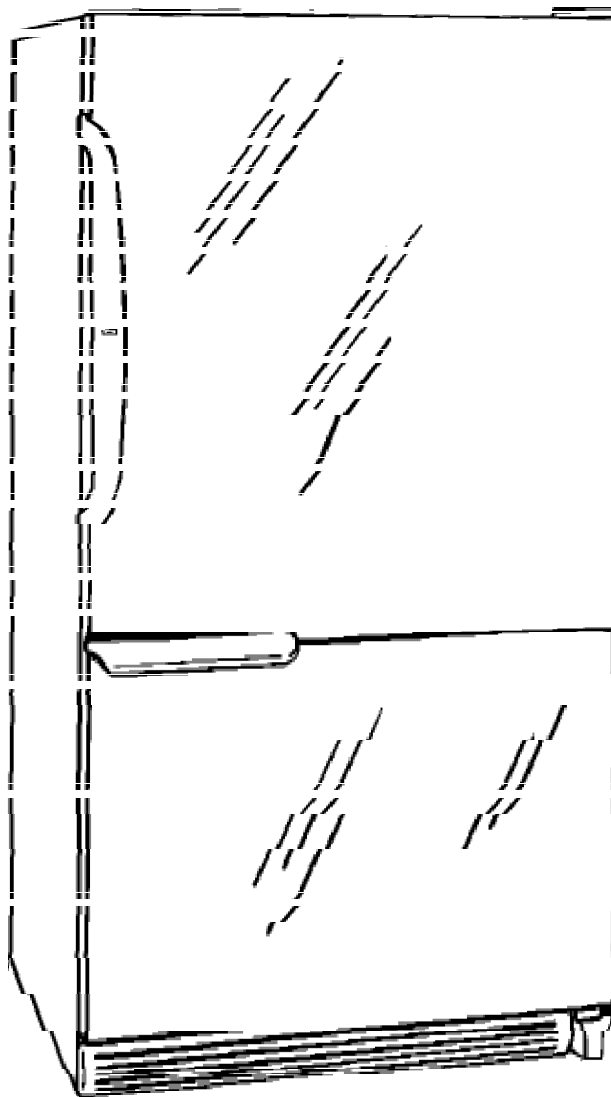


This Base Manual covers 18, 21, and
22 Cu. Ft. Bottom Mount Refrigerators.
Refer to individual Technical Sheet
for specific information on models.

Service

18, 21, & 22 Cu. Ft. Bottom Mount Refrigerators



This manual is to be used by qualified appliance technicians only.
Amana does not assume any responsibility for property damage or
personal injury for improper service procedures done by an

Amana

RS1200004
Revision 0
May 2001

Important Information

Pride and workmanship go into every product to provide our customers with quality products. It is possible, however, that during its lifetime a product may require service. Products should be serviced only by a qualified service technician who is familiar with the safety procedures required in the repair and who is equipped with the proper tools, parts, testing instruments and the appropriate service manual. **REVIEW ALL SERVICE INFORMATION IN THE APPROPRIATE SERVICE MANUAL BEFORE BEGINNING REPAIRS.**

Important Notices for Consumers and Servicers



WARNING

To avoid risk of serious injury or death, repairs should not be attempted by unauthorized personnel, dangerous conditions (such as exposure to electrical shock) may result.



CAUTION

Amana will not be responsible for any injury or property damage from improper service procedures. If performing service on your own product, assume responsibility for any personal injury or property damage which may result.

To locate an authorized servicer, please consult your telephone book or the dealer from whom you purchased this product. For further assistance, please contact:

CONSUMER AFFAIRS DEPT.
AMANA APPLIANCES
AMANA, IOWA 52204

**OR
CALL**

1-319-622-5511 or (1-800-843-0304)
and ask for
Consumer Affairs

If outside the United States contact:

AMANA
ATTN: CONSUMER AFFAIRS DEPT.
AMANA, IOWA 52204, USA
Telephone: (319) 622-5511
Facsimile: (319) 622-2180
TELEX: 4330076 AMANA
CABLE: "AMANA", AMANA, IOWA, USA

Recognize Safety Symbols, Words, and Labels



DANGER

DANGER—Immediate hazards which **WILL** result in severe personal injury or death.



WARNING

WARNING—Hazards or unsafe practices which **COULD** result in severe personal injury or death.



CAUTION

CAUTION—Hazards or unsafe practices which **COULD** result in minor personal injury or product or property damage.

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Product Design



WARNING

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Refrigeration System

Compressor forces high temperature vapor into fan cooled tube and wire condenser where vapor is cooled and condensed into high pressure liquid by circulation of air across condenser coil. (See Refrigerant Flow Diagram, page 18)

High pressure liquid passes into post-condenser loop which helps to prevent condensation around freezer compartment opening and through molecular sieve drier and into capillary tube. Small inside diameter of capillary offers resistance, decreasing pressure, and temperature of liquid discharged into evaporator. Capillary diameter and length is carefully sized for each system.

Capillary enters evaporator at top back. Combined liquid and saturated gas flows through back to bottom of coil and into suction line. Aluminium tube evaporator coil is located in freezer compartment where circulating evaporator fan moves air through coil and into fresh food compartment.

Large surface of evaporator allows heat to be absorbed from both fresh food and freezer compartments by airflow over evaporator coil causing some of the liquid to evaporate. Temperature of evaporator tubing near end of running cycle may vary from -13° to -25° F.

Saturated gas is drawn off through suction line where superheated gas enters compressor. To raise temperature of gas, suction line is placed in heat exchange with capillary.

Temperature Controls

Freezer compartment temperature is regulated by air sensing thermostat at top front of freezer compartment which actuates compressor. Control capillary is inserted in well which routes capillary into freezer. Control should be set to maintain freezer temperature between 0° to -2° F.

Fresh food compartment temperature is regulated an air damper control governing amount of refrigerated air entering fresh food compartment from freezer. Fresh food compartment temperature should be between 38° and 40° F.

Refrigerated Chiller Fresh Deli Drawer (some models)

Chiller Fresh system is a deli drawer in a sleeve. Control on inner wall of fresh food compartment allows freezer air to circulate into sleeve maintaining temperature $4^{\circ} \pm 1^{\circ}$ F colder than fresh food compartment.

Boot must be in place over air inlet. Set to maintain desired temperature in deli drawer.

Defrost System

Every 8 hours of compressor run time defrost timer activates radiant electric defrost heater suspended from evaporator. After 33 minutes of defrost cycle time, timer restores circuit to compressor.

Defrost terminator (thermostat) is wired in series with defrost heater. Terminator opens and breaks circuit when preset high temperature is reached. After defrost thermostat opens, thermostat remains open until end of defrost cycle when cooling cycle starts and terminator senses present low temperature and closes.

Defrost heater is suspended on left side of evaporator coil and across bottom to keep defrost drain free flowing during defrost. Defrost water is caught in trough under evaporator coil and flows through drain hole in liner and drain tubing into drain pan. Air circulated by condenser fan over pan evaporates water.

Component Testing



WARNING

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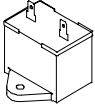


Component	Description	Test Procedures
<div data-bbox="186 472 332 640" data-label="Image"> </div> <p data-bbox="164 401 284 428">Compressor</p>	<p data-bbox="345 401 743 625">When compressor electrical circuit is energized, the start winding current causes relay to heat. After an amount of starting time, the start winding circuit turns off. The relay will switch off the start winding circuit even though compressor has not started (for example, when attempting to restart after momentary power interruption).</p> <p data-bbox="345 646 743 766">With "open" relay, compressor will not start because there is little or no current to start windings. Overload protection will open due to high locked rotor run winding current.</p> <p data-bbox="345 787 743 907">With "shorted" relay or capacitor, compressor will start and overload protector will quickly open due to high current of combined run and start windings.</p> <p data-bbox="345 928 743 1012">With open or weak capacitor, compressor will start and run as normal but will consume more energy.</p>	<p data-bbox="743 401 917 428">Resistance test</p> <ol data-bbox="743 428 1521 577" style="list-style-type: none"> 1. Disconnect power to unit. 2. Discharge capacitor by shorting across terminals with a resistor for 1 minute. <p data-bbox="743 472 1291 499">NOTE: (Some compressors do not have a run capacitor.)</p> <ol data-bbox="743 499 1521 676" style="list-style-type: none"> 3. Remove leads from compressor terminals. 4. Set ohmmeter to lowest scale. 5. Check for resistance between <ul style="list-style-type: none"> Terminals "S" and "C", start winding Terminals "R" and "C", run winding If either compressor winding reads open (infinite or very high resistance) or dead short (0 ohms), replace compressor. <p data-bbox="743 676 885 703">Ground test</p> <ol data-bbox="743 703 1521 856" style="list-style-type: none"> 1. Disconnect power to refrigerator. 2. Discharge capacitor, if present, by shorting terminals through a resistor. 3. Remove compressor leads and use an ohmmeter set on highest scale. 4. Touch one lead to compressor body (clean point of contact) and other probe to each compressor terminal. <ul style="list-style-type: none"> • If reading is obtained, compressor is grounded and must be replaced. <p data-bbox="743 856 901 884">Operation test</p> <p data-bbox="743 884 1521 940">If voltage, capacitor, overload, and motor winding tests do not show cause for failure, perform the following test:</p> <ol data-bbox="743 940 1521 1207" style="list-style-type: none"> 1. Disconnect power to refrigerator. 2. Discharge capacitor by shorting capacitor terminals through a resistor. 3. Remove leads from compressor terminals. 4. Wire a test cord to power switch. 5. Place time delayed fuse with UL rating equal to amp rating of motor in test cord socket. (Refer to Technical Data Sheet) 6. Remove overload and relay. 7. Connect start, common and run leads of test cord on appropriate terminals of compressor. 8. Attach capacitor leads of test cord together. If capacitor is used, attach capacitor lead to a known good capacitor of same capacity. <div data-bbox="966 1207 1299 1564" data-label="Diagram"> <p>The diagram, titled "Test configuration", shows a circuit for testing a compressor. It starts with a "To AC supply" connection leading to a "Switch". Below the switch are "Fuses". The circuit then connects to a "Compressor" with terminals labeled "C", "S", and "R". A "Capacitor" is connected to the "C" and "R" terminals. The diagram illustrates the physical wiring of the test setup.</p> </div> <p data-bbox="743 1606 1521 1921"> <ol data-bbox="743 1606 1521 1921" style="list-style-type: none"> 9. Plug test cord into multimeter to determine start and run wattage and to check for low voltage, which can also be a source of trouble indications. 10. With power to multimeter, press start cord switch and release. <ul style="list-style-type: none"> • If compressor motor starts and draws normal wattage, compressor is okay and trouble is in capacitor, relay/overload, freezer temperature control, or elsewhere in system. • If compressor does not start when direct wired, recover refrigerant at high side. After refrigerant is recovered, repeat compressor direct wire test. If compressor runs after recovery but would not run when direct wired before recover, a restriction in sealed system is indicated. • If compressor does not run when wired direct after recovery, replace faulty compressor. </p>

Component Testing



WARNING

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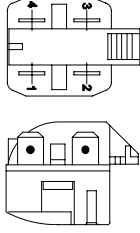
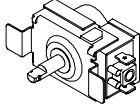
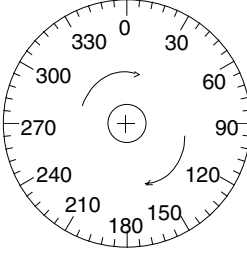
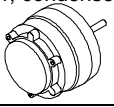
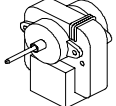
Component	Description	Test Procedures
<p>Capacitor</p> 	<p>Run capacitor connects to relay terminal 3 and L side of line.</p> <p>Some compressors do not require a run capacitor; refer to the Technical Data Sheet for the unit being serviced.</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">  <h3 style="margin: 0;">WARNING</h3> <p>To avoid electrical shock which can cause severe personal injury or death, discharge capacitor through a resistor before handling.</p> </div> <ol style="list-style-type: none"> 1. Disconnect power to refrigerator. 2. Remove capacitor cover and disconnect capacitor wires. 3. Discharge capacitor by shorting across terminals with a resistor for 1 minute. 4. Check resistance across capacitor terminals with ohmmeter set on "X1K" scale. <ul style="list-style-type: none"> • Good—needle swings to 0 ohms and slowly moves back to infinity. • Open—needle does not move. Replace capacitor. • Shorted—needle moves to zero and stays. Replace capacitor. • High resistance leak—needle jumps toward 0 and then moves back to constant high resistance (not infinity).
<p>Condenser</p>	<p>Condenser is a tube and wire construction located in machine compartment.</p> <p>Condenser is on high pressure discharge side of compressor. Condenser function is to transfer heat absorbed by refrigerant to ambient.</p> <p>Higher pressure gas is routed to condenser where, as gas temperature is reduced, gas condenses into a high pressure liquid state. Heat transfer takes place because discharged gas is at a higher temperature than air that is passing over condenser. It is very important that adequate air flow over condenser is maintained.</p> <p>Condenser is air cooled by condenser fan motor. If efficiency of heat transfer from condenser to surrounding air is impaired, condensing temperature becomes higher. High liquid temperature means liquid will not remove as much heat during boiling in evaporator as under normal conditions. This would be indicated by high than normal head pressures, long run time, and high wattage. Remove any lint or other accumulation, that would restrict normal air movement through condenser.</p> <p>From condenser the refrigerant flows into a post condenser loop which helps control exterior condensation on flange, center mullion, and around freezer door. Refrigerant the flows through the drier to evaporator and into compressor through suction line.</p>	<p>Leaks in condenser can usually be detected by using an electronic leak detector or soap solution. Look for signs of compressor oil when checking for leaks. A certain amount of compressor oil is circulated with refrigerant.</p> <p>Leaks in post condenser loop are rare because loop is a one-piece copper tube.</p> <p>For minute leaks</p> <ol style="list-style-type: none"> 1. Separate condenser from rest of refrigeration system and pressurize condenser up to a maximum of 235 PSI with a refrigerant and dry nitrogen combination. 2. Recheck for leaks. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <h3 style="margin: 0;">WARNING</h3> <p>To avoid severe personal injury or death from sudden eruption of high pressures gases, observe the following: Protect against a sudden eruption if high pressures are required for leak checking. Do not use high pressure compressed gases in refrigeration systems without a reliable pressure regulator and pressure relief valve in the lines.</p> </div>

Component Testing



WARNING

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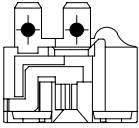


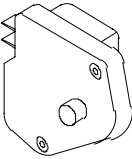
Component	Description	Test Procedures														
 <p>Relay, PTC</p>	<p>When voltage is connected and relay is cool, current passes through relay to start winding.</p> <p>After a short time, current heats the resistor in relay and resistance will rise blocking current flow through relay.</p> <p>Start winding remains in the circuit through run capacitor.</p> <p>Solid state relay plugs directly on compressor start and run terminals. Relay terminals 2 and 3 are connected within relay. Run capacitor is connected to relay terminal 3. L2 side of 120 VAC power is connected to relay terminal 2.</p>	<ol style="list-style-type: none"> 1. Disconnect power to the refrigerator. 2. Remove relay cover and disconnect leads. 3. Check resistance across terminals 2 and 3 with an ohmmeter: Normal = 3 to 12 ohms Shorted = 0 ohms Open = infinite ohms 														
 <p>Control, freezer temperature</p>	<p>Freezer temperature control is a capillary tube operating a single pole, single throw switch.</p> <p>Freezer temperature control controls run cycle through defrost timer.</p> <p>Altitude Adjustment When altitude adjustment is required on a G.E. control, turn altitude adjustment screw 1/7 turn counter clockwise for each 1,000 feet increase in altitude up to 10,000 feet. One full turn equals 10,000 feet maximum.</p> <p>In most cases the need for altitude adjustments can be avoided by simply turning temperature control knob to colder setting.</p>	<p>Check for proper calibration with thermocouple capillary in air supply well by recording cut-in and cut-out temperatures at middle setting. Refer to tech sheet for model being serviced for expected temperatures.</p> <p>Check control contacts are opening by disconnecting electrical leads to control and turning control knob to coldest setting. Check for continuity across terminals.</p> <table border="1" data-bbox="760 1018 1112 1291"> <thead> <tr> <th colspan="2">Altitude Counter in Feet</th> </tr> <tr> <th>Feet Above Sea Level</th> <th>Turn Screw Clockwise (Angular Degrees)</th> </tr> </thead> <tbody> <tr> <td>2,000</td> <td>30</td> </tr> <tr> <td>4,000</td> <td>81</td> </tr> <tr> <td>6,000</td> <td>129</td> </tr> <tr> <td>8,000</td> <td>174</td> </tr> <tr> <td>10,000</td> <td>216</td> </tr> </tbody> </table> 	Altitude Counter in Feet		Feet Above Sea Level	Turn Screw Clockwise (Angular Degrees)	2,000	30	4,000	81	6,000	129	8,000	174	10,000	216
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10,000	216															
<p>Heater, return air duct</p>	<p>Prevents freezing in crisper area by warming air entering crisper during off cycle.</p> <p>Wired across line for operation whenever unit is powered.</p>	<p>Heater is foamed in place at factory. Spare heater foamed in place for use if original heater fails.</p> <p>With power off, check resistance across heater leads. (For resistance values Refer to Technical Data Sheet for model being serviced.)</p>														
<p>Ice Maker</p>	<p>Optional on some models.</p> <p>See "Ice Maker" section for service information.</p>															
 <p>Motor, condenser</p>	<p>Condenser fan moves cooling air across condenser coil and compressor body.</p> <p>Condenser fan motor is in parallel circuit with compressor.</p>	<p>Check resistance across coil.</p>														
 <p>Motor, evaporator fan</p>	<p>Evaporator fan moves air across evaporator coil and throughout refrigerator cabinet.</p>	<ol style="list-style-type: none"> 1. Disconnect power to unit. 2. Disconnect fan motor leads. 3. Check resistance from ground connection solder. Trace to motor frame must not exceed .05 ohms. 4. Check for voltage at connector to motor with unit in refrigeration mode and compressor operating. 														

Component Testing



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Component	Description	Test Procedures								
<p>Overload</p> 	<p>Overload is a temperature and current sensing device.</p> <p>Overload opens when high current or high compressor temperature is sensed.</p> <p>After overload opens, reset can require up to two hours depending on ambient temperature and residual heat load in compressor.</p> <p>Relay (See PTC Relay)</p>	<ol style="list-style-type: none"> 1. Disconnect power to the refrigerator. 2. Remove relay cover and pull relay off compressor. Pull overload protector off compressor common terminal. 3. With ohmmeter, check resistance between male terminal and female pin receptacle terminal which pushes onto compressor common terminal. At ambient room temperature overload protector should have less than 1 ohm resistance. An open overload protector will have infinite resistance. 								
<p>Switch, refrigerator light, freezer light</p> 	<p>Single pole, single throw switch completes circuit for light when door is open.</p>	<p>Check resistant across terminals.</p> <table border="0"> <tr> <td>Switch arm depressed</td> <td>Open</td> </tr> <tr> <td>“NO” terminals</td> <td></td> </tr> <tr> <td>Switch arm up</td> <td>Closed</td> </tr> <tr> <td>“NO” terminals</td> <td></td> </tr> </table>	Switch arm depressed	Open	“NO” terminals		Switch arm up	Closed	“NO” terminals	
Switch arm depressed	Open									
“NO” terminals										
Switch arm up	Closed									
“NO” terminals										
<p>Drier</p> 	<p>Drier is placed at post condenser loop outlet and passes liquefied refrigerant to capillary.</p> <p>Desiccant (20) 8 x 12 4AXH - 7 M>S> - Grams</p>	<p>Drier must be changed every time the system is opened for testing or compressor replacement.</p> <p>NOTE: Drier used in R12 sealed system is not interchangeable with drier used in R134a sealed system. Always replace drier in R134a system with Amana part number B2150504.</p> <p>Before opening refrigeration system, recover HFC134a refrigerant for safe disposal.</p> <ol style="list-style-type: none"> 1. Cut drier out of system using the following procedure. Do not unbrazed drier. 2. Applying heat to remove drier will drive moisture into the system. 3. Score capillary tube close to drier and break. 4. Reform inlet tube to drier allowing enough space for large tube cutter. 5. Cut circumference of drier 1 ¼" below condenser inlet tube joint to drier. 6. Remove drier. 7. Apply heat trap paste on post condenser tubes to protect grommets from high heat. 8. Unbrazed remaining part of drier. Remove drier from system. 9. Discard drier in safe place. Do not leave drier with customer. If refrigerator is under warranty, old drier must accompany warranty claim. 								
<p>Timer, defrost</p> 	<p>Timer motor operates only when freezer control is closed.</p> <p>After specified amount of actual operating time, inner cam in timer throws the contacts from terminal 4, compressor circuit, to terminal 2, defrost thermostat/defrost heater circuit.</p> <p>After specified defrost cycle time, timer cam resets the circuitry through terminal 4 to compressor.</p>	<ol style="list-style-type: none"> 1. To check timer motor winding, check for continuity between terminals 1 and 3 of timer. 2. Depending on rotating position of the cam, terminal 1 of timer is common to both terminal 2, the defrost mode, and terminal 4, the compressor mode. There should never be continuity between terminals 2 and 4. 3. With continuity between terminals 1 and 4, rotate timer knob clockwise until audible click is heard. When the click is heard, reading between terminals 1 and 4 should be infinite and there should be continuity between terminals 1 and 2. 4. Continuing to rotate time knob until a second click is heard should restore circuit between terminals 1 and 4. 								



WARNING

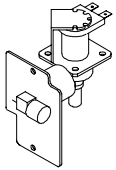

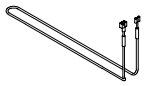
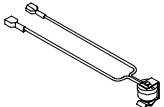
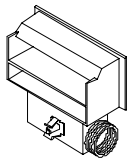
To avoid death or severe personal injury, cut drier at correct location. Cutting drier at incorrect location will allow desiccant beads to scatter. If spilled, completely clean area of beads.

Component Testing



WARNING

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Component	Description	Test Procedures
 <p>Valve, water</p>	<p>Controls water flow to the ice maker.</p> <p>Controlled by thermostat in ice maker.</p> <p>See Ice Maker Section for further information.</p>	<p>Check resistance across coil windings.</p>
<p>Evaporator</p>	<p>Inner volume of evaporator allows liquid refrigerant discharged from capillary to expand into refrigerant gas.</p> <p>Expansion cools evaporator tube and fin temperature to approximately -20°F transferring heat from freezer section to refrigerant.</p> <p>Passing through suction line to compressor, the refrigerant picks up superheat (a relationship between pressure and temperature that assures complete vaporization of liquid refrigerant) as the result of capillary tube soldered to suction line.</p> <p>Refrigerant gas is pulled through suction line by compressor, completing refrigeration cycle.</p>	<p>Test for leaks in evaporator with electronic leak detector or with soap solution. Compressor oil is circulated with refrigerant; check for oil when checking for leaks.</p> <p>For minute leaks</p> <ol style="list-style-type: none"> 1. Separate evaporator from rest of refrigeration system and pressurize evaporator up to a maximum of 140 PSI with a refrigerant and dry nitrogen combination. 2. Recheck for leaks. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <h3 style="text-align: center;">WARNING</h3> <p>To avoid severe personal injury or death from sudden eruption of high pressures gases, observe the following:</p> <ul style="list-style-type: none"> • Protect against a sudden eruption if high pressures are required for leak checking. • Do not use high pressure compressed gases in refrigeration systems without a reliable pressure regulator and pressure relief valve in the lines. </div>
 <p>Heater, evaporator (defrost)</p>	<p>Activated when defrost thermostat, defrost timer, and freezer control complete circuit through heater.</p>	<p>Check resistance across heater.</p> <p>To check defrost system :</p> <ol style="list-style-type: none"> 1. Thermocouple defrost thermostat and plug refrigerator into wattmeter. 2. Turn into defrost mode. Wattmeter should read specified watts (according to Technical Data Sheet). 3. When defrost thermostat reaches specified temperature $\pm 5^\circ\text{F}$ (see Technical Data Sheet), thermostat should interrupt power to heater.
 <p>Thermostat</p>	<p>Thermostat is in a series circuit with terminal 2 of defrost timer, and defrost heater. Circuit is complete if evaporator fan motor operates when cold.</p> <p>Controls the circuit from freezer thermostat through defrost terminator to defrost heater. Opens and breaks circuit when thermostat senses preset high temperature.</p>	<p>Test continuity across terminals.</p> <p>With power off and evaporator coil below freezing, thermostat should show continuity when checked with ohmmeter. See "Heater, evaporator (defrost)" section for additional tests.</p> <p>After defrost thermostat opens, thermostat remains open until end of defrost cycle and refrigerator starts cooling again. Defrost thermostat senses a preset low temperature and resets (closes).</p>
 <p>Damper Control</p>	<p>Damper control balances the air delivery between refrigerator and freezer compartments providing temperature control for refrigerator.</p> <p>Internal capillary activates damper control and door closes restricting flow of air from freezer compartment to refrigerator compartment.</p>	<p>Subject capillary to appropriate temperature (refer to Technical Data Sheet for model being serviced).</p> <p>Damper door should close to within $\frac{1}{4}$" of completely shut.</p> <p>If altitude adjustment is required, turn altitude adjustment screw $\frac{1}{8}$ turn clockwise for each 1,000 feet increase in altitude.</p> <p>There are no electrical connections to damper control. See Technical Data Sheet for damper specifications for unit being serviced.</p>

Service Procedures



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a 10,000 ohm resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Service Equipment

Listed below is equipment needed for proper servicing of HFC134a systems. Verify equipment is confirmed by manufacturer as being compatible with HFC134a and ester oil system.

Equipment must be exclusively used for HFC134a. Exclusive use of equipment only applies to italic items.

- **Evacuation pump**

Check with vacuum pump supplier to verify equipment is compatible for HFC134a. Robinair, Model 15600 2 stage, 6 cubic feet per minute pump is recommended.

- ***Four-way manifold gauge set, with low loss hoses***

- **Leak detector**

- ***Charging cylinder***

- ***Line piercing saddle valve***

(Schroeder valves). Seals must be HFC134a and ester oil compatible. Line piercing valves may be used for diagnosis but are not suitable for evacuation or charging, due to minute holes pierced in tubing. Do not leave mechanical access valves on system.

Valves eventually will leak. Molecules of HFC134a are smaller than other refrigerants and will leak where other refrigerants would not.

- ***Swagging tools***

- ***Flaring tools***

- ***Tubing cutter***

- **Flux**

- **Sil-Fos**

- **Silver solder**

- ***Oil for swagging and flaring***

Use only part # R0157532

- ***Copper tubing***

Use only part # R0174075 and # R0174076

- **Dry nitrogen**

99.5% minimum purity, with -40°F or lower dew point

- **Crimp tool**

- **Tube bender**

- **Micron vacuum gauge**

- ***Process tube adaptor kit***

- **Heat trap paste**

- ***ICI appliance grade HFC134a***

Drier Replacement

Before opening refrigeration system, recover HFC134a refrigerant for safe disposal.

Every time sealed HFC134a system is repaired, drier filter must be replaced with, part # B2150504.

Cut drier out of system by completing the following steps. Do not unbrazed drier filter. Applying heat to remove drier will drive moisture into system.



WARNING

To avoid risk of severe personal injury or death, cut drier at correct location. Cutting drier at incorrect location will allow desiccant beads to scatter. Completely clean area of beads, if spilled.

1. Score capillary tube close to drier and break.
2. Reform inlet tube to drier allowing enough space for large tube cutter.
3. Cut circumference of drier at 1-1/4", below condenser inlet tube joint to drier.
4. Remove drier.
5. Apply heat trap paste on post condenser tubes to protect grommets from high heat.
6. Unbrazed remaining part of drier. Remove drier from system.
7. Discard drier in safe place. Do not leave drier with customer. If refrigerator is under warranty, old drier must accompany warranty claim.

Service Procedures



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a 10,000 ohm resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Refrigerant Precautions



WARNING

To avoid risk of personal injury, do not allow refrigerant to contact eyes or skin.



CAUTION

To avoid risk of property damage, do not use refrigerant other than that shown on unit serial number identification plate.

NOTE: All precautionary measures recommended by refrigerant manufacturers and suppliers apply and should be observed.

Line Piercing Valves

Line piercing valves can be used for diagnosis, but are not suitable for evacuating or charging due to holes pierced in tubing by valves.

NOTE: Do not leave line piercing valves on system. Connection between valve and tubing is not hermetically sealed. Leaks will occur.

Open Lines

During any processing of refrigeration system, never leave lines open to atmosphere. Open lines allow water vapor to enter system, making proper evacuation more difficult.

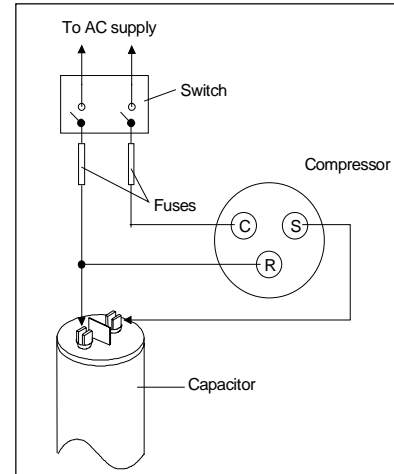
Compressor Operational Test

(short term testing only)

If compressor voltage, capacitor, overload, and motor winding tests are successful (do not indicate a fault), perform the following test:

1. Disconnect power to unit.
 2. Discharge capacitor by shorting capacitor terminals through a resistor.
- NOTE:** Not all units have run capacitor.
3. Remove leads from compressor terminals.
 4. Attach test cord to compressor windings.

