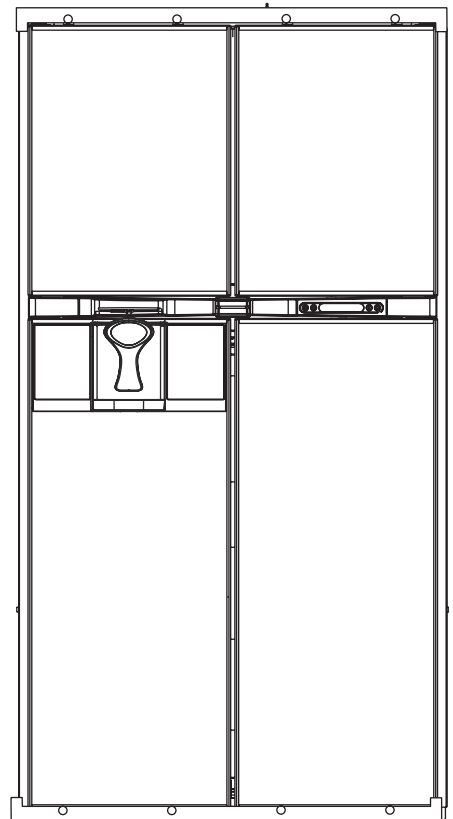
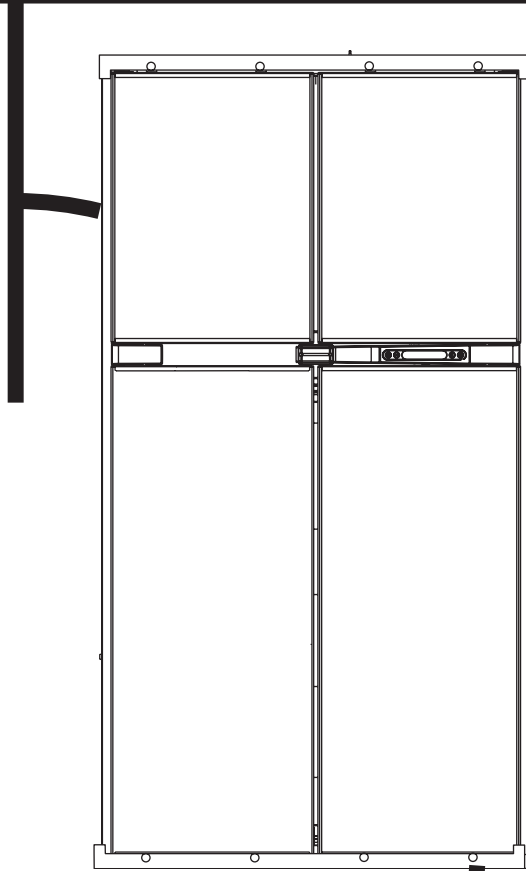




## SERVICE MANUAL 2117 Series Gas/Electric Refrigerators



# **SECTION-1**

## **About this Manual**

This service manual provides maintenance, diagnostic, and repair information for NORCOLD® model 2117-XX gas absorption refrigerators.

The information, illustrations, and specifications contained in this publication are based on the latest product information available at the time of publication. NORCOLD® reserves the right to make changes at any time without notice.

## **Intended Use**

This service manual is reference tool designed for technicians who are knowledgeable in the theory and operation of gas/electric absorption refrigerators, liquefied petroleum (LP) gas–propane–systems, and AC/DC electrical systems as installed in a variety of recreational vehicles (RV).

## **How this Service Manual is Organized**

### **Section—1: Introduction**

This section covers refrigerator model and cooling system identification, certification, installation reference, replacement part statement, technical support contact, safety awareness.

### **Section—2: Specifications**

Provides specifications applicable to 2117-XX series refrigerators.

### **Section—3: Troubleshooting Flowcharts**

This section covers troubleshooting information and flowcharts for faults displayed through the optical control display assembly screen.

### **Section 4: LP Gas System**

This section covers LP gas system pressure requirements, the effects of low or high LP gas pressure, gas valve information and specifications, gas valve serviceability, gas valve replacement procedures, gas valve solenoid coil resistance check, burner tube information, burner and orifice assembly information, burner and orifice cleaning procedure.

### **Section 5: Electrical Components**

This section covers DC power requirement, polarity of connections, power board DC fuse, light assembly, light bulb replacement, thermistor wire assembly, thermistor assembly replacement, divider heater, fans,

fans thermostatic switch, fan replacement procedure, flapper assembly, flapper assembly replacement, spring pin replacements, AC power requirements, AC power cords, AC fuse, and AC heaters.

### **Section 6: Electronic Controls**

This section covers the power board, control panel assembly, replacement of boards, auto and manual defrost information and accessing defrost information through the control panel.

### **Section 7: Cooling System.**

This section covers cooling system refrigerant, leveled operation requirement, poor cooling issues, cooling issues related to cooling system performance, voltage and component effects on cooling performance, LP gas pressure and components issues related to cooling performance, electrical operated components failure related to cooling performance, dirty flue affect flame performance, flue cap blocked or jammed over flue opening, exceeding maximum level limits effect on cooling system performance, inadequate repairs and unauthorized modifications, cooling system monitoring system, high temperature monitoring system, cooling system replacement, cooling system testing, diagnostic flow chart, and cooling unit replacement procedure.

### **Section 8: Diagnostics**

This section covers accessing and navigating through the built in diagnostics, screens identification and segments description.

### **Section 9: Ice Maker**

This section covers ice maker specifications, operational description, troubleshooting chart, replacement procedure, ice maker cycle testing, water valve operation, water valve replacement, water fill line heater, water fill line thermostatic switch information, and ice maker module troubleshooting procedures.

### **Section 10: Water Dispenser**

This section covers water dispenser operation, water valve replacement, reservoir replacement, dispenser switch replacement, and LED circuit board replacement.

### **Section 11: Wiring Schematics & Pictorials**

This section provides wiring schematics and pictorials for models 2117-XX series refrigerator.

# SECTION-1 – INTRODUCTION

## General Information

### Refrigerator Identification

The 2117 and 2117D series gas absorption refrigerator cools on 120 volt AC power or propane gas. The refrigerators electronic controls operate on 12 volt DC.

### Model Letter Codes

The letter after the model number identify optional factory installed components. For example, a 2117DSS has a water dispenser and stainless steel panel wrapped style doors.

### Information Label

The location of the information label is illustrated in Figure 1-1, page 4. It provides the following information:


- Serial number.
- Model number.
- LP gas (propane) pressure.
- Btu/hr.
- AC voltage and amperage.
- DC voltage and amperage.
- Design certification.
- Vent kit requirement.

### Cooling System Serial Number

All genuine Norcold cooling systems are serialized. Serial number labels location are illustrated in Figure 1-2, page 4.

### Certification Information

The 2117-XX series gas/electric absorption refrigerators are certified under *ANSI Z21.19B* standards for installation in mobile homes or recreational vehicles and under Canadian Standards Association *CAN/CGA-1.4-M94*.

Electrical components comply with  standards.


## Replacement Parts

It is advisable to use only authorized **NORCOLD®** replacement parts. Generic parts do not meet **NORCOLD®** specifications for safety, reliability and performance.

The use of unauthorized aftermarket or generic replacement parts voids the refrigerator's limited warranty coverage.

## Technical Assistance

Technical assistance is available to service centers through NORCOLD® Customer Service Center.

-  Telephone: 1-800-444-7210.
-  Fax: 1-937-497-3183.
-  World Wide Web: [www.norcold.com/cda](http://www.norcold.com/cda)

### ➤ IMPORTANT ◀

[www.norcold.com/cda](http://www.norcold.com/cda) subscription are available only to service centers.

The following information will be required to process technical help requests if the product is in warranty and has not been registered with **NORCOLD®**.

- Customer last and first name.
- Address, City, State, Zip Code.
- Telephone number.
- E-mail address (optional).
- Refrigerator model number and serial number.
- RV Make, Model and Year.
- Complete RV VIN number.
- Floor plan number/description.
- RV date of purchase.

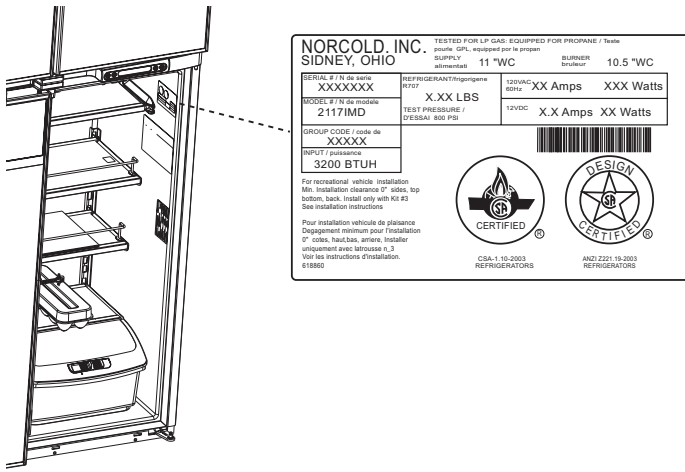


Figure 1-1. — Information label location.

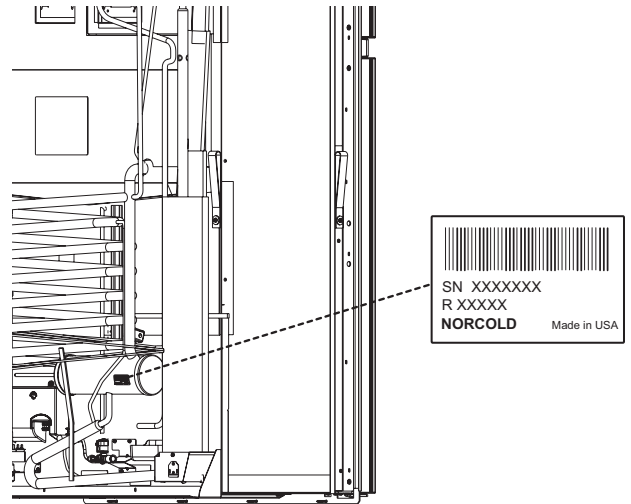


Figure 1-2. — Cooling system serial number label location.

## Safety Awareness

It is not possible to anticipate all of the conceivable ways or conditions under which the refrigerator may be serviced or to provide warnings and cautions as to all of the possible hazards that may be present.

Standard safety precautions and equipment should be used when working on electrical circuits and handling toxic or flammable materials.

Safety goggles and other required protection should be used during any process that can cause material to become airborne, such as removing a leaking cooling unit or cleaning components.

## Safety Symbols and Information

The following safety symbols and information text are used throughout this service manual.



**WARNING**

The **WARNING** symbol and text identify hazards or conditions, which if ignored while performing a task can cause serious injury, death, and/or extensive property damage.



**CAUTION**

The **CAUTION** symbol and text identify hazards or conditions, which if ignored while performing a task can cause injury, and/or property damage.



**IMPORTANT**

IMPORTANT labels are followed by information that **MUST** be followed to complete technical assistance, procedures or tests correctly.



**NOTE**

Provide additional information that assists with completing steps within a procedure or an entire procedure.

# Safety Review

## General Safety

- Prevent child entrapment! Before disposing of the refrigerator, remove all doors and fasten all shelves with retainers.
- External components may have sharp corners and edges. Wear hand protection, such as cut resistant gloves, and exercise extreme care when handling the refrigerator.
- Make sure all hardware, such as hinges and fasteners (retaining screws, etc.), is properly fastened.

## Electrical Safety

- Do not work on live electrical circuits! Turn off AC power and DC power sources before attempting to remove, service, or repair any of the refrigerator's electrical or electronic components.
- Do not over-fuse electrical circuits! Use the specified fuse and AWG wire size.
- Do not wet or spray liquids on or near electrical connections and electronic components! Most liquids, including leak detection solutions, are electrically conductive and create the potential for shock hazards, shorts, damage to electronic circuits, and/or ignite a fire.
- Do not use extension cords to supply AC power to the refrigerator!
- Do not remove the grounding prong from the refrigerator AC power cord!
- Do not use a two prong adapter to connect the refrigerator to the AC outlet!
- Do not modify, bypass, or eliminate any of the refrigerator's electrical components, electronic circuits, or propane gas system components, including AC and DC heaters.
- To prevent shock hazard, disconnect the AC power cord from the electrical outlet before attempting to remove the power board cover.
- Electrical connections and repairs to electrical components must comply with applicable codes.

- Use an anti-static grounding strap before attempting to handle, remove or install the power board.

## Cooling System Safety

- Do not try to repair or recharge the cooling system! The cooling system is sealed and pressurized. It is not rechargeable.
- Do not bend, drop, weld, drill, puncture, saw, or strike the cooling system!
- Wear breathing protection and gloves when handling a leaking cooling system. The cooling system contains ammonia, hydrogen, and sodium chromate.
  - Ammonia can cause severe skin and eye burns.
  - Hydrogen is highly flammable and ignites and burns with intense flame.
  - Certain chromium compounds, such as sodium chromate, are carcinogenic.

## LP Gas Safety

- Do not smoke, light fires, or create sparks when working on the propane gas system!
- Do not use an open flame for leak testing any of the propane gas system components. Propane gas is highly flammable and explosive!
- Always use two wrenches to loosen or tighten LP gas system fittings to prevent damaging components, piping, or fittings. Damaged components, piping, or fittings create the potential for gas leaks.
- Do not use leak test solutions containing ammonia or chlorine. Ammonia and chlorine corrode and break down brass and copper components.

## SECTION 2 — SPECIFICATIONS

### Internal Capacities

Total capacity -----	17 cu. ft.
Freezer -----	5.3 cu.ft.
Fresh food compartment volume -----	11.7 cu.ft.

### Controls

Type -----	Electronic with built-in self diagnostic
ON/OFF/MODE/TEMP SET switches -----	LCD assembly with flush-pushbuttons
Temperature setting range -----	1=cold to 9=coldest
Temperature /defrost sensing devices -----	Thermistors

### Off-level operating limits

Side-to-side -----	3 degrees maximum at refrigerator
Front-to-back -----	6 degrees maximum at refrigerator

### DC power

Electronic controls voltage requirement -----	10.5 to 15.4 VDC
Fuse, Power Board -----	5 A (tan color), automotive blade style
Fuse, Defrost daughter board -----	30 A

### DC amperage draw @ nominal 12 VDC

Automatic ignition -----	0.50 A*
Divider heater -----	0.275 A*
Defrost system -----	15 A*
Flapper heater -----	0.275 A*
Lamp, fresh food compartment -----	0.500 A*
Gas valve -----	0.146 A*
Fans (2) -----	0.950 A (per fan)*
Valve, water dispenser -----	0.830 A*
Dispenser water line heater -----	0.167 A*
Ice maker water line heater (IM Models) -----	0.167 A*
Ice maker water line heater (IMD Models) -----	1.25 A*
Dispenser water valve heater -----	0.458 A*

### AC components

AC heaters -----	3
Wattage, per heater -----	187 W @ 120 VAC
Heater resistance @ ambient temperature (per heater) -----	77 $\Omega$
AUTO and AC manual mode operation voltage requirement -----	108 to 132 VAC
Fuse, power board -----	8 A, 1/4 in. x 1 1/4 in. AGC style, fast acting
Ice maker (IM models only) -----	180 W @ 115 VAC
Water valve, ice maker (IM models) -----	0.210 A**
Water valve, ice maker (IMD models) -----	0.145 A**

### LP gas (propane)

Operating pressure -----	10.5 to 11.5 in. w.c.
Btu/hr 8-slot burner / LP22 orifice -----	3200 Btu/hr @ 11 in. w.c.
Flame sensing -----	Electronic through spark/sense electrode
Electrode tip-to-burner air gap -----	1/8 to 3/16 in.







\* = Calculated

\*\* = Actual

## SECTION 3 — QUICK REFERENCE TROUBLE SHOOTING GUIDE

Problem	Probable Cause	Reference
<b>Blank display- Refrigerator does not turn ON.</b>	12 volt DC not connected to power board.	Page 10
	Loose / broken connector.	Page 10
	Power board F1 fuse open (blown).	Page 12
<b>Poor cooling on AUTO AC or AC manual mode.</b>	One AC heater failed open.	Page 16
	AC voltage less than 108 volt.	Page 54
<b>Poor cooling on AUTO LP or manual LP mode.</b>	Insufficient ventilation.	Page 54
	Gas pressure less than 10.5 In. w. c.	Page 33
	Dirty burner.	Page 38
	Flue clogged or dirty.	Page 54
	Heat deflector cap blocking flue exhaust.	Page 55
<b>Poor cooling on AUTO AC, manual AC, AUTO LP, or manual LP modes.</b>	Insufficient ventilation.	Page 54
	Fan(s) disconnected/malfunction.	Page 55
	Cooling system.	Page 57
	One AC heater failed open.	Page 54
<b>Burner failed to ignite / reignite.</b>	Dirty burner.	Page 54
	Spark/sense electrode wire has no continuity.	Page 26
	Spark/sense electrode gap not 1/8 to 3/16 in.	Page 6
<b>“L1” “oP” fault High temperature limit switch open.</b>	Off level operation.	Page 54
	Insufficient, obstructed or downdraft ventilation.	Page 54
	Heat deflector cap blocking flue opening. Cooling system.	Page 55 Page 54



Fault Code	Probable Cause	Reference
	<p>No 12 volt DC to power board.  Power board F1 fuse open (blown).  Control panel overlay malfunction.</p>	<p>Page 10  Page 10  Page 10</p>
 <p>HE</p>	<p>AC heaters not connected to power board.  AC heaters connected incorrectly to power board.  All three AC heaters failed open.</p>	<p>Page 16  Page 16  Page 16</p>
 <p>rE</p>	<p>AC relay stuck closed.</p>	<p>Page 17</p>
 <p>L0</p>	<p>Less than 10.5 volts DC input to power board.</p>	<p>Page 18</p>
	<p>Fresh food compartment door open or ajar for more than two (2) minutes.</p>	<p>Page 19</p>
 <p>..</p>	<p>Flame present with gas off.</p>	<p>Page 21</p>



## Fault Code

## Probable Cause

## Reference



Open circuit high temperature limit switch.

Page 22



No AC voltage input to power board.  
AC cord unplugged at power board.  
Power board F2 fuse open (blown).

Page 24  
Page 24  
Page 24



Burner failed to ignite or relight.

Page 25



Flame sensing circuit malfunction.

Page 27



Fresh food air thermistor out of range.

Page 28



Freezer fin thermistor out of range.

Page 29



Freezer air thermistor out of range.

Page 30



Cooling unit fans thermistor out of range.

Page 31

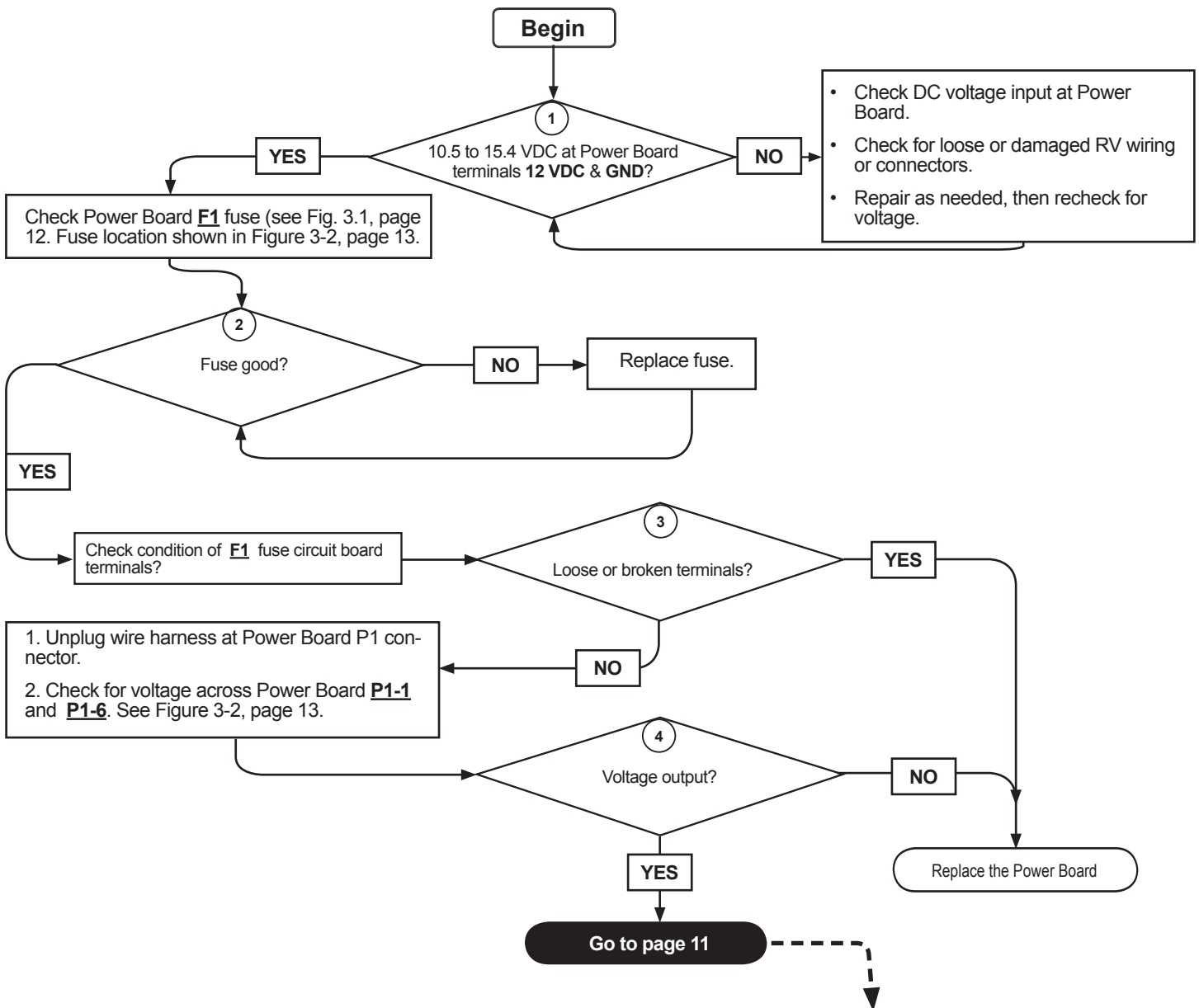
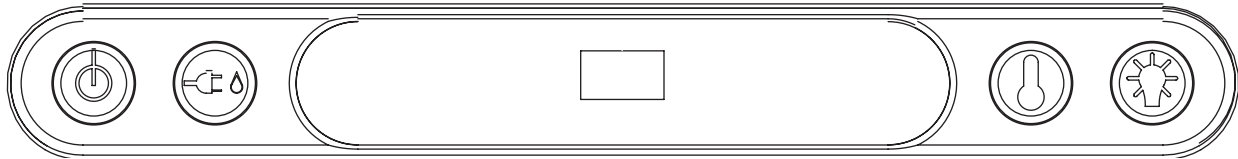


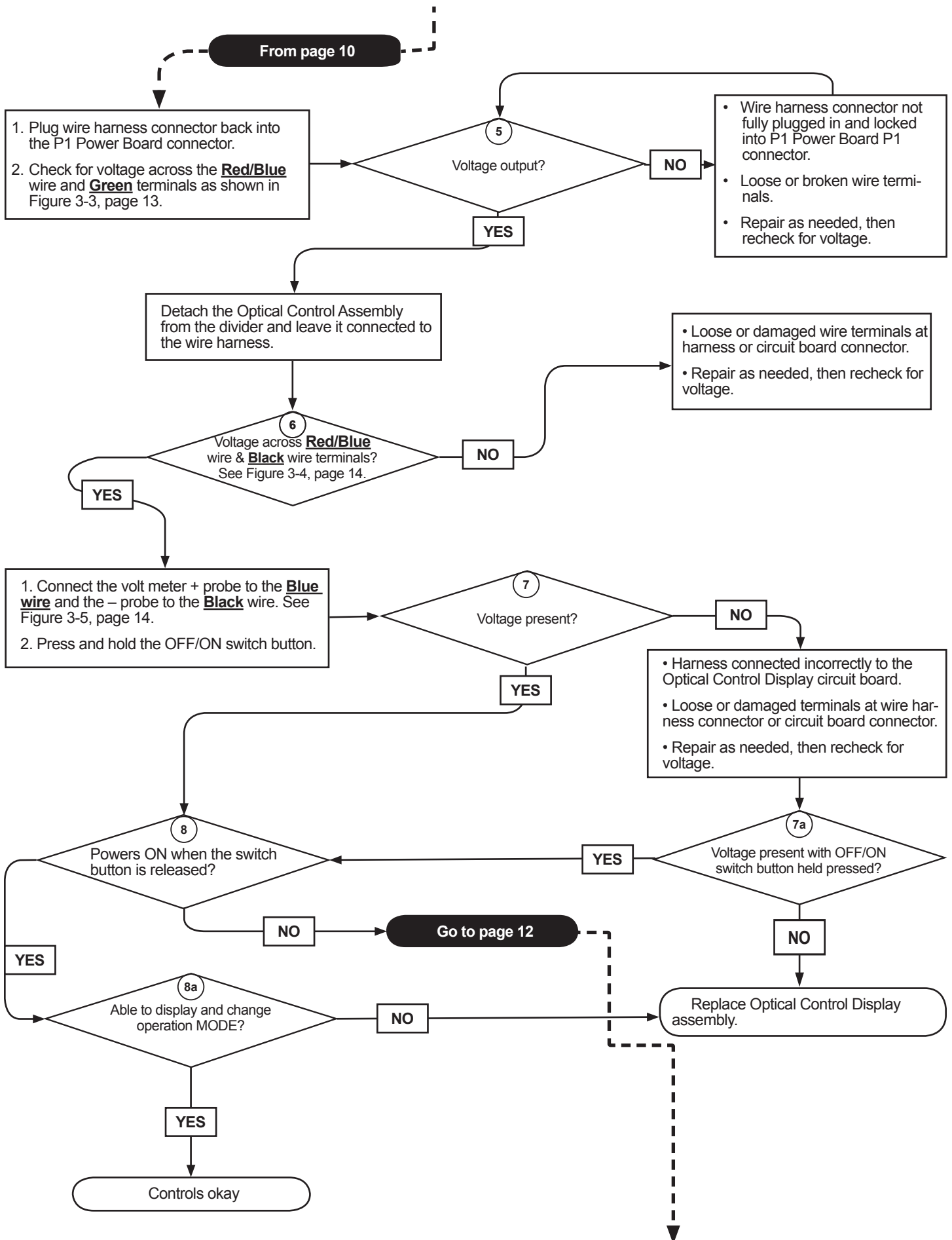
Fresh food fin thermistor out of range.

Page 32

# Troubleshooting Flowcharts

## Blank display- Refrigerator does not turn ON.





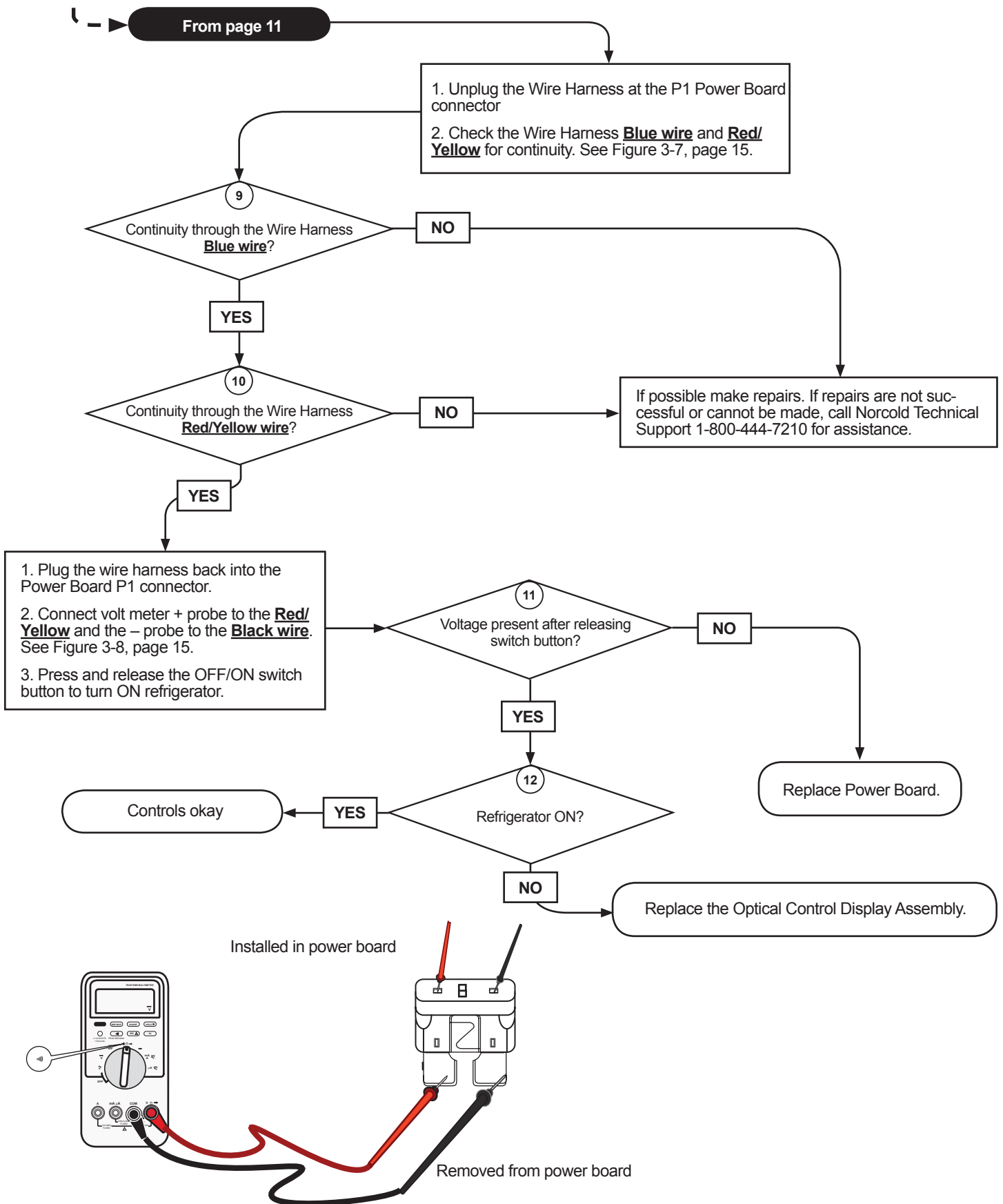


Figure 3-1. —Checking continuity of power board F1 fuse.

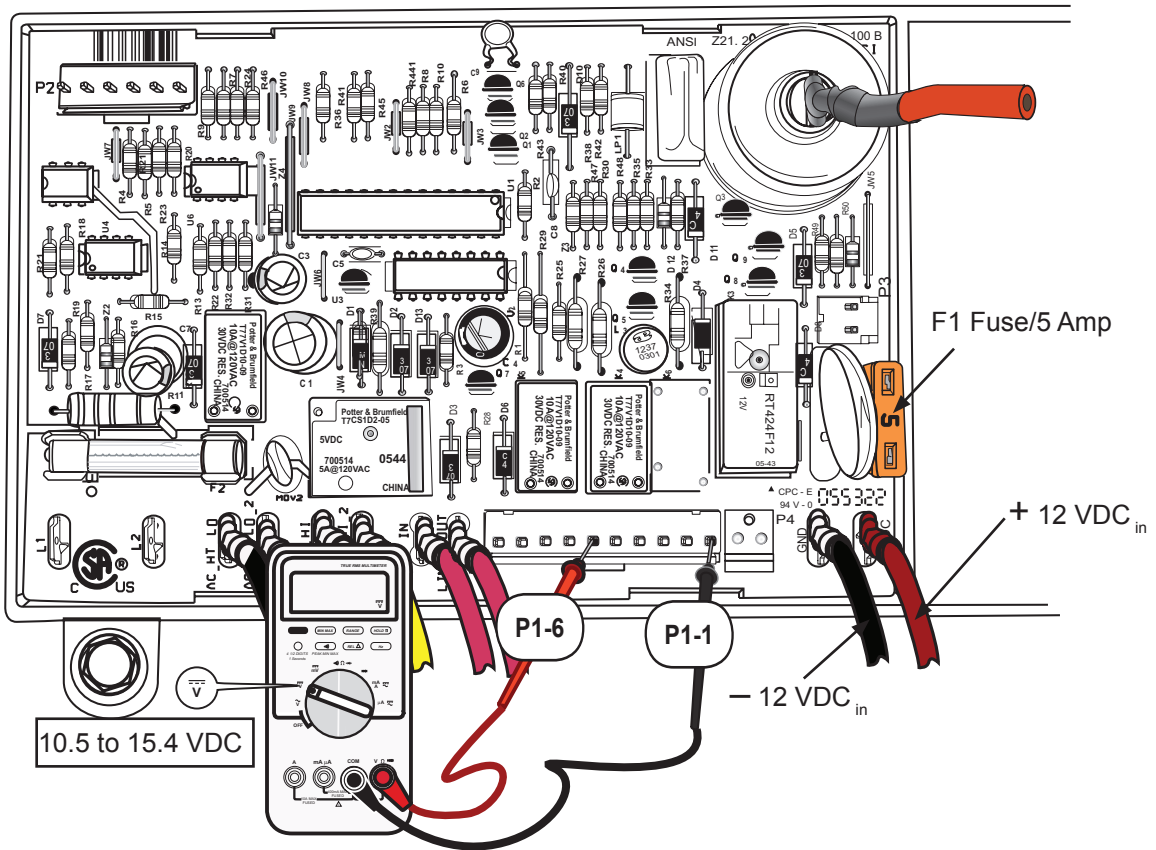


Figure 3-2. — Measuring DC voltage across P1-1 and P1-6 with wire harness disconnected.

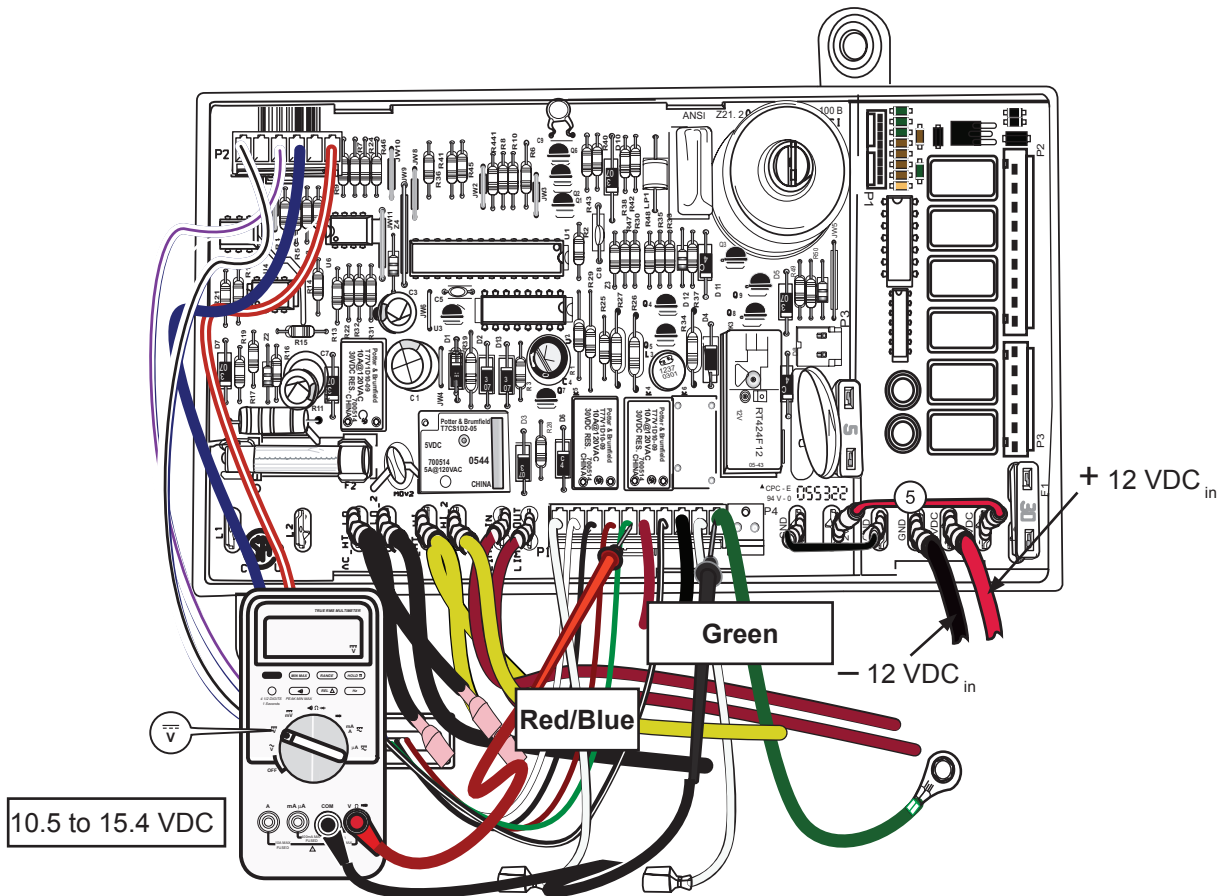
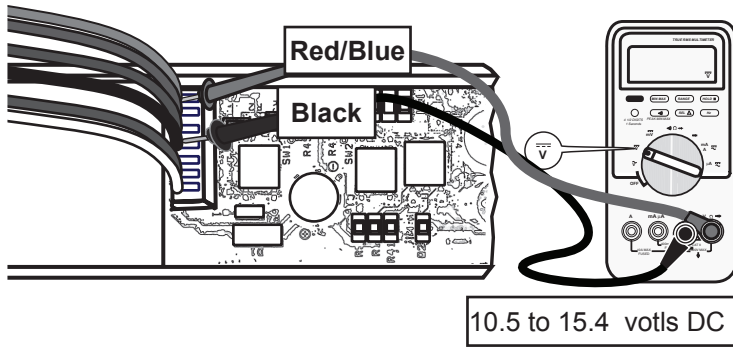


Figure 3-3. — Measuring DC voltage across Red/Blue wire and Green wire.

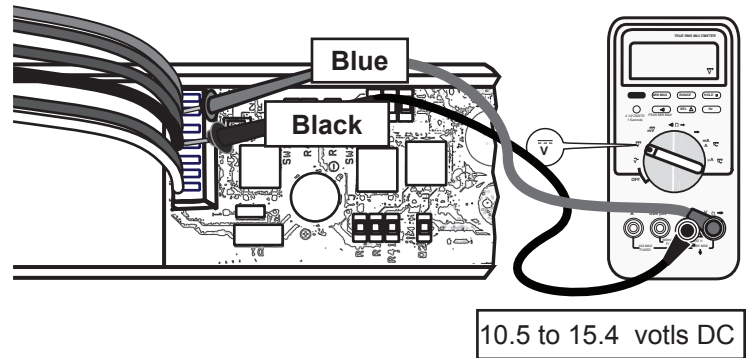


**Figure 3-4. — Measuring DC voltage across the Black wire and Red/Blue wire at the optical controls display assembly circuit board connector.**

Optical Control Display Assembly—Back View

➤ **IMPORTANT** ◀

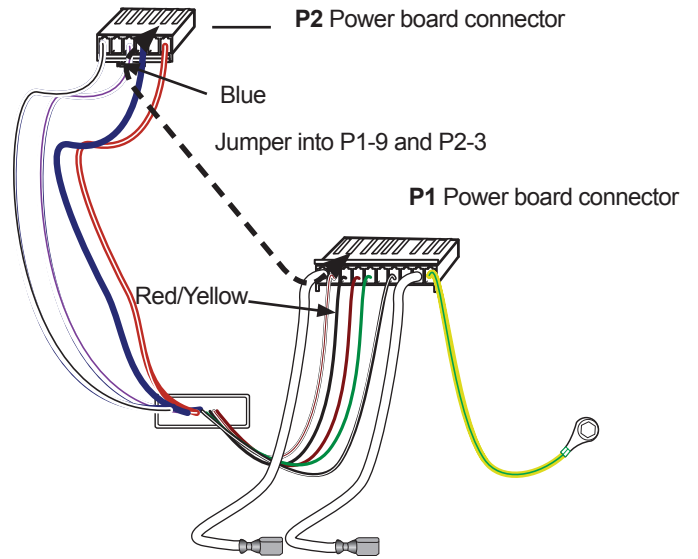
Voltage is only present when the ON/OFF switch button is held pressed while turning ON the refrigerator.



