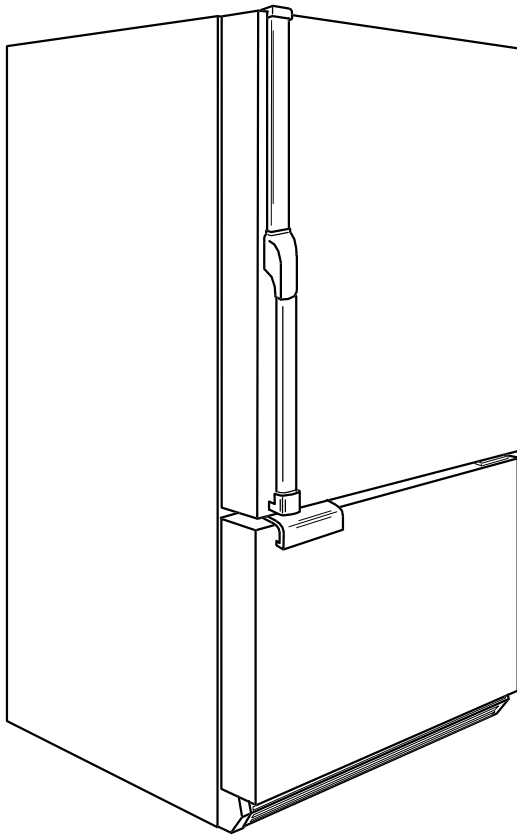




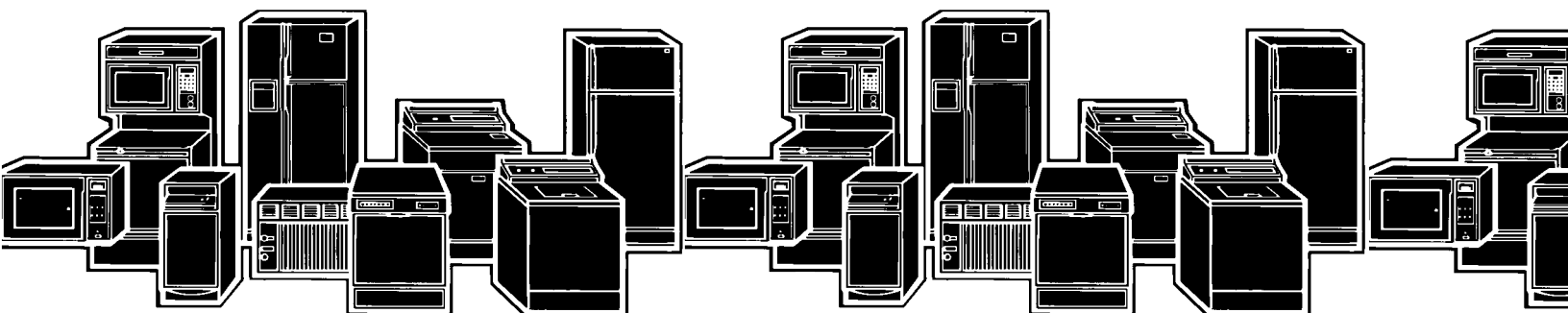
CONSUMER SERVICES TECHNICAL
EDUCATION GROUP PRESENTS

R-86



1997 "F" Model
22 cu. ft.
BOTTOM MOUNT
Refrigerator/Freezers

JOB AID
Part No. 4322228



INTRODUCTION

This Job Aid, *1997 "F" Model, 22 cu. ft. BOTTOM MOUNT REFRIGERATOR/FREEZERS*, (Part No. 4322228) provides specific information for the installation, service and repair of 1997 "F" Model 22 cu. ft. refrigerator/freezers.

1997 "F" Model, 22 cu. ft. BOTTOM MOUNT REFRIGERATOR/FREEZERS has been compiled to provide the most recent information on design, features, troubleshooting, service and repair procedures. Whirlpool required sweep charge procedures are to be strictly adhered to when repairing the sealed system. For a complete explanation of those procedures, refer to the Job Aid, *SWEEP CHARGE PROCEDURES FOR THE 90's*, (Part No. 4321717) and its companion video (Part No. 4321718.)

GOALS AND OBJECTIVES

The goal of this Job Aid is to provide detailed information that will enable the service technician to properly diagnose malfunctions and repair 1997 "F" Model 22 cu. ft. bottom mount refrigerator/freezers.

The objectives of the Job Aid are:

The service technician will -

- Understand proper safety precautions.
- Follow proper refrigerant recovery procedures.
- Successfully troubleshoot and diagnose malfunction.
- Successfully perform necessary repairs.
- Successfully return the refrigerator/freezer to proper operational status.

TO THE INSTRUCTOR/INDEPENDENT STUDENT

At the end of certain sections of this Job Aid you will find a "Confirmation of Learning Exercise." A pencil will be necessary to complete these exercises. Certain exercises may require that service procedures be performed if an appropriate appliance is available.



WHIRLPOOL CORPORATION ASSUMES NO RESPONSIBILITY
FOR ANY REPAIRS MADE ON OUR PRODUCTS BY ANYONE
OTHER THAN AUTHORIZED SERVICE TECHNICIANS.

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SECTION ONE

GENERAL INFORMATION

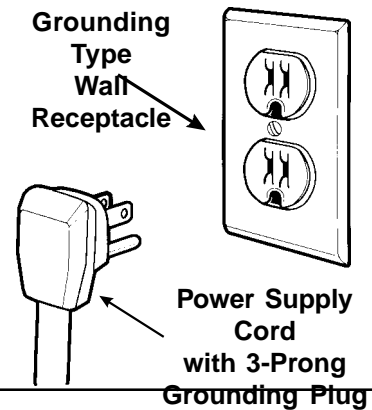
SAFETY

WARNING



To avoid the risk of electrical shock, property damage, personal injury or death:

- The power cord must be plugged into a 3-prong grounding-type wall receptacle, grounded in accordance with the National Electrical Code, ANSI/NFPA 70 - latest edition and local codes and ordinances.
- It is the personal responsibility of the consumer to have a proper 3-prong wall receptacle installed by a qualified electrician.
- **DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE THE POWER CORD GROUNDING PRONG.**
- A separate adequately fused and grounded circuit should be available for this appliance.
- Do not remove any grounding wires from individual components while servicing, unless the component is to be removed and replaced. It is *extremely* important to replace all grounding wires when components are replaced.



WARNING



ELECTRIC SHOCK HAZARD

Disconnect the electrical power before servicing any components .
Failure to do so can result in death or electrical shock.

WARNING



PERSONAL INJURY HAZARD

This unit has several sharp edges in areas where you will be working to remove components for service. Wear protective gloves where sharp edges are present.

R134a REFRIGERANT

Service Information

This product uses R134a refrigerant. This refrigerant requires synthetic Ester oil in the compressor. This cooling system does not tolerate contamination from any of the following:

- Other Refrigerants
- Moisture
- Petroleum-based Lubricants
- Silicone Lubricants
- Cleaning Compounds
- Rust Inhibitors
- Leak Detection Dyes
- Any Other Type of Additive

As a result the following precautions should be observed:

- Use equipment dedicated to R134a sealed system service only.
- Do not leave a replacement compressor open to the atmosphere for more than 10 minutes.
- Always replace the filter-drier when performing any repairs on the sealed system.
- **USE ONLY R134a REFRIGERANT FOR BACKFLUSHING AND SWEEP PROCEDURES.**
- If the rubber plugs on the service replacement compressor appear to have been tampered with or removed, **DO NOT USE THE COMPRESSOR.** Get another one.
- The filter-drier **MUST** be cut from the sealed system. Never unbrazed the filter-drier from system tubing. Applying heat will drive moisture back into the sealed system.

HEALTH AND SAFETY HANDLING	R134a
Allowable Overall Exposure Limit	1,000 ppm
Vapor Exposure to Skin	No Effect
Liquid Exposure to Skin	Can Cause Frostbite
Vapor Exposure to Eyes	Very Slight Irritation
Liquid Exposure to Eyes	Can Cause Frostbite
Above Minimum Exposure Limit	Can Cause Asphyxiation, Tachycardia and Cardiac Arrhythmias.
Safety and Handling	Wear appropriate Skin and Eye protection. Use adequate Ventilation.
Spill Management	Remove or Extinguish Ignition or Combustible Sources. Evacuate or Ventilate Area.
Fire and Explosion Hazards	May Decompose if contact with Flames and Heating elements. Container May Explode IF Heated Due to Pressure Rise. Combustion Products are Toxic.
Storage Conditions	The Procedures / Rules for R12 also Apply to R134a.
Disposal Procedure	Reclaim

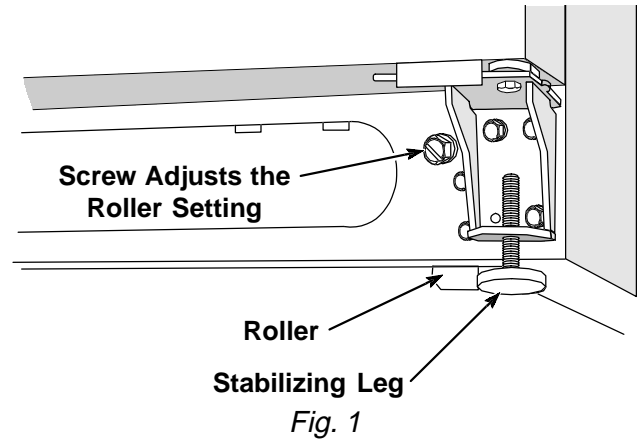
**SEE SWEEP CHARGE PROCEDURES FOR THE 90's,
Part No. 4321717 FOR COMPLETE INSTRUCTION ON
SERVICING THE SEALED SYSTEM.**

INSTALLATION CONSIDERATIONS

Leveling the Unit and Aligning the Doors

Leveling the Refrigerator

1. Remove the toe grille by pulling forward to release it from the metal clips at both ends.
2. Remove the bottom hinge cover by prying the cover away from the hinge bracket. (Fig. 1)
3.
 - a. If the floor IS level side to side, level the front of the cabinet by turning the leveling screw clockwise until the front of refrigerator is 1/4 inch (6.4 millimeters) higher than the back, or 1/2 bubble using a level. Make sure the front of the cabinet is level side to side.
 - b. If the floor is NOT level side to side, use shims under the rear roller(s) to level the back of the cabinet side to side first, then level the front of the cabinet by turning the leveling screw clockwise until the front of refrigerator is 1/4 inch (6.4 millimeters) higher than the back, or 1/2 bubble using a level. Make sure the front of the cabinet is level side to side.
4. Open and close both doors completely to assure proper alignment.
5. Rotate stabilizing leg until they are firmly in place against the floor.
6. Replace the bottom hinge cover by snapping it onto the hinge bracket.
7. Replace the toe grille by inserting the metal clips in the slots in the back of the grille and snapping it into place. Top of the toe grille is indicated on the back.