- Common lead on test cord attaches to C terminal on compressor.
- Start lead on test cord attaches to S terminal on compressor.
- Run lead on test cord attaches to M terminal on compressor.



Attaching Capacitor for Compressor Test

5. Connect a known good capacitor into circuit as shown above. For proper capacitor size and rating, see technical data sheet for unit under test.

NOTE: Ensure test cord cables and fuses meet specifications for unit under test (see Technical Sheet for unit under test).

6. Replace compressor protector cover securely.
7. Plug test cord into outlet, then press and release start cord switch.



CAUTION

To avoid risk of damage to compressor windings, immediately disconnect (unplug) test cord from power source if compressor does not start. Damage to compressor windings occurs if windings remain energized when compressor is not running.

If compressor runs when direct wired, it is working properly. Malfunction is elsewhere in system.

If compressor does not start when direct wired, recover system at high side. After the system is recovered, repeat compressor direct wire test.

If compressor runs after system is recovered (but would not operate when wired direct before recovery) a restriction in sealed system is indicated.

If motor does not run when wired direct after recovery, replace faulty compressor.

Service Procedures



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a 10,000 ohm resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Dehydrating Sealed Refrigeration System

Moisture in a refrigerator sealed system exposed to heat generated by the compressor and motor reacts chemically with refrigerant and oil in the system and forms corrosive hydrochloric and hydrofluoric acids. These acids contribute to breakdown of motor winding insulation and corrosion of compressor working parts, causing compressor failure.

In addition, sludge, a residue of the chemical reaction, coats all surfaces of sealed system, and will eventually restrict refrigerant flow through capillary tube.

To dehydrate sealed system, evacuate system (see paragraph *Evacuation*).

Leak Testing



DANGER

To avoid risk of serious injury or death from violent explosions, NEVER use oxygen or acetylene for pressure testing or clean out of refrigeration systems. Free oxygen will explode on contact with oil. Acetylene will explode spontaneously when put under pressure.

It is important to check sealed system for refrigerant leaks. Undetected leaks can lead to repeated service calls and eventually result in system contamination, restrictions, and premature compressor failure.

Refrigerant leaks are best detected with halide or electronic leak detectors.

Testing Systems Containing a Refrigerant Charge

1. Stop unit operation (turn refrigerator off).
2. Holding leak detector exploring tube as close to system tubing as possible, check all piping, joints, and fittings.

NOTE: Use soap suds on areas leak detector cannot reach or reliably test.

Testing Systems Containing No Refrigerant Charge

1. Connect cylinder of nitrogen, through gauge manifold, to process tube of compressor and liquid line strainer.
2. Open valves on nitrogen cylinder and gauge manifold. Allow pressure to build within sealed system.
3. Check for leaks using soap suds.

If a leak is detected in a joint, do not to attempt to repair by applying additional brazing material. Joint must be disassembled, cleaned and rebrazed. Capture refrigerant charge (if system is charged), unbrazed joint, clean all parts, then rebraze.

If leak is detected in tubing, replace tubing. If leak is detected in either coil, replace faulty coil.

Service Procedures



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a 10,000 ohm resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Restrictions

Symptoms

Restrictions in sealed system most often occur at capillary tube or filter drier, but can exist anywhere on liquid side of system.

Restrictions reduce refrigerant flow rate and heat removal rate. Wattage drops because compressor is not circulating normal amount of refrigerants.

Common causes of total restrictions are moisture, poorly soldered joints, or solid contaminants. Moisture freezes at evaporator inlet end of capillary tube. Solid contaminants collect in filter drier.

If restriction is on low side, suction pressure will be in a vacuum and head pressure will be near normal.

If restriction is on high side, suction pressure will be in a vacuum and head pressure will be higher than normal during pump out cycle.

Refrigeration occurs on low pressure side of partial restriction. There will be a temperature difference at the point of restriction. Frost and/or condensation will be present in most case at the point of restriction. Also, system requires longer to equalize.

Slight or partial restriction can give the same symptoms as refrigerant shortage including lower than normal back pressure, head pressure, wattage, and warmer temperatures.

Total restriction on the discharge side of compressor, when restriction is between compressor and first half of condenser, results in higher than normal head pressure and wattage while low side is being pumped out.

Testing for Restrictions

To determine if a restriction exists:

1. Attach gauge and manifold between suction and discharge sides of sealed system.
2. Turn unit on and allow pressure on each side to stabilize. Inspect condenser side of system. Tubing on condenser should be warm and temperature should be equal throughout (no sudden drops at any point along tubing).
 - If temperature of condenser tubing is consistent throughout, go to step 4.
 - If temperature of condenser tubing drops suddenly at any point, tubing is restricted at point of temperature drop (if restriction is severe, frost may form at point of restriction and extend down in direction of refrigerant flow in system). Go to step 5.

3. Visually check system for kinks in refrigeration line which is causing restriction. Correct kink and repeat step 2.
 4. Turn unit off and time how long it takes high and low pressure gauges to equalize:
 - If pressure equalization takes longer than 10 minutes, a restriction exists in the capillary tube or drier filter. Go to step 5.
 - If pressure equalization takes less than 10 minutes, system is not restricted. Check for other possible causes of malfunction.
 5. Recover refrigerant in sealed system.
- NOTE:** Before opening any refrigeration system, capture refrigerant in system for safe disposal.
6. Remove power from unit.



CAUTION

To avoid risk of personal injury or property damage, take necessary precautions against high temperatures required for brazing.

7. Remove and replace restricted device.
 8. Evacuate sealed system.
 9. Charge system to specification.
- NOTE:** Do not use captured or recycled refrigerant in Amana units. Captured or recycled refrigerant voids any Amana and/or compressor manufacturer's warranty.
- NOTE:** Charge system with exact amount of refrigerant. Refer to unit nameplate for correct refrigerant charge. Inaccurately charged system will cause future problems.

Service Procedures



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a 10,000 ohm resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Evacuation and Charging



CAUTION

To avoid risk of fire, sealed refrigeration system must be air free. To avoid risk of air contamination, follow evacuation procedures exactly.

NOTE: Before opening any refrigeration system, EPA regulations require refrigerant in system to be captured for safe disposal.

Proper evacuation of sealed refrigeration system is an important service procedure. Usable life and operational efficiency greatly depends upon how completely air, moisture and other non-condensables are evacuated from sealed system.

Air in sealed system causes high condensing temperature and pressure, resulting in increased power requirements and reduced performance.

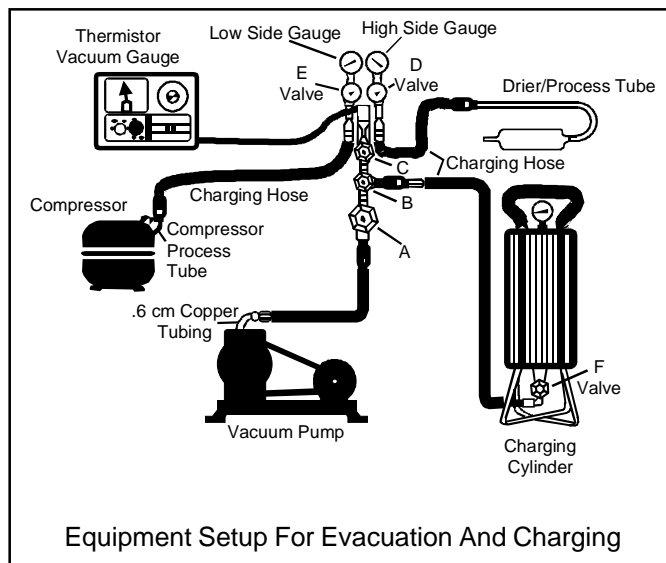
Moisture in sealed system chemically reacts with refrigerant and oil to form corrosive hydrofluoric and hydrochloric acids. These acids attack motor windings and parts, causing premature breakdown.

Before opening system, evaporator coil must be at ambient temperature to minimize moisture infiltration into system.

Evacuation

To evacuate sealed refrigeration system:

1. Connect vacuum pump, vacuum tight manifold set with high vacuum hoses, thermocouple vacuum gauge and charging cylinder as shown in illustration. Evacuation should be done through I.D. opening of tubes not through line piercing valve.
2. Connect low side line to compressor process tube.
3. Connect high side line to drier/process tube.
4. Evacuate both simultaneously. With valve "C" and "F" closed, open all other valves and start vacuum pump.



Equipment Setup For Evacuation And Charging

5. After compound gauge (low side) drops to approximately 29 inches gauge, open valve "C" to vacuum thermocouple gauge and take micron reading.

NOTE: A high vacuum pump can only produce a good vacuum if oil in pump is not contaminated.

6. Continue evacuating system until vacuum gauge registers 600 microns.
7. At 600 microns, close valve "A" to vacuum pump and allow micron reading in system to balance. Micron level will rise.
 - If in 2 minutes, micron level stabilizes at 1000 microns or below, system is ready to be charged.
 - If micron level rises above 1000 microns and stabilizes, open valve "A" and continue evacuating.
 - If micron reading rises rapidly and does not stabilize, a leak still exists in system.

Close valve "A" to vacuum pump and valve "C" to vacuum gauge. Invert charging cylinder and open charging cylinder valve "F" to add partial charge for leak checking. With leak detector, check manifold connections and system for leaks. After locating leak, capture refrigerant, repair leak, and begin at step 1.

Service Procedures



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a 10,000 ohm resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Charging

NOTE: Do not use captured or recycled refrigerant in Amana units. Captured or recycled refrigerant voids any warranty.

NOTE: Charge system with exact amount of refrigerant. Refer to unit serial plate for correct refrigerant charge. Inaccurately charged system will cause future problems.

To charge system:

1. Close valves "A" to vacuum pump and "C" to vacuum gauge and "E" to low side manifold gauge.
2. Set scale on dial-a-charge cylinder for corresponding HFC134a pressure reading.
3. Open valve "F" to charging cylinder and let exact amount of refrigerant flow from cylinder into system. Close valve.
Low side gauge pressure should rise shortly after opening charging cylinder valve as system pressure equalizes through capillary tube.
If pressure does not equalize, a restriction typically exists at capillary/drier braze joint.
4. If pressure equalizes, open valve "E" to low side manifold gauge and pinch off high side drier process tube.
5. Start compressor and draw remaining refrigerant from charging hoses and manifold into compressor through compressor process tube.
6. To check high side pinch-off drier process tube. Close valve "D" to high side gauge. If high side pressure rises, repeat high side pinch-off and open valve "D". Repeat until high side pinch-off does not leak.
7. Pinch-off compressor process tube and remove charging hose. Braze stub closed while compressor is operating.
8. Disconnect power. Remove charging hose and braze high side drier process tube closed.
9. Recheck for refrigerant leaks.

Refrigerant Charge

Refrigerant charge in all capillary tube systems is critical and exact amount is required for proper performance. Factory charges are shown on serial plate.

NOTE: Do not use refrigerant other than shown on serial plate.

Service Procedures



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a 10,000 ohm resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

HFC134a Service Information

HFC134a is alternative refrigerant for CFC12. HFC134a has an ozone depletion potential (ODP) factor of 0.0 and a global warming potential (GWP) factor of 0.27. HFC134a is not flammable and has acceptable toxicity levels. HFC134a is not interchangeable with CFC12. There are significant differences between HFC134a and CFC12 which must be considered when handling and processing refrigeration system.

Health, Safety, and Handling

Health, safety and handling considerations for HFC134A are virtually no different than those for CFC12.

Health, Safety, and Handling	CFC12	HFC134a
Allowable overall exposure limit	1,000 ppm	Same
Vapor exposure to skin	No effect	Same
Liquid exposure to skin	Can cause frostbite	Same
Vapor exposure to eye	Very slight eye irritant	Same
Liquid exposure to eye	Can cause frostbite	Same
Above minimum exposure limit	Can cause Asphyxiation, Tachycardia, and Cardia Arrhythmias	Same
Safety and handling	Wear appropriate skin and eye protection. Use with adequate ventilation.	Same
Spill management	Remove or extinguish ignition or combustion sources. Evacuate or ventilate area.	Same
Fire explosion hazards	May decompose if contact with flames and heating elements. Container may explode if heated due to resulting pressure rise. Combustion products are toxic.	Same
Disposal procedures	Recycle or reclaim.	Same

Comparison of CFC12 and HFC134a Properties

Properties/Characteristics	CFC12	HFC134a
Ozone Depletion Potential (ODP)	1.0*	0.0*
Global Warming Potential (GPW)	3.2*	0.27*
Molecular weight	121	102
Boiling point at 1 atmosphere	-22°F (-30°C)	-15°F (-126°C)
Vapor pressure at 77°F (25°C)	80 psig	82 psig
Liquid density at 77°F (25°C)	82 lb/ft ³	75 lb/ft ³
Flammability	No	No
High-side system operating Pressure at 65°F (18°C)	HFC134a approximately 3 psig higher than CFC12	
Low-side system operating Pressure at 65°F (18°C)	HFC134a approximately 2 psig lower than CFC12	



CAUTION

To minimize contamination, exercise extreme care when servicing HFC134A sealed systems.

- No trace of other refrigerants is allowed in HFC134a systems. Chlorinated molecules in other refrigerants such as CFC12, etc. will lead to capillary tube plugging.
- Ester oil is used in HFC134a systems. Do not use mineral oil. HFC134a and mineral oils cannot be mixed. If mineral oils were used in HFC134a systems, lubricant would not return to compressor and would cause early compressor failure. If significant amount of oil has been lost from compressor, replace oil rather than adding oil.
- Ester oils used in HFC134a systems are so hydroscopic that by the time an inadequate system performance is detected, oil will be saturated with moisture.
- CFC12 has much higher tolerance to system processing materials, such as drawing compounds, rust inhibitors, and cleaning compounds, than HFC134a. Such materials are not soluble in HFC134a systems. If materials were to be washed from system surfaces by ester oils, they could accumulate and eventually plug capillary tube.
- Care must be taken to minimize moisture entering HFC134a system. Do not leave compressor or system open to atmosphere for more than 10 minutes. Excessive moisture in HFC134a system will react with compressor oil and generate acid.
- Compressor must be replaced when performing low side leak repair.
- Drier filter must always be replaced with service drier filter, part #B2150504.

Important: Unbrazing drier filter from tubing will drive moisture from desiccant and into system, causing acids to form. Do not unbrazed filter drier from tubing. If CFC12 service drier was installed in HFC134A system, drier could overload due to excessive moisture.

- HFC134a compatible copper tubing, part #R0174075 (1/4" O.D. X 18" length) and part #R0174076 (5/16" O.D. X 24" length) must be used when replacing tubing.
- Avoid system contamination by using Towerdraw E610 evaporating oil, part # R0157532, when flaring, swagging, or cutting refrigeration tubing.

Service Procedures



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a 10,000 ohm resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Replacement Service Compressor

HFC134a service compressors will be charged with ester oil and pressurized with dry nitrogen. Before replacement compressor is installed, pull out 1 rubber plug. A *pop* from pressure release should be heard. If a *pop* sound is not heard, do not use compressor. Positive pressure in compressor is vital to keep moisture out of ester oil. Do not leave compressor open to atmosphere for more than 10 minutes.

Compressor Testing Procedures



WARNING

To avoid death or severe personal injury, never use oxygen, air or acetylene for pressure testing or clean out of refrigeration system. Use of oxygen, air, or acetylene may result in violent explosion. Oxygen may explode on contact with oil and acetylene will spontaneously explode when under pressure.

Refer to Technical Data Sheet "Temperature Relationship Chart" for operating watts, test points, and temperature relationship test for unit being tested.

- Temperature testing is accomplished by using 3 lead thermocouple temperature tester in specific locations. Test point T-1 is outlet on evaporator coil and T-2 is inlet. Test point T-3 is suction tube temperature midway between where armaflex ends and suction port of compressor (approximately 12 inches from compressor).
- Thermocouple tips should be attached securely to specified locations.
- Do not test during initial *pull down*. Allow one off cycle or balanced temperature condition to occur before proceeding with testing.
- Refrigerator must operate minimum of 20 minutes after thermocouples are installed.
- Turn control to colder to obtain required on time.
- Wattage reading must be recorded in conjunction with temperature test to confirm proper operation.
- Suction and head pressures are listed on "Temperature and Relationship Chart". Normally these are not required for diagnosis but used for confirmation on systems which have been opened.

Brazing



CAUTION

To avoid risk of personal injury or property damage, take necessary precautions against high temperatures required for brazing.

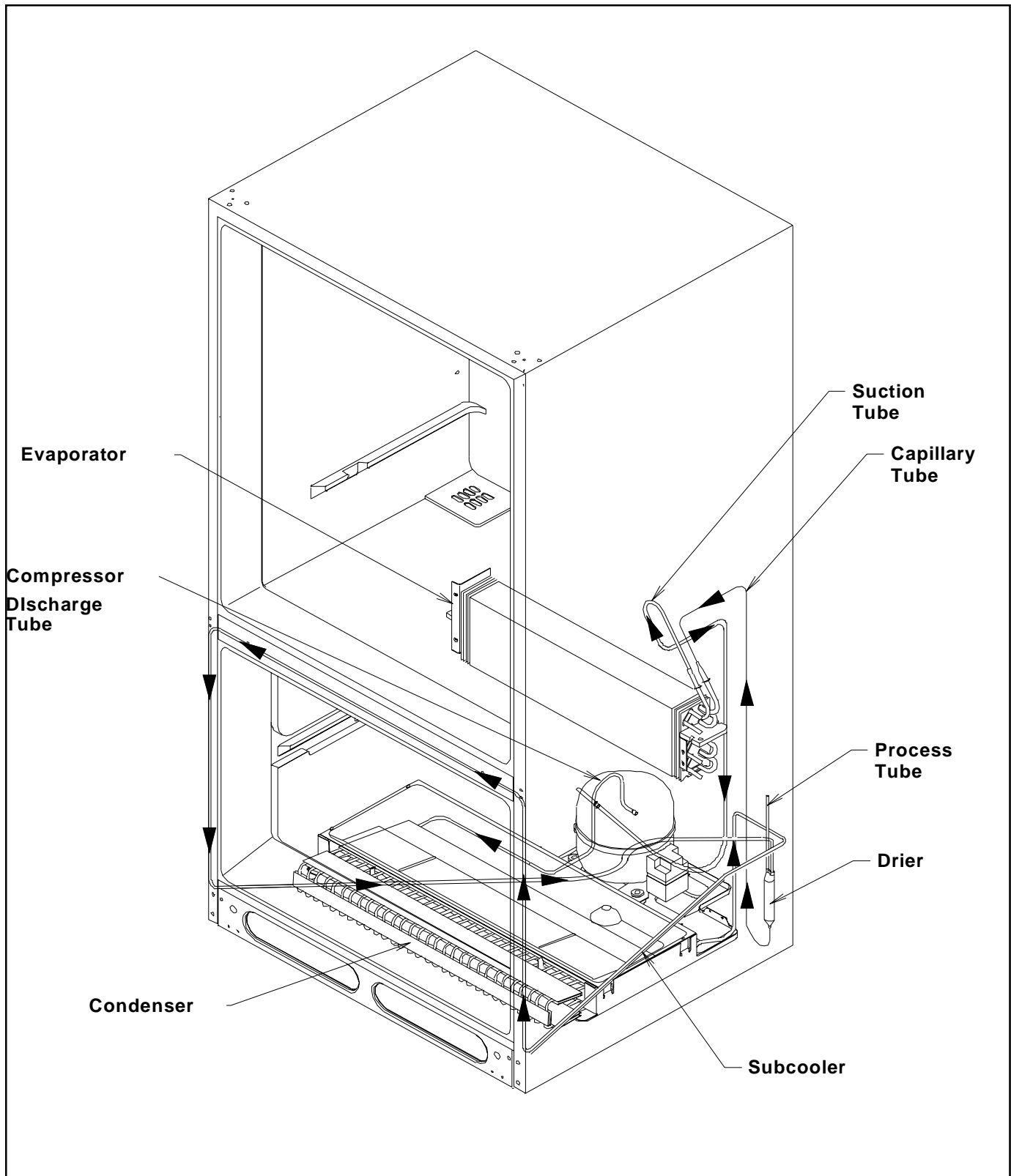
Satisfactory results require cleanliness, experience, and use of proper materials and equipment.

Connections to be brazed must be properly sized, free of rough edges, and clean.

Generally accepted brazing materials are:

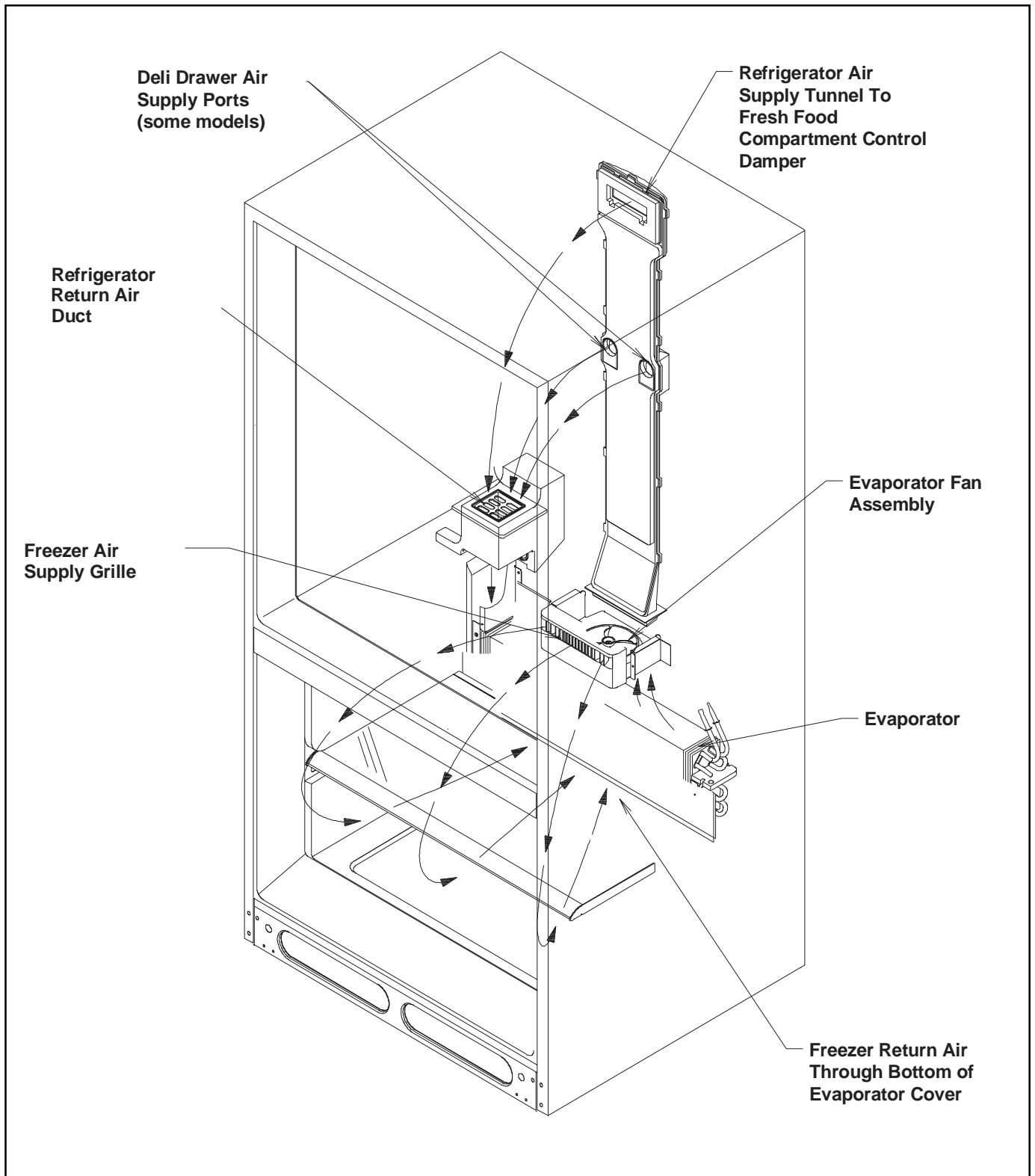
- **Copper to copper joints:** SIL-FOS (alloy of 15 percent silver, 80 percent copper, and 5 percent phosphorous). Use without flux. Recommended brazing temperature is approximately 1400°F. **Do not use for copper to steel connection.**
- **Copper to steel joints:** SILVER SOLDER (alloy of 30 percent silver, 38 percent copper, 32 percent zinc). Use with fluoride based flux. Recommended brazing temperature is approximately 1200°F.
- **Steel to steel joints:** SILVER SOLDER (see copper to steel joints).
- **Brass to copper joints:** SILVER SOLDER (see copper to steel joints).
- **Brass to steel joints:** SILVER SOLDER (see copper to steel joints).

Refrigerant Flow



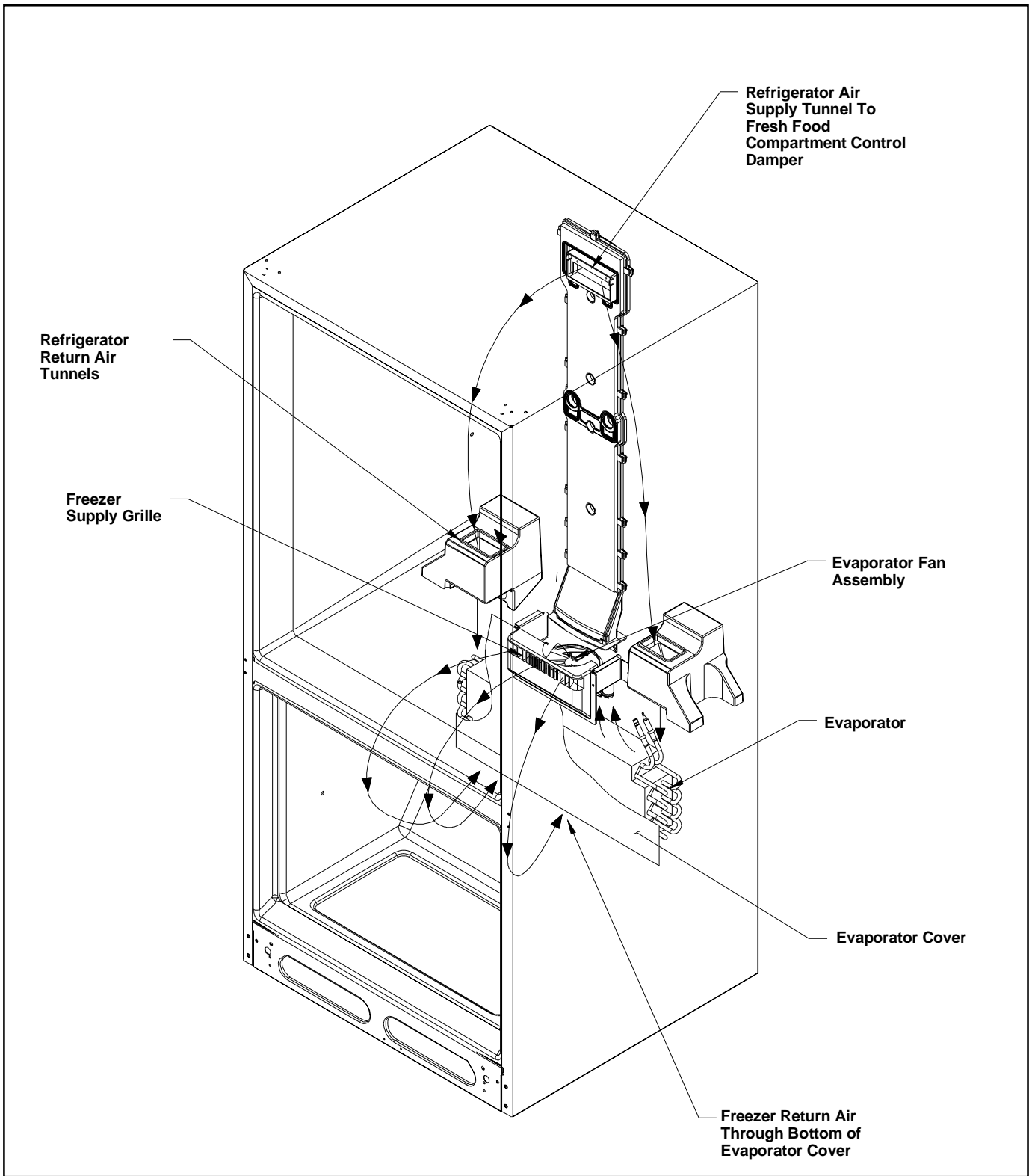
18, 21, 22 cu. ft. Bottom Mount
Refrigerant Flow Diagram

