SERVICE HANDBOOK

MAJOR APPLIANCES

REFRIGERATOR and FREEZER

1975 & Later

GENERAL ELECTRIC

HOTPOINT

IMPORTANT SAFETY NOTICE

Major appliances are complex electromechanical devices. General Electric Company's Major Appliance Service Publications are intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. General Electric Company cannot be responsible for the interpretation of its service publications, nor can it assume any liability in connection with their use.

SAFE SERVICING PRACTICES

To preclude the possibility of resultant personal injury* and/or property damage, ** it is important that safe servicing practices be observed. The following are examples, but without limitation, of such safe practices.

1. Before servicing, always disconnect the product from its electrical power source by removing the product's electrical plug from the wall receptacle, or by removing the fuse (or tripping the circuit breaker to OFF) in the branch circuit serving the product.

   NOTE: If a specific diagnostic check requires electrical power be applied (e.g., a voltage or amperage measurement, etc.) reconnect electrical power only for the time required for such a check, and disconnect it immediately thereafter. During any such check, ensure no other conductive parts (panels, etc.) - or yourself - come in contact with any exposed current-carrying metal parts.

2. Never interfere with or bypass the proper operation of any feature, part or device engineered into the product.

3. If a replacement part is required, use the specified General Electric Company part, or an equivalent which will provide comparable performance.

4. Prior to reconnecting the electrical power source to the refrigerator or freezer, be sure that:

   a. all electrical connections within the product are correctly and securely connected,

   b. all electrical harness leads are properly dressed and secured away from sharp edges, high-temperature components (e.g. resistors, heaters, etc.) and moving parts,

   c. any uninsulated current-carrying metal parts are secure and adequately spaced from all non-current-carrying metal parts,

d. all electrical grounds - both internal and external to the product - are correctly and securely connected,

e. all water connections are properly tightened on refrigerators with automatic icemakers or dispensers,

f. all panels and covers are properly and securely reassembled.

5. Read the SAFETY PRACTICES section beginning on Page G-1 in this Book for additional SAFE SERVICING PRACTICES.

6. Don't attempt a product repair if you have any doubts as to your ability to complete it in a safe and satisfactory manner.

*PERSONAL INJURY, in the form of electrical shock, burns, cuts or abrasions, etc., can occur spontaneously to the individual while attempting to repair or service the product; or may occur at a later time to any individual in the household who may come in contact with the product - unless safe servicing practices are observed.

**PROPERTY DAMAGE, resulting from fire, flood, etc., can occur immediately or at a later time as a result of attempting to repair or service the product - unless safe servicing practices are observed.

PREFACE

This HANDBOOK contains information and service procedures to assist the service technician in correcting conditions that are not always obvious. Service procedures considered obvious are intentionally omitted.

Using the information in this HANDBOOK in conjunction with the Mini-Manuals, which are included with every 1975 through 1986 refrigerator and freezer, will provide comprehensive information on these models.

All electrical data, schematics and pictoral wiring diagrams are in the Mini-Manuals with the product.

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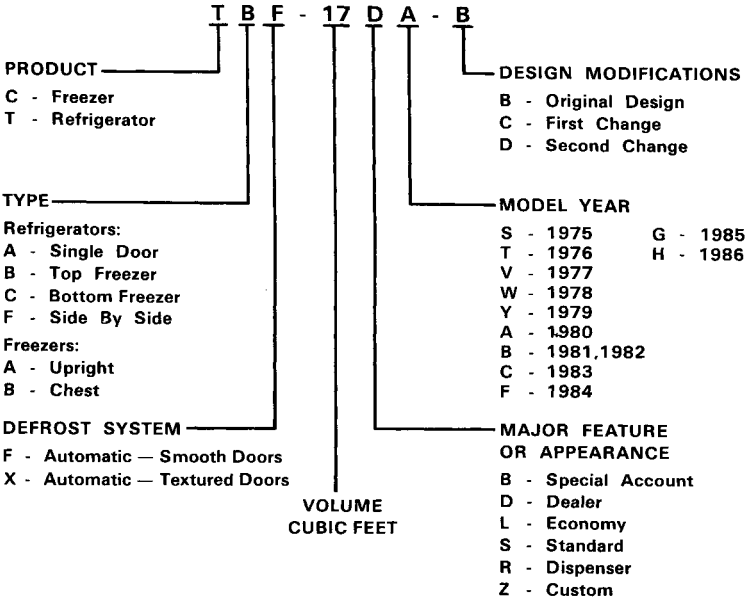
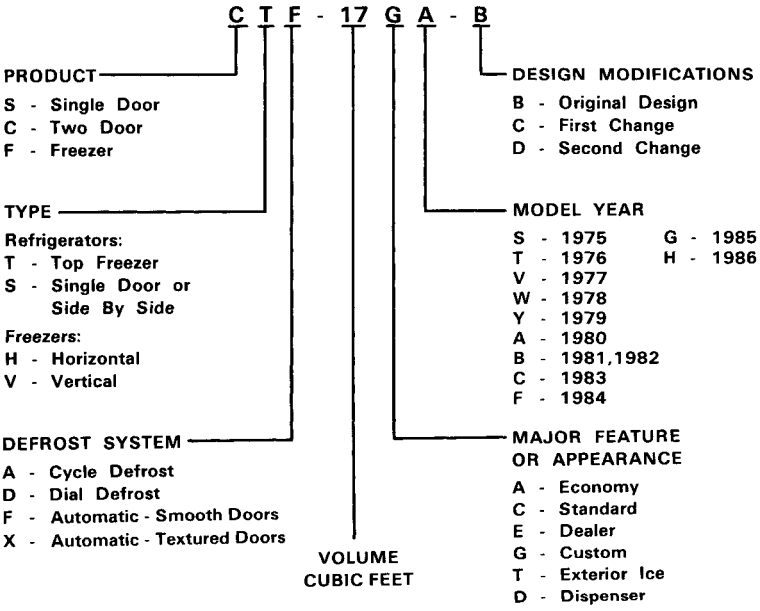


HOTPOINT
MODEL NUMBER IDENTIFICATION



(WR2636,2635)

SERIAL PREFIX - MONTH AND YEAR CODE

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
JAN	AV	AZ	AA	AD	AF	AG	AH	AL	AM	AR	AS	AT	AV
FEB	DV	DZ	DA	DD	DF	DG	DH	DL	DM	DR	DS	DT	DV
MAR	FV	FZ	FA	FD	FF	FG	FH	FL	FM	FR	FS	FT	FV
APR	GV	GZ	GA	GD	GF	GG	GH	GL	GM	GR	GS	GT	GV
MAY	HV	HZ	HA	HD	HF	HG	HH	HL	HM	HR	HS	HT	HV
JUN	LV	LZ	LA	LD	LF	LG	LH	LL	LM	LR	LS	LT	LV
JUL	MV	MZ	MA	MD	MF	MG	MH	ML	MM	MR	MS	MT	MV
AUG	RV	RZ	RA	RD	RF	RG	RH	RL	RM	RR	RS	RT	RV
SEP	SV	SZ	SA	SD	SF	SG	SH	SL	SM	SR	SS	ST	SV
OCT	TV	TZ	TA	TD	TF	TG	TH	TL	TM	TR	TS	TT	TV
NOV	VV	VZ	VA	VD	VF	VG	VH	VL	VM	VR	VS	VT	VV
DEC	ZV	ZZ	ZA	ZD	ZF	ZG	ZH	ZL	ZM	ZR	ZS	ZT	ZV

MINI-MANUAL

All refrigerators and freezers are produced with a Mini-Manual which provides the most frequently needed technical reference data, diagrams and replacement parts for the specific model.

On most models, the Mini-Manual is folded and inserted in a water repellant envelope, located behind the front grille. The envelope is secured to the cabinet by a plastic pin fastener and positioned in such a manner as not to impede the flow of air over the condenser.

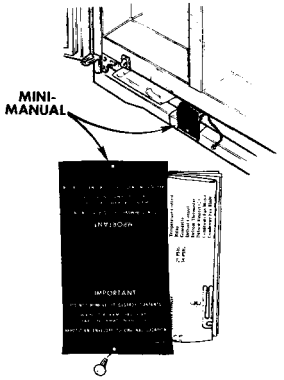


Figure 1 - Mini-Manual Location

On other models, the Mini Manual is pasted on the rear of the cabinet.

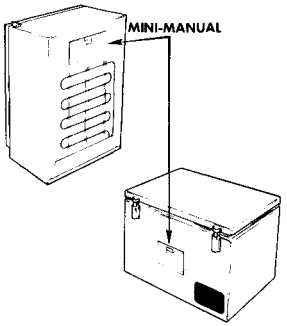


Figure 2 - Mini—manual Location

After servicing a refrigerator or freezer, the Mini-Manual should always be left with the product for future use.

INSTALLATION

Proper installation of a refrigerator or freezer is most important to its operation.

Location

The location is usually decided by the design of the kitchen. However, the customer should be advised if the location is detrimental to the efficient operation of the appliance.

If possible, a refrigerator or freezer should never be placed immediately next to a range, in direct sunlight or near a heat vent.

A refrigerator should not be installed in a location where the ambient temperature will be lower than 60°F, because the compressor will not run frequently enough to maintain proper temperatures.

A freezer should not be installed in a location where the ambient temperature will be higher than 110°F or lower than 32°F, in order to obtain the most efficient operation.

Clearance

Clearance must be provided at the top, sides, front and rear of a refrigerator or freezer for ease of installation, proper air circulation, and for door clearance. The amount of clearance required for a particular model is specified in the Use and Care Book and in the Mini-Manual.

Leveling

A refrigerator or freezer should be firmly positioned on a solid floor. The cabinet should be reasonably level side-to-side and tilted slightly to the rear so the doors will swing closed, when opened to a 45° position. This will also help keep the doors in proper alignment.

CONTROL SETTINGS

Most refrigerators are shipped from the factory with the temperature controls set at the mid positions. Most freezers are shipped with the control set at position "1". At these settings, satisfactory temperatures should be expected. Colder or warmer temperatures can be obtained by changing the control settings. Each setting represents approximately 2°F change. After any control setting change is made, 24-hours should be allowed for the temperature to stabilize before making any additional control setting change.

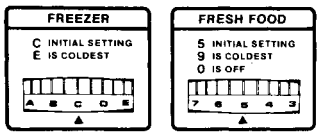


Figure 3 - Control Settings

Most automatic defrost refrigerators have two temperature controls located in the rear of the fresh food compartment. The "Fresh Food" control regulates the compressor operation. Adjusting the control to a higher number allows the compressor to operate longer for colder temperatures in both compartments. The "Freezer" control is a damper that regulates the amount of cold air diverted into the fresh food compartment. When this control is positioned at letter "A", a maximum amount of cold air is diverted from the freezer compartment into the fresh food compartment. This greater volume of cold air, sensed by the "Fresh Food" control, results in shorter compressor operation cycles. Conversely,

when this control is positioned at letter "E", a minimum amount of cold air enters the fresh food compartment resulting in longer compressor operation cycles.

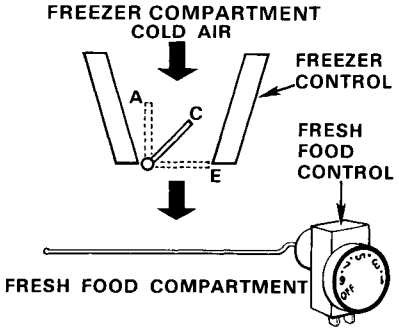


Figure 4 - Temperature Controls

FOOD STORAGE

Although the primary function of a refrigerator or freezer is to preserve perishable foods, refrigeration does not preserve foods indefinitely. Holding food at a low temperature merely reduces the rate at which deterioration takes place.

Fresh Food

Milk will freeze if chilled below 31°F. If milk is permitted to reach room temperature, spoilage may occur quickly even when held at temperatures near 32°F.

Fresh meat should be stored at temperatures as near 32° as is possible without freezing the meat. Bacteria growth in fresh meat, indicated by discoloration, is more rapid when stored at warmer temperatures.

Lettuce will freeze if chilled below 31°F, but will retain good quality for considerable longer periods at 32°F than at 38° to 45°F. Lettuce stored with apples, pears or cantaloupes may develop russet spotting.

Frozen Food

Only top quality foods should be frozen. Freezing cannot improve quality.

Proper packaging is essential to successful freezing of foods. Only wrapping materials that are designed for freezing should be used. Even then, the package must be tightly sealed to prevent "freezer burn" (dehydration).

Meat or poultry that has thawed completely should not be refrozen. However, in Home Garden Bulletin No. 69, the United States Department of Agriculture says: "If foods have thawed only partially and there are still ice crystals in the package, they may be safely refrozen. Refrozen foods, however, should be used as soon as possible. If foods have slowly thawed and have warmed gradually to a temperature of 40°F, they are not likely to be fit for refreezing. Under these conditions, meats, poultry, most vegetables and some prepared foods may become unsafe to eat".

Ice Cream

The composition of ice cream varies from one brand to another, and from one flavor to another depending upon the butter fat content, sugar content and other ingredients. Accordingly, ice cream is a difficult food to store in a freezer to everyone's satisfaction. The various brands, types, flavors and compositions will react differently at a given temperature. Fine

quality ice cream, with a high cream content, will normally require slightly lower temperatures than brands with a low cream content. However, at 0°F most ice cream is considered hard. The ideal serving temperature is 5° to 10°F, again depending on the brand, type, flavor or composition. At 12° to 14°F, the flavor of ice cream is appreciated by more people than at a lower temperature.

Storing ice cream in conventional refrigerators (single-door models) is especially difficult because these models are designed to operate at frozen food temperatures of 8° to 14°F. For better results in these models, the ice cream should be placed in a plastic ice cream container or metal tray and then placed in direct contact with the freezing surface. The temperature control should be turned to a higher number and the chiller tray baffle extended outward.

If ice cream is allowed to melt and is then refrozen, ice crystals will form, giving it a course, rough texture.

USAGE CONDITIONS

Performance data stated in the Mini-Manual, under no load conditions and at ambients of 70° and 90°F, should be used only as a guide. "No Load Performance" simply means no door openings and no food load. These laboratory data closely simulate the performance expected in the home after approximately 8-hours of no usage, such as would be found first-thing-in-the-morning. With usage, and/or operating in a room ambient other than 70° or 90°F, the measured performance of the product will not equate the data shown.

Light Usage

During periods of time when the kitchen is cool, especially in the winter months and when the refrigerator doors are opened less frequently, compressor operation cycles will be shorter than normal. Consequently, the air in both compartments becomes stratified (warm air at the top and cold air at the bottom). This may cause one or more of the following symptoms to develop:

- fresh food too cold
- vegetables freezing
- slow ice making rate
- soft ice cream
- frost on freezer shelves

Under these light usage conditions, the "Freezer" control should be set to a higher letter for a colder freezer compartment temperature. This will allow slightly longer compressor operation cycles and thus diminish the air stratification. If freezing in the fresh food compartment occurs, the "Fresh Food" control should be set to a lower number.

Heavy Usage

During the summer months, higher than normal kitchen ambients will exist in some homes. Higher ambients, in conjunction with a greater demand for ice, and an increase in the number and duration of door openings can result in fresh food temperatures peaking at 45° to 50°F

late in the afternoon and during the dinner hour.

Door openings should be kept to a minimum. Everything needed from the refrigerator before a meal should be taken out with one door opening. Likewise, after a meal, foods should be gathered and placed in the refrigerator with one door opening.

RUN TIME

For a freezer to maintain a desired temperature of 0°F or a combination refrigerator-freezer to maintain a 5°F freezer and 38° to 42°F fresh food temperature, the compressor will usually run more than 50% of the time. In most cases, depending on the usage, the run time will range from 75% to 90%, particularly in the summertime. In extremely hot, humid areas, run time may approach 100%.

Door openings contribute significantly to the run time of any refrigerator or freezer. When the door is opened, some of the heavy cold air slides out of the cabinet, pulling warm air in at the top. Keeping door openings to a minimum will help reduce run time.

Loading the refrigerator or freezer with a large amount of food, especially hot foods, will also add to the run time. Hot foods should be allowed to cool before being placed in the refrigerator or freezer.

Another significant factor that contributes to run time is an empty or lightly loaded freezer. Air alone does not retain cold. An empty refrigerator or freezer must run more to maintain temperatures low enough to satisfy the temperature control and cycle the compressor off. A freezer should be at least three-fourths full to maintain proper temperature and reduce compressor run time.

ENERGY CONSUMPTION

It is difficult to determine the actual operating cost of a refrigerator or freezer due to various operating conditions, such as: usage, location and climate. The energy consumption rating, stated in the Mini-Manual, is the amount of energy consumed by that particular product in kilowatt hours per month (30 days), under laboratory test conditions prescribed by the United States Department of Energy. This test is performed under the following conditions:

- 90°F ambient
- no door openings
- no icemaker operation
- Power/Energy Saver set to "Dry" and "Humid"
- 3/4 freezer load
- automatic defrost operation
- controls set to obtain specified temperatures

To estimate the energy consumption under various usage conditions, the energy consumption rating must be multiplied by a usage factor.

USAGE	MULTIPLIER
Minimum	0.8
Moderate	1.0
Heavy	1.2
Extremely Heavy	1.6

Figure 5 - Usage Multipliers

For example, if the energy consumption stated is 120 KWH/mo. and the refrigerator is operating under "Extremely Heavy" usage, multiply by 1.6 (120 x 1.6 = 192 KWH/mo.). The estimated cost for one month is then determined by multiplying this amount (192 KWH/mo.) by the local cost per kilowatt hour for electricity.

ENERGY SAVER

Most two-door refrigerator models have an energy saver switch that is set to the "normal" (off) position when the refrigerator is shipped from the factory. This turns off the cabinet heaters. With the heaters turned off, moisture may form on the exterior of the cabinet -- especially when the humidity is high. The humidity is most likely to be high in the summer, during the early morning hours, in homes that are not air conditioned. If moisture does form on the exterior of the cabinet, the energy saver switch should be turned on. Over an extended period of time, moisture that forms on the cabinet may cause deterioration of the paint finish.

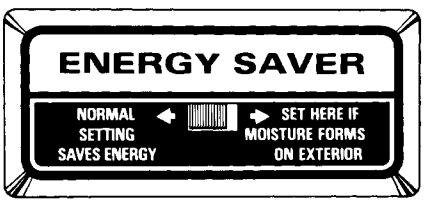


Figure 6 - Energy Saver Switch

SWEATING

All atmospheric air contains moisture. Sweating (condensation of moisture from the air) will occur on any object slightly cooler than room temperature under certain temperature and humidity conditions. We noitce this every day, especially during the hot summer months when moisture forms on cold beverage glasses. Moisture condenses from the air because the glass is at or below the dew point temperature of the surrounding air. Dew point temperature is that temperature at which moisture will begin to condense from the air. For example, if the room temperature is 85°F at 80% relative humidity, any object as little as 6.5° cooler than room temperature will sweat. If, however, at 85°F the relative humidity is 60% the object must be 15.5° cooler than room temperature to sweat.

Refrigerators and freezers are designed so that under normal climatic conditions they will not sweat. However, since no insulation material is perfect, it can be expected that the surface temperature of a refrigerator or freezer will always be somewhat cooler than the surrounding air. If sweating is experienced and is considered to be abnormal, several checks can be made to determine if any corrections or adjustments are necessary.

1. Check the position of the Power/-Energy Saver Switch. If turned off, advise the consumer that the switch must be set to the on position when moisture is present.
2. Check for an abnormally cold freezer compartment temperature.
3. Check for insulation voids in the area where moisture is present.

4. Check for wet insulation due to spillage or improper defrosting.
5. Check for the suction line tubing touching the cabinet.
6. Check the cabinet heaters for operation and be sure they are in complete contact with the cabinet.

The location of the refrigerator or freezer also has a direct bearing on external sweating. A refrigerator located next to a range or in the vicinity of a clothes dryer may sweat at certain times due to increased humidity from these appliances. Refrigerators or freezers located in a basement, garage, outside or other damp location, may also sweat at times.

Under high humidity conditions, sweating can be expected if the cabinet surface temperature is more than 5°cooler than the room ambient.

CLEANING

Cabinet Exterior

The steel cabinet exterior is coated with a high quality baked-on finish. However, without proper care, degradation of this finish can occur and permit rust spots to form.

To keep the cabinet exterior new-looking and provide protection for the exterior finish, a coat of appliance polish wax should be applied soon after installation and then at least twice a year. Proper care of the paint finish will help maintain the new look and provide protection against rusting. WR97X216 Appliance Polish Wax cleans, polishes and waxes in one application and gives the exterior a hard lustrous finish for long-lasting protection against rusting.

Figure 7 - Appliance Polish Wax

Between waxings, soils on the exterior should be wiped off with a clean cloth lightly dampened with appliance polish wax or mild household detergent. A clean soft cloth should be used to dry and polish the cleaned surface. A soiled dishwashing cloth should never be used to wipe the cabinet exterior or door gaskets.

Use of scouring pads, powdered cleaners, bleach, or cleaners containing bleach will damage the finish.

Cabinet Interior

The cabinet interior—fresh food and freezer compartments—should be cleaned at least once a year, using a solution of baking soda and warm

water (one tablespoon of baking soda per quart of water). Cleansing powers or other abrasive cleaners must never be used for this purpose. After cleaning, the interior should be rinsed with a clean cloth or sponge and wiped dry. Excess moisture should be wrung out of the cloth or sponge when cleaning in the vicinity of switches, lights or controls.

Caution: To avoid a potential electrical shock hazard, the power cord should be disconnected before cleaning.

To help eliminate odor and reduce clogging of the defrost water drain tube, a baking soda (one teaspooon) and warm water (two cups) solution should be poured into the drain opening at least once a year.

Machine Compartment

For most efficient operation, the condenser should be cleaned periodically. For best results, use a long handle brush (WX14X51) to loosen the dust and lint which can then be vacuumed up.

Caution: To prevent accidental contact with the condenser fan or other electrical components in the machine compartment, the power cord should be disconnected while cleaning.

The defrost water drain pan should be washed at least once a year with warm sudsy water containing a mild household detergent.

FOOD ODORS

Food odors of one kind or another are responsible for most odor complaints. As soon as food is stored in a refrigerator, the cabinet interior absorbs a "natural food odor". Excessive or unusual odors can result from various conditions such as uncovered food containers, highly seasoned food and citrus fruits all blended together by circulating air inside the cabinet. In some instances, odors originate from decayed food overlooked or spilled in an unnoticed area of the cabinet.

When an excessive or unusual odor of unrecognizable origin develops, the consumer should be advised to clean both the fresh food and freezer compartments thoroughly. All shevles, pans and loose items should be removed from the cabinet. These parts, along with the interior surfaces of the cabinet, including the inner doors and gaskets, should be washed with warm sudsy water containing a mild household detergent. Cleansing powders or other abrasive cleaners must not be used. All parts should then be rinsed with warm water containing baking soda and wiped dry with clean cloths. Care should be taken to prevent water from entering the cabinet or door insulation, or door switches. Likewise, the defrost water pan should be washed, rinsed and dried.

The consumer can prevent most food odors by following good user habits:

1. Keep all foods covered or tightly wrapped.

2. Each week, take inventory of the contents in the fresh food compartment. Dispose of any food that is beginning to spoil.
3. Wipe up spillages immediately with a clean, damp cloth.
4. At least once a year, clean both fresh food and freezer compartments and the defrost water pan. Use warm water and baking soda.
5. Keep an open box of baking soda inside the fresh food compartment. Each month, replace the baking soda with a new box.

SOUND LEVEL

Modern-day refrigerators have many features that refrigerators of just a decade ago did not have. One result of these features is additional complex components which contribute to a higher sound level than older refrigerators. Some of these components operate at the same time and some operate independently. Different sounds may be heard at various times that are unfamiliar to the consumer, yet they are perfectly normal sounds. The more a refrigerator runs, the more the sound is noticed.

Compressor compartment sound levels can often be reduced by dampening or isolating with felt pads and/or with minor adjustments. With the compressor running, inspect for vibrating parts or components, rattling tubes, or any source of sound transmission. Use your hand to help detect vibration and to determine where isolation and dampening is required.

When the sound level produced by a refrigerator or freezer is determined to be normal, the consumer should be so advised. Replacing a compressor (or any other component) under such circumstances will only mislead the consumer to believe there really is a noise problem.

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DOOR CONSTRUCTION

Refrigerator and upright freezer doors consist primarily of an outer door panel, inner door panel, insulation and a gasket. The inner door panel is held to the outer door panel with screws located under the gasket flange. Metal retainer strips, when used, hold the door gasket and add stiffness to the edges of the inner door panel.

Most models use fiberglass for door insulation. Some models, however, use poured foam insulation.

If the trim, handle, nameplate, etc. is removed when servicing an outer door panel, in reassembly use permagum (WR97X81) as a sealer around any screws, studs or fasteners which pass through holes in the outer door panel. This will prevent air leakage into the insulation.

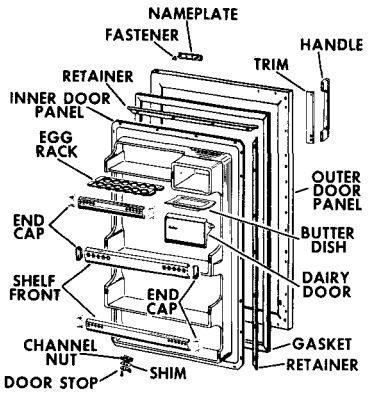


Figure 1 - Typical Door Assembly

Diagonal cross braces are used in some upright freezers to add rigidity to the door. The braces are hooked into the upper corners of the outer door panel with adjustment screws located on the bottom edge.

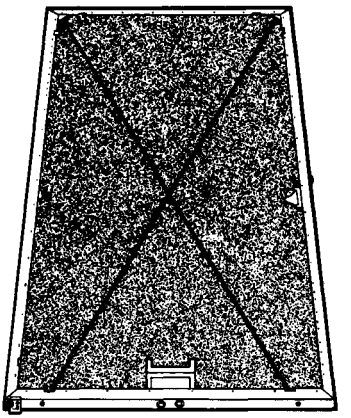


Figure 2 - Diagonal Door Braces

DOOR ADJUSTMENT

A door out of plane with the cabinet can be adjusted as follows:

1. Make sure the cabinet is level side to side and tilted slightly to the rear.
2. Loosen the screws holding the inner door panel to allow the inner door panel to "float".

   NOTE: Failure to loosen all the screws may result in a cracked inner door panel, necessitating a replacement.
3. Pull in the corner or section of the door in the area where the door gasket does not contact the cabinet. While holding the door rigid, tighten the screws at the corners of the inner door panel. Repeat as necessary until the door is in proper plane with the cabinet.

NOTE: On freezer models with diagonal cross braces, after loosening the screws holding the inner door panel, loosen one adjustment screw and tighten the other until the door is in proper plane with the cabinet.

4. Retighten all panel screws.

REVERSIBLE DOORS

Some refrigerator models have doors that are reversible; that is, the door swing can be changed from right to left or vice versa. The door handle, trim, hinges, etc. are designed so they can be mounted on either side of the door and cabinet.

A detailed instruction sheet is included with each of these models showing how this reversing procedure is accomplished. After reversing a door swing, the doors should always be checked to be sure they are in a correct plane with the cabinet, thereby effecting a good door seal.

DOOR GASKETS

Two types of door gaskets, compression and magnetic, are used on refrigerators and freezers. The compression type gasket is used on models that have a magnetic door latch. The magnetic gasket is used on all other models.

Some magnetic gaskets are designed to have less pull on the hinge side. This side is identified in some manner, either ribs or a small hole on the underside of the gasket flap.

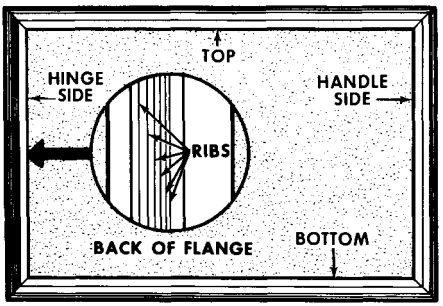


Figure 3 - Magnetic Gasket Identification

Gaskets are held in position by either retainer strips or screws that pass through the inner door panel and gasket and thread into the outer door panel.

To remove a gasket on models having retainer strips, it is only necessary to loosen the screws that pass through the retainer and inner door panel. The gasket can then be removed from under the retainer.

On models where the screws pass through the inner door panel and gasket, it is necessary to remove the screws. Before adjusting a door for a poor gasket seal, check the following.

1. The cabinet should be level side to side.
2. The cabinet should be tilted slightly to the rear so the doors swing closed from a 45° angle.
3. Food containers should not prevent the door from fully closing.
4. There should be no interference between the inner door panel and the breaker strips.

LID GASKETS — CHEST FREEZERS

Gaskets on chest freezers are either a four-side compression type or a three-side compression type with a magnetic strip along the front. Canoe clips and/or dart clips hold the gasket and inner panel to the outer lid.

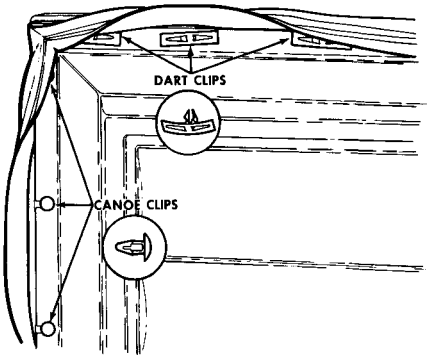


Figure 4 - Gasket Clips

To remove the gasket, pry out the clips, being careful not to damage the outer lid or inner panel.

LID ADJUSTMENT

Adjustment of the lid and gasket is made at the hinges. Elongated holes are provided for horizontal and/or vertical adjustment.

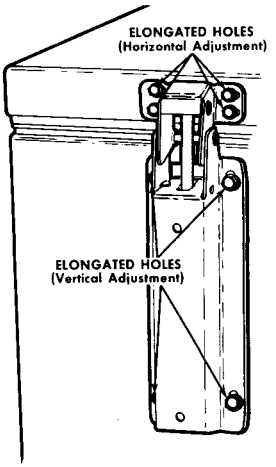


Figure 5 - Lid Adjustment

DOOR SEAL ADJUSTMENTS

Air can enter a cabinet in areas other than around the door gasket. All refrigerators and freezers are manufactured to prevent this by using sealant or plug buttons around all seams, welds, holes, etc. where there is a possibility air could enter the cabinet. These areas should not be overlooked as possible air leaks. These areas include the outer door panel, door trim fasteners, door flanges, gasket retainer screw holes, etc.

To properly check and assure a good door seal, the following procedures must be followed.

1. Check the plane of the door. For example, if one corner of the door is not sealing, loosen the screws from this point halfway to the opposite corners. "Rack" the door, holding it in position and tighten the screws.

2. Place a 115V, 150W outdoor type flood lamp (GE 150 PAR/FL) inside the freezer.
3. Direct the light at one area of the gasket, close the door and check for light between the cabinet flange and gasket. (The light in the room should be subdued as much as possible). Repeat this procedure until the entire door seal area has been checked.

MAGNETIC DOOR LATCH

Some top mount model refrigerators have a magnetic latch assembly as shown in Figure 6.

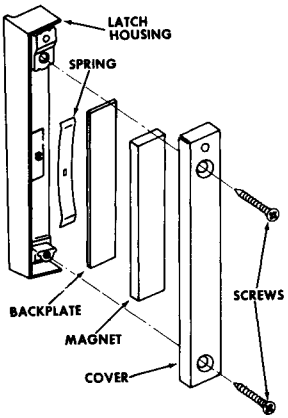


Figure 6 - Magnetic Latch

To adjust the latch, turn the two screws in the cover. Adjustment should be made to have the cover just touch the strike plate when the gasket is compressed.

The strike plate is attached to the front of the cabinet with pop-rivets. To remove the strike, remove the side breaker strip and check the location of the outer case heater and other wiring. Drill through the rivets with a 1/8" drill bit. Replace the strike plate using WR1X1354 1/8" aluminum rivets.

On magnetic latch models, a shipping pin maintains door alignment during shipping and reduces door adjustment upon initial installation.

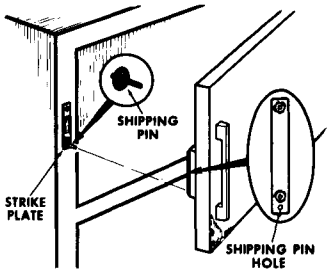


Figure 7 - Shipping Pin

The shipping pins should be left in place until the refrigerator has been installed in its permanent location. The shipping pins should then be discarded.

DOOR NAMEPLATE

The door nameplate, on all models is pressed into fasteners that are inserted in holes in the outer door panel.

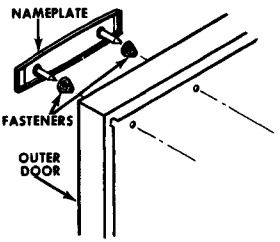


Figure 8 - Nameplate Mounting

DOOR TRIM

On models that have a door trim, plastic fasteners and/or double back tape is used to secure the trim to the door. Some models have metal door trim, others have plastic. On models that have metal trim, to remove the trim, pry out near the fasteners with a putty knife, wrapped with tape to avoid damage to the paint. The fasteners will usually break and new fasteners (WR1X1302) will be required to install the replacement trim. Each fastener has a sealing gasket to prevent moisture-laden air from entering the door. A short piece of double back tape (WR2X4496) may also be used at each end of the trim.

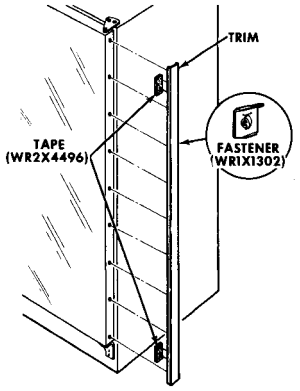


Figure 9 - Door Edge Trim

To mount the trim, slide the fasteners into the trim, position each one opposite a hole in the door and engage in place by bumping the trim with the palm of your hand.

On models that have plastic trim, pry the trim at one end and peal it away from the door. Use MEK Solvent (WD49X23) to remove tape residue.

DOOR SHELVES

Door shelves, in most models are molded into the inner door panel. Metal shelf fronts are attached to the inner door panel by various methods.

Figure 10 shows the shelf front mounting through slots in the inner door panel. After the shelf front is inserted in the slots, the ends are twisted to form locking tabs which hold the shelf front securely to the inner door panel. To replace this type shelf front, remove the inner door panel, straighten the ends and slide the shelf front out. Insert the replacement shelf front into the slots and bend each end outward to lock in place.

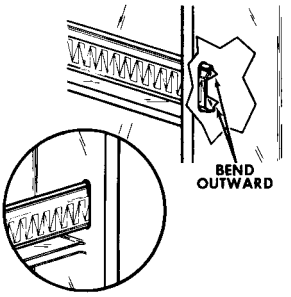


Figure 10 - Shelf Front - Flared Ends

Figure 11 shows a shelf front support with two keyhole type studs and a locating pin to maintain the position of the support. To remove this type support, pry out at the locating pin and lift upward to free the support of the inner door panel. The metal front will then slide off of the support.

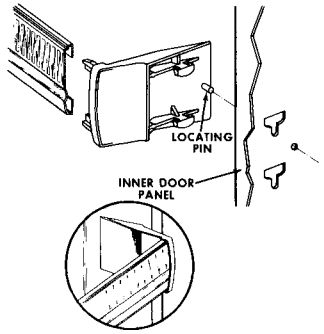


Figure 11 - Shelf Supports with Studs

Figure 12 shows a shelf front support that fits into slots in the inner door panel. To remove this type support, pull out at the bottom, to clear the liner opening with the small tab, and push down. Pull out at the top to clear the opening with the large locking bar and lift upward to remove the support. Slide the shelf front off of the support.

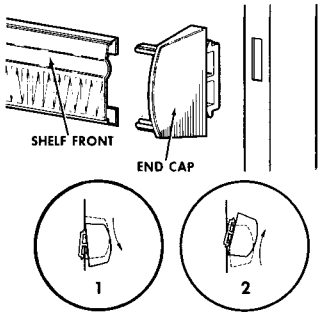


Figure 12 - Slot Mounted Support

Figure 13 shows a shelf front support that is secured by a plastic rivet which is part of the support. To remove this type support, drive the pin through the support and into the inner door. The support can then be removed by pulling outward. Slide the shelf front off of the support. Since the pin will be lost behind the door panel, new rivets will be needed for shelf front replacement.

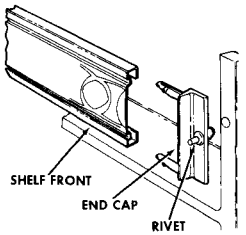


Figure 13 - Support With Rivets

Some upright freezers have a shelf front that uses two rivets at each end to secure the front to the inner panel. See Figure 14. Those fronts are removed by pushing the pin through the rivet and into the inner door. New rivets will be needed for replacing this type shelf front.

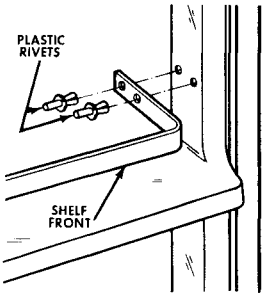


Figure 14 - Rivet Mounted Shelf Front

Figure 15 shows door bins which are used on some models. These bins hook into slots in the inner door panel. Metal tracks, fastened to the back of the inner door panel with screws and grommets provide rigid support for the bin hooks. To remove a bin, lift up at both sides to free the hook type support from the metal tracks.

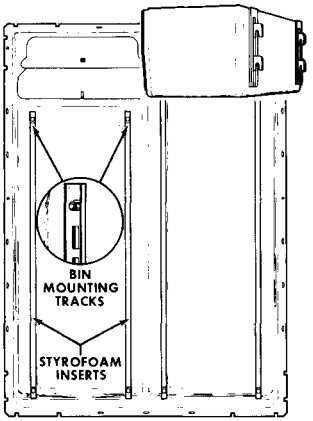


Figure 15 - Door Bins

Some door shelves (side-by-side models) are removable as an assembly along with the supports. The shelf bottom is riveted to the supports which hook into a shelf ladder or track that is secured to the inner door panel by a plastic cap and fastener.

To remove the shelf assembly, raise up and pull out at the top to free the support top hook. Continue pulling outward to free the longer bottom hook.

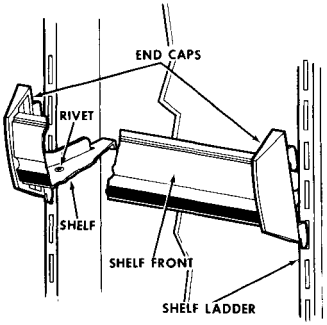


Figure 16 - Door Shelf Assembly

To remove the shelf track on some models, it is necessary to remove the inner door panel for access to the metal fasteners that secure the shelf track studs. On others, the shelf track can be removed by removing the screws or plastic push-in fasteners that secure the track to the inner door panel, without removing the panel.

DOOR HANDLES

Door handles on some refrigerators and freezers are secured by screws from inside the door. To remove these handles, the inner door panel must first be removed.

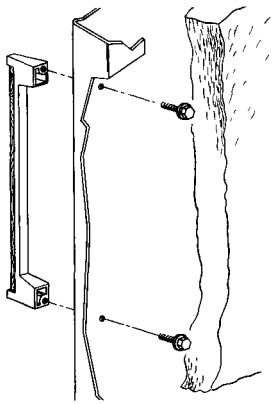


Figure 17 - Door Handle Mounting

Front removable handles are used on some side-by-side models. These can be distinguished in two ways: (1) separate end caps and (2) a straight insert. Handles mounted from the rear have a one-piece handle body and a tapered insert.

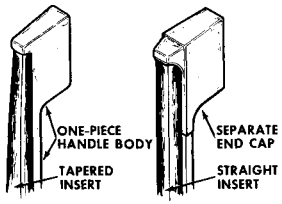


Figure 18 - Handle Construction

To remove the front mounted handle; using two small blade screwdrivers (one at each side), pry out the insert, starting at the bottom, until the end of the insert is out beyond the end cap. Then, position a screwdriver under the exposed end of the insert and continue prying the insert until it can be pulled free from the handle body. Remove the two screws that are visible after removing the insert.

NOTE: Use extreme care when removing the insert to avoid damage to the end cap.

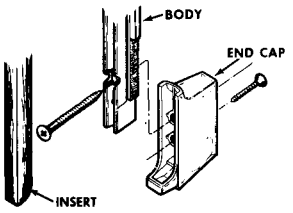


Figure 19 - Handle Assembly

CABINET CONSTRUCTION

Refrigerator and upright freezer cabinets consist primarily of the outer case, inner liner, and insulation. The outer case is painted steel. Outer cases are not available for replacement.

The liner, on most models, is steel with welded or crimped seams and finished with porcelain, baked enamel, powder paint or epoxy paint. Some refrigerators have a separate liner for each compartment but most models use a single liner with a dividing partition between the freezer and fresh food compartments. On some models, plastic liners are used.

Many models have fiberglas insulation and the liner is fastened to the outer case with screws through nylon spacers and metal supports at the corners. Some models use foam insulation poured between the outer case and liner that bonds the two together. On these models, the liner is not removable.

Complete disassembly of the cabinet is required if the liner or insulation is replaced. Remove doors, baskets, shelves, bins and all other lift-out parts. When replacing the liner, transfer any brackets, braces, nut-strips, or supports not provided with the replacement part.

When servicing the outer case of any refrigerator or freezer, be sure in reassembly to use permagum (WR97X81) as a sealer around any screws or fasteners which pass through holes in the outer case. This will assure minimum possible leakage of air into the insulation.

A typical refrigerator cabinet is assembled as shown in Figure 20.

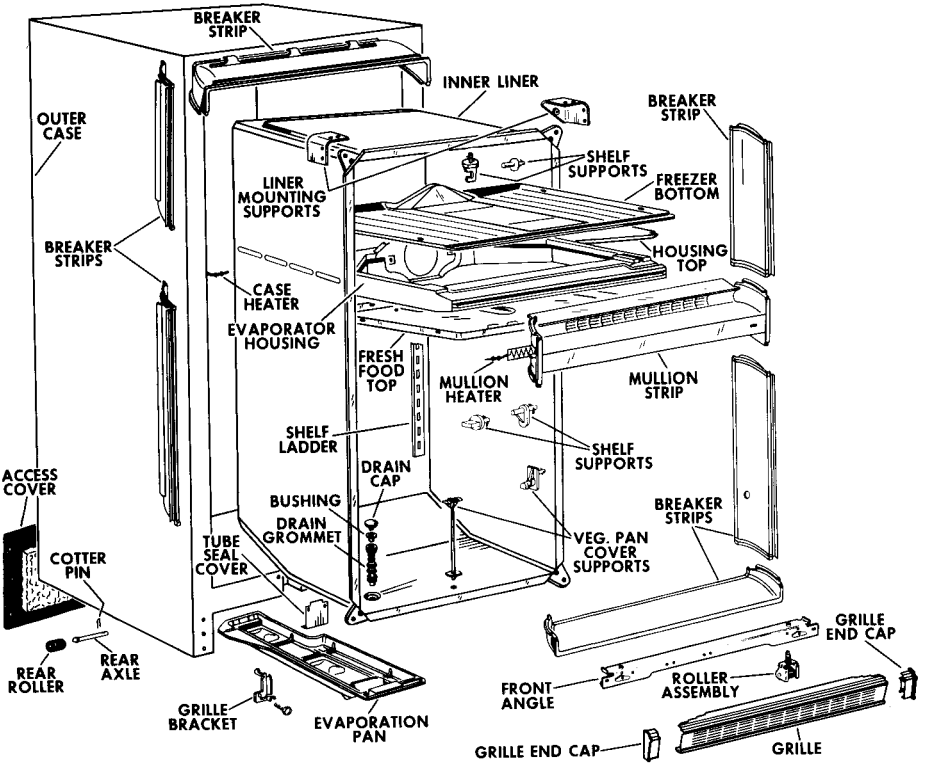


Figure 20 - Refrigerator Cabinet Assembly

MOBILITY

Some model refrigerators have mobility (rollers) to enable the customer to roll the refrigerator out from the wall for cleaning. Some models have the capability of adding mobility.

A WR49X218 mobility kit is available for purchase by the customer for installation on the following models:

TBF-16AR, SR,AT,ST,AV,SV,AW, SW,AY,SY,AA,SA
TBF-17SA, LB, SB, LC, SC, SF
TBF-18ER, SR, ET, EV, EW, EY, EA
TBX-18SG, SH
CTF-15DR, DT
CTF-16CR, CT, CV, CW, CY, CA
CTF-17AA, PA, AB, CB, PB, CC, CF
CTF-18AT, AV, AW, AY, AA
CTX-18CG,CH

Because the above models have forced draft condensers, **no other type mobility should be used.** Generally, the accessory rollers which are available locally, raise the cabinet

off of the floor to a position higher than normal. When a model with a forced draft condenser is raised, the divider baffle in the compressor compartment is also raised and the result is improper air flow over the condenser and compressor. Improper air flow will result in "poor refrigeration".

BREAKER STRIPS & FRAMES

Refrigerators and freezers that have metal liners use breaker strips and/or breaker frames to prevent direct heat transfer from the outer case to the liner.

Breaker strips are made of different types of plastic and differ in size and shape according to the cabinet. Removal, however, is basically the same; by starting with the side breakers, regardless of whether it is the overlapping (watershed) or fitted type.

A few breaker strips have unique methods of removal and/or installation which will be covered specifically, otherwise, installation is opposite of removal.

TA/SSD-10 MODELS

Side breaker strips on these models have a channel along the entire length of the breaker that fits over the edge of the liner. The front of the breaker is then pressed into a channel in the outer case flange. The design of the side breakers eliminates the need for retainer clips. See figure 21.

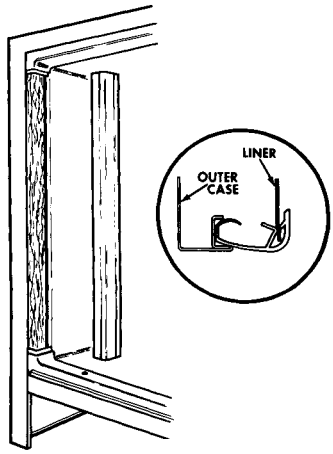


Figure 21 - Side Breaker

To remove a side breaker, pry out to disengage the breaker from the liner. Pull out on the breaker to remove it from the outer case. The bottom breaker has a lip that fits over the outer case flange and is secured by two plastic rivets that pass through the liner flange. To remove the bottom breaker, the pins must be pushed through the rivets into the insulation. (Retrieve the pins for reuse when reinstalling the breaker.) Pry the rivets out and remove the breaker by pulling up at one end to clear the outer case flange. See figure 22.

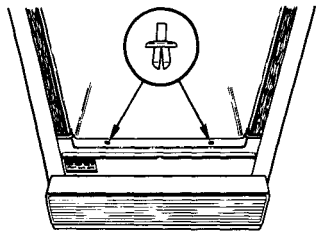


Figure 22 - Bottom Breaker

Remove the top breaker by pulling down at one side to disengage the front edge from the clips and to clear the outer case flange.

SSD-12 MODELS

Breaker strips on SSD-12 models are held by clips in the outer case channel and the liner flange. A ridge along the front edge of the breaker facilitates removal. Using a putty knife, start at the center and disengage the front of the breaker from the clips. See figure 23.

After disengaging the breaker from the outer case flange clips, reach in behind the breaker using the hands to disengage the breaker from the liner clips.

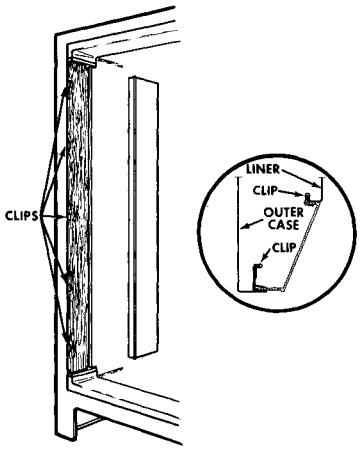


Figure 23 - SSD-12 Side Breaker

The top and bottom breakers can be removed by starting at one corner and disengaging the breaker in the same manner as the side breakers.

Breaker strips on 1977 and later models are the overlapping type. A channel along the rear of the breaker fits over the liner. The front of the breaker strip snaps under clips along the outer case flange. See figure 24.

To remove the top breaker, at one side, pull down from the case flange. Continue pulling to release the breaker from the case flange and the liner.

To remove a side breaker, at the bottom, pull outward to disengage the breaker from the clips and liner. The bottom breaker is removed by pulling up at one side to release the breaker from the case flange and liner.

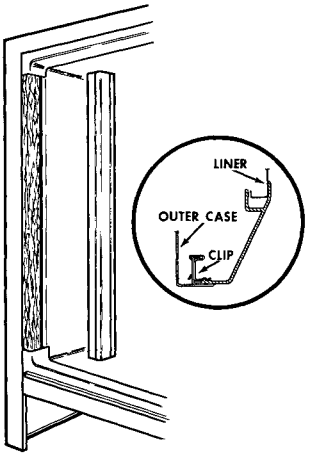


Figure 24 - SSD-12 Side Breaker

CTA-12 MODELS (1975-1978)

Breaker strips on CTA-12 models are held by clips in the outer case channel and the liner flange. Because of the interlocking design, the fresh food side breaker strips must be removed first. A ridge along the front edge of the breaker facilitates removal. Using a putty knife, start at the center and disengage the front of the breaker from the clips.

After disengaging the breaker from the case flange clips, reach in behind the breaker using the hands to disengage the breaker from the liner clips. The bottom breaker can be removed by pulling up at one corner to disengage it from the clips and clear the case flange.

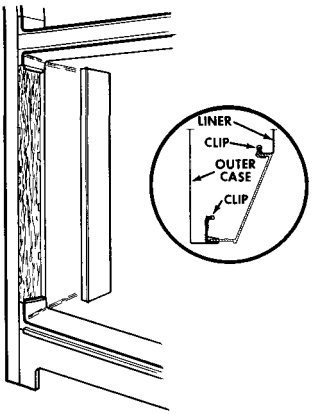


Figure 25 - CTA-12 Side Breaker

The fresh food top breaker and the freezer breaker frame is a one-piece assembly.

To remove the freezer breaker frame:

1. Remove both doors and the center hinge.
2. Remove both fresh food side breakers.
3. Remove the mullion plate and heater assembly.
4. Pull the breaker to one side until the opposite side disengages from the case flange.

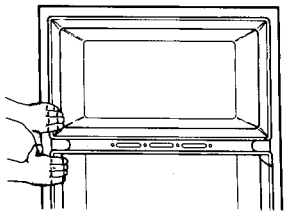


Figure 26 - Pull Breaker to One Side

5. Pull the breaker frame from the case flange at the other side and remove.

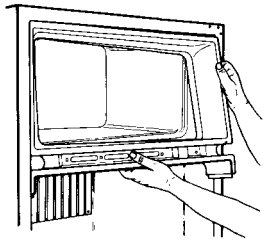


Figure 27 - Removing Breaker Frame

Breaker strips on 1977 and 1978 models are the overlapping type. A channel along the rear of the breaker fits over the liner. The front of the breaker strip snaps under clips along the outer case flange. See figure 28.

To remove the top breaker:

1. At one side, pull down to disengage the breaker from the case flange. Continue pulling to release the breaker from the case flange and the liner.

To remove a side breaker:

1. At the bottom, pull outward to disengage the breaker from the clips and liner. The bottom breaker is

removed by pulling up at one side to release the breaker from the case flange and liner.

The freezer breaker frame is removed in the same manner as 1975 models.

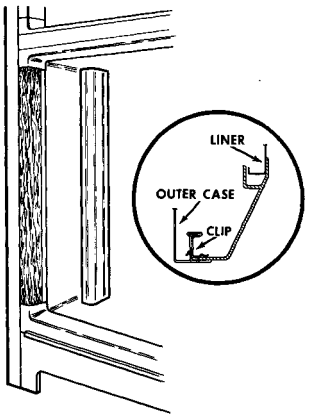


Figure 28 - CTA-12 Side Breaker

TB12, 14/CTA14 Models CTA12 Models (1979-1984)

The fresh food side breaker strips on these models are removed by starting at the bottom and prying out with a putty knife, working the breaker loose from the clips along the entire length of the breaker. See figure 29.

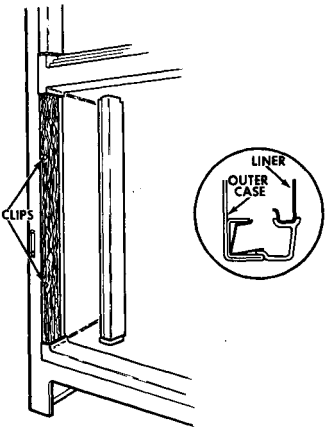


Figure 29 - Side Breaker

The fresh food bottom breaker is removed by pulling one side up to clear the case flange. Continue working the breaker loose along the front until it can be removed.

The fresh food top breaker is part of the one piece freezer breaker frame. Two small side breakers are also used in the freezer compartment with the freezer breaker frame.

To remove the freezer breaker frame:

1. Remove both doors and the center hinge.
2. Remove the two freezer side breakers and foam slabs, using a putty knife to disengage the breakers from the case flange.

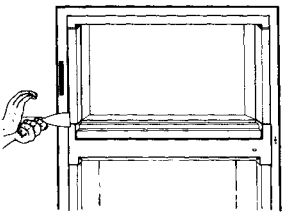


Figure 30 - Freezer Side Breakers

3. Remove the mounting screws in the freezer compartment and in the top of the fresh food compartment.

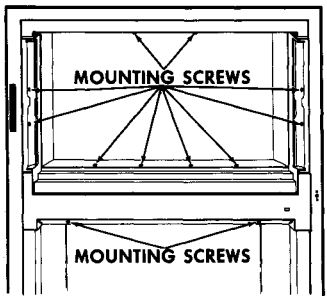


Figure 31 - Breaker Frame Mounting Screws

4. Remove the fresh food side breakers.
5. Grasp the breaker frame and pull to one side, enough for the other side to disengage from the case flange.
6. Pull the breaker from the case flange and remove.

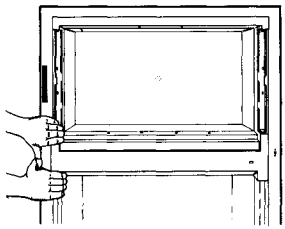


Figure 32 - Removing Breaker Frame

TBF/CTF-14, 15, 16 MODELS

Breaker strips on these models have a channel along the length of the breaker that fits over the liner, while clips are used to secure the breaker along the outer case flange at the front. See figure 33.

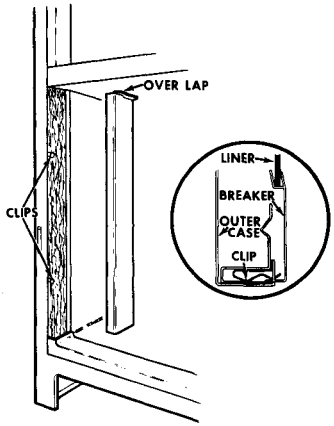


Figure 33 - Side Breaker

Because of the design of the fresh food liner top, a top breaker is not required in the fresh food compartment. The side breakers have an overlapping flange at the top for appearance purposes.

The side breakers overlap the bottom breakers in a watershed type design.

To remove the fresh food side breaker:

1. Grasp the breaker at the lower end.
2. Pull outward to disengage the breaker from the clips and liner and remove.

A one-piece breaker frame is used for the top and sides in the freezer compartment.

To remove the freezer breaker frame:

1. Grasp one side of the breaker frame at the bottom.
2. Pull outward to disengage the frame from the clips and liner.

3. Repeat at the opposite side.

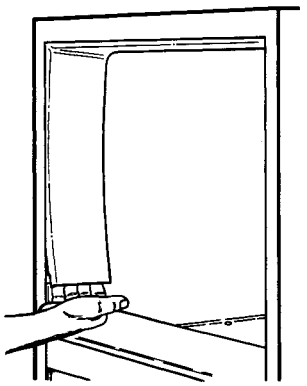


Figure 34 - Freezer Breaker Frame

4. Push both sides into the freezer compartment until the leading edge of the top breaker disengages from the clips.
5. Pull outward on the frame at the top to disengage it from the liner flange.

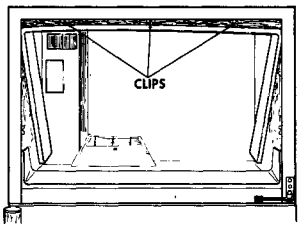


Figure 35 - Removing Breaker Frame

To remove the freezer bottom breaker: (after removing the breaker frame)

1. Remove the freezer floor.
2. Pull up at one side and across the front to disengage the breaker from the clips.
3. Pull out to disengage the breaker from the guide pins at the rear.

When reinstalling the freezer bottom breaker, be sure the slots in the breaker fit under the heads of the two guide pins in the evaporator housing.

To install the breaker frame (bottom breaker in place):

1. Position the strip of fiberglas insulation around the breaker frame.
2. Place the sides of the frame inside the freezer compartment at a 45° angle.
3. Hook the frame over the liner at the top and swing the sides to the front of the freezer engaging the front of the breaker under the clips across the top.
4. Hook the sides over the liner flange and press into position under the clips.

Stops are molded into the fresh food side breakers and the top of the breaker frame to limit installation behind the case flange.

CTF-15 MODELS (1975) TBF/CTF-16, 18 MODELS

Breakers on 15', 16', and 18' models consist of strips at the top, bottom and sides and a mullion breaker frame which includes the freezer bottom and fresh food top breakers.

The same breakers are used in both 16 and 18 cu. ft. models, except the fresh food side breakers are longer in the 18 cu. ft. models.

A channel along the entire length of the breaker fits over the liner. The front lip of the breaker is pressed into the case flange channel and held in position with clips. See figure 36.

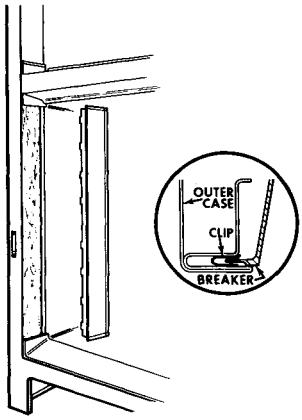


Figure 36 - Side Breaker Strip

Removal should begin at the lower end of the side breaker. Using the palm of the hand or a putty knife, pry the edge of the breaker from the outer case flange and pull forward to disengage the breaker from the liner. The top and bottom breakers are removed in a similar manner.

To remove the mullion breaker frame, both doors, the center hinge and the side breakers in both the fresh food and freezer compartments must be removed.

Press the mullion breaker frame to one side to disengage the opposite side from the outer case flange. Pull out on the loose side to remove the frame. Use care when removing the frame to prevent damage to the mullion heater.

TBF/CTF-21 MODELS

The flexible breaker strips on 21ft. models have a lip along the front edge that fits into a channel behind the case flange and tabs at the rear that snap over the liner edge. Retainer clips are used at the front edge. See figure 37.

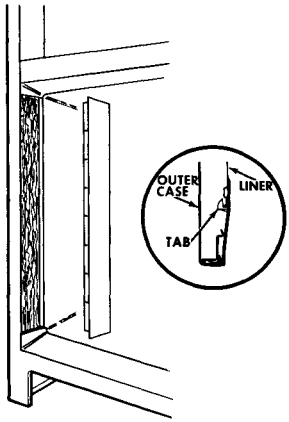


Figure 37 - Side Breaker Strip

Because of the overlapping design, removal should start with the top breakers in both the fresh food and freezer compartments.

1. Grasp one end of the top breaker and pull out and down to disengage the breaker from the case flange and clips.
2. Continue pulling the breaker away from the cabinet, disengaging the tabs from the liner.

The side and bottom breakers are removed in a similar manner.

All breakers, with the exception of the freezer side breakers, have an indexing tab near the center. This tab fits into a slot in the case flange for proper alignment of the breaker.

TFF/CSF SIDE -BY-SIDE MODELS

The side, top and bottom breakers on all side-by-side model refrigerators have breaker retainer strips to hold the breakers in place.

To replace these breakers:

1. Cut through the sealer at the mitered corners with a sharp thin knife to cut the tape that holds the breaker in place during assembly.

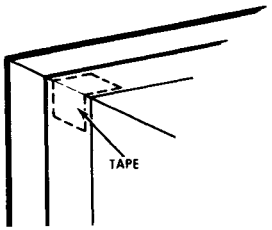


Figure 38 - Cut Tape in Corners

2. Insert a thin putty knife between the flange of the outer case and the breaker strip, approximately four (4) inches from the top corner.

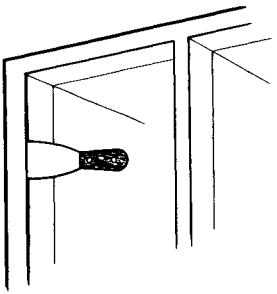


Figure 39 - Use Putty Knife to Remove

3. Gently pry the breaker strip from the channel down the entire length of the breaker, using fingertips after the breaker is initially released. Be careful to avoid damage to the paint on the outer case.
4. After releasing the breaker strip from the outer case, pull the breaker from the liner. Tape is used to secure the breaker to the liner during assembly, but should pull loose easily. If not, cut the tape with a putty knife.

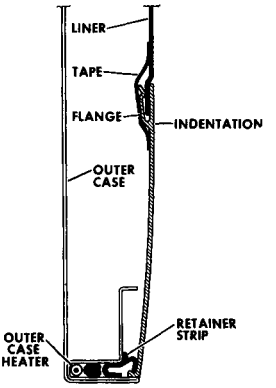


Figure 40 - Side-By-Side Breaker

5. Before reinstalling the breaker, clean all loose foam from under the front edge of the liner and from the channel along the inside of the outer case flange.
6. Carefully reposition the case heater and fiberglas insulation. Position the retainer strips in the channel. The leading edge of the retainer should be facing out to engage the breaker.

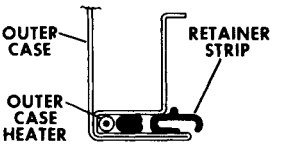


Figure 41 - Breaker Strip Retainer Position

7. Push the channel of the breaker into place over the edge of the liner.
8. Engage the front edge of the breaker into the retainer and push the breaker into the channel until the surface of the breaker is flush with the outer case.
9. Reseal the mitered corners with RTV sealer.

The mullion breakers do not use retainers. The mullion plate has barbs (dents) stamped into the rear flange at one-inch intervals to retain the front flange of the breaker. Removal is the same as with side breakers.

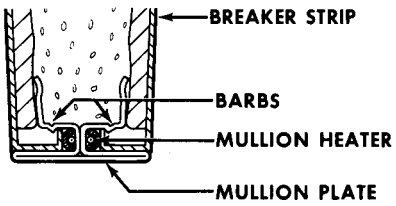


Figure 42 - Mullion Breakers

NOTE: When installing a mullion breaker, squeeze the flange of the breaker into the mullion channel. Do not hit or strike the breaker into position. This may chip the flange as it rides over the barbs. Use wide jaw pliers to squeeze into place. Protect the breaker with a piece of the old breaker to prevent marking with the pliers.

CA10, 12-D, 15 MODELS
FV10, 12, 15 MODELS

Breaker strips on these models for 1975 and 1976 are held by clips in the outer case flange channel and the liner flange. A ridge along the front edge of the breaker facilitates removal. Using a putty knife, start at the center and disengage the front of the breaker from the clips.

After disengaging the breaker from the case flange clips, reach in behind the breaker using the hands to disengage the breaker from the liner clips.

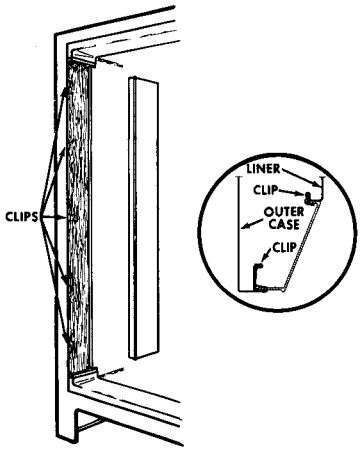


Figure 43 - Side Breaker Strips

The top and bottom breakers can be removed by starting at one corner and disengaging the breaker in the same manner as the side breakers.

Breaker strips on 1977 and later models are the overlapping type. A channel along the rear of the breaker fits over the liner. The front of the breaker strip snaps under clips along the outer case flange.

To remove the top breaker, at one side, pull down to disengage the breaker from the case flange. Continue pulling to release the breaker from the case flange and the liner.

To remove a side breaker, at the bottom, pull outward to disengage

the breaker from the clips and liner. The bottom breaker is removed by pulling up at one side to release the breaker from the case flange and liner.

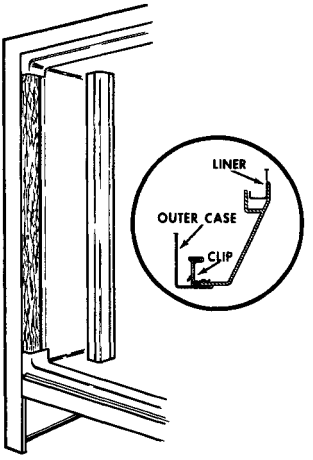


Figure 44 - Side Breaker Strips

CA/FV-13, 16, 19, 21 CAF-16D CAF/FVF-19 FVF-16E

Breaker strips on these model freezers have tabs on the underside rear edge which engage the liner and flanges at the front that are pressed into the outer case channel. See Figure 45. To remove these breaker strips, starting at the bottom, use fingers to pry the front edge of the strip from the outer case flange. The top and bottom breaker strips can be removed using the same procedures after removing both side breakers.

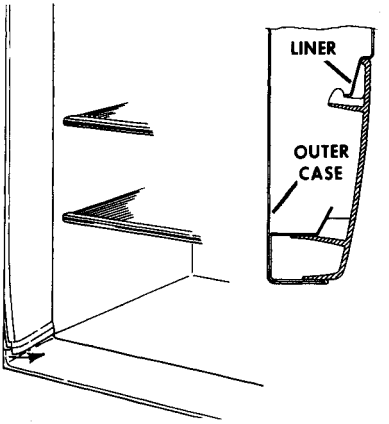


Figure 45 - Side Breaker Strips

CAF/FVF-16C MODELS CA-12C MODELS

Breaker strips on these models have a notched channel along the entire length of the breaker that fits over the liner edge. The front of the breaker is held in place behind the case flange by clips.

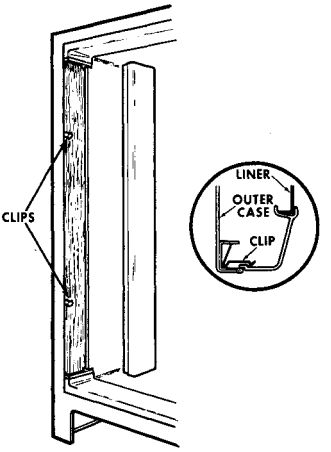


Figure 46 - Side Breaker

To remove a side breaker, pry the breaker loose from the clips with the palm of your hand or a putty knife. After the breaker is free from the clips, pull forward to disengage it from the liner.

The top breaker is removed by pulling down and out at one side and then along the length of the breaker.

The bottom breaker has an overlapping flange along the front and is removed by pulling up and out at one side and then along the length of the breaker.

CB/FH5, 8 MODELS

On these models, the one-piece breaker frame (collar) is replaceable. Care should be taken when removing the old collar as some foam insulation may adhere to the underside of the collar.

Before installing the replacement collar, fill any voids in the insulation with permagum (WR97X81).

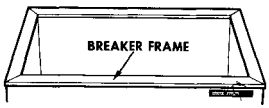


Figure 47 - FH5,8 Breaker Frame

NOTE: CB/FH16 model freezers also have a one piece soft vinyl frame (collar) fitted over flanges of the outer case and inner liner. However, due to the manner in which this breaker frame is installed, it is not a replaceable part.

CB/FH15 MODELS (Large Corner Trim)

Breaker strips on large corner trim model freezers, are positioned under the flange of the outer case and fitted over the edges of the inner liner on all sides.

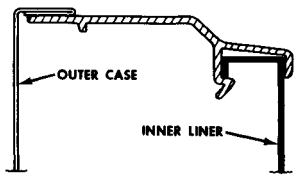


Figure 48 - Breaker Strip

Corner trims are used to cover the ends of the breaker strips and conceal the joints where the breakers meet.

To remove the corner trim, lift one inside corner end that overlaps the breaker. Insert a thin blade screwdriver under the trim and release the locking tab, while lifting the trim. Repeat at the opposite corner end. After releasing both locking tabs, lift the inside edge and pull the trim from the outer case flange.

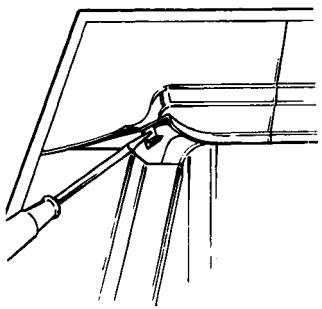


Figure 49 - Removing Corner Trim

To remove a breaker strip, after removing the corner trim, grasp the breaker at one end along the inner edge and lift upward to disengage it from the liner. Then, pull the breaker toward the center of the freezer to release it from the outer case flange.

CB/FH15,20,25 MODELS (Small Corner Trim)

Breaker strips on small corner trim model freezers have mitered corners and a corner trim to cover the miter joint. The breakers fit under the case flange and snap over the edge of the liner.

To remove these breakers:

1. Remove the corner trim by sliding the trim from under the case flange.

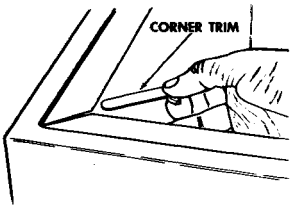


Figure 50 - Removing Corner Trim

2. Using a bottle cap opener as a removal tool, insert the opener under the inside edge of the breaker to free it from the liner. Continue prying at short intervals along the breaker until it can be removed.

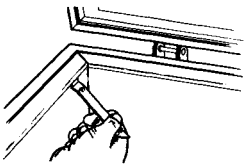


Figure 51 - Removing Breaker Strip

To install the breaker:

1. Insert one mitered end under the case flange and bow the breaker until the other end can be fitted under the flange.

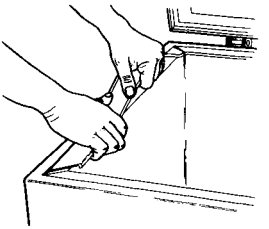


Figure 52 - Installing Breaker Strip

2. Press down on the breaker, working the front edge under the case flange. Snap the inner edge over the liner.

3. Reinstall the corner trims.

NOTE: If the front breaker is to be removed, the lock strike must be removed first. Remove the screw and pry up at the right side to release the locking tab.

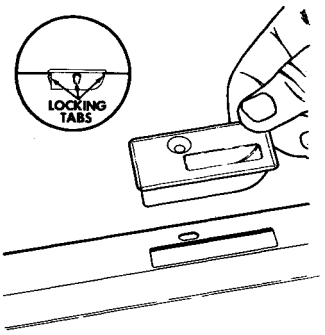


Figure 53 - Lock Strike Removal

LID HINGE REMOVAL

Care should be taken when removing the lid hinges on chest freezers. The hinges are mounted under spring tension.

When removing a lid hinge, always hold pressure against the hinge while removing the mounting screws. After removing the screws, gradually release pressure on the hinge.

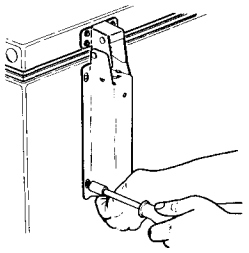


Figure 54 - Removing Lid Hinge

COMPARTMENT DIVIDER — TBF/ CTF-17, 19, 22 TBX/CTX-18, 20, 22, 23

The compartment divider assembly on these models consists of the mullion plate, the freezer floor, the foam divider insulation and the fresh food liner top.

To remove the mullion plate:

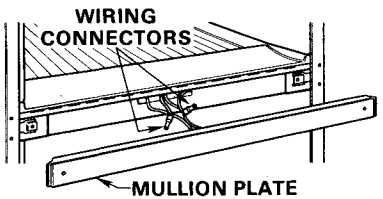


Figure 55 - Mullion Plate Removal

1. Remove the freezer door and the fresh food door.
2. Remove the center door hinge and the screws at each end of the mullion.
3. Slide the mullion plate to one side (away from the center hinge location). Use a putty knife (blade wrapped with tape) if necessary to pry the mullion plate away from the outer case flange (at the center hinge location). After one end of the mullion plate is free from the case flange, the other end can be pulled free.
4. Disconnect the wiring connectors from the mullion heater leads.

Upon reinstalling the mullion plate, use new wiring connectors (WR2X4330). Dress the wiring leads and connectors into the wiring pocket in the divider insulation behind the mullion plate so as to prevent a cold air passage into the mullion area. Insert the mullion plate behind the case flange (at the side away from the center hinge location) while engaging the top edge into tabs along the underside of the freezer floor and the bottom edge under the fresh food liner top. Slide the mullion plate back, partially behind the case flange (at the center hinge location). Reinstall the screws, hinges and doors.

To remove the freezer floor:

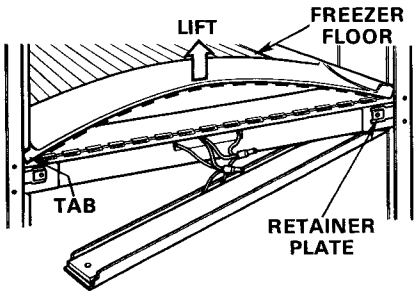


Figure 56 - Freezer Floor Removal

1. Remove the mullion plate as described above. (The wiring connectors need not be removed in order to remove the freezer floor.)

2. Lift up (bow) the freezer floor at the front center sufficiently to disengage the tabs at each side from behind the case flange. (If the freezer floor is cold, it may be advisable to bathe it with a hot towel to make it more flexible.)

3. Pull the freezer floor straight forward and withdraw it from the channels in the sides of the liner.

Upon reinstalling the freezer floor, make sure the foam gaskets (WR2X7072) are properly positioned in the channels so as to seal against the bottom of the floor and the back side of the tabs at each side. The gaskets should be tucked behind the case flange and up against the top of the floor channel, extending toward the rear. Place the floor into the liner, positioned within the channels, and push it to the rear until the tabs at each side are near the case flange. Lift up to bow the floor and engage the tabs behind the case flange. Reinstall the mullion as described above. Pull the floor forward so that gaps do not exist between the tabs and the case flange.

To remove the foam divider insulation and fresh food liner top:

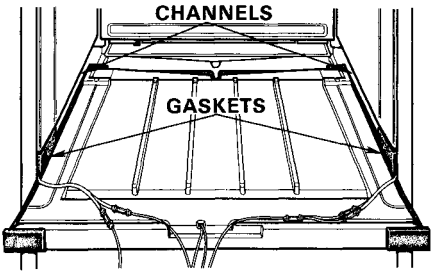


Figure 57 - Divider Removal

1. Remove the mullion plate and freezer floor as described above.

2. Remove the control console and disconnect the wiring harness connectors. On some models, the lamp socket must be disengaged from the metal reflector shield. On other models, the metal lamp reflector shields at each side of the console must be removed.

3. Remove the mullion/center hinge retainer plates (nut strips) in front of the divider.

4. Pull the fresh food liner top together with the foam divider insulation straight forward and withdraw it from the channels in the sides of the liner.

Upon reinstalling the divider insulation and fresh food liner top, inspect the gasket at the sides and especially along the rear of the fresh food liner top for deformation. If necessary, add a WR2X3899 foam gasket. Place the insulation and top assembly into the liner, positioned within the channels,

and push it fully back against the rear of the liner. Push the divider insulation down into the channels to provide clearance for installing the floor. Dress the case heater leads into the channels in the divider insulation and seal the channels with a dab of permagum (WR97X81) in two locations at each side to prevent air flow in the channels. Reinstall the floor and the mullion plate. Reinstall the control console making sure the gasket (WR14X312) at the rear of the nozzle provides a tight seal against the rear of the liner when the console is installed.

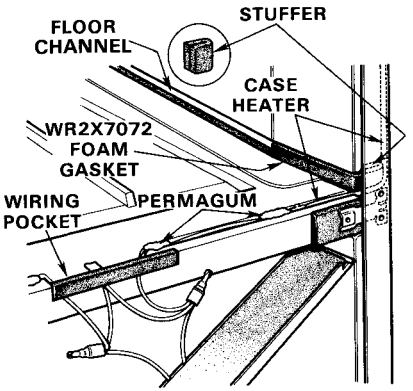


Figure 58 - Divider Installed

COMPARTMENT DIVIDER — TB/CTA-13,15

The mullion is secured with two (2) screws. A mullion heater, mounted on an adhesive-backed aluminum foil strip, is positioned behind the mullion. A wiring connector on the mullion heater leads provides an easy means of disconnecting the heater from the harness. A star washer for grounding purposes is positioned between the mullion and the heater foil at each hole in the mullion. An adhesive-backed foam gasket is applied to the back of the mullion heater.

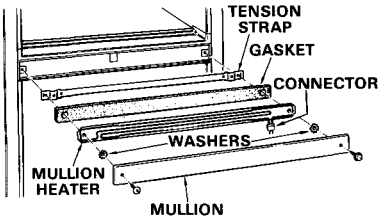


Figure 59 - Mullion Assembly

A tension strap, mounted in front of the mullion frame, is used to hold the sides of the outer case in proper alignment and thus minimize the gap between the ends of the mullion frame and the sides of the liner. The strap is mounted to the mullion end brackets with a screw at each end. A slot is provided in the end of the strap to allow use of the blade type screwdriver in prying the strap into position.

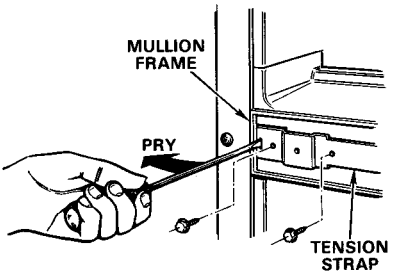


Figure 60 - Tension Strap Replacement

The mullion frame is fitted over the front edges of the freezer evaporator bottom, divider insulation, and fresh food liner top. Two (2) screws are used to secure the mullion frame to the fresh food liner top. A piece of fiberglass insulation is fitted between the mullion frame and divider insulation.

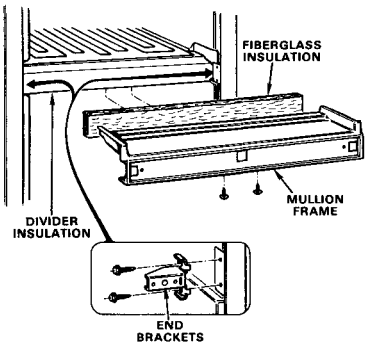


Figure 61 - Mullion Frame

The fresh food liner top is supported by ribs molded into the sides and rear of the liner. A foam gasket, applied to the back of the liner, seals against the rear of the divider insulation.

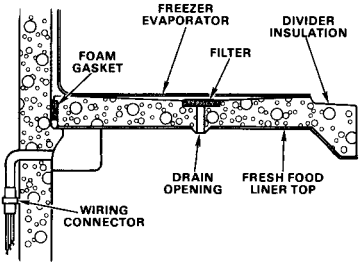


Figure 62 - Compartment Divider

The divider insulation and fresh food liner top can be removed together as an assembly, after disconnecting the wiring connector at the rear of the outer case and dismounting the serpentine heater and temperature control capillary.

DOOR HANDLES — TFX MODELS

The full-length door handles on some General Electric side-by-side models are front removable. To disassemble a handle from the door, first remove the Phillips head screw at the bottom

of the upper handle insert. Pry the upper insert loose, starting at the bottom. Pry the lower insert loose — starting at the bottom — then, swing it upward and disengage the top of the insert from the handle. Remove the Phillips head screws at the top and bottom of the handle to remove the handle from the door. A metal stiffener is attached to the handle by two (2) Torx (#T-15) screws.

Holes for the backplates are slotted vertically to allow proper alignment of the backplates with the handle. Screws for the backplates thread directly into the door panel.

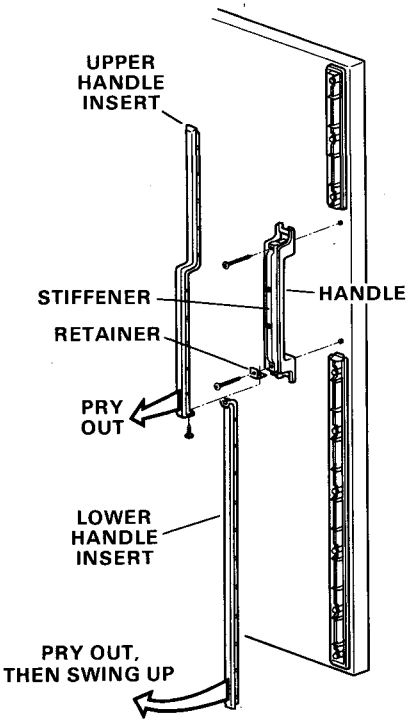


Figure 63 - Door Handles

COUNTER DOOR

Some General Electric models have a Refreshment Center compartment on the fresh food door. The compartment door permits access to the uppermost fresh food Porta-Bin and provides a convenient, temporary counter when the door is fully opened. The handle across the top of the door operates a latch to unlock the door. Snubbers, built into the stop arms and located inside the door, prevent the door from immediately dropping down after being unlatched.

A stainless steel trim over the lower edge of the door handle extends back under the handle to cover the mounting screws. Removal of the trim from the handle will result in unavoidable damage to the trim. Accordingly, a new trim will be required if the original trim is removed.

When installing the handle, the torsion springs must be positioned on the handle pivots and the loops of the springs positioned over molded shoulders on the door front.

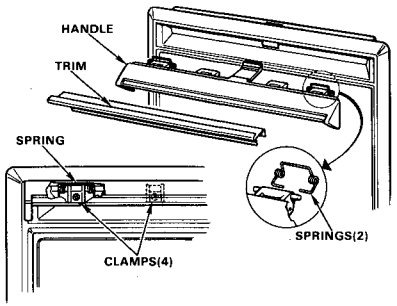


Figure 64 - Door Handle Assembly

The outer door frame, glass front, and inner door panel are cemented together with foam insulation between

the panels. The counter surface is also cemented in place to the inner door panel. Thus, the door cannot be disassembled.

The stop arm and snubber assemblies are attached to the door at each side with Torx (#T-20) screws. The screw nearest the top of the door has a flat head and the lower screw has a shoulder head with a plastic bushing that serves as a stop for the stop arm. These screws thread into metal nut strips inside the door assembly. The left and right stop arm and snubber assemblies are not interchangeable from one side to the other. The inner surface of the snubber mounting plates are stamped with an "L" or an "R" to designate the proper side for assembly.

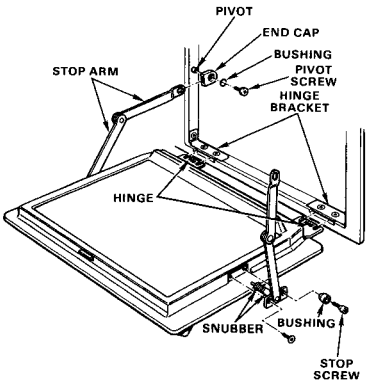


Figure 65 - Door Assembly

The stop arms are attached with Torx (#T-15) screws to pivot pins at the sides of the breaker frame. An end cap and a bushing at the pivot end of each stop arm provide bearing surfaces at the pivot points.

The slotted hinges are also attached by Torx (#T-20) screws to the breaker frame, permitting in-or-out adjustment of the door.

To adjust the door hinges:

1. Loosen all four (4) lower hinge bracket screws one (1) full turn;
2. Firmly press in at both sides of the door;
3. Check for equal spacing along the top of the door (if spacing is unequal, pull out one lower corner to compensate);
4. Carefully open the door and tighten all four (4) screws;
5. Close the door and recheck.

The compression type gasket is press-fitted into a channel in the breaker frame. The gasket is easily removable by pulling it out of the channel. Ribs formed in the sides of the gasket provide a friction fit to hold the gasket snugly.

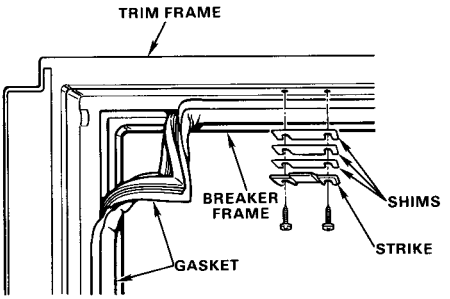


Figure 66 - Door Gasket & Strike

The door strike, mounted to the breaker frame at the top of the opening, has slotted holes for adjustment. Shims may be used to position the strike for positive engagement by the latch.

The trim frame, surrounding the breaker frame at the front of the fresh food door, has molded pins on the back that are pressed into fasteners in the fresh food outer door. The trim frame can be removed with the aid of a putty knife, however, care must be taken to avoid breaking the pins.

DOOR SHELF FRONTS

Door shelf fronts, on later models that are engaged into slots in the inner door, have a lanced tab at each end to secure the shelf front to the inner door. To remove this type shelf front, press near the end of the front to release the tab while pulling the front out of the slot.

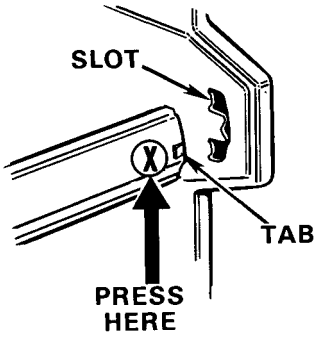


Figure 67 - Shelf Front

This type shelf front, on some models, engages an end cap which is secured to the inner door. To remove the shelf front, the end cap must first be disengaged from the inner door. Pull the end cap out at the bottom and push it down, then tilt it out at the top and pull it up and out of the slot in the inner door. Disengage the front from the end cap by pressing near the end to release the tab while pulling the end cap off of the front.

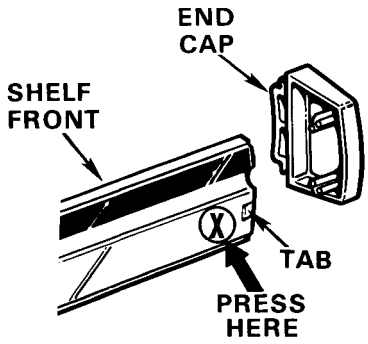


Figure 68 - Shelf Front & End Cap

Some models, that have deep door shelves, are equipped with snuggers to corral small items on the door shelf and thus prevent them from tipping over as the door is opened and closed. The snugger can be removed after disengaging the front from the end cap.

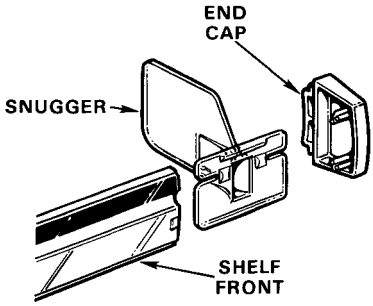


Figure 69 - Shelf Snugger

SHELF SUPPORTS — TBF-12

The shelves in Model TBF-12 are positioned on plastic pin type supports. The pin, when driven flush

with the end of the support, expands tabs to secure the support to the liner.

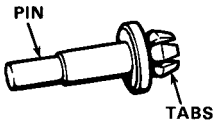


Figure 70 - Pin Type Support

BREAKER STRIPS — TBF-12

A two-piece breaker frame is used at the front of the freezer compartment. Individual breaker strips are used at the front of the fresh food compartment. The procedure for removal and replacement of these breakers is similar to other models that have breakers. Begin with the top breaker, where it overlaps and disengage it first from the outer case flange; then pull it from the edge of the liner. Replacement is in reverse sequence.

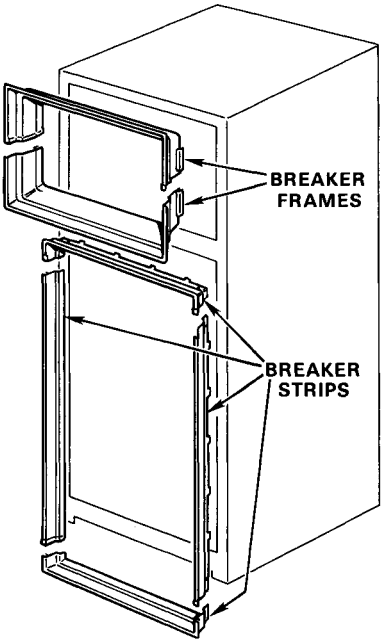


Figure 71 — Breaker Frames & Strips

EVAPORATOR COVER — TMNF-17 & LARGER

The evaporator cover, on top-mount no-frost 17 cu.ft. and larger models is held in place by the top grille and the ice service grille. On 22 cu. ft. and 23 cu.ft. models an additional screw, covered by a plug button near the center of the cover, helps secure the cover. Gaskets are located on the rear of the cover — along the sides and at the ice service grille opening. These gaskets must be properly positioned and in good condition to insure proper air circulation through the evaporator.

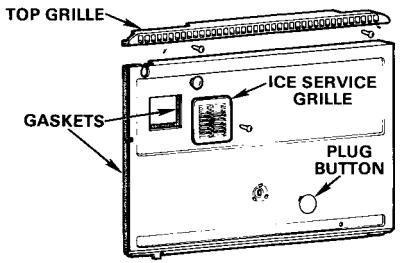


Figure 72 - Evaporator Cover Assembly

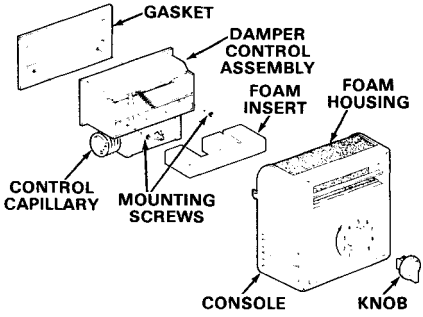


Figure 73 - Air Damper Control

AIR DAMPER CONTROL—TCX-20

Fresh food temperature is regulated by an adjustable air damper mounted behind the control console. There are no electrical connections to this control. The damper opens and closes automatically by means of a mechanical linkage with a capillary and bellows assembly which reacts to changes in the fresh food compartment air temperatures.

For the warmest setting the damper closes at 34°F, for the middle setting the damper closes at 27°F, and for the coldest setting the damper closes at 20°F. Upon temperature rise in the fresh food compartment, the damper gradually opens. If the temperature continues to rise, the damper will continue to open, providing a supply of cold air upon demand as sensed by the capillary and bellows assembly.

PORTA-BINS

On TFX-27 model refrigerators, the fresh food door porta-bins have metal hookbrackets that engage into tracks at the sides of the inner door. The tracks are secured with Torx (#T-10) screws. The screws thread into stiffeners that are positioned on the back side of the inner door to increase its rigidity. A #T-10 Torx bit, suitable for use with 1/4" hex magnetic screwdriver, is available under catalog number WX5X1920.

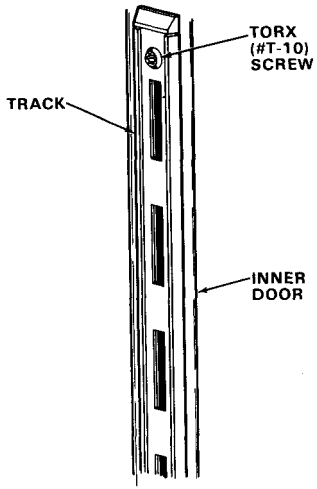


Figure 74 - Porta-Bin Track

The metal hook-brackets can be removed from the porta-bin by pressing in and down on the lower hook. To reinstall the hook-bracket into the porta-bin, engage it into the slot and, while pulling out on the upper hook, press upward at the lower end.

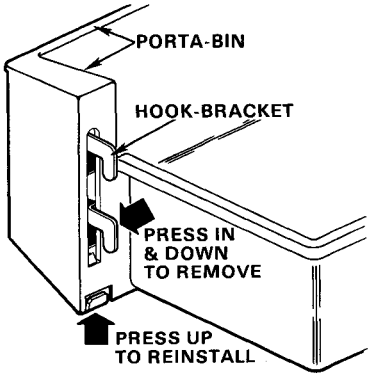
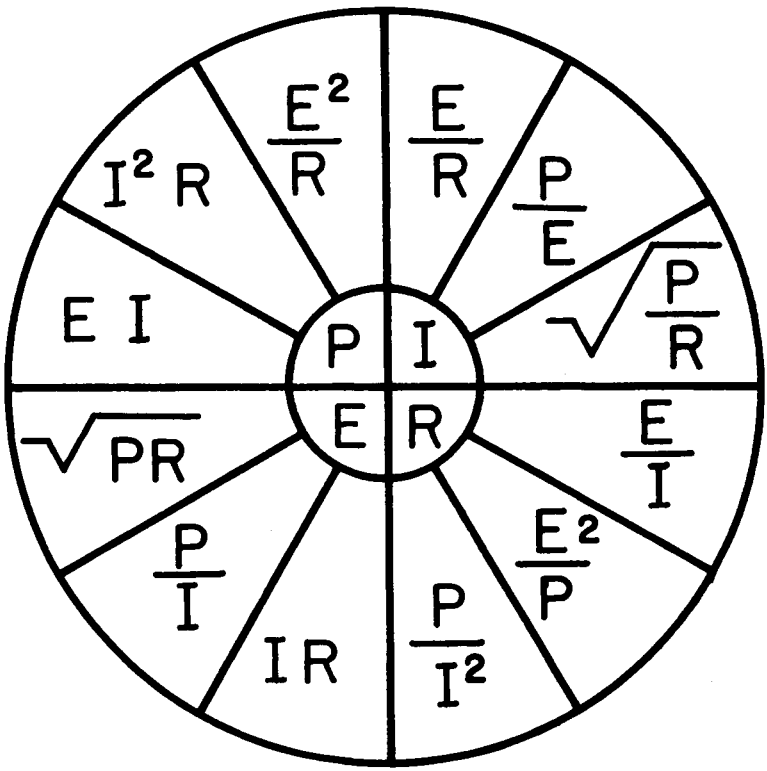


Figure 75 - Porta-Bin

INDEX



P-WATTS
I-AMPS

E-VOLTS
R-OHMS

POWER SOURCE

Separate branch circuits should be provided for the refrigerator and freezer. Each circuit should be protected with a fuse or circuit breaker having a rating that conforms to the local electrical code. The wall receptacle should be properly polarized and grounded to minimize the possibility of electrical shock hazard.

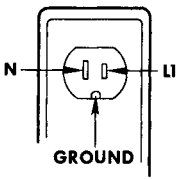


Figure 1 - Polarized Receptacle

The use of extension cords should be avoided. However, if an extension cord is absolutely necessary, it should be a UL listed, three-wire, grounding type, properly polarized and capable of carrying 15 amperes minimum.

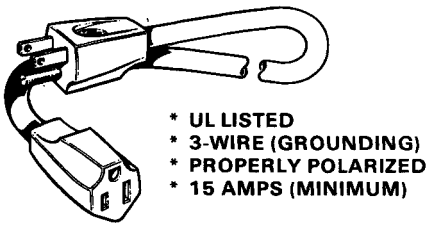


Figure 2 - Extension Cords

Most refrigerators and freezers are designed to operate either on 115 Volts AC, 60 Hertz or 100 Volts AC, 50 Hertz.

The amperage rating specifies the amount of current the circuit should withstand for that particular model. The current draw will vary, depending upon whether the compressor has just started running or is near the end of the running cycle. Therefore, the amperage rating should neither be used as a standard for comparing the current draw of the product or any of the electrical components thereof, nor in an attempt to calculate the energy consumption of the product.

The energy consumption rating is stated in the Mini-Manual for each model. This rating gives an approximation of the amount of energy the product is expected to consume under "normal" or moderate operating conditions. (See GENERAL Section — Energy Consumption.)

POWER CORD

The three-wire grounding type power cord is polarized to coincide with a properly polarized and grounded wall receptacle. The round pin terminal of the plug mates with the earth ground supplied to the wall receptacle and is connected to the green center conductor of the power cord, which is attach- to the product forming a chassis ground. The two flat blade terminals of the power cord mate with the hot and neutral line terminals of the wall receptacle to provide a voltage source circuit for the product. The neutral conductor of the power cord is identified by either molded ribs or dashed lines on the insulation covering the conductor.

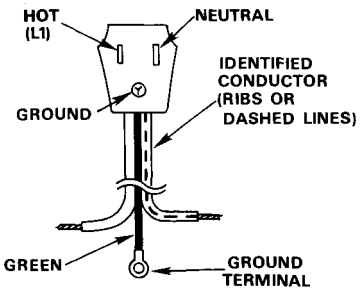


Figure 3 - Grounding Power Cord

When replacing a power cord, connect the conductors so that correct polarity is maintained and attach the ground wire to the original location. A potential safety hazard exists if polarity is reversed or the ground conductor is not properly connected.

GROUNDING

A case bonding ground system effectively grounds all electrical components and conductive surfaces which could inadvertently become electrically energized. These parts, made electrically common through a network of grounding paths, are connected to earth ground through the green conductor of the power cord.

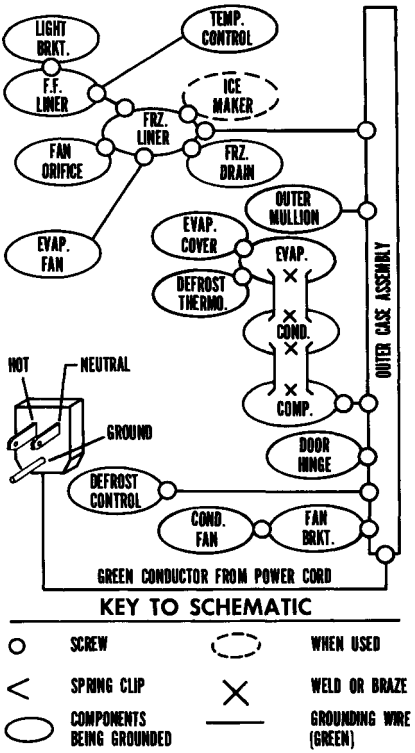


Figure 4 - Typical Ground Paths

For the most part, the grounding system is accomplished through metal-to-metal contact inherent in the construction of the product. Some electrical components, however, have ground wires that are connected to metal surfaces.

NOTE: If ground wires, screws, straps, clips, nuts or washers used to complete a path to ground are removed for service or for any reason, they must be reconnected to their original position and properly fastened. Failure to do so will create a possible electrical shock hazard.

COMPRESSOR MOTOR

The compressor motor, mounted directly to the compressor and located inside a sealed steel case, has two windings. One is a start winding and the other a run winding. The windings are connected together internally, forming a common connection. A lead is connected to each of the windings, and to the common connection. These three leads are then connected to glass-sealed terminals that extend through the compressor case. On most ocmpressors, the terminals are clustered in a triangle (pyramid) pattern and, reading from left to right, are identified: Start, Common and Run.

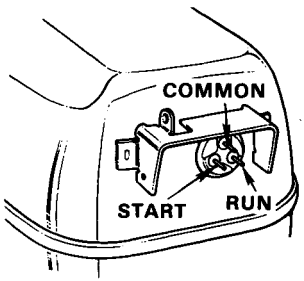


Figure 5 - Compressor Terminals

NOTE: On some compressor (other than General Electric or Tecumseh), the terminal identification differs from the description and illustration above.

Danfoss compressors have an unusual terminal configuration. The terminals are upside-down as compared to General Electric compressors.

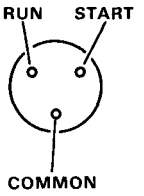


Figure 6 - Danfoss Terminals

On rotary compressors, although the terminals are located on the top of the compressor case, they are configured in the traditional manner, but rotated clockwise 120°.

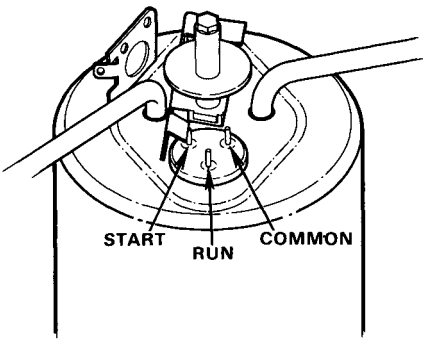


Figure 7 - Rotary Terminals

To check the start and run windings, first disconnect the power cord and remove the relay from the compressor terminals. Using a ohmmeter, measure the resistance between the terminals to obtain three different readings. The highest reading will be between the start and run terminals, which is the two windings in series. The lowest will be between the run and common terminals for the run winding. The intermediate reading will be between the start and common terminals for the start winding (which is usually more than two tirnes greater

than the run winding). When the compressor is warm, the resistance readings of both windings will be somewhat higher than the values shown on the schematic wiring diagram. Also, check between each terminal and ground with the ohmmeter set to the highest range. If a winding is found to be either open or shorted to ground, the compressor has failed.

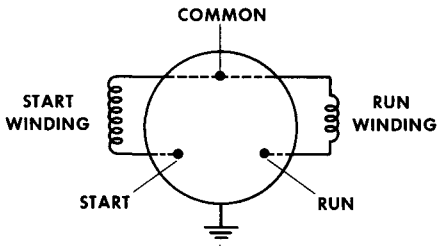


Figure 8 - Compressor Windings

(To direct start the compressor, see Diagnosis Section - Direct Start Test.)

RELAY

The relay momentarily energizes the start winding to start the rotation of the compressor motor. On most models, a current-sensing type relay is used that consists of an armature, a solenoid coil and a set of contacts. The armature is positioned partially inside the solenoid coil and the normally open contacts are suspended below the armature.

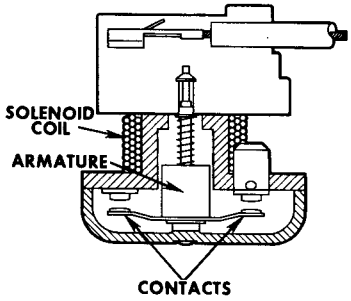


Figure 9 - Relay Construction

One side of the solenoid coil is connected to one side of the contacts at the "L" (line) terminal. The "M" (main) terminal connects to the run winding and the "S" (start) terminal connects to the start winding. Thus, the relay coil is in series with the run winding and the contacts are in series with the start winding.

When line voltage is applied to the "L" (line) terminal of the relay and the "C" (common) terminal of the compressor motor, a heavy current surges through the run winding and relay coil. This creates a strong magnetic field in the coil, lifting the armature, which closes the contacts and energizes the start winding. As the motor accelerates to approximately 75% of full speed, the run winding current diminishes, thus reducing the magnetic field of the coil. This allows the armature to "drop-out" by the force of gravity, opening the contacts, which de-energizes the start winding. The motor, then, continues to operate on the run winding only.

The relay coil and contacts can be checked for continuity, using ohmmeter. Place one probe on the "L" terminal and the other probe in the

"M" terminal to test the coil. A zero-ohm reading indicates continuity through the coil. Then, place one probe on the "L" terminal and the other probe in the "S" terminal to test the contacts. With the relay in the upright position, the contacts should be open and the reading should be infinity. With the relay turned upside down, the contacts should be closed and the reading should be zero-ohms. Even though a relay has continuity through the coil and contacts, it may still fail to operate properly due to burned contacts or a binding armature. Therefore, the best test for a suspected inoperative relay is to install a new one having the same specifications.

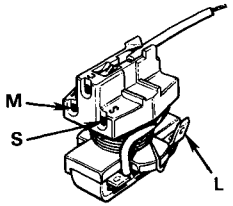


Figure 10 - Relay Terminals

When removing and replacing a relay that is mounted directly to the compressor terminals, pull it straight off and push it straight on. Avoid wiggling the relay side-to-side or up-and-down to prevent damage to the relay and/or compressor terminals. Some replacement relays have a lead wire welded to a terminal that is not required in most applications. If not needed, the lead should be snipped off close to the terminal.

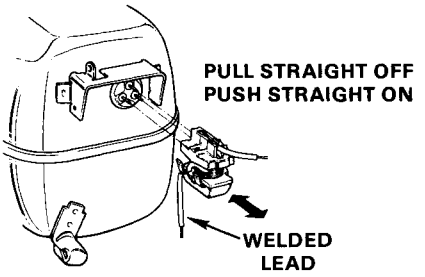


Figure 11 - Relay Replacement

Most refrigerators, of recent production, use a solid state type relay. Some are mounted directly to the compressor terminals. The solid state relay for the rotary compressor is mounted remotely with wiring leads connecting to the compressor terminals.

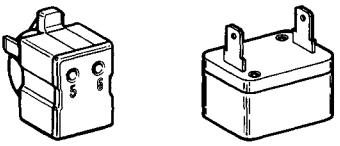


Figure 12 - Solid State Relays

Unlike the mechanical type relay, the solid state relay has no coil and no moving contacts. This relay consists of a small solid state wafer that has a low resistance (from 5 to 25 ohms) at room temperature. The wafer is positioned between electrical terminals that connect to the compressor terminals.

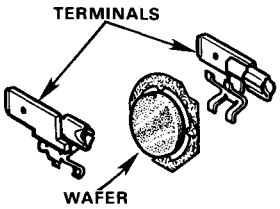


Figure 13 - Relay Components

As voltage is initially applied to the compressor circuit, current flows through the run winding and, in parallel, through the realy and start winding. Initially, the resistance of the relay is low enough to pass sufficient current through the start winding and permit the compressor to start. Then, instantaneously, the resistance of the relay goes high — in effect, reducing the current flow through the relay to a trickle. This trickle current causes the resistance of the relay to remain high, thus keeping the relay "open". This type of relay is called a PTC (positive temperature coefficient) relay because the resistance goes high as the temperature increases.

The solid state relay can be tested for continuity, using an ohmmeter. The measured resistance of the relay, at room temperature, should be within 10% of the value stated on the schematic wiring diagram for the particular model.

GUARDETTE

The Guardette provides overload protection to the compressor motor by responding to both temperature and current. The Guardette consists primarily of a bimetal element and a set of normally closed contacts. Most Guardettes used in refrigerators and freezers also have an auxiliary heater for faster response in the event the motor stalls. Lead wires are generally welded to the Guardette terminals. However, the terminals may be spade type, screw type, or some combination thereof.

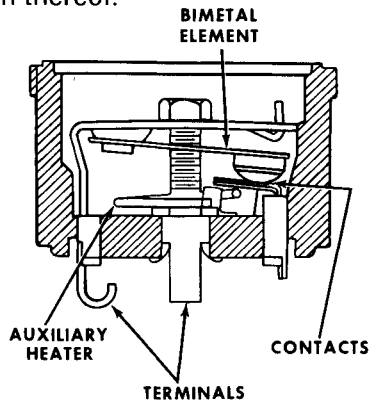


Figure 14 - Guardette Construction

The Guardette, mounted externally and in direct contact with the compressor case, is connected in series with both windings of the motor. If the motor fails to start for any reason, the heavy locked rotor current will cause the bimetal element to heat which then quickly flexes, snapping the contacts open and interrupting current flow through the motor. Likewise, if the motor overheats to an unsafe level, the combination of current and temperature will cause the bimetal to snap the contacts open. Upon cooling, the bimetal flexes back and snaps the contacts closed. The motor will continue to cycle on the Guardette so long as the original reason for tripping persists.

The Guradette can be tested for continuity with an ohmmeter probe placed on each terminal. If the Guardette has tripped, allow it to cool in the room ambient before checking. Even though continuity is observed, it is difficult to determine if the Guardette is operating within the specification limits. If there is any doubt, replace it. Bear in mind, however, that what may seem to be "nuisance tripping" usually is dependable Guardette operation, protecting the compressor motor from outside causes. (See DIAGNOSIS section — Line Voltage Test).

NOTE: A Guardette should NEVER be by-passed in the circuit, not even as a temporary measure until the proper replacement can be installed.

When replacing a Guardette that has lead wires welded to the terminals, cut the wires so as to allow for splices outside of the terminal cover. Use closed-end or "bell-type" connectors to splice the wires. Where more than two wires are connected to the Guardette, care must be taken to properly reconnect the Guardette in the circuit.

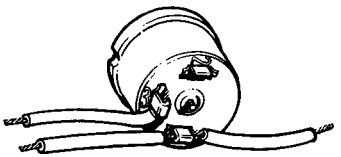


Figure 15 - Guardette Leads Welded

NOTE: Do not attempt to solder wires to the Guardette terminals. Excess solder flowing into the Guardette will result in fusing the contacts closed.

The Guardette must be held in close contact with the compressor case in order to properly sense the compressor case temperature. In some instances, a strap type retainer is used for this purpose. Generally, however, the terminal cover has a recessed "pocket" that secures the Guardette in position. Regardless of which method is used, make sure the Guardette is held against the compressor case and the terminal cover is positioned securely.

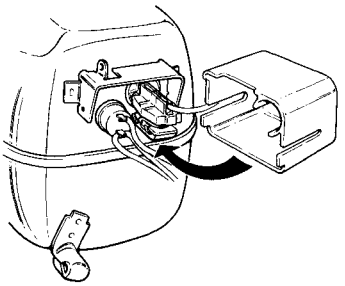


Figure 16 - Cover Installation

Some compressors have an internal motor overload protector. Accordingly, an external Guardette is not used. The schematic wiring diagram for the particular model will indicate whether the overload protection device is internal or external.

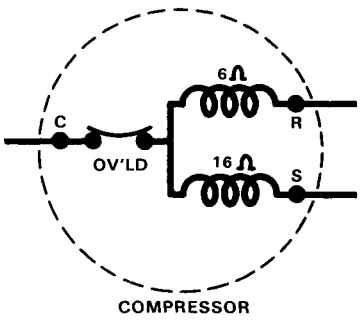


Figure 17 - Internal Overload

CAPACITORS — START AND RUN

Start capacitors are sometimes used to increase the motor starting torque. Run capacitors are used with specially constructed compressor motors to increase the running efficiency. Although both types are connected in series with the start winding, each requires a special relay in order to provide for proper electrical connections to the circuit. The start capacitor, connected in series with the relay contacts, is utilized only for motor starting — while the relay contacts are closed. Whereas, the run capacitor is connected in parallel with the relay contacts, and is shunted while the relay contacts are closed for starting, but is utilized along with the start winding after the relay contacts open and so long as the motor operation continues. The compressor will start and run without the run capacitor being in the circuit, but will not run as efficiently.

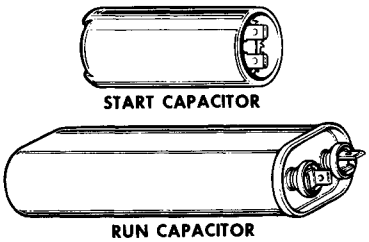


Figure 18 - Start & Run Capacitors

The capacitor can be checked by using an analog ohmmeter set to the highest range (RX 10K or higher). First, disconnect the power cord, remove the leads from the capacitor and, as a precaution, discharge it by shorting the terminals with an insulated screwdriver. Then, place the ohmmeter probes on the capacitor terminals and observe the ohmmeter reaction. Reverse the probes, to reverse the polarity, and again observe the ohmmeter reaction. The ohmmeter should register zero-ohms and then deflect slowly back toward infinity when the capacitor is in good condition. The ohmmeter should register zero-ohms if the capacitor is shorted, and infinity if it is open. If the capacitor has a metal case, check for continuity from each terminal to the case. If the capacitor is shorted to ground, it must be replaced. Even though the capacitor checks good with an ohmmeter, it may still fail to operate properly due to internal leakage. Therefore, the best test for a suspected inoperative capacitor is to install a new one having the same voltage and capacitance specifications.

SUCTION TUBE THERMOSTAT

A suction tube thermostat, used on side-by-side refrigerators equipped with rotary type compressors, is connected in series with the compressor circuit. The thermostat is mounted on the suction tube, just above the accumulator, and covered with a fiberglass and foil bonnet. The purpose of the thermostat is to interrupt compressor operation in the event the compressor should run backwards following a momentary power outage (of less than one second duration). If this phenomenon should occur, the suction tube will quickly become hot and cause the thermostat to open soon thereafter.

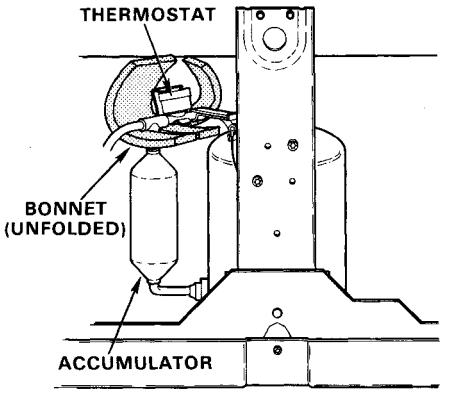


Figure 19 - Suction Tube Thermostat

TEMPERATURE CONTROL

A temperature control is used on all refrigerators and freezers to regulate the operation of the compressor and thus maintain desired food temperatures. The temperature control consists primarily of a capillary tube and bellows assembly, a set of normally closed contacts, and a mechanical linkage.

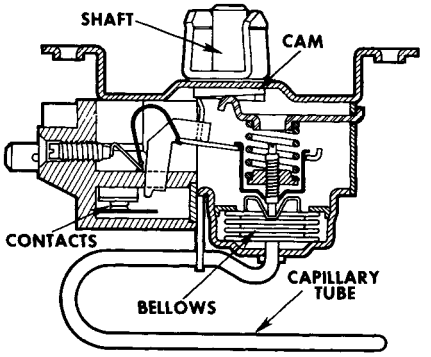


Figure 20 - Temperature Control

Pressure within the gas-charged capillary tube and bellows assembly responds to temperature sensed at the coldest point along the length of the capillary tube. Rising temperature causes the pressure to increase and expand the accordion-type bellows. The expanded bellows actuates the linkage which allows the contacts to close. When the temperature drops, the bellows contracts due to a decrease in pressure and the snap-action of the linkage opens the contacts.

On some models, the control senses evaporator temperature and, on others, the temperature of the air. Accordingly, a control that has the capillary tube fastened to the evaporator is calibrated to a much lower (colder) temperature than one that has the capillary tube suspended in the air stream.

On some freezer models, the temperature control does not have an "off" setting. This prevents the user or, more likely, a small child from inadvertently turning the control off. On some manual defrost refrigerators, the temperature control has a "defrost" setting that provides partial refrigeration, at approximately 55°F., for overnight defrosting.

The control used on cycle-defrost models allows frost accumulation on the fresh food evaporator to melt during the off cycle, thus, providing the cycle-defrost feature. (Additionally, a serpentine heater is used to insure complete defrosting of the evaporator.)

All temperature controls are carefully calibrated at the factory for use at altitudes from sea level up to 1400 feet above sea level. The lower barometric pressure at higher altitudes causes the control to cycle at a colder temperature than at sea level. Therefore, it may be necessary to recalibrate the control for higher altitude installations. If a control is accidentally dropped on a hard surface, the calibration can shift. Likewise, replacement controls for some models require recalibration for proper operation.

The calibration adjustment screw is accessible through a hole in the front of the control. An arrow, on the control front, indicates the direction to turn the screw for a colder calibration.

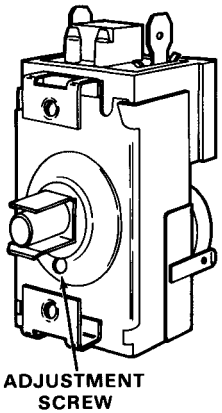


Figure 21 - Control Recalibration

To recalibrate the control, disconnect the power cord and, using a narrow (1/8-inch wide) blade screwdriver, turn the adjusting screw only in the direction and to the extent necessary. Adjusting the screw 1/8-turn will result in approximately 1.5° F.calibration shift.

ALTITUDE	ADJUSTMENT
1400 — 3200 FT.	1/8 TURN CW
3200 — 5000 FT.	1/4 TURN CW
5000 — 7000 FT.	3/8 TURN CW
OVER 7000 FT.	1/2 TURN CW

Figure 22 - Altitude Settings

The temperature control contacts can be tested for continuity, using an ohmmeter. With one probe placed on each control terminal, turn the control to the "off" setting and back on to check for contacts opening and closing.

The calibration can be checked with a remote sensing thermometer (temperature tester). Clamp the thermocouple to the control capillary tube at the point most likely to sense the coldest temperature. Refer to the "Electrical Specifications" in the Mini-Manual for the temperature control limits and compare this data with the temperature measurements as the control cycles off and on.

If the contacts fail to open and/or close, or if the calibration has shifted more than 4° F., the control should be replaced.

When replacing the temperature control, proper placement and mounting of the capillary is of utmost importance. Also, if sleeving is positioned over the capillary on the original control, it must be used on the replacement and positioned in the same location. The following capillary locations are used on various models:

Capillary clamped to evaporator — The capillary must be fully under the clamp and the clamp screws firmly tight. The capillary should be dressed so that it is elevated slightly, for at least a short distance, from the clamp location back toward the bellows. Care should be taken to prevent the capillary from contacting the evaporator tubing at any point other than the clamp location.

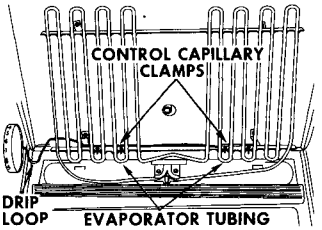


Figure 23 - Clamped to Evaporator

Capillary inserted in well — The capillary must be fully inserted into the well. Before removing the inoperative control, mark the capillary with respect to the opening to the well. After removing the control, transfer the mark to the capillary on the replacement control. Then, insert the capillary into the well to the dimension marked. Sometimes, hot towels are required to warm the capillary well area of the evaporator before the capillary can be fully inserted. If the capillary well opening is in the room ambient, it should be sealed with permagum after the capillary is fully inserted. This will prevent moisture condensation dripping from the well.

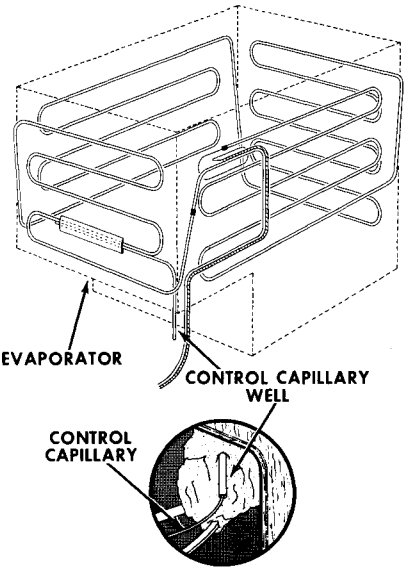


Figure 24 - Inserted in Well

Capillary wound on thermal mass — The capillary must be wound tightly around the thermal mass. To insure a tight fit, wind the capillary around the thermal mass approximately three loops. Slip the coiled capillary off the thermal mass and tighten the loops by twisting to reduce to coil diameter. After loosening or removing the thermal mass, insert it into the coiled capillary with a twisting (rotating) motion, being sure it fits into the loops tightly. Reinstall and tighten the thermal mass with the coiled capillary in position.

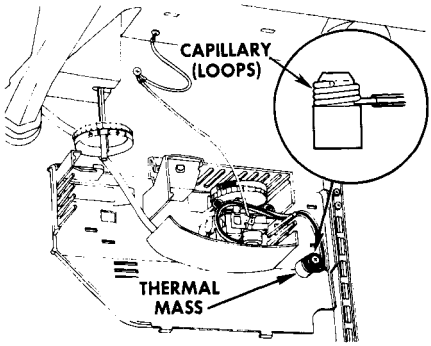


Figure 25 - Wound on Thermal Mass

Capillary suspended in air — The capillary should be formed and located in the same manner as originally installed. On some models, the capillary is coiled inside the control console and on others it is positioned outside of the control console.

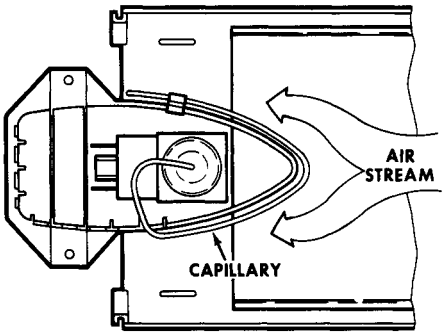


Figure 26 - Suspended in Air

CONDENSER FAN

Larger capacity models require a fan to provide forced draft cooling needed for the condenser and compressor. Room ambient air, being drawn by the fan, enters the machine compartment through the front grille at the base of the cabinet. It then circulates over and through the condenser, picking up heat. On most forced draft models, the warm air is discharged over the drain pan and expelled through the front grille at the left side. On later side-by-side models, and all forced draft models with rotary compressors, the air is expelled at the rear of the cabinet. The condenser fan provides a secondary benefit in aiding evaporation of water from the drain pan.

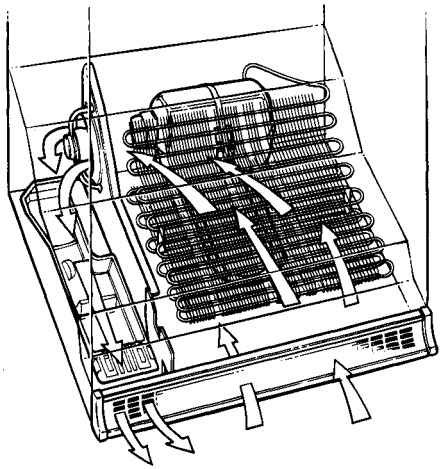


Figure 27 - Condenser Fan Air Flow

NOTE: Baffles that are used to channel and direct the air flow must be correctly positioned to insure proper air flow over and through the condenser. Also, the cabinet must not be elevated above the floor to the extent that the baffles on the underside of the machine compartment are ineffective, allowing air flow to by-pass the condenser.

In time, condenser fan operation will deposit household lint and dust on the condenser which will impede air flow through the condenser, unless it is cleaned periodically. Likewise, the condenser fan blade will become coated with dust, reducing its efficiency.

When servicing the condenser fan, accumulated dust on the fan blade should be cleaned off to improve efficiency of the fan. Also, any wiring near the blade should be properly dressed to avoid obstructing the fan blade.

The condenser fan motor is mounted to three brackets which are mounted to the metal divider baffle in the machine compartment. Where the baffle has keyhole slots to aid in mounting the brackets, care must be taken to insure that the screw heads do not "crawl" out of the slots while tightening the mounting screws. The fan blade is secured to the motor shaft by a nut. The large single bearing is permanently lubricated for the life of the motor.

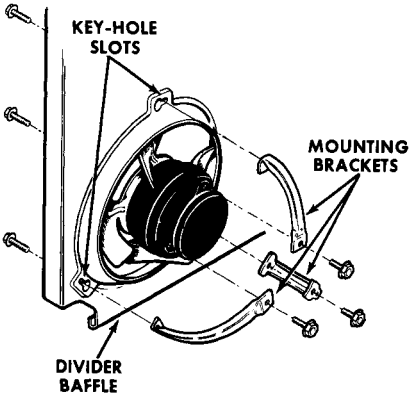


Figure 28 - Typical Mounting

The condenser fan motor mount is isolated on some side-by-side refrigerators. Rubber grommets are used to isolate the motor mounting brackets from the fan baffle (orifice).

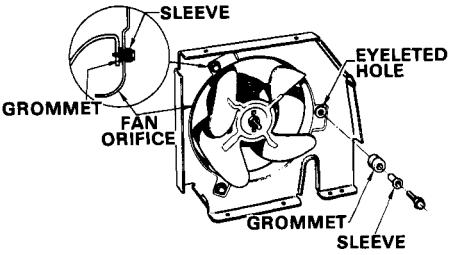


Figure 29 - Isolated Mounting

On models that have a rotary compressor, the condenser fan motor is mounted to a plastic shroud with three Torx (#T-25) screws. The fan motor and blade can be removed after disconnecting the harness and removing the mounting screws. Rotate the motor and fan assembly, remove the nut and blade, then remove the motor.

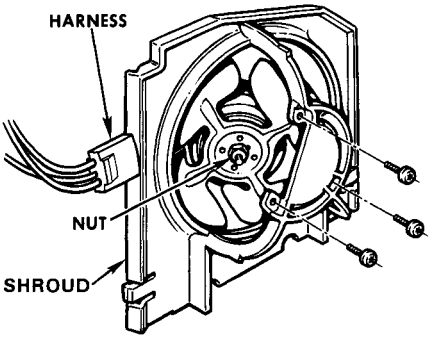


Figure 30 - Fan Motor Removal

EVAPORATOR FAN

An evaporator fan is used on atuomatic defrost models to circulate air

through the evaporator and within the fresh food and freezer compartments. Cold air from the evaporator is drawn through the fan and discharged into the freezer and fresh food compartments. After circulating throughout both compartments, picking up heat from the food, the warmer air is returned to the evaporator.

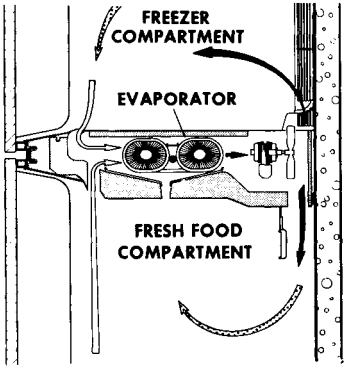


Figure 31 - Evaporator Fan Air Flow

NOTE: Grilles, ducts, baffles and gaskets of various designs are used to channel and direct the air flow. These must be correctly positioned to insure proper air flow through the evaporator and within both compartments

When replacing or servicing the evaporator fan motor or blade, it is very important that the blade be correctly positioned on the motor shaft. If the blade is reversed (installed backwards) or positioned too far in either direction on the motor shaft, it will not properly propel the air. The blade should be installed on the shaft so that, when the motor rotates, the blade will cut into the air and scoop it out through the fan orifice. Generally, the blade should be positioned so that one-third (1/3) of its depth (or approximately 1/4-inch) protrudes through the fan orifice in the direction of air flow. However, on some models, the proper position of the fan blade in relation to the orifice is different. Accordingly, the air flow diagram in the Mini-Manual (describing the proper dimension for the blade position) should be consulted for a particular model.

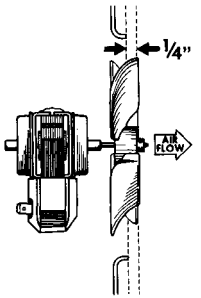


Figure 32 - Fan Blade Positioning

A Turbine type fan blade, used on later no frost upright freezers, is positioned inside the air duct and partially covered by the orifice.

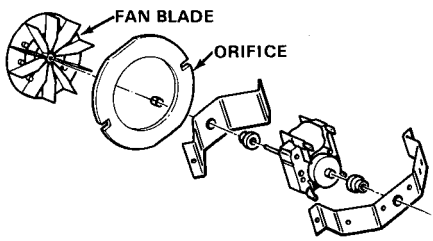


Figure 33 - Turbine Fan

Rubber grommets or isolators that are used to mount the fan motor must be in position not only to insure quiet motor operation but also to properly center the blade in the orifice. Likewise, the mounting screws must be

tight to properly secure the motor. All wiring should be carefully dressed to avoid obstructing the fan blade. The bearings are permanently lubricated for the life of the motor.

FAN MOTOR TESTING

Since the condenser fan and the evaportor fan are electro-mechanical devices, they are subject to both electrical and mechanical failures. To test the motor winding, use an ohmmeter and refer to the schematic wiring diagram for the resistance value. However, if the motor has been previously replaced, its resistance may be slightly different than the value shown on the schematic wiring diagram.

Fan motors, used on refrigerators and freezers, seldom fail due to an open winding. Likewise, an intermittent operation is isolated to the motor; the motor should be replaced.

More commonly, the motor will stall due to an obstruction of the fan blade. Because condenser fan and evaporator fan motors are designed to withstand a prolonged stalled condition, it should not be necessary to replace the motor after the obstruction is removed.

Rotate the fan blade slowly by hand with the motor shaft in the extreme positions (in and out) to check for a distorted blade or internal motor binding condition. Then, to check for worn bearings in the motor, spin the blade briskly and observe whether it turns freely or is sluggish. Also, listen for noise from the bearings and inspect for an unbalanced blade while the motor is energized. If the motor binds, or the bearings are rough or noisy, replace the motor. If the blade is unbalanced, it should be replaced.

However, don't suspect that a fan blade is unbalanced because it appears to be "deformed" near the tip of one or more blades. These raised, irregular shaped areas on the back (low pressure side) of the fan blade are molded into the blade to dynamically balance it and thus provide for quieter, smoother operation.

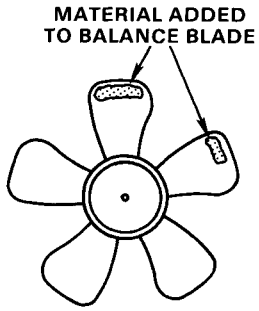


Figure 34 - Balance Fan Blade

DEFROST CONTROL

The defrost control consists of a clock motor, attached to an insulated housing that contains a cam, and a single pole, double throw switch.

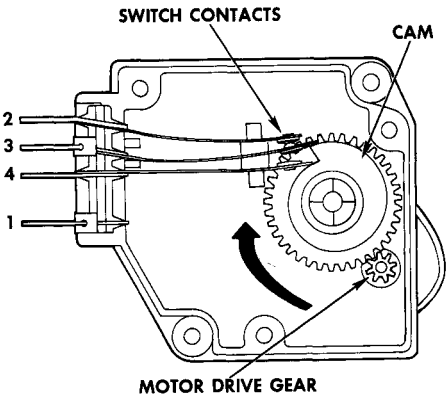


Figure 35 - Defrost Control

The purpose of the defrost control is to regulate the frequency of defrost cycles and the duration of each cycle. This is accomplished by energizing the clock motor to drive a set of gears that, in turn, rotates the cam which operates the switch. The defrost cycle begins when the cam has rotated to the position where terminal 4 switch blade drops off the edge of the cam. This opens the first set of contacts (terminals 3 and 4) and closes the second set of contacts (terminals 3 and 2). As the cam continues to rotate, terminal 3 switch blade will drop off the edge of the cam. This opens the second set of contacts (terminals 3 and 2) and closes the first set of contacts (terminals 3 and 4) thus, ending the defrost cycle. An audible "SNAP" can be heard each time a switch blade drops off the edge of the cam (at the beginning and ending of the defrost cycle).

To test the control electrically, use an ohmmeter and refer to the schematic wiring diagram for the proper terminals and resistance value of the control motor. Advance the cam manually to check continuity of the contacts for the compressor as well as for the defrost heater. The contacts should open and close for each circuit. Check the resistance of the control motor also. However, if the defrost control has been previously replaced, the resistance of the motor may be different than the value shown on the schematic wiring diagram. The motor resistance can be as low as 800 ohms or as high as 4000 ohms, depending on the control used. This test, however, will not prove that the control motor will run and advance the cam.

An operational test can be made which will check both the mechanical and electrical aspects of the defrost control. First, make sure the compressor is running, then manually advance the cam to the beginning of the defrost cycle. When the mark on the cam aligns with the mark on the control housing, an audible "SNAP" will be heard. Observe that the compressor stops.

Continue to advance the cam, while counting the number of "clicks" as the cam is rotated, until the second "SNAP" is heard. Advance the cam around to the beginning of the defrost cycle, where the marks align and the "SNAP" is heard. Continue to advance the cam, counting the "clicks" until only one "click" remains before the end of the defrost cycle. Wait approximately ten minutes to allow the control to advance through the remainder of the defrost cycle. Observe heater operation while listening for the second "SNAP" and for the com-

pressor to resume operation. If the defrost control does not advance, it should be replaced.

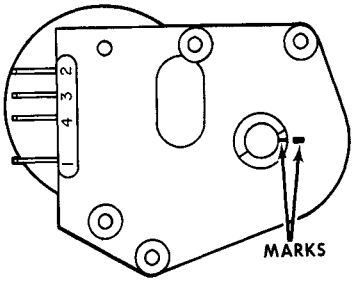


Figure 36 - Defrost Cycle Marks

NOTE: A defrost control failure usually results in a frost blocked evaporator. Due to the abnormal amount of frost accumulated, the evaporator must be completely defrosted to prevent a subsequent residual icing condition. If a heat gun is used, care must be taken to prevent melting foam and plastic parts adjacent to the evaporator.

When replacing a defrost control, make sure the proper size and type screw is used to mount the control to the bracket. A larger screw will damage the plastic control housing. Use the original screw to connect the replacement control ground wire to the cabinet in the same location as the original ground wire. Replacement defrost controls for some models are supplied as a kit which also contains mounting brackets, adapter brackets, lead wires, screws and instructions. Most, however, are supplied as individual controls that are like-for-like replacements.

Sankyo and Paragon defrost controls are interchangeable, however, the electrical terminals on the Sankyo control are in reverse order. Accordingly, when replacing one control with the other, care must be taken to insure that the wire leads are transferred to identically numbered terminals.

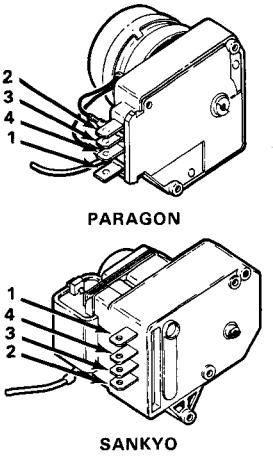


Figure 37 - Interchangeable Controls

DEFROST THERMOSTAT

The defrost thermostat consists of a single pole switch, a bimetal disc, and transfer pin within a metal and plastic case that is sealed with epoxy. Lead wires, welded to the internal terminals, extend through the case.

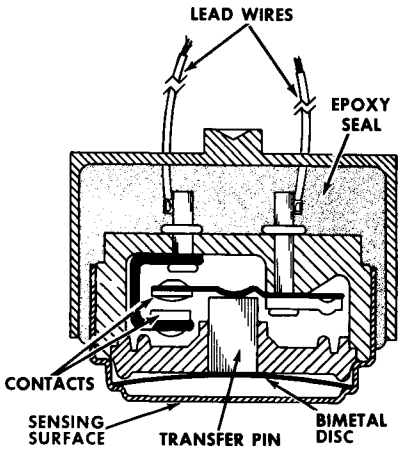


Figure 38 - Thermostat Construction

The purpose of the defrost thermostat is to de-energize the heater, during the defrost cycle, when the frost has melted from the evaporator. After all frost has been completely removed from the evaporator, the temperature of the evaporator begins to rise rapidly. When the limit temperature of the thermostat is sensed, the bimetal disc warps and pushes the transfer pin against a switch blade which opens the switch contacts. Conversely, when the temperature of the evaporator has cooled sufficiently, the bimetal disc warps in the opposite direction. Then, the spring-loaded switch blade pushes the transfer pin out of the way and closes the contacts.

The only practical method for testing the thermostat is to check it for continuity with an ohmmeter while it is mounted to a cold evaporator. Since the contacts should be closed (except during the later part of the defrost cycle and for the first few minutes thereafter) if the evaporator is cold and the contacts are found to be open, the thermostat has failed.

NOTE: If a defrost thermostat has failed, it should NEVER be by-passed in the circuit until the proper replacement can be installed. Such action would cause overheating of the defrost heater and surrounding surfaces which could result in severe damage to the product.

NOTE: A defrost thermostat failure usually results in a frost blocked evaporator. Due to the abnormal amount of frost accumulated, the evaporator must be completely defrosted to prevent a subsequent residual icing condition. If a heat gun is used, care must be taken to prevent melting foam and plastic parts adjacent to the evaporator.

When replacing a defrost thermostat, it must be mounted firmly in contact with the evaporator in order to properly sense the evaporator temperature. A clamp type bracket is used to mount the thermostat in various locations on the evaporator, depending upon the design of the product. Some are mounted directly to the evaporator tubing and others to the metal drain pan or plate. Lead wires should be spliced to the harness with closed-end or "bell" type connectors and the open end filled with RTV sealant to prevent moisture from entering the connection. Replacement defrost thermostats are generally supplied as a kit which also contains mounting brackets, wire connectors and instructions.

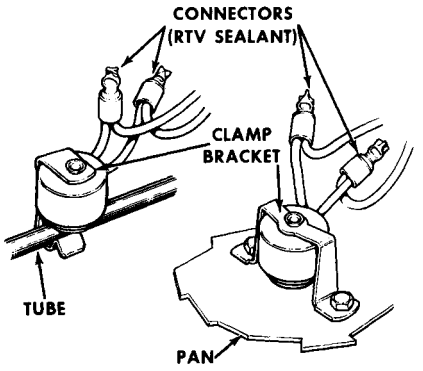


Figure 39 - Thermostat Mounting

DEFROST HEATER

The defrost heater, used on most models, consists of a heating element encased in a glass tube with terminals extending through insulated end caps. Most models use only a single heater, some use two heaters and others use three heaters. Where more than one heater is used, they are connected in series on some models and in parallel on others. Single heaters and heaters connected in parallel are operated on 115 volts, whereas heaters connected in series are operated on a lesser voltage accordingly.

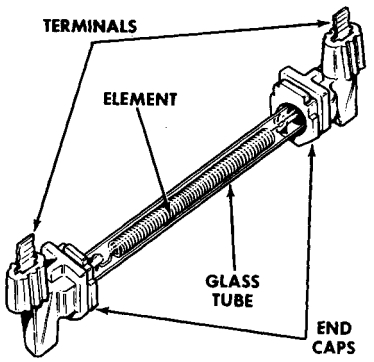


Figure 40 - Defrost Heater

The purpose of the defrost heater, located within and/or below the evaporator, is to melt the frost that has accumulated on the evaporator, and to warm the drain trough during the defrost cycle.

Defrost heaters should be tested for proper resistance as indicated on the schematic wiring diagram, using an ohmmeter. However, a visual inspection should also be made and the heater replaced if any of the following conditions are observed:

- element is open
- glass tube is broken
- glass tube is opaque with excessive green/black coating inside
- element coils are bunched together
- end caps or terminals are broken, deteriorated or corroded.

NOTE: Where heaters are connected in series and one has failed, NEVER by-pass the inoperative heater if a replacement is not available. The increased voltage applied to the other heater(s) could result in serious product damage. Furthermore, heaters connected in series should be replaced as a complete set. Replacing only one heater will cause early failure of the other heater(s). If the glass tube is broken, remove all broken pieces of glass from the drain trough area to prevent subsequent blockage of water in the drain tube.

NOTE: A defrost heater failure usually results in a frost blocked evaporator. Due to the abnormal amount of frost accumulated, the evaporator must be completely de-

frosted to prevent a subsequent residual icing condition. If a heat gun is used, care must be taken to prevent melting foam and plastic parts adjacent to the evaporator.

Defrost heaters are mounted to various types of brackets that secure the end caps. Reflector shields are also attached to the mounting brackts. When removing a heater from its mounting, use care in bending the tabs, which lock the heater and reflector shield in place, to prevent breaking the locking tab. Bend them only enough to allow heater removal and, likewise, to secure the replacement heater.

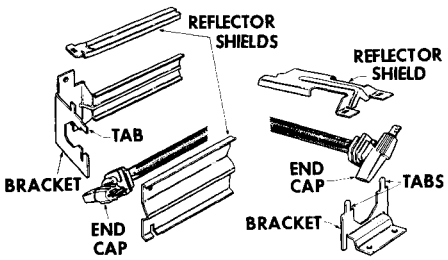


Figure 41 - Heater Mounting

NOTE: When replacing a defrost heater, avoid handling the glass tube with bare hands. Even minute quantities of salt, or other contaminants from the hands, deposited on the surface of the glass will increase the brittleness which could result in premature failure of the heater. Handle the heater by the end caps. If it should be necessary to grasp the glass tube, clean it afterward with a damp paper towel (avoid the use of a cloth).

Lead wires should be in good condition and firmly attached to the heater terminals to insure a good electrical connection. More importantly, lead wires must be properly dressed along the sides of the evaporator to avoid pinching under the evaporator cover and to prevent burning by the heater. Air stops or foam blocks positioned at the sides of the evaporator to channel and direct the air flow, must be properly repositioned, if dislocated while working with the wiring harness. Replacement defrost heaters for some models are supplied as a kit which also contains lead wires, reflector shields, mounting brackets and instructions. Most, however, are supplied as single like-for-like replacements.

SERPENTINE HEATER

Cycle-defrost model refrigerators have a small, low-wattage heater attached to the inlet and outlet tubing of the fresh food evaporator. The purpose of the serpentine heater is to insure complete defrosting of the fresh food evaporator during the off cycle. Connected across the the temperature control contacts (in series with the compressor), the heater is energized only during the off cycle.

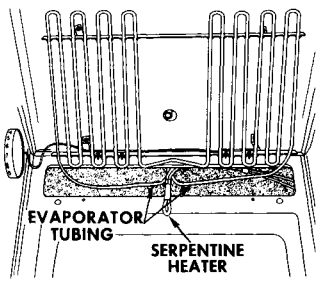


Figure 42 - Serpentine Heater

CABINET HEATERS

Resistance heaters are used in most refrigerator and freezer cabinets to warm critical areas. Heaters, placed behind the outer case flange (at the front of the freezer compartment) and behind the mullion (at the front, between the compartments) are used to prevent sweating on the exterior of the cabinet in these areas. Some top mount, automatic defrost model refrigerators have a heater placed on the surface above the liner top in the fresh food compartment. Its purpose is to prevent moisture from condensing on the fresh food liner top. On some models, it also serves to prevent ice accumulation in the defrost water drain area.

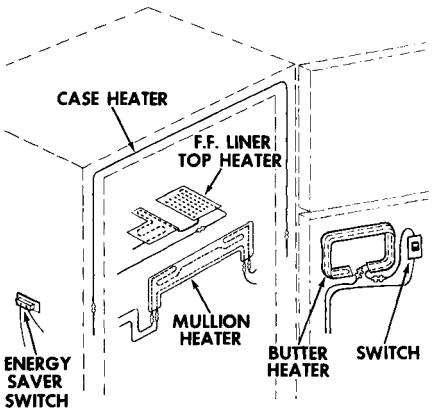


Figure 43 - Cabinet Heaters

During times when the humidity is low, these heaters are not needed to prevent sweating. Thus, on many two-door refrigerator models of recent years, an "energy saver" switch is provided which allows manual control of the heaters.

Case, mullion and fresh food liner top heaters are generally connected in parallel with each other and in series with the energy saver switch (when used). On most models, these heaters are also connected in series with the defrost thermostat. Connected thusly, some or all of these heaters (depending upon the model) are de-energized when the energy saver switch is positioned to the "dry" or "normal" setting and during the time when the defrost thermostat contacts are open.

Some models have a heater placed inside the inner door panel, surrounding the butter compartment. This heater is controlled by a switch which allows selection of butter consistency from hard to soft. Thus, the heater is energized when the switch is set to "soft" and de-energized when set to "hard". Although the butter conditioner circuit is connected in parallel with other cabinet heaters, it is not dependent upon the defrost thermostat for operation.

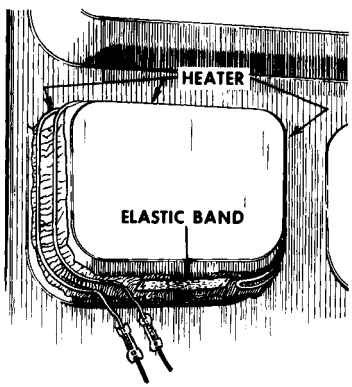


Figure 44 - Butter Heater

To test a cabinet heater, first disconnect the power cord, then disconnect one side of the heater from other parallel connected components. Connect an ohmmeter, set to the proper range, to the heater lead wires and compare the reading with the resistance value shown on the schematic wiring diagram.

On some models, the case heater is inaccessible for replacement, because it is foamed in place and there are no breaker strips. However, many models have a spare heater which can be connected in the event the originally connected heater fails.

When replacing a heater, it must be in contact with a metal surface along the entire length of the heater to effectively dissipate its heat. Loose areas where the heater does not make contact, and/or where the heater overlaps or doubles back closely, will cause a hot spot and eventually burn open. Use fiberglass insulation to hold the heater in a channel or aluminum tape to secure the heater in contact with the metal surface.

NOTE: Where a heater is used to warm a non-metallic (plastic) surface, it is essential for aluminum foil to be placed between the heater and the surface to be heated. Because plastic does not readily conduct heat, a heater must NEVER be placed in direct contact with any plastic part.

Sweating on the exterior of the cabinet or doors may be due to causes other than a burned-out heater, such as:

— Excessively high humidity
— Abnormally cold compartment temperature
— Energy Saver switch positioned "dry" or "normal"
— Door gasket not sealing to case, or to door, or to inner door
— Inner door shifted, excessive gap at one side
— Unsealed openings in case or door
— Defrost thermostat contacts not fully closed
— Insulation mispositioned, wet, or void
— Heater mispositioned or not in direct contact with metal at some point.

Heater kits are available for some models to correct a sweating condition of the freezer door exterior. (See FIELD CORRECTIONS section — Door Sweating — Upright Freezers).

INTERIOR LIGHT

Most refrigerators and many freezers have an interior light with a switch that is automatically operated when the door (or lid) is opened. The interior light consists of a lamp that is inserted into a socket and a switch.

NOTE: Extreme care should be taken when removing a lamp that has a broken glass bulb to prevent cuts from the glass and, more importantly, electrical shocks from the live filament wires. As a precaution, the power cord should always be disconnected before replacing a burned-out lamp — whether the glass is broken or not.

Molded plastic type lamp sockets are easily removed by prying the metal locking clip outward at the base of

the socket and then disengaging the hook from the mounting opening. The socket terminals can be released from the socket by bending upward on the center terminal and depressing the locking tab on the shell terminal.

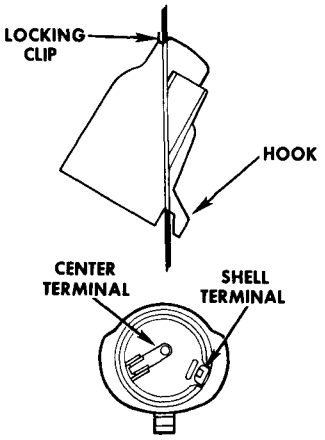


Figure 45 - Lamp Locket Removal

Switches are generally mounted in such a manner as to be directly operated by the door. However, on most chest freezers, a mercury type switch is encapsulated into the lamp socket and is operated by gravity of the pool of mercury when the lid is opened.

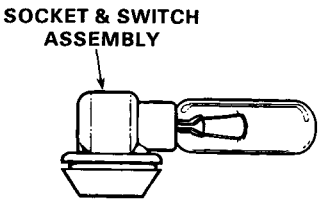


Figure 46 - Freezer Lid Light

The Refreshment Center compartment on some models has an interior light. A magnet, inside the top edge of the compartment door, de-activates a reed switch when the door is closed. The reed switch is located above the breaker frame. Accordingly, the inner door panel must be removed to gain access to the switch. The lamp is a standard 7C7 type and is covered by a light shield. To remove the light shield, compress both sides to release locking tabs.

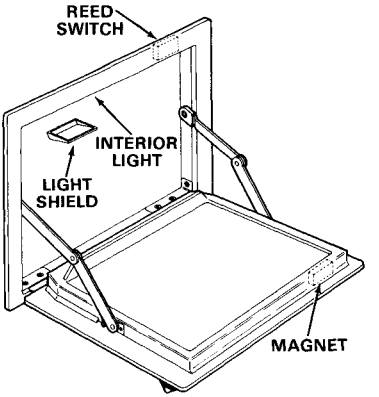


Figure 47 - Refreshment Center Light

While interior lights provide a convenience to the consumer in illuminating the cabinet interior, they can be a source of "poor refrigeration" if the lamp remains energized while the door (or lid) is closed. Failure of the lamp to be de-energized when the door (or lid) is closed may be due to an inoperative switch or improper switch actuation. This condition can be easily checked by peeping into the compartment while slowly opening and closing the door (or lid). If the light remains on when the door is closed, but the switch functions properly when manually operated, check improper engagement of the switch by the door. In some cases, it may be necessary to

adjust or reposition the door and/or the inner door panel for proper switch actuation.

Door operated light switches are either the plunger type or the rocker type. Removal of some plunger type switches requires access to the rear of the switch in order to compress the mounting tabs. Other plunger type switches can be merely pried free from the mounting opening. Rocker type switches can be removed from the front by first prying the left side out slightly, then prying the right side out fully. Use a putty knife having the blade wrapped with tape to prevent scratching the finish surrounding the switch.

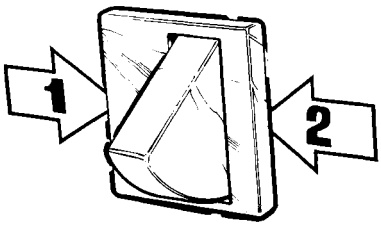


Figure 48 - Rocker Switch Removal

SIGNAL LIGHT

Many freezer models have a signal light, connected directly across the line, to indicate that power is applied to the product. Various types and sizes of neon lamps are used for this purpose.

Neon type lamps are susceptible to "blinking" or intermittent operation prior to failing completely. However, a test should be made with a "known-good " neon lamp to make sure the blinking condition is not a reliable warning of an intermittent wiring harness or house wiring connection.

Most neon lamps used for signal lights have a metal bezel that enables removal of the lamp from the front by prying along the outer edge. Use a putty knife having the blade wrapped with tape to protect the finish surrounding the light opening.

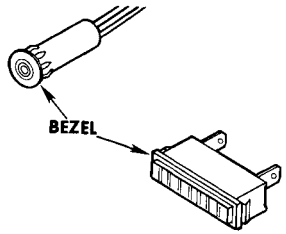


Figure 49 - Neon Signal Lamps

TEMPERATURE MONITOR

Some freezer models have a Temperature Monitor feature. The temperature monitor basically consists of a switch and a buzzer that operates on line voltage and is activated either by an additional set of contacts in the temperature control or by a separate temperature sensor. The buzzer will sound when the switch is set to the "On" position and a significant temperature rise is detected.

On upright freezer models, two signal lights are also included in the temperature monitor feature. An amber signal light indicates that power is applied to the freezer. A red signal light is energized when a significant temperature rise is detected, regardless of the switch position.

The various temperature monitor components that are used on a particular model are shown on the respective schematic wiring diagram.

WIRING HARNESS REPAIRS

The wiring harness is color coded to aid identification of individual conductors. Correspondingly, the wire colors are indicated on the schematic and pictorial wiring diagrams. On most models, brown and orange are the wire colors used to designate the hot (brown) and neutral (orange) conductors. On other models, black and white are used for these conductors. Likewise, other wire colors are dedicated for specific purposes, such as blue for the conductor from the defrost control to the defrost heater.

Because the wiring harness in the machine compartment is partially exposed to the consumer, and to protect it from compressor heat, heavier insulation is used for the machine wiring than for the cabinet wiring. On many models the machine wiring harness physically separates from the cabinet wiring harness at the R-E-D connector. For the most part, the cabinet wiring harness is either within the structure of the cabinet or encased by metal channels externally and, thus, heavy insulation is not required. However, in instances where the cabinet wiring extends into the machine compartment, or is otherwise exposed to the consumer, an additional sleeve type covering or tape wrapping is used.

Complete wiring harnesses are not availavle as replacement parts for any model. Accordingly, if a wiring fault should occur, it must be repaired. For splicing of wires, closed end (bell type) connectors and insulated butt splice connectors are the only types recommended. When the splices are located in the vicinity of the evaporator or in other moist areas, the open ends of the connectors must be filled with RTV Sealant and the open end positioned downward to prevent moisture from entering.

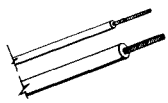
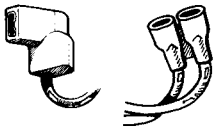
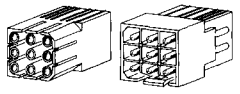
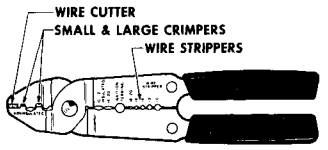
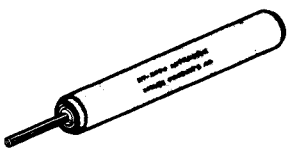
 BULK WIRE KITS (STRANDED, 18GA.)	**WR97X181** — STANDARD INSULATION FOR CABINET HARNESSES 4 — 10' LENGTHS: BROWN, ORANGE, BLACK, WHITE
	WR97X182 — HEAVY INSULATION FOR MACHINE HARNESSES 3 — 6' LENGTHS: BROWN, ORANGE, BLACK
 WIRE CONNECTORS (CRIMP TYPE)	**WR2X4330** — CLOSED END, SHORT SLEEVE FOR 4 WIRES
	WR2X4686 — CLOSED END, LONG SLEEVE FOR 5 WIRES
	WR2X4329 — BUTT SPLICE
 PUSH ON LEADS (1/4" TERMINALS)	**WR2X3294** — SINGLE, ANGLE INSULATED TERMINAL 4" LEAD WITH STANDARD INSULATION
	WR2X3338 — DOUBLE, STRAIGHT INSULATED TERMINALS 22" LEADS WITH HEAVY INSULATION
 CONNECTOR KIT (R-E-D)	**WR49X233** — MALE AND FEMALE CONNECTORS 9 EACH MALE AND FEMALE TERMINALS INCLUDED

Figure 50 - Wiring Harness Parts and Kits

Only two (2) special tools are required for safe and effective wiring harness repairs.



WX5X398 TERMINAL TOOL



WX5X19 EXTRACTOR TOOL

Figure 51 - Special Tools

INDEX — ROUND CUBE STYLE

(Continued on next page)

INDEX — CRESCENT CUBE STYLE

ROUND CUBE STYLE

IDENTIFICATION

Each icemaker is identified by catalog number. An identification label is affixed to the icemaker as shown in Figure 1. The catalog number of the icemaker must be specified when ordering replacement parts.

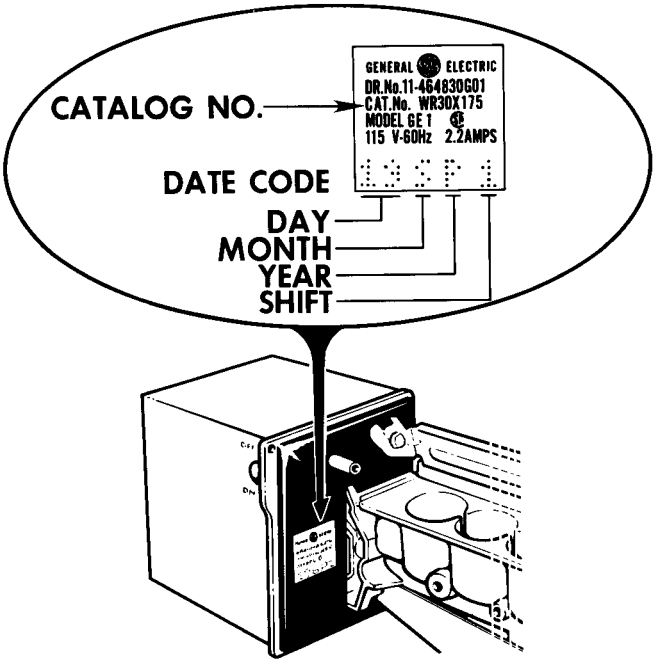


Figure 1 - Location of Identification Label

TYPES

Only two basic types are used, however, slight variations exist within each type to accommodate specific application requirements.

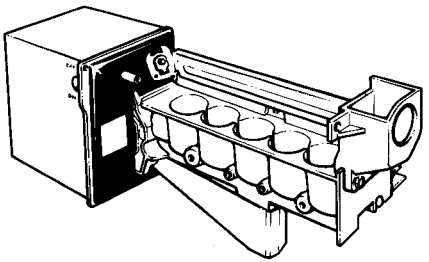


Figure 2 - Sweep Type - Used in most General Electric and Hotpoint models.

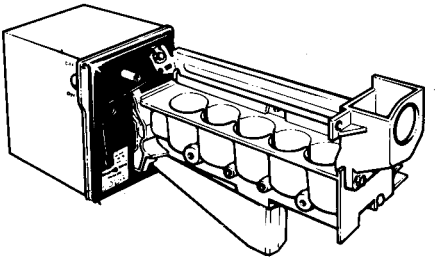
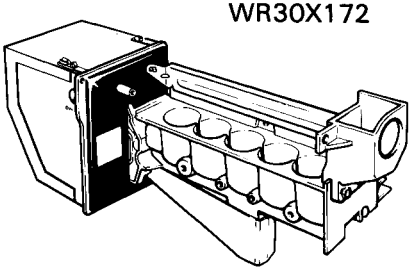
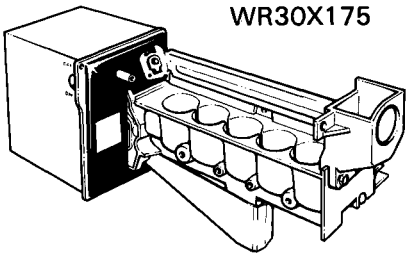
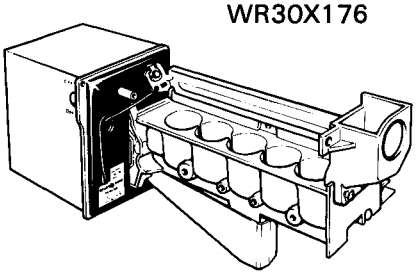
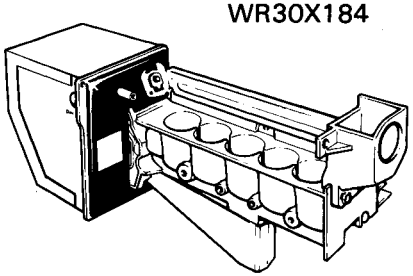
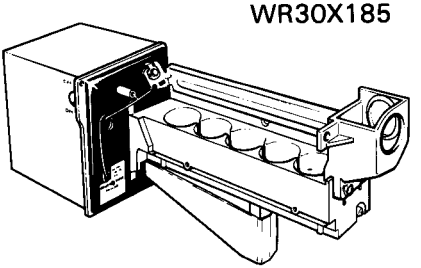
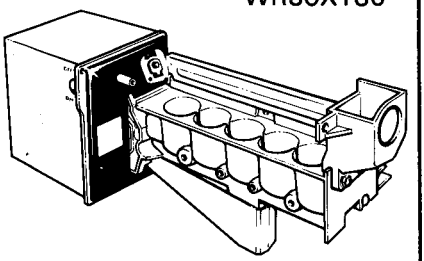
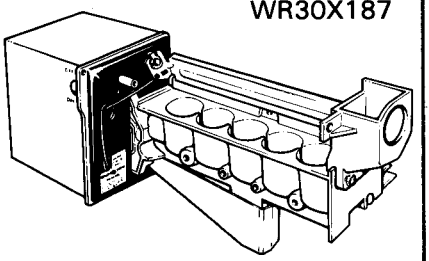
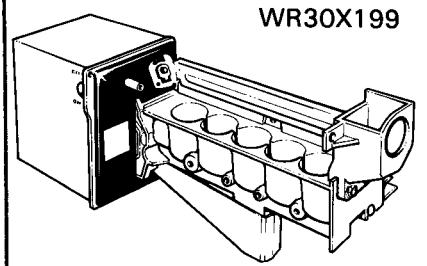
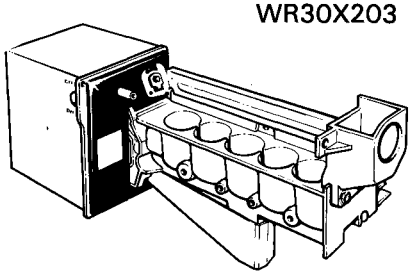
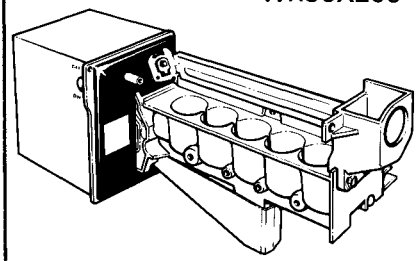
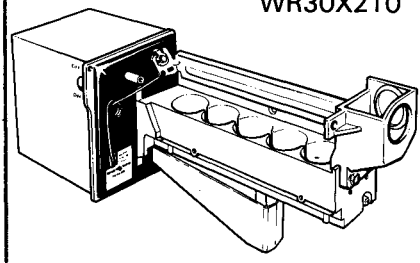
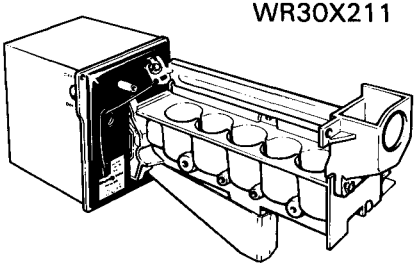


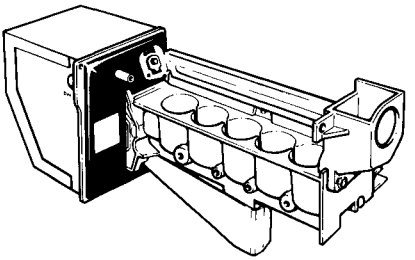
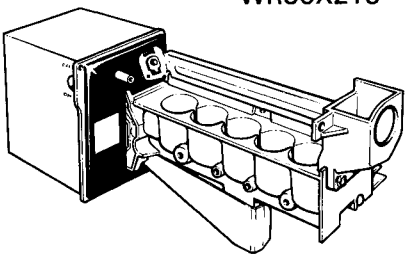
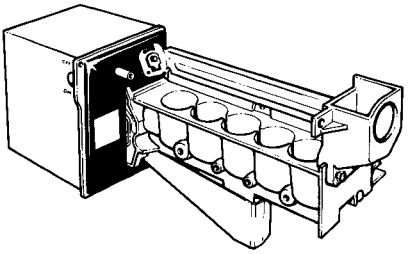
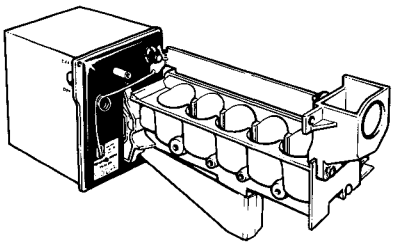
Figure 3 - Snap Action Type - Used exclusively in General Electric TBF-21, 22 dispenser models, TCF drawer models and early TFF-24R dispenser models.

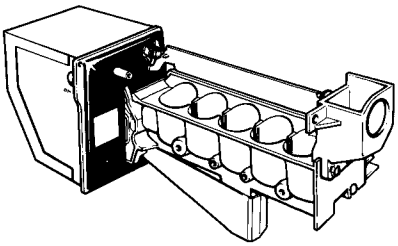
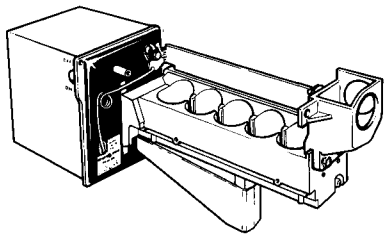
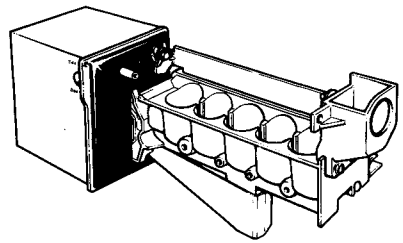
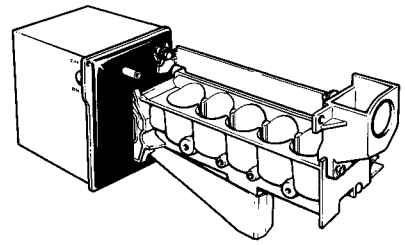
ICEMAKER SURVEY

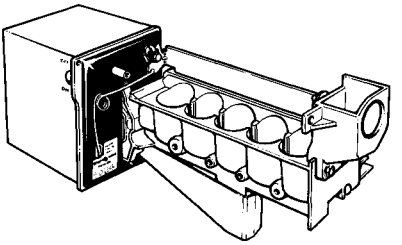
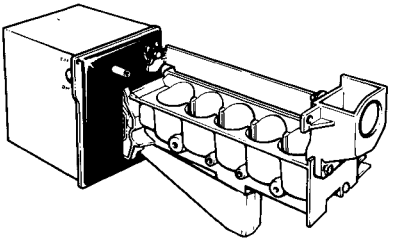
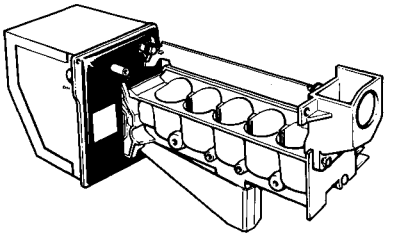
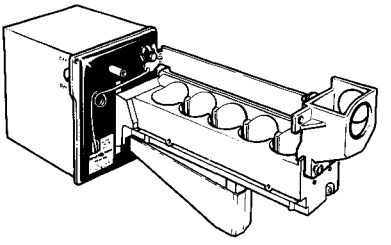
WR30X172 	SWEEP TYPE -5 Wire Power Cord -Integral Mold Fin -Metal Mechanism Cover -Photo Sensing Ice Level Controlled -Replaced by WR30X184	CSF-22KR CSF-24KR
WR30X175 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Replaced by WR30X186	TBF-16AR,AT,AV, AW TBFM18VW TFF-22RS,RT,RV, RW TFF-24RS,RT,RV, RW GE KIT 1 HPT KIT 1
WR30X176 	SNAP TYPE -4 Wire Power Cord -Integral Mold Fin -Metal Rake -Replaced by WR30X186	TBF-21RR
WR30X184 	SWEEP TYPE -5 Wire Power Cord -Integral Mold Fin -Metal Mechanism Cover -Photo Sensing Ice Level Controlled -Replaced by WR30X212	CSF-22KR CSF-24KR

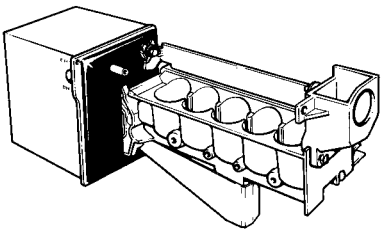
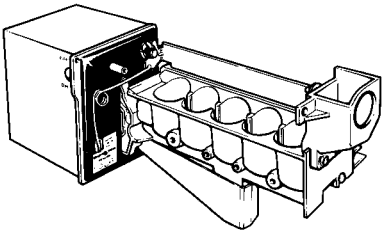
WR30X185 	SNAP TYPE -3 Wire Power Cord -No Mold Fin -Metal Rake -Replaced by WR30X210	Standard Replacement for TCF & early TFF-24R Models
WR30X186 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Plastic Rake (later production) -Replaced by WR30X209	TBF-16AY,AA TBFM17VA TBFM21VY TFF-22RY,RA TFF-24RY,RA CSF-22MT,MV, MW,MY, MA CSF-24MT,MV, MW,MY,DA GE KIT 1 & HPT KIT 1
WR30X187 	SNAP TYPE -4 Wire Power Cord -Integral Mold Fin -Metal Rake -Replaced by WR30X186	TBF-21RT,RV,RW, RY,RA,RB
WR30X199 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Plastic Rake -Stainless Steel Pad -Replaced by WR30X186	TBF-16AA TBFM17VA,VB TBFM19KB GE KIT 1 HPT KIT 1 UK KIT 1

WR30X203 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Plastic Rake -Replaced by WR30X186	TFF-20RB TFF-22RA.RB TFF-24RA,RB CSF-22MA,MB CSF-22TB CSF-24DA,DB
WR30X209 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Plastic Rake -Aluminum Pad -Large Pad Screw -Replaced by WR30X237	Standard Replacement for Most Models
WR30X210 	SNAP TYPE -3 Wire Power Cord -No Mold Fin -Metal Rake -Large Pad Screw -Replaced by WR30X236	Standard Replacement for TCF & Early TFF-24R Models
WR30X211 	SNAP TYPE -4 Wire Power Cord -Integral Mold Fin -Metal Rake -Large Pad Screw -Replaced by WR30X234	TBF-21RB

WR30X212 	SWEEP TYPE -5 Wire Power Cord -Integral Mold Fin -Metal Mechanism Cover -Photo Sensing Ice Level Controlled -Large Pad Screw -Replaced by WR30X235	Standard Replacement for CSF-22/24K Models
WR30X213 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Plastic Rake -Stainless Steel Pad -Large Pad Screw -Replaced by WR30X238	TBFM17VB CTFM15VB UK KIT 1
WR30X214 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Plastic Rake -Large Pad Screw -Replaced by WR30X238	TFF-20RB TFF-22RB TFF-24RB CSF-22TB CSF-24DB
WR30X234 	SNAP TYPE -4 Wire Power Cord -Integral Mold Fin -Flat Metal Rake -Large Pad Screw -Replaced by WR30X237	TBF-21RB

WR30X235 	SWEEP TYPE -5 Wire Power Cord -Integral Mold Fin -Metal Mechanism Cover -Photo Sensing Ice Level Controlled -Flat Metal Rake -Large Pad Screw -Replaced by WR30X251	Standard Replacement for CSF-22/24K Models
WR30X236 	SNAP TYPE -3 Wire Power Cord -No Mold Fin -Flat Metal Rake -Large Pad Screw -Replaced by WR30X252	Standard Replacement for TCF & Early TFF-24R Models
WR30X237 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Flat Metal Rake -Aluminum Pad -Large Pad Screw -Replaced by WR30X253	Standard Replacement for Most Models
WR30X238 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Flat Metal Rake -Stainless Steel Pad -Replaced by WR30X241	TBF-17AF TBFM17VB TFF/TFX-20RC,RF TFF/TFX-22RC,RF TFX-24EF TFF/TFX-24RC,RF TFF/TFX-24SC,SF CTFM15VC CSF/CSX-22TC,TF CSF/CSX-24DC,DF UK KIT 1

WR30X239 	SNAP TYPE -4 Wire Harness -Integral Mold Fin -Flat Metal Rake -Large Pad Screw -Replaced by WR30X254	TBF-22RC TBX-22RF
WR30X241 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Flat Metal Rake -Aluminum Pad -Large Pad Screw -Replaced by WR30X237	TBFM17VB, VC CTFM15VB, VC UK KIT 1
WR30X251 	SWEEP TYPE -5 Wire Power Cord -Integral Mold Fin -Metal Cover -Photo Sensing -Flat Metal Rake -Aluminum Pad -Large Pad Screw	Standard Replacement for CSF-22/24K Models
WR30X252 	SNAP TYPE -3 Wire Power Cord -No Mold Fin -Flat Metal Rake -Aluminum Pad -Large Pad Screw	Standard Replacement for TCF & Early TFF-24R Models

WR30X253 	SWEEP TYPE -4 Wire Power Cord -Integral Mold Fin -Flat Metal Rake -Aluminum Pad -Large Pad Screw	Standard Replacement for Most Models
WR30X254 	SNAP TYPE -4 Wire Harness -Integral Mold Fin -Flat Metal Rake -Aluminum Pad -Large Pad Screw	TBX-22RG,RH

ACCESSORY ICEMAKER KITS

The GE KIT 1 or UK-KIT-1 accessory icemaker kits can be installed in the following General Electric model refrigerators.

TBF-14BV,BW,BY,BA,BB
TBF-14DR,DT,DV,DW,DY,DA,DB
TBF-15DB,DC,DF
TBF-15SB,SC,SF
TBF-15XF
TBF-15ZB,ZC,ZF
TBF-16BV,BW,BY,BA
TBF-16CV,CW,CY,CA
TBFG16CW
TBF-16DR,DT,DV,DW,DY,DA
TBF-16VR,VT,VV,VW,VY,VA
TBF-17BA-BB,BF
TBF-17CF
TBF-17DA-DB,DC
TBF-17KA
TBF-17LB,LC
TBF-17PB,PC
TBF-17SA,SB,SC,SF
TBF-17VA-VB,VC
TBF-17WA,WB,WC
TBF-17ZA-ZB-ZC
TBF-18BV,BW,BY
TBF-18CV,CW,CY
TBF-18DR,DT,DV,DW,DY,DA
TBX-18DF
TBF-18ET,EV,EW,EY,EA
TBF-18KW
TBX-18LF
TBX-18PF
TBF-18VR,VT,VV,VW,VY,VA
TBF-18ZW,ZY,ZA
TBX-18ZF
TBF-19BB
TBF-19DB,DC
TBF-19PB,PC
TBF-19ZB,ZC
TBX-20DF
TBX-20KF
TBX-20PF
TBX-20ZF
TBF-21BV,BW,BY,BA,BB
TBF-21CR,CT,CV
TBF-21DR,DT,DV,DW,DY,DA,DB
TBF-21KR,KT,KV,KW
TBF-21TW
TBF-21VY,VA,VB
TBF-21ZA,ZB
TBF-22DC
TBF-22PC
TBF-22ZC
TBX-23CF
TBX-23DF
TBX-23ZF
TFF-18ER,ES,ET,EV,EW,EY,EA
TFF-19BV,BW,BY,BA
TFF-19DR,DS,DT,DV,DW,DY,DA
TFF-19LA,LB,LC
TFX-19LF
TFF-19VS,VT,VV,VW,VY,VA
TFF-20BA,BB
TFF-20DA,DB,DC
TFX-20DF
TFX-20PF
TFF-20VA,VB,VC
TFF-22DR,DS,DT,DV,DW,DY,DA,DB,DC
TFX-22DF
TFF-22KR,KS,KT,KV,KW,KY
TFF-22ZA,ZB,ZC
TFX-22ZF
TFF-24DR,DS,DT,DV,DW,DY,DA
TFF-24ZA,ZB,ZC
TFX-24ZF

ICEMAKER

The HPT KIT 1 or UK-KIT-1 accessory kits can be installed in the following Hotpoint model refrigerators:

CTF-14ER,ET,EV,EW,EY,EA,EB
CTF-15AF
CTF-15CB,CC,CF
CTF-15DR*
CTF-15EB,EC,EF
CTF-15GB,GC,GF
CTF-16CR,CT,CV,CW,CY,CA*
CTF-16ER,ET,EV,EW,EY,EA*
CTF-17AB-AC
CTF-17BF
CTF-17CA,CB,CC,CF
CTF-17EA,EB,EC
CTF-17GA,GB,GC
CTF-17HF
CTF-17PA,PB,PC
CTF-18AV,AW,AY,AA*
CTF-18CR,CT,CV,CW,CY,CA*
CTF-18ER,ET,EV,EW,EY,EA*
CTX-18EF
CTF-18GY,GA*
CTX-18GF
CTF-18HV,HW,HY*
CTX-18LF
CTF-19EB,EC
CTF-19GB,GC
CTF-20EF
CTX-20EF
CTX-20GF
CTF-21CR
CTF-21ER,ET,EV,EW,EY,EA,EB
CTF-21GT,GV,GW,GY,GA,GB
CTF-22EC
CTF-22GC
CTX-23EF
CTX-23GF
CTX-23HF
CSF-19AY,AA
CSF-19DR
CSF-19ER,ET,EV,EW,EY,EA
CSF-20AA,AB,AC
CSF-20EA,EB,EC
CSX-20EF
CSX-20LF
CSF-22ER,ET,EV,EW,EY,EA,EB,EC
CSX-22EF

***NOTE: When a UK-KIT-1 Accessory Icemaker Kit is installed in Hotpoint CTF-15,16,18 models indicated above (*), a Pub. No. 86-3520 Air Duct is also required.**

A label on the back of each refrigerator that will accept an accessory icemaker kit indicates the appropriate kit to be used and the specific instructions to be followed. See Figure 4. The instructions included with the kit cover all of the steps to properly install the kit in the various refrigerator models.

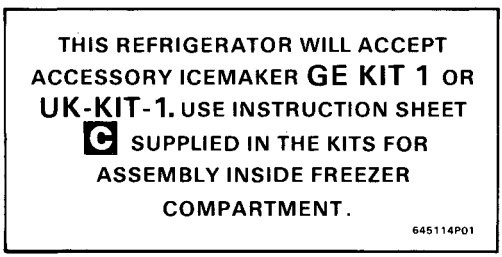


Figure 4 - Typical Label on Back of Refrigerator

WATER LINE INSTALLATION

If the refrigerator is to be operated before the water connection has been installed, the icemaker on-off lever must be kept in the "OFF" position.

A cold water supply line, with pressure between 15 and 120 PSIG, must be available for proper icemaker operation. Copper tubing, 1/4-inch O.D., should be used to connect the refrigerator to the cold water line. Plastic tubing or plastic fittings should not be used because the water supply line is under constant pressure. Certain types of plastic tubing may become brittle with age and crack, resulting in water leakage. Instructions for installing the water supply line are furnished with the installation kit. However **all installations must be in accordance with local plumbing code requirements.**

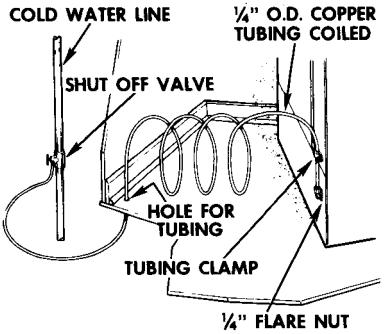


Figure 5 - Typical Installation

The copper tubing should be connected to the closest frequently used drinking water line, through a shut-off valve having a minimum inside diameter of 5/32-inch. Shut-off valves with a smaller inside diameter, especially the self-piercing type, should not be used because mineral deposits collecting inside the valve will reduce the water flow to the icemaker after only a few months' operation. The valve should be located in an easily accessible spot and, preferably into the side of a vertical water pipe. When connected to a horizontal water pipe, the connection should be to the top or side of the pipe, rather than the bottom, to avoid drawing off any sediment from the pipe.

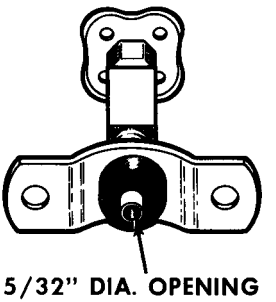


Figure 6 - Shut-off Valve

The copper tubing should be routed through a hole in the floor, wall or adjacent base cabinet—as close to the wall as possible. Sufficient extra tubing (about 8-feet, coiled into 3-turns of about 10-inches diameter) should be provided to allow the refrigerator to move out from the wall.

The copper tubing should be connected to the water valve with a 1/4-inch S.A.E. flare nut and secured to the back of the cabinet with a metal clamp to relieve strain.

Some localities may have sand or sediment present in the water supply in

such quantities that collect in the screen of the valve and tend to reduce the water flow to the icemaker. Where such conditions exist, it is recommended that a filter be installed in the line near the refrigerator. Instructions for installing the water filter in a variety of locations are furnished with the filter.

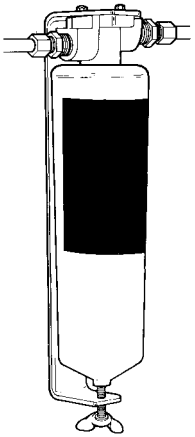


Figure 7 - Water Filter

ICEMAKER MOUNTING

Most icemakers have an easy-mount bracket with key-hole slots that hooks over two screws located in the side of the freezer liner. An adjustable bracket, used on some models for additional support, attaches to the top of the freezer liner. Alternately, the icemaker in some models is mounted to the side of the freezer liner with three screws that are located at the top and bottom of the mold.

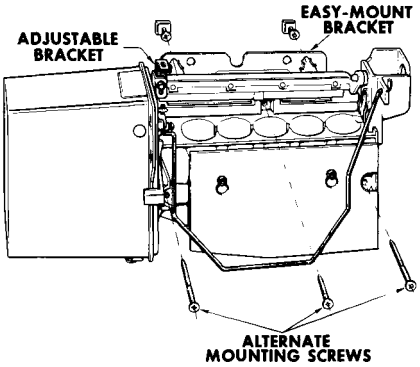


Figure 8 - Icemaker Mounting

The icemaker mounting on Hotpoint Exterior Ice Service models is similar, but has an additional screw through the rear of the mold. The ice chute and shelf completely enclose the icemaker. Three screws secure the chute to the freezer liner and the shelf above the icemaker rests on four supports in the liner.

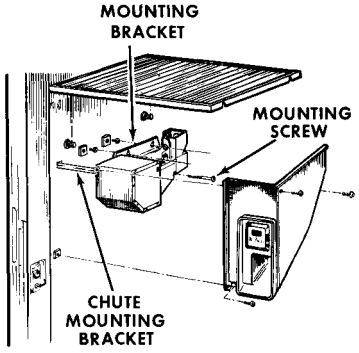


Figure 9 - Exterior Ice Service

Before mounting the icemaker, the power cord plug should be connected and firmly seated, and the opening of the fill cup positioned over the end of the fill tube. To prevent water from spraying out of the fill cup and/or freezing in the fill tube, the end of the fill tube should not rest against the inner surface of the fill cup.

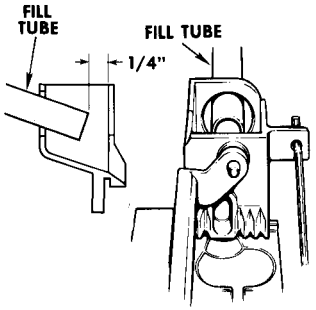


Figure 10 - Fill Tube Position

WATER VALVE MOUNTING

The water valve is mounted inside the machine compartment. Only one screw is used to secure the water valve bracket to the left rear corner of the refrigerator cabinet. The wiring harness lead wires have push-on terminals that connect to the water valve solenoid terminals. A 1/4-inch S.A.E. flare fitting is provided for connecting a copper water supply line to the inlet of the water valve.

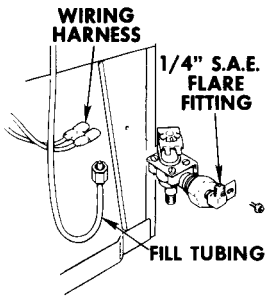


Figure 11 - Water Valve Mounting

Plastic fill tubing is connected to the outlet of the water valve by means of a plastic compression type fitting. The compression nut should only require "hand-tightening" when connecting the fill tubing to the water valve outlet. The fill tubing, routed out of the machine compartment and up the cabinet back, is inserted into the fill tube grommet and secured with a small hose clamp. Clamps are also used to secure the fill tubing to the cabinet back. The fill tube grommet extends from the cabinet back, through the cabinet insulation and into the freezer compartment.

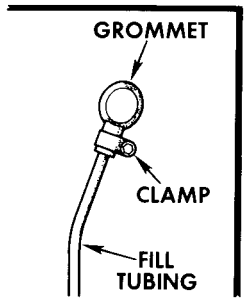


Figure 12 - Fill Tubing From Valve

OPERATION

The convenience of "automatic ice" is accomplished by means of an ice-making cycle which is a combination of electrical and mechanical operations. The complete cycle is divided into five portions: FREEZE,RELEASE, EJECTION, SWEEP, AND WATER FILL.

A description of the cycle of operation begins with water in the mold:

Freeze

Heat is removed from the water in the mold and freezing takes place. At this time, under normal operating conditions, the feeler arm switch is closed (see figure 13). The leaf switch contacts are open with the cam positioned as shown in "A" of figure 13. When the cubes are frozen the operating thermostat closes.

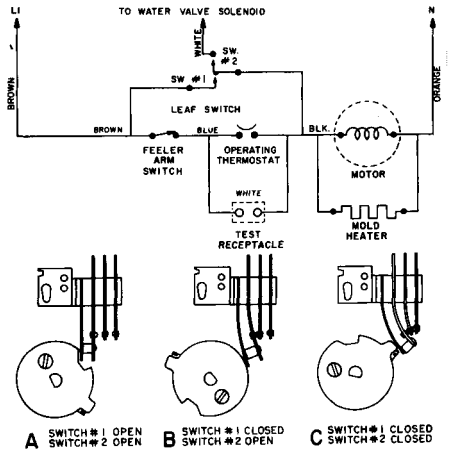


Figure 13 - Circuit with Cam Positions

Release

With the closing of the operating thermostat, a series circuit is completed through the feeler arm switch, and the operating thermostat to energize the motor and mold heater (see figure 13). The motor begins rotation but is immediately stalled by the frozen ice. The motor will remain in a stalled condition two to four minutes until the heater has melted the ice free from the mold.

At this time the cam on the motor shaft has advanced sufficiently to close switch no. 1 of the leaf switch thus completing a "holding circuit" around the feeler arm switch and the operating thermostat (see figure 13).

Once switch no. 1 is closed as shown in "B" of figure 13, the cycle will continue to the end with the motor and mold heater energized. Under normal conditions, the operating thermostat will open soon after the mold heater is energized.

Ejection

When the ice has been melted free from the mold, the motor resumes operation. The ejector lever, operated by the cam, raises the pad which pushes the cubes upward. The pad continues to rise until the cubes are fully out of the mold.

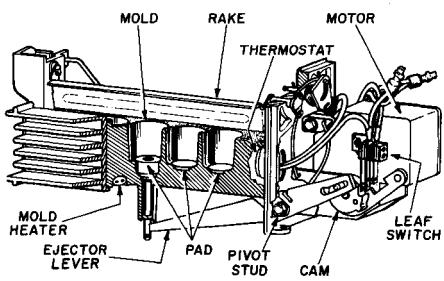


Figure 14 - Ejection

Sweep

As the pad reaches a maximum height, the feeler arm raises, and the rake sweeps the cubes from the pad into the ice bucket (see figure 15).

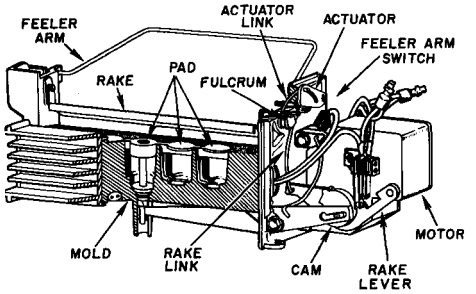


Figure 15 - Sweep

While the pad returns to the bottom of the mold, the feeler arm lowers, (the feeler arm switch opens if the bucket is full) and the rake returns to its original position against the mold flange.

The rake is driven by a fulcrum and a link connected to the rake lever. The rake lever, located between the cam and the motor with one end pivoted on the motor housing, is operated by a pin on the back side of the cam.

The feeler arm is driven by the actuator which is operated by a link connected to the rake fulcrum.

Water Fill

As the pad nears the bottom of the mold, the lobe on the cam closes Switch No. 2 (water fill switch) as shown in "C" of figure 13, energizing the water valve solenoid. The magnetic force of the energized solenoid raises the armature, allowing water to flow through the diaphragm. NOTE: THE DIAPHRAGM DOES NOT MOVE OR FLEX. Water then enters the fill cup for approximately six seconds and is directed into the mold, furnishing the required amount of water for the next cycle.

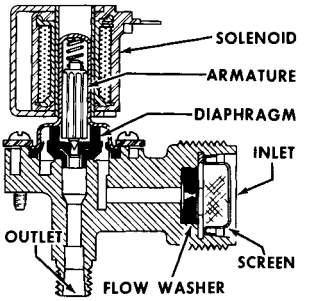


Figure 16 - Icemaker Water Valve

The 80 mesh screen in the inlet of the water valve prevents most foreign matter from entering the valve. The flow washer "meters" the water flow rate to a constant 13 cubic centimeters per second for pressures of 15 to 120 PSI.

Cycle Termination

The motor continues to rotate the cam after the pad is seated in the bottom of the mold, until switch no. 1 of the leaf switch is opened by the notch in the cam as shown in "A" of figure 13 thus terminating the cycle (the operating thermostat is open at this time).

When the ice level is at a maximum, the feeler arm comes to rest on the ice, opening the feeler arm switch. This prevents further cycles of the icemaker unitl ice is removed from the bucket.

Cycle Time

The average total cycle time is two to four minutes, although the actual motor operation time is only about 61 seconds. The difference is due to the length of time the motor is in a stalled condition.

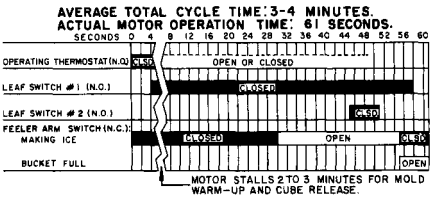


Figure 17 - Time Cycle Chart

Photo Sensing Types

The photo sensing type icemaker, used in refrigerators featuring Exterior Ice Service, is similar in mechanical operation to icemakers used in other refrigerators. However, this type differs significantly in electrical operation.

Due to the remote location of the ice bucket, there is no feeler arm or feeler arm switch to control the operation of the icemaker with respect to the ice level in the bucket. The icemaker operating thermostat contains a small internal heater. In the freezer compartment, a photo switch is located in the left breaker strip. A high intensity light source is located in the right breaker strip directly opposite the photo switch. Located below the photo switch, an ice service door switch interrupts the circuit to the icemaker: (1) when the ice service door is opened, (2) when the freezer door is opened, or (3) if the bucket is removed.

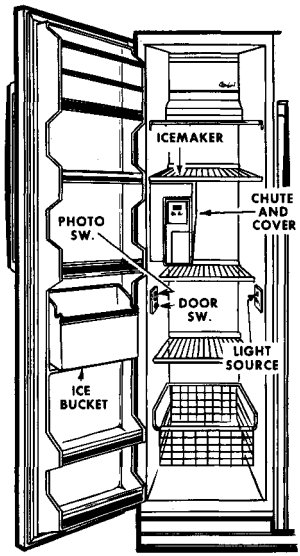


Figure 18 - Exterior Ice Service Components

The light source beam passes through openings in the sides of the ice bucket to strike the photo switch. When the ice level reaches a maximum height, the light beam to the photo switch is interrupted by the ice cubes. The absence of light causes the photo switch to conduct current. With the photo switch conducting, the heater inside the icemaker operating thermostat is energized.

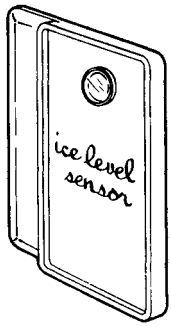


Figure 19 - Light Source

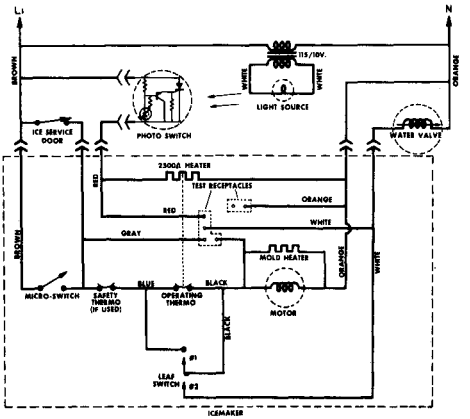


Figure 20 - Photo Sensing Type Icemaker Circuit Schematic

As long as the thermostat heater is energized, the thermostat contacts will not close because the thermosat temperature will not drop to 16 degrees F. When a sufficient amount of ice is removed from the bucket, the photo switch again receives the beam of light and no longer conducts current. With the photo switch not conducting, the heater inside the icemaker operating thermostat is de-energized. The temperature of the operating thermostat is allowed to drop to 16 degrees F, the contacts close, completing the circuit to energize the motor and mold heater, initiating the icemaker cycle of operation.

A micro-switch, located in the same position as the feeler arm switch on other icemakers is operated by the actuator. This switch by-passes the ice service door switch in the latter portion of the cycle after the cubes are swept from the pad. It assures the completion of the cycle if the freezer door is opened, the ice service door is opened, or the ice bucket is removed.

Manual control of the icemaker is accomplished with the "on-off" knob at the photo switch which exposes the photo switch to light when turned to the "on" position and covers the photo switch when turned "off"

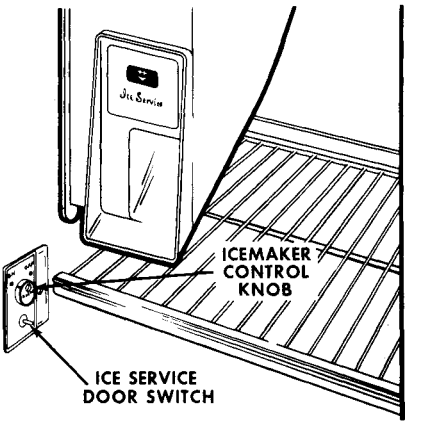


Figure 21 - Manual Control

USE AND CARE

The following operating tips should be remembered when servicing icemakers:

1. Water may overflow the mold on the first or second cycle when an icemaker is initially installed. Due to the absence of ice in the mold during the first cycle, the motor continues through the cycle without stalling. Accordingly, the heater is not energized long enough to cause the thermostat to open. Thus, the motor continues immediately into the second cycle

and water enters a second time, overfilling the mold.

2. It is recommended that the first few batches or ice cubes be thrown away after an icemaker is initially installed, or after any extended period of non-use, so that remaining impurities in the water will be flushed out.

3. The shut-off valve should be turned off if the refrigerator is not to be used for a considerable time, such as a vacation or in a summer cottage. This is a safety precaution against possible flooding in the event the icemaker should malfunction, or damage due to freezing.

4. The icemaker "on-off" lever should be turned off when the water supply is shut off. This will prevent the icemaker from operating without water which may shorten the life of the mold seal and/or water valve solenoid. Also, each time the icemaker cycles, heat is produced which must be removed by increased compressor running time.

5. Ice cubes that are stored for a considerable length of time may shrink in size and fuse together or become cloudy and taste stale. This is due to the cold dry air that is circulated throughout the refrigerator and over the ice cubes. Occasional stirring of the cubes will help prevent them from lumping. However, to avoid this, the ice bucket should be emptied periodically and washed with mild soap or detergent and warm water.

   If the unpleasant ice cube taste persists, or is noticed in other foods such as butter or margarine, the consumer should be advised to clean both compartments thoroughly.

6. Ice cubes may be discolored with a green-bluish hue under certain rare circumstances. The cause of this unusual discoloration may be due to a combination of factors such as local waters of certain characteristics, household plumbing and the accumulation of copper salts in an inactive water supply line which feeds the icemaker. Continued consumption of such discolored ice cubes may be injurious to health. If such discoloration is observed, the ice cubes should be discarded and the condition corrected as soon as possible. A high quantity water filter (WR97X214) will help alleviate this problem.

7. Slow ice cube production may occur in some models even when the freezer temperature is satisfactory. This is due to the lower compressor running time of some energy efficient models that results in cold air passing over the icemaker less frequently. Adjusting the freezer temperature control to a colder setting will increase the compressor running time and improve ice cube production.

DIAGNOSIS

Visual Inspection

Before making any test of the icemaker or related components, a visual inspection should be made with the icemaker in the refrigerator. This will provide the factual information necessary to determine what tests (if any) should be made and thus serve as the basis in rendering an accurate diagnosis.

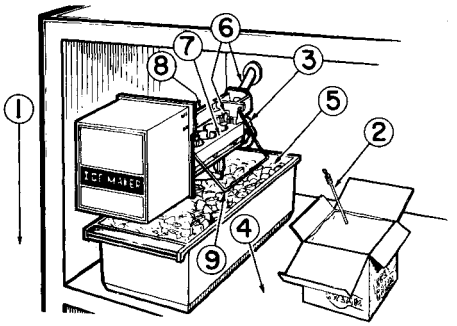


Figure 22 - Make A Visual Inspection

1. Check for WATER ON THE FLOOR under the refrigerator. Any water found may indicate a leak at the water valve or connections. A leak at the outlet of the water valve will cause a low water fill at the icemaker.

2. Check the FREEZER TEMPERATURE. Optimum frozen food temperature is 0° to 8°F.
   a. A temperature colder than 0°F. can cause:
      1. The ice cubes to crack, resulting in broken ice cubes in the ice bucket.
      2. The operating thermostat to close prematurely (icemaker cycles before cubes are frozen) ejecting "ice shells" or "hollow ice" with water remaining in the mold or ice cubes cracking open in the ice bucket, resulting in frozen lumps of ice.
      3. The ice cubes to remain frozen to the pad, resulting in ice cubes being "snapped" from the pad during sweep, thus, missing the bucket.
   b. A temperature warmer than 8°F. may cause:
      1. Ice cube "lumping" or "fusing", especially when the freezer compartment is lightly loaded or subjected to frequent door openings.
      2. A poor "ice rate" (long periods between cycles) or "not enough ice".

3. Check that the POWER CORD IS FULLY CONNECTED to the power receptacle. A loose power cord can cause an intermittent or no operation condition.

4. Check the FREEZER COMPARTMENT for ice cubes on the shelves or the freezer bottom. Any cubes found out of the ice bucket may be due to:
   a. A low water fill quantity resulting in light-weight cubes missing the bucket when swept from pad.
   b. The pad not seating in the bottom of the mold resulting in ice cubes, frozen to the pad, being "snapped" from the pad during sweep.

c. The feeler arm bent or switch out of adjustment, resulting in overfilling of the ice bucket.

d. The ice chute being broken or not properly positioned (Exterior Ice Service Models).

e. The plastic mold shield broken or missing (Exterior Ice Service Models).

f. The ice service door switch sticking (Exterior Ice Service Models).

5. Examine the ICE IN THE ICE BUCKET. All cubes should be approximately 1" in height, solid and with no "lumping", "fusing" or "ice sheeting" in the bucket.

   a. Ice cubes oversize or undersize indicates an incorrect water quantity.

   b. Ice cubes with liquid centers indicates premature cycling of icemaker.

   c. Ice cubes "lumping" or "fusing" may be due to long storage periods.

   d. "Ice Sheeting" may be due to:

      1. The ice bucket being removed from freezer compartment for long periods of time, allowing the cubes to melt.

      2. Spillage of water as a result of overfilling of the mold or leaks from the fill tube, fill cup or mold seal.

6. Check that the FILL TUBE AND FILL CUP ARE FREE OF ICE.

   a. Ice in the fill tube or fill cup may be due to the water valve not fully closing.

   b. Ice in the fill cup only may be due to a restriction of the fill cup outlet.

7. Check the WATER OR ICE LEVEL IN THE MOLD. The water or ice level should be below the top of the mold. A water level higher than normal may indicate: hardening of the rubber parts inside the water valve, icemaker motor stalling during water fill, or water fill screw out of adjustment.

   a. If the water level is too high:

      1. Water may spill from the mold during water fill, causing "lumping" or "ice sheeting" in the ice bucket.

      2. Ice cubes may remain webbed together when swept into the ice bucket.

   b. If the water level is too low:

      1. Light-weight cubes, still frozen to the pad, may be "snapped" by the rake and miss the ice bucket.

      2. Ice cubes may be too short for the rake to sweep them from the pad, and thus, return to the mold.

8. Examine the RAKE and LINKAGE

   a. The rake should be firmly positioned against the mold flange. If the rake is not firmly against the mold flange, or has too

much "slack" or "play" in the linkage, the rake action may not occur soon enough to sweep the ice cubes from the pad. Ice cubes then fall back into the mold, causing overfilling of the mold during water fill.

9. Check the FEELER ARM, SWITCH AND MECHANISM

   a. The feeler arm movement should be free from binding when raised and lowered. A binding feeler arm can result in "no ice" because the switch will not be closed. A distorted feeler arm can cause overfilling of the bucket. Interference of the feeler arm movement by shelves or food packages can cause the motor to stall.

   b. The feeler arm switch should "click" when the feeler arm is raised and lowered. If the feeler arm switch is inoperative or out of adjustment, overfilling of the ice bucket will occur. The feeler arm screw and push-nut should be in position and secure. These parts, if loose, can drop under the pad, preventing the pad from seating in the bottom of the mold.

On Hotpoint Exterior Ice Service Refrigerators (with photo sensing type icemakers), these additional items should be checked if the icemaker is inoperative:

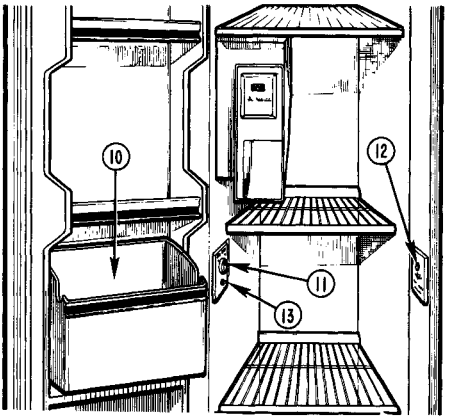


Figure 23 - Visual Inspection - Photo Sensing Type

10. Check that the ICE BUCKET is in place and is properly positioned.

11. Inspect the opening in the PHOTO SWITCH plate for obstructions.

12. Examine the LIGHT SOURCE for:

    a. Foreign matter on the lens.

    b. Burned out bulb.

    c. Darkened bulb.

    d. Missing lens.

3. Determine if the ICE SERVICE DOOR SWITCH:

   a. Plunger is depressed sufficiently when the door is closed.

   b. Plunger actuator arm is positioned properly.

Mechanical Test Procedure

Most mechanical testing can be made with the icemaker in the freezer compartment.

1. To check the CYCLE OF OPERATION, ice should be frozen in the mold, the on-off lever in the on

position and the feeler arm lowered. Initiate a cycle of operation by inserting a shorting tool into the white test receptacle.

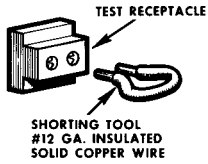


Figure 24 - Test Receptacle and Shorting Tool

On Hotpoint photo sensing types, insert the shorting tool into the "foot" of the "L" shaped test receptacle and depress the ice service door switch to initiate a cycle of operation.

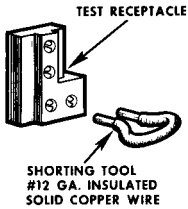


Figure 25 - Test Receptacle (Photo Sensing Types)

Observe the icemaker operation:

RELEASE - the motor should operate momentarily, then stall. The mold should warm slightly, releasing the ice cubes from the mold.

EJECTION - the motor should resume operation, pushing the ice cubes out of the mold cavities. The cubes should continue to rise until the pad reaches a minimum height of 1/16-inch above the top of the mold.

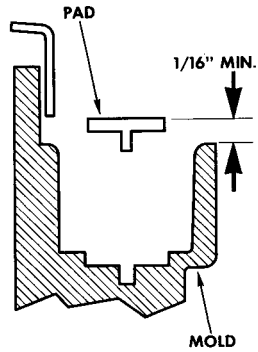


Figure 26 - Pad Height Clearance

SWEEP - while the pad is at its maximum height, the rake should operate, sweeping the ice cubes from the pad.

WATER FILL - as the pad begins to lower, water should enter through the fill tube into the fill cup and be distributed in the mold without spillage. The fill time should be about 6 seconds to give the correct fill quantity. The water fill should stop completely with no indication of water leaking through the valve.

CYCLE TERMINATION - the pad should seat firmly in the bottom of the mold and operation should stop within 8 to 10 seconds after water fill. The ejector rod should be free of water with no indication of water leaking from the mold seal.

It can be determined if the pad is seating firmly in the bottom of the mold by feeling the relationship of the pad and the mold bottom.

2. To check the WATER FILL QUANTITY, recycle the icemaker and measure the water quantity

in a bottle graduated in cc's (cubic centimeters). The water fill quantity should be at least 70cc's but not more than 85cc's (optimum is 80cc's).

The test adapter shown in figure 27 will facilitate testing in as much as the cycle can be interrupted by the toggle switch, the neon signal light will glow during water fill without energizing the water valve; however, the water valve can be manually energized by the momentary contact switch. A four wire adapter cord is included with the 14298 icemaker tester for use with four wire power cords.

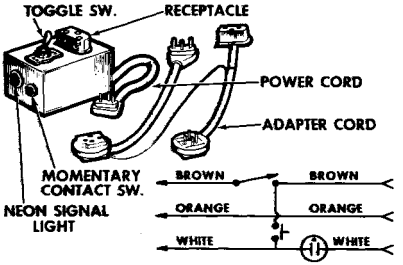


Figure 27 - Robinair 14298 Test Adapter

Electrical Test Procedure

Most electrical testing can be made with the icemaker in the freezer compartment after removing the ice bucket and mechanism cover. It is important, however, that the icemaker power cord be disconnected.

1. To check for PROPER VOLTAGE at the icemaker power receptacle, use a voltmeter to measure line voltage between the brown lead and orange lead terminals. See figure 28.

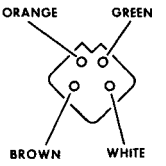


Figure 28 - Power Receptacle

2. To check the OPERATING THERMOSTAT, the mold temperature must be below 16°F., and the on-off lever in the off position. See figure 29.

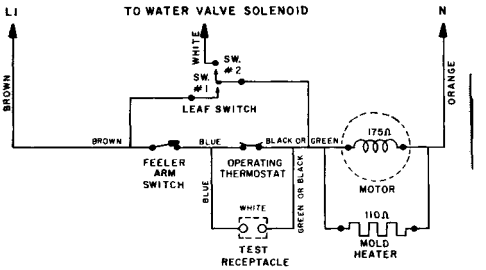


Figure 29 - Icemaker Wiring Schematic

   a. Use an ohmmeter to test for circuit continuity between the terminals of the white test receptacle.
      1. Continuity (0 ohms) indicates the operating thermostat contacts are closed.

3. To check the FEELER ARM SWITCH, the on-off lever should be in the on position, and the leaf switch contacts open.

   a. Continuity (0 ohms) indicates the feeler arm switch contacts are closed. Raising and lowering the feeler arm should open and close the switch contacts.

4. To check the MOTOR, disconnect one wire from the motor at one of the bell type connectors.

   a. Use an ohmmeter to measure the motor resistance.

      1. The motor resistance should be approximately 175 ohms.

5. To check the MOLD HEATER, disconnect one wire from the mold heater at one of the bell type connectors.

   a. Use an ohmmeter to measure the mold heater resistance. The mold heater resistance should be approximately 110 ohms.

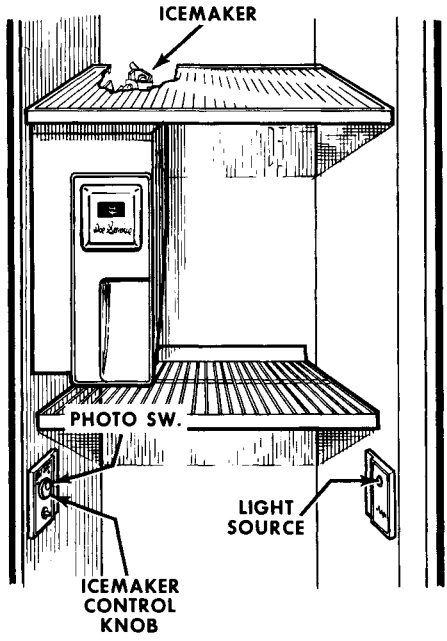


Figure 30 - Ice Level Control Components

Photo Sensing Ice Level Control Testing

The freezer compartment has a photo switch located in the left breaker strip and a high intensity light source located in the right breaker strip directly opposite the photo switch (see figure 30). The light source uses a no. 68 bulb operating on 10 volts A.C., supplied by a step-down transformer mounted in the unit compartment above the condenser fan. The operating thermostat in the icemaker has a 2500 ohm internal heater which, when energized, prevents the thermostat contacts from closing to start an ejection cycle.

Because the photo switch has a plastic case, a ground is not needed. Therefore, the photo switch can be snapped into the mounting plate correctly in either of two positions.

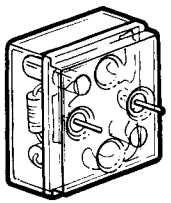


Figure 31 - Photo Switch

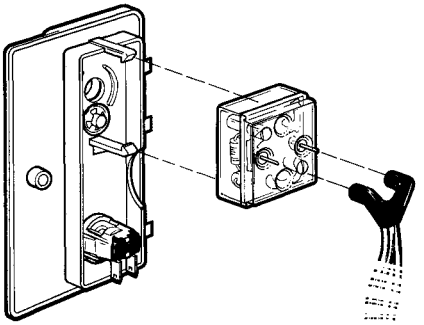


Figure 32 - Photo Switch Mounting

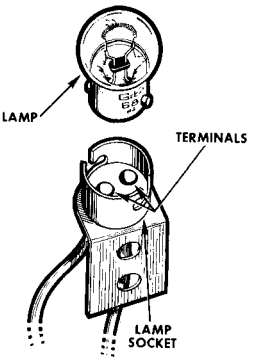


Figure 33 - Light Souce Lamp Socket

The following tests can be made with the icemaker in the freezer compartment and the power cord connected. The refrigerator power cord should be connected and the fresh food temperature control turned "on".

1. To determine the condition of the light source circuits:

   a. Check for PROPER VOLTAGE at the LAMP SOCKET, remove the lamp cover plate and bulb, then use a voltmeter:

      1. Measured voltage across the two lamp socket terminals should be approximately 10 volts, see figure 33.

   CAUTION: TO PREVENT DAMAGE TO THE TRANSFORMER, DO NOT ALLOW THE VOLT METER LEADS TO TOUCH THE LAMP SOCKET SIDES WHILE MEASURING VOLTAGE.

   b. Check for PROPER VOLTAGE at the TRANSFORMER PRIMARY, remove the unit compartment rear access cover and disconnect the transformer connector block, then use a voltmeter:

      1. Measured voltage across the orange and brown leads in the female terminals portion of the connector block should be approximately 115 volts (line voltage). See figure 34.

   c. Check TRANSFORMER WINDING resistance, use an ohmmeter:

      1. The primary resistance can be measured between male jack 3 and female jack 9 in the 14442 R-E-D tester. The measured resistance should be 170 ohms.

      2. Measured secondary winding resistance at the white leads in the male terminal portion of the connector block should be 2 ohms.

CAUTION: DO NO ATTEMPT TO MEASURE RESISTANCE AT THE FEMALE TERMINAL PORTION OF THE CONNECTOR BLOCK WITH THE REFRIGERATOR POWER CORD CONNECTED TO THE OUTLET RECEPTACLE.

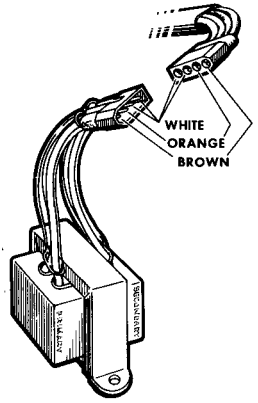


Figure 34 - Light Source Transformer and Connector

2. To accurately determine the condition of the photo switch circuit, a WR97X190 neon test light should be used. The WR97X190 test light has a built in ballast and does not require an external resistor. Its electrodes are large enough for a difference in intensity to be readily seen and distinguished.

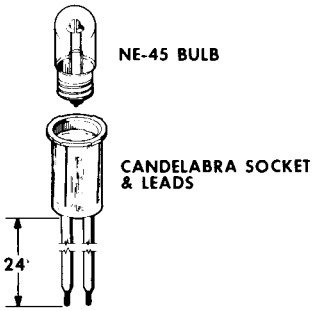


Figure 35 - WR97X190 Test Light

By using the neon test light and the following chart, the condition of the photo switch operating thermostat heater and light beam alignment can be determined by comparing the neon test light results with those shown in the chart. The test must be made with the refrigerator in operation.

Test procedure to be made with refrigerator in operation.

ICE MAKER MANUAL CONTROL KNOB POSITION – "ON"		CONDITION OF COMPONENT
ICE SERVICE DOOR CLOSED	ICE SERVICE DOOR OPEN 1"	
One electrode lights	One electrode lights	Mispositioned or Obstructed light beam
Neon off	One electrode lights	Photo switch & heater good
Neon off	Neon off	Photo switch open
Both electrodes light	Both electrodes light	Photo switch shorted
Both electrodes light	Both electrodes light, one brighter than the other	Thermostat heater open

NOTE: If a pocket neon test light is used, an open operating thermostat heater may show the same symptoms as a shorted photo switch. (Both electrodes light under darkened and lighted conditions). Most of the pocket type test lights will not distinguish one electrode lighting brighter than the other as in the case of an open thermostat heater.

a. Remove the shelf above the icemaker, and place the test light between the red lead terminal in the "L" shaped test receptacle and the orange lead in the remaining (two opening) test receptacle (see figure 36).

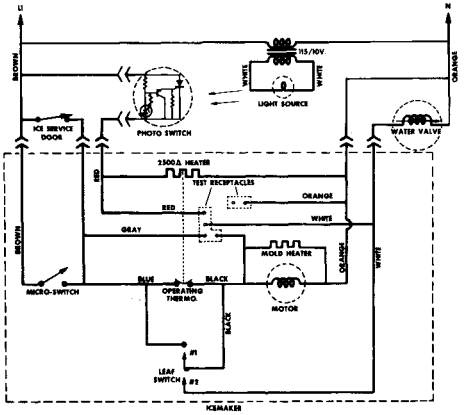


Figure 36 - Schematic with Receptacles on Cover Top

Route the test light out of the freezer compartment at the hinge side. Turn the control knob "on" and close the freezer door. Open (approximately 1") and close the ice service door and observe the test light. Opening and closing the ice service door interrupts the light beam as though turning the control knob "on" and "off". It also shows whether any of the door components might be out of alignment, thereby blocking the light beam when the freezer door is closed. Compare the results of the test light with the conditions listed in the chart.

3. To check the OPERATING THERMOSTAT HEATER, use an ohmmeter:

   a. Measured resistance between the red and orange lead terminals at the icemaker power cord should be 2500 ohms (see figure 37).

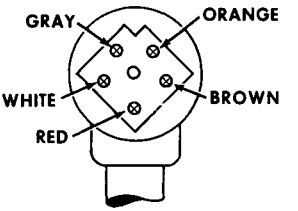


Figure 37 - Power Cord Plug

The following tests can be made with the icemaker in the freezer compartment after removing the shelf above the icemaker, the ice chute and the mechanism cover. Also, disconnect the icemaker power cord. See figure 38.

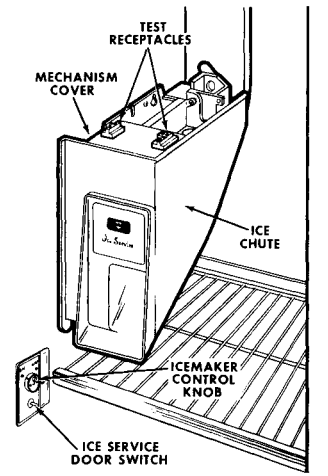


Figure 38 - Disconnect Power Cord

Remove Ice Chute and Mechanism Cover Prior to Testing

1. To check for PROPER VOLTAGE at the icemaker power receptacle use a voltmeter:

   a. Measured voltage between the brown and orange lead ter-

minals (see figure 39) should be approximately 115 volts (line voltage).

b. Measured voltage between the gray and orange lead terminals, while depressing the ice service door switch, should be approximately 115 volts (line voltage).

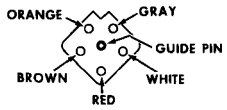


Figure 39 - Power Receptacle

2. To check the OPERATING THERMOSTAT, (mold temperature must be below 16°F. leaf switch contacts open) use an ohmmeter:

   a. Test for continuity between the gray and black lead terminals of the "L" shaped test receptacle (see figure 40).

      1. Continuity (0 ohms) indicates operating thermostat is closed.

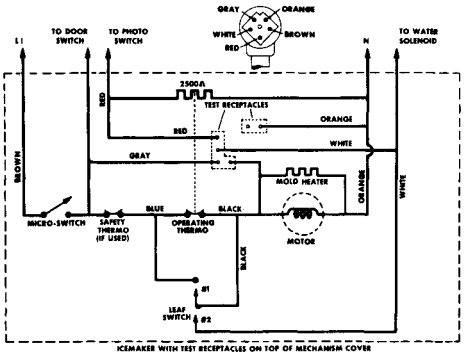


Figure 40 - Schematic

3. To check the MOTOR, disconnect wire from the motor at one of the bell type connectors.

   a. Use an ohmmeter to measure the motor resistance.

      1. The motor resistance should be approximately 175 ohms.

4. To check the MOLD HEATER, disconnect one wire from the mold heater at one of the bell type connectors.

   a. Use an ohmmeter to measure the mold heater resistance. The heater resistance should be 110 ohms.

5. To check the MICRO SWITCH, the leaf switch contacts must be open and the cam in the "off" position. Use an ohmmeter to test for continuity between the terminals of the switch.

   a. Infinity (no deflection) indicates the switch contacts are open.

   b. To check switch continuity, rotate the cam to a position slightly beyond the water fill or loosen the top switch mounting screw and move the switch away from the actuator.

   c. Continuity (0 ohms) indicates the switch contacts are closed.

   NOTE: The micro switch must be adjusted to .010 inch gap between the switch arm and the "off" position.

DIAGNOSIS GUIDE

This quick reference guide is a summary of conditions which could cause a failure.

DOES NOT MAKE ICE

(Icemaker Not Operating)

1. On-off lever in off position.
2. Circuit open to icemaker.
   a. Power Cord
   b. Icemaker Receptacle
   c. Cabinet Wiring
3. Feeler arm switch open.
   a. Out of adjustment or inoperative
   b. Feeler arm raised (off position)
   c. Feeler arm bent
4. Operating thermostat open.
   a. Out of calibration or inoperative
   b. Freezer not cold enough
5. Leaf switch inoperative.
   a. Improperly adjusted
   b. Leaves bent
   c. Contacts burned or dirty
   d. Contact spacer missing
6. Motor inoperative.
   a. Winding open
   b. Jammed or stalled
7. Mold heater inoperative.
8. Wiring open.
9. Exterior Ice Service Models Only:
   a. Icemaker control knob in off position
   b. Ice bucket missing or not properly positioned
   c. Door switch (at photo switch)
      1. Open or plunger not fully depressed
      2. Actuating arm distorted
   d. Light source
      1. Light blocked
      2. Bulb burned out or darkened
      3. Transformer windings open
      4. Wiring open
      5. Lens missing
   e. Photo switch shorted

DOES NOT MAKE ICE

(Icemaker Cycles but No Water Fill)

1. Water supply not plumbed in.
2. Shut-off valve closed or restricted.
3. Water line restricted.
4. Ice in fill tube.
5. Water valve inoperative.
   a. Solenoid open
   b. Valve stuck
   c. Valve restricted
   d. Circuit open to valve
6. Leaf switch out of adjustment or inoperative.

DOES NOT SHUT OFF

(Bucket Overfills)

1. Feeler arm bent or missing.
2. Feeler arm blocked.
3. Feeler arm switch out of adjustment.
4. Feeler arm switch stuck closed.
5. Exterior Ice Service Models only:
   a. Operating thermostat heater open.
   b. Photo switch open.
   c. Wiring open.

FLOODING OR ICE BUILD-UP—OTHER THAN CUBES
(Water or Ice in Freezer or Bucket)

1. Cubes not ejecting-fall back into mold
   a. Insufficient pad rise
   b. Incorrect water fill quantity
   c. Insufficient rake operation
   d. Pad not seating properly in bottom of mold (Dry Seal)
   e. Icemaker not level
   f. Mold heater not heating evenly
2. Water overfilling
   a. Fill time excessive
   b. Valve flow rate too high
   c. Mold heater not heating evenly
3. Fill tube improperly positioned in fill cup
4. Mold seal leaking
   a. Improper seal installation
   b. Insufficient lubrication (Dry Seal)
5. Icemaker tilted
6. Water valve not closing
7. Double cycling
   a. Motor coasting through "off"
   b. Moisture shorting leaf switch
8. Leaf switch improperly adjusted or bent
9. Fill cup not sealed to mold
10. Cube build-up in bucket under ejector rod

OVERSIZE CUBES
(Mushroom Head Cubes, Sometimes in Clusters)

1. Water fill time excessive
2. Water valve not closing
3. Water valve flow rate too high
4. Mold heater not heating evenly

SMALL CUBES
(Mold Underfilling)

1. Water fill time short
2. Low water pressure
3. Water valve restricted
4. Water supply restricted
5. Water valve or fill tubing leaking
6. Water valve flow rate low

UNACCEPTABLE CUBE CONDITION (Odor, Taste, Lumping, Sublimation, Frost, Color)

1. Odor and/or taste
   a. Long storage periods
   b. Transfer of food odors
   c. Water supply mineral
2. Lumping or fusing
   a. Bucket removed for long periods
   b. Frequent or long door openings
   c. Freezer too warm
   d. Freezer lightly loaded
   e. Light usage
3. Sublimation and / or frost
   a. Long storage periods
   b. Freezer lightly loaded
   c. Freezer too cold
4. Color
   a. Water supply
   b. Copper tubing

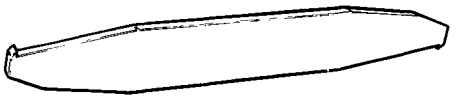
CUBES MISSING THE BUCKET
(Cubes on Freezer Bottom or Shelf)

1. Pad not seating in mold
   a. Pad binding

b. Pad or ejector rod slot misaligned
c. Pad bent or pitted
d. Foreign material under pad

2. Water fill time short
3. Water pressure low
4. Water valve or supply line restricted
5. Water valve flow rate low
6. Mold heater not heating evenly
7. Exterior Ice Service Models Only:
   a. Plastic mold shield broken or missing
   b. Ice chute broken or not properly positioned
   c. Door switch (at photo switch)
      1. Plunger sticking
      2. Shorted
   d. Micro switch shorted or not properly adjusted

SPECIAL TOOLS



Seal Remover (WX5X294 Robinair 14368) For Removing Mold Seal Retainer Washer

Seal Installer (WX5X260 Robinair 14173) For Installing Mold Seal

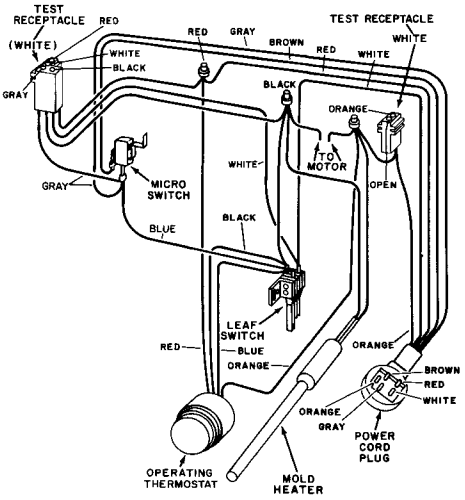
ICEMAKER

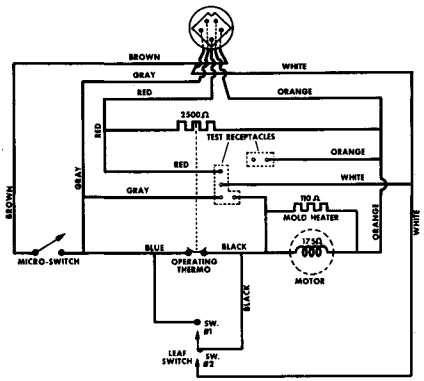
WR30X172

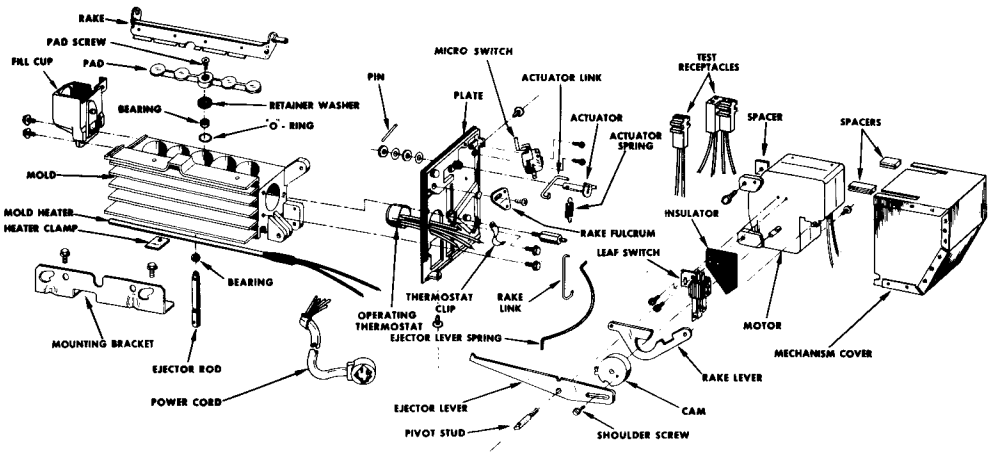
DATA

Operating Thermostat Limits 26°-14°F.
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle ..... 2 - 4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2 -5 1/2







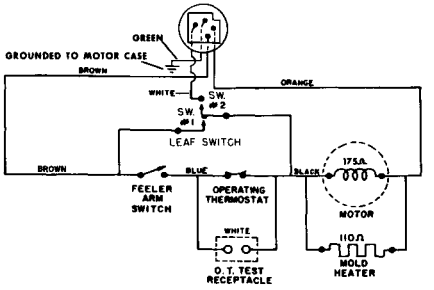
(WR4544,1213,14145)

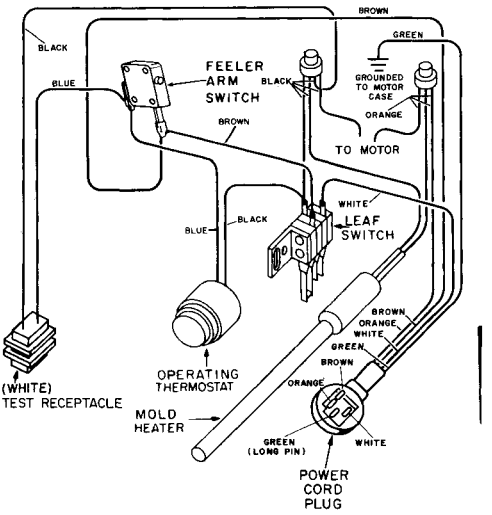
WR30X175, WR30X199, WR30X203, WR30X209, WR30X213, WR30X214,

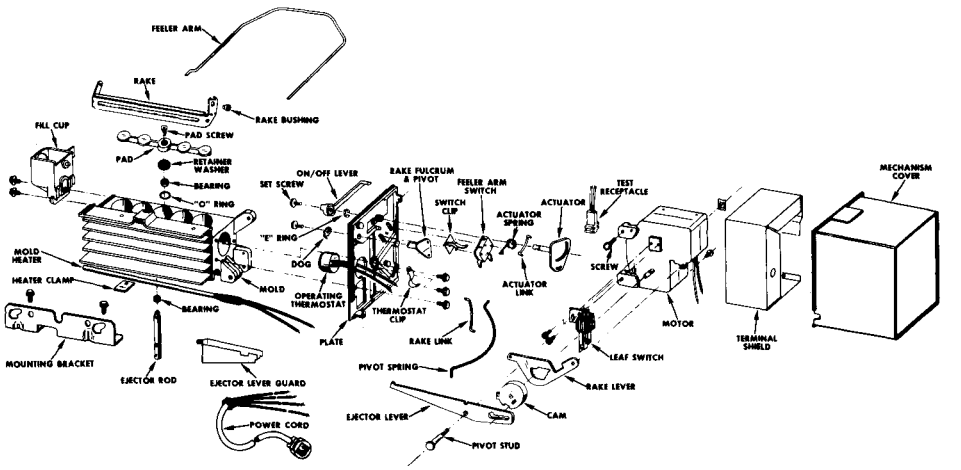
DATA

Operating Thermostat Limits 26°—16°F.
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle ..... 3 - 4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2 - 5 1/2





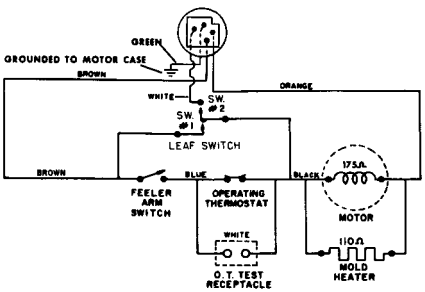


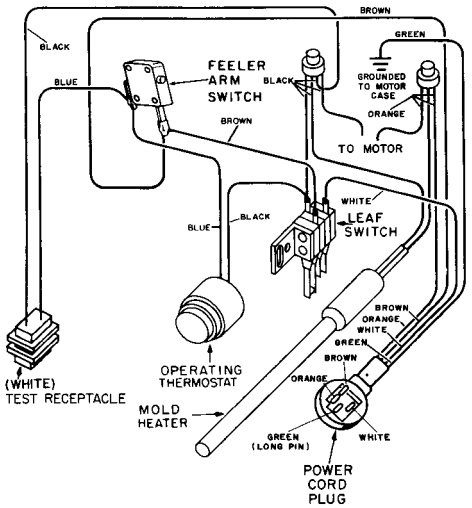
ICEMAKER

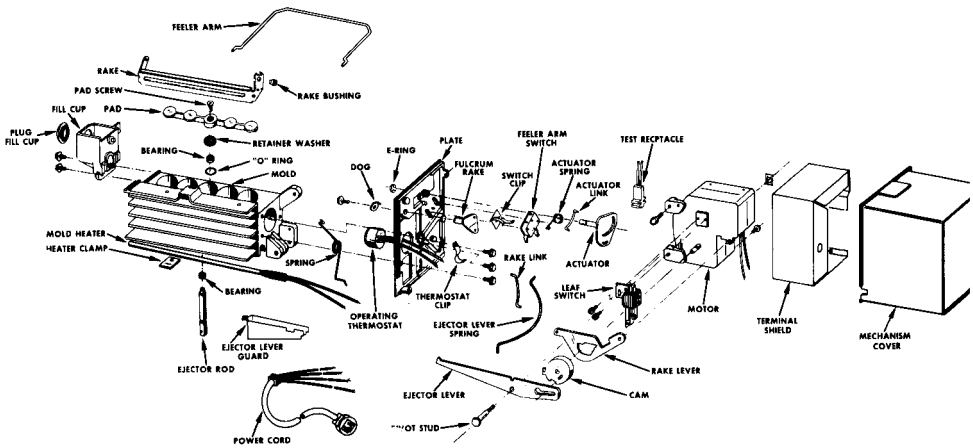
WR30X176
DATA

Operating Thermostat Limits 26°—16°
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle 3-4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2 - 5 1/2





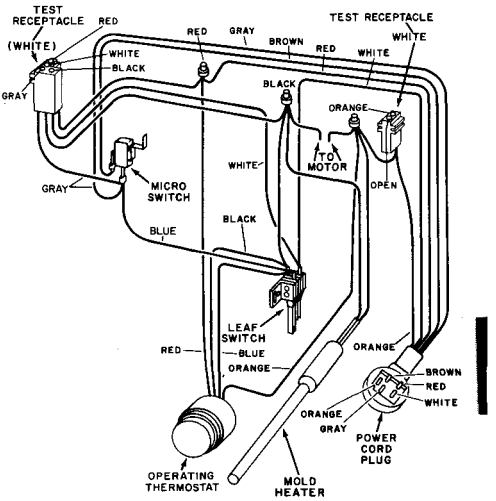


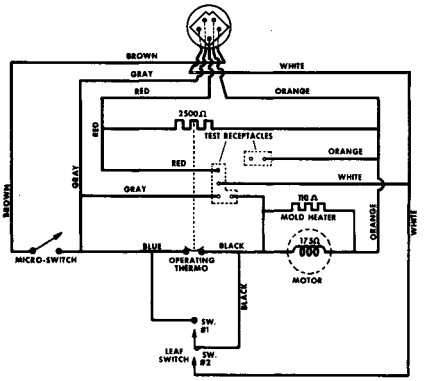
WR30X184, WR30X212

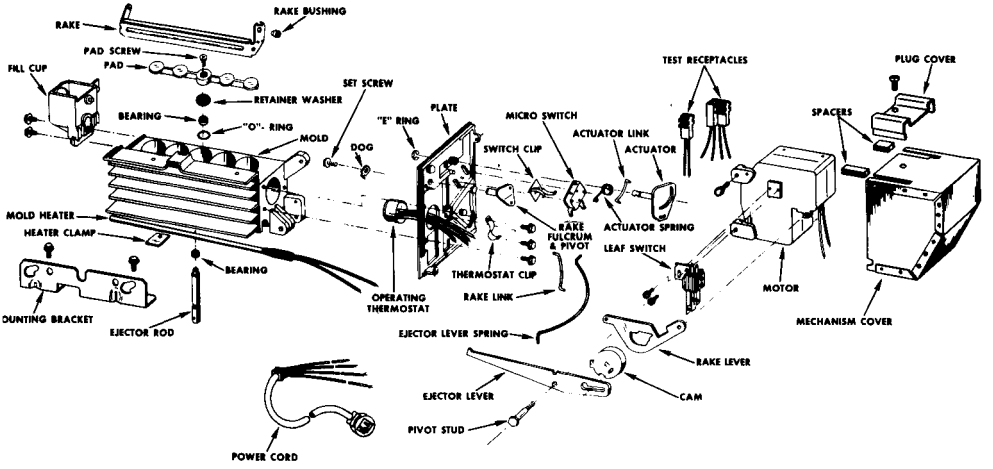
DATA

Operating Thermostat Limits 26°-14°F.
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle ..... 2 - 4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2 - 5 1/2



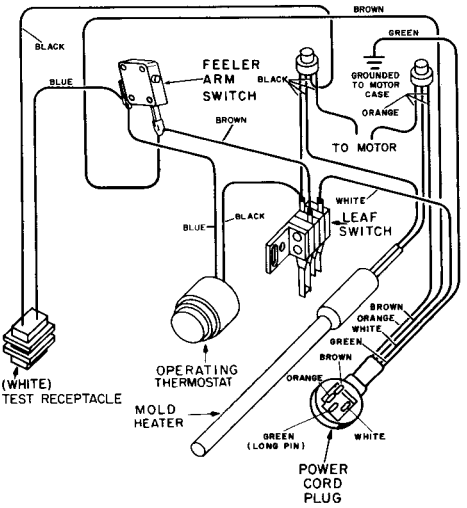


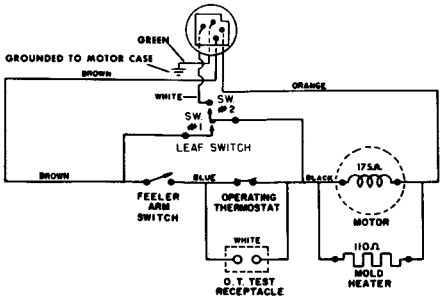


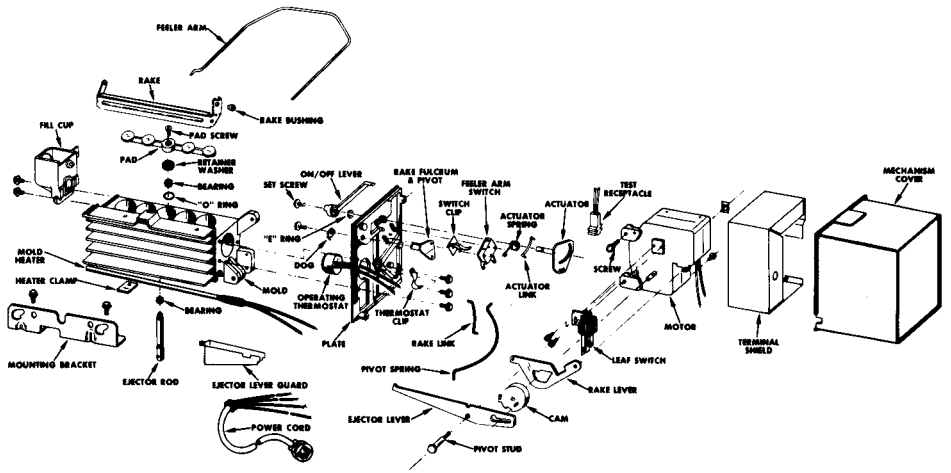
WR30X186
DATA

Operating Thermostat Limits 26° - 13°F.
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle ..... 3 - 4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2 - 5 1/2





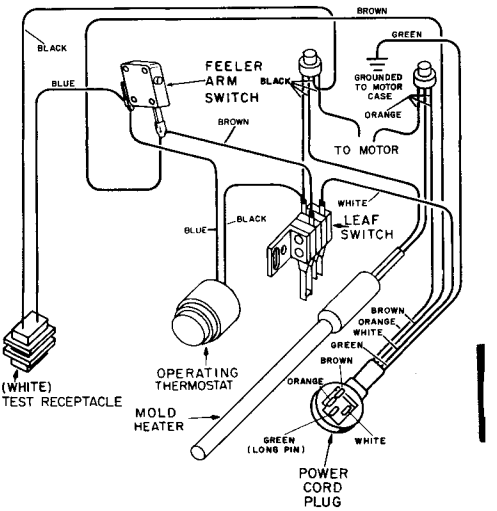


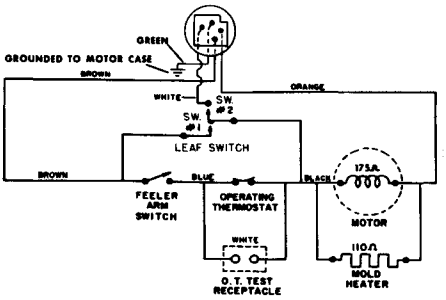
WR30X187, WR30X211

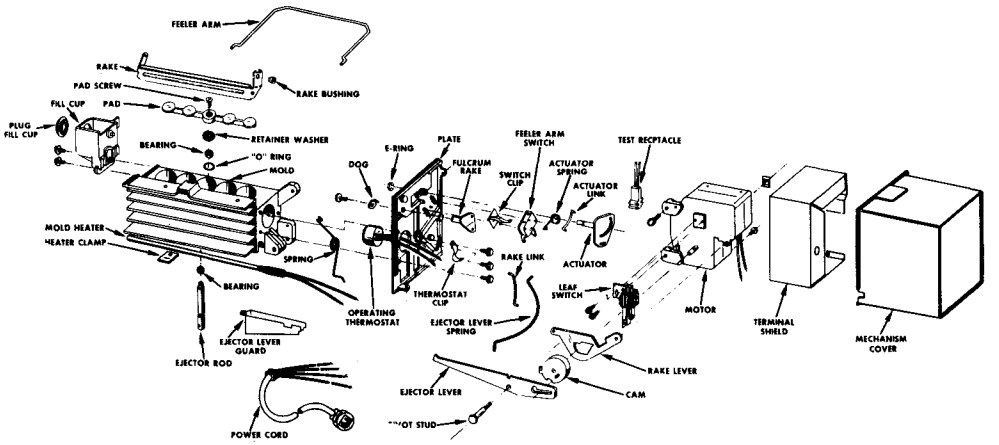
DATA

Operating Thermostat Limits 26°-13°F.
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle 3-4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2 - 5 1/2







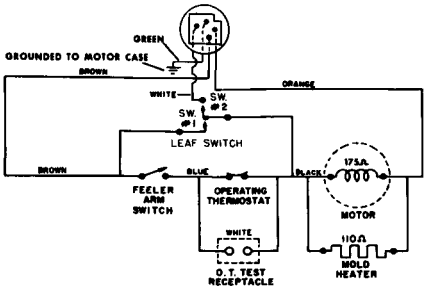
ICEMAKER

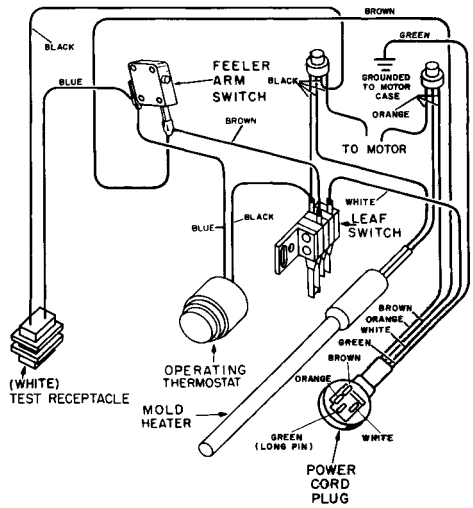
WR30X234

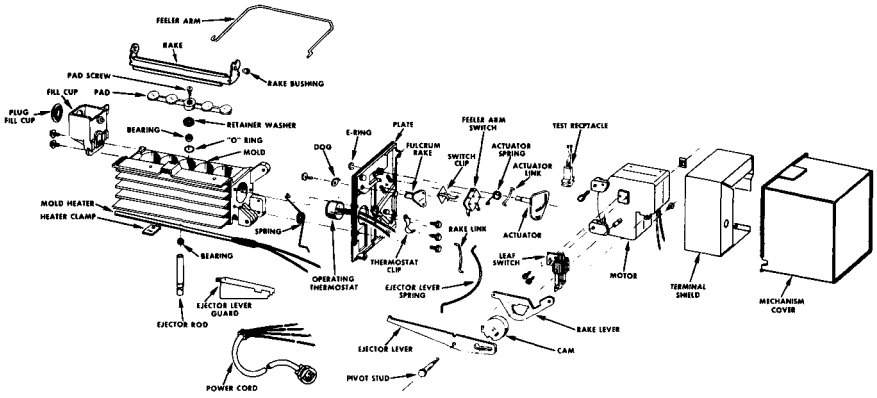
DATA

Operating Thermostat Limits 26°-16°
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle 3-4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2-5 1/2





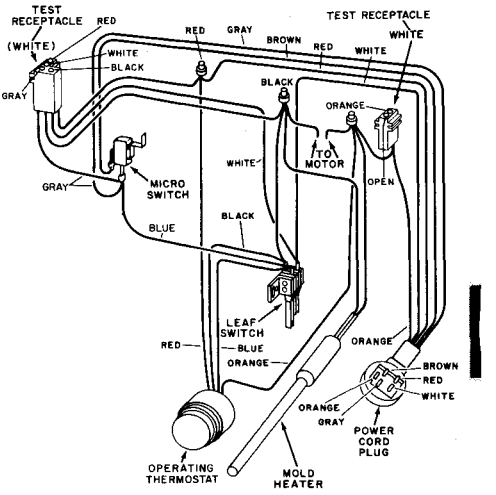


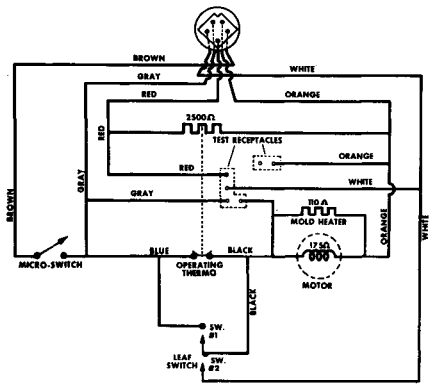
WR30X235

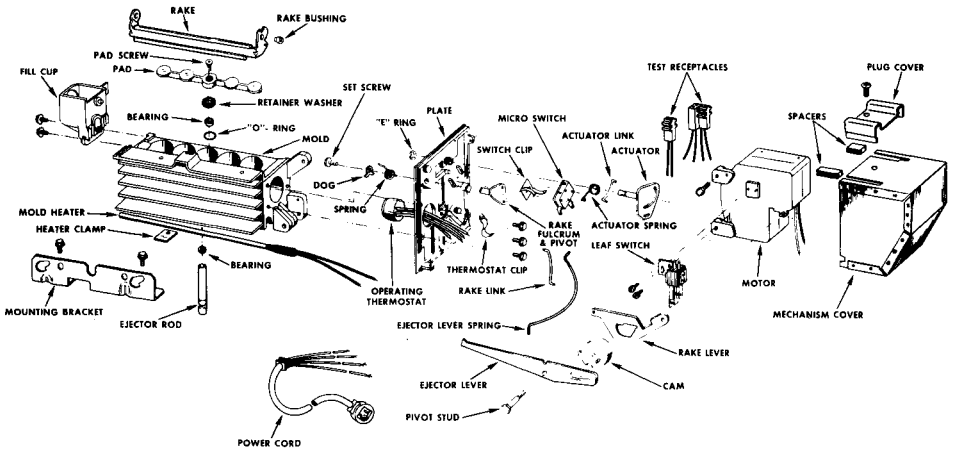
DATA

Operating Thermostat Limits 26°-14°F.
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle ..... 2 - 4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2-5 1/2







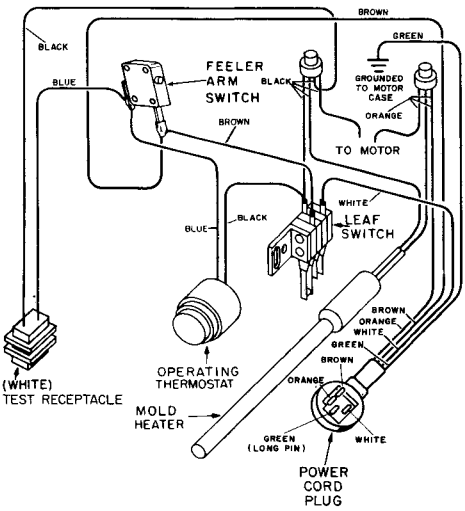
ICEMAKER

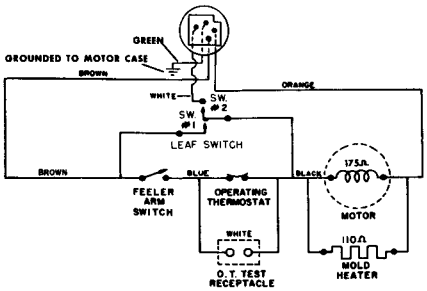
WR30X237, WR30X238, WR30X241

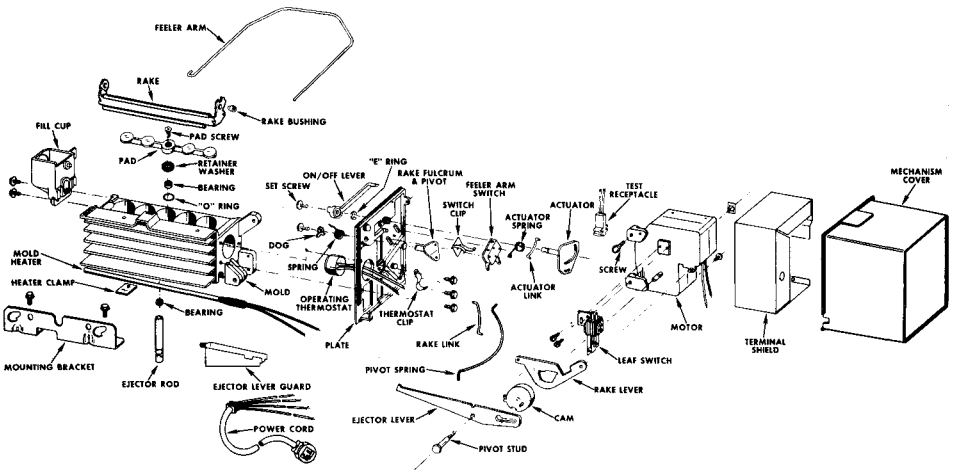
DATA

Operating Thermostat Limits 26°-13°F.
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle ..... 3 - 4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2-5 1/2





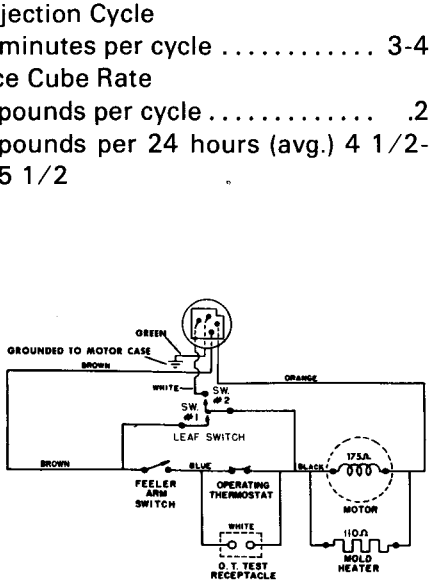


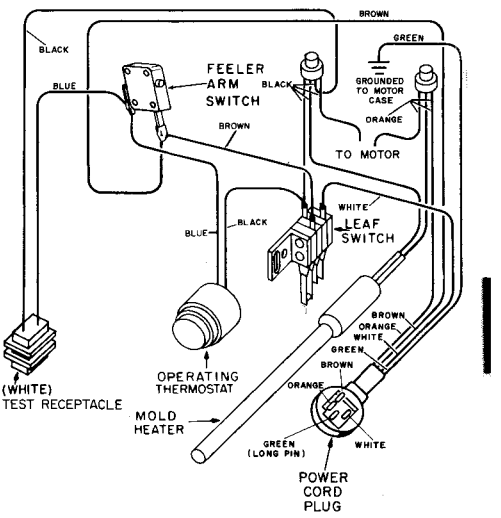
WR30X239

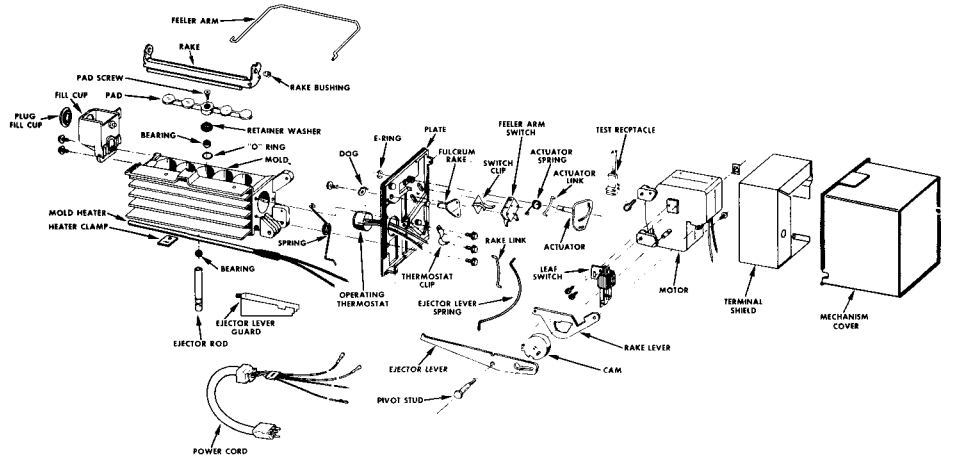
DATA

Operating Thermostat Limits 26°-16°F.
Mold Heater Watts 120
Motor RPM 1

Ejection Cycle
minutes per cycle 3-4
Ice Cube Rate
pounds per cycle 2
pounds per 24 hours (avg.) 4 1/2-5 1/2







SERVICE NOTES

CUBE DISCOLORATION

Under certain circumstances, ice cubes may be discolored, usually appearing with a green-bluish hue. The cause of this unusual discoloration is due to a combination of factors such as water characteristics, household plumbing, and the accumulation of copper salts in an inactive water supply line which feeds the icemaker. Certain things can be done to help alleviate this condition:

1. Check for an adequate ground at the wall receptacle and at the copper water line connection to the refrigerator cabinet.
2. Replace the existing 1/4" copper tubing water line connecting the icemaker to the household plumbing with new copper tubing.
3. Reconnect the new copper tubing to a more frequently used water line. Use the shortest length possible. Attach the valve to a vertical water line.
4. Instruct the customer that low usage aggrevates this condition. Empty the ice bucket once a week.
5. Install a filter (WR97X214) in the icemaker water line as close to the refrigerator as possible.

SMALL CUBES OR NO ICE

When servicing an icemaker for "small cubes" or "no ice", determine the true cause of the problem rather than just increasing fill time. If the icemaker appears to be cycling normally, the problem is MOST likely caused by the water line saddle valve (if used) having an inlet port restricted by mineral deposits. Replace this valve with an approved saddle valve (WX8X5) having an inlet of 5/32" I.D.

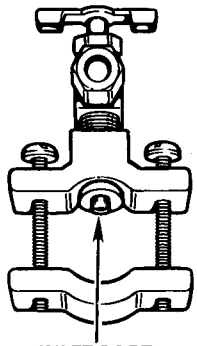


Figure 41 - Saddle Valve

Never use a self-piercing saddle valve or one with an inlet port smaller than 5/32" I.D. These types are subject to early failure do to mineral build-up at the inlet which restricts the water flow and results in "small cubes".

INTERMITTENT FLOODING

Mysterious icemaker flooding (overfilling) where no fault is found with the icemaker or water valve, may be due to shorted terminals in the icemaker power receptacle. Internal shorting between the brown and white lead terminals, will energize

the water valve. This condition could be intermittent, making diagnosis of the problem more difficult.

To check the icemaker receptacle:

1. Unplug the icemaker power cord and using a voltmeter, measure for voltage between the orange and white terminals of the icemaker receptacle. Reading should be 0 volts. If a voltage reading is observed, replace the icemaker receptacle.

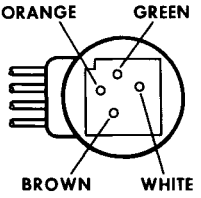


Figure 42 - Icemaker Receptacle

2. If the voltage reading is 0 volts, unplug the refrigerator power cord and disconnect the white wire from the icemaker water valve. Using an ohmmeter set on the high scale, measure for resistance between the brown and white pin terminals, reading should be infinity. If continuity is observed, replace the icemaker receptacle.

   On models where the icemaker receptacle is mounted on the surface of the liner, remove the receptacle and make the resistance check again while flexing the receptacle and wires back and forth.

   If continuity is observed, replace the receptacle.

INTERMITTENT ICE MAKING

In checking an intermittent ice making call, where the ice bucket is not full, water is frozen in the mold and the freezer temperature is normal, use the WR97X190 test light to check the photo switch circuit.

If test results show the photo switch is conducting (energizing the thermostat heater), several obvious reasons could be the cause:

1. Foreign matter on the light lens.
2. Lens missing.
3. Burned out lamp.
4. Darkened lamp.
5. Shorted photo switch.

Some of the not too obvious reasons are:

1. Improperly positioned door assembly.
2. Lamp or lamp housing improperly positioned.
3. Photo switch housing improperly positioned.

Any of these three items could block the lamp beam, the result being the same as a full bucket. As the misposition of these parts is difficult to determine, a redesigned ice bucket is available to compensate for any slight misalignment of these parts. The redesigned bucket has slots that are approximately 5/16" wider than previous buckets.

AVOIDING MOTOR DAMAGE

When removing the icemaker motor terminal shield, the clip securing the

shield to the motor bearing should be released by cutting with diagonal cutters. Releasing the clip by prying with a screwdriver can loosen or damage the motor bearing resulting in a stalled motor later.

When replacing the terminal shield, bend the side inward slightly to allow it to rest on the motor bearing and omit the clip. Be sure to secure the terminal shield with the bottom screw.

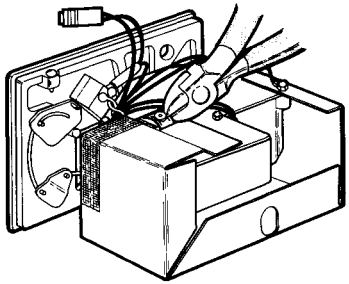


Figure 43 - Cut Clip to Remove

REPAIR KITS

The following repair kits are available for icemaker servicing. Each kit contains the necessary parts and an instruction sheet to make a complete and effective repair.

Kit No.	Description
WR23X103	Leaf Switch
WR23X5127	Photo Switch
WR29X97	Motor Assembly
WR29X110	Retractor Asm.
WR29X120	Pad Screw (sm. & lg.)
WR29X128	Actuator
WR29X137	Metal Rake
WR29X141	Motor Assembly
WR29X144	Rod, Pad & Screw (lg.)
WR29X145	Mold Seal (sm. & lg.)
WR29X146	Ejector Pad (lg.)
WR50X22	Thermostat (16°)
WR50X38	Thermostat (photo)
WR51X199	Mold Heater

LOOSE FEELER ARM

When servicing an icemaker because of a loose feeler arm or for any reason, tighten the actuator set screw, (but do not over-tighten) and replace the original feeler arm retainer push nut with the latest feeler arm retainer clip, WR29X98, to secure its position.

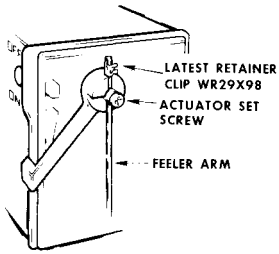


Figure 44 - Feeler Arm Attachment

WHITE PARTICLES IN ICE CUBES

The source of "white particles" observed in melting ice cubes (even when the tap water shows no evidence of these particles) is the water. **All** water contains some dissolved mineral, primarily calcium carbonate. When the water contains a considerable amount of minerals (particularly dissolved calcium carbonate) it is often referred to as "hard" water. There is, however, a limit to how much of a substance water will hold in solution. For calcium carbonate in

water, at ordinary temperatures, the limit is only a small fraction of a percent. Further, most solubility limits are lower at lower temperatures. For example, it is a common observation that it is more difficult to dissolve sugar in iced tea than in hot tea.

Here's what happens when hard water is used to make ice cubes. First, as tap water is cooled, the limit on how much mineral content can remain dissolved decreases. Second, as ice crystals form, less water remains to hold the minerals and the solution becomes more concentrated. The solubility limit is reached and dissolved minerals precipitate as solid particles. These particles become trapped in the ice as freezing continues. An originally dissolved mineral has merely been converted to a visible form. Most frequently, these particles are calcium carbonate, a common ingredient in products intended for internal use and contained in antacid preparations, pill coatings and tooth paste.

In summary, when hard water is used for making ice cubes, these particles should be expected.

Figure 45 - White Particles in Ice Cubes

ICE BUCKET OVERFILLING

Ice cubes falling from the icemaker bucket in 16 and 18 cu. ft. models may be due to the bucket overfilling. The 1-1/4 inch diameter feeler arm extension (WR2X4694) that is included with the accessory icemaker kit, should be installed on the icemaker feeler arm as directed by the instruction sheet in the kit.

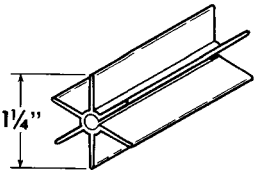


Figure 46 - Feeler Arm Extension

If the bucket overfilling persists after installing the WR2X4694 feeler arm extension, a taller ice bucket, Catalog Number WR30X145, is available. When using this bucket, it wll be necessary to remove the feeler arm extension from the icemaker.

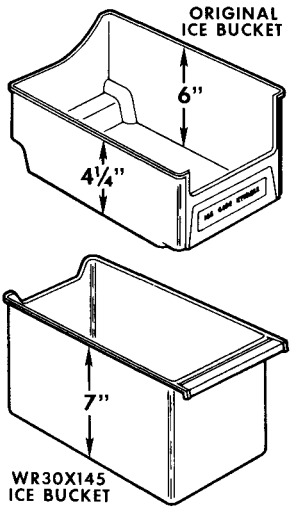


Figure 47 - Ice Buckets

FEELER ARM INSTALLATION

The short feeler arm included with the WR30X185, 210, 236 or 252 Replacement Icemaker is to be used when installing the replacement in early TFF24R model refrigerators.

Occasionally, the actuator is broken while installing the feeler arm. The following installation procedure can prevent this. Hold the feeler arm perpendicular to the icemaker and insert the "hook" end in the actuator opening. Carefully rotate the feeler arm back and forth to gently ream burrs from the opening. When the feeler arm can be moved freely to a position parallel to the icemaker, compress it slightly and insert the "straight" end into the fill cup hole. Be sure to install the retainer on the "straight" end of the feeler arm at the fill cup.

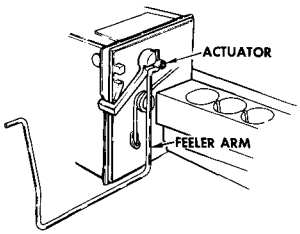


Figure 48 - Install the Feeler Arm

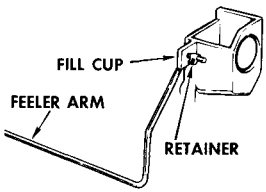


Figure 49 - Install the Retainer

Occasionally, the feeler arm binds following installation preventing it from moving up and down freely to open and close the feeler arm switch. This binding condition can be corrected by compressing or bending the feeler arm ends inward slightly.

Figure 50 - Compress Feeler Arm

RETRACTOR MALFUNCTION

If the retractor malfunctions on previous installations of WR30X185, 210, 236, or 252 icemakers, a WR29X110 Retractor Service Package can be used to correct the condition. The package includes a new design retractor assembly, a feeler arm, an instruction sheet and other necesary parts.

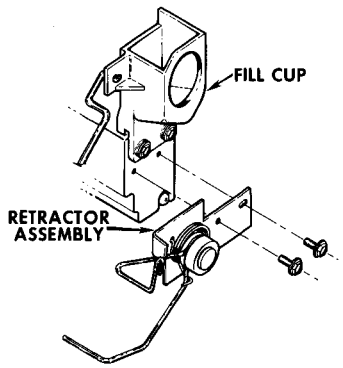


Figure 51 - New Design Retractor

RESTRICTED FILL TUBING

The plastic fill tubing on TBF-21R, TBF-22R and TBX-22R model refrig-

erators is routed through an aluminum conduit (in the foam insulation) from the rear of the cabinet to the rubber grommet above the icemaker fill cup.

If the fill tubing is restricted in the conduit, a fill tube repair kit is available to correct this condition. Included in the kit is a new plastic water line and nut, an aluminum conduit, miscellaneous hardware and an instruction sheet. For TBF-21R models, use WR49X238. For TBF-22R and TBX-22R models, use WR49X299.

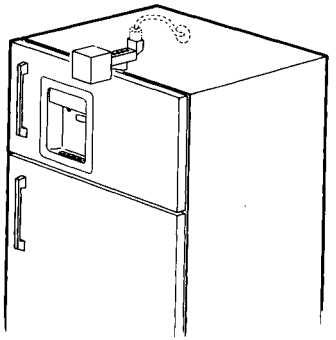


Figure 52 - Conduit in Foam

FILL TUBE ICING

Occasionally, icemaker fill tubes become clogged with ice which is generally caused by a "drip leak" through the water valve or by cabinet insulation missing around the fill tube grommet. An intermittent fill tube icing condition will sometimes cause erratic or very low ice rates.

Check the water valve by disconnecting the plastic tubing at the valve outlet, drying the area and watching for small droplets passing through the valve. Observation will reveal the cabinet insulation condition in the fill tube grommet area.

Persistent or recurring fill tube icing may be corrected by the WR51X216 fill tube heater which can be plugged into the icemaker receptacle. The icemaker can then be plugged into the back of the heater plug. When using this heater on vinyl fill tubes, wrap the tube (area under the heater) with one turn of WD49X28 aluminum tape for more even heat distribution.

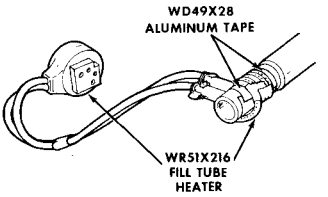


Figure 53 - Fill Tube Heater

ICE CUBES LUMPING OR FUSING

Ice cubes lumped or fused together in the storage bucket of an automatic icemaker are often caused in the following manner. During the fill portion of the cycle, water exiting the fill cup is wicked around the edge of the mold instead of running into the cube cavity in the mold. It then pours over the edge of the mold at the side or back and drips into the ice bucket.

Evidence of this condition can be observed by white, yellowish or brown stains or mineral deposits on the mold sides, particularly under the fill cup. Icicles hanging from the mold in this area are also an indication.

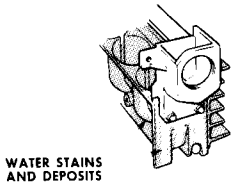


Figure 54 - Examine The Mold

To minimize this condition, remove the fill cup and carefully brush away any loose mineral deposits. Spread a heavy bead of WX6X200 RTV 102 silicone sealant on the rear edge of the mold as shown.

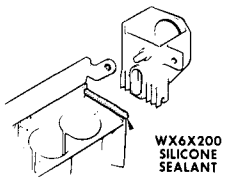


Figure 55 - Apply RTV Sealant

Install the fill cup spreading the sealant. Apply additional sealant, if necessary, to allow forming a "dam" at the fill cup front, particularly building up and shaping the corners as shown.

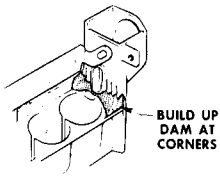


Figure 56 - Form a Dam

Use care to prevent the sealant from interfering with the rake movement, cube ejection or water existing from the fill cup.

ACCESSORY WATER FILTER

Accessory water filter, Catalog No. WR97X214 is available for use with Icemaker and Dispenser model refrigerators.

Figure 57 - Accessory Water Filter

The replacement cartridge (WR97X 215) is included with the water filter. The cartridge contains two rigid, porous cellulose fiber elements - one at the cartridge inlet, the other at the outlet to stop all particulate matter larger than five microns (.0002"). These two elements clear the water of excesive sand, clay, talc or rust, thus helping to protect the water valve from damage or failure.

Additionally a bed of premium activated charcoal granules removes most oily, medicinal, chemical, plastic, metallic, detergent and algae tastes. It will also remove chlorine, most organic flavoring agents and the colors and odors associated with these tastes.

Silica crystals in the charcoal bed dissolve slowly to inhibit hardening of mineral and scale formations and to reduce corrosion.

The filter will not remove iron, acids or sulfur tastes and odors which are generally soluble in water. For best results, the filter cartridge should be replaced every 12 months under normal usage and water conditions - more often under severe conditions.

Compression fittings and Teflon tape, included with the filter, provide for easy installation in the 1/4" OD copper tubing water supply line to the refrigerator. Two wood/metal screws are furnished to secure the mounting bracket in a suitable location. Also included are two clamps, screws, nuts and a ground wire to provide continuity around the filter and Installation Instructions.

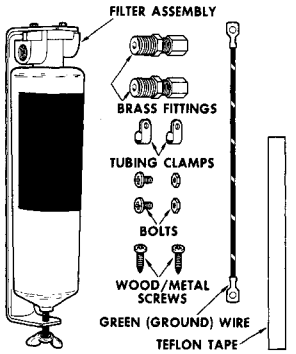


Figure 58 - Filter and Installation Parts

The filter should not be installed where the water pressure exceeds 125 PSI or where the water temperature exceeds 100°F.

The complete filter for initial installations is WR97X214. The replacement cartridge only (with instructions) is WR97X215.

PLATE REPLACEMENT

Replacing a warped or distorted mechanism plate requires removal and reassembly of the actuator. Before removing the actuator, take note of how the spring and link engage the actuator.

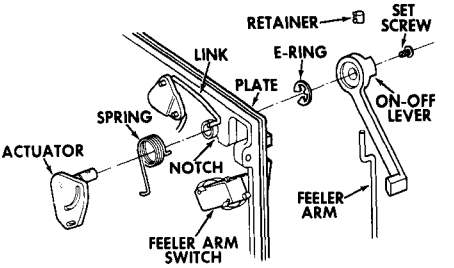


Figure 59 - Actuator Assembly

To install the actuator to the plate:

1. Position the link up (out of the way and for easy assembly later).

2. Position the spring over the shaft of the actuator, engaging the hook of the spring into the small slot.

3. Apply a small amount of lubricant (WR97X219) to the shaft of the actuator.

4. Slide the actuator (with the spring in place) partially into the hole in the plate and engage the free end of the spring into the notch in the plate

5. Lift the coils of the spring up into position against the plate and hold the spring in place.

6. Engage the link into the large slot of the actuator, rotate the actuator

(counterclockwise) slightly to clear the plunger on the feeler arm switch, and push the actuator fully into place.

7. Hold the actuator in position and install the E-ring in the groove of the actuator shaft.

NO ICE

A no ice condition in CSF-22, 24K model refrigerators may be caused by a poor dirty contact between the light source bulb and socket. If the light appears dim, check for this condition. Clean the bulb and socket contacts and be sure the light beam is properly aligned.

It has also been found that some WR23X5122 light bulbs have filaments that are not centered in the glass. This also causes a no ice condition because of an improperly aligned light beam.

To correct, bend the bracket to properly align the beam with the photo switch.

PLASTIC LINER DAMAGE-PREVENTION AND REPAIR

An icemaker installed in a refrigerator that has a plastic liner should have a metal isolator plate positioned between the icemaker and the liner. The purpose of the isolator plate is to prevent extensive damage to the plastic liner in the event the icemaker overheats due to a prolonged mechanical stall. When servicing an icemaker in a refrigerator that has a plastic liner make sure the isolator plate (WR29X116) is installed as shown below.

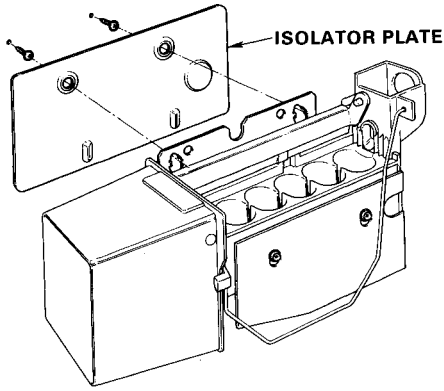


Figure 60 - Isolator Installation

Damage to the plastic liner, resulting from a stalled and overheated icemaker, can be successfully repaired using a WR49X262 Liner Repair Kit. The kit includes locator templates (for cutting out the damaged area of the liner), a specially designed metal plate along with the necessary mounting hardware, and instructions.

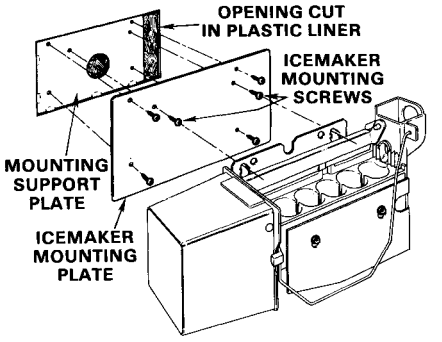


Figure 61 - Liner Repair

LUBRICATION

WR97X219 "Rheolube #368" is available in one oz. tubes for the lubrica-

tion of parts **inside** the mechanism cover. This new lubricant is compatible with the black plastic plate material and supersedes WR97X162 "lubriplate" grease which should no longer be used for icemaker lubrication.

WR97X163 Silicone lubricant (mold seal area) is also compatible with the plate material and should be used to lubricate parts **outside** the mechanism cover.

ICE CUBE FLIPPING

Icemakers are more likely to flip cubes beyond the bucket unless operating within the following parameters: (1) the water fill should be within ¼-inch from the top of the mold, (2) the freezer package temperature should be within 0°to 8°F. Check these two items first and make necessary adjustments, if required. This will correct many cube flipping conditions.

However, icemakers that have plastic rakes and/or stainless steel pads are more prone to cube flipping even when operating within the above parameters. Stainless steel pads can be identified by the dark gray color — aluminum pads are a lighter, silver gray or gold color.

To minimize cube flipping on these icemakers, the plastic rake can be replaced by the WR29X137 Metal Rake (spring-loaded return type). Read and follow the instructions included with the kit. On icemakers having the larger (¼-inch) pad screw, the stainless steel pad can be replaced by the WR29X146 Aluminum Pad. On icemakers having the smaller pad screw, use the WR29X144 aluminum Pad, Rod and Seal Kit. This will also update the icemaker with the larger, ¼-inch pad screw. After installing a replacement pad, check for proper alignment of the mechanism to be sure no binding condition exists.

Sweep type icemakers manufactured from January 1980, to June, 1982, have plastic rakes. Icemakers manufactured from January, 1980, to October, 1982, (except replacement icemakers) have stainless steel pads. Starting in October, 1982, Accessory Kit Icemakers (WR30X241) have aluminum pads.

IMPROVED ICE CUBE PRODUCTION

Refrigerators operating under "light usage" conditions — especially energy-efficient models — have short spans of compressor running time and long off cycles. Accordingly, cold air is circulated only during the brief intervals that the compressor and evaporator fan are running. This condition results in slow freezing of ice (with either an automatic icemaker or ice cube trays) even though the freezer temperature is 5°F.

Setting the freezer temperature control to a colder setting will reduce the time required to freeze ice. This is primarily due to the longer run time rather than the resulting colder freezer temperature. In most instances setting the freezer temperature control colder will satisfy the consumer.

ICEMAKER

On no-frost model refrigerators, when setting the freezer temperature control colder fails to satisfy the consumer, a WR49X300 Temperature Control Compensator can be installed to improve this condition. The compensator is a small 3½-watt heater that is attached to the back of the temperature control and connected to the control terminals. Accordingly, when the control cycles off, the heater provides a bias effect on the control bellows which results in more frequent run cycles of shorter duration. Under moderate or heavy usage conditions, the compensator has little or no effect on the operation of the refrigerator due to the small amount of wattage involved.

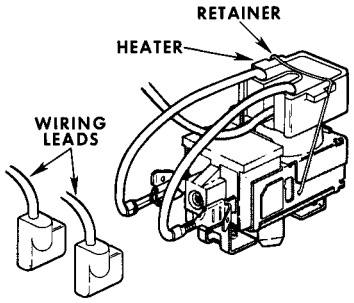


Figure 62 - Control Compensator Installed

NOTE: A temperature control compensator must NEVER be used on a cycle-defrost model refrigerator. A long off-cycle is essential on these models to allow complete defrosting of the fresh food evaporator.

WATER SPILLAGE

On TBF-22R model refrigerators, a mispositioned icemaker fill tube can cause a massive accumulation of ice in the freezer compartment. Symptoms of this malfunction can be one or more of the following:

- Ice Cubes Too Small
- Crushed Ice Only
- Water/Ice in Bottom of Freezer
- Ice Won't Dispense

This condition can be corrected by removing and discarding the aluminum fill tube and sealing the fill cup to the icemaker with WX6X200 RTV Sealant. Be sure to remove any ice that has formed behind the icemaker and auger motor assemblies.

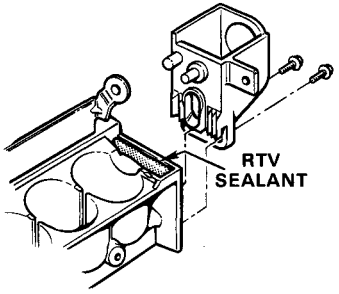


Figure 63 - Seal Fill Cup

To properly seal the fill cup to the icemaker, remove the fill cup and apply a bead of sealant to the end of the icemaker mold. Reinstall the fill cup, spreading the sealant. Smooth out the sealant at the outlet of the fill cup. Apply additional sealant, if needed, to seal the gap between the fill cup and the back flange of the mold.

PAD SCREW LOOSENING OR BREAKING

An icemaker pad screw loosening, stretching or breaking is attributed to water entering crevices under the pad screw head then freezing and expanding during each cycle. To prevent this condition, icemakers produced beginning in January, 1985, have:

- a stainless steel pad screw that is stronger,
- a silicone o-ring that seals the pad screw to the pad,
- an aluminum pad that accomodates the o-ring, and
- an aluminum shim washer that seals the pad to the ejector rod.

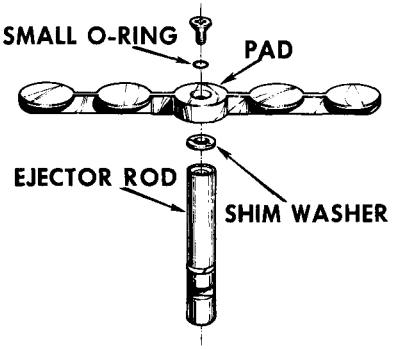


Figure 64 - Pad and Rod Assembly

Accordingly, new catalog numbers have been assigned to identify this improvement as follows:

WR30X251	Photo Sensing Type
WR30X252	Replacement Snap Type
WR30X253	Replacement Sweep Type
WR30X254	TB/TBX-22R Replacement

To correct an icemaker pad screw loosening, stretching or breaking condition, on previously produced icemakers that have the large (¼-inch) pad screw, use a WR29X146 pad kit.

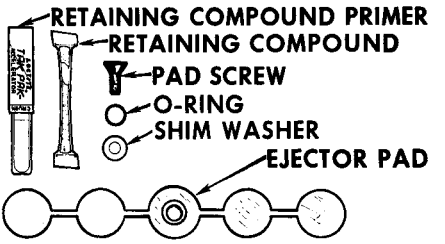


Figure 65 - Pad Kit

To update an earlier produced icemaker, that has the small pad screw, use a WR29X144 pad, Rod and Seal Kit.

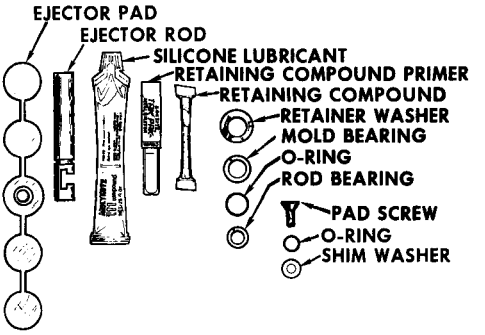


Figure 66 - Pad, Rod and Seal Kit

The WR29X145 Seal Kit also has the stronger pad screw, o-ring and shim washer. However, do not attempt to install the o-ring on the pad screw —unless the icemaker has the new deep recess pad.

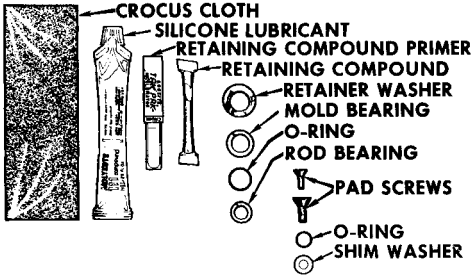


Figure 67 - Seal Kit

CRESCENT CUBE STYLE

The crescent cube style icemaker, introduced with the "G" (1985) refrigerator line, is designated Model JS2. The JS2 icemaker is included in the UK-KIT-2 and UK-KIT-3 Accessory Icemaker Kits and in all factory-installed icemaker applications — except in the TBX-22R Model refrigerator.

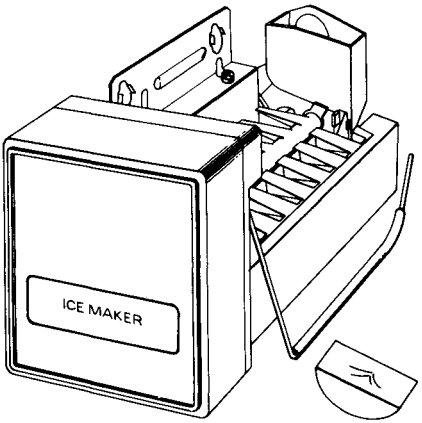


Figure 68 - Model JS2 Icemaker

ACCESSORY ICEMAKER KITS

The UK-KIT-2 Accessory Icemaker Kit is designed for use in all applications that previously accepted the UK-KIT-1. Also, the UK-KIT-2 is intended for use as a replacement in all "M" (1971) and later General Electric and Hotpoint refrigerators equipped with an automatic icemaker — except models which have an ice dispenser feature in the freezer door.

The UK-KIT-3 Accessory Icemaker Kit is designed for use exclusively in bottom-mount model refrigerators. The UK-KIT-3 is basically the same as the UK-KIT-2 — except:

- the icemaker fill cup has a fill tube hole in a different location,
- the fill tube extension is the correct length and does not require cutting to size,
- the ice bucket is shallow, and
- the water valve fill tubing is shorter.

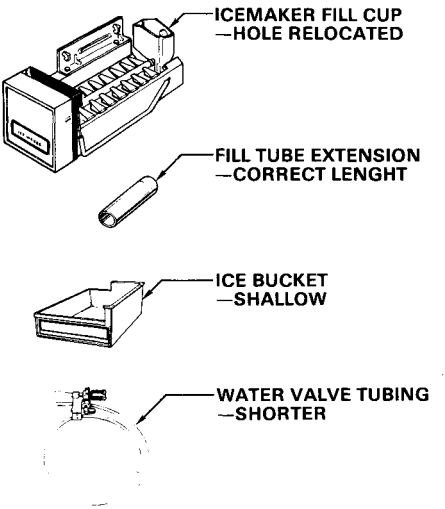


Figure 69 - UK-KIT-3 Differences

The UK-KIT-1 or UK-KIT-2 accessory icemaker kits can be installed in the following General Electric model refrigerators.

TBF-14AG
TBF-14DG
TBF-14SG
TBF-14VG
TBF-14XG
TBF-16DG
TBF-16SG
TBF-16TG
TBF-16VG
TBF-16XG
TBF-16ZG
TBX-18BG,BH
TBX-18CG,CH
TBX-18DG,DH
TBX-18KG,KH
TBX-18LG,LH
TBX-18PG,PH
TBX-SG,SH
TBX-18VH
TBX-18ZG,ZH
TBX-19TH
TBX-20DG,DH
TBX-20KG,KH
TBX-20PG,PH
TBX-20ZG,ZH
TBX-23CG,CH
TBX-23DG,DH
TBX-23ZG,ZH
TFX-19LG,LH
TFX-20DG,DH
TFX-20KH
TFX-20PG,PH
TFX-22DG,DH
TFX-22KH
TFX-22ZG,ZH
TFX-24ZG,ZH

The UK-KIT-1 or UK-KIT-2 accessory icemaker kits can be installed in the following Hotpoint model refrigerators.

CTF-14AG
CTF-14CG
CTF-14EG
CTF-16AG
CTF-16CG
CTF-16EG
CTF-16GG
CTX-18CG,CH
CTX-18EG,EH
CTX-18GG,GH
CTX-18HG,HH
CTX-18LG,LH
CTX-20EG,EH
CTX-20GG,GH
CTX-23EG,EH
CTX-23GG,GH
CSX-20EG,EH
CSX-20LG,LH
CSX-22EG,EH

The UK-KIT-3 accessory icemaker kit can be installed in the following General Electric model refrigerators.

TCX-20ZG

INSTALLATION

Complete installation instructions, included with the accessory icemaker kits, cover all of the steps necessary to properly install the appropriate kit in the various refrigerator models. A label on the back of each refrigerator, that will accept an accessory icemaker kit, indicates the appropriate kit to be used and the specific instructions to be followed.

Figure 70 - Accessory Kit Instructions

Figure 71 - Label on Refrigerator

When installing the accessory kit — either for a new installation, or as a replacement — it is vitally important that the water valve and all other items called for in the installation instructions be used for proper icemaker operation.

The icemaker has an easy-mount bracket, with key-hole slots, that hooks over two screws. Icemakers that are factory-installed in some models have an additional angle bracket at the bottom front.

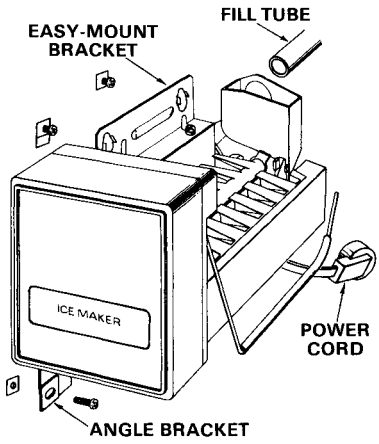


Figure 72 - Icemaker Installation

The ice bucket is positioned beneath the icemaker either on a shelf or on the freezer floor, depending upon the model application. If the distance between the bottom of the icemaker and the top of the ice bucket is greater than 1/2 to 5/8-inch, the feeler arm will not adequately control the ice level in the bucket.

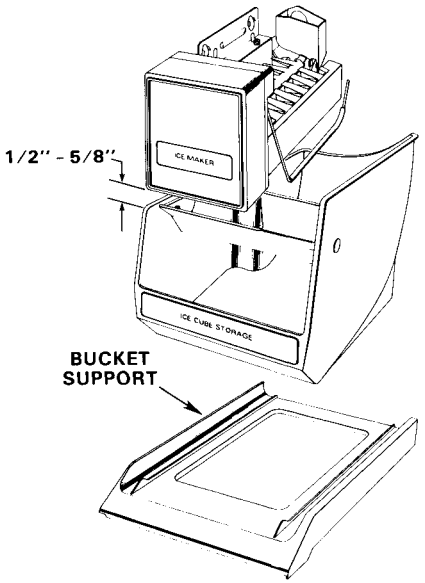


Figure 73 - Ice Bucket Installation

A bucket support, furnished with the accessory icemaker kit, is for use on models where the ice bucket is positioned on the freezer floor. This support will elevate the bucket approximately 1-inch. On earlier top-mount 16 and 18 models, that call for instruction sheet "B", a taller bucket support is required to elevate the bucket approximately 2-inches.

The water valve is mounted inside the machine compartment. Plastic fill tubing is connected to the outlet of the water valve by means of a plastic compression type fitting. The compression nut should require only "hand-tightening". The fill tubing, routed out of the machine compartment and up the cabinet back, is inserted into the fill tube grommet and secured with a small clamp. Fasteners (or clamps) are used to secure the fill-tubing to the cabinet back and, also, to take up slackness in the tubing.

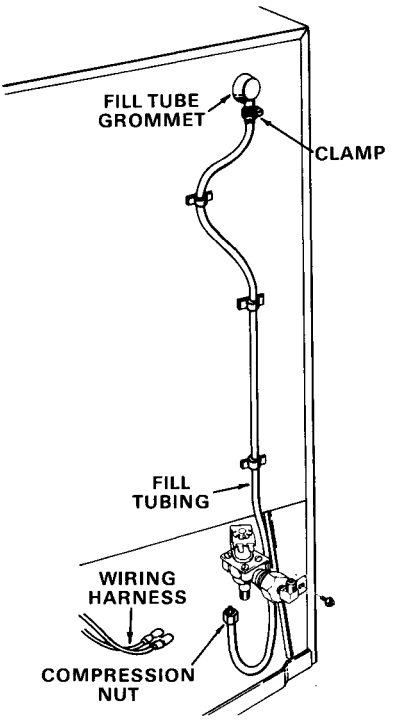


Figure 74 - Water Valve Installation

A ¼-inch S.A.E. male flare fitting is provided for connecting the water supply line to the inlet of the water valve. Only copper tubing is recommended for the water supply line.

OPERATION

The convenience of automatic ice is accomplished by means of an icemaking cycle which is a combination of electrical and mechanical operations. The complete icemaking cycle

consists of two (2) revolutions of the ejector and is divided into six (6) phases.

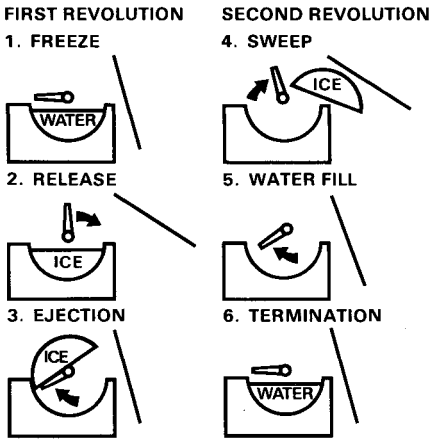


Figure 75 - Icemaking Cycle

A description of the cycle of operation begins with the icemaker installed in a refrigerator that is operating and with water in the icemaker mold:

Freeze

Heat is gradually removed from the water in the mold and the water eventually becomes frozen. During this time, the feeler arm may be either up or down (icemaker either "off" or "on"). However, the thermostat is open. Thus, even with the feeler down (icemaker "on") the icemaker will not begin operation until the thermostat senses a temperature of 15°F and closes.

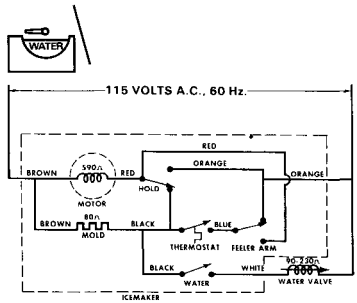


Figure 76 - Freeze

Release

With the closing of the thermostat, a series-parallel circuit is completed through the thermostat and feeler arm switch to energize the motor and mold heater. After the motor has rotated the ejector (clockwise) a few degrees, the hold switch breaks from red to black and makes from red to orange, thus completing a holding circuit around the thermostat and feeler arm switch. As the motor continues to rotate, the mold heater begins to release the ice cubes from the mold. During this time, the feeler arm raises and the switch breaks from blue to orange and makes from blue to red. This action instantaneously provides a new path for mold heater current flow.

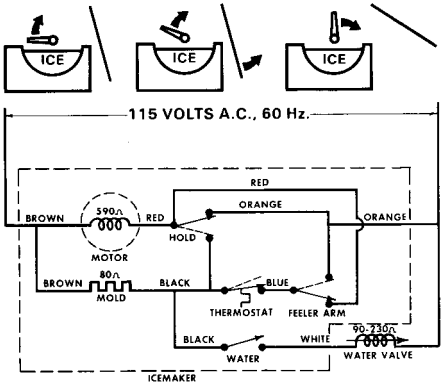


Figure 77 - Release

Ejection

When the ejector has rotated approximately 180-degrees, the feeler arm lowers, then the switch breaks from blue to red and makes from blue to orange. This action again instantly changes the path for mold heater current flow. As the ejector contacts the ice in the mold, the motor stalls for several seconds — until the mold has warmed sufficiently for the ice cubes to be released. The motor then resumes operation and the ejector pushes the cubes out of the mold. During this time, the water switch closes for 7½-seconds. However, the water valve is not energized because the thermostat remains closed during the first revolution, providing a path of least resistance for the mold heater. After the ejector has completed one full revolution, the cubes are fully ejected out of the mold and are balanced on the top of the ejector.

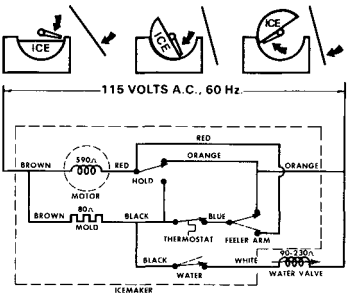


Figure 78 - Ejection

Sweep

Upon completing one full revolution, the hold switch breaks from red to orange and makes from red to black. However, the motor and mold heater continue to be energized because the thermostat remains closed throughout the first revolution. Thus, a second revolution begins and the hold switch again completes the holding circuit for the motor to continue. As the ejector continues to rotate, the feeler arm raises while the ice cubes are swept from the icemaker and fall into the ice bucket. At some time, during the second revolution, the thermostat opens due to the continued operation of the mold heater.

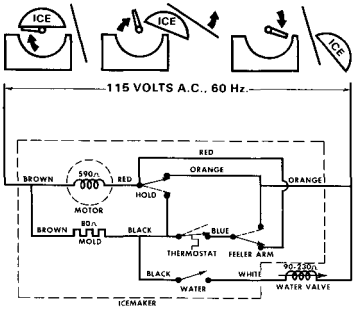


Figure 79 - Sweep

Water Fill

Just before the ejector completes the second revolution, the water switch closes. With the thermostat now open, the water switch energizes the water valve in series with the mold heater. The mold heater drops approximately 35 volts, accordingly, the water valve solenoid operates on approximately 80 volts (from a 115 volt A.C. line). The water switch remains closed for 7½-seconds to fill the mold with water.

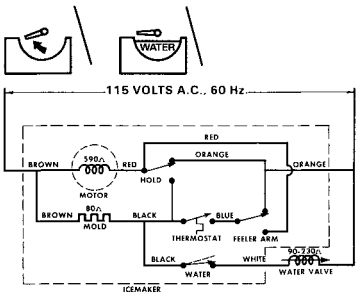


Figure 80 - Water Fill

Termination

When the hold switch again breaks, from red to orange and makes from red to black, the motor ceases operation due to the open thermostat. Accordingly, the icemaker has completed its cycle. Total cycle time is 6-minutes — excluding the stall time.

The icemaker will resume operation again when the thermostat closes. However, if the feeler arm comes to rest on ice cubes accumulated in the bucket, the icemaker wil not begin another cycle — even when the thermostat closes — until sufficient ice has been removed from the bucket to allow the feeler arm to lower.

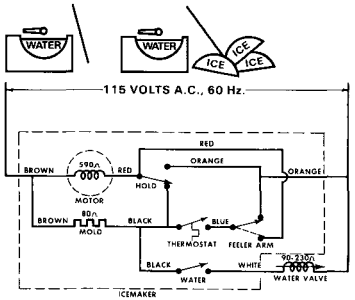


Figure 81 - Termination

DIAGNOSIS

Visual Inspection

Before making any test of the icemaker or related components, a visual inspection should be made while the icemaker is installed in the refrigerator. This will provide the factual information necessary to determine what test (if any) should be made and thus serve in rendering an accurate diagnosis.

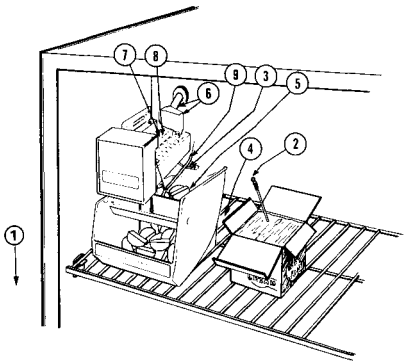


Figure 82 - Visual Inspection

1. Check for WATER ON THE FLOOR under the refrigerator. Any water found may indicate a leak at the water valve or connections. A leak at the outlet of the water valve will cause a low water fill at the icemaker.

2. Check the FREEZER TEMPERATURE. Optimum frozen food temperature is 0° to 8°F. A temperature colder than 0°F can cause:

   - The ice cubes to crack, resulting in broken ice cubes in the ice bucket.
   - The operating thermostat to close prematurely, resulting in "ice shells" with water remaining in the mold; or ice cubes cracking open in the ice bucket, resulting in frozen lumps of ice.

   A temperature warmer than 8°F may cause:

   - Ice cube "lumping" or "fusing" in the ice bucket, especially when the freezer compartment is lightly loaded or subjected to frequent door openings.
   - A "poor ice rate" or "not enough ice" due to long periods between cycles.

3. Check that the icemaker POWER CORD is fully connected. A loose power cord can cause an intermittent or "no operation" condition.

4. Check for ICE CUBES OUT OF THE BUCKET. Any cubes found out of the ice bucket may be due to:

   - A mispositioned ice bucket or a missing bucket support.
   - The feeler amr bent or the switch inoperative.

5. Examine the ICE IN THE BUCKET. All cubes should be approximately 3/4-inch in height, solid and with no "lumping", "fusing" or "ice sheeting" in the bucket.

   - Ice cubes either oversize or underside may indicate an incorrect water fill quantity.
   - Ice cubes with liquid centers indicate premature cycling of the icemaker.
   - Ice cubes "lumping" or "fusing" may be due to either long storage time, or the ice bucket being removed from the freezer compartment for long periods of time.
   - "Ice sheeting" may be due to spillage of water as a result of overfilling of the mold or leaks from the fill tube or fill cup.

6. Check the FILL TUBE AND FILL CUP. The fill tube should be positioned in the fill cup. The fill tube and fill cup should be free of ice.

   - Ice in the fill tube may be due to the fill tube grommet not seated in the cabinet back.
   - Ice in the fill tube or fill cup may be due to the water valve not fully closing.
   - Ice in the fill cup only may be due to a restriction of the fill cup outlet.

7. Check the WATER OR ICE LEVEL IN THE MOLD. The water or ice level should be approximately 1/8-inch over the cube spillways.

   - A water or ice level higher than normal may indicate hardening of the rubber parts inside the water valve or water fill screw out of adjustment.

   - A water or ice level lower than normal may indicate a clogged saddle valve, clogged water valve screen, or a leak at the outlet of the water valve or tubing.

8. Examine the EJECTOR. The ejector should be at the 9-o'clock position with no excessive play.

   - The ejector at the 4-o'clock position may indicate an inoperative mold heater.

   - The ejector at any position other than 9-o'clock or 4-o'clock may indicate an inoperative motor.

   - Excessive play in the ejector indicates a broken or missing part inside the icemaker.

9. Check the FEELER ARM AND SWITCH.

   - The feeler arm movement should be free from binding when raised and lowered. A binding feeler arm can result in "no ice". A distorted or bent feeler arm can cause overfilling of the ice bucket. Interference of the feeler arm movement by shelves or food packages can cause the motor to stall.

   - The feeler arm switch should "click" when the feeler arm is raised and lowered. If the switch is inoperative or the linkage is broken or missing, the icemaker may either overfill the ice bucket or fail to operate.

Electrical Testing

Most electrical testing can be accomplished while the icemaker is installed in the freezer compartment after removing the ice bucket, icemaker front cover and screws securing the plate to the housing. It is important, however, that the icemaker power cord be disconnected. A wiring diagram is located inside the cover for ready reference.

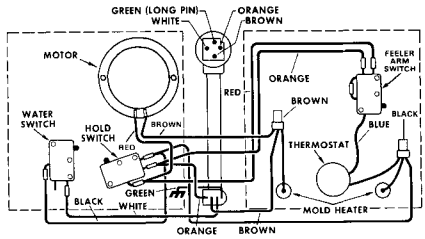


Figure 83 - Wiring Diagram

1. To check for proper VOLTAGE at the icemaker receptacle, use a voltmeter to measure line voltage:

   - between the brown and orange terminals — line and neutral.

   - between the brown and white terminals — line and neutral through the water valve solenoid.

   - between the brown and green — line and ground.

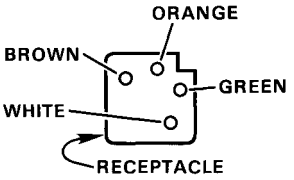


Figure 84 - Icemaker Receptacle

2. To check the THERMOSTAT, the mold temperature must be below 15°F, and the feeler arm down ("on"). Use an ohmmeter to measure continuity between the blue and black leads of the thermostat.

3. To check the FEELER ARM SWITCH, use an ohmmeter to measure continuity:

   - between the blue and orange terminals while the feeler arm is down ("on").
   - between the blue and red terminals while the feeler arm is up ("off").

4. To check the HOLD SWITCH, use an ohmmeter to measure continuity:

   - between the red and black terminals while the cam is in the "off" position, and no continuity between the red and orange terminals.
   - between red and orange terminals while the cam is in the "on" position, and no continuity between the red and black terminals.

5. To check the WATER SWITCH, use an ohmmeter to measure continuity between the black and white terminals while the cam is rotated to the water fill position, and no continuity when the cam is rotated beyond the water fill position.

6. To check the MOTOR, disconnect one lead from the motor and use an ohmmeter to measure approximately 590-Ohms.

7. To check the MOLD HEATER, use an ohmmeter to measure between the two heater leads approximately 80-Ohms.

Mechanical Testing

In order to test-cycle the icemaker, it must first be removed from the freezer compartment and the water or ice emptied from the mold. If water is in the mold when the icemaker is test-cycled, the mold will overfill. If ice is in the mold and the thermostat is open, the mold heater will not be energized. Accordingly, the motor will stall due to the ice in the mold. To remove the ice from the mold, hold the icemaker upside down, over the sink, while running hot tap water over the bottom of the mold. While warming the mold, water must not enter the housing area.

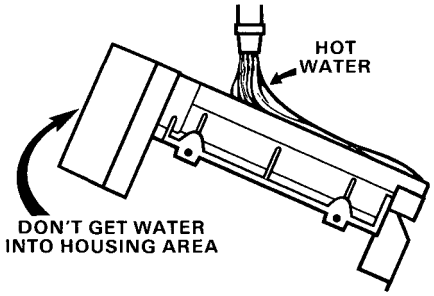


Figure 85 - Ice Removal

1. To initiate a TEST-CYCLE, connect the icemaker power cord, remove the front cover and, with a small blade screwdriver, rotate the motor shaft counterclockwise approximately 1/8-turn to engage the hold switch. Attempting to turn the motor shaft while the motor is energized will likely result in gear strippage, either inside the motor, or externally. After the motor begins operation the cycle will continue, approximately 3-minutes until the ejector completes one (1) revolution.

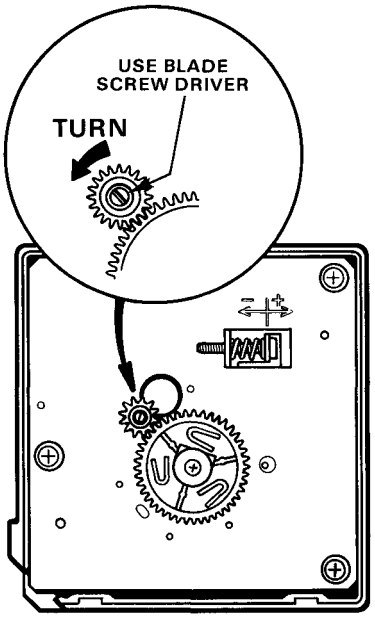


Figure 86 - Cycle Initiation

2. To check the WATER FILL QUANTITY, it is not necessary to empty the water or ice from the mold. Dismount the icemaker, disconnect the power cord and remove the front cover. Rotate the motor shaft clockwise approximately 1/2-turn or until the ejector contacts the top of the ice. Hold a bottle, graduated in cubic centimeters (cc's) under the fill tube and connect the icemaker power cord. The icemaker will begin operation and, after only a few seconds of operation, advance to the water fill phase of the cycle. The water fill quantity should be at least 100 cc's but not more than 150 cc's.

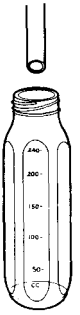


Figure 87 - Water Fill Check

To either increase or decrease the water fill quantity, turn the adjustment screw in the direction indicated on the plate. One (1) full turn of the adjustment screw will change the water fill quantity by approximately 20 cc's.

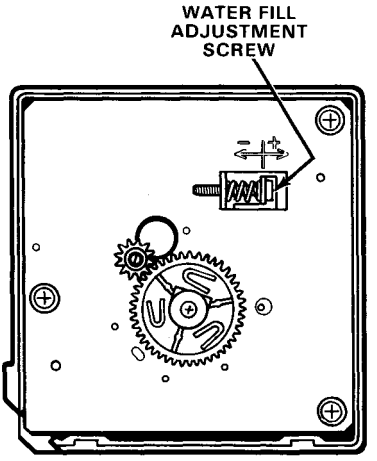


Figure 88 - Water Fill Adjustment

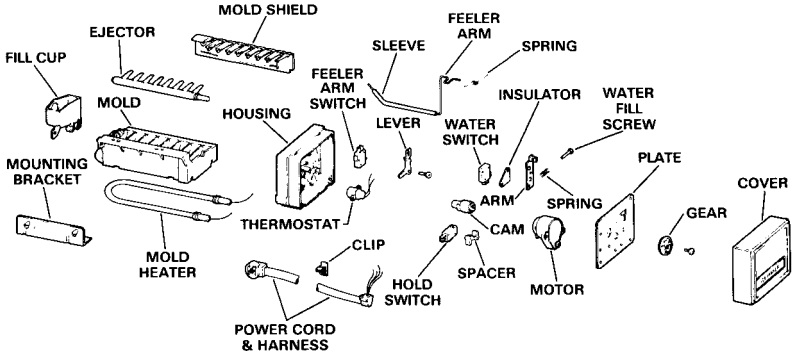


Figure 89 - Icemaker Assembly

DISASSEMBLY & REASSEMBLY

No special tools or test equipment are required to service this icemaker. WR97X163 Silicone lubricant (tool item) should be readily available for use, as required.

Mold Shield

When reinstalling the mold shield, apply a heavy film of silicone lubricant (WR97X163) to the top surface of the mold that is covered by the mold shield. The purpose of the silicone lubricant is to prevent water from wicking over the mold.

Fill Cup

When reinstalling the fill cup, apply a thin film of silicone lubricant (WR97X163) to the end (bearing surface) of the ejector. The silicone lubricant, in addition to lubricating the ejector, will help prevent moisture from entering and freezing the ejector to the fill cup.

Ejector

When reinstalling the ejector, apply a thin film of silicone lubricant (WR97X163) to the bearing surfaces at each end of the ejector.

Cover

Two (2) notches are provided at the bottom of the housing to enable the use of a coin or a large blade screwdriver to pry the cover partially from the housing. A wiring diagram is inside the cover.

Cam & Gear

When reinstalling the cam and gear, apply a coating of silicone lubricant (WR97X163) to the bearing surface of the cam that protrudes through the plate and to the front surface of the

plate surrounding the hole for the cam. Make sure the gear is installed so that the three (3) points on the back of the gear are in contact with the front of the plate.

Feeler Arm, Spring & Lever

Do not bend or distort the feeler arm in the process of removing it. Apply a thin film of silicone lubricant (WR97X163) to the feeler arm hole in the housing and to the pivot hole in the lever.

Thermostat

When reinstalling the thermostat, scrape off all old thermal mastic and wipe the mating surfaces of the thermostat and end of the mold to remove all dust particles. Apply a thin film of thermal mastic (furnished with the replacement thermostat) to the sensing surface of the thermostat.

SWITCH ICING

Moisture entering the housing of a crescent cube icemaker can cause ice crystals to form on or around one or more of the switches. The icing condition prevents the switch plunger from operating and results in erratic operation or icemaker failure. Switch icing is not always easy to diagnose because the ice crystals dissipate very quickly when exposed to room temperature and, in some cases, the motor or mold heater will generate enough heat to clear the switches temporarily.

In most instances, the switch icing condition can be prevented from recurring, by installing a WR29X5142 Plug Strip to cover the five (5) holes along the top rear of the icemaker housing. Beginning with May, 1985 production, all crescent cube icemakers will have the holes plugged.

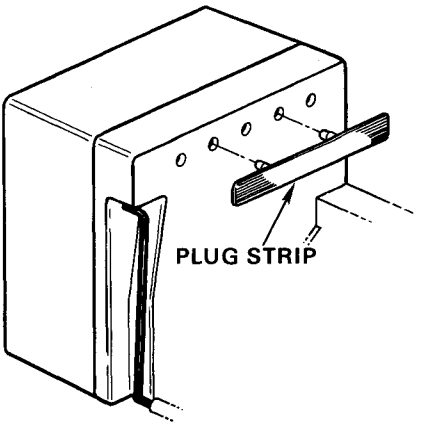


Figure 90 - Plug Strip Installation

In extreme cases, where the switch icing condition persists, install a WR29X5143 Auxiliary Heater inside the icemaker housing. Complete instructions are furnished with the heater.

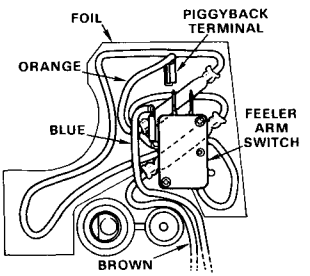


Figure 91 - Heater Installation

INDEX

DISPENSER MODELS

DISPENSER MODEL FEATURES

REFRIGERATOR MODEL	ICE CUBES	CRUSHED ICE	CHILLED WATER	RECESS LIGHT	ELEC-TRONIC CONTROL
TBF-21RR,RT	X	X			
TBF-21RT-N	X				
TBF-21RV,RW,RY,RA, RB	X	X			
TBF-22RC	X	X			
TBX-22RF,RG,RH	X	X			
TFF-20RA,RB,RC	X				
TFX-20RF,RG,RH	X				
TFF-22RS,RT	X	X			
TFF-22RV,RW,RY, RA,RB,RC	X	X	X		
TFX-22RF,RG,RH	X	X	X		
TFX-24EF,EG,EH	X	X	X	X	X
TFX-24FG,FH	X	X	X	X	X
TFF-24RS,RT,RV, RW,RY	X	X	X	X	
TFF-24RA,RB,RC	X	X	X	X	
TFX-24RF,RG,RH	X	X	X	X	
TFF-24SC	X	X	X	X	
TFX-24SF,SG,SH	X	X	X	X	
TFX-27EH	X	X	X	X	X
TFX-27FH	X	X	X	X	X
CSX-22DH	X		X		
CSF-22MT,MV,MW, MY,MA,MB	MANUAL		X		
CSF-22TB,TC	MANUAL		X		
CSX-22TF,TG	MANUAL		X		
CSF-24MT,MV, MW,MY	MANUAL		X		
CSF-24DA	X		X		
CSF-24DB,DC,DF	X		X	X	
CSX-24DF,DG,DH	X		X	X	

ICE DISPENSER OPERATION

1. Either "Ice Cubes" or "Crushed Ice" can be selected by positioning the selector button accordingly. On some models, a single cradle is used for both water and ice. A three-position switching arrangement provides for selection of either "Chilled Water", "Crushed Ice" or "Ice Cubes".

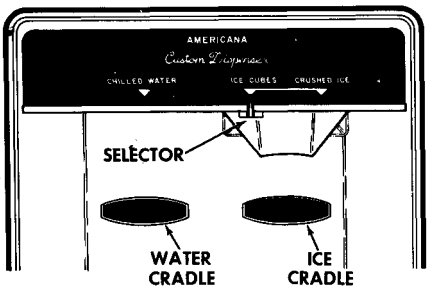


Figure 1 - Dispenser Controls

NOTE: Some models do not dispense "Crushed Ice" (see chart at beginning of section). All references to the operation of the Dispenser are the same for models that dispense "Ice Cubes" only, as well as those that also provide "Crushed Ice". The differences are the additional parts used (crusher blades, solenoid, etc.) to provide this feature.

2. When the ice cradle is pressed, a plunger actuates a crank rod located on the back of the recess assembly.

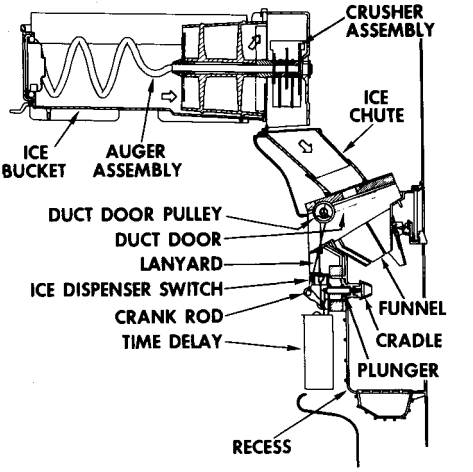


Figure 2 - Ice Dispenser Components

3. The crank rod pulls downward on the lanyard. The lanyard, connected from the crank rod up to the duct door pulley and down to the time delay, opens the duct door.

4. When the cradle is fully depressed, the dispenser switch contacts close, energizing the auger motor.

5. With the selector button positioned for "Crushed Ice", ice cubes (being pushed out of the bucket by the auger assembly) fall onto the ice deflector. See Figure 3. The rotating crusher blades, mounted on the front of the auger shaft, pick the cubes up from the ice deflector and bring them in contact with the stationary blades where crushing takes place. The crushed ice falls down the chute, through the open duct door and into the glass at the cradle.

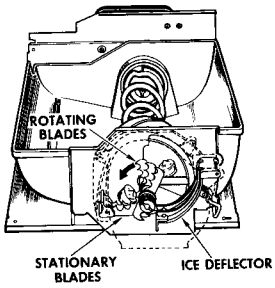


Figure 3 - Crusher Mechanism

6. On models that provide "Crushed Ice", with the selector button positioned for "Ice Cubes", a solenoid is located next to the auger motor and operates a lever which pulls the ice deflector back against the housing. Ice cubes then fall down the chute, through the open duct door and into the glass at the cradle.

   When the dispenser selector button is positioned from Crushed Ice" to "Ice Cubes", some crushed ice will be dispensed at first. This is normal as some ice may remain in the crusher housing between each dispensing.

7. Releasing the dispenser cradle de-energizes the auger motor and solenoid and the time delay slowly closes the duct door.

WATER DISPENSER OPERATION

1. When the cradle is pressed, a plunger actuates a switch which energizes a water valve. The water valve opens, pressurizing the water reservoir located in the fresh food compartment. (On some models, the selector button must be positioned for "Chilled Water" since a single cradle is used for both water and ice).

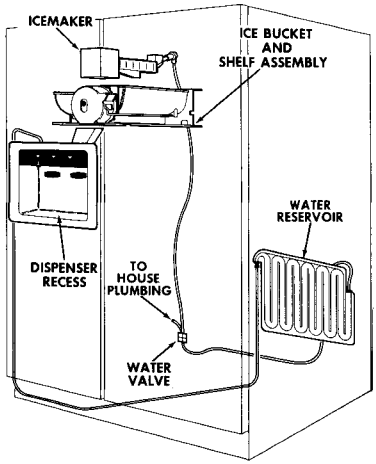


Figure 4 - Component Locations

2. Chilled water flows from the water reservoir, through the connecting tubing to the recess and into the glass at the cradle.

3. When the glass is removed, the switch opens, de-energizing the water valve, stopping the flow of water.

RECESS ASSEMBLY SERVICE

Most service to the recess assembly can be accomplished by working through the service opening in the inner door panel after removing the service cover.

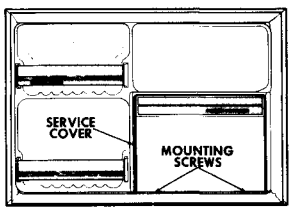


Figure 5 - Service Cover—TBF-21R

Removing two screws at the bottom of the cover will allow access to most of the components located on the rear of the recess.

Some models have a snap-in service cover. Push down at the top to disengage the tabs from the liner, lift up to remove.

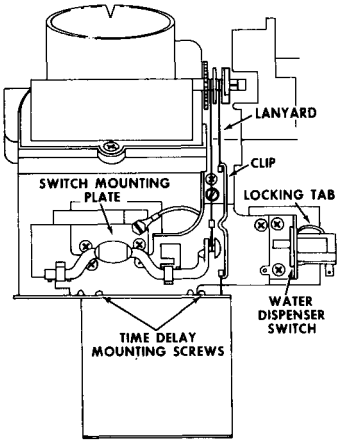


Figure 6 - Rear of Recess

Time Delay Replacement

1. Unhook the lanyard from the clip.
2. Remove the two screws securing the time delay to the bracket and slide to the right to remove.

On some models, due to limited access, the following additional steps are required.

3. Remove the three screws securing the water dispenser switch and plate to the recess. See Figure 6.
4. Remove the wires from the switch terminals.
5. Remove the switch and plate assembly being careful not to damage the cradle spring.
6. Slide the time delay to the right and up to remove.

Reverse the procedure for installation. Be sure the duct door closes fully after hooking the lanyard to the clip.

Ice Dispenser Switch Replacement

1. Unhook the lanyard from the crank and remove the crank by pressing down on the right side and up on the left to disengage it from the hook type supports.
2. Remove the screws securing the switch plate to the recess and the ground wire (if used) to the plate. See Figure 6.
3. On the right side of the recess where the metal plates join (below the pulley), remove the top screw.
4. Loosen the lower screw and swing the time delay and plate to the right.
5. Remove the two screws securing the switch plate to the recess.
6. Remove the dispenser switch and plate being careful not to damage the cradle spring. Reverse the procedure for installation.

Lanyard Replacement

1. Unhook the lanyard from the clip.
2. Unwind the lanyard from the pulley and remove the loop from the crank. Straighten out any kinks.

To reinstall the lanyard:

1. Place a nickel (coin) between the crank and the plunger to set the proper tolerance.

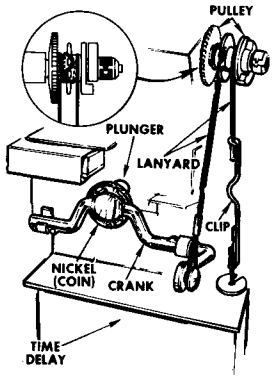


Figure 7 - Threading the Lanyard

2. Hook the loop of the lanyard over the end of the crank.
3. Thread the lanyard behind the pulley and wind 1 1/2 times on the left side.
4. Rotate the knurled wheel of the pulley to firmly close the duct door.
5. Hold the duct door closed, pull tension on the lanyard and engage the lanyard into the notched hub of the pulley in a zig-zag pattern.
6. Wind the lanyard around the right side of the pulley one full turn and hook the end of the lanyard into the clip.
7. Remove the nickel and check the operation. Make sure the duct door closes fully.

1. The plunger screws into the cradle from the rear.

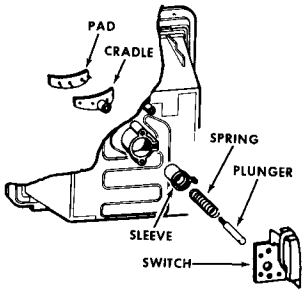


Figure 8 - Cradle and Plunger Assembly

2. The metal bracket and switch plate(s) must be removed for access to the cradle sleeve (s).

Escutcheon Removal

1. Slide the selector button if applicable to the center position and disengage the selector switch lever by reaching in behind the escutcheon and pushing the lever to the rear.
2. Remove the mounting screw, pull down and to the side to remove the escutcheon.

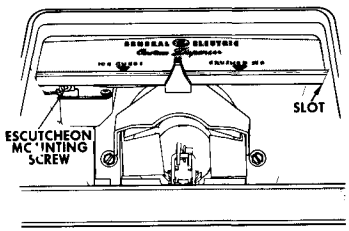


Figure 9 - Escutcheon Removal

Selector Switch Replacement

1. After removing the escutcheon, remove the two switch plate mounting screws.

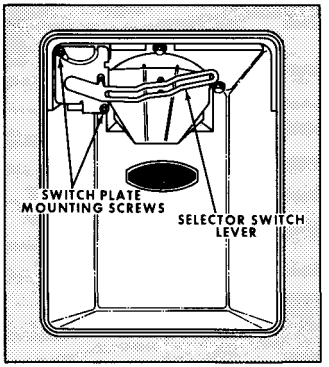


Figure 10 - Switch Plate Removal

2. The selector switch fits onto pins molded into the switch housing. Pull the switch off of the pins for access to the wiring connectors. Some TFF-22 models have two selector switches. The top switch is the water/ice selector switch. The bottom switch is the cube selector switch. All other models have only one (cube) selector switch.

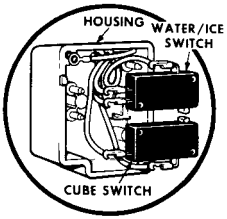


Figure 11 - Selector Switches

Recess Trim Removal

Studs on the rear of the recess trim pass through fasteners in the outer door panel and are secured with pal-nuts. See Figure 12. The inner door panel must be removed for access to the pal-nuts.

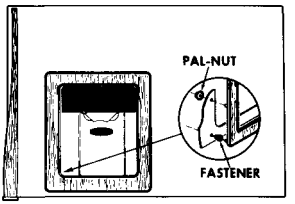


Figure 12 - Recess Trim Mounting

Duct Door Replacement

The duct door is removable from the front.

1. Press in on the ice cradle to fully open the duct door and prevent damage to the door stop.
2. Reaching in through the funnel and behind the open duct door, press forward at the top to disengage the clips from the actuator.

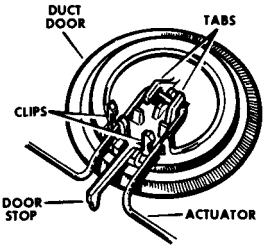


Figure 13 - Duct Door

3. Rotate the duct door 1/4 turn counter-clockwise to disengage the tabs and remove the door. Reinstallation is in reverse procedure. However, the duct door must be held in the fully open position when engaging the clips on to the actuator to prevent breaking the door stop.

Recess Cleaning

The Dispenser recess should be cleaned regularly. Abrasive type cleaners and/or scouring pads

should not be used because the abrasive action will damage the finish of the recess housing and grille.

Water deposits can be removed with a mixture of one teaspoon non-precipitating water softening compound (Calgon) or citric acid powder per pint of hot tap water. Soak until the deposit disappears or becomes loose enough to rinse away. In very severe cases, a soft bristle brush may be needed to completely remove the deposits.

Figure 14 - Recess Cleaning

ICE BUCKET AND SHELF

The operation of the ice bucket auger assembly on all dispenser models is the same.

An auger motor, mounted at the rear of the bucket shelf, is energized when the ice cradle is fully depressed. The motor turns the auger which pushes the cubes out of the bucket into the housing for delivery to the glass at the cradle.

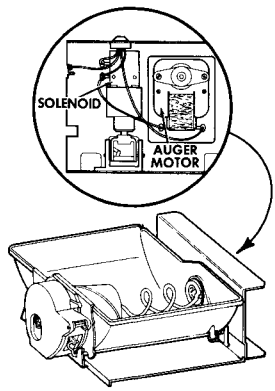


Figure 15 - Ice Bucket and Shelf

On some models, a two-piece metal cover is positioned over the motor to prevent moisture from entering the motor. The front cover is mounted to the auger motor with screws. The rear cover and gasket is secured to the front cover with two spring clips.

The bucket is held in position by a catch at the front and, on some models, a support at the top right rear side. The components of the ice bucket assembly are shown in Figure 16. Some parts vary between models, however, assembly of these components is essentially the same.

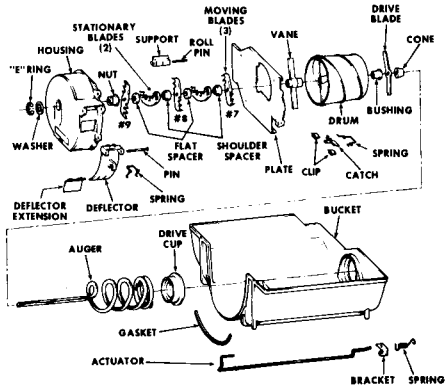


Figure 16 - Ice Bucket Assembly

DOOR REMOVAL

Wiring to the Dispenser is routed through the freezer door top hinge. A wiring harness connector is located under the hinge cover.

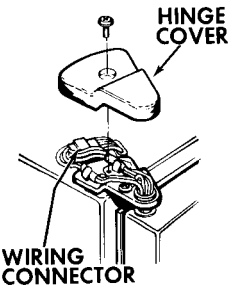


Figure 17 - Wiring Harness to Door

On some models, plastic tubing (for the water dispenser) is routed through the bottom hinge of the freezer door.

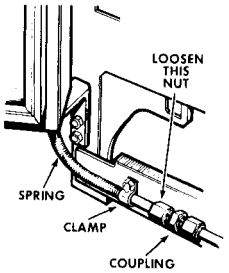


Figure 18 - Water Tubing to Door

Before removing the door, disconnect the power cord from the wall receptacle. Remove the tubing clamp and loosen the coupling nut. Pull the tubing from the coupling. With the door closed, remove the top hinge cover, disconnect the wiring connector and remove the top hinge screws. Then (if the model has a water dispenser), hold the door closed and remove the bottom hinge screws. Remove the door together with both hinges to avoid damage to the wiring harness or water tubing.

When reinstalling the door, dress the wiring at the top hinge to prevent pinching of wires by the hinge cover.

DIAGNOSIS GUIDE

WILL NOT DISPENSE ICE (No Ice in Bucket)

1. Icemaker on-off lever off
2. Water supply not plumbed in
3. Shut-off valve closed
4. Shut-off valve or water line restricted
5. Water valve stuck or solenoid open
6. Icemaker water line leaking or restricted
7. Wiring to icemaker open
8. Icemaker power cord not plugged in
9. Icemaker inoperative

WILL NOT DISPENSE ICE (Ice in Bucket)

1. Door switch not actuated
2. Dispenser switch not actuated
3. Auger not operating
   a. motor inoperative
   b. motor frozen with ice
   c. drive stripped
   d. jammed with ice lumps
4. Duct door not opening
   a. ice dispenser cradle binding
   b. door frozen with ice
   c. cradle plunger broken
   d. crank rod missing or broken
   e. lanyard broken or worn
   f. pulley or crank stripped
5. Wiring open

(WR1264,1617)

DISPENSER MODELS

WILL NOT DISPENSE ICE CUBES
(Dispenses Crushed Ice)

1. Selector button set for crushed ice
2. Selector lever not attached to button
3. Selector switch not actuated
4. Bucket improperly positioned
5. Actuator not engaged by stirrup
6. Solenoid frozen with ice
7. Solenoid inoperative
8. Wiring open

DISPENSER CONTINUES AFTER GLASS REMOVED
(Ice Flows Without Cradle Being Pressed)

1. User removing glass too quickly
2. Cradle sleeve sticking

ICE MISSES GLASS WHEN DISPENSED
(Ice Is Not Directed Into Glass)

1. User positioning glass too low
2. User using glass too small diameter
3. Funnel torn or broken
4. Some crushed ice over-spray normal

ICE DISPENSER CRADLE HARD TO PUSH

1. Cradle sleeve binding
2. Time delay binding
3. Duct door frozen with ice
4. Duct door binding

CUBES ON FREEZER SHELVES OR BOTTOM
(Ice Cubes Out of Bucket)

1. Bucket overfilling
2. Duct door not opening
   a. ice dispenser cradle binding
   b. door frozen with ice
   c. cradle plunger broken
   d. crank rod missing or broken
   e. lanyard broken or worn
   f. pulley or crank stripped
3. Time delay inoperative
4. Auger motor continues to be energized
   a. dispenser switch shorted
   b. wiring shorted
5. Duct blocked with ice

DUCT DOOR FROSTING
(Frozen With Ice or Frost)

1. Duct door not sealing
   a. door misaligned, binding or broken
   b. time delay inoperative
   c. lanyard improperly adjusted
   d. lanyard slipping
2. Fresh food vent tube mispositioned or blocked
3. Recess heater open
4. Wiring to heater open

WILL NOT DISPENSE WATER
(No Water From Dispenser)

1. Water supply not plumbed in
2. Shut-off valve closed
3. Shut-off valve or water line restricted
4. Water valve stuck or solenoid open
5. Reservoir or water line leaking
6. Reservoir or water line frozen
7. Door switch not actuated
8. Dispenser switch not actuated
9. Wiring open

DISPENSER CONTINUES AFTER GLASS REMOVED
(Water Flows Without Cradle Being Pressed)

1. Water valve not closing
2. Wiring to valve crossed
3. Cradle sleeve sticking
4. Dispenser switch shorted
5. Wiring shorted
6. Reservoir restricted-trapped air
7. Over sensitive water switch

WILL NOT DISPENSE CHILLED WATER
(Water Not Cold Enough)

1. First glassful warm normal
2. Temperature control set too warm
3. Heavy usage of dispenser
4. Heavy usage of fresh food compartment

WATER SPLASHES FROM RECESS SUMP
(Recess Sump Overflows)

1. Excessive water or ice spillage
2. Recess heater open ('75 - '80)
3. Recess heater not contacting bottom ('75 - '80)

DIAGNOSIS S-T-E-P PROCEDURE

A quick and easy diagnosis method for the Dispenser feature is called SYSTEMATIC TESTING AND EVALUATION PROCEDURE (S-T-E-P). This method utilizes the natural senses of looking, feeling and listening in making an initial investigation. If all components are functioning properly, a complete evaluation can be made in less than one minute without using any tools or test equipment. By using only the natural senses, any abnormal condition of the Dispenser feature will be detected and the cause isolated. Then, only common hand tools and a volt-ohmmeter will be required for testing of components and circuitry to pinpoint the cause of the abnormal condition.

The S-T-E-P diagnosis method is presented in the form of a flow diagram. The diagram contains four to six steps depending on the model of the refrigerator. The S-T-E-P diagram is to be used in conjunction with the Mini-Manual in those cases where an electrical schematic or pictoral diagram is needed. However, in most instances, the S-T-E-P diagram alone will provide all the assistance necessary to diagnose abnormal conditions of the Dispenser in the shortest possible time.

This procedure is applicable to all Dispenser models (except CSF22M and CSF24M). Some steps are omitted depending on the model.

For example: All six steps apply to TFF24R models. Other models such as the CSF24DA have only four steps. An appropriate S-T-E-P diagram is included with each Dispenser model refrigerator.

Use the S-T-E-P diagram on every service call for any complaint relating to the Dispenser. Begin with STEP 1 and proceed through the sequence of steps until an abnormal condition is found. Do not skip any steps. After isolating an abnormal condition, determine the cause and make the repair. After making the repair, begin with STEP 1 and proceed through the entire sequence as an operational check-out to confirm that all components are functioning properly.

Step 1 - Icemaker Operation

The icemaker is a separate feature of the refrigerator. In order for the Dispenser to dispense ice into the glass at the cradle, the icemaker must function properly. Therefore, the first step is to evaluate or qualify the condition of the icemaker and to determine if it is producing suitable ice to be dispensed through the Dispenser.

Figure 19 - Look for Ice Cubes in the Ice Bucket

If all ice cubes in the ice bucket are approximately one-inch in height, solid and with no "lumping" of ice cubes or "ice sheeting" in the bottom of the bucket, the icemaker is performing normally. Proceed directly to STEP 2.

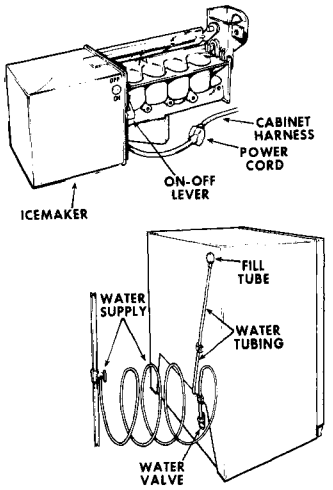


Figure 20 - Causes for Abnormal Ice or No Ice

If abnormal ice is found in the ice bucket, such as ice cubes significantly smaller than one-inch in height, or a sheet of ice in the bottom of the bucket, check: the water supply (shut-off valve clogged, water filter clogged), the water valve (screen clogged, mineral encrusted), the icemaker (seal, leaf switch). If very little or no ice is in the ice bucket, check for ice in the icemaker mold.

When normal ice is in the icemaker mold, check: the icemaker on-off lever (off position), the icemaker power cord (disconnected), the cabinet harness (loose connectors, broken wires), the icemaker (thermostat, motor). When no ice is in the icemaker mold, check: the water supply (shut-off valve closed or clogged, water filter clogged, tubing crimped), the water valve (screen clogged, solenoid open), the plastic water tubing (crimped, disconnected), the fill tube (clogged with ice).

Step 2 - Recess Heater Operation

The purpose of the recess heater is to prevent sweating of the recess, frosting of the duct door, and to aid in evaporation of water in the recess sump. The heater is connected across-the-line and is energized full-time. The second step is to determine if the heater is operative.

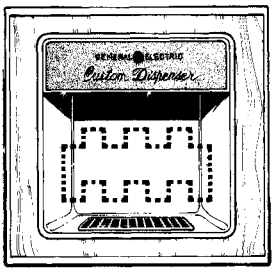


Figure 21 - Feel for Heat at Recess

If the back of the recess is warmer than the sides, the recess heater is performing normally. This not only qualifies the heater, but also indicates that the various wiring connectors within the cabinet and door harnesses are all connected together and that line voltage is being supplied to the components located inside the freezer door. Proceed directly to STEP 3.

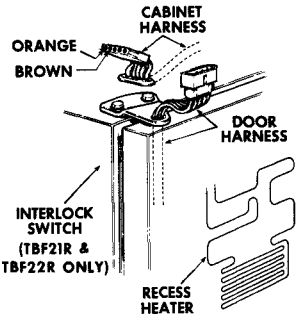


Figure 22 - Causes for No Heat at Recess

If no heat is felt at the recess back, check for AC power to the door at the top hinge wiring connector. Line voltage should be measured between the brown and orange lead terminals of the cabinet wiring harness.

NOTE: When checking for voltage at the wiring connector, do not insert the voltmeter probes into the socket terminals. In most cases, the probes will be larger than the terminals. Forcing the probes into the terminals will distort them and cause a poor connection when the wiring connector is reconnected.

When normal AC power is measured, check: the door harness (loose connectors, broken wires), the recess heater (inoperative). When no AC power is measured, check: the cabinet harness (loose connectors, broken wires), the interlock switch — TBF-21R and TBF-22R MODELS ONLY (inoperative).

Step 3 - Auger Motor Operation

The auger motor provides the driving force for the dispensing of ice through the Dispenser. The third step is to qualify the auger motor, related switches and wiring harnesses.

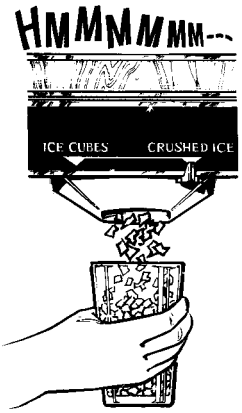


Figure 23 - Listen for Auger Motor and Expect Ice Delivery

If a normal motor sound is heard and "Ice Cubes" or "Crushed Ice" is delivered depending on the model, the auger motor and related components are performing normally. Proceed directly to STEP 4.

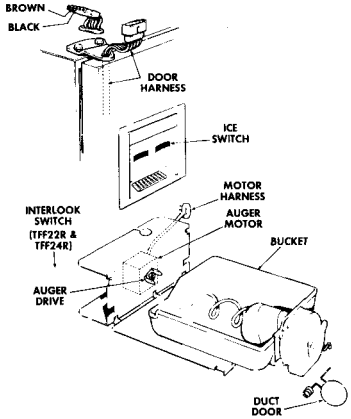


Figure 24 - Cause for No Motor Sound and No Ice Delivery

If a normal motor sound is heard but no ice is delivered, check: the auger drive (stripped, broken), bucket position (mispositioned), bucket ice

jammed (auger drum frozen), motor frozen (iced), duct door frozen (frosted).

If no motor sound is heard and no ice is delivered, check for AC power to the door at the top hinge wiring connector. Line voltage should be measured between the brown and black lead terminals of the cabinet wiring harness.

When normal AC power is measured check: the interlock switch side-by-side MODELS ONLY (inoperative), the ice switch — or cradle switch— (inoperative), door harness (loose terminals, broken wires). When no AC power is measured, check: the auger motor (open winding), the motor harness (not plugged into receptacle, broken wires).

Step 4 - Cube Solenoid Operation

The purpose of the cube solenoid is to open the ice deflector in the ice crusher housing of the ice bucket assembly when dispensing "Ice Cubes". Crushed ice will be dispensed if the cube solenoid is inoperative. The fourth step is to determine if the cube solenoid is operative after having established that the auger motor is functioning properly.

Figure 25 - Listen for Solenoid and Expect Ice Cube Delivery

If a normal solenoid sound is heard and normal ice cubes are delivered, the solenoid and related components are performing normally. Proceed directly to STEP 5.

NOTE: For TBF-21R and TFF-22R models, that do not have the "Chilled Water" function , STEP 4 is the last step in the procedure. At this point, if all steps have indicated normal conditions, all components of the Dispenser are functioning properly. For model having the "Chilled Water" function, proceed to STEP 5.

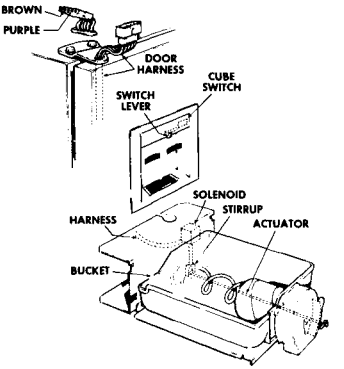


Figure 26 - Causes for No Solenoid Sound and No Cube Delivery

If a normal solenoid sound is heard but no ice cubes are delivered (some crushed ice is normal), check: the cube deflector (broken, binding, frozen), bucket retention (mispositioned), actuator in stirrup (mispositioned).

If no solenoid sound is heard and no ice cubes are delivered (crushed ice is delivered), check for AC power to the door at the top hinge wiring connector. Line voltage should be measured between the brown and purple lead terminals of the cabinet wiring harness.

When normal AC power is measured, check: the cube switch — or selector switch — (inoperative), the switch lever (broken, loose), the door harness (loose terminals, broken wires), solenoid (frozen, jammed). When no AC power is measured, check: the solenoid (open coil), solenoid harness (loose connector, broken wires).

Step 5 - Water Valve Operation

The "Chilled Water" function is used on some TFF-22R models, all TFF24R models and Hoptoint CSF24D. The fifth step is to qualify or evaluate that all components of this feature are functioning properly.

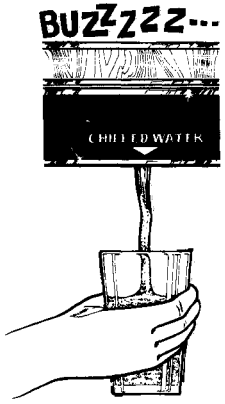


Figure 27 - Listen for Water Valve and Expect "Chilled Water" Delivery

If a normal water valve sound is heard and normal "Chilled Water" is delivered, the "Chilled Water" feature is performing normally. Proceed directly to STEP 6.

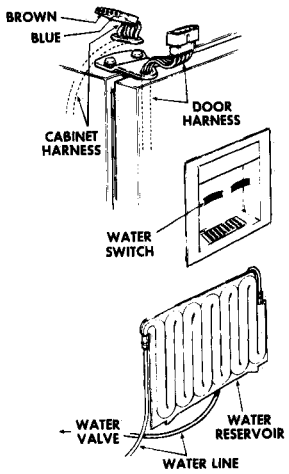


Figure 28 Causes for No Valve Sound and No Water Delivery

If a normal water valve sound is heard and no water is delivered, check for AC power to the door at the top hinge wiring connector. Line voltage should be measured be-

tween the brown and blue lead terminals of the cabinet wiring harness.

When normal AC power is measured, check: the water switch - or cradle switch - (inoperative), the door harness (loose terminals, broken wires). When no AC power is measured, check: the water valve (solenoid open), the cabinet harness (loose terminals, broken wires).

Step 6 - Dispenser Light Operation

The dispenser light - or night light - is a separate feature of some models.

Since this is the least significant feature of the Dispenser, it is the last step in the procedure.

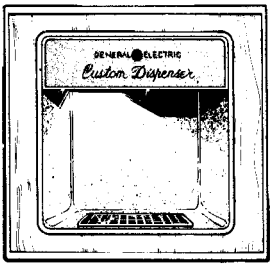


Figure 29 - Look for Light at the Recess

If the lamp lights, this feature is performing normally. At this point, if all steps have indicated normal conditions, ALL COMPONENTS OF THE DISPENSER ARE FUNCTIONING PROPERLY.

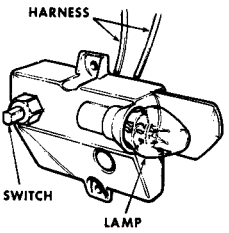


Figure 30 - Causes for No Light

If no light appears, check: the lamp (burned out), the light switch (inoperative), the door harness (loose connectors, broken wires).

CSF-22M, CSF-22T & CSF-24M MODELS (HOTPOINT)

CSF-22M, CSF-22T and CSF-24M side-by-side model refrigerators include the "Water-and-ice" feature.

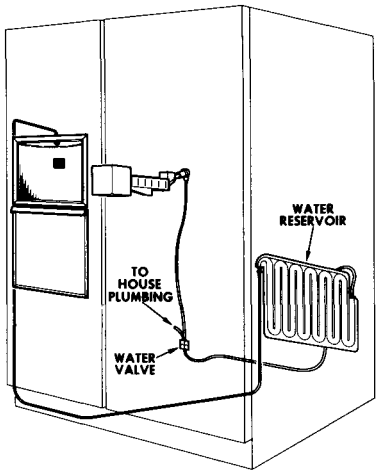


Figure 31 - Water-"N"-Ice Components

WATER FEATURE

Water can be obtained at the freezer door by pressing a glass against the pad in the center of the recess. See Figure 32. Behind the pad is plunger switch which energizes a water valve providing water to the glass. When the glass is removed, the switch opens, de-energizing the water valve, stopping the flow of water.

A grommet on the rear of the pad snaps into a round opening in the recess. To remove the pad, pull out at one corner. To re-install the pad, press the grommet into the round opening.

The switch and plate is secured to the switch housing with one screw. A tab on the switch plate mates with a notch in the housing. Remove the screw and the switch and plate assembly can be removed.

Disconnect the wiring leads, press in on the switch locking tabs and the switch can be removed from the mounting plate.

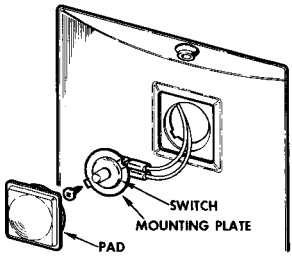


Figure 32 - Pad and Switch

ICE FEATURE

Ice may be obtained through the exterior ice service door without opening the freezer door. When the ice service door is opened, a hook, fitted on the back of the door is pushed outward by a spring loaded sliding actuator. The extended hook catches the ice bucket, pulling it forward, permitting cubes to be removed without opening the freezer door. See Figure 33.

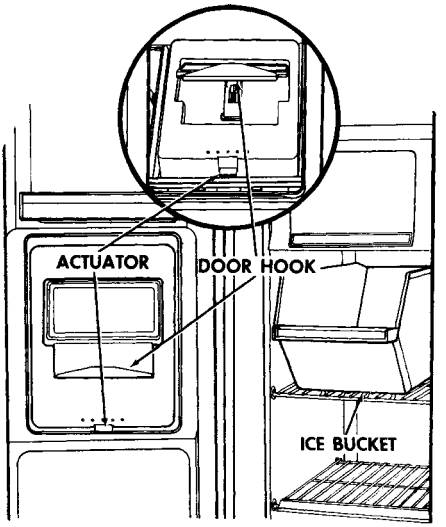


Figure 33 - Ice Service Door Hook

The ice bucket slides on raised rails formed in the freezer shelf. Stops formed into the shelf prevent the bucket from coming out too far unless it is lifted to clear these stops.

Two light switches, located in a housing mounted to the left side of the liner are actuated by the ice bucket as it slides in and out. The switches are wired in series, with one switch normally open and one switch normally closed.

As the ice bucket is pulled forward, the rear switch is released and the light is turned on. If the ice bucket is completely removed, the front switch is released and the light is turned off (when the freezer door is closed). See Figure 34.

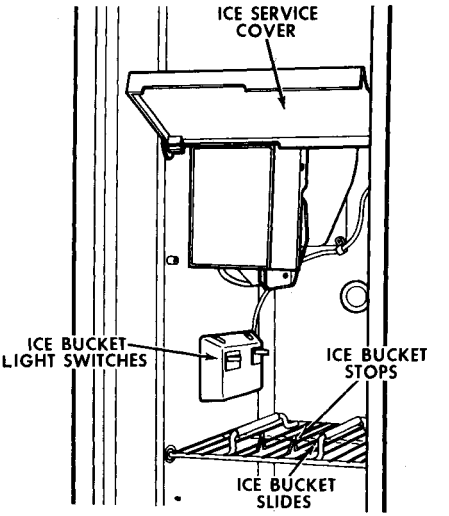


Figure 34 - Shelf, Switches & Ice-maker

ICEMAKER

An ice service cover hinges on a support in each side of the liner. The cover can be raised to operate the on-off lever. For icemaker servicing, it can be removed by lifting off of the support pins.

The icemaker is mounted with two screws that pass through the easy-mount bracket and thread into grommets in the side of the liner.

WATER RESERVOIR

A series-flow water reservoir is mounted at the rear of the fresh food compartment. This allows for a slight chilling of the water before it is dispensed at the freezer door recess.

To service the water reservoir:

1. Remove the vegetable and meat pans.
2. Remove the duct cover by pressing down to disengage it from under the return air grill.

3. Lift up at the rear of the glass veg pan cover and push it to the rear to disengage it from the front supports. Remove the glass cover and gasket. See Figure 35.

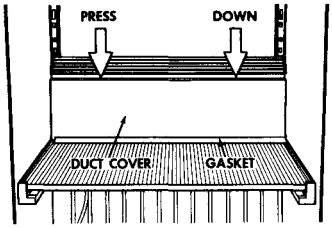


Figure 35 - Duct Cover Removal

4. Remove the two water line compression nuts on each side of the reservoir. See Figure 36.
5. Lift up to clear the bottom supports and remove the reservoir.

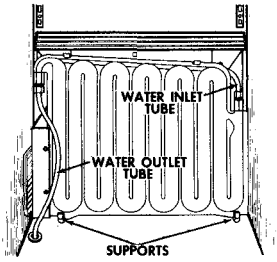


Figure 36 - Water Line Connections

The water line from the reservoir to the recess is routed through a conduit between the liner and outer case to the front angle. A coupling (union) connects the tubing at this point before it enters the door through the lower hinge. A flexible spring is positioned over the tubing for protection, before it passes through the lower hinge.

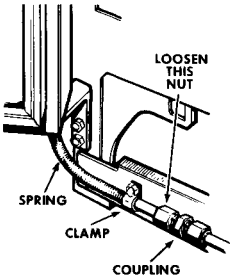


Figure 37 - Water Line Coupling

DOOR REMOVAL

1. At the front angle, loosen one of the compression nuts and pull the tubing out of the coupling.
2. Remove the strap and flexible spring.
3. At the top hinge, disconnect the wiring connector and remove the hinge mounting screws.
4. Remove the lower hinge mounting screws.
5. Remove both hinges with door.

RECESS SERVICE

Wiring to the recess assembly is routed through the top hinge and a plastic conduit imbedded in the foam insulation. See Figure 38.

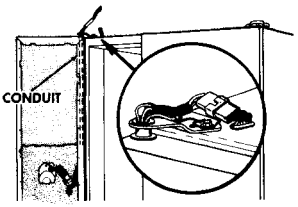


Figure 38 - Wiring Harness Routing

To service the recess heater, it is necessary to remove the inner door panel. The recess trim is held by pal-nuts. By removing the pal-nuts,

pulling the water line out of the grommet and disconnecting the wiring connector, the recess assembly can be removed. See Figure 39. A ground wire connects to the outer door panel with a spade terminal.

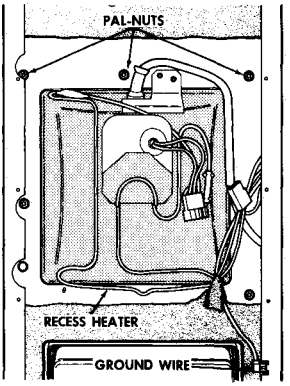


Figure 39 - Recess Heater

SERVICE NOTES

WATER CONTINUES TO FLOW

If water continues to flow from the chilled water dispenser after the cradle is released, check for trapped air in the water reservoir. Normally, all air is purged from the reservoir when it is initially filled with water. However, if the passage across the top of the reservoir is plugged, some air will be trapped and compressed by the water pressure while dispensing. When the cradle is released the valve closes, however, water continues to flow momentarily — until the compressed air is equalized. To correct this condition, replace the reservoir.

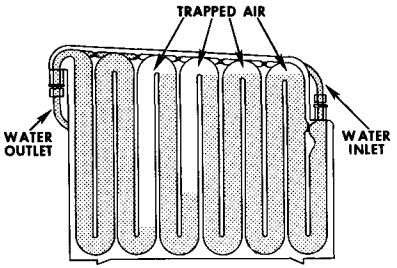


Figure 40 - Air in Reservoir

If water flows from the chilled water dispenser when the cradle is not depressed, check for an over sensitive water dispenser cradle switch. To correct the condition, replace the switch. The WR23X177 Switch should be used as a replacement for the rocker type switch (WR23X192) and bracket (WR2X4771).

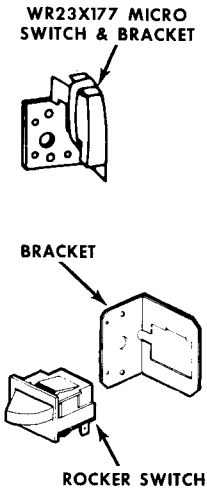


Figure 41 - Cradle Switches

RESERVOIR FREEZING

Freezing of water in the reservoir may occur on some models due to light usage. To correct this condition:

1. Install a WR49X300 Temperature Control Compensator on the back of the temperature control.

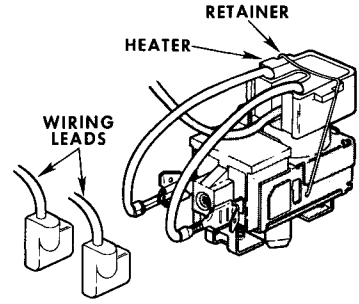


Figure 42 - Control Compressor

2. Add WR2X2374 Insulated Tubing over the reservoir outlet tubing (at the left side).
3. Set the meat/vegetable damper control to the "vegetable" setting.

BROKEN AUGER DRIVE J-NUT TBF-21R

On TBF-21R models, a broken auger drive J-nut may be due to an incorrect hole size in the drive fork. To correct this condition, replace the drive fork (WR2X4854) and J-nut (WR1X1547).

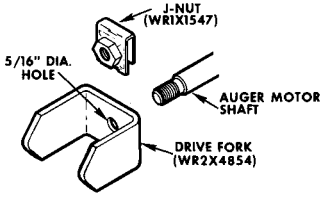


Figure 43 - TBF-21R Auger Drive

CRUSHED ICE ONLY

Dispensing of crushed ice when the selector button is position for "Ice Cubes" may be due to:

- a mispositioned ice bucket
- jammed ice deflector or actuator lever
- selector switch lever not attached
- inoperative solenoid, or open wiring.

Also, do not overlook binding of the cube solenoid. This is primarily caused by frosting or icing. To correct this condition:

1. Remove the solenoid assembly and check for rough spots or burrs on the armature. Sand off accordingly.

   NOTE: Do not remove the foam shroud. It must be secured to the bottom of the solenoid. If it is moisture saturated, replace the shroud (WR17X1063).

2. Apply a **small** amount of silicone lubricant (WR97X163) to the sides of the armature.
   NOTE: Do **not** apply lubricant to the **top** of the armature as it will cause the armature to "hang up".

3. Reinstall the solenoid assembly and manually raise the armature and let it drop. If it does not drop freely, disassemble and remove some of the lubricant. Reinstall and check.

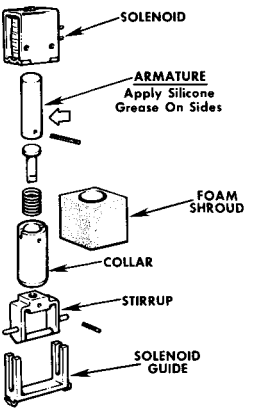


Figure 44 - Solenoid Assembly

DUCT DOOR FROZEN

An intermittent time delay can cause the duct door to close too soon, thus trapping ice in the chute. As the ice is melted by the heater, the duct door becomes frozen shut.

To check for an inoperative time delay, open the freezer door and operate the ice dispenser cradle slowly about ten times. If, during one of these operations, the duct door closes too fast, (immediately) after the cradle is released, an inoperative time delay is indicated. Replaced the time delay (WR9X268).

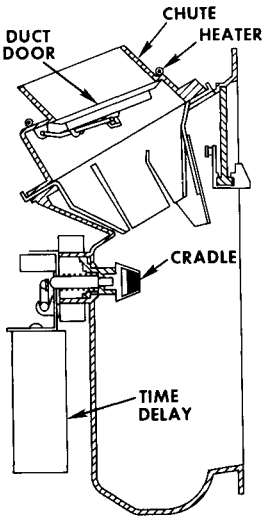


Figure 45 - Ice Dispenser Mechanism

DUCT DOOR HELD OPEN

If the duct door fails to close (remains open), examine the funnel for a warped funnel "finger", excess flashing at the edges of the "finger", or some of the "fingers" webbed together. Excess flash should be trimmed off to allow approximately 1/32-inch space between the "fingers". If a funnel finger is warped (bent inward to trap the duct door), replace the funnel (WR17X1256).

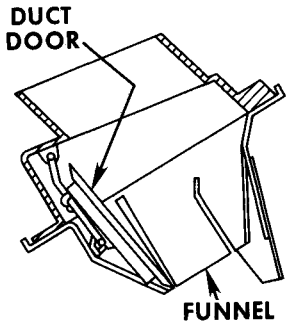


Figure 46 - Duct Door Held by Funnel

Check also for a friction bind of the duct door stop against the bottom of the chute. To correct this condition, remove the duct door and file the tip of the stop to provide a smooth radius, where it makes contact with the bottom of the chute.

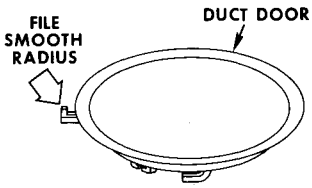


Figure 47 - Duct Door Stop to be Filed

ICE BUCKET LATCH

The ice bucket latch, located at the bottom front, holds the bucket in position on the shelf. If one of the retainers used to secure the catch and spring pops off, the retainer, catch and spring are usually lost (see Figure 48). For this reason the catch, spring and both retainers are included in the WR49X247 Bucket Latch Kit.

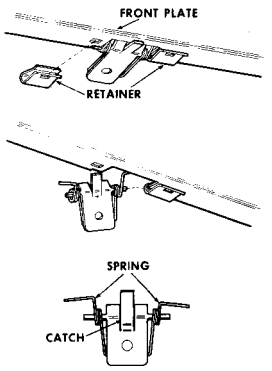


Figure 48 - Ice Bucket Latch

DOOR HARNESS WIRING OPEN

If an open circuit to the Dispenser develops, due to a broken or separated wire in the harness, do not attempt to splice a wire in that portion of the harness that passes through the hinge or conduit. Listed below are harness kits for a safe and effective repair.

WR49X198
TFF-24RE

WR49X199
TFF-24RL
TFF-24RM

WR49X201

TFF-22RV	TFF-24RT
TFF-22RW	TFF-24RV
TFF-22RY	TFF-24RW
TFF-22RA	TFF-24RY
TFF-22RB	TFF-24RA
TFF-22RC	TFF-24RB
TFX-22RF	TFF-24RC
TFX-22RG	TFX-24RF
TFX-22RH	TFX-24RG
TFF-24RN	TFX-24RH
TFF-24RP	TFX-24SF
TFF-24RR	TFX-24SG
TFF-24RS	TFX-24SH

WR49X201 (cont'd.)

CSX-22DH	CSF-24DF
CSF-24DA	CSX-24DF
CSF-24DB	CSX-24DG
CSF-24DC	CSX-24DH

WR49X206
TFF-21RL
TFF-22RM

WR49X219

TBF-21RR	TBF-21RB
TBF-21RT	TBF-22RC
TBF-21RV	TBX-22RF
TBF-21RW	TBX-22RG
TBF-21RY	TBX-22RH
TBF-21RA	

WR49X229
TFF-22RN
TFF-22RP
TFF-22RR
TFF-22RS
TFF-22RT

WR49X258
TFF-20RA
TFF-20RB
TFF-20RC
TFX-20RF
TFX-20RG
TFX-20RH

WR49X5103

CSF-22MT	CSF-22TC
CSF-22MV	CSF-22TF
CSF-22MW	CSF-24MT
CSF-22MY	CSF-24MV
CSF-22MA	CSF-24MW
CSF-22MB	CSF-24MY
CSF-22TB	

Each kit contains a wiring harness, connector block, bell-type connectors and an instruction sheet.

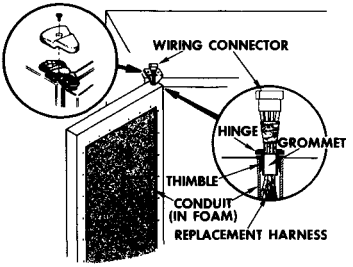


Figure 49 - Harness Service Kits

DISPENSER CRADLE SWITCH

An alternate dispenser cradle switch (WR23X144), used on some models, can be replaced without removing the mounting plate from the back of the dispenser recess. Remove the screw that secures the housing to the plate, then unhook the housing at the opposite end and release the two locking tabs that secure the switch to the housing.

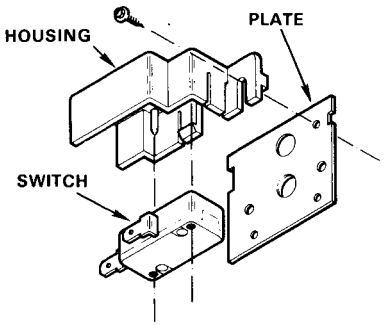


Figure 50 - Cradle Switch Assembly

LIGHT SWITCHES NOT ACTIVATED

When shelf extensions are added to the ice bucket shelf of CSF22/24 "M" model refrigerators, the shelf is moved to the right. The ice bucket also moves to the right and in some cases may not engage the ice bucket light switches. If this occurs, place the bucket in position on the shelf and mark the position of the light switch levers on the inside of the bucket. On the outside of the bucket, place a WR2X7034 rubber bumper at each marked location.

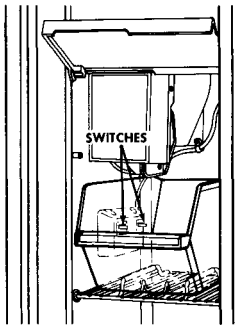


Figure 51 - Rubber Bumper Location

FALLING SHELF ABOVE ICEMAKER

On CSF22/24 "M" model refrigerators, a falling plastic shelf above the icemaker may be corrected by replacing the two right side shelf supports with two WR2X6253 supports.

FALLING ICE SERVICE COVER

On CSF22/24 "M" model refrigerators, if the ice service cover falls off the supports due to insufficient engagement, replace the original WR2X3986 supports with two WR2X6300 supports. The new supports are 1/4-inch longer and thus engage farther into the cover.

These supports are the spring lock type that are removed and replaced by rotating **clockwise** 180°(½-turn).

Figure 52 - WR2X6300 Cover Support

ICE BUCKET OVERFLOWING

Icicles forming on food packages stored in the slide out bin below the ice bucket shelf, on TFF-24RV (1977) and later dispenser model refrigerators, is primarily caused by ice cubes overflowing the bucket.

To correct this condition, install a WR49X260 Ice Cube Overflow Kit. This kit consists of a rear bucket spacer, a bucket stabilizer rivet, side bucket deflectors and instructions.

When servicing for icicles on food packages, be sure to also check for a poor ice maker cup seal (See ICE-MAKER section — Ice Cubes Lumping or Fusing).

DUCT DOOR NOT CLOSING

The duct door not fully closing on TFF-20RA or RFF-22RA models may be due to the lanyard and/or pulley being stalled or jammed by a cardboard cover over these parts.

When servicing either of these 1980 models for a partially open duct door, remove and discard the cardboard cover. On all later production TFF-20RA and TFF-22RA models starting with September, 1980, production (serial prefix SG), the carboard cover is not used. Obviously, there are other reasons for a duct door not fully closing, such as a loose pulley, loose lanyard, weak time delay, etc. The parts should also be checked for proper operation. The cardboard cover was only used on early production 1980 TFF-20RA and TFF-22RA models.

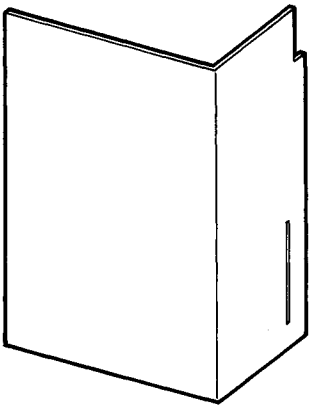


Figure 53 - Cardboard Cover

REPLACEMENT WATER TUBING

Beginning with late 1978 ("W-P") dispenser models, the "chilled water" tubing is welded to the water reservoir inlet and outlet. If the tubing should break on one of these models, it is not necessary to replace the reservoir (unless the break is within approximately 6-inches of the inlet or outlet). Instead, order a WR17X1483 Water Tubing Kit, cut the tubing approximately 6-inches back from the reservoir, and splice the tubing using the union furnished in the kit. See Figures 54 and 55.

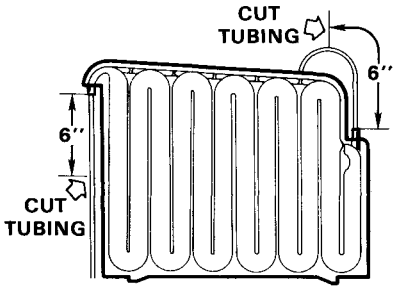


Figure 54 - 48 oz. Water Reservoir

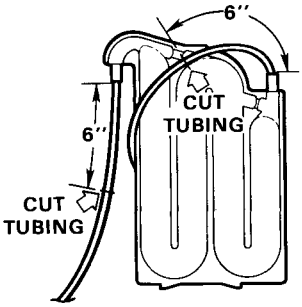


Figure 55 - 38 oz. Water Reservoir

SERVICE COVER REMOVAL — SIDE-BY-SIDE MODELS

When removing the dispenser recess service cover on side-by-side models, care must be taken to avoid breaking the tabs on the back of the cover.

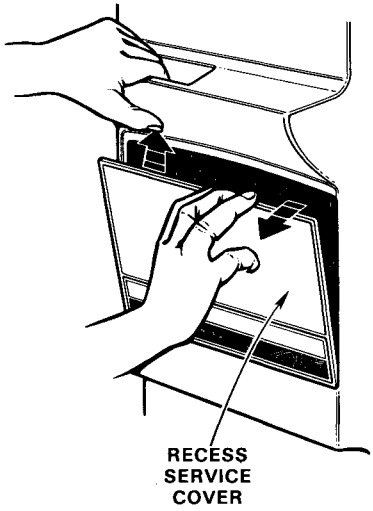


Figure 56 - Service Cover Removal

A simple technique for removing the service cover is to first press upward on the inner door panel, near the center, just above the cover, while pulling outward on the top of the cover with fingertips. This will flex the inner door panel enough to disengage it from the upper tabs of the cover. Then, the cover can be removed by lifting upward to disengage the lower tabs from the inner door. panel.

To reinstall the service cover, position the lower tabs over the edge of the inner door panel then gently press along the top of the cover to engage the upper tabs.

INTERMITTENT ICE/WATER DISPENSING

Intermittent or repeat occurrences of "no ice or water dispensing" may be due to:

- the freezer door wiring harness connector not firmly connected,
- the freezer door interlock switch not fully actuated when the door is closed, or
- ice formed on the cradle switch, plunger and/or tab of the cradle sleeve, preventing the switch from energizing the dispenser mechanism.

If ice forms on the cradle switch, plunger or sleeve tab, check for a plugged vent equalization tube (at the lower rear of the fresh food compartment, behind the water reservoir). The vent tube should be open. On TFF-22RB models, the insulation around the cradle switch may be insufficient. After removing any ice accumulation from around the cradle switch, install a WR14X327 Insulation. An instruction sheet is included with the special notched insulation. Do not use any other insulation to avoid blocking movement of the time delay lanyard.

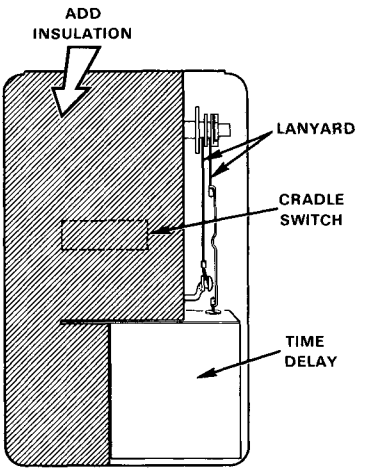


Figure 57 - Insulation Installed

ICE SHELF DISASSEMBLY - TBX22R

On TBX-22R Models a chute, mounted to the icemaker shroud (mold shield), channels water spillage from the icemaker to the area below the ice shelf.

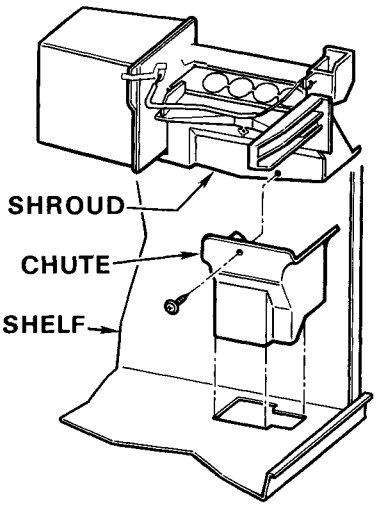


Figure 58 - Chute Assembly

DISPENSER MODELS

The chute is located behind the auger motor and solenoid cover, at the right side. To remove the cover; first remove the two mounting screws, then disengage the tab at the left side and swing the cover out at the left side far enough to reach in and disconnect the wiring harness connector.

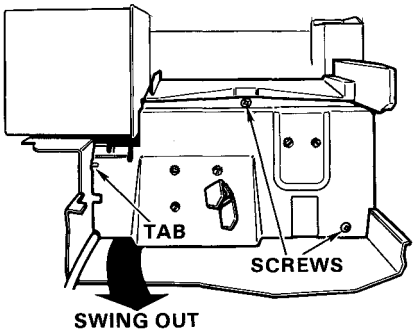


Figure 59 - Cover Removal

ELECTRONIC SYSTEM

OPERATION

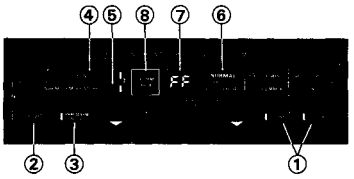


Figure 60 - Control Console

1. A selection of either ice cubes or crushed ice is made on some models by touching either the "CUBES" or "CRUSHED" pad on the control console. A green signal light indicates the selection that has been made. A beep will be heard each time either pad is touched.

2. The dispenser recess light is operated by touching the "LIGHT" pad on the control console. A single touch turns the light on or off. A beep will be heard each time the pad is touched.

3. The door alarm can be set by touching the "DOOR ALARM ON/OFF" pad on the control console. The beeper will then sound after either the fresh food or freezer door has been open for 30 seconds. The beeper will continue to sound until both doors are closed or the alarm is set off. A green signal light indicates the alarm is set. A beep will be heard each time the pad is touched.

4. A red signal light on the control console will flash any time either the fresh food or freezer door is open or ajar more than 1/4-inch. The signal will be extinquished when both doors are close.

5. A red signal light on the control console will appear when the freezer temperature is above normal. The signal will be extinquished when the temperature is reduced to normal.

6. A green lighted word "NORMAL" on the control console indicates that no failure has been detected by the diagnostic system.

7. A flashing green diagnostic code will be displayed on the control console when a failure has been detected by the diagnostic system. If more than one coded function requires attention at the same time, the one with the highest priority will be displayed until erased. The following codes are shown in order of priority:

   FF - frozen food should be checked for thawing.
   PF - power has been interrupted.
   CI - icemaker is not operating properly.
   dE - defrost system has failed.
   CC - freezer temperature is warm.

8. The System Check/Reset provides a review of all five diagnostic codes. Touching the "SYSTEM CHECK" pad will advance the review sequence of codes. If no failure is detected, the review sequence will continue until the system is reset.

SYSTEM CHECK/RESET

TOUCH: SYSTEM CHECK

OBSERVE: DIAGNOSTIC CODE SEQUENCE AND SIMULTANEOUS "NORMAL" FF, PF, CI, dE, CC

"NORMAL" REMAINS LIT —IF NO FAULT DETECTED

FAULT CODE REMAINS ON DISPLAY —IF FAULT DETECTED

Figure 61 - System Check/Reset

NOTE: On "F" (1984) and "G" (1985) models, touching the "SYSTEM CHECK" pad will erase any diagnostic code from the display. On "H" (1986) and later models, some of the diagnostic codes will be erased automatically if the condition is corrected; other codes will be erased by touching the "SYSTEM CHECK" pad only if the condition has been corrected. Refer to the appropriate Mini-Manual for the operation of a particular model.

HANDLING ELECTRONIC COMPONENTS

Care should be exercised when handling electronic circuit boards to prevent damage due to electrostatic discharge.

Figure 62 - Exercise Care

POWER MODULE ASSEMBLY

The power module assembly, together with the transformer, is mounted to the back of the dispenser recess. The assembly can be removed through the service opening in the inner door. After loosening the lower mounting screw, remove the other mounting screw at the left side, then gently move the lanyard aside as the assembly is withdrawn. Reassembly is in reverse order, however, care must be taken to prevent trapping the lanyard behind the power module housing. Also, it is imperative that the green ground wire and the white-green ground wire are both attached to the metal cover upon reassembly.

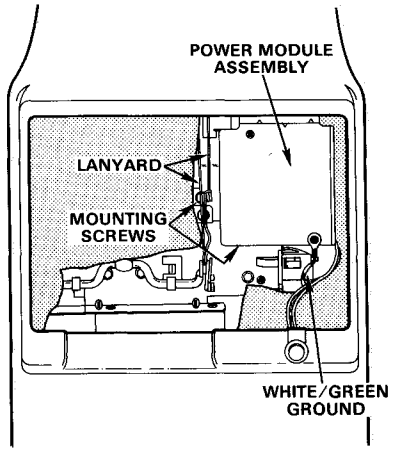


Figure 63 - Power Module Assembly

Remove the two screws, securing the metal cover to the housing, for access to the power module circuit board, transformer connector and temperature sensor connector. The power module board contains the relays, for

the light and cube solenoid, and the power supply circuits to rectify and filter the voltage source.

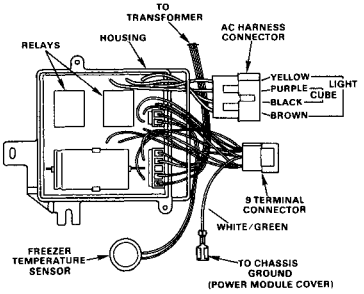


Figure 64 - Power Module Components

DOOR ALARM SENSOR

The door alarm sensor consists of a reed switch and a magnet. The reed switch, mounted on the right edge of the freezer door, is normally open. The magnet mounted on the left edge of the fresh food door opposite the reed switch, operates the switch. When both doors are closed, the magnet closes the switch.

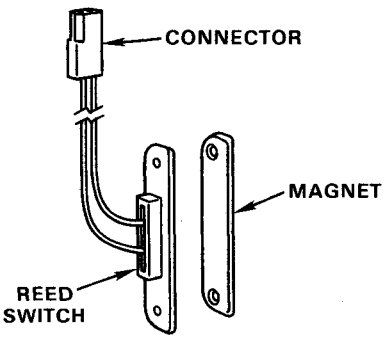


Figure 65 - Door Alarm Sensor

CONTROL CONSOLE

The control console can be removed by carefully inserting a small blade screwdriver at the lower edge and prying downward at two places. The wiring harness connector plugs onto the back of the board.

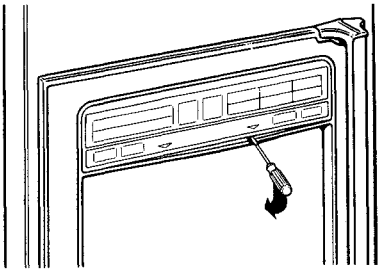


Figure 66 - Control Console Removal

To remove the circuit board from the housing, place it face-down on a soft work surface and remove the screws at the back. Avoid lifting the housing, after removing the board, to prevent the switch buttons from falling out of position in the housing.

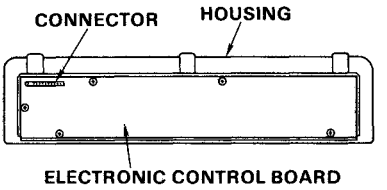


Figure 67 - Control Console

CURRENT SENSORS

Two sensors are used to detect current flow through the icemaker and defrost heaters. Both sensors are

located in the freezer compartment near the evaporator. Accordingly, to gain access to either sensor, it is necessary to remove the evaporator cover.

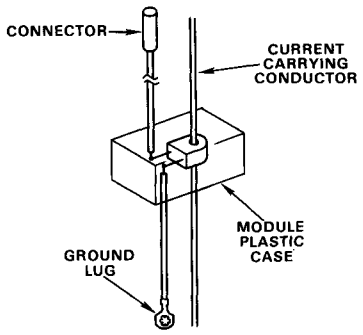


Figure 68 - Current Sensor

DIAGNOSIS

The electronic system is designed so that if a total electronic system failure should occur, the only effect on the refrigerator would be:

- loss of the dispenser recess light and,
- inability to dispense ice cubes (only crushed ice will be dispensed).

Obviously, the electonic system, along with its monitor and diagnostic functions, would also be affected.

NOTE: To diagnose a specific failure of the electronic system of a particular model, refer to the diagnosis flow chart in the appropriate Mini-Manual.

VISUAL/AUDIBLE OBSERVATION

Any visual or audible response from the control console is an indication that the transformer and a major portion of the power module are functioning. If the light and cube relays can be heard opening and closing, as the appropriate control console pads are touched, this indicates the relays are operating. However, the relay contacts may not actually be opening and closing.

CURRENT FLOW CHECK

The electronic system also provides a means for checking icemaker and defrost current flow by touching and holding the "SYSTEM CHECK" and "CUBES" pads simultaneously. If current is detected in either the icemaker or defrost circuits, a read-out can be observed on the display.

CURRENT FLOW CHECK
—ICEMAKER/DEFROST

TOUCH AND HOLD SIMULTANEOUSLY:

SYSTEM CHECK + CUBES

OBSERVE DISPLAY:

C = ICEMAKER CURRENT FLOW

d = DEFROST CURRENT FLOW

dC = DEFROST & ICEMAKER CURRENT FLOW

INDUCE ICEMAKER CYCLE AND/OR DEFROST CYCLE MANUALLY TO CHECK

Figure 69 - Current Flow Check

VOLTAGE/RESISTANCE MEASUREMENTS

Voltage measurements can be made at the control board wiring harness connector which will verify the power supply voltages fromt he power module assembly. Also, from this connector, resistance measurements can be made of all of the sensors. Remove the control console and disconnect

the wiring harness connector. Use meter lead probes that have a needle point and refer to the Mini-Manual for the proper measurements on a particular model.

RELAY TESTING

To check the light and cube relay contacts, disconnect the four-terminals AC Harness Connector (containing the brown, yellow, black and purple wires) from the power module. (This short four-wire harness, extending from the power module, connects directly to the relay contacts and does not have a voltage potential when the harness is separated.) Using an ohmmeter to check for continuity; place the probes on the male terminals in the connector, extending from the power module, for the appropriate (light or cube) relay contacts. Then, touch the respective pad (light or cube) on the control console to operate the relay while observing the ohmmeter response.

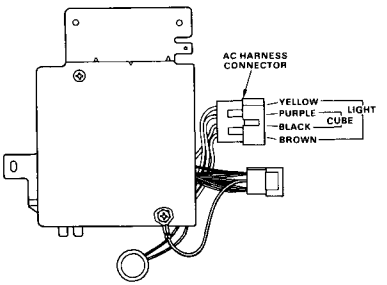


Figure 70 - Power Module

CAUTION: This test is made while voltage is applied to the refrigerator. Accordingly, care must be taken to make sure the ohmmeter is not connected to the female terminals in the mating connector which contains line voltage.

POWER UP RESET

The electronic system provides a means for simulating a power up routine without disconnecting and reconnecting the power cord. The power up routine demonstrates that the power module, microcomputer (on the control board) and timing functions (on the control board) are operative by providing a visual check of the display, the five indicator lights and the "normal" light plus an audible check of the beeper.

NOTE: A power up reset will erase all diagnostic codes and reset the timing function of the electronic system.

To initiate the power up reset, touch the "SYSTEM CHECK" and "CRUSHED" pads simultaneously.

POWER UP RESET

TOUCH SIMULTANEOUSLY:

SYSTEM CHECK + CRUSHED

OBSERVE POWER UP ROUTINE:

A. ONE BEEP, AND
   ALL LED INDICATORS LIT 5 SECONDS,
   DISPLAY SHOWS 8E , THEN
B. FLASHING PF DIAGNOSTIC CODE
C. "DOOR ALARM" & "CRUSHED" LIT
D. "NORMAL" LIT
E. DISPENSER LIGHT OFF
F. "WARM TEMPERATURE" LIT
   —IF TEMPERATURE ABOVE 55°F.

Figure 71 - Power Up Reset

INDEX

INTRODUCTION

Diagnosis is briefly defined as "a careful investigation of the facts to determine the nature of a thing". In applying diagnosis to refrigerator servicing, too many basic facts are overlooked simply because they are not checked. Make a careful and thorough investigation of all of the facts to determine the true cause of a complaint.

Many complaints require only customer education or reassurance that the refrigerator or freezer is operating according to specifications. At other times, the refrigerator or freezer is not operating properly and a preliminary examination should be made to correctly diagnose the problem.

Preliminary Examination

1. Temperatures of fresh food and freezer compartments — Are temperatures normal for usage conditions?
2. Temperature control settings — Are control settings correct for temperatures expected?
3. Customer usage — Is the operation normal?
4. Room Ambient — Is the kitchen hot?
5. Evaporator — Does it need defrosting?
6. Defrost control, heaters and circuit — Are all components operating properly?
7. Condenser — Is it clogged with dust or lint?
8. Condenser fan — Is it operating?
9. Evaporator fan — Is it operating?
10. Door switch — Is the light off when the door is closed?
11. Door gasket — Is it sealing completely?

TEMPERATURE MEASUREMENTS

Correct temperature measurement is very important in determining if the refrigerator is operating properly. When measuring cabinet temperatures, it must be remembered that customer usage plays a big part in maintaining proper temperatures within the cabinet.

Temperature measurements in either the fresh food or freezer compartments should never be made of the air. Air temperature fluctuates drastically from the end of one cycle to the beginning of the next and any time the door is opened. The only way to measure temperature performance is to place a thermometer directly into a container of food or liquid that has been in the refrigerator for at least 24 hours. Wait at least three minutes before reading the thermometer. In the mornings, temperatures will usually be lower than in the afternoons, especially with heavy usage during the day.

Freezer temperatures are best measured in ice cream that has been in the freezer for at least 12 hours. Insert the thermometer directly into the ice cream. After two minutes, remove and insert the thermometer

into another part of the ice cream. Read the temperature after three minutes.

If no ice cream is available, or the customer objects, place the thermometer between two packages of frozen food. Read the temperature after four minutes.

The temperature readings should be compared with the model data on the Mini-Manual. But remember, the temperatures shown under model data were recorded under no-load conditions, which among other specifications means no door openings.

RAPID ELECTRICAL DIAGNOSIS

On models that have the Rapid Electrical Diagnosis (R-E-D) feature, a quick and accurate method of diagnosing electrical faults is available. From the front of the cabinet, without disconnecting the power cord, without disassembling any parts and without unloading any food packages, the electrical system can be evaluated through a special multi-circuit connector. The multi-circuit connector, when separated, isolates parallel circuits in the wiring harness to permit testing of all electrical components and related wiring within the main harness.

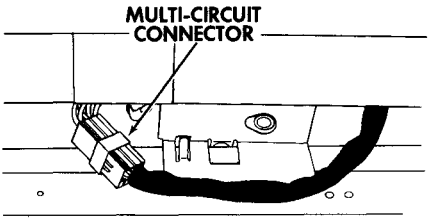


Figure 1 - Connector Location

Tools Required

To perform the test, a special adapter (WX5X337 Robinair 14442) is connected into the wiring harness through the multi-circuit connector.

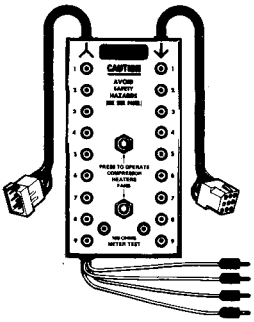


Figure 2 - R-E-D Test Adapter

The wiring harness is thus conveniently extended to a row of jacks, serving as test points, on each side of the test adapter panel. The jacks are identified by number corresponding to the actual wiring terminal location in the multi-circuit connector. Above the two rows of jacks, the electrical symbols for the terminals in the multi-circuit connector are indicated. On the left side, female terminals are indicated by the arrow tail and on the right side, male terminals are indicated by the arrow point.

The upper push button switch completes the circuit through the test adapter to jack no. 3 on the left side ("3 female").

This terminal in the multi-circuit connector is always the line ("hot") side of the power cord. The lower push button switch completes the circuits through the brown and orange jumpers, extending from the bottom of the test adapter.

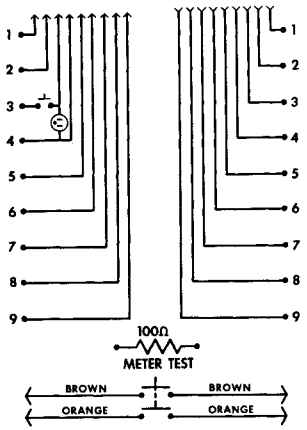


Figure 3 - Test Adapter Diagram

The test adapter is used in conjunction with an ordinary ohmmeter for resistance testing of component circuits. As long as the ohmmeter is in good working condition (fully charged batteries, leads not broken, etc.) the reading should be satisfactory since the resistance values to be measured are relatively low.

Test Data

Reference data for making the test will be found in the Mini-Manual (see GENERAL Section for location and description of Mini-Manual). Located beside the schematic diagram are component circuits or segments of the schematic diagram.

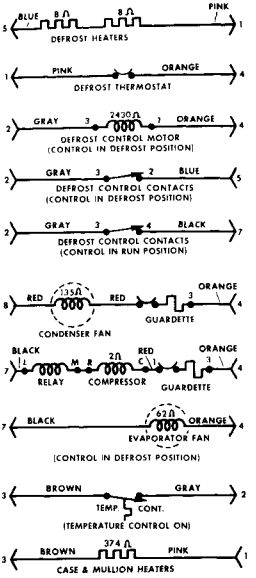


Figure 4 - Typical Component Circuits

The component circuits, covering only the basic operating components for each model, should not be considered as a test sequence, but rather a guide for making resistance tests. The resistance values of all components have a tolerance of plus-or-minus 5%. When two or more components are in series in a single component circuit (i.e. defrost heaters), the resistance values of all the components should be added together. When two or more components are in parallel (i.e. case and mullion heaters), often a single symbol is used in the component circuit to represent the parallel combination. In this case, the resistance value shown is the combined total of all components in parallel. Conditions, if any, that must be met prior to making a resistance test are indicated below each component circuit - in parenthesis.

NOTE: It is essential that the symbols used in the schematic diagrams and components circuits be understood in order to use this test with utmost efficiency.

The terminals within the multi-circuit connector are indicated on the schematic diagram and component circuits by an arrow and a number. The point of the arrow indicates a male terminal and the tail of the arrow indicates a female terminal. The number identifies the terminal location in the connector.

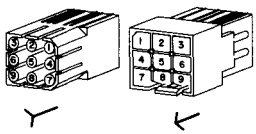


Figure 5 - Multi-circuit Connector

A table, indicating the components that can be operated remotely through the test adapter and the connections to be made, is included in the Mini-Manual. See figure 6. The symbols used in the table represent the test points on the test adapter for connecting the jumpers. Where two test points are shown, only one jumper (either brown or orange) is used — from one test point to the other. Likewise, where four test points are shown, both jumpers are used.

COMPONENTS ENERGIZED THROUGH R-E-D	
CONDENSER FAN	3 to 8
COMPRESSOR	3 to 7
EVAPORATOR FAN	3 to 7 AND 4 to 4
DEFROST HEATERS	3 to 5 AND 4 to 1

Figure 6 - Components Operated Remotely

The ability to energize components one-at-a time can be helpful when tracing the source of a noise complaint.

Models Covered

The R-E-D test may be used on all refrigerator and freezer models having the multi-circuit connector.

When To Use The Test

This test was developed to aid in determining the nature of electrical faults that are not obvious. It would be a waste of time to use this test to determine the cause of "interior light does not come on". Likewise, it is impractical to use this test for diagnosing special feature components, such as the butter conditioner, automatic icemaker, etc., since these components can be tested independently. This test should be used, however, to test the defrost thermostat, heaters and other component circuits that are not otherwise readily accessible for testing.

How To Perform the Test

1. Turn the temperature control off before separating the multi-circuit connector to prevent arcing at the terminals.
2. Separate the multi-circuit connector and connect the test adapter.

CAUTION: When the power cord is connected to the wall receptacle, one or more of the terminals within the connectors is above ground potential ("hot"). Handle the wiring harness and connector as if all terminals were above ground potential.

3. Observe that the "power on" neon light is lighted when the test adapter is connected to the wiring harness. If the neon light does not light when the test adapter is connected, determine the cause before making any resistance test or before attempting to energize any component through the tester.

NOTE: Any one of the following could be the cause of the neon light failing to light: burned out neon light, blown house fuse, loose terminals or crossed wiring in the connector. Make a voltage check across test jacks "3 female" and "4 female" on the test adapter while pressing the upper switch.

4. Adjust the ohmmeter to "zero" at both ends of the scale. Check the reliability of the ohmmeter using the 100-ohm Meter Test on the test adapter.

NOTE: If the ohmmeter does not read exactly 100 ohms, do not attempt to adjust the meter. Because the ohms scale is non-linear, adjusting the meter to read 100 ohms will incorrectly bias the meter.

5. Refer to the test data in the Mini-Manual. Whether a resistance test should be made or an attempt to separately operate the component(s) is dependent upon the nature of the condition described by the customer.

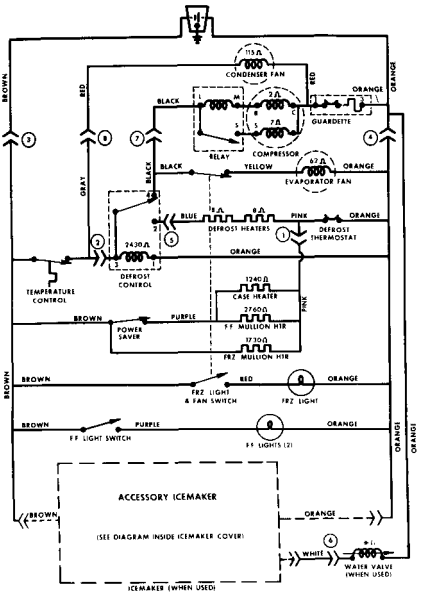
Example — Resistance Test

The condition described by the customer is "food in the freezer compartment is thawing, the milk is warm, and yet the compressor has been running constantly".

1. The service technician, making a visual observation, confirms that frozen food packages are thawing and that the compressor is running. He also notices that the evaporator cover is frosted, indicating a defrost problem. The following components are immediately suspected:

   a. defrost heaters
   b. defrost thermostat
   c. defrost control motor
   d. defrost control contacts

2. With the R-E-D test adapter connected, the service tehnician refers to the schematic diagram.



* WATER VALVE RESISTANCE MAY BE 225Ω, 245Ω OR 600Ω

Figure 7 - Typical Schematic Diagram

3. The defrost heaters are checked as a combined resistance from "5 male" to "1 male". The ohmmeter should indicate about 20 ohms.
4. When the defrost thermostat contacts are closed, a reading of 0 ohms should be indicated from "1 male" to "4 male".
5. The defrost control motor should read 2430 ohms from "2 female" to "4 male". (The defrost control must be in the DEFROST position).
6. The defrost control contacts (from no. 3 to no. 2) should indicate 0 ohms from "2 female" to "5 female" with the control in the DEFROST position.

NOTE: The push button switches should never be pressed when making resistance tests.

Example — Component Operation

The condition described by the customer is "food is thawing in the freezer compartment and the compressor is not running".

1. The service technician confirms the symptoms and determines the following could be at fault:
   a. relay
   b. guardette
   c. compressor
   d. condenser fan
   e. temperature control
   f. defrost control
   g. open wiring
   h. low voltage
2. With the R-E-D test adapter connected, the service technician refers to the table (see figure 6) to determine the connections to be made when energizing components.
3. The compressor should operate when a jumper is connected from "3 female" to "7 female" and both switches on the test adapter are pressed simultaneously. This will confirm if the relay, guardette and compressor are operative.
4. With a jumper connected from "3 female" to "8 female", the condenser fan should run when both switches on the test adapter are pressed simultaneously.
5. If the components operate and the cause of the trouble is not found, resistance tests should be made of all other related component circuits.

NOTE: The two jumpers are color-coded (brown and orange) to aid in making proper connections. Always plug in both ends of the same jumper before pressing either switch. A jumper should never be connected from "3 female" to "4 female" (this would result in a short circuit since these are line terminals).

When the jumpers are connected as shown in the table, voltage is applied directly to the component circuit. Thus, the defrost heaters can be energized to clear accumulated frost even when the defrost thermostat is open.

R-E-D Connector Separation

When separating the R-E-D connector, remember, if the power cord is connected to the wall receptacle there is voltage at the R-E-D connector. After lifting the locking tab, always pull straight out to separate. Never bend the connector, when separating, to avoid damage to the terminals in the connector.

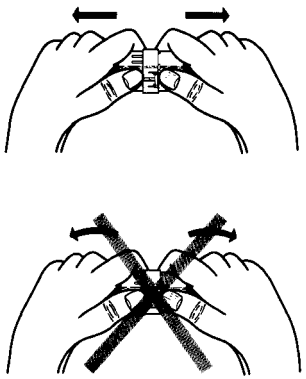


Figure 8 - Separating R-E-D Connector

REFRIGERATION SYSTEM DIAGNOSIS

Proper performance of a refrigeration system is dependant upon proper operation of all components that are included in the system.

If the compressor will not start — obviously, no refrigeration will take place. Failure of the compressor to start may be the fault of the compressor or it may be the result of a fault other than the compressor. It is important to pinpoint the fault in order to prevent unnecessary condemnation of compressors. Use the LINE VOLTAGE TEST to determine if the branch circuit is adequate. If an adequate circuit is provided, use the DIRECT START TEST.

If the compressor will run — but poor refrigeration or no refrigeration occurs, look for a cause other than the refrigeration system. Check for: poor door seal, interior light remaining on, evaporator fan or condenser fan not running, defrost heaters remaining on, capillary - suction line separation, dirty condenser, machine compartment baffle out of position, etc. If a cause other than the refrigeration system is not found, check the suction pressure. If the suction pressure is zero or above, use the COMPRESSOR CAPACITY TEST. If the suction pressure is in a vacuum, use the LEAK — RESTRICTION TEST.

LINE VOLTAGE TEST

Failure of the compressor to start may be due to insufficient voltage. Generally, "normal" line voltage is between 115 and 120 volts. Some variations from this range can be expected and, within reasonable limits, does not adversely effect the ability of the compressor to start. However, under some circumstances, the voltage can become too low to permit the compressor to start. Where guardette tripping occurs, the voltage should be tested under a load.

1. Insert the voltmeter probes into the vacant side of the duplex wall receptacle to which the refrigerator or freezer power cord is connected.

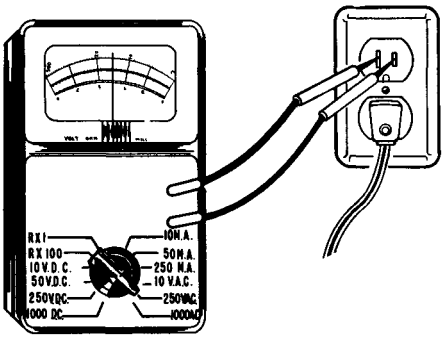


Figure 9 - Voltage Test

2. If the compressor is running, disconnect the power cord and immediately reconnect it to load the circuit. (Usually, the compressor will not restart until the system internal pressure equalizes.)

3. Read the voltage while the compressor is trying to start and before the guardette trips.

   - If the voltage is between 98 and 105 volts, a low voltage start kit can compensate for the inadequate voltage supply and permit proper operation of the compressor.

   - If the measured voltage is above 130 volts or below 98 volts, the consumer should be notified to contact the electric utility or an electrician accordingly.

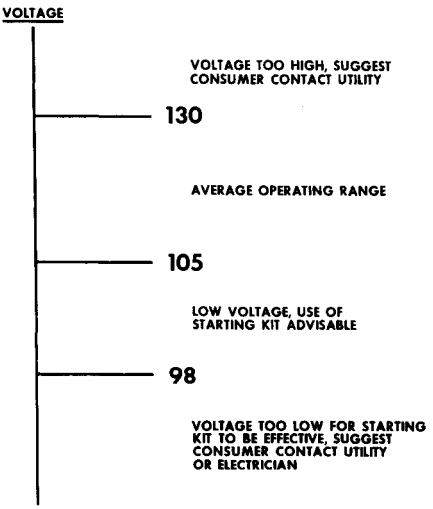


Figure 10 - Voltage Scale

DIRECT START TEST

Failure of the compressor to start may be due to any of the following:
- Compressor too hot (restricted air flow, inoperative condenser fan)
- Line voltage too low (use LINE VOLTAGE TEST)
- Relay or guardette inoperative
- Refrigeration system restriced
- Compressor motor windings open or shorted
- Compressor mechanically stalled

Only a compressor fault necessitates a Hi-Side replacement. Attempt to direct start the compressor, using a properly fused test harness (WX-5X142 Robinair 12507) and a terminal adapter (WX5X226 Robinair 12940).

1. Disconnect the power cord and remove the relay from the compressor terminals.

2. Plug the terminal adapter directly onto the compressor terminals.

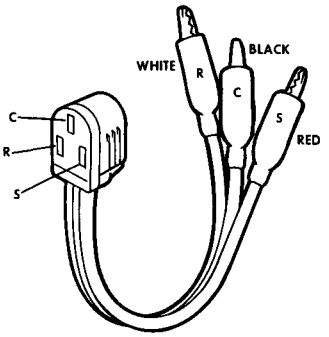


Figure 11 - Terminal Adapter

3. Attach the clip connectors of the test harness to the adapter connectors for the corresponding start, common and run terminals.

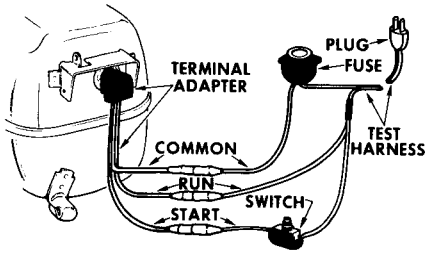
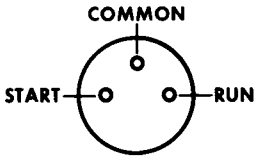
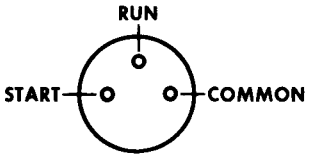


Figure 12 - Direct Start Harness

NOTE: Some compressors, having a combination relay - guardette, have unusual pin terminal wiring as shown in Figure 13.



GE & TECUMSEH COMPRESSORS



NECCHI & MATSUSHITA COMPRESSORS (USING COMBINATION RELAY-GUARDETTE)

Figure 13 - Compressor Terminals

4. Plug the test harness into the wall receptacle and momentarily close the switch to the start winding.

If the compressor starts — replace the relay and guardette.

If the compressor does not start within five seconds — immediately disconnect the test harness. Check the heat of the compressor. It must be cool enough so that the hand can be held in direct contact with the compressor case. If necessary, cool the compressor. If the compressor then starts, look for restricted air flow in the machine compartment.

If the compressor will not start after being cooled, check for the possibility of a restriction. In some instances, a capillary restriction will allow the condenser to become filled with a mixture of oil and R-12 with part of the R-12 charge remaining in the compressor as a vapor. In attempting

to force the remaining R-12 vapor into the condenser that is already full, the compressor can build up very high pressures, draw excessive current and trip on the guardette. Once the compressor has tripped, it may not restart even on direct test until the pressure has been relieved by cutting the condenser tube.

To relieve the pressure on models with in-condenser dryers, cut the condenser tube 1/2" to 1" from the capillary. Cut the tube in such a manner to relieve the pressure gradually. When cutting a tube, always make provisions to protect the consumer's floor from oil, etc.

On models with pencil and pickle type dryers, cut the condenser tube before it enters the dryer as these type dryers will be removed completely regardless of restriction location.

On dryer-in-condenser models, if the restriction is in the dryer, the condenser tubing back to the crimp must be removed. See Figure 14. On these models, when the complete dryer is removed, replace the amount of tubing removed with an equal amount of copper tubing before installing the replacement dryer.

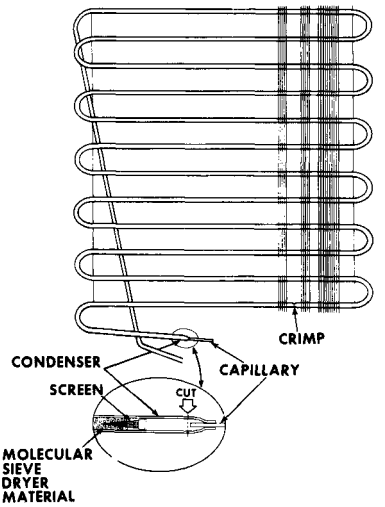


Figure 14 - Dryer-in-Condenser

After cutting the condenser tube to relieve pressure, try again to restart the compressor with the direct start harness. If the compressor starts, DO NOT condemn the compressor.

If the compressor fails to start with the condenser tube open, it has either an electrical fault, or is mechanically stalled. In either case, the compressor must be condemed.

COMPRESSOR CAPACITY TEST

The Compressor Capacity Test is a means to assist the Service Technician in making an accurate diagnosis of compressors to prevent unnecessary condemnations for low capacity.

Low capacity, where some refrigeration exists, is an extremely rare occurrence; but one which can puzzle even a well-trained technician. The capacity test eliminates all guess-work. It can be performed quickly and it is accurate.

To perform the test, the suction line s pinched closed with a special pinch-off tool and the reading from a compound gauge is compared with the data supplied with the model. If the vacuum read on the compound gauge is as good or better than the model data, then the compressor is positively good and must not be replaced.

Tools Required

. Pinch-off Tool (WX5X299 Imperial 105FF or Robinair 14416)

. Charging Valve Tool (WX5X157 Robinair 14476)

. Charging Hose

. Compound Gauge

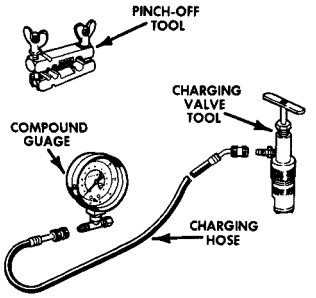


Figure 15 - Tools Required

All tools must receive good care in order to perform correctly. The compound gauge must be properly calibrated, otherwise it will give a false reading.

All tools, when connected to the refrigeration system, must be clean and leak proof. If air is allowed to enter the charging tool, hose or gauge connections during the test, it will be drawn into the compressor. Air in the compressor will cause the compressor to fail the test and may result in a mechanical stall.

Always use a watch or clock to time the test. Do not guess at the time. A time piece with a sweep second hand is preferable though not absolutely necessary.

When To Use The Test

1. When there is reason to suspect a low capacity compressor.

   Do not waste time running a Compressor Capacity Test when the symptoms definitely point in another direction. When symptoms point to a possible low capacity compressor, then use the test. Believe the results of the test. When the compressor passes the capactiy test, look for the fault somewhere else.

   Among other possible faults are:

   - Dirty condenser or inoperative condenser fan.
   - Usage and Load conditions.
   - Control setting imbalance.
   - Need for customer education.

   The Compressor Capacity Test will not pinpoint other faults, it will only distinguish between a good compressor and one that is low capacity.

2. When the suction pressure is zero or above.

Before performing the test, always observe the suction pressure. If the pressure is zero or above, the symptoms point to a possible low capacity compressor. Then use the test. If the suction pressure is below zero, do not use the test. Any compressor that is capable of pulling a normally charged system into a vacuum is a good compressor. There is no point in running the test with the operating suction pressure in a vacuum. The compressor will pass the test. If there is a serious complaint on a machine with its suction pressure in a vacuum, then the most likely fault to look for is (a) leak or restriction (b) inoperative evaporator fan (c) defrost system fault. It is not a fault of the compressor.

The capacity test must be performed before replacing any Hi-Side for low capacity.

How To Perform The Test

1. Pull the refrigerator away from the wall and remove the rear machine compartment cover (leave the power cord connected to the wall receptacle—compressor running).

2. Attach the charging tool, hose and compound gauge to the compressor charging valve. Be certain that all connections are tight. When the compressor begins to pull a vacuum, if connections are not tight, air will be drawn into the compressor and will always cause the compressor to fail the test. It could also cause the compressor to stall.

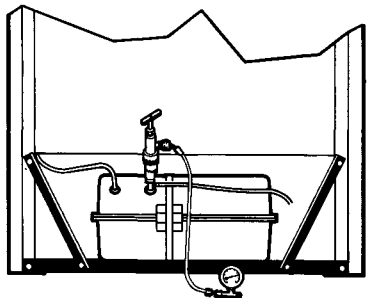


Figure 16 - Tools Installed

3. Open the charging valve and observe the suction pressure. If the pressure is zero or above, proceed with the test. If the pressure is below zero, discontinue the test and look elsewhere for the fault. The compressor is all right.

4. Select a place on the suction line to install the pinch-off tool. Keep the tool away from the capillary tube. Always install the tool between the compressor and the beginning of the suction/capillary heat exchanger.

5. Tighten the wing nuts on the pinch-off tool and observe the time when the hand on the gauge begins to drop. If the hand stops moving after a few seconds, tighten the wing nuts more. Time the test for two minutes from the time that the hand on the gauge first began to drop.

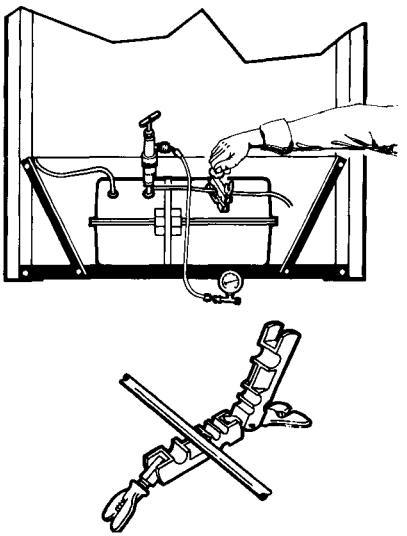


Figure 17 - Tighten Pinch-Off Tool

6. At the end of the two minutes, observe the gauge and compare the reading with the model data supplied in the Mini-Manual. Determine by this comparison whether the compressor passed or failed the test.

7. Remove the tool from the suction line and reposition it with the pinched suction tube in the proper size hole. For 5/16" suction tubes, it is necessary to separate the pinch-off tool and reverse the two halves. Place the tool on the pinched portion of the tube and tighten the wing nuts as tight as possible by hand to reopen the tube.

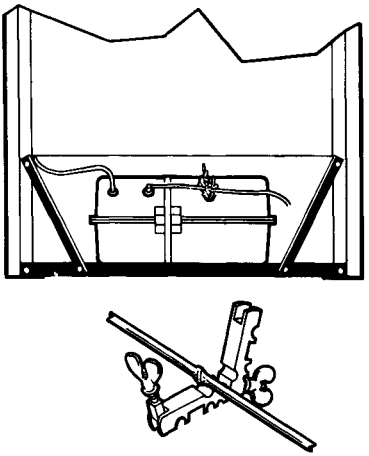


Figure 18 - Opening Pinched Line

After The Test

1. If the vacuum pulled by the compressor with the suction line pinched off was not as good as that specified in the model data, replace the compressor. It is low capacity. Example: Model Data specifies 20 inches vacuum. If the compressor pulled less than 20 inches, it is low capacity.

2. If the vacuum pulled by the compressor is as good or better than that specified in the model data, the compressor is good and must not be replaced. Look somewhere else for the cause of the complaint.

LEAK-RESTRICTION TEST

The Leak-Restriction Test is a quick and positive means of distinguishing between a refrigerant leak and a restriction after other diagnosis procedures have definitely narrowed the fault down to the refrigeration system.

The symptoms produced by a refrigerant leak and a restriction are similar. Either condition will cause suction pressure to be lower than normal.

When To Use The Test

There are several things that will cause a refrigerator to operate at a warmer than normal temperature. There are also other things besides a leak or a restriction that will cause a refrigeration system to operate in a vacuum.

Before a Leak-Restriction test is performed, the following checks and observations must be made.

- Customer usage and/or high ambients
- Temperature control settings
- Defrost system (control, thermostat, heaters)
- Evaporator fan
- Condenser fan
- Dirty condenser
- Interior Lights
- Door gasket seal
- Automatic icemaker

If all of these items are found to be operating correctly, then perform the test.

This Leak-Restriction test is based on the fact that every refrigerator, regardless of type, has a built-in diagnostic tool. That tool is the condenser.

If refrigerant flow in a system is restricted, the condenser will be at room temperature. If a system has a leak, the condenser will be warm, depending on the amount of refrigerant lost.

The tools required to perform the leak restriction test are:

1. Charging Valve Tool (WX5X157 Robinair 14476).
2. Charging Hose.
3. Compound Gauge.
4. Refrigerate 12.

How To Perform The Test

1. Pull the refrigerator away from the wall and leave the power cord plugged into the wall receptacle (compressor running).
2. Attach the charging tool to the compressor charging valve.
3. Attach a hose and compound gauge to the charging tool.
4. Open the compressor charging valve and read the suction pressure. If the suction pressure is above zero, discontinue the test. The fault is not a leak or a restriction. If the suction pressure is in a vacuum, proceed to step 5.

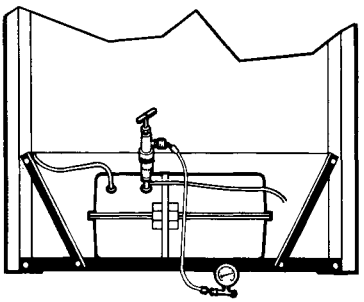


Figure 19 - Read Pressure

5. Examine the last pass of the condenser/dryer and capillary tube. If any part of the last pass of the condenser/dryer or capillary tube is cold or sweating, a partial restriction has caused a pressure drop resulting in boiling of the R-12.

   If the condenser has cooled to room temperature throughout, diagnosis is restriction. NOTE: A complete loss of refrigerant will also result in a cool condenser throughout.

6. If the last pass of the condenser/dryer and capillary is warm, diagnosis is a leak because the lower passes of the condenser cannot be warm if a restriction exists.

To confirm a Leak or Restriction, add R-12 to the system.

1. Add 3 oz. (WR97X174) to systems with a normal charge of 5 1/2 oz. or less.
2. Add 4.5 oz. (WR97X193) to systems with a normal charge of more than 5 1/2 oz.
3. Observe the performance of the condenser for 2 - 4 minutes. If the entire condenser warms up throughout, the diagnosis is a leak.

   If the lower 2/3 of the condenser remains at room temperature (cool), the diagnosis is restriction. The top pass or two may increase in temperature at first but will soon cool to room temperature.

Whenever a restriction is diagnosed on models with in-condenser dryers, it must be determined whether or not to cut out the in-condenser dryer. This can be determined by cutting the condenser tube with a tube cutter 1/2" to 1" from the cap tube and making a visual inspection.

It is obvious that if you see the end of the cap tube stopped up with solder or a foreign material, this is your restriction and it is only necessary to cut off approximately 1 1/2" of capillary inlet and install a replacement dryer.

If, however, you see a grayish, yellowish-white or black paste like substance or loose beads inside the condenser tube, the in-condenser dryer must be cut out back to the first crimp and an equal amount of copper tubing installed along with a replacement dryer.

The tubing must be replaced because in cases of high usage and high ambients, this small amount of tubing removed can create a problem. DO NOT attempt to remove only the beads. There is no 100% guarantee that all of the beads will

come out no matter how it is done. The tubing size of the replacement dryer is 3/16" O.D. One bead is all that it takes to stop up this tube.

CHECKING FOR LEAKS

When searching for a leak, it is important to overcharge the system to elevate all pressures. With the compressor running, stop the condenser fan (if used) to further increase the pressure and check:

1. Compressor to exhaust tube joint.
2. Exhaust tube to condenser joint.
3. Condenser to "pickle" dryer.
4. Condenser (or dryer) to capillary joint.

For low side check, disconnect the power and allow pressures to build up in the low side of the system, then check:

1. Charging valve screw on compressor.
2. Suction tube to compressor joint.
3. Brazed or epoxy joints at inlet and outlet of evaporator.

LEAK DETECTION METHODS

Soap Solution - Probably the method used most by technicians to check for leaks is the use of soap bubbles or regular household dishwashing liquid in undiluted form. Whenever the soap solution method is used, a small dental type mirror should be used to check the back side of solder joints.

Halide Torch - Success in using a halide torch depends upon the condition of the copper reactor plate which produces a blue flame. When refrigerant is detected, the flame will change from blue to green. Minute changes in color of the flame, caused by a very small leak, may be difficult to distinguish.

Electronic Leak Detector - Electronic leak detectors are very sensitive to halogen gases in the atmosphere. Due to sensitivity of the electronic leak detector, it requires considerable practice to become skillful in its use.

NOTE: Electronic leak detectors are too sensitive to use around models with foam insulated cabinets. Foam insulation contains Refrigerant 11 as a blowing agent and the leak detector will invariably pick up its presence.

NOTE: If either a halide torch or an electronic leak detector is used, always keep the area in, and around, the machine compartment clear of refrigerant by use of a small fan. Turn the fan off when leak testing.

ACCESSING REFRIGERATION SYSTEM — ROTARY COMPRESSOR MODELS

The rotary compressor does not have a service valve (compressor charging valve). Therefore, the recommended method for accessing the refrigeration system is to permanently install a WR86X10 service valve on the low pressure process tube.

NOTE: Do not make any attachment to the high pressure process tube.

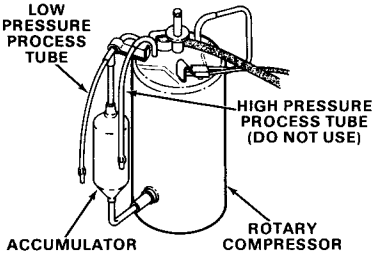


Figure 20 - Rotary Compressor

To install the valve without losing refrigerant from the system:

1. pinch the low pressure process tube closed, near the accumulator,
2. cut off the closed end of the tube,
3. install the valve, either with a Lok-Ring connector or by brazing,
4. open the pinched tube

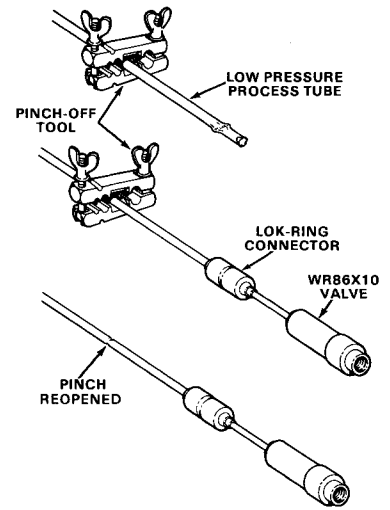


Figure 21 - Valve Installation

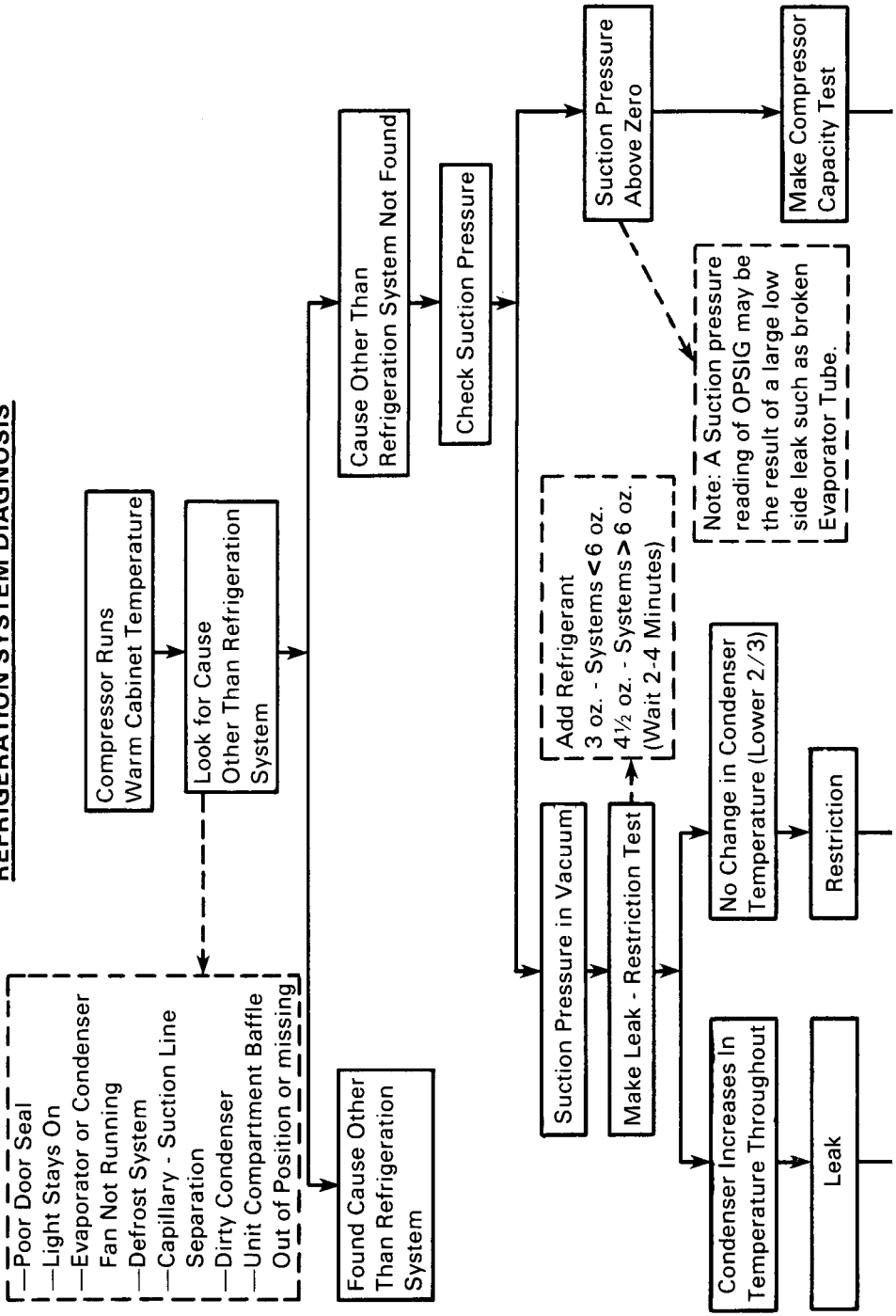
After servicing the refrigeration system, the service valve must be dressed downward, similar to the original position of the process tube, in order to minimize vibration.

NOTE: If a self-piercing, line-tap type valve is used as an alternate method to access the system, it must be removed and the process tube brazed closed.

DIAGNOSIS GUIDES

A recommended sequential step for refrigeration system diagnosis is shown in Figure 20.

Although the principles of diagnosis are the same for all refrigerators and freezers, a separate detailed procedure is employed for chest freezers due to their unique construction. These steps are shown in Figure 21. Because the evaporator and condenser tubing of chest freezers is encased in foam insulation, the tubing is not accessible for leak checking. The existance of an internal evaporator or condenser leak cannot be determined by inserting the probe of a leak detector into the cabinet insulation area or under the breaker strips. Because foam insulation contains refrigerant, its presence will invariably be detected — whether or not an internal leak exists.


REFRIGERATION SYSTEM DIAGNOSIS
—Poor Door Seal
—Light Stays On
—Evaporator or Condenser Fan Not Running
—Defrost System
—Capillary - Suction Line Separation
—Dirty Condenser
—Unit Compartment Baffle Out of Position or missing
Compressor Runs Warm Cabinet Temperature
Look for Cause Other Than Refrigeration System
Found Cause Other Than Refrigeration System
Cause Other Than Refrigeration System Not Found
Check Suction Pressure
Suction Pressure in Vacuum
Make Leak - Restriction Test
Add Refrigerant
3 oz. - Systems < 6 oz.
4½ oz. - Systems > 6 oz.
(Wait 2-4 Minutes)
Suction Pressure Above Zero
Note: A Suction pressure reading of OPSIG may be the result of a large low side leak such as broken Evaporator Tube.
Make Compressor Capacity Test
No Change in Condenser Temperature (Lower 2/3)
Restriction
Condenser Increases In Temperature Throughout
Leak

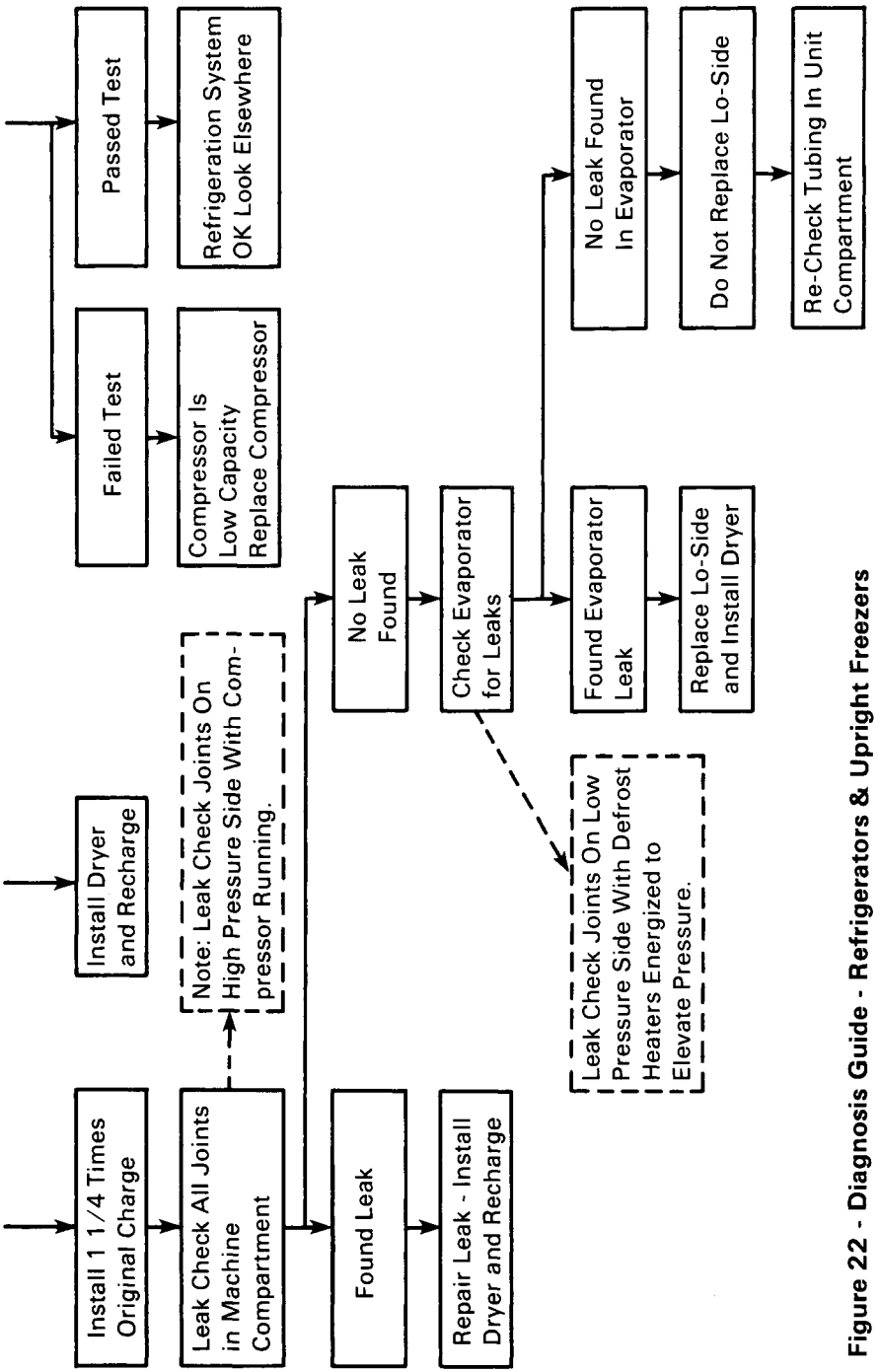
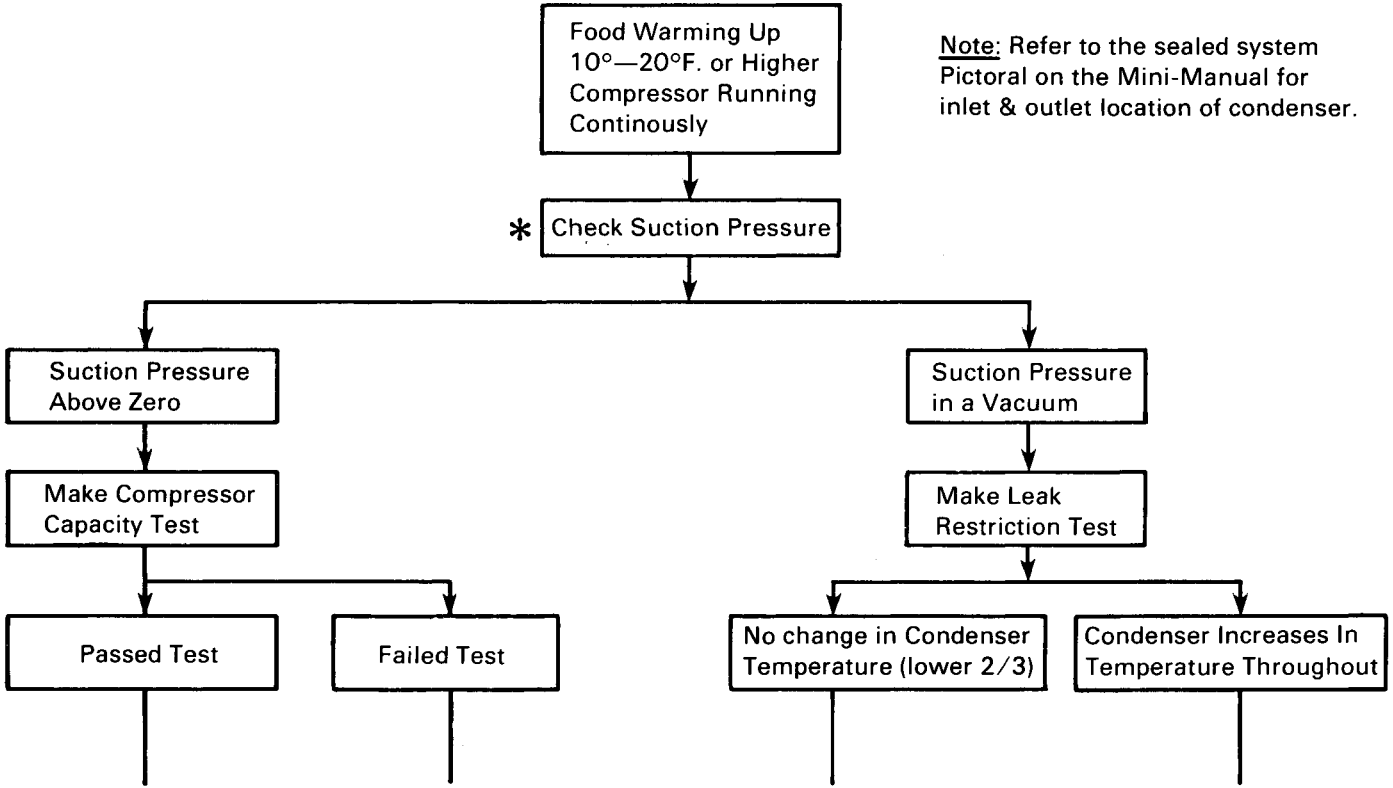
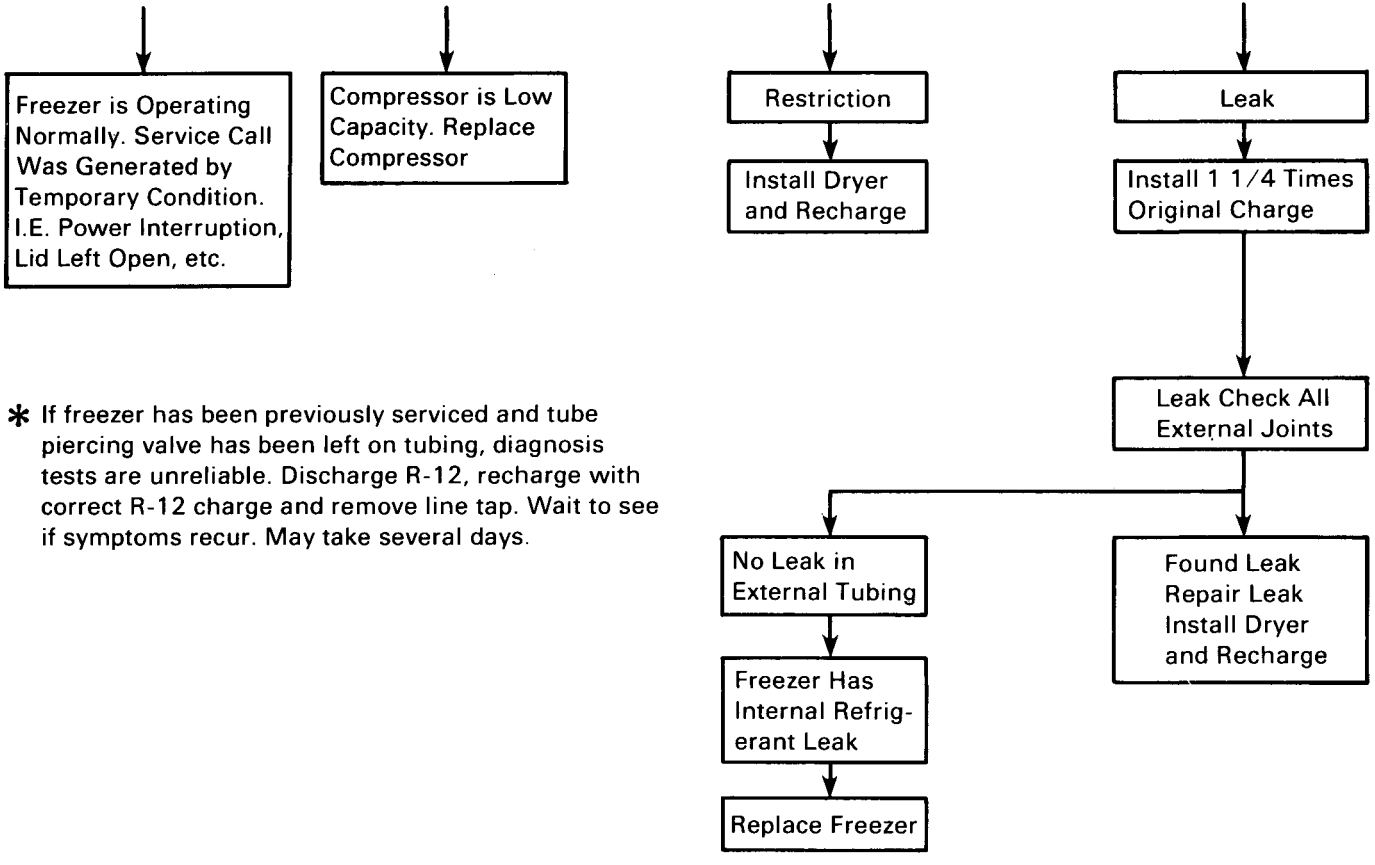


Figure 22 - Diagnosis Guide - Refrigerators & Upright Freezers

REFRIGERATION SYSTEM DIAGNOSIS



Note: Refer to the sealed system Pictoral on the Mini-Manual for inlet & outlet location of condenser.



* If freezer has been previously serviced and tube piercing valve has been left on tubing, diagnosis tests are unreliable. Discharge R-12, recharge with correct R-12 charge and remove line tap. Wait to see if symptoms recur. May take several days.

Figure 23 - Diagnosis Guide - Chest Freezers

INDEX

ELECTRICAL

Electrical Safety Responsibilities

General Electric and Hotpoint refrigerators and freezers are designed, engineered, manufactured and tested in adherence to the requirements of established safety codes, standards and specifications. One important segment of this effort deals with the potential hazards of electrical shock during both service and use of the electrical products involved.

The service technicians' responsibility must include the safety of the product. It is very important that the technician:

1. honor all built-in safety features and other safety related requirements of the product.

2. be continually alert for defeated or non-honored safety features or safety requirements.

3. be immediately responsive to all recognized safety hazards and reported incidents of electrical shock.

Electrical Safety Test Procedures

General Electric Company makes leakage-current training available to improve the effectiveness of the technicians' safety related responsibilities.

Information about safety training, test procedures and product test specifications for General Electric and Hotpoint refrigerators and freezers is available from any Product Service Region of the General Electric Company.

Test procedures and measurement specifications which are related to leakage-current include the following:

Electrical-service tests

Ground-path continuity (bonding) tests

Leakage-current test

Resistance (insulation) test

Grounding

For personal safety, all appliances equipped with a three prong power cord must be properly grounded. These three prong power cords mate with a standard three prong (grounding) wall receptacle. See figure 1.

DO NOT, UNDER ANY CIRCUMSTANCES, CUT OR REMOVE THE THIRD (GROUND) PRONG FROM THE POWER CORD.

Wall receptacles can be and sometimes are miswired such that the polarity is incorrect and their grounds are inadequate or nonexistent. IF THERE IS ANY DOUBT AS TO WHETHER THE WALL RECEPTACLE IS MISWIRED OR IMPROPERLY GROUNDED. THE CUSTOMER SHOULD HAVE IT CHECKED BY A QUALIFIED ELECTRICIAN.

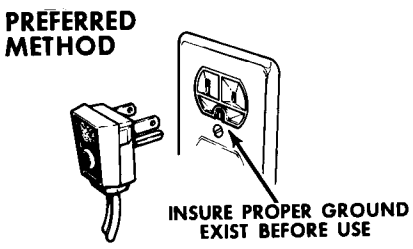


Figure 1 - Three Prong Receptacle

Where a standard two-prong wall receptacle is encountered, it is the personal responsibility of the customer to have it replaced with a properly grounded three-prong wall receptacle. The customer should be advised of this by the service technician.

When local codes permit, however, a TEMPORARY CONNECTION may be made to a properly grounded two-prong wall receptacle by the use of a UL listed adapter which is available at most local hardware stores. See Figure 2. The larger slot in the adapter must be aligned with the larger slot in the receptacle. NOT PERMITTED IN CANADA.

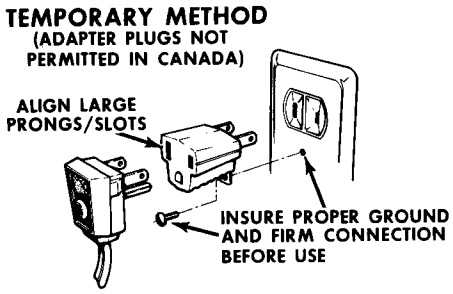


Figure 2 - Temporary Connection

CAUTION: Attaching the adapter ground terminal to the wall receptacle cover screw does not ground the appliance unless the wall receptacle is grounded through the house wiring.

When disconnecting the power cord from the adapter, hold the adapter with one hand. If this is not done, the adapter ground terminal will very likely break with repeated use. Should this happen, either REPLACE THE ADAPTER or DO NOT USE the appliance.

Appliance Grounding

Any part of a refrigerator or freezer that is capable of conducting an electrical current is grounded.

If any ground wire, screw, strap, nut etc., is removed for service, or for any reason, it must be reconnected to its original position with the original fastener before the appliance is put in operation again. Failure to do so will create a possible shock hazard and an unsafe condition. (See Electrical Service Section - Grounding.)

Circuit

Separate branch circuits should be provided for the refrigerator and freezer. Extension cords should not be used. If use of an extension cord is unavoidable, it should be a UL listed, three-wire, grounding type properly polarized and capable of carrying 15 amperes minimum. (See Electrical Service Section - Power Source.)

Circuit Protection

Only fuses or circuit-breakers with ratings that conform to the local electrical code should be used to protect the refrigerator circuit. If they are found to be rated too high, the customer should be advised of a potential fire hazard. The correct fuses or circuit-breakers should be installed, before the refrigerator is operated.

Electrical Cords

Repair or replace immediately all electric service cords that have become frayed or otherwise damaged. Do not use a cord that shows cracks or abrasion damage along its length or at either the plug or connector end. Never unplug the cord by pulling on the wire. Always grip the plug firmly and pull straight out from the receptacle.

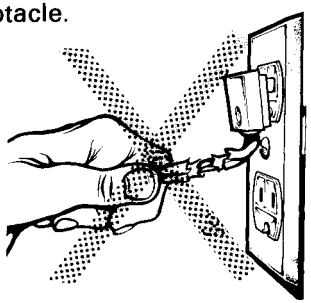


Figure 3 - Improper Cord Removal

Splicing Electrical Wires

When it is necessary to cut and splice electrical wires, the splice should be staggered rather than side by side. All splices should be made with bell type connectors. Position the open end down after filling the connector with RTV sealer (WX6X200) to seal out moisture.

SERVICE PRACTICES

Disconnect Electrical Power

Power should be disconnected from the refrigerator or freezer when service is to be performed which will involve contact or near contact with electrical devices or wiring. Sometimes it is necessary to conduct tests with the power on as is the case when using the R-E-D tester. In such instances, use extreme caution to prevent electrical shock. Read the safety instructions printed on the R-E-D tester. Be sure that the customer's children do not touch any parts, wires or tools that might be energized. Always ask the customer to remove children from the work area.

Tools

It is important to have and use proper tools. The tool box and its contents should be checked periodically to be sure they are clean and in good working condition. Worn or broken tools are a cause of accidents and should be replaced.

All test equipment and electrical tools should be in good working order and free from electrical shock hazards. All electric power tools must be properly grounded or safely insulated to prevent the danger of electrical shock.

Door Removal

Some Dispenser models have electrical wires that pass from the cabinet to the door. Refer to the DISPENSER MODELS section for door removal instructions.

Lid Removal — Chest Freezers

Care should be taken when removing the lid on chest freezers. The lid hinges are mounted to the cabinet under spring tension.

When removing a lid hinge, always hold pressure against the hinge while removing the mounting screws. After removing the screws, gradually release pressure on the hinge. See Figure 4.

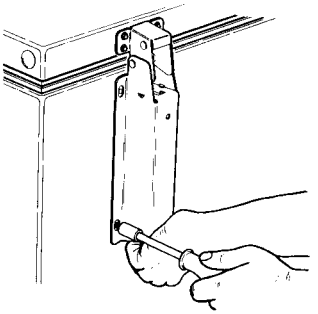


Figure 4 - Removing Lid Hinge

Foam Kits

Use only approved foam kits of the self extinguishing type. Read and follow the directions that accompany the foam kit. Provide adequate ventilation and avoid breathing fumes. Ask bystanders to leave the immediate area where the refoaming takes place. Avoid direct contact with skin or eyes.

Wear gloves and safety goggles. In case of contact with eyes, flush thoroughly with water and get medical attention.

CUSTOMER — USER PRACTICES

Combustible Material Storage

Combustible material such as gasoline, hexane, naptha, benzine, butane, propane, alcohols, benzol, lacquer solvent, etc. SHOULD NOT BE stored in a refrigerator. Normal electrical arcing of the temperature control, light and fan switches, defrost control, Guardette and relay may ignite the vapors emitted from these materials.

Litter

Litter, including paper, or rags should not be allowed to accumulate in the area of the compressor compartment. Often rags, paper towels, etc. will be saturated with combustible cleaning solvents. Such materia should not be allowed near the normally warm compressor or in proximity to the electrical wires or the compressor, relay, Guardette and switches. Forced draft condenser should be periodically cleaned with long handled brush (WX14X51) and vacuum cleaner.

Refrigerators Unused

An unused or abandoned refrigerator or freezer is hazardous to children because of the possibility of entrapment. To prevent this possibility, REMOVE THE DOOR on an

refrigerator or freezer not being used. In many areas, this is a law. It requires only a few minutes to make the unused unit safe.

Refrigerator Coils and Surfaces

After the refrigerator is in operation, do not touch the refrigerating coils or surfaces, particularly when hands are damp or wet. Skin may adhere to these extremely cold surfaces.

Icemaker

Some refrigerators are equipped with automatic icemakers. Do not place fingers or hands on the icemaker mechanism while it is operating. This will prevent contact with the moving parts of the ejector mechanism or with the heating element that releases the cubes.

Defrosting

On models where the freezer must be defrosted manually, never use a sharp object to remove the frost. This could result in damage to the evaporator. Follow the instructions in the Use and Care Book for defrosting.

Replacing Light Bulb

A burned out light bulb might break when being replaced. In order to avoid contact with a live wire, the refrigerator should be unplugged.

NOTE: Turning the temperature control to the "OFF" position does not remove power to the light. A cloth should be used to remove and replace the light bulb as a precaution against glass breakage.

REFRIGERATION SYSTEM REPAIR

Refrigerant Charge Removal

Before cutting refrigerant tubes, always discharge the refrigerant from the system by opening the screw in the compressor charging valve to allow the refrigerant vapor to escape. If refrigerant tubes are cut while the system is under pressure, the escaping refrigerant may spray oil on the floor, wall or cabinets. In addition to being unsightly, oil on the floor can be a safety hazard by causing someone to fall. Do not release refrigerant in the presence of an open flame.

Dryer Removal

When cutting open a tube containing molecular sieve dryer material, catch the dryer material and do not allow it to fall on the floor. The dryer material may be oil soaked and in addition may damaged some types of vinyl floor covering.

Brazing Torch Use

Only use a torch that is in good working order. When using acetylene fuel, be sure the fuel tank is equipped with the proper pressure control valves. The fuel tank should always be used from the upright position. Be sure there are no leaks from the shut off valve, control valves, torch or hose.

Torch fuels have a strong odor. If a leak is detected in any brazing apparatus, immediately discontinue use and remove the apparatus to a safe area until repairs are effected. Always discharge the refrigerant from the refrigeration system and make certain the compressor charging valve is open before applying heat to any part of the system.

Use of a brazing torch requires extreme caution. The flame must never be pointed in any direction other than the exact joint which is to be brazed. Careless or thoughtless handling of a torch could cause injury to a person or damage to property. Do not touch a heated tube until it has cooled. When the joint to be brazed is near electrical wiring, painted surfaces, plastic parts, fiberglass or polyurethene foam insulation, a heat shield should be used to isolate such parts from the torch flame.

Evacuation, Purging and Charging

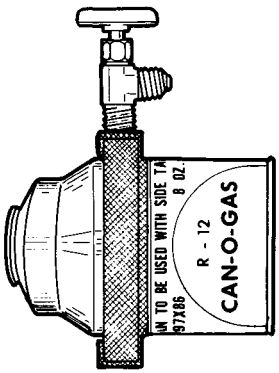
Purge valves are located on replacement Hi-Sides in the exhaust (discharge) tube and also on replacement dryers. These valves should be opened with a spline wrench while holding the valve body with pliers. Do not attach valves or other fittings to the purge valve.

When the purge valve is opened for evacuation and purging, place a cloth over the valve to catch any oil spray from the valve.

Most refrigerators and freezers contain a compressor with a charging valve welded to the compressor case. Some compressors, however, employ only a process tube. If a "tube piercing valve" is used on the process tube to service the unit, the valve should be removed and the process tube brazed closed following service.

Handling Refrigerants

In the past, premeasured R-12 refrigerant has been furnished in 2¾-inch diameter containers (cans). These containers have a pressure release feature in the top which requires an adapter ring (WR97X191) for the dispensing valve to permit tapping the container from the side.



DISPENSING VALVE UP FOR GAS
DISPENSING VALVE DOWN FOR LIQUID

Figure 5 - Older Refrigerant Cans

As present inventories are depleted, premeasured R-12 refrigerant will be furnished to 2-9/16-inch diameter containers. The new small diameter containers have a pressure release feature in the bottom which permits tapping from the top, thus eliminating the need for an adapter ring.

A WR97X218 Dispensing Valve, having a built-in check valve, should be used for additional safety. This dispensing valve is supplied with a clamp for attachment to the top of the new small diameter container. The brass ring, also supplied with this dispensing valve, is not needed and thus should be discarded.

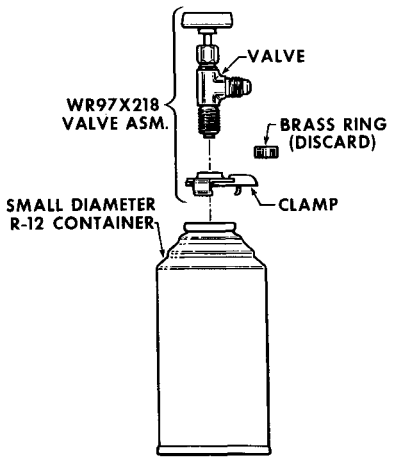


Figure 6 - Newer Refrigerant Cans

Refrigerants in closed containers are under pressure. Never puncture a refrigerant container.

Refrigerants in cans should be stored where the temperature does not exceed 125 degrees fahrenheit.

Refrigerant cans (even empty ones) should not incinerated.

Never point the nozzle of a refrigerant can toward any person.

Never apply heat from any source to a container of refrigerant. Heat will cause the pressure in the container to rise which could cause the container to rupture.

Refrigerants are for industrial use only and should not be used by persons who are unfamiliar with the potential safety hazards involved in handling and using refrigerants.

Use of Goggles

As a safety precaution, when handling or working with refrigerants, goggles for eye protection are strongly recommended.

Comfortable, ventilated goggles are available under catalog number WX5X105 which can be worn with most prescription eye glasses and meets ANSI-Z-87.1 specifications. (NOTE: The lenses are impact resistant but NOT unbreakable.)

There are various forms of eye protection available at various prices. The correct type should be selected for the job. Any type goggles used should at least meet ANSI-Z-87.1 specifications.

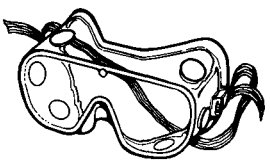


Figure 7 - WX5X105 Goggles

Brazing Tubing Stubs

The tubes of an inoperative compressor should be brazed closed to prevent oil spillage in the customer's home or during transporting.

Nitrogen Use

When using nitrogen in the service shop to detect leaks, the following safety precautions should be practiced:

1. The nitrogen supply should be equipped with a proper pressure regulator. Its hoses and fittings should be free of leaks.
2. Pressure in the Refrigeration System being tested should not exceed 200 p.s.i.g.

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(Continued on next page)

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ERRATIC TEMPERATURES - FROST FREE MODELS

Erratic temperatures in frost-free refrigerators may be due to intermittent evaporator fan operation. Four conditions may exist:

1. Binding of the rotor and/or shaft (due to rough or tight bearings or a rusted stator).
2. Loose stator wires at either or both spade terminals.
3. Fan switch not fully depressed.
4. Fan blade hitting orifice or freezer floor.

If binding of the rotor is suspected, the fan blade should be rotated slowly in the extreme front and rear positions of the shaft. If any resistance to rotation is detected, the motor should be replaced.

If loose stator wires are suspected, (see Figure 1) the wires should be soldered to the spade terminals of the motor. After soldering, a continuity check of the motor should be made. If open, the motor should be replaced.

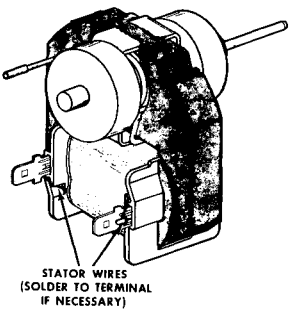


Figure 1 - Loose Stator Wires

If insufficient fan switch depression is suspected, attach a WR2X7034 adhesive backed rubber bumper to the door where the switch plunger makes contact. See Figure 2.

NOTE: The door must be free of moisture when attaching the bumper.

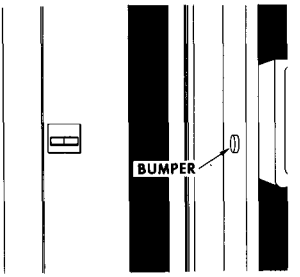


Figure 2 - Rubber Bumper Attached

LEVELING LEGS - FLOOR DAMAGE

Beginning March, 1976 (serial Prefix "FZ"), the leveling leg used on the following model refrigerators and freezers was changed from a one-inch, 12-point configuration to a 1 1/4-inch hex-head type.

TA-10DT*	TBF-16ST	SSD-10CT*
TA-12ST*	TBF-18ET	CTA-14CT
TB-12ST*	CA-12CT*	CTF-16CT
TB-14ST	CAF-16CT	CTF-18AT
TBF-16AT		FVF-16CT

*

Note: Models indicated have only two front leveling legs. All other models have four (front and rear).

The larger-headed, smooth-sided leveling leg, WR2X4978, will lessen the possibility of damage to cushion-type floor covering when the cabinet is moved across the floor.

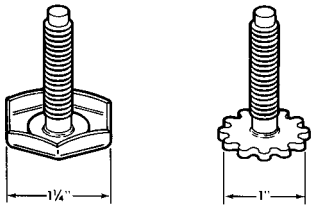


Figure 3 - Leveling Legs

●DEFROST WATER ON FRESH FOOD PACKAGES

TBF-14DR, DT CTF-14CR, CT
TBF-14SR,ST CTF-14DR, DT

The above model refrigerators are designed for the defrost water to flow down the fresh food liner back and across the liner bottom to the drain opening. It is possible for users to inadvertently push food containers against the liner which become wet during the defrost cycle. To prevent this from happening and permit users more freedom in storing fresh foods, a WR49X227 Drain Cover can be installed to direct and contain the defrost water as it passes down the liner back. Instructions are included for easy customer installation.

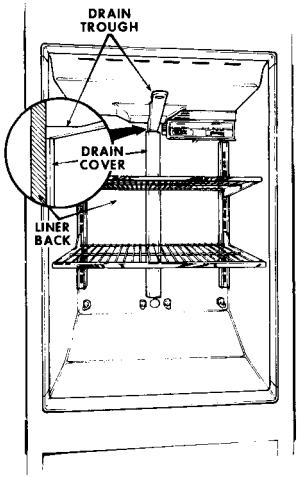


Figure 4 - WR49X227 Installed

●DEFROST WATER ON LINER REAR WALL — TBF/CTF-16,18 (1975-76)

Defrost water spreading excessively over the rear wall of the liner may be due to an improperly molded funnel (WR2X3537).

To check, remove the funnel and examine the opening at the center for a thin web of plastic flashing which may be causing the water to spill out of the funnel at the sides rather than the center. If flashing is present, use a knife to trim away the excess material or replace the funnel.

●WATER IN OUTER CASE - TBF/CTF-16

Water in the outer case of TBF/CTF16 model refrigerators with the external drain system may be due to the drain funnel not engaging the drain grommet elbow.

With the introduction of the external drain system, two new drain funnels are used. When installed, the drain funnels appear alike. However, the drain funnel used on 18 cu. ft. model refrigerators is 1 5/8" shorter than the funnel used on 16 cu. ft. models. Therefore, when water is found in the outer case of 16 cu. ft. model refrigerators (serial prefix MZ through LA), also check the length of the drain funnel.

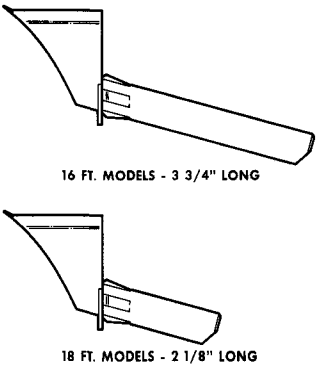


Figure 5 - Drain Funnels

WATER LEAKING FROM CABINET - TBF/CTF-16 MODELS

Water found in the bottom of the outer case of TBF/CTF16 model refrigerators with serial prefix "FV" thru "RV" has been traced to defrost water leaking through the liner at the two vegetable pan cover supports located at the center rear of the liner. See Figure 6. To seal the supports to the liner, replace with a new WR2X4812 support. The replacement support has an integral gasket for sealing to the liner.

The use of a small amount of white silicone rubber around the area of the sealing surface of the support will insure a water tight seal.

To drain the water that has accumulated in the outer case, dislodge the drain tube and grommet assembly at its connection in the outer case bottom. Allow the water to drain until the rate slows to a slow, irregular drip, reinstall the drain tube grommet.

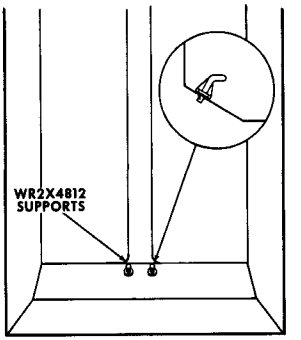


Figure 6 - Vegetable Pan Supports

●BOWED VEGETABLE PAN COVER - TBF/CTF-16

On TBF/CTF-16 model refrigerators (serial prefix "SZ" thru "HA"), tight vegetable pans due to bowed vegetable pan covers may be corrected by replacing the cover front support with a new WR2X4898 support.

The new support has a less restricting support area for the cover to allow for any variation in liner width.

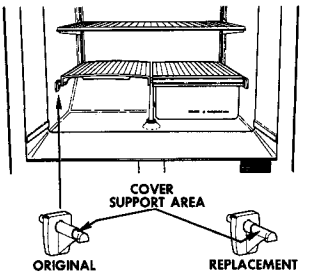


Figure 7 - Bowed Covers

●BREAKER STRIP LOOSE — SIDE-BY-SIDE MODELS

On early (1975) side-by-side refrigerators with the barbed mullion, loose breaker strips may be corrected by one of the following procedures:

1. Tape the mullion breaker flange lip (except in the long notched area) with 3/4" filament tape. The tape should cover one-half of the breaker flange and then around the lip and rear of the flange.

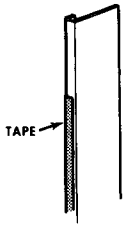


Figure 8 - Tape on Breaker Flange

2. If adding tape will not hold the breaker in place, install a new mullion breaker. Install the top of the mulion breaker above the top breaker. This will prevent "popping out" at the top.

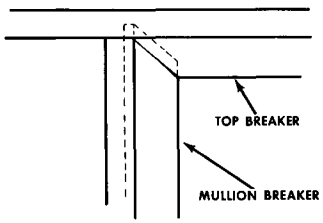


Figure 9 - Breaker Installed at Top

NOTE: When installing a mullion breaker, squeeze the flange of the breaker into the mullion channel. Do not hit or strike the breaker into position. This may chip the flange as it rides over the barbs. Use wide jaw pliers to squeeze into place. Protect the breaker with a cloth, piece of old breaker to prevent marking with the pliers.

● FALLING FREEZER SHELVES — SIDE-BY-SIDE MODELS

One unusual occurance of foam insuation is shrinkage. Even though pouring of foam insulation is closely controlled to avoid any abnormal condition, shrinkage can occur. If this happens on models where the freezer shelf rods fit into grommets in the side of the liner, the shelf may fall. DO NOT ORDER NEW SHELVES! To correct this condition, two shelf extensions of different lengths are available:

WR1X1548—3/4" long
WR1X1549—1 1/8" long

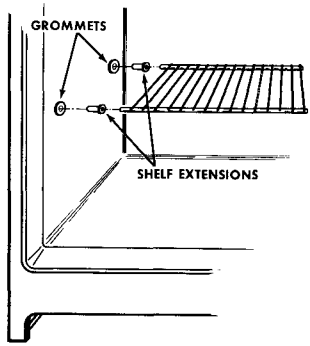


Figure 10 - Shelf Extensions Added

● FREEZER BASKETS FALLING — SIDE-BY-SIDE MODELS

The freezer storage basket may fall off the front and/or rear supports in some side-by-side refrigerators. To correct this condition, replace the original front and/or rear supports with replacement supports that have a longer "reach". The catalog number of these replacement supports are: Front - WR2X7036, and Rear - WR2X2931. The increased "reach" of the front support is 1/8-inch, and the rear is 1/4-inch.

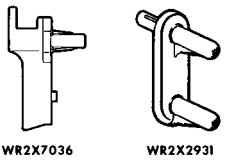


Figure 11 - Basket Supports

NOTE: Because the locating pin on the rear support is larger than the hole in the liner, it will have to be trimmed off to obtain a flush fit with the liner.

ICE/WATER IN BOTTOM OF FREEZER - CAF/FVF-16C MODELS (1975-77)

Ice and/or water in the bottom of a CAF/FVF-16C model freezer may be due to a kink in the drain tube between the liner and outer case. To correct this condition, replace the drain tube or insert a short piece of plastic tube (WR2X6087) into the drain tube to straighten the kink and hold the drain open.

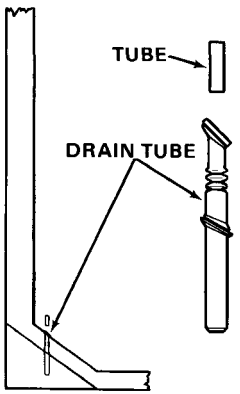


Figure 12 - Tube Installation

● BREAKER FRAME FROSTING CB/FH-5, 8 CHEST FREEZERS

If an uneven area should develop in the one piece breaker frame on these model freezers where the gasket will not seal properly, the following procedure should be followed.

1. Carefully pry up the breaker frame only in the area where the gasket is not sealing.
2. If the unevenness is caused by a "hump" in the foam insulation, trim the insualtion with a sharp knife.
3. If the unevenness is caused by a lack of insulation in a small area, add permagum (WR97X81) to this area.
4. Smooth the permagum out, to fill in the uneven area, and press the breaker frame back into position.

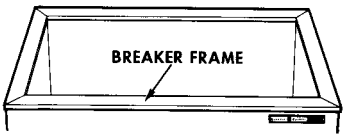


Figure 13 - Breaker Frame

● R-E-D CONNECTOR/TERMINAL SERVICE PACKAGE

A WR49X233 connector and terminal service package is available for the repair of damaged R-E-D connectors on refrigerators and freezers.

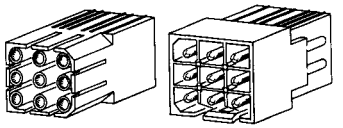


Figure 14 - R-E-D Connector

This service package contains the male and female portion of the connector, nine male terminals and nine female terminals and instructions. A WX5X19 extractor tool can be used for easy removal of the pin-and-socket type terminals.

Figure 15 - Extractor Tool

● DEFROSTING WHEN REPLACING DEFROST CONTROL

When replacing a defrost control that has caused evaporator blockage (frost or ice), it is imperative that the evaporator be completely defrosted before leaving the job.

In many cases, the defrost control has been replaced and turned to the defrost position thinking this would completely remove the frost or ice from the evaporator. In some instances, it will, however, the evaporator cover should be removed to be sure the evaporator is clear of frost or ice.

The evaporator should always be checked when replacing any component that may cause evaportor frost or ice buildup.

● IMPROPERLY WIRED DEFROST CONTROL

An inopertive refrigerator or no refrigeration, within a short time after installation, may be due to an improperly wired defrost control. If a replacement control is installed and connected wire, a repeat failure will occur.

Figure 16 shows the proper wiring connections, according to wire color for defrost controls presently being used.

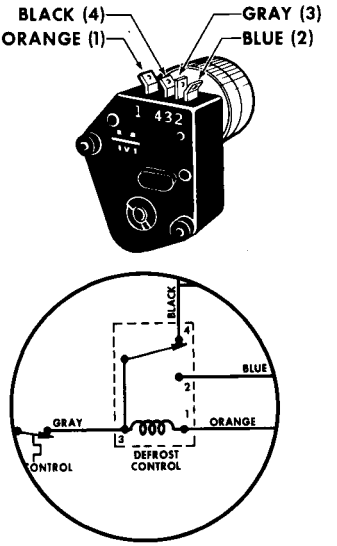


Figure 16 - Correct Defrost Control Wiring

● HIGH TEMPERATURES — LONG RUN

On no-frost model refrigerators where high temperatures in the freezer and fresh food compartments are encountered (sometimes intermittent), check the defrost control.

If the defrost heater(s) is energized during the run cycle, more heat is added than is removed. The defrost heater(s) will cycle on the defrost thermostat, allowing temperatures to return to normal, until the defrost thermostat closes again. These symptoms may be incorrectly diagnosed as a moisture restriction in the refrigeration system or a defective compressor.

To check the defrost control, disconnect the power cord and pull the wires from terminals 2 and 4. Using an ohmmeter, check for continuity between terminals 2 and 4 while rotating the control knob 2 or 3 full turns. If continuity is shown at any time, replace the defrost control.

GUARDETTE TRIPPING — LOW VOLTAGE

Where guardette tripping occurs, the line voltage should be tested under a load (see DIAGNOSIS section - Line Voltage Test). If the voltage supplied is marginal, a WR49X231 Accessory Low Voltage Start Kit can be used on most models to compensate for the inadequate voltage and permit proper operation of the compressor. Included in the kit is a start capacitor, universal PTCR relay, mounting hardware and an instruction sheet.

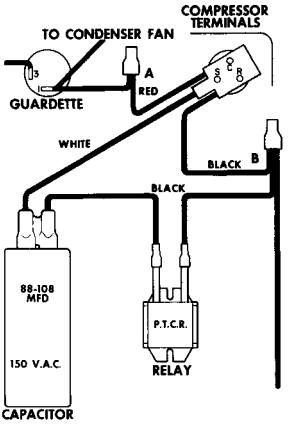


Figure 17 - Start Kit Installation

● DRAIN PAN OVERFLOW — TBF/CTF-14

On TBF-14 or CTF-14 Models, defrost water overflowing the drain pan can be corrected by replacing the original pan with a WR49X241 Drain Pan which holds a larger volume of water.

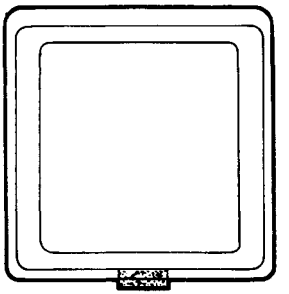


Figure 18 - Larger Drain Pan

●VEGETABLE DRAWER FALLING TB-12S/CTA-12C

A vegetable storage drawer falling out of the slide supports of either a Model TB-12S or a CTA-12C Refrigerator can be corrected by installing

one or two 1/8" thick WR2X7062 Shims between the support and the liner. It will be necessary to replace the two support screws with longer screws (WZ4X244) in order to ensure adequate attachment of the support.

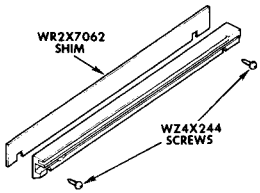


Figure 19 - Shim Installation

● INCOMPLETE DEFROSTING TBF/CTF-21

Ice accumulation at the rear and sides of the spiral fin evaporator in the following model refrigerators may be the result of early opening of the defrost thermostat.

TBF21CR-R through TBF21CT-C
TBF21DR-F through TBF21DT-B
TBF21KR-P through TBF21KT-B
TBF21RR-D through TBF21RT-B
CTF21CR-D through CTF21CR-S
CTF21ER-F through CTF21ET-B
CTF21GT-B

If so, replace the defrost thermostat with a WR50X60 (operating limits 58°-28°F). The original defrost thermostat, WR50X25 had operating limits of 42°-22°F.

In addition to replacing the defrost thermostat, check the following:

1. The above models were produced with a 6 hour 25 minute defrost control. Be sure it has not been replaced with a 6 hour 20 minute control.
2. Check the evaporator drain pan for proper fit to the evaporator housing. If the pan is "riding" up at the front, bend as shown in Figure 20.

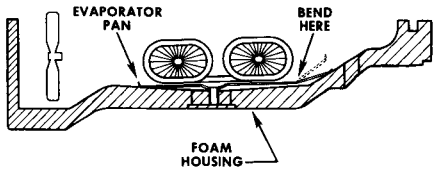


Figure 20 - Bend Drain Pan

3. Be sure the foam blocks are in position at each end of the evaporator to prevent air by-passing the evaporator.

Beginning in September 1976 (Serial Prefix "SZ"), these model refrigerators were produced with a lower wattage (432-watt) defrost heater (WR51X236) and a new defrost thermostat (WR50X31) with operating limits of 55° - 25°F.

● DEFROST HEATER REPEAT FAILURE — TFF/CSF MODELS

Repeat defrost heater failure on side-by-side model refrigerators may be due to:

1. A shorted or grounded wire between the two heaters causing increased current flow through one heater.

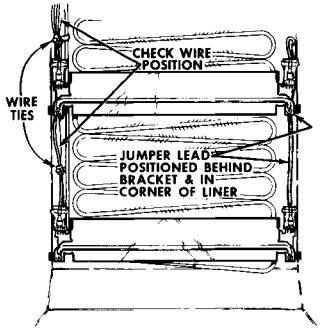


Figure 21 - Check Jumper Wire

2. Incorrect heater application. Earlier side-by-side models used three heaters instead of two. The resistance of the heater in the three heater models was 5 ohms with a glass sheath diameter of 11/32". On the two heater models, the resistance was 8 to 10 ohms with a glass sheath diameter of 7/16".

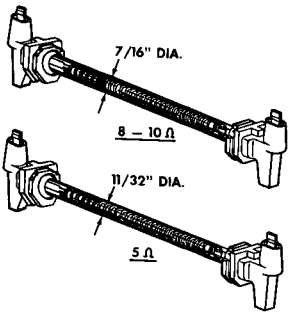


Figure 22 - Radiant Defrost Heaters

If a 5-ohm defrost heater (three heater model) is installed on a two heater model (8 to 10-ohm), current flow will increase through this heater causing an early failure.

Therefore, when a defrost heater fails, use the correct defrost heater kit and always replace both heaters.

In summary:

1. Use the correct heater kit.
2. Replace both heaters.
3. Install the heavy insulated jumper wire included in the kits.

● CONDENSER LOOP REPLACEMENT TFF/CSF MODELS

All 1980 and later side-by-side model refrigerators have a loop of 5/32-inch seamless copper tubing positioned around the perimeter of the freezer compartment opening. This loop of tubing, connected to the end of the main condenser, is called a "condenser loop".

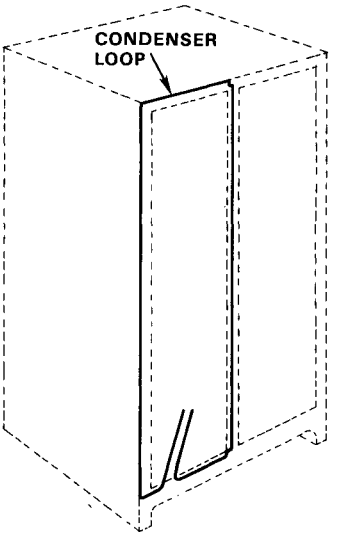


Figure 23 - Loop Location

The primary function of the condenser loop is to prevent moisture from forming on the cabinet front flanges. On side-by-side models prior to 1980, electrical heaters were used for this purpose.

If a refrigerant leak occurs at some point in the condenser loop other than at the connecting joints, the entire condenser loop must be replaced. Preformed condenser loops are available as replacement parts. Consult the appropriate parts catalog for the correct number. Instructions are included with the replacement part.

● EVAPORATOR ICING — SIDE-BY-SIDE MODELS

Repeat evaporator icing between the defrost heaters on side-by-side model refrigerators (having the single bank shredded fin evaporator) may be due to insufficient defrost heater time.

To correct this condition, add a second defrost thermostat (WR50X60) as shown in Figure 24. Mount the thermostat to the fourth loop on the right side. Some of the fins will have to be removed to provide space for mounting.

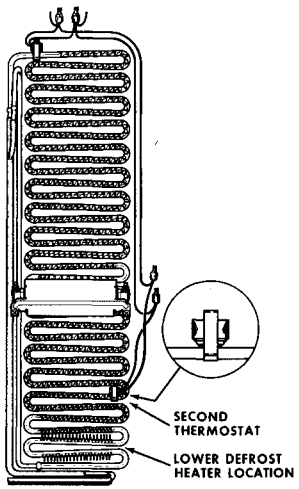


Figure 24 - Second Thermostat Location

Electrically connect the second thermostat in parallel with the original thermostat. See Figure 25. Dress the wiring up the side of the evaporator, positioning it where it will not be cut by the evaporator fins. Use bell type connectors and fill them with RTV sealant to seal out moisture.

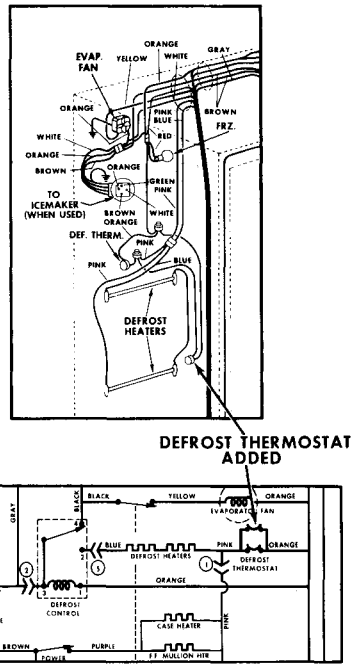


Figure 25 - Wiring Connection

In addition to adding the second thermostat, replace the existing defrost control with a WR9X370. This 30 minute control will provide additional "off" time to avoid guardette "tripping" when the compressor restarts after a defrost cycle.

Remember, evaporator icing can also be caused by other things such as: an intermittent defrost thermostat, loose wiring connections, low refrigerant

charge etc. Be sure one of these is not causing the icing condition before installing the defrost thermostat and defrost control.

COMPRESSOR NOISE

The level of sound of an operating compressor will vary from one refrigerator to another. In normal operation, the strokes of the compressor operation generate vibrations in the high pressure (condenser) tube which will cause the tube to become a resonator at a point near the compressor.

A WR49X236 vibration dampener kit is available to lower the compressor sound level at this point. Included in the kit is an aluminum tie wire, two rubber grommets, and an instruction sheet.

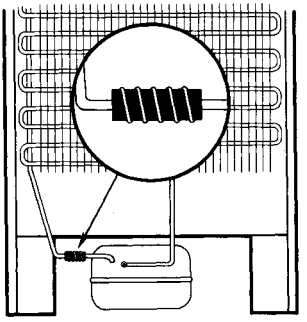


Figure 26 - WR49X236 Installed

RETRACTABLE CONDENSER NATURAL DRAFT MODELS

The natural draft condenser on the following model refrigerators, is shipped in a retracted position, that is tight against the rear of the outer case.

TA10	CA12C
TA12	SSD10
TB12	CTA12 (1979-1984)

One piece of tape is used on each side to hold the condenser in the shipping position. The installer instruction advises the installer to "remove tape and pull condenser away from cabinet to lock in place". Should the condenser not be locked in place and the refrigerator pushed against the wall at the rear, the condenser will collapse to a position close to the case. If the condenser remains in a collapsed or retracted position, there will be insufficient air circulation over the condenser to properly disipate heat and therefore performance will be affected.

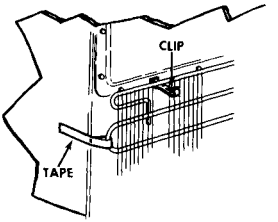


Figure 27 - Condenser Retracted

● COMPRESSOR SOUND REDUCTION

Improved sound blocks and pads, originally developed for the new TBF-22 and CTF-22 Models, can be installed on any size GE manufactured compressor to assist in reducing the operating sound level. The WR49X-292 Sound Block Kit contains heavy cast-iron blocks, fitted into molded rubber pads, which are attached to

the front and rear surfaces of the compressor with a large adjustable clamp. Instructions are furnished with the kit.

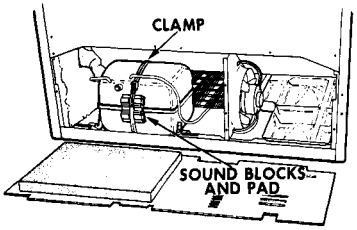


Figure 28 - Sound Block Kit

● EVAPORATOR FAN ICE JAMMED TBF/CTF-16, 18

Condensation, dripping from the underside of the freezer floor during the defrost cycle on TBF/CTF-16,18 models, can jam the evaporator fan with ice. To correct this condition, use a WR49X217 Seal Kit. Instructions are included with the kit.

● CONDENSATION ON CHILLER TRAY

Condensation (water) dripping from the underside of the chiller tray, on single-door manual defrost models, can be corrected by replacing the chiller tray. Replacement chiller trays have insulated bottoms that reduce moisture accumulation.

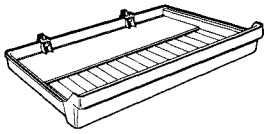


Figure 29 - Chiller Tray

● EXCESSIVE CABINET TILT

A refrigerator cabinet should be "leveled" so the doors swing closed from a 45° open position. The threads of the WR2X4667 front roller assembly were reduced to automatically produce a front-to-rear tilt of the cabinet. In those cases where this tilt may seem excessive and be objectionable to the customer, a WR2X4858 front roller assembly is available to lower the front of the cabinet slightly. Replace both front rollers. This new roller assembly has additional threads at the lower end to allow the cabinet to be positioned closer to the floor. The front of the cabinet should never be lowered, however, to the point that the doors will not swing shut when opened to a 45° angle.

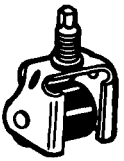


Figure 30 - WR2X4858 Front Roller

● HANDLE TRIM CAP CRACKED TBF MODELS

A crack in the handle trim cap on General Electric reversible door model refrigerators is the result of a stress condition caused by the attaching screw and the fit of the cap to the handle. The handle insert retainer has been modified to help relieve the stress.

When a handle trim cap has cracked, replace the cap (WR2X4927) and insert retainer (WR2X4925). Also install a nylon spacer washer (WR1X1114) under the retainer to prevent any possible stress on the cap.

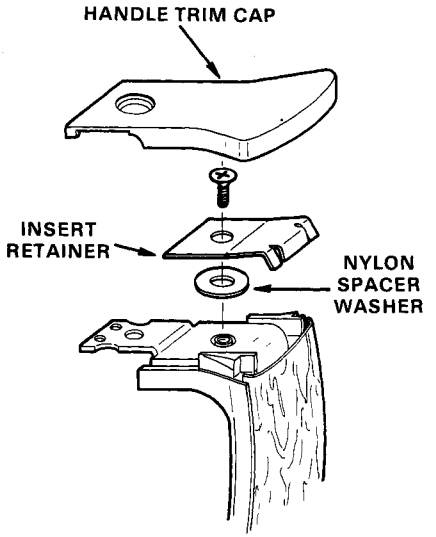


Figure 31 - Handle Assembly

EXCESSIVE MOISTURE IN VEGETABLE PANS

Excessive moisture in the vegetable pans (and meat pan on some models) may occur under one or more of the following conditions:

Low usage
Normal to heavy food load
High ambient/humidity location

This condition, on most models, can be corrected by drilling two (2) 3/8-inch diameter holes on each side of the pan. The holes should be located one-inch from the top and equally spaced from front to back.

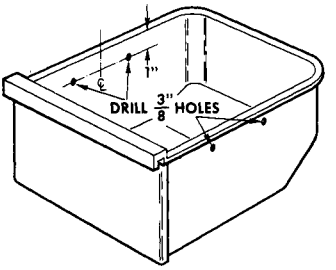


Figure 32 - Drill Holes

Also, install one WR17X1513 Vegetable Pan Grid in the bottom of the pan. This grid will keep vegetables from resting directly on the pan bottom.

In addition, on side-by-side models:

1. Using RTV sealer or water bar permagum (WR97X140), plug the fresh food equalization vent tube (located at the lower right rear wall of the fresh food liner, behind the vegetable pan).

2. When a gasket is used to seal the top rear of the vegetable pan, cut off the gasket flap.

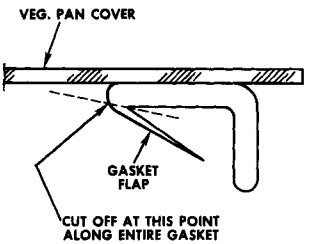


Figure 33 - Cut Off Flap

● DRAIN OVERFLOWING/ICING

A drain tube overflowing or drain tube icing condition is usually due to bacteria growth or foreign particles

inside the drain tube. This condition can be quickly corrected, using a meat baster to force air or hot tap water through the drain tube.

Figure 34 - Meat Baster

To prevent this condition from re-curring, the customer should be advised to pour a solution of baking soda (one-teaspoon) and two cups of hot (not boiling) water into the drain opening once or twice a year.

On side-by-side models, if icing of the drain tube persists, a WR49X248 Drain Tube Heater Kit can be installed to correct the condition. The kit contains an aluminum drain tube, a low wattage heater and instructions.

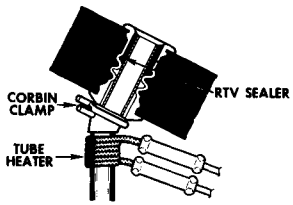


Figure 35 - WR49X248 Drain Tube Heater Kit

● RTV SILICONE SEALANT

RTV silicone sealant is specified for various applications in the service and repair of refrigerators and freezers. There are many formulations of RTV sealant, however, the approved type for use in refrigerators and freezers is RTV 102. This is available in a 3-ounce tube under catalog number WX6X200.

Figure 36 - WX6X200 RTV Sealant

● FALLING FRESH FOOD SHELVES CTF-16CW-B

CTF-16CW-B refrigerators with serial numbers beginning "AD" (January 1978), "DD" (February, 1978), and "FD" (March, 1978) may experience the fresh food shelves falling off the front supports due to insufficient contact with the supports. To correct this condition, replace the original six supports (two for each of three shelves) with six WR2X6173 shelf supports. Care should be exercised when removing and installing the supports to prevent damage to the liner.

Beginning with April, 1978 production, serial Prefix "GD", the CTF-16CW-B is manufactured with the WR2X6173 longer and stronger shelf support.

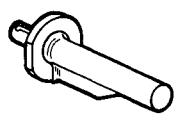


Figure 37 - WR2X6173 Shelf Support

(WR2004,2154,2183,2251)

FREEZER BREAKER FRAME BOWING TB-14SW-C, CTA-14CW-C

Bowing at the sides of the freezer breaker frame on TB-14SW-C or CTA-14CW-C Model refrigerators, with serial numbers beginning "HD" through "ZD", can be corrected by installing four (4) WZ4X244 screws.

Drill two (2) 3/16-inch clearance holes through the plastic breaker frame at each side. Locate the holes 5/16-inch in from the rear edge, 4 1/2 inches down from the top and 4 1/2 inches up from the bottom. Drill 1/16-inch pilot holes in the metal sides of the evaporator, aligned with the holes through the plastic. (No tubing is located on the sides of the evaporator).

Drive the screws through the breaker frame and into the evaporator, but avoid overtightening the screws which will result in stripping.

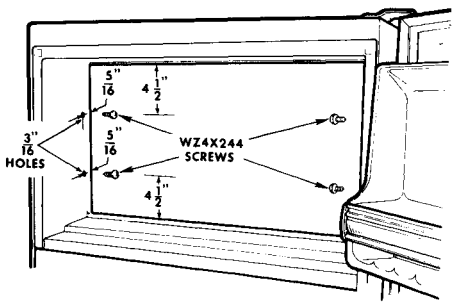


Figure 38 - Screw Locations

FRESH FOOD FREEZING-TBF/CTF-14 MODELS

Fresh food freezing below, and in front of, the control console can occur in TBF-14 and CTF-14 Models. Because cold air from the evaporator is discharged through the control console, the area directly below, and in front of, the control console will normally be the coldest area in the fresh food compartment. On recently produced models, a label is affixed to the liner, approximately two-inches below the control console, calling attention to this area being a "SUPER-COLD ZONE".

If freezing of food occurs in this area, check the control settings and those components that could cause this condition (i.e., temperature control, nozzle damper assembly, air duct insert and gasket, etc.) Also, check for cold air leaking into the fresh food compartment around the sides and rear of the foam evaporator housing. Remove the freezer floor and direct light from a 150-watt lamp (GE 150 PAR/FL) upward from the fresh food compartment. Any light that passes through the gasket seal between the foam housing and the liner sides and/or rear is an indication of an inadequate seal. Apply RTV sealer (WX6X200) around the sides and rear (inside the freezer compartment) to completely seal the evaporator housing to the liner.

Only after determining that the temperature regulating components and foam evaporator housing are operating properly and correctly assembled, a WR49X252 Air Deflector should be installed to help prevent fresh food freezing.

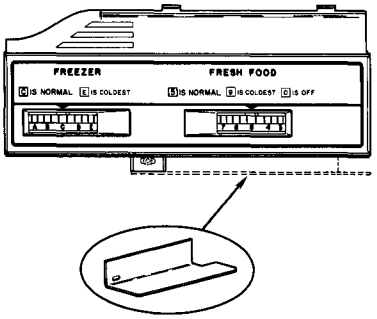


Figure 39 - Air Deflector

The air deflector is installed under the control console to diffuse the cold air flow. Installation instructions are included with the air deflector.

● COMPRESSOR FRONT MOUNT NOISE

Compressor stopping noises, sometimes thought to be internal to the compressor case, are actually at the front mounting and caused by a loose rivet and grommet.

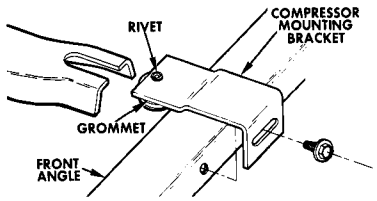


Figure 40 - Compressor Front Mount

To determine if the noise is at the mounting, remove the mounting bracket and support the front of the compressor horizontally by forcing a drop cloth under the front of the oil cooler tubing. Cycle the compressor on and off. If the noise is stopped or diminished, examine the rubber grommet and rivet. The grommet should not be loose. If the grommet is loose, either peen the end of the rivet to tighten it or drill it out and replace the rivet with a bolt, two washers and a self-locking nut.

Torque the new bolt and nut to the point where the rubber grommet starts to compress. Cycle the compressor and torque the bolt to give minimum running and no stopping noises.

● REPLACEMENT CONDENSER — WR84X38

The WR84X38 natural draft 29-pass condenser replaces the WR84X28 21-pass condenser used on TBF-14 "W-D" (1978) and earlier, CTF-14 "W-D" (1978) and earlier refrigerators.

When replacing the WR84X28 with the WR84X38 condenser, 3/4 ounce additional refrigerant charge, 4-WR2X3388 mounting brackets and 4-WZ4X338 screws are required because of differences in size and configuration. These mounting brackets, screws and charge instructions are currently included with the WR84X38 condensers.

● REFRIGERATED FREEZER SHELF REPAIR

Wire and tube type refrigerated shelves for upright freezers are steel that can and should be repaired, using good silver brazing practices. Individual shelves and heat-exchangers are supplied separately. Leaks are the only type failures that occur in the shelves. Most of the leaks occur at

the joints between the shelves and do not require shelf replacement. Other types of leaks generally are discovered during the first two months of operation. These also can be repaired by silver brazing.

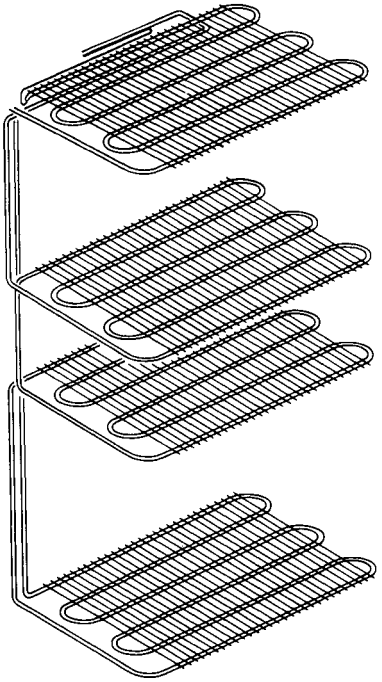


Figure 41 - Refrigerated Shelves

COMPRESSOR CHARGING VALVE CAP SCREW

When a newly installed refrigerator "runs but does not refrigerate", often the preliminary diagnosis is: "was not charged with refrigerant at the factory". This suspecion is "confirmed" when all efforts to find a leak anywhere in the refrigeration system are unsuccessful.

It could be that the source of the leak is the compressor charging valve. A loose or improperly fitted screw inside the charging valve will allow the "factory charge" to leak out after it leaves the factory. It's easy to overlook the charging valve as a leak source —especially if the charging valve tool is attached to the valve while checking the system for a leak.

If a leak is found at the charging valve, rather than change the Hi-Side, install a WR86X16 Cap Screw which has a sealing washer that will effectively seal the charging valve port.

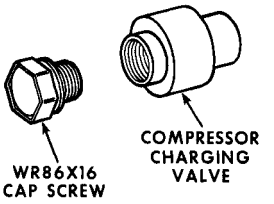


Figure 42 - Charging Valve Cap Screw

Under very high humidity conditions, such as encountered in basement and garage installations, the outer door on upright freezers may sweat. Whenever service is required for outer door sweat, always first check for adequate insulation in the door and that the inner door panel breather holes are not blocked. A WR49X4108 Heater Kit (which includes a hollow pin hinge, top hinge, crossover harness, heater, and instructions) can be used to correct a door sweating condition on the following models:

GENERAL ELECTRIC

CA-13DW-D and later
CA-16DW-D and later
CA-16EW-D and later

GENERAL ELECTIRC (cont'd.)

CA-19DW-D and later
CA-21DW-D and later
CAF-16DW-D and later

HOTPOINT

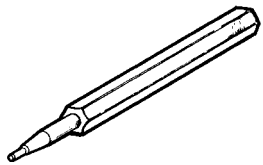
FV-13CW-D and later
FV-16AW-D and later
FV-16CW-D and later
FV-19CW-D and later
FV-21CW-D and later
FVF-16CW-D and later

● DRYER REPLACEMENT — TFF/CSF MODELS

All 1980 and later Side-by-Side Model Refrigerators have a condenser loop positioned around the perimeter of the freezer compartment cabinet front flanges (replacing the conventional electric heater previously used). This loop, made of 5/32-inch cooper tubing, is connected to the end of the main condenser located in the machine compartment. A "pickle" type dryer is connected to the other end of the loop.

When installing a WR86X83 Dryer on a model that has the condenser loop:

1. If brazing the tubes together, it will be necessary to "size" the 3/16-inch dryer inlet tube to accept the 5/32-inch swaging tool, WX5X399 (Robinair 14821), is available for this purpose.



WX5X399 SWAGING TOOL

Figure 43 - 5/32" Swaging Tool

2. If using Lokring connectors, sizing the tubes is not necessary. A WR88X30 3/16 to 5/32-inch reducer is available for joining the dryer inlet tube to the condenser loop tube.

● DRAIN PAN OVERFLOW - TFF/CSF MODELS

On TFF and CSF "W-P" (1978) through "A" (1980) side-by-side refrigerators, defrost water overflowing the drain pan is primarily due to a mispositioned pan. However, don't overlook the possibility of a poor door seal allowing an excessive frost accumulation, or a cracked drain tube, as the root cause for water on the floor in the vicinity of the drain pan.

In most instances, the drain pan overflow condition can be corrected by installing a WR49X259 Support Kit to level and properly position the drain pan. If this condition persists after installing the support kit, install a WR32X824 Pan which will hold more water due to its increased depth.

Proper positioning of the drain pan is very important even with the new, deeper pan. The lower part of the pan front feet must be between the front angle and the front of the condenser in order to obtain optimum water

evaporation. The foam blocks on the front of the pan and foam tape at the rear of the pan will secure it in position.

DOOR HEIGHT ADJUSTMENT — TFF/CSF MODELS

To simplify raising or lowering the freezer door on 1980 and later side-by-side refrigerators, the holes in the freezer door bottom hinge are slotted. This will permit aligning the top of the freezer door with the fresh food door without adding or removing notched shims at the bottom of the freezer door.

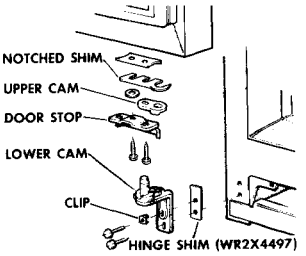


Figure 44 - Lower Hinge Assembly

To raise or lower the freezer door:

— Remove the top screw from the bottom hinge.
— Remove and discard the clip.
— Reinsert the screw, but do not tighten it.
— Loosen the bottom screw and raise or lower the freezer door as required
— Securely tighten both screws.

Replacement hinges will be supplied without the clip and can be used for either the fresh food or freezer door. The catalog number of the new hinge is WR13X526. DO NOT use the new hinge on older models because the door closure cams may not be made of the same material and can cause a door binding problem.

LEVELING LEG CAPS

Refrigerators installed on hard, smooth floor surfaces sometimes tend to move about the floor when the door is opened. Conversely, if the floor covering is of soft vinyl or carpet material, it is difficult for the consumer to move the refrigerator away from the wall.

To correct either of these conditions, accessory caps are available for all 1-1/4-inch leveling legs. For hard, smooth floors use a WR2X7084 Cap on each of the front leveling legs. For soft vinyl or carpet floors use a WR2X4810 Cap on 12-point legs or WR2X4968 Cap on 6-sided legs—at the front and rear.

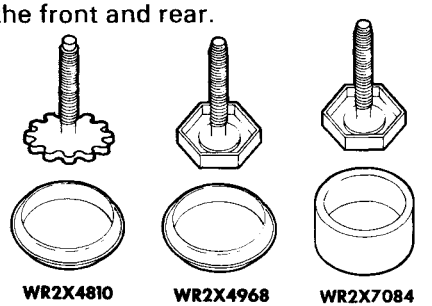


Figure 45 - Accessory Caps For Leveling Legs

EVAPORATING ICING — TBF/CTF-17

On TBF-17 or CTF-17 "A" (1980) model refrigerators, ice in the evaporator, (due to incomplete defrosting) can be corrected by relocating the

the defrost thermostat. Remove the thermostat from its original location and carefully remove the original mounting bracket from the thermostat. Use a WR1X1602 Bracket to attach the thermostat to the inlet tube of the evaporator.

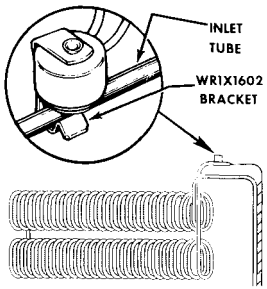


Figure 46 - Defrost Thermostat Relocated

Examine the wiring connections at the defrost heater and the defrost control for loose terminals which could also cause an incomplete defrosting condition.

When clearing the ice from the evaporator, if a heat gun is used, care must be taken to prevent damage to foam and plastic parts adjacent to the evaporator.

Before reinstalling the evaporator cover, determine that the fan housing and evaporator plate are properly sealed against the liner. Also, make sure the evaporator coils are fitted to the evaportor plate and will not interfere with the evaporator cover. Any opening between the fan housing and the liner, the evaporator plate and the liner, and/or the evaporator cover and the liner will affect the performance of the refrigerator.

● SOUND LEVEL REDUCTION

There are many operating components in refrigerators and freezers that contribute to the overall sound level. Some components operate at the same time and some independently. The consumer may hear different sounds at various times that are completely unfamiliar, yet are normal operating sounds.

Compressor compartment sound levels can often be reduced by dampening or isolating with WR2X-6417 felt pads and/or with minor adjustments. With the compressor running, inspect for vibrating parts or components, rattling tubes or any source of sound transmission. Use your hand to help detect vibration and to determine where isolation and dampening is required.

Compressor Mounting

— Rubber grommet not mating with front mount slot.
— Front bracket screw loose.
— Front bracket grommet rivet loose, vibrating when compressor cycles (use felt pads on underside of bracket to isolate from front angle).
— Compressor touching rear channel (use felt pads to isolate).
— Rear brackets twisted and/or binding.
— Rear bracket screws loose.

Condenser — Natural Draft

— Mounting brackets and/or bracket screws loose.
— Tubes contacting case back, drain tube or main condenser passes.
— Loose wires vibrating (cut and remove with pliers).

Condenser — Forced Draft
— Tubes or wires contacting outer case sides, bottom or metal baffles (adjust condenser retaining clips and bracket on rear of oil cooler tube, use felt pads to isolate).
— Bracket loose at front mount (use felt pads to isolate).

Tubing
— Compressor discharge tube contacting outer case or condenser.
— Suction/capillary tubing contact ing condenser, outer case or drain tube.

Condenser Fan
— Blade bent or loose.
— Motor brackets/screws loose.

Condenser Fan Divider Baffle
— Loose or vibrating at rear channel (isolate with felt pads).
— Baffle or baffle extension contacting front angle.

Defrost Control
— Mounting bracket contacting outer case bottom.
— Mounting bracket screws loose.

Drain Pan
— Contacting and vibrating on drain tube, condenser tubing, compressor, outer case sides or front and rear channels (isolate with felt pads).
— Drain pan retainer clips contacting outer case bottom (bend away from case bottom).

Rear Baffle
— Rear baffle or access cover loose or improperly positioned.

● SOUND LEVEL REDUCTION — ACCESSORY KIT

The WR49X261 Accessory Sound Level Reduction Kit is for application on the following models:

GENERAL ELECTRIC	HOTPOINT
TA-11	SSD-11
TA-14	SSD-14
TB-12	CTA-12**
TB-14	CTA-14***
TBF-14	CTF-14***
TBF-16	CTF-16
TBF-18	CTF-18
TBF-21	CTF-21
TFF-18*	CSF-18*
TFF-19	CSF-19
TFF-20	CSF-20
TFF-22	CSF-22
TFF-24	CSF-24

*"M" (1971) and later models
** "Y" (1979) and later models
***"R" (1974) and later models

Follow the instructions closely, properly installing all parts recommended for that particular model, in order to obtain maximum effectiveness. Since this kit applies to many models, not all parts are used on every model.

NOTE: The kit should be used only on refrigerators having **above normal** operating sound levels. Results will be **minimal** if used where sound levels are considered normal.

NOTE: The kit will not reduce evaporator "gurgling, cracking or popping" sounds or evaporator fan vibration. Often a warped or unbalanced blade is the cause of excessive fan vibration.

● DOOR GASKET SEAL - 1979 UPRIGHT FREEZERS

A good door seal on some 1979 model upright freezers was difficult to obtain because of the door gasket. Either the top or bottom corners of the gasket on the handle side were misshaped or the magnet in the gasket did not have the required pull force.

On comparable 1980 upright freezers, a new and improved gasket is used. In addition to correcting the seal at the corners and magnetic pull force, the hinge side has a different configuration than the other three sides, as illustrated. This reduces gasket fold-over and scrubbing. The hinge side is identified with a rib on the gasket flap.

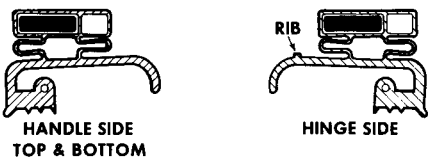


Figure 47 - Door Gasket Sections

The new gasket will automatically be furnished for applicable 1979 upright freezers when the original gasket is ordered.

● EVAPORATOR ICE BALL TB/CTA-12, 14 MODELS

On TB-12/14 and CTA-12/14 Models, a ball of ice can begin to form on the fresh food evaporator tubing if only a slight amount of frost remains when the temperature control cycles "ON". Liquid refrigerant trapped in a bend (low point in the evaporator tubing), continuing to boil during the "OFF" cycle, prevents the temperature of the tubing from rising above 32°F. The problem can be aggravated by the evaporator tubing touching the liner back cover (plastic insert which covers the opening in the liner) behind the evaporator.

To correct this condition:

1. Dismount the fresh food evaporator from the liner top.
2. Install a WR9X208 constant-on type temperature control. Route the longer control capillary fully across the evaporator and install the additional clamp (furnished with the control) at the right side of the evaporator. Make sure both clamps are firmly tightened. Install the capillary clips (also furnished) between the clamps and at the right side of the evaporator. Form a high loop in the control capillary at the left side of the evaporator (where the capillary leaves the clamp).

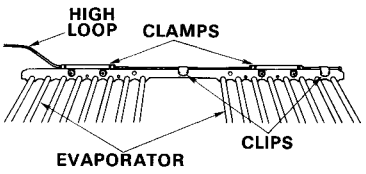


Figure 48 - Capillary Properly Mounted

3. Remove the plastic liner back cove and replace the original 7-wat serpentine heater with a WR51X301 10-watt heater. Re

move the left side fresh food breaker strip and pull the brown and black lead wires of the new heater all the way around to the front, left side of the liner in order to make the connections at the original splices.

4. Add a WR82X64 bagged insulation strip behind the opening in the liner back. Reinstall the cover in the opening.

5. Straighten and reshape the evaporator tubing so as to remove the liquid traps.

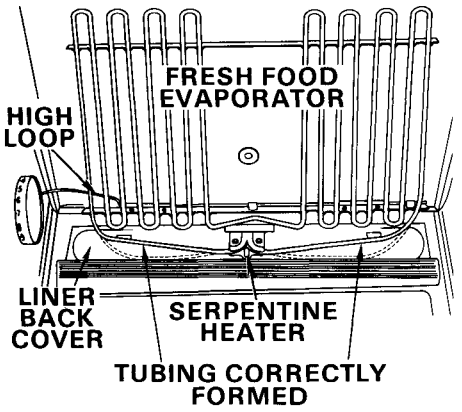


Figure 49 - Tubing Correctly Formed

6. Remount the evaporator to the liner top and dress the evaporator tubing to prevent contact with the liner back cover.

●DOOR GASKET SCRUBBING

Door gasket scrubbing at the hinge side of the door can be corrected with a light application of pure petroleum jelly (such as Vaseline brand) to the gasket sealing surface. Silicone oil should not be used because it will migrate into the door switches, contaminating the contacts, and cause switch failure.

Pure petroleum jelly is preferred over the WR97X210 Lubricant previously recommended for this purpose because it lasts longer between applications, is more readily available, and is more economical to use.

A scrubbing condition can eventually cause the sealing surface of the gasket to fold over and bind the door, preventing it from closing. If this occurs:

1. Warm the entire length of gasket with a heat gun to help take out the "set". (Due to the intense heat from the heat gun, care must be taken to avoid melting the gasket.

2. Reform the gasket to its original position while it is warm.

3. Apply a thin film of pure petroleum jelly to the gasket sealing surface.

4. Check for a smooth wiping action as the door is closed and opened.

5. Adjust the door hinges, if necessary, to maintain adequate spacing for the gasket at the hinge side. Use a penny or a dime as a guage to check for equal spacing near the top and bottom of the door. A penny should be used for side-by-side models and a dime for most other models.

▶JUICE RACK FRONT REPLACEMENT TFF MODELS

A time saving technique for replacing a juice rack front on some TFF (side-by-side) model refrigerators eliminates removing the freezer inner door panel.

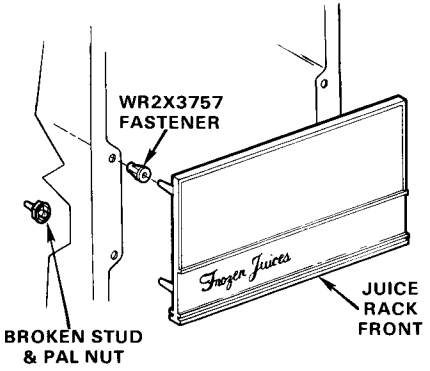


Figure 50 - Front Replacement

1. Remove the broken or damaged juice rack front by shearing off the studs that protude into holes in the inner door panel. Use a putty knife with a sharp edge. Tap the putty knife handle with a hammer to break each remaining stud. Exercise care to avoid cracking the inner door panel. The broken stud and pal nut will fall behind the panel. (Likely some studs were previously broken — the primary reason for replacing the front.)

2. Insert a WR2X3757 fastener into each hole in the inner door panel corresponing with each stud on the replacement front. Some fronts have four (4) studs, others have as many as six (6). Twelve (12) fasteners are furnished under catalog number WR2X3757.

3. Mount the replacement juice rack front by inserting the studs into the fasteners. Press firmly and evenly at each side to fully seat all studs into the fasteners.

●FREEZER SHELF FALLING TFF-24R MODEL

Slide-out storage bin type freezer shelves may fall off the slide support in some TFF-24R model refrigerators. To correct this condition, install a plastic shim behind the left and right slide supports. A WR2X7133 Shim Kit contains two (2) shims plus an instruction sheet.

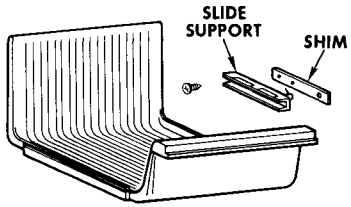


Figure 51 - Shim Installation

●DEFROSTING FROST-BLOCKED EVAPORATORS

A failure of any component in the defrost system usually results in a frost-blocked evaporator. Accordingly, the evaporator must be completely defrosted at the time the repair is made.

Attempting to clear the frost from the evaporator by merely advancing the defrost control to the defrost cycle will likely result in a repeat service call. With an excessive frost accumulation on the evaporator, defrost heater operation may continue through the entire defrost cycle and still not completely remove all of the

frost. Any partially melted frost will refreeze, forming a solid mass of ice. Residual ice, being more dense than frost, may not ever be melted away —even after repeated defrost cycles.

If a heat gun is used to defrost the evaporator, care must be taken to prevent melting foam and plastic parts adjacent to the evaporator.

The use of hot water in manually defrosting the evaporator is much quicker and safer than the heat gun. However, hot water can be sloppy; and the excess water must be recovered.

Equipment has been specially designed and constructed for using hot water to manually defrost evaporators. The WX5X560 Sprayer is specially constructed for use with hot water. (Most sprayers, locally available, caution against the use of hot liquids.) The WX5X561 Recovery Pan is specially designed for use on no-frost top-mount as well as side-by-side models.

◗SWEATING FREEZER DOOR TOP OR CASE TBF/CTF-17, 19

Sweating along the top of the freezer door gasket, and/or the top of the outer case on TBF-17/19 and CTF-17/19 Models is likely caused by cold air blowing up under the door gasket. This condition can be corrected by sealing the gasket flap to the inner door panel and raising the freezer door.

To seal the gasket flap to the inner door:

1. Make sure the gasket is properly seated in the retainer strip and the screws are adequately tight (do not overtighten).
2. Warm the inner surface of the gasket flap and the corresponding surface of the inner door panel to remove dampness.
3. Apply a piece of WR2X6141 doublesided tape all the way across the top of the inner door panel (behind the gasket flap and over the gasket retainer strip). Press the gasket flap against the tape to seal it in place.

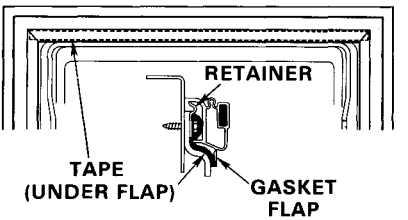


Figure 52 - Seal Gasket Flap

To raise the freezer door:

1. Loosen the top hinge mounting screws and lift the freezer door off of the center hinge.
2. Add one WR1X1114 nylon washer to the existing washer on the center hinge pin. (More than two washers may nullify the effectiveness of the door stop.)
3. Reinstall the freezer door. Properly align it to the outer case, and firmly tighten the top hinge screws.

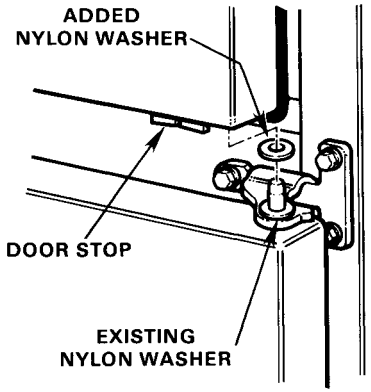


Figure 53 - Raise Freezer Door

● WATER SPILLAGE IN FRESH FOOD COMPARTMENT TBF/CTF-17, 19

The source of water on the fresh food liner bottom (under the vegetable pans), in TBF-17/19 and CTF-17/19 Models, may be attributed to defrost water leakage from the drain funnel. A drain funnel improperly aligned with the drain trough will allow defrost water to flow down the back of the fresh food liner (generally from the vicinity of the control console). Adjustment of the drain funnel for proper alignment with the drain trough necessitates partially removing the compartment divider. (See Cabinet Service Section — Compartment Divider).

With the divider assembly partially removed, ample access is provided for adjusting the drain funnel. Inspect the gasket along the rear of the fresh food liner top for deformation. If necessary, add a WR2X3899 gasket.

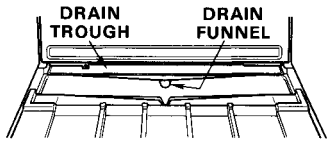


Figure 54 - Funnel Access

● WARM FREEZER TEMPERATURE TBF/CTF-17, 19

Warm temperatures, especially noticeable in the freezer compartment of TBF-17/19 and CTF-17/19 Models, may be caused by short cycling of the temperature control. Cold air leaking into the fresh food compartment, either at the rear of the compartment divider or at the rear of the control console, is sensed by the temperature control and causes the short cycling.

To correct this condition:

Remove the mullion plate and the freezer floor. Slide the divider assembly (fresh food liner top and foam insulation) forward approximately 5 to 6 inches. (See Cabinet Service Section — Compartment Divider).

Add a WR2X3899 foam gasket strip to the rear surface of the fresh food liner top (below the existing gasket) and reassemble the compartment divider.

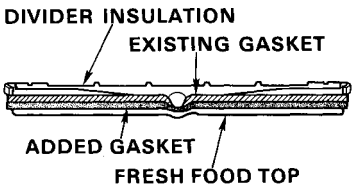


Figure 55 - Divider Rear Gasket

Upon reassembling the control console, inspect the foam gasket (WR14X312) applied to the rear of the nozzle. Make sure the gasket is correctly positioned around the nozzle opening and that it provides a tight seal against the rear of the liner when the console is installed.

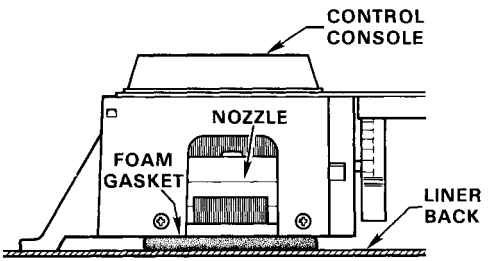


Figure 56 - Console Rear Gasket

◗SWEATING MULLION TBF/CTF — 17, 19

Sweating on the mullion and/or sides of the outer case (in the vicinity of the mullion) on TBF-17/19 and CTF-17/19 Models is likely caused by cold air blowing into the mullion, through crevices at the sides of the freezer floor.

To correct this condition:

1. Remove the mullion plate and the freezer floor. (See Cabinet Service Section — Compartment Divider).
2. Peel off the existing WR2X7072 foam gaskets at each side of the liner. Cut off two pieces of the gasket approximately 2-inches long and fold the pieces to form stuffers. Dress the case heater back into the cavity behind the case flange and insert a stuffer on top of the heater at each side. Install a new WR2X7072 foam gasket, beginning with one end tucked behind the case flange and the gasket up against the top of the floor channel, extending toward the rear at each side of the liner.

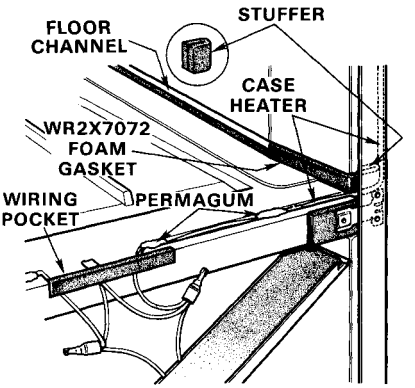


Figure 57- Seal Mullion Area

3. Dress the case heater leads into the channels near the front of the foam divider insulation. Seal the channels with a dab of permagum (WR97X81) in two locations at each side to prevent air flow in the channels.
4. Reinstall the freezer floor and the mullion plate. Make sure the wiring and connectors are positioned in the wiring pocket in the divider insulation, behind the mullion plate so as to prevent a cold air passage. Add a piece of foam

gasket, if necessary, to seal this area.

5. Pull the freezer floor forward so that gaps do not exist between the tabs and the case flange. Seal the seams between the freezer floor and the liner and at the ends of the tabs with RTV Sealer (WX6X200). Smooth out the sealer to provide a neat appearance.

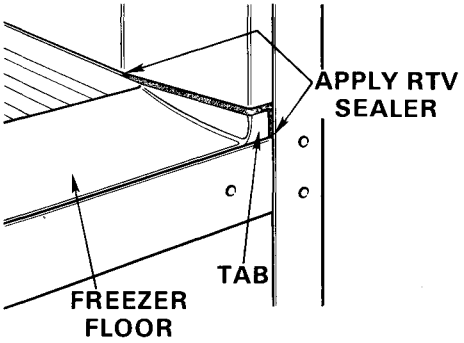


Figure 58 Seal Freezer Floor

● LEVELING LEG LOCKNUTS

If leveling leg threads in the base of a cabinet become stripped, locknuts can be positioned above and below the threaded hole to secure the leveling leg. Two different thread sizes have been used for leveling legs in recent years. The locknuts for 5/16" - 18 are WZ7X39 and for 3/8" - 16 are WZ7X49.

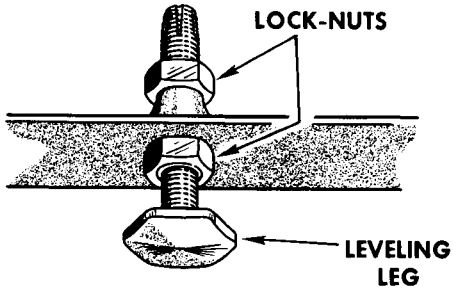


Figure 59 - Leveling Leg Locknuts

● VEGETABLE PAN CONTROL WANDERING — TBF-17/19

On some TBF-17 and TBF-19 Models, which have an adjustable humidity vegetable pan, the humidity control knob may have a tendency to "wander" (change settings) as the pan is pulled out and/or pushed in. This condition can be corrected by installing a piece of WR2X7072 foam gasket behind the vegetable pan cover front trim.

1. Using scissors, cut a ½" x 3¼" piece from the WR2X7072 gasket.
2. Remove the vegetable pan cover and place it upside-down on a work surface.
3. Dry off any moisture that may be present on the sloping surface behind the cover front trim.
4. Peel the paper backing and adhere the foam gasket piece to the sloping surface — positioned approximately ⅛" back from the control knob slot, and down against the sliding channel.

5. Move the control knob back and forth to make sure it slides smoothly (but with some resistance against the gasket peice).

6. Reinstall the cover and pan.

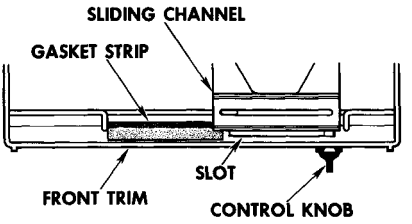


Figure 60 - Gasket Strip Added To Cover

◗ WARM FREEZER TEMPERATURE TBF/CTF-21

Warm freezer compartment temperatures (ranging from 10 to 16°F.) in TBF-21 and CTF-21 Model Refrigerators can be due to a bowed liner allowing cold air to escape into the fresh food compartment. Cool air leaking at gaps between the compartment divider and the liner, along the sides and/or rear, prematurely "satisfies" the temperature control.

This condition can be verified by using a 150-watt outdoor flood lamp (GE 150 PAR/FL) placed inside the fresh food compartment. After removing the freezer floor, direct the light along the sides and rear of the compartment divider while observing for the presence of light in the freezer compartment.

Seal any gaps along the sides or rear of the evaporator foam housing, using as many as three (3) lengths of foam gasket (WR14X241). After removing the paper from the gasket adhesive, the gaskets are to be folded together to double the thickness as shown below. Install gaskets, folded as shown at "A", along the sides and rear of the foam housing (as needed). Also, install gaskets, folded as shown at "B", in the front corners behind the case flanges at the mullion. RTV sealant (WX6X200) may also be required for an effective seal.

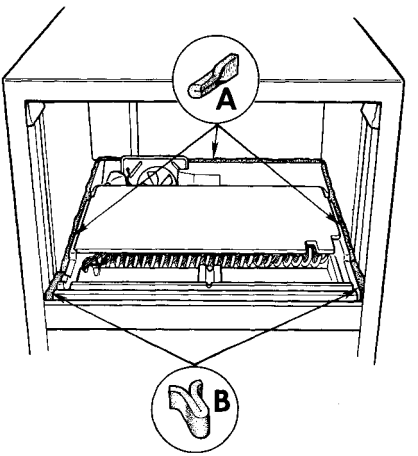


Figure 61 - Foam Housing Sealed

● SWEATING LINER TOP — TBF/CTF-14,15,16

Excessive moisture on the fresh food liner top, of some TBF-14,15,16, CTF-14,15 and 16 "B" (1982) and later model refrigerators, is due to moisture-laden air entering the cabinet and collecting on an abnormally cool liner top. In many instances, this condition can be minimized by:

1. Adjusting the doors, hinges and gaskets for a maximum door seal, and
2. Setting the freezer temperature control slightly colder (for a longer run time).

If this condition persists, install a WR49X305 Liner Top Heater Kit.

NOTE: In the process of installing the heater there is a chance damage will occur to the evaporator foam housing (WR17X1625). Accordingly, it is advisable to have a replacement foam housing on hand before attempting the repair.

SWEATING LINER TOP — TBF/CTF-21

Excessive condensation of moisture may occur on the fresh food liner top of TBF-21 and CTF-21 "A" (1980) and later model refrigerators. This is due to moisture-laden air entering the cabinet and collecting on an abnormally cool liner top.

This condition can be corrected by sealing the cabinet to prevent the entry of moisture-laden air and installing a fresh food liner top heater.

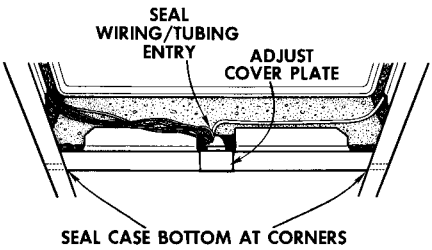


Figure 62 - Cabinet Sealing

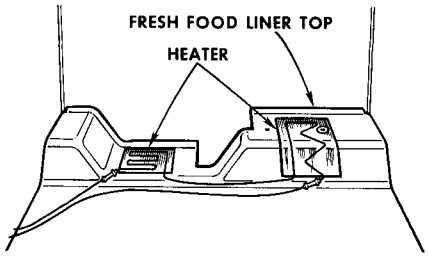


Figure 63 - Liner Top Heater Installed

A service kit, WR49X298, includes an evaporator housing, a liner top heater and other essential parts necessary to complete the repair. Complete instructions are furnished with the kit.

DOOR HINGE THIMBLE ADJUSTMENTS

Door thimbles for hinge pins, on top-mount refrigerators produced in recent years, are made of a plastic material. These thimbles are threaded into retainers located inside the outer door panel. Indentions in the bottom of the thimbles allow the use of a #2 Phillips screwdriver for easy removal and reinstallation. The retainers are securely fastened to the outer door panel so as to remain in position when the thimble is removed. The catalog number of the replacement plastic thimble is WR2X6278.

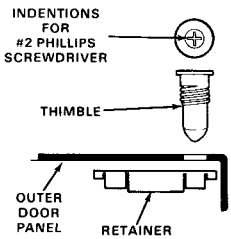


Figure 64 - Removable Hinge Thimble

A buildup of frost or moisture inside a door may be due to a loose door thimble allowing moisture-laden air to enter the door. This condition can be corrected by removing the door and tightening the thimble, using a #2 Phillips screwdriver. To insure an air-tight seal, loosen the thimble partially, apply a small amount of RTV Sealant (WX6X200) under the thimble flange, then re-tighten.

A squeaking door can be corrected by lubricating the hinge pins. Use only pure petroleum jelly (such as Vaseline brand) because most other petroleum products (oils) have additives that will deteriorate plastic.

● EXTERNAL CONDENSER KIT — FREEZERS

Most freezers (chest and upright) have an internal condenser (condenser tubing bonded to the inside of the freezer cabinet).

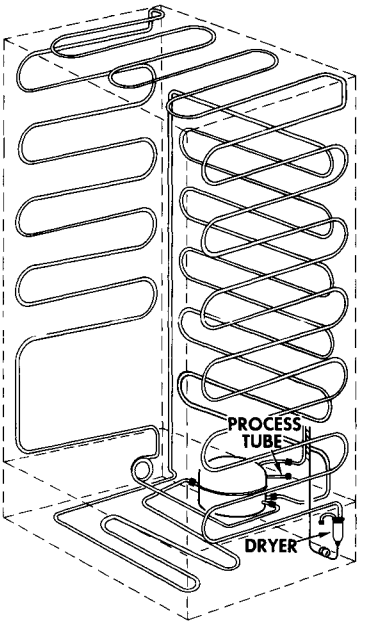


Figure 65 - Internal Condenser

An external condenser kit is available for some models that develop a leak in the internal condenser tubing. Refer to the appropriate parts catalog to determine if an external condenser kit is available for a particular model. Included in the kit are: an external condenser, mounting hardware, a case heater and an instruction sheet.

A WR86X83 Dryer should also be used when installing the new condenser.

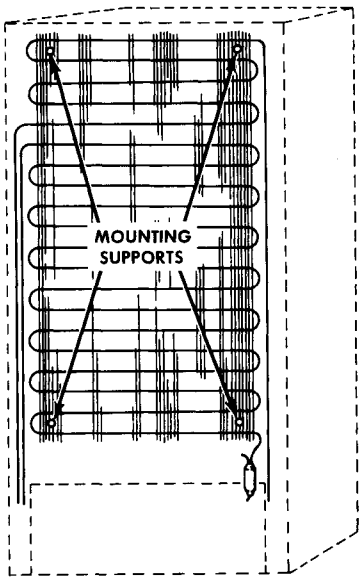


Figure 66 - External Condenser

● RAPID FROST ACCUMULATION TB-12,14, CTA-12,14

A rapid accumulation of soft frost at the top, near the front center, of the freezer compartment on TB-12, TB-14, CTA-12 or CTA-14 model refrigerators is caused by air leaking into the freezer copartment. The major source of air leaking into the freezer compartment is an open seal between the door gasket and the case flange and/or between the door gasket and the door panel.

Check for an open seal between the door gasket and the case flange by using a flood lamp inside the freezer compartment. Refer to the CABINET SERVICE section for door adjustment procedures. Adjust the plane of the door if necessary.

To minimize air leakage into the freezer compartment of these models, apply a small amount of WX6X200 RTV Sealant between the gasket and the door panel, at the corners, to seal under the corners of the gasket and to fill the groove of the miter. See figure 67. In addition, check all retainer strip screws to be certain they are snug but do not over-tighten the screws.

Figure 67 - Apply Sealant

In some instances, a plastic thimble for the door hinge pin may not be fully seated. This condition will allow air to leak into the freezer door causing an accumulation of frost in the insulation of the door, as well as allowing air to leak on into the freezer compartment. On models where the plastic thimble appears not to be flush or tight to the door panel, loosen it a few turns and apply a small amount of sealer around the thimble, then retighten it. See Figure 68.

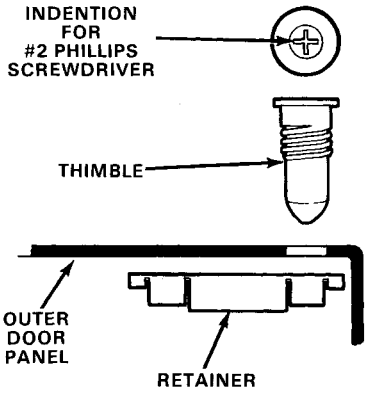


Figure 68 - Door Thimble

If the condition persists, install a WR49X230 Breaker Frame Gasket kit. An instruction sheet is included with the kit.

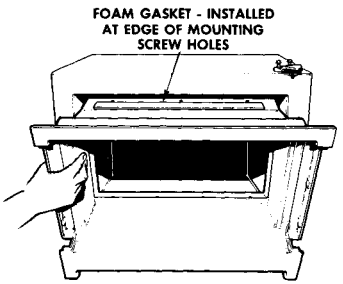


Figure 69 - Breaker Frame Gasket

◗ SWEATING - EXTERNAL — TBF/CTF-14,15,16

Sweating at the front of the outer case on TBF/CTF-14,15,16 Models can be prevented by installing a WR49X303 External Condensation Kit. The kit provides materials and instructions for sealing the evaporator housing and breaker strip areas to prevent cold air from reaching the outer case.

In highly humid locations, if the sweating condition persists, a WR49X304 Mullion-Case Heater Kit is available. This kit contains higher wattage mullion and case heaters and instructions.

● DOOR ADJUSTMENT - TMNF MODELS

The doors on top-mount, no-frost models can be adjusted to correct for an inadequate door gasket seal or to align the doors to the cabinet. Slotted holes in the top hinge allow for in-or-out or side-to-side adjustment of the freezer door. The center hinge, on most models, is also slotted to permit additional side-to-side adjustment.

The freezer door can be raised slightly by using a WR1X1600 Washer (3/32" thick) in place of the WR1X1114 Washer (1/16" thick). Caution: More than 3/32" thickness will cause the door stop to be ineffective. For TBF/CTF-14,15,16 Models, the door can be raised an additional amount by installing an additional WR2X6292 Shim (1/32" thick), or one WR2X-7071 Shim (3/32" thick) at the door stop. The WR2X7071 Shim can also be used on TBF/CTF-17,18,19,21 and TBX/CTX-18,20,22,23 Models, but it will be necessary also to install one WR2X4501 Half Shim at the door stop to balance the thimble in the door.

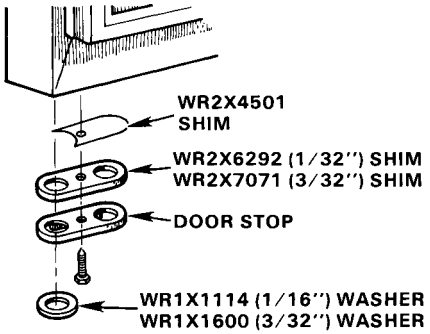


Figure 70 - Shims and Washers

The bottom hinge can be relocated to adjust the fresh food door up-or-down or side-to-side. Remove the rivet that secures the hinge nut strip. A large flat blade screwdriver, used as a chisel, will easily shear the head of the soft aluminum rivet, allowing removal of the nut strip.

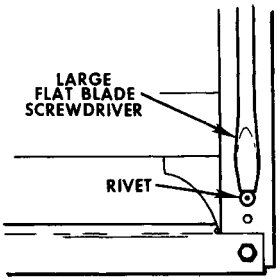


Figure 71 - Shear Rivet Head

Using a 3/16" diameter fine tooth chain saw file, elongate the hinge mounting holes in the cabinet flange — in the direction and to the extent necessary. A chain saw file (available at most hardware stores) has fine, sharp teeth which will quickly cut into the cabinet metal. DO NOT USE A "RAT-TAIL" FILE, which is tapered and has coarse teeth.

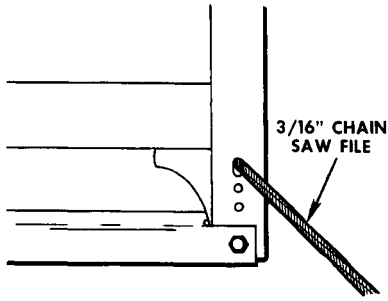


Figure 72 - Elongate Holes

Reinstall the hinge and nut strip. It is not necessary to secure the nut strip with a new rivet. Use a "dab" of permagum, if needed, to temporarily hold the nut strip until the hinge can be reinstalled. Make sure, however, that the nut strip is positioned so that the "barbs" at the corners of the nut strip "bite" into the cabinet. Reinstall the doors and adjust the hinges as required to properly align the doors to the cabinet.

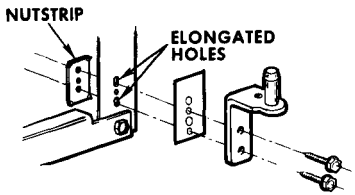


Figure 73 - Reinstall Hinge

● EVAPORATOR TAPPING SOUND — SIDE-BY-SIDE MODELS

A mysterious tapping sound may be emitted from the evaporator in some side-by-side refrigerators produced during late 1983 (i.e., TFF24RC-M) and early 1984 (i.e., TFF24RF-B). The tapping sound is caused by pockets of

vapor (large gas bubbles) forming inside the capillary tube, resulting in a pulsing refrigerant flow into the evaporator.

This condition can be quickly and easily corrected by clamping the capillary tube beneath the discharge tube. Install a WR1X1692 clamp around the capillary tube and the discharge tube at a point 2-inches to the right of the joint to the condenser. While holding the capillary tube **beneath** the discharge tube, and the clamp screw positioned **above** the discharge tube, tighten the clamp until the capillary tube is held **very tightly** against the discharge tube.

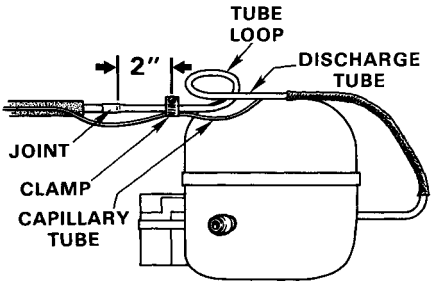


Figure 74 - Clamp Installed

Beginning May 1, 1984, (Serial Prefix HR) this correction was incorporated at the factory.

EVAPORATOR FAN NOISE — SIDE-BY-SIDE MODELS

On side-by-side model refrigerators, the evaporator fan motor wiring leads (including the ground wire) can vibrate against the back wall of the freezer liner causing an increased sound level. The sound may easily be misdiagnosed as an unbalanced fan blade or noisy fan motor, resulting in unnecessary replacement of either or both parts.

To correct this vibration noise, remove the evaporator cover and wrap the evaporator fan motor wiring leads — together with the main freezer wiring harness — using a piece of WR2X-7072 Foam Tape as illustrated.

Beginning March 1, 1984 (Serial Prefix FR) the correction was incorporated at the factory.

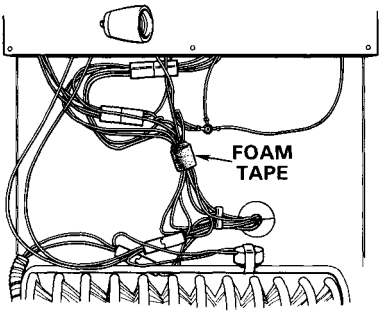


Figure 75 - Wiring Leads Taped

● OUTER DOOR SWEAT - UPRIGHT FREEZERS

Outer door sweat on some 1979 and later model upright freezers can be corrected by installing a WR49X5115 Foam Slab Insulation kit. Complete instrucitons are included with the kit. The WR49X5115 kit can only be used on the following upright freezers:

GENERAL ELECTRIC MODELS

CA10DC	and later
CA13DWD	and later
CA16DWD	and later
CA16EWD	and later
CA19DWD	and later
CA21DWD	and later
CAF16DWD	and later

HOTPOINT MODELS

FVF10CC	and later
FV13CWD	and later
FV16AWD	and later
FV16CWD	and later
FV19CWD	and later
FV21CWD	and later
FVF16EWD	and later

- **INTERMITTENT OR POOR REFRIGERATION — TBF/CTF-14,15,16**

A mysterious, poor refrigeration complaint on TBF/CTF-14,15,16 **Natural Draft Condenser** Model Refrigerators may be due to an overhead fan, open window or ventilator duct circulating air over the natural draft condenser. Under such circumstances, the top passes of the condenser will be abnormally cool, and the refrigeration system low side pressure will be in a slight vacuum, giving the symptoms of a leak, restriction or low charge.

To confirm the diagnosis, place an unfolded newspaper over the top 8 or 10 passes of the condenser. Within 2 to 3 minutes the top passes of the condenser should begin to feel warm and the system pressure should begin to rise above 0 PSIG. On these models, include this test as part of the sealed system diagnosis and try this **first**. It could save considerable time and prevent misdiagnosis.

To correct this condition, install a WR49X302 Condenser Cover Kit on the top portion of the condenser, using the fasteners furnished. Instructions for installation are included with the kit. DO NOT add refrigerant to the system and DO NOT cut out part of the condenser, which could adversely affect performance with a change of usage or season.

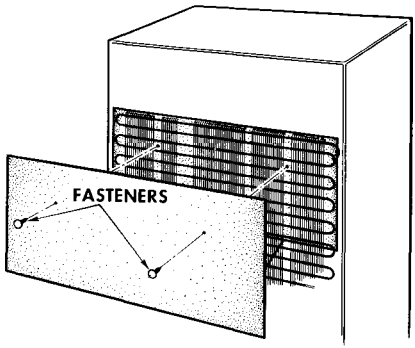


Figure 76 - Condenser Cover Kit

- **EVAPORATOR RUSTING - UPRIGHT FREEZERS**

Upright freezers, starting with the 1979 model year and later, that exhibit rusting on the steel evaporator tubing can be repaired in the following manner:

1. Clean off the rust affected areas, using steel wool.
2. Apply NAPA/Martin Senour 6877 Triple Etch Metal Cleaner, using a small brush.
3. Rinse and dry areas to be painted.
4. Spray on an application of NAPA/Martin Senour 7867 Brite Aluminum fast-dry spray lacquer.

   Note: All surfaces to be painted must be dry and at room ambient.

The above listed products are generally available at NAPA auto parts stores.

HEAT EXCHANGER SEPARATION TBX/CTX MODELS

Heat exchanger (capillary-suction tube) separation on TBX/CTX model refrigerators, may result in one or more of the following symptoms:

- Long run time
- Warm fresh food temperatures
- Moisture around control console
- Water on floor behind refrigerator
- Moisture or frost on rear access cover

For any of the above symptoms, examine the heat exchanger for separation of the capillary from the suction tube — along the entire length of the original solder contact area. Any separation will affect performance of the refrigerator. To correct this condition, use a WR49X268 Heat Exchanger Repair Kit. Follow the instructions furnished with the kit. To insure good contact of the capillary with the suction tube, polish the tubes with steel wool or fine-grit sandpaper before installing the ties.

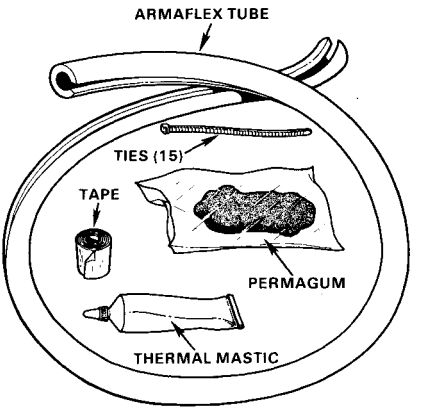


Figure 77 - Heat Exchanger Repair Kit

• RAPID FROST ACCUMULATION/ DOOR DRIPPING—TB/CTA-12,15

Rapid frost accumulation on the freezer evaporator (at the top front) and/or water dripping from the freezer door (when held open for long periods of time, such as loading large quantities of food or while defrosting) may occur on some early production (November, 1984 "VR" through July, 1985 "MS") TB-13,15 and CTA-13,15 model refrigerators. These symptoms are caused by warm, moisture-laden air entering the freezer door interior and the freezer compartment due to:

- the freezer inner door vent holes improperly positioned,
- inadequate sealing of the freezer door gasket to the outer door (particularly at the freezer door miters), and
- inadequate sealing of the foam compartment divider to the sides of the liner.

FIELD CORRECTIONS

To correct these conditions, the following procedures must be carefully observed:

1. Drill ten (10) holes, 1/8-inch diameter, on a horizontal line centered in the leading edge of the bottom freezer door shelf. Space the holes 1/2-inch apart (5 on each side), beginning 3-inches from the outer edges of the door shelf. The holes will allow moisture and ice, trapped behind the inner door, to vaporaize and be drawn to the freezer evaporator.

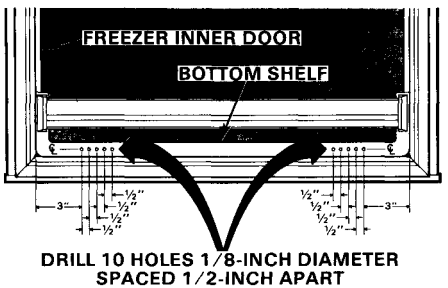


Figure 78 - Drill Holes

2. Seal all four (4) freezer outer door corners, at the miters, using WX6X101 Clear or WX6X200 White RTV Sealant. Loosen the two (2) retainers screws nearest each of the four (4) corners of the door. Cut the tip of the sealant applicator for the smallest opening and inject the sealant into the miter **behind** the gasket. Use care not to bend the gasket retainers which will prevent the gasket from sealing against the outer door at the corners. Retighten all screws and wipe off any excess sealant that may ooze out of the miter.

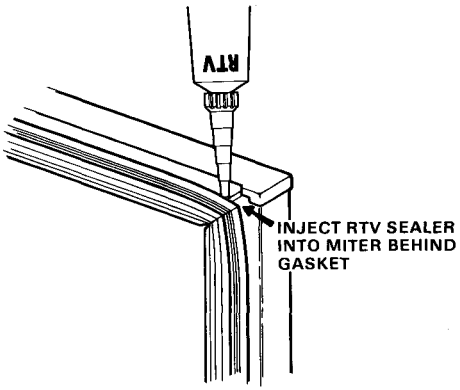


Figure 79 - Seal Door Corners

3. Check the freezer door gasket for proper sealing against the outer door, along the sides, top and bottom. Loosen the retainer screws and adjust the gasket, if necessary, for proper gasket seal. Use RTV sealant, if necessary.

4. As the door closes, check to be sure the balloon section of the inner edge of the freezer door gasket (ridge between the magnet and inner edge flap) contacts the liner in the breaker area, across the top, to prevent ice and condensation from forming on the inner door top. Raise the door, if necessary, using WR1X5090 Washers on the center hinge pin.

5. Check the freezer door gasket for proper sealing against the cabinet front flange, along the sides, top and bottom, using a 150-watt flood light. Adjust the top hinge and/or re-plane the door, if necessary.

6. Seal the foam compartment divider to the sides of the liner, using two (2) lengths of WR14X241 Foam Gasket. Fold the gasket together along the adhesive surface and press it fully into the openings along the sides of the fresh food top, using a putty knife. Make sure the gasket goes **fully** above the fresh food top so that it effectively seals the foam divider to the sides of the liner. Cutting a length of foam gasket and folding it in half will provide better sealing at the front area of both sides.

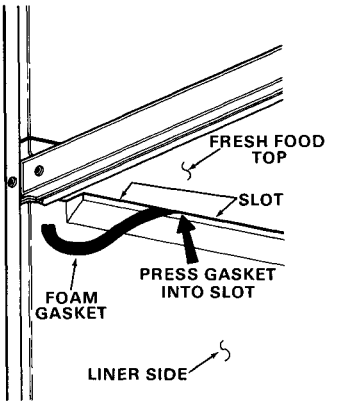


Figure 80 - Seal Divider

NOTE: Sealing only the fresh food top to the liner sides is not acceptable to minimize frost accumulation in the freezer compartment.

7. If the refrigerator has recently been defrosted (last few days), ice inside the freezer door will be minimal and will sublimate through the new vent holes within a week. Otherwise, request the customer to defrost the freezer compartment in a day or two. Explain that water will drip from the freezer door during this defrost, but should not be a problem thereafter.

● INTERNAL SWEATING — TA7SG

Internal sweating — below the light shield, and down the back of the liner — may occur on TA7SG model refrigerators produced during May, June and July, 1985 (serial prefixes HS, LS and MS). In some instances, the light bulb may also fail permaturely due to moisture contacting the light socket.

To correct this condition, remove the wiring access cover at the rear of the cabinet. Seal the wiring entry hole in the case back (behind the interior light) with a ball of WR97X140 Sealer. Inspect the light socket (WR23X5140 and replace it if necessary.

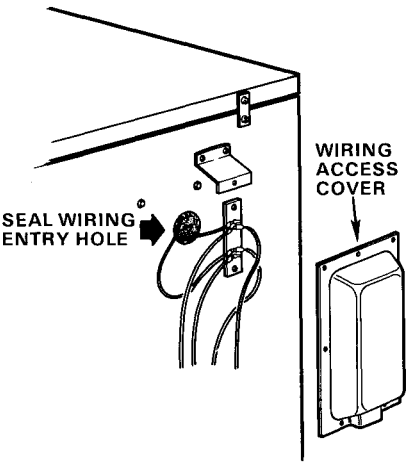


Figure 81 - Seal Hole

● ERRATIC PERFORMANCE — TB/CTA-13,15

Some TB13,15 and CTA13,15 Models installed in homes with marginal or fluctuating voltage have occasionally been unable to start, indicating symptoms of intermittent or erratic performance and occasional warm internal temperatures. Beginning with September, 1985 production, those models with serial prefix "SG" and later, have compressors with greatly improved starting characteristics.

For those TB13,15 and CTA13,15 Models manufactured prior to September, 1985, a capacitor start kit, WR49X306, is available. These models are equipped with Danfoss compressors and the WR49X306 Capacitor Start Kit was designed specifically for use with this Danfoss compressor only. Do not attempt to use this kit on any other compressors or to use any other capacitor start kit on the Danfoss compressor.

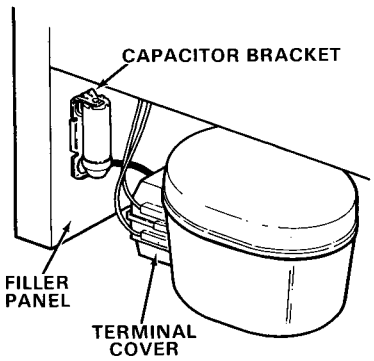


Figure 82 - Start Capacitor

● FRESH FOOD EVAPORATOR BULGED/BURST—TB/CTA-13,15

A WR49X307 Evaporator Cover is available for TB13,15 and CTA13,15 models experiencing bulged and/or burst areas along the temperature control capillary mounting tube on the fresh food evaporator. The cover is secured to the lower portion of the evaporator with the lower two evaporator mounting screws.

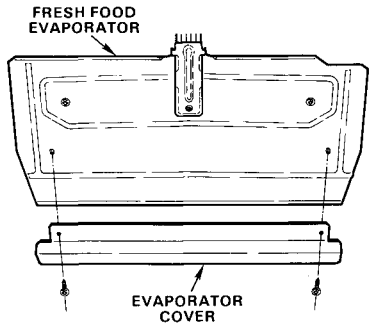


Figure 83 - Cover Installation

The bulged and burst areas are caused by residual water (from defrosting) entering the tube on the right side and freezing. Although the evaporator appearance is affected, the performance is in no way affected since this tube is not part of the sealed system. Beginning with April, 1986, "GT" serial prefix, the left end of the control capillary mounting tube will be open to allow the water to drain out, thus preventing ice forming in the tube causing the poor appearance.

On models where service is required for other reasons, if the fresh food evaporator does not indicate a bulged or burst area, drill a 1/8-inch diameter hole in the front side along the lower edge of the left end of he control capillary mounting tube as shown. Be sure to withdraw the control capillary approximately two-inches to prevent damage when drilling the drain hole.

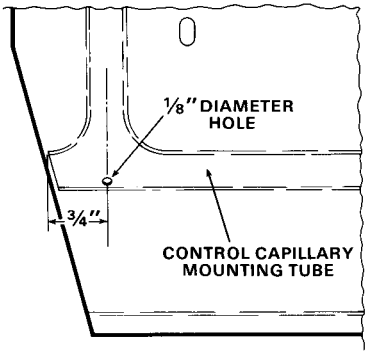


Figure 84 - Drill Hole

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LOUISVILLE, KY. 40225

GENERAL ELECTRIC

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CAT. NO. WX10X88