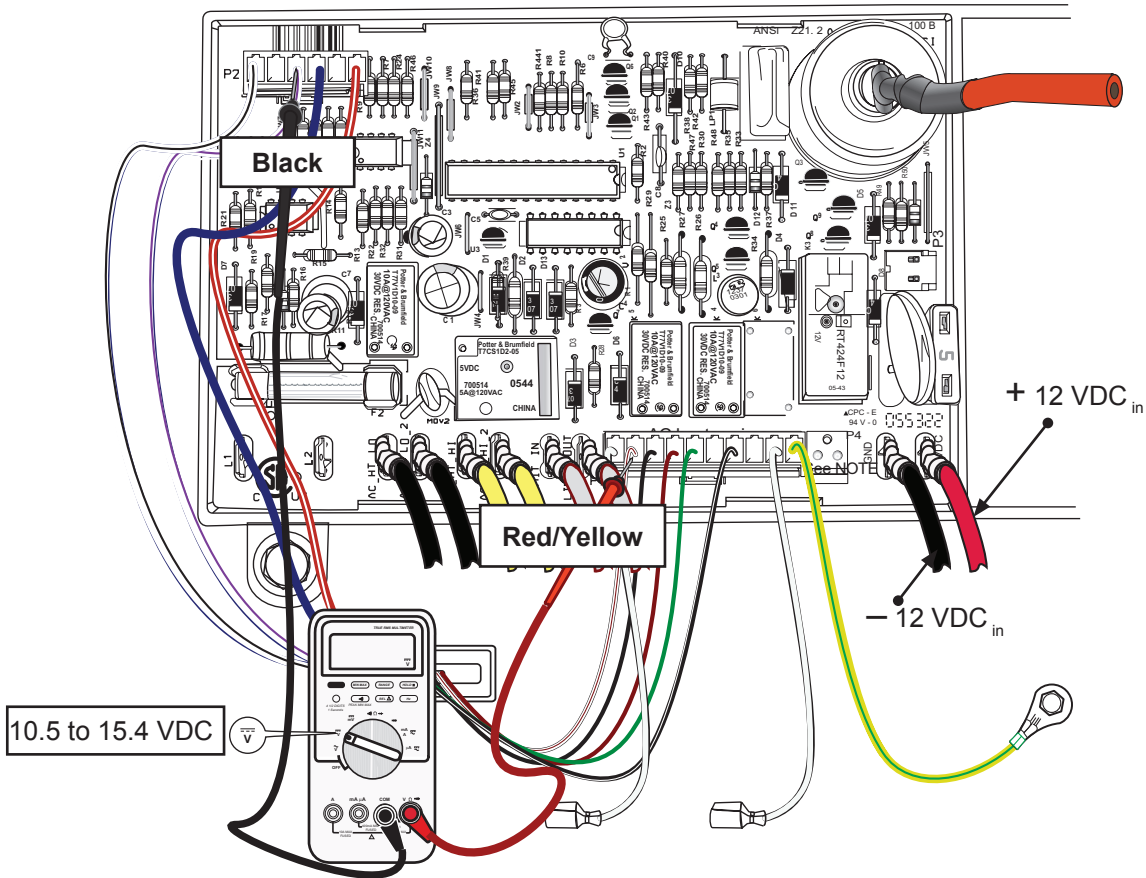
**Figure 3-5. — Measuring DC voltage across Black wire and Blue wire at the optical control display assembly circuit board connector.**

**To check Red/Yellow wire and Blue wire for continuity:**

1. Disconnect P1 and P2 from Power Board.
2. Disconnect Optical Control Assembly P1 from circuit board.
3. Jump Red/Yellow wire and Blue wire at Power Board P1 and P2 connector.
4. Connect ohm meter to Red/Yellow wire and Blue wire contacts at Optical Control Display wire harness connector.



**Figure 3-7. — Location of wire harness Red/Yellow wire and Blue wire in P1 Optical Control Display wire harness plug and Power Board P1 and P2 Connectors.**



**Figure 3-8. — Measuring DC voltage across the Red/Yellow (+) and Black (-) wire.**



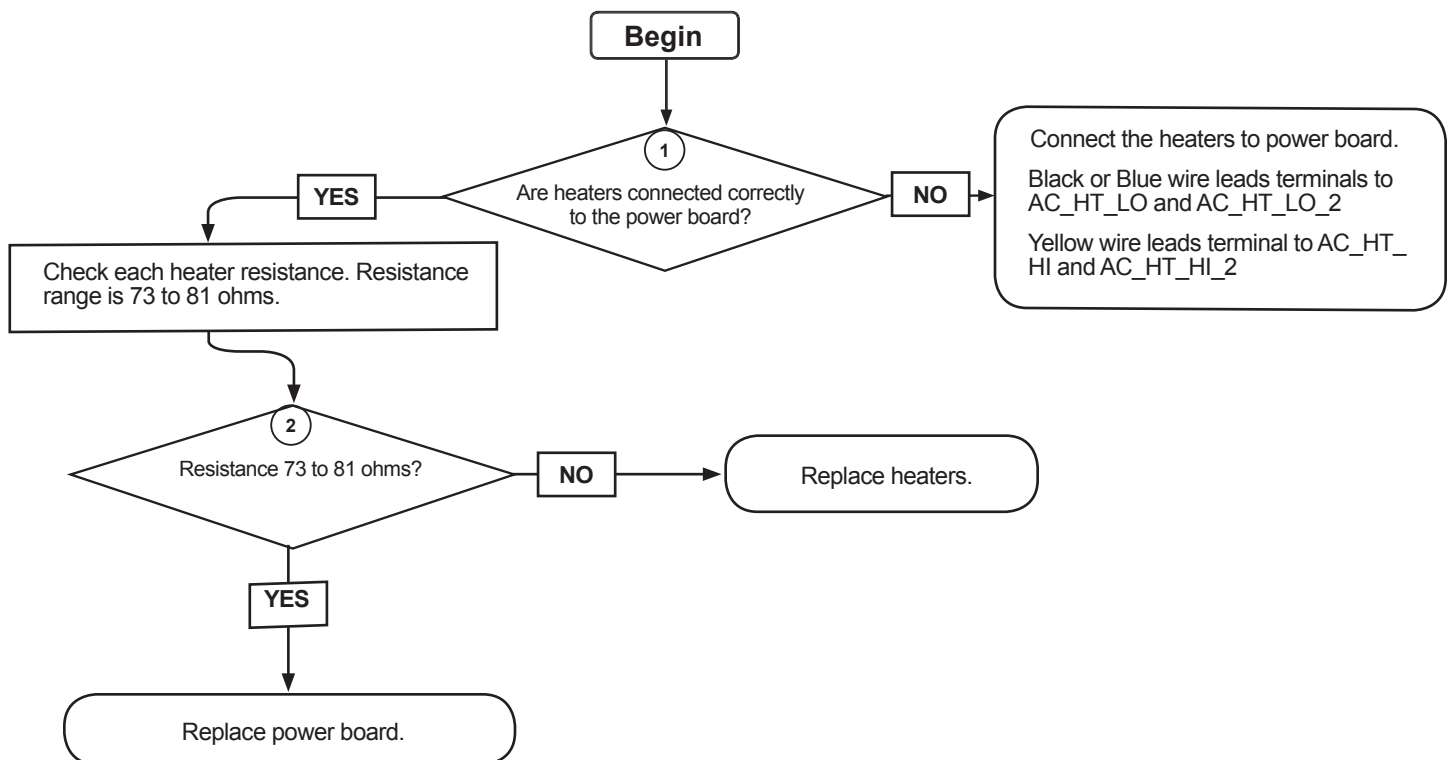
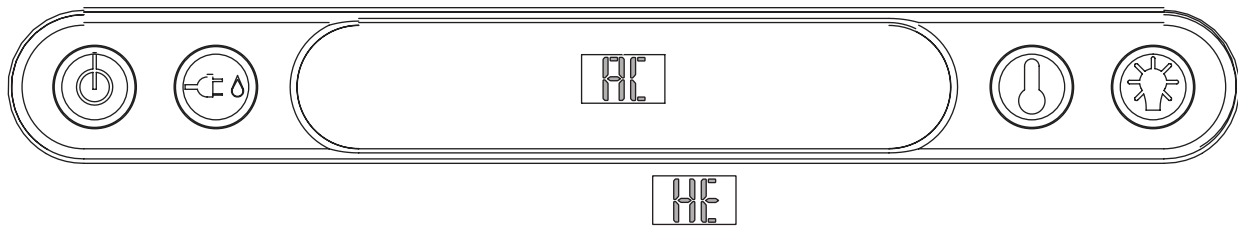
## AC HE Code— AC Heaters Failed Open

### ➤ IMPORTANT ‹

The AC HE fault is recorded in either the AUTO or Manual AC mode. The following may apply.

**AUTO MODE:** When AC heaters current input falls below 0.5 amperes and AUTO LP has locked out, the fault is set and recorded to non volatile memory approximately 25 seconds after it occurs, providing there is a call for cooling.

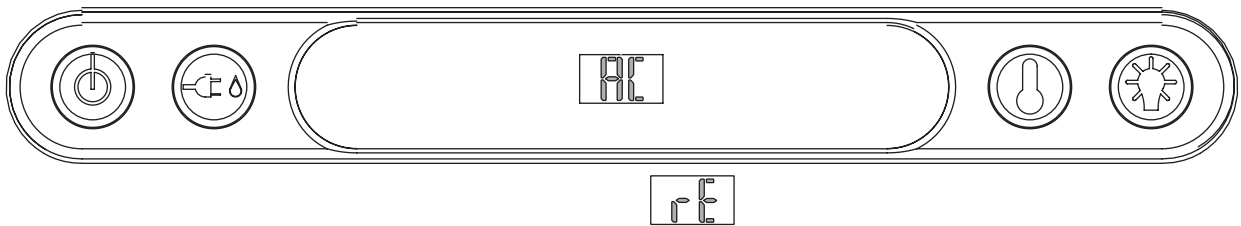
**AC manual mode:** When AC heater current input falls below 0.5 amperes, the fault is set and recorded to non volatile memory approximately 25 seconds it occurs only when the controls call for cooling.



## AC rE Code—AC Relay Stuck Closed

➤ **IMPORTANT** ◀

The AC rE fault is recorded in all operating modes any time AC heater current is sensed on when it is supposed to be off. The AC rE code displays and is recorded in non volatile memory approximately 25 seconds after the fault occurs.



Power board AC heater relay contacts stuck in the closed position. AC current to heaters is being sensed by the controls

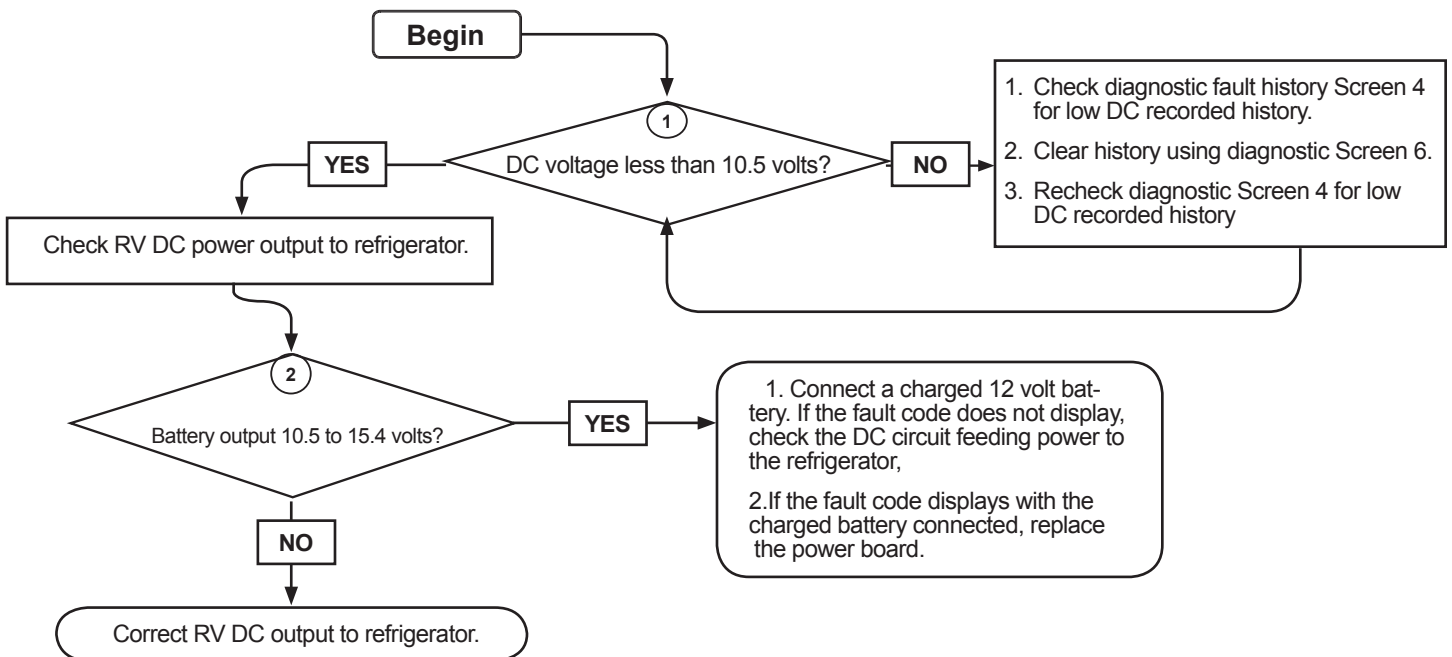
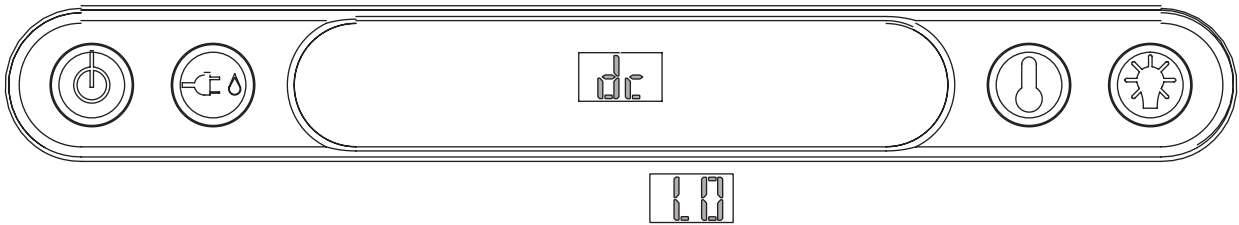
Replace power board.

## dc LO Fault Code—DC Voltage Low

➤ **IMPORTANT** ◀

The dc LO fault is recorded in all operating modes any time DC voltage input falls below 10.5 volts DC.

The dc LO code displays and is recorded in non volatile memory approximately 25 seconds after the fault occurs.

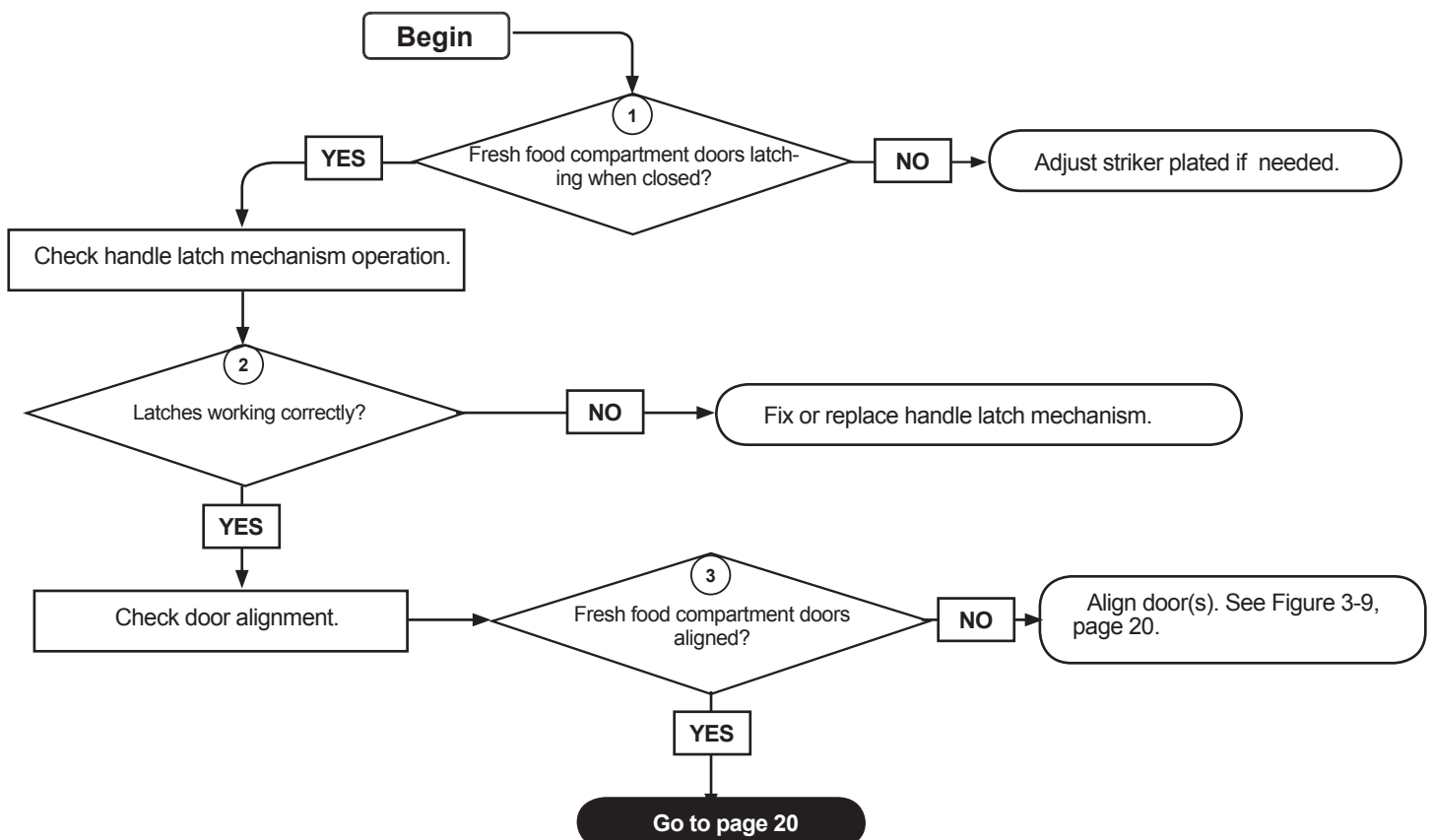
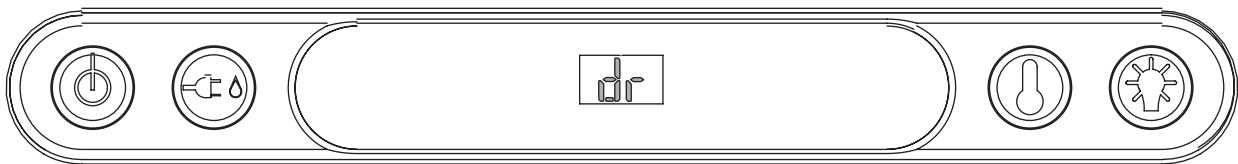


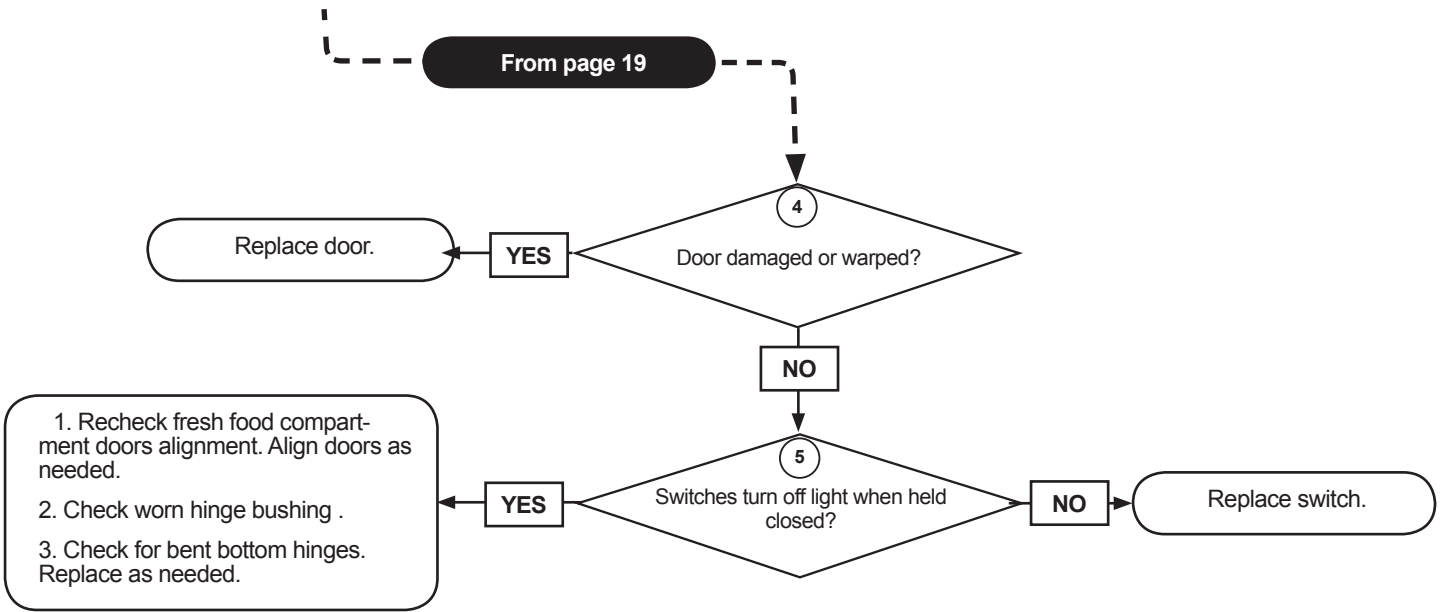
## dr Code—Door sensed ajar or open for more than 2 minutes

### ➤ IMPORTANT ◀

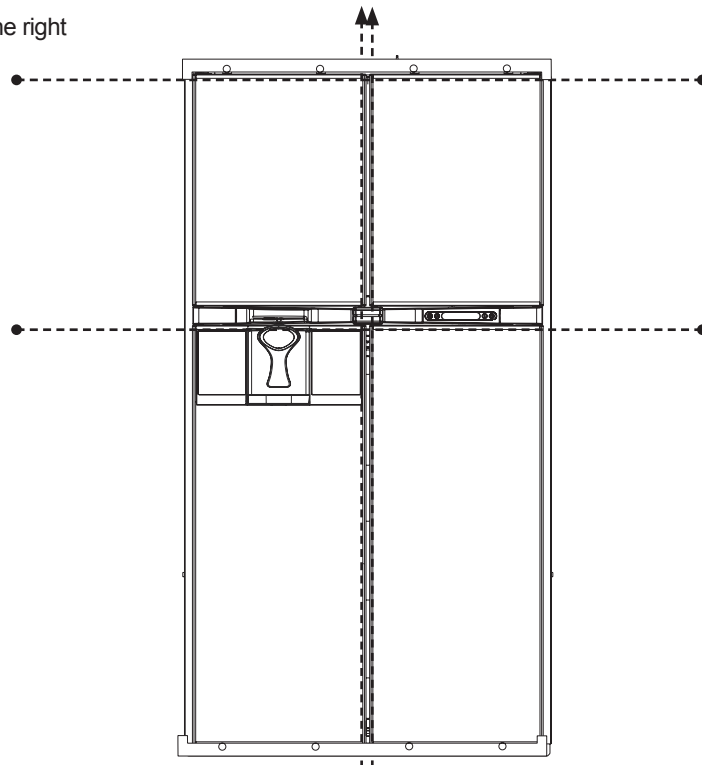
The dr fault is recorded in all operating modes any time one or both fresh food compartment door has been sensed open for two minutes. The controls turn the light off after the two minute period.

The dr code displays and is recorded in non volatile memory approximately 25 seconds after the fault occurs.





Adjust door hinges until the left door and the right door rail are leveled (even).



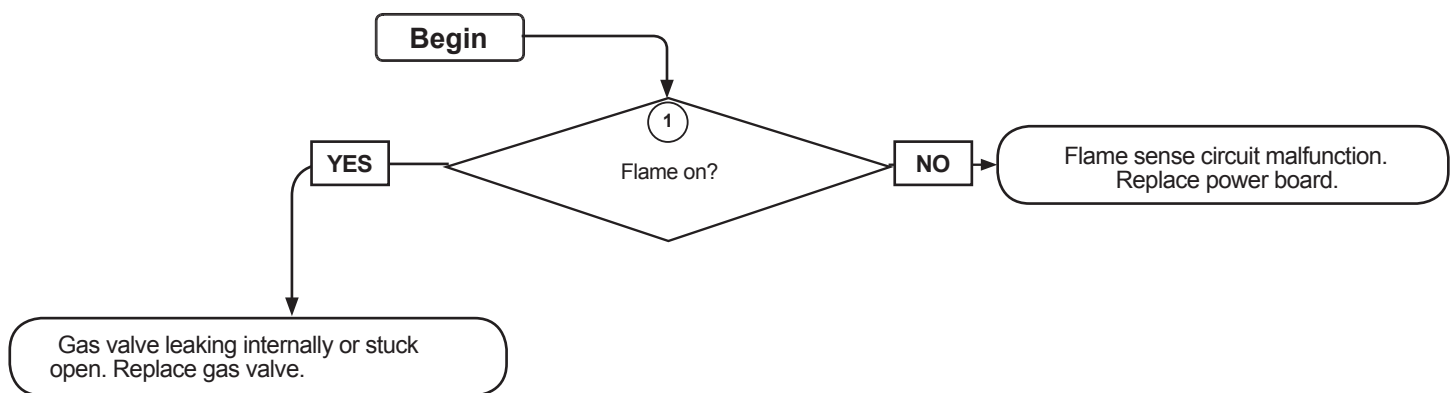
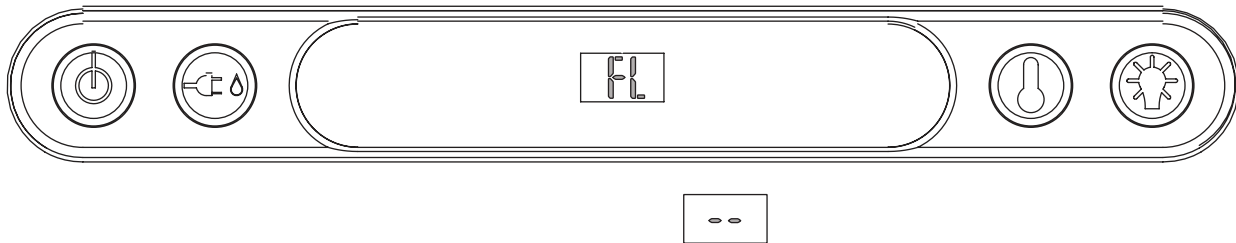
Adjust so the doors panel retainers are evenly spaced vertically.

**Figure 3-9. —Fresh food compartment door adjustment criteria.**

## FL -- Code — Flame Present with Gas Off

### ➤ IMPORTANT ‹

The FL -- fault is recorded in all operating modes any time a flame is sensed at the burner when is not supposed to be lit. The FL -- fault displays and is recorded in non volatile memory approximately 25 seconds after it occurs.

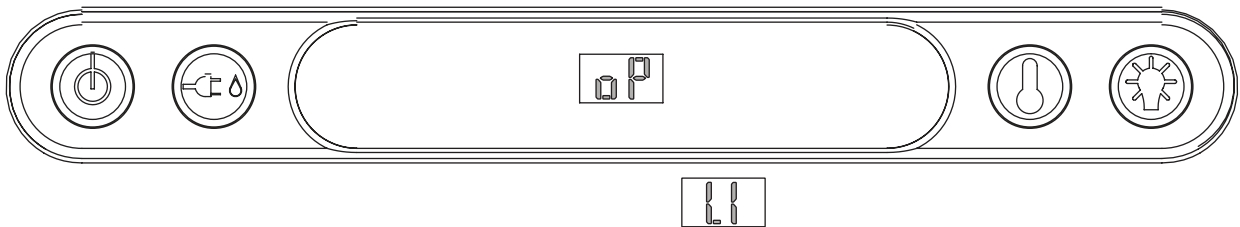


## L1 oP Code — Open High Temperature Limit Switch

### ➤ IMPORTANT ◀

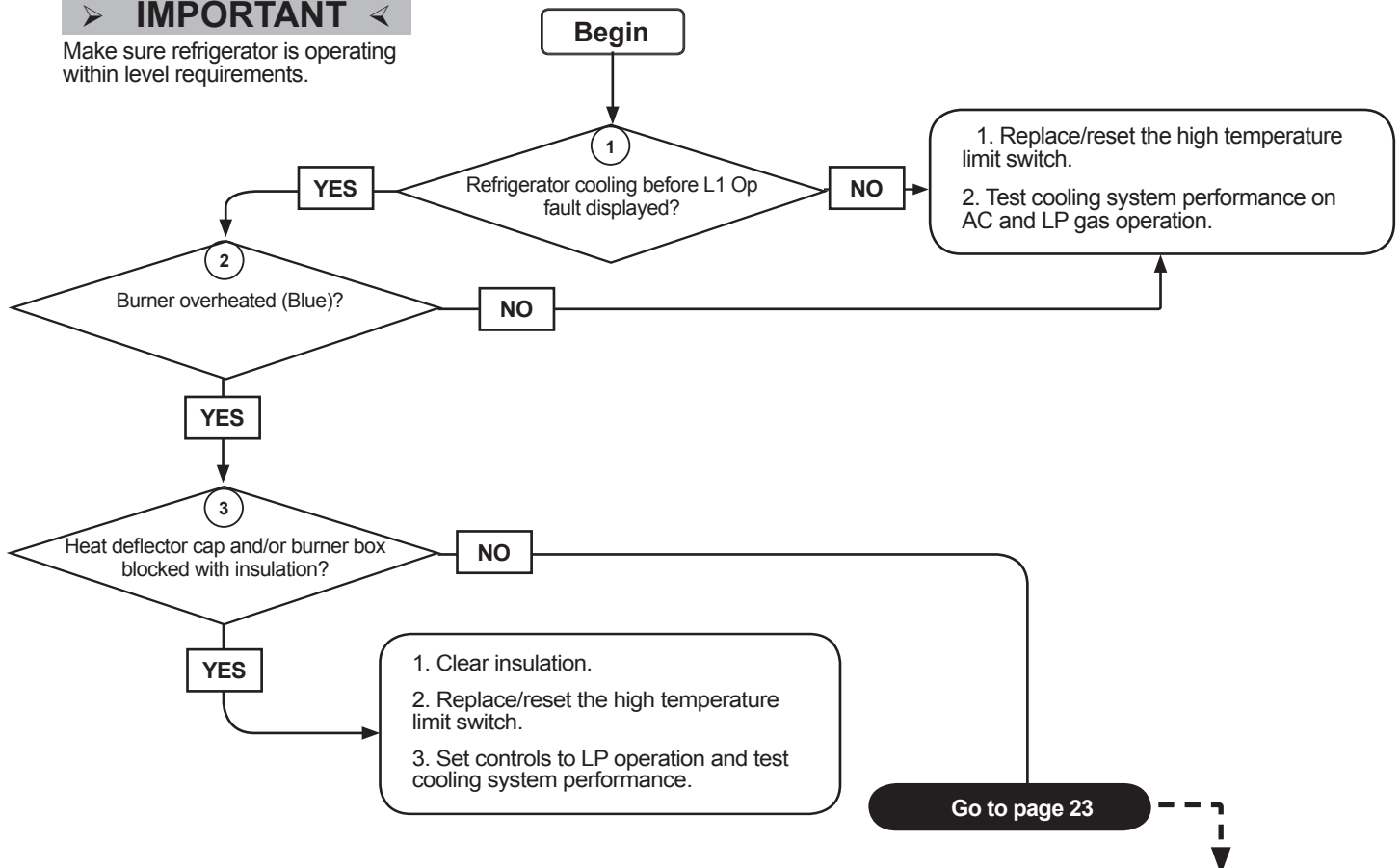
The L1 oP indicates the high temperature limit switch is open or disconnected. The switch is located on the cooling system canister. It is designed to open when the cooling system boiler temperature exceeds 378 degrees Fahrenheit (192.2 degrees Celsius).

On units with non-resettable switch, replace the switch with a resettable switch. On units with resettable switches, reset the switch. In both cases troubleshoot for the L1 oP fault cause.

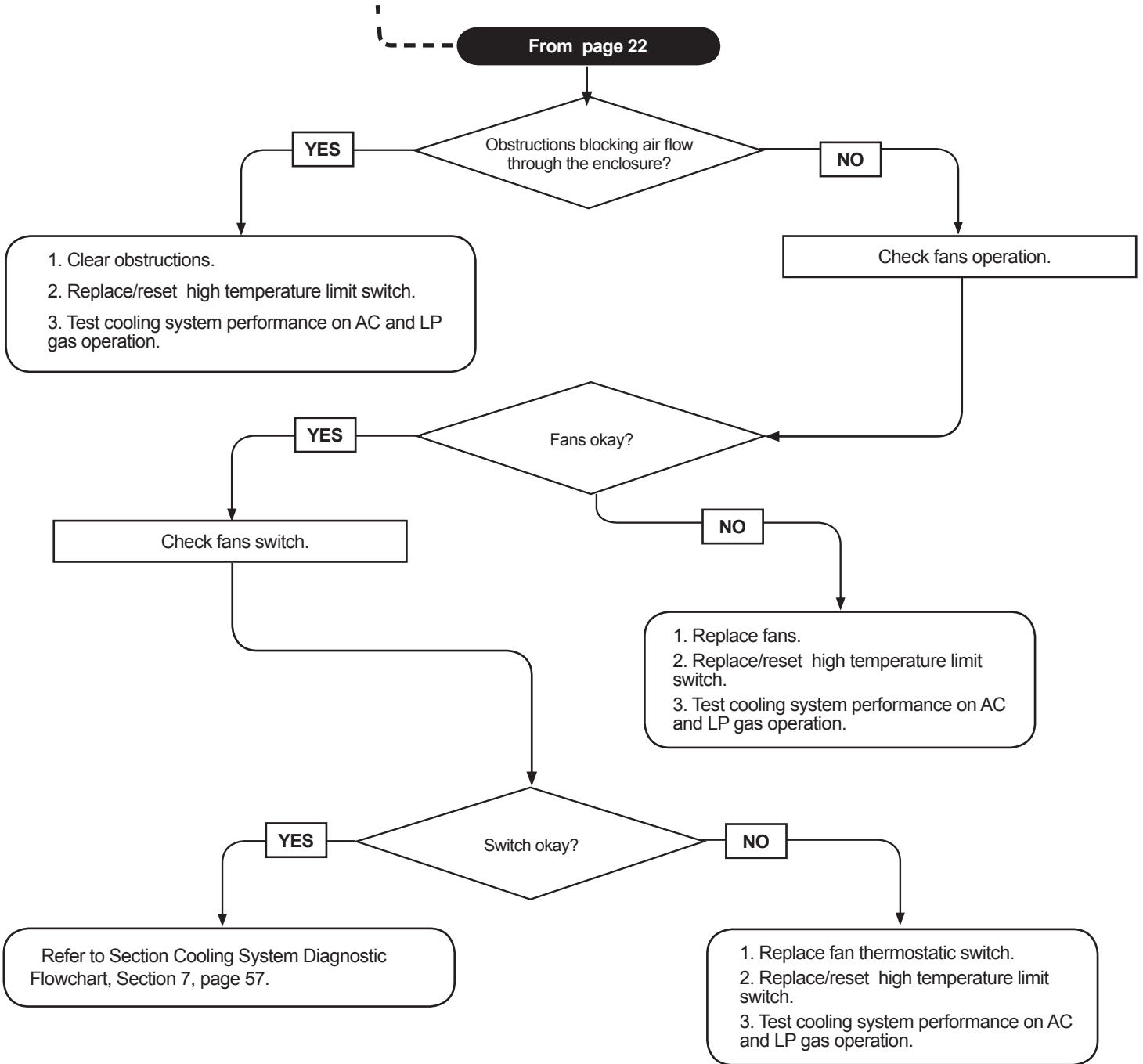


### ➤ IMPORTANT ◀

Make sure refrigerator is operating within level requirements.





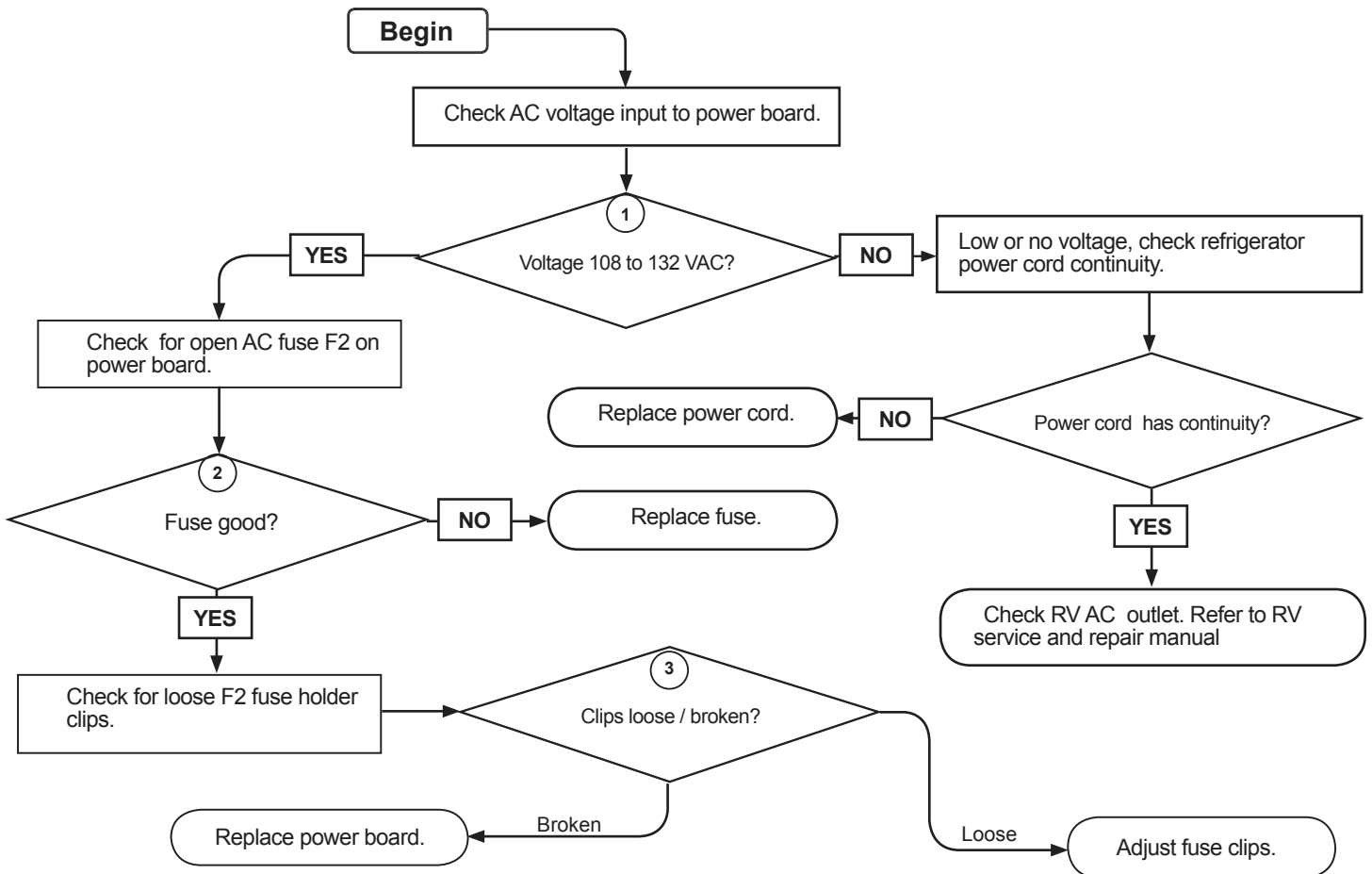
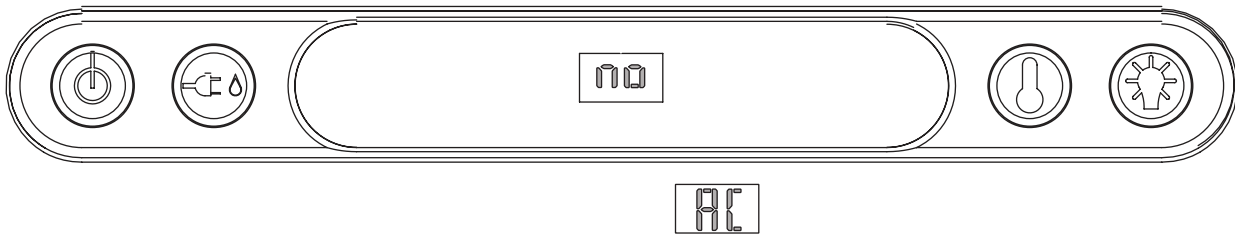


## no AC Code—AC Mode Selected/ AC Voltage Not Available

➤ **IMPORTANT** ◀

The no AC fault is recorded in either the AUTO or AC manual mode. For the fault to occur in the Auto AC Mode AC voltage has to fall below 85 volts with LP gas operation locked out by the controls. This fault is recorded approximately 25 seconds later provided there is a call for cooling.

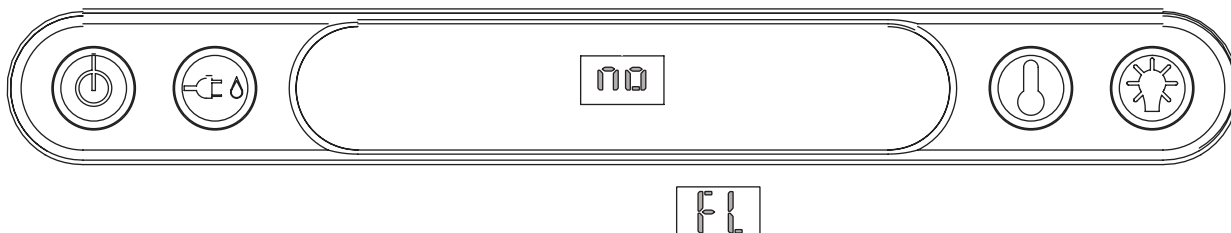
For the fault to occur in AC Manual Mode, AC voltage input has to fall below 85 volts only when the controls call for cooling. The alarm sounds and the fault displays approximately 25 seconds later.



