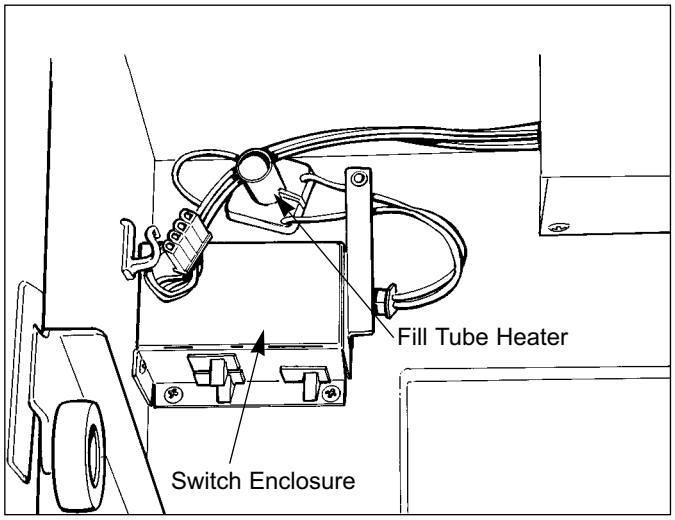


Figure 7-42. Model 611, 650 Icemaker Fill Tube/Heater & Switch Enclosure

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

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove switches.

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 Access and Removal (Models 611, 650)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove thermistor.

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.*

Freezer Evaporator Cover Removal (Models 611, 650)

The freezer evaporator cover is located at the top of

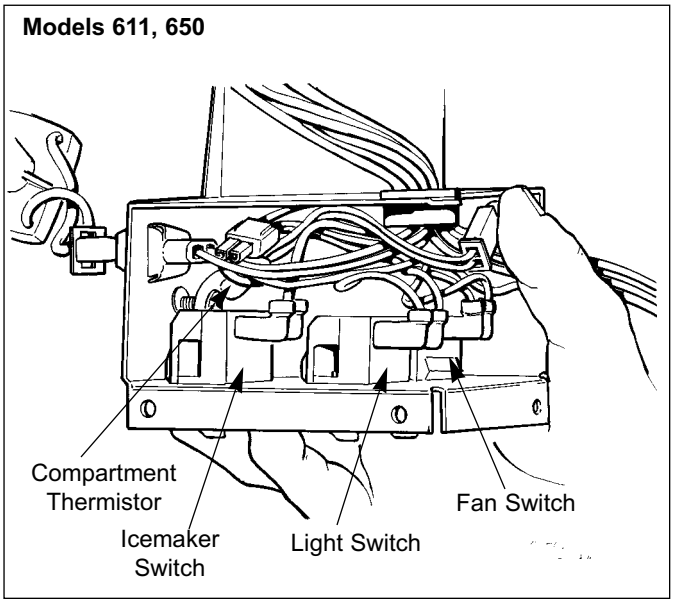


Figure 7-43. Model 611, 650 Switch Enclosure

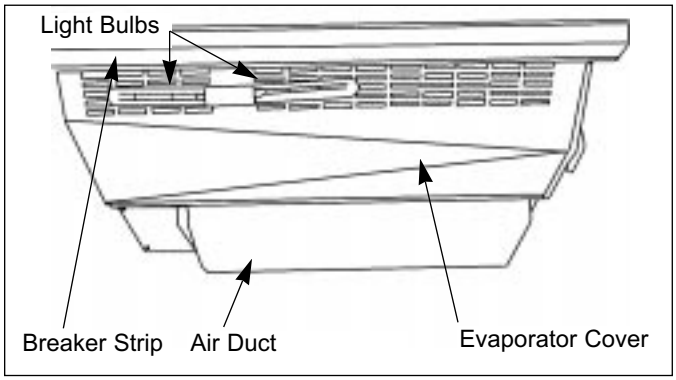


Figure 7-44. Model 611, 650 Freezer Compartment, Top

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.)

Freezer Evaporator Fan Assembly Access and Removal (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.

Freezer Evaporator Thermistor (Models 611, 650)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove evaporator fan assembly.

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)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to defrost terminator.

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.)

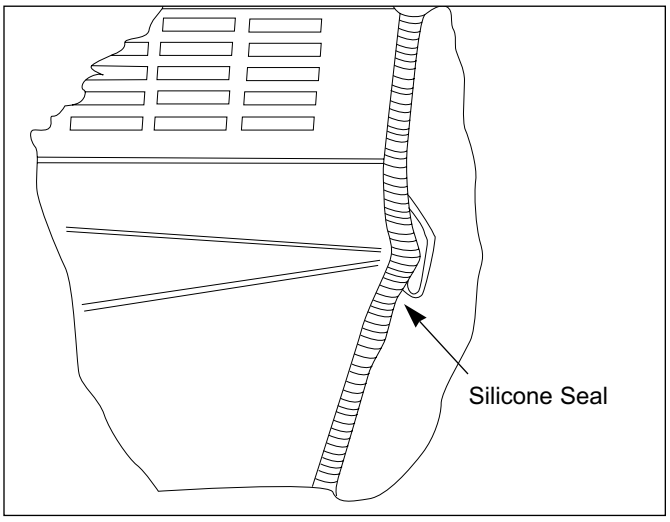


Figure 7-45. Model 611, 650 Silicone Seal

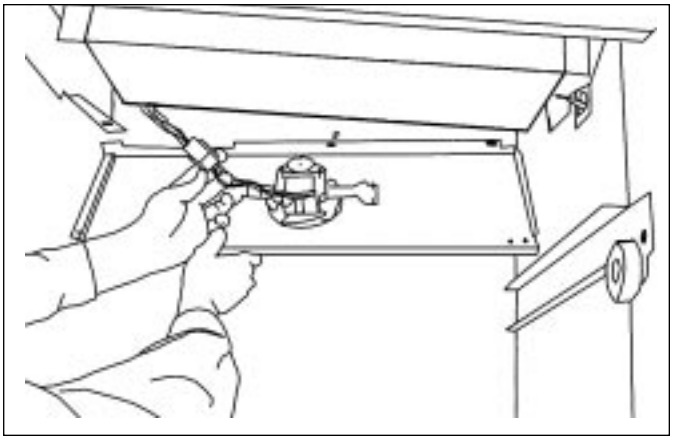


Figure 7-46. Model 611, 650 Freezer Evaporator Fan and Shroud

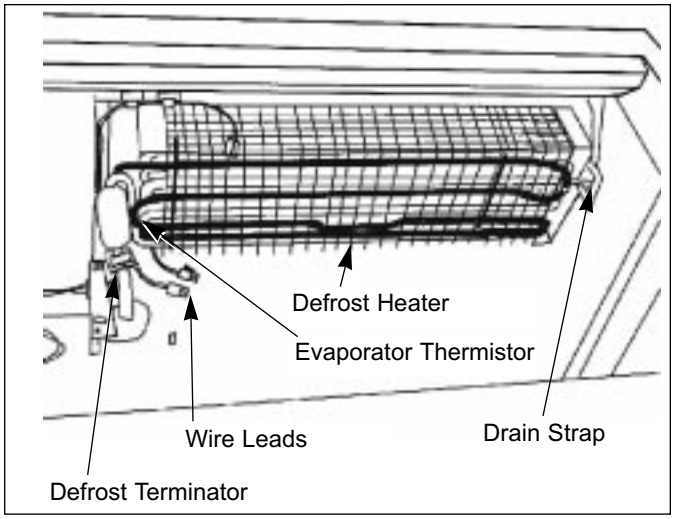


Figure 7-47. Model 611, 650 Freezer Evaporator Area

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

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove defrost heater.

⚠ CAUTION

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 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.)*

Freezer Lower Light Diffuser Removal (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.*

Freezer Compartment Thermistor (Models 632, 642)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove thermistor.

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,*

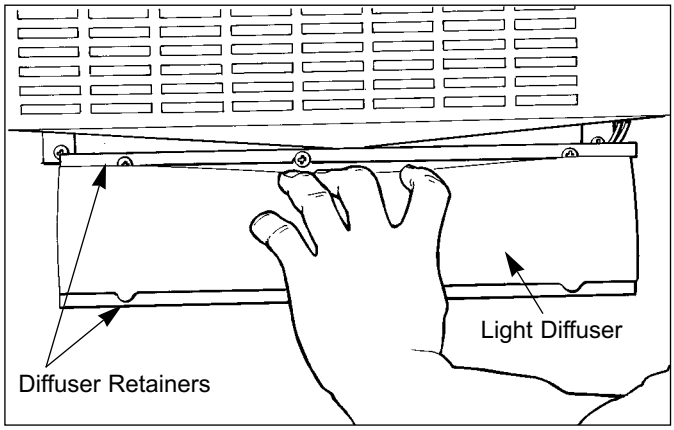


Figure 7-48. Model 632, 642 Lower Light Diffuser

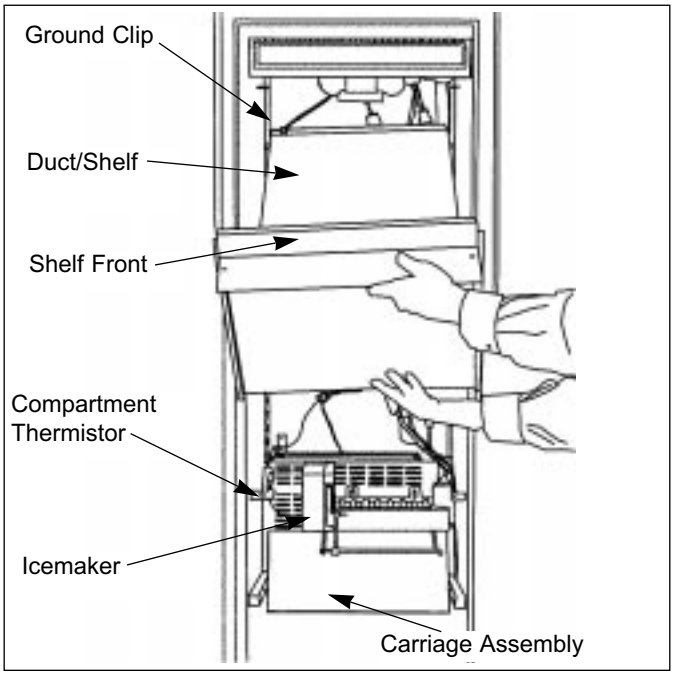


Figure 7-49. Model 632, 642 Freezer Compartment

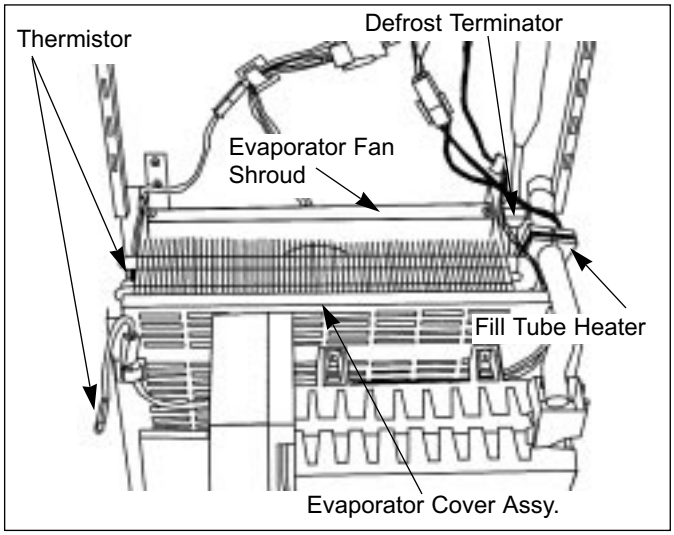


Figure 7-50. Model 632, 642 Evaporator Area

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.)

Freezer Duct/Shelf Assembly Removal (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.)*

Icemaker Access and Removal (Models 632, 642)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove icemaker.

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.)

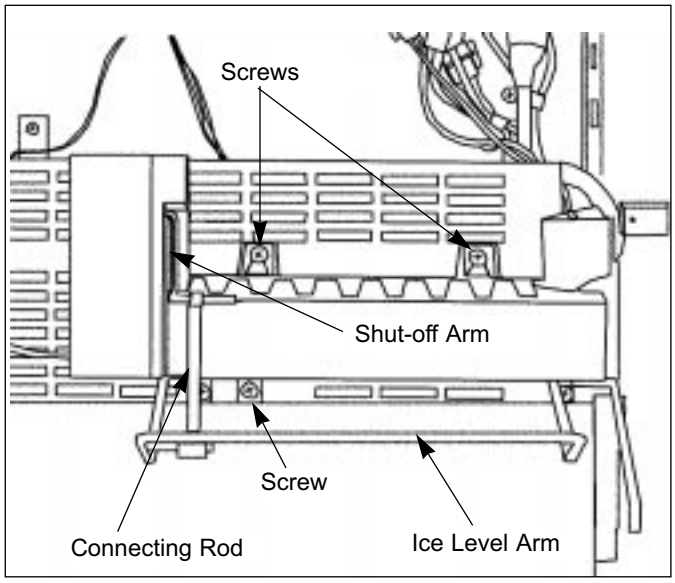


Figure 7-51. Model 632, 642 Icemaker

Icemaker Fill Tube Heater Access and Removal (Models 632, 642)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove icemaker fill tube heater.

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 Access and Removal (Models 632, 642)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove evaporator fan assembly.

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)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove defrost terminator.

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 Removal (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 Access and Removal (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.)

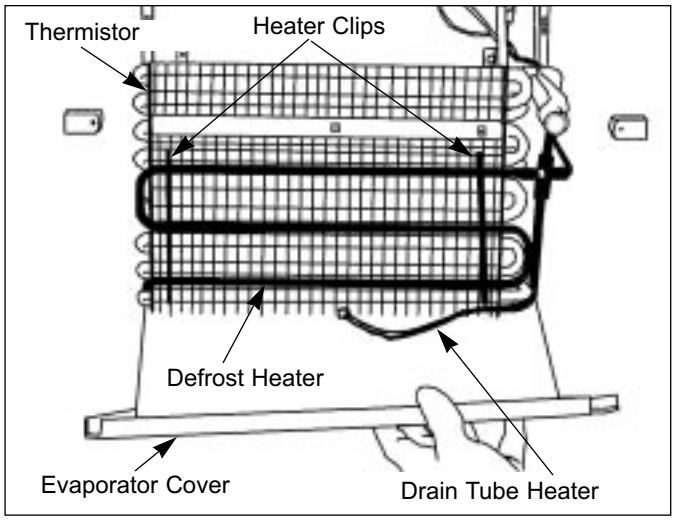


Figure 7-52. Model 632, 642 Evaporator Access

Defrost Heater Access and Removal (Models 632, 642)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove defrost heater.

⚠ CAUTION

Evaporator fins are sharp and could cause minor personal injury.

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 Access and Removal (Models 632, 642)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove drain tube heater.

⚠ CAUTION

Evaporator fins are sharp and could cause minor personal injury.

To access and remove the drain tube heater, the air duct/shelf assembly, ice bucket carriage assembly, ice-

maker 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)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove thermistor.

⚠ CAUTION

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)

⚠ CAUTION

Light bulbs are hot and could cause minor personal injury.

⚠ WARNING

Electrical shock hazard. If bulb should separate from base, disconnect power to unit before attempting to remove base from socket.

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 Removal (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.

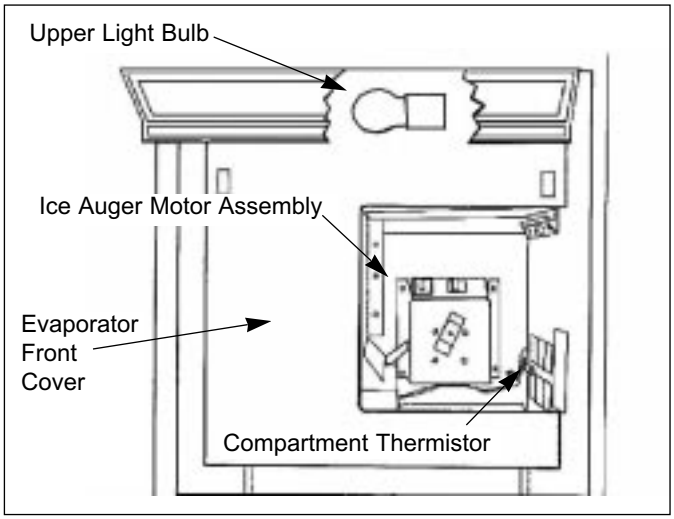


Figure 7-53. Model 690 Upper Freezer Area

Ice Auger Motor Assembly Access and Removal (Model 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove ice auger motor assembly.

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.*

Freezer Evaporator Front Cover Access and Removal (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 Access and Removal (Models 680 & 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove evaporator fan assembly.

NOTE: *The freezer evaporator fan in the Model 680 is attached to the lower evaporator cover assembly. See Freezer Lower Evaporator Cover Assembly Access and Removal (Models 680 & 690) below.*

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 (Models 680 & 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove thermistor.

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 (Models 680 & 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove thermistor.

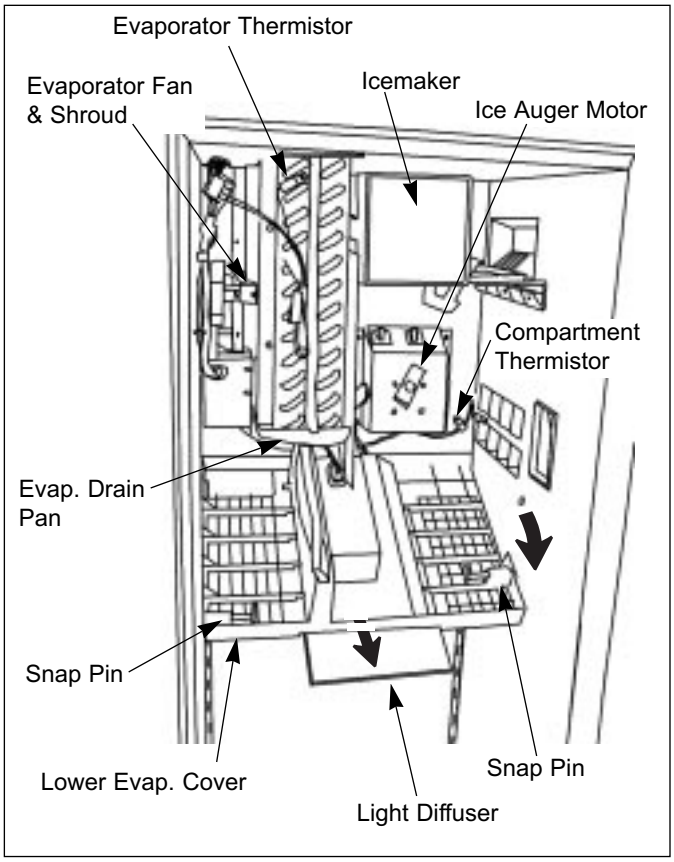


Figure 7-54. Models 680 & 690 Freezer Evaporator Area

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 Removal (Models 680 & 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.)

Freezer Rear Duct Removal (Models 6880 & 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 Assembly Access and Removal (Models 680 & 690)

> **⚠ CAUTION**
>
> **While removing the lower evaporator cover assembly, hold the light diffuser as it may slide out.**

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 7-54.)

Icemaker Carriage Assembly Access and Removal (Models 680 & 690)

> **⚠ WARNING**
>
> **The icemaker is attached to the icemaker carriage assembly. To avoid electrical shock, disconnect power to unit before attempting to remove icemaker carriage assembly.**

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 Access and Removal (Models 680 & 690)

> **⚠ WARNING**
>
> **To avoid electrical shock, disconnect power to unit before attempting to remove icemaker .**

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.)

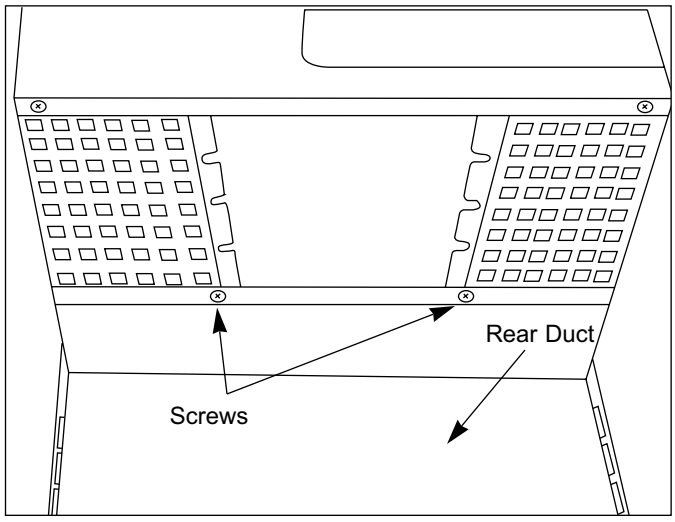


Figure 7-55. Models 680 & 690 Rear Duct Removal

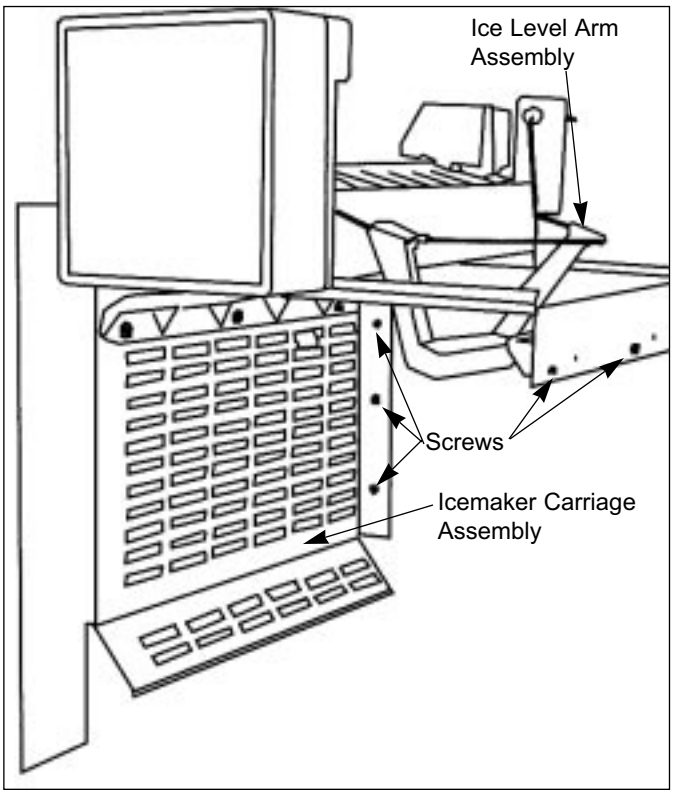


Figure 7-56. Models 680 & 690 Icemaker and Carriage Assembly

Icemaker Fill Tube Heater Access and Removal (Models 680 & 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove icemaker fill tube heater.

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.)

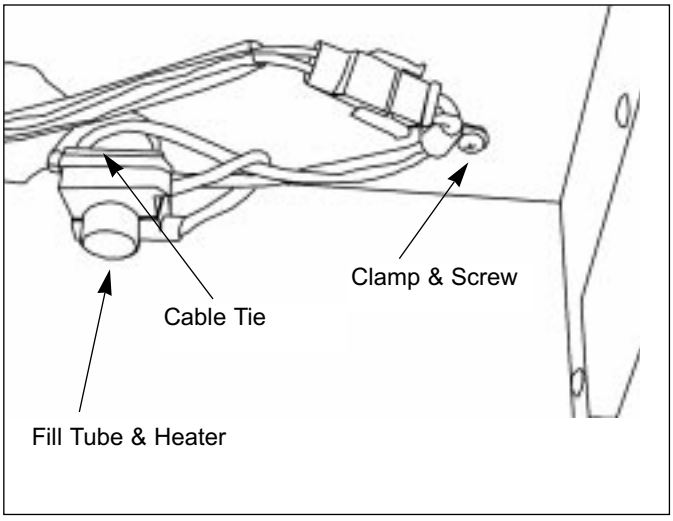


Figure 7-57. Models 680 & 690 Fill Tube Heater Removal

Freezer Drain Tube Heater Access and Removal (Models 680 & 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove drain tube heater.