Ice Maker Installation

Ice Maker Kit AMKIT97 is used only on the "F" model 22 cu. ft. Bottom Mount Refrigerator/Freezer. The AMKIT97 features a wiring harness, shut-off arm and fill valve specifically designed for this unit. The ice bin comes standard in the refrigerator/freezer, not as part of the AMKIT97 ice maker kit.

Installation of this kit requires the use of 1/4" copper tubing between the household water supply and the single solenoid water valve mounted on the base rail at the rear of the cabinet.

Installation Tips:

1. Allow 12 hours after installation before expecting the first harvest of ice. Time required depends on the freezer temperature and the amount of food in the freezer and refrigerator compartments.
2. The storage bin supplied with the product will hold approximately eight (8) pounds of ice cubes.
3. The storage bin fills in three to four days depending on the frequency of use. Two to four pounds of ice will be made in a 24-hour period with a 0° to 2° F freezer food temperature.
4. To temporarily meet demands for increased ice production, turn the freezer control to a colder setting. Return the freezer control to the normal setting as soon as possible.

SECTION ONE

CONFIRMATION OF LEARNING EXERCISES

In the blank to the left of the statement, place a **T** if the statement is **TRUE** or an **F** if the statement is **FALSE**.

- ___ 1. It is permitted to remove the round grounding prong on a three-prong plug if the wall receptacle is not a three-prong grounding type.
- ___ 2. It is permitted to use leak detection dyes to determine the location of leaks in an R134a sealed system.
- ___ 3. The front rollers can be adjusted to level the refrigerator/freezer by turning a hex-head screw located behind the toe grille at the left and right sides of the cabinet.
- ___ 4. The ice storage bin is provided with the refrigerator/freezer, not the Ice Maker Kit.
- ___ 5. The AMKIT97 is the only modular ice maker kit used on this unit.

SECTION TWO

THEORY OF OPERATION

TEMPERATURE CONTROL

Refrigerant Flow

Freezer temperature is regulated by an air sensing thermostat inside the control box located at the top front of the freezer compartment. This thermostat actuates the compressor to circulate refrigerant through the sealed system. (Fig. 2) The thermostat should be set to maintain 0° - 2°F freezer food temperature.

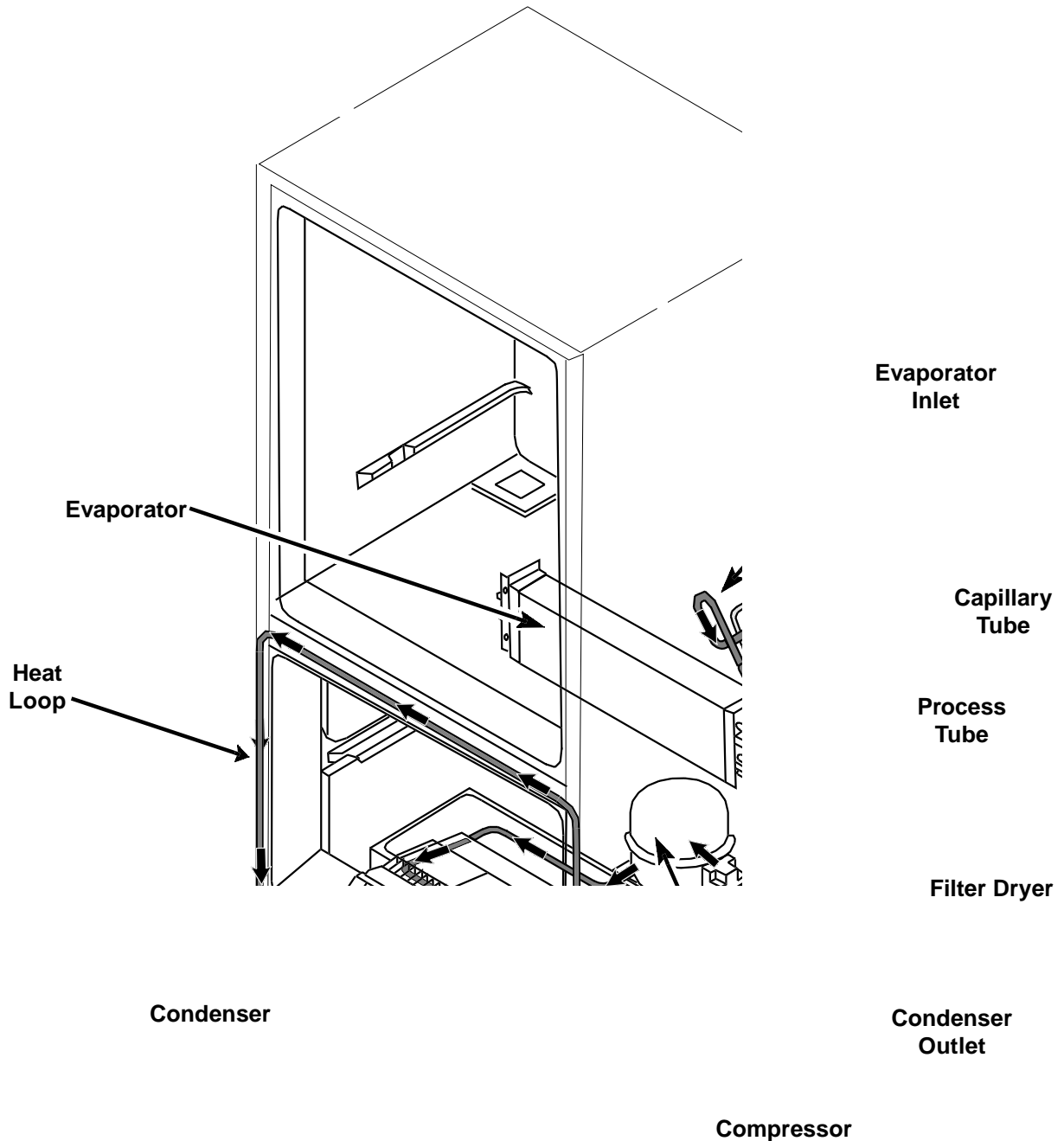


Fig. 2

Air Flow

Refrigerator temperature is regulated by an automatic air damper control. The air damper control is a thermostat that manually actuates the air damper door. This control governs the amount of refrigerated air entering the refrigerator compartment. (Fig. 3) The control should be set to maintain 28°F to 40°F fresh food temperature.

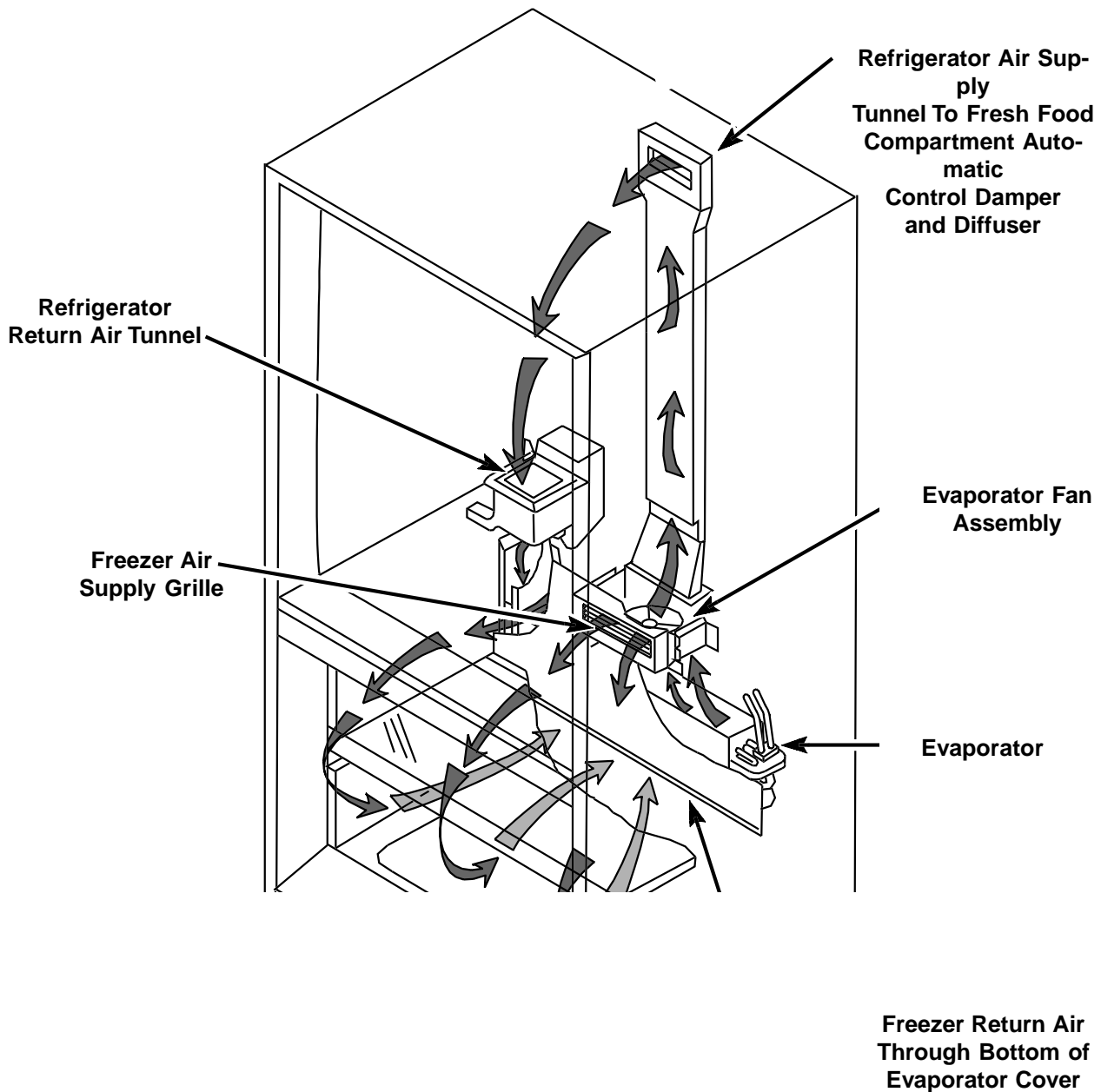
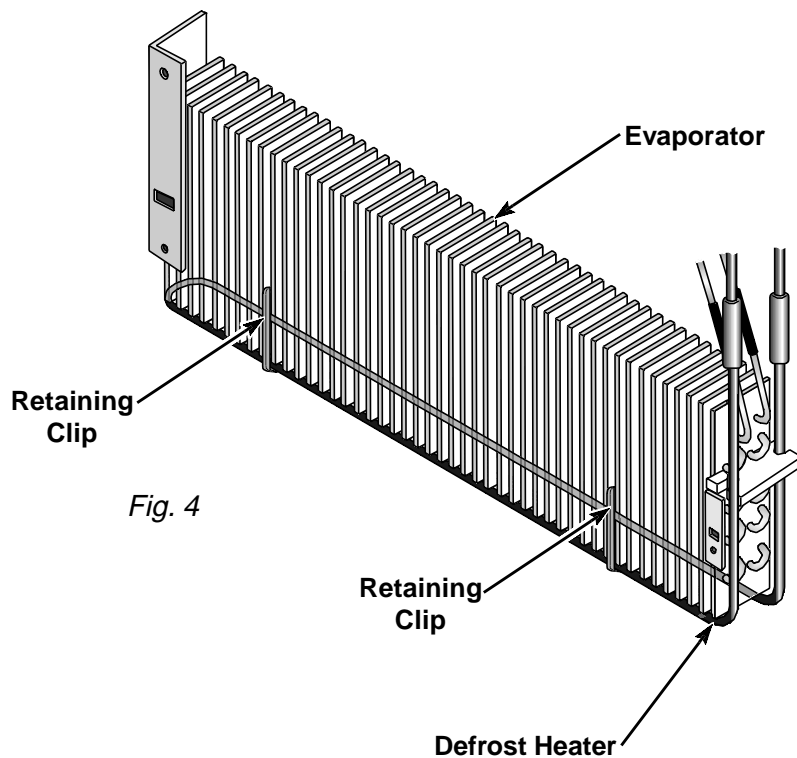