## no FL Code—Burner Failed to Light/Relight

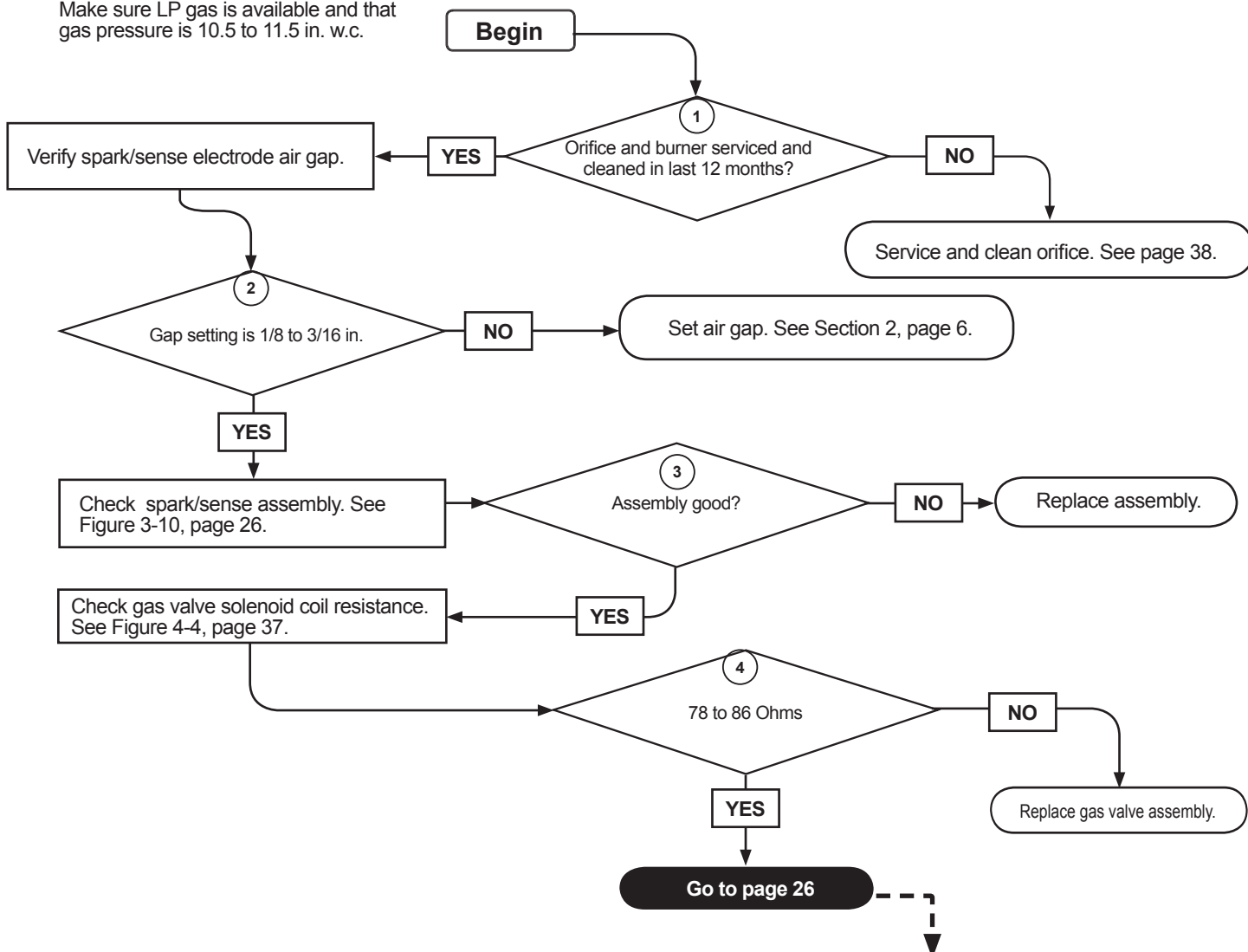
➤ **IMPORTANT** ◀

The no FL fault is recorded in both the AUTO and MANUAL LP mode. Once the 30-second trial for ignition has timed out, the fault is set and recorded in non volatile memory approximately 25 seconds later.



➤ **IMPORTANT** ◀

Make sure LP gas is available and that gas pressure is 10.5 to 11.5 in. w.c.



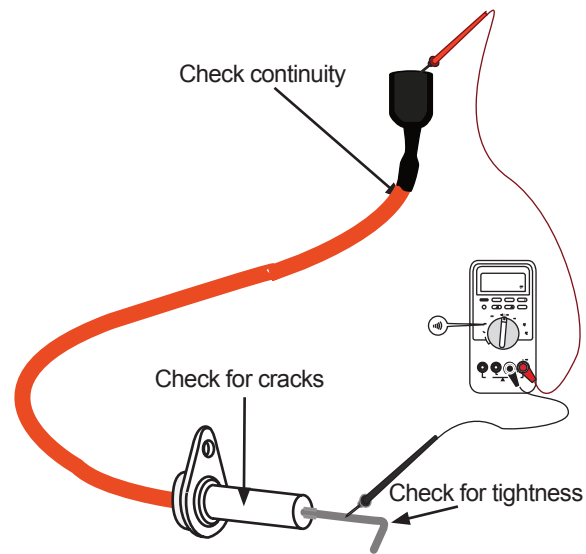
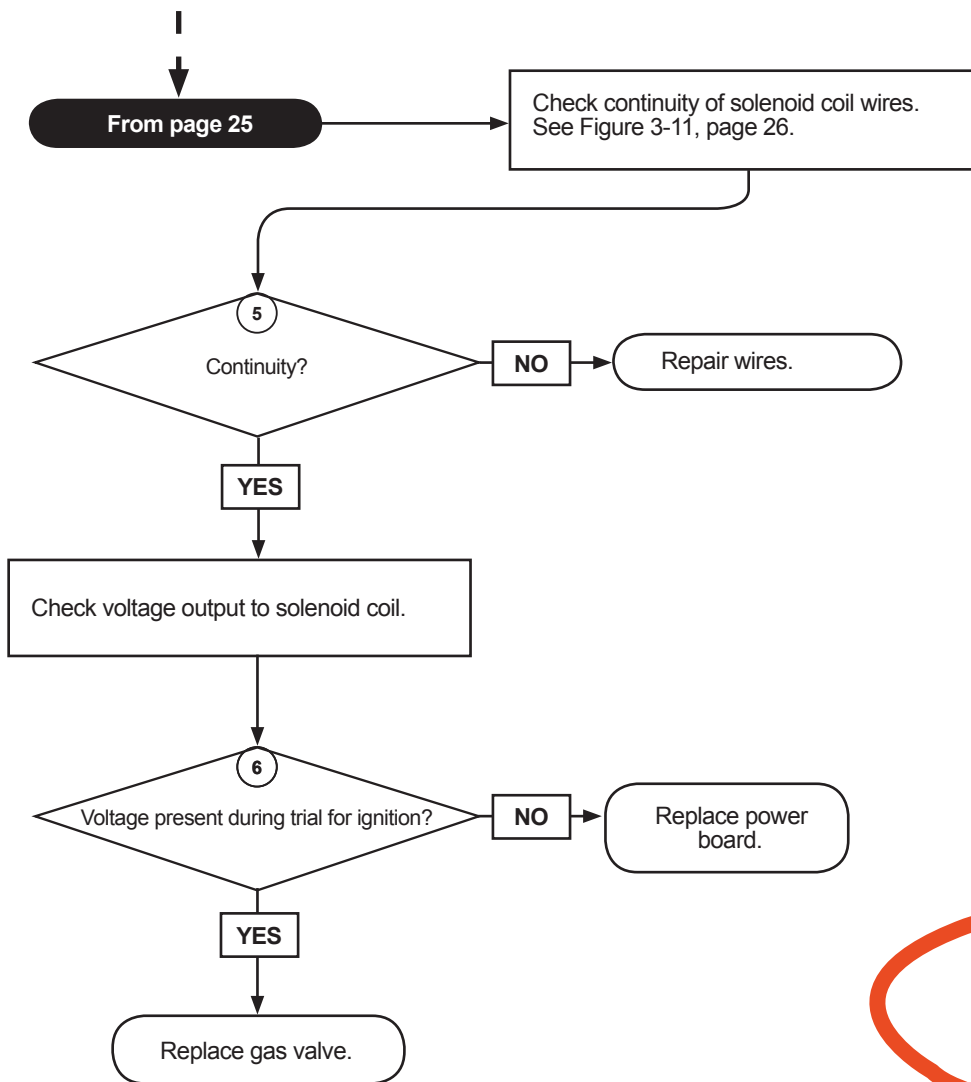


Figure 3-10. — Spark/electrode assembly.

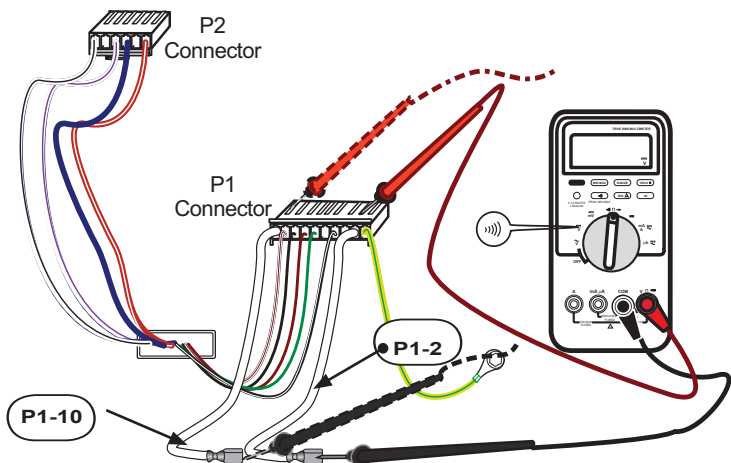


Figure 3-11. — Checking solenoid coil wires continuity.

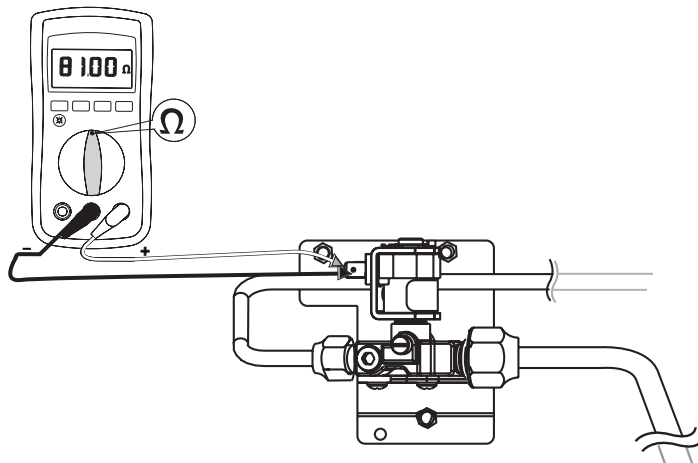


Figure 3-12. — Checking solenoid coil resistance.

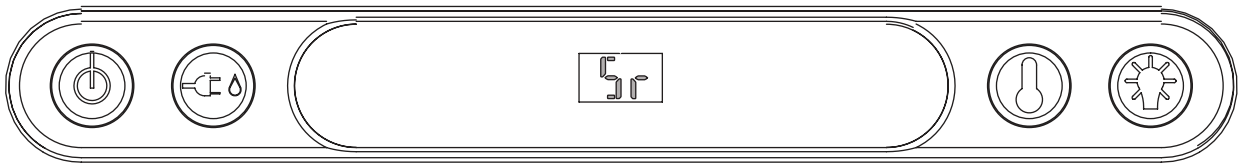
## Sr Code—Flame Sensing Malfunction

### ➤ IMPORTANT ◀

This fault is recorded in all operating modes anytime one of the following occurs:

1. Problem in flame sense circuitry.
2. Gas valve drive circuit present when it is not supposed to be.
3. Gas valve drive circuit not present when it is supposed to be.
4. Internal memory fault.

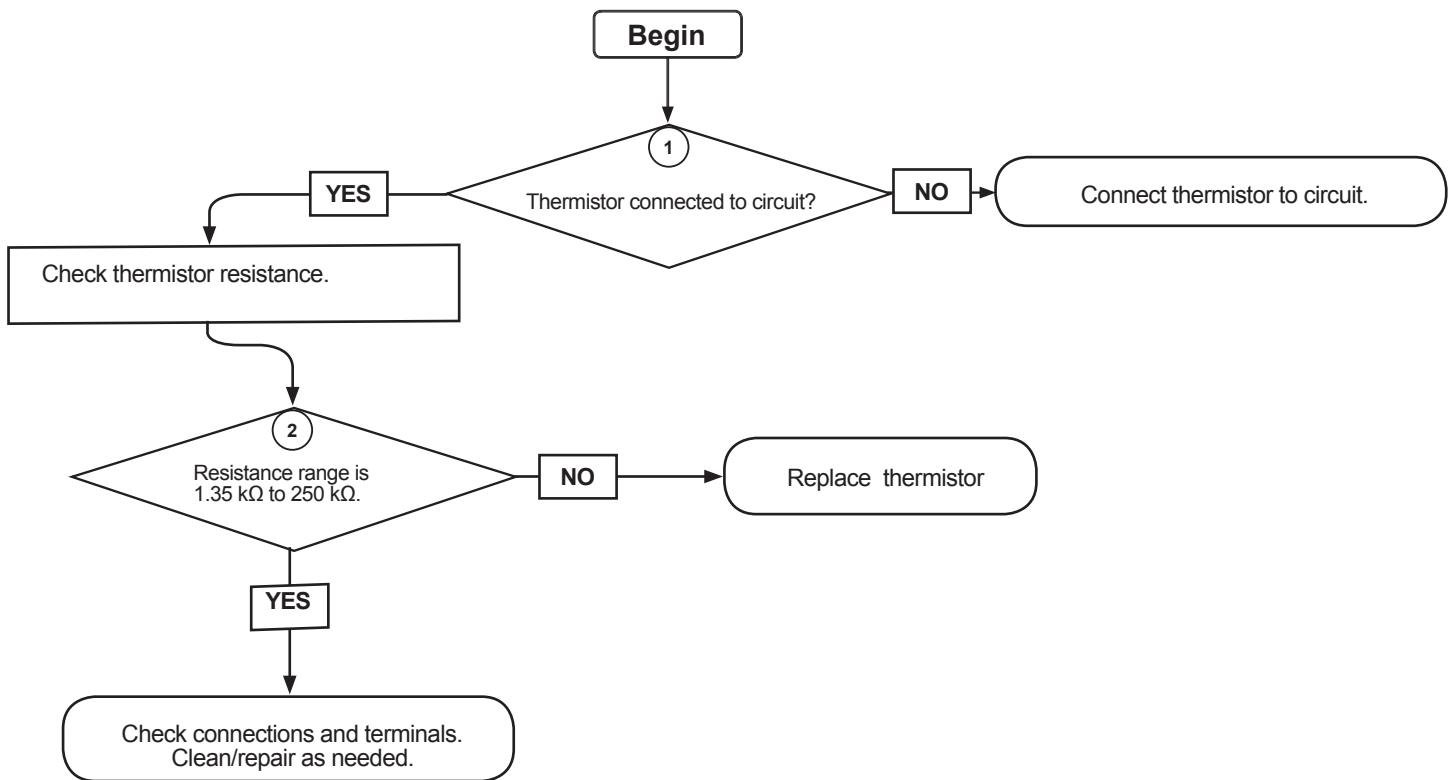
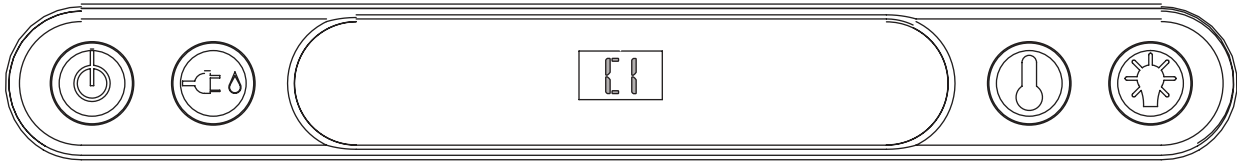
The fault registers approximately 25 seconds later in Diagnostic screen 5, segment #5.



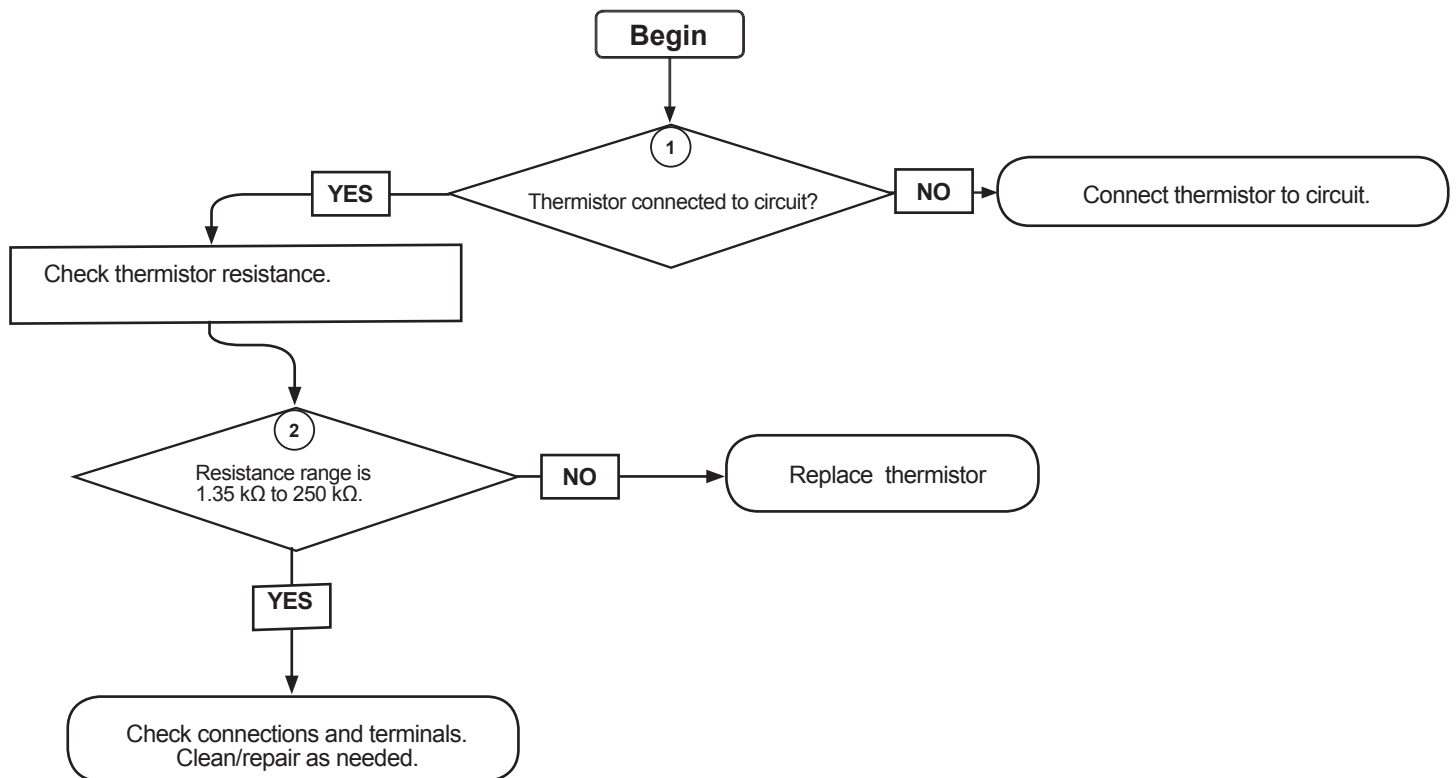
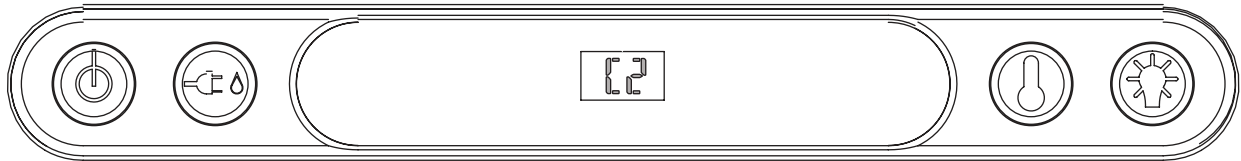
Ensure white wire from P1-10 to gas valve is not pinched behind gas valve bracket etc., which could lead to the gas valve output voltage being shorted to ground.



## C1—Fresh Food Air Thermistor Out of Range

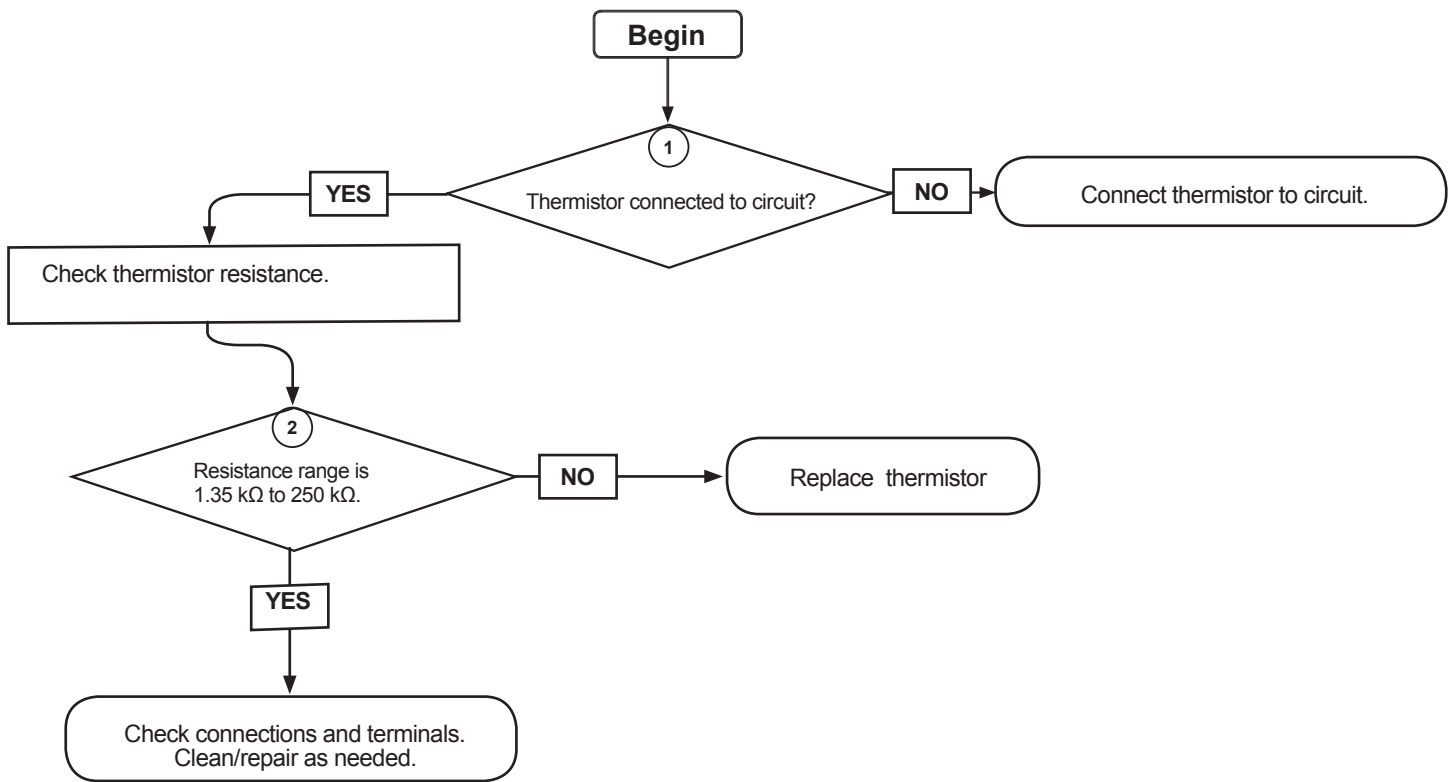
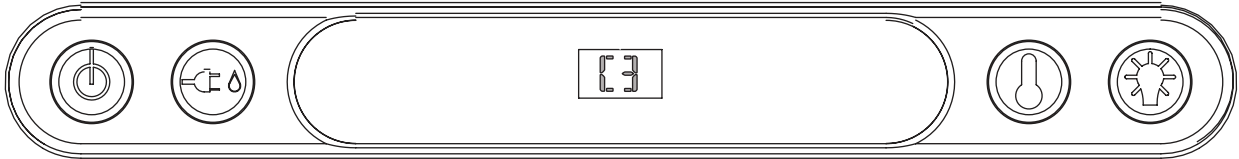


## C2—Freezer Fin Thermistor Out of Range

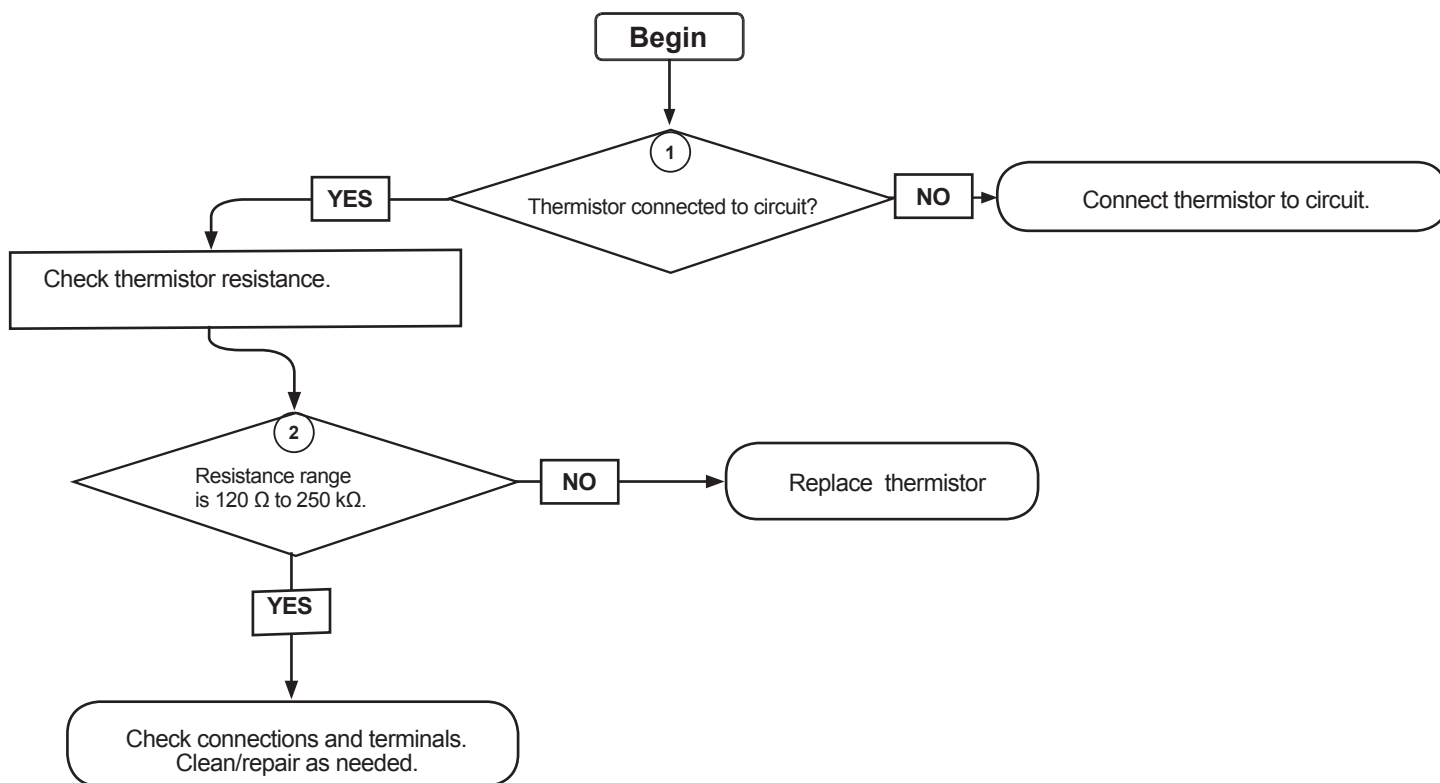
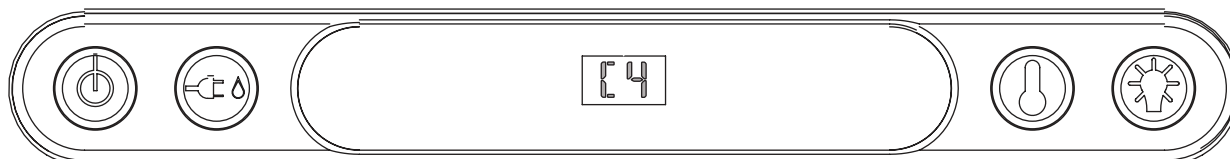




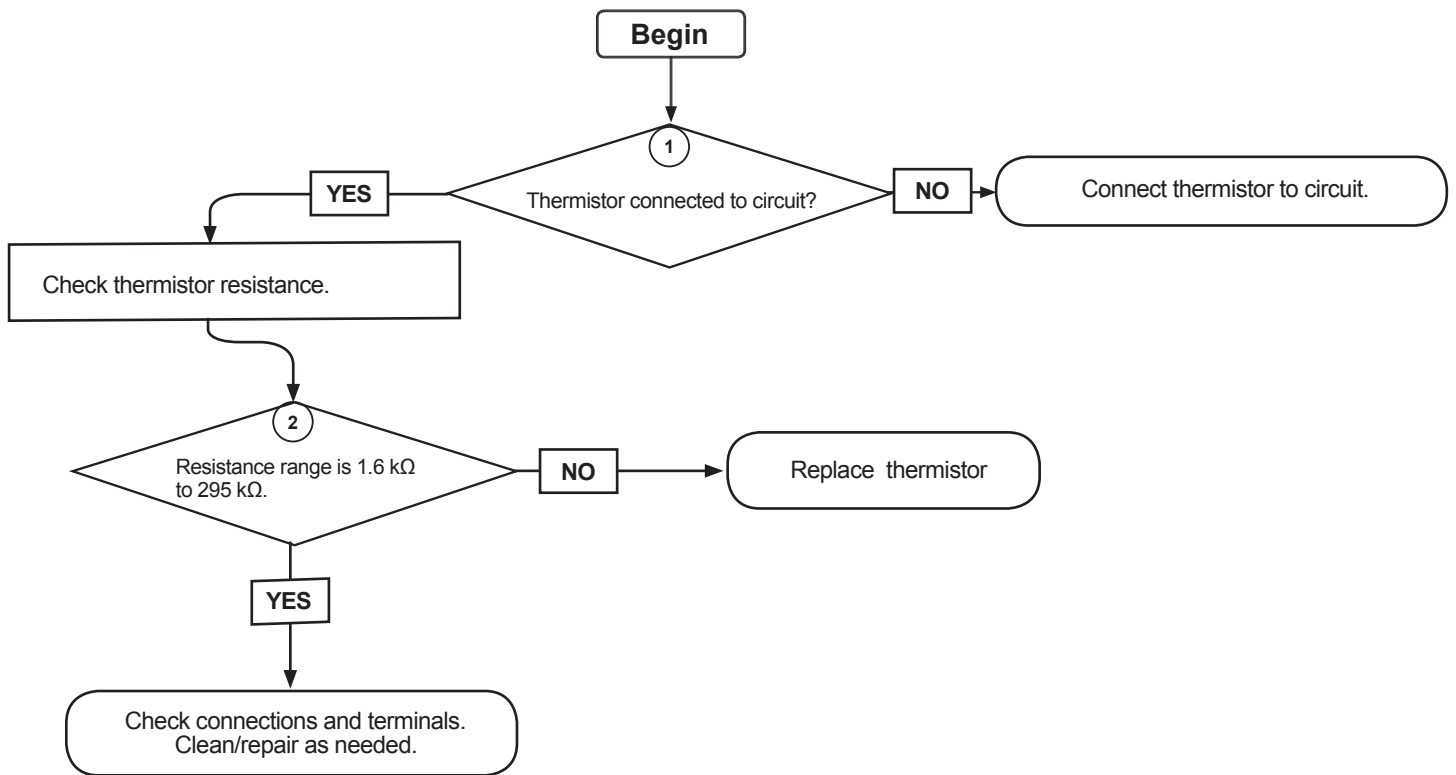
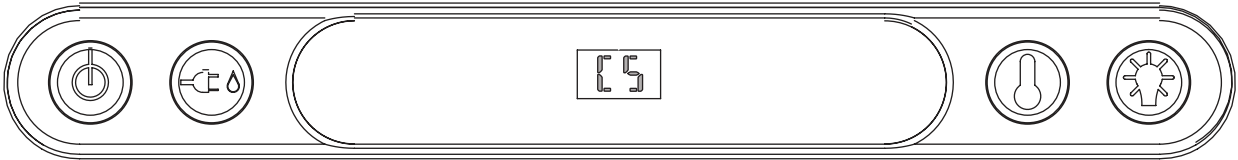
### C3—Freezer Air Thermistor Out of Range



## C4—Cooling Unit FansThermistor Out of Range



## C5—Fresh Food Fin Thermistor Out of Range



## **SECTION 4 —LP GAS SYSTEM**



**When working on or near the LP gas system:**

- **Do not smoke or light fires! Extinguish all open flames!**
- **Do not use matches, lighters or an open flame to test for LP gas leaks. LP gas is highly flammable and explosive.**
- **Do not connect the refrigerator directly to the LP gas container. Always use an approved LP gas regulator to supply propane gas to the refrigerator.**
- **Do not modify any of the refrigerator LP gas system components, piping, or fittings.**
- **Do not cross thread fittings. Be careful when connecting or disconnecting components, piping or fittings.**
- **Always use two wrenches to loosen or tighten fittings to prevent damaging components, piping, or fittings. Damaged components, piping, or fittings create the potential for gas leaks.**
- **Leak test all fittings that have been taken apart or disturbed during servicing, repairing or replacing components.**

### **Pressure Requirements**

The LP gas system is for propane gas at a nominal pressure of 11 inches water column (" w.c.). Propane gas pressures between 10.5 and 11.5" w.c. provide necessary amount of gas for efficient combustion and heat generation.

#### **Gas pressure below 10.5" w.c.**

Gas pressure below 10.5" w.c. results in a weak flame with low heat input to the cooling system boiler. Low heat input directly affect cooling performance

Additionally, the weak flame may not be sensed by the controls flame sensing circuit, which will cause the controls to shut off the gas valve, lockout gas operation and display the no flame fault code (no FL).

#### **Gas pressure above 11.5" w.c.**

Propane gas pressure above 11.5" w.c. tends to lift the flame from the burner or blow out the flame, which will cause the controls to shut off the gas valve, lockout gas operation and display the no flame fault code (no FL).

High LP gas pressure can cause incomplete propane gas combustion, which may be indicated by a "popping" sound at the burner.

#### **Checking propane gas pressure**

Use a "U" shaped manometer or comparable tool to check propane gas pressure.

When checking propane gas pressure, at least 50 percent of the RV btu load need to be on. This ensures that the LP gas regulator is capable of delivering and maintaining gas pressure throughout the system, including the refrigerator.

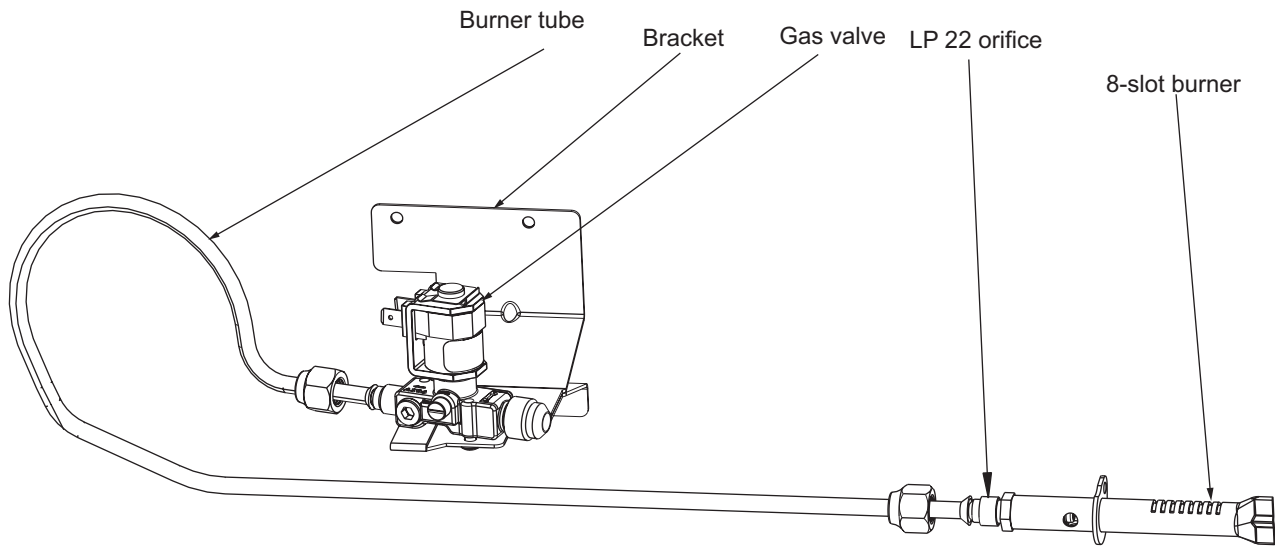


Figure 4-1. —2117 LP gas system components.

### Gas Valve

The gas valve is illustrated in Figure 4-2.

### Specifications

Solenoid coil amp draw...	0.146 A @ 12 VDC
Resistance .....	81 OHMS
Maximum pressure .....	1/2 PSI

### Operation

In AUTO LP gas mode or LP gas mode operation the controls energize the solenoid coil to open the gas valve. Spring pressure closes the valve when the controls stop the flow of current to the solenoid coil.

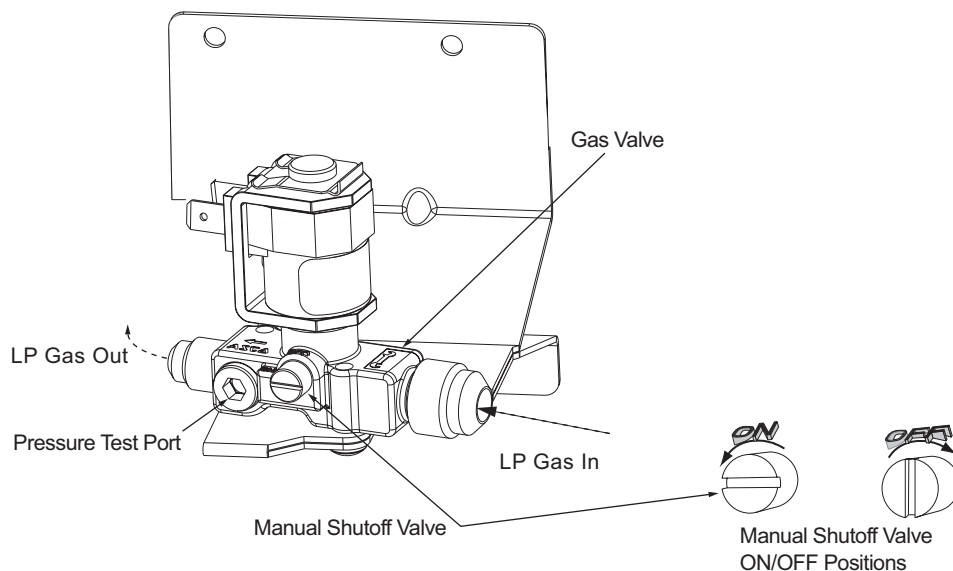


Figure 4-2. —Gas valve.

## Serviceability

The gas valve has no replaceable parts.

The valve and its 12 volt DC solenoid coil terminals should be maintained dry and clean.

## Gas Valve Replacement Procedure

Tools:

#2 Stubby Phillips Screwdriver

9/16" Open end wrench

5/8" Open end wrench.

Leak test solution

To replace the gas valve:

1. Turn off the refrigerator.
2. Disconnect DC power at the power board.
3. Unplug AC cord at the RV outlet.
4. Shut off the gas valve(s) at the LP gas container(s).
5. Disconnect the 12 volt DC power supply wires at the gas valve solenoid coil.



**Always use two wrenches to loosen or tighten fittings to prevent damaging components, piping, or fittings. Damaged components, piping, or fittings create the potential for gas leaks.**

---



### NOTE

For steps 6 through 12 refer to Figure 4-3, page 36.

---

6. Disconnect the LP gas supply line.
7. Disconnect the burner tube.
8. Remove two, #8/32 X 3/8" Phillips screws that hold the existing gas valve to the bracket, then remove the valve. See Figure 4-3, page 36.
9. Install the new gas valve on the bracket and fasten it to the bracket using the two, #8/32 x 3/8" Phillips screws removed in step 8 .
10. Reverse steps 7 through 5 to connect the LP gas supply line and the burner tube to the new valve.