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.*

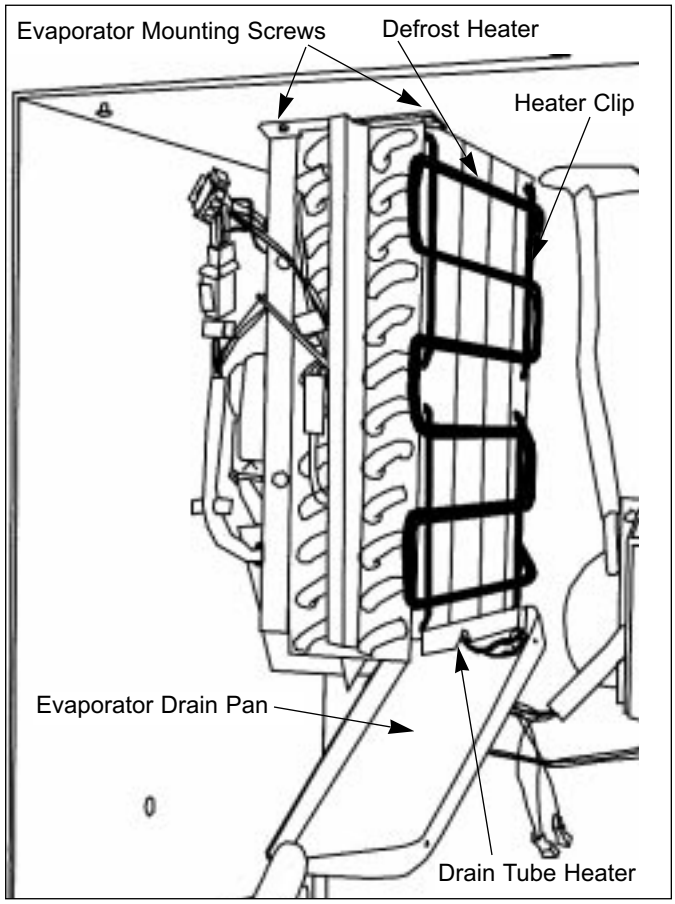


Figure 7-58. Models 680 & 690 Freezer Evaporator, Front

Freezer Evaporator Defrost Heater Access and Removal (Models 680 & 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove defrost heater.

⚠ CAUTION

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 (Models 680 & 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove defrost terminator.

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.)

LOWER COMPRESSOR AREA MECHANICAL AND ELECTRICAL COMPONENT ACCESS AND REMOVAL

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.

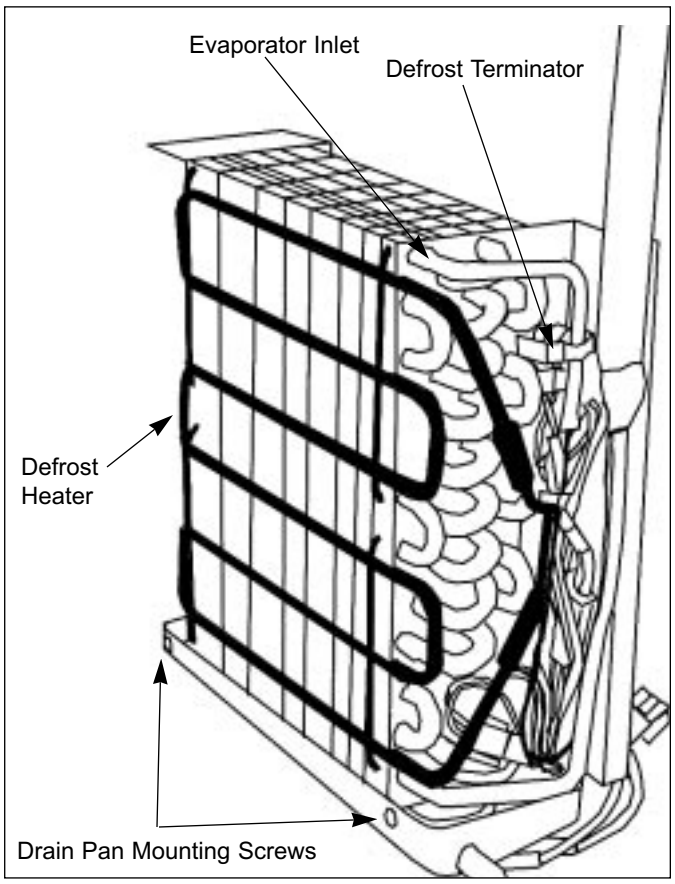


Figure 7-59. Models 680 & 690 Freezer Evaporator, Rear

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

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove light and fan switches.

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.)

Water Valve Access and Removal (Model 601F)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove water valve.

⚠ CAUTION

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.)

Condenser Fan Access and Removal (Models 601R, 601F)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove condenser fan assembly.

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.)

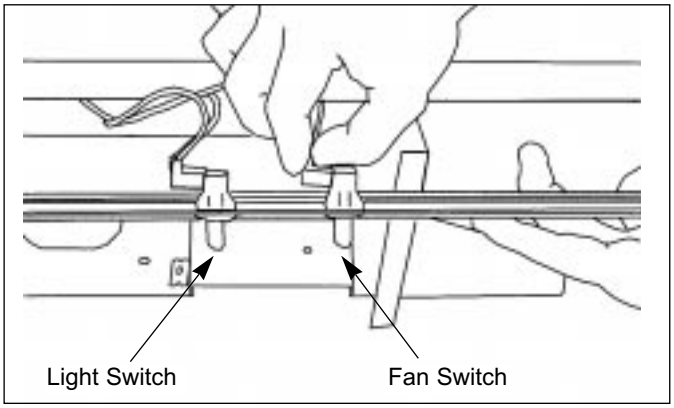


Figure 7-60. Model 601F Light Fan & Switches

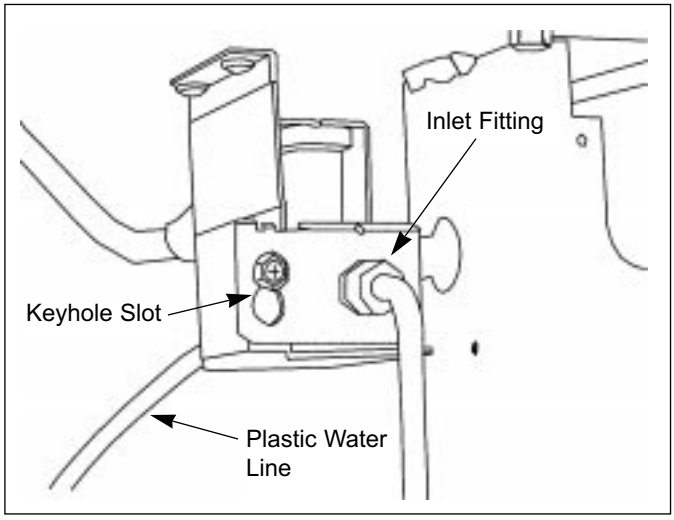


Figure 7-61. Model 601F Water Valve Removal

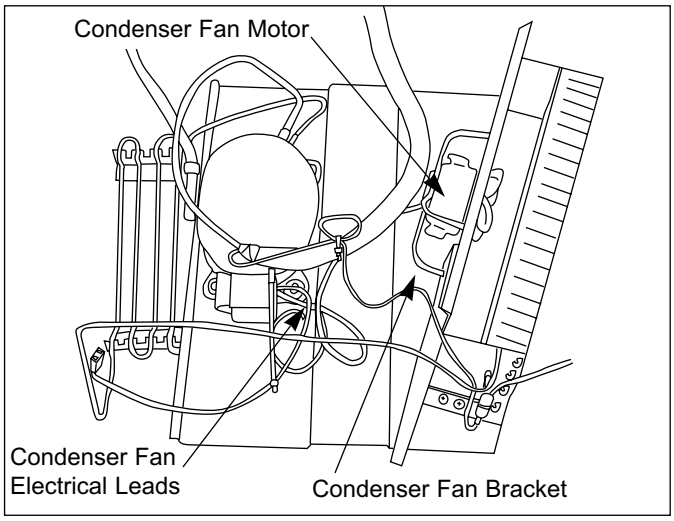


Figure 7-62. Model 601R, 601F Condenser Fan Removal

UPPER COMPRESSOR AREA MECHANICAL AND ELECTRICAL COMPONENT ACCESS AND REMOVAL

This section covers the Models 611, 632, 642, 650, 680 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 Switch Access and Removal (Models 611, 632, 642, 650, 680, 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove light and fan switches.

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.)

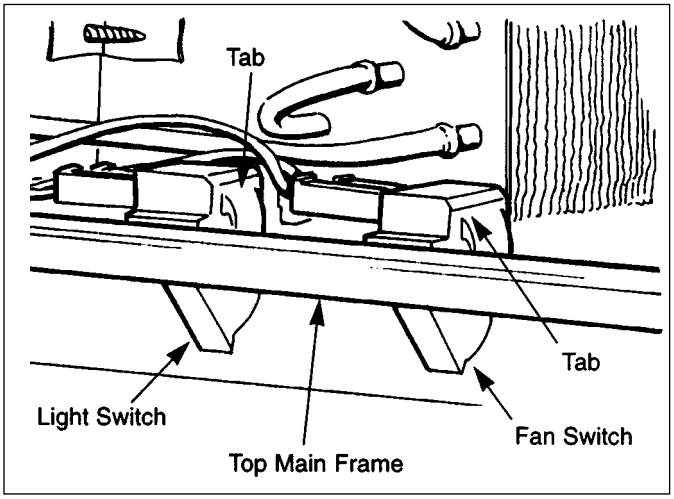


Figure 7-63. Model 611, 632, 642, 650, 680, 690 Light & Fan Switches

Dual Water Valve Removal (Models 680 & 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove water valve.

⚠ CAUTION

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

NOTE: *Though the water valve on the model 680 & 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.

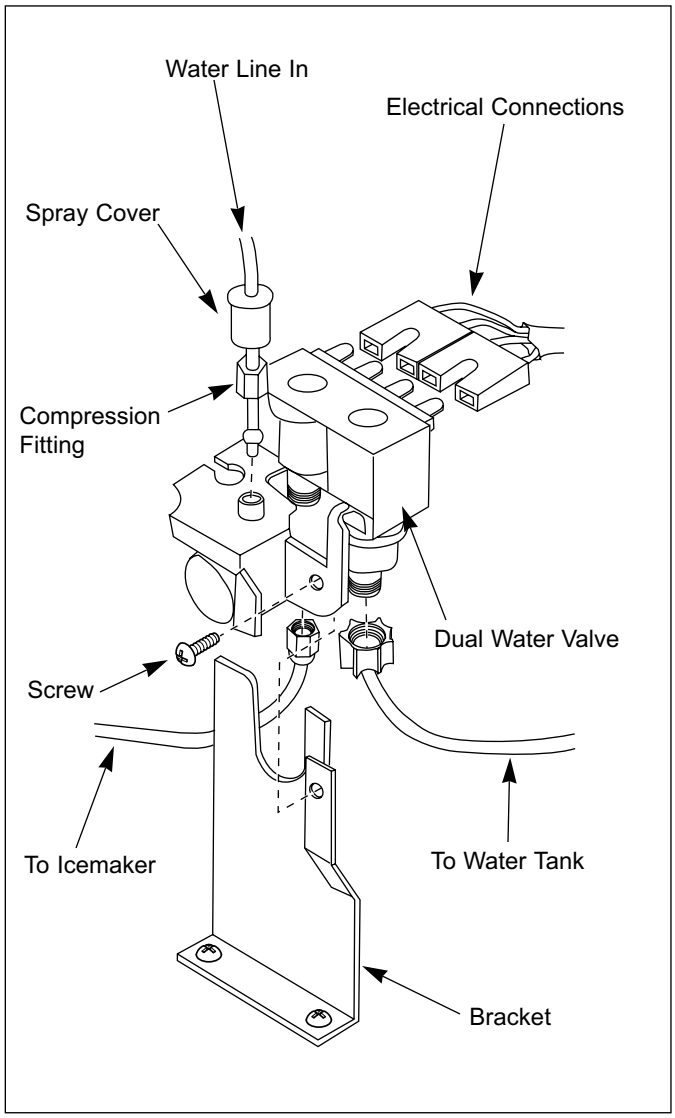


Figure 7-64. Models 680 & 690 Dual Water Valve

Remove the screw which holds the valve to the bracket and lift the valve up and out. (See Figure 7-64.)

Condenser Fan Access and Removal (Models 611, 632, 642, 650, 680, 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove condenser fan assembly.

⚠ CAUTION

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

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.)

WATER VALVE ACCESS AND REMOVAL - DRAIN PAN AREA (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.

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove water valve.

⚠ CAUTION

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

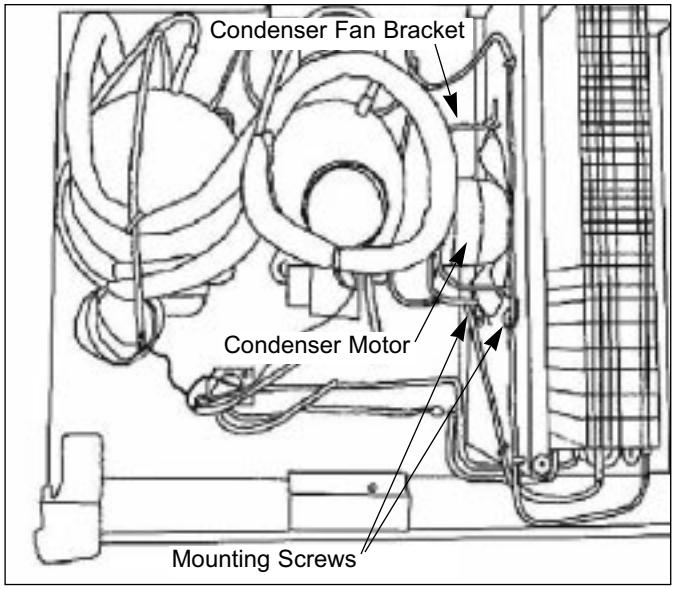


Figure 7-65. Models 611, 632, 642, 650, 680, 690 Condenser Fan

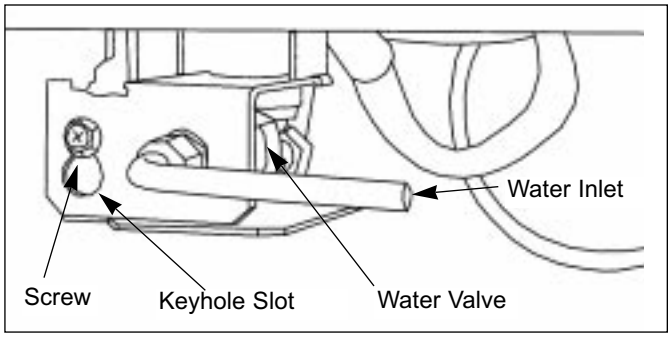


Figure 7-66. Models 611, 632, 642, 650 Water Valve Removal

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.)

SEALED SYSTEM COMPONENT REMOVAL

This section explains how to remove sealed system components during a sealed system repair on 600 Series units. 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.

⚠ WARNING

If it is necessary to disconnect electrical components in order to remove a sealed system component, disconnect power to unit to avoid electrical shock.

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 Removal (Models 601R, 601F)

⚠ CAUTION

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.*

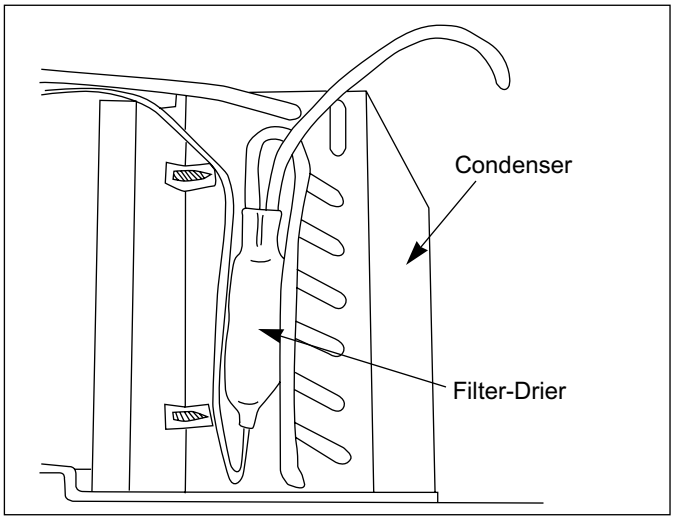


Figure 7-67. Model 601R, 601F Filter-Drier Location & Position

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

Compressor Removal (Models 601R, 601F)

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

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove a compressor.

⚠ CAUTION

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 dis-

charge lines approximately one inch from the compressor, then pull compressor out. (See Figure 7-68.)

Drain Pan Condensate Heater Loop Removal (Model 601R)

⚠ WARNING

It is not necessary to pull unit from its installation in order to replace the condensate heater loop. If unit is pulled from installation, it will be very top heavy at this time and could tip.

⚠ CAUTION

If unit is pulled from installation, floor must be covered to protect against damaging the floor.

⚠ CAUTION

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

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.)

Condenser Removal (Models 601R, 601F)

⚠ WARNING

It is not necessary to pull unit from its installation in order to replace the condenser. If unit is pulled from installation, it will be very top heavy at this time and could tip.

⚠ CAUTION

If unit is pulled from installation, floor must be covered to protect against damaging the floor.

⚠ CAUTION

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

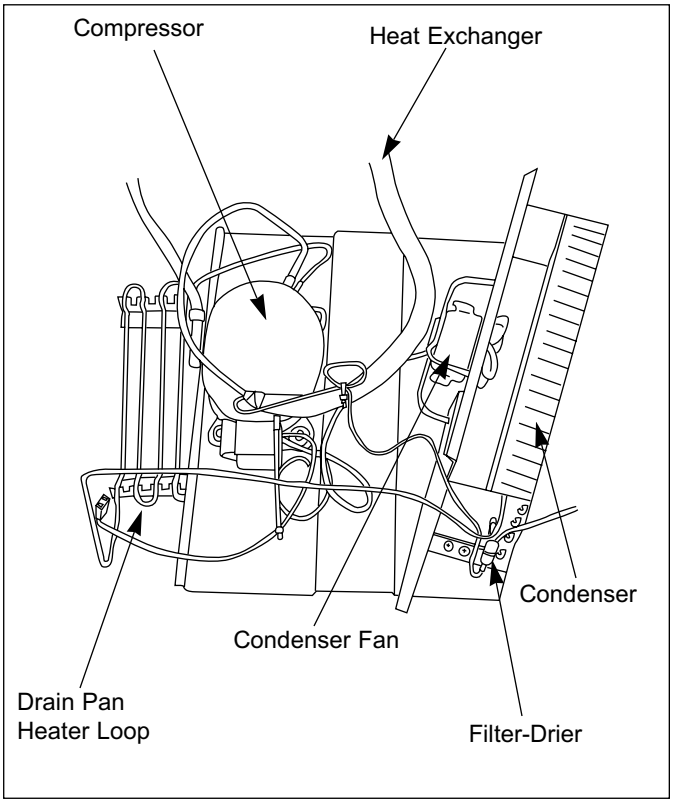
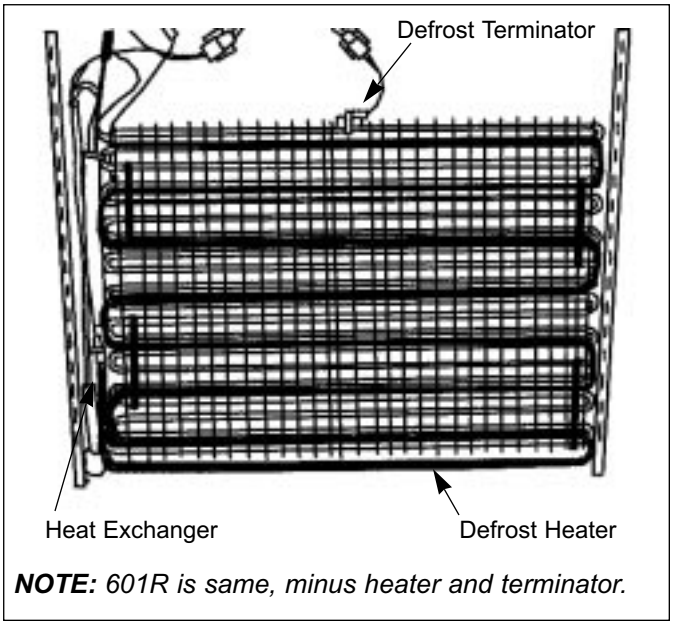


Figure 7-68. Model 601R Compressor Area Layout



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

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

⚠ CAUTION

Condenser fins are sharp and could cause minor personal injury.

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.)

Evaporator Removal (Models 601R, 601F)

> ⚠ **CAUTION**
>
> **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.)

Heat Exchanger Removal (Models 601R, 601F)

> ⚠ **CAUTION**
>
> **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 Removal (Models 611, 632, 642, 650, 680, 690)

> ⚠ **CAUTION**
>
> **Compressor and tubing may be hot and could cause minor personal injury.**

The filter-driers are secured to a drier bracket in the compressor area by a cable tie. (See Figures 7-70 & 7-71.) To remove a filter-drier, the unit grille and compressor baffle must first be removed. Then, after capturing the refrigerant from the sealed system, cut the cable tie which secures the filter-driers to the drier bracket. Now, 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 outlet of the filter-drier must be facing downward in order to function properly. (See Figure 7-70.)*

Compressor Removal (Models 611, 632, 642, 650, 680, 690)

⚠ WARNING

To avoid electrical shock, disconnect power to unit before attempting to remove compressor.

⚠ CAUTION

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

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

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.

Condenser Removal (Models 611, 632, 642, 650, 680, 690)

⚠ WARNING

It is necessary to pull the unit from the installation to replace the condenser. The unit is very top heavy and could tip.

⚠ CAUTION

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

⚠ CAUTION

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

⚠ CAUTION

Condenser fins are sharp and could cause minor personal injury.

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

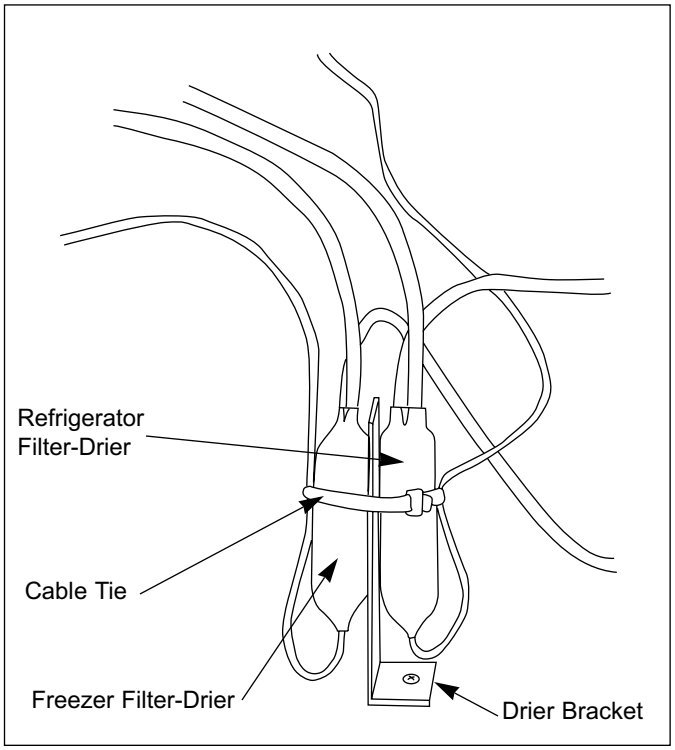


Figure 7-70. Models 611, 632, 642, 650, 680, 690 Filter-Drier Location & Position

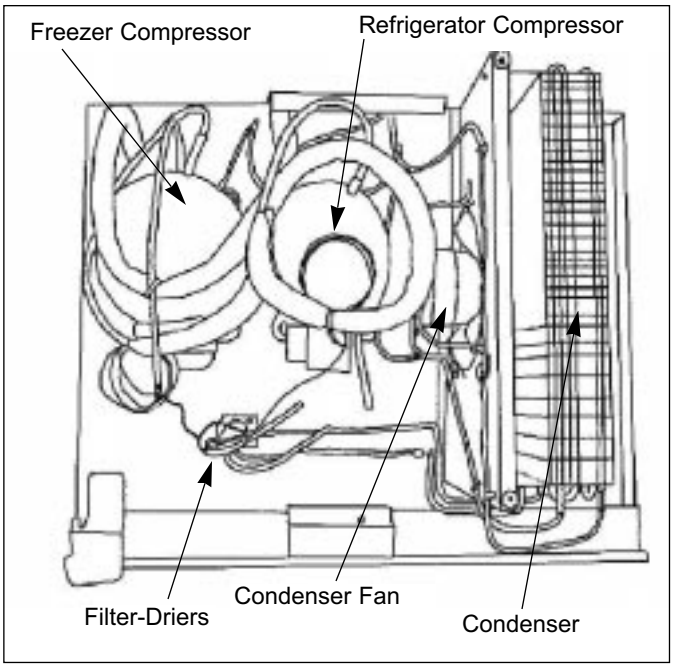


Figure 7-71. Models 611, 632, 642, 650, 680, 690 Upper Compressor Area

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 Removal (Models 611, 632, 642, 650, 680, 690)

⚠ CAUTION

Evaporator fins are sharp and could cause minor personal injury.

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

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.)

Refrigerator Heat Exchanger Removal (Models 611, 632, 642, 650, 680, 690)

⚠ CAUTION

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 out side of the heat exchanger hole. Now, pull the heat exchanger down out of the heat exchanger hole. (See Figures 7-71 and 7-72.)