Cabinet Air Flow



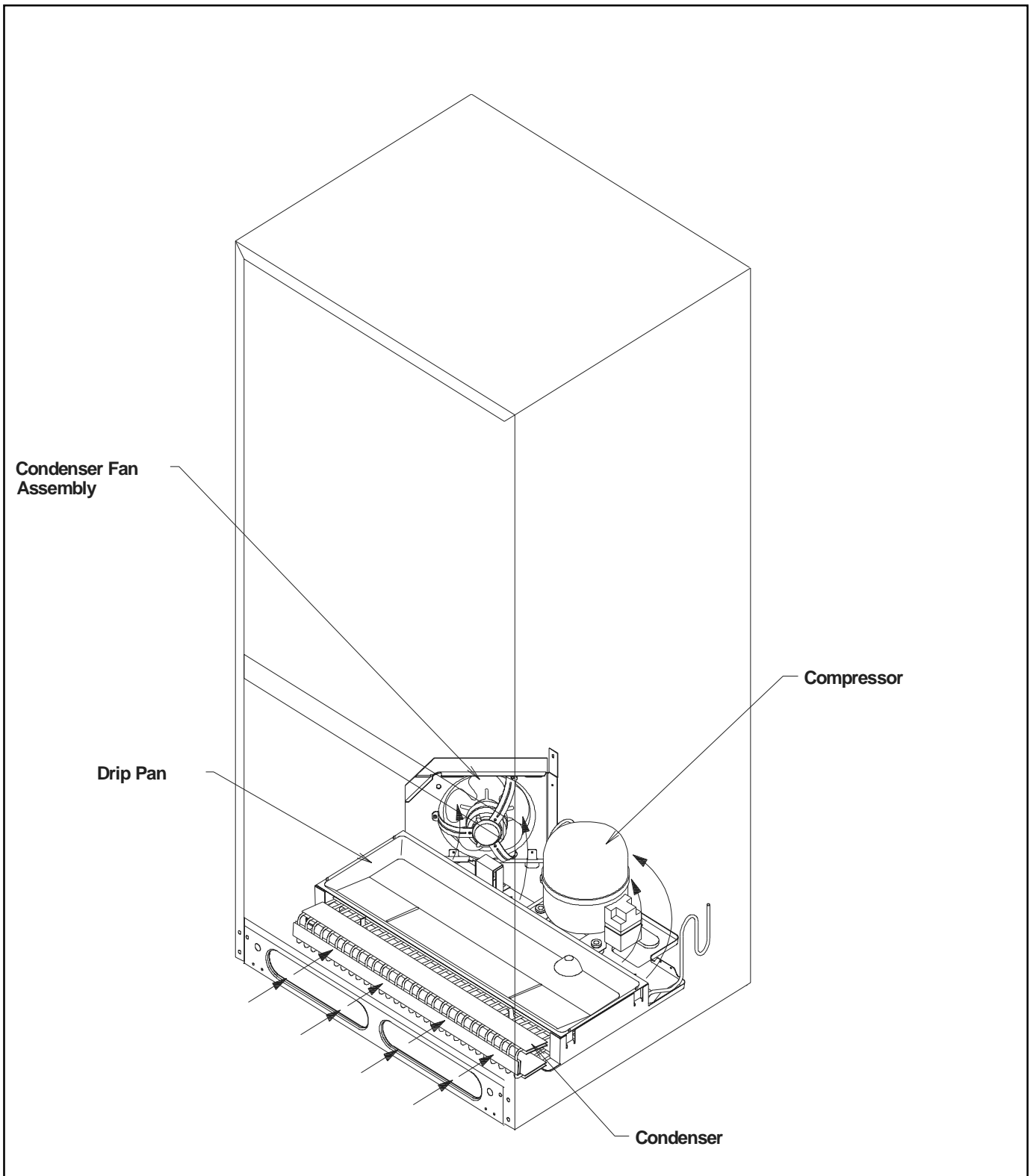
**21, 22 cu. ft. Bottom Mount
Cabinet Air Flow Diagram**

Cabinet Air Flow



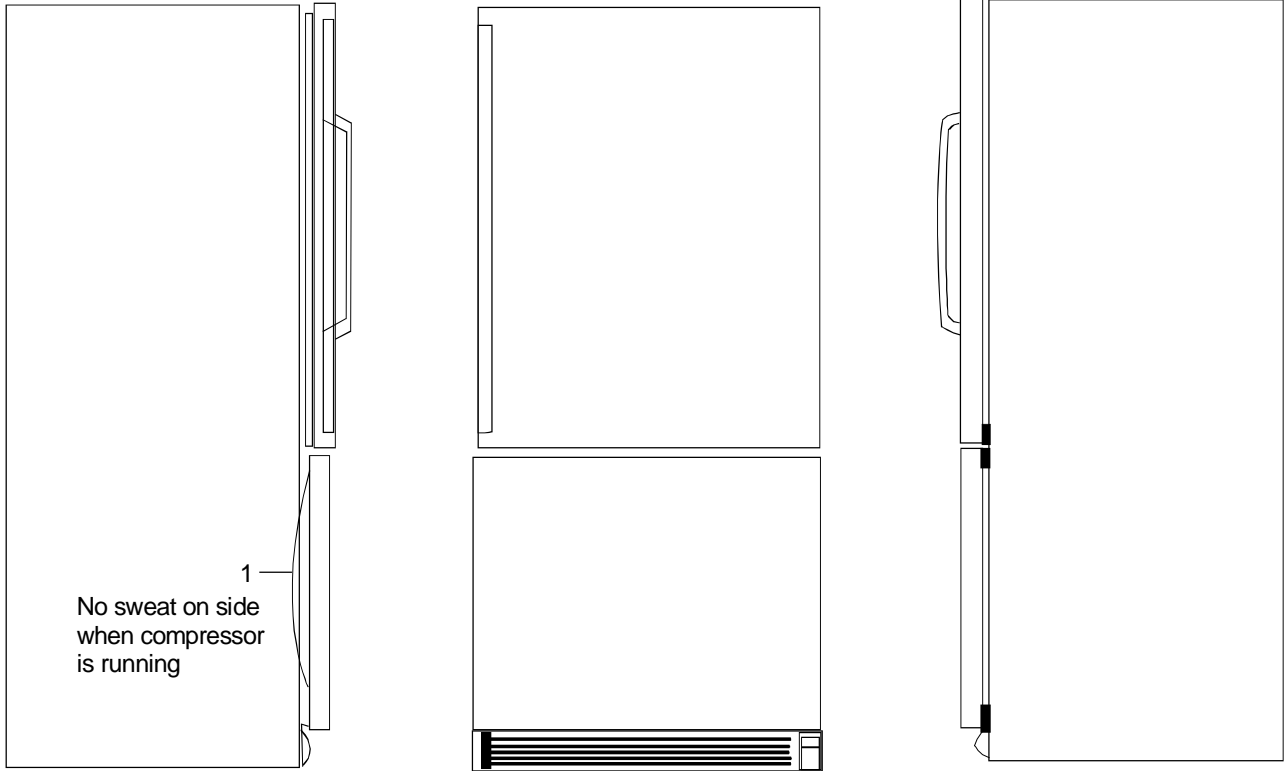
**18 cu. ft. Bottom Mount
Cabinet Air Flow Diagram**

Machine Compartment Air Flow



**18, 21, 22 cu. ft. Model Bottom Mount
Machine Compartment Air Flow Diagram**

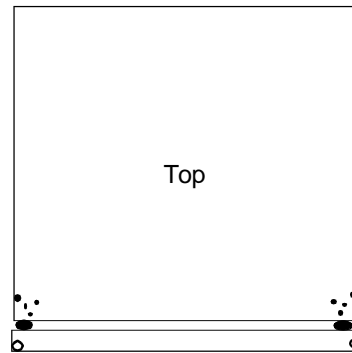
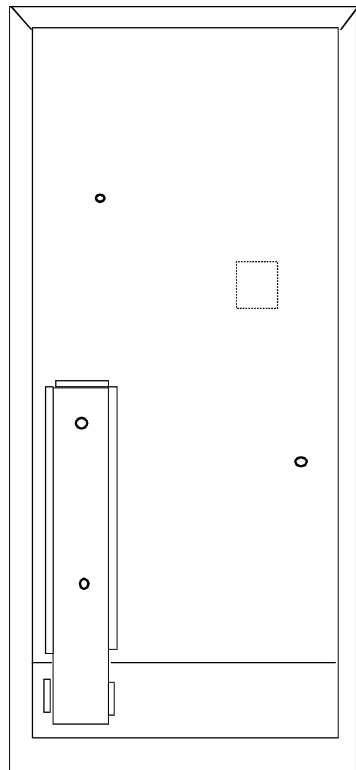
Typical External Sweat Pattern



CLASSIFICATION OF CONDENSATION

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

Conditions after 4 hour
Laboratory Sweat Test.
Ambient: 90 dF
Relative humidity 84%
Refrigerator Temp. 40 dF
Freezer Temp. 0 dF



Refrigerator door bottom

No sweat on side
when compressor
is running

Center mullion

Freezer door top

Freezer door bottom

Lower mullion

Troubleshooting Chart



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Troubleshooting chart on following pages contains symptoms that may be seen in malfunctioning units. Each symptom is accompanied by one or more possible causes and by a possible remedy or test to determine if components are working properly.

Symptom	Possible Causes	Corrective Action
Unit does not run	No power to unit	Check for power at outlet. Check fuse box/circuit breaker for blown fuse or tripped breaker. Replace or reset.
	Faulty power cord	Check with test light at unit; if no circuit and current is indicated at outlet, replace or repair.
	Low voltage	Check input voltage for proper voltage. Take appropriate action to correct voltage supply problem.
	Faulty motor or freezer temperature control	Check all connections are tight and secure. Jumper across terminals of control. If unit runs, replace control.
	Faulty timer	Check with test light. Replace if necessary.
	Faulty relay	Check relay. Replace if necessary.
	Faulty compressor	Check compressor motor windings for opens/shorts. Perform compressor direct wiring test. Replace if necessary.
	Faulty overload	Check overload for continuity. NOTE: Ensure compressor/overload are below trip temperature before testing. Replace if necessary.
Refrigerator section too warm	Excessive door opening	Consumer education
	Overloading of shelves	Consumer education
	Warm or hot foods placed in cabinet	Consumer education
	Cold control set too warm	Set control to colder setting.
	Poor door seal	Level cabinet. Adjust hinges. Replace gasket.
	Refrigerator airflow	Check damper is opening by removing grille. With door open, damper should open. Replace if faulty. Turn control knob to colder position.
	Interior light remains on	Check switch. Replace if necessary.
	Faulty condenser fan or evaporator fan	Check fan and wiring. Replace if necessary.
	Faulty compressor	Replace compressor.

Troubleshooting Chart



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Symptom	Possible Causes	Corrective Action
Refrigerator section too cold	Refrigerator temperature control set too cold	Adjust refrigerator temperature control.
	Refrigerator airflow not properly adjusted	Check air flow.
Freezer and refrigerator sections too warm	Temperature controls set too warm	Reset temperature controls.
	Poor door seal	Level cabinet. Adjust hinges. Replace gasket.
	Dirty condenser or obstructed grille	Check condenser and grille. Clean.
	Faulty control	Test control. Replace if failed.
	Refrigerant shortage or restriction	Check for leak or restriction. Repair, evacuate and recharge system.
Freezer section too cold	Freezer temp control set too cold	Adjust freezer temperature control.
	Faulty control	Test control. Replace if failed.
	Cold control capillary not properly clamped to evaporator	Reposition clamp and tighten.
Unit runs continuously	Temperature control set too cold	Adjust temperature control.
	Dirty condenser or obstructed grille	Check condenser and grille. Clean.
	Poor door seal	Level cabinet. Adjust hinges. Replace gasket.
	Interior light remains on	Check switch. Replace if necessary.
	Faulty condenser fan or evaporator fan	Check fan and wiring. Replace if necessary.
	Faulty control	Test control. Replace if failed.
	Refrigerant shortage or restriction	Check for leak or restriction. Repair, evacuate and recharge system.
	Refrigerant overcharge	Check for overcharge. Evacuate and recharge system.
	Air in system	Check for low side leak. Repair, evacuate and recharge system.
Unit runs continuously. Temperature normal.	Ice on evaporator	See "Ice on evaporator".
Unit runs continuously. Temperature too cold.	Faulty defrost thermostat	Check thermostat. Replace if necessary.
Noisy operation	Loose flooring or floor not firm	Repair floor or brace floor.
	Cabinet not level	Level cabinet.
	Tubing in contact with cabinet, other tubing, or other metal	Adjust tubing.
	Drip pan vibrating	Adjust drain pan.
	Fan hitting another part	Ensure fan properly aligned and all attaching hardware and brackets are tight and not worn. Tighten or replace.
	Worn fan motor bearings	Check motor for loss of lubricant or worn bearings. Replace if necessary.
	Compressor mounting grommets worn or missing. Mounting hardware loose or missing	Tighten hardware. Replace grommets if necessary.
	Free or loose parts causing or allowing noise during operation	Inspect unit for parts that may have worked free or loose or missing screws. Repair as required.

Troubleshooting Chart



WARNING

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Symptom	Possible Causes	Corrective Action
Frost or ice on evaporator	Defrost thermostat faulty	Check defrost thermostat. Replace if failed.
	Evaporator fan faulty	Check fan motor. Replace if failed.
	Defrost heater remains open	Check defrost heater continuity. Replace if failed.
	Defrost control faulty	Check control and replace if failed.
	Open wire or connector	Check wiring and connections. Repair as necessary.
	Refrigerant shortage or restriction	Check for leak or restriction. Repair, evacuate and recharge system.
Unit starts and stops frequently (cycles on and off)	Loose wire or thermostat connections	Check wiring and connections. Repair as necessary.
	Supply voltage out of specification	Check input voltage. Correct any supply problems.
	Overload protector open	Check overload protector for continuity. If open, replace overload. NOTE: Ensure overload/compressor are below trip temperature before testing.
	Faulty compressor motor capacitor (some compressors do not require motor capacitor)	Check capacitor for open/short. Replace if necessary. NOTE: Discharge capacitor before testing.
	Faulty fan motor	Check fan motor. Replace if failed.
	Restricted air flow	Check condenser and grille for dirt. Clean.
	Refrigerant shortage or restriction	Check for leak or restriction. Repair, evacuate and recharge system.

System Diagnosis

CONDITION	SUCTION PRESSURE VARIATION FROM NORMAL	HEAD PRESSURE VARIATION FROM NORMAL	T1 INLET TEMPERATURE VARIATION FROM NORMAL	T2 OUTLET TEMPERATURE VARIATION FROM NORMAL	T3 SUCTION TEMPERATURE VARIATION FROM NORMAL	WATTAGE VARIATION FROM NORMAL
Refrigerant Overcharge	Increase	Increase	Warmer	Warmer	Colder	Increase
Shortage of Refrigerant	Decrease	Decrease or Increase See Text	Colder	Warmer	Warmer	Decrease
Partial Restriction	Decrease	Decrease or Increase See Text Note 2	Colder	Warmer	Warmer	Decrease
Air in System	Near Normal	Increase	Warmer	Warmer	Warmer	Increase
Low Ambient Installations (High Ambients the Reverse)	Decrease	Decrease	Colder	Warmer	Warmer	Decrease
Additional Heat Load	Increase	Increase	Warmer	Warmer	Warmer	Increase
Inefficient Compressor	Increase	Normal or Decrease	Warmer or Colder	Warmer	Warmer	Decrease

Symptoms of an Overcharge

- Above normal freezer temperatures.
- Longer than normal or continuous run.
- Freezing in refrigerator, especially on forced air meatkeeper models.
- Higher than normal suction and head pressure.
- Higher than normal wattage.
- Evaporator inlet and outlet temperatures warmer than normal.
- Suction tube temperature below ambient. Always check for separated heat exchanger when suction temperature is colder than ambient.

Various conditions could indicate an overcharge. For example, if the cooling coil is not defrosted at regular intervals, due to a failure of the defrost system, the refrigerant will "flood out" and cause the suction line to frost or sweat. The cause of this problem should be corrected rather than to purge refrigerant from the system. Running the freezer section colder than necessary (-2 to -1 F. is considered normal package temperatures) or continuous running of the compressor for a variety of reasons, or the freezer fan motor not running, may give the indication of an overcharge.

Symptoms of Refrigeration Shortage

- Rise in food product temperature in both compartments. (See Note 1 below.)
- Long or continuous run time.
- Look for obvious traces of oil that would occur due to a leak or cracked refrigerant line.
- Lower than normal wattage.
- Compressor will be hot to touch because of the heat generated by the motor windings from long continuous running. It will not be as hot as it would be with a full charge and long run times for some other reason such as a dirty condenser.
- Depending on the amount of the shortage, the condenser will not be hot, but closer to room temperature. The capillary tube will be warmer than normal from a slight shortage.
- If the leak is on the high side of the system, both gauges will show lower than normal readings and will show progressively lower readings as this charge becomes less. The suction pressure gauge will probably indicate a vacuum.
- If the leak is on the low side of the system the suction pressure gauge will be lower than normal - probably in a vacuum - and the head pressure gauge will be higher than normal. It will probably continue to become higher because air drawn in through the leak is compressed by the compressor and accumulates in

System Diagnosis

the high side (condenser) of the system.

- Only partial frosting of evaporator instead of even frosting of entire coil.

NOTE 1: Usually the first thing that is noticed by the user is a rise in temperature foods. Although temperatures will rise in both the freezer section and the food compartment, the frozen meats and vegetables will not thaw immediately. The customer doesn't associate the problem with the freezer section and will first notice that milk and other food beverages are not cold enough.

Under some circumstances, such as in the case of forced air meatkeeper model with a slight shortage of refrigerant, freezing in the food compartment may be experienced due to the additional running time. With a refrigerant leak, however, it always gets worse and as the refrigerant charge decreases the temperature will continue to rise.

With a shortage of refrigerant the capillary line will not have a full column of liquid. As a result, there is a noticeable hissing sound in the evaporator. This should not be mistaken for the regular refrigerant boiling sounds that would be considered normal.

Symptoms of a Restriction

Always remember refrigeration (cooling) occurs on the low pressure side of a partial restriction (obviously a total restriction will completely stop the circulation of refrigerant and no cooling will take place).

Physically feel the refrigeration lines when a restriction is suspected. The most common place for a restriction is at the drier-filter or at the capillary tube inlet or outlet. If the restriction is not total there will be a temperature difference at the point of restriction, the area on the evaporator side will be cooler. In many cases frost and/or condensation will be present. A longer time is required for the system to equalize.

Any kinked line will cause a restriction so the entire system should be visually checked.

A slight restriction will give the same indications as a refrigerant shortage with lower than normal back pressure, head pressure, and wattage, warmer product temperatures.

NOTE 2: If a total restriction is on the discharge side of the compressor, higher than normal head pressures and wattages would result. This is true only while the low side is being pumped out and if the restriction was between the compressor and the first half of the condenser.

To diagnose for a restriction versus a refrigerant shortage, discharge the system, replace the drier-filter, evacuate and recharge with the specified refrigerant charge. If the unit performs normally three possibilities exist: 1) refrigerant loss, 2) partially restricted drier-filter, and 3) moisture in system.

If the unit performs as it previously did you may have a restricted capillary line or condenser or kinked line. Find the point of restriction and correct it.

A restriction reduces the flow rate of the refrigerant and consequently reduces the rate of heat removal. Complete restriction may be caused by moisture, solid contaminants in the system, or a poorly soldered joint. Moisture freezes at the evaporator inlet end of the capillary tube or solid contaminants collect in the drier-filter. The wattage drops because the compressor is not circulating the usual amount of refrigerant.

As far as pressure readings are concerned, if the restriction, such as a kinked line or a joint soldered shut is anywhere on the low side, the suction pressure would probably be in a vacuum while the head pressure will be near normal. If the restriction is on the high side, the suction pressure, again, will probably be in a vacuum while the head pressure will be higher than normal during the pump out period described earlier. In either case, it will take longer than the normal ten minutes or so for the head pressure to equalize with the low side after the compressor stops.

Symptoms of Air in System

This can result from a low side leak or improper servicing. If a leak should occur on the low side, the temperature control would not be satisfied; thus, continuous running of the compressor would result. The compressor would eventually pump the low side into a vacuum drawing air and moisture into the system. Air and R134A do not mix so the air pressure would be added to the normal head pressure, resulting in higher than normal head pressures.

One way to determine if air is in the system is to read the head pressure gauge with the product off and evaporator and condenser at the same temperature and then take the temperature on the condenser outlet tube. This temperature should be within 3° or 4° F. of what the Pressure-Temperature Relation chart shows for the given idle head pressure. If the temperature of the condenser outlet is considerably lower than the idle head pressure of the gauge this would indicate there is air in the system.

Thorough leak checking is necessary. Correct the source of the leak. Do not attempt to purge off the air because this could result in the system being undercharged. It is best to discharge, replace drier, evacuate and recharge with the specified refrigerant charge.

System Diagnosis

Symptoms of Low or High Ambient Temperature Installation

Lower ambient air temperature reduces the condensing temperature and therefore reduces the temperature of the liquid entering the evaporator. The increase in refrigeration effect due to operation in a lower ambient results in a decrease in power consumption and run time. At lower ambients there is a reduction in cabinet heat leak which is partially responsible for lower power consumption and run time.

An increase in refrigeration effect cannot be expected below a certain minimum ambient temperature. This temperature varies with the type and design of the product.

Generally speaking, ambient temperatures cannot be lower than 60° F. without affecting operating efficiency. Conversely, the higher the ambient temperature the higher the head pressure must be to raise the high side refrigerant temperature above that of the condensing medium. Therefore, head pressure will be higher as the ambient temperature raises. Refrigerators installed in ambient temperatures lower than 60° F. will not perform as well because the pressures within the system are generally reduced and unbalanced. This means that the lower head pressure forces less liquid refrigerant through the capillary line. The result is the symptoms of a refrigerant shortage. The lower the ambient temperature the more pronounced this condition becomes.

When a point where the ambient temperature is below the cut-in of the Temperature Control is reached, the compressor won't run.

The drain traps will freeze in ambient temperatures of 32° F.

Heat Load

A greater heat load can result from the addition of more than normal supply of foods, such as after doing the weekly shopping. Other items contributing to an additional heat load would be excessive door openings, poor door sealing, interior light remaining on, etc.

An increase in heat being absorbed by the refrigerant in the evaporator will affect the temperature and pressure of the gas returning to the compressor. Compartment temperatures, power consumption, discharge, and suction pressures are all affected by heat load.

Pressures will be higher than normal under heavy heat load.

Disassembly Procedures



WARNING

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Unpack unit

1. Cut wires at top and bottom of crate. Remove and discard both wires and the lid. Retain the Styrofoam pads.
2. Being careful not to damage finish, cut crate apart at the corners, pull it off unit and discard the pieces.

NOTE: When performing the next step remember that the machine compartment cover will not bear the weight of the unit.

3. Lay two Styrofoam pads (removed from top of unit) on floor behind refrigerator. Arrange pads so that, when unit lays on its back, it will rest on pads – one pad at a point just above the machine compartment cover and the other at a point just below the top of the unit.

CAUTION:

To minimize possibility of severe personal injury and/or property damage, two person lift is advised before attempting steps 4 thru 6.

4. Tip the refrigerator backwards and lower gently so that it lays on the pads you placed in Step 3.
5. Remove bolts that mount pallet to bottom of unit. Discard bolts and pallet.

NOTE: To avoid damage to unit, do not leave unit on its back any longer than necessary.

6. Lift refrigerator back into upright position. Remove and discard cardboard from between doors.

Remove doors if necessary

1. Open both compartment doors. Remove door buckets, all shelving and drawers from refrigerator and freezer compartments. Place components on a padded surface to avoid damage.
2. Close both doors and tape them shut so they won't fall off unexpectedly when hinges are removed.

NOTE: To minimize possibility of personal injury and/or property damage, make sure unit doors are taped shut before you undertake the next steps:

3. On top of unit, remove and retain plastic cap from door hinge.
4. Remove and retain screws from top door hinge. Unless door reversal is intended, leave Posi-Pin shim in place.
5. Pull tape off of door and lift door off unit. Set door on a padded surface to prevent damage to finish.
6. Remove and retain center hinge pin and all plastic shims. Note number and location of shims as you do so.

7. Pull tape off freezer door and lift door off unit. Set door on a padded surface to prevent damage to finish.
8. If clearance requirements so dictate, remove center and lower door hinges:
 - a. Remove screws from center hinge bracket. Remove and retain bracket, screws, and all shims.
 - b. Remove toe grille by pulling it directly away from unit, and pop plastic cover off bottom door hinge. Grille and cover are fragile: keep both parts safe from harm.
 - c. Remove bottom hinge pin and all shims from bottom hinge bracket. Note number and location of shims. Retain all parts.
 - d. Loosen mounting screws from bottom hinge bracket. Remove and retain bracket and bolts.

Refrigerator Compartment

Light Bulb, Light Switch

1. Loosen mounting screws from refrigerator light cover. Remove screws and cover and refrigerator light bulb. Retain all parts.
2. Remove screws from light housing. Disconnect wires from light housing, making note of colors and locations as you do so. Remove light housing from compartment and retain all parts.
3. Use a taped putty knife to carefully pry light switch out of liner. When light switch is free of compartment liner, remove wires from light switch. Remove light switch from unit.

Temp-Assure™ Damper Control

1. Pull knob off front of unit.
2. Pop tabs on lower edge of control cover out of compartment liner. Then, rolling lower edge of cover forward and up, work tabs on cover's upper edge out of compartment liner. Retain all parts.
3. Remove and retain Styrofoam control insert. Work control mechanism free of locking tabs and remove mechanism from unit.

Disassembly Procedures



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Freezer Compartment

Freezer Temperature Control

1. Pull control knob down and out of unit. Retain.
2. Find one cover mounting screw in space vacated by control knob. Remove mounting screw and cover. Retain all parts.
3. Remove control-bracket mounting screws. Retain
4. Noting color and location of all wires, disconnect wires from control mechanism. Remove mechanism and mounting bracket from unit.
5. Remove mounting screws from control mechanism. Separate mechanism from bracket. Retain screws.

Light Switch, Light Socket

1. Remove mounting screws from rear edge of light shield. Pull light shield back and down, out of unit. Remove light bulb and retain all parts.
2. With putty knife covered with tape to protect plastic surface, pry light switch out of cabinet liner.
3. When light switch is free of compartment liner, remove wires from light switch. Remove light switch from unit.
4. Remove mounting screws from rear edge of light housing. Pull housing back and down, remove wires from back of housing and remove housing from unit.

Freezer Back Panel

1. Loosen screws that mount icemaker to freezer compartment walls.
2. Pull icemaker gently away from wall of compartment. As you do so, work fill cup free of fill tube. Unplug icemaker electrical connector and remove icemaker from unit.
3. Loosen and remove screws that hold 2 shelf glides in place at left and right sides of compartment. Pull front end of each glide away from the wall and in, toward center of compartment. That motion frees tabs at back ends of glides from slots in compartment walls. Pull glides free of slots and remove glides.

NOTE: Freezer compartment should now be empty and walls should be clear of anything that will obstruct removal of back panel.

1. If unit has no icemaker loosen mounting screw from icemaker connection cover. Remove mounting screw and cover.
2. Near icemaker connections, in left side of freezer compartment, two plastic buttons cover holes for mounting icemaker. Loosen screws that hold buttons in place. Remove screws and buttons.
3. Loosen and remove screws that hold 2 shelf glides in place at left and right sides of compartment.

4. Pull front end of each glide away from the wall and in, toward center of compartment. That motion frees tabs at back ends of glides from slots in compartment walls. Pull glides free of slots and remove glides.

NOTE: Freezer compartment should now be empty and walls should be clear of anything that will obstruct removal of back panel.

Evaporator Fan, Evaporator Motor

1. Loosen and remove screws that hold evaporator cover to back of compartment. Pop icemaker plug free of evaporator cover and remove evaporator cover from compartment.
2. Remove screws that anchor evaporator fan bracket to back wall of compartment. Pull fan and bracket out of place as a unit and turn or roll them as necessary to ease access to wiring and electrical connections.
3. Free fan bracket from wiring harness by using needle-nosed pliers to pull out plastic clips.
4. Unplug electrical connectors from bracket and fan motor. Remove bracket and motor from unit.
5. Separate bracket and motor by removing screws that mount fan to bracket.
6. Pull plastic fan off motor shaft.

Defrost Terminator (Thermostat)

1. Terminator is fastened to evaporator tubing with a spring clip.
2. Snap terminator off tubing and unplug wire connectors.
3. Remove terminator from unit.

Defrost Heater

1. Remove screws that secure left and right air dams to back wall of unit.
2. Cut plastic ties that hold evaporator heater leads to wiring harness. Unplug evaporator heater from wiring harness at both sides of unit.
3. Grip evaporator tubing at left and right sides and tug evaporator sharply forward. Evaporator will pop out of plastic clips that hold it to back wall of unit. Then roll bottom of evaporator forward and up, exposing evaporator heater in its location amid fins at bottom of evaporator.
4. Taking care to notice how and where they are placed, remove spring clips that hold heater into evaporator fins.
5. Pull evaporator heater out of evaporator fins, being careful that heater electrical leads do not snag on air dams, evaporator fins, tubing or other object.

Disassembly Procedures



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Evaporator Removal

NOTE: Reclaim refrigerant per instructions in "Service Procedures" before attempting evaporator removal. To avoid system contamination, do not leave system open for more than 10 minutes.

1. Remove heat exchanger and machine compartment covers from back of unit.
2. Unbraid suction tube at compressor.
3. Score and break capillary tube at drier.
4. Straighten heat exchanger. Then pull evaporator and heat exchanger as an assembly, out, through front of freezer compartment.

NOTE: If Styrofoam block in back wall of cabinet exterior is damaged during evaporator removal or replacement, repair damaged area with mastic sealer.

