



Service

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

This Base Manual covers general information

Refer to individual Technical Sheet
for information on specific models

This manual includes, but is
not limited to the following:

18 & 21 Cubic Foot Top Mount Refrigerators

ATB1821AR*
ATB1830AR*
ATB1836AR*
ATB1838AE*
ATB1832AR*
ATB2130AR*
ATB2132AR*
ATB2136AR*
ATB2138AR*
ATF2136AR*
ATF2138AR*
CTB1821AR*
CTN1821AE*
CTL1821AE*
CTB2121AR*
CTF2126AR*
MTB1891AR*
MTB1893AR*
MTB1895AE*
MTB2193AR*
MTB2195AR*
MTF2193AR*
MTF2195AE*

MAYTAG®

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Important Information

Important Notices for Servicers and Consumers

Maytag will not be responsible for personal injury or property damage from improper service procedures. 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 information. **IT IS THE TECHNICIANS RESPONSIBILITY TO REVIEW ALL APPROPRIATE SERVICE INFORMATION BEFORE BEGINNING REPAIRS.**



WARNING

To avoid risk of severe personal injury or death, disconnect power before working/servicing on appliance to avoid electrical shock.

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

Customer Service Support Center

CAIR Center

<u>Web Site</u>	<u>Telephone Number</u>
WWW.AMANA.COM	1-800-843-0304
WWW.JENNAIR.COM	1-800-536-6247
WWW.MAYTAG.COM	1-800-688-9900
CAIR Center in Canada	1-800-688-2002
Amana Canada Product	1-866-587-2002

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, product or property damage.

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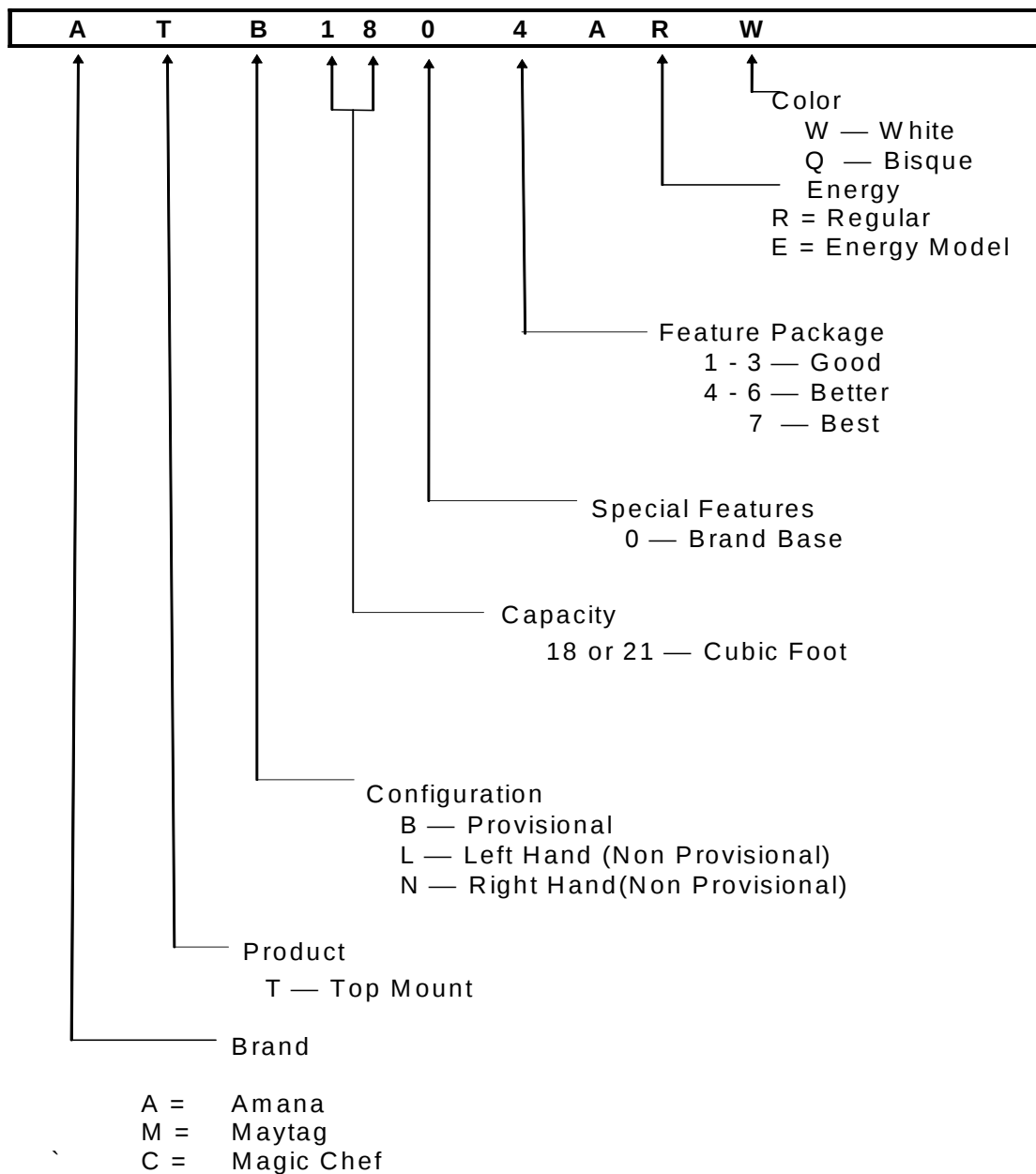
Model Identification

Top Mount Refrigerator models vary in trim and accessories, but all models have the same basic construction. "Operating Instructions" and "Service Instructions" apply to all cabinets unless stated otherwise.

For positive identifications of individual units, state complete serial number, model, and type. This information is found on the serial plate located on front upper right hand corner of foodliner or on some models, exterior back of the outer casing.

An explanation of coding contained in *Type* position is shown below.

Model Identification

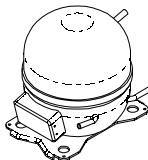


Component Testing



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.

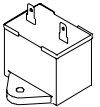
Component	Description	Test Procedures
 Compressor	When compressor electrical circuit is energized, the start winding current causes relay to heat. After an amount of starting time, the start winding circuit turns off. The relay will switch off the start winding circuit even though compressor has not started (for example, when attempting to restart after momentary power interruption). 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. With "shorted" relay or capacitor, compressor will start and overload protector will quickly open due to high current of combined run and start windings. With open or weak capacitor, compressor will start and run as normal but will consume more energy.	Resistance test 1. Disconnect power to unit. 2. Discharge capacitor by shorting across terminals with a resistor for 1 minute. NOTE: (Some compressors do not use a run capacitor.) 3. Remove leads from compressor terminals. 4. Set ohmmeter to lowest scale. 5. Check for resistance between - 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. Ground test 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. • If reading is obtained, compressor is grounded and must be replaced. Operation test If voltage, capacitor, overload, and motor winding tests do not show cause for failure, perform the following test: 1. Disconnect power to refrigerator. 2. Discharge capacitor, if present, by shorting 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. The diagram illustrates the test configuration for the compressor. It shows an AC supply connected to a switch. The switch is connected to a set of fuses. The fuses are connected to the compressor terminals: C (Common), S (Start), and R (Run). A capacitor is connected to the C and R terminals. The S terminal is connected to the R terminal. The diagram is labeled 'Test configuration'. 9. Plug test cord into wattmeter to determine start and run wattage and use a multimeter to check for low voltage, which can also be a cause of a compressor not starting. 10. With power to multimeter, press start cord switch and release. • If compressor motor starts and draws normal wattage, compressor is okay and trouble is with either the capacitor, relay/overload, 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.

Component Testing



WARNING

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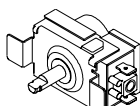
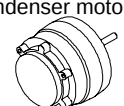
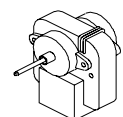
Component	Description	Test Procedures
Capacitor 	Run capacitor connects to relay terminal 3 and L side of line. Some compressors do not require a run capacitor; refer to the Technical Data Sheet for the unit being serviced.	 WARNING To avoid electrical shock which can cause severe personal injury or death, discharge capacitor through a resistor before handling. 1. Disconnect power to refrigerator. 2. Disconnect the capacitor wires if present. 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. • 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).
Condenser	Condenser is a long folded tube construction located in machine compartment. Condenser is on high pressure discharge side of compressor. Condenser function is to transfer heat absorbed by refrigerant to ambient. Higher pressure gas is circulated through condenser where, as gas temperature is reduced, It 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. Condenser is air cooled by condenser fan motor. If efficiency of heat transfer from condenser to surrounding air is impaired, condensing temperature will increase. 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. From the condenser the refrigerant flows into a post condenser loop which helps control exterior condensation on flange, center mullion, and around freezer door. Refrigerant flows through the drier to the capillary tube to the evaporator and back to the compressor through suction line.	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 that may indicate the location of the leak. A certain amount of compressor oil is circulated with refrigerant. Leaks in post condenser loop are rare because loop is a one-piece steel tube. "For small leaks" 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.  WARNING 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.

Component Testing



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.

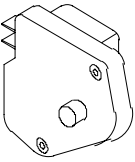
Component	Description	Test Procedures														
Overload / Relay	When voltage is connected and relay is cool, current passes through relay to start winding. After a short time, current heats the resistor in relay and resistance will raise blocking current flow through relay. Start winding remains in the circuit through run capacitor. 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.	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														
Temperature control	 Temperature control uses a capillary tube to sense the temperature in the compartment. Depending upon the temperature it senses it will open or close a single pole, single throw switch. Temperature control controls run cycle through defrost timer. 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. In most cases the need for altitude adjustments can be avoided by simply turning temperature control knob to colder setting.	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. Check control contacts are opening by disconnecting electrical leads to control and turning control knob to coldest setting. Check for continuity across terminals. <table><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><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></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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Ice maker	Optional on some models. See “Ice Maker” section for service information.															
Condenser motor	 Condenser fan moves cooling air across condenser coil and compressor body. Condenser fan motor is in parallel circuit with compressor.	Check resistance across windings If open replace motor.														
Evaporator fan motor	 Evaporator fan moves air across evaporator coil and through the refrigerator and freezer compartment.	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 the proper operating voltage at the connector to motor with unit in refrigeration mode and compressor operating.														

Component Testing



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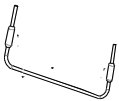
Component	Description	Test Procedures
Switch, upper freezer light 	Single pole, single throw switch completes circuit for light when door is open.	Check resistant across terminals. Switch arm depressed "NO" terminals Open Switch arm up "NO" terminals Closed
Drier 	Drier is placed at post condenser loop outlet and passes liquefied refrigerant to capillary. Desiccant (20) 8 x 12 4AXH - 7 M>S> - Grams	Drier must be changed every time the system is opened for testing or compressor replacement. NOTE: Drier used in R12 sealed system is not interchangeable with drier used in R134a sealed system. Before opening refrigeration system, recover HFC134a refrigerant for safe disposal. 1. Cut drier out of system using the following procedure. Do not unbrazed drier since this will drive moisture into the system. 2. Score capillary tube close to drier and break. Reform inlet tube to drier allowing enough space for large tube cutter. 3. Cut circumference of drier 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.  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.
Defrost timer 	Timer motor operates only when fresh food control is closed. 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. After specified defrost cycle time, timer cam resets the circuitry through terminal 4 to compressor.	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.

Component Testing



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.

Component	Description	Test Procedures
Evaporator	The low pressure in the evaporator allows liquid refrigerant exiting the capillary to expand into a gas. Expansion cools evaporator coil temperature to approximately -20°F transferring heat from freezer section to refrigerant. Passing through suction line back to the 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. Refrigerant gas is circulated through the suction line by compressor, completing refrigeration cycle.	Test for leaks in evaporator with electronic leak detector or with soap solution. Compressor oil is circulated with refrigerant; check for the presence of oil when checking for leaks. For minute leaks 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.
Evaporator heater (defrost)	Activated when defrost thermostat, defrost timer, and freezer control complete circuit through heater. 	Check resistance across heater. To check defrost system : 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.
Thermostat (defrost)	Thermostat is in a series circuit with terminal 2 of defrost timer, and defrost heater. Controls the circuit from freezer thermostat through defrost terminator to defrost heater. Opens and breaks circuit when thermostat senses preset high temperature.	Test continuity across terminals. With power off and evaporator coil below freezing, thermostat should show continuity when checked with ohmmeter. See "Heater, evaporator (defrost)" section for additional tests. After defrost thermostat opens, thermostat remains open until end of defrost timer cycles and refrigerator starts cooling again. Defrost thermostat senses a preset low temperature and resets (closes).



WARNING

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.

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 the circumference of the capillary tube close to drier and break at the score.
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 the cabinet bottom 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

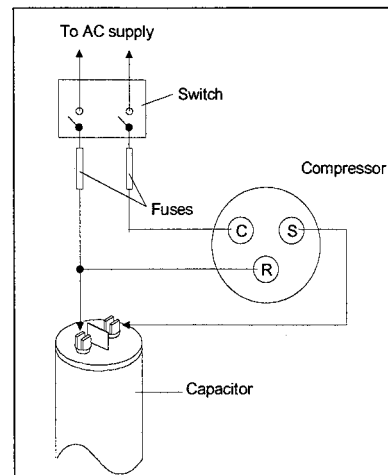
During any processing of refrigeration system, never leave lines open to atmosphere. Open lines allow water vapor to enter system, making proper evacuation more difficult.

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 use a 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 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

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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 units. Captured or recycled refrigerant voids any 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.

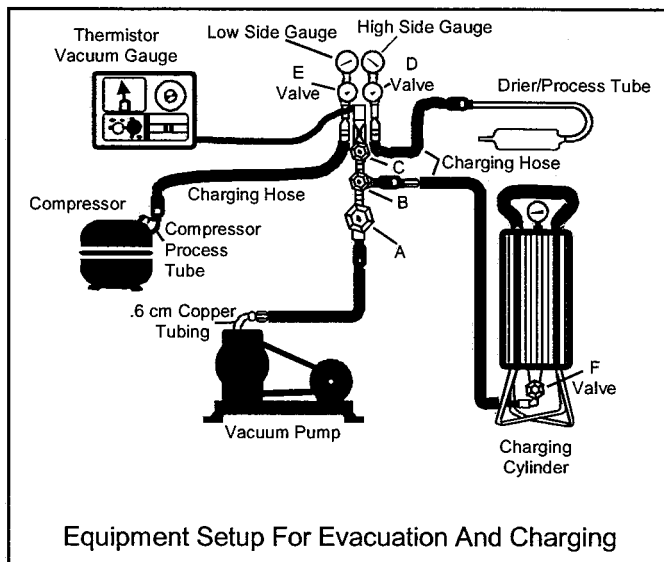
Moisture in sealed system chemically reacts with refrigerant and oil to form corrosive hydrofluoric and hydrochloric acids. These acids attack motor windings and parts, causing premature breakdown.