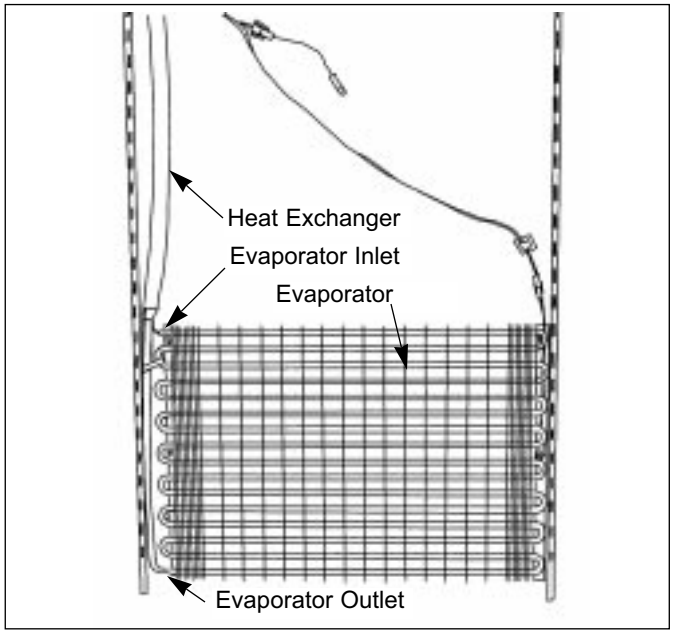


Figure 7-72. Models 611, 632, 642, 650, 680, 690 Refrigerator Evaporator Area

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 Removal (Models 611, 650)

⚠ CAUTION

Evaporator fins are sharp and could cause minor personal injury.

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

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.

Freezer Heat Exchanger Removal (Models 611, 650)

⚠ WARNING

It is necessary to pull the unit from the installation to replace the freezer heat exchanger. The unit is very top heavy and could tip. See Tip Warning in the Installation Section of this manual.

⚠ CAUTION

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

⚠ CAUTION

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.*

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 out side 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 Removal (Models 632, 642)

⚠ CAUTION

Evaporator fins are sharp and could cause minor personal injury.

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

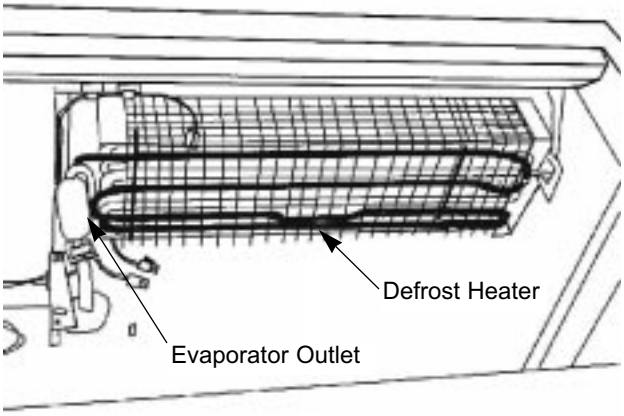


Figure 7-73. Model 611, 650 Freezer Evaporator Area

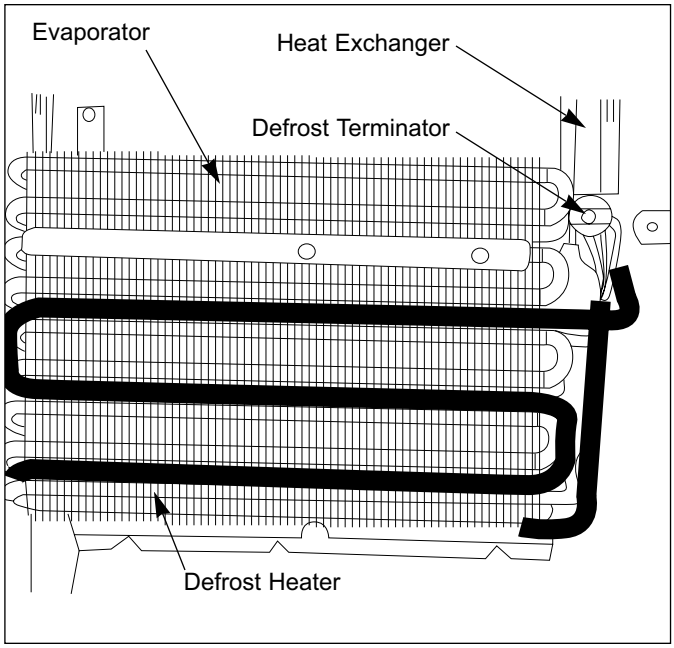


Figure 7-74. Model 632, 642 Freezer Evaporator Area

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.)

Freezer Heat Exchanger Removal (Models 632, 642)

> **⚠ CAUTION**
>
> **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. 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 Removal (Models 680 & 690)

> **⚠ CAUTION**
>
> **Evaporator fins are sharp and could cause minor personal injury.**

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.)

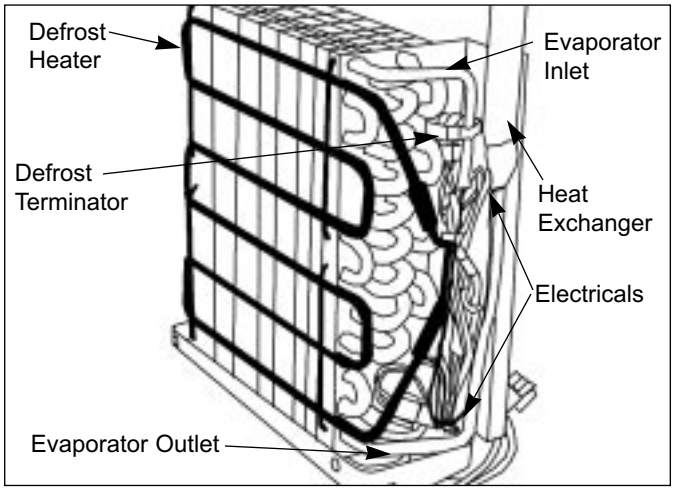


Figure 7-75. Models 680 & 690 Freezer Evaporator (Rear View)

Freezer Heat Exchanger Removal (Model 690)

> **⚠ CAUTION**
>
> **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 out side 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.*

SECTION 9

TROUBLESHOOTING GUIDE

For units starting with serial #1810000

TROUBLESHOOTING GUIDES

This section of the manual contains the Error Code Troubleshooting Guide to be referenced if a 600 Series unit, starting with serial #1810000, experiences temperature problems and/or Error Codes appear during Diagnostic Mode. The General Troubleshooting Guide that follows covers all problems that a 600 Series may experience. This is followed by Sealed System Diagnostics Tables along with a Temperature/Low Side Pressure Chart, to be referenced if the sealed system must be entered. The last entry in this section is the Membrane Switch/Ribbon Cable Test Procedure.

HOW TO USE THE ERROR CODE TROUBLESHOOTING GUIDE

Error Codes are registered if a unit experiences thermistor or defrost system errors. These types of errors can lead to a unit experiencing temperature problems. If Error Codes are registered, they will appear when Diagnostic Mode is initiated.

To initiate Diagnostic Mode, press and hold either COLDER key, then press the UNIT ON/OFF key, then release both keys. Now, check to see if Error Codes are present, being sure to toggle through all error and temperature readings by pressing either COLDER key or either WARMER key. (See Error Code Table Below)

NOTE: *Currently, Error Codes are registered because of thermistor or defrost system errors only. When subsequent software and electrical changes occur, more error codes will be added and the Error Code Troubleshooting Guide will be expanded.*

If Error Codes appear during Diagnostic Mode, follow the Error Code Troubleshooting Guide on the following page. The left column of the troubleshooting guide lists the error codes. The information in the right column explain what tests to perform and/or what action to take to correct the error.

NOTE: *If error codes are observed in diagnostic mode, a non-flashing SERVICE annunciator will appear on the LCD when Diagnostic Mode ends, indicating error codes are still registered. To clear the non-flashing SERVICE annunciator and the error codes, the problem must be corrected and the unit must be ON. Then, press and hold the Door Ajar Alarm Bell ON/OFF key for 15 seconds. The control will emit a short "beep" when the SERVICE annunciator and error codes are cleared.*

Error Code Table	
CODE	**INDICATION**
05	***Refrig. Cabinet Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's***
06	***Refrig. Evaporator Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's***
07	***Freezer Cabinet Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's***
08	***Freezer Evaporator Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's***
20	***Defrost Under-heat with No Voltage Feedback Through Gray/White Wire at Defrost Start***
21	***Defrost Overheat***
22	***No Voltage Feedback Through Gray/White Wire at Defrost Start***
23	***Defrost Overheat with No Voltage Feedback through Gray/White Wire at Defrost Start***
24	***Defrost Under-heat***

ERROR CODE TROUBLESHOOTING GUIDE

ERROR CODE	TEST / ACTION
05	a. Check refrigerator compartment thermistor electrical connections and continuity from thermistor to J1 on control board. Reconnect / repair connections. b. Check resistance of refrigerator compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
06	a. Check refrigerator evaporator thermistor electrical connections and continuity from thermistor to J1 on control board. Reconnect / repair connections. b. Check resistance of refrigerator evaporator thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
07	a. Check freezer compartment thermistor electrical connections and continuity from thermistor to J1 on control board. Reconnect / repair connections. b. Check resistance of freezer compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
08	a. Check freezer evaporator thermistor electrical connections and continuity from thermistor to J1 on control board. Reconnect / repair connections. b. Check resistance of freezer evaporator thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
20	a. With a cold evaporator (< 10°F), initiate Manual Defrost. If compressor starts 5 minutes after defrost is initiated, check Grey/White wire connections and continuity from defrost heater to J4-4 on control board. Reconnect / repair Grey/White wire &/or electrical connections. b. Check for proper ohm readings of defrost heater. Replace heater if defective. c. Check defrost terminator and its electrical connections, Reconnect / repair bad connections or replace terminator if defective. d. Initiate Manual Defrost, check for 115V AC at E2 on control board. If no voltage, replace board. e. Initiate Manual Defrost, check for 115V AC from E2 (Blue Wire) on control board to defrost terminator. Reconnect / repair blue wire &/or electrical connections. f. Reference wiring diagram to identify components in same White wire circuit as defrost heater. Check all White wire electrical connections and continuity from defrost heater to J7-8 on control board.
21	a. Check for proper mounting and location of freezer evaporator thermistor and defrost heater. Remount correctly. b. Check for correct wire connection at control board, Blue wire at E2 on control board. If connected to wrong pin, reconnect correctly. c Check for electrical short of Blue wire to another circuit. Repair Blue wire &/or electrical connections. d. Check for proper operation of defrost terminator (Cut-in 30°F/Cut-out 55°F. For model 601F ONLY: Cut-in 30°F/Cut-out 70°F). Replace if defective.
22	a. Initiate Manual Defrost. If compressor starts 5 minutes after defrost is initiated, check Grey/White wire connections and continuity from defrost heater to J4-4 on control board. Reconnect / repair Grey/White wire &/or electrical connections.
23	a. Check for proper mounting and location of freezer evaporator thermistor and defrost heater. Remount correctly. b. Check for correct wire connection at control board, Blue wire at E2 on control board. If connected to wrong pin, reconnect correctly. c Check for electrical short of Blue wire to another circuit. Repair Blue wire &/or electrical connections. d. Initiate Manual Defrost. If compressor starts 5 minutes after defrost is initiated, check Grey/White wire connections and continuity from defrost heater to J4-4 on control board. Reconnect / repair Grey/White wire &/or electrical connections.
24	a. Check for proper ohm readings of defrost heater. Replace heater if defective. b. Check for proper mounting and location of freezer evaporator thermistor and defrost heater. Remount correctly.

HOW TO USE THE GENERAL TROUBLESHOOTING GUIDE

The General Troubleshooting Guide Table of Contents on the following page indicates how the General 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. The information in the center column of the Troubleshooting Guide identifies possible causes for the problem. The information in the right column explains the tests to perform and/or what action to take to correct the problem.

***For Problems "A" through "H"*:**

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.
3. When Diagnostic Mode is initiated, check to see if "Error Codes" are present, being sure to toggle through all the error and temperature readings by pressing either COLDER key or either WARMER key. (See Thermistor Location Code Tables below.)
4. If Error Codes are present, refer to Error Code Troubleshooting Guide on previous pages.
5. If there are no Error Codes, initiate Manual Component Activation Mode (which lasts for 5 minutes) by pressing and holding the desired compartment COLDER and UNIT ON/OFF keys for 10 seconds, then observe the 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.*
6. 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, 680, 690	
THERMISTOR LOCATION	**CODE**
Freezer Compartment	***F***
Refrigerator Compartment	***r***
Freezer Evaporator	***FE***
Refrigerator Evaporator	***rE***

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

MODEL 601F	
THERMISTOR LOCATION	**CODE**
Freezer Compartment	***F***
Freezer Evaporator	***FE***

For All Problems:

If the unit's temperature history is needed to help diagnose the problem, initiate Temperature Log Recall Mode as described below. This allows the preceding fourteen days of the unit's temperature history to be observed.

a. *To View Compartment Temperature History Only:* Begin with the unit ON. Now, press and hold the desired compartment WARMER key, then press the UNIT ON/OFF key, then release both keys.

b. *To View Compartment or Evaporator Temperature History:* Begin with the unit in Diagnostic Mode. While in Diagnostic Mode, toggle through the readings until the desired thermistor temperature is displayed on the LCD. Now, press the WARMER key for that compartment and the UNIT ON/OFF key simultaneously.

GENERAL TROUBLESHOOTING GUIDE TABLE OF CONTENTS

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
A.) Warm Freezer Temperature with "SERVICE" Flashing ***Pointers:*** *1. Evaporator temp -20°F or lower, see:* • *Door ajar* • *Lights ON w/door closed* • *Evaporator fan fault* • *Compartment thermistor misread* • *Evaporator heavily frosted* • *Sealed system fault - leak or partial restriction* *2. Evaporator. Temp. between -19°F & 0°F, see:* • *Condenser Air Flow* • *Compartment thermistor misread* • *Sealed system fault, leak* *3. Evaporator. Temp. 0°F or higher, see:* • *Power to compressor fault,* • *Sealed system fault, leak, restriction or inefficient compressor* ***NOTE:*** *"Pointers" do not apply to cabinet initial pulldown from ambient temperatures.* ***NOTE:*** *To clear flashing SERVICE annunciator after repairs, power OFF, then back ON.* ***NOTE:*** *To clear non-flashing SERVICE annunciator after repairs, press door ajar alarm bell ON/OFF key for 15 seconds.* *(Continued)*	**Door Ajar** a. Food product obstruction b. Door/cabinet hinge problem	 a. Move obstruction. b. Check and replace hinge if defective.
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed or blade is loose c. Condenser fan motor disconnected d. Condenser fan motor defective e. No power from control board to condenser fan (Does not apply to single compressor models) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction or tighten nut on motor shaft. c. Check electrical connections from motor to J7-1 on control board, or from motor to compressor on single compressor models. Reconnect / repair connections. d. Check for 115V AC to motor, replace motor if defective. e. Check for 115V AC at J7-1 on control board (with compressor running). Replace board if defective.
	Light ON with Door Closed a. Switch depressor missing or bent, not depressing light switch b. Faulty light switch	 a. Replace/straighten switch depressor. b. Check operation of light switches, lights off when switch is depressed. Replace switch if defective.
	Evaporator Fan Fault a. Switch depressor missing or bent, not depressing fan switch b. Fan blade obstructed or out of position c. Faulty fan switch *(**NOTE:** A compressor must be running)* d. Evaporator fan motor disconnected e. Evaporator fan motor defective *(**NOTE:** Compressor must be running)*	 a. Replace/straighten switch depressor. b. Move obstruction or reposition blade. c. Check for 115V AC to fan switch, depress fan switch and check for 115V AC from switch to motor. Replace switch if defective. d. Check electrical connections of motor. Reconnect / repair bad connections. e. Check for 115V AC at fan motor with fan switch depressed. Replace motor if defective.
	Compartment Thermistor Misread	Check resistance of compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
(Continued) **A.) Warm Freezer Temperature with "SERVICE" Flashing** *(See Pointers on previous page)*	**Evaporator Heavily Frosted** a. Door ajar b. Evaporator fan fault c. Compartment thermistor misread d. Defrost heater or drain trough heater disconnected or faulty e. Defrost terminator disconnected or faulty. f. Defrost sense line disconnected. g. No power from control board to defrost circuit	 a. See Door Ajar on previous page. b. See Evaporator Fan Fault on previous page. c. See Compartment Thermistor Misread on previous page. d. Check electrical connections of heaters. Reconnect / repair bad connections. Check resistance of heaters, replace if defective. e. Check electrical connections, Reconnect / repair bad connections or replace terminator if defective. f. Look for Error Codes 20, 22 or 23 or Manually initiate defrost by pressing ICE key for 5 seconds. If defrost lasts exactly 5 minutes, check all connections of gray/white wire from terminator to J4-4 on control board. Reconnect / repair bad connections. g. Manually initiate defrost by pressing ICE key for 5 seconds. Check for 115V AC at E2 on control board. Replace control board if defective.
	Power to Compressor Fault	Initiate Manual Component Activation Mode and check for 115V AC at E7 on control board. Replace control board if defective.
	Sealed System Fault • Sealed System Leak • Sealed System Restriction • Inefficient Compressor	See Sealed System Diagnostic Tables at back of Troubleshooting Guide

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
B.) Warm Freezer Temperatures <u>without</u> "SERVICE" Flashing ***Pointers:*** *1. "Sr" appears during Diagnostic Mode, see:* • *Unit in Showroom Mode* *2 Evaporator temp -20°F or lower , see:* • *Door ajar* • *Lights ON w/door closed* • *Evaporator fan fault* • *Compartment thermistor mis-read* • *Evaporator heavily frosted* • *Sealed system fault - leak or partial restriction* *3. Evaporator. Temp. between -19°F & 0°F, see:* • *Warm food load* • *High room ambient* • *Door ajar* • *Condenser air flow* • *Sealed system fault, leak* *4. Evaporator. Temp. 0°F or higher, see:* • *Power To Compressor fault* • *Sealed system fault, leak restriction or inefficient compressor* ***NOTE:** "Pointers" do not apply to cabinet initial pulldown from ambient temperatures.* ***NOTE:** To clear non-flashing SERVICE annunciator after repairs, press door ajar alarm bell ON/OFF key for 15 seconds.* *(Continued)*	**No Power to Unit**	Check power to unit, plug unit in or switch supply circuit breaker ON.
	Unit Switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT ON/OFF key.
	Unit in Showroom Mode	Press UNIT ON/OFF key to OFF, then 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 unit performs best between 60°F(16°C) and 90°F(32°C).
	Door Ajar a. Food product obstruction b. Door/cabinet hinge problem	 a. Move obstruction. b. Check and replace hinge if defective.
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed or blade is loose c. Condenser fan motor disconnected d. Condenser fan motor defective e. No power from control board to condenser fan (Does not apply to single compressor models) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction or tighten nut on motor shaft. c. Check electrical connections from motor to J7-1 on control board, or from motor to compressor on single compressor models. Reconnect / repair connections. d. Check for 115V AC to motor, replace motor if defective. e. Check for 115V AC at J7-1 on control board (with compressor running). Replace board if defective.
	Light ON with Door Closed a. Switch depressor missing or bent, not depressing light switch b. Faulty light switch	 a. Replace/straighten switch depressor. b. Check operation of light switches, lights off when switch is depressed. Replace switch if defective.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
(Continued) **B.) Warm Freezer Temperatures <u>without</u> "SERVICE" Flashing** *(See Pointers on previous page)*	**Evaporator Fan Fault** a. Switch depressor missing or bent, not depressing fan switch b. Fan blade obstructed or out of position c. Faulty fan switch *(**NOTE:** A compressor must be running)* d. Evaporator fan motor disconnected e. Evaporator fan motor defective *(**NOTE:** Compressor must be running)*	 a. Replace/straighten switch depressor. b. Move obstruction or reposition blade. c. Check for 115V AC to fan switch, depress fan switch and check for 115V AC from switch to motor. Replace switch if defective. d. Check electrical connections of motor. Reconnect / repair bad connections. e. Check for 115V AC at fan motor with fan switch depressed. Replace motor if defective.
	Compartment Thermistor Misread	Check resistance of compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
	Evaporator Heavily Frosted a. Door ajar b. Evaporator fan fault c. Compartment thermistor misread d. Defrost heater or drain trough heater disconnected or faulty e. Defrost terminator disconnected or faulty. f. Defrost sense line disconnected. g. No power from control board to defrost circuit	 a. See Door Ajar on previous page. b. See Evaporator Fan Fault on previous page. c. See Compartment Thermistor Misread on previous page. d. Check electrical connections of heaters. Reconnect / repair bad connections. Check resistance of heaters, replace if defective. e. Check electrical connections, Reconnect / repair bad connections or replace terminator if defective. f. Look for Error Codes 20, 22 or 23 or Manually initiate defrost by pressing ICE key for 5 seconds. If defrost lasts exactly 5 minutes, check all connections of gray/white wire from terminator to J4-4 on control board. Reconnect / repair bad connections. g. Manually initiate defrost by pressing ICE key for 5 seconds. Check for 115V AC at E2 on control board. Replace control board if defective.
	Power to Compressor Fault	Initiate Manual Component Activation Mode and check for 115V AC at E7 on control board. Replace control board if defective.
	Sealed System Fault • Sealed System Leak • Sealed System Restriction • Inefficient Compressor	See Sealed System Diagnostic Tables at back of Troubleshooting Guide