Drawer Assembly (some models)

1. Open drawer to fully open position.
2. Remove upper basket.
3. Remove shipping screws one in each rail marked on side of rail.
4. Lift front of drawer up and out to remove drawer.

Drawer Rails

1. Remove screws inside plastic rail retainer.
2. Pull front end of each glide away from the wall and in, toward center of compartment. That motion frees tabs at back ends of glides from slots in compartment walls. Pull glides free of slots and remove glides.
3. Remove rails from retainer by depressing plastic tabs on back side of retainer.
4. Slide rails off of retainer.

Bottom of cabinet

Front Roller Assembly

1. Remove toe grille by pulling it straight away from unit.
2. Raise front of refrigerator at least 4" off the deck and block it up.
3. Working at front of unit remove two roller-assembly mounting screws.
4. Remove roller assembly from unit.

Rear Roller Assembly

NOTE: Condensate drip pan may spill when steps 1 thru 4 are performed. Have a towel ready to mop up spillage.

1. Raise back of refrigerator at least 4" off the deck and block it up.
2. Remove condenser-fan grille, heat-exchanger cover and machine-compartment cover.

3. Remove two rear mounting bolts from compressor.
4. With a Torx driver, remove mounting screws from both ends of cabinet brace.
5. Remove rollers from cabinet brace by sliding roller axles lengthwise, so they fall out of brace.

Machine compartment

Defrost Timer

1. Remove toe grille by pulling it straight away from unit.
2. Locate timer box at right front corner of unit, and remove screws that hold lid on box.
3. Remove lid, reach in, and unplug harness leads from defrost timer.
4. Remove lid and timer as an assembly. Then separate lid and timer by removing screws that hold timer to lid.

Condenser Fan & Fan Motor

1. Remove mounting screws from condenser fan mounting plate.
2. Work mounting plate up, off mounting tabs. Unplug wiring harness connector from fan motor and remove condenser fan assembly from unit.
3. On backside of fan motor, screws secure the motor to its brackets. Remove those screws.
4. Note which side of fan blade is "front" and which side is "rear." Then use pliers to loosen nut that secures fan blade to motor shaft. Remove nut and fan blade.

Condensate Drain Pan

NOTE: Condensate drip pan may spill when steps 1 thru 4 are performed. Have a towel ready to mop up spillage.

1. Remove heat-exchanger cover, condenser-fan grille and machine-compartment cover.
2. Remove, but do not disassemble, condenser fan motor and mounting plate per instruction above.
3. Remove rear compressor bolts. Pull machine tray, as an assembly, about 4" rearward.
4. Reach into machine compartment and pop plastic drip pan up, off metal mounting clips. Remove pan from unit.

Condensate Drain Tube

1. Remove heat-exchanger cover, condenser-fan grille and machine-compartment cover.
2. Drip tube is mounted to bottom of cabinet with "P" clamps. Reach into machine compartment and remove screws that secure the "P" clamps.
3. Pull drip tube down, off drain nipple and back, out of unit.

Disassembly Procedures



WARNING

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Overload/Relay

1. Remove heat exchanger cover, condenser fan grille and machine compartment cover.
2. Discharge capacitor (if unit is so equipped) through a 10.000-ohm resistor.
3. Using fingers and standard screwdriver, press and pry bale strap off the overload/relay cover.
4. Remove cover to access overload/relay components.

Compressor

1. Remove heat exchanger cover, machine compartment cover and condenser fan grille.
2. Remove drier.
3. Disconnect all compressor wiring.
4. Unbrazed low and high pressure lines at compressor.
5. Remove compressor mounting bolts.
6. Lift compressor out of unit.

NOTE: Install new drier and compressor per instructions in "Service Procedures." Evacuate and recharge sealed system per instructions in "Service Procedures."

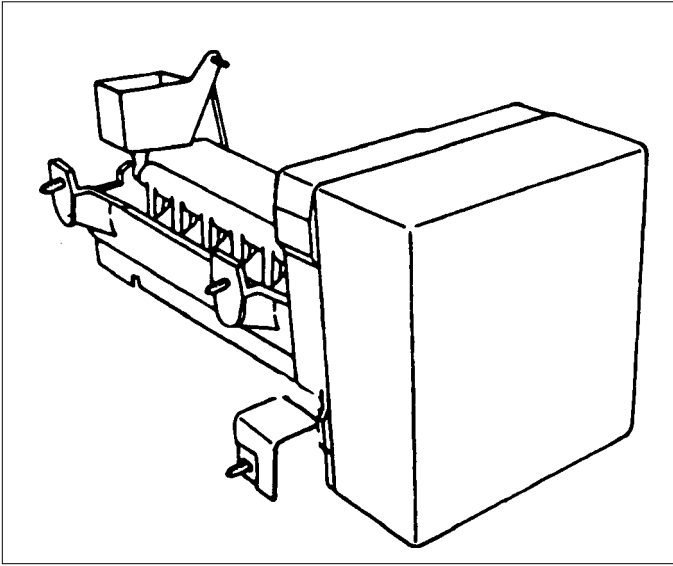
Condenser Removal

NOTE: Condenser and machine tray are a 1 piece assembly and must be replaced as a unit.

1. Under front of unit, remove toe grille, defrost timer and timer box.
2. From backside of unit, remove heat exchanger cover, machine compartment cover and condenser fan grille.
3. Remove condenser fan and mounting plate.
4. Remove drier and compressor.
5. Disconnect all cabinet wiring from machine tray.
6. Reach in the machine compartment from the rear and pull machine compartment tray with condenser out the back of unit.

Appendix A

Ice Maker



Operation

When the thermostat has sensed temperature $-8.3^{\circ} \pm 1.5^{\circ} \text{ C}$ ($17^{\circ} \pm 3^{\circ} \text{ F}$), the thermostat closes. The current now has a path through the thermostat to the motor (see wiring diagram). The motor is linked with the drive gear. From the module, there are copper contacts that ride on copper strips on backside of drive gear. As the drive gear rotates, these contacts will make or break a circuit (tract) to the copper strips to operate the ice maker.

The design of the ice maker allows all of the components to be tested without removing the ice maker or moving the refrigerator away from the wall to access the water valve.

Remove the cover and you will see the test points identified on the module.

N = Neutral side of line

M = Motor connection

H = Heater Connection

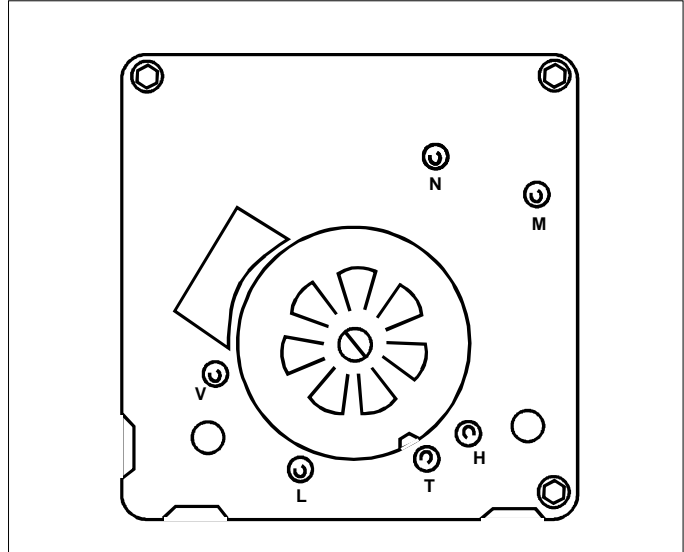
T = Thermostat connection

L = L1 side of line

V = Water valve connection

NOTE: Read this section completely before doing any testing or adjusting.

The test holes are identified as *N, M, V, etc.*



Specifications

Mold Heater	- 185 Watts, 264 Ohms
Thermostat (Bimetal)	- Close $-8 \pm 1^{\circ} \text{ C}$ ($17 \pm 3^{\circ} \text{ F}$) Opens $0^{\circ} \pm 1^{\circ} \text{ C}$ ($17 \pm 3^{\circ} \text{ F}$)
Water Fill	- 140 cc, 7.5 Sec.
Motor Cycle	- Stamped in Circuit, Plug in Connectors, One Revolution of blades take three minutes plug stall time on ice. (Eject and Water Fill)

Testing Procedures

Ice maker plugged into power, shut-off arm down, freezer cold

1. Test point *L* and *N* will verify 230 volts to Ice maker module. Make sure test probes go into test points 1.3 cm (1/2").
2. Test points *T* and *H* will verify the bimetal thermostat is open or closed

Short *T* and *H* with an insulated piece of wire to run motor. If the motor doesn't run, replace module assembly.

If the motor runs, replace the bimetal thermostat.

3. Leave the jumper in for half of a revolution, touch the heater mold. If the mold feels warm, the heater is working properly.

Remove jumper and the water valve will be energized in last half of revolution providing mold heater has not failed.

(Make sure the freezer temperature is cold enough to close the bimetal thermostat.)



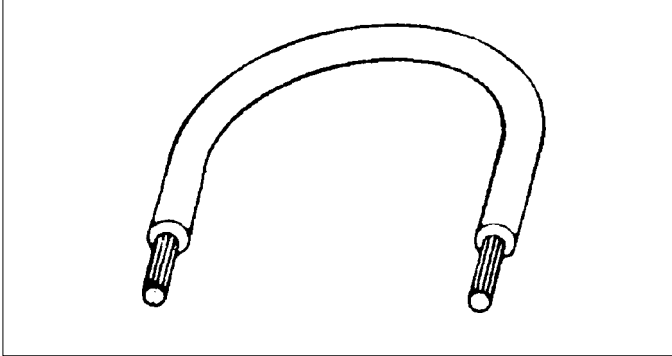
CAUTION

Damage to ice maker can result if any other contacts are shorted together other than those specified.

Ice Maker

Shunt Connection

A wire shunt made from an insulated piece of 14-gauge wire with the ends stripped back about 5/8 inch (1.5 cm).



MODULE OHMMETER CHECKS (NO POWER TO ICE MAKER & EJECTOR BLADES IN END OF CYCLE POSITION)			
TEST POINTS	COMPONENT	MODULE POSITION	OHMS
L - H	MOLD HEATER	ATTACHED TO SUPPORT	264
L - M	MOTOR	SEPARATED FROM HEATER	16,100

MODULE VOLTAGE CHECKS WITH METER OR TEST LIGHT (POWER TO ICE MAKER)			
TEST POINTS	COMPONENT	LINE VOLTAGE	0 VOLTS
L - N	MODULE	POWER OK	NO POWER
T - H	BIMETAL	OPEN	CLOSED
L - H	HEATER	ON	OFF
L - M	MOTOR	ON	OFF
N - V	WATER VALVE	ON	OFF

Disassembly Procedures

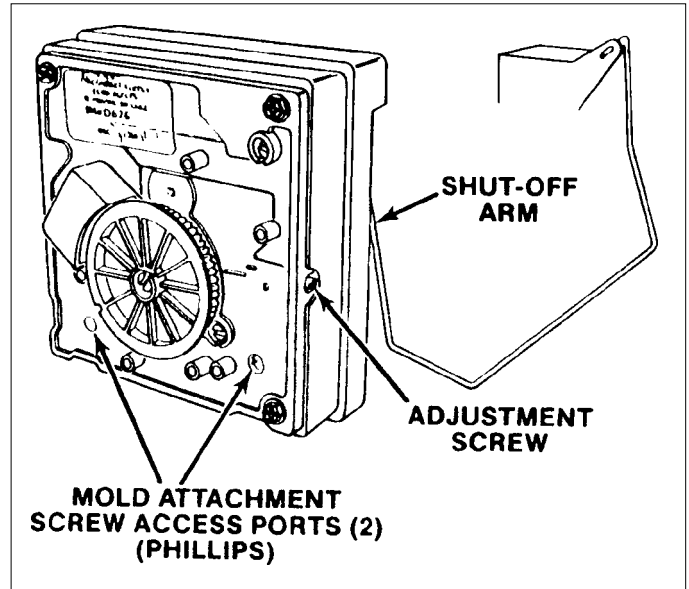
Cover

Pull water adjustment knob first and snap off cover. Note knob position and reinstall in same position for same water fill.



CAUTION

To avoid possible electrical shock always turn off power before beginning any disassembly.

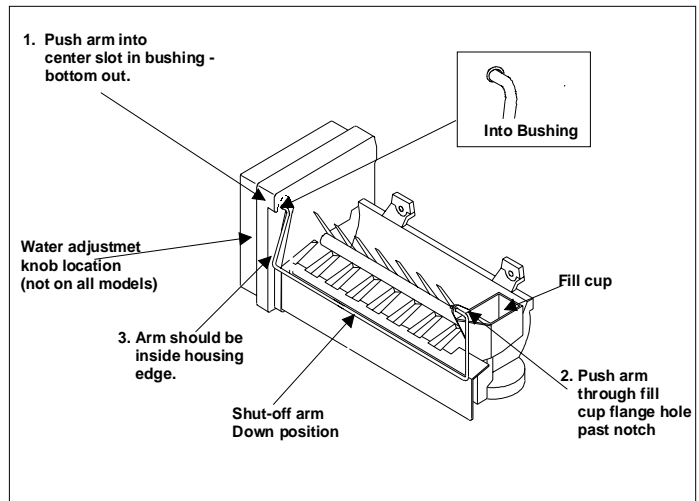


Module, Motor, and Support Assembly

Insert phillips driver in access ports in module. Loosen both screws. Disconnect shut-off arm. Pull mold from support assembly. To remove module only, remove three phillips screws and pull module out of housing.

Shut-Off Arm

Pull out from white bushing. Reinsert to full depth. Follow steps 1, 2, and 3 below.



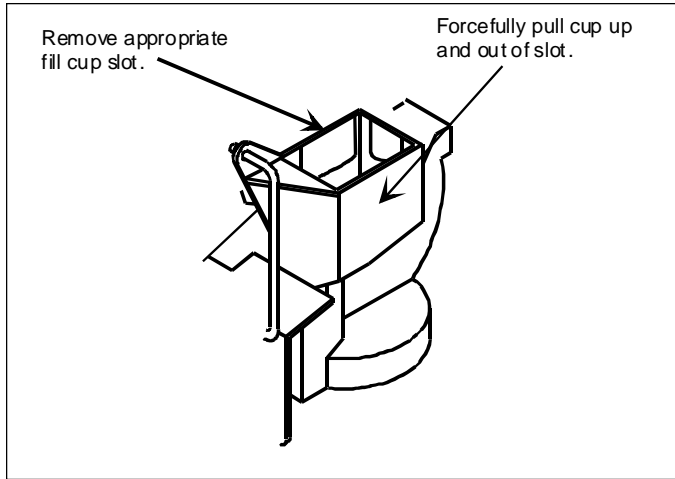
Module and Heater Assembly

Remove module and support assembly. Install on new mold and heater assembly.

Ice Maker

Fill Cup

Remove module and support assembly. Remove ejector blades and shut-off arm. Pull fill cup from mold.

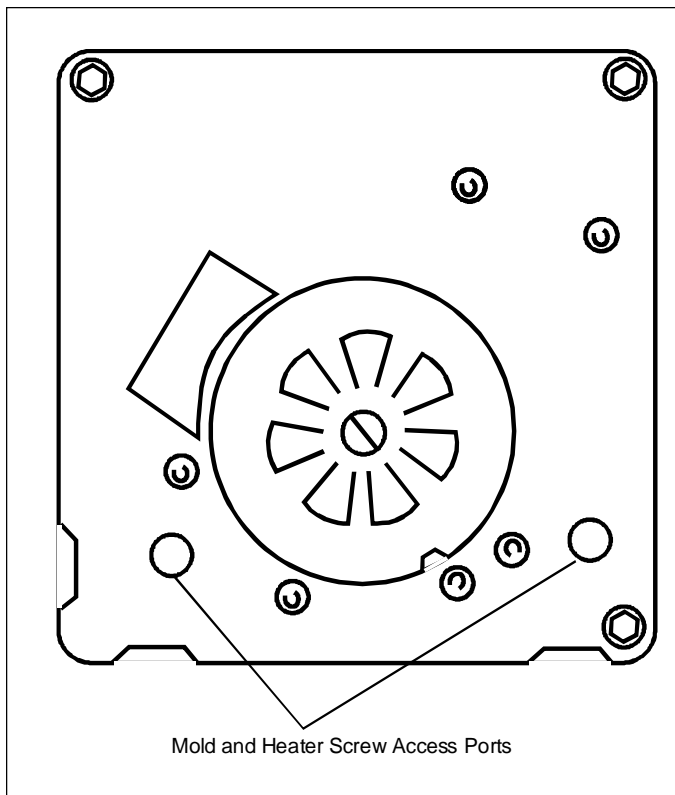



Ejector Blades or Stripper

Remove module and support assembly. When reinstalling ejector blades, realign "D" coupling with module cam.

Accessing Control box

To remove motor and contact assembly from control box, take out three screws (arrows) and pull free after disconnecting shut-off arm.





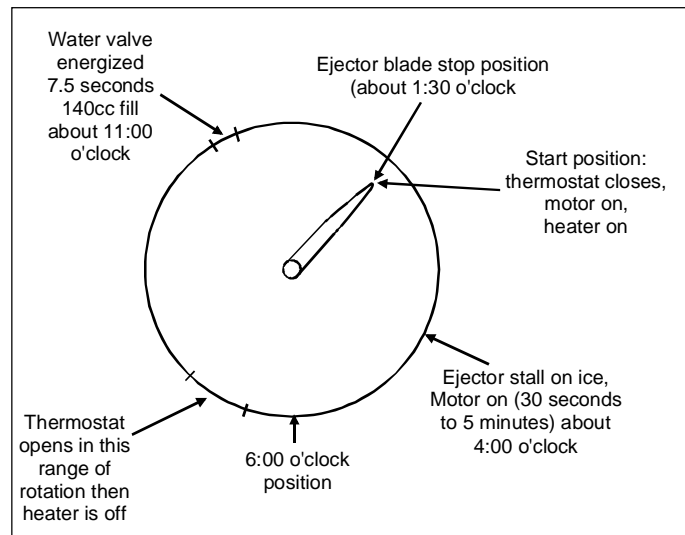
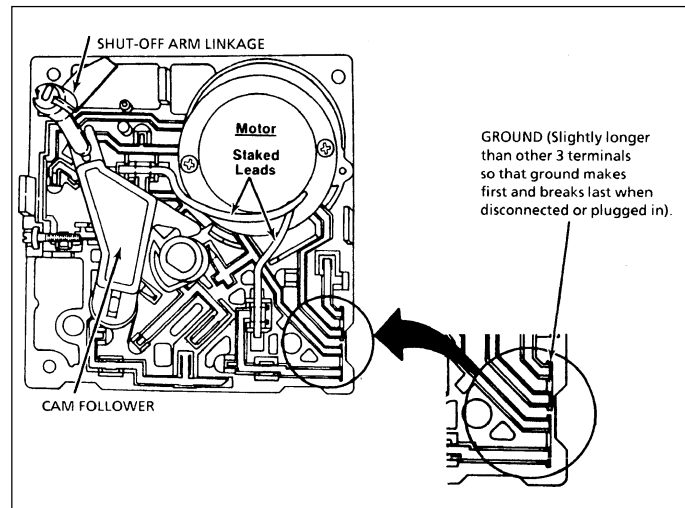
CAUTION

To avoid damage to main assembly, do not rotate blades or drive gear.

There are several switches which will jam if manually turned counterclockwise and gears will be destroyed if turned clockwise. To advance the ice maker into the cycle, use a jumper to bridge *H* to *R* and unless the motor is defective, it will run. (The shut-off arm must be in the on position.)

NOTE: There are several slotted shafts on the motor assembly board. Do not under any circumstances insert a screwdriver and attempt to turn these shafts. The slots are to permit assembly only.

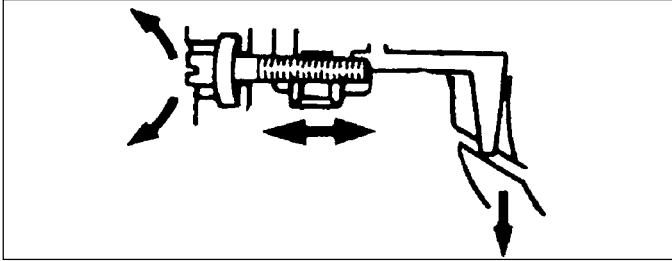
NOTE: There are not repairable or replaceable components in the module. Unless you are replacing the module, there should be no need to remove it when diagnosing or repairing the ice maker.



Ice Maker

Water Fill Adjustment

Turning the water level adjustment screw will move the contact in its relationship with the contact ring segment. This causes the contact to vary time the water valve is energized, since the contact ring is tapered at the end of the fill time.



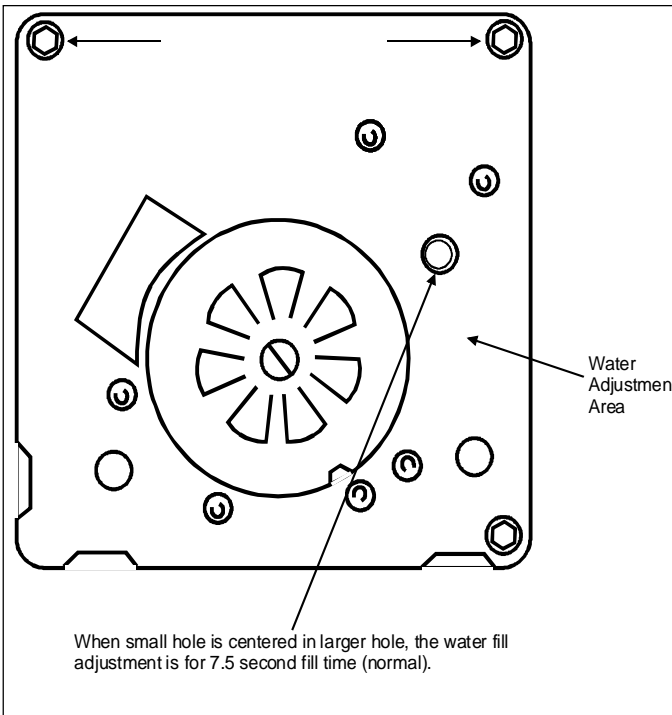
Turning screw clockwise decreases fill;
counterclockwise increase fill amount.

1/2 turn equals 20 cc or 1.2 seconds
Full turn equals 40 cc or 2.4 seconds

CAUTION

Maximum adjustment is one full turn either direction.
Additional rotation could damage module.

If water valve adjustment screw falls out, just put it
back in and align the hole in the hole as shown.



Water Problems

Water quality can cause ice makers to fail, or produce unacceptable cubes. If mineral content or sand is a problem, the screen in the fill valve can restrict, or a particle of sand can keep the valve from seating properly. Results will be small crescents (or no ice) or flooding of the ice container if the water valve does not close. Where required, install the ASAP granular activated carbon, odor, tastes, and sediment filter, Part Number R0183114.

Mineral contact can also lime up the mold, causing wicking of water over the mold and poor cube release. Silicone is applied at the upper edges, around fill cup and stripper.

Temperature Problems

Temperatures in freezer section which average above the normal $-18^{\circ}\pm 1^{\circ}\text{C}$ ($0^{\circ}\pm 2^{\circ}\text{F}$) will slow production of ice. Complaints of inadequate ice cube production may be corrected by simply setting the freezer to a colder temperature. The thermostat cycling temperature in the 1-revolution ice maker is $-8^{\circ}\pm 1^{\circ}\text{C}$ ($17^{\circ}\pm 3^{\circ}\text{F}$). Obviously, the ice will be well frozen when these temperatures are achieved but cycling time will be slowed if freezer temperature is not cold enough to achieve these mode temperatures easily.

NOTE: Only the thermostat, mold, with heater and wiring harness, are replaceable. Any other failure (including the motor) requires replacement of the module assembly. The service replaceable mold assembly comes with a new mold heater installed.

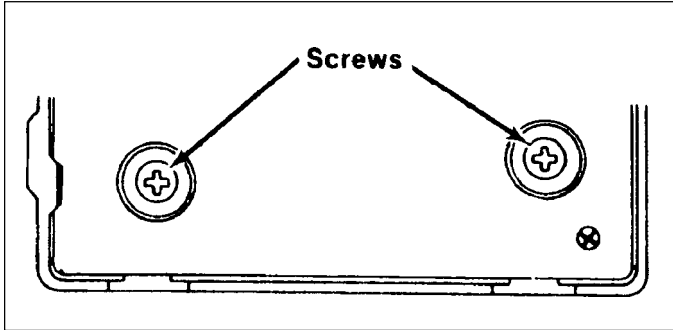
External plastic parts are also replaceable.

A failed mold heater requires complete replacement of the mold and mold heater assembly.

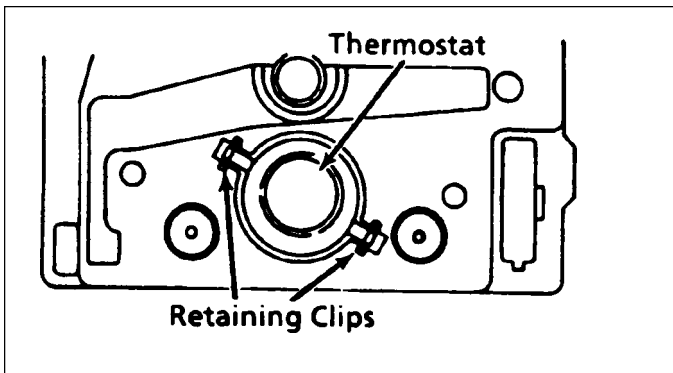
Ice Maker

Servicing Thermostat

The thermostat can be removed and replaced having been diagnosed as inoperative. Remove control box from mold by taking out two phillips screws.



Pull (front of Black Housing) free of the mold, and see the thermostat on mold side.

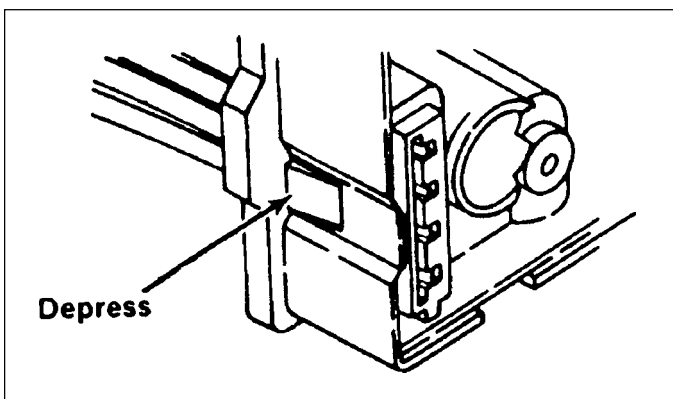


Using needle nose pliers, grasp one of the thermostat clips and pull out. Press in new thermostat, making sure pins are properly indexed. Using this procedure, it is not necessary to remove the electrical assembly.

If replacing the module, transfer the clips to the new mold support. (Use new thermal bonding material.)

Servicing Wire Harness

To remove wiring harness, depress retaining tab and pull plug free.



CAUTION

To avoid property damage, always test for water leaks after repair or replacement of the water valve. Do not over tighten connection to household water supply.

Dual Water Valve

The dual water valve has two solenoids. When the tan encapsulated solenoid is energized the amount of water allowed to enter ice maker mold is directly proportional to the length of time the water valve switch is held closed by the timing cam.

Inside the valve is a flow washer which acts as a water pressure regulator. Proper ice maker fill is 140 cc \pm 10 cc at 7.5 seconds of water fill at an inlet pressure ranging from 1.4 to 8.2 bar (20 to 120 PSI).

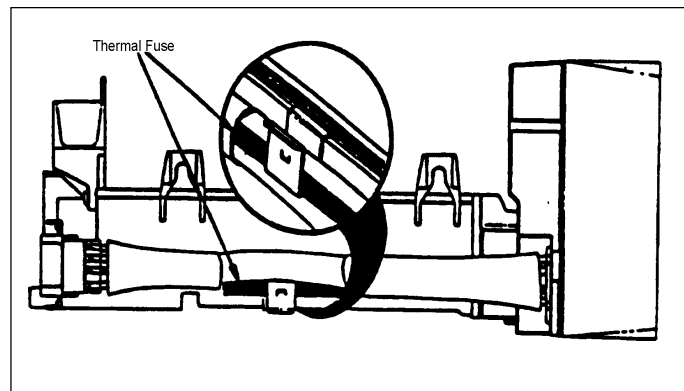
When the light blue encapsulated solenoid is energized water flows through the coiled water tank to the cavity spickett.

The water flow rate is to be 1.7 to 3.5 liter per minute with 1.4 to 8.2 bar (20 to 120 PSI) pressure drop across valve.

The valve also incorporates a 80 mesh screen water strainer.