**Do not wet or spray leak test solution on or near electrical connections or electronic components. All water leak test solution conducts electricity and may create electric shock hazard, shorts, and/or damage circuits.**

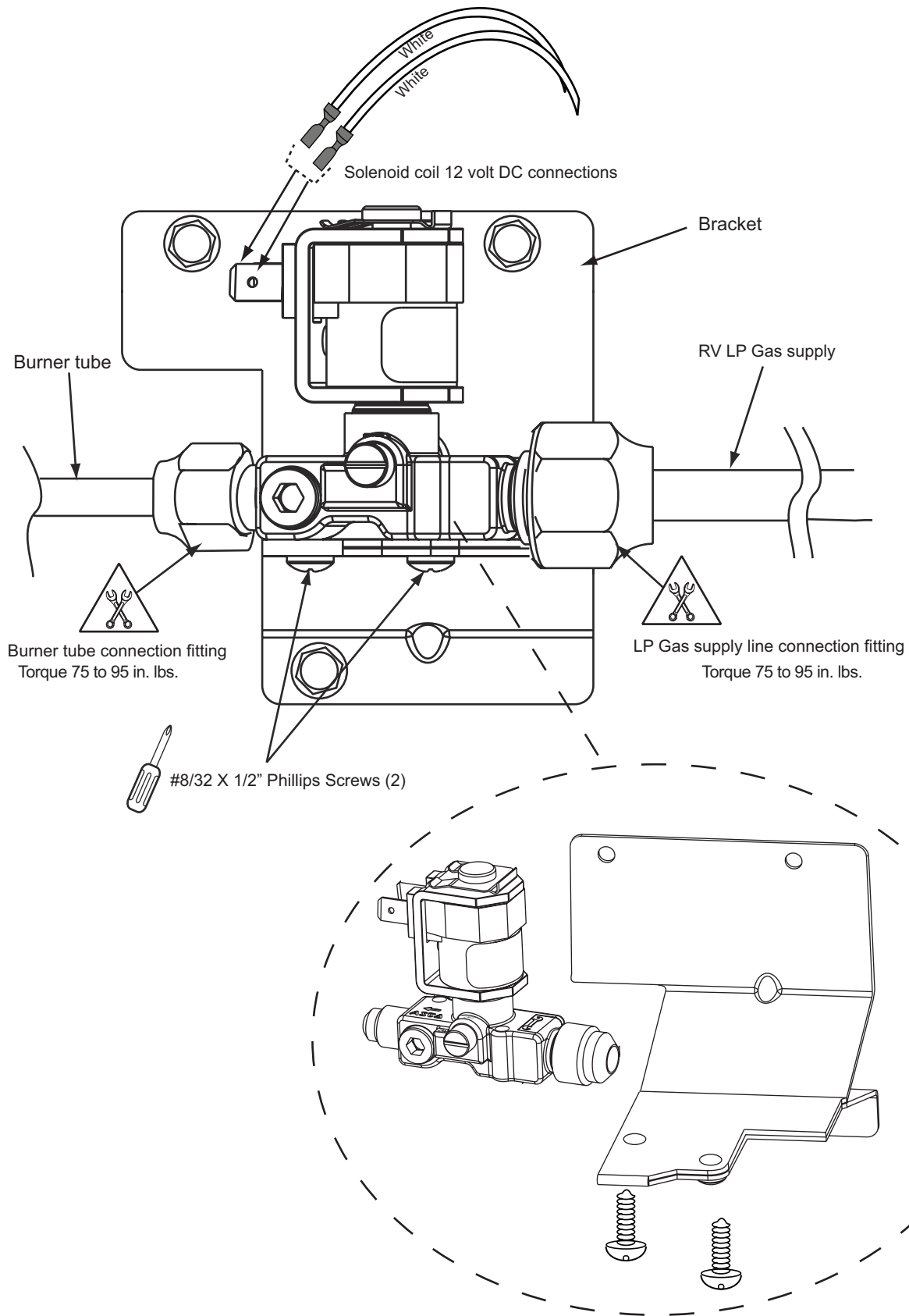
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**Do not use leak test solutions that contain ammonia or chlorine. Ammonia and chlorine corrode brass and copper components.**

---

11. Open the gas valve(s) at the LP gas container(s).
12. Leak test the LP gas supply line fitting.
13. Plug the AC cord into the RV outlet.
14. Connect 12 VDC power to the power board.
15. Turn on the refrigerator, then set the MODE to LP gas operation.
16. Leak test the gas valve burner tube connection fitting, the burner tube orifice connection at the orifice assembly.



**Figure 4-3. —Gas valve replacement.**

## Measuring Solenoid Coil Resistance

Tools:

Multimeter

To measure solenoid coil resistance.

1. Turn off the refrigerator.
2. Disconnect wires at the solenoid coil connections.
3. Set multimeter to the Ohm function.
4. Connect multimeter probes to the solenoid coil terminals as illustrated in Figure 4-4.

—Coil resistance should be within 78 and 86 ohms.

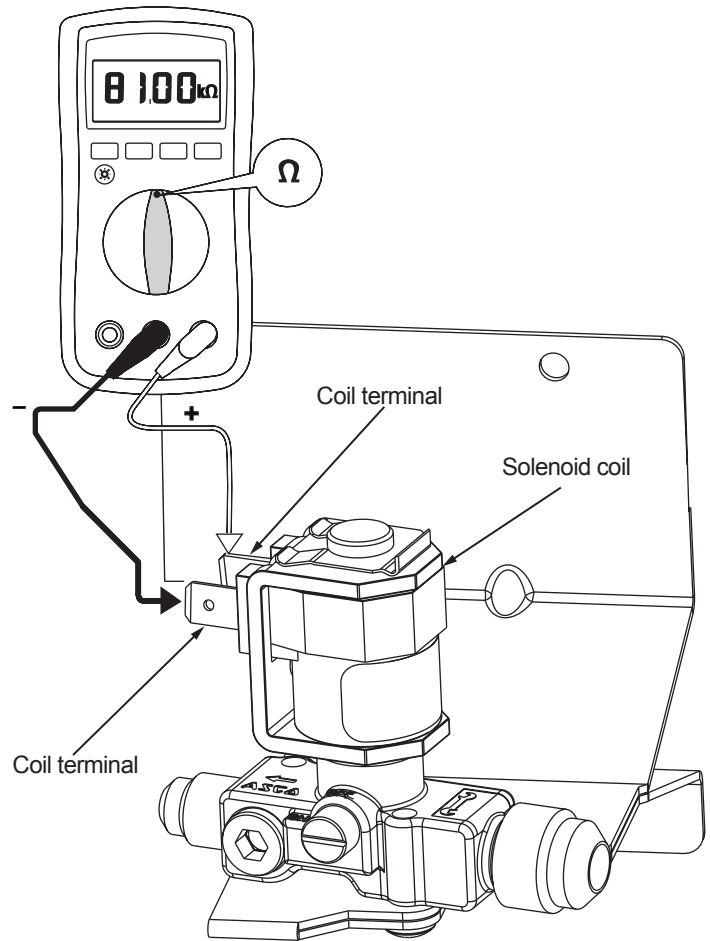


Figure 4-4. —Checking solenoid coil resistance.

## Burner Tube Assembly

The burner tube is 1/4 inch OD aluminum tubing. The anti-vibration loop absorbs vibration to prevent metal fatigue. Each end of the tube ends in a double flare. The burner tube is illustrated in Figure 4-5.

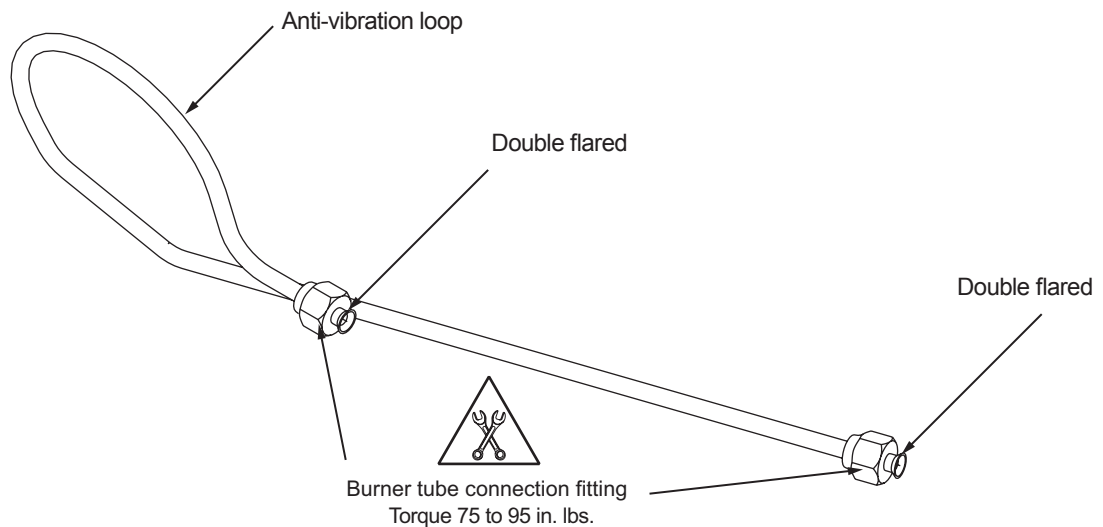


Figure 4-5. —Burner tube assembly.



## Burner and Orifice Assembly

The 8-slot burner, illustrated in Figure 4-6 is fitted an LP 22 cap style orifice. The burner is retained in the burner box by a #8/32 x 1" Phillips pan head screw.

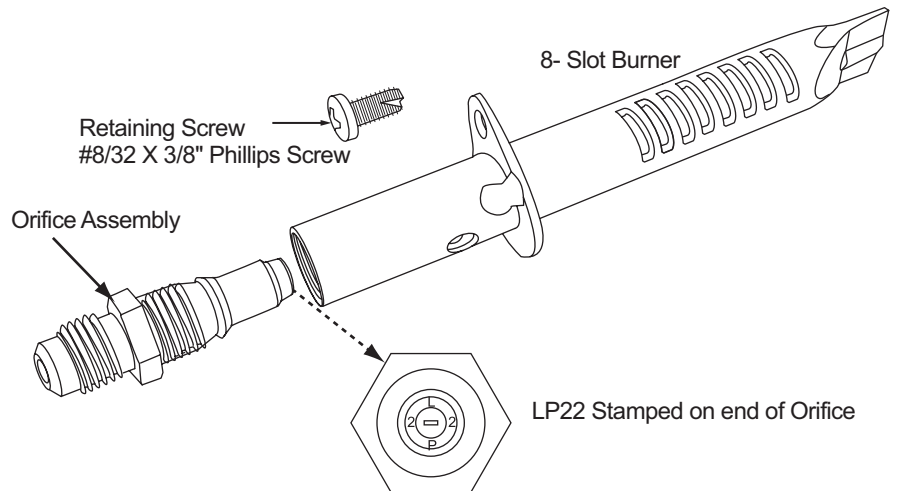


Figure 4-6. —Burner and orifice assembly.

## Burner and Orifice Cleaning Procedure



**WARNING**

**Burn hazard! Allow the burner box and orifice and burner assembly to cool before attempting removal and disassembly.**

Tools:

#2 Medium Phillips tip screw driver

1/4" Nutdriver

1/2" Open end wrench

5/8" Open end wrench.

Small wire brush

Scouring pad

Denatured alcohol

Leak test solution

1. Power off the refrigerator.
2. Shut off the gas valve(s) at the LP gas container(s).
3. Turn the manual shutoff valve to the OFF position
4. Move the drain hose out of the way.
5. Remove the drip cup screw, then remove the drip cup.



**WARNING**

**Always use two wrenches to disconnect the burner tube from the orifice adapter to prevent damaging the tube or orifice adapter fitting. A damaged burner tube, or orifice adapter fitting creates a potential for gas leaks.**

6. Remove the burner box cover screw , then remove the burner box cover.
7. Disconnect the burner tube at the orifice adapter.
8. Remove the orifice assembly from the burner.
9. Remove the burner retaining screw, then pull the burner out of the burner box.



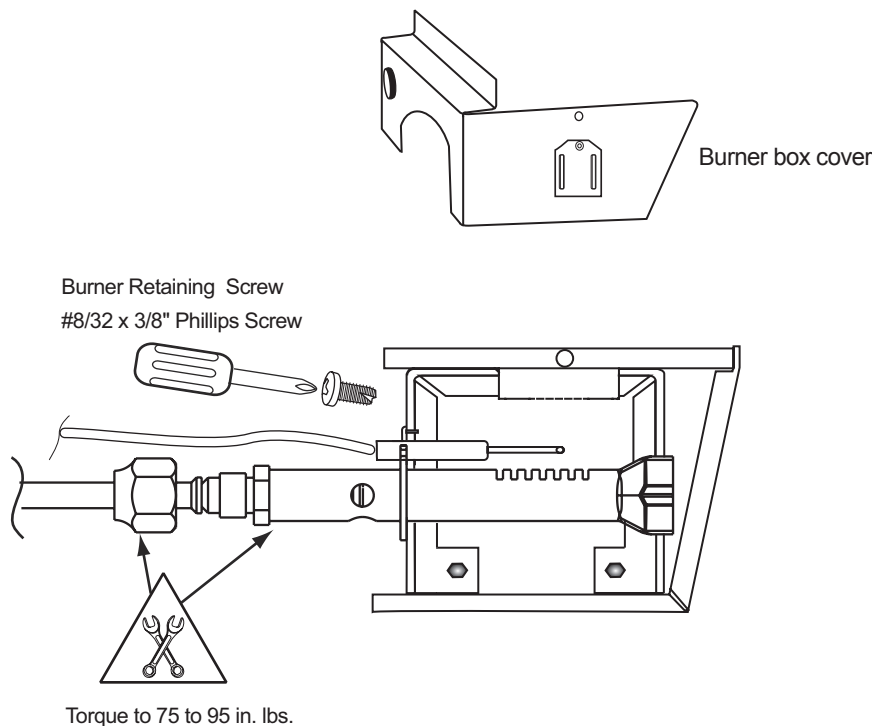
**WARNING**

**Do not insert any type of cleaning tool, wire, or drill bit through the orifice. Inserting of any type of cleaning tool, wire, or drilling damages the orifice and creates fire hazard.**

10. Check the orifice. Replace if the condition of the orifice assembly is questionable. To clean the orifice assembly, dip the assembly in denature alcohol and air dry.
11. Clean the burner. The slots may be cleaned with a scouring pad or wire brush.
12. Insert the burner into the burner box, then install the #8/32 x 3/8" Phillips retaining screw. See Figure 4-7.
13. Install the orifice assembly onto the burner. Thread the orifice assembly into the burner by hand, then finish tightening using two wrenches.
14. Connect the burner tube to the orifice adapter fitting. Thread the fitting by hand, then torque fitting within 75 and 95 in. lbs.
15. Install the burner box cover and fasten in place the retaining screw.
16. Open the valve(s) at the LP gas container(s).
17. Open the manual shut-off at the gas valve.
18. Turn on the refrigerator, then select the LP gas mode.
19. Leak test LP gas connections.

 **WARNING**

**Always use two wrenches to install the orifice assembly into the burner to prevent damaging the orifice adapter assembly or burner threads. A damaged orifice adapter for burner creates a potential for gas leaks.**



**Figure 4-7. —Installing burner in burner box**

# SECTION 5 – ELECTRICAL POWER REQUIREMENTS AND COMPONENTS

## DC Power Requirement

Refrigerator controls require 12 volt DC to operate. Minimum control voltage input is 10.5 volts; maximum is 15.4 volts.

## Polarity

The correct polarity of connections to the power board connections is:

- + 12 volt DC (positive) has to be connected to power board terminal **12VDC**. See Figure 5-1.
- 12 volt DC (negative) has to be connected to power board terminal **GND**. See Figure 5-1.

## Power Board DC Fuse

The power board is protected by a 5 amp, standard automotive blade style fuse. Fuse location is shown in Figure 5-2.

- Remove the light cover.
- Remove the existing light bulb.
- Install the new light bulb (P/N 61689122). Make sure the light bulb is fully seated and captured in the light fixture clips.
- Reinstall the light cover.
- Turn on the refrigerator.

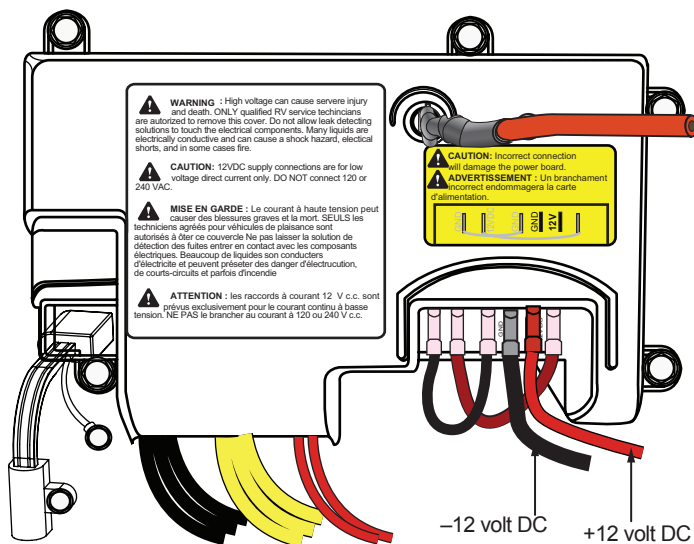


Figure 5-1. — DC power connections polarity.

## Fresh Food Compartment Light

Door operated switches turn the fresh food compartment light ON and OFF. Figure 5-3, illustrates the location of the switch operated by the right door.

## Light bulb replacement

To replace the light bulb see Figure 5-4, page 41 and:

- Turn off the refrigerator.

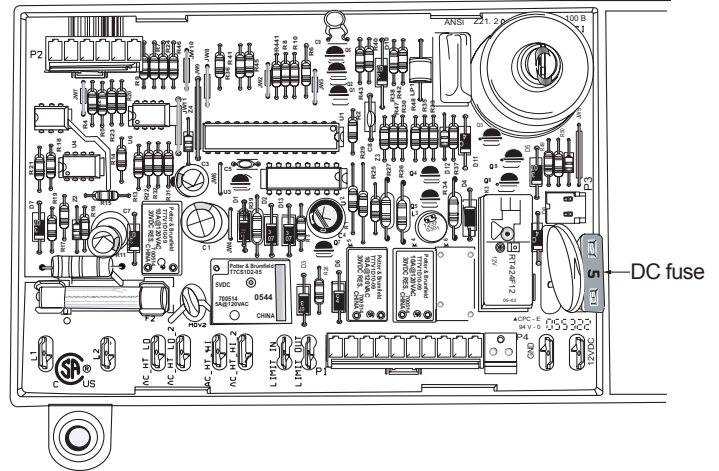


Figure 5-2. —DC power fuse location.

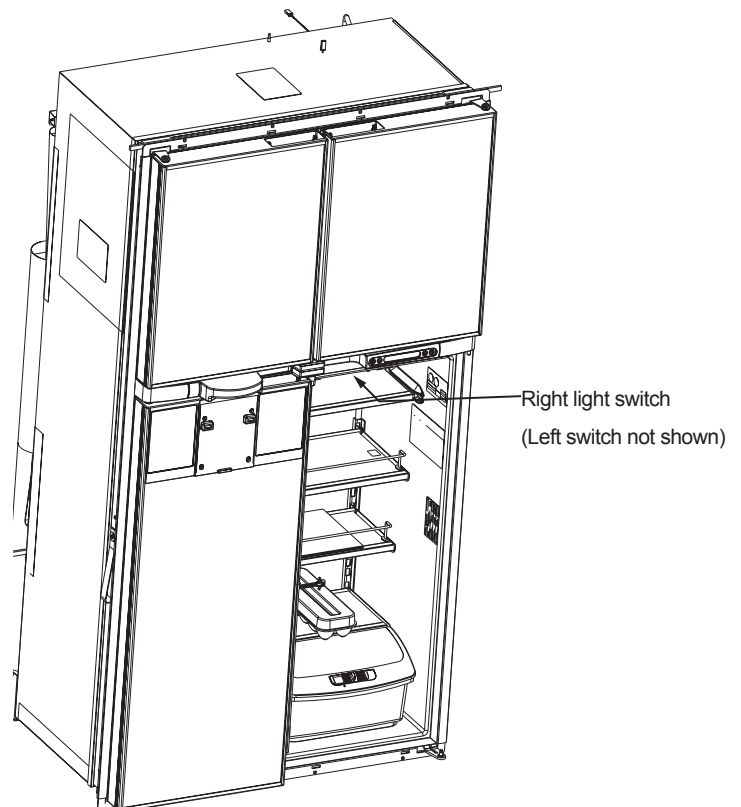
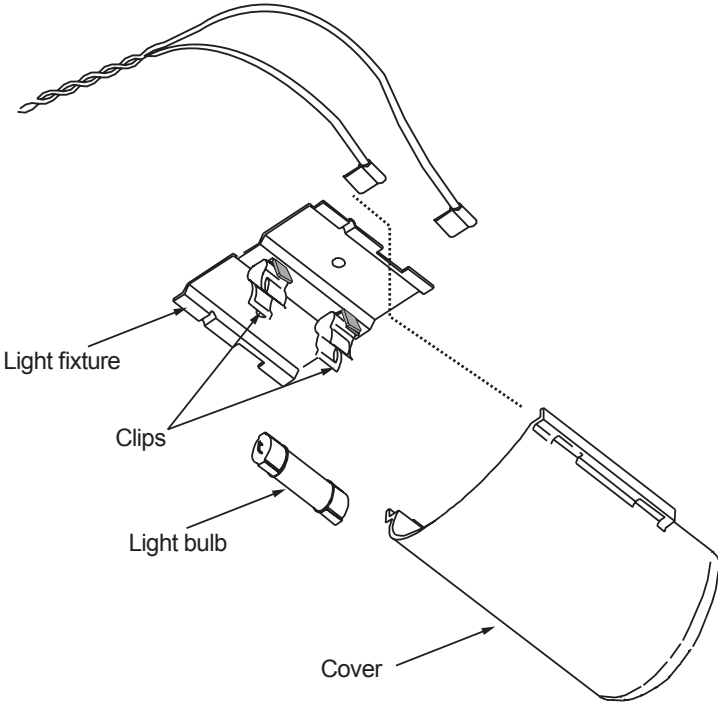


Figure 5-3. —Light switch location

➤ **IMPORTANT** ◀

In roof vented installations it may be necessary to remove the refrigerator from the enclosure to measure thermistor resistance or to check the fan operation.

In sidewall installations the thermistor resistance and fan operation can be checked after removing the upper sidewall vent.



**Figure 5-4.** —Light fixture assembly.

**Divider Heater**

The divider heater is permanently “foamed” between the freezer and fresh food compartment divider. Turning on the refrigerator automatically turns on the divider heater.

Power output to the divider heater is turned off during defrost bypass.

**External Fans**

Two 12 volt DC fans, shown in Figure 5-5, installed on the cooling system foam plug boost ventilation.

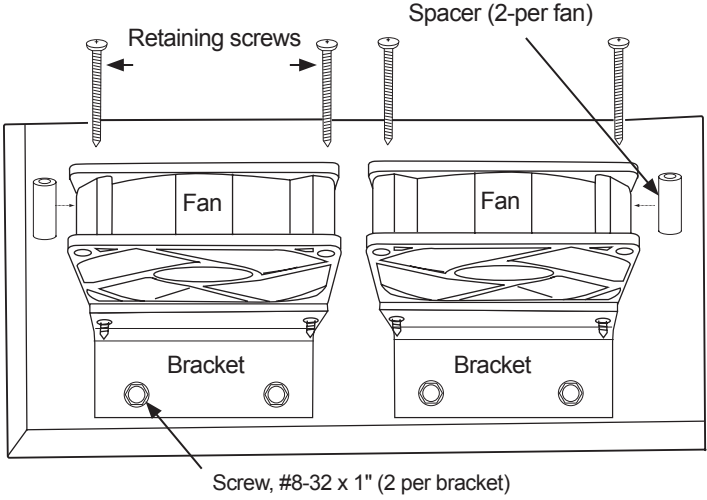
Each fan draws 0.900 amps @ 12 volt DC. Fan resistance through the fan motor circuit is approximately 1.5 Ω (each fan).

External fan output is turned on when there is a call for cooling by the external fan thermistor.

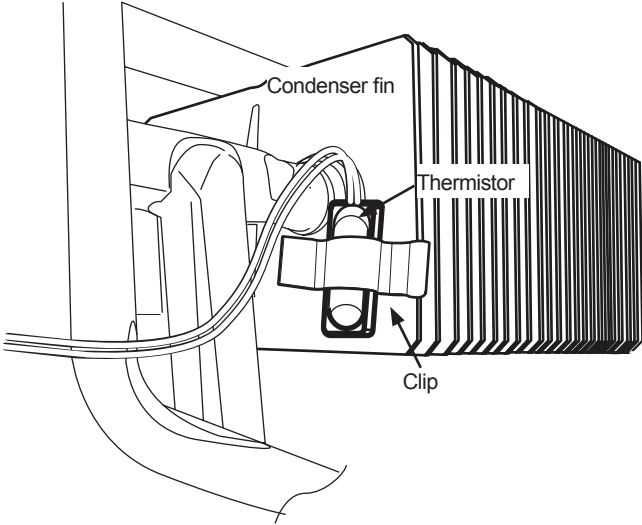
**Fan Thermistor**

Figure 5-6 illustrates the location of the thermistor that controls fan operation. The fans run when the thermistor senses fin temperature to be 130 °F (54.4 °C) and above. When the fin temperature is 115 °F (46 °C) or below the fans are idle.

Thermistor failure, indicated by fault code C4 on the display, will cause both fans to run continuously.



**Figure 5-5.** —Fans and hardware.



**Figure 5-6.** —Fan thermistor location.

## Checking Thermistor Resistance

To check thermistor resistance:

1. Disconnect the thermistor from the harness.
  2. Set the multi meter to ohm meter function.
  3. Connect probes to thermistor terminals.
- Out of range thermistor measures less than 120  $\Omega$  or more than 250 k $\Omega$ .
  - Open thermistor reads O.L. (open).

## Fan replacement

### ➤ IMPORTANT ◀

Fan replacement requires removal of the refrigerator from the enclosure.

The RV manufacturer may have installed additional brackets and screws. Always, double check for additional screws and brackets before attempting to remove the refrigerator from the enclosure.

Tools:

1/4" nut driver

#2 Phillips-tip screwdriver

To remove the existing fan:

1. Disconnect the existing fan positive (+) wire connector and negative (-) wires. See Figure 5-7.
2. Remove the existing fan and bracket from sump. Save the screws, and spacers to reinstall the new fan.
3. Reverse steps 3 to 1 and refer to Figure 5-7 to install replacement fan.

## Flapper Assembly

The flapper assembly, shown in Figure 5-8, is hinged to the left fresh food compartment door. It acts as the vertical sealing surface for the fresh food compartment doors inboard gasket.

The flapper is equipped with a 12 volt DC moisture reduction heater. The heater is supplied DC power through wires foamed into the door liner.

The heater turns on when the spring pins, on the hinge side of the door, make contact with

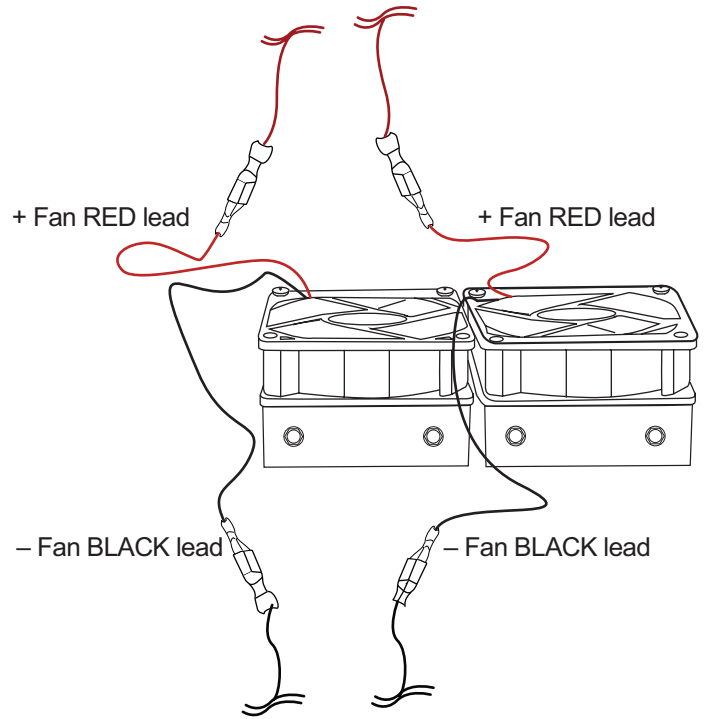


Figure 5-7. Fans, wiring and connections.

the permanent contacts located on the side of the fresh food cabinet. See Figure 5-8.

For the heater to turn on, both fresh food compartment doors have to be fully closed. Powering on the refrigerator automatically energizes the flapper heater circuit.

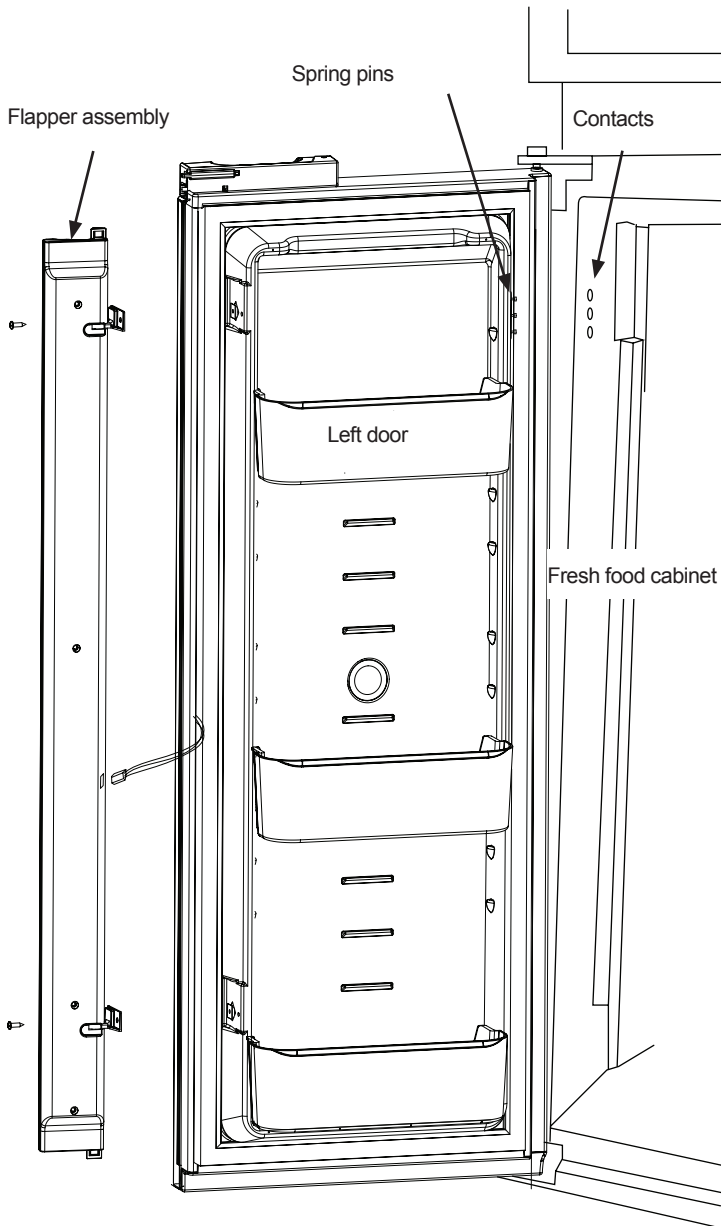
Heater operation can be detected by touching the exterior surface of the flapper assembly. The surface facing away from the fresh food compartment should be slightly warm to the touch.

If the surface feels cold to the touch or has moisture accumulation, troubleshoot the heater:

1. Check for bent, broken or missing spring pins.
2. Check door alignment. If needed align door so all spring pins make full contact with the center of the contacts on the cabinet.
3. Check heater resistance. Resistance measurement should read approximately 40 to 47  $\Omega$ .

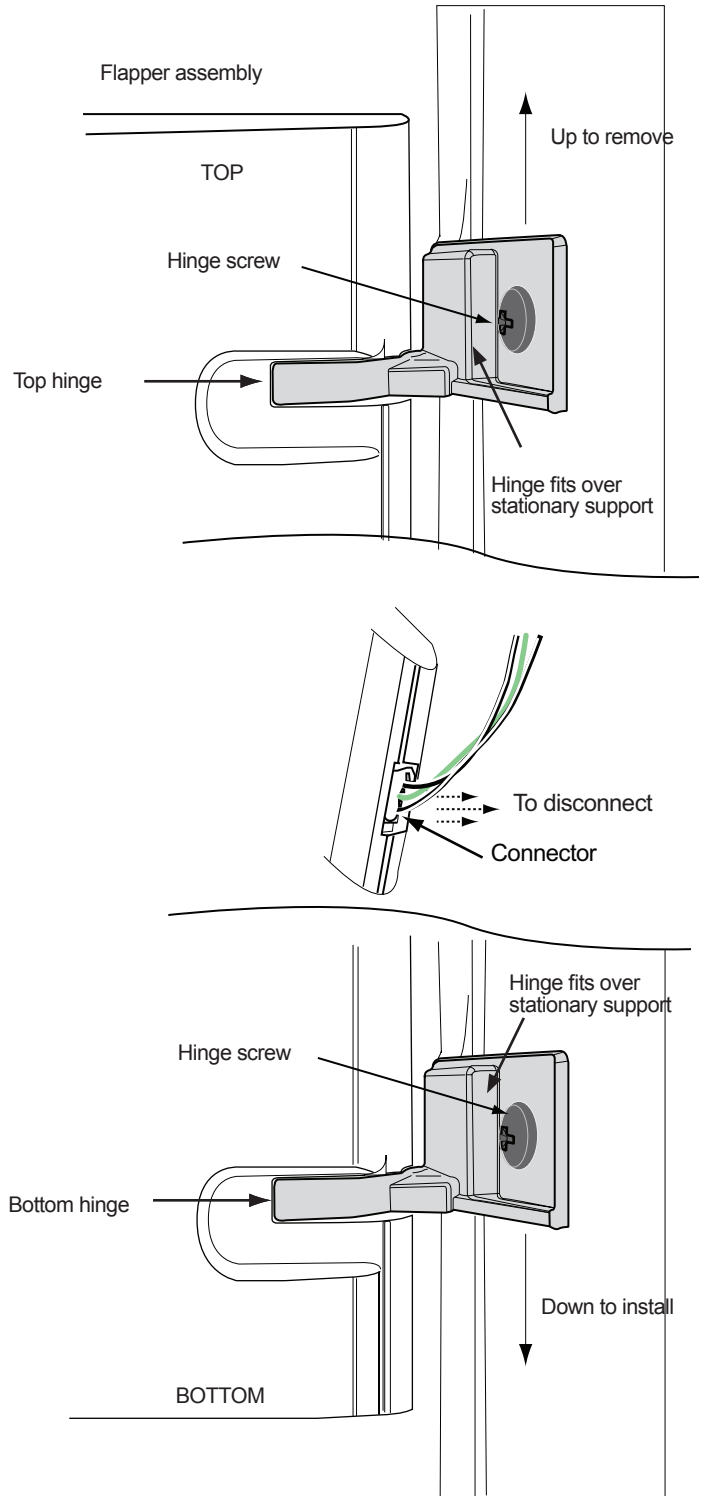
Replace the flapper assembly if the heater is open, or if the resistance is not within the values given in step 3.

A shorted heater will cause the F1 in the power board to blow, causing the refrigerator to lose DC power.



To install the replacement flapper assembly reverse steps 4 through 1 and refer to Figure 5-9.

After completing installation, close and open the door several times to make sure the flapper assembly retracts when out of the guide blocks and extends when fully seated in the guide blocks.



**Figure 5-9. — Flapper assembly hinges and wiring connector.**

**Figure 5-8. — Flapper assembly, left door, fresh food compartment.**

### Flapper replacement

Tools:

# 2 Phillips screwdriver

To remove the flapper assembly:

Refer to Figure 5-9 for location of components.

1. Power off refrigerator.
2. Open the left fresh food compartment door.
3. Remove the bottom and top flapper hinge screws.
4. Lift the flapper assembly until the hinges are clear of the stationary supports.
5. Disconnect the wiring connector at the at the flapper heater.



## CAUTION

Do not attempt to remove the spring pin flange from door! The flange is not a replaceable part. Attempting to remove the flange will disconnect the wires from the pins housing resulting in door replacement.

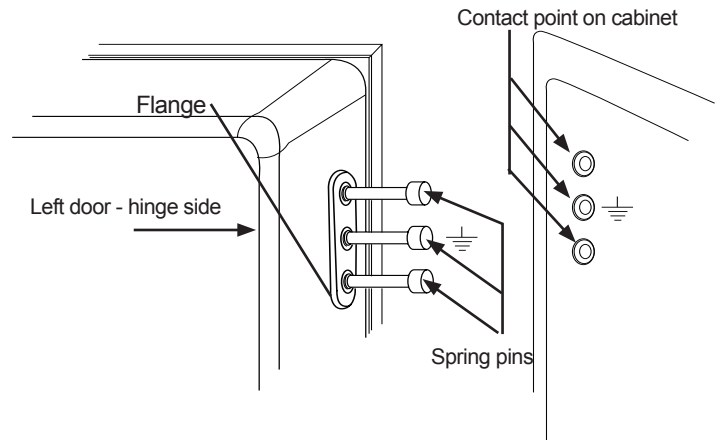


Figure 5-10. —Spring pins and cabinet contacts.

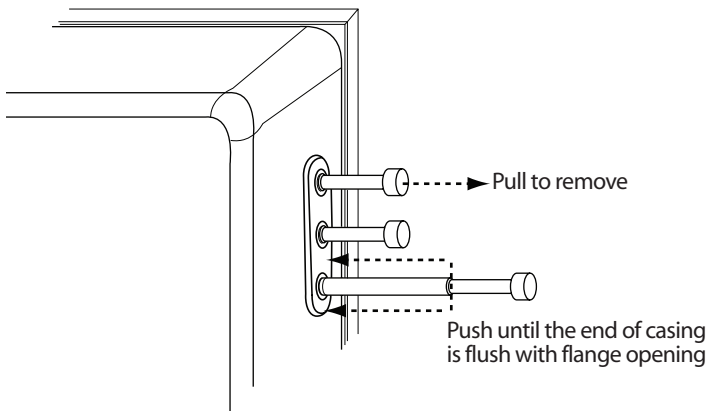


Figure 5-11. —Spring pin removal and installation.

### Spring pin replacement

A jammed, bent or broken spring pin must be replaced to keep the flapper heter operational.

To replace a spring pin refer to Figure 5-11 and proceed.

1. Open the left fresh food compartment door.
2. Pull out the existing spring pin from the flange.
3. Push and seat the replacement spring pin into the contact flange.
4. Check spring pin operation.
  - a. Push the pin all the way until seated then release.
  - b. Spring pressure should extend the pin fully when the contact is released.

### Spring pins and contact point

Figure 5-10 illustrates the spring pins along with the respective cabinet contact points.

### AC Power Requirements

AUTO AC or AC mode operation requires 108 to 132 volts AC. Voltage is to be supplied through a 2 pole/3 wire/20 amp grounding type receptacle.

## WARNING

- Do not remove the grounding prong from the refrigerator AC power cord!
- Do not use a two prong adapter to connect the AC cord to an AC outlet!

### AC Power Cord

The AC power cord is shown in Figure 5-12. The cord is attached to the refrigerator back plate with a #8-32 x 1" hex head screw. The cord ground wire lug is independently attached to the back plate with a #8-32 x 1" hex head screw.

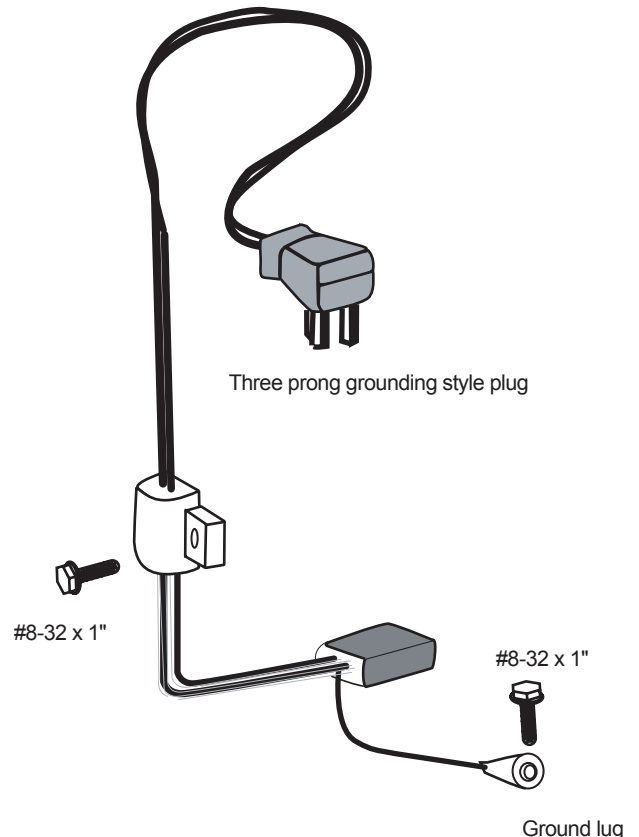


Figure 5-12. — AC Power cord.

## AC Fuse

The AC fuse, shown on Figure 5-13, is an 8 amp fast acting 1/4 x 1-1/4" AGC fuse.

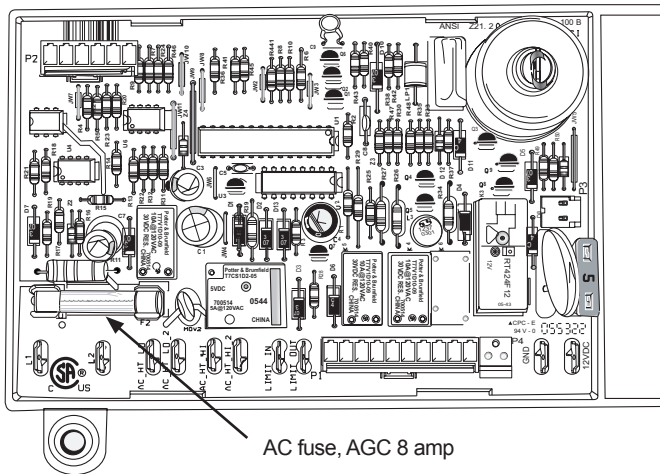


Figure 5-13. —AC fuse location.

## 120-Volt AC Heaters

Three 120-volt AC heaters generate the heat load required for AUTO AC and AC manual mode operation. Each heater is rated for 187 watts @ 120-volt AC. Figure 5-15 illustrates the AC heaters fully seated in the heater tubes.

Each heater resistance value of 73 to 81  $\Omega$  at ambient temperature.

To replace heater(s) the refrigerator has to be removed from the enclosure.