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
C. Warm Refrigerator Temperatures with "SERVICE" Flashing ***Pointers:*** *Refrigerator door must be open and compressor running for <u>five minutes</u>.* *1. "EE" appears in place of refrigerator evap. temperature, see:* • *Evaporator thermistor disconnected or shorted* *2. Evaporator temp 15°F or lower within 5 minutes w/ door open, see:* • *Door ajar* • *Lights stay ON* • *Evaporator fan fault* • *Compartment or evaporator thermistor misread* • *Evaporator heavily frosted* • *Sealed system fault - leak or partial restriction* *3. Evaporator. Temp. cannot pull below 30°F within 5 minutes w/ door open, see:* • *Condenser Air Flow* • *Compartment or evaporator thermistor misread* • *Sealed system fault, leak or inefficient compressor* 4. Evaporator. Temp. 35°F or higher after 5 minutes w/door open, see: • *Condenser Air Flow* • *Power to compressor fault* • *Sealed system fault, leak, restriction or inefficient compressor* ***NOTE:*** *"Pointers" do not apply to cabinet initial pulldown from ambient temperatures.* ***NOTE:*** *To clear flashing SERVICE annunciator after repairs, power OFF, then back ON.* ***NOTE:*** *To clear non-flashing SERVICE annunciator after repairs, press door ajar alarm bell ON/OFF key for 15 seconds.* *(Continued)*	**Door Ajar** a. Food product obstruction b. Door/cabinet hinge problem	 a. Move obstruction. b. Check and replace hinge if defective.
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed or blade is loose c. Condenser fan motor disconnected d. Condenser fan motor defective e. No power from control board to condenser fan (Does not apply to single compressor models) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction or tighten nut on motor shaft. c. Check electrical connections from motor to J7-1 on control board, or from motor to compressor on single compressor models. Reconnect / repair connections. d. Check for 115V AC to motor, replace motor if defective. e. Check for 115V AC at J7-1 on control board (with compressor running). Replace board if defective.
	Light ON with Door Closed a. Switch depressor missing or bent, not depressing light switch b. Faulty light switch	 a. Replace/straighten switch depressor. b. Check operation of light switches, lights off when switch is depressed. Replace switch if defective.
	Evaporator Fan Fault a. Switch depressor missing or bent, not depressing fan switch b. Fan blade obstructed or out of position c. Faulty fan switch *(**NOTE:** A compressor must be running)* d. Evaporator. fan motor disconnected e. Evaporator fan motor defective *(**NOTE:** Compressor must be running)*	 a. Replace/straighten switch depressor. b. Move obstruction or reposition blade. c. Check for 115V AC to fan switch, depress fan switch and check for 115V AC from switch to motor. Replace switch if defective. d. Check electrical connections of motor. Reconnect / repair bad connections. e. Check for 115V AC at fan motor with fan switch depressed. Replace motor if defective.
	Evaporator Thermistor Disconnected or Shorted	Check for "EE" & "rE" in diagnostic mode. Check refrigerator evaporator thermistor electrical connections from thermistor to J1 on control board. Reconnect / repair connections. Check resistance of refrigerator evaporator thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
	Compartment or Evaporator Thermistor Misread	Check resistance of refrigerator compartment and evaporator thermistors for 30,000 to 33,000 ohms at 32°F. Replace if defective.
	Evaporator Heavily Frosted a. Door or drawer ajar b. Evaporator fan fault c. Thermistor misread	 a. See Door Ajar above. b. See Evaporator Fan Fault above. c. See Thermistor Misread above.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
(Continued) **C. Warm Refrigerator Temperatures with "SERVICE" Flashing** *(See Pointers on previous page)*	**Power to Compressor Fault**	Check for 115V AC E6 on control board. Replace control board if defective.
	Sealed System Fault • Sealed System Leak • Sealed System Restriction • Inefficient Compressor	See Sealed System Diagnostic Tables at back of Troubleshooting Guide
D. Warm Refrigerator Temperatures <u>without</u> "SERVICE" Flashing ***Pointers:*** *Refrigerator door must be open and compressor running for <u>five minutes</u>.* *1. "Sr" appears during Diagnostic Mode, see:* • *Unit in Showroom Mode* *2 Evaporator temp 15°F or lower within 5 minutes w/ door open, see:* • *Door ajar* • *Lights stay ON* • *Evaporator fan fault* • *Compartment or evaporator thermistor misread* • *Evaporator heavily frosted* • *Sealed system fault - leak or partial restriction* *3. Evaporator Temp. cannot pull below 30°F within 5 minutes w/ door open, see:* • *Warm food load* • *High room ambient* • *Door ajar* • *Condenser air flow* • *Sealed system fault, leak* *4.* Evaporator Temp. 35°F or higher after 5 minutes w/door open, see: • *Condenser Air Flow* • *Power to compressor fault* • *Sealed system fault, leak, restriction or inefficient compressor* ***NOTE:** "Pointers" do not apply to cabinet initial pulldown from ambient temperatures.* ***NOTE:** To clear non-flashing SERVICE annunciator after repairs, press door ajar alarm bell ON/OFF key for 15 seconds.* *(Continued)*	**No Power to Unit**	Check power to unit, plug unit in or switch supply circuit breaker ON.
	Unit Switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT ON/OFF key.
	Unit in Showroom Mode	Press UNIT ON/OFF key to OFF, then 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 refrigerator for warm food load. Instruct customer.
	High Room Ambient	Instruct customer unit performs best between 60°F(16°C) and 90°F(32°C).
	Door Ajar a. Food product obstruction b. Door/cabinet hinge problem	 a. Move obstruction. b. Check and replace hinge if defective.
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed or blade is loose c. Condenser fan motor disconnected d. Condenser fan motor defective e. No power from control board to condenser fan (Does not apply to single compressor models) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction or tighten nut on motor shaft. c. Check electrical connections from motor to J7-1 on control board, or from motor to compressor on single compressor models. Reconnect / repair connections. d. Check for 115V AC to motor, replace motor if defective. e. Check for 115V AC at J7-1 on control board (with compressor running). Replace board if defective.
	Light ON with Door Closed a. Switch depressor missing or bent, not depressing light switch b. Faulty light switch	 a. Replace/straighten switch depressor. b. Check operation of light switches, lights off when switch is depressed. Replace switch if defective.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
(Continued) **D. Warm Refrigerator Temperatures <u>without</u> "SERVICE" Flashing** *(See Pointers on previous page)*	**Evaporator Fan Fault** a. Switch depressor missing or bent, not depressing fan switch b. Fan blade obstructed or out of position c. Faulty fan switch *(**NOTE:** A compressor must be running)* d. Evaporator fan motor disconnected e. Evaporator fan motor defective *(**NOTE:** Compressor must be running)*	 a. Replace/straighten switch depressor. b. Move obstruction or reposition blade. c. Check for 115V AC to fan switch, depress fan switch and check for 115V AC from switch to motor. Replace switch if defective. d. Check electrical connections of motor. Reconnect / repair bad connections. e. Check for 115V AC at fan motor with fan switch depressed. Replace motor if defective.
	Compartment or Evaporator Thermistor Misread	Check resistance of refrigerator compartment and evaporator thermistors for 30,000 to 33,000 ohms at 32°F. Replace if defective.
	Evaporator Heavily Frosted a. Door or drawer ajar b. Evaporator fan fault c. Thermistor misread	 a. See Door Ajar on previous page. b. See Evaporator Fan Fault above. c. See Thermistor Misread above.
	Power to Compressor Fault	Check for 115V AC E6 on control board. Replace control board if defective.
	Sealed System Fault • Sealed System Leak • Sealed System Restriction • Inefficient Compressor	See Sealed System Diagnostic Tables at back of Troubleshooting Guide
E. Warm or Normal Temperatures in Both Compartments with "SERVICE" Flashing	**High Room Ambient**	Instruct customer unit performs best between 60°F(16°C) and 90°F(32°C).
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed or blade is loose c. Condenser fan motor disconnected d. Condenser fan motor defective e. No power from control board to condenser fan (Does not apply to single compressor models) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction or tighten nut on motor shaft. c. Check electrical connections from motor to J7-1 on control board, or from motor to compressor on single compressor models. Reconnect / repair connections. d. Check for 115V AC to motor, replace motor if defective. e. Check for 115V AC at J7-1 on control board (with compressor running). Replace board if defective.
	Refrigerator Evaporator Thermistor Disconnected or Shorted	Check for "EE" & "rE" in diagnostic mode. Check refrigerator evaporator thermistor electrical connections from thermistor to J1 on control board. Reconnect / repair connections. Check resistance of refrigerator evaporator thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
F. Warm Temperatures in Both Compartments <u>without</u> "SERVICE" Flashing	**No Power to Unit**	Check power to unit, plug unit in or switch supply circuit breaker ON.
	Unit Switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT ON/OFF key.
	Unit in Showroom Mode	Press UNIT ON/OFF key to OFF, then 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 unit performs best between 60°F(16°C) and 90°F(32°C).
	Door Ajar a. Food product obstruction b. Door/cabinet hinge problem	 a. Move obstruction. b. Check and replace hinge if defective.
	Condenser Air Flow a. Dirty condenser b. Condenser fan blade obstructed or blade is loose c. Condenser fan motor disconnected d. Condenser fan motor defective e. No power from control board to condenser fan (Does not apply to single compressor models) *(**NOTE:** A compressor must be running)*	 a. Clean condenser. b. Remove obstruction or tighten nut on motor shaft. c. Check electrical connections from motor to J7-1 on control board, or from motor to compressor on single compressor models. Reconnect / repair connections. d. Check for 115V AC to motor, replace motor if defective. e. Check for 115V AC at J7-1 on control board (with compressor running). Replace board if defective.
G. Warm or Normal Freezer Temperatures with "EE" Displayed for Freezer Temp and "SERVICE" Flashing	**Freezer Compartment Thermistor Disconnected or Shorted**	Check for "EE" & "F" in diagnostic mode. Check freezer compartment thermistor electrical connections from thermistor to J1 on control board. Reconnect / repair connections. Check resistance of freezer compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
H. Warm or Normal Refrigerator Temperatures with "EE" Displayed for Refrigerator Temp and "SERVICE" Flashing	**Refrigerator Compartment Thermistor Disconnected or Shorted**	Check for "EE" & "r" in diagnostic mode. Check refrigerator compartment thermistor electrical connections from thermistor to J1 on control board. Reconnect / repair connections. Check resistance of refrigerator compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
I. Product Temperature 10° or More Colder than Displayed Temperature	**Compartment Thermistor Misread**	Check resistance of compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
J. 1. "Extremely" Cold Temperatures Displayed ***(1° to 7° in Refrigerator and -21° to -15° in Freezer)*** **2. If outside US - "Extremely" Warm Temperatures Displayed** ***(34° to 45° in Refrigerator and -5° to 5° in Freezer)***	**1. Control Set to Display Celsius but Customer Thought it Was Fahrenheit** **2. If Outside US - Control Set to Display Fahrenheit but Customer Thought it Was Celsius**	1. Switch unit OFF, then ON, then press & hold Bell key and UNIT ON/OFF key for 10 seconds. 2. Switch unit OFF, then ON, then press & hold Bell key and UNIT ON/OFF key for 10 seconds.
K. "ICE" and "SERVICE" Flashing on LCD	**Water Valve Energized Longer then Fifteen Seconds**	Check icemaker area for jammed ice cube, clear jam if present. Check levelness of icemaker, level if needed. Check position of fill cup. Reposition if in ice path. Check water supply pressure; must be constant 20-100 PSI. If not, instruct customer. Check water valve operation, opens when 115V AC is applied, closes completely when 115V AC is removed. Water valve Ohms = 160. Replace if defective.
L. No Ice, "ICE" Displayed on LCD, but not Flashing **NOTE:** *The Icemaker system is disabled for 45 minutes after each harvest.*	**Unit Has Not Run Long Enough**	Freezer must be 15°F/± 3°F for icemaker to operate, approximately 24 hours after unit installation. Instruct customer.
	Warm Freezer Temperatures *(**NOTE**: Freezer must be 17°F or colder for icemaker to function)*	See PROBLEM A, B, E, F & G earlier in Troubleshooting Guide.
	Shut-off Arm Stuck in Up/Off Position	Check shut-off arm, if stuck in up/off position, correct problem.
(Continued)	**Disconnected or Defective Water Valve**	Check electrical connections and water connections at water valve, Reconnect / repair connections. Check resistance of water valve, 160 ohms. Replace if defective.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
(Continued) **L. No Ice, "ICE" Displayed on LCD, but not Flashing** **NOTE:** *The Icemaker system is disabled for 45 minutes after each harvest.*	**Icemaker System Fault**	Bypass 45 minute dwell by pressing ICE ON/OFF key to OFF, then again to ON. Then, depress icemaker switch and manually start icemaker cycle by turning drive gear counter-clockwise with flat-blade screwdriver. Watch cycle of icemaker and see #1, #2 & #3 below.
		1. If icemaker starts and finishes cycle: ***NOTE:*** *Icemaker will only complete 1 revolution if above 15°F/± 3°F.*
	a. Disconnected or damaged electrical connections at icemaker or water valve, or defective water valve.	a. Visually inspect electrical connections at icemaker & valve. Repair or replace connection. Then, check valve operation with test cord. If valve does not open, replace valve.
	b. Defective Thermostat	b. Check continuity of thermostat - Open at 48° ± 6°F, Close at 15° ± 3°F. Replace thermostat if defective.
	c. Defective Solenoid Switch	c. With icemaker in park position, check solenoid switch terminals “C” & “NO” for continuity. Then, with icemaker ejector between 8:00 & 10:00 position, check solenoid switch terminals “C” & “NC” for continuity. If no continuity on either check, replace solenoid switch.
		2. If icemaker starts but does not finish cycle:
	c. Defective Holding Switch	c. With icemaker in park position, check holding switch terminals “C” & “NC” for continuity. Then, with icemaker ejector between 10:00 & 12:00 position, check holding switch terminals “C” & “NO” for continuity. If no continuity on either check, replace holding switch.
	d. Defective Shut-off Switch	d. With icemaker in park position, check shut-off switch terminals “C” & “NO” for continuity. Then, with icemaker ejector between 12:00 & 2:00 position, check shut-off switch terminals “C” & “NC” for continuity. If no continuity on either check, replace shut-off switch.
	e. Defective Mold Hearer or Thermostat	e. Check mold heater for 75-85 ohms. If outside range, replace mold body assembly. If heater checks OK, replace thermostat.
		3. If icemaker motor does NOT start:
	f. Shut-off Arm in up (OFF) position	f. Lower shut-off arm.
	g. Defective Drive Motor	g. Check operation of motor with a test cord. If motor does not run, replace motor.
	h. Disconnected or damaged electrical connections at icemaker	h. Check for 115V to icemaker. If no power, check/repair electrical connection.
	i. Icemaker switch disconnected or faulty	i. Check power to and from icemaker switch. reconnect or repair connection. Replace switch if defective.
	j. Electrical connection at control board or control board defect.	j. Check for 115V AC at J7-5 on control board. If power is present, check and repair connection. If no power, replace control board.
(Continued)		

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
(Continued) **L. No Ice, "ICE" Displayed on LCD, but not Flashing** **NOTE:** *The Icemaker system is disabled for 45 minutes after each harvest.*	**Frozen Fill Tube** a. Water Supply Problem b. Disconnected or defective fill tube heater c. No power from control board to fill tube heater	 a. Check water supply pressure; must be constant 20-100 PSI. If not, instruct customer. b. Check electrical connections at fill tube heater. Reconnect / repair connections. Check resistance of fill tube heater, 2300 - 2900 Ohms. Replace if defective. c. Check for 115V AC at J7-3 on control board. Replace board if defective.
M. No Ice and "ICE" Not Displayed on LCD	**Icemaker System Not Energized**	Press ICE key. " ICE" should appear on LCD.
N. Icemaker produces 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.
O. Icemaker Produces Hollow Cubes	**Freezer Too Cold, Cycles Icemaker Too Soon**	See PROBLEM "I" earlier in Troubleshooting Guide.
	Not Enough Thermal-Mastic on Icemaker Thermostat	Inspect icemaker, apply more Thermal-Mastic.
	Icemaker System Fault	See "Icemaker System Fault"
P. Icemaker Produces Small cubes	**Water Supply Problem**	Check water supply pressure; must be constant 20-100 PSI. If not, instruct customer.
	Icemaker Not Level	Check level of icemaker, adjust if needed
Q. Water in Ice Bucket / Clump of Ice in Ice Bucket	**Low Fill Adjustment on Icemaker**	Check for 100-110 cc. fill (3.5-3.75 oz.). If low, increase by turning adjusting screw counterclockwise.
	Icemaker Not Level	Check level of icemaker, adjust if needed
	High Fill Adjustment on Icemaker	Check for 100-110 cc. fill (3.5-3.75 oz.). Turn adjusting screw clockwise to decrease.
	Water Valve Energized Too Long	Check icemaker area for jammed ice cube, clear jam if present. Check levelness of icemaker; level if needed. Check position of fill cup, reposition if in ice path. Check water supply pressure; must be constant 20-100 PSI. If not, instruct customer. Check water valve operation, opens when 115V AC is applied, closes completely when 115V AC is removed. Water valve Ohms = 160. Replace if defective.
	Intermittent Warm Freezer Temperatures	See PROBLEM A, B, E, F & G earlier in Troubleshooting Guide.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
R. Membrane Switch on Control Panel Malfunctioning	**Control Panel Ribbon Cable Disconnected or Connected Incorrectly**	Check control panel ribbon cable at control board. All pins on board should be in ribbon cable terminal. See "Pin 1 Identification Procedure" on page 9-21, to identify Pin 1 of ribbon cable terminal, then verify Pin 1 of cable aligns with Pin 1 on control board.
	Control Panel Assembly Defective (OR) No Signal Read at Control Board	See Membrane Switch/Ribbon Cable Test Procedures. If membrane switch fails any test, replace control panel assembly. If switch passes all tests, replace control board.
S. No Lights	**No power to unit**	Check power to unit, plug unit in or switch supply circuit breaker ON.
	Unit switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT ON/OFF key.
	Unit in Sabbath Mode	Press UNIT ON/OFF key.
	Defective or loose light bulb(s)	Install a known good light bulb.
	Light Terminator Interrupt / Door Ajar	Check for proper door closing. If door is open too long, lighting system is interrupted by the terminator. If door is obstructed, move obstruction. If door will not close properly, adjust door or replace hinge if defective. After correcting problem, bulbs must cool down before normal lighting function returns.
	Light Switch Disconnected or Defective	Check wire connections at light switch. Reconnect/repair. Check for 115V AC to and from light switch. Replace switch if defective.
	Lighting System Wiring Disconnected or Defective	Check for 115V AC from light sockets back to J7-4 on control board. Reconnect/repair or replace defective components.
	No Power From Control Board (***NOTE:*** *See Unit in Sabbath Mode above.)*	Check for 115V AC at J7-4 on control board. Replace board if defective. (***NOTE:*** *See Unit in Sabbath Mode above.)*
T. Lights Stay ON with Doors Closed - **(May be Accompanied by Door/Drawer Ajar Alarm Bell)**	**Door Ajar** a. Food product obstruction b. Door/cabinet hinge problem	 a. Move obstruction. b. Check and replace hinge if defective.
	Switch Depressor Not Hitting Switch	Replace or repair switch depressor
	Light Switch Defective	Check for 115V AC to and from light switch. Replace switch if defective.
	Wiring to Light Switch and Fan Switch Crossed	Check operation of light switch & fan switch, lights OFF when light switch depressed, fan ON when fan switch depressed. If crossed, reconnect wiring correctly.
	Food Product Obstruction	See "Door Ajar" above.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
U. No Accent Lights (Model 601RG, 611G, 650G Only)	**Accent Lighting System Wiring Disconnected or Defective**	Check wiring and connections, then with LIGHTS ON/OFF key in on position, check for 115V AC at: • Pin J7-5 on Model 601RG • Pin J7-3 on Models 611G or 650G Reconnect/repair wiring or replace control board if defective.
	Defective light strip(s)	Install known good light strip(s).
	Membrane Switch on Control Panel Malfunctioning	See “Membrane Switch on Control Panel Malfunctioning” on previous page.
V. Condensation on Glass Door (Model 601RG, 611G, 650G Only)	**High Room Ambient**	Instruct customer
	Door Ajar a. Food product obstruction b. Door/cabinet hinge problem	a. Move obstruction. b. Check and replace hinge if defective. (Also see “Door Not Able to Close Completely” below.)
	Air Leak	Check wiring and heat exchanger holes. Seal if open. If door gasket is new, place small bead of silicone under four corners of gasket, 3”-4” long.
	Unit in Sabbath Mode with Heavy Usage (Fan ON Feature after door close inactive)	Instruct customer. Press UNIT ON/OFF Key.
	Door Heater Defect	Check heater for 2300 - 2900 ohms. If bad, unplug heater and plug in redundant heater.
W. Door Not Able to Close Completely	**Unit Not Level**	Check levelness of unit. Adjust levelness if un-level.
	Improper Door Adjustment	Adjust doors.
	Door/Cabinet Hinge Problem	Replace hinge if defective.
X. Doors Uneven	**Unit Not Level**	Check levelness of unit. Adjust levelness if un-level.
	Improper Door Adjustment	Adjust doors.
	Door/Cabinet Hinge Problem	Replace hinge if defective.

SEALED SYSTEM DIAGNOSTICS TABLES

Before entering sealed system, see General Troubleshooting Guide starting on page 9-4, specifically problems “A” - “D”, referencing “Pointers” in first column. By initiating Diagnostic Mode and observing evaporator temperatures, you may find it unnecessary to enter the sealed system. The table on following page also provides a quick reference for temperature/pressure correlation.

NOTE: *Always use solder-on process valves. Do NOT use bolt-on process valves as they are prone to leak.*

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

NORMAL OPERATING PRESSURES			
Model		Normal Low-Side Pressures	Normal High-Side Pressures
601R	Refrigerator	10 psi to 36 psi	90 psi to 100 psi
601RG	Refrigerator	10 psi to 36 psi	90 psi to 100 psi
601F	Freezer	1” vacuum to 13 psi	90 psi to 100 psi
611	Refrigerator	6 psi to 40 psi	90 psi to 100 psi
	Freezer	2” vacuum to 14 psi	90 psi to 100 psi
611G	Refrigerator	6 psi to 40 psi	90 psi to 100 psi
	Freezer	2” vacuum to 14 psi	90 psi to 100 psi
632	Refrigerator	11 psi to 38 psi	90 psi to 100 psi
	Freezer	1” vacuum to 9 psi	90 psi to 100 psi
642	Refrigerator	11 psi to 38 psi	90 psi to 100 psi
	Freezer	1” vacuum to 9 psi	90 psi to 100 psi
650	Refrigerator	6 psi to 40 psi	90 psi to 100 psi
	Freezer	2” vacuum to 14 psi	90 psi to 100 psi
650G	Refrigerator	6 psi to 40 psi	90 psi to 100 psi
	Freezer	2” vacuum to 14 psi	90 psi to 100 psi
680	Refrigerator	16 psi to 36 psi	90 psi to 100 psi
	Freezer	1” vacuum to 9 psi	90 psi to 100 psi
690	Refrigerator	16 psi to 36 psi	90 psi to 100 psi
	Freezer	1” vacuum to 9 psi	90 psi to 100 psi

EVAPORATOR TEMPERATURE / SEALED SYSTEM LOW-SIDE PRESSURE CORRELATION

NOTE: *The temperature/pressure table at right is for reference only. A unit's temperature/pressure correlation may differ from those listed due to: variations in evaporator thermistor location, set-points, where the sealed system is in the refrigeration cycle, abmient temperature, etc. If a unit is experiencing temperature problems, it is recommended that you follow the "Pointers" in the first column of the General Troubleshooting Guide. After all mechanical and electrical components have been ruled out, sealed system pressures can be checked by applying solder-on process valves and referencing the preceding page. Do NOT use bolt-on process valves as they are prone to leak. This table should only be used as a last quick check before entering the sealed system.*

Temp °F	Pressure
-30	10” Vac
-25	7” Vac
-20	4” Vac
-15	0” Vac
-10	2 Psi
-5	4 Psi
0	7 Psi
5	9 Psi
10	12 Psi
15	15 Psi
20	18 Psi
25	22 Psi
30	26 Psi
35	30 Psi
40	35 Psi
45	40 Psi
50	45 Psi
55	51 Psi
60	57 Psi
65	64 Psi
70	71 Psi
75	78 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*

CONTROL PANEL MEMBRANE SWITCH / RIBBON CABLE TEST

If integrity of control panel assembly is suspect, perform continuity tests at membrane switch ribbon cable terminal housing. Begin by disconnecting ribbon cable from control board. Disengage control board from control panel. Remove control panel assembly from unit and place it on solid surface.

Pin 1 Identification Procedure

The ribbon cable wires are exposed at back of terminal housing (see Figure 9-1). If Pin 1 is not labeled on ribbon cable or terminal housing tag, follow guidelines below to identify Pin 1:

1. If terminal housing is BLUE, then Pin 1 is closest to arrow on housing.
2. If terminal housing is BLACK, check for continuity between first two pins at each end of housing while pushing UNIT ON/OFF key. If there is continuity, then Pin 1 is at that end.

Continuity Test Procedure

1. Identify model number being serviced in left column of table below.
2. Press key listed at top of table.
3. Corresponding numbers to right of model number and below key being pressed are the pin numbers on terminal housing that should have continuity.