Wiring Harness

A one-time thermal fuse micro device 78°C (170° F) is incorporated into the ice maker wiring harness to protect the plastic liner from melting if the ice maker should overheat. The thermal fuse is spliced into the red wire of the ice maker harness. The thermal fuse is a 78° C (170°F) nonresettable fuse. A "No Ice" complaint could be caused by excessive heat. Replacing only the wiring harness will only temporarily solve the problem. The ice maker thermostats should also be replaced



Ice Maker Troubleshooting Chart

I. NO ICE/LOW ICE PRODUCTION	
1. Freezer not cold enough	1. Adjust Freezer or Repair Freezer
2. Broken Locking Tab on Vertical Cam	2. Change Ice Maker Module
3. Module Shut-Off Switch And Contacts Shorted & Burned	3. Change Ice Maker Module
4. Motor Stalled or Stripped	4. Change Ice Maker Module
5. Check Ejector Position	
A. Park (2:30 Ejector Position)	
1 Contaminated Module (No run when jumped through "T" and "H" probe holes)	1. Change Ice Maker Module
2 Open/Missing Thermostat	2. Install or Replace Thermostat (Apply Fresh Alumilastic)
3 No Power To Icemaker (Harness)	3. Trace Power to Determine Discontinuity
4 Jammed Cubes (Notice size of Cube, Hollow?)	4. Unjam Cube, Check Fill Tube & Fill-Cup Assembly
5 Little or No Water to Ice Maker (Note Cube Size)	
a. Frozen Fill Tube (Leaky Water Valve)	a. Change Ice Maker Valve
b. Kinked Water Line	b. Un-Kink Line, Check for Weak Spots
c. Obstructed Water Line to Ice Maker or Refrigerator	c. Water Line Must Be Cleared
d. Clogged Water Valve	d. Change Water Valve
e. No Power to Water Valve	e. Trace Power to Determine Discontinuity
f. Low Water Pressure (NOTE: Jump Cycle through "T" & "H" Probe holes for 10 Sec. , Then Remove Jumpers) Catch Water in Glass	f. Water Pressure Must Be Increased (20 -120 psi) (1.4 - 8.2 bar) Should be About 140 cc's
g. Open Heater Circuit	g. Change Mold and Heater Assembly
h. Closed Thermostat	h. Change Thermostat
i. Damaged Heater Tulips on Module	i. Change Module
j. Heater Pins Too Short - Not Contacting Module	j. Change Mold/Heater Assembly
6 Bail Shut-off Arm In Vacation Mode - No Ice	6. Lower Bail Shut-off Arm To Begin Cycle
7 Bail Shut-off Arm Binds When Raised or Lowered	
a. Water/Ice in Actuator/Housing Hole	a. Remove Module, Dry Actuator and Housing Hole
b. Housing Hole Small or Burred	b. Repair or Replace Ice Maker
c. Actuator O.D. Large or Burred	c. Replace Ice Maker Module
d. Module Housing Damaged	d. Replace Ice Maker Module
e. Bail Shut-off Arm Misformed	e. Replace Bail Shut-off Arm
8 Little/No Alumilastic on Thermostat	8. Apply Fresh Coat of Alumilastic to Thermostat
9 Housing to Mold Screws Not Seated	9. Tighten Two Screws With Phillips Driver (20-26 In.lb) (22.8 - 29.6 cm/kg)
10 Heater Not Staked In Mold	10 Replace Mold/Heater Assembly, Apply fresh Coat of Alumilastic
11 Wrong Heater Temperature	11 Replace Mold/Heater Assembly, Apply fresh Coat of Alumilastic

Ice Maker Troubleshooting Chart

I. NO ICE/LOW ICE PRODUCTION (cont.)	
5. Check Ejector Position (cont)	
B. 3:00 Ejector Position	
1. Contamination	1. Replace Ice Maker Module
2. Cube Jammed (Notice Size of Cube, Hollow?)	2. Un-Jam Cubes
3. Ice Maker or Refrigerator Not Level	3. Level as Needed
4. No Power To Ice Maker	4. Trace Power to Determine Discontinuity
5. Excessive Water-Fill Volume (Large Cubes)	5. Adj. Volume Screw on Module, Change Water Valve or Lower Pressure
6. Rack of Cubes Fell Back Into Mold During Ejection	6. Install New Fill Cup, Check Fill Tube Assy.
C. 4:00 Ejector Position	
1. Contamination	1. Change Ice Maker Module
2. Thermostat out of calibration	2. Change Out Thermostat, Apply Fresh Coat Of Alumilastic
3. Open Heater Circuit (Motor Should be Oscillating)	3. Change Mold/Heater Assy, Apply Fresh Coat Of Alumilastic
4. Little/No Alumilastic on Thermostat	4. Apply Fresh Coat Of Alumilastic
5. Heater Not Staked In Mold	5. Change Mold/Heater Assy, Apply Fresh Coat Of Alumilastic
6. Broken Locking Tabs on Vertical Cam	6. Change Module
D. 6:00 Ejector Position	
1. Contamination	1. Change Ice Maker Module
2. Hollow Cubes	2. Refer to Section III, "Hollow Cubes"
3. Insufficient Water To Ice Maker, Small Cubes	3. Refer to Section III, "Hollow Cubes"
E. 7:30 Ejector Position	
1. Contamination (Motor Will Not Oscillate)	1. Change Ice Maker Module
2. Bail Arm Stuck in Ice or Obstructed	2. Remove Obstruction, Replace Ice Maker Module
3. Pac-Man Cubes (Cubes not formed properly)	3. Un-Jam Unit, Check Fill Cup And Fill Tube Assy.
F. 9:00 Ejector Position	
1. Contamination	5. Change Ice Maker Module
2. Cube Frozen to Fill Cup or Mold	5. Un-Jam Unit, Install New Fill Cup and Module

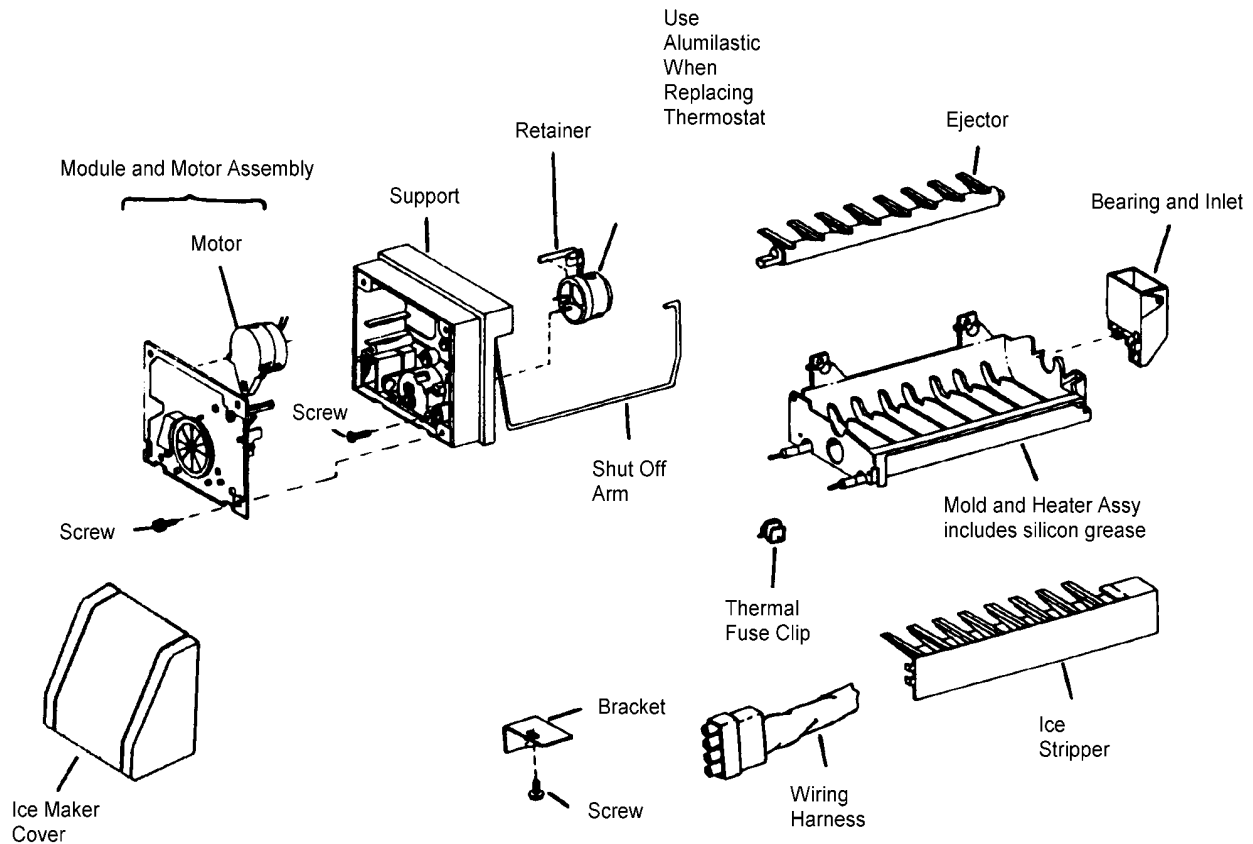
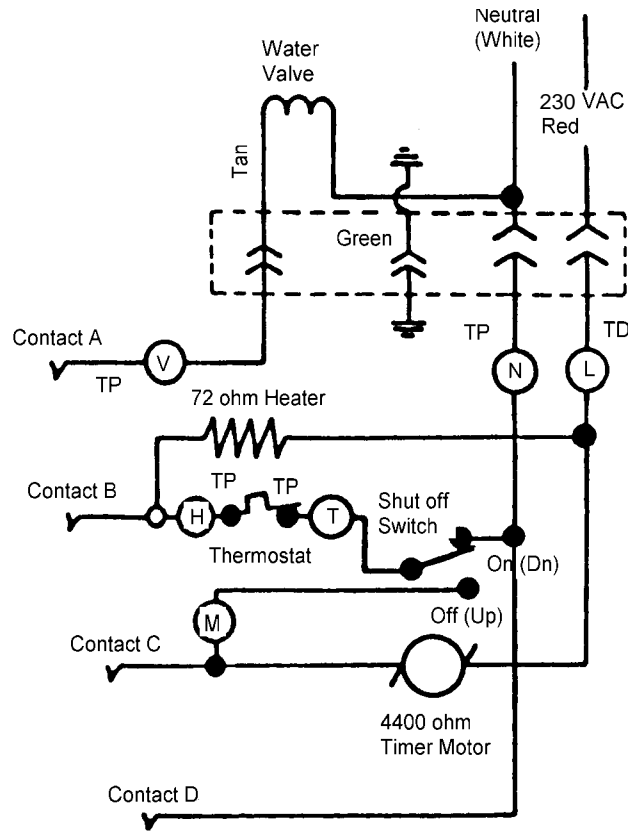
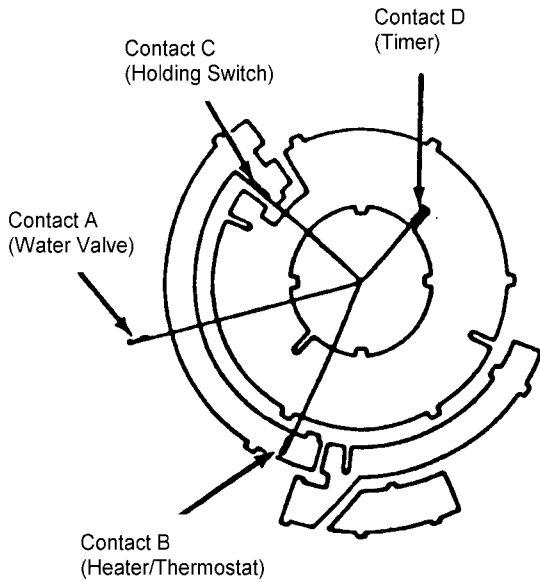
Ice Maker Troubleshooting Chart

II. OVER PRODUCTION OF ICE	
1. Bail Shut-off Arm Not in Actuator	1. Replace Bail Shut-off Arm in Actuator, Note for Loose Fit
2. Misformed Bail Shut-off Arm	2. Replace Bail Shut-off Arm
3. Shut-Off Lever Broken or Bypassing Vertical Cam	3. Replace Ice Maker Module
4. Broken Module Actuator	4. Replace Ice Maker Module

III. HOLLOW ICE CUBES	
1. Water Fill Volume Too Low	1. Adj. Screw On Module, Clear Water Path Or Change Water Valve
2. Improper Freezer Air-Flow	2. Re-Direct Air Flow Away from Ice Maker Thermostat
3. Thermostat Out Of Calibration	3. Change Thermostat, Apply Fresh Alumilastic

IV. FLOODING OR ICE SLABS IN BUCKET OR FREEZER	
1. Thermostat Out Of Calibration	1. Change Thermostat, Apply Fresh Alumilastic
2. Jammed Cube Stalled In Water-Fill Cycle	2. Remove Cube, Determine Reason For Stall
3. Leaky Water Valve	3. Change Water Valve
4. Fill Volume of Water Valve Excessive	4. Change Water Valve
5. Motor Stalled In Water-Fill Cycle (12:00 Ejector Position)	5. Change Ice Maker Module
6. Contaminated Module	6. Change Ice Maker Module
7. Refrigerator or Ice Maker Not Level	7. Level As Necessary
8. Excessive Water Pressure	8. Lower Water Pressure (20-120 psi) (1.4 - 8.2 bar)
9. Module Shut-Off Switch and Contacts Shorted And Burned	9. Change Ice Maker Module
10. Broken Locking Tab On Vertical Cam (Stalled in Waterfill)	10. Change Ice Maker Module
11. Fill-Tube Not Properly Located In Fill Cup	11. Reposition Fill Tube
12. Fill Cup Water Opening Flashed Over/Plugged	12. Change Fill Cup
13. Cubes Fell Over Back Of Ice Maker, Melting Into Freezer	13. Install New Fill Cup

Ice Maker Wiring Diagram and Parts Layout



Appendix B

Installation Instructions

This refrigerator operates most efficiently when it is properly installed. Amana cannot be responsible for loss, injury or damage caused by improper installation or unqualified personnel.

WARNING

To minimize risk of death, personal injury and/or property damage, read and heed all safety messages.

Unpack unit

1. Cut wires at top and bottom of crate. Remove and discard both wires and lid. Retain Styrofoam pads.
2. Being careful not to damage finish, cut crate apart at corners, pull it off unit and discard the pieces.

NOTE: When performing the next step remember that the machine compartment cover will not bear the weight of the unit.

3. Lay two Styrofoam pads (retained in Step 1) on floor behind refrigerator. Arrange pads so that, when unit lays on its back, it will rest on pads – one pad at a point just above the machine compartment cover and the other at a point just below the top of the unit.

CAUTION

To minimize risk of personal injury and/or property damage, get someone to help lift the refrigerator before attempting steps 4-6.

4. Tip the refrigerator backward and lower it gently so that it lays on pads placed in Step 3.
5. On bottom of unit, use a 7/16" wrench to remove bolts that hold pallet to unit. Discard bolts and pallet.

CAUTION

To avoid property damage, don't leave unit lying on its back any longer than is absolutely necessary.

6. Lift refrigerator back into upright position. Remove and discard cardboard from between doors.

WARNING

To avoid risk of electrical shock that can cause death or severe personal injury, disconnect unit from power before removing doors. Connect to power only after doors are replaced.

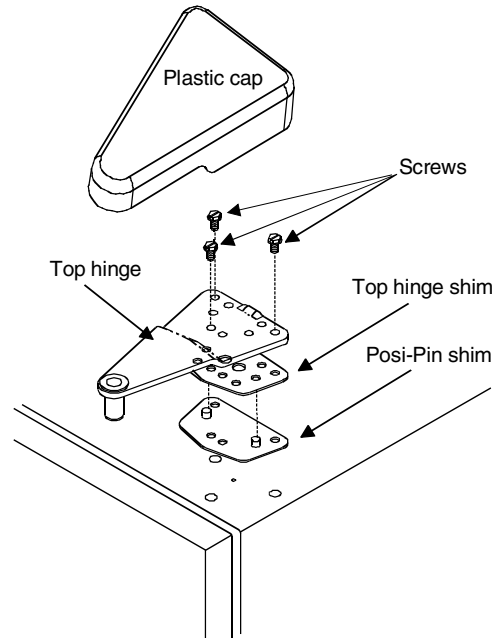
Remove doors if necessary

1. Open both compartment doors. Remove door buckets, all shelving and drawers from refrigerator and freezer compartments. Place components on a padded surface to avoid damage.
2. Close both doors and tape them shut so they don't fall off unexpectedly when hinges are removed.

WARNING

To reduce risk of death, severe personal injury and/or property damage due to falling objects, always tape doors shut before hinges are removed.

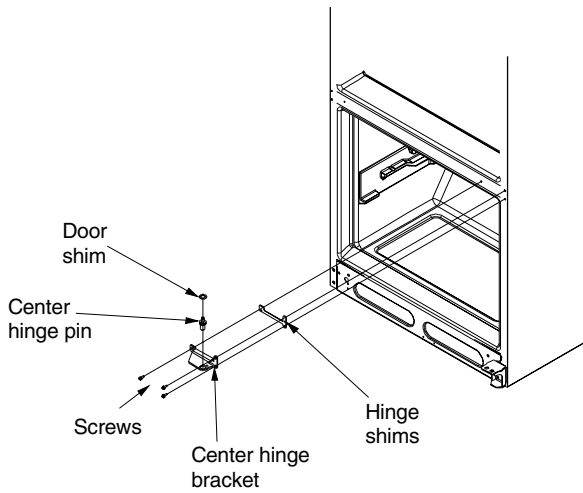
3. On top of unit, remove and retain plastic cap from door hinge.



4. Removal of plastic cap exposes top hinge and the 3 screws that secure it. With 5/16" nut driver, remove and retain screws and top door hinge. Leave Posi-Pin shim in place.
5. Pull tape off door and lift door off unit. Set door on padded surface to prevent damage to finish.
6. With 5/16" nut driver (some units require a 9/32" nut driver), remove and retain center hinge pin and all shims. Note number and location of shims (above or below hinge) as you do so.

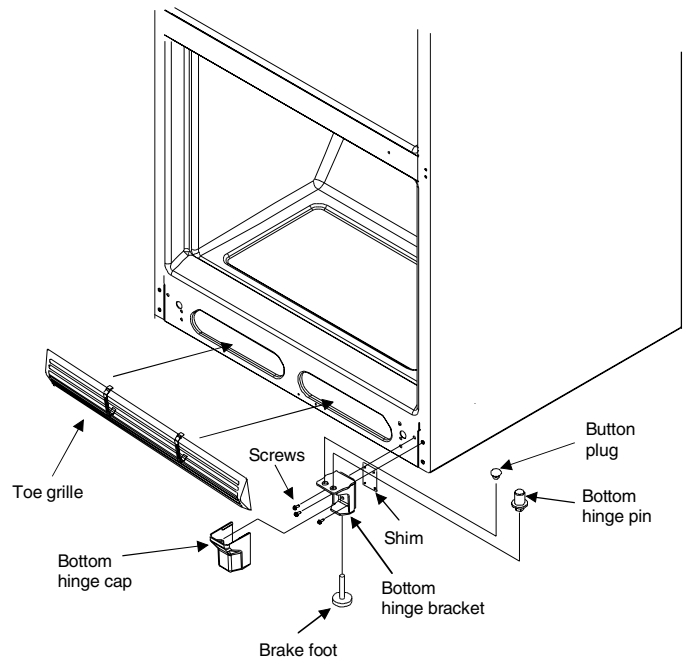
Installation Instructions

NOTE: Grille and cover are fragile: keep both parts safe from harm.



Center Hinge Nomenclature

7. Pull tape off freezer door and lift door off unit. Set door on a padded surface to prevent damage to finish.
8. If clearance requirements so dictate, remove center and lower door hinges:
 - A. Use No. 2 Phillips screwdriver to remove 3 screws from center hinge bracket. Remove and retain bracket, screws, and all shims.
 - B. Remove toe grille by pulling it directly away from unit, and pop plastic cap off bottom hinge.



Bottom Hinge Nomenclature

- C. Remove bottom hinge pin and all shims from bottom hinge bracket. Note number of shims. Retain all parts.
- D. With 3/8" nut driver, loosen 3 mounting screws from bottom hinge bracket. Remove and retain bracket and screws.

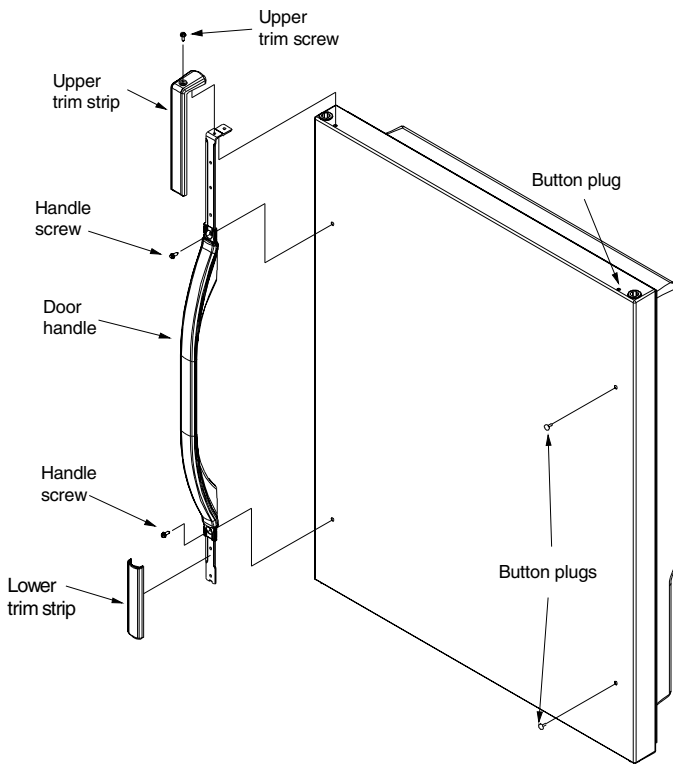
Situate the unit

1. Wrap refrigerator carefully with blanket or appliance pad. Slide appliance cart under side of unit. Thread cart strap around refrigerator and tighten strap.
2. Move refrigerator in front of final location. Remove cart strap, cart and padding.
3. You must decide what to do next.
 - If door reversal is called for, skip to Door Reversal or (if unit has contour doors) to Contour Door Reversal.
 - If door reversal is not called for and unit has an icemaker, perform Step 4 and then skip to Water Supply.
 - If door reversal is not called for and unit has no icemaker, perform Step 4 and then skip to Final Steps.
4. Rehang doors by reversing removal procedure.

Installation Instructions

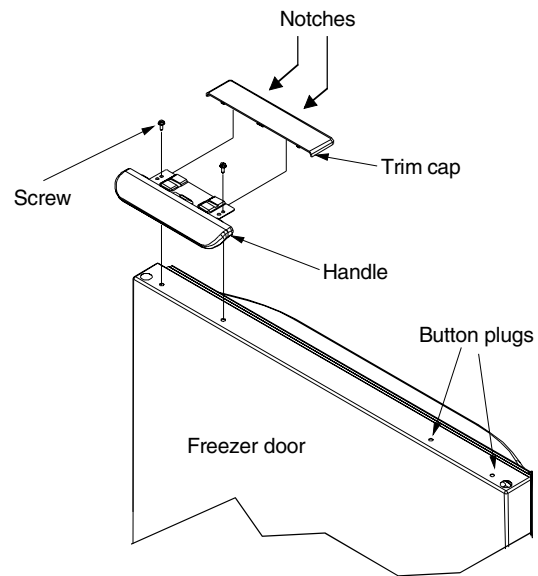
Door Reversal

1. Remove upper trim screw from top edge of refrigerator door.
2. Remove plastic trim strips from top and bottom of refrigerator door handle by prying trim away from door with a taped putty knife.



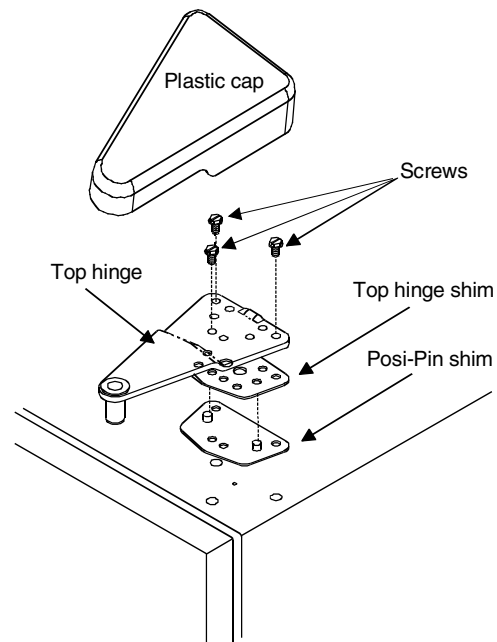
Refrigerator Door Handle Nomenclature

3. Remove screws from each end of handle and remove handle.
4. From top edge of door, at the hinge side, remove 1 button plug. From front of door, at the hinge side, remove two button plugs. Transfer plugs to opposite side of door. Use plugs to fill holes left vacant by door handle removal.
5. Open freezer door and locate two notches at back edge of freezer door-handle trim cap. Use a flat-tipped screwdriver in those notches to pry up and remove trim cap.
6. Removal of trim cap exposes two Phillips-head screws. With a No. 2 Phillips screwdriver, remove those screws and remove freezer door handle.
7. From top edge of freezer door, at the hinge side, remove two button plugs. Transfer plugs to opposite side of door. Use plugs to fill holes left vacant by handle removal.



Freezer Door Handle Nomenclature

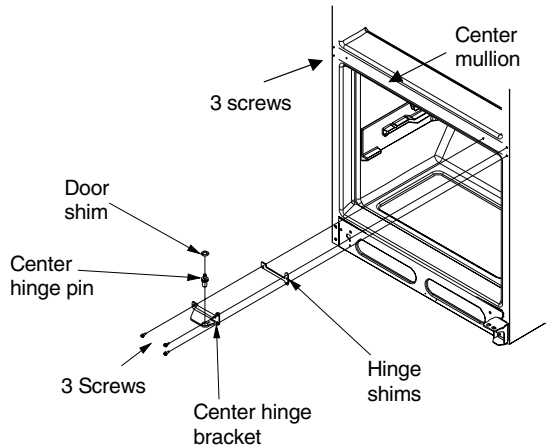
8. Pry off top-hinge cover. Use 5/16" nut driver to remove top-hinge mounting screws. Remove top hinge and shims (if present). Save all parts for reuse.
9. If unit is equipped with a Posi-Pin locator shim, carefully peel locator off top of refrigerator and lay it aside where the adhesive backing will stay clean.



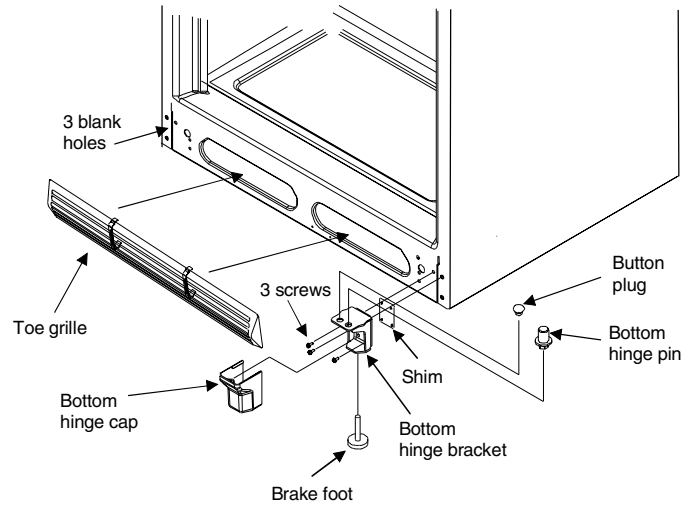
Top Hinge Nomenclature

Installation Instructions

10. Lift refrigerator door off center hinge pin. Be sure that all shims stay on center hinge pin. Set door aside on a clean, padded surface to protect the finish and customer's property.
11. Use a 5/16" nut driver (some units require a 9/32" nut driver) to remove the center hinge pin. Note number and location of (above or below the hinge) of all shims. Retain all parts for use in reassembly.



Center Hinge & Mullion

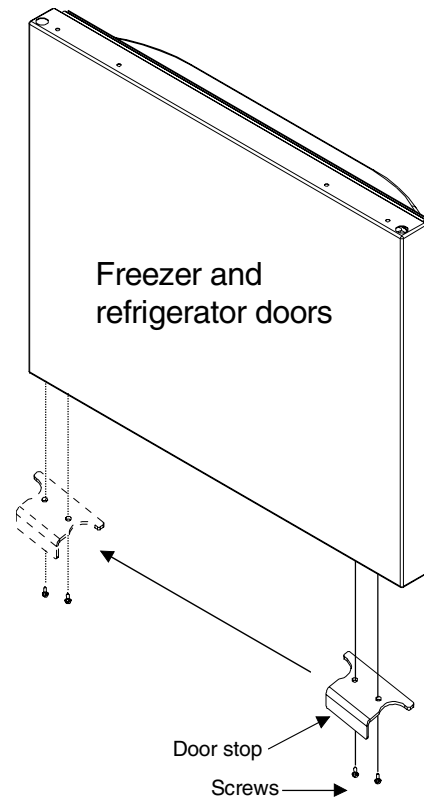


Bottom Hinge Nomenclature

12. Lift freezer door off bottom hinge and set door aside on a clean, padded surface to protect the finish and customer's property. Make sure as you do so that all shims stay with bottom hinge pin.
13. From the center mullion, on the side opposite the hinge, use 5/16" nut driver to remove 3 screws. Retain parts for reuse.
14. Use a No. 2 Phillips screwdriver to remove center hinge and all shims. Reinstall hinge and shims on opposite side of cabinet, in holes vacated during Step 13. Use screws removed during Step 13 to fill holes left vacant by hinge removal.
15. Remove toe grille and bottom-hinge cap(s).
16. Use a 3/8" nut driver to remove 3 screws from bottom hinge bracket. Move bottom hinge to opposite side of cabinet and remount, threading screws into holes left blank for that purpose.
17. Reverse position of button plug and bottom hinge pin with all shims.