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 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 amount or type 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 hygroscopic 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 unbraid 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.

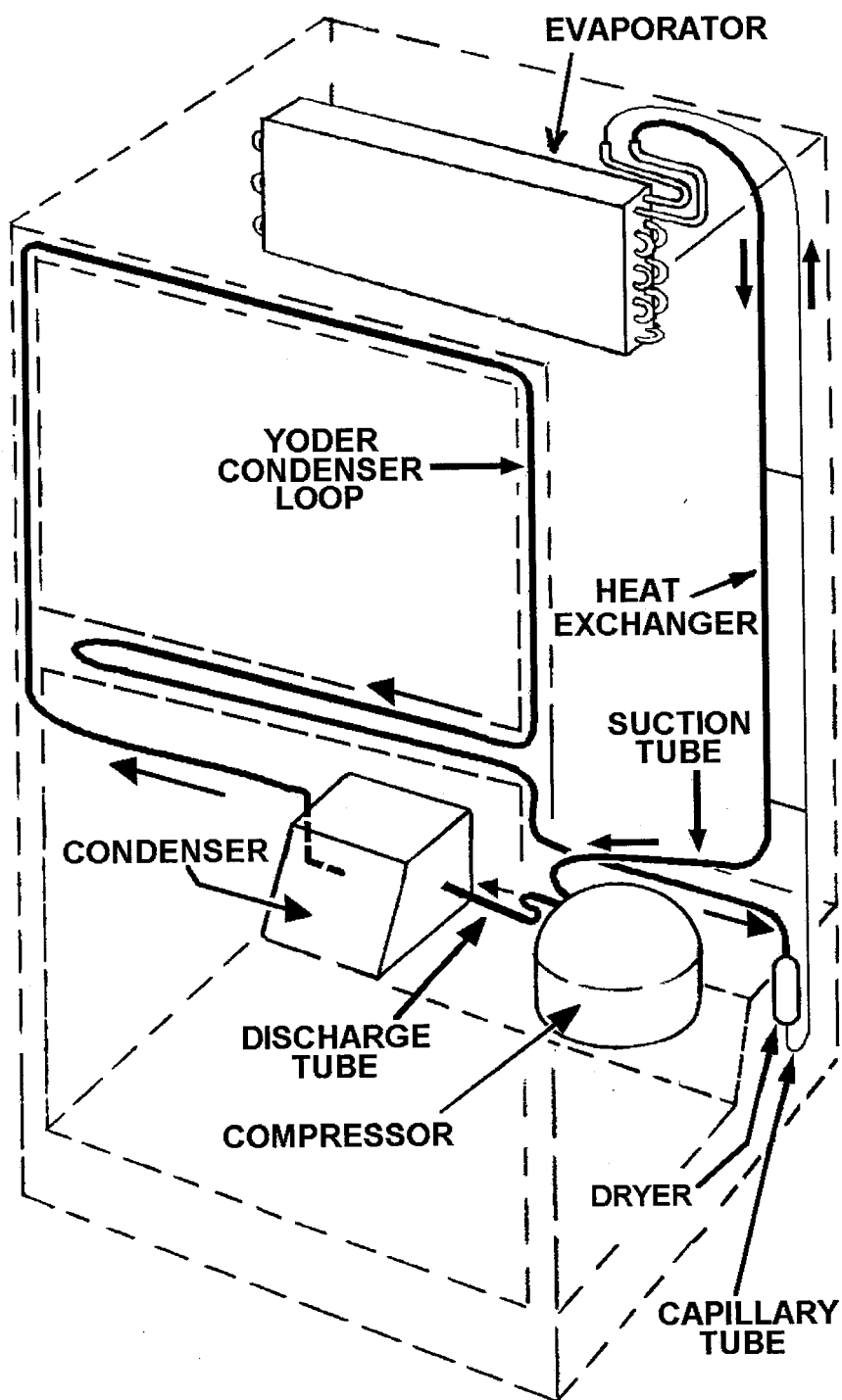
Satisfactory results require cleanliness, experience, and use of proper materials and equipment.

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

Generally accepted brazing materials are:

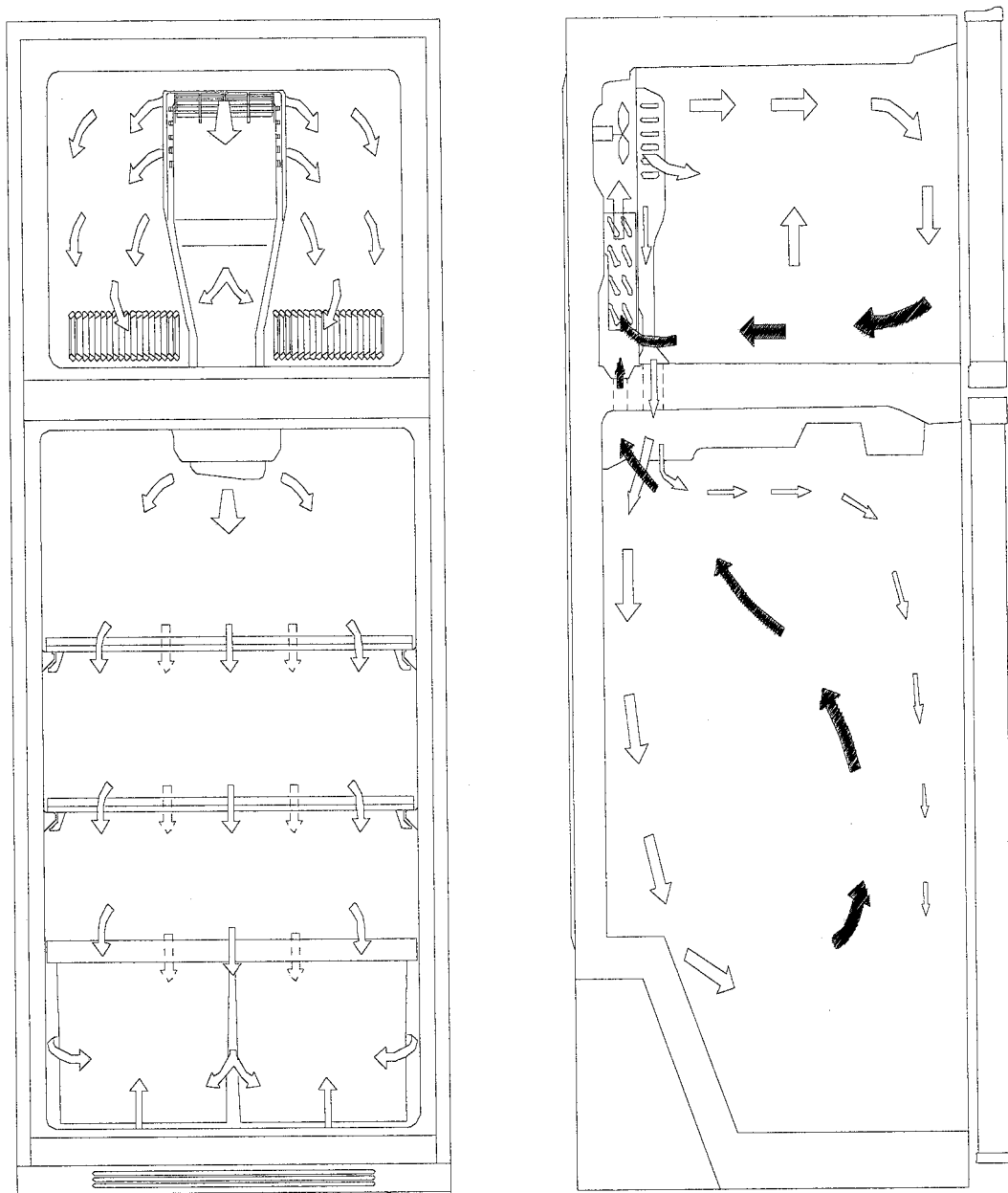
- **Copper to copper joints:** SIL-FOS (alloy of 15 percent silver, 80 percent copper, and 5 percent phosphorous). Use without flux. Recommended brazing temperature is approximately 1400°F. **Do not use for copper to steel connection.**
- **Copper to steel joints:** SILVER SOLDER (alloy of 30 percent 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 cu. ft. Top Mount
Refrigerant Flow Diagram

Cabinet Air Flow



**18 & 21 cu. ft. Top Mount
Cabinet Air Flow Diagram**

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 operate	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 voltage 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 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	Turn control knob to colder position.
	Interior light remains on	Check switch. Replace if necessary. Check to make sure door contacts switch. Adjust door 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.
	Ice on evaporator	
Freezer section too cold	Freezer temp control set too cold	Adjust freezer temperature control.
	Airflow restricted between freezer and fresh food compartment	Remove restriction
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".
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

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
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 Fusible link	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.
- 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 conditons 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 sytem. The freezer section operating colder than necessary (-2 to -1 F. is considered normal temperature) or continuous running of the compressor may give the indication of an overcharge.

Symptoms of Refrigeration Shortage

- Rise of food 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 the high side (condenser) of the system.

System Diagnosis

- 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 of their fresh food. Although temperatures will rise in both the freezer section and the fresh 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, a slight shortage of refrigerant, might cause food in the fresh food compartment to freeze 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 55° 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 55° 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.

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

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.

Door Removal

Freezer Door

1. Open both compartment doors. Remove door buckets, 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.
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.

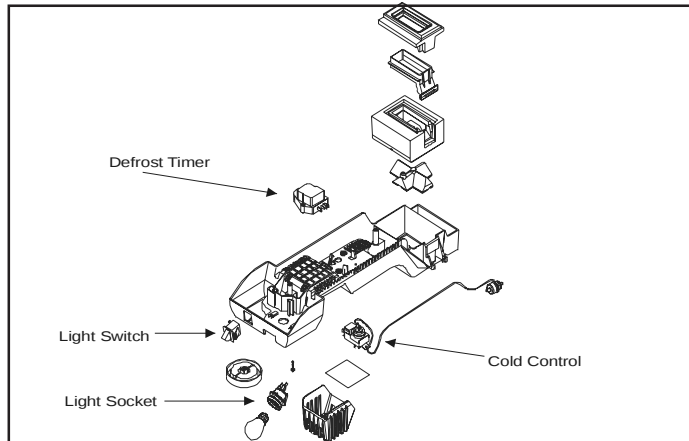
Fresh Food Door

1. Pull tape off fresh food door and lift door off unit. Set door on a padded surface to prevent damage to finish.
2. 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. On some models the toe grill will need to be removed. To do this either unscrew the screws that hold it in place or if the grill is held in by clips pull the grille from each end to release it from the unit. The grille is 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.

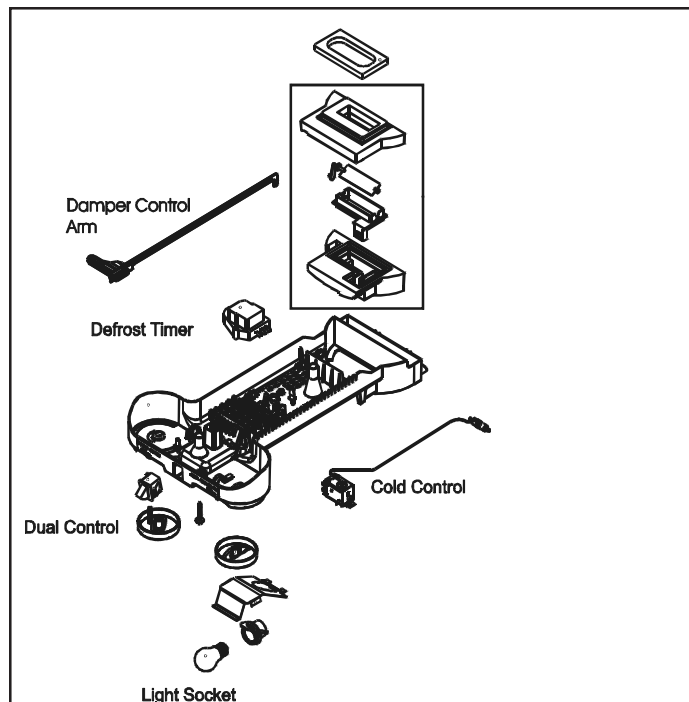
NOTE: When reassembling hinges lubrication of hinges is necessary.

- d. Loosen mounting screws from bottom hinge bracket. Remove and retain bracket and bolts.

Refrigerator Compartment



Single Control Model



Dual Control Model

Disassembly 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 resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Light Bulb Cover (some models)

1. To remove the light cover squeeze and unsnap the light cover.
2. Remove light bulb.

Light Bulb Assembly

1. Remove the light cover as described above. Retain all parts.
2. Remove light bulb.
3. Models with Fresh Food air tunnel only. Remove the screw cover insert located above the center cantilever rail. Remove the support spacer located behind the screw cover insert. The fresh food air tunnel can then be slid downward. This allows space between the control housing and tunnel to ease disassembly.
4. Remove two screws holding the Control Housing Assembly to Fresh Food ceiling.
5. Remove Control Housing Assembly by dropping it down and sliding it forward to release drain tube from back wall.
6. Disconnect wire harness plug from ceiling.
7. On back side of Control Housing Assembly disconnect wires from light bulb socket.
8. Squeeze tabs on back side of Light Bulb Socket to release it from housing.

Defrost Timer

1. After following procedures 1-6 on removing light bulb assembly.
2. While holding the timer push the tab at the rear of the housing to release the timer and lift the timer out of housing.
3. Disconnect plug from timer.
4. Reverse procedure to reassemble.

Light Switch

1. After following procedures 1-6 on removing light bulb assembly.
2. Disconnect wires from light switch.
3. Squeeze tab to release light switch from light assembly.
4. Reverse procedure to reassemble.

Cold Control

1. After following procedures 1-6 on removing light bulb assembly.
2. Disconnect wires from Cold Control.

3. Release Cold Control by pushing down on the tabs that hold it in the control housing, slide the control past the clips to remove control.
4. Remove Capillary Tube from assembly.
5. Reverse procedure to reassemble.

Freezer Compartment

Evaporator Cover

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

1. Remove 4 screws from Evaporator Cover.
2. Pull forward to reveal wiring, disconnect harness plug attached to rear wall.
3. Remove Evaporator cover.
4. Reverse procedure to reassemble.