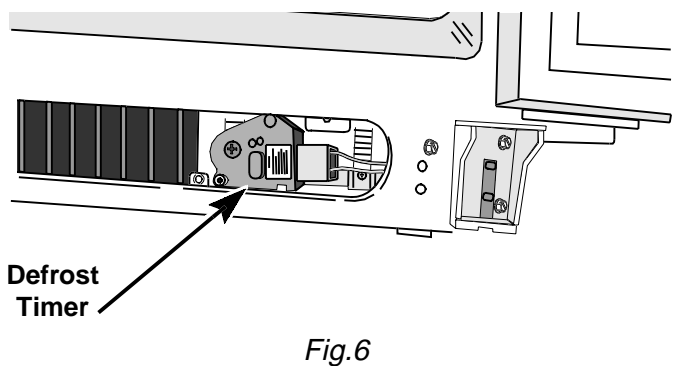
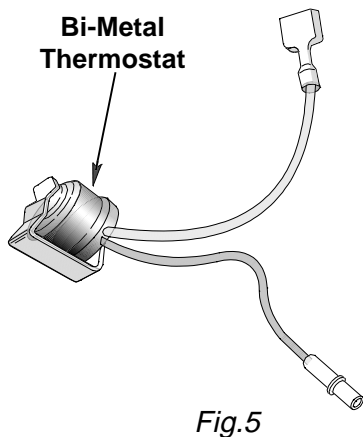
Fig. 3

Defrost System

Automatic defrost every eight hours of compressor run time is accomplished by a radiant electric heater suspended beneath the evaporator. (Fig. 4)



The defrost timer is located in a box at the right side of the cabinet behind the toe grille. (Fig. 5) The defrost timer actuates the defrost heater through the bi-metal thermostat. (Fig. 6)



The bi-metal thermostat is attached to the outlet side of the evaporator coil tubing and opens at 48°F to terminate the defrost heating. After 33 minutes from the start of defrost cycle, the timer restores operation to the compressor circuit. The bi-metal thermostat contacts close at 13°F, enabling the defrost heater to operate during the next defrost cycle. The defrost heater is suspended on the right side and across the bottom of the evaporator. The defrost heater also provides warming to the defrost drain area to keep it clear during the defrost cycle.

SECTION TWO

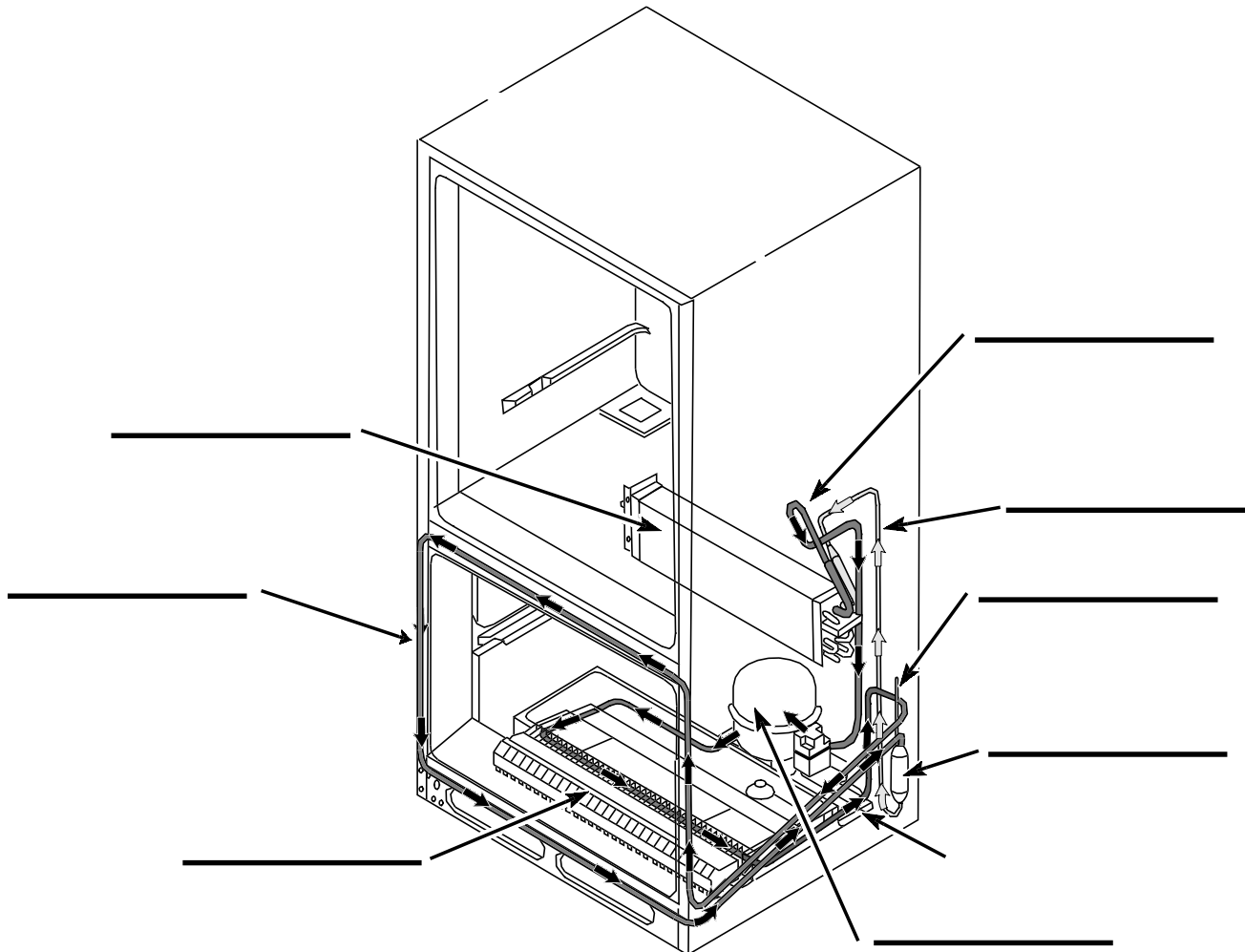
CONFIRMATION OF LEARNING

EXERCISES

In the blank to the left of the statement, place a **T** if the statement is **TRUE** or an **F** if the statement is **FALSE**.

- ___ 1. This refrigerator/freezer is provided with a refrigerant heat loop that is foamed in place around the freezer compartment door.
- ___ 2. Air flow from the freezer compartment to the refrigerator compartment is regulated through a motorized air damper door.
- ___ 3. The defrost timer is located inside the freezer compartment control box.
- ___ 4. The defrost cycle is designed to occur after eight hours of compressor run-time.
- ___ 5. The defrost bi-metal thermostat is designed to open at 48°F and close at 13°F.

Label all of the components in the illustration below.



SECTION THREE COMPONENT ACCESS

Accessing the components in the 22 cu. ft. Bottom Mount Refrigerator/Freezer is generally quite similar to other typical Whirlpool units.

Accessing the Component Compartment

Components located in the component compartment are assembled on a slide out tray at the bottom of the unit. The compressor, filter-drier, condenser, condenser fan and water supply valve are located in this area. To gain access to these components the compartment, heat exchanger and condenser fan covers must be removed and the tray slid out.

1. Remove the six (6) hex-head screws securing the condenser fan cover to the cabinet. (Fig. 7-a)
2. Remove the four (4) screws securing the heat exchanger cover to the back of the unit. (Fig. 7-b)
3. Remove the five (5) screws securing the component compartment cover to the cabinet. (Fig. 7-c)
4. Remove the two (2) screws securing the water supply valve to the base rail. (Fig. 8) **NOTE:** If a water supply valve is mounted on the bracket, it is not necessary to disconnect the copper supply tubing or the plastic supply tubing.