NOTE: On any unit, button plug should be in hole at inside edge of bottom hinge bracket. Hinge pin (with shims) should be in hole at outer edge of bracket.

18. On bottom edge of both refrigerator and freezer doors, use a No. 2 Phillips screwdriver to move door stops to sides opposite their present location.



Relocate Door Stop

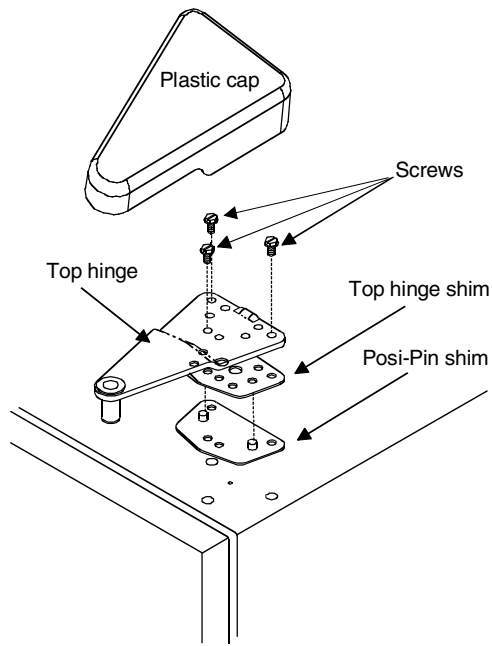
19. Rehang freezer door by setting it on the bottom hinge pin and reinstalling the center hinge pin and all shims. Use a 5/16" nut driver to screw the center hinge pin into the hinge. Be sure all shims are in their proper places.

Installation Instructions

20. On top edge of freezer door, on side opposite hinge, use a No. 2 Phillips screwdriver to install freezer door handle and cap.
21. Set refrigerator door on center hinge pin and install the top hinge. Be sure all shims are present and correctly located. Replace the plastic hinge cap.
22. Install refrigerator handle and handle trim caps.
23. Install toe grille by snapping it into place.

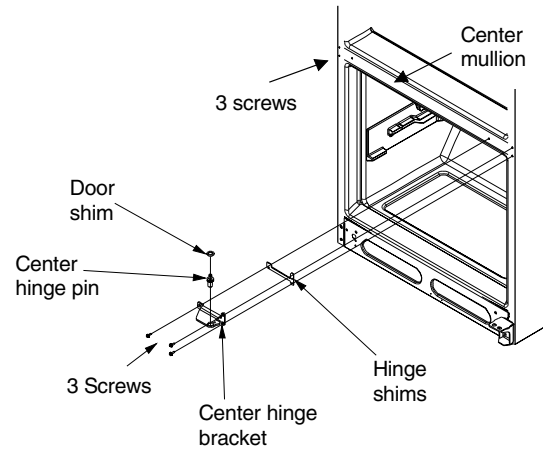
Contour Door Reversal

1. Remove buckets from fresh food and freezer doors.
2. Pry off top hinge cover. Use 5/16" nut driver to remove top-hinge mounting screws. Remove top hinge and shims (if present). Save all parts for reuse.
3. If unit is equipped with a Posi-Pin locator shim, carefully peel locator off top of refrigerator and lay it aside where the adhesive backing will stay clean.



Top Hinge Nomenclature

5. Use a 5/16" nut driver (some units require a 9/32" nut driver) to remove the center hinge pin. Note location of all shims (above or below hinge). Retain all parts for use in reassembly.
6. Lift freezer door off bottom hinge and set door aside on a clean, padded surface to protect the finish and customer's property. Verify that all shims stay with bottom hinge pin.
7. Remove toe grille and bottom-hinge cap(s).
8. From the center mullion, side opposite hinge, use 5/16" nut driver to remove 3 screws. Retain screws for reuse in Step 8.

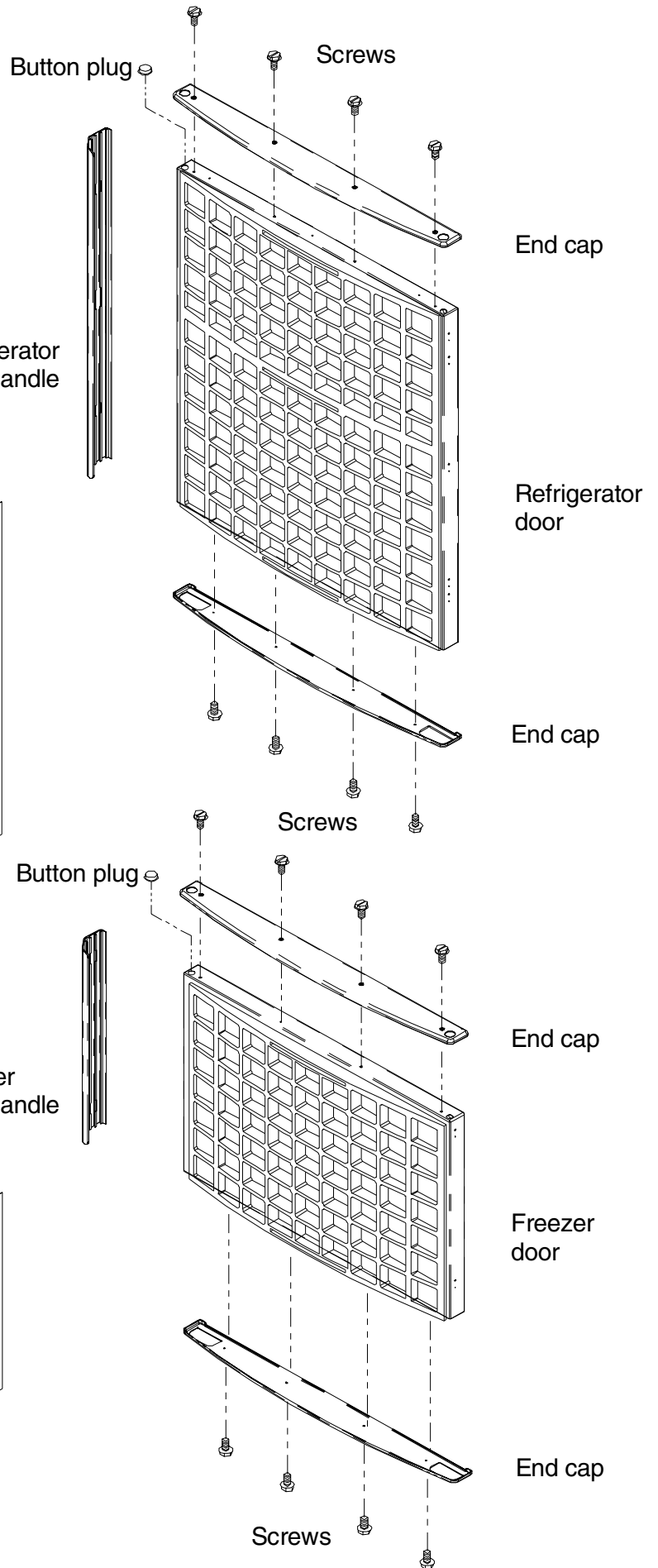
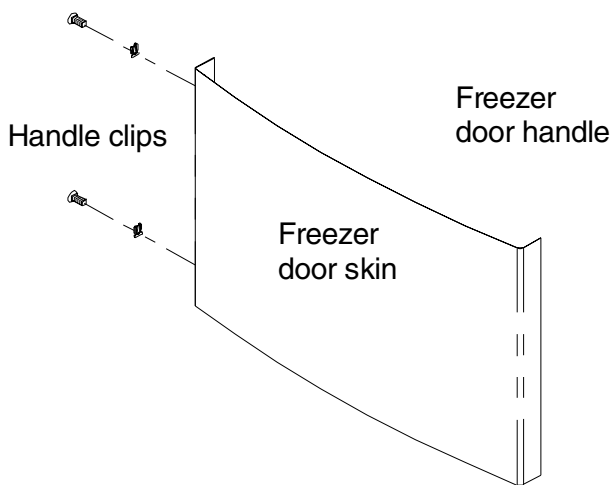
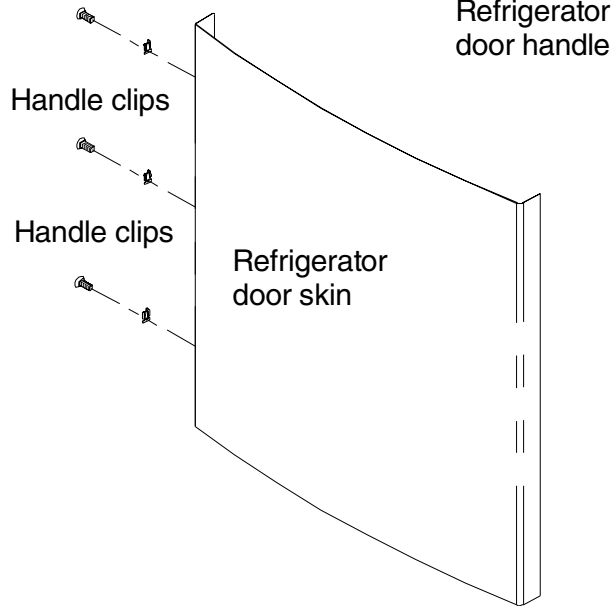


Center Hinge Nomenclature

3. Lift refrigerator door off center hinge pin. Be sure that door closure and all shims stay on center hinge pin. Set door aside on a clean, padded surface to protect the finish and customer's property.
4. On top of cabinet, side opposite hinge, use putty knife to remove three button plugs. Press plugs into holes vacated by hinge removal.

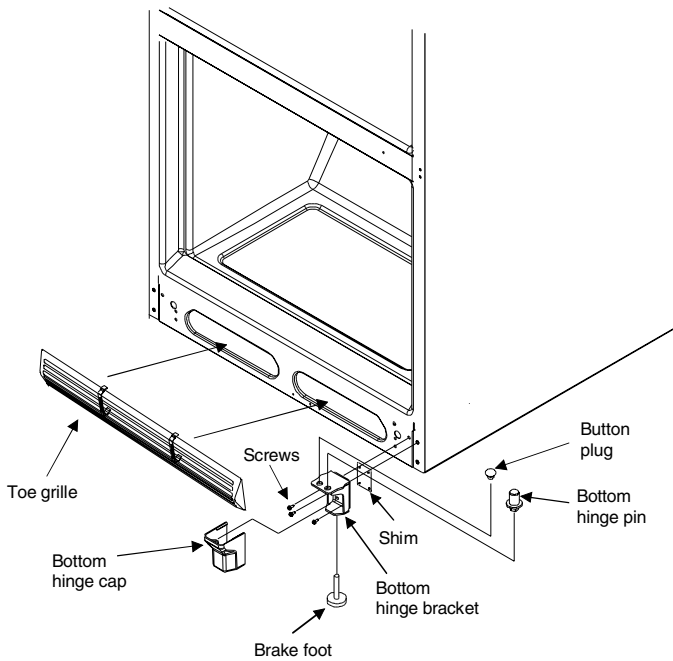
Installation Instructions

Contour Door Nomenclature



Installation Instructions

9. Use a No. 2 Phillips screwdriver to remove center hinge and all shims. Reinstall hinge and shims on opposite side of cabinet, in holes vacated during Step 7. Use hex-head screws removed during Step 7 to fill holes left vacant by hinge removal.

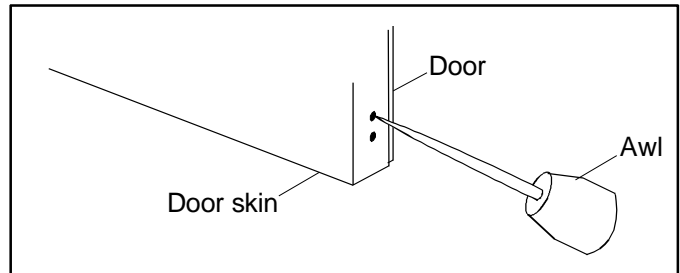


10. Use a 3/8" nut driver to remove 3 screws from bottom hinge bracket. Move bottom hinge to opposite side of cabinet and remount, threading screws into holes left blank for that purpose.
11. Reverse position of button plug and bottom hinge pin with all shims.

NOTE: On any unit, button plug should be in hole at inside edge of bottom hinge bracket. Hinge pin (with shims) should be in hole at outer edge of bracket.

12. Place refrigerator door on a protected surface (carpeted floor or table covered with blanket).
13. Remove end caps.
- Remove screws from cap on each end of door.
 - Move button plug to hole at opposite side of door.

14. Remove refrigerator door handle.
- Use rubber mallet to tap underside of handle toward top end of door. Handle will slide upward approximately 1/2" and release from handle clips.
 - Remove handle clips. Retain screws and clips.
15. Remove and rotate door skin.
- Pull up skin from handle side of door. Unhook skin from hinge side and remove. Turn skin 180° laterally and replace on door.
 - Use awl to align holes in skin with holes in door. Replace handle clips by inserting tabs in holes with tabs pointing toward top of door. Secure handle clips with screws.

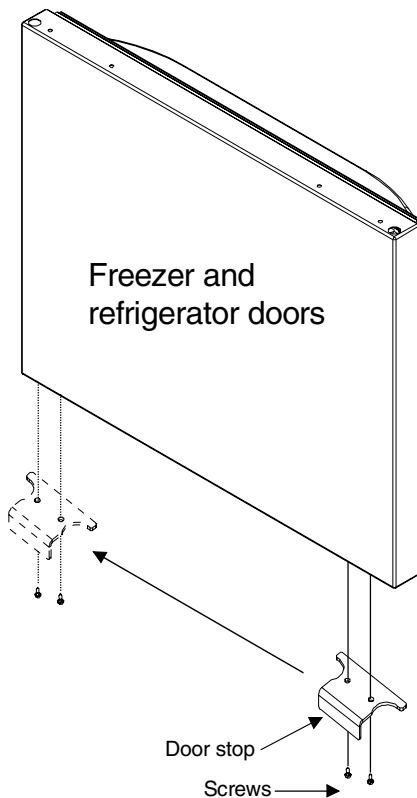


16. Replace handle.
- Slip handle onto clips. Use rubber mallet to tap handle toward bottom of door until handle won't move farther. If handle isn't tight, check to make sure you didn't miss any clips.

Installation Instructions

17. Reverse door stop.

- Locate door stop on bottom end of door.
- Remove two mounting screws. Move door stop to current hinge side and replace screws.



Relocate Door Stop

18. Replace end caps.

- Put end caps in place. Replace screws.
- If end caps rattle after tightening, remove them; put double-sided tape under them, and replace them once again using screws.

19. Set fresh food door aside and place freezer door on protected surface.

20. Remove end caps from freezer door.

- Remove screws from cap on each end of door.
- Move button plug to hole at side opposite.

21. Perform steps 12 through 20 on freezer door.

22. Remount both doors by reversing steps 1 through 9.

Water Supply

WARNING

To avoid risk of electrical shock which can cause severe personal injury or death, disconnect power to refrigerator before connecting water supply. After connecting water supply, connect power.

CAUTION

To avoid property damage, make sure water supply is connected per instructions below.

1. Connect water supply.

- a. Get a licensed plumber to connect shut-off valve and water-supply tube to household plumbing in compliance with local codes.

NOTE: Use only seamless, flexible, 1/4" (6 mm) copper tubing. Tubing must be long enough to reach from water supply to refrigerator connection plus an additional 8' (2.4 M) with which to form service loop behind refrigerator.

NOTE: The correct type of shut-off valve requires that a 1/4" (6 mm) hole be drilled in the household water pipe before the valve is attached. Do not use a self-piercing shut-off valve or a valve of any size other than 1/4" (6 mm). Amana is not responsible for property damage caused by improper water connection.

CAUTION

To avoid property damage, have towels ready to soak up spillage before attempting the rest of these steps.

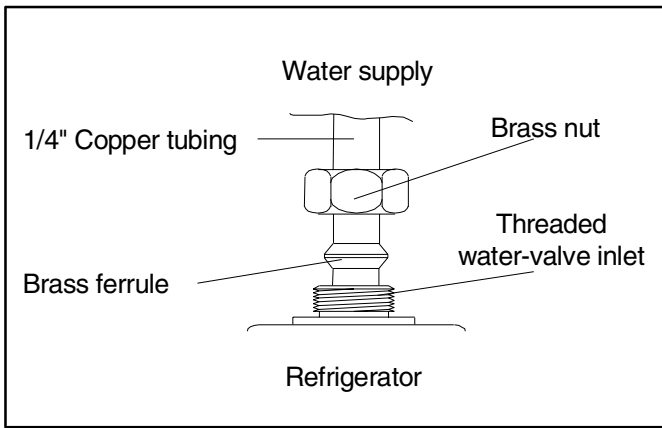
- b. Confirm that water pressure at refrigerator end of water-supply line is between 20 psi and 100 psi (between 1.4 and 7.0 kg/cm²).

NOTE: Units with filter require pressure between 35 psi and 100 psi (2.5 and 7.0 kg/cm²).

NOTE: Water valve in your refrigerator will not work properly if system pressure is not within spec.

- c. Remove plastic cap from water-valve inlet port on back of refrigerator. Place brass nut and brass ferrule on copper water-supply tube.

Installation Instructions

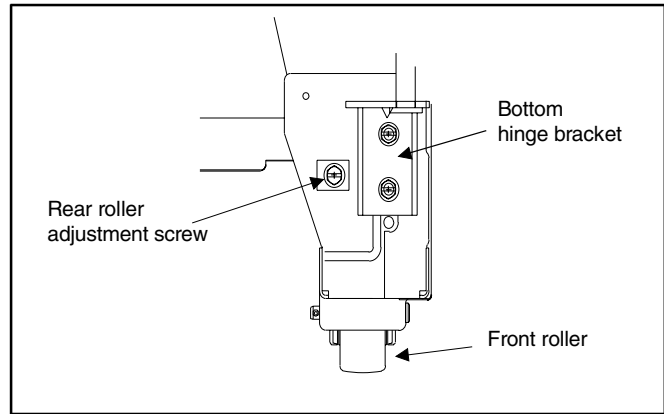


- d. Slide water-supply tube into water-valve inlet port. Slide ferrule and nut down to inlet port. Start nut onto threaded inlet port. Turn nut down finger tight and finish with a spanner.
2. Confirm that connection is secure by pulling on copper tubing.
3. Turn on water supply valve at household plumbing and check system for leaks.
4. Use slack in tubing to form service loop behind refrigerator taking care, as you do so, not to kink the tubing.

Final Steps

1. Plug in power cord.
2. Move refrigerator into final location.
3. Level refrigerator per instructions in the owner's manual.

4. Align refrigerator door.
 - a. Lay a carpenter's level across front edge of unit.
 - b. At bottom of unit, in front: Turn roller-adjustment screws and/or use shims as needed to raise or lower corners until unit is level and stable.



- b. At top of unit, side opposite hinges, refrigerator door corner should be about 1/8" higher than corner at the hinge. Door will sag level when loaded with food.
- c. Lay a dime on refrigerator door gasket. Use dime to space refrigerator doors 11/16" from edge of cabinet.
- d. Tighten all hinge screws.
5. Clean the unit.
 - Get a clean sponge or clean, soft cloth and a solution of warm water and mild detergent.
 - Wash door liners, door gaskets and painted, exterior surfaces of unit.

NOTE: Do not use abrasives or harsh cleansers.

Appendix C

Amana Bottom Freezer Refrigerator Owner's Manual

Keep these instructions for future reference. Be sure this manual stays with refrigerator.



As an Energy Star® Partner, Amana® has determined that this product* meets the Energy Star® guidelines for energy efficiency.

* Energy Star® applies to some models. Qualifying models are designated with the Energy Star® logo located on the product.

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Recognize this symbol as a safety precaution.

Parts and Accessories

Purchase replacement parts and additional accessories (e.g. refrigerator shelves) over the phone. To order accessories for your product, call **1-800-843-0304** inside U.S.A. or **319-622-5511** outside U.S.A., or contact us on the internet at www.amana.com.

Electrical Requirements

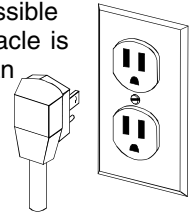


WARNING

To avoid electrical shock which can cause severe personal injury or death do not cut or remove the round grounding prong from the plug. Refrigerator must be grounded at all times. Do not remove warning tag from power cord.

Do not use a two-prong adapter. Do not use an extension cord.

This refrigerator is equipped with a three-prong (grounding) plug for protection against possible shock hazards. If a two-prong wall receptacle is encountered, contact a qualified electrician and have the two-prong wall receptacle replaced with a properly grounded three-prong wall receptacle in accordance with the National Electrical Code.



Refrigerator is designed to operate on a separate 103 to 126 volt, 15 amp., 60 cycle line.

Model Identification

Thank you for purchasing this Amana® refrigerator. Please read this Owner's Manual thoroughly. This manual provides proper maintenance information. Any questions, call the Consumer Affairs Department at **1-800-843-0304** inside U.S.A. and **1-319-622-5511** outside the U.S.A., or contact us on the internet at www.amana.com.

Complete registration card and promptly return. If registration card is missing, call the Consumer Affairs Department.

When contacting Amana, provide product information. Product information is on the serial plate, located on upper left corner ceiling of Fresh Food section. Record the following information.

Model Number: _____

Manufacturing Number: _____

S/N or Serial Number: _____

Date of Purchase: _____

Dealer's name and address: _____

Service

Keep a copy of sales receipt for future reference or in case warranty service is required. Any questions or to locate an authorized servicer, call 1-800-NAT-LSVC (1-800-628-5782) inside U.S.A. 319-622-5511 outside U.S.A. Warranty service must be performed by an authorized servicer. Amana also recommends contacting an authorized servicer if service is required after warranty expires.

For more information visit our website:
www.amana.com

Asure™ Extended Service Plan

Amana offers long-term service protection for this new refrigerator. Asure™ Extended Service Plan is specially designed to supplement Amana's strong warranty. This plan covers functional parts, labor, and travel charges. Call **1-800-528-2682**, or contact us on the internet at www.amana.com, for information.



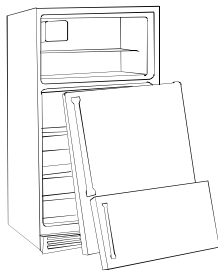
DANGER

Proper Disposal of Your Refrigerator

IMPORTANT: Child entrapment and suffocation are not problems of the past. Junked or abandoned refrigerators are still dangerous--even if they will sit for "just a few days." If you discard an old refrigerator, please follow the instructions below to help prevent accidents.

BEFORE YOU THROW AWAY YOUR OLD REFRIGERATOR OR FREEZER:

- Take off the doors.
- Leave the shelves in place so that children may not easily climb inside.



Space Requirements



WARNING

Keep flammable materials and vapors, such as gasoline, away from refrigerator. Failure to do so can result in death, explosion, fire, or burns.

- To ensure proper ventilation for your refrigerator, allow for a 1"(2.5 cm) space at the top of your refrigerator.
- If your refrigerator has an ice maker, make sure you leave some extra space at the back to allow for the water line connection. The refrigerator can be flush with the back wall if you do not have an ice maker installed.
- If you are installing your refrigerator next to a fixed wall, leave 2 1/2" minimum on hinge side (depending on your model) to allow for the door to swing open 90°.

NOTE: Do not install the refrigerator near an oven, radiator, or other heat source. Do not install the refrigerator in a location where the temperature will fall below 55°F (13° C).

Installation Instructions

Proper installation will ensure this refrigerator operates most efficiently. Amana cannot be held responsible for improper installation.

Service Notice: Contour Door Models Only

Only a qualified servicer can reverse this door. To have doors reversed, please call **1-800-843-0304**. There is a fee for this service.

Tools Required

Putty knife (blade covered with masking tape)

9/32" hex nut driver (some models)

5/16" hex nut driver (some models)

3/8" hex nut driver

Phillips screwdriver

Blade screwdriver

IMPORTANT:

- Save all screws for reuse.
- For plug removal requiring use of flat blade screwdriver or putty knife, **blade of tool must be covered with masking tape to avoid damage to refrigerator finish.** For plugs using a screwdriver or nut driver style head, use appropriate tool to avoid damage to plugs.

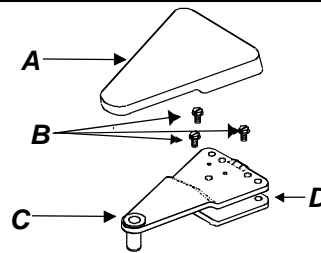
To Remove Doors



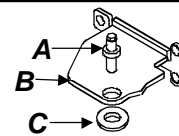
WARNING

To avoid electrical shock which can cause severe personal injury or death, disconnect power to refrigerator before removing doors. After replacing doors, connect power.

1. Remove top hinge cover(A--some models). Top hinge cover snaps off. While supporting refrigerator door, remove top hinge(C) and shim(D) using 5/16" hex nut driver to remove screws(B).



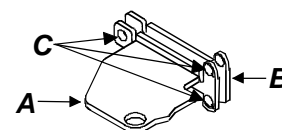
2. Lift refrigerator door off center hinge.
3. While supporting freezer door, remove center hinge pin(A) from center hinge bracket(B) with 9/32" hex nut driver. Remove and retain all round washer shims(C), if present.



4. Remove freezer door by lifting door off bottom hinge.

To Remove Hinges

1. Remove center hinge bracket(A) and shim(B) by removing screws(C) using Phillips screwdriver.



2. Remove toe grille and bottom hinge cover. Both snap off.

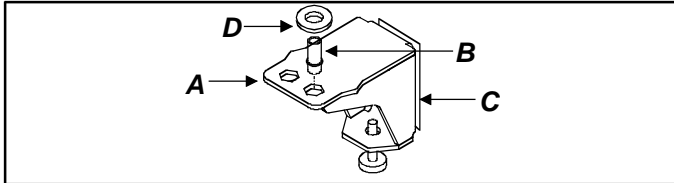
To Reverse Doors

Service Notice: Contour Door Models Only

Only a qualified servicer can reverse this door. To have doors reversed, please call **1-800-843-0304**. There is a fee for this service.

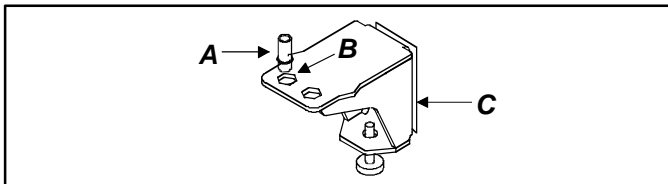
For Non-Contour Door Models

- Remove bottom hinge(A) and shim(C) with $\frac{3}{8}$ " hex nut driver. Remove hinge pin(B). Remove and retain all round washer shims(D), if present.



Reverse Hinges

- Transfer three cabinet plugs from top corner of cabinet to holes left from top hinge removal.
- Transfer three $\frac{5}{16}$ " hex head screws opposite center hinge area to the holes left by center hinge removal.
- Transfer all hinges and shims to opposite side of cabinet.
 - Replace bottom hinge pin(A) in bottom hinge bracket(C) in hole(B) outside of cabinet, along with all washer shims retained from hinge removal.

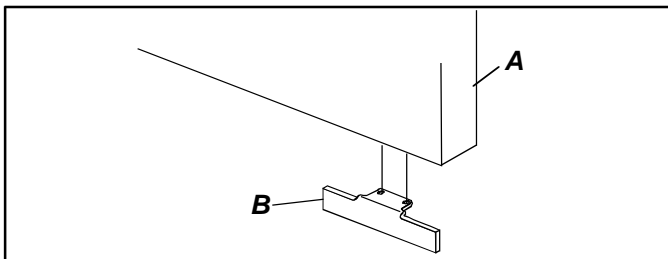


- Install top hinge screws loosely to allow enough clearance to reinstall door.

IMPORTANT: To avoid damage to interior finish, remove buckets and shelves from freezer and refrigerator door before continuing door reversal. Lay doors interior-side down on carpet, or a table or floor protected with blankets or towels.

Remove Door Stop

- Unscrew 2 Phillips screws and remove door stop(B) from refrigerator and freezer door(A). Retain all screws for door stop replacement.



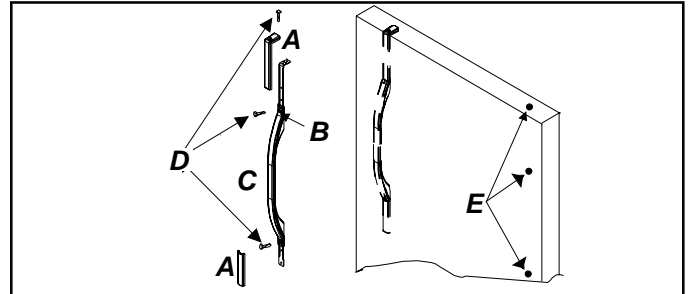
Reverse Handles (side-mounted design)

To reverse handles on contour model, see service notice at top of page.

Reverse Handles (front-mounted design)

- Remove handle screw from top handle trim(A). Pry up edge of handle trim on both ends of handle using a putty knife with the blade covered with masking tape. Remove handle(C) from door by removing 1 remaining mounting screw at each end of handle.