   NOTE: *If any continuity tests show failure, replace entire control panel assembly.*

MODEL	UNIT ON/OFF KEY	ALARM (🔔) ON/OFF KEY	ICE ON/OFF KEY	REFRIG WARMER KEY	REFRIG COLDER KEY	FREEZER WARMER KEY	FREEZER COLDER KEY	BULK ICE KEY	LIGHTS ON/OFF KEY
601R	1 - 2	2 - 5	NA	3 - 4	4 - 5	NA	NA	NA	NA
601RG	1 - 2	2 - 5	NA	3 - 4	4 - 5	NA	NA	NA	2 - 3
601F	1 - 2	2 - 5	2 - 3	NA	NA	3 - 4	4 - 5	NA	NA
611	1 - 2	2 - 5	2 - 3	1 - 6	5 - 6	3 - 4	4 - 5	NA	NA
611G	1 - 2	2 - 3	2 - 5	3 - 4	4 - 5	1 - 6	5 - 6	NA	1 - 4
632	1 - 2	2 - 5	2 - 3	1 - 6	5 - 6	3 - 4	4 - 5	NA	NA
642	1 - 2	2 - 5	2 - 3	1 - 6	5 - 6	3 - 4	4 - 5	NA	NA
650	1 - 2	2 - 5	2 - 3	1 - 6	5 - 6	3 - 4	4 - 5	NA	NA
650G	1 - 2	2 - 3	2 - 5	3 - 4	4 - 5	1 - 6	5 - 6	NA	1 - 4
680	1 - 2	2 - 3	2 - 5	3 - 4	4 - 5	1 - 6	5 - 6	1 - 4	NA
690	1 - 2	2 - 3	2 - 5	3 - 4	4 - 5	1 - 6	5 - 6	1 - 4	NA

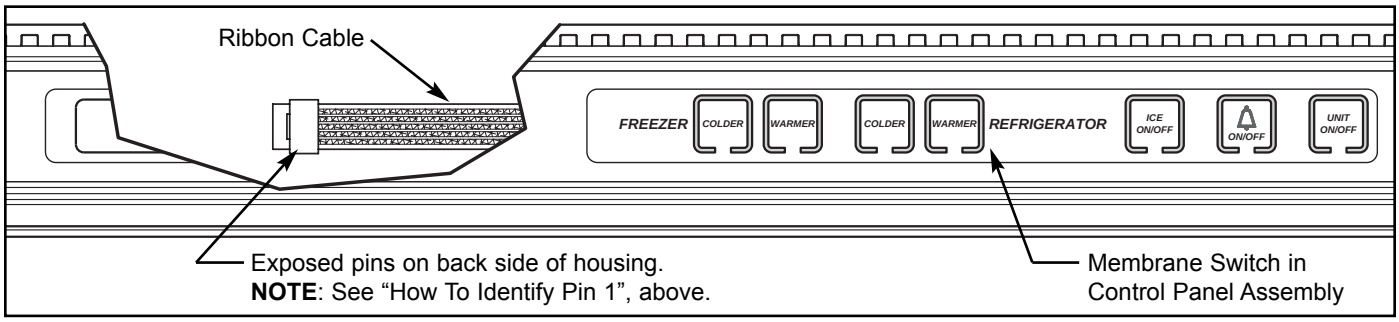


Figure 9-1. Control Panel Assy with Cut-Away View to Show Ribbon Cable *(Model 632 Control Panel Shown)*

SECTION 10

TECHNICAL DATA

For units starting with serial #1810000

Model 601R

	REFRIGERATOR
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	10 oz. (PTS #1978387) 8.5 oz (SWS #1978387)
NORMAL OPERATING PRESSURES	
Low Side	10 psi to 36 psi
High Side	90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*	
Service Part No.	4201880
Manufacturer	Embraco
Mfg. Part No.	EMI30HER
Original Compressor / Service Compressor Amps	0.9 / 0.9
Original Compressor / Service Compressor BTU's	280 / 280
DEFROST METHOD	"Off Cycle Defrost" Evap > 38°F before Compressor ON.
DEFROST TERMINATOR	
Cut-In Temp.	----
Cut-Out Temp.	----
DEFROST HEATER	
Watts	----
Amps	----
Ohms	----
DRAIN TUBE HEATER	
Watts	----
Amps	----
Ohms	----
FILL TUBE HEATER	
Watts	----
Amps	----
Ohms	----
WATER VALVE	
Watts	----
Amps	----
Ohms (Inductive)	----
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	30000 - 33000

Model 601RG

	REFRIGERATOR
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	10 oz. (PTS #1978387) 8.5 oz (SWS #1978387)
NORMAL OPERATING PRESSURES	
Low Side	10 psi to 36 psi
High Side	90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*	
Service Part No.	4201880
Manufacturer	Embraco
Mfg. Part No.	EMI30HER
Original Compressor / Service Compressor Amps	1.0 / 0.9
Original Compressor / Service Compressor BTU's	370 / 280
DEFROST METHOD	"Off Cycle Defrost" Evap > 38°F before Compressor ON.
DEFROST TERMINATOR	
Cut-In Temp.	----
Cut-Out Temp.	----
DEFROST HEATER	
Watts	----
Amps	----
Ohms	----
DRAIN TUBE HEATER	
Watts	----
Amps	----
Ohms	----
FILL TUBE HEATER	
Watts	----
Amps	----
Ohms	----
WATER VALVE	
Watts	----
Amps	----
Ohms (Inductive)	----
THERMISTORS (Evap & Compartment)	30000 - 33000
Ohms at 32°F / 0°C	
DOOR HEATER	
Watts	5
Amps	.5
Ohms	2300 - 2900

Model 601F

	FREEZER
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	11 oz.
NORMAL OPERATING PRESSURES Low Side High Side	 1” vacuum to 13 psi 90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.* Service Part No. Manufacturer Mfg. Part No. Original Compressor / Service Compressor Amps Original Compressor / Service Compressor BTU’s	 4202250 Panasonic DA73C 1.2 / 1.3 715 / 880
DEFROST METHOD	“Adaptive Defrost” Intervals and duration varies. Followed by 5 min. compressor delay.
DEFROST TERMINATOR Cut-In Temp. Cut-Out Temp.	 30°F / -1°C 55°F / 13°C
DEFROST HEATER Watts Amps Ohms	 640 5.5 19 - 23
DRAIN TUBE HEATER Watts Amps Ohms	 7 .06 1700 - 2080
DRAIN TROUGH HEATER Watts Amps Ohms	 50 .4 240 - 280
FILL TUBE HEATER Watts Amps Ohms	 5 .04 2300 - 2900
WATER VALVE Watts Amps Ohms (Inductive)	 50 .4 160
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	 30000 - 33000

Model 611

	REFRIGERATOR	FREEZER
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	10 oz.	8.5 oz. (PTS #1921778) 7 oz. (SWS #1921778)
NORMAL OPERATING PRESSURES		
Low Side	6 psi to 40 psi	2" vacuum to 14 psi
High Side	90 psi to 100 psi	90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*		
Service Part No.	4201880	4202280
Manufacturer	Embraco	Embraco
Mfg. Part No.	EMI30HER	EMI60HER
Original Compressor / Service Compressor Amps	1.2 / 1.2	2.5 / 2.5
Original Compressor / Service Compressor BTU's	280 / 280	585 / 585
DEFROST METHOD	"Off Cycle Defrost" Evap > 38°F before Compressor ON.	"Adaptive Defrost" Intervals and duration varies. Followed by 5 min. compressor delay.
DEFROST TERMINATOR		
Cut-In Temp.	----	30°F / -1°C
Cut-Out Temp.	----	55°F / 13°C
DEFROST HEATER		
Watts	----	640
Amps	----	5.5
Ohms	----	19 - 23
DRAIN TUBE HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
DRAIN TROUGH HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
FILL TUBE HEATER		
Watts	----	5
Amps	----	.04
Ohms	----	2300 - 2900
WATER VALVE		
Watts	----	50
Amps	----	.4
Ohms (Inductive)	----	160
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	30000 - 33000	30000 - 33000

Model 611G

	REFRIGERATOR	FREEZER
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	6 oz.	8.5 oz. (PTS #1921778) 7 oz. (SWS #1921778)
NORMAL OPERATING PRESSURES		
Low Side	6 psi to 40 psi	2" vacuum to 14 psi
High Side	90 psi to 100 psi	90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*		
Service Part No.	4201880	4202280
Manufacturer	Embraco	Embraco
Mfg. Part No.	EMI30HER	EMI60HER
Original Compressor / Service Compressor Amps	1.2 / 1.2	2.5 / 2.5
Original Compressor / Service Compressor BTU's	280 / 280	585 / 585
DEFROST METHOD	"Off Cycle Defrost" Evap > 38°F before Compressor ON.	"Adaptive Defrost" Intervals and duration varies. Followed by 5 min. compressor delay.
DEFROST TERMINATOR		
Cut-In Temp.	----	30°F / -1°C
Cut-Out Temp.	----	55°F / 13°C
DEFROST HEATER		
Watts	----	640
Amps	----	5.5
Ohms	----	19 - 23
DRAIN TUBE HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
DRAIN TROUGH HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
FILL TUBE HEATER		
Watts	----	5
Amps	----	.04
Ohms	----	2300 - 2900
WATER VALVE		
Watts	----	50
Amps	----	.4
Ohms (Inductive)	----	160
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	30000 - 33000	30000 - 33000
DOOR HEATER		
Watts	5	----
Amps	.5	----
Ohms	2300 - 2900	----

Model 632

	REFRIGERATOR	FREEZER	
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	10 oz.	9 oz. (PTS #1921778) 7 oz. (SWS #1921778)	
NORMAL OPERATING PRESSURES			
Low Side	11 psi to 38 psi	1" vacuum to 9 psi	
High Side	90 psi to 100 psi	90 psi to 100 psi	
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*		*(See price list for serial number breaks)*	
Service Part No.	4201880	4202250	4202280
Manufacturer	Embraco	Panasonic	Embraco
Mfg. Part No.	EMI30HER	DA73C	EMI60HER
Original Compressor / Service Compressor Amps	1.2 / 1.2	1.2 / 1.3	1.2 / 2.5
Original Compressor / Service Compressor BTU's	280 / 280	715 / 880	715 / 585
DEFROST METHOD	"Off Cycle Defrost" Evap > 38°F before Compressor ON.	"Adaptive Defrost" Intervals and duration varies. Followed by 5 min. compressor delay.	
DEFROST TERMINATOR			
Cut-In Temp.	----	30°F / -1°C	
Cut-Out Temp.	----	55°F / 13°C	
DEFROST HEATER			
Watts	----	640	
Amps	----	5.5	
Ohms	----	19 - 23	
DRAIN TUBE HEATER			
Watts	----	7	
Amps	----	.06	
Ohms	----	1700 - 2080	
DRAIN TROUGH HEATER			
Watts	----	----	
Amps	----	----	
Ohms	----	----	
FILL TUBE HEATER			
Watts	----	5	
Amps	----	.04	
Ohms	----	2300 - 2900	
WATER VALVE			
Watts	----	50	
Amps	----	.4	
Ohms (Inductive)	----	160	
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	30000 - 33000	30000 - 33000	

Model 642

	REFRIGERATOR	FREEZER
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	9 oz.	7.5 oz. (PTS #1921778) 7 oz. (SWS #1921778)
NORMAL OPERATING PRESSURES		
Low Side	11 psi to 38 psi	1" vacuum to 9 psi
High Side	90 psi to 100 psi	90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*		*(See price list for serial number breaks)*
Service Part No.	4201880	4202250 / 4202280
Manufacturer	Embraco	Panasonic / Embraco
Mfg. Part No.	EMI30HER	DA73C / EMI60HER
Original Compressor / Service Compressor Amps	1.2 / 1.2	1.4 / 1.3 / 1.4 / 2.5
Original Compressor / Service Compressor BTU's	280 / 280	860 / 880 / 860 / 585
DEFROST METHOD	"Off Cycle Defrost" Evap > 38°F before Compressor ON.	"Adaptive Defrost" Intervals and duration varies. Followed by 5 min. compressor delay.
DEFROST TERMINATOR		
Cut-In Temp.	----	30°F / -1°C
Cut-Out Temp.	----	55°F / 13°C
DEFROST HEATER		
Watts	----	640
Amps	----	5.5
Ohms	----	19 - 23
DRAIN TUBE HEATER		
Watts	----	7
Amps	----	.06
Ohms	----	1700 - 2080
DRAIN TROUGH HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
FILL TUBE HEATER		
Watts	----	5
Amps	----	.04
Ohms	----	2300 - 2900
WATER VALVE		
Watts	----	50
Amps	----	.4
Ohms (Inductive)	----	160
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	30000 - 33000	30000 - 33000

Model 650

	REFRIGERATOR	FREEZER
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	8 oz.	6 oz. (PTS #1921778) 7 oz. (SWS #1921778)
NORMAL OPERATING PRESSURES		
Low Side	6 psi to 40 psi	2” vacuum to 14 psi
High Side	90 psi to 100 psi	90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*		
Service Part No.	4201880	4202280
Manufacturer	Embraco	Embraco
Mfg. Part No.	EMI30HER	EMI60HER
Original Compressor / Service Compressor Amps	1.2 / 1.2	2.5 / 2.5
Original Compressor / Service Compressor BTU’s	280 / 280	585 / 585
DEFROST METHOD	“Off Cycle Defrost” Evap > 38°F before Compressor ON.	“Adaptive Defrost” Intervals and duration varies. Followed by 5 min. compressor delay.
DEFROST TERMINATOR		
Cut-In Temp.	----	30°F / -1°C
Cut-Out Temp.	----	55°F / 13°C
DEFROST HEATER		
Watts	----	640
Amps	----	5.5
Ohms	----	19 - 23
DRAIN TUBE HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
DRAIN TROUGH HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
FILL TUBE HEATER		
Watts	----	5
Amps	----	.04
Ohms	----	2300 - 2900
WATER VALVE		
Watts	----	50
Amps	----	.4
Ohms (Inductive)	----	160
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	30000 - 33000	30000 - 33000

Model 650G

	REFRIGERATOR	FREEZER
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	7 oz.	6 oz.
NORMAL OPERATING PRESSURES		
Low Side	6 psi to 40 psi	2" vacuum to 14 psi
High Side	90 psi to 100 psi	90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*		
Service Part No.	4201880	4202280
Manufacturer	Embraco	Embraco
Mfg. Part No.	EMI30HER	EMI60HER
Original Compressor / Service Compressor Amps	1.2 / 1.2	2.5 / 2.5
Original Compressor / Service Compressor BTU's	280 / 280	585 / 585
DEFROST METHOD	"Off Cycle Defrost" Evap > 38°F before Compressor ON.	"Adaptive Defrost" Intervals and duration varies. Followed by 5 min. compressor delay.
DEFROST TERMINATOR		
Cut-In Temp.	----	30°F / -1°C
Cut-Out Temp.	----	55°F / 13°C
DEFROST HEATER		
Watts	----	640
Amps	----	5.5
Ohms	----	19 - 23
DRAIN TUBE HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
DRAIN TROUGH HEATER		
Watts	----	----
Amps	----	----
Ohms	----	----
FILL TUBE HEATER		
Watts	----	5
Amps	----	.04
Ohms	----	2300 - 2900
WATER VALVE		
Watts	----	50
Amps	----	.4
Ohms (Inductive)	----	160
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	30000 - 33000	30000 - 33000
DOOR HEATER		
Watts	5	----
Amps	.5	----
Ohms	2300 - 2900	----

Model 680

		REFRIGERATOR	FREEZER	
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*		9 oz.	9 oz. (PTS #1921778) 7 oz. (SWS #1921778)	
NORMAL OPERATING PRESSURES				
	Low Side	16 psi to 36 psi	1" vacuum to 9 psi	
	High Side	90 psi to 100 psi	90 psi to 100 psi	
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.*			*(See price list for serial number breaks)*	
	Service Part No.	4201880	4202250	4202280
	Manufacturer	Embraco	Panasonic	Embraco
	Mfg. Part No.	EMI30HER	DA73C	EMI60HER
	Original Compressor / Service Compressor Amps	1.2 / 1.2	1.4 / 1.3	1.4 / 2.5
	Original Compressor / Service Compressor BTU's	280 / 280	860 / 880	715 / 585
DEFROST METHOD		"Off Cycle Defrost" Evap > 38°F before Compressor ON.	"Adaptive Defrost" Intervals and duration varies. Followed by 5 min. compressor delay.	
DEFROST TERMINATOR	Cut-In Temp.	----	30°F / -1°C	
	Cut-Out Temp.	----	55°F / 13°C	
DEFROST HEATER	Watts	----	640	
	Amps	----	5.5	
	Ohms	----	19 - 23	
DRAIN TUBE HEATER	Watts	----	7	
	Amps	----	.06	
	Ohms	----	1700 - 2080	
DRAIN TROUGH HEATER	Watts	----	15	
	Amps	----	.13	
	Ohms	----	790 - 970	
FILL TUBE HEATER	Watts	----	5	
	Amps	----	.04	
	Ohms	----	2300 - 2900	
WATER VALVE	Watts	20	50	
	Amps	.2	.4	
	Ohms (Inductive)	260	160	
THERMISTORS (Evap & Compartment)	Ohms at 32°F / 0°C	30000 - 33000	30000 - 33000	
MULLION CHUTE HEATER	Watts	15	----	
	Amps	.13	----	
	Ohms	790 - 970	----	
GLASS WELL HEATER	Watts	5	----	
	Amps	.04	----	
	(PTS #1810000) Ohms	2600 - 3100	----	
	(Heater 1 - SWS #1810000) Ohms	1400 - 1800	----	
	(Heater 2 - SWS #1810000) Ohms	2600 - 3100	----	

Model 690

	REFRIGERATOR	FREEZER
CHARGE (R-134a Refrigerant) ***NOTE:*** *Always check serial tag for exact charge*	10 oz.	8 oz. (PTS #1921778) 7 oz. (SWS #1921778)
NORMAL OPERATING PRESSURES Low Side High Side	 16 psi to 36 psi 90 psi to 100 psi	 1" vacuum to 9 psi 90 psi to 100 psi
COMPRESSOR ***NOTE:*** *Always check current parts price list for possible substitutions.* Service Part No. Manufacturer Mfg. Part No. Original Compressor/Service Compressor Amps Original Compressor/Service Compressor BTU's	 4201880 Embraco EMI30HER 1.2 / 1.2 280 / 280	*(See price list for serial number breaks)* 4202250 | 4202280 Panasonic | Embraco DA73C | EMI60HER 1.4 / 1.3 | 1.4 / 2.5 860 / 880 | 715 / 585
DEFROST METHOD	"Off Cycle Defrost" Evap > 38°F before Compressor ON.	"Adaptive Defrost" Intervals and duration varies. Followed by 5 min. compressor delay.
DEFROST TERMINATOR Cut-In Temp. Cut-Out Temp.	 ---- ----	 30°F / -1°C 55°F / 13°C
DEFROST HEATER Watts Amps Ohms	 ---- ---- ----	 640 5.5 19 - 23
DRAIN TUBE HEATER Watts Amps Ohms	 ---- ---- ----	 7 .06 1700 - 2080
DRAIN TROUGH HEATER Watts Amps Ohms	 ---- ---- ----	 15 .13 790 - 970
FILL TUBE HEATER Watts Amps Ohms	 ---- ---- ----	 5 .04 2300 - 2900
WATER VALVE Watts Amps Ohms (Inductive)	 20 .2 260	 50 .4 160
THERMISTORS (Evap & Compartment) Ohms at 32°F / 0°C	 30000 - 33000	 30000 - 33000
MULLION CHUTE HEATER Watts Amps Ohms (Inductive)	 15 .13 790 - 970	 ---- ---- ----
GLASS WELL HEATER Watts Amps (PTS #1810000) Ohms (Heater 1 - SWS #1810000) Ohms (Heater 2 - SWS #1810000) Ohms	 5 .04 2600 - 3100 1400 - 1800 2600 - 3100	 ---- ---- ---- ---- ----

SECTION 11

WIRING DIAGRAMS & SCHEMATICS

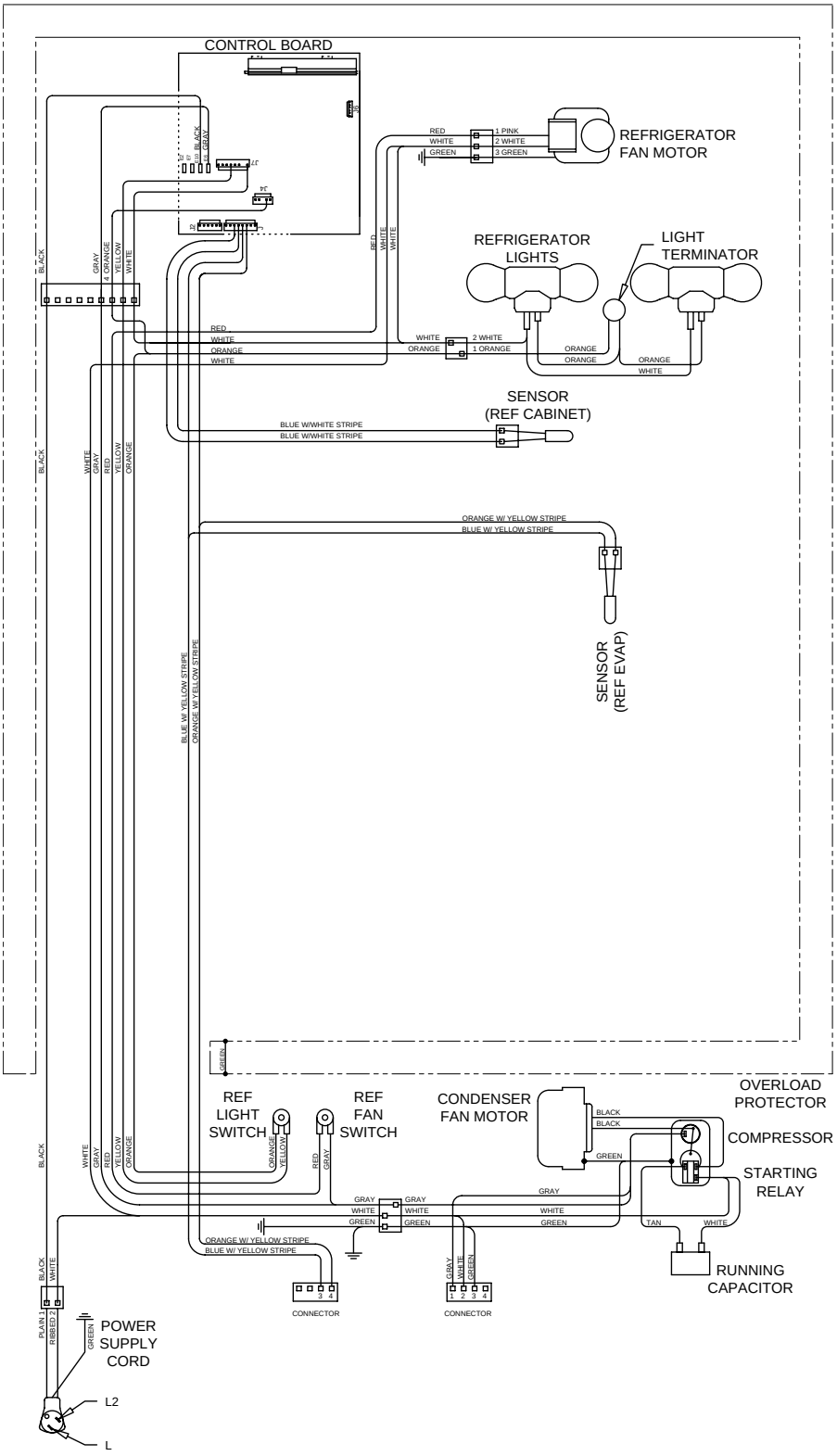
For units starting with serial #1810000

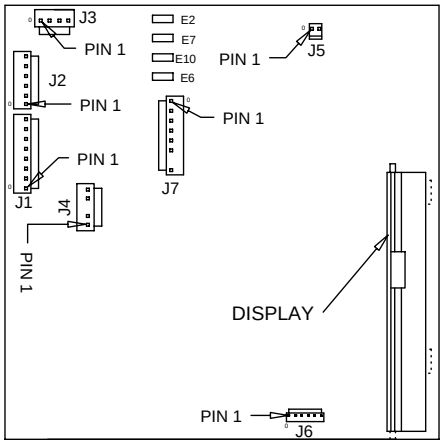
NOTE: *Due to our continuous improvement program, it is recommended to always use the wiring diagrams supplied with the appliance, located in an envelope in the compressor area. These diagrams should only be used for reference prior to servicing a Sub-Zero appliance.*

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





CONTROL BOARD DETAIL

CONTROL BOARD SUMMARY

CIRCUIT	DESCRIPTION	FUNCTION	COLOR
120 VOLT CIRCUITS			
E2	DEF HTR	NOT USED	
E7	FCOMP	NOT USED	
E10	POWER IN	POWER INTO BOARD	BLACK
E6	RCOMP	POWERS REF COMPRESSOR AND CONDENSER FAN	GRAY
J7-1	C FAN	NOT USED	
J7-2	E FAN	NOT USED	
J7-3	LITES	POWERS LIGHTS	YELLOW
J7-4			
J7-5		NOT USED	
J7-6		NOT USED	
J7-7	NEU	NOT USED(NO PIN)	
J7-8		NEUTRAL INTO BOARD	WHITE
J4-1		NOT USED	ORANGE
J4-2		SENSES IF REF DOOR OPEN	
J4-3		REF DOOR LIGHT SENSE	
J4-4		NOT USED(NO PIN)	
J4-5		NOT USED	
LOW VOLTAGE THERMISTOR CIRCUITS			
J1-1		NOT USED	
J1-2		NOT USED	
J1-3		SENSES REF EVAP TEMP	ORANGE/YLW
J1-4		REF EVAP	
J1-5		SENSES REF EVAP TEMP	BLUE/YLW
J1-6		REF EVAP	
J1-7		SENSES REF CABINET TEMP	BLUE/WHITE
J1-8		REF COMPARTMENT	
		SENSES REF CABINET TEMP	BLUE/WHITE
		REF COMPARTMENT	
		NOT USED	
		NOT USED	

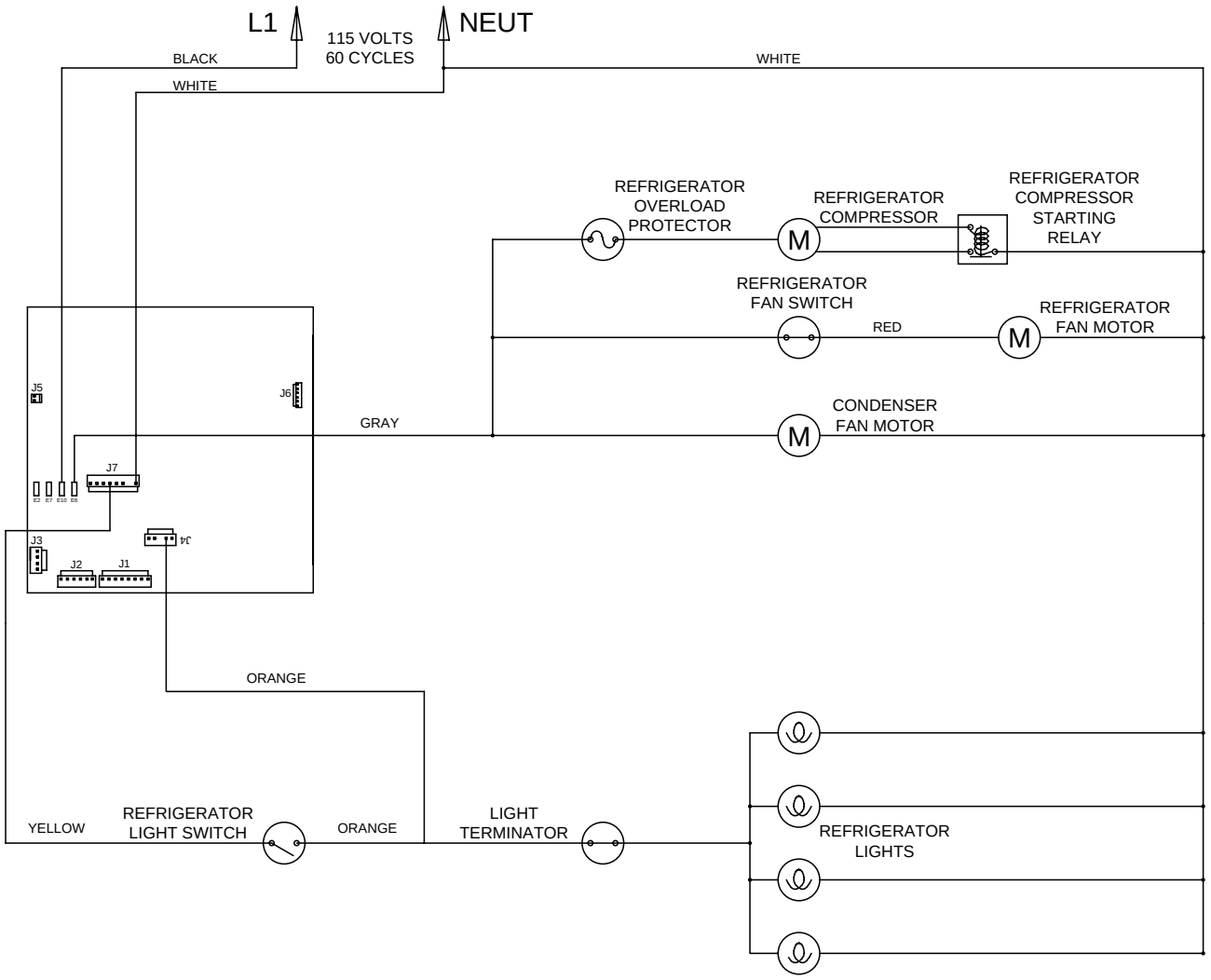
PART NUMBER 3756711

WIRING SCHEMATIC
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 complete.
-Failure to observe the above warnings may result in severe electrical shock.