Freezer Temperature Control

1. Follow instructions
2. Remove Evaporator cover.
3. On backside of Evaporator cover squeeze tabs to release the Freezer Air Tunnel from the cover.
4. Reverse procedure to reassemble.

Evaporator Fan, Evaporator Motor

1. Follow instructions for removing Evaporator Cover.
2. Remove screws that anchor evaporator fan bracket to Evaporator Cover. Pull fan and bracket away from Evaporator Cover.
3. Free fan bracket from wiring harness by disconnecting wires to motor.
4. Carefully pull the evaporator fan blade off motor shaft.
5. Separate bracket and motor by removing screws from retainer bracket to release motor from bracket.
6. When reinstalling motor reference position of terminals of new motor the same as old motor.
7. Reverse procedure to reassemble.

Defrost Terminator (Thermostat)

1. Follow instructions for removing Evaporator Cover.
2. Terminator is fastened to the suction line with a spring clip.
3. Snap terminator from tubing and unplug harness from back wall of cabinet.
4. Remove terminator from unit.

Defrost Heater

1. Follow instructions for removing Evaporator Cover.
2. Pull the evaporator away from back wall of cabinet.
3. Disconnect plugs from both sides of heater plugging into back wall of cabinet.
4. Tilt the evaporator up taking care not to kink heat

Disassembly 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 resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

exchanger tubing to evaporator coil.

5. Un-clip Defrost Heater from evaporator.

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. Follow instructions in removing Evaporator Cover.
2. Remove defrost thermostat. Refer to defrost thermostat removal.
3. Remove defrost heater. Refer to defrost heater removal.
4. Install protective cloth to prevent damage to cabinet liner.
5. Unbrazed suction copper tube at evaporator.
6. Score and break copper capillary at evaporator.
7. Install new evaporator and reassemble taking care not to kink tubing when reassembling.

Bottom of Cabinet

Front Roller Assembly

1. Remove toe grille by either unscrewing or pulling it straight away from unit.
2. Raise front of refrigerator at least 4" off the deck and block it up.
3. Remove screws holding roller assembly to unit.
4. Remove roller assembly from unit.

NOTE: Condensate drip pan may be full of water when steps 1 thru 2 are performed. Remove Condensate drip pan to prevent spillage.

Rear Roller Assembly

1. Tape both doors shut to prevent doors from opening
2. Raise back of refrigerator at least 4" off the deck and block it up.
3. Remove machine-compartment cover.
4. Locate and cut roller pins with hacksaw or grinder.
5. Install new rollers and install new pins.
6. Pinch end of pin to prevent pin from coming out of bracket.

NOTE: Condensate drip pan may be full of water when steps 1 thru 2 are performed. Remove Condensate drip pan to prevent spillage.

Condensate Drain Pan

1. Remove Toe Grill.
2. Drain pan is then visible and can be unsnapped from cabinet bottom and pulled forward for removal.
3. Remove drain pan.

Machine Compartment

Condenser Fan & Fan Motor

1. Remove machine compartment cover.
2. Unplug wiring harness connector for the fan motor.
3. Screws secure the motor to its brackets. Remove screws to disassemble brackets from motor.
4. Note which side of fan blade is "front" and which side is "rear." Use adjustable wrench to loosen nut that secures fan blade to motor shaft. Remove nut and fan blade.

Compressor



CAUTION

Protect all plastic side walls of Machine Compartment from Torch Flame with Heat Shield.

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

1. Remove machine compartment cover.
2. Remove drier.
3. Disconnect all compressor wiring and overload/relay assembly.
4. Unbrazed low and high pressure lines at compressor.
5. Remove compressor mounting pins.
6. Lift compressor out of unit.

Overload/Relay/Capacitor

1. Remove machine compartment cover.
2. Using fingers and standard screwdriver, press and pry bale strap off the overload/relay assembly.
3. Disconnect wires from overload/relay assembly. Reference wire location for proper reassembly.
4. Unplug overload/relay assembly from compressor.

Condensate Drain Tube

1. Condensate Drain is foamed in liner and is not field replaceable.

Condenser Removal

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

1. Remove machine compartment cover.
2. Unbrazed tubing going to PC loop and heat exchanger.
3. Disconnect Condenser Fan electrical plug.
4. Tape both doors shut to prevent doors from opening
5. Raise back of refrigerator at least 6" off the deck and block it up.
6. Remove Philips head screws to base pan and lift and slide condenser out back of unit.

Appendix A

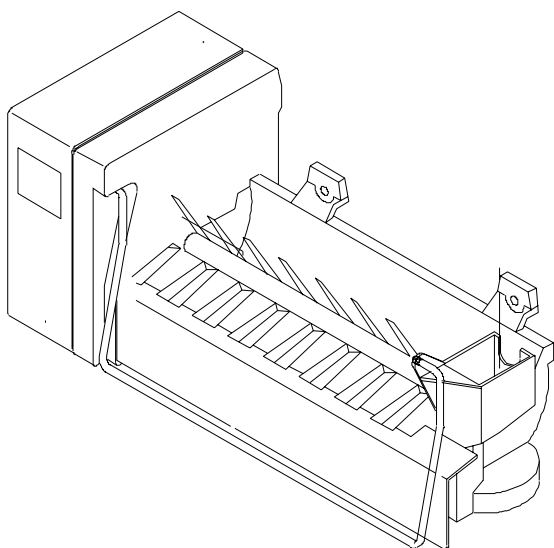
⚠ WARNING

To avoid risk of electrical shock that can cause death or severe personal injury, disconnect unit from power before servicing unless tests require power. Discharge capacitors through a 10,000-ohm resistor before handling. Wires removed during disassembly must be replaced on correct terminals to ensure proper grounding and polarization.

Ice Maker Service Instructions

⚠ CAUTION

To minimize risk of personal injury and/or property damage, read this section of the manual completely before attempting any tests or adjustments.



Operation

When the thermostat senses temperature of $17 \pm 3^{\circ}\text{F}$ ($-8 \pm 1^{\circ}\text{C}$), the thermostat closes. Current now has a path through the thermostat to the motor.

The motor turns the drive gear. Electrical contacts protruding from the module brush against copper strips on the backside of the drive gear (illustration P. 41). As the drive gear turns, the rotating copper strips make and/or break connections between the electrical contacts, controlling icemaker operations.

Design of the ice maker allows testing of all components without removing the ice maker or having to access the water valve.

Remove the cover and you will see test points identified on the module as *N*, *M*, *V*, etc.

N: Neutral side of line

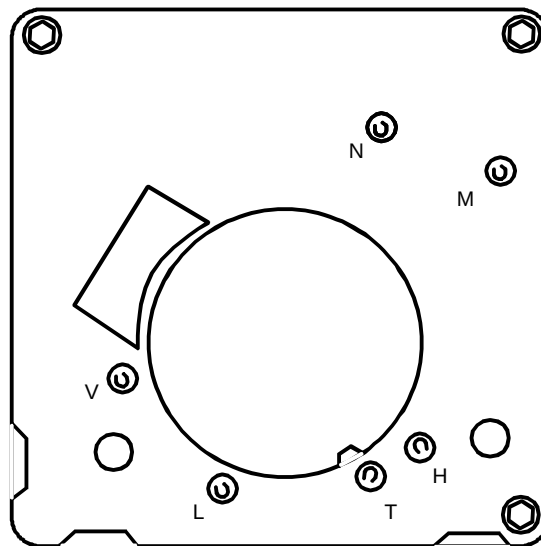
M: Motor connection

H: Heater connection

T: Thermostat connection

L: L1 side of line

V: Water valve connection



Specifications

Mold Heater	- 185 Watts, 264 Ohms
Thermostat (Bimetal)	- Close $17 \pm 3^{\circ}\text{F}$ ($-8 \pm 1^{\circ}\text{C}$) - Opens $32 \pm 3^{\circ}\text{F}$ ($0 \pm 1^{\circ}\text{C}$)
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)

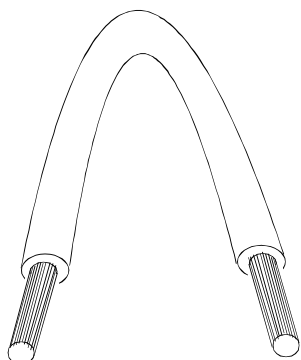
Test Procedures

Necessary preconditions: Ice maker plugged into power; shut-off arm down; freezer not warmer than 2°F

1. Use voltmeter across test points *L* and *N* to verify 115 volts for ice maker module. Make sure test probes go into test points at least 1/2" (1.3 cm).
2. Make a shunt: Get a 6" piece of 14-gauge wire. Strip 1/2" of insulation off both ends and bend the wire into a horseshoe shape (illustration P. 38).

⚠ WARNING

To avoid risk of electrical shock that can cause death or severe personal injury, disconnect unit from power before servicing unless tests require power. Discharge capacitors through a 10,000-ohm resistor before handling. Wires removed during disassembly must be replaced on correct terminals to ensure proper grounding and polarization.



Shunt made of 14-gauge wire

3. Test points *T* and *H* will verify the bimetal thermostat is open or closed.
 - Force motor run by shunting *T* to *H*.
 - If motor doesn't run, motor is faulty. Replace ice maker.
 - If motor does run, bimetal thermostat is faulty. Replace ice maker.

NOTE: Make sure freezer temperature is cold enough to close the bimetal thermostat.

4. Leave jumper in for half a revolution, then touch heater mold.
 - If mold feels warm, heater works properly.
 - If mold doesn't feel warm, heater is faulty. Replace ice maker.
5. Remove jumper and water valve will energize in last half of revolution, if mold heater has not failed.

NOTE: Make sure freezer temperature is cold enough to close the bimetal thermostat.

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

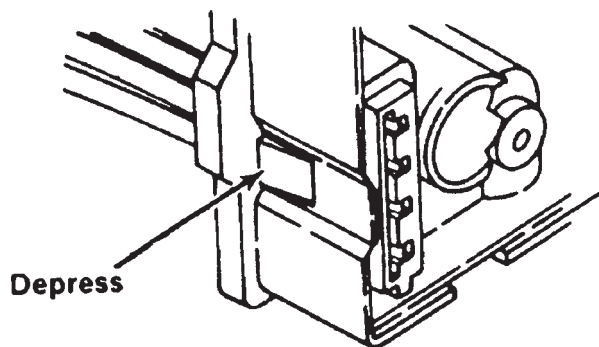
Disassembly

NOTE: Mold & heater assembly, module assembly, support assembly and thermostat are not replaceable. If any of those components are faulty, ice maker must be replaced as a unit.

1. Snap plastic cover off module.
2. Pull shut-off arm out back of support assembly.

NOTE: When reassembling unit, be sure to push shut-off arm as far as it will go into bushing in back of support assembly.

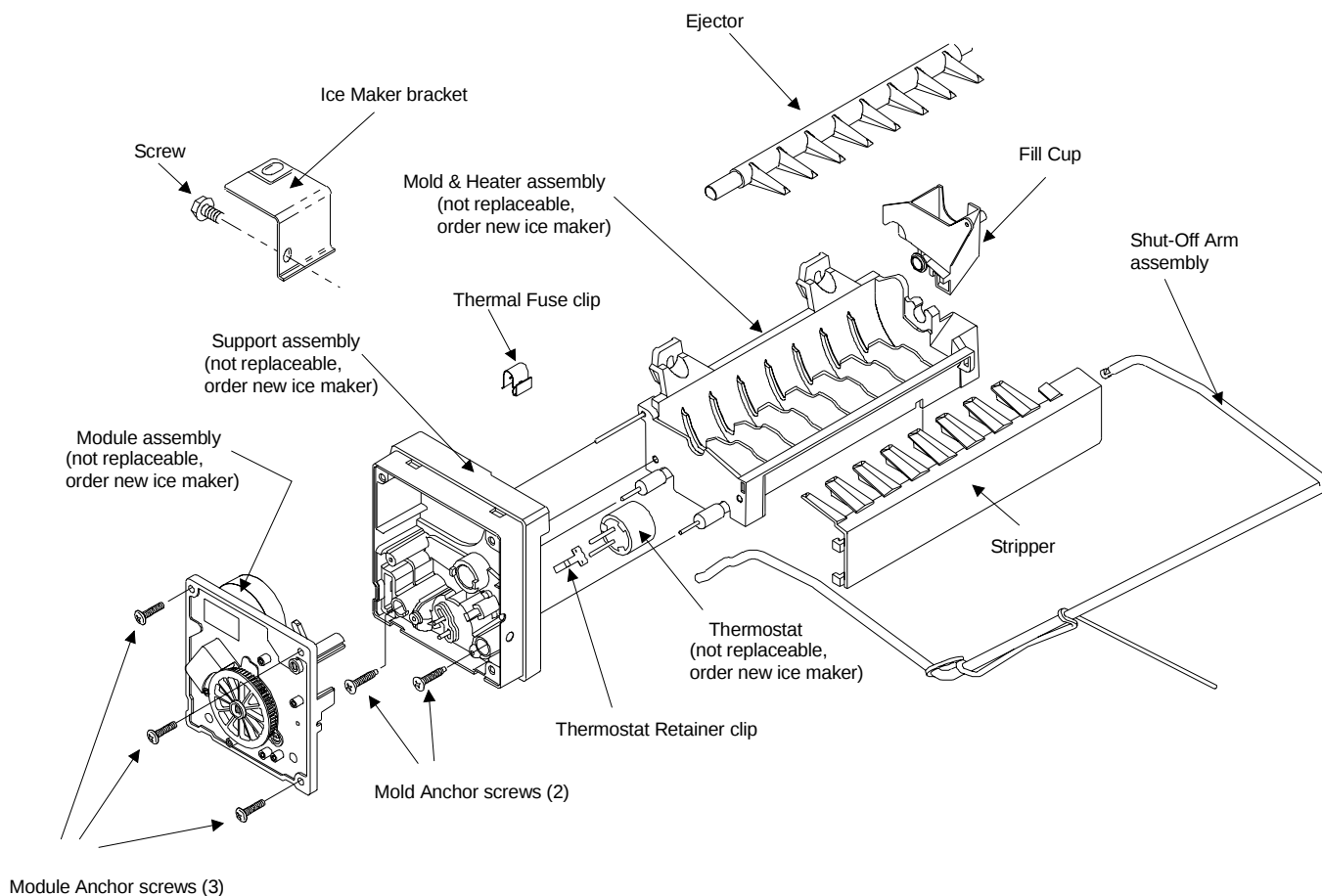
3. At side of mold & heater assembly, pull thermal fuse out of its clip (See "Thermal Fuse," P. 41).