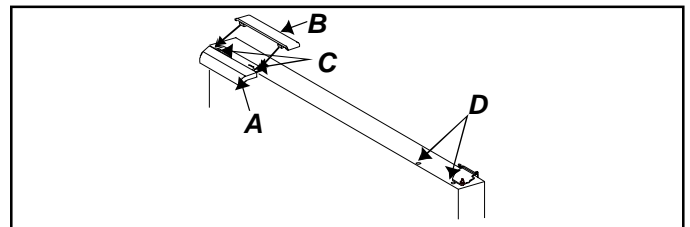
- Remove 1 plug from top hinge side of door and 2 from front hinge side of door. Replace 3 plugs in empty mounting holes.
- Mount refrigerator handle on opposite side of door using mounting screws removed in previous step.
- Snap handle trim into place and replace screw at top of handle.



A Handle trim
B Name plate
C Handle

D Screw
E Plugs

- Open freezer door 90°. Locate two notches on back of freezer handle. Insert flat screwdriver driver blade or putty knife blade wrapped in masking tape. Pry up back edge of handle cap and remove from handle.
- Remove handle from door by removing two mounting screws.
- Remove 2 plugs from opposite side of freezer door and replace in empty mounting holes.
- Mount freezer handle to opposite side of door using mounting screws removed in previous step.
- Angle front edge of handle cap downward toward back lip of freezer handle. Verify bottom tab on freezer cap slides under rear lip of freezer handle. Snap rear edge of handle cap in place.



A Freezer handle
B Handle cap

C Screws
D Plugs

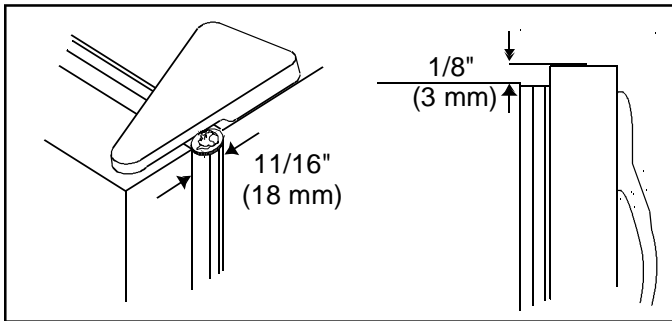
Remove Door Stop

- Mount door stop opposite handle side on underside of door.

To Replace Doors

- Place freezer door on bottom hinge pin.
- Replace center hinge pin with hex nut driver. Make sure fit is tight. Replace round shims and door closure.
- Replace top hinge and shims, but allow enough clearance to slide hinge side of refrigerator door into place. Tighten down top hinge to securely hold door.
- Use a dime at top to space door $\frac{11}{16}$ " (18 mm) from cabinet.
- Handle side of door should be approximately $\frac{1}{8}$ " (3 mm) higher than hinge side. **Door will become level when it is loaded with food.**

Note: If not proceeding with *Connect ice maker water supply line*, continue with section entitled *Leveling Refrigerator*.



Connect ice maker water supply line (some models)

⚠ DANGER

To avoid electrical shock which can cause severe personal injury or death. Disconnect power to refrigerator before connecting water supply.

⚠ CAUTION

Observe the following to avoid property damage:

- Make sure water pressure to water valve is between 20 and 100 pounds per square inch.
- Tighten adapter fitting and nuts with pliers and wrenches. Do not overtighten.
- Check for water leaks and correct if necessary before returning refrigerator to normal location. After 24 hours check again for leaks.

Important

- Before connecting water supply, contact a plumber to connect copper tubing to household plumbing in compliance with local codes and ordinances.
- **DO NOT use piercing type or 3/16" saddle valves!** Both reduce water flow, become clogged with time and in addition, may cause leaks if repair is attempted. The correct type—a **shut-off valve**—requires a 1/4" hole to be drilled in the water supply pipe before valve attachment.
- Do not install copper tubing in area where temperatures drop below 32°F (0°C).

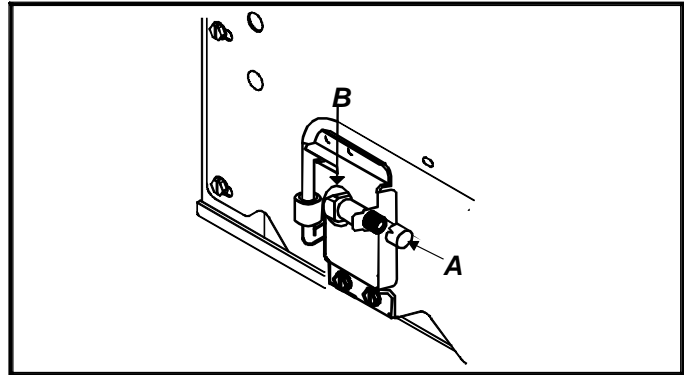
Materials Required

- 1/4" O.D. (6 mm) flexible copper tubing
- 1/2" open end wrench

Length of copper tubing must reach from water supply connection to water valve inlet port on back of refrigerator, plus additional 8 ft. (2 m) of tubing for a service loop. A service loop will allow refrigerator to be pulled away from the wall without disconnecting tubing.

Procedure

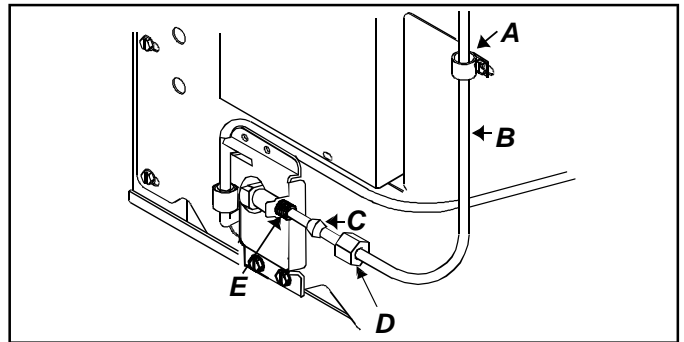
1. Remove plastic cap from water valve inlet port.



A Plastic cap

B Water valve inlet port

2. Place brass nut and brass sleeve on copper tubing. (Brass nut and sleeve are found in your literature packet.) Insert copper tubing into water valve inlet port. Connect brass nut on copper tubing to water valve inlet port. Make sure copper tubing is secure by pulling on copper tubing.



A "P" clamp

B Copper tubing

C Brass sleeve

D Brass nut

E Water valve inlet port

3. Create a service loop using extreme care to avoid kinks. Secure copper tubing to refrigerator cabinet with a "P" clamp. It is important to secure copper tubing to refrigerator to avoid leaks when pushing refrigerator back into opening.
4. Turn on water supply to refrigerator and check for leaks. Correct any leaks at connection. Be careful not to overtighten connection.
5. Proceed to *Leveling Refrigerator* for final refrigerator placement.

Leveling Refrigerator

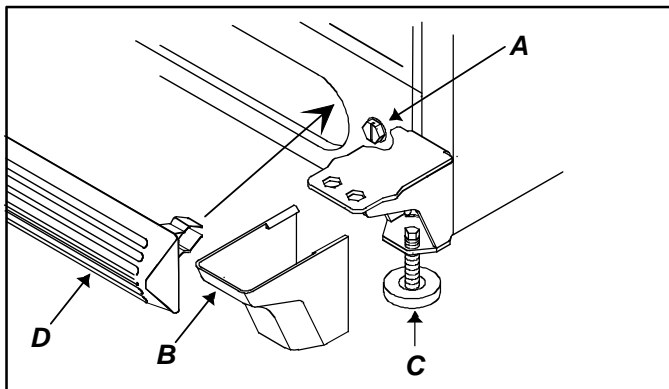


CAUTION

Protect soft vinyl or other flooring with cardboard, rugs or other protective material to avoid property damage.

If your refrigerator requires an ice maker water supply connection, proceed to *Connect ice maker water supply* section before leveling your refrigerator.

1. Plug in power cord.
2. Move refrigerator into final location.
3. Level refrigerator using a level placed on top of the refrigerator.
 - Remove toe grille. Remove bottom hinge cover if refrigerator has a stabilizing leg.
 - Turn roller adjustment screws to raise or lower refrigerator cabinet. Front of refrigerator must be $\frac{1}{4}$ " (6 mm), or $\frac{1}{2}$ bubble on your level, higher than the back of your refrigerator.
 - Make sure refrigerator cabinet is level from side to side by adjusting left and right roller adjustment screw **(A)**.
 - Turn stabilizing leg **(C—some models)** clockwise until firmly against floor.
4. Replace toe grille **(D)** and bottom hinge cover **(B)**. See markings on inside of toe grille to insure proper placement.
 - **Snap top portion into place first.** Press down on lower part of grille until bottom portion snaps into place.



- A Roller adjustment screw D Toe grille
B Bottom hinge cover
C Stabilizing leg (some models)

5. Review *Installation Checklist* in Owner's Manual with consumer.

Installation Checklist

This checklist is for personal records only.

Consumer Installer

Doors

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Handles are solidly attached to doors. |
| <input type="checkbox"/> | <input type="checkbox"/> | Handle side of door is 1/8" (3 mm) higher than hinge side. (Door lowers when loaded with food.) |
| <input type="checkbox"/> | <input type="checkbox"/> | Doors seal completely to refrigerator cabinet. |

Leveling

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Refrigerator is tilted 1/4" (6 mm) from front to rear. |
| <input type="checkbox"/> | <input type="checkbox"/> | Toe grille is properly attached to refrigerator. |

Ice Maker

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Water supply to refrigerator is turned on. |
| <input type="checkbox"/> | <input type="checkbox"/> | Water leaks are not present at connection between household water supply and refrigerator. (After 24 hours, consumer should check connection for water leaks.) |
| <input type="checkbox"/> | <input type="checkbox"/> | Ice maker arm is in <i>on</i> position for ice production. (It may take up to 24 hours for first harvest of ice.) |

Product Literature

- Owner's manual is reviewed including the following information.
- product registration card
 - Fresh Food and Deepfreeze® controls
 - Humidity-controlled crispers
 - normal operating sounds

Notes _____

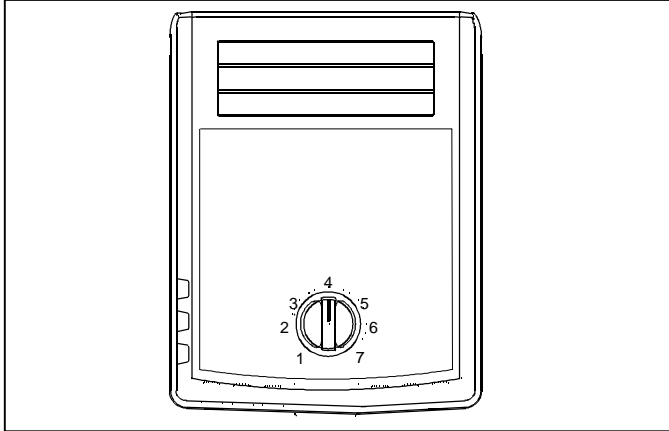
Consumer's Signature Installer's Signature Installer's Company Name/Phone Number Date

Controls

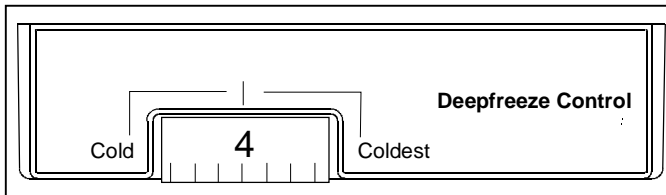
This refrigerator is designed to operate at normal household temperatures of 55° to 110°F (13° to 43°C).

Fresh Food and Deepfreeze® Controls

Fresh Food control is located on upper rear wall of Fresh Food section.



Deepfreeze® control is located on left front ceiling of freezer section.



Setting Controls

When Deepfreeze® control is set to *OFF*, neither refrigerator nor freezer sections will cool. Initially, set both controls to 4. Wait 24 hours for refrigerator and freezer sections to stabilize temperatures. After 24 hours, adjust controls, one number at a time, as desired. One is warmest setting and seven is coldest.

Set controls precisely using a household thermometer with a temperature range between -5° to 50°F (-21° to 10°C).

Put thermometer snugly between frozen packages in freezer section. Wait 5–8 hours. If Deepfreeze® temperature is not 0° to 2°F (-17° to -16°C), adjust Deepfreeze® control one number at a time. Check again after 5–8 hours.

Put thermometer in a glass of water in middle of Fresh Food section. Wait 5–8 hours. If Fresh Food temperature is not 38° to 40°F (3° to 4°C), adjust Fresh Food control one number at a time. Check again after 5–8 hours.

Fresh Food Features

Fresh Food Shelves

Shelves adjust to meet individual storage needs. Some models feature Spillsaver™ Shelves and Easy Glide™ shelves. Spillsaver™ Shelves hold minor spills for easier cleaning.



CAUTION

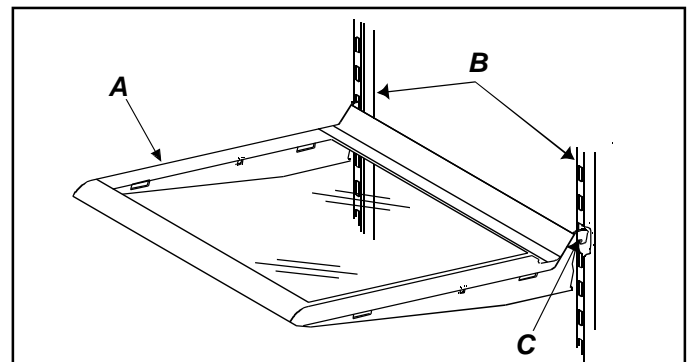
Make sure shelf is secure before replacing items on shelf to avoid property damage.



CAUTION

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

- Remove shelves by lifting up shelf front, releasing hooks from metal track, then pulling out.
- Replace shelves by inserting hooks into metal track and lowering front of shelf.

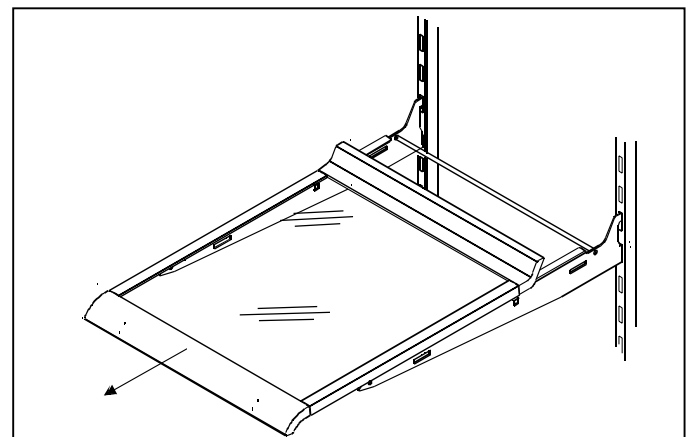


A Shelf

B Metal rack

C Hook

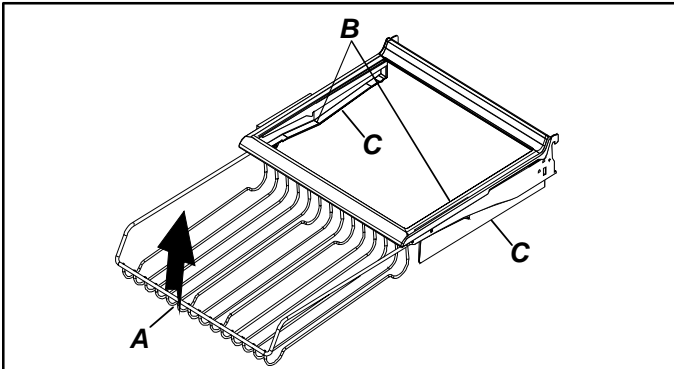
Easy Glide™ shelves pull forward for easy access to items in back.



Beverage Organizer (some models)

The beverage organizer slides out from underneath the glide-out shelf. This may hold 12 cans or other desired beverages.

- Before removing organizer, empty contents.
- Remove organizer(A) by pulling organizer forward until it catches on grooves(B) in shelf rail(C). Lift organizer front and pull out.
- To replace, guide organizer(A) into shelf rails(C) until forward movement is stopped by groove(B). Lift organizer front and ease organizer toward back of unit.



A Organizer
B Grooves

C Shelf rails

Adjustable Deli Drawer (some models)

- Remove drawer and sleeve by lifting and pulling out. Refer to "Spillsaver™ Shelves" for instructions on removing and replacing shelf.
- Replace drawer by sliding into place.

Garden Fresh™ Crispers

Garden Fresh™ crispers keep produce fresh longer. Wrap produce tightly. Do not wash produce before placing in crispers. Excess moisture could cause produce to spoil prematurely. Do not line crispers with paper towels. Paper towels retain moisture.

Garden Fresh™ crisper control is located below front shelf trim. Control adjusts humidity in crisper drawers. Slide control to *high* for produce with leaves such as lettuce, spinach or cabbage. Slide control to *low* for produce with skins such as cauliflower, corn or tomatoes.

Remove shelf and crisper drawers by completing the following steps:

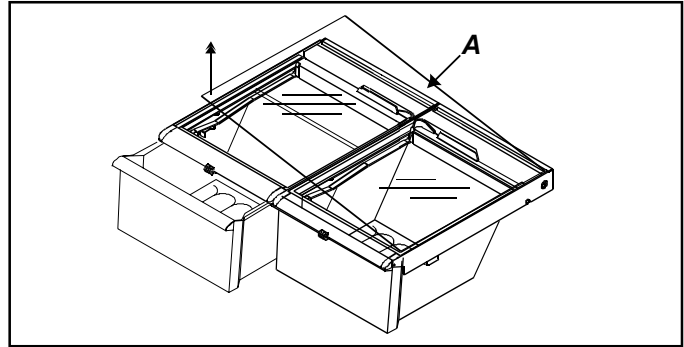
1. Open left crisper.
 - For doors hinged on left, open right crisper.



CAUTION

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

2. Remove glass crisper top by gently pushing up from underneath. Tilt one end up and pull out.



A Glass crisper top

3. Remove left crisper by lifting from front while supporting underneath and pulling out. For doors hinged on left, remove right crisper.
4. Remove support post at recess in bottom center of Fresh Food section.
5. Remove other crisper by sliding to opposite wall. Lift from front while supporting underneath and pull out.
6. Replace crispers and shelf by performing steps 2–5 in reverse order.

Chiller Fresh™ System (some models)

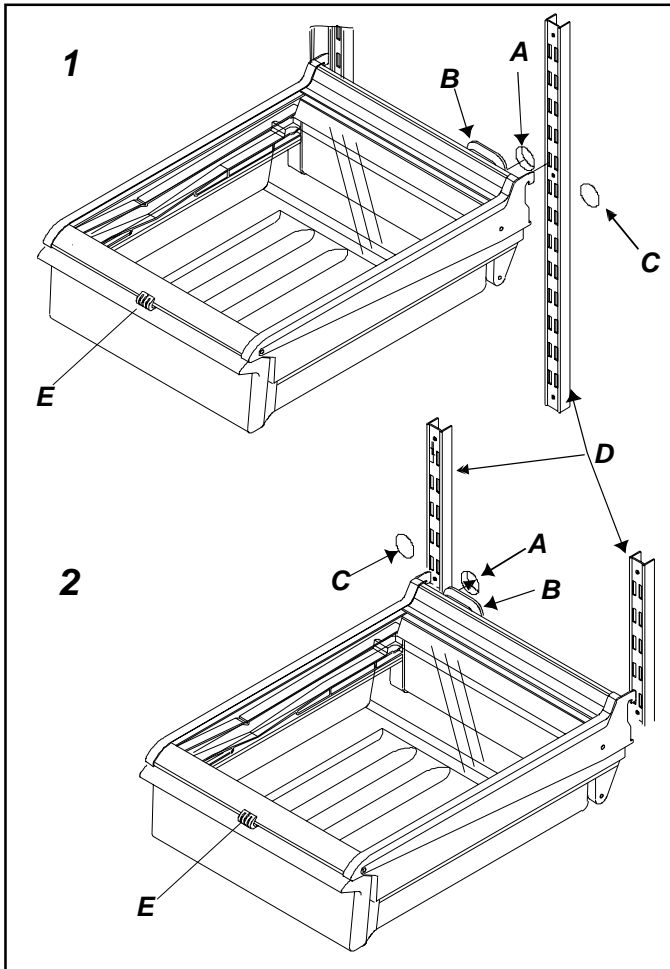
The Chiller Fresh™ System features a drawer inside a sleeve. Freezer air circulates between drawer and sleeve. This system keeps food fresh longer and up to 5°F (3°C) colder than refrigerator temperature.

Chiller Fresh™ control is located below front shelf trim. Control adjusts amount of air circulating around drawer. Slide control to *COLD* for normal refrigerator temperature and to *COLDER* for colder temperature. Ice crystals may form on drawer or food on *COLDER* setting. Cold air entering the Chiller Fresh™ drawer can decrease refrigerator temperature. Fresh Food control may need to be adjusted to a lower number to compensate for colder air.

Chiller Fresh™ drawer can be moved from the left to the right side of the refrigerator compartment to accommodate different storage needs. To move drawer perform the following steps:

1. Remove drawer by lifting and pulling out. Remove shelf by lifting from front, releasing hooks from metal track, then pulling out.
2. Remove plastic cap from back wall of Fresh Food section by placing a knife covered with masking tape underneath cap and pulling forward.
3. Rotate boot 180° to opposite side.
4. Insert plastic cap in hole opposite side of Fresh Food section. Confirm cap is snugly in place. Cold air may cause food to freeze if cap is not replaced.

5. Replace shelf by inserting hooks into metal track and lowering the front. Use slots 4 though 6 only.
6. Replace drawer by sliding in. Make sure boot fits snugly over air inlet in back wall.

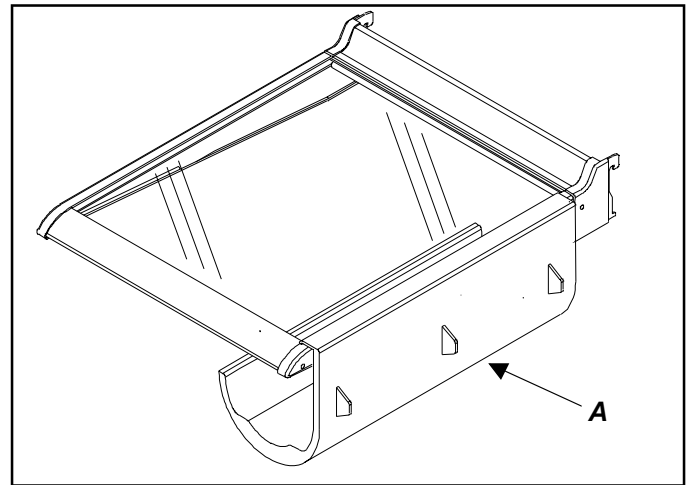


- 1 Chiller Fresh System installed on left side of refrigerator.
 - 2 Chiller Fresh System installed on right side of refrigerator.
- | | |
|-------------|---------------|
| A Air inlet | C Plastic cap |
| B Boot | D Metal rack |

Storage Rack (some models)

Storage rack provides convenient storage for a large bottle, eggs, etc.

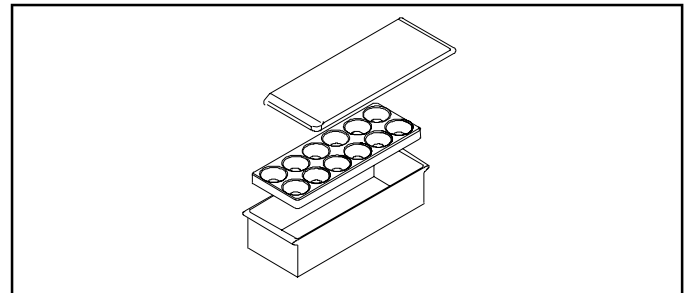
- Hang rack by hooking over side of shelf.



A Bottle rack

Covered Storage Bucket (some models)

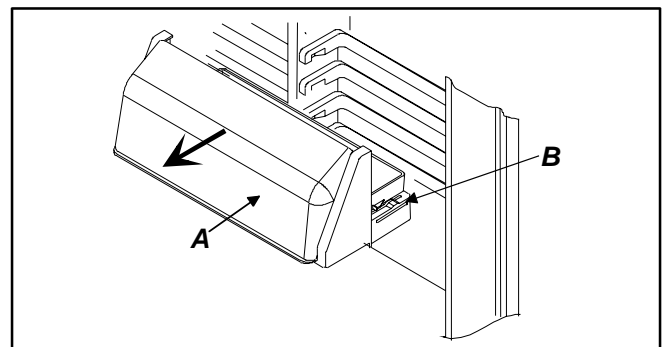
The covered storage bucket has a lid and removable egg tray. When tray is removed, bucket will accept standard egg carton, ice, etc.



Dairy Center (some models)

The dairy center provides convenient storage for butter, cheese, etc.

- Remove dairy center by lifting door, pushing tabs of shelf down on both sides, and pulling out.
- Replace dairy center by sliding in until tabs lock into place, then lower door.



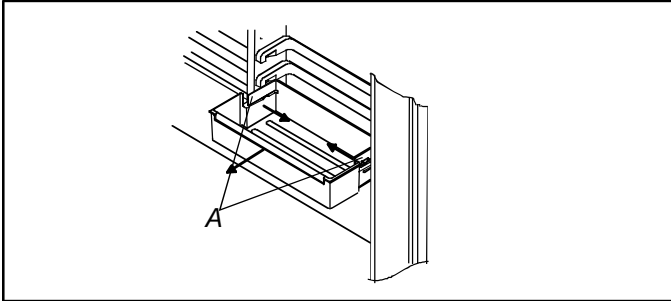
A Door

B Tab

Door Buckets

Door buckets adjust to meet individual storage needs.

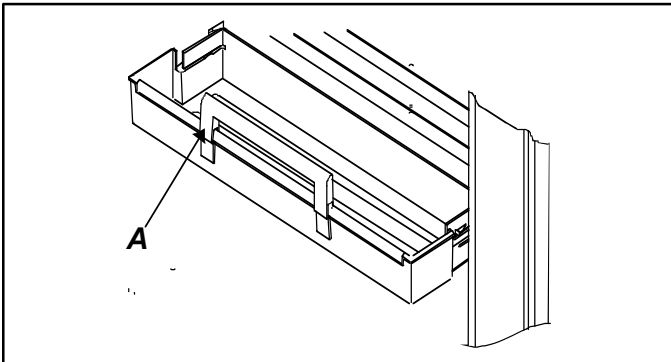
- Remove door buckets by pushing tabs on both sides of shelves toward center and pulling bucket out.
- Replace door buckets by sliding in until tabs lock into place.



A Tabs

Tall Package Retainer (some models)

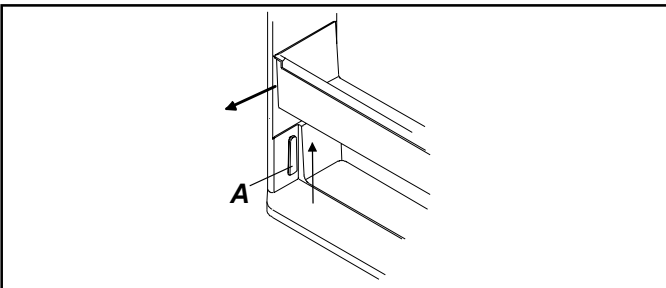
Tall package retainer keeps tall items secure. Retainer fits on front edge of any refrigerator door bucket or door shelf.



A Tabs

Door Shelves

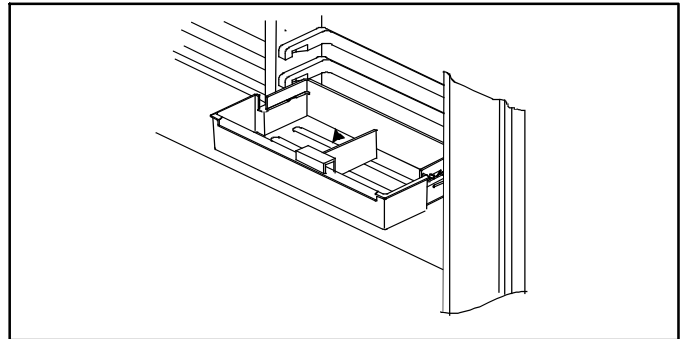
- Remove door shelves by lifting ends and pulling out.
- Replace door shelves by placing shelf on glides and sliding down.



A Glide

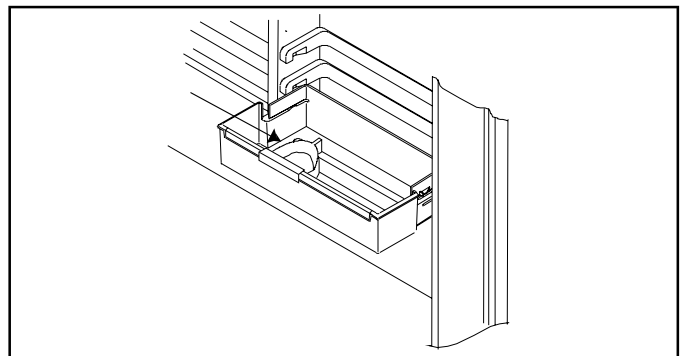
Adjustable Divider (some models)

Adjustable divider keeps items in place and adjusts to meet individual storage needs. Divider fits in any door bucket or door shelf.



Bottle Holder (some models)

Bottle holder keeps items in place and adjusts to meet individual storage needs. Bottle holder fits in any door bucket or door shelf.