HIGH VOLTAGE WIRING SCHEMATIC

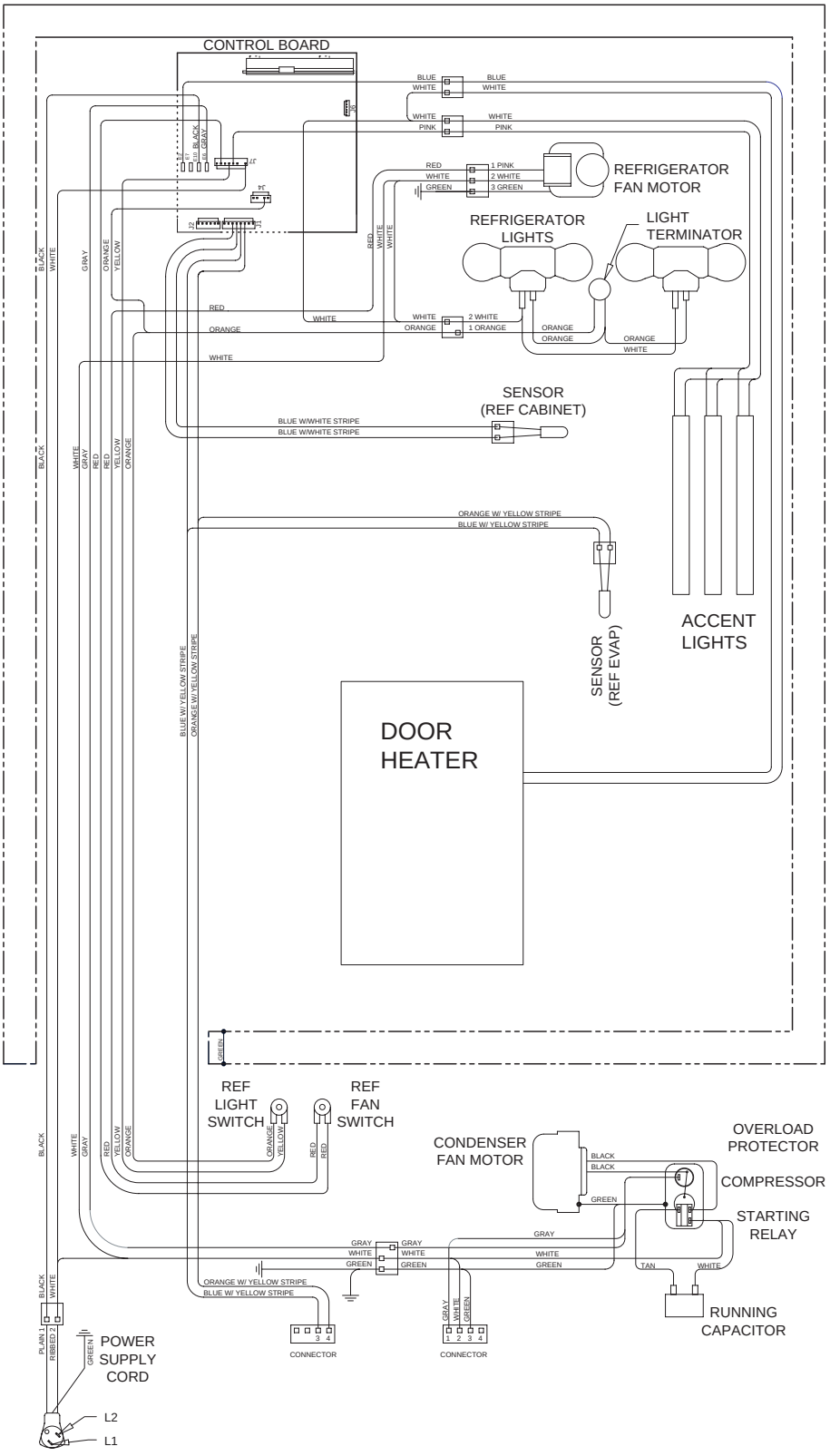


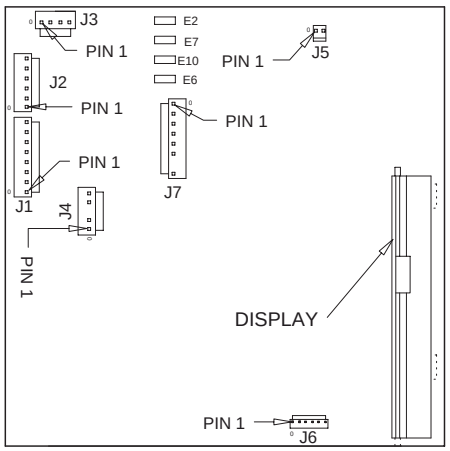
PART NUMBER 3756711

WIRING DIAGRAM
MODEL 601RG

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





CONTROL BOARD DETAIL

CONTROL BOARD SUMMARY

CIRCUIT	DESCRIPTION	FUNCTION	COLOR
120 VOLT CIRCUITS			
E2	DEF HTR	POWERS DOOR HEATER	BLUE
E7	F COMP	NOT USED	
E10	L1	POWER IN	BLACK
E6	R COMP	POWERS REF COMPRESSOR AND CONDENSER FAN	GRAY
J7-1	C FAN	NOT USED	
J7-2	E FAN	POWERS REF EVAP FAN	RED
J7-3		NOT USED	
J7-4	LITES	POWERS LIGHTS	YELLOW
J7-5	ICE	ACCENT LIGHTS	PINK
J7-6		NOT USED	
J7-7		NOT USED(NO PIN)	
J7-8	NEU	NEUTRAL INTO BOARD	WHITE
J4-1		NOT USED	ORANGE
J4-2		REF DOOR LIGHT SENSE	
J4-3		NOT USED(NO PIN)	
J4-4		NOT USED	
J4-5		NOT USED	
LOW VOLTAGE THERMISTOR CIRCUITS			
J1-1		NOT USED	
J1-2		NOT USED	
J1-3		REF EVAP	SENSES REF EVAP TEMP	ORANGE/YLW
J1-4		REF EVAP	SENSES REF EVAP TEMP	BLUE/YLW
J1-5		REF COMPARTMENT	SENSES REF CABINET TEMP	BLUE/WHITE
J1-6		REF COMPARTMENT	SENSES REF CABINET TEMP	BLUE/WHITE
J1-7		NOT USED	
J1-8		NOT USED	

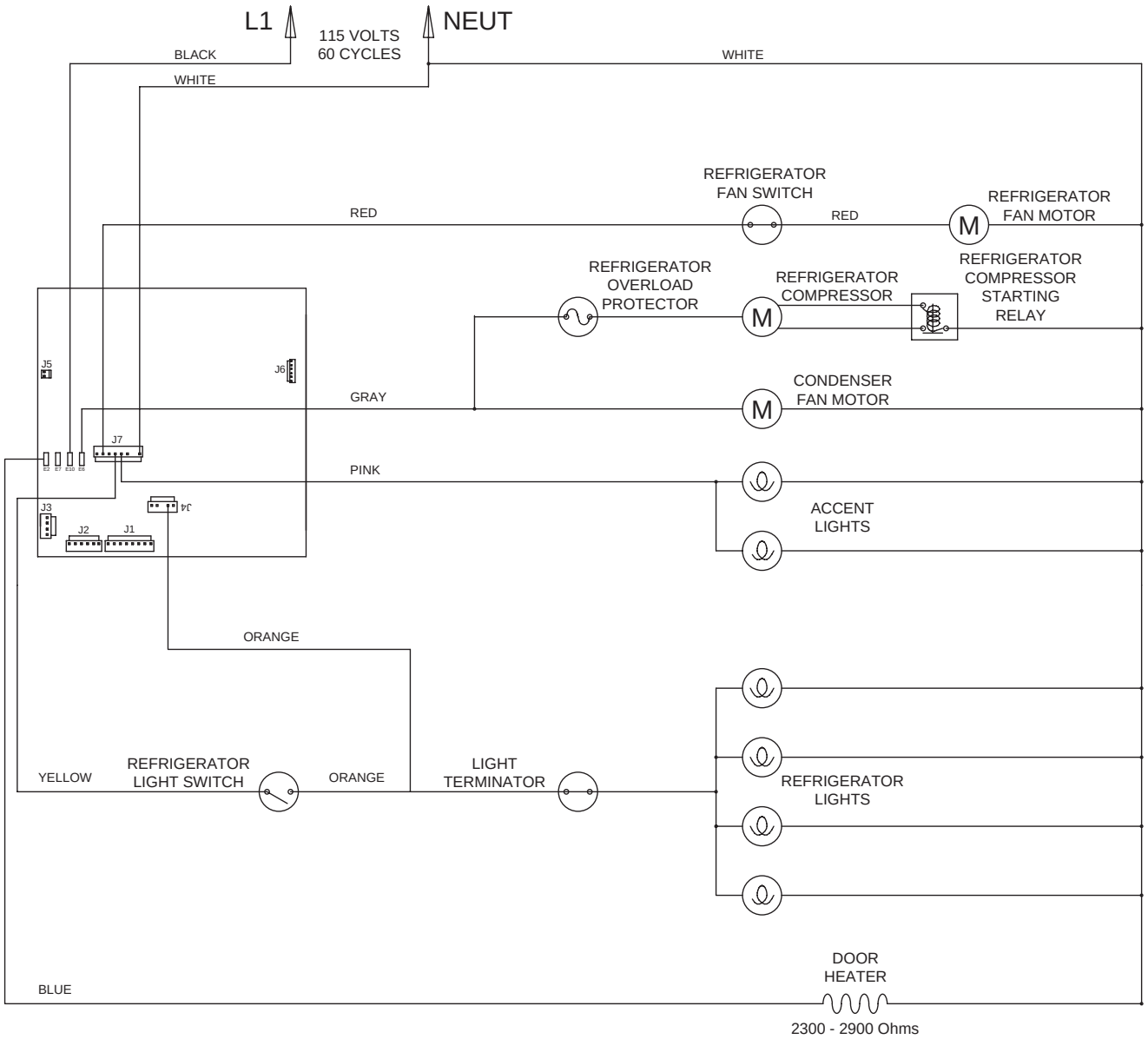
PART NUMBER 3757370

WIRING SCHEMATIC
MODEL: 601RG

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

HIGH VOLTAGE WIRING SCHEMATIC

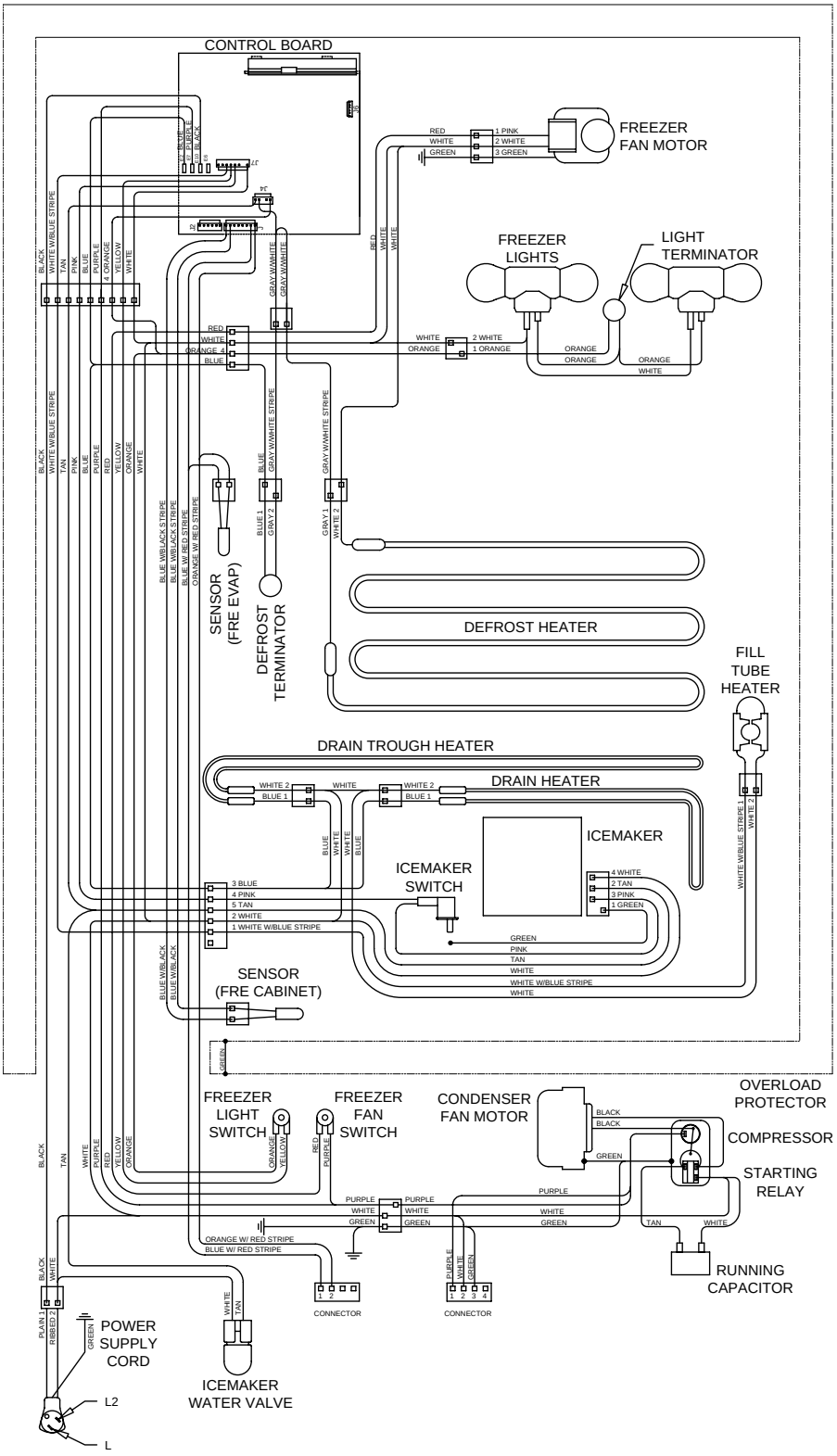


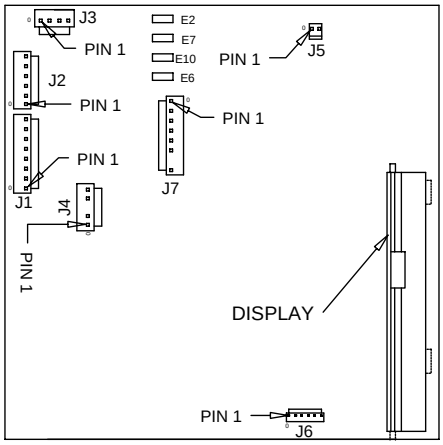
PART NUMBER 3756711

WIRING DIAGRAM
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 complete.
-Failure to observe the above warnings may result in severe electrical shock.





CONTROL BOARD DETAIL

CONTROL BOARD SUMMARY

CIRCUIT	DESCRIPTION	FUNCTION	COLOR
120 VOLT CIRCUITS			
E2	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
E7	FRZ COMPRESSOR	POWERS FRZ COMPRESSOR AND CONDENSER FAN	PURPLE
E10	POWER IN	POWER INTO BOARD	BLACK
E6	NOT USED		
J7-1	NOT USED		
J7-2	NOT USED		
J7-3	ICE MAKER ACC (FILL TUBE)	POWERS FILL TUBE HEATER AND ACCESSORIES	WHITE/BLUE
J7-4	LITES	POWERS LIGHTS	YELLOW
J7-5	ICE MAKER	POWERS ICE MAKER	PINK
J7-6	NOT USED		
J7-7	NOT USED(NO PIN)		
J7-8	NEU	NEUTRAL INTO BOARD	WHITE
J4-1		SENSES IF FRZ DOOR OPEN	ORANGE
J4-2	NOT USED(NO PIN)		
J4-3	NOT USED		
J4-4	DEF SENSOR	SENSES WHEN DEF HEATER SHUTS OFF	GRAY/WHITE
J4-5	ICE MAKER VALVE SENSOR	SENSES WATER VALVE ACTIVATION	TAN
LOW VOLTAGE THERMISTOR CIRCUITS			
J1-1	FRZ EVAP	SENSES FRZ EVAP TEMP	ORANGE/RED
J1-2	FRZ EVAP	SENSES FRZ EVAP TEMP	BLUE/RED
J1-3	NOT USED		
J1-4	NOT USED		
J1-5	NOT USED		
J1-6	NOT USED		
J1-7	FRZ COMPARTMENT	SENSES FRZ CABINET TEMP	BLUE/BLACK
J1-8	FRZ COMPARTMENT	SENSES FRZ CABINET TEMP	BLUE/BLACK