4. Remove wiring harness by depressing retainer tab as you pull the plug out.
 5. Reach into mold anchor-screw access ports with a Phillips screwdriver and loosen two mold anchor screws. Then pull support assembly away from mold.
 6. Remove three module anchor screws and pull module out of support assembly.
 7. Pull stripper and ejector off module.
- NOTE: During reassembly, align "D" shape of ejector shaft with "D" shaped socket in module cam.
8. Remove fill cup. Finally (if desired) remove thermal fuse clip and ice maker bracket.

⚠ WARNING

To avoid risk of electrical shock that can cause death or severe personal injury, disconnect unit from power before servicing unless tests require power. Discharge capacitors through a 10,000-ohm resistor before handling. Wires removed during disassembly must be replaced on correct terminals to ensure proper grounding and polarization.

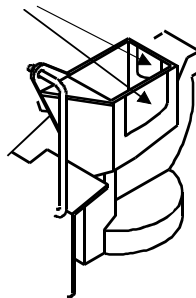


NOTE: New fill cups are molded with two break-out slots for a fill tube. This is done so that the same cup can be used in several applications.

To install a new fill cup:

- a. Disassemble ice maker per instructions above.
- b. Using ordinary pliers on new fill cup, break out fill slot required by your application.
- c. Mount new fill cup and reassemble ice maker.

Break out appropriate tab to make slot for fill tube



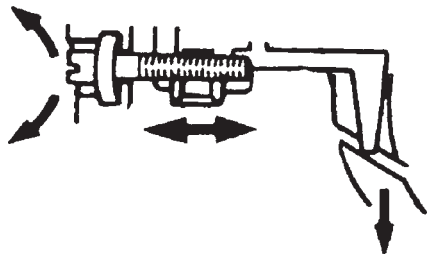
Water Fill Adjustment

Turning the water level adjustment screw moves the contact point in relationship with the contact ring segment upon which it rides. Because the contact ring is tapered, movement of the contact point causes variation

WARNING

To avoid risk of electrical shock that can cause death or severe personal injury, disconnect unit from power before servicing unless tests require power. Discharge capacitors through a 10,000-ohm resistor before handling. Wires removed during disassembly must be replaced on correct terminals to ensure proper grounding and polarization.

in the length of time that the water valve is energized.

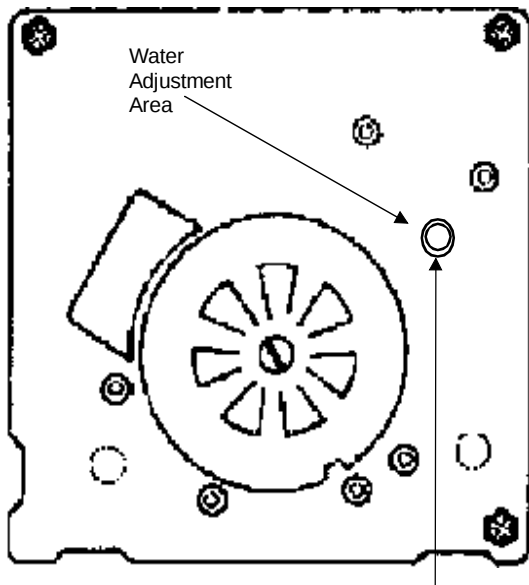


- Turning screw clockwise decreases fill time; turning screw counterclockwise increases fill time.
- One half turn equals 20 cc or 1.2 seconds. A full turn equals 40 cc or 2.4 seconds.

CAUTION

Maximum adjustment is one full turn in either direction. Additional rotation can damage the module.

If water valve adjustment screw falls out, put it back in and turn it until the holes align as shown below.



When small hole is centered in larger hole, water fill time is 7.5 seconds (normal).

Water Problems

Water quality can cause ice makers to fail, to flood, or produce unacceptable cubes. If mineral content or sand is a problem, the screen in the fill valve can clog and

restrict water flow. A particle of sand can prevent the valve from seating properly.

Symptoms of clogging include small crescents (or no ice). Symptoms of a dirty valve include flooding of the ice container when the water valve does not close. 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 that average more than $0 \pm 2^{\circ}\text{F}$ ($18 \pm 1^{\circ}\text{C}$) slow the formation of ice. Therefore, complaints of inadequate ice production can sometimes be corrected by setting the freezer thermostat to a colder temperature. Thermostat cycling temperature in the one-revolution ice maker is $17^{\circ} \pm 3^{\circ}\text{F}$ ($-8^{\circ} \pm 1^{\circ}\text{C}$). Obviously, the ice will be well frozen when those temperatures are achieved. But cycling time is slow if freezer temperature is not cold enough to achieve those temperatures easily.

Bimetal Thermostat

Follow "Test Procedures" (P. 37) to test operation of the bimetal thermostat.

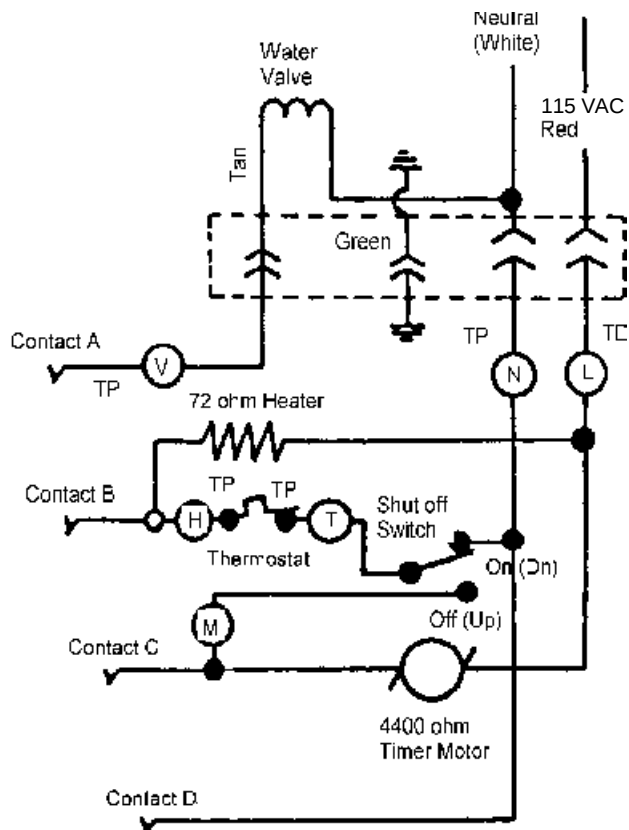
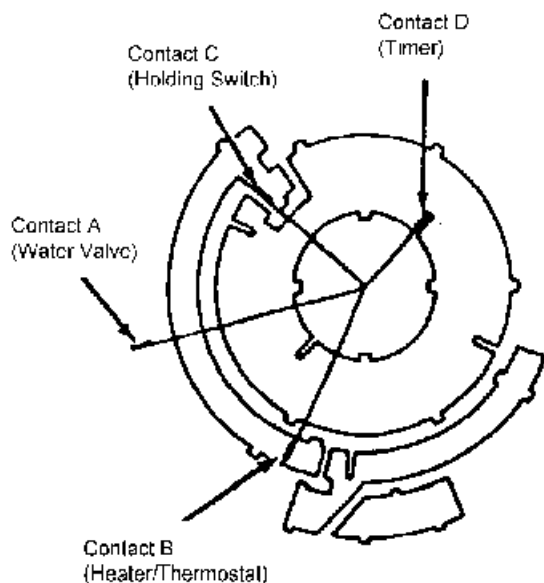
NOTE: Replacement thermostats are no longer available for ice makers. If your thermostat is faulty, order a new ice maker.

⚠ WARNING

To avoid risk of electrical shock that can cause death or severe personal injury, disconnect unit from power before servicing unless tests require power. Discharge capacitors through a 10,000-ohm resistor before handling. Wires removed during disassembly must be replaced on correct terminals to ensure proper grounding and polarization.

Wiring Diagram

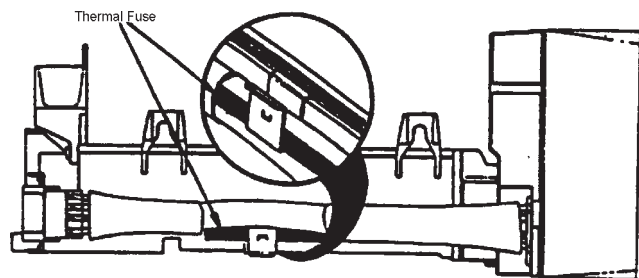
Copper Strips on Backside of Drive Gear



Thermal Fuse

A one-time thermal fuse, incorporated into the ice maker wiring harness, protects the plastic liner from melting if the ice maker overheats. The thermal fuse is spliced into the red wire of the ice maker harness. It is a nonresettable fuse, and it is designed to blow at 170°F (78° C).

Presence of this fuse in the circuit means that a "No Ice" complaint could be caused by excessive heat. Where overheating is the problem, replacement of the wiring harness is a temporary solution. The ice maker should also be replaced.



⚠ CAUTION

To minimize risk of property damage, do not overtighten connection to household water supply. Always test for leaks after repair or replacement of water valve.

Water Valve

When the solenoid is energized, the amount of water allowed to enter the ice-maker mold is determined by two factors:

- Duration of the timing cam that closes the water switch.
- Water pressure present in the tubes.

Proper ice maker fill is 140 ± 10 cc in 7.5 seconds of water fill time at an inlet pressure of 20 to 120 PSI (1.4 to 8.2 bar).

Inside the valve, a flow washer acts as a water pressure regulator. This results in a pressure drop across the valve of 20 to 120 psi (1.4 to 8.2 bar). The valve incorporates an 80-mesh screen water strainer.

⚠ WARNING

To avoid risk of electrical shock that can cause death or severe personal injury, disconnect unit from power before servicing unless tests require power. Discharge capacitors through a 10,000-ohm resistor before handling. Wires removed during disassembly must be replaced on correct terminals to ensure proper grounding and polarization.

Icemaker Troubleshooting Chart

I. No Ice or Low Ice Production	
1. Freezer not cold enough	1. Adjust or repair freezer
2. Broken locking tab on vertical cam	2. Replace ice maker
3. Module shut-off switch and contacts shorted & burned	3. Replace ice maker
4. Motor stalled or stripped	4. Replace ice maker
5. Check ejector position	
A. Park (ejector at 2:30 position)	
1. Contaminated module (Doesn't run when jumped through "T" and "H" probe holes)	1. Replace ice maker
2. Open or missing thermostat	2. Replace ice maker
3. No power to ice maker (harness)	3. Trace power to locate discontinuity
4. Jammed cubes (Notice cube size; hollow?)	4. Clear cube jam; check fill tube & fill cup
5. Little or no water to ice maker (Notice cube size)	
a. Frozen fill tube (leaky water valve)	a. Replace water valve
b. Kinked water tube	b. Un-kink water tube; check for weak spots
c. Clogged water tube to ice maker or refrigerator	c. Clear stoppage
d. Clogged water valve	d. Replace water valve
e. No power to water valve	e. Trace power to locate discontinuity
f. Low water pressure	f. Pressure must be 20 to 120 psi (1.4 to 8.2 bar). Test by jumping "T" to "H" for 7.5 seconds; then remove jumpers; catch water in glass. Should be about 140 cc's.
g. Open heater circuit	g. Replace ice maker
h. Closed thermostat	h. Replace ice maker
i. Damaged heater tulips on module	i. Replace ice maker
j. Heater pins too short; don't contact module	j. Replace ice maker
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 or ice in actuator/housing hole	a. Remove module; dry actuator & housing holes
b. Housing hole small or burred	b. Repair or replace ice maker
c. Actuator O.D. large or burred	c. Replace ice maker
d. Module housing damaged	d. Replace ice maker
e. Bail shut-off arm misformed	e. Replace bail shut-off arm
8. Little or no Alumilastic on thermostat	8. Apply fresh coat of Alumilastic to thermostat
9. Housing-to-mold screws not seated	9. Tighten housing-to-mold screws (20-26 in. lb. or 22.8-29.6 cm/kg)
10. Heater not staked in mold	10. Replace ice maker
11. Wrong heater temperature	11. Replace ice maker
12. Broken shut-off lever (mislocated shut-off switch)	12. Replace ice maker
B. Ejector in 3:00 position	
1. Contamination	1. Replace ice maker
2. Jammed cubes (Notice cube size; hollow?)	2. Clear cube jam
3. Ice maker or refrigerator not level	3. Level as necessary
4. No power to ice maker	4. Trace power to locate discontinuity
5. Excessive water-fill volume	5. Adjust volume screw on module, change water valve or lower water pressure
6. Rack of cubes fell back into mold during ejection	6. Install new fill cup; check fill tube assembly
C. Ejector in 4:00 position	
1. Contamination	1. Replace ice maker
2. Thermostat out of calibration	2. Replace ice maker
3. Open heater circuit (motor should be oscillating)	3. Replace ice maker
4. Little or no Alumilastic on thermostat	4. Apply fresh coat of Alumilastic to thermostat
5. Heater not staked in mold	5. Replace ice maker
6. Broken locking tabs on vertical cam	6. Replace ice maker

WARNING

To avoid risk of electrical shock that can cause death or severe personal injury, disconnect unit from power before servicing unless tests require power. Discharge capacitors through a 10,000-ohm resistor before handling. Wires removed during disassembly must be replaced on correct terminals to ensure proper grounding and polarization.