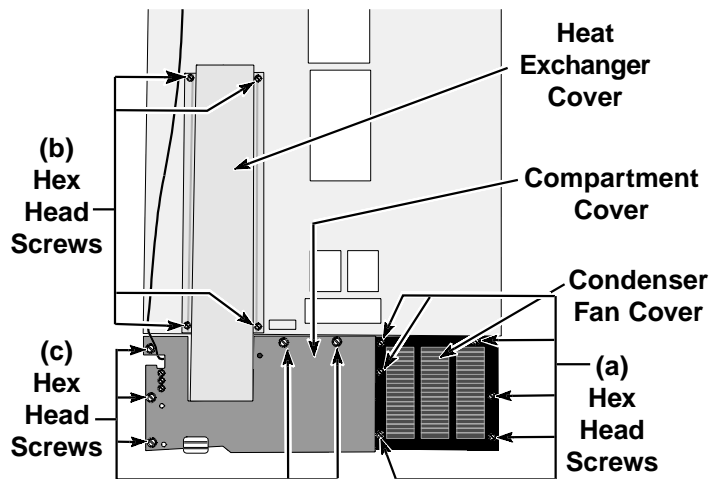


Fig. 7

4. Push the filter-drier out of its retaining bracket and gently move it out of the way. **NOTE:** Take care not to kink any of the tubing connected to the filter-drier.
5. Remove the two (2) compressor mounting bolts securing the slide out tray to the lower rear cabinet rail. (Fig. 8)
6. Carefully slide the tray out from the unit. (Fig. 8) **NOTE:** The tray can only slide out a few inches without kinking the tubing. To slide the tray completely out, the sealed system must be purged and the tubing disconnected.

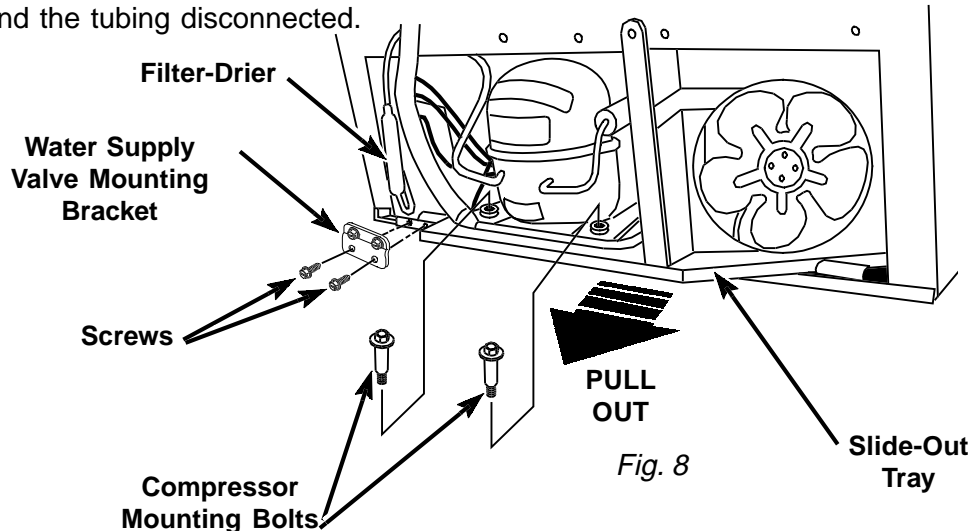


Fig. 8

Accessing the Heat Exchanger and Wiring Harness

The heat exchanger and wiring harness are located under the metal cover on the back of the cabinet. Remove the four (4) screws securing the cover to the back of the cabinet. (Fig. 9 & 10)

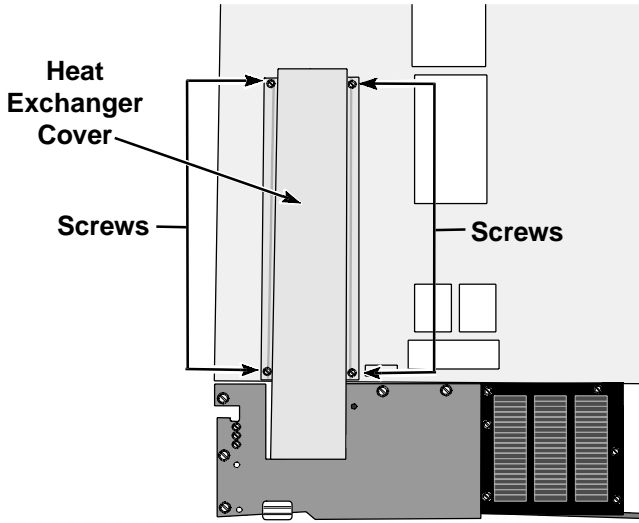


Fig. 9

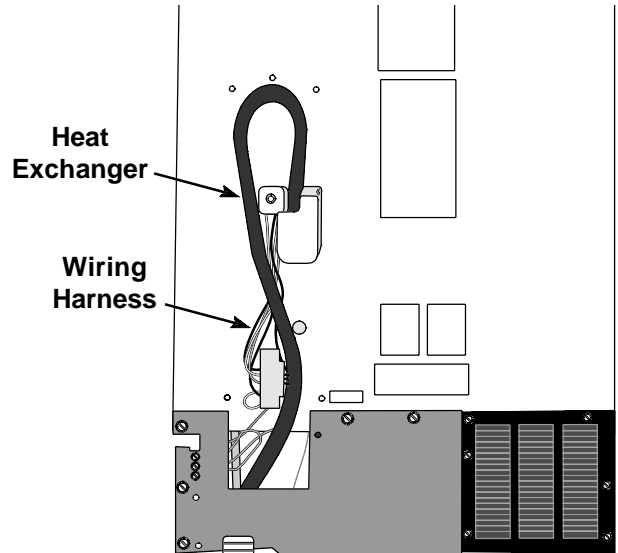


Fig. 10

Accessing Component in the Freezer Section

The evaporator, automatic ice maker, and other associated components are all accessible inside the freezer section.

Removing the Automatic Ice Maker

1. Remove the hex-head screw securing the bottom bracket to the freezer liner.
2. Loosen the two (2) screws in the slotted brackets at the top of the automatic ice maker three or four turns. (These screws must be removed if the evaporator cover is to be removed.) (Fig. 11)
3. Slide the automatic ice maker up and off the screws.
4. Disconnect the automatic ice maker wiring harness connector and remove the automatic ice maker from the unit.
5. Remove the extension from the water inlet tube.

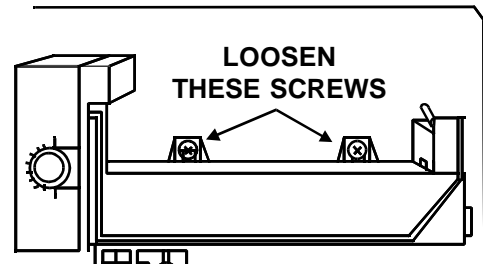


Fig. 11

Servicing the Evaporator and Other Related Components

The evaporator, evaporator fan, defrost bi-metal and defrost heater are located behind the evaporator cover.

1. Remove the automatic ice maker, if present. (See procedure above.)
2. Remove the eight (8) screws securing the evaporator cover, ice maker wiring harness cover and air diffuser in the freezer section. (Fig. 12)

3. Pull the evaporator cover up and out of the unit.

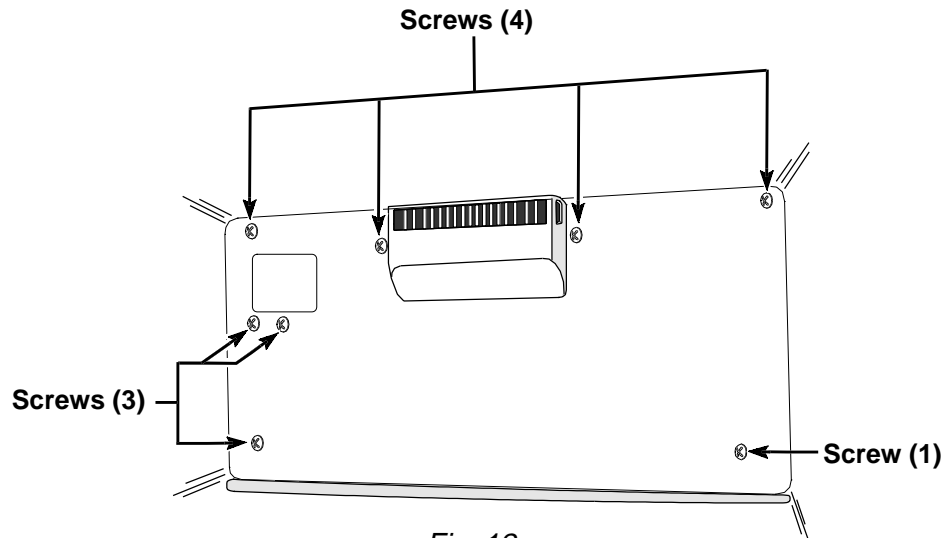


Fig. 12

Removing the Evaporator Fan Motor

The evaporator fan motor is mounted on a bracket that is attached to a shroud mounted to the back wall of the freezer section. (Fig. 13)

1. Removing the two (2) hex-head screws that secure the fan motor bracket to the shroud.
2. Disconnect the wiring harness connectors from the evaporator fan motor terminals.

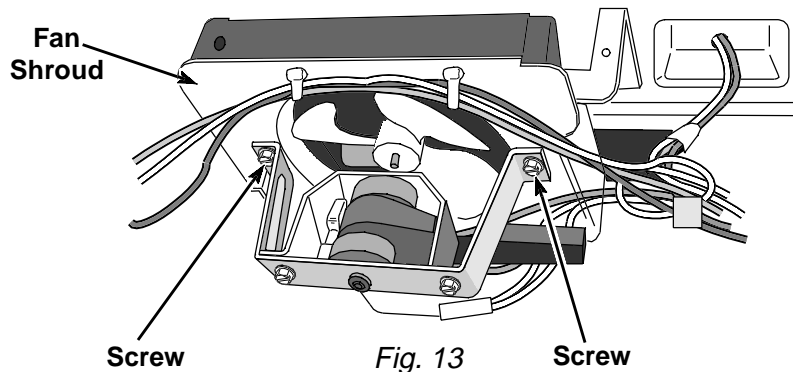


Fig. 13

Servicing the Evaporator, Defrost Bi-metal and Defrost Heater

The evaporator, defrost bi-metal (Fig. 14) and defrost heater (Fig. 15) are serviceable parts on these units.