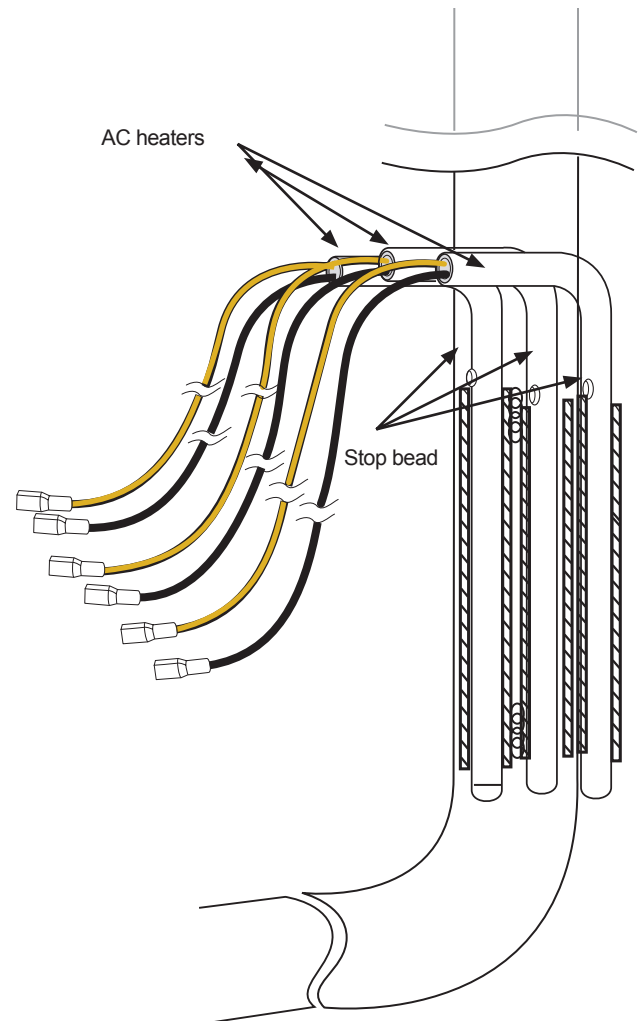


Figure 5-15. —AC heaters installed in heater tubes.



**Burn hazard! Allow the canister and heaters to cool before attempting removal and replacement.**



# SECTION 6 —ELECTRONIC CONTROLS

## Power Board

A front view of the power board is illustrated in Figure 6-1. Inputs, outputs, monitoring information, fault codes, and diagnostics are communicated through a wire harness that links the power board to the optical control panel.

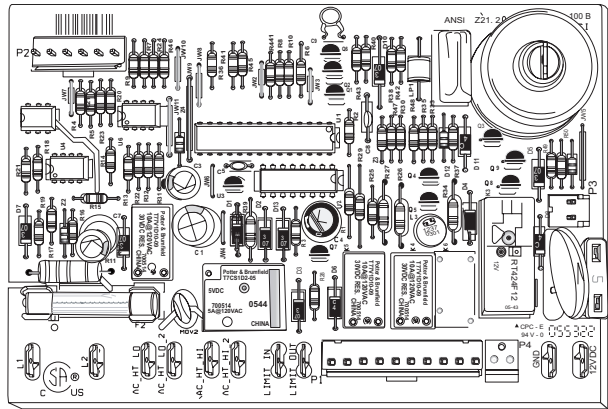


Figure 6-1. — Power board.

 **NOTE**

The wire harness is “foamed” into the cabinet. It is not a replaceable component.

## Base

The base, illustrated in Figure 6-2, is attached to the refrigerator back plate with three 8/32 x 1" hex screws. The power board is retained on the base by four locking tabs; the defrost board by two locking tabs.

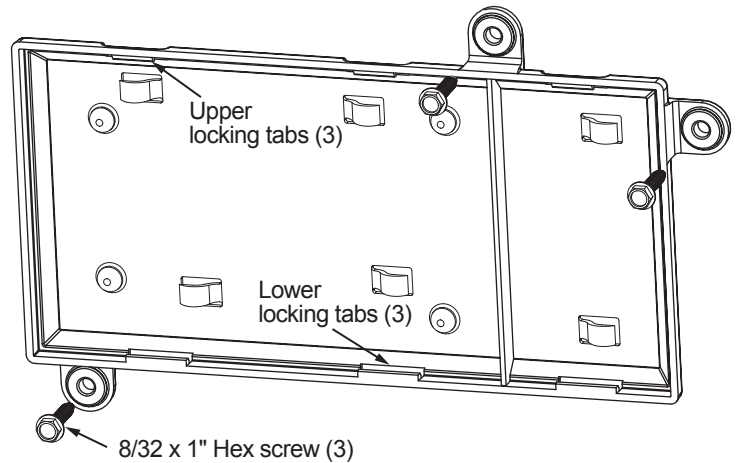


Figure 6-2. — Base, power board.

## Cover

The cover, illustrated in Figure 6-3, is attached to the refrigerator back plate with two 8/32 x 1" hex screws. Figure 6-4, page 52 illustrates the cover over the power board.

 **NOTE**

Ice maker/water dispenser models

It may be necessary to move the water valve out of the way to remove and install the cover.

## Troubleshooting

Refer to Section 3 for troubleshooting information.

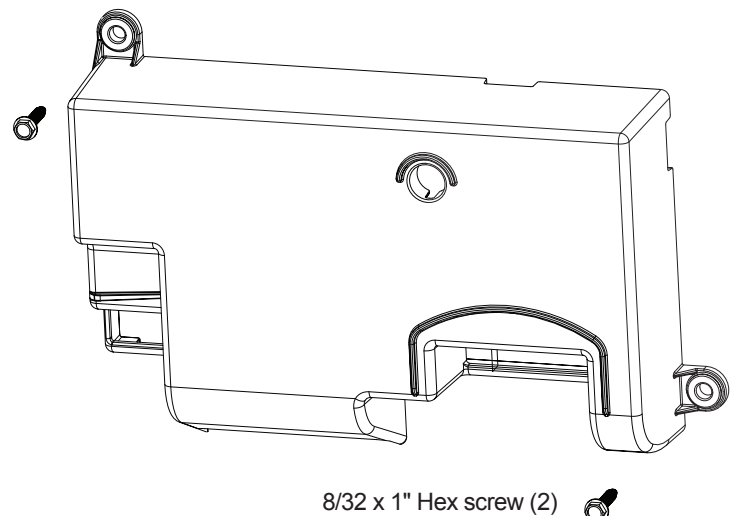
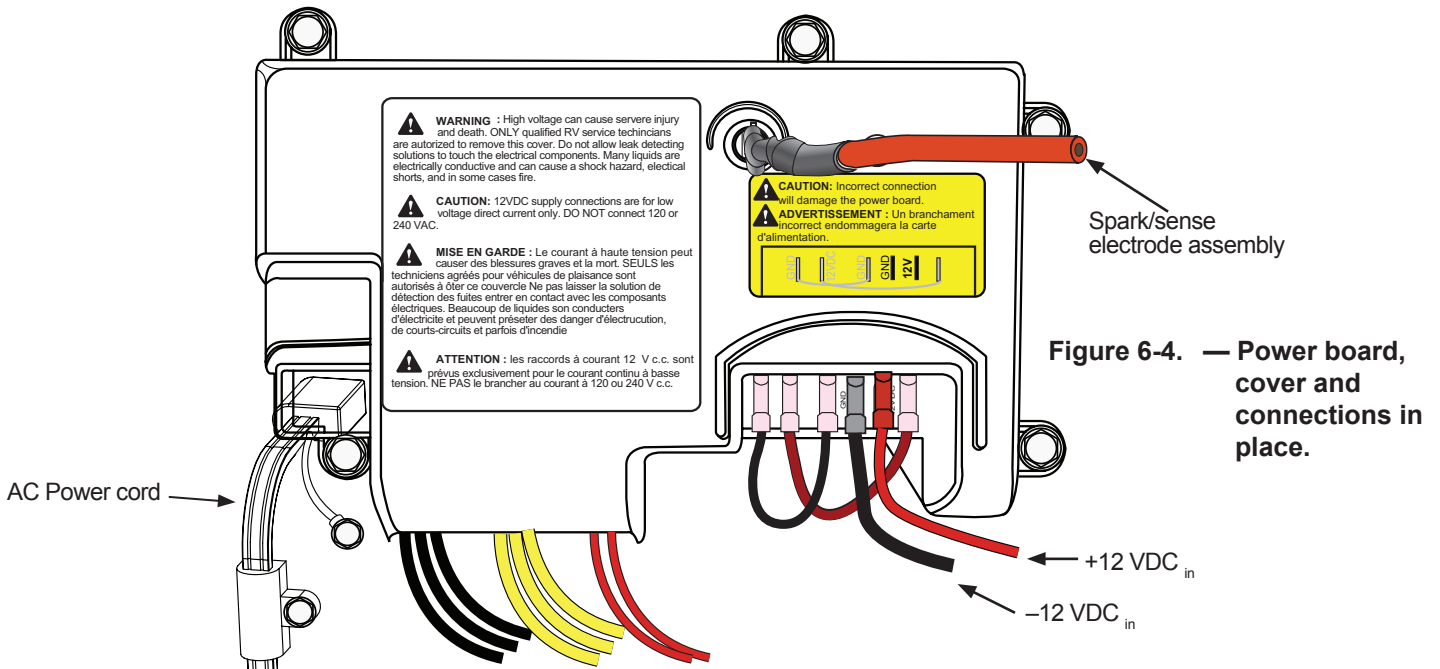
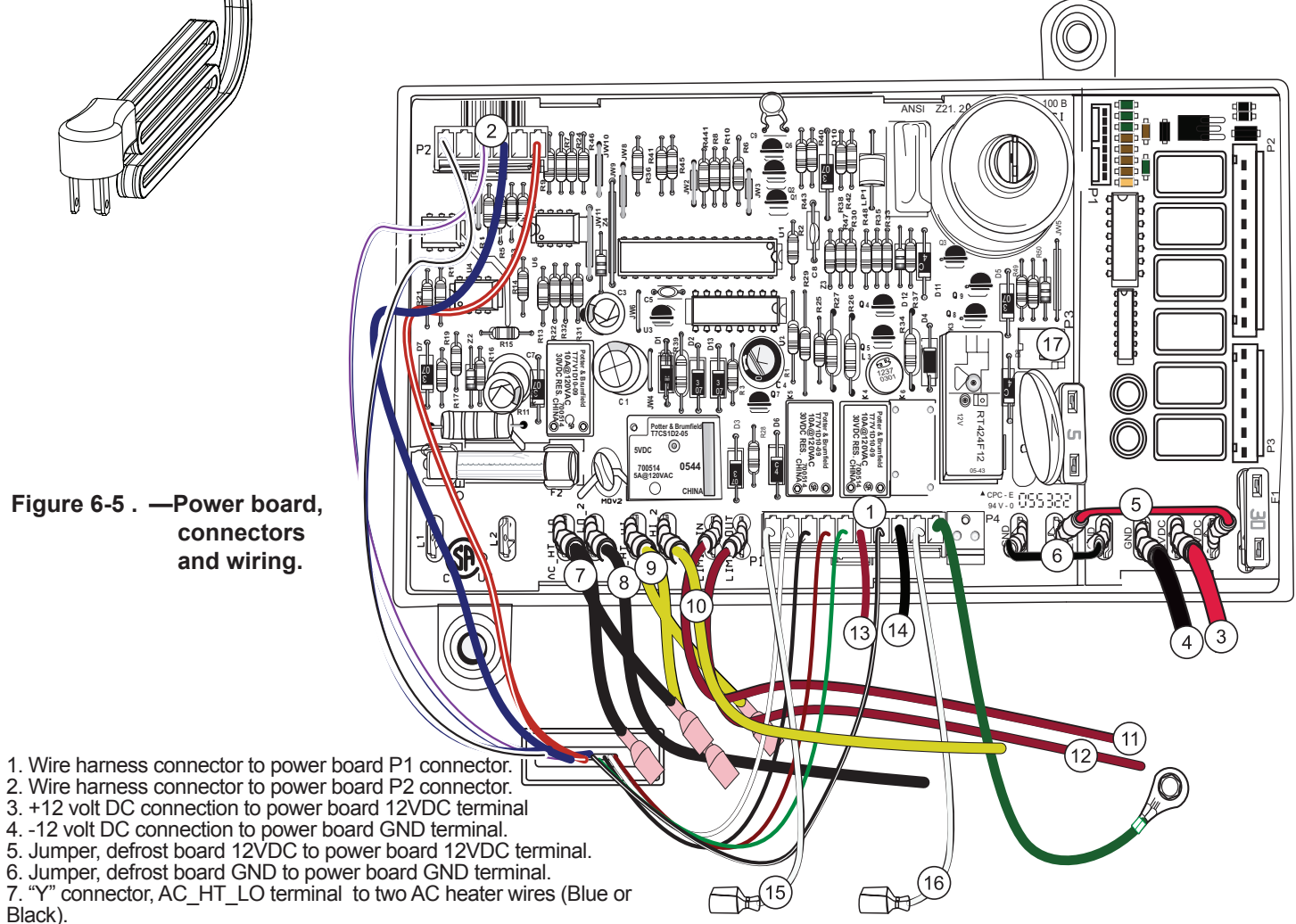


Figure 6-3. — Cover, power board.



**Figure 6-4. — Power board, cover and connections in place.**



**Figure 6-5 . —Power board, connectors and wiring.**

1. Wire harness connector to power board P1 connector.
2. Wire harness connector to power board P2 connector.
3. +12 volt DC connection to power board 12VDC terminal
4. -12 volt DC connection to power board GND terminal.
5. Jumper, defrost board 12VDC to power board 12VDC terminal.
6. Jumper, defrost board GND to power board GND terminal.
7. "Y" connector, AC\_HT\_LO terminal to two AC heater wires (Blue or Black).
8. AC heater wire, AC\_HT\_LO\_2 to single heater wire (Blue or Black).
9. "Y" connector, AC\_HT\_HI terminal to two AC heater wires (Yellow).
10. AC heater wire, AC\_HT\_HI\_2 to single heater wire (Yellow).
11. Temperature LIMIT IN from high temperature limit switch.
12. Temperature LIMIT OUT to power board.
13. +12 volt DC to water line heater and water dispenser circuit.
14. -12 volt DC to water line heater and water dispenser circuit.
15. +12 volt DC output to gas valve solenoid coil (LP gas mode only).
16. -12 volt DC output to gas valve solenoid (LP gas mode only).
17. Connector defrost board communications with power board.

## Power board replacement

Tools:

1/4" nut driver

Anti-static wrist strap

1. Power OFF the refrigerator.
2. Power OFF the RV DC power to the refrigerator.

For steps 3 through 5 see Figure 6-6.

3. Unplug the AC power cord (1) at the RV AC receptacle and at the power board (2).
4. Disconnect DC power supply wires at power board terminals GND (3) and 12VDC (4).
5. Disconnect the spark/sense electrode wire (5).
6. Remove the power board cover 8/32 x 1" hex screws (6) (7).
7. Remove the cover (8).

For steps 8 through 12, See Figure 6-7.

8. Disconnect the AC heater wires at power board:
  - a. Blue or Black (8a) wire and Blue or Black "Y" (8a) jumper terminals AC\_HT\_LO and AC\_HT\_LO2
  - b. Yellow wire (8b) and Yellow "Y" (8b) jumper terminals AC\_HT\_HI and AC\_HT\_HI2.
9. Disconnect the high temperature limit switch wire leads terminals LIMIT IN and LIMIT OUT (9).
10. Disconnect the wire harness connector at terminal P1 (10).
11. Disconnect the wire harness connector at terminal P2 (11).
12. Disconnect the defrost board communication wiring at power board connector P3 (12).
13. Disconnect daughter board jumper wire assembly from power board (13).

14. Remove the existing power board from the base.
- To install the replacement power board, reverse steps 14 through 1 to complete replacement power board installation.

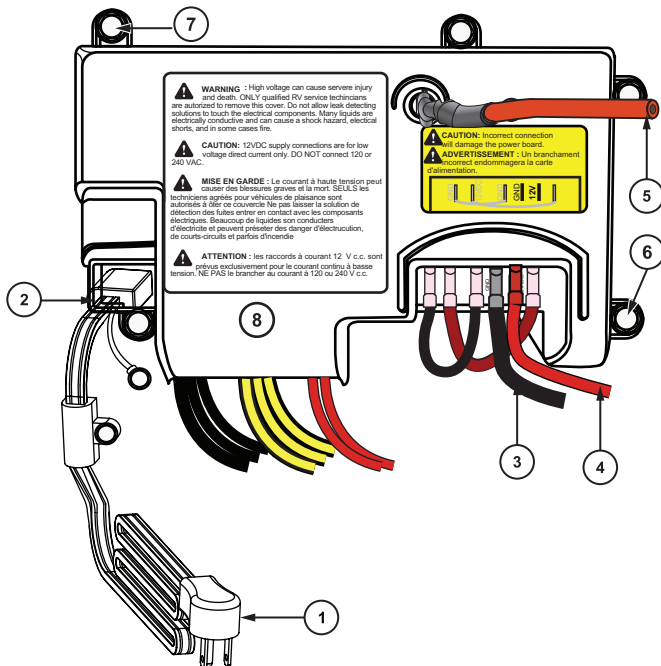


Figure 6-6. —Power board external connection.

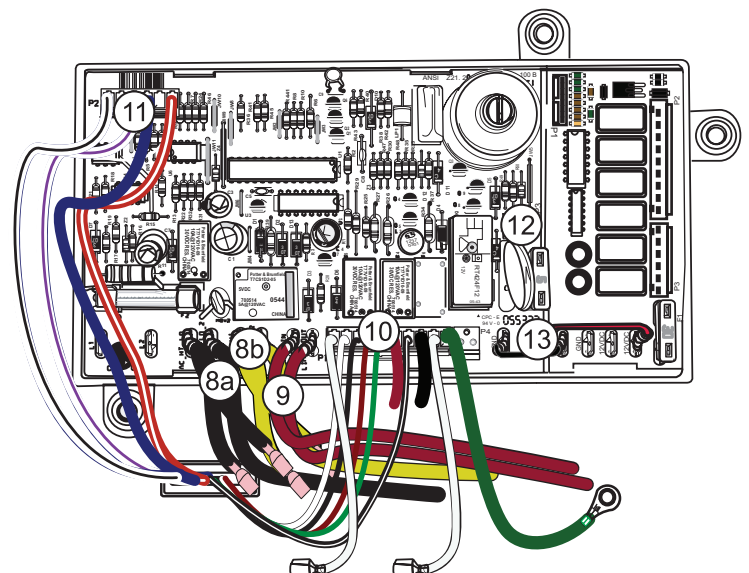


Figure 6-7. —Power board external connection.

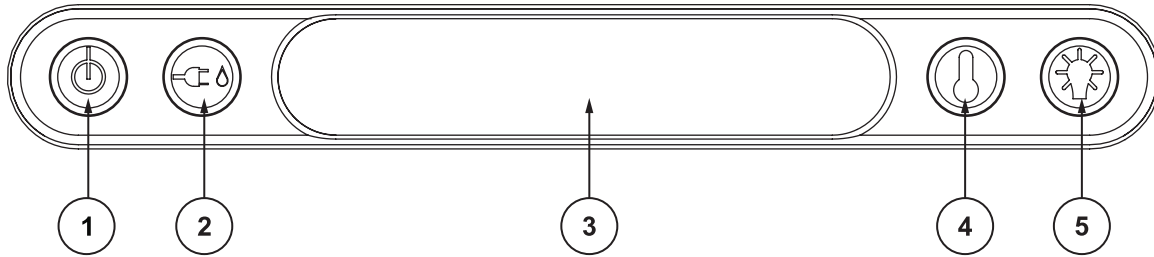


Figure 6-8. —Control panel.

## Control Panel

The control panel, illustrated in Figure 6-8, contains the ON/OFF switch button (1), MODE switch button (2), LCD module (3), TEMP SET switch button (4) and LCD brightness button (5).

The ON/OFF switch button turns the refrigerator on and off. Holding the ON/OFF switch button pressed in for approximately one second turns off the refrigerator.

Operation mode, AUTO, AC manual or LP gas, can be selected by pressing and holding the MODE switch button. Pressing the button momentarily displays the active operation mode for 10 seconds.

The LCD module displays actual information. See Figure 6-9 for details.

One of nine temperature settings, 1 (cold) through 9 (coldest), can be selected by pressing and holding the TEMP SET switch button. Pressing the button momentarily displays the setting for 10 seconds.

Control panel troubleshooting instructions may be found on Section 3 of this manual.

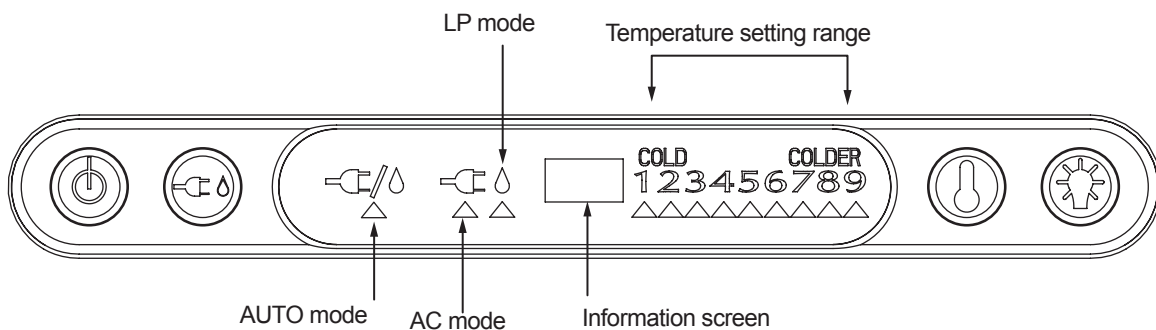


Figure 6-9. —LCD module icons and information screen.

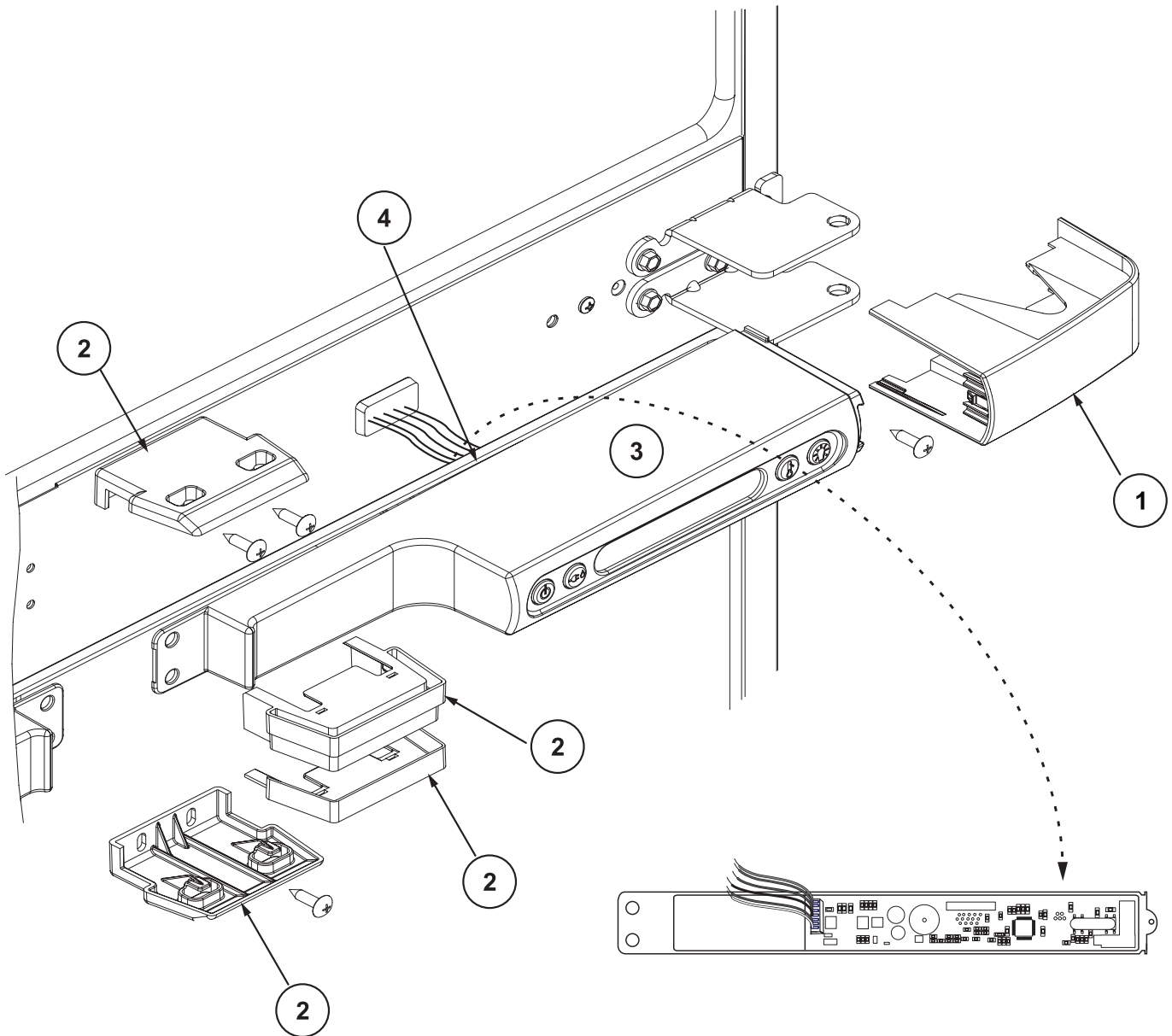


Figure 6-10. —Control panel and related components.

## Control Panel Replacement

Tools:

#2 Phillips Screwdriver

To replace the control panel see Figure 6-10, and:

1. Power OFF the refrigerator.
2. Remove the right side hinge cover (1).
3. Remove the striker mechanism (2).
4. Remove the control panel from the divider (3).
5. Disconnect the wire harness from (4) the control panel circuit board
6. Connect the wire harness to the replacement control panel (3).
7. Reverse steps 5 through 1 to complete installation of replacement control panel.



## Defrost and Temperature Control

### Defrost and Temperature Control

Freezer and food compartment defrost and temperature control is through the defrost and temperature control daughter board.

#### Description of Operation

The defrost and temperature control controls the operation of the cooling system fans, freezer fan, fresh food compartment fan, and automatic defrost cycle.

#### Freezer Fan

Freezer fan operation is controlled through temperature input provided by the thermistor attached to the freezer fin assembly and a thermistor sensing freezer air temperature.

The fan turns on when freezer fin temperature is below 10°F (-12°C) and cooling demand is present or if thermistor resistance range is less than 1.35 kΩ or greater than 250 kΩ and cooling demand is present.

The fan turns off when freezer fin temperature is above 20°F (-7°C), freezer air temperature is below -5°F (-21°C), no cooling demand is present or when the controls are in defrost.

#### Fresh Food Compartment Fan

Fresh food compartment fan operation is controlled through a thermistor located on the fresh food compartment fin assembly.

The fan turns on when fresh food fin temperature is below 40°F (4°C) with cooling demand present or if thermistor resistance is less than 1.6 kΩ or more than 295 kΩ out of range.

The fan turns off when fresh food fin temperature is above 50°F (10°C), no demand for cooling is present or when the controls are in defrost.

#### Defrost Interval Timer

This timer counts cooling run time when freezer temperature is below 30°F (-1°C). This value is stored in non-volatile memory. The timer will count if freezer fin temperature is open (greater than 250 kΩ). It will not count if the thermistor is shorted (less than 1.35 kΩ).

Defrost Interval timer clears when freezer fin temperature is above 30°F (-1°C) or if the freezer fin thermistor is shorted (less than 1.35 kΩ).

When defrost interval timer reaches 780 minutes (13 hours) control initiates defrost. When in defrost, cooling demand is inhibited, the freezer and fresh food compartment fans are turned off, the freezer heater and the fresh food compartment heater are energized.

If the freezer fin climbs above 80 °F (26.6 °C) during defrost, fault code A1 displays.

If the fresh food compartment fin climbs above 80°F (26.6°C) during defrost, fault code A2 displays.

The A1 and A2 fault codes do not display if the thermistor serving the assigned fin assembly is open or shorted.

#### Freezer Heater

The freezer heater is de-energized when freezer fin temperature goes above 38°F (3°C) or if the thermistor is out of range ( <1.35kΩ or >250kΩ).

#### Drip Tray Heater

The drip tray heater is energized for 30 minutes after the freezer heater is turned off. If manual defrost is initiated, the drip tray heater will turn off.

## Fresh Food Compartment Heater

This heater is de-energized when fresh food fin temperature climbs above 35°F (1.6°C) or if the fresh food compartment fin thermistor is out of range (<.16kΩ or >295kΩ).

Cooling demand is allowed to resume when both, the freezer and the fresh food compartment fin heaters are off.

## Defrost Cycle Termination

A defrost cycle ends automatically if the cycle is not completed within 60 minutes or if the freezer fin and the fresh food compartment fin thermistors are both out of range or if the input voltage is below 10.5vdc for more than 30 seconds (the low voltage terminate timer begins when defrost initiates) or by turning the control OFF/ON or by removing the power/power interruption to the control.

The Table below provides cut-in and cut-out fresh food temperatures for the corresponding temperatures display indications when the refrigerator is operating in the backup mode.

Table

Fresh Food Compartment Air Temperature Cut-in and Cut-Out Temperatures and Corresponding Temperature Display Indications

Temperature Setting	Fresh Food Compartment Air Cut -Out °F (°C)	Fresh Food Compartment Air Cut -In °F (°C)	BOS Mode Duty Cycle %
1	36	42	20%
2	34	40	30%
3	32	38	40%
4	30	36	50%
5	28	34	60%
6	26	32	70%
7	24	30	80%
8	22	28	90%
9	20	26	100%

### NOTE

Backup operation system (BOS) duty cycle is only active if the fresh food compartment air thermistor is open or shorted. The control panel displays the C1 fault code.

---

## Manual Defrost Function —Diagnostic Mode “A”

To initiate a manual defrost cycle:

1. Set the controls to Diagnostics by pressing the MODE and TEMP switch buttons at the same time.
2. Press the MODE button until screen “A” displays. “dF” will display soon after.
3. Press and hold the TEMP switch button until “dF” changes to “GO”.
4. Release the TEMP switch button when “GO” displays.
5. Press and hold the TEMP switch button until “dF” displays.

### ➤ IMPORTANT ◀

Manual defrost can be cancelled by turning the refrigerator OFF then back ON or by removing power to the controls.

---

### ➤ IMPORTANT ◀

Manual defrost is cancelled if the Defrost Bypass is initiated.

---

### ➤ IMPORTANT ◀

Defrost bypass can be cancelled by turning the refrigerator OFF, then back ON or by removing power to the controls.

---

## Manual Defrost Function —Diagnostic Mode “b”

To initiate a 96-hour defrost bypass cycle:

1. Set the controls to Diagnostics by pressing and holding the MODE and TEMP buttons at the same time.
2. Press the MODE button until screen “b” displays. Shortly thereafter, “bp” will display
3. Press and hold the TEMP button until “Go” displays.
4. Release the TEMP button when “Go” displays.
5. Press and hold the TEMP button until “bp” displays.
6. Once the defrost bypass mode has been set, press the MODE and TEMP buttons at the same time and hold to exit the diagnostics mode. Once out of the diagnostic mode, “no df” will alternately be displayed in the center of the LCD display.

### **Note:**

The divider heater output is turned off while in the defrost bypass mode.

External fan operation is turned on anytime there is a call for cooling by the refrigerator, i.e. it is not controlled by the external fan thermistor while in the defrost bypass mode.



## **SECTION 7 — COOLING SYSTEM**

The cooling system is a sealed gas absorption refrigeration system charged with R 707 refrigerant.



### **NOTE**

R 707 refrigerant contains anhydrous ammonia, water, and hydrogen. The refrigerant also contains sodium chromate a corrosion inhibitor.

Optimal cooling system efficiency requires controlled heat application, sufficient air flow to remove heat and supply combustion air, and leveled operation.

### **Leveled Operation**

Cooling system efficiency is not affected when the vehicle is driven. When parked, off-level operation should not exceed three (3) degrees from side-to-side and/or six (6) degrees front-to-back at the refrigerator.

### **Poor cooling**

Poor cooling may be the result of one or a combination of:

- Insufficient or obstructed ventilation.
- Low AC voltage.
- AC heater failure.
- Low propane pressure.
- Dirty burner.
- Fan failure
- Dirty flue.
- Blocked or jammed heat deflector cap.
- Operation over maximum off-level limits.
- Inadequate repairs.
- Unauthorized modifications.

### **Insufficient or obstructed ventilation**

Insufficient or obstructed ventilation reduces cooling efficiency because the heat load generated and dissipated by the system is not efficiently removed.

To maintain cooling efficiency cooling air has to flow freely over the external walls of the absorber coils and over the condenser fins. When ventilation is suspected of being the cause of poor cooling, make sure that:

- Air intake vent and exhaust vent are clear.
- Vents have are not covered with insect screen, plastic sheeting, leaves or a birds nest.
- Loose insulation is not blocking air flow over the condenser or absorber or the flue opening.
- Both fans are working.
- DC voltage is 10.5 VDC or higher.

### **Low AC voltage**

Three, 187 Watt AC heaters generate the heat load required to turn liquid ammonia into vapor. Also to generate the correct amount of heat voltage needs to be 108 to 132 volts.

### **AC heater failure**

One AC heater failure causes the system to operate at half the heat input required. The heat output of two heater is insufficient to generate the ammonia vapor required.

### **Low propane pressure**

Propane pressure of 10.5 to 11.5 in. w. c. is needed to ignite a flame that generates the heat required for operation.

### **Dirty burner**

A dirty burner affects the burner heat output. Under normal operating conditions the burner and flue need to be checked and cleaned annually.

### **Fan failure**

The fans turn on at 130°F and off at 115°F. One failed fan causes poor cooling.

### **Dirty flue**

A dirty flue restricts the flame from drawing sufficient secondary combustion air. Little or no secondary combustion air causes a weak or lazy flame. A partial view of the flue and spiral baffle is shown in Figure 7-1, page 55.

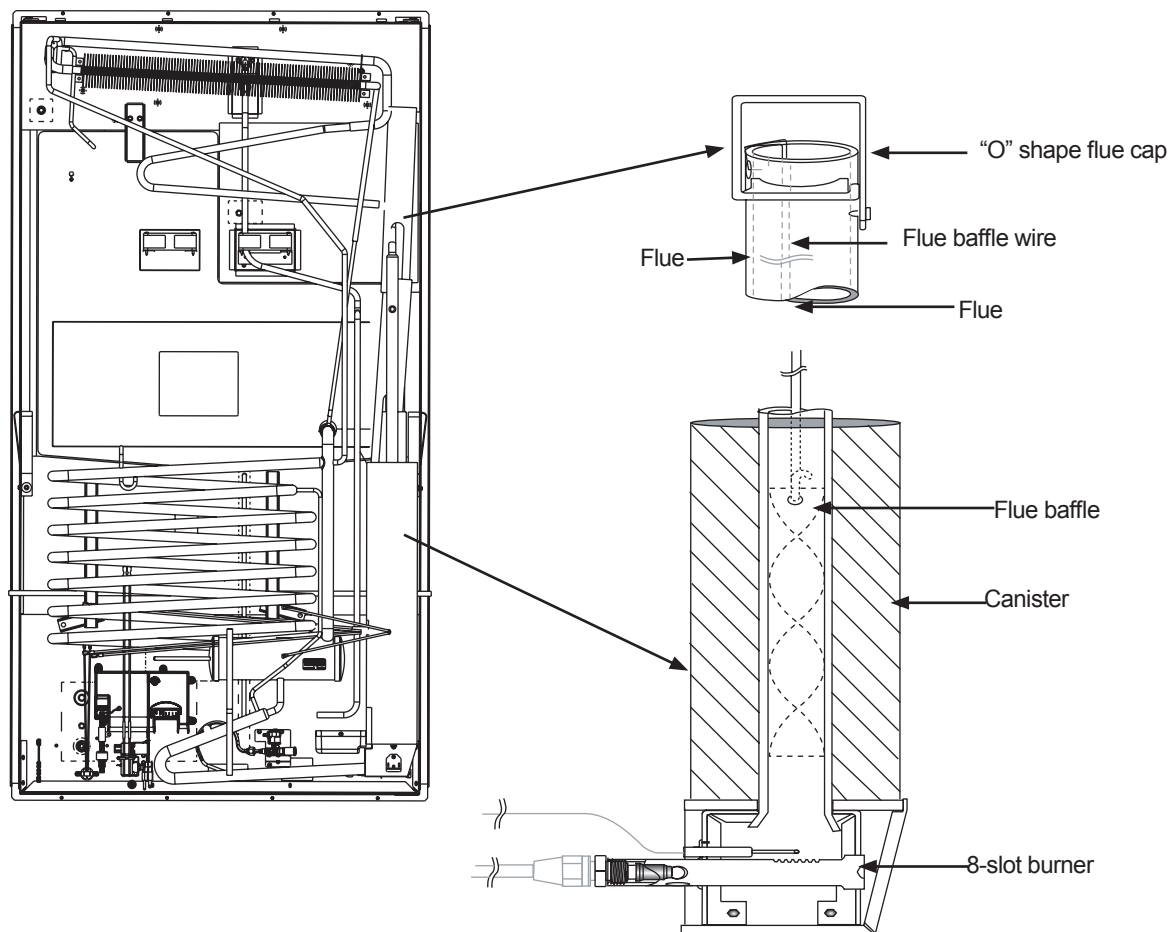


Figure 7-1. —Flue and associated components.

### Blocked or jammed flue cap

A flue cap that is blocked with insulation and or jammed against the flue opening restricts the flow of exhaust gases from the burner box. The flue cap location is shown in Figure 7-1.

### Operation over maximum leveled limits

The refrigeration cycle works on gravity flow. Exceeding off-level limits during operation affects the flow of refrigerant through the system.

### Inadequate repairs

Inadequate repairs that may result in poor cooling include:

- Failure to properly seal the cooling system to the cabinet.
- Failure to seal the drip tube penetration.
- Altering the angle of the condenser.

### Unauthorized modifications

Unauthorized modifications include:

- Removal of enclosure baffles.

- Removal of insulating canister
- Installation of insect screen over intake and/or exhaust vent openings
- By-passing or tampering with the control.
- Relocation of fans and/or thermostatic switch.

### High Temperature Monitor System

The purpose of the high temperature monitor system is to prevent damage to the cooling unit due to an overheating condition in the boiler.

An overheating condition may be caused by one or a combination of the following:

- Insufficient or obstructed ventilation.
- Inadequate installation in enclosure.
- Heat deflector cap blocked by insulation.
- Heat deflector cap jammed against flue opening.
- Exceeding off-level limits.
- Cooling unit blockage.

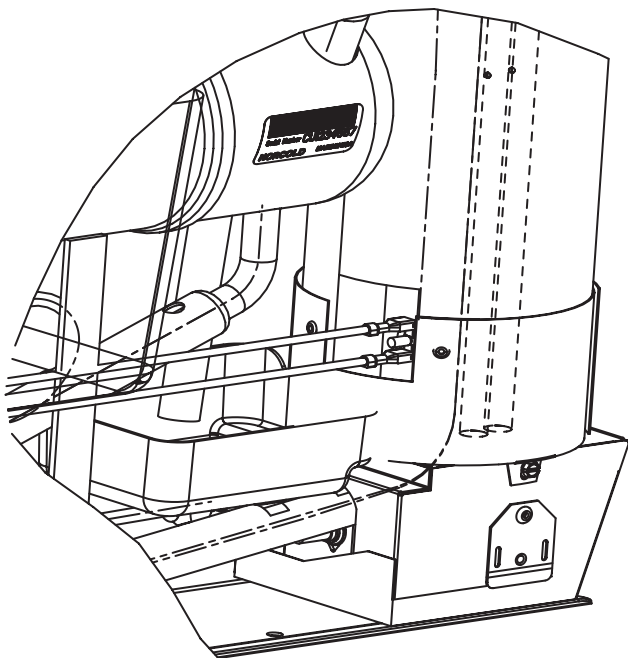


Figure 7-3. — The high temperature limit switch.

The high temperature limit switch acts as a temperature supervising device. This switch is positioned near the boiler to provide the best possible monitoring of temperature switch configuration with a resettable switch. Figure 7-3 shows the configuration of the high temperature limit switch at the time of this publication.

If the boiler temperature begins to rise to an abnormal level, the electrical contact in the switch opens to prevent the boiler from overheating.

The controls are programmed to recognize an open switch. When the switch opens the controls:

- Stop AC and LP gas operation.
- Displays the oP LI fault code

## Cooling Unit Testing

The cooling System Diagnostic Flowchart on page 57-58 provides sequential steps to troubleshoot the cooling system. Before attempting to replace the cooling system:

1. Make sure the conditions listed in Cooling System Replacement section are met.
2. Power on the refrigerator.
3. Set MODE to the AC manual mode or the LP manual mode.
4. Set TEMP SET to setting 9 (coldest).
5. Place digital thermometer probe or thermometer immersed in a container of water on the left freezer shelf, against the evaporator plate.

6. Power off the ice maker.
7. Set the controls to Diagnostics.
  - a. Navigate to screen C, fin temperature.
  - b. Record time and fin temperature.
8. Allow the refrigerator to operate for eight hours with all doors fully closed.

Replace cooling unit when all of these are met:

1. No temperature change in Diagnostics mode screen C.
2. High temperature limit switch is open and fault L1 oP displays.
3. The leveling chamber is extremely hot and absorber coils are at ambient temperature (approximately).

## Cooling System Replacement

The cooling system has to be tested for proper operation. Test results need to show that both the freezer and the fresh food cabinet do not cool in AUTO mode, AC manual mode or in LP manual mode. Before attempting to test the cooling unit make sure:

- The refrigerator is leveled.
- DC voltage input to power board is 10.5-15.4 volts.
- AC voltage input to power board is 108-132 volts.
- All three AC heaters draw amperage.
- Gas pressure is 10.5 to 11.5 in. w. c.
- The burner and the orifice are clean.
- Flame appearance normal.
- The flue is clean.
- The flue baffle installed.
- Ventilation is correct.
- Intake vent is clear.
- Exhaust vent is clear.
- Both external fans are operational.
- Door gaskets are in good condition.
- Doors are properly aligned.
- Thermistor on the proper fin.
- High temperature limit switch is not open.