I. No Ice or Low Ice Production (cont)		
5. Check ejector position (cont)	1. Adjust or repair freezer	
D. Ejector at 6:00 position		
1. Contamination (motor doesn't oscillate)	1. Replace ice maker	
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. Ejector at 7:30 position		
1. Contamination (motor doesn't oscillate)	1. Replace ice maker	
2. Bail arm stuck in ice or obstructed	2. Remove obstruction or replace ice maker	
3. Pac-Man cubes (cubes not formed properly)	3. Un-jam unit; check fill-cup and fill-tube assembly	
F. Ejector at 9:00 position		
1. Contamination	1. Replace ice maker	
2. Cube frozen fo fill cup or mold	2. Un-jam unit; install new fill cup or new ice maker	
II. Overproduction of Ice		
1. Bail shut-off arm not in actuator	1. Replace bail shut-off arm in actuator; watch 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	
4. Broken module actuator	4. Replace ice maker	
III. Hollow Ice Cubes		
1. Water fill volume too low	1. Adjust screw on module; clear water path or change water valve	
2. Improper freezer air flow	2. Redirect air flow away from ice-maker thermostat	
3. Thermostat out of calibration	3. Apply fresh Alumilastic; replace ice maker	
IV. Flooding; Ice Slabs in Bucket or Freezer		
1. Thermostat out of calibration	1. Apply fresh Alumilastic; replace ice maker	
2. Jammed cube stalls unit in water-fill cycle	2. Remove cube; find cause of jamming	
3. Leaky water valve	3. Replace water valve	
4. Fill volume of water excessive	4. Adjust screw on module; change water valve	
5. Motor stalled in fill cycle (ejectors in 12:00 position)	5. Replace ice maker	
6. Contaminated module	6. Replace ice maker	
7. Refrigerator or ice maker not level	7. Level as necessary	
8. Excessive water pressure	8. Lower pressure to 20-120 psi (1.4-8.2 bar)	
9. Module shut-off switch and contacts shorted & burned	9. Replace ice maker	
10. Broken locking tab on vertical cam (stalled in fill cycle)	10. Replace ice maker	
11. Fill tube not properly located in fill cup	11. Reposition fill tube	
12. Fill cup water opening flashed over or plugged	12. Install new fill cup	
13. Cubes fall over back of ice maker, melting into freezer	13. Install new fill cup	

Appendix B

Top Freezer

Refrigerator

Use & Care Guide

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Important Safety Instructions

Installer: Please leave this manual with this appliance.

Consumer: Please read and keep this Use & Care Guide for future reference. This manual provides proper use and maintenance information.

Keep sales receipt and/or cancelled check as proof of purchase.

If you have questions, call:

1-800-688-1120 U.S.A. and Canada

1-800-688-2080 (U.S. TTY for hearing or speech impaired) (Mon.-Fri., 8 a.m.-8 p.m. Eastern Time)

Have complete model and serial number identification of your refrigerator. This is located on a data plate inside the refrigerator compartment, on the upper left side. Record these numbers below for easy access.

Model Number _____

Serial Number _____

Date of Purchase _____

In our continuing effort to improve the quality and performance of our appliances, it may be necessary to make changes to the appliance without revising this guide.

What You Need to Know About Safety Instructions

Warning and Important Safety Instructions appearing in this manual are not meant to cover all possible conditions and situations that may occur. Common sense, caution and care must be exercised when installing, maintaining or operating appliance.

Always contact your dealer, distributor, service agent or manufacturer about problems or conditions you do not understand.

Recognize Safety Symbols, Words, 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 property damage.

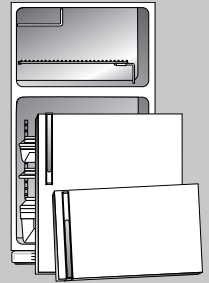
DANGER

To reduce risk of injury or death, follow basic precautions, including the following:

IMPORTANT: Child entrapment and suffocation are not problems of the past. Junked or abandoned refrigerators are still dangerous – even if they sit out for “just a few days.” If you are getting rid of your old refrigerator, please follow the instructions below to help prevent accidents.

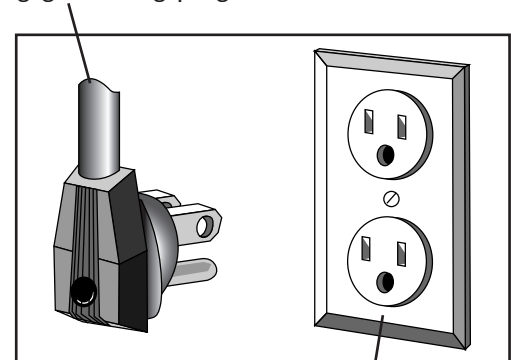
Before you throw away your old refrigerator or freezer:

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



This appliance is equipped with a three-pronged grounding plug for your protection against possible electrical shock hazards. It must be plugged into a grounding receptacle. Where a standard two-prong wall receptacle is encountered, it is the personal responsibility and obligation of the customer to have it replaced with a properly grounded three-prong wall receptacle. Do not under any circumstances, cut or remove the third (ground) prong from the power cord. Do not use an adapter plug.

Power supply cord with three-prong grounding plug



Grounding type wall receptacle



Important Safety Instructions

WARNING

To reduce risk of fire, electric shock, serious injury or death when using your refrigerator, follow these basic precautions, including the following:

1. Read all instructions before using the refrigerator.
2. Observe all local codes and ordinances.
3. Be sure to follow grounding instructions.
4. Check with a qualified electrician if you are not sure this appliance is properly grounded.
5. Do not ground to a gas line.
6. Do not ground to a cold-water pipe.
7. Refrigerator is designed to operate on a separate 115 volt, 15 amp., 60 cycle line.
8. Do not modify plug on power cord. If plug does not fit electrical outlet, have proper outlet installed by a qualified electrician.
9. Do not use a two-prong adapter, extension cord or power strip.
10. Do not remove warning tag from power cord.
11. Do not tamper with refrigerator controls.
12. Do not service or replace any part of refrigerator unless specifically recommended in Use & Care Guide or published user-repair instructions. Do not attempt service if instructions are not understood or if they are beyond personal skill level.
13. Always disconnect refrigerator from electrical supply before attempting any service. Disconnect power cord by grasping the plug, not the cord.
14. Install refrigerator according to Installation Instructions. All connections for water, electrical power and grounding must comply with local codes and be made by licensed personnel when required.
15. Keep your refrigerator in good condition. Bumping or dropping refrigerator can damage refrigerator or cause refrigerator to malfunction or leak. If damage occurs, have refrigerator checked by qualified service technician.
16. Replace worn power cords and/or loose plugs.
17. Always read and follow manufacturer's storage and ideal environment instructions for items being stored in refrigerator.
18. Your refrigerator should not be operated in the presence of explosive fumes.
19. Children should not climb, hang or stand on any part of the refrigerator.
20. Clean up spills or water leakage associated with water installation.

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE



Installation

Your new refrigerator was packed carefully for shipment. Remove and discard shelf packing and tape.

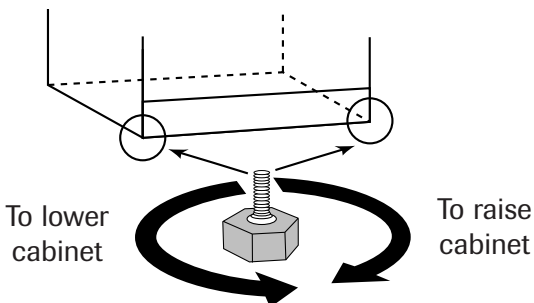
Location

- Allow for a free flow of air through the front base grille.
- Install the refrigerator where the room temperature will not go below 55° F (13° C). With temperatures below 55° F (13° C), the refrigerator will not run frequently enough to maintain proper temperature in the freezer.
- Allow a minimum ½" clearance on the sides, top and back for ease of installation. If refrigerator is placed with the door hinge side against a wall, you may want to allow additional space so the door can be opened wider.
- Use caution when installing the unit on vinyl or hardwood floors so as not to mark or otherwise damage the flooring. A piece of plywood, a rug or other material should be used to protect the floor while positioning the unit.

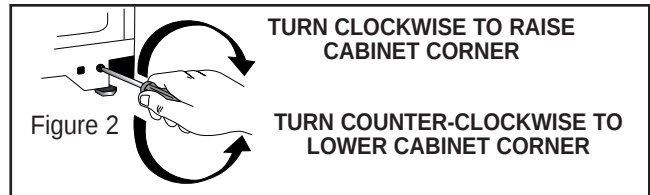
Leveling

To enhance its appearance and to maintain performance, your refrigerator should be leveled after it has been rolled into its final location.

- Adjust the leveling/lock screws beneath each front corner at the base of the cabinet. Turn these leveling/lock screws clockwise to raise a cabinet corner and counterclockwise to lower a cabinet corner.



- If the floor is not level and it is necessary to raise the rear of the cabinet, we suggest rolling the rear wheels onto a piece of plywood or other shim material.
- Refrigerator models that have adjustable wheels can be leveled by removing the base grille and adjusting the wheels with a 1/4" socket or screwdriver. (See figure 2.)



Front Base Grille (on select models)

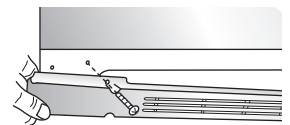
The front base grille (select models) which was packaged inside the refrigerator for shipment and should be installed after the refrigerator has been leveled.

“Snap on” style:

- To install, align the spring clips with the round openings in the cabinet and push each end in until the grille locks into place.
- To remove this style of base grille, grasp both ends and pull straight out.

“Screw on” style:

- Use a Phillips screwdriver to remove the two Phillips head screws at the base of the refrigerator.
- Align the base grille to the screw holes. (The cut out side on the base grille installs around the lower hinge of the door.)
- Secure the base grille into place by reinstalling the Phillips screws back into their original screw holes.
- Reverse these steps to remove this style of base grille.



Energy Saving Tips

- Locate the refrigerator away from heat producing appliances such as the range or dishwasher, heat vents and direct sunlight.
- Level the refrigerator and do not block ventilation around the front base grille.
- Let hot dishes cool slightly before putting into the refrigerator or freezer.
- Cover liquids.
- Keep the freezer full to near capacity so less cold air will escape during door openings. When the freezer is less than ⅔ full, place milk cartons half full of water in the freezer.
- Wipe moisture from the outside of containers before placing them into the refrigerator.
- Avoid opening the doors too often.



Installation

⚠ WARNING

To avoid electrical shock which can cause severe personal injury or death:

- Disconnect power to refrigerator before reversing doors.

Reversing Doors

Tools Required:

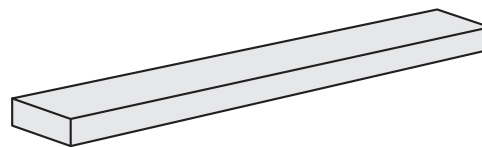
- $\frac{5}{16}$ " end wrench
- Phillips screwdriver
- Putty knife
- $\frac{5}{16}$ " socket and ratchet

Unplug the refrigerator.

1. Pry off hinge cap with a putty knife and set aside.
2. With a $\frac{5}{16}$ " socket and ratchet, remove screws from the upper hinge and set aside.
3. Carefully lift and remove freezer door (including the upper hinge) off the center hinge.
4. With a $\frac{5}{16}$ " socket and ratchet, remove the screws and middle hinge from the top of refrigerator door. With a putty knife, pry out the plug buttons and replace them on the opposite side.
5. Carefully lift and remove refrigerator door.
6. Remove front base grille and set aside (see p. 3).
7. With a $\frac{5}{16}$ " socket and ratchet, remove hinge plate from lower corner of refrigerator and secure it on the opposite side.
8. Remove plate from the underside of refrigerator door and secure it on the opposite side with a $\frac{5}{16}$ " socket and ratchet.
9. With a $\frac{5}{16}$ " socket and ratchet, remove the door stop from the underside of the freezer door and secure it on the opposite side.
10. With a putty knife, pry out the plug button(s) from tops of freezer and refrigerator doors and replace them on the opposite side.
11. Remove screw hole plugs from top of cabinet and replace on the opposite side.
12. With a $\frac{5}{16}$ " socket and ratchet, remove washers and stem from the inside of the hinge plate and place them on the outside of the hinge plate.
13. Carefully replace refrigerator door on the hinge plate in lower corner.

14. Attach the middle hinge with the screws removed from the opposite side and secure them using a $\frac{5}{16}$ " wrench.

15. Carefully place freezer door on top of hinge arm. Use foam door spacer to set gap.



Note

- Do not discard the foam door spacer. Doors may settle with use.

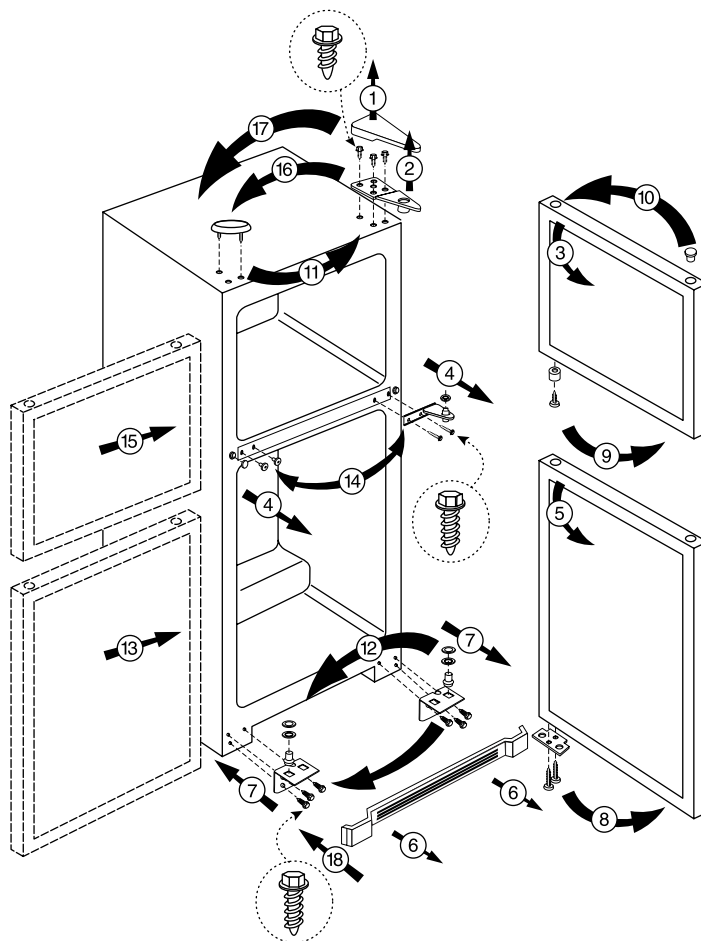
16. Slide top hinge into place on freezer door and secure screws with $\frac{5}{16}$ " wrench.

Confirm that all screws have been tightened securely.

17. Snap hinge cap securely in place.

18. Replace front base grille (see p. 3).

Remember to plug in your refrigerator and reset the controls to the appropriate setting(s).