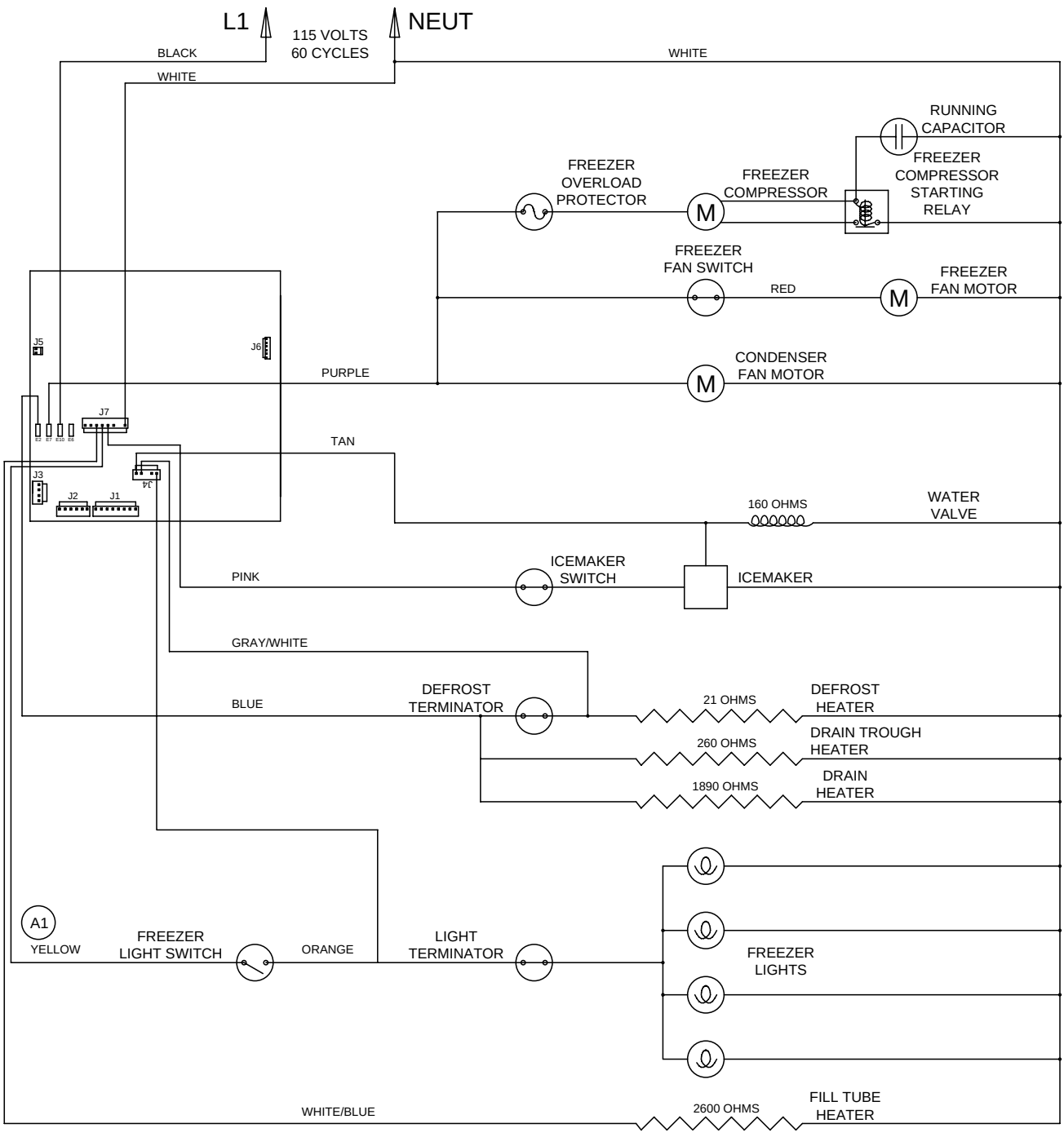
PART NUMBER 3756690

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

HIGH VOLTAGE WIRING SCHEMATIC

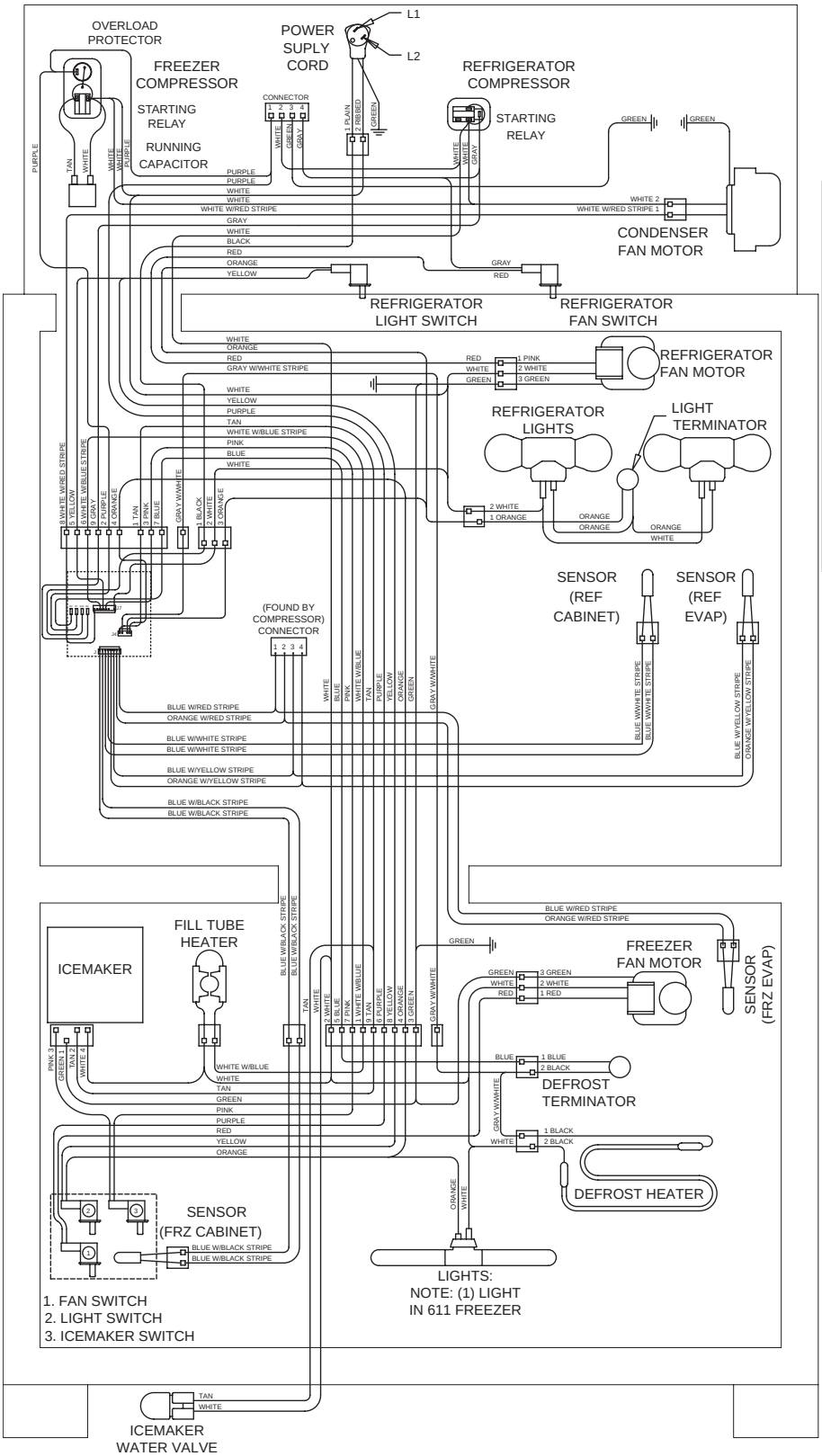


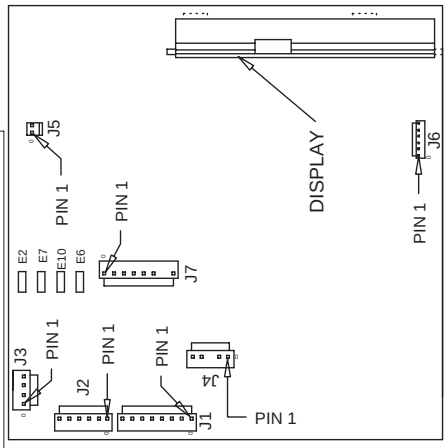
PART NUMBER 3756690

WIRING DIAGRAM
MODELS: 611 & 650

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





CONTROL BOARD SUMMARY

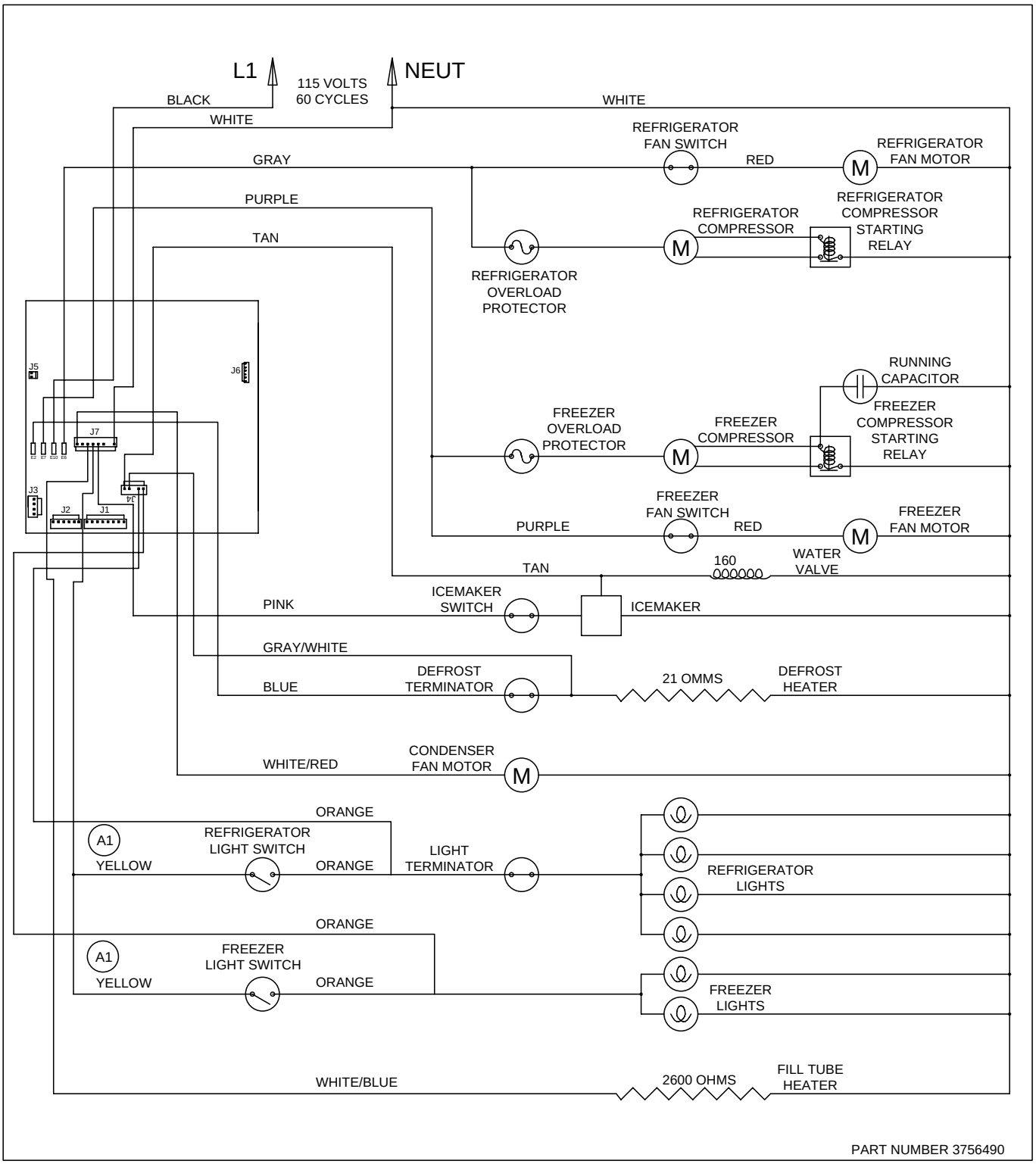
CIRCUIT	DESCRIPTION	FUNCTION	COLOR
	120 VOLT CIRCUITS		
E2	DEF HTR	POWERS DEFROST CIRCUIT	BLUE
E7	FCOMP	POWERS FRZ COMPRESSOR	PURPLE
E10	L1	POWER INTO BOARD	BLACK
E6	RCOMP	POWERS REF COMPRESSOR	GRAY
J7-1	C FAN	POWERS CONDENSER FAN	WHITE/RED
J7-2	NOT USED		
J7-3	ICE MAKER ACC (FILL TUBE)	POWERS FILL TUBE HEATER AND ACCESSORIES	WHITE/BLUE
J7-4	LITE	POWERS LIGHTS	YELLOW
J7-5	ICE MAKER	POWERS ICE MAKER	PINK
J7-6	NOT USED		
J7-7	NOT USED(NO PIN)		WHITE
J7-8	NEU	NEUTRAL INTO BOARD	BROWN
J4-1		FREEZER DOOR SENSE	ORANGE
J4-2		FREEZER DOOR LIGHT SENSE	
J4-3		NOT USED(NO PIN)	
J4-4		DEF SENSOR	GRAY/WHITE
J4-5		ICE MAKER VALVE SENSOR	TAN
	LOW VOLTAGE THERMISTOR CIRCUITS		
J1-1		SENSES FRZ EVAP TEMP	ORANGE/RED
J1-2		SENSES FRZ EVAP TEMP	BLUE/RED
J1-3		SENSES REF EVAP TEMP	ORANGE/YELLOW
J1-4		SENSES REF EVAP TEMP	BLUE/YELLOW
J1-5		SENSES REF CABINET	BLUE/WHITE
J1-6		SENSES REF CABINET TEMP	BLUE/BLACK
J1-7		SENSES FRZ CABINET TEMP	
J1-8			BLUE/BLACK

PART NUMBER 3756490

WIRING SCHEMATIC MODELS: 611 & 650

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

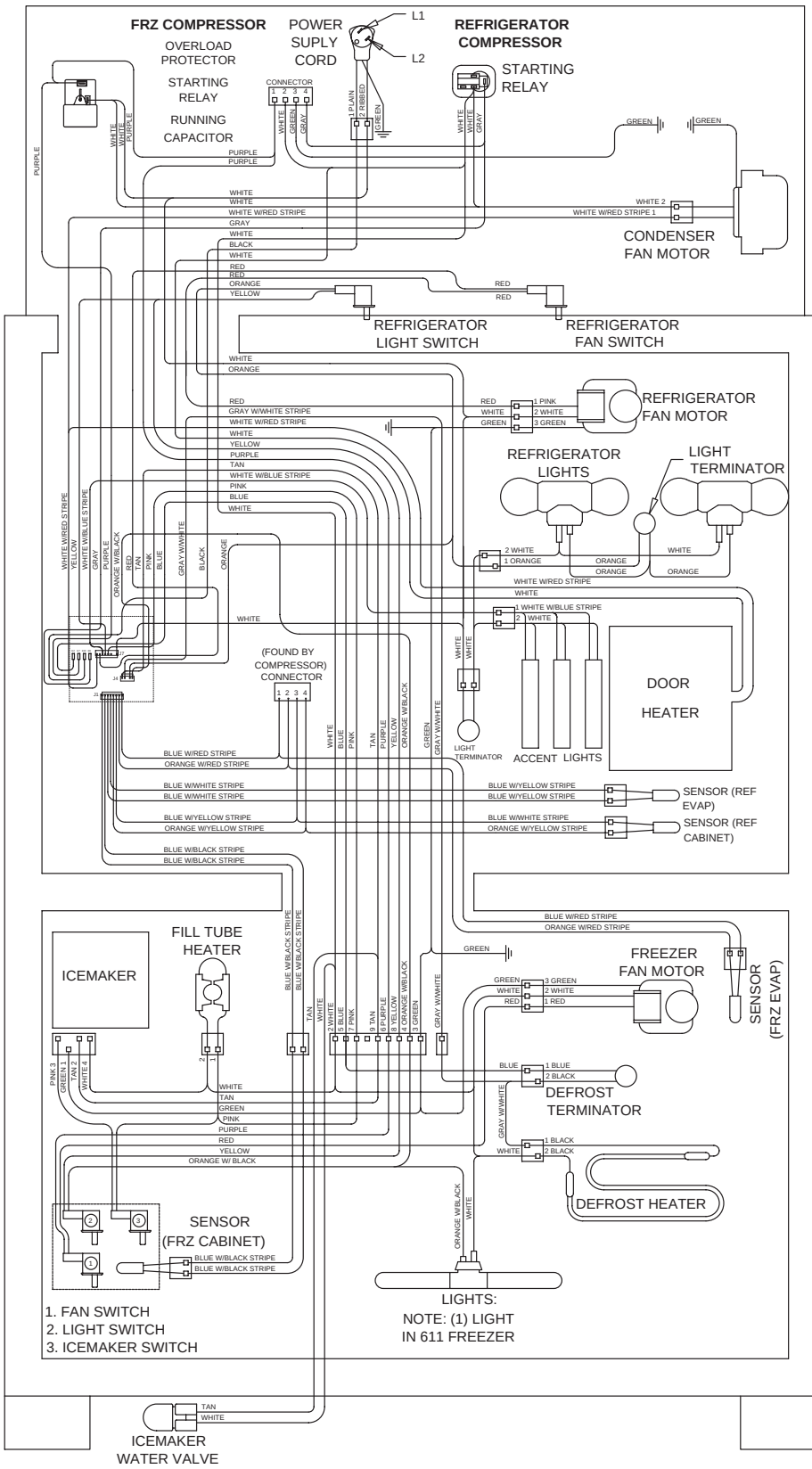


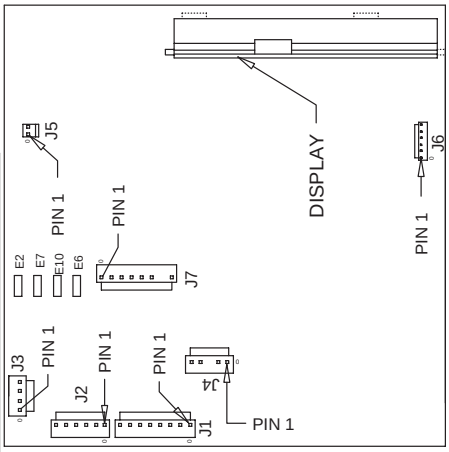
PART NUMBER 3756490

WIRING DIAGRAM
MODELS: 611G & 650G

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





CONTROL BOARD SUMMARY

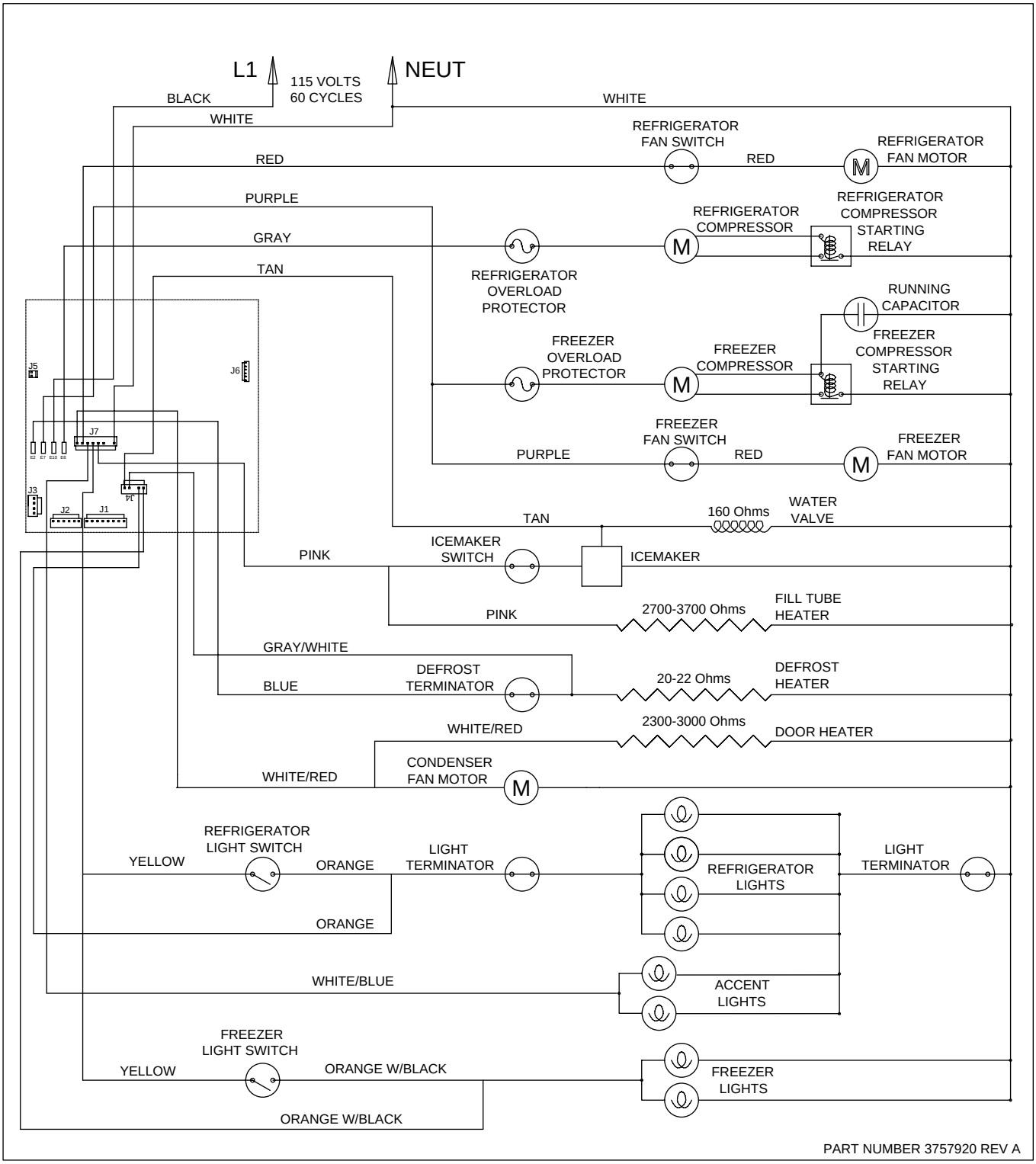
	CIRCUIT	DESCRIPTION	FUNCTION	COLOR
120 VOLT CIRCUITS				
E2	DEF HTR	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
E7	FCOMP	FRZ COMPRESSOR	POWERS FRZ COMPRESSOR	PURPLE
E10	L1	POWER IN	POWER INTO BOARD	BLACK
E6	RCOMP	REF COMPRESSOR	POWERS REF COMPRESSOR	WHITE/RED
J7-1	C FAN	COND FAN AND DOOR HEATER	POWERS CONDENSER FAN AND DOOR HEATER	RED
J7-2	E FAN	REF EVAP FAN	POWERS REF EVAP FAN	WHITE/BLUE
J7-3	IACC	ACCENT LIGHTS	POWERS ACCENT LIGHTS	YELLOW
J7-4	LITE	LIGHTS	POWERS LIGHTS	PINK
J7-5	ICE	ICE MAKER/FILL TUBE HTR	POWERS ICE MAKER AND FILL TUBE HEATER	
J7-6		NOT USED		
J7-7		NOT USED (NO PIN)		
J7-8	NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
J4-1	FDR	FRZ DOOR LIGHT SENSE	SENSES IF FRZ DOOR OPEN	ORANGE W/BLACK
J4-2	RDR	REF DOOR LIGHT SENSE	SENSES IF REF DOOR OPEN	ORANGE
J4-3		NOT USED(NO PIN)		
J4-4		DEF SENSOR	SENSES WHEN DEF HEATER SHUTS OFF	GRAY/WHITE
J4-5		ICE MAKER WATER VALVE	SENSES WATER VALVE ACTIVATION	TAN
LOW VOLTAGE THERMISTOR CIRCUITS				
J1-1		FRZ EVAP	SENSES FRZ EVAP TEMP	ORANGE/RED
J1-2		FRZ EVAP	SENSES FRZ EVAP TEMP	BLUE/RED
J1-3		REF EVAP	SENSES REF EVAP TEMP	ORANGE/YELLOW
J1-4		REF EVAP	SENSES REF EVAP TEMP	BLUE/YELLOW
J1-5		REF COMPARTMENT	SENSES REF CABINET	BLUE/WHITE
J1-6		REF COMPARTMENT	SENSES REF CABINET TEMP	BLUE/WHITE
J1-7		FRZ COMPARTMENT	SENSES FRZ CABINET TEMP	BLUE/BLACK
J1-8		FRZ COMPARTMENT	SENSES FRZ CABINET TEMP	BLUE/BLACK

PART NUMBER 3757920 REV A

WIRING SCHEMATIC MODELS: 611G & 650G

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

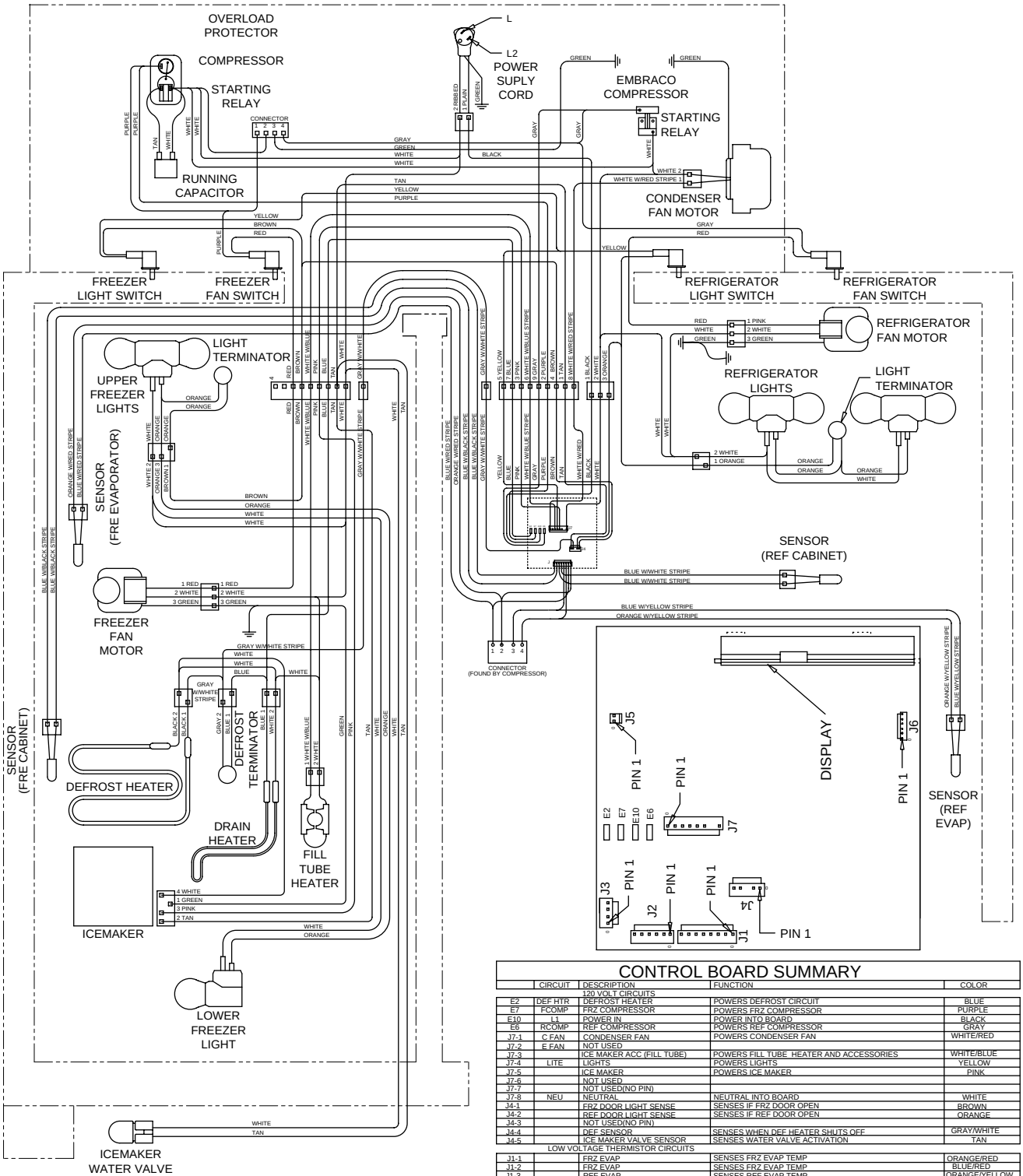


PART NUMBER 3757920 REV A

WIRING DIAGRAM
MODELS: 632/642

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



CONTROL BOARD SUMMARY

	CIRCUIT	DESCRIPTION	FUNCTION	COLOR
		120 VOLT CIRCUITS		
E2	DEF HTR	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
E7	FCOMP	FRZ COMPRESSOR	POWERS FRZ COMPRESSOR	PURPLE
E10	L1	POWER IN	POWER INTO BOARD	BLACK
E6	RCOMP	REF COMPRESSOR	POWERS REF COMPRESSOR	GRAY
J7-1	C FAN	CONDENSER FAN	POWERS CONDENSER FAN	WHITE/RED
J7-2	E FAN	NOT USED		
J7-3		ICE MAKER ACC (FILL TUBE)	POWERS FILL TUBE HEATER AND ACCESSORIES	WHITE/BLUE
J7-4	LITE	LIGHTS	POWERS LIGHTS	YELLOW
J7-5		ICE MAKER	POWERS ICE MAKER	PINK
J7-6		NOT USED		
J7-7		NOT USED(NO PIN)		
J7-8	NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
J4-1		FRZ DOOR LIGHT SENSE	SENSES IF FRZ DOOR OPEN	BROWN
J4-2		REF DOOR LIGHT SENSE	SENSES IF REF DOOR OPEN	ORANGE
J4-3		NOT USED(NO PIN)		
J4-4		DEF SENSOR	SENSES WHEN DEF HEATER SHUTS OFF	GRAY/WHITE
J4-5		ICE MAKER VALVE SENSOR	SENSES WATER VALVE ACTIVATION	TAN
		LOW VOLTAGE THERMISTOR CIRCUITS		
J1-1		FRZ EVAP	SENSES FRZ EVAP TEMP	ORANGE/RED
J1-2		FRZ EVAP	SENSES FRZ EVAP TEMP	BLUE/RED
J1-3		REF EVAP	SENSES REF EVAP TEMP	ORANGE/YELLOW
J1-4		REF EVAP	SENSES REF EVAP TEMP	BLUE/YELLOW
J1-5		REF COMPARTMENT	SENSES REF CABINET	BLUE/WHITE
J1-6		REF COMPARTMENT	SENSES REF CABINET	BLUE/WHITE
J1-7		FRZ COMPARTMENT	SENSES FRZ CABINET TEMP	BLUE/BLACK
J1-8		FRZ COMPARTMENT	SENSES FRZ CABINET TEMP	BLUE/BLACK