# Cooling System Diagnostic Flowchart



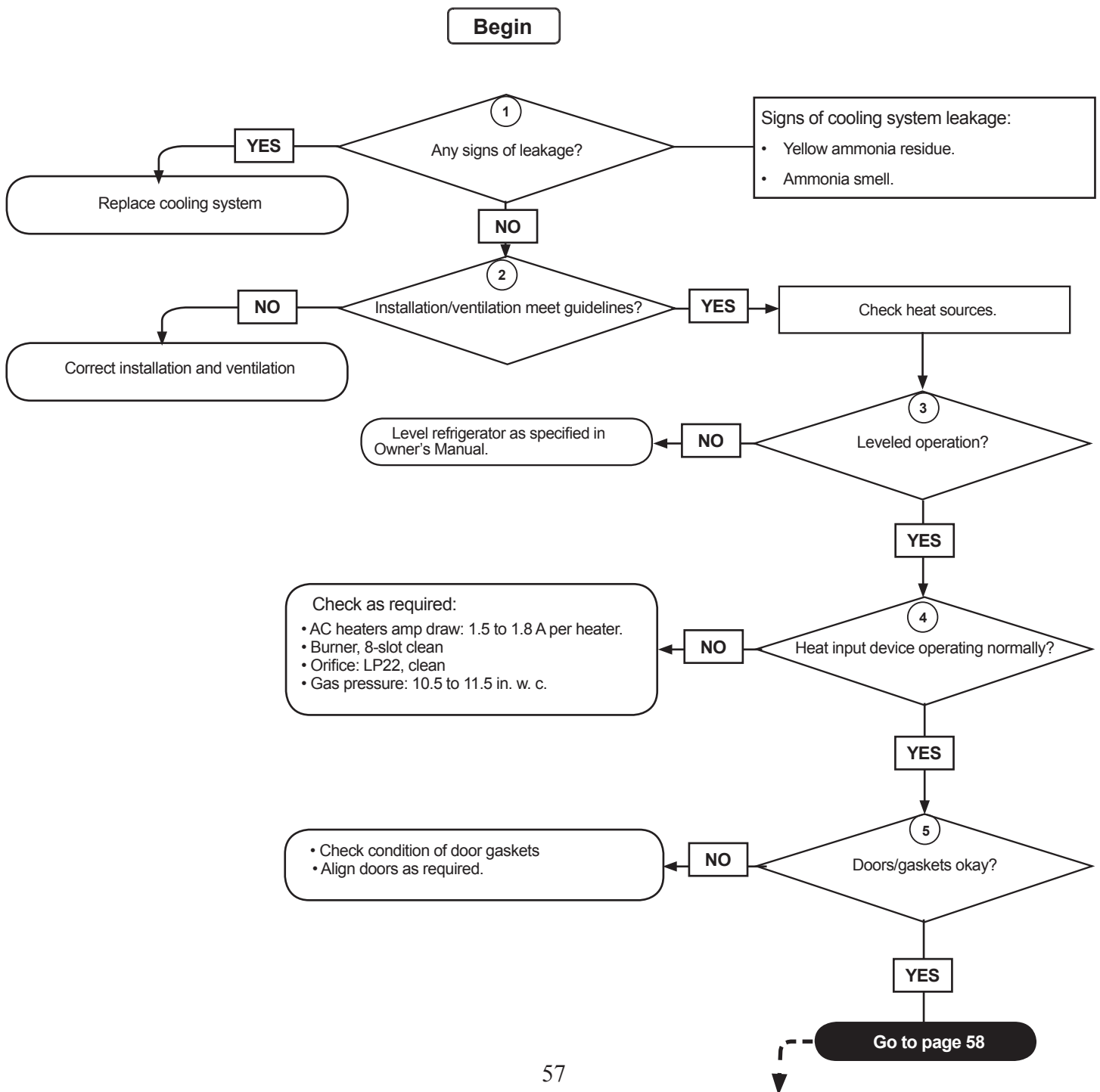
## WARNING

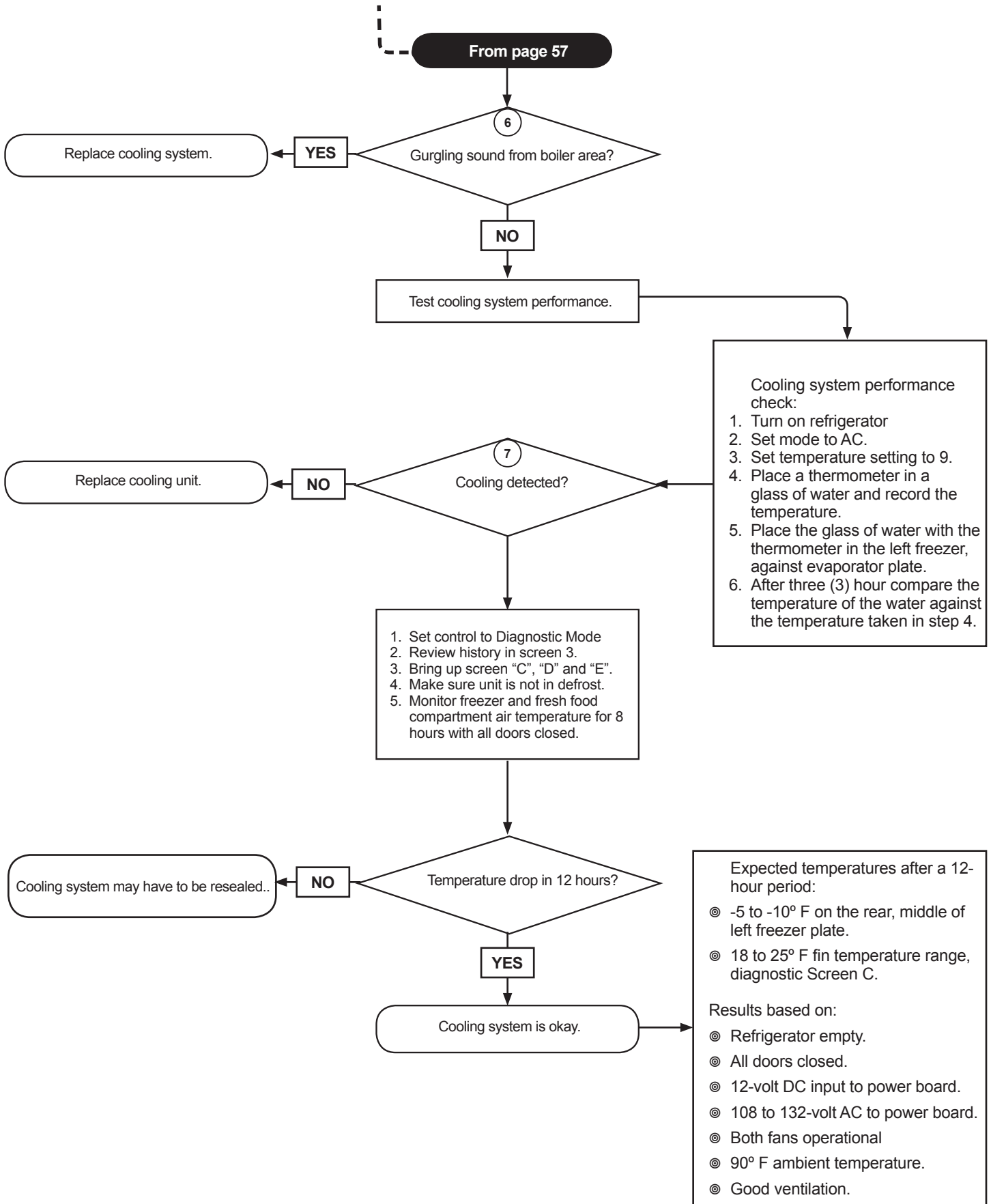
Do not bypass or modify the refrigerator controls. Do not wire the heater directly. Heaters are supplied power through a fused circuit.



## WARNING

Do not power ON the refrigerator if the cooling system has a leak or is suspected of having a leak.





## Cooling System Removal

### ◀IMPORTANT▶

Cooling system replacement requires removing the refrigerator from the enclosure.

It is not possible to anticipate all of the RV manufacturers enclosure design or refrigerator installations practices.

Always, double check for additional screws and brackets before attempting to remove the refrigerator from the enclosure as certain RV manufacturers may install additional brackets or screws to secure the top and the sides of the refrigerator to the enclosure.

Tools:

1/4" nut driver

5/16" nut driver

3/16" Hex wrench -long or "T" handle style

7/16" open end wrench

9/16" open end wrench

5/8" open-end wrench

#2 Phillips screwdriver

1. Disconnect all AC and DC power sources.
2. Remove upper and lower right side freezer shelves.
3. Remove the freezer fan shroud. See Figure 7-4.
4. Disconnect the freezer defrost heater from circuit.
5. Disconnect the freezer thermostatic switch from circuit.
6. Disconnect the freezer fin thermistor.

### —Water dispenser units

- a. Remove the paddle assembly.
  - b. Remove the water dispenser cover.
  - c. Disconnect the spigot.
  - d. Disconnect the wiring and remove the bracket containing the LED board, spigot, and switch as an assembly.
7. Remove all fresh food compartment shelves.
  8. Remove fresh food compartment fan shroud.

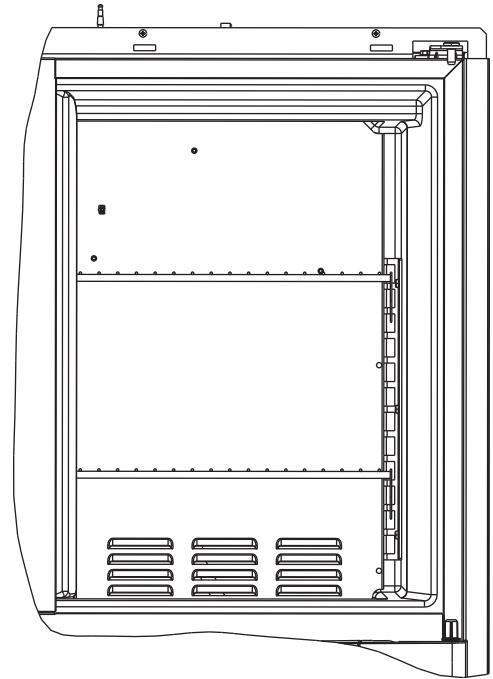


Figure 7-4. —Freezer fan should.

9. Remove air temperature thermistor from shroud.
10. Remove the fresh food compartment air circulation fan assembly.
11. Unplug fan assembly from circuit.
12. Remove 8 hex head screws from fresh food compartment fin assembly.



13. Disconnect the defrost heater from circuit. Connector is on left side of fin assembly.
14. Remove fin assembly.



### CAUTION

**Protect the front of the refrigerator! Cover the floor with a moving blanket/pad or similar soft material to protect the floor as well as the refrigerator doors panels and optical display when the refrigerator is laid down on the floor.**

---



### WARNING

**Do not handle the refrigerator without the assistance of an able person. Attempting to handle the refrigerator without additional help may cause personal injury and/or extensive property damage.**

---

15. With the assistance of two able persons, lay the refrigerator on the floor doors side down.
16. Disconnect and remove the water valve assembly. See Section 9 for information on the ice maker water valve and the ice maker/water dispenser water valve.



### WARNING



**Always use two wrenches to loosen or tighten fittings to prevent damaging components, piping, or fittings. Damaged components, piping, or fittings create the potential for gas leaks.**

---

17. Disconnect and remove the gas valve assembly (with bracket). See Section 4 for information on gas valve connections and fittings.
18. Disconnect and remove the spark/sense electrode assembly.
19. Remove the power board cover then disconnect the AC heaters leads and the high temperature limit switch leads.
20. Disconnect and remove fans.
21. Disconnect thermistor from condenser fin.

**For steps 22 through 26 refer to Figure 7-6 on page 62.**

22. Remove hold down bracket.
23. Cut the tape along the edges of the cooling unit wrapper.
24. Remove condenser bracket screws (4).
25. Remove absorber bracket screws (2).
26. Lift absorber coil enough to move wiring and ice maker water line (if present) to the left side of the cabinet.



### WARNING

**Do not attempt to pull the cooling unit out of the enclosure without the assistance of an able person. Attempting to pull the cooling unit without additional help may cause personal injury and/or extensive property damage.**

---

27. With the help of an able person lift the cooling unit out of the cabinet.
28. Remove all thermal sealant from the cabinet steps and freezer plates.
29. Remove all thermal sealant from the evaporator coils and plug.

### Applying Thermal Mastic Sealant



### CAUTION

Use only NORCOLD approved Thermal Mastic sealant (part number 61450740). Do not use silicon, latex or petroleum base sealant. Silicone, latex and petroleum-sealants may damage the cabinet and/or cooling system foam plug, greatly reducing cooling efficiency.

---

Sealing the cooling unit to the cabinet requires all three tubes of Thermal Mastic sealant supplied with the replacement cooling unit. For proper dispersal the tube tip needs to be cut to dispense a bead no wider than 3/4 inch wide.

### ➤ IMPORTANT ◀

Apply the sealant as outlined in the following steps. Failure to apply the sealant as outlined will result in poor cooling performance.

1. Apply a 3/4 inch wide x 1/2 inch thick bead of Thermal Mastic sealant to the surface of the evaporator tubes shown in Figure 7-7.
2. Apply 3/4 inch wide x 1/2 inch thick bead of Thermal Mastic sealant on the four sides of the cabinet opening. See Figure 7-8, page 63.

### Installing Cooling Unit into Cabinet

1. Make sure the ice maker water line, wiring, and fan wiring are out of the way on the opposite side of the flue tube.

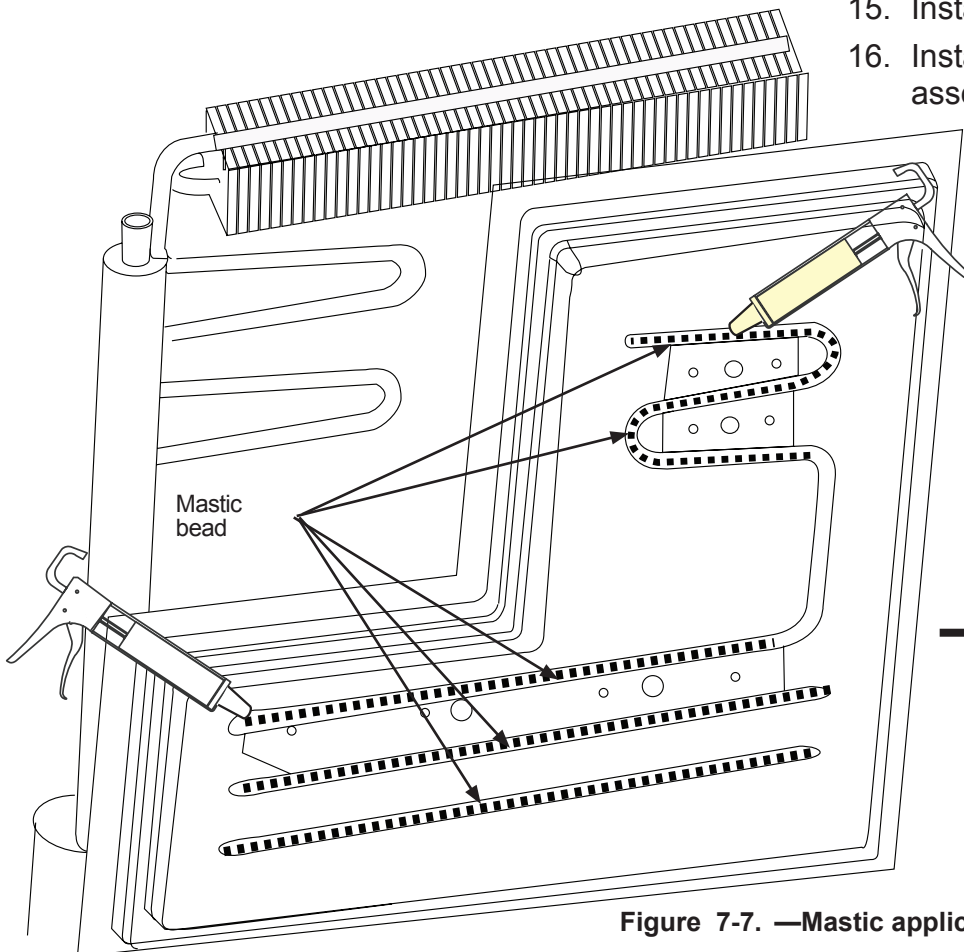


### WARNING

**Do not attempt to install cooling unit out of the enclosure without the assistance of an able person. Attempting the installation without additional help may cause personal injury and/or extensive property damage.**

2. Carefully lift the cooling system and align the foam plug over the cabinet opening.
3. Lower the cooling unit evenly into the cabinet opening.

4. Seat the cooling unit firmly into the cabinet by applying even pressure on each corner of the foam plug.
5. Route the ice maker water tube (IM models), and wiring between the cabinet and absorber coils.
6. Install condenser brackets screws. Tighten each screw 15 to 20 inch-pound.
7. Install the absorber coil brackets screws. Tighten each screw 15 to 20 inch-pound.
8. Install and tighten the hold down bracket.
9. Tape the foam plug wrapper edges to the cabinet using two inch wide adhesive backed HVAC aluminum tape or poly mask sealing tape.
10. Make sure the heat deflector cap is firmly on the flue tube.
11. Attach the thermistor to the thermistor fin.
12. Install and connect the fans.
13. Connect the AC heater wires to the power board.
14. Connect the high temperature limit switch to the power board.
15. Install the power board cover.
16. Install the spark/sense electrode assembly.



**Always use two wrenches to loosen or tighten fittings to prevent damaging components, piping, or fittings. Damaged components, piping, or fittings create the potential for gas leaks.**

Figure 7-7. —Mastic application on evaporators tubes surface.



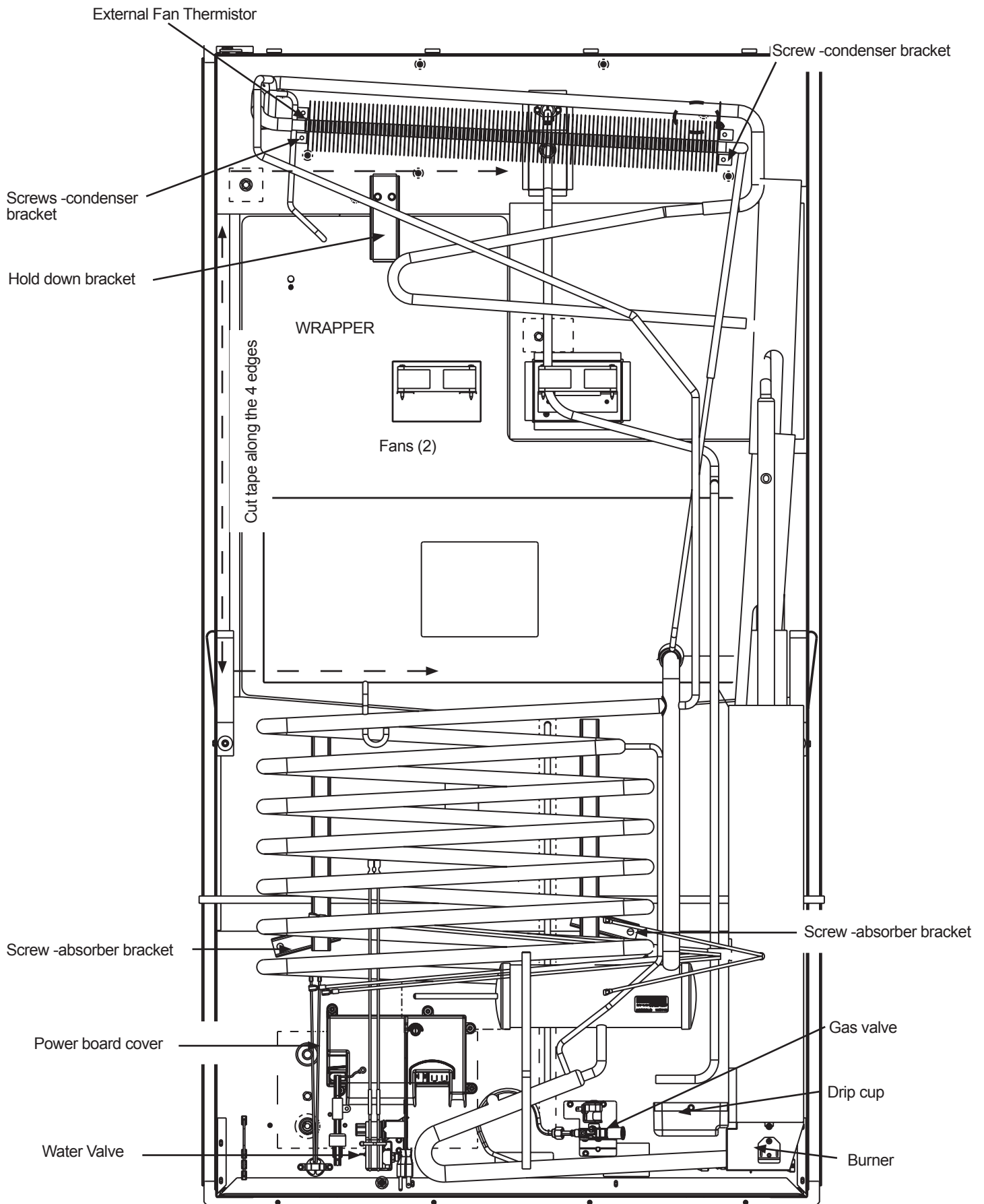


Figure 7-6. — Cooling unit component location.

17. Install the gas valve and burner assembly.
18. Install the burner box cover.
19. Install the drip cup.
20. Install the ice maker water valve (IM models), then reconnect wiring and tubing.

**! WARNING**

**Do not attempt to upright the refrigerator without the assistance of an able person. Up righting without additional help may cause personal injury and/or extensive property damage.**

21. Upright the refrigerator.
22. Install the freezers fin assembly, then connect the thermistor, defrost heater and thermostatic switch.
23. Install the freezer fan shroud.
24. Install freezer shelves.
25. Connect the fresh food compartment fin defrost heater.
26. Attach the fresh food compartment fin to the fin assembly.
27. Install the fresh food compartment fin assembly.
28. Install the fresh food compartment fin air temperature thermistor.
29. Install the fresh food compartment fan assembly.

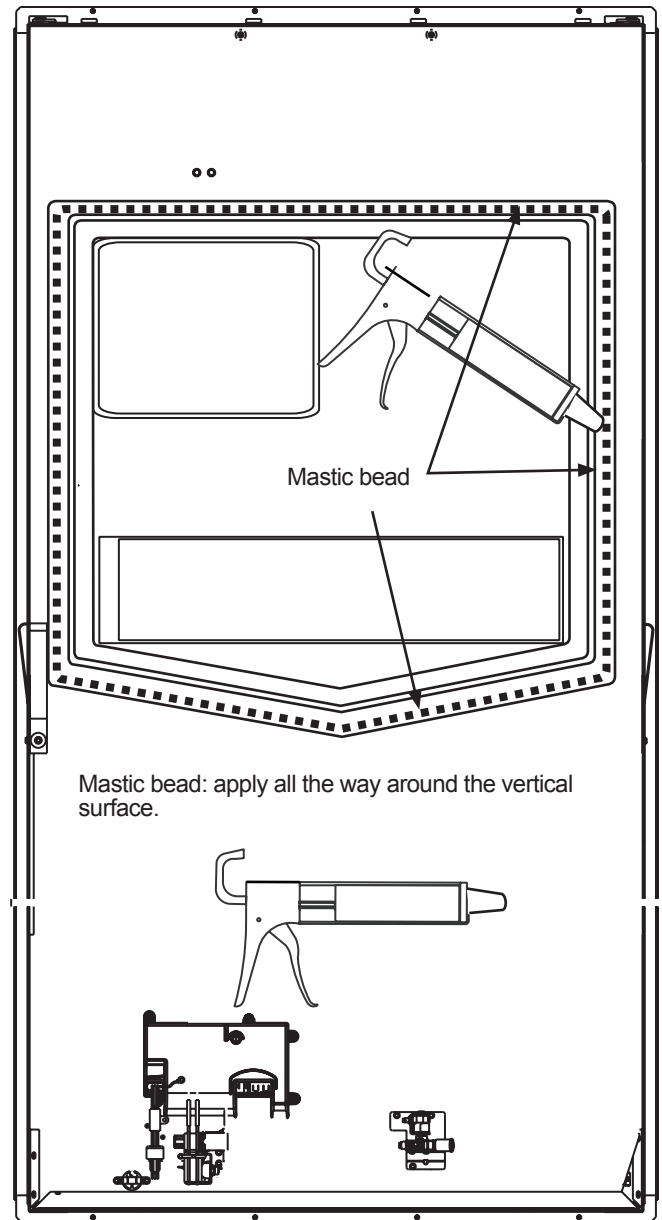


Figure 7-8. —Mastic application on cabinet opening.

**Checking for gas leaks after installation**

After installing the refrigerator in the enclosure and connecting RV propane supply line to the gas valve.

1. Connect 12 volt DC to the power board.
2. Plug the AC power cords to the RV outlets.
3. Open the LP gas container gas valve
4. Leak check the gas valve connection. No leaks allowed.
5. Power on refrigerator, then select LP manual mode operation.
6. Leak check all of the refrigerator gas connections. No leaks allowed.
7. Place refrigerator in service.

## SECTION 8 —DIAGNOSTICS

### Diagnostic Mode

The diagnostics mode is a tool designed to assist in verifying temperature, inputs, outputs, and to retrieve recorded fault stored by the controls. The diagnostic information is displayed in the center of the LCD module.

Each screen displayed has a particular function. For example, screen (C) displays fin temperature, and screens four (4) and five (5) display stored fault history.

The information is presented using illuminated LCD segments and alphanumerical codes.

Figure 8-1 shows the pattern seen on the control panel when diagnostic mode is accessed.

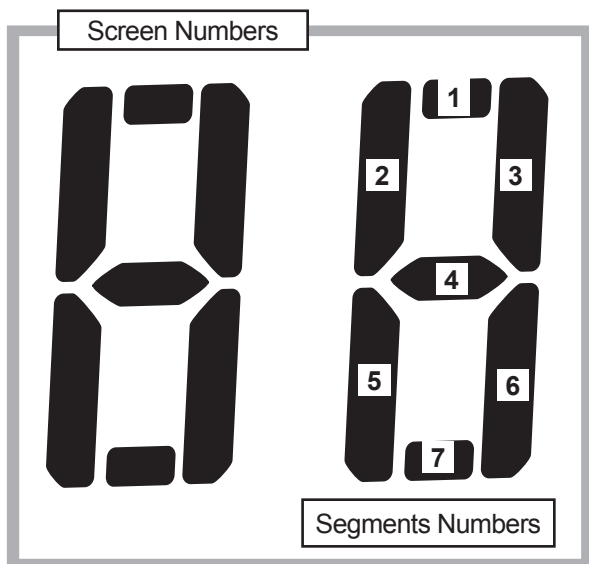







Figure 8-1. —Optical control display screen and segments numbering.

### Setting Display to Diagnostics



To set the display to diagnostics:

1. Press and hold down the MODE  and switch TEMP  switch buttons at the same time.
2. Release the switch buttons when  displays.
3. Within two seconds  displays on the screen.

### Displaying screens through

1. Press the MODE  button.
2. Release the switch button when the next or the desired screen appears on the display.

### Returning the Display to Normal Mode:

1. Press and hold down the MODE  and switch TEMP  switch buttons at the same time.
2. Release the switch buttons when the active operation mode displays.

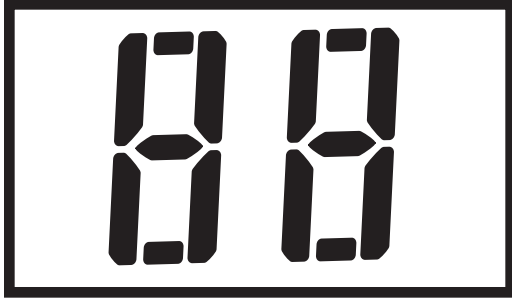
#### NOTE

Powering the refrigerator OFF and back ON also returns the optical control display to its normal display mode.

# Diagnostic Screens Information

## Screen 1

The number **1** displays and within five seconds the screen number turns off and All segments illuminate to indicate the controls are set to diagnostics.



Replace the control panel assembly if any segment shown in the above illustration fail to illuminate.

Pressing the MODE  switch button displays screen 2.

## Screen 2

The number **2** displays and within five seconds the screen turns off.

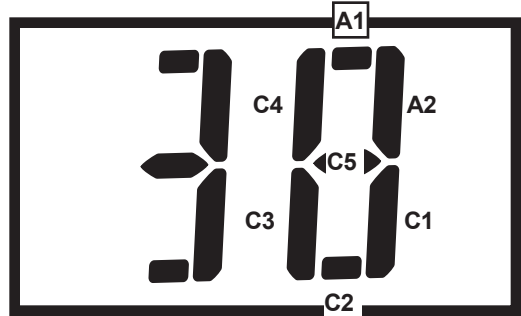


Replace the optical control display assembly if any segment illuminates.

Pressing the MODE  switch button displays screen 3.

## Screen 3 -Defrost Fault History

The number **3** displays and within five seconds, if present, recorded defrost fault history displays.



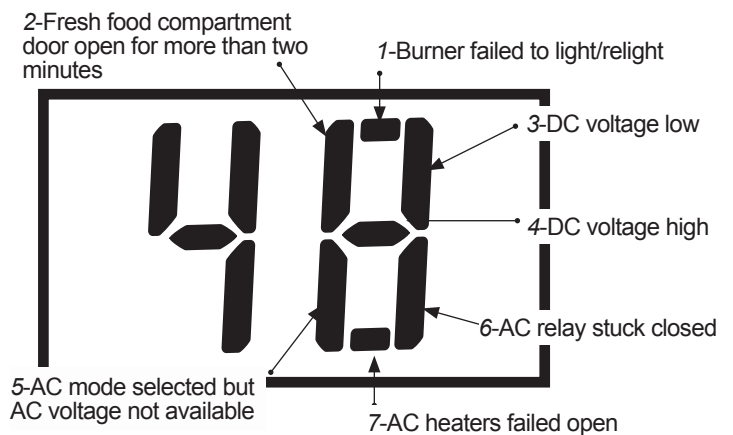
LEGEND:

- A1: Defrost on, freezer fin above 80 °F
- A2: Defrost on, fresh food fin above 80 °F.
- C1: Fresh food air thermistor open or shorted (<1.35 kΩ or >250 kΩ).
- C2: Freezer fin thermistor open or shorted (<1.35 kΩ or >250 kΩ).
- C3: Freezer air thermistor open or shorted (<1.35 kΩ or >250 kΩ).
- C4: External fan thermistor open or shorted (<120 Ω or >250 kΩ).
- C5: Fresh food fin thermistor open or shorted (<1.6 kΩ or >295 kΩ).

Pressing the MODE  switch button displays screen 4.

## Screen 4 Stored Fault History

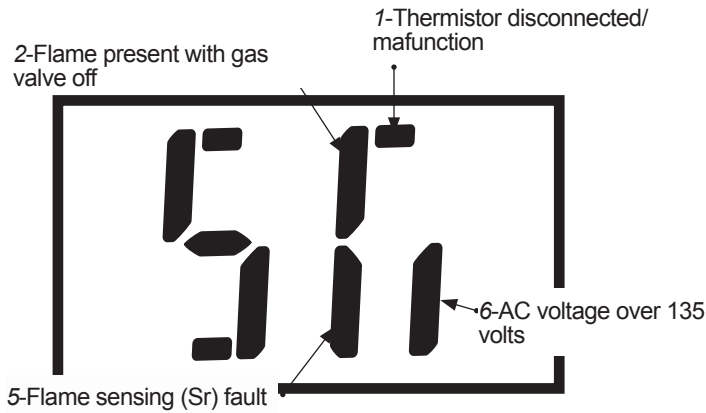
Displays stored fault history using illuminated segments. Segments fault descriptions are illustrated below.



Pressing the MODE  switch button displays screen 5.

## Screen 5 Stored Fault History



Display stored fault history screens using illuminated segments. Segments fault descriptions are illustrated below.



Pressing the MODE  switch button displays screen 6.

## Screen 6 -Erase Stored Fault History

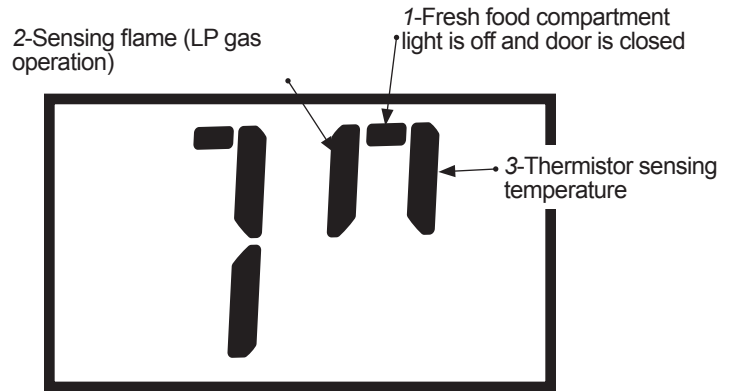
Screen 6 is used to erase stored fault history in screens 3, 4, and 5. To erase stored fault history:

1. The displays shows the letters “ER”
2. Press and hold the TEMP  switch button until the letters “CL” appears on the screen.
3. Wait five seconds.
4. Press and hold the TEMP  switch button until the letters “ER” appears on the screen

Pressing the MODE  switch button displays screen 7.

## Screen 7 -Power Board Inputs

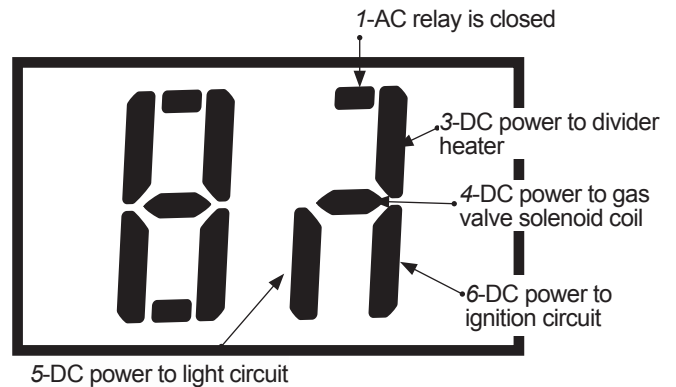
Displays “live” power board inputs through illuminated segments. The assigned segments and information are illustrated below.



Pressing the MODE  switch button displays screen 8.

## Screen 8 -Power Board Outputs

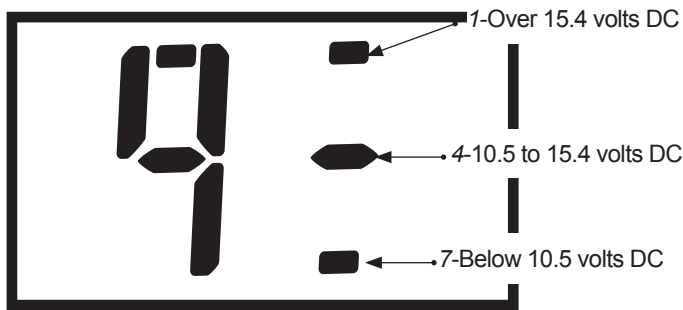
Displays “live” power board outputs through illuminated segments. The assigned segments and information are illustrated below.



Pressing the MODE  switch button displays screen 9.

## Screen 9 -DC Voltage Input

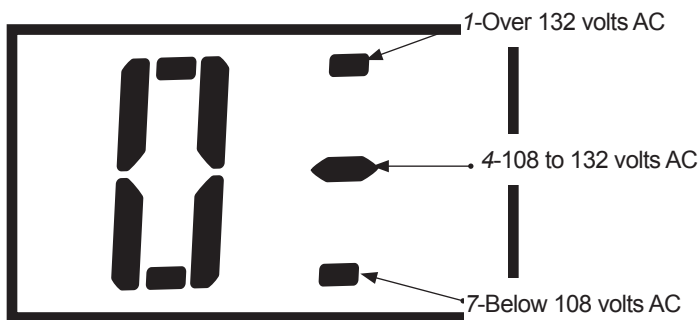
Displays DC voltage input to power board through illuminated segments. The assigned segments and information are illustrated below.



Pressing the MODE  switch button displays screen 0.

## Screen 0 - AC Voltage Input

Displays AC voltage input to power board through illuminated segments. The assigned segments and information are illustrated below.



Pressing the MODE  switch button displays screen A.

## Screen A - Manual Defrost – See page 53

Pressing the MODE  switch button displays screen b.

## Screen B - Manual Defrost Bypass – See page 53

Pressing the MODE  switch button displays screen C.

## Screen C - Fresh Food Fin Temperature

The letter C displays and within five seconds the fresh food compartment fin temperature displays.

Pressing the MODE  switch button displays screen d.

## Screen d - Fresh Food Air Temperature

The letter d displays and within five seconds fresh food compartment air temperature displays.

Pressing the MODE  switch button displays screen E.

## Screen E - Freezer Fin Temperature

The letter E displays and within five seconds freezer fin temperature displays.

Pressing the MODE  switch button displays screen F.

## Screen F - Freezer Air Temperature

The letter F displays and within five seconds freezer air temperature displays.

Pressing the MODE  switch button displays screen H.

## Screen H - External Fan Temperature

The letter H displays and within five seconds the temperature sensed by the external fan thermistor displays.

Pressing the MODE  switch button displays screen 1.

To return display to AUTO, AC or LP Mode:

1. Press and hold MODE and TEMP switch buttons at the same time.
2. Release the switch buttons when the selected operation mode display.

Turning the refrigerator OFF and back ON also returns the display to the selected operation mode.

## SECTION 9 —ICE MAKER

### Ice Maker

The ice maker, shown in Figure 9-1, is supplied AC power through a wire harness. It is ON when the shut-off arm is lowered to the down position and OFF when the shut-off arm is raised to the up position.

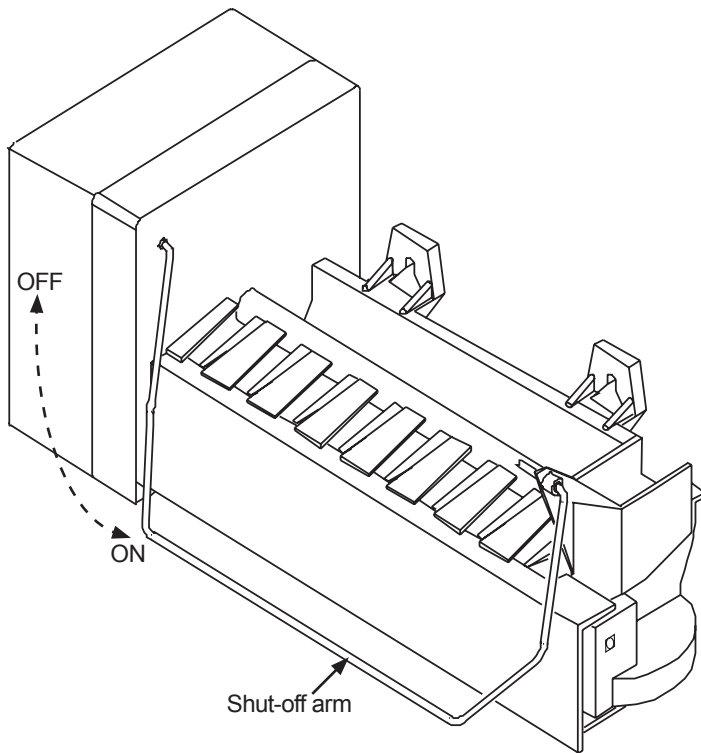


Figure 9-1. —Ice maker.

### Specifications

Cycle duration.....	3.5 to 7 minutes
Water fill capacity .....	4.7 fl. oz. (140 mL)
Ice yield .....	3.5 lbs/24 hr.. (approximate)
Electrical rating .....	185 W @115 VAC/60 Hertz
Amperage (A) draw:	
Cycle on/heater on.....	1.6 A
Cycle on/heater off.....	0.3 A
Cycle off.....	No amperage draw
Motor .....	1.5 W/8800 ohms
Mold heater.....	185 W/72 ohms

### Operation

The left freezer temperature determines the efficiency of the ice maker. The colder the temperature in the freezer, the faster the water in the mold will freeze.

To harvest the ice the temperature in the freezer needs to be colder than 12 °F (-11.1 °C).

The thermostat attached to the mold senses the mold temperature. At approximately 17 to 14 °F (-8.3 to -10 °C) the thermostat energizes the stepper motor and the heater.

As the motor turns the ejector blades begin to make contact with the top of the ice cubes. The motor rotates back and forth causing the blades to exert pressure on the ice cubes as the mold heater warms the bottom of the mold.

Once the ice cubes are freed, the motor continues to turn the ejector, which in turn sweeps the ice cubes out of the mold and into the ice bin. At the same time the shut-off arm begins to swing up, which indicates the end of ice harvesting. This begins a new cycle.

As the ejector blades point to the 12 o'clock position, the water valve opens for approximately seven seconds to refill the mold with approximately 4.7 fluid ounces of water.

After the mold is refilled, the shut-off arm drops to the ON position. When the thermostat senses mold temperature to be 17 to 14 °F (-8.3 to -10 °C) the cycle starts again.

### Ice Yield

The ice maker can produce up to 3-1/2 pounds per day, depending on usage and freezer door openings.

## Components

### AC Power Cord

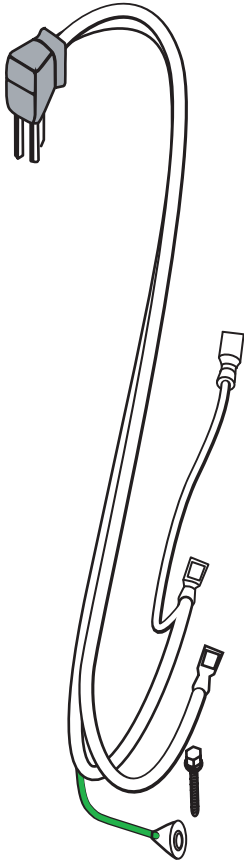


Figure 9-2. —Ice Maker Power Cord.

Figure 9-2 shows the AC power cord for the 2117 ice maker. The cord connects to the ice maker four-wire harness.