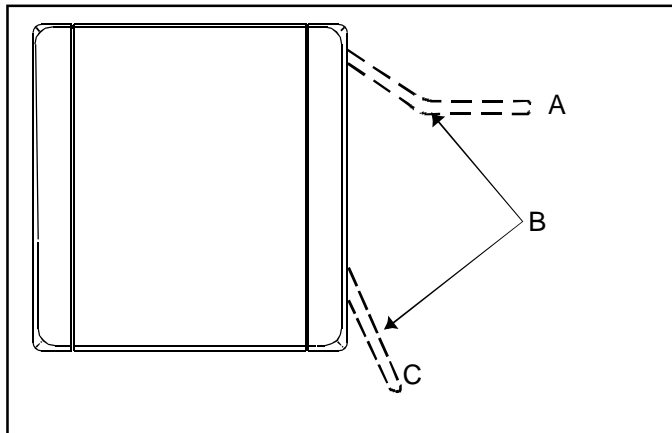
Deepfreeze® Features

Frost-Free System

The Fresh Food and freezer sections are completely frost-free. Defrosting is automatic under normal conditions.

Automatic Ice Maker (some models)

- Make sure ice bucket is in place and ice maker arm is down.



A Off position
B Ice maker arm
C On position

- After freezer section reaches normal temperature, the ice maker fills with water and begins operating. For optimum ice production, it is recommended that freezer section be at least half full. Allow 24–48 hours after installation before first harvest of ice. Ice maker produces 7 to 9 harvests of ice in a 24-hour period under ideal conditions.

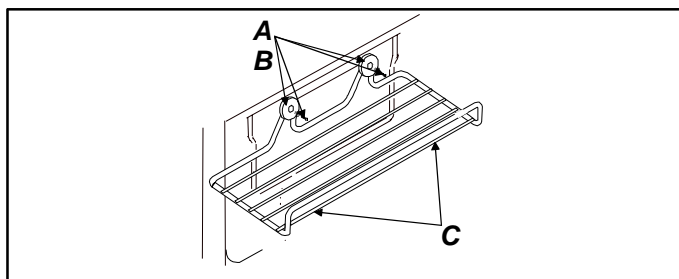
- After ice is formed, ice maker drops ice cubes into ice storage bucket. During ice production, ice maker arm raises and lowers. When ice storage bucket is full, ice maker arm turns ice maker off.

Note: Discard first 3 harvests of ice so any impurities left in the water line after installation are not consumed.

- If you wish to stop automatic ice production lift ice maker arm. A definite click is heard when proper position is reached. Ice maker arm will remain in that position until pushed down.

Ice Service Rack (some models)

Install ice service rack by placing ice service rack on washers and sliding down.



A Washer
B Screws
C Ice service rack



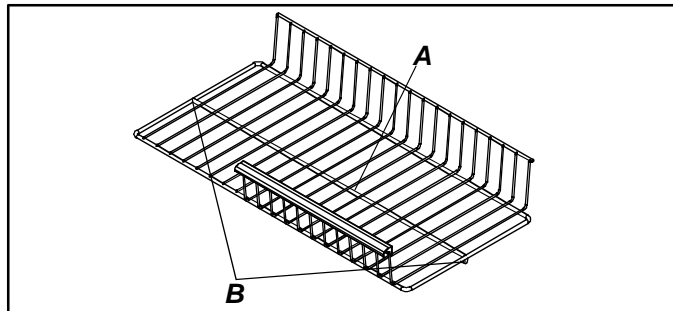
CAUTION

Make sure shelf is secure before placing items on shelf to avoid property damage.

Slideout Shelf (some models)

Slide out shelf pulls forward for easy access to items in back.

- Remove slideout shelf by sliding forward until ball point beneath center rail catches in molding groove.
- Grasp shelf by center rail, pull up, and remove.
- Slide in until ball point falls into molding groove.

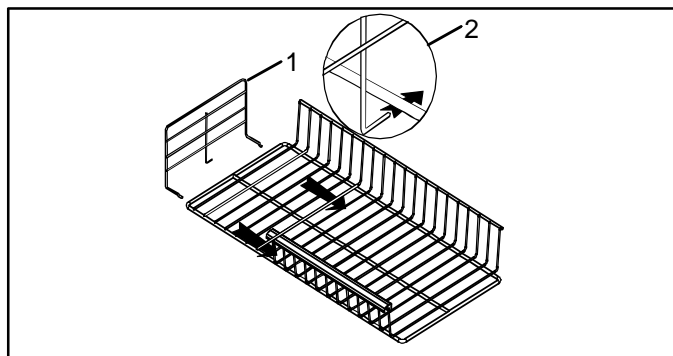


A Central rail
B Ball

Vertical Shelf Divider (some models)

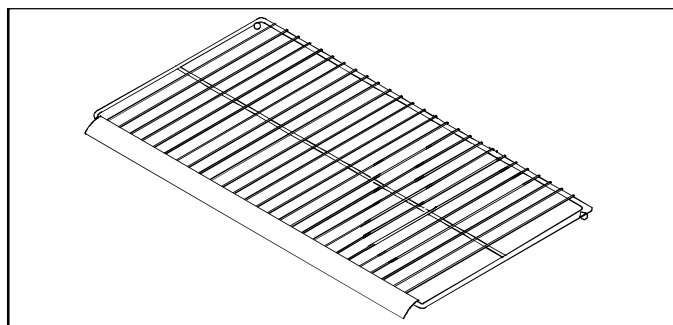
Install vertical shelf divider by completing the following steps:

1. Slide prongs of shelf divider beneath desired grill work, slightly off-center from center rail.
2. Press top of divider down and slide hook assembly beneath center rail.



Fixed Wire Shelf (some models)

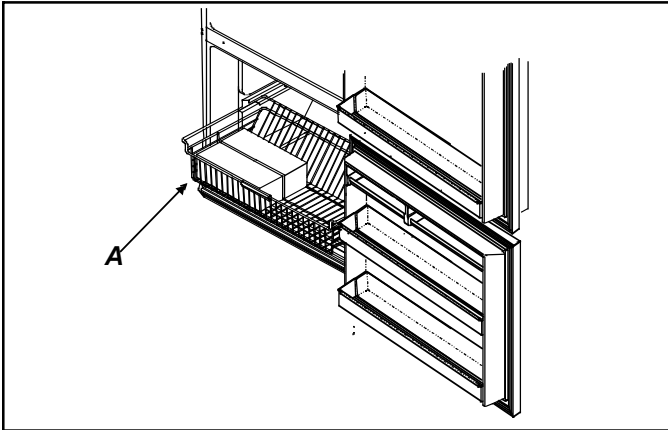
- Remove wire shelf by pulling out. A sharp tug may be necessary.
- Replace wire shelf by sliding in until back locks in place.



Wire Basket

Wire basket slides out for easy access to items in back.

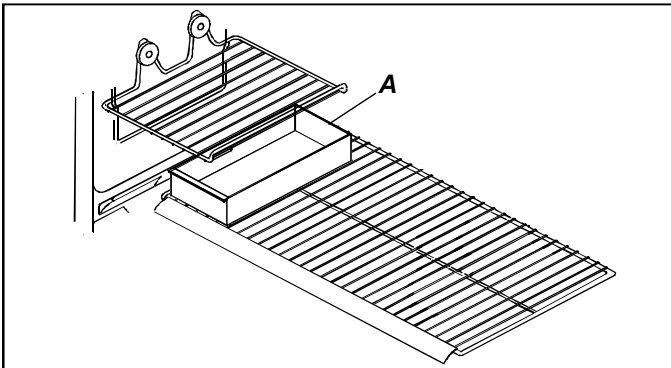
- Remove wire basket by lifting and pulling out.
- Replace wire basket by sliding in.



A Wire basket

Ice Bin (some models)

Ice bin sits below the ice service rack on the wire freezer shelf.



A Ice bin

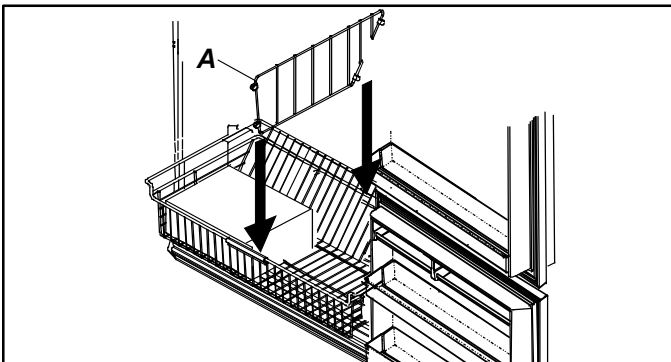
Vertical Basket Divider

Install vertical basket divider by completing the following steps:

1. Align clips on side of divider with rungs in basket wall.
2. Press top of divider down until divider meets bottom of basket

To remove divider:

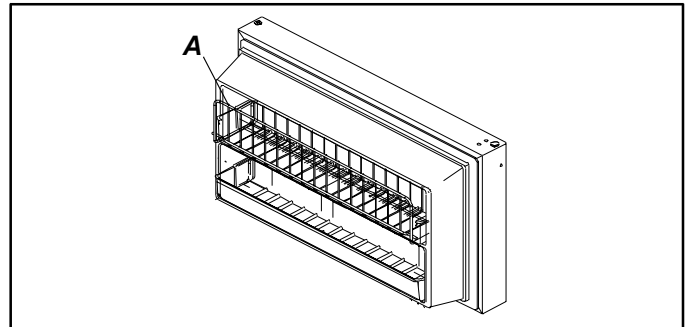
1. Grasp top of divider and pull straight up.



A Vertical basket divider

Tilt-Out Bin (some models)

The tilt-out bin provides convenient storage for frozen food items in freezer door and tilts forward for easy access of those items.



A Tilt-out bin

Care and Cleaning



WARNING

Disconnect power to refrigerator before cleaning to avoid electrical shock which can cause severe personal injury or death. After cleaning, restore power.



CAUTION

Read and follow all manufacturer's cleaning directions to avoid personal injury or property damage.

General

See section on Stainless Steel Cleaning if doors are stainless steel.

1. Wash surfaces with 4 tablespoons baking soda dissolved in 1 quart warm water and a soft, clean cloth.
2. Rinse surfaces with warm water. Dry surfaces with a soft, clean cloth.
 - Do not use the following items:
 - abrasive or harsh cleaners, ammonia, chlorine bleach, etc.
 - concentrated detergents or solvents
 - metal scouring padsThese items can scratch, crack and discolor surfaces.
 - Do not place buckets, shelves, etc. in dishwasher.

Stainless Steel Cleaning

Damage to stainless steel finish due to improper use of cleaning products, or using non-recommended cleaning products, is not covered under warranty.

For Amana recommended products, call our Consumer Affairs division at **1(800) 843-0304**, or contact us on the internet at www.amana.com.

1. Wash surfaces with warm soapy water and a soft, clean cloth or sponge.
2. Rinse surfaces with warm water. Dry surfaces with a soft, clean cloth.
 - Do not use the following harsh cleaners:
 - abrasive or acidic cleaners(ammonia, chlorine bleach, vinegar-based product, etc.
 - citrus-based cleaners
 - scouring pads(metal, textured plastic, etc.)These items can scratch, discolor, or permanently tarnish surfaces.
3. Follow up rinsing by immediately drying with a soft, clean cloth. This will avoid water spotting on stainless steel finish.

Adhesives

1. Remove adhesive residue from refrigerator surfaces by rubbing toothpaste into adhesive with fingers until adhesive loosens.
2. Rinse surface with warm water. Dry surface with a soft, clean cloth.

Door Gaskets

1. Clean door gaskets every 3 months according to General Cleaning instructions. Clean any spills immediately.

Condenser Coil

Clean condenser coil behind toe grille every 3 months to ensure maximum performance of refrigerator.

Accumulated dust and lint may cause the following:

- reduced cooling performance
 - increased energy usage
 - premature part failure
1. Remove toe grille by holding ends and pulling away from refrigerator.
 2. Clean front surface of condenser coil with a vacuum cleaner hose nozzle.
 3. Replace toe grille by inserting clips in holes and snapping in. See *Leveling Refrigerator* section.
 4. Raise stabilizing legs (some models) by turning counterclockwise.



CAUTION

Protect soft vinyl or other flooring with cardboard, rugs or other protective material to avoid property damage.

5. Pull refrigerator away from wall. Run a vacuum brush across grille on back of refrigerator.

Glass Shelves



CAUTION

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

Remove shelf by lifting front, releasing hooks from metal track then pulling out. Place shelf on a towel. Allow shelf to adjust to room temperature before cleaning.

Clean crevices by completing the following:

1. Dilute mild detergent and brush solution into crevices using a plastic bristle brush. Let sit for 5 minutes.
2. Spray warm water into crevices using faucet spray attachment.
3. Dry shelf thoroughly and replace shelf by inserting hooks into metal track and lowering it from the front.

Odor Removal

1. Remove all food and disconnect power to refrigerator.
2. Clean all interior surfaces including ceiling, floor, and walls according to General Cleaning instructions above. Pay special attention to corners, crevices, and grooves. Include all drawers, shelves, and gaskets.
3. Connect power to refrigerator and return food to refrigerator. Wash and dry all containers. Wrap foods in tightly sealed containers to prevent further odor. After 24 hours, check if odor has been eliminated.

Complete steps 4–9 if odor has not been eliminated.

4. **With unit unplugged, place crispers on top shelf of refrigerator section.** Pack refrigerator and freezer sections, including doors, with crumpled sheets of newspaper.
5. Place charcoal briquettes randomly throughout newspaper.
6. Close doors and let stand 24–48 hours.
7. Remove charcoal briquettes and newspapers.
8. Complete steps 2–3.

If odor is still not eliminated, contact a customer service representative with the number located in the Model Identification section.

Light Bulb Replacement



WARNING

Disconnect power to refrigerator before replacing light bulb to avoid electrical shock which can cause severe personal injury or death. After replacing light bulb, restore power.



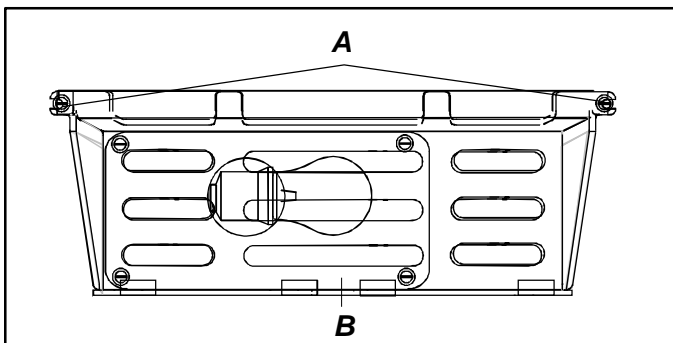
CAUTION

Observe the following to avoid personal injury or property damage.

- Allow light bulbs to cool
- Wear gloves when replacing light bulb.

Fresh Food Light

- Remove light bulb cover by removing ¼" hex nut screws. Replace with appliance bulb **no greater than 60 watts.**
- Replace light bulb cover by replacing ¼" hex nut screws.

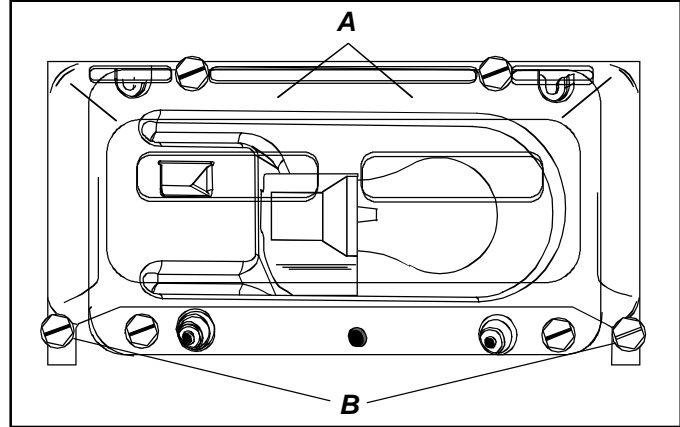


A ¼" hex nut screws

B Light bulb cover

Freezer Light

- Remove light bulb cover by removing ¼" hex nut screws. Replace with appliance bulb **no greater than 60 watts.**
- Replace light bulb cover by replacing ¼" hex nut screws.



A Light bulb cover

B ¼" hex nut screws

Vacation Tips

Complete the following steps for short vacations.

1. Remove perishable foods.
2. If an ice maker is installed, move ice maker arm to *Off* position. (See "Automatic Ice Maker" section page 12)

Complete the following steps for long vacations.

1. Empty refrigerator and freezer sections.
2. Unplug refrigerator.
3. Clean refrigerator and door gaskets according to General Cleaning instructions in "Care and Cleaning" section.
4. Prop doors open, so air can circulate inside.
5. If an ice maker is installed, turn off water supply to refrigerator and move ice maker arm to *Off* position. (See "Automatic Ice Maker" section page 12)

Energy Tips

This refrigerator is designed to be one of the most energy efficient refrigerators available. Reduce energy use by observing the following.

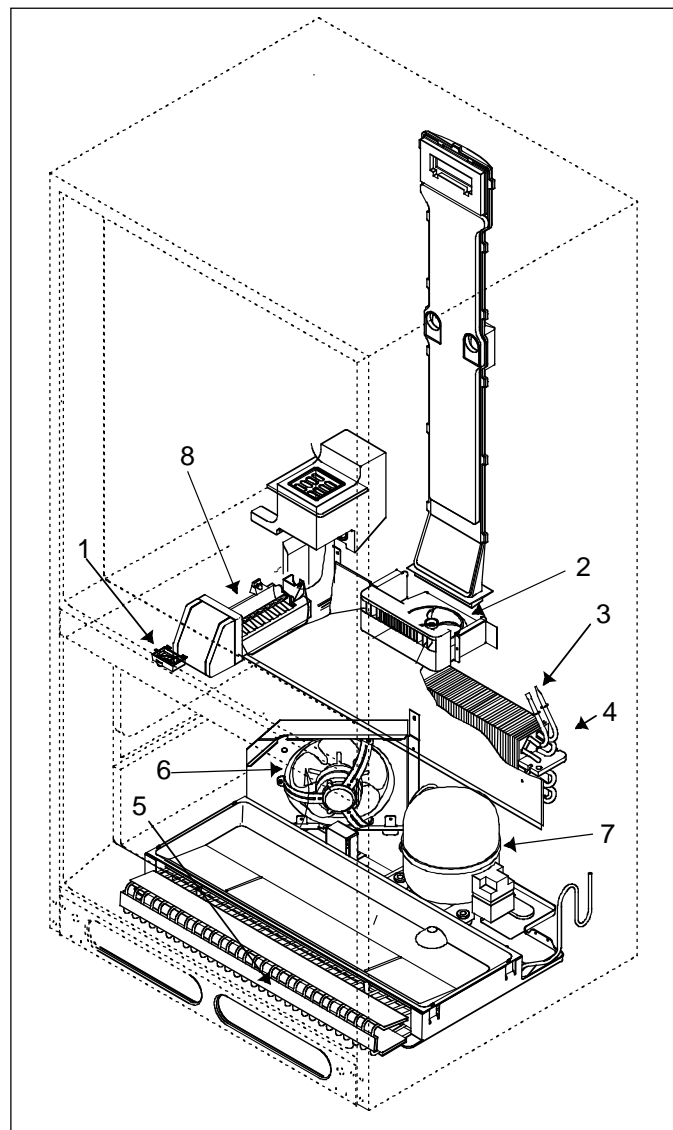
- Operate in normal household temperatures of 55° to 110°F (13° to 43°C) away from heat sources and direct sunlight.
- Set refrigerator, freezer, and temperature controlled meat drawer system controls no colder than necessary.
- Keep freezer section full.
- Keep door gaskets clean and pliable. Replace gaskets if worn.
- Keep condenser coils clean.

Normal Operating Sounds

This new refrigerator may be replacing a differently designed, less efficient or smaller refrigerator. Today's refrigerators have new features and are more energy efficient. As a result, certain sounds may be unfamiliar. These sounds are normal and will soon become familiar to you. They also indicate refrigerator is operating and performing as designed.

1. **Freezer control** clicks when starting or stopping compressor.
2. **Freezer fan** air rushes and whirs.
3. **Sealed system** (evaporator and heat exchanger) refrigerant flow gurgles, pops or sounds like boiling water.
4. **Defrost heater** sizzles, hisses or pops.
5. **Defrost timer** sounds like an electric clock and snaps in and out of defrost cycle.
6. **Condenser fan** air rushes and whirs.
7. **Compressor** has a high pitched hum or pulsating sound and cycles on and off.
8. **Ice cubes** from ice maker (some models) drop into ice bucket.
9. **Ice maker water valve hookup** (some models) buzzes when ice maker fills with water. This occurs whether or not refrigerator is connected to water supply. If refrigerator is not connected to water supply, stop sound by raising ice maker arm to *Off* position. Ice maker water valve hookup is located behind condenser fan in back of refrigerator.

Note: Foam insulation is very energy efficient and has excellent insulating capabilities. However, foam insulation is not as sound absorbent as previously used fiberglass insulation.



Before Calling For Service

Problem	Solution
Refrigerator does not operate.	<ul style="list-style-type: none"> • Make sure freezer control is on. • Make sure refrigerator is plugged in. If not, firmly plug the cord into a live outlet with proper voltage. • Check fuse or circuit breaker. Plug in another item at that wall outlet. If outlet does not work, replace the fuse or reset the circuit. • If freezer control is on, light works but 2 fans and compressor are not operating, refrigerator may be in defrost cycle. Wait 40 minutes to see if refrigerator restarts.
Refrigerator still will not operate.	<ul style="list-style-type: none"> • Unplug refrigerator. Transfer food to another refrigerator or place dry ice in freezer section to preserve food. Call for service.
Food temperature appears too warm.	<ul style="list-style-type: none"> • See above sections. • Allow time for recently added warm food to reach refrigerator or freezer temperature. Adding food warms the refrigerator. It can take a few hours for the refrigerator to return to normal temperature. • Check gaskets for proper seal. Gaskets should seal tightly to cabinet. • Clean condenser coil. See “Condenser Coil” instructions in “Care and Cleaning” section. • Adjust refrigerator and or freezer control. See “Setting Controls” instructions in “Controls” section. • Freezer or refrigerator light stays on. If light stays on, call service. • Return air vents behind crisper are blocked restricting airflow. Locate return air vent behind crispers and remove any debris that blocks vents or restricts airflow.
Chiller Fresh™ System temperature is too warm.	<ul style="list-style-type: none"> • Slide control to colder setting. • Adjust freezer control to colder setting. See “Setting Controls” instructions of “Controls” section. • Verify Chiller Fresh™ System cap has been moved if drawer has been moved from left to right side of cabinet. See “Chiller Fresh™ System” section.
Food temperature is too cold.	<ul style="list-style-type: none"> • Clean condenser coil. See “Condenser Coil” instructions in “Care and Cleaning” section. • Adjust refrigerator control. See “Setting Controls” instructions in “Controls” section. • Adjust freezer control to warmer setting. See “Setting Controls” instructions in “Controls” section. Allow several hours for temperature to adjust. • Verify plastic cap is in place near Chiller Fresh™ System. See “Chiller Fresh™ System” section.
Refrigerator runs too frequently.	<ul style="list-style-type: none"> • It may be normal to maintain constant temperature. • Doors have been opened frequently or for an extended period of time. When the door is opened warm humid air is allowed into the refrigerator. The more the door is opened the more warm air the refrigerator must cool. • Allow time for recently added warm food to reach refrigerator or freezer temperature. It can take a few hours for the refrigerator to return to normal temperature. • Clean condenser coil. See “Condenser Coil” instructions in “Care and Cleaning” section. • Adjust freezer control. See “Setting Controls” instructions in “Controls” section. • Check gaskets for proper seal. Gaskets should seal tightly to cabinet. • Freezer light stays on. If light stays on, call service • Make sure refrigerator is level. See “Leveling Refrigerator” section of Installation Instructions.

Problem	Solution
Water droplets form on inside of refrigerator.	<ul style="list-style-type: none"> It is normal during high humidity periods or if doors have been opened frequently. Wrap food tightly and wipe off damp containers prior to storing in the refrigerator to avoid moisture accumulation.
Water droplets form on outside of refrigerator.	<ul style="list-style-type: none"> Check door seals for proper seal. Gaskets should seal tightly to cabinet. It is normal during high humidity periods or if doors have been opened frequently.
Chiller Fresh™ System or crisper drawer does not close freely (some models).	<ul style="list-style-type: none"> Check for a package that may prevent drawer from closing properly. Confirm drawer is in proper position. Clean drawer channels with warm, soapy water. Rinse and dry thoroughly. Apply a thin layer of petroleum jelly to drawer channels. Confirm refrigerator is level.
Refrigerator has an odor.	<ul style="list-style-type: none"> See “Odor Removal” instructions in “Care and Cleaning” section.
Refrigerator makes unfamiliar sounds or seems too loud.	<ul style="list-style-type: none"> It may be normal. See “Normal Operating Sounds” section.
Ice cubes have an odor.	<ul style="list-style-type: none"> See “Odor Removal” instructions in “Care and Cleaning” section. Ice maker was recently installed. Discard first few batches of ice to avoid discolored or off-flavored ice. Food has not been wrapped tightly in either refrigerator or freezer compartment. Rewrap foods since odors may migrate to the ice if food is not wrapped properly. Discard ice and clean ice bucket or trays more frequently. Ice cubes are porous and absorb odors easily. Water supply contains minerals such as sulfur. In some situations a filter may need to be installed to eliminate taste and odor problems.
Ice cubes stick together or “shrink”.	<ul style="list-style-type: none"> Empty ice cube bucket or trays more frequently. If used infrequently, ice cubes may stick together or shrink.
Ice maker is not producing ice.	<ul style="list-style-type: none"> Water pressure may be too low or high. Ice maker requires a water pressure of 20-100 psi to function properly. Confirm ice maker arm is down. See “Automatic Ice Maker” section. Confirm household water supply is reaching water valve. Make sure the water valve shut off is fully turned on. Piercing type or $\frac{3}{16}$” saddle valve was used for hookup. Both reduce water flow and may become clogged with time. Replace these valves with correct type of saddle valve requiring $\frac{1}{4}$” hole to be drilled in water supply pipe prior to valve attachment. Confirm ice maker wiring harness is inserted completely in proper holes. Check for kinks in copper or plastic tubing. Remove kinks or replace tubing. Check electrical connections to water valve coil and connector block on refrigerator cabinet. If a water filter has been installed on the water line outside the refrigerator, check the filter for clogs or improper installation of the filter.
Ice maker is not producing enough ice.	<ul style="list-style-type: none"> Ice maker has just recently been installed or a large amount of ice has just been used. Wait 24 hours for ice production to begin and for ice maker to restock after emptied. Confirm household water supply is reaching water valve. Make sure the water valve shut off is fully turned on. Piercing type or $\frac{3}{16}$” saddle valve was used for hookup. Both reduce water flow and may become clogged with time. Replace these valves with correct type of saddle valve requiring $\frac{1}{4}$” hole to be drilled in water supply pipe prior to valve attachment. Check for kinks in copper or plastic tubing. Remove kinks or replace tubing. Confirm freezer section is operating at proper temperature and that freezer is, at least, half-full. Freezer must be cold enough to produce ice. See “Setting Controls” section.
Ice forms in inlet tube to ice maker.	<ul style="list-style-type: none"> Check water pressure. Low water pressure causes valves to leak. Piercing type or $\frac{3}{16}$” saddle valve was used for hookup. Both reduce water flow and may become clogged with time. Replace these valves with correct type of saddle valve requiring $\frac{1}{4}$” hole to be drilled in water supply pipe prior to valve attachment.

Warranty

Full One Year Warranty Full Five Year Warranty on Sealed System Components and Food Compartment Liner Limited Ten Year Warranty on Sealed System Components

First Year

Amana Appliances will repair or replace, free of charge, any part which is defective due to workmanship or materials.

Second through Fifth Year

Amana Appliances will replace, free of charge, any sealed system component (compressor, condenser, evaporator, drier, and interconnecting tubing) and repair any food compartment liner (exclusive of door liner) which is defective due to workmanship or materials.

Sixth through Tenth Year

Amana Appliances will provide a free replacement part, f.o.b. Amana, Iowa, for any sealed system component (compressor, condenser, evaporator, drier, and interconnecting tubing) and repair any food compartment liner (exclusive of door liner) which is defective due to workmanship or materials.

Warranty Limitations

- Begins at date of original purchase.
- Applies to product used within the United States or in Canada if product has Canadian Standards Association listing when shipped from the factory.
- Service must be performed by an **authorized** Amana technician.

Warranty Is Void If

- Serial plate is defaced.
- Product is used on a commercial, rental or leased basis.
- Product has defect or damage due to product accident, alteration, connection to an improper electrical supply, fire, flood, lightning, or other conditions beyond the control of Amana Appliances.
- Product is improperly installed or used.

Owner's Responsibilities

- Provide proof of purchase (sales receipt).
- Provide normal care and maintenance. Replace owner replaceable items where directions appear in Owner's Manual.
- Make product reasonably accessible for service.
- Pay premium service costs for service outside technician's normal business hours.
- Pay for service calls related to product installation or usage.

In no event shall Amana Appliances be liable for incidental or consequential damages including food loss*

* This warranty gives you specific legal rights and you may have others which vary from state to state. For example, some states do not allow the exclusion or limitation of incidental or consequential damages so this exclusion may not apply to you.

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