Removing the Defrost Bimetal

1. Disconnect the wiring harness connectors from the defrost bi-metal leads.
2. Slide the bi-metal mounting clip from the outlet tubing of the evaporator.

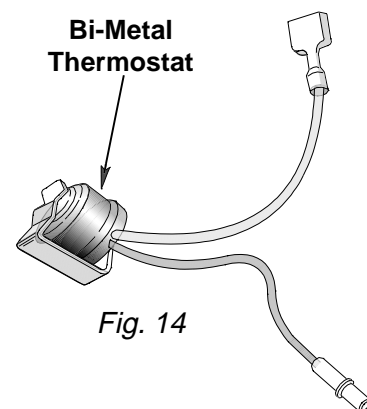
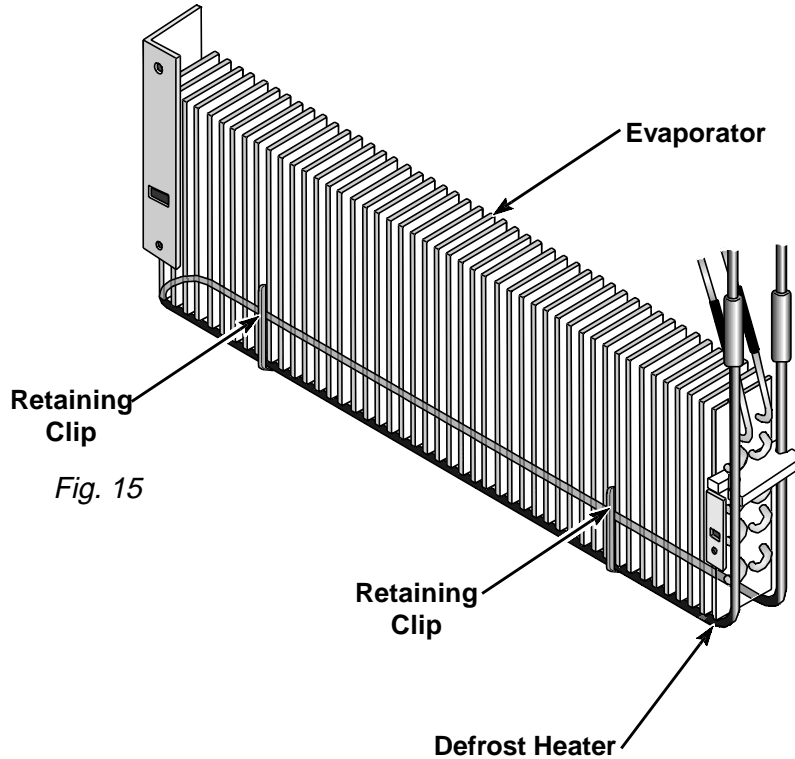


Fig. 14

Removing the Defrost Heater Element

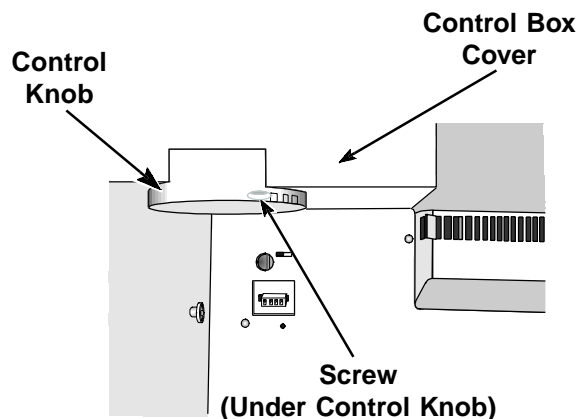
1. Disconnect the wiring harness connectors from the defrost heater element leads.
2. Carefully unsnap the evaporator tubing from the four (4) plastic clips that secure the evaporator to the heat shield at the back of the freezer compartment and remove the Styrofoam blocks on the right side of the evaporator. Do not break this block. It will need to be reinstalled when replacing the evaporator in the freezer section.
3. Tip the bottom of the evaporator up and, with a pair of needlenose pliers, remove the two clips that secure the heater element to the bottom of the evaporator. (Fig. 15) This will free the heater element from the evaporator.



Removing the Thermostat

The thermostat that controls the refrigeration system is located on the ceiling of the freezer compartment.

1. Carefully pull the control knob from the thermostat. (Fig. 16)
2. Remove the one (1) screw securing the control box cover to the control box assembly and remove the control box cover.
3. Remove the two (2) screw securing the thermostat to the mounting bracket and the one (1) screw securing the ground wire to the mounting bracket. (Fig. 17)
4. Disconnect the wiring leads from the thermostat terminals.
5. The thermostat can now be removed from the unit.



NOTE: The wire leads for the Return Air Heater and the Auxilliary Return Air Heater elements are located inside the freezer thermostat control box. The wire leads for the "regular" element are one (1) red and one (1) white. The wire leads for the auxilliary element are both black.

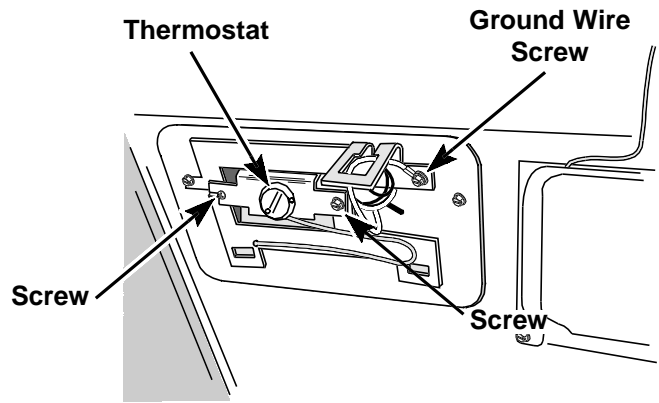


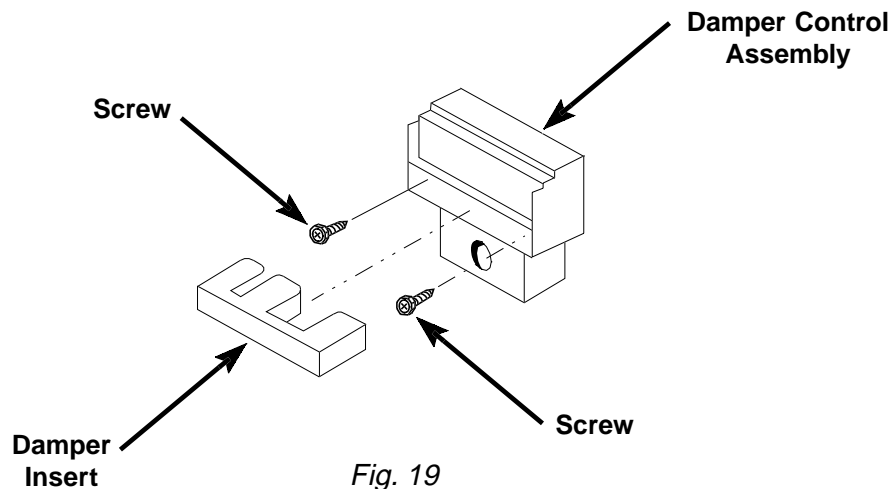
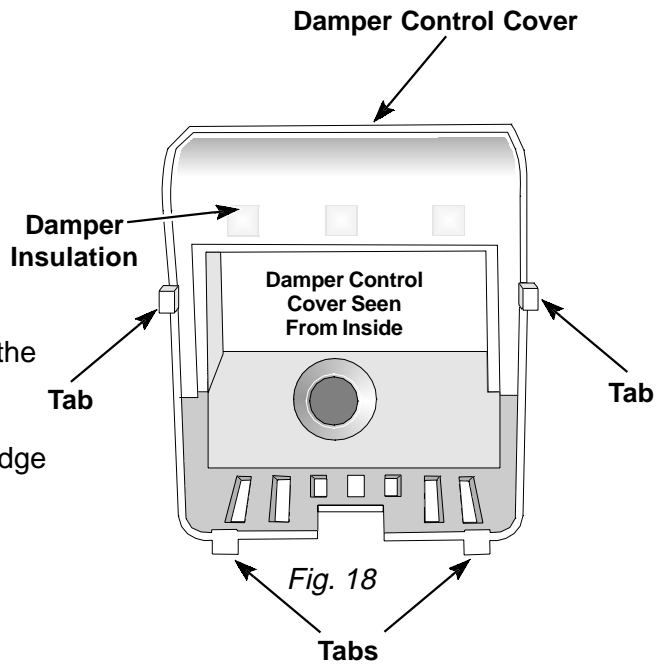
Fig. 17

Accessing Component in the Refrigerator Section

Removing the Cold Air Inlet Damper

The cold air inlet control damper is located at the top center of the refrigerator section. This assembly contains a mechanical thermostat that operates a dampening door to regulate the flow of cold air into the refrigerator compartment.

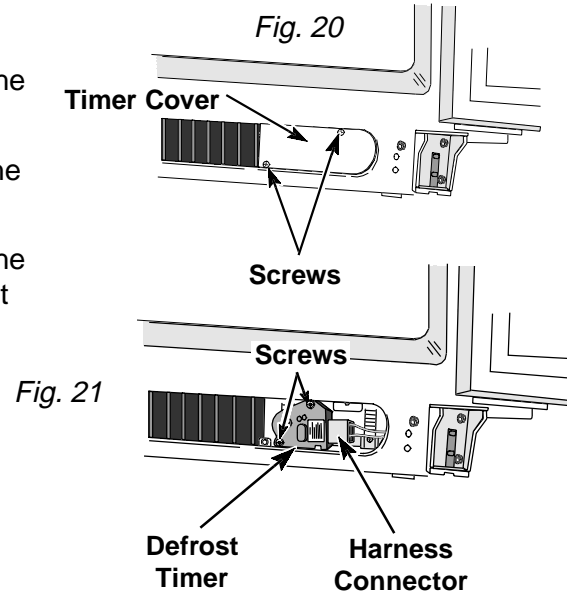
1. Remove the damper control knob.
2. Press in on the two (2) side tabs securing the control cover to the back panel of the refrigerator section. (Fig. 18) Then, tip the control cover forward and pull it up to dislodge the two (2) tabs at the bottom.
3. Remove the Styrofoam insert and the two (2) screws securing the damper control assembly to the back panel of the refrigerator compartment. (Fig. 19)



Accessing the Defrost Timer

The defrost timer is mounted to the timer cover box at the left side of the unit behind the toe grille.