The cord is to be plugged into a 2 pole/3 wire/20 amp grounding type receptacle.

## Wire Harness

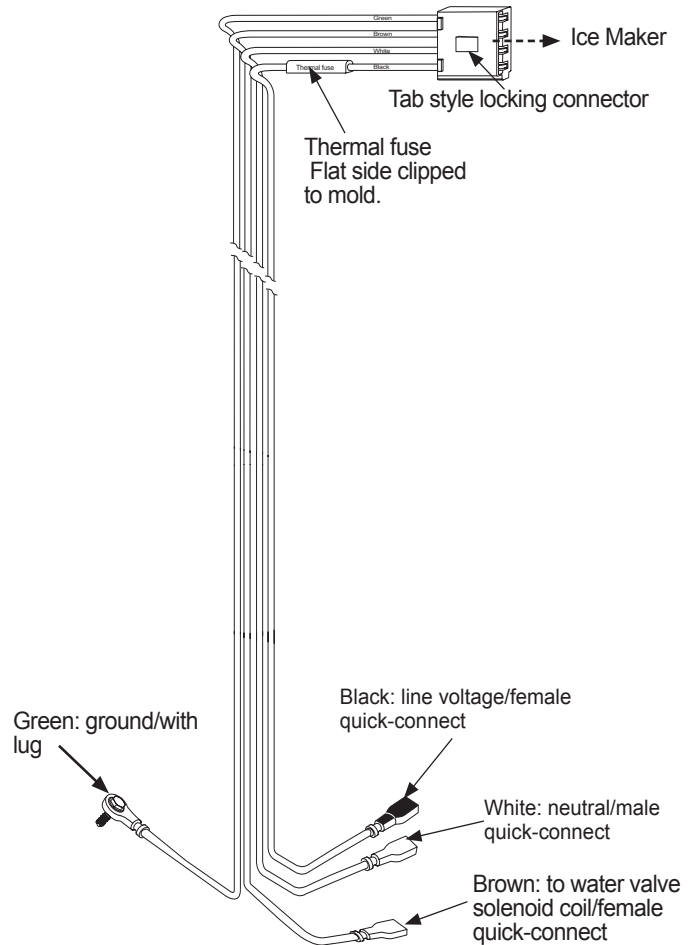


Figure 9-3. —Wire Harness.

Figure 9-3 shows the wires color coding and application.

### ➤ IMPORTANT ⚡

**A four-wire harness supplies AC power to the ice maker module. The ice maker and its harness are in no way connected to the refrigerator wire harness, to the power board or to the optical control display assembly.**



## Water Fill Line

Figure 9-4 shows the water fill line. The fill line connection at the water valve is a 1/4 inch plastic compression fitting. The connection at the water fill tube is made with a 1/2 inch hose clamp.

The fill line is covered with a foil style 12 volt DC heater. See “**Water Line DC Heater**” in this section.

### NOTE

The refrigerator has to be removed from the enclosure to service or replace the water fill line.

## Water Fill Tube

The water fill tube shown in Figure 9-4, is installed and sealed at the factory. It is not a replaceable component.

## Water Line Heater

In ambient temperatures of 42 to 38 °F (5.5 to 3.3 °C) and lower, the water line heater keeps the fill line and water valve body from freezing when the refrigerator is on. This heater is controlled by a thermostatic switch, shown in Figure 9-5.

### WARNING

**The water line heater does not protect the ice maker water valve and fill line at ambient temperatures of 0 degrees Fahrenheit (-17 degrees Celsius). At these ambient temperatures the water valve and the water fill line need to winterized.**

The thermostat energizes the circuit when ambient temperature is approximately 42 to 38 °F (5.5 to 3.3 °C) and de-energizes at approximately 48 °F (8.8 °C).

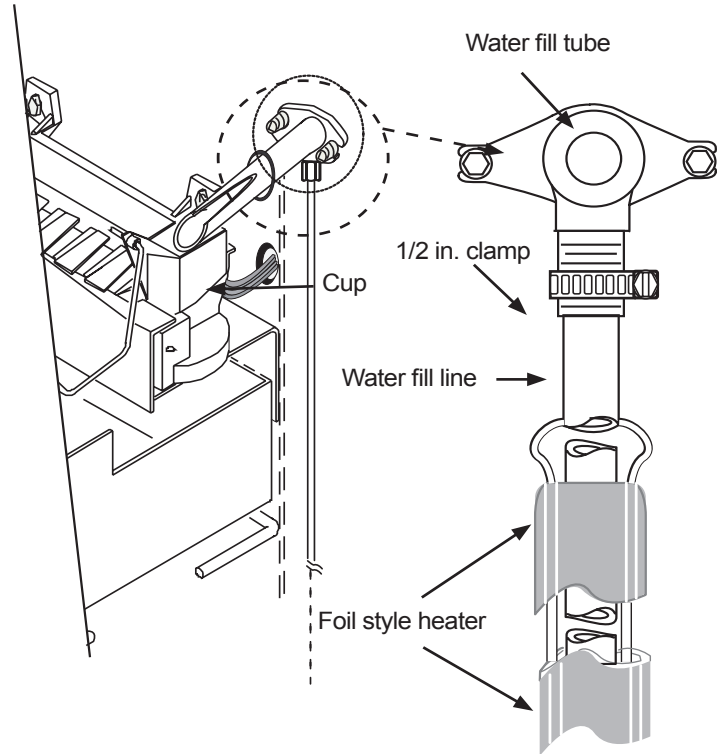


Figure 9-4. —Water fill line and water fill tube connection.

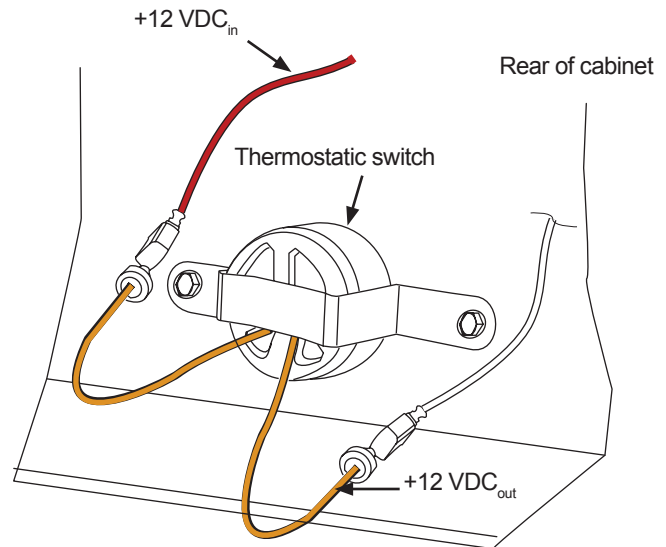


Figure 9-5. —Thermostatic switch and connections.

## Water Valve

The water valve, shown in Figure 9-6, is not a repairable component.

The solenoid coil is rated for 20 Watts @120 VAC. The ice maker cycle energizes the coil for approximately seven seconds shortly after the ice cubes are ejected. Approximately 4.7 fluid ounces of water refill the mold during the seven second period.

## Water Valve Replacement

### NOTE

This procedure applies only to the ice maker water valve part number 618253. The ice maker/water dispenser valve replacement procedure appears in Section 10, page 82.

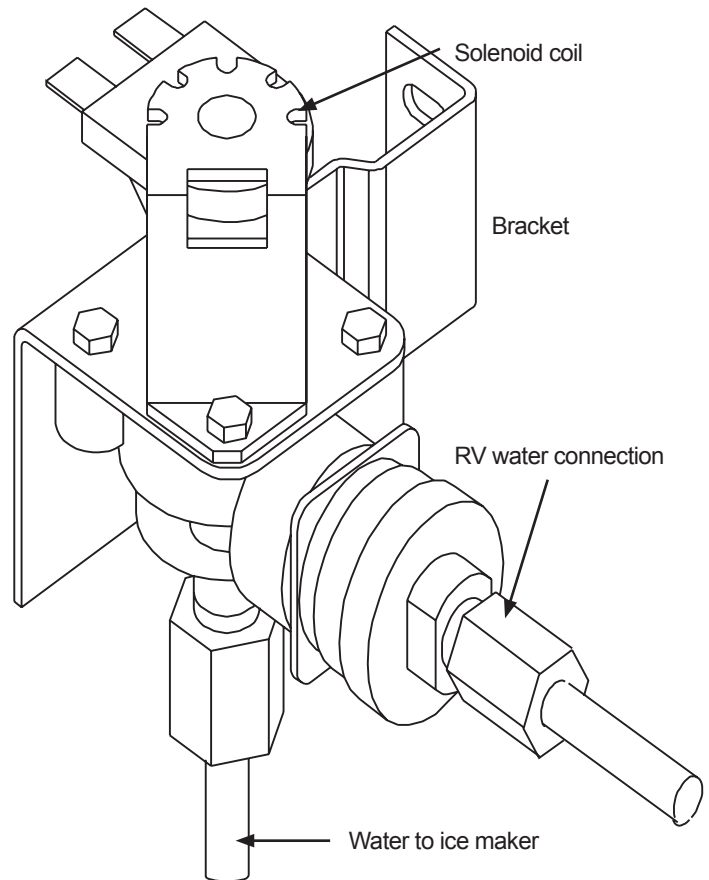


Figure 9-6. —Water valve and water connections.

Remove the water valve proceed as follows and refer to Figure 9-6 and Figure 9-7 (page 72).

### WARNING

**Unplug the refrigerator AC power cord from the RV receptacle when working on the water valve. Failure to unplug the AC power cord may expose the technician and/ or other personnel to an electrical shock hazard.**

1. Unplug the ice maker AC power cord from RV receptacle.
2. Shut off the water supply to the water valve
3. Disconnect the BROWN wire and the WHITE wire at the solenoid coil.
4. Disconnect thermostatic switch and the water fill line heater:
5. Disconnect the BROWN wire from the heater WHITE wire and unwrap the heater wire from the valve body.
6. Disconnect remaining switch BROWN wire from the +12 volt DC in RED wire.
7. White heater wire from the -12 volt DC in BLACK wire
8. Disconnect the RV water supply line at the water valve.
9. Disconnect the ice maker water fill line at the water valve.
10. Detach the water valve assembly bracket from the back plate by removing the two screws along with their spacers. Retain screws and spacers to install replacement valve.
11. Reverse steps 10 through 1 and see Figure 9-6 and Figure 9-7 (page 72), to install the replacement water valve.

## Cycling the Ice Maker Manually

Cycling the ice maker manually verifies the motor works, the mold heater turns on and off, the shut-off arm travels to the OFF position, the water valve opens for seven seconds, and the shut-off arm drops to the ON position.

Figure 9-8 shows the jumper wire needed for jumpering test points L and H.

Before starting, shut off the water supply to the water valve and make sure the AC power cord is plugged into an energized receptacle.

To manually cycle the ice maker:

1. Remove the ice bin and freezer shelf.
2. Detach the ice maker from the evaporator plate. **Do not to pull on the wire harness.**
3. Rotate the ice maker so the module cover faces toward the freezer door, then remove the cover.



### WARNING

**Pull the jumper wire out when a “click” sound is heard or no later than 15 seconds after jumpering terminals T and H. Failure to remove jumper wire may damage the ice maker.**

4. Jump test points T and H. See Figure 9-9, page 73.

### NOTE

Figure 9-10, page 73 shows the cycle events after jumpering test points T and H. Jumpering the points bypasses the thermostat, which causes the motor and the mold heater to come on.

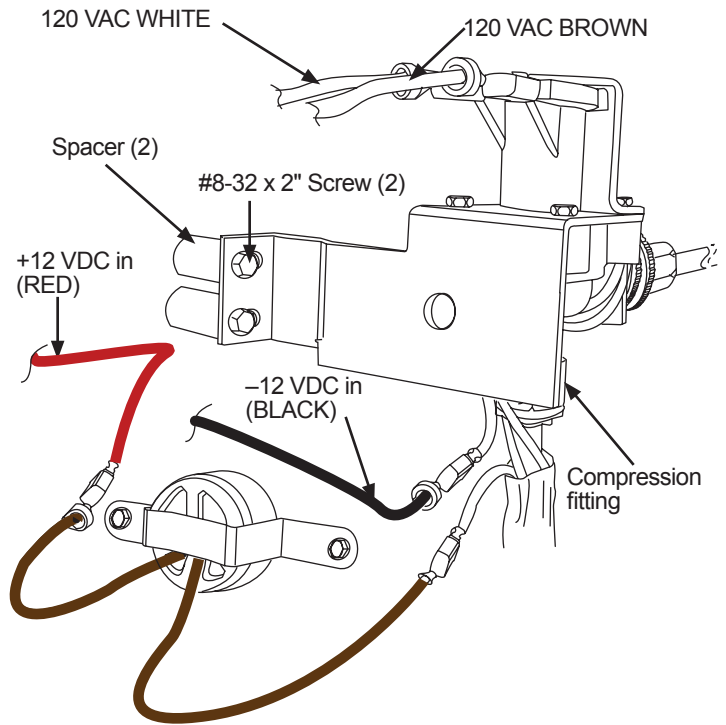


Figure 9-7. —Water valve bracket and electrical connections.

14 AWG insulated wire  
8 to 10 inches long

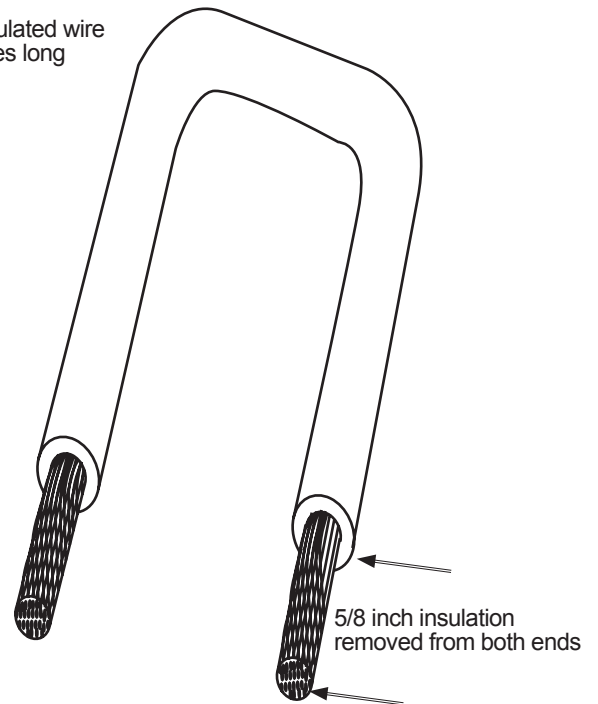


Figure 9-8. —14 AWG jumper wire.

6. Pull out the jumper wire when a “click” sound is heard and no later than 15 seconds after jumpering test points T and H.
  - a. The motor turns the ejector in a clockwise direction and the mold heater energizes.
  - b. The heater de-energizes as the ejector fingers pass through the 6 o’clock position.
  - c. The shut off arm begins to move up to the OFF position as the ejector fingers pass through the 9 o’clock position.
  - d. The opening of the water valve takes place as the ejector fingers pass through the 12 o’clock position. The valve closes approximately seven seconds later.
  - e. The shut-off arm drops to the ON position after the water valves is de-energized.
  - f. The ejector parks at the 2 o’clock position.
  - g. The cycle continues when the thermostat senses 17 to 14 degrees Fahrenheit (-8.3 to -10 degrees Celsius).

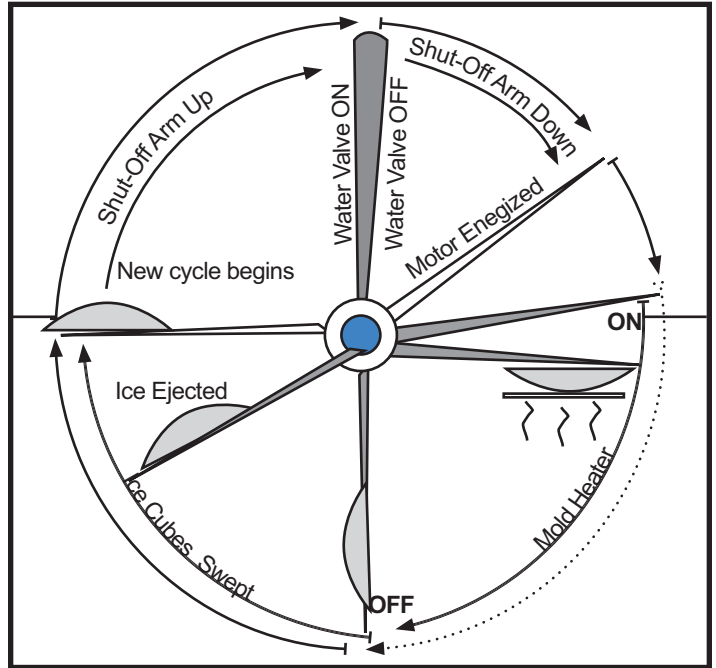


Figure 9-10. — Ice maker 7-minute cycle events.

### Testing Water Valve Operation

Water valve operation can be tested by jumpering points V and L.

Before this test is performed, make sure AC power is available, shut off the water supply to the water valve, and make an insulated wire jumper like the one shown in Figure 9-8, page 72.

To test water valve operation:

1. Remove the ice bin and freezer shelf.
2. Detach the ice maker from the evaporator plate. **Do not to pull on the wire harness.**
3. Rotate the ice maker so the module cover faces toward the freezer door, then remove the cover.
4. Insert one end of the jumper in test point V and the other in test point L. See Figure 9-11, page 74.

When jumpered, the solenoid coil should make a click sound followed by a continuous buzzing sound as long as the jumper remains in test points V and L.

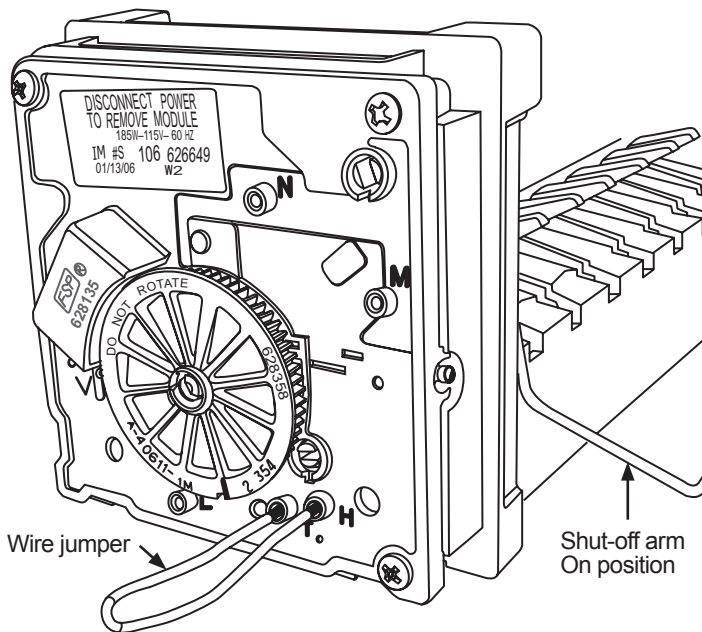


Figure 9-9. —Cycling the ice maker manually.

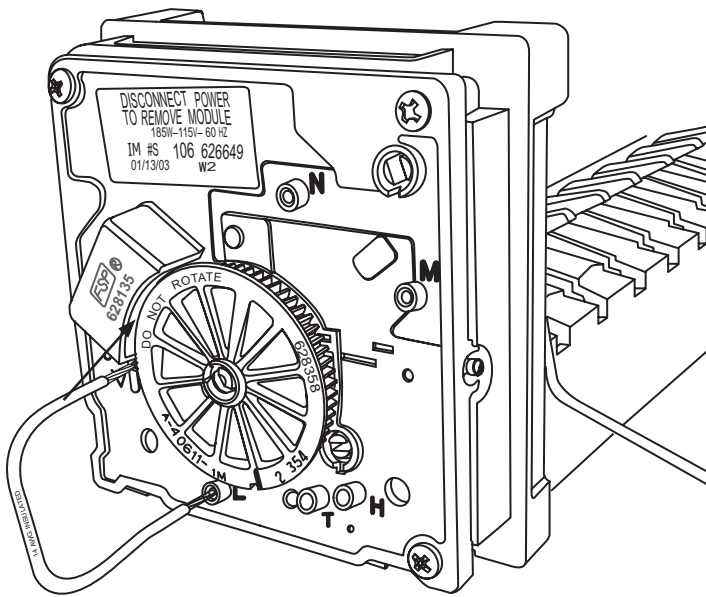


Figure 9-11. —Jumpering test points V and L.

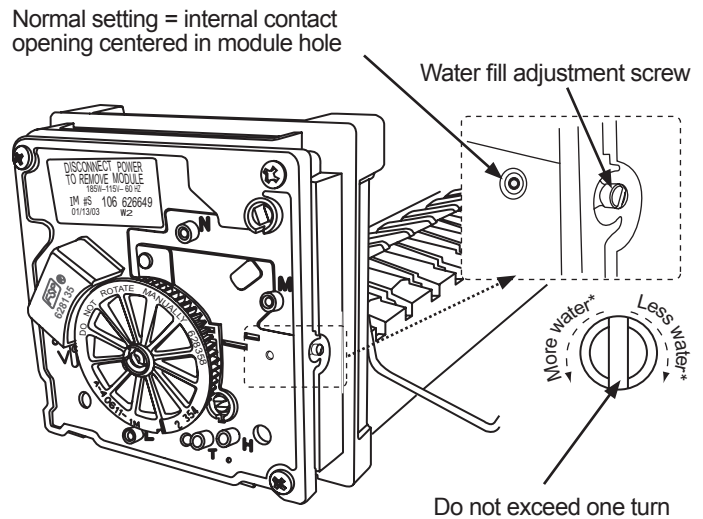


Figure 9-12. —Water adjustment screw and contact alignment location.

## Water Fill Adjustment

The water fill adjustment is set at the factory. The production of thin ice cubes indicate not enough water in the mold. The ejector rocking back and forth may indicate fused ice cubes due to too much water in the mold. Both of these conditions may require adjusting the water fill to increase or decrease the time the water valve remains open. To adjust the water fill capacity screw:

1. Remove the ice bin and freezer shelf.
2. Detach the ice maker from the evaporator plate. **Do not to pull on the wire harness.**
3. Rotate the ice maker so the module cover faces toward the freezer door, then remove the cover.
4. Rotate the ice maker so the shut-off arm is facing towards the freezer door.
5. Locate the contact opening shown in Figure 9-12.

### NOTE

Do not turn the water fill adjustment screw if the contact opening is centered in the module hole. See Figure 9-12.

### WARNING

**Do not turn the water fill adjustment screw more than one turn. Turning the screw more than one turn may damage the contacts.**

6. Turn the adjustment screw clockwise or counterclockwise to align the center of the contact with the module hole. See Figure 9-12.



## Checking Water Valve Solenoid Coil Resistance

The solenoid coil resistance should measure between 295 and 360 ohms. It can be checked at the water valve solenoid coil as shown in Figure 9-13 or through the ice maker module test points V and N as shown in Figure 9-14.

To check resistance through points V and N:

1. Remove the ice bin and freezer shelf.
2. Detach the ice maker from the evaporator plate. **Do not pull on the wire harness.**
3. Rotate the ice maker so the module cover faces toward the freezer door, then remove the cover.
4. Roll the ice maker so the shut-off arm side is down with the module facing away from the freezer.

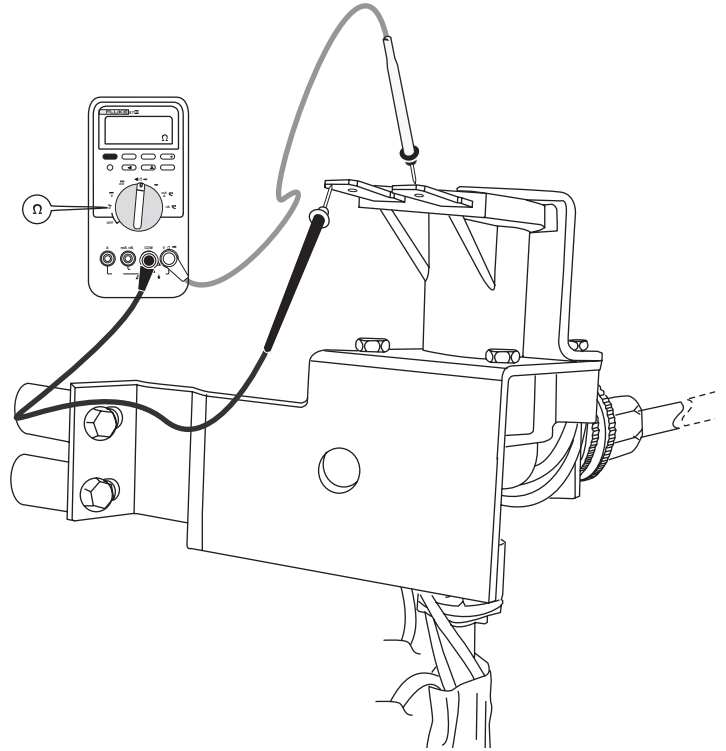


Figure 9-13. —Measuring solenoid coil resistance.

### NOTE

The multimeter test probe tips must be at least 1/2 inch long to contact the test points.

5. Set the multimeter to ohmmeter function, then insert one probe into point V and the other into point N.

## Checking Mold Heater Resistance

The mold heater resistance should measure between 71 to 79 ohms. To check the mold heater resistance through test points L and H:

1. Remove the ice bin and freezer shelf.
2. Detach the ice maker from the evaporator plate. **Do not pull on the wire harness.**
3. Rotate the ice maker so the module cover faces toward the freezer door, then remove the cover.
4. Lower the shut-off arm to the ON position.

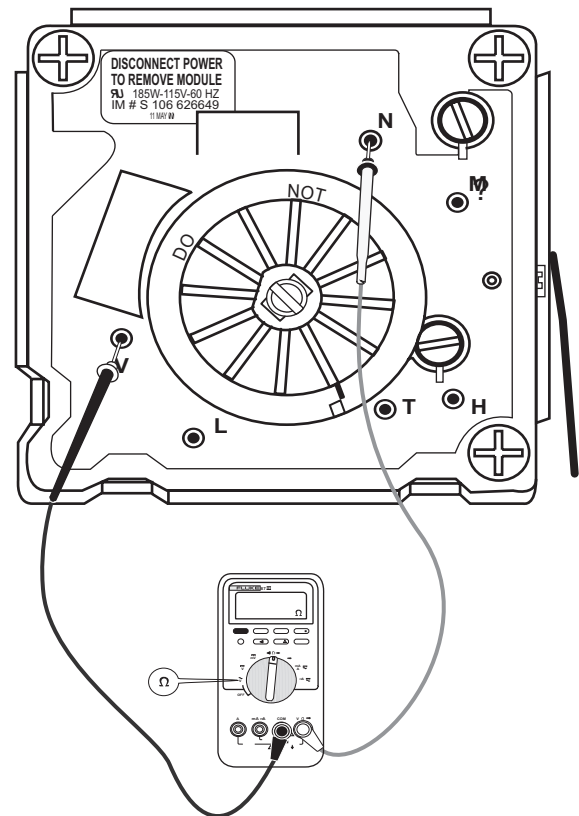


Figure 9-14. —Measuring solenoid coil resistance through wire harness

 **NOTE**

The multimeter test probe tips must be at least 1/2 inch long to contact the test points.

5. Set the multimeter to ohmmeter function, then insert one probe into point L and the other into point H as Figure 9-15 shows.

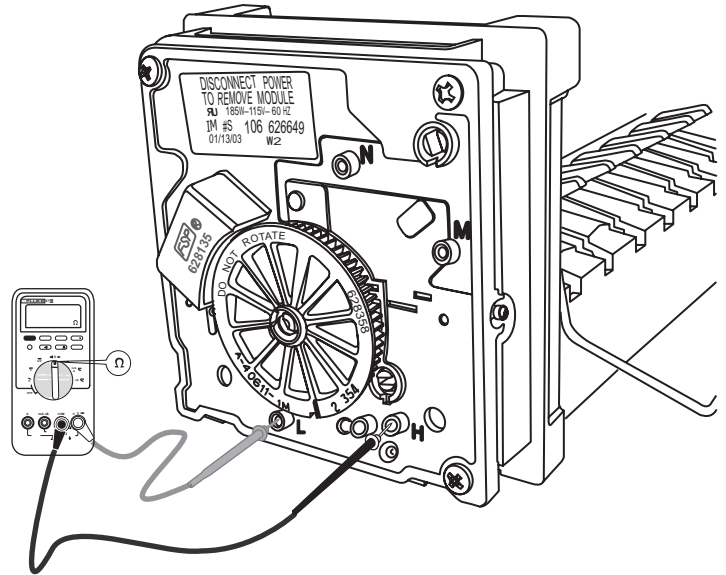


Figure 9-15. —Measuring mold heater resistance.

### Checking Voltage to the Stepper Motor Connection

AC voltage at the stepper motor connection can be checked through test points N and M

1. Remove the ice bin and freezer shelf.
2. Detach the ice maker from the evaporator plate. **Do not to pull on the wire harness.**
3. Rotate the ice maker so the module cover faces toward the freezer door, then remove the cover.
4. Lower the shut-off arm to the ON position
5. Make sure AC power is available to the ice maker.

 **NOTE**

The multimeter test probe tips must be at least 1/2 inch long to contact the test points.

6. Set the multimeter to AC voltage function, then insert one probe into point N and the other into point M as Figure 9-16 shows.
- 108 to 132 VAC: normal voltage to motor.
  - 0 voltage: check voltage at AC outlet and continuity of ice maker power cord.
  - 108 to 132 volts AC through AC power cord: Check ice maker wire harness BLACK wire and WHITE wire for continuity.

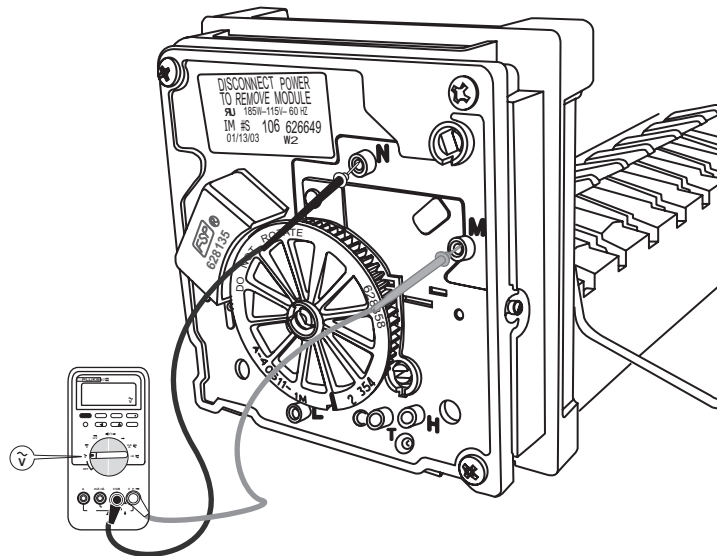


Figure 9-16. —Measuring voltage at stepper motor.

## Ice Maker Troubleshooting Chart

Symptom	Probable Cause	Solution
Not cycling and no ice in mold.	<ol style="list-style-type: none"> <li>1. No AC power available.</li> <li>2. No water available.</li> <li>3. Water valve strained clogged.</li> <li>4. Water valve failed to open.</li> </ol>	<ol style="list-style-type: none"> <li>1. Restore AC power.</li> <li>2. Restore water pressure.</li> <li>3. Clean water valve strainer.</li> <li>4. Check solenoid coil connections and resistance.</li> </ol>
Not cycling / ice in mold.	<ol style="list-style-type: none"> <li>1. Shut-off arm in OFF position.</li> <li>2. No AC power available.</li> <li>3. Leaky water valve.</li> <li>4. Jammed ice cubes.</li> <li>5. Mold heater open -no resistance.</li> <li>6. Module thermostat faulty.</li> <li>7. Excessive mineral deposits buildup in mold</li> </ol>	<ol style="list-style-type: none"> <li>1. Lower to ON position.</li> <li>2. Restore AC power.</li> <li>3. Replace water valve</li> <li>4. Check for bent shut-off arm</li> <li>5. Replace ice maker.</li> <li>6. Replace ice maker.</li> <li>7. Clean mineral deposits buildup in mold.</li> </ol>
Excessive frost on and around ice maker.	<ol style="list-style-type: none"> <li>1. Air entering freezer compartment.</li> <li>2. Open container(s) in freezer.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check freezer door gasket /wire harness Permagum seal.</li> <li>2. Containers that contain liquids have to be sealed prior to placing in freezer.</li> </ol>
Not cycling / AC power available	<ol style="list-style-type: none"> <li>1. Mold heater failed open</li> <li>2. Stepper motor failure</li> <li>3. Mold thermostat faulty.</li> <li>4. Thermal fuse open.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace ice maker.</li> <li>2. Replace ice maker.</li> <li>3. Replace ice maker.</li> <li>4. Replace wire harness.</li> </ol>
Water spilling over ice maker mold.	<ol style="list-style-type: none"> <li>1. Ice jam with cycle in fill position.</li> <li>2. Leaky water valve.</li> <li>3. Mold thermostat failure.</li> <li>4. Stepper motor failure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clear jammed ice cubes..</li> <li>2. Replace water valve</li> <li>3. Replace ice maker.</li> <li>4. Replace ice maker.</li> </ol>
Ice maker trips GFI	<ol style="list-style-type: none"> <li>1. Excessive frost buildup behind ice maker.</li> <li>2. Connection at water valve wrong.</li> <li>3. Harness contacts wet and corroded.</li> <li>4. Mold heater shorted to ground.</li> </ol>	<ol style="list-style-type: none"> <li>1. Defrost freezer/remove and dry ice maker connection and module.</li> <li>2. Correct connection at water valve solenoid coil.</li> <li>3. Remove ice maker to clean and dry contacts.</li> <li>4. Check mold heater for short..</li> </ol>



## Ice Maker Replacement Procedure

### Tools

5/16" nut driver

#2 Flat blade screwdriver

To remove the ice maker:

1. Turn off the refrigerator.
2. Unplug the ice maker AC power cord at the RV outlet.
3. Remove the ice bin, and the freezer shelf.
4. Remove two ice maker mounting screws. Shown in Figure 9-17, ①.
5. Rotate the ice maker so the front cover faces the freezer door and its front side facing down.

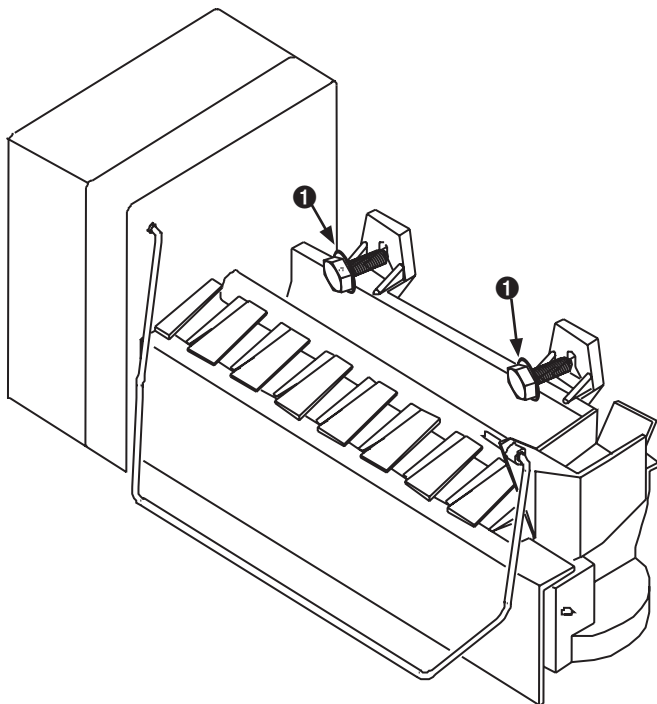


Figure 9-17. —Ice maker fasteners and back plate.

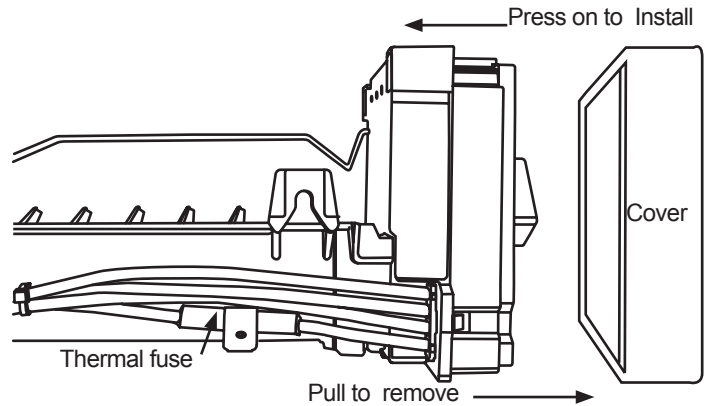


Figure 9-18. —Module cover.

### Steps 6 to 10, see Figure 9-18 and Figure 9-19

6. Remove module cover.
7. Detach thermal fuse.
8. Unplug harness plug from module.
9. Remove the shut-off arm. See Figure 9-20,
10. Reverse procedure to install ice maker.

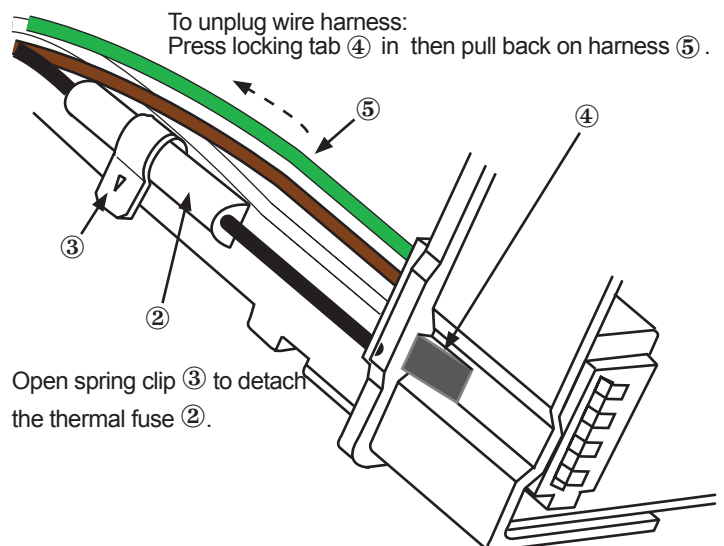


Figure 9-19. —Harness plug and thermal fuse

Figure 9-21 shows the back view of modular water valve assembly on 2117 IMWD (ice maker and water dispenser).

The label on the side of the assembly lists the assembly part number, specifications, and identifies the water dispenser solenoid coil (colored Blue, 12 VDC) and the ice maker solenoid coil (colored Red, 120 VAC).

Two 8-32 x 1" hex head screws hold the extension bracket to the back panel. The assembly is held on the extension bracket with two 8-32 x 1" hex head screws.

The valve assembly is supplied water through a 1/4" compression style fitting, which feeds both, the water dispenser valve and the ice maker water valve.

### Ice Maker Water Valve

Figure 9-21 and Figure 9-22 illustrate and provide information for the ice maker solenoid operated water valve.

### Water Dispenser Valve

For information on the water dispenser water valve refer to Section 10.

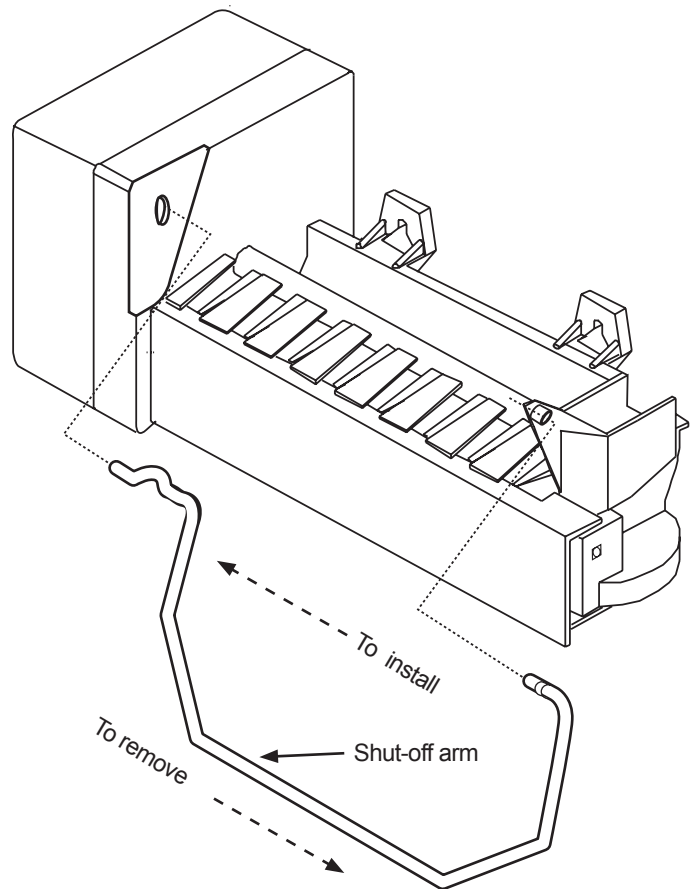


Figure 9-20. —Shut-off arm removal and installation.