Installation

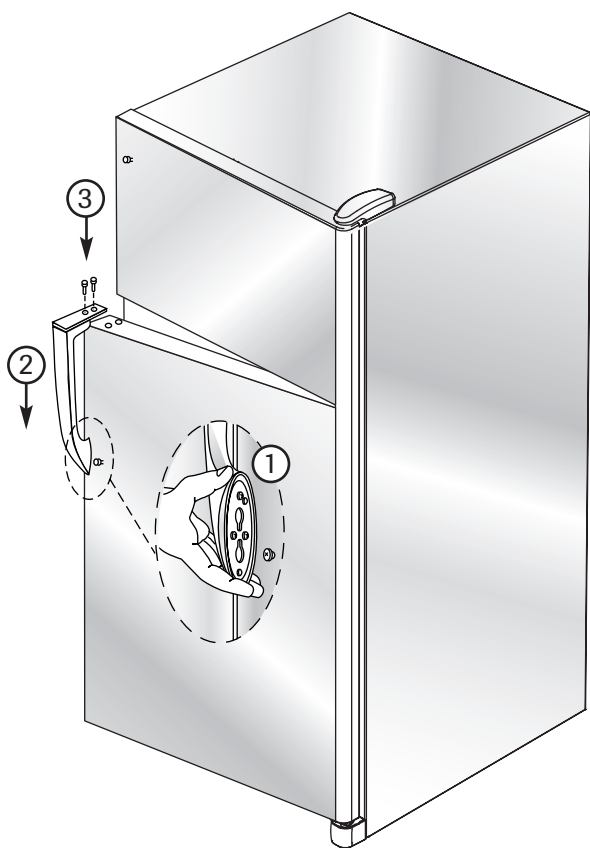
Handle Installation

Tools Required:

- Phillips screwdriver

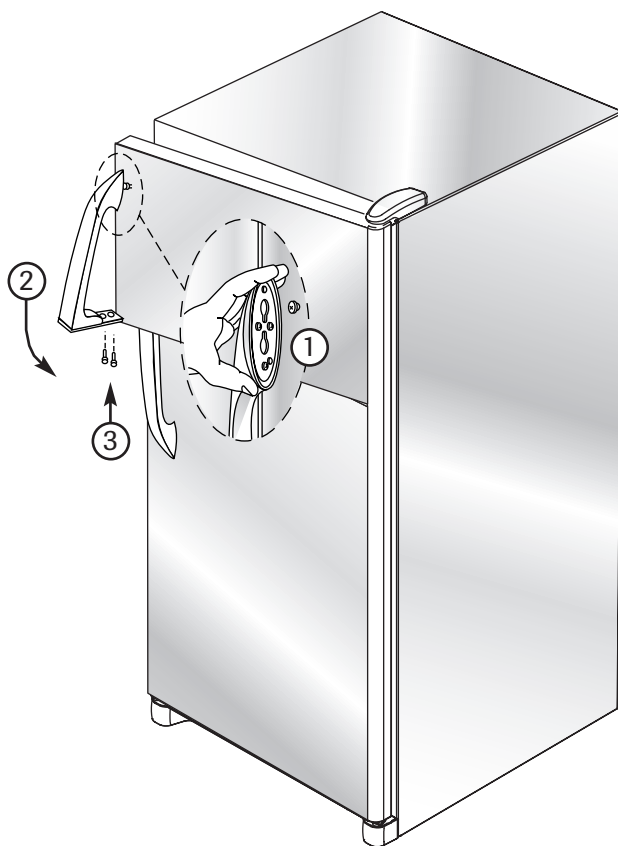
Fresh Food Door Handle:

1. Align handle with mounting stud in door.
2. Pull handle down.
3. Secure handle with two screws.

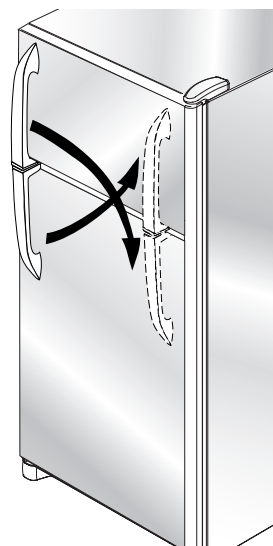


Freezer Door Handle:

1. Holding the handle at an angle align it with the mounting stud on the door.
2. Pull the handle down at an angle and rotate it so the holes in the bottom of the handle line up with the holes in the bottom of the freezer door.
3. Secure handle with two screws.
4. Reverse the procedure to remove handle if necessary.



5. If desired, the handles can be mounted on the opposite side, so the door would open to the left rather the right. To remove the handles reverse the above steps. Flip the handles 180 degrees and mount them on the opposite doors.





Installation

Connecting the Water Supply (select models)

⚠ WARNING

To reduce the risk of injury or death, follow basic precautions, including the following:

- Read all instructions before installing ice maker.
- Do not attempt installation if instructions are not understood or if they are beyond personal skill level.
- Observe all local codes and ordinances.
- Do not service ice maker unless specifically recommended in Use & Care Guide or published user-repair instructions.
- Disconnect power to refrigerator before installing ice maker.
- Water damage due to an improper water connection may cause mold/mildew growth. Clean up spills or leakage immediately.

⚠ CAUTION

To avoid property damage or possible injury, follow basic precautions, including the following:

- Consult a plumber to connect **¼" O.D. copper tubing** to household plumbing to assure compliance with local codes and ordinances.
- Confirm water pressure to water valve is between 35 and 100 pounds per square inch. 20 pounds per square inch if there is not a water filter.
- Do not use a self-piercing, or ⅝" saddle valve. Both reduce water flow and can become clogged over time, and may cause leaks if repair is attempted.
- Tighten nuts by hand to prevent cross threading. Finish tightening nuts with pliers and wrenches. Do not overtighten.
- Wait 2-3 hours before placing refrigerator into final position to check and correct any water leaks. Recheck for leaks after 24 hours.
- Verify the copper tubing under the sleeve is smooth and free from defects. Do not reuse an old sleeve.

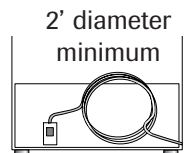
Materials Needed

- ¼" outer diameter flexible copper tubing
- Shut-off valve (requires a ¼" hole to be drilled into water supply line before valve attachment)
- Adjustable wrench
- ¼" hex nut driver

Note

- Add 8' to tubing length needed to reach water supply for creation of service loop.

1. Create service loop with copper tubing (minimum 2' diameter). Avoid kinks in the copper tubing when bending it into a service loop.

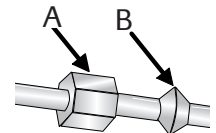


2. Remove plastic cap from water valve inlet port.

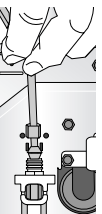


3. Place brass nut (A) and sleeve (B) on copper tube end as illustrated.

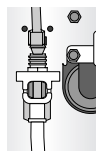
Reminder: Do not use an old sleeve.



4. Place end of copper tubing into water valve inlet port. Shape tubing slightly. Do not kink – so that tubing feeds straight into inlet port.

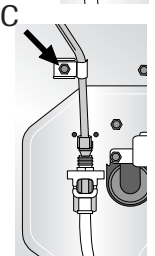


5. Slide brass nut over sleeve and screw nut into inlet port. Tighten nut with wrench.



IMPORTANT: Do not overtighten. Cross threading may occur.

6. Pull on tubing to confirm connection is secure. Connect tubing to frame with water tubing clamp (C) and turn on water supply. Check for leaks and correct if necessary. Continue to observe the water supply connection for two to three hours prior to moving the refrigerator to its permanent location.

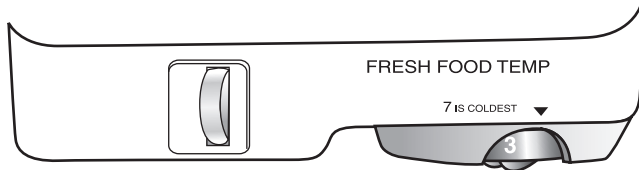


7. Monitor water connection for 24 hours. Correct leaks, if necessary.



Temperature Controls

In some models the fresh food control is located at the top of the fresh food compartment and the freezer control is located at the back of the freezer compartment as show below:

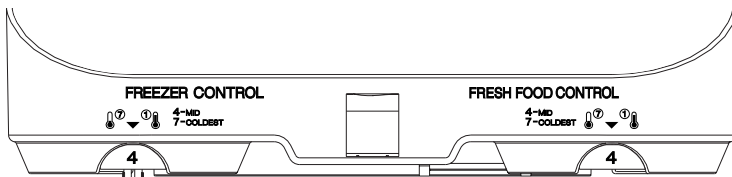


INITIAL SETTING



FREEZER CONTROL

In other models, both controls are located at the top of the fresh food compartment as shown below:



Initial Settings

- The fresh food control has settings from 1 (cold) to 7 (coldest). Initially set this control on 4.
- The freezer control, when located at the back of the freezer, has settings from cold to coldest. Initially set this control at the mid-line initial setting.
- When the freezer control is located at the top of the fresh food compartments, it has settings from 1 (cold) to 7 (coldest). Initially set this control on 4.

Note

- Your refrigerator will run continuously for several hours when you first start it. This is normal.
- Let the refrigerator run at least four hours before adding food.

Adjusting the Temperature Controls

- 24 hours after adding food, you may decide that one or both compartments should be colder or warmer. If so, adjust the control(s) as indicated in the following table.

- Except when starting the refrigerator, do not change either control more than one number at a time.
- Allow 24 hours for temperatures to stabilize before resetting.
- Changing either control will have some effect on the temperature of the other compartment.

TEMPERATURE CONTROL GUIDE

Fresh Food Compartment too Warm	Adjust fresh food control to next higher setting.
Fresh Food Compartment too Cold	Adjust fresh food control to next lower setting.
Freezer too Warm	Adjust freezer control to next colder setting.
Freezer too Cold	Adjust freezer control to next warmer setting.
Turn Refrigerator "OFF"	Set fresh food control to "OFF":*

- * Turning the fresh food control to "OFF" stops cooling in both compartments. It does not shut off power to the refrigerator.

No Defrosting

Your refrigerator is designed to defrost automatically.

Note

- During the automatic defrost cycle, you may notice a red glow/reflection in the vents on the back wall of the freezer compartment and you may hear the sound of water droplets coming into contact with the defrost heater. This is normal during the defrost cycle.

Warm Cabinet Surfaces

At times, the front of the refrigerator cabinet may be warm to the touch. This is a normal occurrence that helps prevent moisture from condensing on the cabinet. The condition will be more noticeable when you first start the refrigerator, during hot weather and after excessive or lengthy door openings.



Looking Inside

Fresh Food Compartment

Shelves (style may vary)

⚠ CAUTION

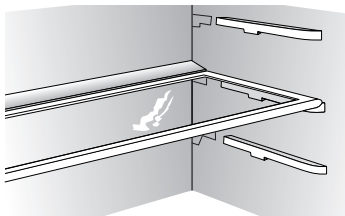
To avoid personal injury or property damage:

- Never attempt to adjust a shelf when it is loaded with food.
- Confirm that shelf is secure prior to loading items onto it.
- Handle glass shelves with care. Shelves may break suddenly if nicked, scratched or exposed to sudden temperature changes.

Select models are equipped with wire or glass full width shelves that are supported by rails molded into the interior walls of the fresh food compartment. These shelves can easily be adjusted to alternate positions within the compartment.

To Adjust a Full Width Shelf:

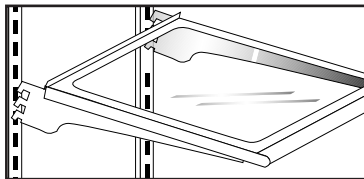
- Grasp each side of the shelf.
- Pull the shelf forward approximately 1".
- While supporting the shelf from underneath, lift it up and out.
- Slide the shelf into the desired alternate position.



Shelves in other models hook into support rails located on the back wall of the fresh food compartment.

To Remove:

- Slightly tilt up the front and lift up the rear of the shelf, then pull the shelf straight out.



To Lock Into Another Position:

- Tilt up the front edge of the shelf.
- Insert the hooks into the desired frame openings and let the shelf settle into place.
- Be sure the shelf is securely locked at the rear.
- On certain models the outside edge of the shelf rests on rails formed into the side of the fresh food compartment.

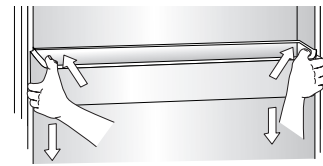
The bucket-style **Door Shelves** accommodate a variety of container sizes and shapes.

To Remove:

- Grasp the shelf on each end.
- Lift the shelf up and out.

To Reinstall:

- While holding the shelf on each end, slide the shelf in and down.
- Push down on the interior center of the shelf to snap it completely into place.



The **Crispers** provide a storage area for fruit and vegetables. Some crisper drawers have slide humidity controls.

FRUIT	VEGETABLES
HUMIDITY CONTROLLED	

For fruit storage, slide the control (select models) to the left to provide lower humidity conditions in the drawer.

For vegetable storage, slide the control (select models) to the right to provide higher humidity conditions in the drawer.

For best results, keep the crispers tightly closed.

To Remove:

- Pull out the crisper until it stops.
- Tilt the drawer up slightly and pull it out.

To Reinstall:

- With the drawer tilted up slightly, align the drawer in the tracks and slide in.

The **Crisper Top** serves as the lower refrigerator shelf.

To Remove:

- Remove the crisper drawers.
- Slightly lift up the front of the shelf.
- Support the shelf from underneath to lift it up and then out of the cabinet.

To Reinstall:

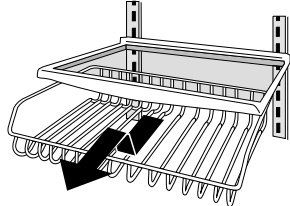
- With the shelf front tilted slightly upward, carefully insert the crisper top back into the cabinet.
- Position the rear and sides of the shelf on the supports and let the crisper top settle into place.



Looking Inside

Can Rack (select models)

The **Can Rack** slides out from underneath a shelf. It can hold up to twelve 12-ounce beverage cans.



To Remove:

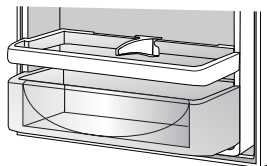
- Pull rack out to full extension. Tilt up the front of rack and pull straight out.

To Install:

- Insert rack into frame rails and push back into place.

Tall Bottle Retainer/Snugger (select models)

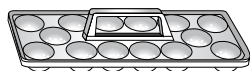
The **Tall Bottle Retainer** prevents tall bottles from tipping forward. The Retainer can be placed above any removable door bucket.



The **Snugger** attached to the Tall Bottle Retainer keeps bottles and other containers in place when the door is opened or closed. Adjust the Snugger by sliding from side to side. Select models also feature snuggers in the door bucket itself.

Egg Tray With Handle (style may vary/select models)

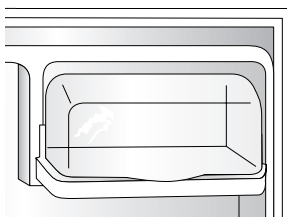
The **Egg Tray with Handle** holds a “dozen-plus” eggs. It can be removed to carry to a work area or to be washed.