1. Remove the toe grille.
2. Remove the two (2) hex head screws securing the cover of the defrost timer box. (Fig. 20)
3. Disconnect the wiring harness connector from the defrost timer terminals. (Fig. 21)
4. Remove the two (2) hex head screws securing the defrost timer to the cover and remove the defrost timer. (Fig. 21)



SECTION THREE CONFIRMATION OF LEARNING EXERCISES

In the blank to the left of the statement, place a **T** if the statement is **TRUE** or an **F** if the statement is **FALSE**.

- ___ 1. The thermostat to control temperature in the freezer section is located in the refrigerator compartment.
- ___ 2. The heat exchanger and main wiring harness is accessible behind a panel attached to the back of the cabinet.
- ___ 3. The defrost timer is located in a box behind the toe grille at the bottom of the unit.
- ___ 4. The automatic damper control that regulates air flow into the refrigerator compartment must be disconnected from the wiring harness when it is to be replaced.
- ___ 5. The defrost bi-metal thermostat is attached to the back wall of the freezer compartment.

If a 1997 Model F 22 cu. ft. Bottom-Mount refrigerator/freezer is available, perform the following service procedures.

- A. Perform all the steps necessary to pull the component compartment slide out tray out a few inches to access the compressor and condenser fan.
- B. Perform all steps necessary to remove the defrost heater element from the evaporator.
- C. Perform all steps necessary to remove the temperature control thermostat from the control box.
- D. Perform all steps necessary to remove the damper door assembly and damper control thermostat.

SECTION FOUR

TROUBLESHOOTING AND DIAGNOSTICS

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE
1. Operating Sound Level	A. See Owners manual for explanation of normal operating sounds.
2. Freezer Warm - Compressor Off	A. Temperature Control defective or setting too warm B. Defrost control stalled in defrost mode (defective) C. Compressor defective D. Overload and/or relay defective
3. Too Cold in Refrigerator	A. Refrigerator damper control knob set too cold B. Refrigerator damper control not closing C. Freezer temperature control knob set too cold D. Restricted condenser air E. Refrigerant shortage or restriction F. Overcharge
4. Freezer Warm - Compressor Cuts Off on Overload	A. Heavy usage and/or high ambient B. Restricted condenser air C. Compressor machine compartment back cover is missing D. Cabinet elevated off floor E. Condenser fan motor inoperative F. Condenser fan blade loose or missing G. Improper voltage H. Relay or overload faulty I. Compressor motor winding open J. Non-condensables in system K. Overcharge
5. Freezer Too Warm - Compressor Operating	A. Control knob set too warm B. Control out of calibration C. Restricted condenser air D. Inoperative condenser fan motor E. Door left open F. Heavy usage G. Freezer fan motor inoperative H. Defrost thermostat open I. Defrost heater open J. Freezer or condenser fan blade loose or off K. Evaporator heavily frosted L. Defrost control stuck in compressor run mode M. Drain plugged N. Loss of refrigerant or restriction O. Inefficient compressor
6. Too Warm in Refrigerator	A. Refrigerator setting too warm B. Damper doesn't open C. Freezer control set too warm D. Supply air duct blocked E. Return air duct blocked F. Heavy usage or high ambient temperature
7. Freezer Too Cold	A. Freezer temperature control knob set too cold B. Freezer temperature control out of calibration
8. Long off Cycle - Too Warm at Start	A. Low ambient temperature B. Freezer temperature control knob set too warm C. Freezer temperature control out of calibration

PROBLEM	POSSIBLE CAUSE
9. Short off Cycle	<ul style="list-style-type: none"> A. High ambient and/or heavy usage B. Freezer control knob set too cold C. Freezer control out of calibration D. Light on constantly E. Poor door seal
10. Long or Continuous Operation	<ul style="list-style-type: none"> A. Heavy Usage and/or high ambient B. Inadequate condenser air flow C. Freezer temperature set too cold D. Freezer temperature control out of calibration E. Freezer temperature control relay frozen closed F. Loss of refrigerant or restriction
11. Short Run Cycle	<ul style="list-style-type: none"> A. Low ambient and/or light usage B. Freezer temperature control setting too warm or control out of calibration
12. Condensation on Cabinet Exterior	<ul style="list-style-type: none"> A. High humidity installation (design accepts bead of water on exterior of cabinet after 4 hours with a 0° to 2°F. (-18° to -17°C.) freezer food temperature and 38° to 40°F. (3°C to 4°C) refrigerator food temperature in 84% R.H. conditions (See example of typical sweat pattern under above conditions on <i>page 19.</i>) B. Freezer control set too cold C. Freezer control out of calibration D. Poor door gasket seal E. Insulation void
13. No Ice/Low Ice Production	<ul style="list-style-type: none"> A. Freezer not cold enough B. Broken Locking Tab on Vertical Cam C. Module Shut-Off Switch and Contacts Shorted and Burned D. Motor Stalled or Stripped E. Check Ejector Position F. Bail Shut-Off Arm In Vacation Mode - No Ice G. Bail Shut-Off Arm Binds When Raised or Lowered H. Little/No Alumilastic on Thermometer I. Housing to Mold Screws Not Seated J. Heater Not Staked In Mold K. Wrong Heater Temperature L. Broken S/O Lever (Miscalibrated Shut-Off Switch)
14. Over Production of Ice	<ul style="list-style-type: none"> A. Bail Shut-Off Arm Not in Actuator B. Misformed Bail Shut-Off Arm C. Shut-Off Lever Broken or Bypassing Vertical Cam D. Broken Module Actuator
15. Hollow Ice Cubes	<ul style="list-style-type: none"> A. Water Fill Volume Too Low B. Improper Freezer Air-Flow C. Thermostat Out of Calibration
16. Flooding or Ice Slabs in Bucket or Freezer	<ul style="list-style-type: none"> A. Thermostat Out of Calibration B. Jammed Cube Stalled in Water-Fill Cycle C. Leaky Water Valve D. Fill Volume of Water Excessive E. Motor Stalled in Water-Fill Cycle (12:00 Ejector Position) F. Contaminated Module G. Refrigerator or Ice Maker Not Level H. Excessive Water Pressure I. Module Shut-Off Switch and Contacts Shorted and Burned J. Broken Locking Tab on Vertical Cam (Stalled in Water-fill) K. Fill-Tube Not Properly Located in Fill Cup L. Fill Cup Water Opening Flashed Over/Plugged M. Cubes Fell Over Back of Ice Maker, Melting Into Freezer

DIAGNOSTIC INFORMATION

! WARNING



ELECTRIC SHOCK HAZARD

Disconnect the electrical power before servicing any components. Failure to do so can result in death or electrical shock.

PERFORMANCE DATE *(NORMAL OPERATING CONDITIONS)

AMB	WATTS	SYSTEM PRESSURE (PSIG)	
		HIGH SIDE	LOW SIDE
70°	160±20	85±20	0
90°	165±20	135±20	1
110°	185±20	180±20	2

*Normal operating conditions are viewed when air and temperature controls are at mid-setting, freezer section temperature is between 0°- 5°F and unit is cycling.

NOTE: Watt and pressure readings will vary and are influenced by existing condition of the appliance, such as iced-up evaporator, condition of the condenser, defrost cycle, pull-down time and customer use.

SERVICE INFORMATION

1. Do not interchange the compressor suction and process stubs.
2. Refrigerant charge must be applied to high side only.
3. Ice Maker and Water Valve not original equipment on all models.
4. **CAUTION:** Ice Maker cycle **MUST** be initiated electrically. Do not try to manually start cycle.
5. Service defrost bi-metal (55°F) open.
6. Defrost timer may contain a capacitor in series with motor. Do not continuity test when checking for failed timer motor. Instead, energize timer and listen for gear movement.
7. Part number can be found on component.

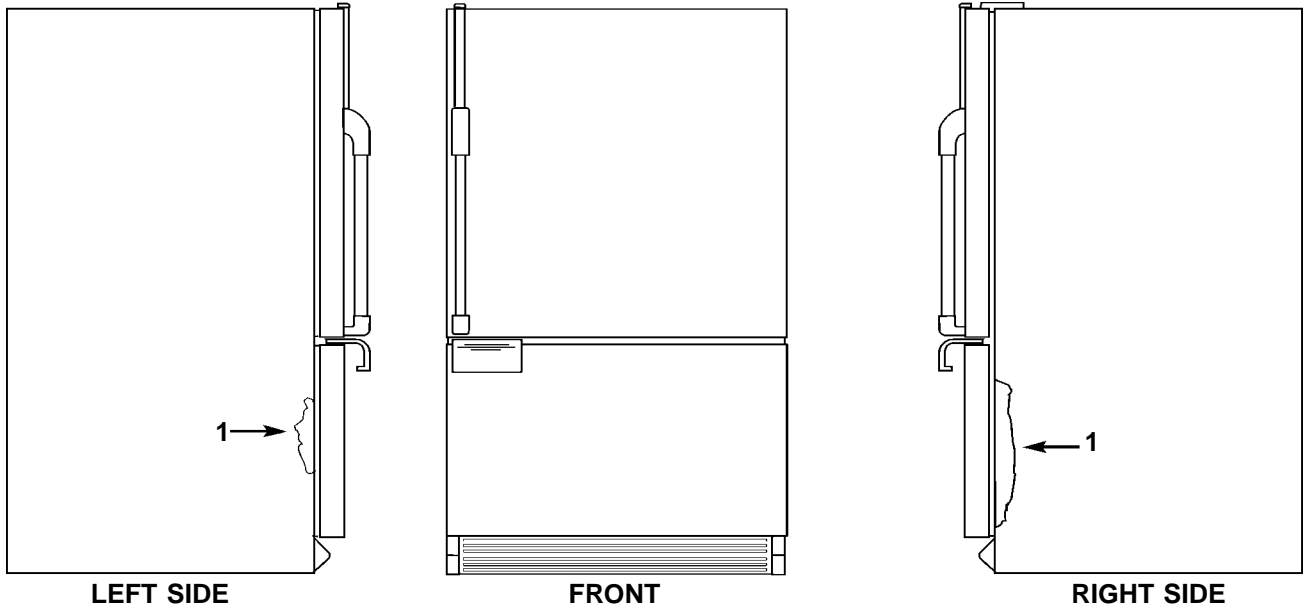
GENERAL COMPONENT INFORMATION BE SURE AND USE CORRECT REPLACEMENT PARTS

120VAC COMPONENT	WATTAGE @120VAC	OHMS RESISTANCE	TECUMSEH TP1380Y
COMPRESSOR	--	--	12049703
RUN WINDING	--	2.6	--
START WINDING	--	4.35	--
PTC RELAY	--	--	10097202
OVERLOAD	--	--	10377015
RUN CAPACITOR	--	--	C8931604
THERMOSTAT	--	--	C8946703
DEFROST TIMER MOTOR	--	1320	10530702
DEFROST HEATER	450	30	10428409
BI-METAL	--	--	10442407
EVAPORATOR FAN	10.9	--	10654206
CONDENSER FAN	10	--	10884501
RETURN HEATER	1	13300	10624901