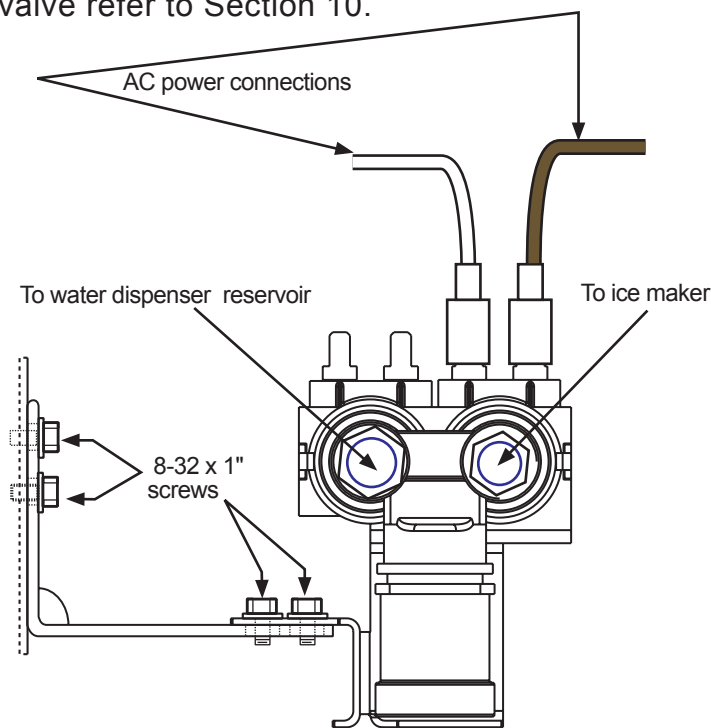


Figure 9-21. — Ice maker and water dispenser modular valve - Side view.

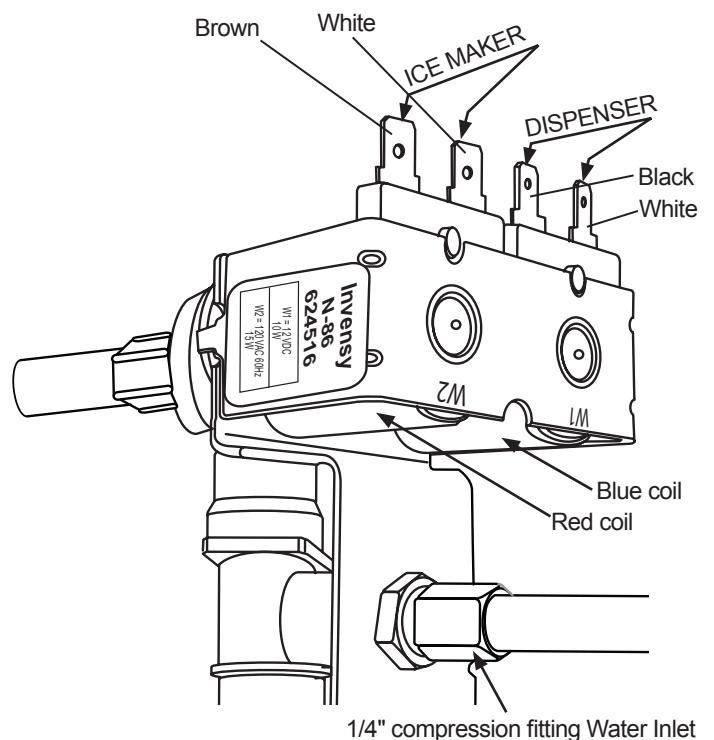


Figure 9-22. — Ice maker and water dispenser modular valve - Back View.

## SECTION 10 — WATER DISPENSER

The water dispenser is an optional system installed at the factory. The main components are the divider mounted water dispenser (Figure 10-1), the reservoir (Figure 10-2), and the water valve (Figure 10-3).

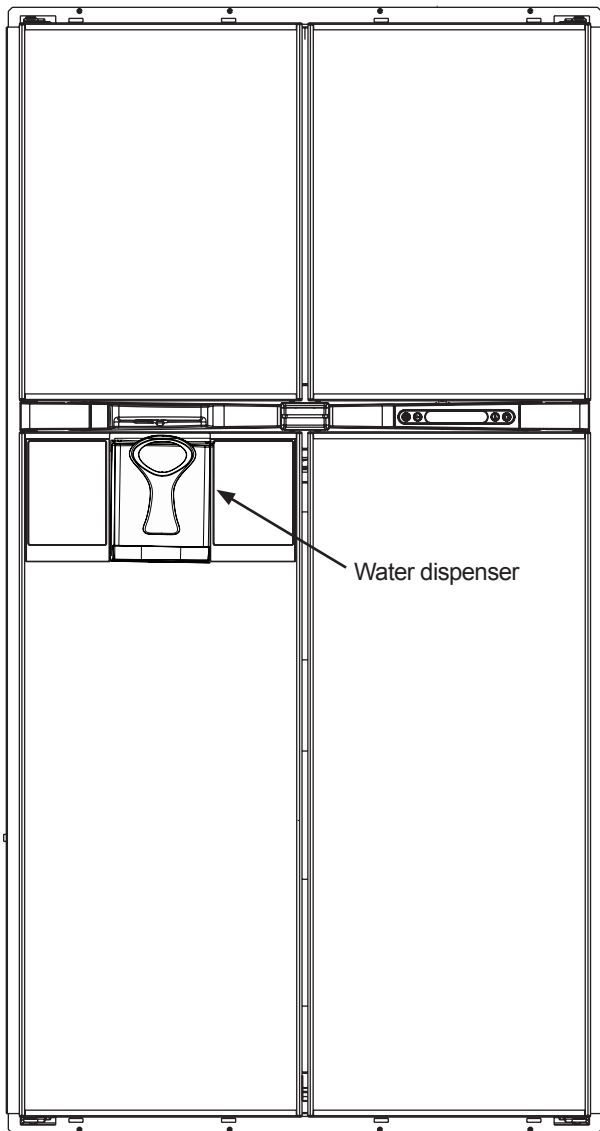


Figure. 10-1. —Water dispenser-external view.

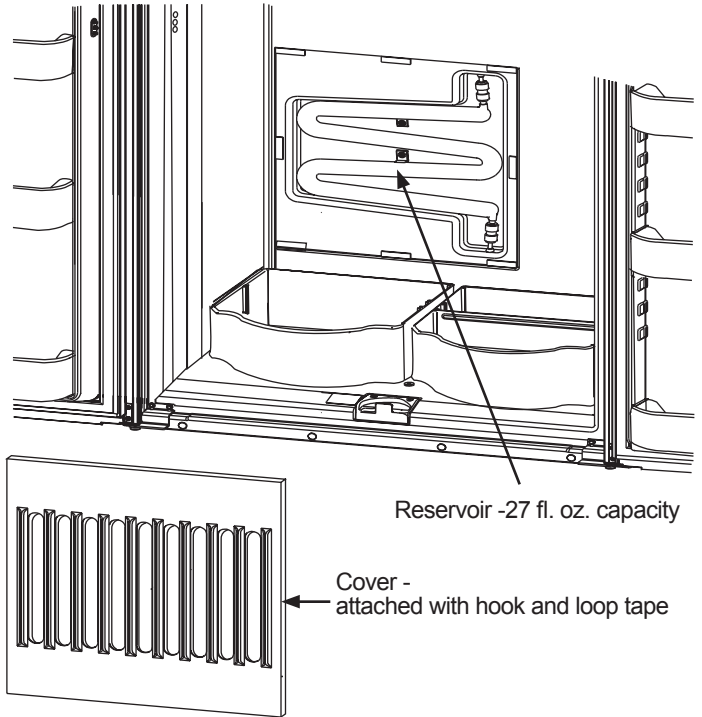


Figure. 10-2. —Reservoir in cabinet recess and cover.

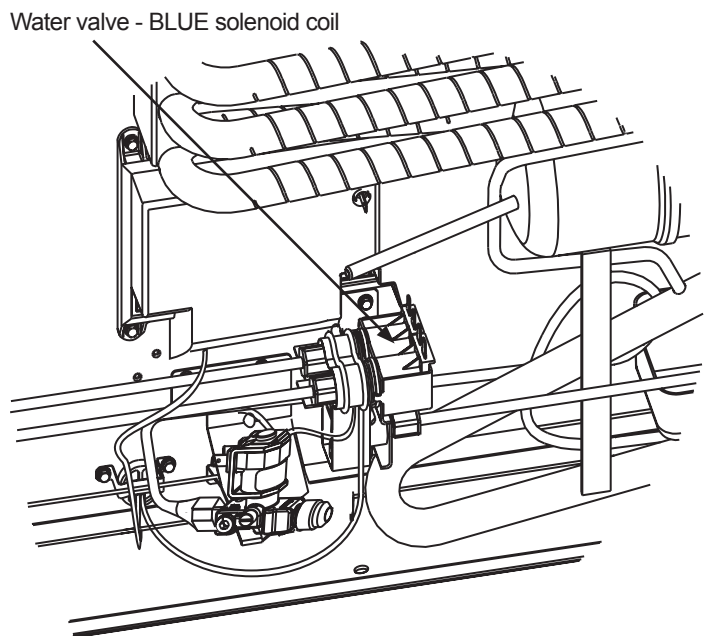


Figure. 10-3. —12 volt DC solenoid operated water valve.

## Water Dispenser —Operation

The water dispenser works: Pressing a small container against the spring-loaded paddle drives in the plunger, which closes the switch.

The switch sends power to the water valve solenoid coil. The electromagnetic force created by the coil opens the water valve, allowing water flow into the reservoir.

Water flows from top of the reservoir to the spigot. The water flowing out of the spigot is replaced by water flowing into the reservoir as illustrated in Figure 10-4

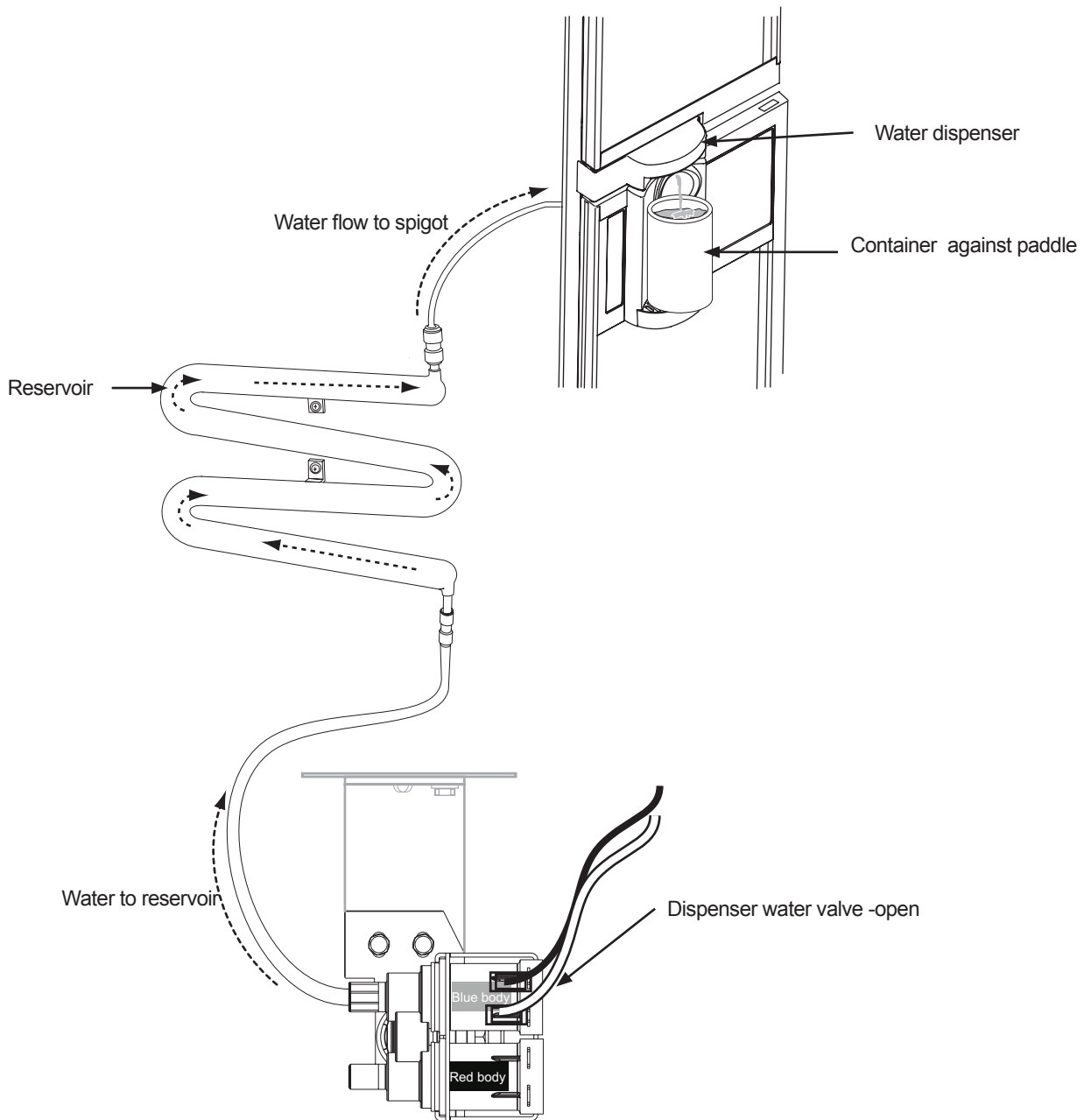


Figure. 10-4. — Water flow through dispenser system.

## Water Valve Replacement

### NOTE

This procedure applies only to the modular ice maker and water dispenser valve assembly, part number 624516.

To remove the water valve assembly proceed as follows and refer to Figure 10-5 and Figure 10-6.

### WARNING

**Unplug the refrigerator AC power cord from the RV receptacle when working on the water valve. Failure to unplug the AC power cord may expose the technician and/ or other personnel to an electrical shock hazard.**

1. Unplug the ice maker AC power cord from RV receptacle.
2. Shut off the water supply to the valve
3. Disconnect the BROWN ① wire and the WHITE ② wire at the ice maker solenoid coil.

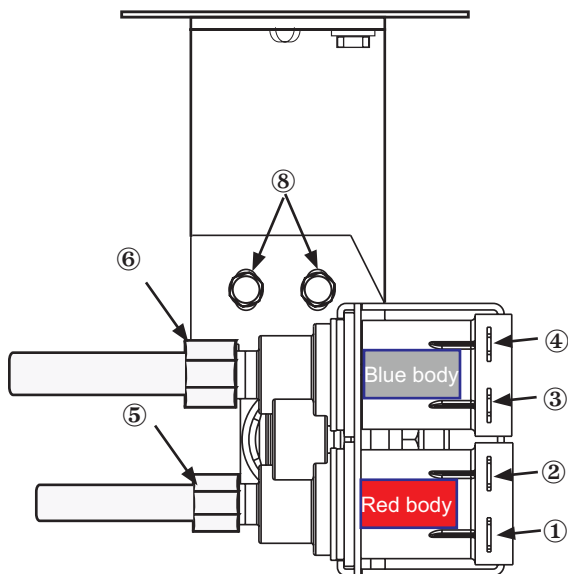


Figure. 10-5. —Water valve connections -Top View.

4. Disconnect the +12 volt DC BLACK ③ wire and the -12 volt DC WHITE ④ wire from the water valve solenoid coil.
5. Disconnect thermostatic switch and the water fill line heater:
  - a. The switch BROWN wire from the heater WHITE wire.
  - b. The remaining thermostatic switch BROWN wire from the +12 volt DC RED wire.
  - c. White heater wire from the -12 volt DC BLACK wire
6. Disconnect the ice maker water fill line ⑤ at the ice maker water valve.
7. Disconnect the water dispenser fill line ⑥ at the water dispenser valve.
8. Disconnect the RV water supply line ⑦ at the water valve.
9. Detach the water valve assembly bracket from the back plate. Retain screws to install replacement valve.
10. Reverse steps 9 through 1 and see Figure 10-5 and Figure 10-6 to install the replacement water valve.

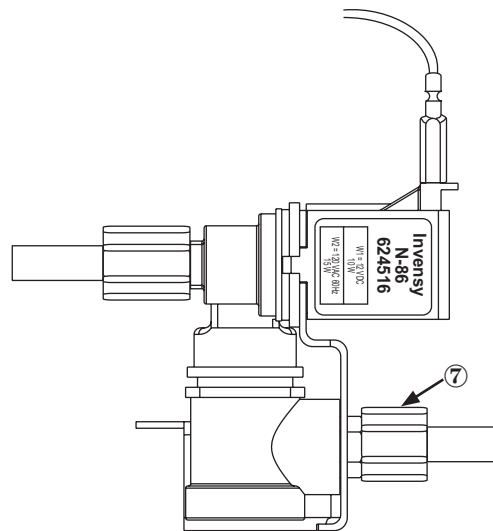


Figure. 10-6. —Water valve inlet connection -Side View.

## Reservoir Replacement

### Tools

#### # 2 Phillips Screwdriver

1. Shut off the water supply to the valve.
2. Place a suitable container under the spigot then operate dispenser to relieve water pressure.
3. Power off the refrigerator.
4. Disconnect the water line at the valve and place the end in suitable container to catch the draining water. See Figure 10-7, ① and ② .
5. Remove the reservoir compartment cover. See Figure 10-8, ③ .
6. Disconnect the dispenser water line at the reservoir. See Figure 10-9 ④ . Allow water to drain into the container (placed in step 4).
7. Disconnect the water fill line from the reservoir. See Figure 10-9 ⑤ .
8. Remove the retaining screws, then pull the reservoir out of the cabinet recess. See Figure 10-9, ⑥ and ⑦
9. Reverse steps 8 through 1 to install replacement reservoir.

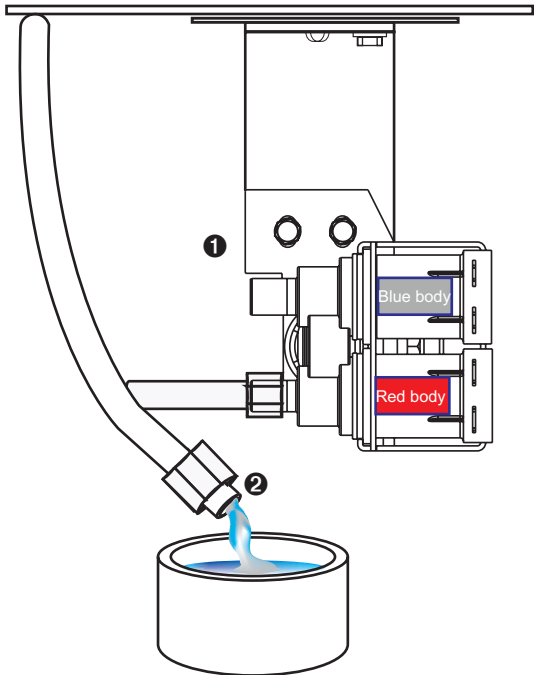


Figure 10-7. —Draining reservoir before removal.

## Dispenser Switch Replacement

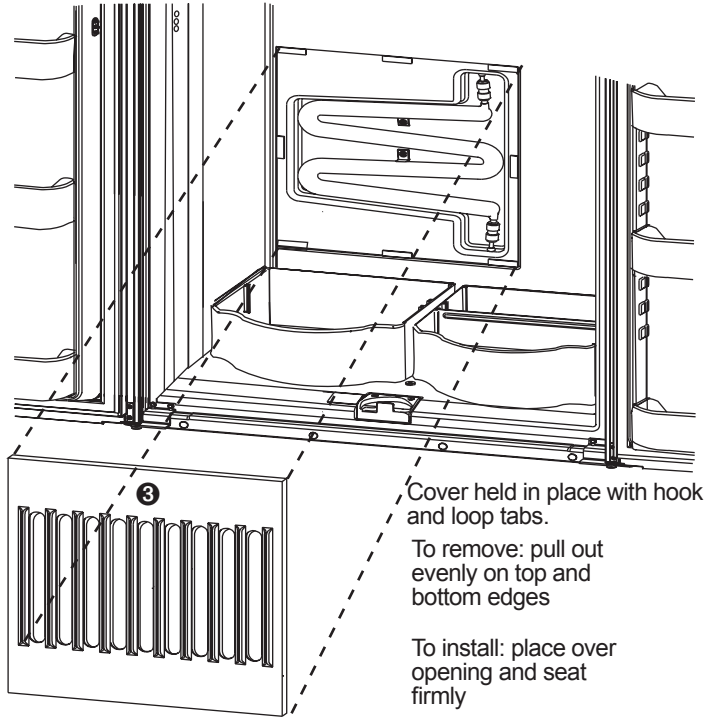


Figure 10-8. —Cover for reservoir recess.

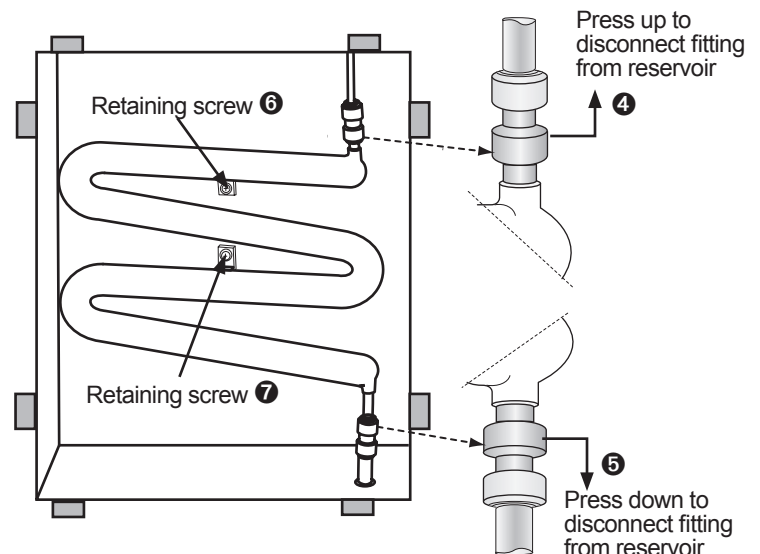


Figure 10-9. —Reservoir fittings and retaining screws.

## LED Circuit Board Replacement

### Tools

#### # 2 Phillips Screwdriver

1. Power off the refrigerator.
2. Remove the left hinge cover.
3. Remove the striker plate.
4. Remove water dispenser cover. See Figure 10-10.
5. Disconnect circuit board from circuit. See Figure 10-11, A
6. Remove circuit board from bracket. See Figure 10-11, B, C and D.
7. Reverse steps 6 through 1 to install replacement LED circuit board.

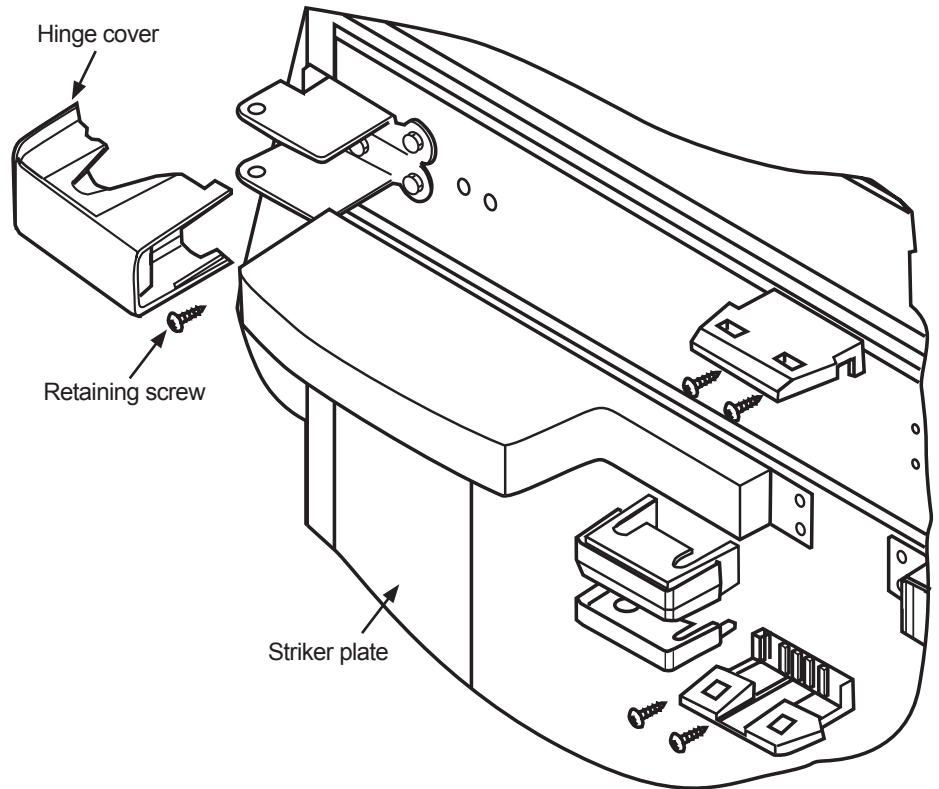


Figure. 10-10. — Cover, water dispenser.

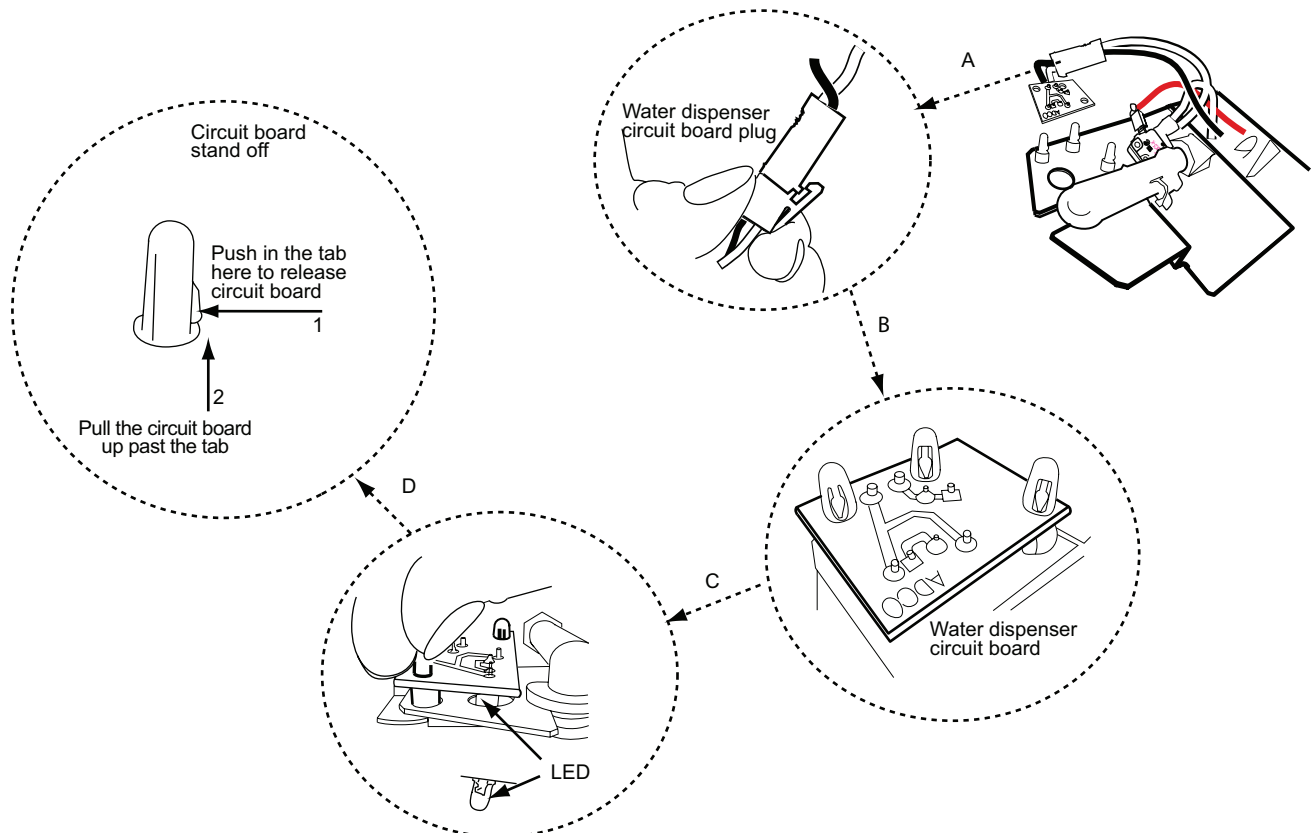


Figure. 10-11. —LED circuit board replacement



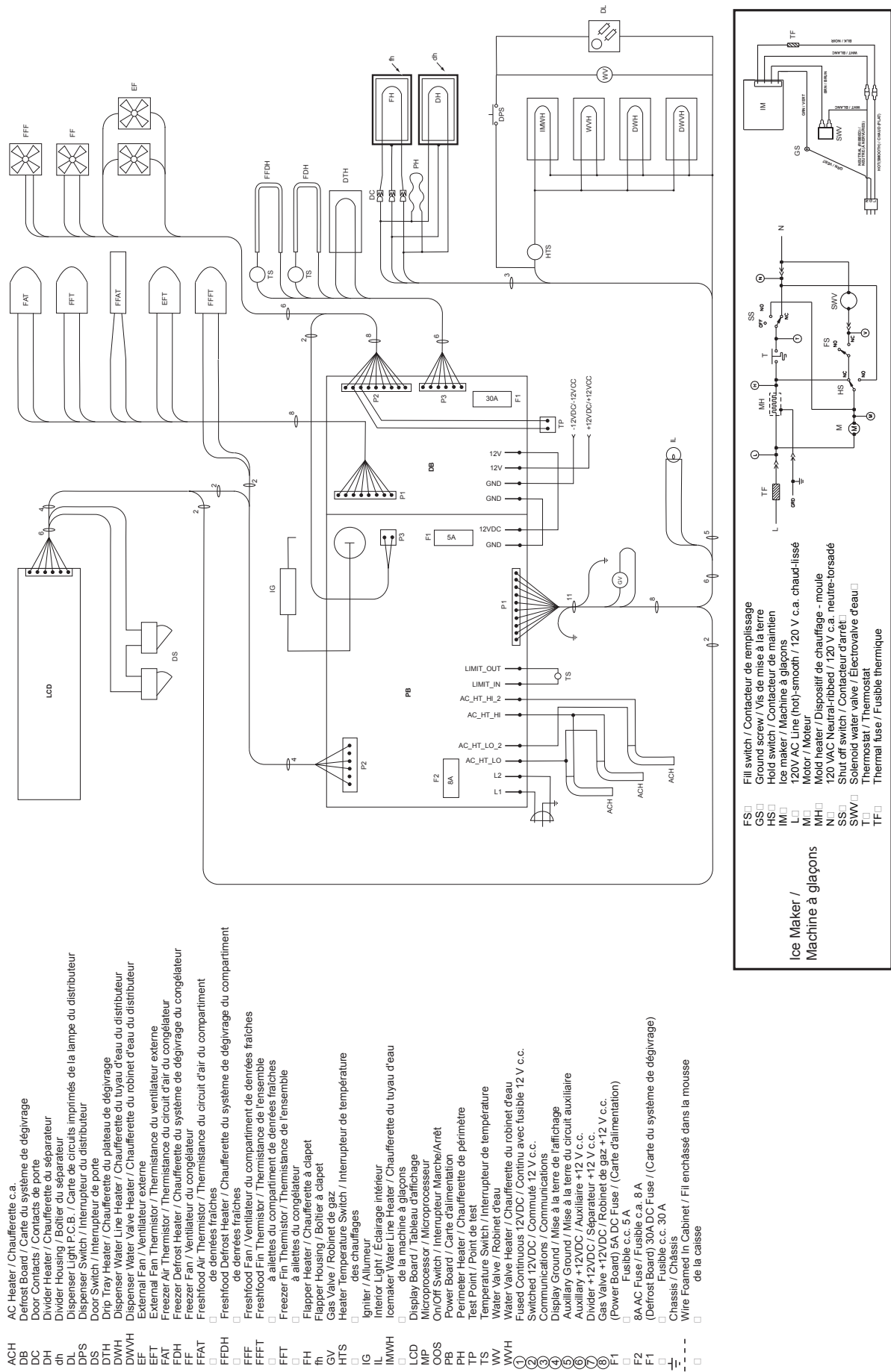
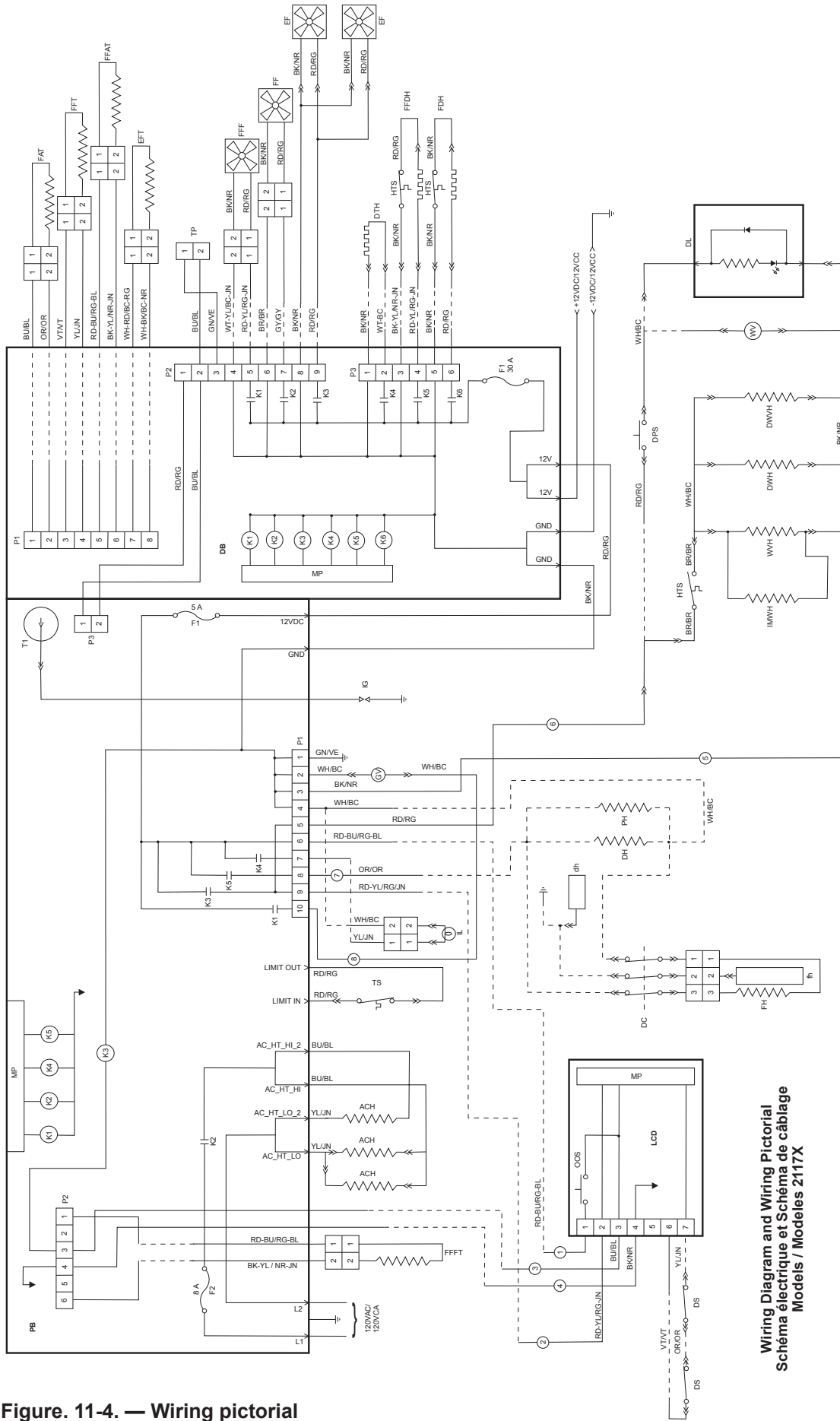


Figure. 11-3. — Wiring pictorial



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Wiring Diagram and Wiring Pictorial  
 Schéma électrique et Schéma de câblage  
 Models / Modèles 2117X

Figure. 11-4. — Wiring pictorial

# Ice Maker Wiring Diagram and Pictorial

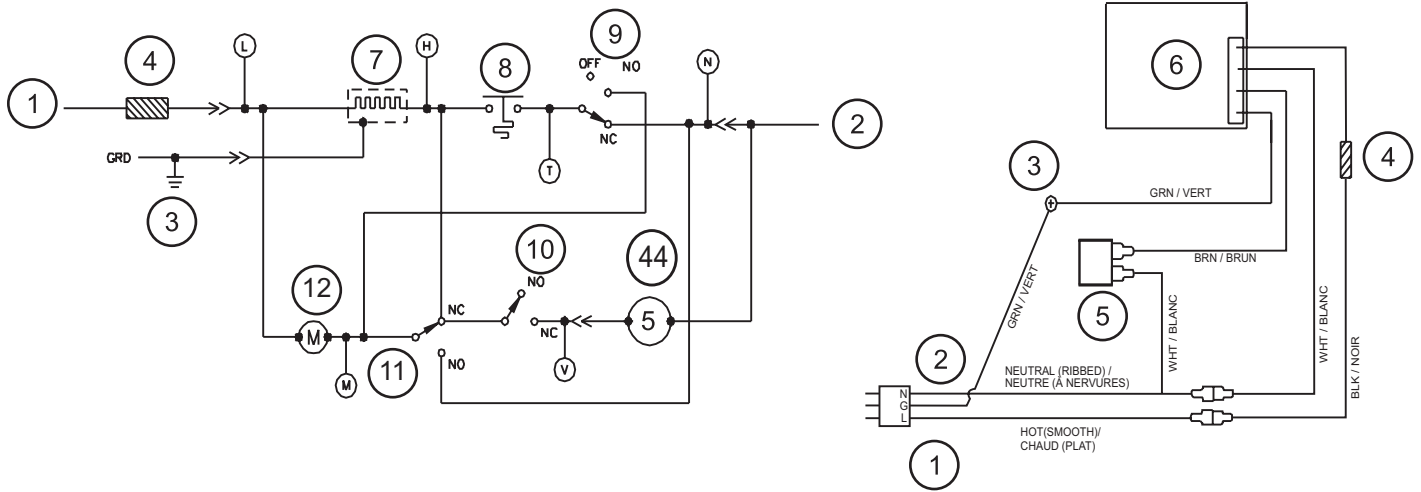
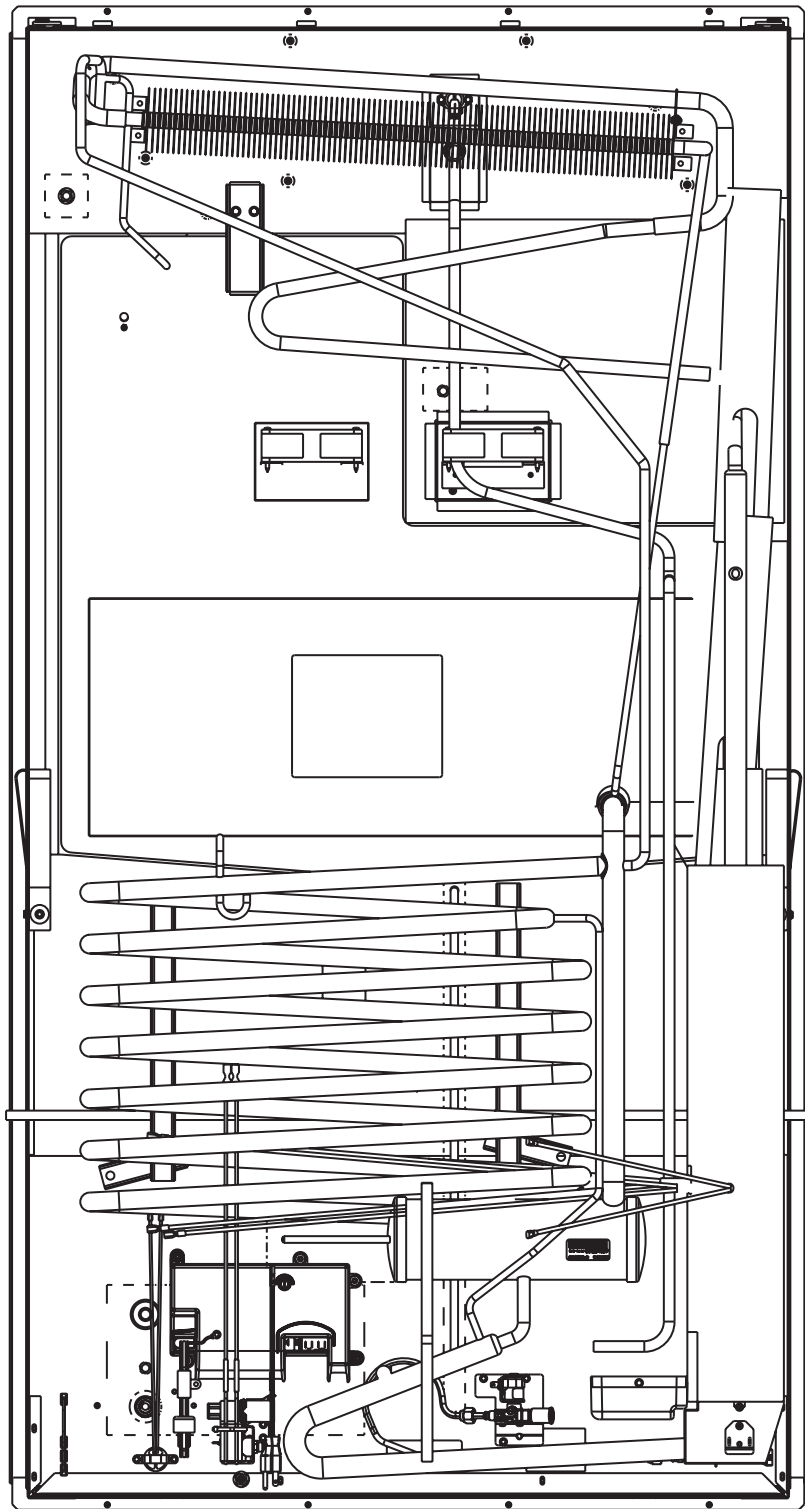


Figure. 11-5. — Ice maker wiring diagram and pictorial

- 1 ..... 120 VAC Hot/Smooth
- 2 ..... 120 VAC Neutral/Smooth
- 3 ..... Ground connection
- 4 ..... Thermal Fuse
- 5 ..... Solenoid Coil/Water valve
- 6 ..... Ice Maker
- 7 ..... Mold Heater
- 8 ..... Mold Thermostat
- 9 ..... ON/OFF Switch
- 10 ..... Fill Switch
- 11 ..... Hold Switch
- 12 ..... Stepper Motor



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