PART NUMBER 3756771

WIRING SCHEMATIC MODELS: 632/642

⚠ WARNING

-This wiring information is provided for use by qualified service personnel only.
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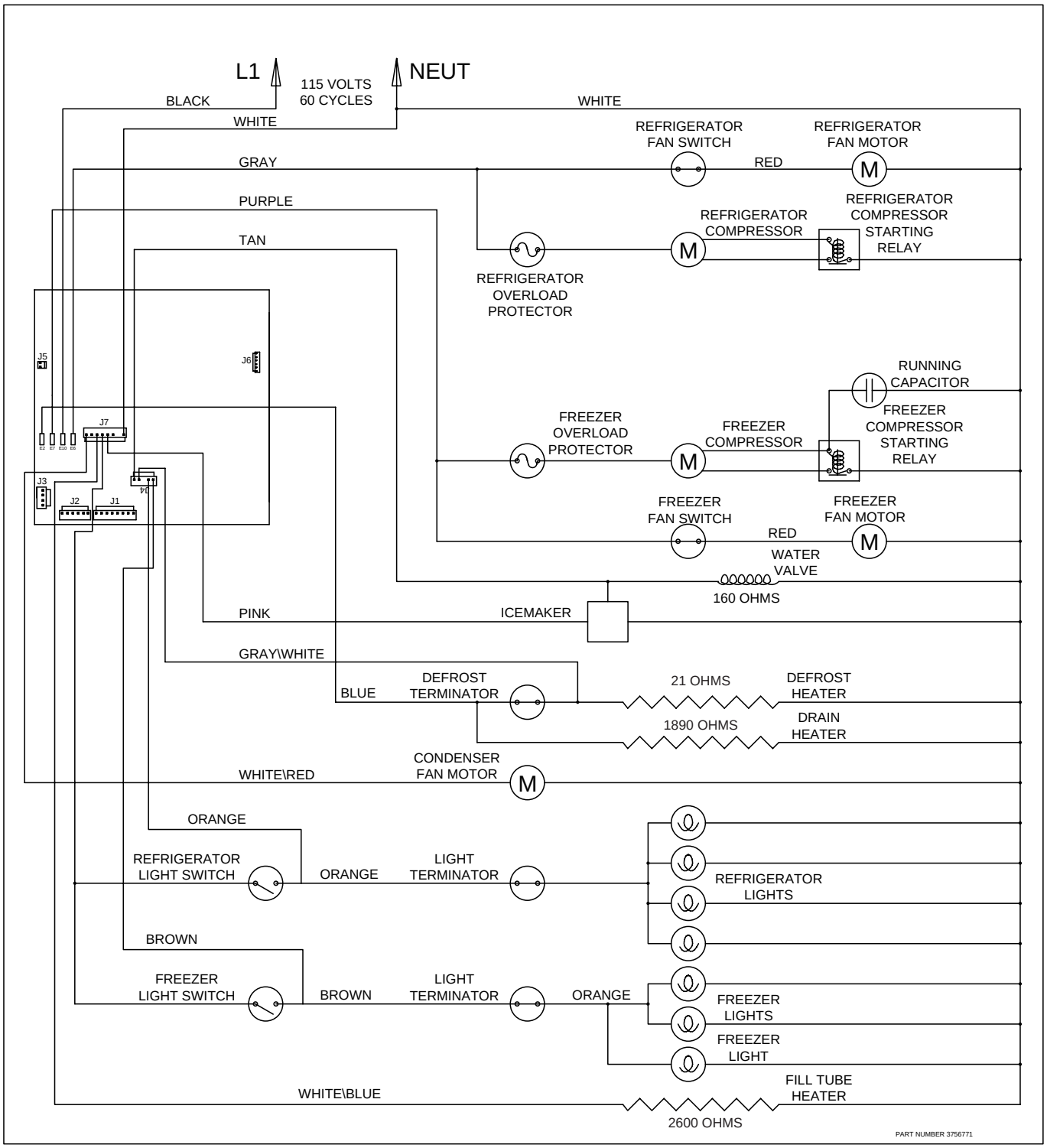
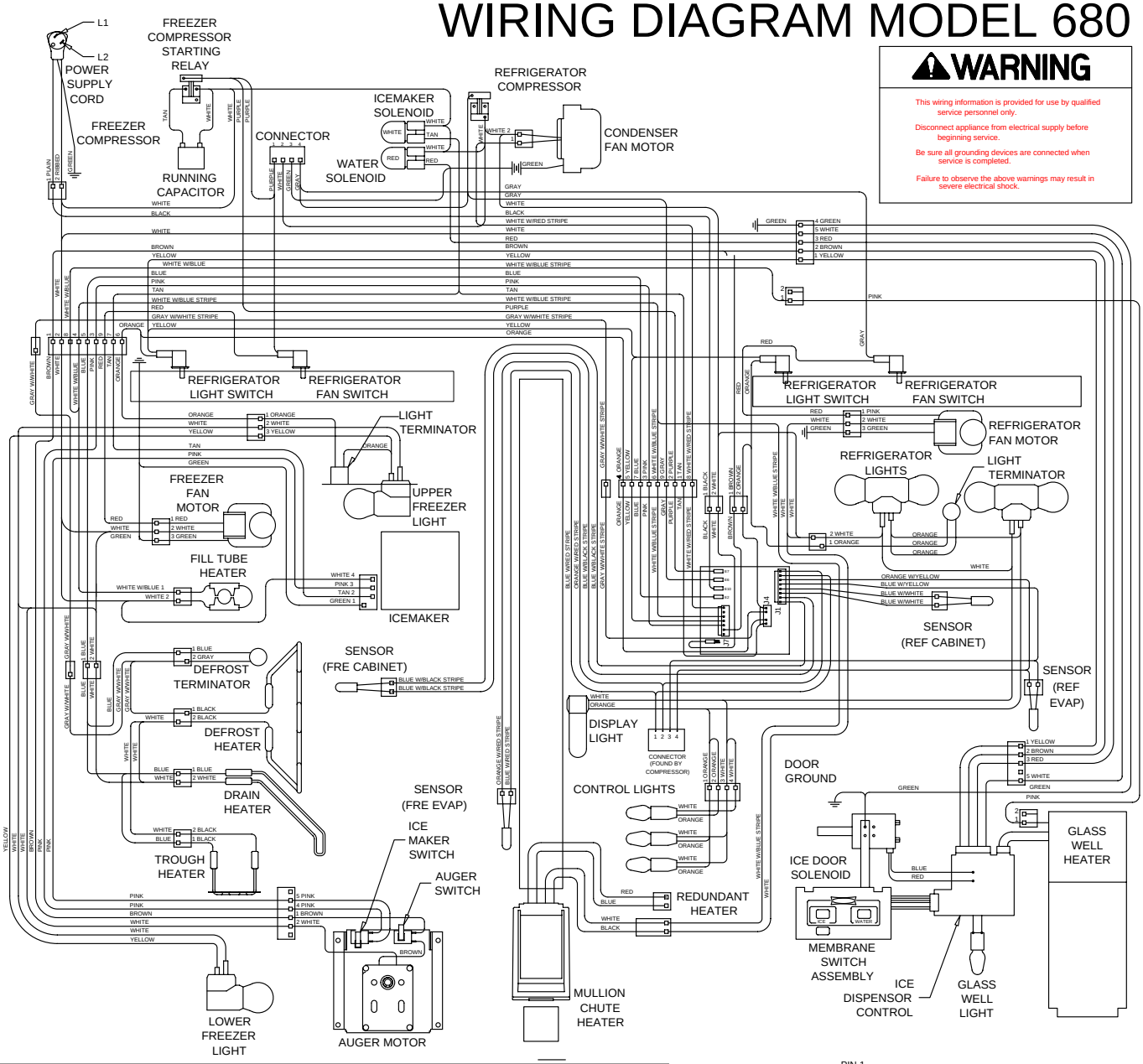
-Be sure all grounding devices are connected when service is complete.
-Failure to observe the above warnings may result in severe electrical shock.



WIRING DIAGRAM MODEL 680



⚠ WARNING

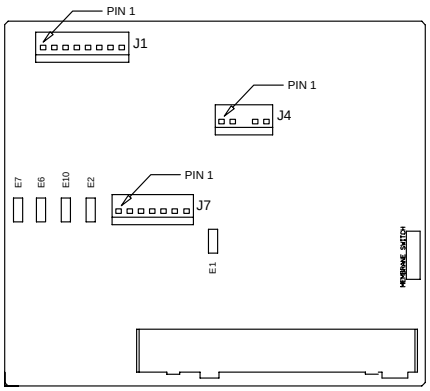
This wiring information is provided for use by qualified service personnel only.

Disconnect appliance from electrical supply before beginning service.

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

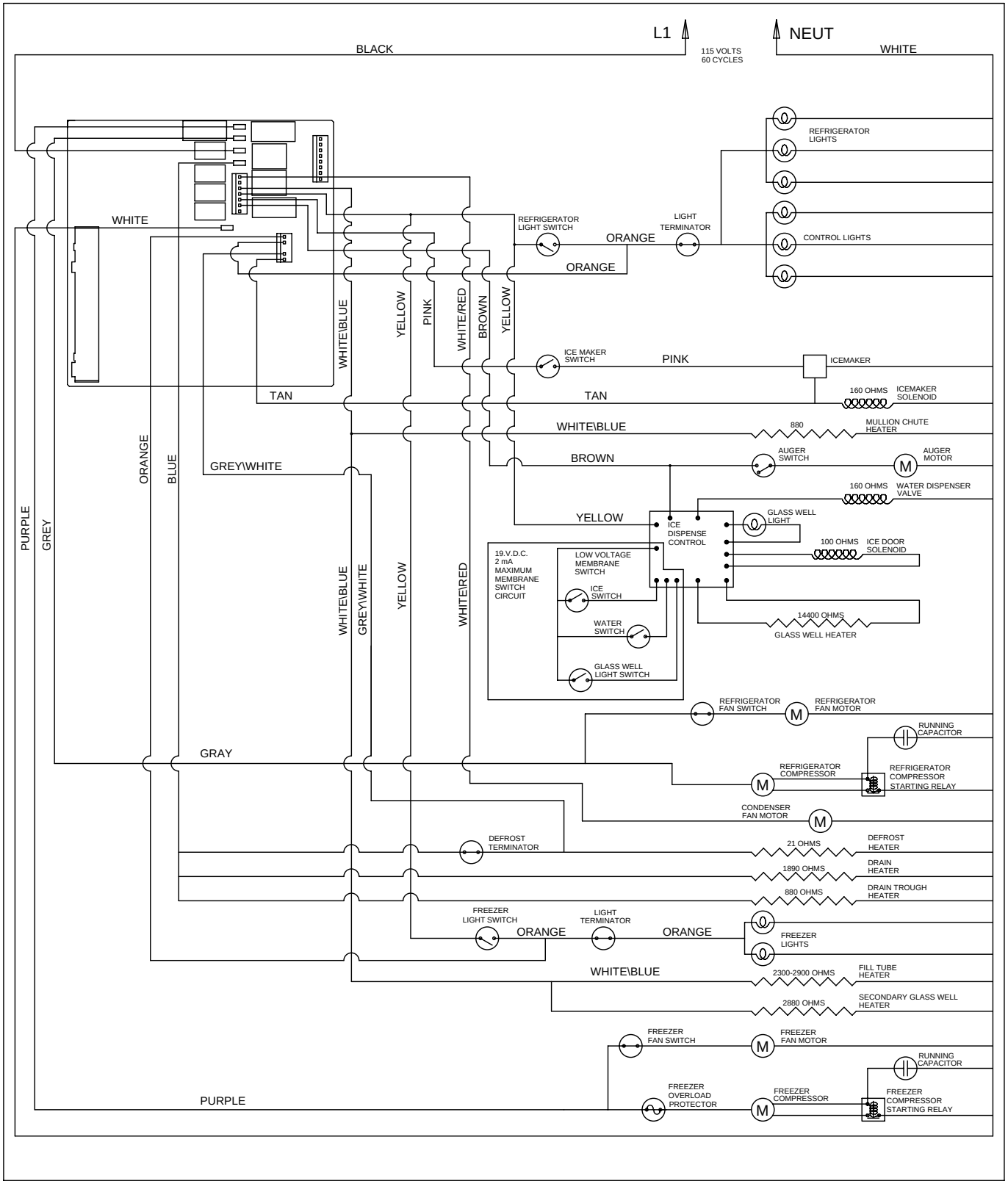
Failure to observe the above warnings may result in severe electrical shock.

CONTROL BOARD SUMMARY				
	CIRCUIT	DESCRIPTION	FUNCTION	COLOR
		120 VOLT CIRCUITS		
E6	RCOMP	REFRIGERATOR COMPRESSOR	POWERS REFRIG. COMPRESSOR	GRAY
E7	FCOMP	FREEZER COMPRESSOR	POWERS FREEZER COMPRESSOR	PURPLE
E10	L1	POWER IN	POWER INTO BOARD	BLACK
E2	DEF HTR	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
J7-1	C FAN	CONDENSER FAN	POWERS CONDENSER FAN	WHT/RED
J7-2	E FAN	NOT USED		
J7-3	IACC	ICE MAKER ACCESSORIES(FILL TUBE)	POWERS FILL TUBE AND ACCESSORIES	WHT/BLUE
J7-4	LITE	LIGHTS	POWERS LIGHTS	YELLOW
J7-5	ICE	ICEMAKER	POWERS ICEMAKER	PINK
J7-6	IAUG	BULK ICE	POWERS AUGER MOTOR	BROWN
J7-7		NOT USED		
E1	NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
J4-1	F DR	FREEZER LIGHT SENSOR	SENSES IF FREEZER DOOR OPEN	ORANGE
J4-2	R DR	REF LIGHT SENSOR	SENSES IF REF DOOR OPEN	ORANGE
J4-3		NOT USED (NO PIN)		
J4-4		DEFROST SENSE-TERMINATOR	SENSES WHEN HEATER SHUTS OFF	GRAY/WHT
J5-5		ICE MAKER VALVE	SENSES WATER VALVE ACTIVATION	TAN
		LOW VOLTAGE THERMISTOR CIRCUITS		
J1-1	EVAP FRZ	FREEZER EVAPORATOR	SENSES FRE EVAP TEMP	ORANGE/RED
J1-2	EVAP FRZ	FREEZER EVAPORATOR	SENSES FRE EVAP TEMP	BLU/RED
J1-3	EVAP REF	REFRIGERATOR EVAPORATOR	SENSES REF EVAP TEMP	ORANGE/YEL
J1-4	EVAP REF	REFRIGERATOR EVAPORATOR	SENSES REF EVAP TEMP	BLU/YEL
J1-5	REF	REFRIGERATOR COMPARTMENT	SENSES REF COMPARTMENT TEMP	BLU/WHT
J1-6	REF	REFRIGERATOR COMPARTMENT	SENSES REF COMPARTMENT TEMP	BLU/WHT
J1-7	FRZ	FREEZER COMPARTMENT	SENSES FREEZER COMPARTMENT TEMP	BLU/BLK
J1-8	FRZ	FREEZER COMPARTMENT	SENSES FREEZER COMPARTMENT TEMP	BLU/BLK



PART NUMBER 3756521

SCHEMATIC MODEL 680



PART NUMBER 3756521

WIRING DIAGRAM MODEL 690

⚠ WARNING

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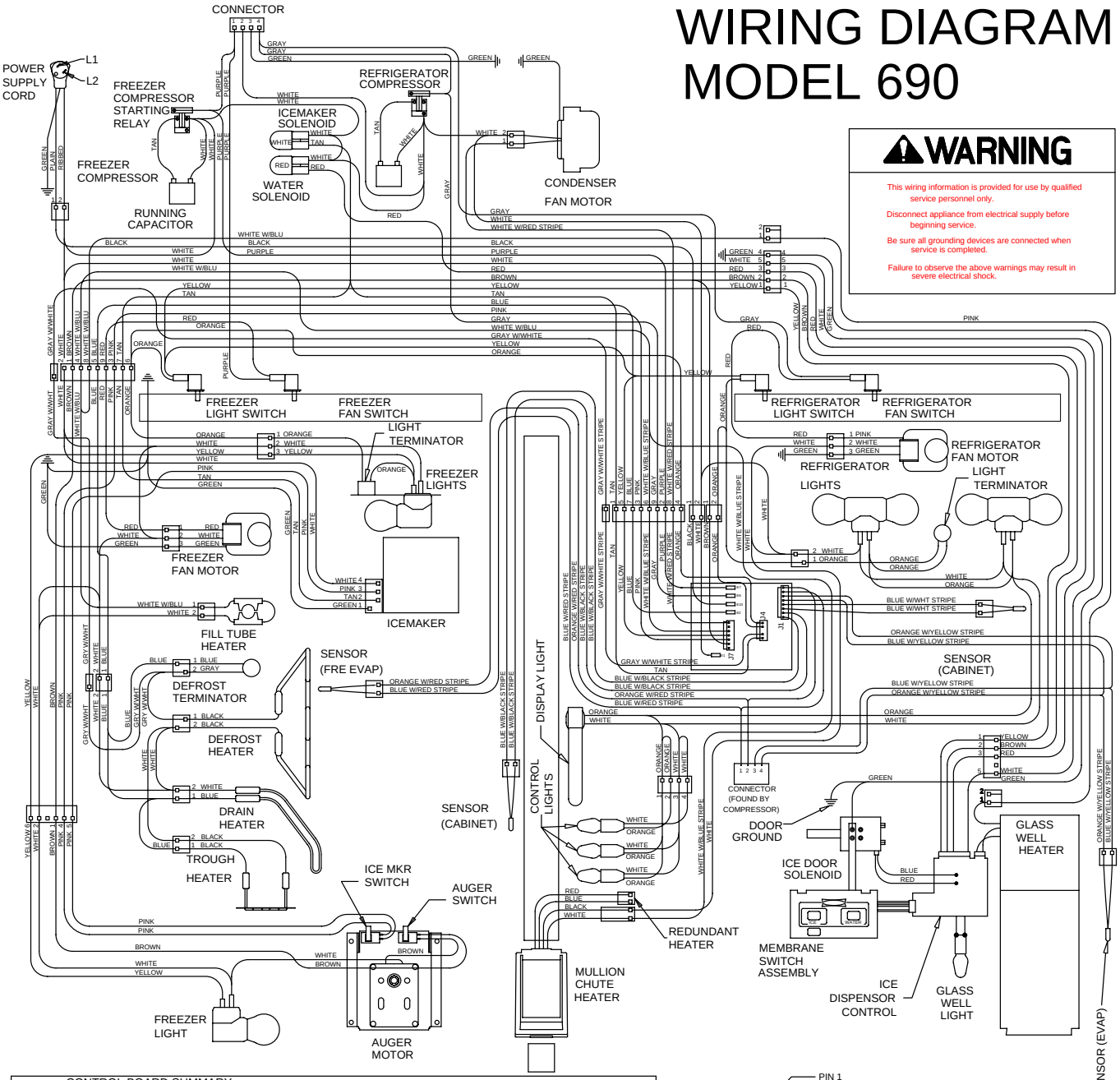
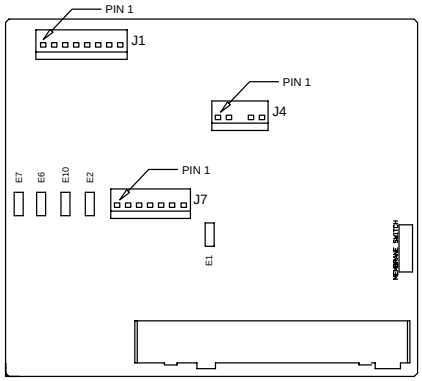
Disconnect appliance from electrical supply before beginning service.

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

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

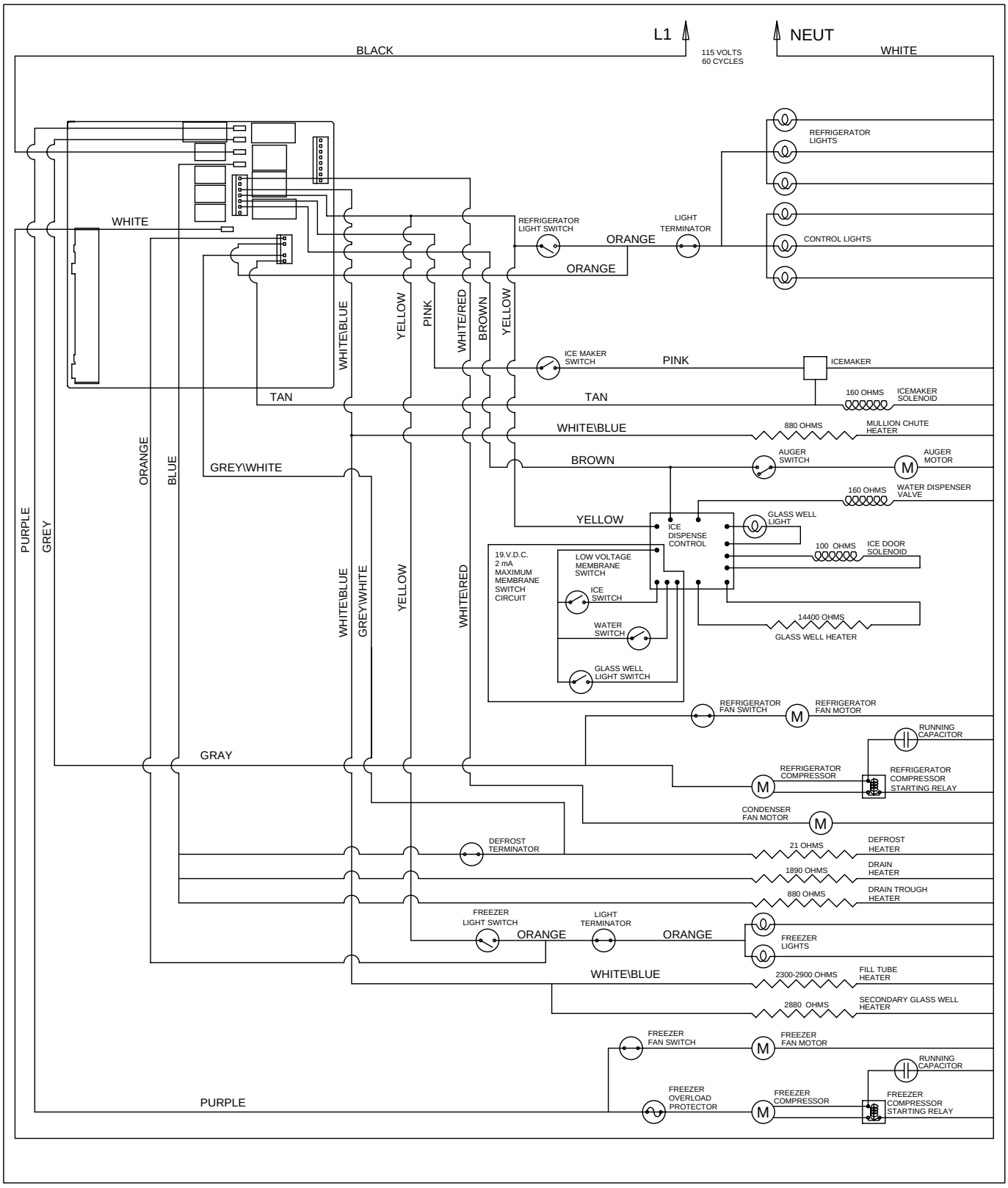


CONTROL BOARD SUMMARY				
	CIRCUIT	DESCRIPTION	FUNCTION	COLOR
		120 VOLT CIRCUITS		
E6	RCOMP	REFRIGERATOR COMPRESSOR	POWERS REFRIG. COMPRESSOR	GRAY
E7	FCOMP	FREEZER COMPRESSOR	POWERS FREEZER COMPRESSOR	PURPLE
E10	L1	POWER IN	POWER INTO BOARD	BLACK
E2	DEF HTR	DEFROST HEATER	POWERS DEFROST CIRCUIT	BLUE
J7-1	C FAN	CONDENSER FAN	POWERS CONDENSER FAN	WHT/RED
J7-2	E FAN	NOT USED		
J7-3	IACC	ICE MAKER ACCESSORIES(FILL TUBE)	POWERS FILL TUBE AND ACCESSORIES	WHT/BLUE
J7-4	LITE	LIGHTS	POWERS LIGHTS	YELLOW
J7-5	ICE	ICEMAKER	POWERS ICEMAKER	PINK
J7-6	IAUG	BULK ICE	POWERS AUGER MOTOR	BROWN
J7-7		NOT USED (NO PIN)		
E1	NEU	NEUTRAL	NEUTRAL INTO BOARD	WHITE
J4-1	F DR	FREEZER LIGHT SENSOR	SENSES IF FREEZER DOOR OPEN	ORANGE
J4-2	R DR	REF LIGHT SENSOR	SENSES IF REF DOOR OPEN	ORANGE
J4-3		NOT USED (NO PIN)		
J4-4		DEFROST SENSE-TERMINATOR	SENSES WHEN HEATER SHUTS OFF	GRAY/WHT
J5-5		ICE MAKER VALVE	SENSES WATER VALVE ACTIVATION	TAN
		LOW VOLTAGE THERMISTOR CIRCUITS		
J1-1	EVAP FRZ	FREEZER EVAPORATOR	SENSES FRE EVAP TEMP	ORANGE/RED
J1-2	EVAP FRZ	FREEZER EVAPORATOR	SENSES FRE EVAP TEMP	BLU/RED
J1-3	EVAP REF	REFRIGERATOR EVAPORATOR	SENSES REF EVAP TEMP	ORANGE/YEL
J1-4	EVAP REF	REFRIGERATOR EVAPORATOR	SENSES REF EVAP TEMP	BLU/YEL
J1-5	REF	REFRIGERATOR COMPARTMENT	SENSES REF COMPARTMENT TEMP	BLU/WHT
J1-6	REF	REFRIGERATOR COMPARTMENT	SENSES REF COMPARTMENT TEMP	BLU/WHT
J1-7	FRZ	FREEZER COMPARTMENT	SENSES FREEZER COMPARTMENT TEMP	BLU/BLK
J1-8	FRZ	FREEZER COMPARTMENT	SENSES FREEZER COMPARTMENT TEMP	BLU/BLK



PART NUMBER 3756522

SCHEMATIC MODEL 690



PART NUMBER 3756522