-- NOTES --

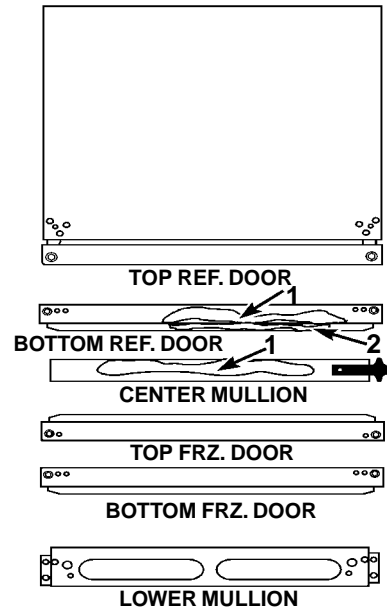
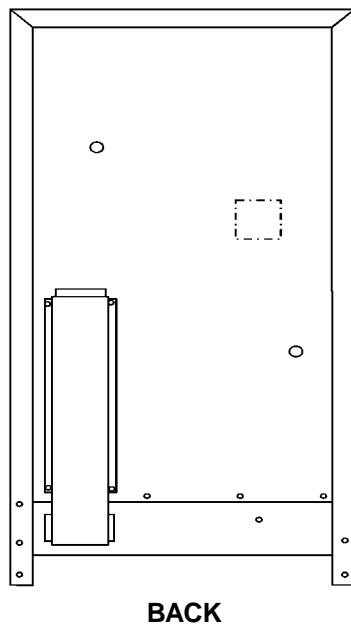
SECTION FIVE TECH TIPS

TYPICAL EXTERNAL SWEAT PATTERNS

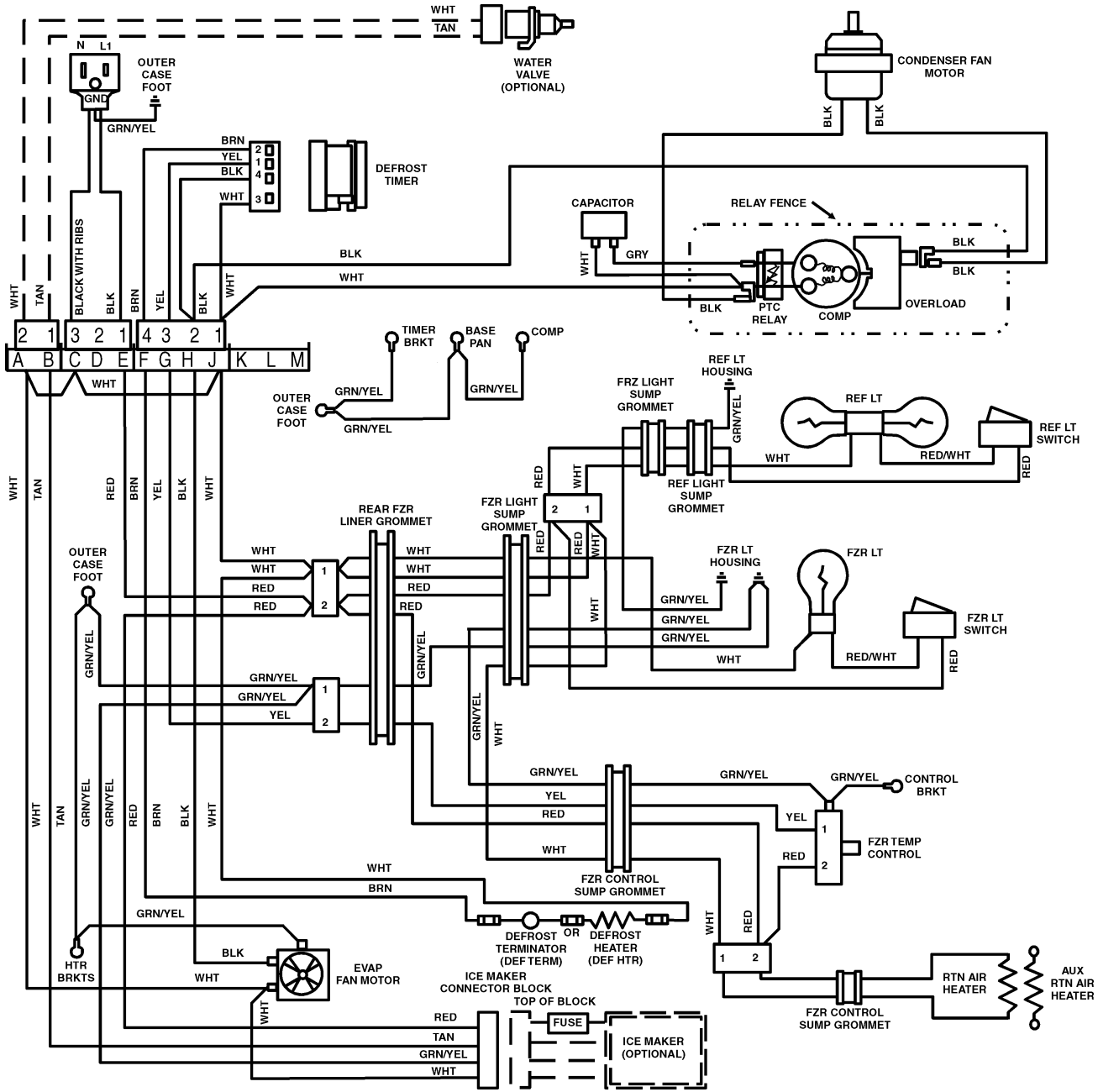


CLASSIFICATIONS OF CONDENSATION

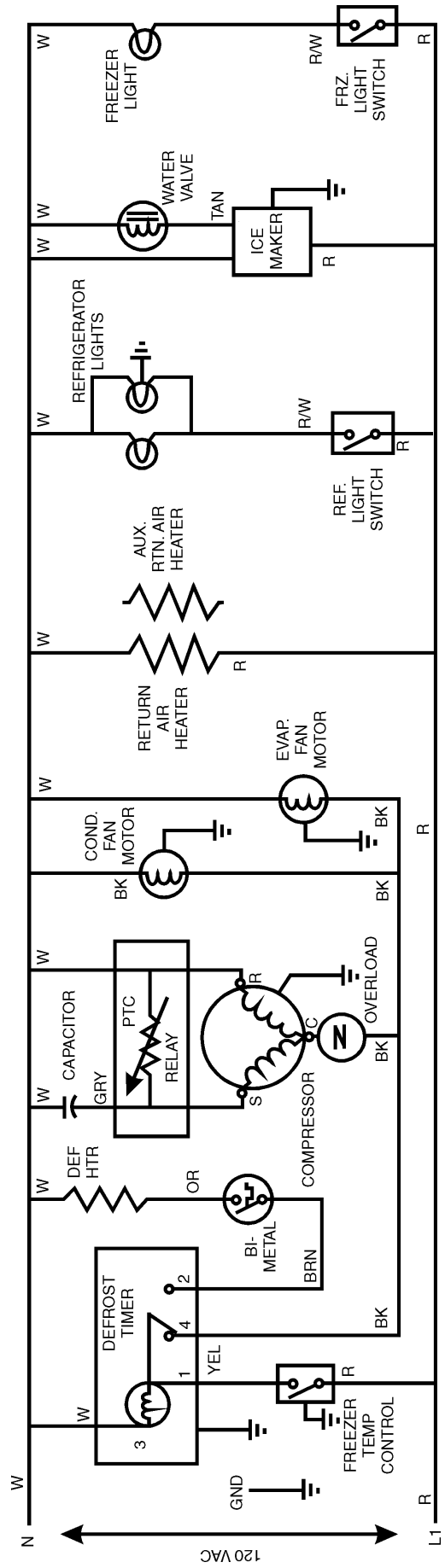
- 1 = Haze or fog
- 2 = Beading
- 3 = Beads or small drops
- 4 = Drops running together