Dairy Compartment

The **Dairy Compartment** is covered and designed to store spreadable food items such as butter or margarine.

To use this compartment, simply raise the lid to store or retrieve items.



This compartment can be removed for cleaning. Rotate the cover open. Grasp the dairy compartment from the bottom and lift out.

On select models, this compartment can be installed on the left or right side of the door.

Freezer Compartment

⚠ CAUTION

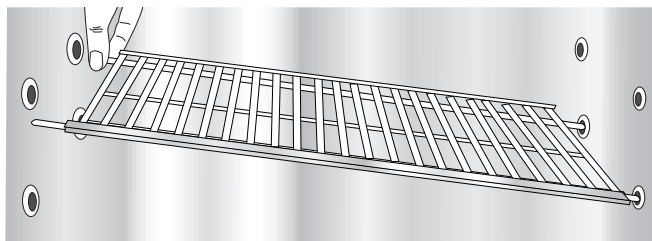
To avoid personal injury or property damage:

- Never attempt to adjust a shelf when it is loaded with food.
- Confirm that shelf is secure prior to loading items onto it.

Some refrigerators have a full-width shelf in the freezer compartment. This shelf can be adjusted to accommodate a variety of frozen food loads.

To Adjust the Shelf:

- Slide the shelf to the left.
- Lift the left support bars out of the wall support cups.
- Reposition the shelf in the alternate position.



The **Slide Out Freezer Basket** (select models) is found in the main freezer compartment. It is a convenient storage area, providing easy access to items stored in the rear of the freezer. Slide the basket out to reach or store frozen foods.

To Remove the Basket:

- Pull the basket until it stops.
- Lift and pull the basket out.

To replace the basket, reverse the removal procedure.

The **Drop Down Freezer Basket** (select models) is found on the lower shelf of the freezer door. This area provides space for frozen food items that tend to shift or slide (such as bagged vegetables).

Ice Cube Trays

Select models are equipped with ice cube trays. To release the ice cubes from a tray, hold the tray upside down over a container and twist both ends.

Automatic Ice Maker (optional)

Note

- Energy rating guides that are posted on the refrigerator at the time of purchase do not include optional ice maker energy usage.

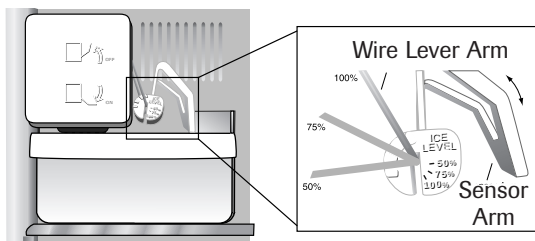
Select models are automatic ice maker ready. The number of the appropriate ice maker kit needed for installation into these models appears on the data plate. The kit contains installation instructions and water connection instructions.

Other models have a factory installed ice maker.

Connect the ice maker to the water supply as instructed in the separate instructions furnished with the ice maker. **Proper water flow and a level refrigerator is essential for optimal ice maker performance.**

After your refrigerator has been connected to the water supply, move the sensor arm into the down position. The ice maker will fill with water when the freezer reaches the proper temperature.

Some ice makers are equipped with an adjustable sensor arm that allows you to adjust the amount of ice in your ice storage tray for times when less ice is needed.



To adjust the amount of ice produced: (select models) Rotate the wire lever arm to provide the desired level of ice production. The 100% setting provides maximum ice production.

- It may be 8 to 12 hours before the ice maker furnishes any usable ice cubes. The first one or two batches will probably contain undersized and irregular cubes because of air in the supply line.
- The initial batch may also contain impurities from the new water supply piping. Therefore, all cubes from the first two or three batches should be discarded.

- When the ice cubes are ejected it is normal for several cubes to be joined together at the ends. They can easily be broken apart. The ice maker will continue to make ice until the supply of ice cubes raises the sensor arm, shutting the ice maker off.
- Certain sounds may accompany the various cycles of the ice maker. The motor may have a slight hum, the cubes will rattle as they fall into an empty storage pan and the water valve may click or “buzz” occasionally.
- If the ice is not used frequently, the ice cubes will become cloudy, shrink, stick together and taste stale. Empty the ice storage bin periodically and wash it in lukewarm water. Be sure to dry the bin before replacing it.
- To remove the ice bin, pull it forward, away from the ice maker. To avoid the ice maker dumping ice while the bin is removed, turn the ice maker off by lifting the sensor arm.
- To replace the ice bin, reverse the above procedure. Turn the ice maker on by lowering the sensor arm.
- Beverage and foods should not be placed in the ice storage bin for quick chilling. These items can block the sensor arm, causing the ice maker to malfunction.
- Turn off (arm up) the ice maker when the water supply is to be shut off for several hours.

⚠ WARNING

To avoid personal injury or property damage:

- Do not place fingers or hands on the automatic ice making mechanism while the refrigerator is plugged in. This will help protect you from possible injury. It will also prevent interference with moving parts of the ejector mechanism and the heating element that releases the cubes.
- Under certain rare circumstances, ice cubes may be discolored, usually appearing with a green-bluish hue. The cause of this unusual discoloration can be a combination of factors such as certain characteristics of local waters, household plumbing and the accumulation of copper salts in an inactive water supply line which feeds the ice maker. Continued consumption of such discolored ice cubes may be injurious to health. If such discoloration is observed, discard the ice cubes and contact your dealer to purchase and install a water line filter.
- Water damage due to improper water connection may cause mold/mildew growth.



Food Storage Tips

Fresh Food Storage

- The fresh food compartment of a refrigerator should be kept between 34° F (1° C) and 40° F (4° C) with an optimum temperature of 37° F (3° C). To check the temperature, place an appliance thermometer in a glass of water and place in the center of the refrigerator. Check after 24 hours. If the temperature is above 40° F (4° C) adjust the control as explained on page 7.
- Avoid overcrowding the refrigerator shelves. This reduces the circulation of air around the food and results in uneven cooling.

Fruits and Vegetables

- Storage in the crisper drawers traps humidity to help preserve the fruit and vegetable quality for longer time periods (see page 8).
- Sort fruits and vegetables before storage and use bruised or soft items first. Discard those showing signs of decay.
- Always wrap odorous foods such as onions and cabbage so the odor does not transfer to other foods.
- While vegetables need a certain amount of humidity to remain fresh, too much moisture can shorten storage times (especially leafy items). Drain vegetables well before storing.

Meat and Cheese

- Raw meat and poultry should be wrapped securely so leakage and contamination of other foods or surfaces does not occur.
- Occasionally mold will develop on the surface of hard cheeses (Swiss, Cheddar, Parmesan). Cut off at least an inch around and below the moldy area. Keep your knife or instrument out of the mold itself.

Do not try to save individual cheese slices, soft cheese, cottage cheese, cream, sour cream or yogurt when mold appears.

Dairy Food

- Most dairy foods such as milk, yogurt, sour cream and cottage cheese have freshness dates on their cartons for appropriate length of storage. Store these foods in the original carton and refrigerate immediately after purchasing and after each use.

Frozen Food Storage

- The freezer compartment of a refrigerator should be kept at approximately 0° F (-18° C). To check the temperature, place an appliance thermometer between the frozen packages and check after 24 hours. If the temperature is above 0° F (-18° C), adjust the control as explained on page 7.
- A freezer operates more efficiently when it is at least $\frac{2}{3}$ full.

Packaging Foods for Freezing

- To minimize dehydration and quality deterioration use aluminum foil, freezer wrap, freezer bags or airtight containers. Force as much air out of the packages as possible and be sure they are tightly sealed. Trapped air can cause the food to dry out, change color and develop an off-flavor (freezer burn).
- Overwrap fresh meats and poultry with suitable freezer wrap prior to freezing.
- **Do not refreeze meat that has completely thawed.**

Loading the Freezer

- Avoid adding too much warm food to the freezer at one time. This overloads the freezer, slows the rate of freezing and can raise the temperature of frozen foods.
- Leave a space between the packages so cold air can circulate freely, allowing food to freeze as quickly as possible.
- Avoid storing hard-to-freeze foods such as ice cream and orange juice on the freezer door shelves. These foods are best stored in the freezer interior where the temperature varies less with door openings.



Food Storage Tips

Food Storage Chart

Storage times are approximate and may vary depending on type of packaging, storage temperature, and the quality of the food when purchased.

FOODS	REFRIGERATOR	FREEZER	STORAGE TIPS
<u>DAIRY PRODUCTS</u>			
Butter	1 month	6-9 months	Wrap tightly or cover.
Milk and cream	1 week	Not recommended	Check carton date. Close tightly. Don't return unused portions to original container. Don't freeze cream unless whipped.
Cream cheese, cheese spread and cheese food	1-2 weeks	Not recommended	Wrap tightly.
Cottage cheese	3-5 days	Not recommended	Store in original carton. Check carton date.
Sour cream	10 days	Not recommended	
Hard cheese (Swiss, Cheddar and Parmesan)	1-2 months	4-6 months May become crumbly	Wrap tightly. Cut off any mold.
<u>EGGS</u>			
Eggs in the shell	3 weeks	Not recommended	Refrigerate small ends down.
Leftover yolks or whites	2-4 days	9-12 months	For each cup of yolks to be frozen, add 1 tsp. sugar for use in sweet, or 1 tsp. salt for non-sweet dishes.
<u>FRUITS</u>			
Apples	1 month	8 months (cooked)	May also store unripe or hard apples at 60-70° F (16-21° C).
Bananas	2-4 days	6 months (whole/peeled)	Ripen at room temperature before refrigerating. Bananas and avocados darken when refrigerated.
Pears, plums, avocados	3-4 days	Not recommended	
Berries, cherries, apricots	2-3 days	6 months	
Grapes	3-5 days	1 month (whole)	
Citrus fruits	1-2 weeks	Not recommended	May also store at 60-70° F (16-21° C). If refrigerated, store uncovered.
Pineapples, cut	2-3 days	6-12 months	Will not ripen after purchase. Use quickly.
<u>VEGETABLES</u>			
Asparagus	1-2 days	8-10 months	Don't wash before refrigerating. Store in crisper.
Brussels sprouts, broccoli, cauliflower, green peas, lima beans, onions, peppers	3-5 days	8-10 months	Wrap odorous foods. Leave peas in pods.
Cabbage, celery	1-2 weeks	10-12 months	Wrap odorous foods and refrigerate in crisper.
Carrots, parsnips, beets, and turnips	7-10 days	8-10 months	Remove tops. Wrap odorous foods and refrigerate in the crisper.
Lettuce	7-10 days	Not recommended	



Food Storage Tips

FOODS	REFRIGERATOR	FREEZER	STORAGE TIPS
<u>POULTRY AND FISH</u>			
Chicken and Turkey, whole	1-2 days	12 months	Keep in original packaging for refrigeration. Place in the Meat and Cheese Drawer. When freezing longer than 2 weeks, overwrap with freezer wrap.
Chicken and Turkey, pieces	1-2 days	9 months	
Fish	1-2 days	2-6 months	
<u>MEATS</u>			
Bacon	7 days	1 month	Fresh meats can be kept in original packaging for refrigeration.
Beef or lamb, ground	1-2 days	3-4 months	
Beef or lamb, roast and steak	3-5 days	6-9 months	
Ham, fully cooked, whole	7 days	1-2 months	Place in the Meat and Cheese Drawer. When freezing longer than 2 weeks, overwrap with freezer wrap.
half	5 days	1-2 months	
slices	3 days	1-2 months	
Luncheon meat	3-5 days	1-2 months	Unopened, vacuum-packed luncheon meat may be kept up to 2 weeks in the Meat and Cheese Drawer.
Pork, roast	3-5 days	4-6 months	
Pork, chops	3-5 days	4 months	
Sausage, ground	1-2 days	1-2 months	
Sausage, smoked	7 days	1-2 months	
Veal	3-5 days	4-6 months	Processed meats should be tightly wrapped and stored in the Meat and Cheese Drawer.
Frankfurters	7 days	1 month	

Sources: United States Department of Agriculture; Food Marketing Institute; Cooperative Extension Service, Iowa State University



Storing the Refrigerator

Vacations*

If you will be gone for a month or less, leave the controls at the usual settings.

During longer absences:

1. Remove all food.
2. Shut off the ice maker (if installed) and the valve where you tapped into the water line to supply the refrigerator.
3. Disconnect the refrigerator from the electrical outlet.
4. Bleed the water from the ice maker fill line and dry the ice maker thoroughly.

* If using an automatic ice maker, discard first two or three ice harvests, when refrigerator is put back into service.

5. Clean and dry the refrigerator thoroughly.

6. Leave the doors open to prevent odors.

WARNING

Water damage due to improper disconnection and drainage may cause mold/mildew growth.

Moving*

When moving, follow instructions listed in *Vacations*. In addition, remove and carefully pack any items that are easily removable. Ship the refrigerator in an upright position with the doors taped shut.



Care & Cleaning

Refer to the chart on the following page for specific refrigerator cleaning guidelines.

WARNING

To avoid electrical shock which can cause severe personal injury or death:

- Disconnect the power cord before moving or cleaning the refrigerator.
- Disconnect the power cord before replacing the light bulb.

CAUTION

To avoid personal injury:

- Wear gloves when changing a light bulb to protect against possible broken glass.

3. To prevent an accidental spill, drain any defrost water which may have accumulated in the defrost drain pan. This pan is located behind the front base grille. To remove the pan, push down on both sides and slide it out.

4. If your model has been connected to a water supply for an automatic ice maker, turn off the water before moving the refrigerator.

5. Pull the refrigerator out from the wall.

Replacing a Light Bulb

Always use a standard 40 watt appliance bulb.

Fresh Food Compartment

The light bulb is located under the top of the fresh food compartment.

- Remove light shield, if present.
- Unscrew the light bulb and replace.

Freezer Compartment

The freezer light (select models) is located on the back wall, near the upper right corner.

To remove the bulb cover:

- Grasp the top and bottom of the bulb cover. Press in the areas of the attachment tabs, applying enough pressure to unhook the tabs. At the same time, pivot the cover down and remove.
- Unscrew the lightbulb and replace.
- Replace the bulb cover by pivoting it back into place and snapping the tabs into the appropriate slots.

No Clean™ Condenser

A clean condenser means more efficient refrigerator operation. Thanks to the unique design of the No Clean™ Condenser, there is no longer a need for routine condenser cleaning in normal home usage surroundings.

Some operating environments may be particularly dusty or greasy. In these situations, the condenser can be periodically cleaned to insure maximum efficiency.

Cleaning Under the Refrigerator

1. Disconnect the power cord.
2. Raise the locking feet, if engaged (see page 3).

Care & Cleaning

WARNING

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

CAUTION

To avoid personal injury or property damage, observe the following:

- Do not touch refrigerated surfaces with wet or damp hands, they may stick to the cold metal surfaces.
- Before cleaning the freezer, allow it to warm up.
- Allow glass shelves to warm up before immersing in warm water.

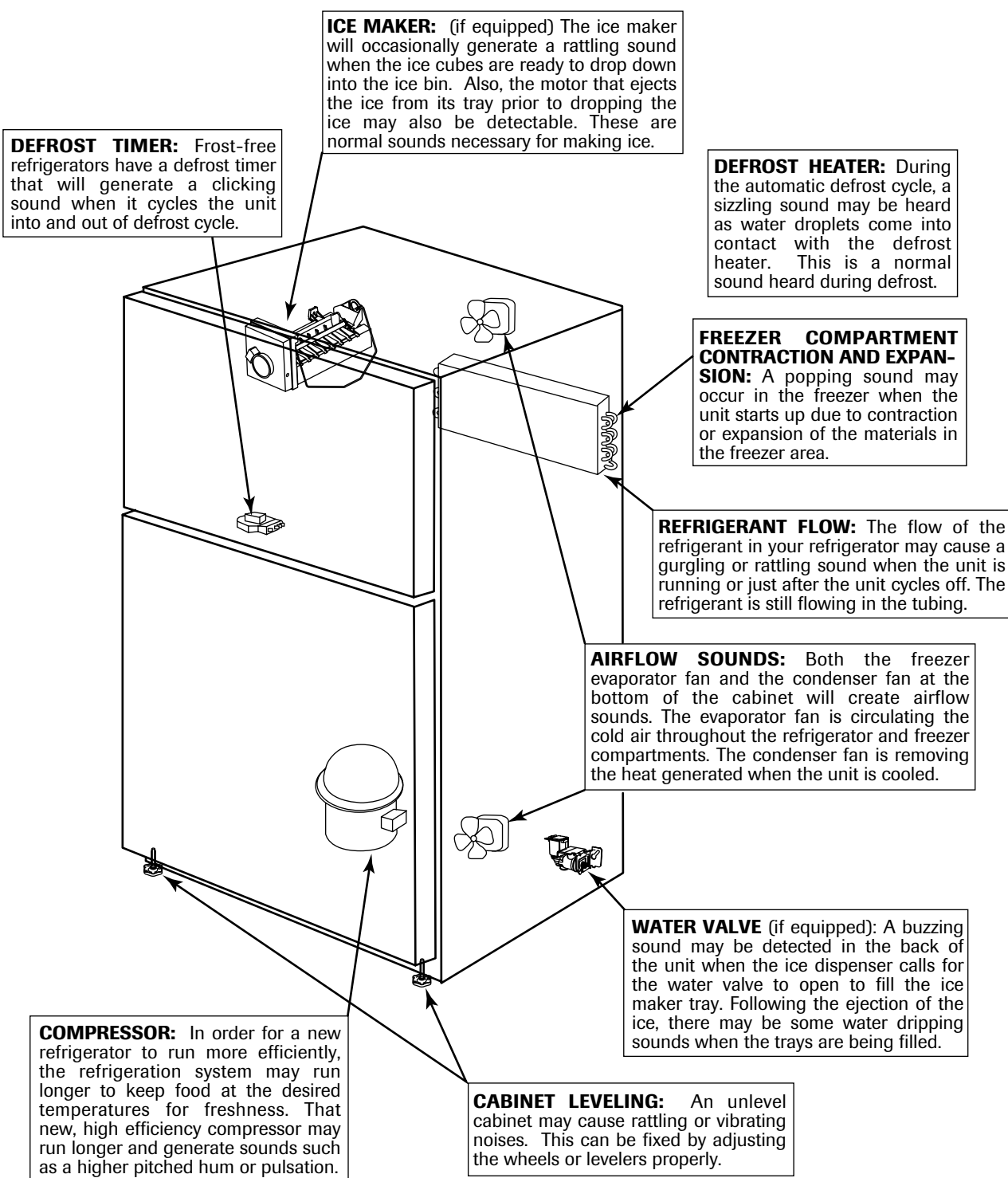
Refrigerator Cleaning Chart

PART		TIPS AND PRECAUTIONS
REFRIGERATOR EXTERIOR		
Front base grille	Mild detergent and warm water. Mild liquid sprays. Vacuum cleaner attachment.	Remove the front base grille (see page 3).
Condenser	Cleaning brush (Part No. 20001017) available from your dealer.	No need for cleaning unless environment is particularly greasy, dusty or there is significant pet traffic in the home (see page 14).
Door handles	Mild detergent and warm water. Mild liquid sprays.	
Painted metal surfaces: Cabinet, doors	Mild detergent and warm water. Mild liquid sprays.	Dry with a clean, soft cloth. Do not wipe the refrigerator with a soiled dishwashing cloth or wet towel. These may leave residue that can scratch and weaken the paint. Do not use scouring pads, powdered cleansers, bleach or cleaners containing bleach. These products can scratch and erode the paint finish. Do not wax plastic or vinyl parts.
Defrost Drain Pan	Mild detergent and warm water.	Routine cleaning usually not necessary unless environment is particularly humid or dusty. Pan should be drained and cleaned prior to moving the refrigerator (see page 14).
Stainless steel doors (select models)	Light cleaning: mild detergent and warm water. Moderate soil: Bon Ami*. Discolorations: Cameo Stainless Steel Cleaner*.	Use a soft cloth or sponge. Always wipe with the grain of the stainless steel. Do not use chlorine bleach or a cleaning product that contains chlorine bleach. After cleaning, rinse and dry. To restore luster and remove streaks follow with Stainless Steel Magic Spray* (Part No. 20000008).
Stainless look exterior finish	Wash with a clean, soft cloth or sponge and a mild detergent in warm water.	Do not use abrasive or harsh cleaners, or cleaners designed for Stainless Steel. Dry thoroughly with a soft cloth.
REFRIGERATOR AND FREEZER INTERIOR		
Door gasket	Baking soda and warm water. Mild detergent and warm water.	Use 1-2 tablespoons baking soda per quart of water. Be sure to wring out excess water from sponge or cloth when cleaning around controls, lights, or electrical parts.
Glass shelves	Mild detergent and warm water. Glass cleaner. Mild liquid sprays.	Allow the glass to warm up to room temperature before immersing in warm water. Never use hot water.
Interior and door liner	Mild detergent and warm water. Baking soda and warm water.	See above for baking soda solution. Do not use abrasive cleaners, concentrated detergents, bleaches, cleaning waxes, solvents or polish cleaners to clean the refrigerator interior.
Drawers, bins, shelves, etc.	Mild detergent and warm water.	Dry thoroughly. Do not wash in automatic dishwasher.

? Troubleshooting

Normal Operating Sounds

Improvements in refrigeration design may produce sounds in your new refrigerator that are different or were not present in an older model. These improvements were made to create a refrigerator that is better at preserving food, is more energy efficient, and is quieter overall. Because new units run quieter, sounds may be detected that were present in older units, but were masked by higher sound levels. Many of these sounds are normal. Please note that the surfaces adjacent to a refrigerator, such as hard walls, floors and cabinetry may make these sounds seem even louder. The following are some of the normal sounds that may be noticed in a new refrigerator.



Troubleshooting

Review this chart of troubleshooting tips first...you may not need to call for service at all.

	PROBLEM	POSSIBLE CAUSES	WHAT TO DO
GENERAL OPERATION	Won't run	Power cord not plugged in.	Push plug into outlet.
		No power to outlet.	Replace fuse, reset circuit breaker.
		Fresh food control set to "OFF" position.	Set fresh food control (see page 7).
		Refrigerator is in automatic defrost.	Wait 25 minutes for defrost cycle to end.
		Room temperature less than 55° F (13° C).	Relocate unit to proper climate (see <i>Installation</i> on page 3).
	Runs too long, too frequently	Today's refrigerators start and stop more often to maintain even temperatures.	
		Normal at startup for new or recently installed units.	Wait 24 hours for refrigerator to completely cool down (see <i>Temperature Controls</i> on page 7).
		Prolonged or frequent door openings.	This is normal. Minimize door openings.
		Door not sealing.	Check to see if something is preventing door from closing.
		Front base grille blocked.	Unblock to allow warm air to exit unit.
	Light not working	Bulb burned out.	Unplug refrigerator and change bulb (see page 14).
		No power to unit.	Check to see if power cord is completely plugged in properly.
	Visible glow in freezer vents	Appearance of a red glow or reflection is normal during the defrost cycle.	
	Warm air from cabinet bottom	This is normal air flow for condenser circulation.	
TEMPERATURE	Cabinet vibrates	Cabinet not level. Weak floor.	Level cabinet (see page 3).
	Odor in cabinet	Odor producing foods not covered.	Cover or wrap odorous foods tightly. Clean cabinet.
	Noise, sounds and vibrations	Normal noise.	See <i>Normal Operating Sounds</i> (page 16).
		Cabinet not level.	Level cabinet (see page 3).
	Freezer, refrigerator too warm	Control set too warm. Prolonged door openings.	Adjust temperature control (see page 7). Minimize door openings.
		Room temperature less than 55° F (13° C).	Unit will not run often enough to maintain proper temperatures.
		Products with high sugar content may not harden completely when frozen.	
	Freezer, refrigerator too cold	Control set too cold.	Adjust temperature control (see page 7).



Troubleshooting

	PROBLEM	POSSIBLE CAUSES	WHAT TO DO
ICE	Automatic icemaker not working	Sensor arm in up position.	Adjust sensor arm down to “ON” position.
		Cabinet not level.	Level unit (see page 3).
		Water supply not connected or restricted.	Connect water supply, or clear obstructions.
		Freezer too warm.	Adjust freezer temperature control (see page 7).
	Ice cubes have odor/taste	Old cubes.	Discard; ice cubes may absorb odors which affect taste.
		Bad water quality.	Contact local water treatment company.
		Food transmitted odor/taste to ice.	Wrap foods tightly.
	Ice cubes sticking in tray	Residue from minerals in the water.	Wipe trays with vinegar-soaked cloth until clean.
	Ice cubes evaporating	Limited use of ice.	Dump old ice cubes.
	Moisture on cabinet surface between doors	Not unusual during periods of high humidity.	
MOISTURE	Moisture on inside cabinet walls or in crisper	Hot humid weather.	Normal.
		Frequent or prolonged door openings.	Minimize door openings.
		Door not closed properly.	Check to see if something is preventing door from closing.
		Food not wrapped properly.	Wrap or cover all foods tightly.
	Foods dry out	Crisper not tightly closed.	Close crisper all the way.
		Temperature controls set too cold.	Adjust temperature controls (see page 7).
		Packages not wrapped or sealed properly.	Wrap or cover all foods tightly.
	Excessive moisture in crisper	Hot, humid weather.	Minimize door openings.
		Humidity slide on crisper needs adjustment.	Slide control to “Fruit” setting to allow more moisture to leave the drawer.
		Too much moisture on fresh produce before storing.	Do not wash items prior to storage. Wait to wash fresh items until right before use.
		Foods not stored properly.	Store leafy vegetables in a loosely closed plastic bag. Store items with an outer skin (i.e. apples, oranges, pears, grapes, cucumbers, etc.) in a vented bag or unwrapped in the drawer. Store mushrooms and berries in original vented cartons or boxes, not in plastic bags.



Warranty & Service

Warranty

Full One Year Warranty - Parts and Labor

One (1) year - From the original retail purchase date, any part which fails in normal home use will be repaired or replaced free of charge.

Ice Maker - When purchased with the refrigerator and installed by the dealer, the ice maker will be considered part of the refrigerator for warranty purposes.

Limited Warranty - Major Refrigeration Components

Second Through Fifth Year - After the first year from the date of original purchase, through the fifth year, the manufacturer will repair or replace, at its option, free of charge for parts and labor, any part of the sealed refrigeration system (consisting of the compressor, evaporator, condenser, drier and connecting tubing) and the cabinet liner (exclusive of the door liner) which fail in normal home use. All other costs, including mileage, transportation, trip charge and diagnostic charge, if required, shall be the responsibility of the owner.

Note

The full warranty and the limited warranties apply when the refrigerator is located in the United States or Canada. Refrigerators located elsewhere are covered by the limited warranties only including parts that fail during the first year.

Limitations of Liability

The warrantor shall not be liable for any incidental or consequential damages, including food loss. Some states do not allow the exclusion or limitation of consequential damages, so the above limitation or exclusion may not apply to you.

*The specific warranties expressed above are the **ONLY** warranties provided by the manufacturer. These warranties give you specific legal rights, and you may also have other rights which vary from state to state.*

What is Not Covered By These Warranties:

1. Conditions and damages resulting from any of the following:
 - a. Improper installation, delivery, or maintenance.
 - b. Any repair, modification, alteration, or adjustment not authorized by the manufacturer or an authorized servicer.
 - c. Misuse, abuse, accidents, or unreasonable use.
 - d. Incorrect electric current, voltage, or supply.
 - e. Improper setting of any control.
2. Warranties are void if the original serial numbers have been removed, altered or cannot be readily determined.
3. Light bulbs.
4. Products purchased for commercial or industrial use.
5. The cost of service or service call to:
 - a. Correct installation errors.
 - b. Instruct the user on the proper use of the product.
 - c. Transport the appliance to the servicer.
6. Consequential or incidental damages sustained by any person as a result of any breach of these warranties. Some states do not allow the exclusion or limitation of consequential or incidental damages, so the above exclusion may not apply.

If You Need Service

- Call the dealer from whom your appliance was purchased or call Maytag ServicesSM at 1-800-688-1120 U.S.A. and Canada, to locate an authorized servicer.
- Be sure to retain proof of purchase to verify warranty status. Refer to *Warranty* for further information on owner's responsibilities for warranty service.
- If the dealer or service company cannot resolve the problem, write to Maytag ServicesSM, Attn: CAIR[®] Center, P.O. Box 2370, Cleveland, TN 37320-2370 or call **1-800-688-1120 U.S.A. and Canada.**
- User's guides, service manuals and parts information are available from Maytag ServicesSM, Maytag Customer Assistance.

Note

- When writing or calling about a service problem, please include the following information:
 - a. Your name, address and telephone number;
 - b. Model number and serial number;
 - c. Name and address of your dealer or servicer;
 - d. A clear description of the problem you are having;
 - e. Proof of purchase (sales receipt).