WIRING HARNESS SCHEMATIC

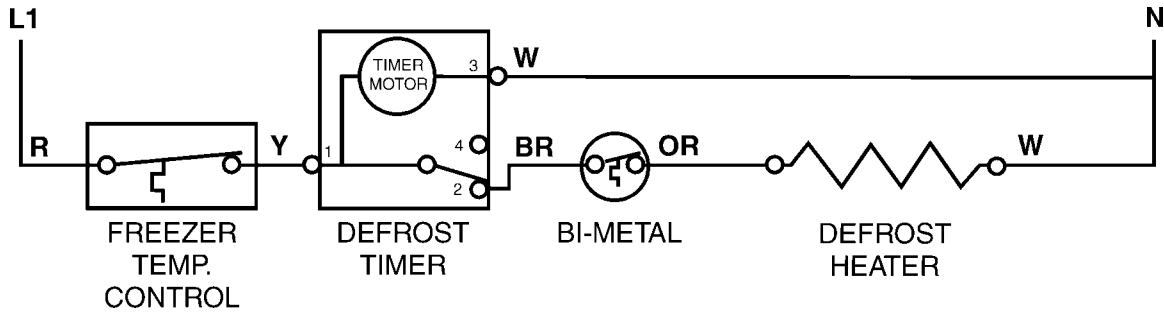


WIRING DIAGRAM

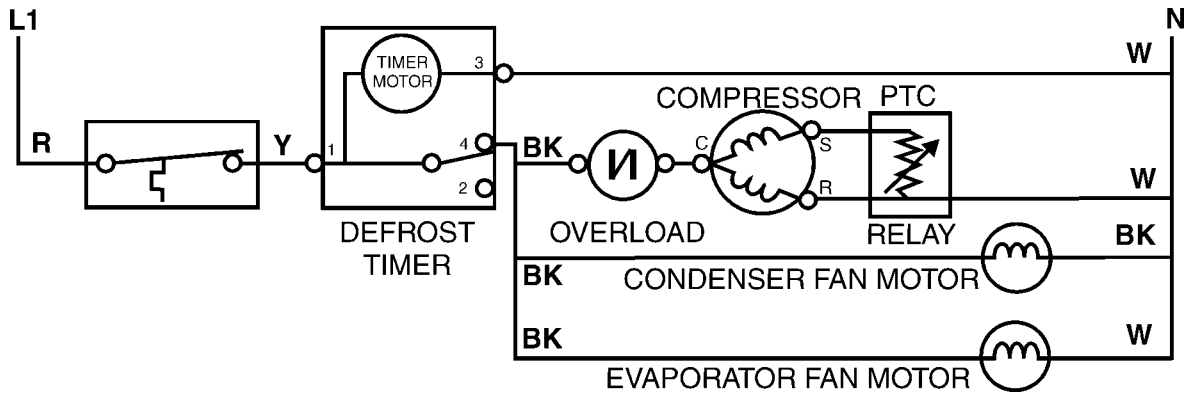


STRIP CIRCUITS

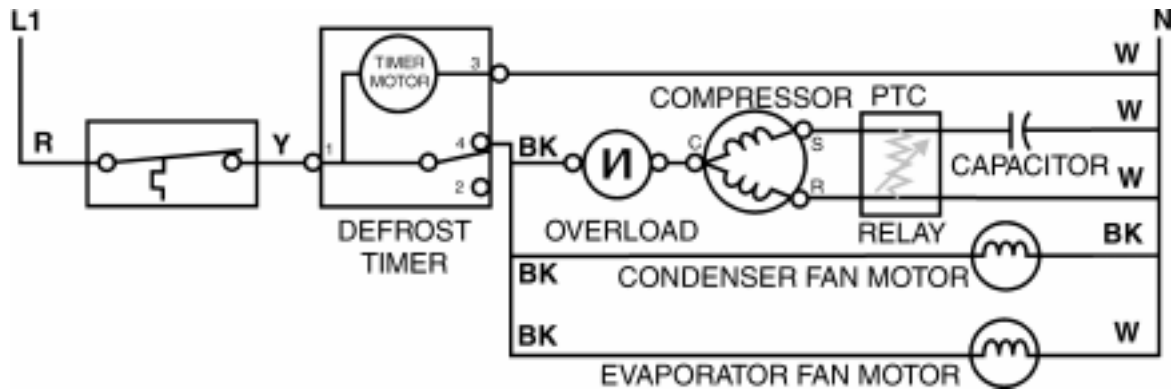
1. Defrost Circuit - Defrost Heater Energized



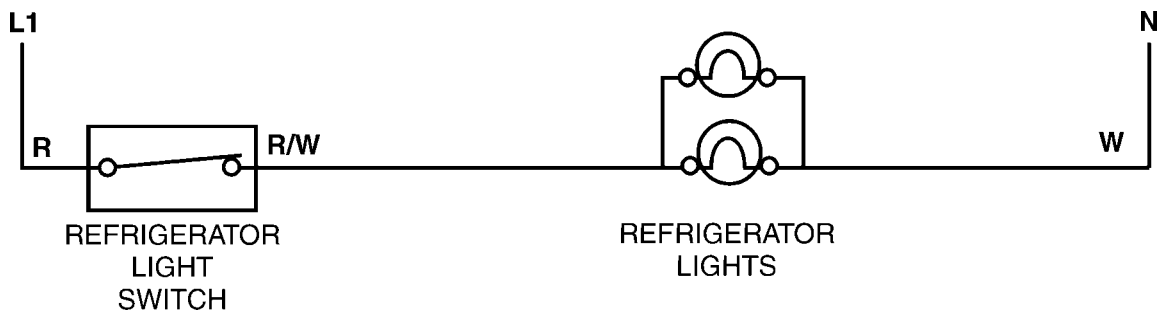
2. Cooling Circuit - Freezer Thermostat Calling For Cooling (at instant of compressor start).



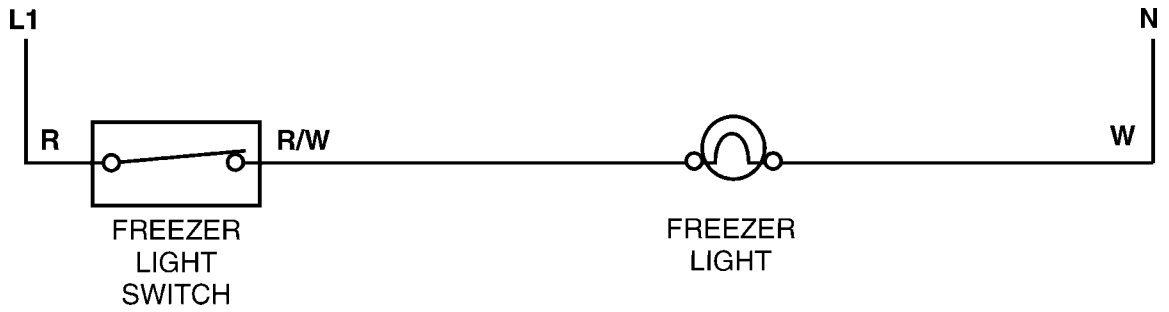
3. Cooling Circuit - Freezer Thermostat Calling For Cooling (Running).



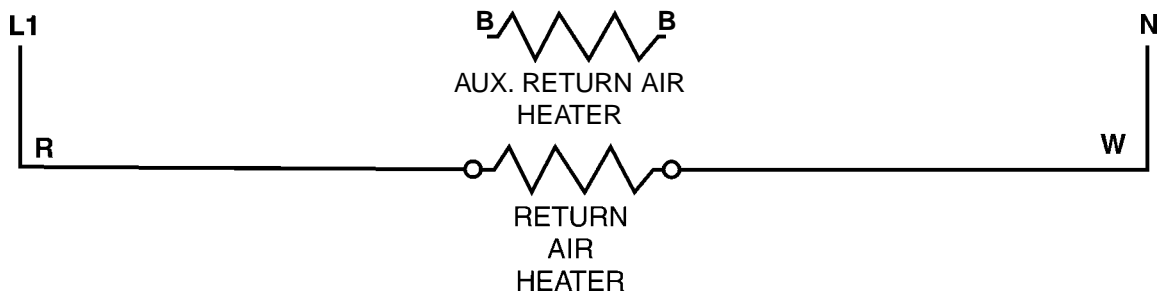
4. Refrigerator Lights Circuit - Refrigerator Door Open



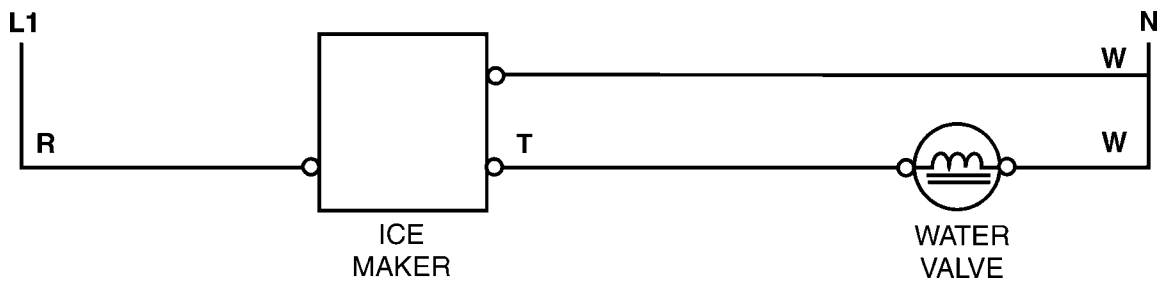
5. Freezer Light Circuit - Freezer Door Open



6. Return Air Heater Circuit



7. Automatic Ice Maker/Water Supply Valve Circuit



SERIAL AND MODEL NUMBER DESIGNATORS

The serial number for all Whirlpool and KitchenAid brand refrigerator/freezers contain the following designations:

Manufacturer Site/Source	EC	G	39	40174
Calendar Year				
Calendar Week				
Sequential Serial Number				

The model number for the KitchenAid brand 22 cu. ft. bottom mount refrigerator/freezers contain the following designations:

Model Number	K	BR	S	22	K	F	WH	0
Marketing Channel (if present)								
KitchenAid Brand = K								
Product Identification BR = Bottom Mount Freestanding Reversible Door Swing								
Merchandise Scheme/Series S = Superba								
Capacity								
Features - Accepts Ice Maker Kit								
Year of Introduction								
Color WH = White AL = Almond BL = Black								
Engineering Changes (Numeric)								

The model number for the Whirlpool brand 22 cu. ft. bottom mount refrigerator/freezers contain the following designations:

Model Number	E	B	22	D	K	X	F	W	0	0
Marketing Channel (if present)										
Product Group E = Refrigeration										
Product Identification Bottom Mount Freezer										
Capacity										
Model Series D = DesignerStyle - Glass										
Ice Maker Adaptable										
Door Swing (Right Reversible)										
Year of Introduction (1997)										
Color W = White N = Almond B = Black										
Energy/Power Designator										
Engineering Changes (Numeric)										

FOR TECHNICAL ASSISTANCE
ON WHIRLPOOL AND KITCHENAID BRANDS
WHILE AT THE CUSTOMER'S HOME CALL;

THE TECHNICAL ASSISTANCE LINE: 800-253-2870

Have your store number ready to identify you as an Authorized Servicer

ANSWER SHEET

CONFIRMATION OF LEARNING

EXERCISES

Section One

True or False Statements:

1. F
2. F
3. T
4. T
5. T

Section Two

True or False Statements:

1. T
2. F
3. F
4. T
5. T

Section Three

True or False Statements:

1. F
2. T
3. T
4. F
5. F

Section One

Label the Components:

