Fridge-Freezer Combination
Side-by-Side

KE 650-2-2T

Küppersbusch

THE HEART OF A GOOD KITCHEN

GB

Service Manual: H7-420-64-01-A

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Contents

1. Introduction

This refrigeration service manual provides the information necessary to service Side-by-Side model refrigerators.

Note: The KE 650-2-2T covered in this Service Manual uses R134a refrigerant.

Each part of this manual is divided into sections relating to a general group of components and each section is subdivided into various parts describing a particular component or service procedure.

This service manual is a valuable service tool and care should be taken to keep it up to date by prompt and proper filing of subsequent pages as they are issued.

The following models are covered in this service manual:

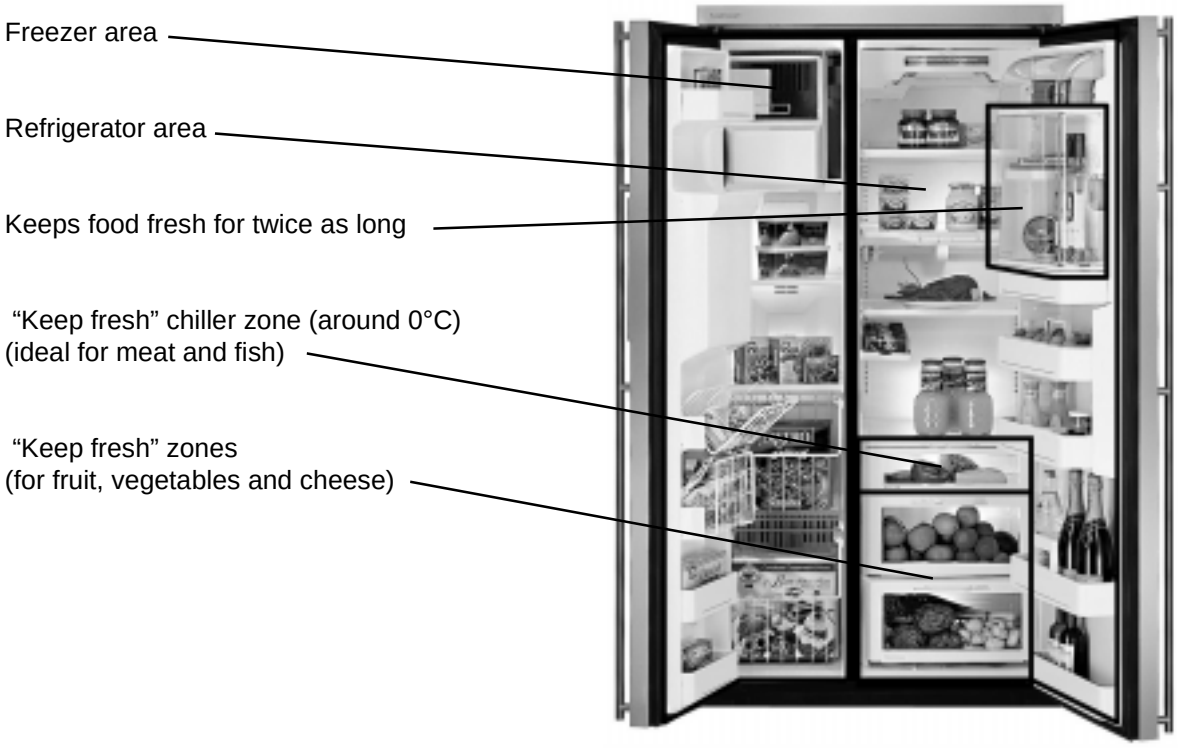
	KE 650-2-2T Side-by-Side Model
W x H x D	915 x 1.815 x 733 mm incl. handle
Total capacity.	603 l
Fridge area	402 l
Freezer area	201 l
Noise level	47 dB
Power consumption	1,9 kWh / 24 h
Energy efficiency class	B
No-Frost-System	Yes
No-Clean-Condenser	Yes
Water inlet with Aquastop	Yes
Free-standing unit on rollers	Yes
Climazone technology	Yes

General

The American style Fridge-Freezer Combination “Side-by-Side“ is the centrepiece of any kitchen. The high quality of workmanship and finish, including stainless steel front, side and top panels, guarantee many years of proud ownership.

The appliance is fitted with state of the art technology, such as:

- No-Frost-System
- No-Clean-Condenser
- As the compressor is cooled from the front, both the front and fitting to a wall.
- Water inlet with Aquastop
- Self-closing doors with magnetic catches
- Free-standing unit on rollers
- Climazone technology
- Automatic icemaker with dispenser and separate light switch



2. Components

2.1 Auto Damper Control Models

The Auto Damper model refrigerator has two controls and both have capillary sensing. The Auto Damper controls the fresh food temperature and the Freezer Temperature Control guides the freezer temperature.

The fresh food compartment temperature is maintained by a damper assembly located at the back of the temperature control housing. Changes in air temperature cause the damper door to open and close.
A control rod and gear connect the fresh food control knob to the damper control.

Turning the fresh food control knob to the *warmest* position decreases the flow of chilled air into the fresh food section. The freezer compartment temperature control warms at a slower rate and cools at a faster rate, decreasing the compressor run time necessary to maintain a satisfied freezer temperature control.

Turning the fresh food control knob to a *warmer* setting decreases the flow of chilled air into the fresh food section. The freezer compartment temperature controls warms at a slower rate and cools at a faster rate, decreasing the compressor run time necessary to maintain a satisfactory freezer temperature control.

2.1.1 Checking the Auto Damper

1. **Disconnect the unit from the mains supply.**
2. Open the fresh food door and remove any items on the top shelf.
3. Set the fresh food control to the coldest position.
4. Remove the light shield cover by pulling down on the back corners of the cover and sliding the cover forward.
5. Remove the fascia/radiant shield mounting screws. Remove the control housing mounting screw at the back, bottom centre of the control housing. Slide the control housing to the right. Lower the control housing.
6. Disconnect the temperature control housing electrical quick disconnect.
7. Remove the temperature control housing from the refrigerator and place on a flat work surface.
8. Remove the auto damper control rod retainer, control rod and the slide control gear from the auto damper control.
9. Turn the control housing over.
10. Remove the two auto damper mounting screws, then remove the auto damper from the control housing.
11. Mark the auto damper rod approximately 6 mm away from the housing.
12. Uncoil the auto damper capillary tube approximately 100 mm.
13. Submerge into a glass of ice (no water). Watch for door to move to the closed position.
14. Remove from ice and warm capillary tube (use your hand). Watch door for opposite reaction.
15. If no movement is detected, replace the control.

2.1.2 Exchanging the temperature regulator

1. Disconnect the appliance from the mains supply.

2. Open the fresh food door and remove any items on the top shelf.

3. Remove the light cover. To do this, pull the rear corners down and slide the cover forwards.

4. Undo the screws on the rear of the regulator housing. Push the regulator housing towards the right and remove from its holder.

5. Disconnect the push-on connectors from the temperature regulator housing.

6. Take the temperature regulator housing out of the fridge-freezer and place it on a level work surface.

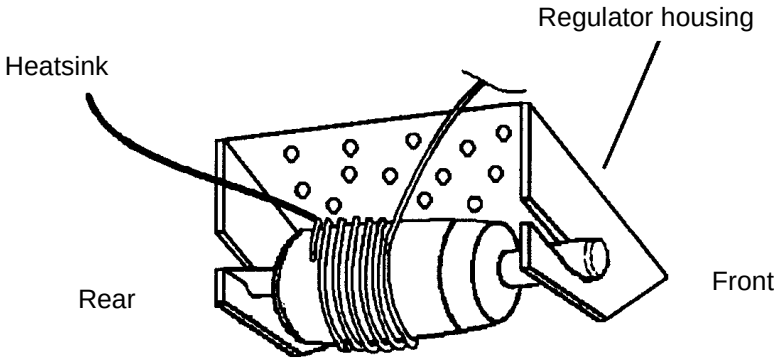
7. Take the regulator out of the housing.

8. Pull the cables away from the clips on the temperature regulator housing.

9. Remove the regulator by applying pressure to the locking mechanism with your right thumb. Turn and remove the regulator with your left hand.

10. To remove the heatsink, insert the blade of a screwdriver between the heatsink and the regulator housing. Turn the screwdriver to release.

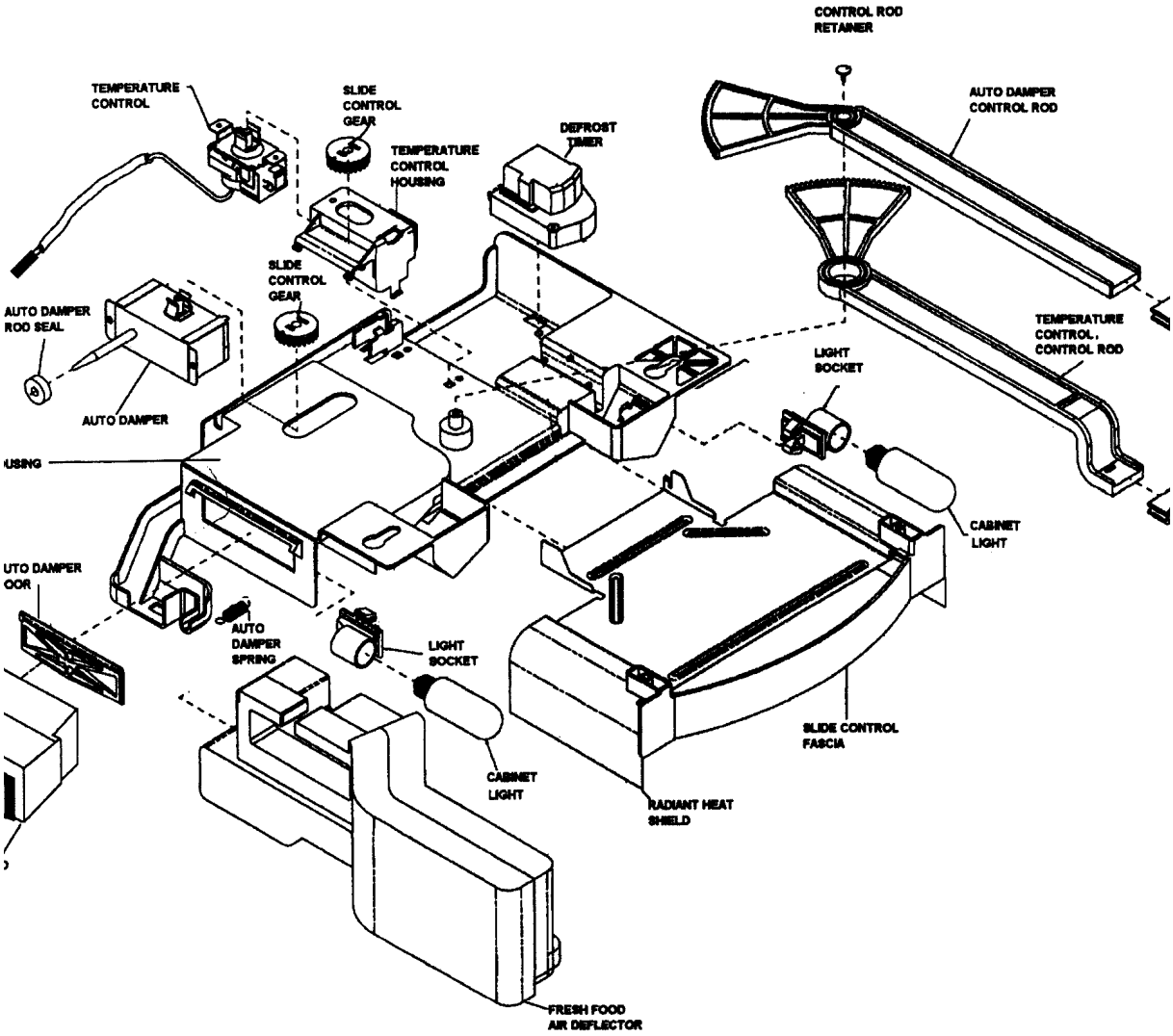
11. Fit the replacement housing in reverse order.



2.1.3 Auto Damper Control Replacement

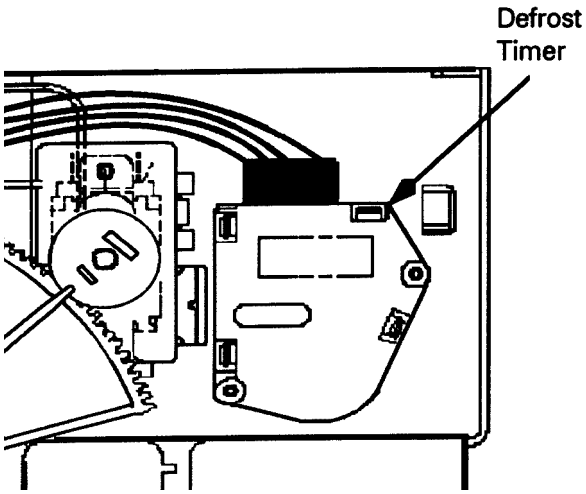
1. Complete steps 1 through 10, checking auto damper.
2. Reinstall new auto damper.
3. Reinstall control housing in reverse order of removal.

2.1.4 Auto Damper Control - Exploded View

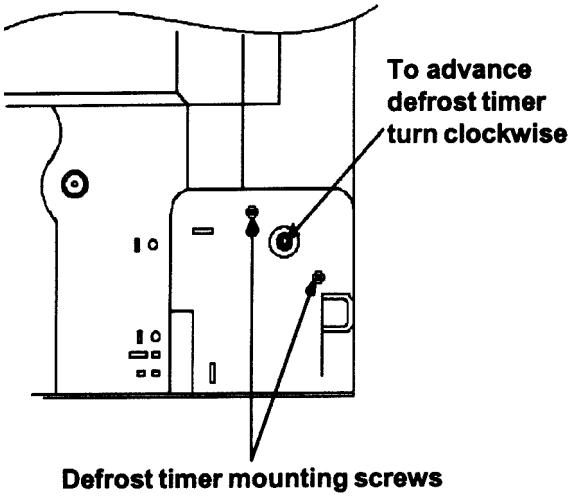


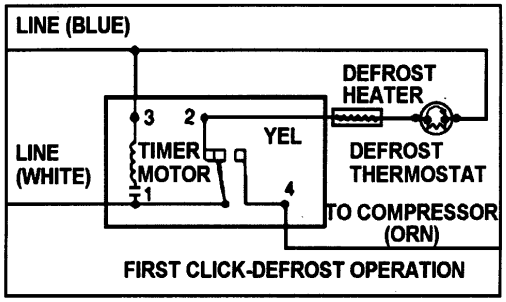
2.2 Defrost Timer

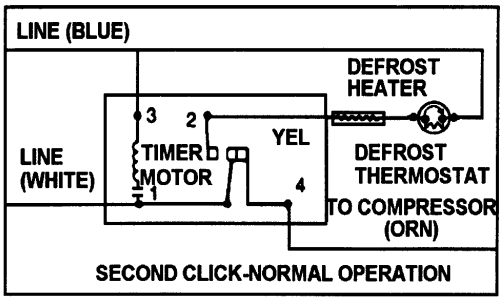
The freezer evaporator defrosting system is actuated by an electric timer. The timer is mounted in the control housing located in the fresh food compartment.



The timer control shaft is designed for screwdriver advancement. When manually setting the timer to initiate defrosting, turn the control shaft clockwise until you establish the approximate location of the defrost cycle. Then turn the shaft slowly, and stop immediately when the first click is heard. The schematic illustrates the timer circuits in sequence.

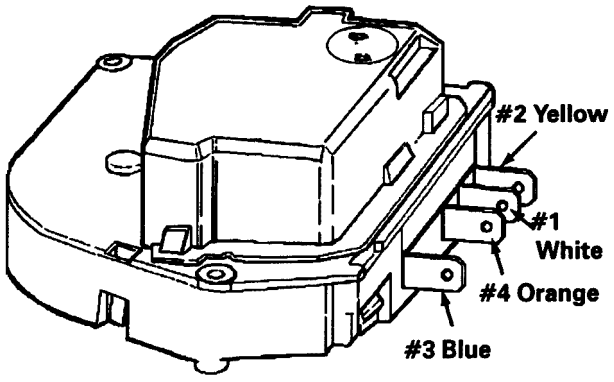






1st Click – The timer turns off the compressor and freezer fan circuit for approximately **23 minutes, and it energises the defrost heater.** Once the temperature of the defrost termination thermostat reaches the cut-out point, the termination thermostat will open the circuit to the radiant heater. However, the compressor circuit remains open for the duration of the defrost interval.

2nd Click – The timer switches off the defrost circuit and starts the compressor, freezer fan, and the condenser fan motor. The compressor and fan motors are now governed by the temperature control for a period of approximately **8 hours** of the compressor run time, after which a new defrost cycle begins.



2.2.1 Checking the Defrost Timer

Disconnect all wires from the timer and attach ohmmeter probes to the terminals specified in the accompanying chart. If no continuity is indicated, the timer is defective.

To Test	Turn Timer Knob to	Check between Terminals
Timer Motor Circuit	Leave as is	1 + 3*
Defrost Circuit	1st Click	1 + 2
Compressor Circuit	2nd Click	1 + 4

* See Maytag Monthly Bulletin, June 1993 volume: 03 Issue 40 Page 1 Low watt Timers (this test works on all low watt timers).

2.2.2 Timer Replacement

1. **Disconnect the unit from the mains supply.**
2. Open the fresh food door and remove any items on the top shelf.
3. Remove the light shield cover by pulling down on the back corners of the cover and sliding the cover forward.
4. Remove the fascia/radiant shield mounting screws. Remove the control housing mounting screw at the back of the control housing. Slide the control housing to the right and lower it from the control housing supports.
5. Disconnect the temperature control housing electrical quick disconnect.
6. Remove the temperature control housing from the refrigerator and place on a flat work surface.
7. Remove the two timer mounting screws.
8. Disconnect the electrical connector from the timer.
9. Install the replacement timer in reverse order of removal.

2.3 No-Frost-System

These models use a metal sheath heater to remove accumulated frost from the freezer evaporator and drain through during a defrost cycle. The defrost timer (models) energises the defrost heater every 8 hours of accumulated compressor run time. When the temperature in the thermostat area reaches approximately +6.1°C, the thermostat contacts open the circuit to the defrost heater.
An ohmmeter check will determine if all phases of the defrost cycle are functioning properly. The defrost thermostat contacts open at approximately +6.1°C, and closes at approximately -9.4°C.
The defrost thermostat has a 240 K ohm resistor connected internally across the two terminals. This resistor permits checking the defrost heater when the evaporator is -9.4°C, or higher.
An ohmmeter can be used to test the defrost heater and thermostat without disassembling the freezer compartment even if the evaporator temperature is -9.4°C, or higher. To check, proceed as follows:

1. Disconnect the unit from the mains supply.

2. Open the fresh food door and remove any items on the top shelf. Remove the light shield and the fascia/radiant shield mounting screws in the temperature control housing, remove the rear mounting screws. Lower the control housing.

3. Disconnect the timer wire harness connector from the defrost timer.

4. Set the ohmmeter to R x 1K scale and connect the probes to the No. 2 and No. 3 terminals of the disconnect plug.

5. The meter should read between 20 to 40 ohms. The resistance is not critical. The heater is working if there is continuity between terminals No. 2 and No. 3. If there are no resistance readings (open circuit) the defrost heater and thermostat must be checked separately.

NOTE: When using the meter, avoid touching the probes as this could result in a false reading and misdiagnosis.

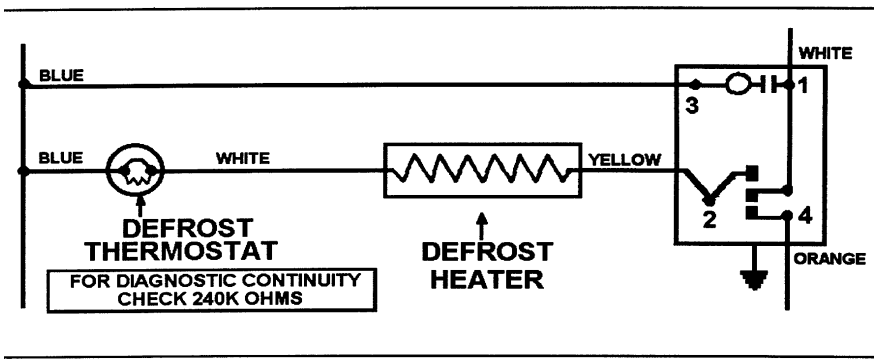
To test defrost heater and thermostat when the evaporator temp. is -9.4°C (or below) proceed as follows:

1. Disconnect the unit from the mains supply and plug into a wattmeter.

2. Plug the wattmeter into power source and manually advance the defrost timer to the defrost cycle. See the defrost timer section for information on manually advancing the timer.

3. The wattmeter should read between 345 to 475 watts depending on the model (total wattage of the timer motor and defrost heater). If the reading is 0 to 4.5 watts, the defrost heater or thermostat is defective. To further isolate the defective part, proceed to step 4.

4. Disconnect the unit from the watt meter.



5. Follow step 2 and 3 of testing the heater and thermostat when the evaporator temperature is -9.4°C, or higher.

6. If the meter reads approximately 240K ohms, the defrost thermostat is defective.

To use an ohmmeter, set the meter to R x 1K scale. If the reading is approximately 20 to 40 ohms, the defrost heater and thermostat are operative.

2.4 Defrost Heater Replacement

1. Disconnect the unit from the mains supply.

2. Remove the icemaker, if fitted.

3. Remove the evaporator cover by loosening the top two screws on each corner of the cover and removing the bottom screws on each corner.

4. Tilt the top of the evaporator cover forward and disconnect the wire harness connector.

5. Remove the evaporator cover and fan motor assembly. It is very important that this part be reinstalled in the same manner as it was originally.

6. Disconnect the defrost heater wire leads. Using long nose pliers, remove the defrost heater retainer clips. (One on the right side of the heater and one on the left side).

7. Install the replacement heater in the reverse order of removal.

2.5 Defrost Thermostat Replacement

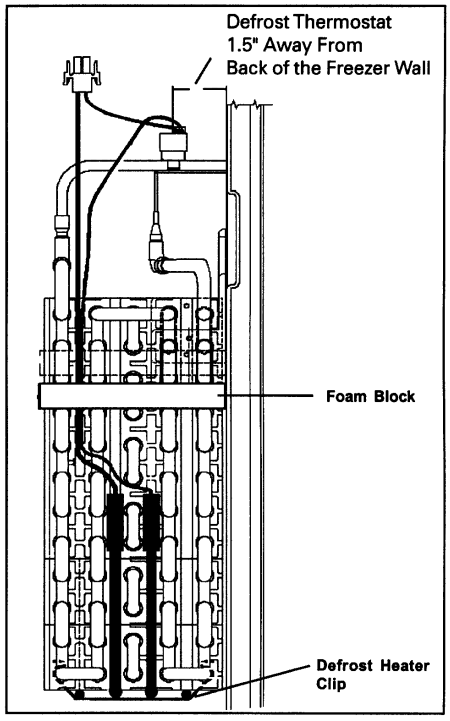
The defrost termination thermostat is located on the top right side of the evaporator.

1. Follow the first five steps in replacing the defrost heater.

2. Disconnect the leads from the thermostat.

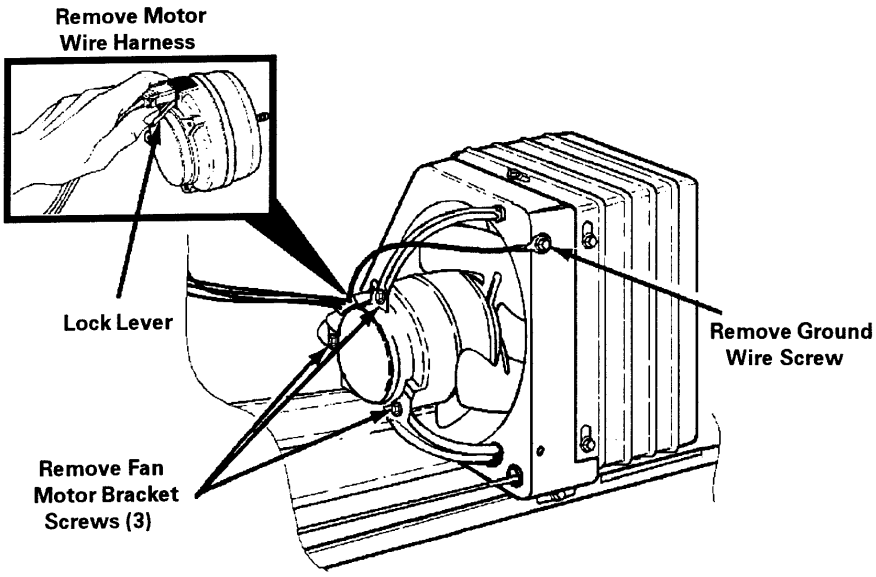
3. Remove the defrost thermostat and mounting clip by releasing the mounting clip that is snapped around the evaporator tubing.

4. Install the new defrost thermostat in the reverse order of removal. Make sure the thermostat is located per the drawing below.



2.6 Condenser Fan Motor

The condenser fan motor is connected in parallel with the compressor. If the compressor runs but the motor doesn't, the motor is either defective or disconnected. If neither operates, check the cold control, defrost timer, and the cabinet wiring.



2.6.1 To Check The Condenser Motor Direct

1. Disconnect the unit from the mains supply.

2. Remove the insulated cover from the rear of the cabinet.

3. Disconnect the condenser fan motor lead connector on the motor terminals.

To remove the lead connector from the condenser fan motor, grasp the connector with your thumb inserted between the connector and the locking lever as shown. Pull the connector away from the motor.

4. Attach a 230 V test cable to condenser motor and plug into the mains. If the motor fails to operate, it is defective and must be replaced.

2.6.2 Condenser Fan Motor Replacement

1. Disconnect the unit from the mains supply.

2. Remove the insulated cover from the rear of the cabinet.

3. Disconnect the condenser fan motor lead connector on the motor terminals.

4. Remove the screws that mount the fan motor to the brackets.

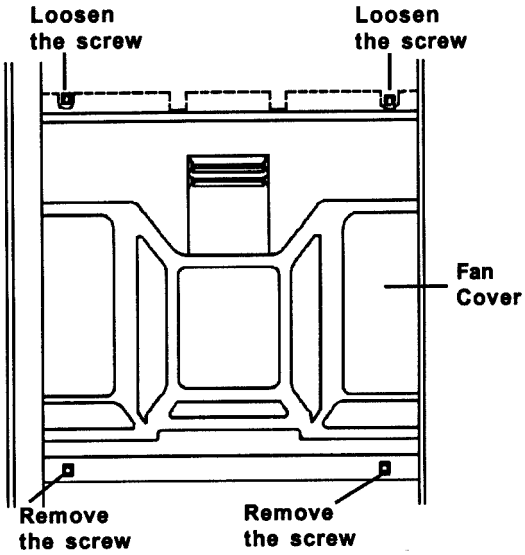
5. Transfer the fan blade to the replacement motor, making sure it is installed in the same manner as the original.

6. Install the fan motor leads and earth wire.

7. Install those parts previously removed. Test run the unit.

2.7 Freezer Fan Motor

The freezer fan circulates the cooled air throughout the fresh food and freezer compartment. The fan blade is made of polyethylene and is pushed onto the shaft. It is important, when replacing the fan blade, that the hub of the fan blade faces out towards the back of the evaporator fan cover. If the fan fails or operates erratically, the reduced air circulation will result in poor cooling characteristics.



2.7.1 Freezer Fan Motor Diagnosis

1. Disconnect the unit from the mains supply.

2. Remove the freezer shelving.
3. Loosen the two top screws and remove the two bottom evaporator cover mounting screws.
4. Grasp the bottom of the cover. Carefully pull the cover forward and down to clear the upper flange.
5. Disconnect the evaporator fan motor leads. The wire leads are self-locking and it is important to squeeze the clip before pulling the leads off the terminals.
6. Remove the evaporator fan motor assembly and place it on a work surface.
7. Connect the motor terminals to a service cable and plug the cable into the mains supply.
8. If the motor fails to operate, it is defective and must be replaced.

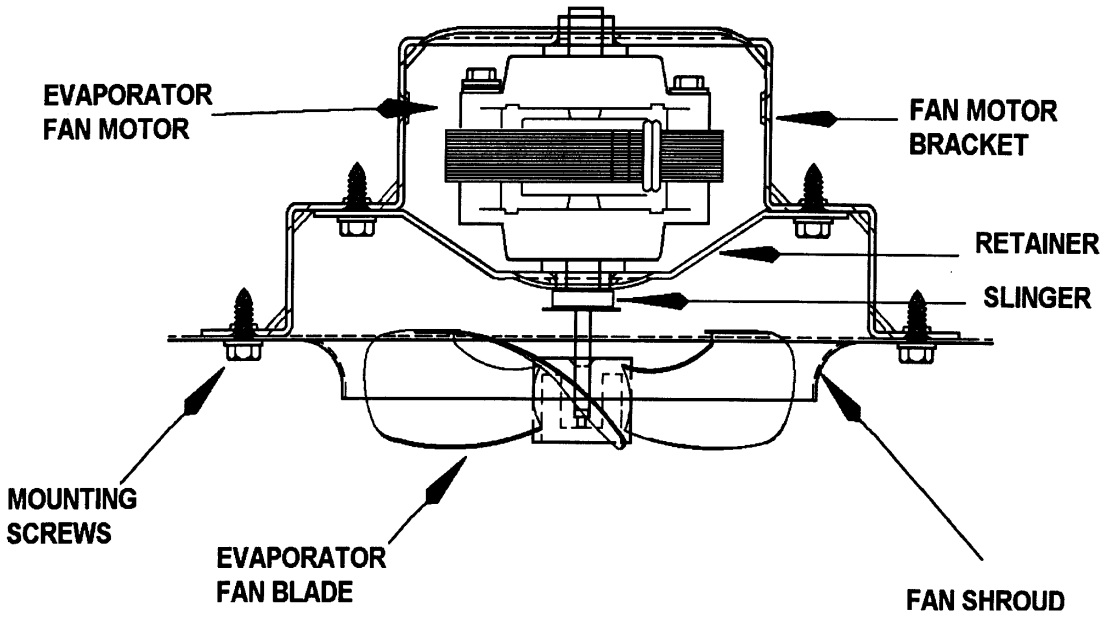
2.7.2 Freezer Fan Motor Replacement

1. Follow steps 1 through 5 “Freezer Fan Motor Diagnosis”.
2. Remove the screws that secure the motor bracket assembly to the fan shroud.
3. Remove the fan blade by pulling it off the shaft.
4. Remove the screws that secure the rear bracket to the front bracket. Remove the motor from the rear mounting bracket.
5. Install the new motor to the rear mounting bracket. Mount the rear bracket to the front mounting bracket.
6. Install the slinger disc and fan blade on the replacement in the same position as on the original motor shaft.

NOTE: Make sure the slinger disc does not drag on the fan bushing.

7. Install the motor and bracket assembly onto the evaporator cover.
8. Connect the wire leads and the earth wire to the motor.
9. Reassemble those parts previously removed and test the unit.

The fan blade is provided with a stop on the face of the hub. It is properly installed when the blade is positioned so the stop rests against the end of the shaft.



3. Cabinet and Related Components

3.1 Adjustable Cantilever Shelves

Type 1 – Two support hook frame design

Glass or wire cantilever shelves may be available with your refrigerator. To remove a shelf, tilt front up and lift the rear up a fraction of an inch and pull straight out. To lock the shelf into another position, tilt the shelf with the front up. Insert hooks into desired shelf openings and let the shelf settle into place. Check that the shelf is securely locked into position before loading it with food.

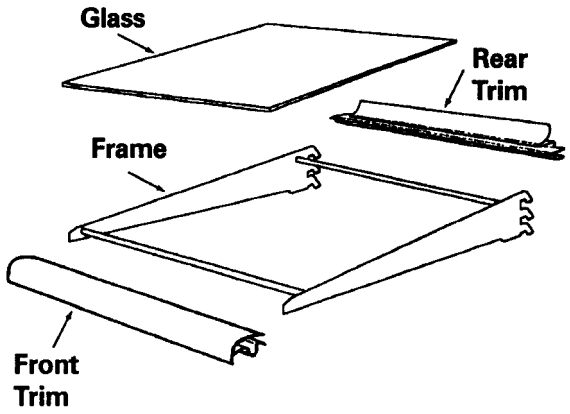
Type 2 – Three support hook frame design

To remove the shelf, grasp the shelf at the front with one hand and push up under the shelf back with the other hand and pull out. To lock the shelf into another position, keep the shelf horizontal, guiding the support hooks into the slots in the shelf support at the rear of the cabinet. Lower the shelf until the hooks lock into position. Check that the shelf is securely locked into position before loading with food.

3.2 Cantilever Shelf Trim

The cantilever shelf trims are easily removed by placing the shelf on a flat work surface. Raise the front of the shelf, grasp the right underside of the front trim, and pull toward you. Next, remove the glass from the rear trim and remove trim.

Install the new rear trim on the glass. Place the shelf in a vertical position (shelf front up). Install the glass and rear trim by applying a downward force on the rear metal shelf cross brace until it snaps securely in place. Next, install the front trim on the glass and the front metal shelf cross brace.



3.3 Cabinet Doors and Associated Parts

3.3.1 Inner Door Liner Replacement

The polystyrene inner door liner and the door seal are mounted to the outer panel by screws placed around the door flange. The inner door liner can be replaced without removing the door from the cabinet. If it is necessary to remove the door liner, proceed as follows:

1. Turn the control to the ”OFF” position.
2. Open the freezer door and remove the screws from around the door flange.
3. Remove the door liner and transfer the seal to the replacement liner. Make sure the lip of the seal will sandwich between the inner and outer door panel.
4. Position the replacement door liner and loosely install all the screws around the door flange.
5. Open and close the door several times to check the seal for proper alignment.
6. Carefully open the door by pulling on the middle of the door panel.

NOTE: Do not pull the door by the handle or the panel will shift out of alignment.

7. Tighten all corner screws.
8. Open and close the door several times. Recheck the door seal for proper alignment. If alignment is correct, tighten the remaining screws.
   Tighten the screws until they are just snug, then turn clockwise another one-half turn.

NOTE: Do not attempt to twist the door panel after all screws have been tightened.

9. Transfer the shelves and the trim to the replacement liner.

3.3.2 Outer Door Panel Replacement

NOTE: Remove all food from the freezer door.

1. Turn the control to the “OFF” position.
2. Remove door handle and trim.
3. Use a soft lead pencil to trace around the upper hinge. (This will aid in replacing the hinge).
4. Remove the upper hinge and place it on top of the unit with newspaper or cloth underneath to prevent scratching. Do not misplace the spacers. Place the door on a padded work surface.
5. Transfer the handle, trim, plug button, bushings, gaskets and liner to replacement panel.
6. Install the top hinge using the tracing to align the hinge.

3.4 Front Wheel Assembly

The front wheel assembly is securely fastened by two screws to the faceplate of the cabinet.

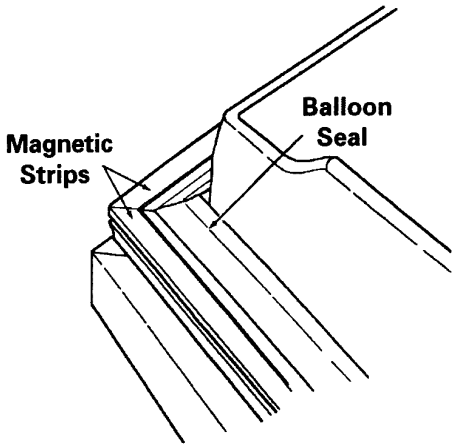
Depending on the model, you will encounter adjustable or non-adjustable front wheel assemblies. To lock the cabinet in place, lower the front levelling legs.

3.5 Cabinet Levelling

To enhance its appearance and maintain efficient performance, the refrigerator should be level. The front wheels were adjusted at the factory so the doors were properly aligned and the cabinet level. However, jarring in transit, or standing the refrigerator on uneven floors may cause the doors to shift out of alignment. If front alignment is necessary, use a spanner to adjust the wheel. Clockwise raises the cabinet, counter-clockwise lowers the cabinet. If front wheels are not adjustable, use levelling legs to level.

3.6 Door Seal

The drawing shows a view of the magnetic door seal used on all models mentioned in this manual. The magnetic strips are attracted to the metal cabinet front, providing an excellent seal around the entire door. A visual inspection of the door seal while opening and closing will reveal any areas of poor seal. You will notice a slight expansion and compression of the seal bellows as the door is opened and closed.



3.7 Toe-in & Toe-out Adjustments

To seal evenly around the entire door, the seal must make contact at the top and bottom at the same time. For this reason, the door, when ajar, should not *toe-in or toe-out*. To correct a *toe-in or toe-ou*t condition, first check that the hinge-side of the door is parallel with the cabinet then proceed as follows:

1. Check the cabinet levellers and adjustable wheels. Raising the handle side may correct a toe-out; lowering may correct toe-in.
2. Loosen all inner panel mounting screws along the top, bottom and handle side of the door. Do not loosen the screws along the hinge side.
3. Hold the corner that toes-in stationary, and push in on the toe-out corner until the door is lined parallel with the cabinet.
4. Open and close the door several times to ensure a proper fit. *If necessary, repeat steps 2 and 3.*
5. Tighten all loosened screws.

3.8 Hinge Adjustments

Hinge adjustments are necessary when:

1. The seal is not sealed sufficiently along the hinge side of the door.
2. The seal is compressed more than 1.6 mm on the hinge side (causing a poor seal elsewhere around the top.)
3. The distance between the door and cabinet is greater at the top than it is at the bottom, or vice versa.
4. The hinge side of the door is not 1.6 mm out past the side of the cabinet when (measured from the side of the cabinet), or when the door panel top is not 2.8 mm above the cabinet top.
5. If one or more of these conditions exist, adjust one or both hinges to correct the trouble. Raising the hinge side may correct a door sag.

3.9 Door Alignment

The cabinet door on all models is in correct alignment when:

1. The hinge side of the door is an equal distance from the cabinet flange at the top and bottom.
2. The gasket seals smoothly and is compressed no more than 1.6 mm along the hinge side with the door closed.
3. The door lines up with the side of the cabinet (viewed from the front). The door panel is parallel with the cabinet top.

In many cases, levelling the refrigerator will eliminate the need for cabinet door adjustments. Ensure that the refrigerator is plumb by checking all edges as well as both sides of the cabinet with a carpenter's level.

3.10 Door Switch

Disconnect the unit from the mains supply.

The door switches can be easily removed by using a flat blade screw driver or putty knife. Pry from the liner and disconnect wires.

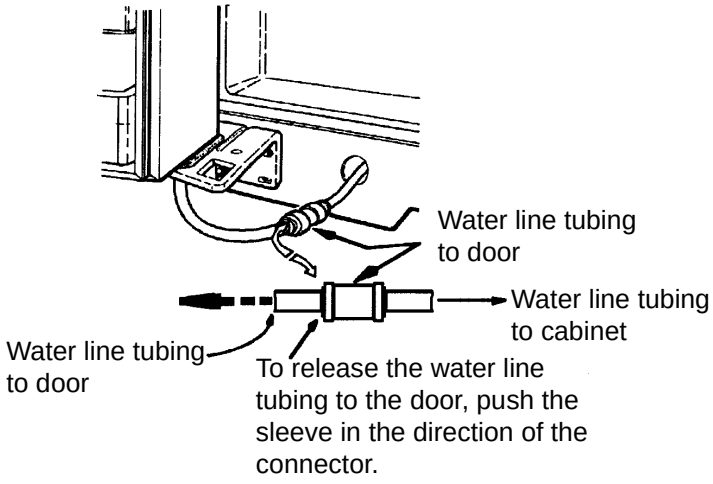
3.11 Water/Ice Dispenser Freezer Door Removal

Before attempting to remove the door hinge, look at your refrigerator and note the exact number and position of all protective shims on the door hinge. Later, when you replace the hinge, these must be positioned correctly.

1. **Disconnect the unit from the mains.**
2. Open the door completely. Remove the bottom hinge cover by squeezing on the bottom and top while pulling it toward you.
3. Locate the water line tubing coming out of the cabinet. Carefully pull on the tubing until the connector is on the outside of the cabinet.
4. Disconnect the door water line tubing.
5. Remove the top hinge cover.
6. Disconnect the door wire harness by pulling apart the two halves of the connector. **Do not pull the wires.**
7. Mark the position of the top hinge with a lead pencil.
8. Remove the earth wire screw with a ¼" ratchet spanner. Hold door with one hand and finish removing screws. Leave the hinge in the door.
9. Replace the door in reverse order of removal.

Water/Ice Freezer Door Removal

1)



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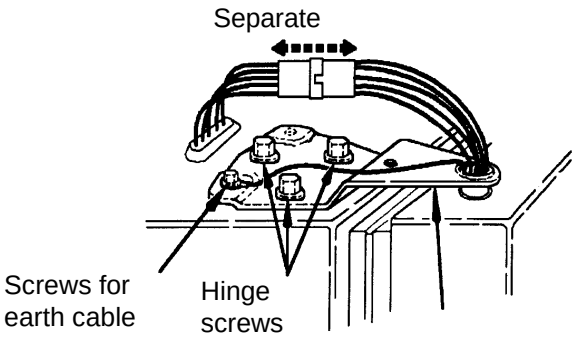
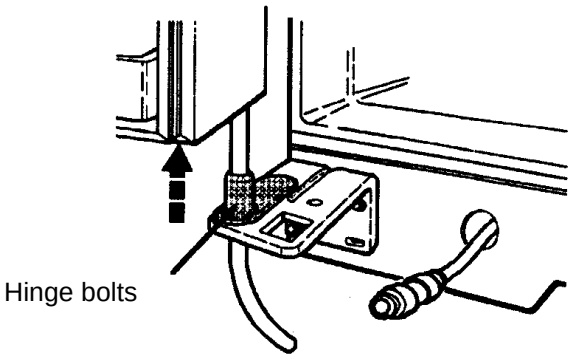
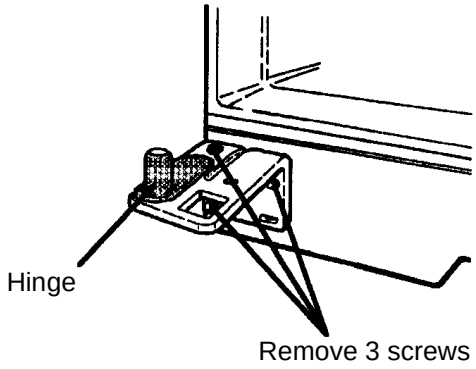


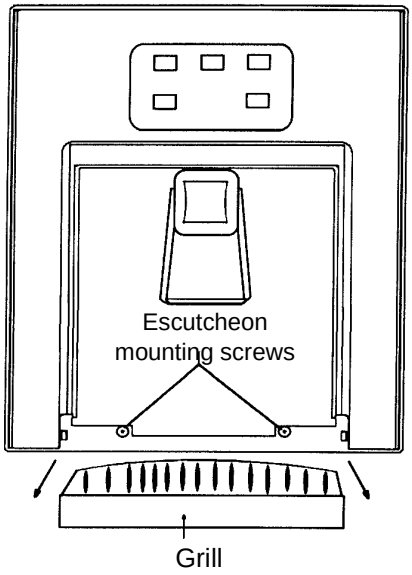
3) Lift the door enough to allow an assistant to withdraw the tubing through the hinge bolts. Then place the door on a smooth, non-abrasive surface.



4) Mark the location of the bottom hinge with a pencil. Use an 8mm ratchet spanner to remove the 3 screws from the bottom hinge.



3.12 Fountain Assemblies – Manual Slide Control

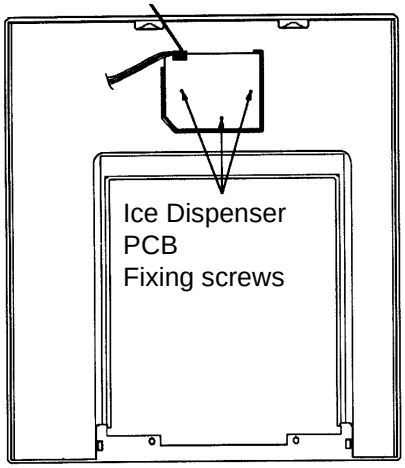


3.12.1 Ice and Water Fountain Bracket Assembly Removal

1. **Disconnect the unit from the mains.**
2. Pull straight out to remove the grill from the fountain sump.
3. Remove the two escutcheon mounting screws.
4. Raise the escutcheon up and off the fountain assembly.
5. Place slide selector in centre position.
6. Remove the three fountain bracket mounting screws.

.

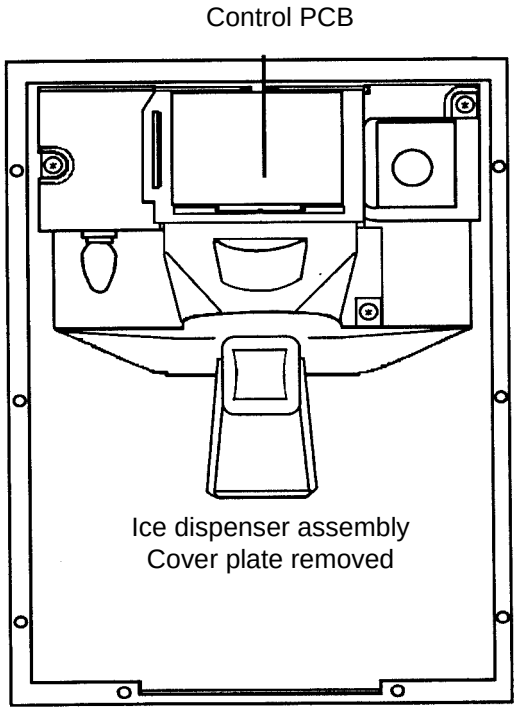
Disconnect the PCB plug-in connectors from the
ice dispenser PCB
(pull up)



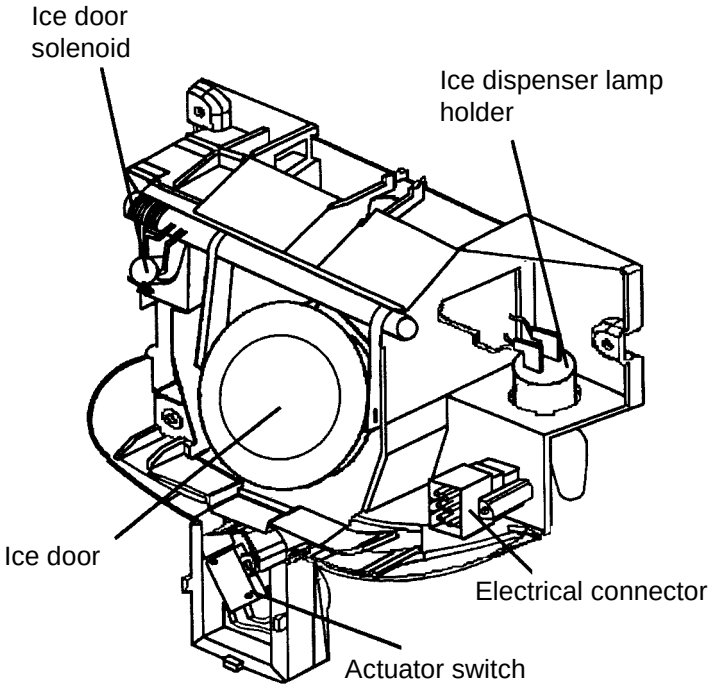
Rear view of the ice dispenser cover plate

7. Carefully pull the assembly out of the fountain housing. You now have full access to the solenoid, dispenser mechanism, PC delay board, lock switch, light socket, and the light switch.

8. To repair the assembly, disconnect electrical quick disconnect.



3.12.2 Crusher and Water/Cube



3.12.3 Checking and Replacing the Actuator Switch

1. Disconnect the unit from the mains.

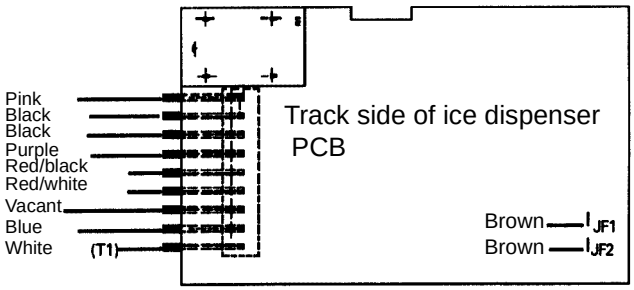
2. Perform steps 1 to 6 of To Remove Ice & Water Fountain Bracket Assembly.
3. Check the continuity of the switch. If defective, go to step 4.
4. Remove the mounting screw.
5. Remove the switch.
6. Remove the wire leads.
7. Install new switch in reverse order of removal.

3.12.4 Electronic Control Board Troubleshooting

The following checks should only be made by a qualified service technician.

No LED's illuminated on the fountain touch pad

1. Check the ribbon cable/wire connection between the two PC boards ("Mechanically Tight").
2. Checking the AC line in fountain verifies operation/closure of door interlock switch.



3. Check fountain heater continuity. **Unplug the unit**. Check heater resistance neutral to heater connection it should read approximately 4800 ohms.
4. Replace LED/Switch board.
5. Replace fountain control board.

Some LED's will not light

1. Replace LED/Switch board.
2. Replace fountain control board.

Fountain light will not light

1. Check bulb and mechanical connections.
2. Does fountain light illuminate during a dispense?

Yes: (a) Replace LED/Switch board.

No: (b) Replace fountain control board.

Will not dispense ice or water

1. Press lock button 3 times. If another LED lights, replace LED/Switch PC board.
2. When actuator pad is pressed, does fountain light come on?

NOTE: Make sure fountain light bulb is good!

No: (a) Check actuator switch and mechanical connections.

(b) Replace PC control board.

Yes: (a) If nothing works (ice door solenoid/auger/cube solenoid/water valve), replace PC control board.

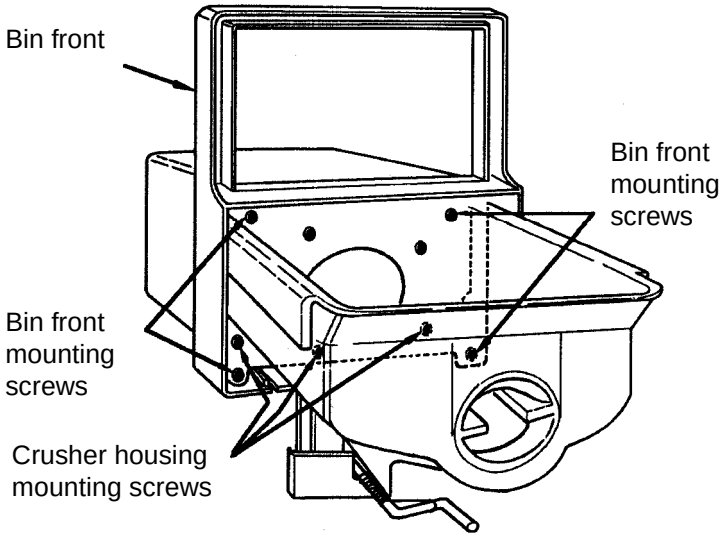
No: (b) If some functions work check for 230 VAC at ice door solenoid/auger/cube solenoid/ water valve terminals during dispense.

(1) If 230 VAC output exists, replace component.

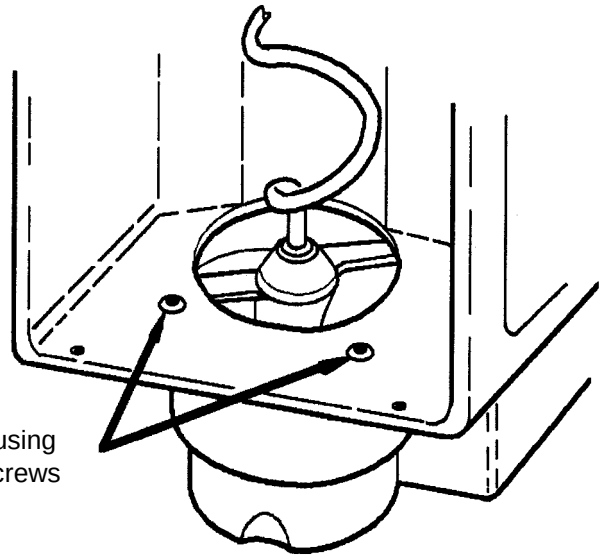
(2) If 230 VAC output is not present, replace control board.

3.13 Ice Crusher Bin Shelf Assembly

1. To service the ice/crusher related components, turn the icemaker off by lifting the shut off arm. Remove the bin assembly.
2. Remove the four bin front mounting screws.

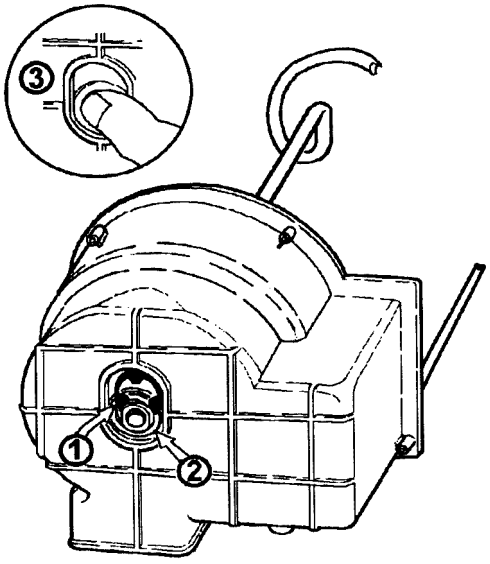


3. Place the bin assembly on the crusher housing.

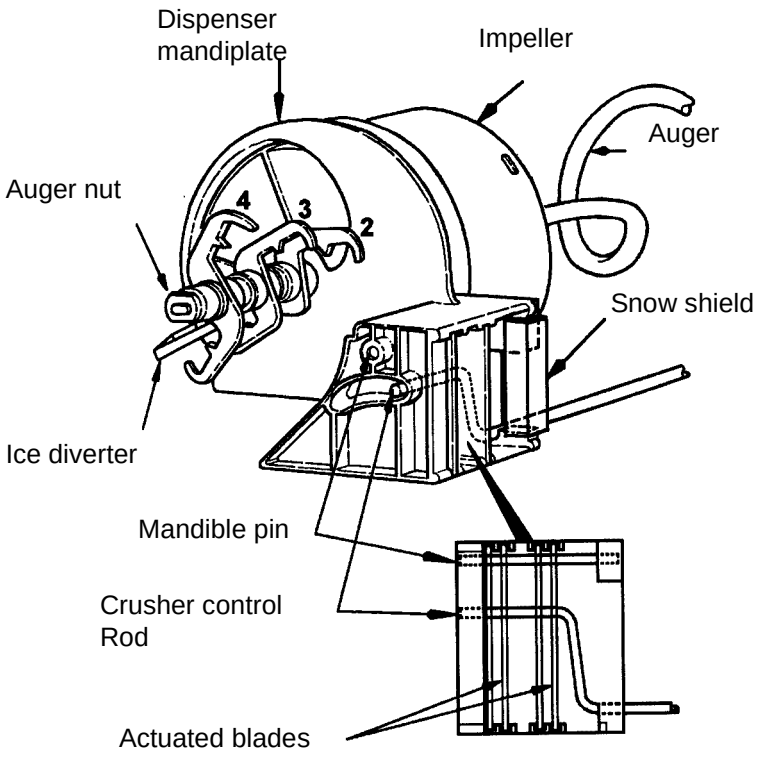


Crusher housing
mounting screws

4. Care should be taken when removing the control rod spring to ensure it does not snap back on your finger.



5. When removing the control bracket, hold the clip; this will prevent it from being thrown off.
6. When removing the crusher housing, position the snap ring (1) as shown in the above drawing, then remove it and the retainer washer (2).
7. Push the auger assembly away from the crusher housing using your thumb (3).
8. To remove the auger nut, turn it clockwise.

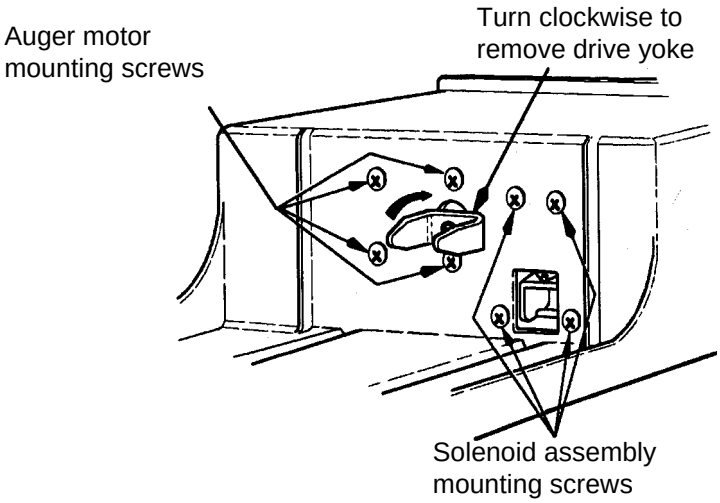


9. Replace the parts as required. The number on the blades should face the back of the auger nut. Blade number 4 should be nearest to the auger nut.

10. Make sure the ice diverter is aligned to the boss on the dispenser mandiplate.

11. Reinstall all other components in the reverse order of removal.

3.14 Ice/Crusher Bin Shelf Enclosure Assembly



The auger motor and solenoid are located behind the storage bin. The yoke, fastened to the motor, engages the drive ring and turns auger in a clockwise direction. Both the yoke and drive ring are designed to prevent a loosening of the yoke by exerting counterpressure while in operation.

The auger motor make one revolution approximately every three seconds. To determine the free movement of the auger motor, place the selector switch in either cube or crushed position (slide selector models). On electronic models, push the cube or crushed selector pad. Open the freezer door, push and hold the cabinet interlock switch in the closed position while pushing the dispenser actuator pad.

The solenoid is energised only when the selector switch is in the cube position. This will pull back the actuated blades. To determine the free movement of the solenoid/yoke assembly, place the selector switch (slide selector models) in the cube position. On electronic models, push the cube selector pad. Open the freezer door. While pushing the dispenser actuator pad, push and hold the cabinet interlock switch in the closed position. Observe the control rod yoke for vertical movement.

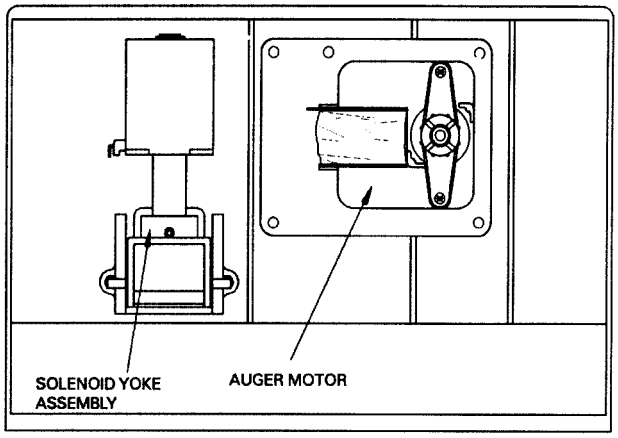
The auger motor and the solenoid/control rod yoke assembly are easily removed.

1. Disconnect the unit from the mains supply.

2. Remove the ice/crusher bin assembly.

3. Remove the retainer screw at the bottom left side of the ice/crusher bin shelf enclosure.

4. Pull the shelf forward and disconnect the quick disconnect.



5. Remove the assembly from the freezer and place on a flat work surface.

6. To check the auger motor, attach an ohmmeter probe to the auger motor terminals. The meter should show resistance. If the meter does not show resistance, the motor should be replaced.

7. To replace the motor, hold the auger motor armature and turn the yoke clockwise, releasing yoke from the motor shaft. Remove the yoke and washer.

8. Remove the four mounting screws that fasten the motor enclosure. Remove the motor from the enclosure.

9. Install the replacement part in reverse order of removal.

10. To check the solenoid yoke assembly, attach an ohmmeter to the solenoid terminals. The meter should show resistance. If it does not show resistance, replace the solenoid yoke assembly.

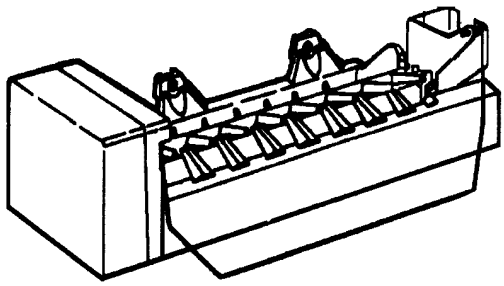
11. Remove the four screws that fasten the solenoid yoke assembly to the enclosure. Remove the assembly from the enclosure.

12. Install the replacement part in reverse order of removal.

4. Icemaker

4.1 Servicing

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

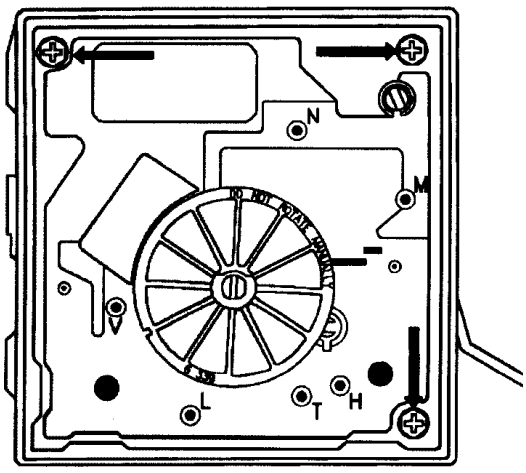


Remove the cover and you will see the test points identified on this module.

N	Neutral side of line
M	Motor connection
H	Heater connector
T	Thermostat connection
L	L1 side of line
V	Water valve connection

NOTE: Read this section completely before doing any testing or adjusting. Refer to the tech sheet for complete testing information.

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



4.2 Test Procedures

Ice-maker plugged into power/Shut-off arm down/Freezer cold:

- Test points L & N will verify 230 volts to icemaker module.
  (Make sure your test probes go into the test points 12.5 mm.)
- Test points T & H will verify if the bimetal thermostat is open or closed.
  Short T & H with an insulated piece of wire (1,5 mm²) to run the motor. If the motor doesn't run, replace the module assembly. If the motor runs, replace the bimetal thermostat.
- If you leave the jumper in for half of a revolution, you can feel the heater in the mould heat up, if it is good.
  Remove the jumper and the water valve will be energised in the last half of the revolution.
  (Make sure the freezer temperature is cold enough to close the bimetal).

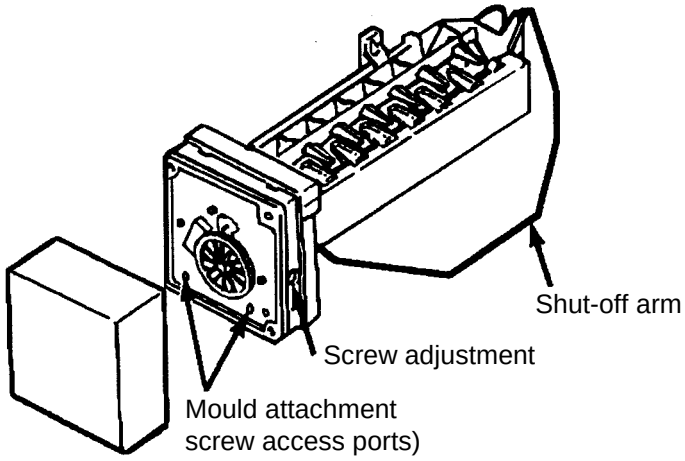
NOTE: Do not short any contacts other than those specified. Damage to the ice-maker can result.

Ice Maker Unplugged:

- Test points L & H will check the resistance of the heater (72 ohms).
  Replace the mould and the heater assembly if not near this value (+/- 10 ohms).
  (Ejector blades should be at the end of the cycle position).

4.3 Service Procedures

Cover: Pull water adjustment knob first and snap off cover. Index knob and reinstall in same position for same water fill. (Some units may not have index knobs).



Module, Motor and Support Assembly:

1. Insert Phillips screwdriver in access ports of module.
2. Loosen both screws.
3. Disconnect shut-off arm.
4. Pull mould from support assembly.
5. To remove module only, remove 3 Phillips screws and pull module out of housing.

Shut-Off Arm:

Pull out from white bushing. Reinsert to full depth. See pae 37 for detailed position.

Mold & Heater:

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

Bimetal:

Remove module and support assembly. Pull out retaining ring clips with bimetal.

Fill Cup:

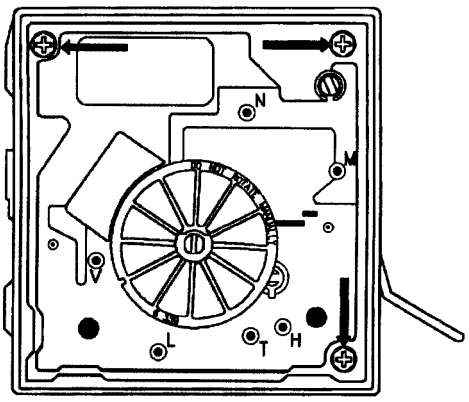
Remove module and support assembly. Remove ejector blades and shut-off arm. Pull fill cup up from mould.

Ejector Blades or Stripper:

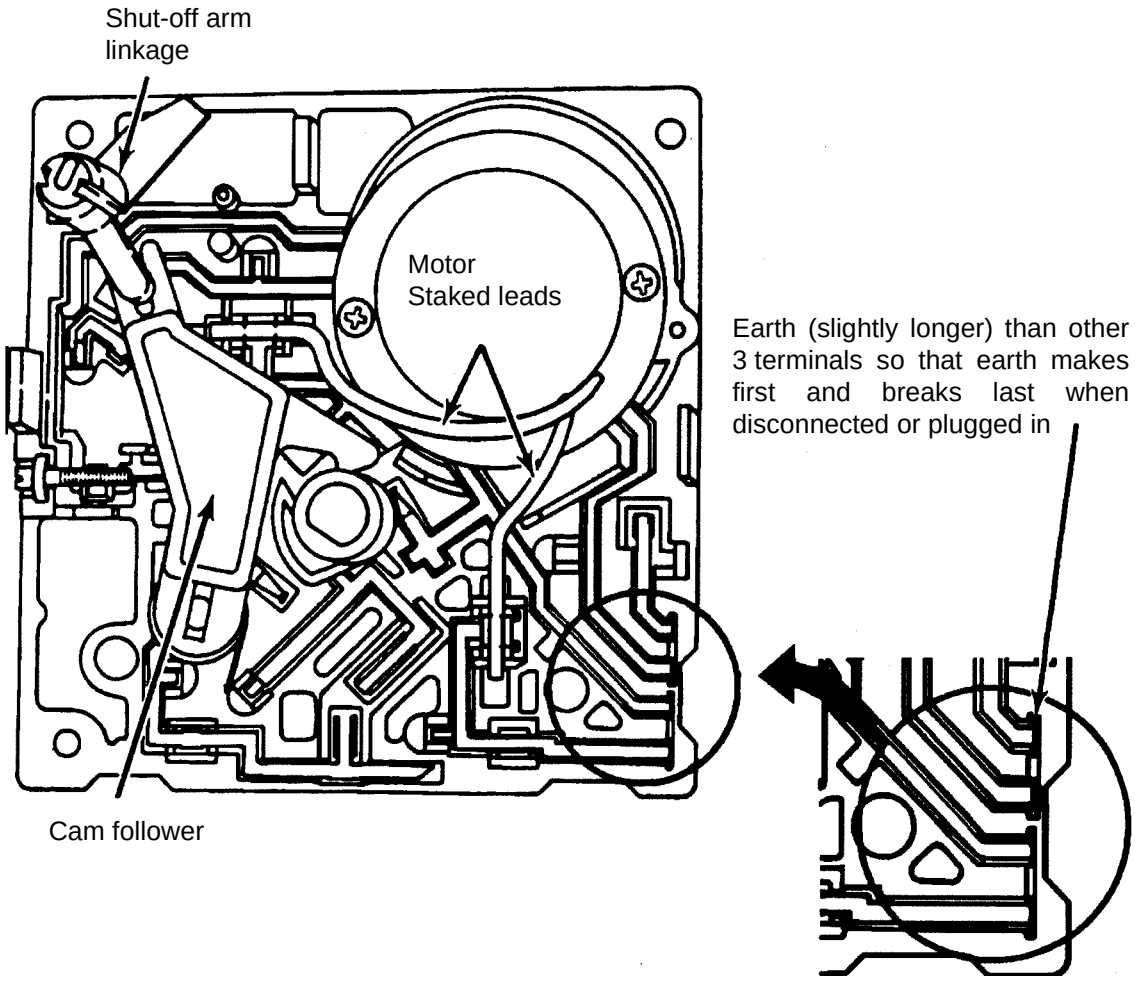
Remove module and support assembly. When reinstalling ejector blades, realign ”D” coupling with module cam.

4.4 Accessing the Control Box

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



4.5 Module Components



Warning
Never rotate the blade or the drive gear!
It will ruin the main assembly.

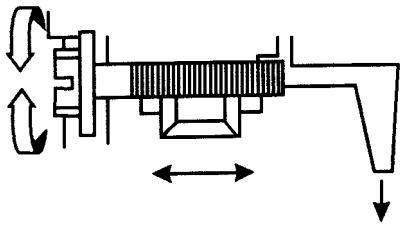
There are several switches which will jam if manually turned counterclockwise. Also, the gears will be destroyed if turned clockwise. If you need to advance the icemaker into the cycle, use a jumper to bridge ”H” to ”T”. Unless the motor is defective, it will run. (The shut-off arm must be in the ”ON” position).

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

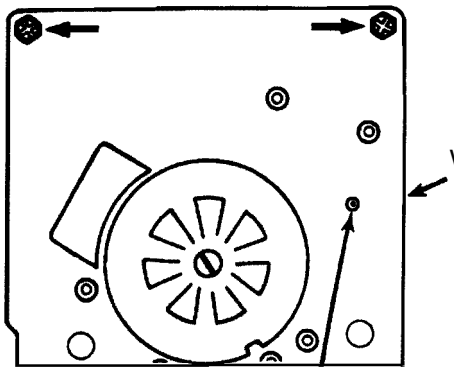
Note: There are not repairable or replaceable components in the module. Unless replacing the module, there should be no need to remove it when diagnosing on repairing the icemaker.

4.6 Water Fill Adjustments

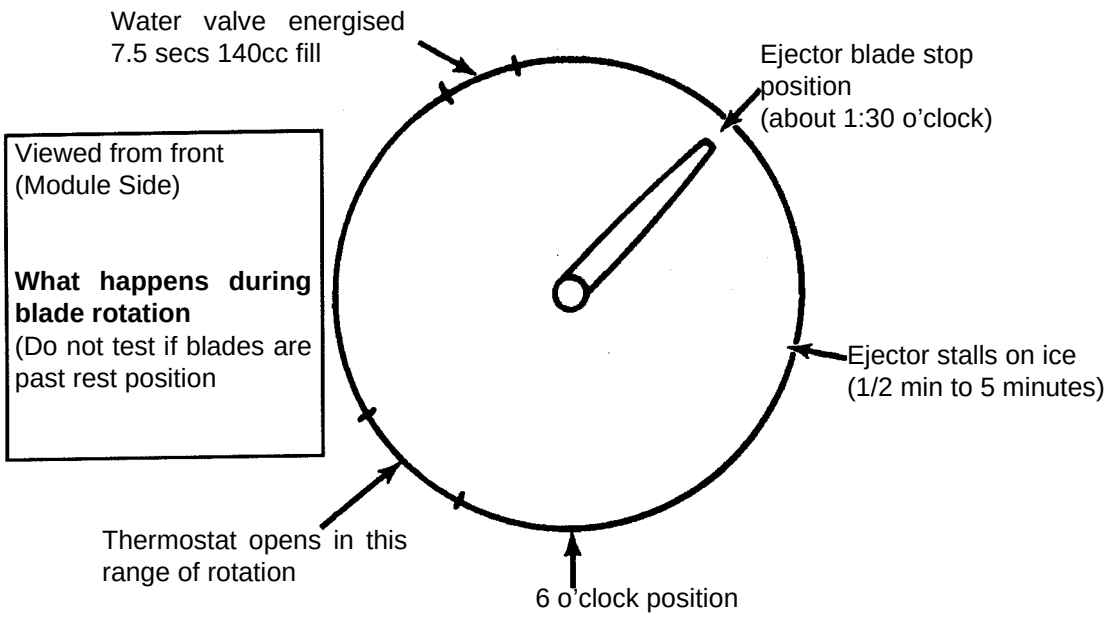
Turning the water level adjustment screw will move the contact in its relationship with the contact ring segment. This causes the contact to vary the time that the water valve is energised since the contact ring is tapered at the end of the fill time.



- Turning the knob or screw clockwise decreases fill – counterclockwise increases the fill amount.
- Only one revolution is possible with the cover on, due to a stop moulded on cover.
- 360° will affect fill by 40cc – 180° varies the fill by 20cc.
- Further adjustment could damage module.
- If water valve adjustment screw falls out, put it back in and align the hole in the hole as shown.



When small hole is centred in larger hole the water fill adjustment is for 7.5 seconds fill time (normal).



4.7 Water Problems

Water quality can cause icemakers to fail or produce unacceptable cubes. If mineral content or sand is a problem, the screen in the fill valve can restrict. A particle of sand can keep the valve from seating properly. Results will be small crescents (or no ice) or flooding of the ice container if the water valve does not close.

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

4.8 Temperature Problems

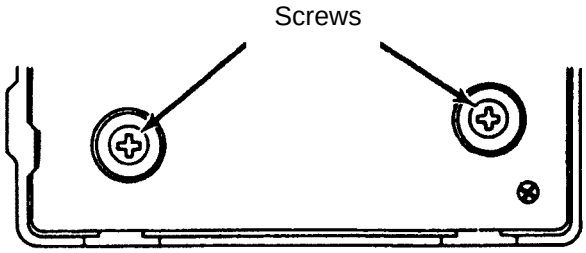
Temperatures in the freezer section which average above the normal (-17.8 ± 2.8°C) will slow the production of ice. Complaints of inadequate crescent production may be corrected by setting the freezer to a colder temperature, in this one-revolution ice-maker (-8.3 ± 1.7°C). Obviously, the ice will be well frozen when these temperatures are achieved, but cycling time will be slowed if the freezer temperature is not cold enough to achieve these mould temperatures easily.

Note: Only the thermostat, mould with heater and wiring harness are replaceable. Any other failure (including the motor) requires replacement of the module assembly. If you are replacing the mould assembly, it comes with a new mould heater installed.
External plastic parts are also replaceable.

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

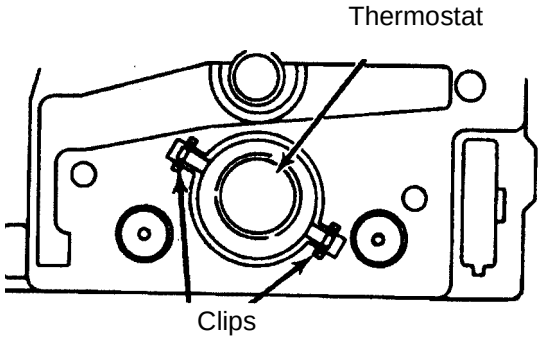
4.9 Thermostat

If the thermostat is diagnosed as defective, it can be removed and replaced easily. Remove the module from the mould by taking out two Phillips screws.



Pull
(front of module)

Pull the housing free of the mould and you will see the thermostat on the mould side.



Using needle nose pliers, grasp one of the thermostat clips and pull out.

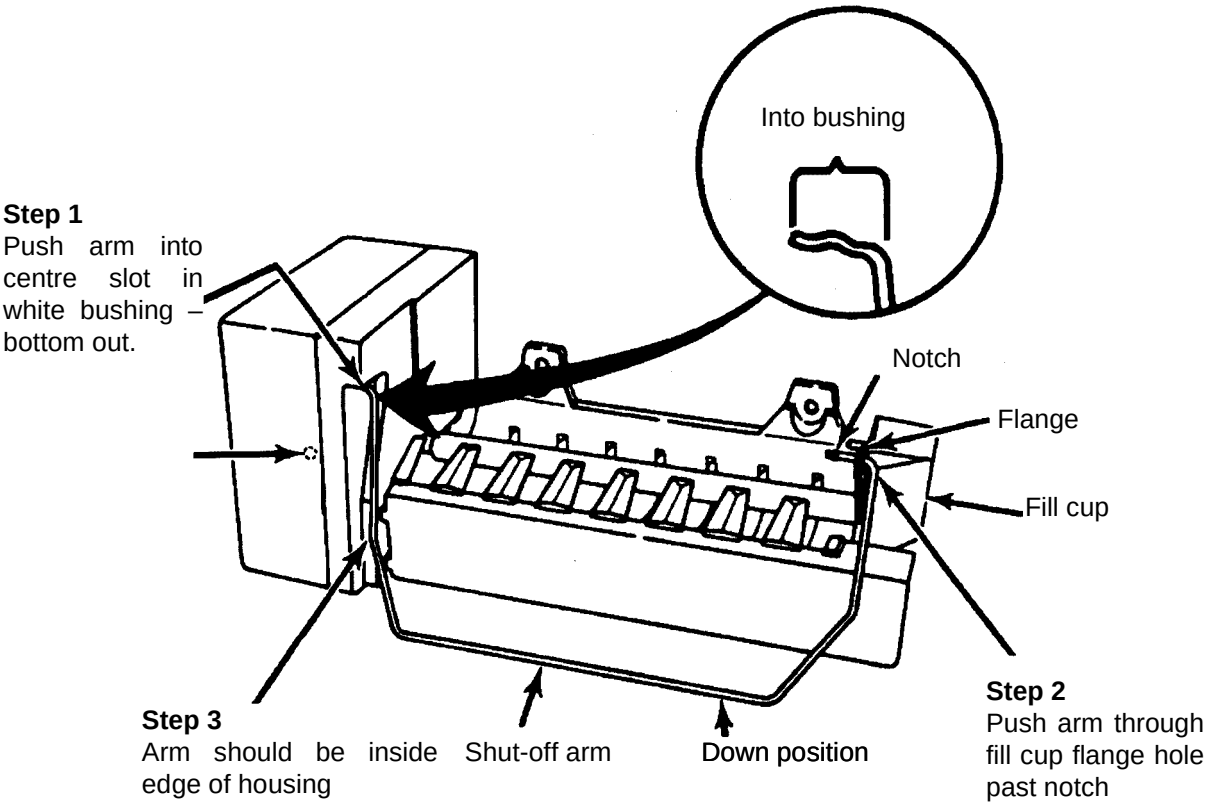
Press in new thermostat, making sure that pins are properly indexed. Using this procedure, it is not necessary to remove the electrical assembly. If you are replacing the module, transfer the clips to the new mould support. (Use new thermal bonding material.)

5. Installation

Installation procedure

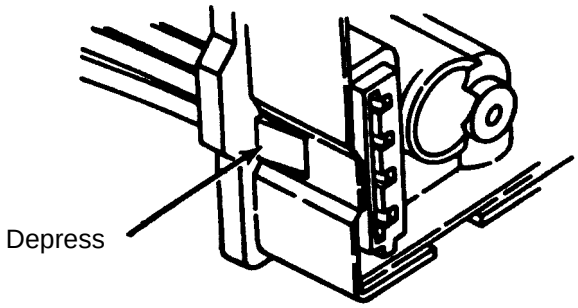
Start with arm in ”down” position.

Follow steps 1, 2, and 3.



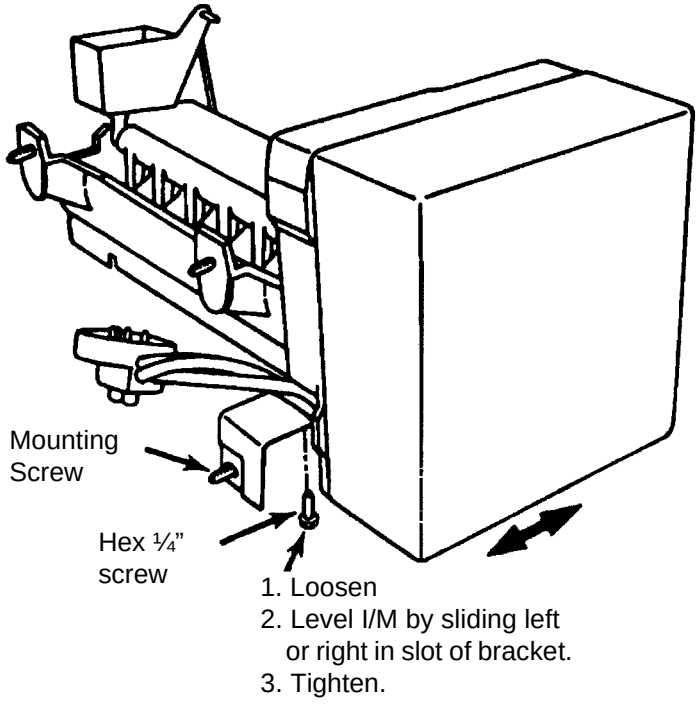
5.1 Harness

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



5.2 Leveling Icemaker

This device ensures uniform ice crescents.

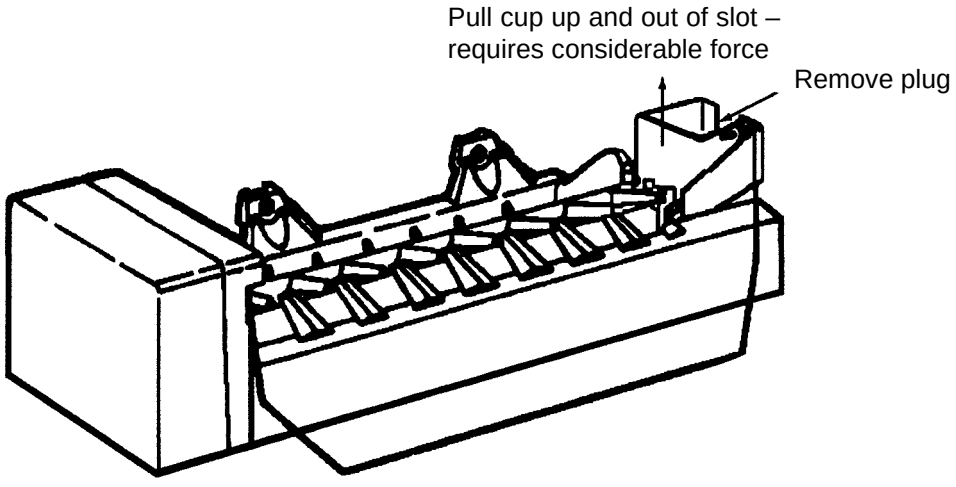


Make sure the refrigerator is level front to back (adjust legs or rollers).

5.3 Removing & Replacing Fill Cup

To remove fill cup, you must separate mould and blade from module housing. Remove blade from fill cup.

The appropriate breakout plug needs to be removed from the fill cup for your model. Check old icemaker.



5.4 Other Information

- Motor connectors can be damaged if leads are removed.
- The motor is available only as part of the complete module assembly.
- One revolution of the blade takes three minutes (plus stall time on ice).
- Bench test lead can be made from cabinet socket.
- Tan and white wires on socket plug are water valve leads.

5.5 Specifications

Mould Heater .....185 watts, 72 ohms

Thermostat (Bimetal) .....Close -8.3° ± 1.7°C; Open 0° ± 1.7°C

Water Fill .....140cc, 7.5 seconds

Motor .....1.5 watts, 8,450 ohms

Module .....Stamped Circuit, Plug-inConnectors

Cycle .....One revolution (ejects and water fill)

6. Troubleshooting

Warning

DISCONNECT THE UNIT FROM THE MAINS

Condition	Possible Cause	Correction
Unit does not run No light in refrigerator	No power to fuse box of house	Check and advise customer to call an electrician
	Mains socket - Defective socket - Open circuit to mains socket	Advise customer to have defective socket replaced Replace fuse. If problem not corrected, advice customer to call electrician
	Defective service cable plug	Replace
	Open service cable or open machine compartment wiring harness	Repair or replace if necessary. Refer to wiring harness diagrams and check circuit
	Two simultaneous problems - light bulb out and open AC circuit to compressor	Replace light bulb Refer to wiring harness diagrams and check circuit.
Unit does not run Light in refrigerator works	Temperature control - Defective or adjusted incorrectly - AC circuit open to control	See below: Replace or adjust if necessary Refer to wiring harness diagrams and check circuit.
	Defrost timer - Defective (contacts completing compressor circuit are open) - AC circuits open to timer (motor winding or contacts) - May be defrosting	See below: Replace Refer to wiring diagrams and check circuit Repair or replace
	Overload protector - AC circuit open to overload - Defective overload	See below: Refer to wiring diagrams and check circuit Repair or replace
	Starting relay - AC circuit open to coil (overload does not click) - Defective relay	See below: Refer to wiring diagrams and check circuit Replace

Condition	Possible Cause	Correction
Unit does not run. Light in refrigerator works	Compressor motor - AC circuit open to compressor - Defective compressor (overload may or may not click depending upon what is wrong with compressor) - Low line voltage (overload will click one and off as unit tries to start	See below: Refer to wiring diagrams and check circuit Replace Check voltage. Must be at least 100V with all other load on the line
Unit run excessively or continuously	Complete or possible partial restriction under high ambient (cycles on overload protector after unit stops and tries to restart)	See ”Checking Operating Pressure”
	Check to ensure light does not stay on continuously	Check light switch and replace if needed. Check door adjustment
	Dirty or restricted condenser, due to particularly greasy, dusty, or significant pet traffic in the home	Advise customer that it may require cleaning periodically in this environment
	Defective cold control	Repair or replace
	Condenser fan not running.	Repair or replace
Unit does not run for period of time after defrost	Defrost timer is defective (does not advance – advance to cool cycle)	Replace.
Unit runs continuously but there is no cooling in refrigerator and freezer compartments	Substantial loss of sealed system charge (low wattage readings)	Locate and repair leak before recharging
	Restricted capillary or drier on high side (low wattage readings while running). Will cycle on overload when unit tries to start after defrost cycle, or after having been shut-off and restriction is still present	Replace defective part or parts
	Defective compressor	Repair or replace
Unit runs continuously. The refrigerator and freezer compartment are both too cold (normal wattage reading)	Temperature control is defective (short contacts or not adjusted)	Replace or adjust as required
	Freezer control not adjusted properly	See ”Freezer Cold Control” for proper adjustment.(see Service Manual 1)

Condition	Possible Cause	Correction
Unit runs continuously. The refrigerator compartment not could enough, but freezer compartment is colder than normal	Air duct from freezer to refrigerator is blocked (normal wattage reading)	Remove what is blocking the air duct. See ”Air Flow Diagram”
Unit runs excessively or continuously. The refrigerator and freezer compartments are cooling, but are not cold enough	Freezer fan. - Defective fan motor - AC circuit to fan open (lower wattage readings)	See below: Replace Refer to wiring diagrams and check circuit
	Not defrosting (lower wattage readings than normal and frost buildup or evaporator) - Defective defrost timer, de frost heater or defrost terminal thermostat - AC circuit to defrost system open	See below: Replace defective part or parts Refer to wiring diagrams and check circuit
	Temperature control	See below
	High setting of temperature control may result in these conditions under very severe environmental and usage conditions (high humidity and large number of freezer and refrigerator door openings)	Check and adjust for proper setting
	Sealed system. - Overcharge (high wattage readings) - Undercharged (low wattage readings) - Partial restriction	See below Evacuate and recharge with proper amount of refrigerant Check and see „Checking Operating procedure“ Check and see „Checking Operating procedure
	Compressor motor defective. Inefficient compressor (low wattage readings)	Replace
	Condenser fan - AC circuit to fan open (high wattage readings) - Defective fan (high wattage readings	See below: Refer to wiring diagrams and check circuit Replace
	Dirty or restricted condenser due to particularly greasy, dusty or significant pet traffic in the home	Advise customer that it may require cleaning periodically in this environment

Condition	Possible Cause	Correction
Unit runs excessively or continuously. The refrigerator and freezer compartments are cooling, but are not cold enough	Too much warm food placed in refrigerator at one time	Advise customer
	Air (no leak) in sealed system	Replace drier and evacuate system thoroughly, recharge with proper amount of refrigerant
Unit runs excessively. Refrigerator compartment eventually gets could enough, but freezer compartment is too cold	Partial restriction in air duct from freezer to refrigerator.	Check and remove what is causing the restriction. See „Air Flow Diagram“
	Freezer cold control setting too cold.	Adjust control for proper adjustment, see ”Freezer Cold Control”
	High usage of refrigerator especially in high ambient temperature	Advise customer
Unit runs excessively. The refrigerator compartment and freezer compartment both too cold (normal wattage readings)	Setting of temperature control too high for prevailing environmental and usage conditions	Reset control
	Defective temperature control	Replace
	Door seals may be leaking	Adjust door or replace door gasket
Unit runs excessively, but temperature appears to be normal in refrigerator	Problem is one of customer usage and education with severe environmental conditions after confirmation by a temperature recording. Frequent door openings	Advise customer
	Light may stay on constantly in refrigerator	Check light switch and replace if needed. Check door adjustment
	Inefficient compressor	Replace
Short running cycle. Refrigerator and freezer compartment are cooling, but are not cold enough	Temperature control - Defective control (normal wattage readings) - Improper setting of temperature control for prevailing environmental and usage conditions	See below Replace Reset control

Condition	Possible Cause	Correction
Short running cycle. Refrigerator and freezer compartment are cooling, but are not cold enough	Air circulation	See below
	- Ventilation around condenser is blocked	Check and advise customer
	- Condenser fan is defective	Replace
	- Dirty or restricted condenser, due to particularly greasy, dusty, or significant pet traffic in the home	Advise customer that it may require cleaning periodically in this environment
	- AC circuit to condenser fan is defective (high wattage readings, unit may be cycling on the overload protector)	Refer to wiring diagrams and check circuit
	Compressor motor defective (high wattage readings. Unit maybe cycling on the overload protector)	Replace
	High resistance contacts or too many broken wire strands in compressor motor AC circuit (high wattage readings, unit may be cycling on the overload protector)	Check and replace broken part. Refer to wiring diagrams and check circuit
	Overload protector defective (normal wattage readings)	Replace
	Too much warm food placed in the unit at one time. May be cycling on overload	Advise customer
Unit runs and cycles. Refrigerator is normal, but freezer is not cold enough (normal wattage readings)	Poor freezer door seal	Adjust door or replace if necessary
	Freezer air baffle control setting too warm	Reset control. For proper setting, see “Freezer Cold Control”
	Room temperature too cold	Advise customer
	Excessive freezer door openings	Advise customer
	Too much warm food placed in freezer at one time	Advise customer
	Few refrigerator door openings (low usage in low)	Advise customer
	Check for refrigerant leaks	Repair or replace

Condition	Possible Cause	Correction
Run time normal. Refrigerator compartment is not cold enough, but freezer compartment is normal or possibly colder than normal. Sweating, but refrigerator and freezer are working normally	Air flow problem	Check and remove what is causing the restriction See “Air Flow Diagram”
	Interior sweating	See below:
	- Bad door seals	Replace
	- Excessive door openings during hot humid weather	Advise customer
	- Storage of excessive un-covered liquids especially if they are inserted into refrigerator while warm	Advise customer
	- Void in insulation	Check and add insulation if possible
	- Overcharged	Evacuate system and recharge with proper amount of refrigerant
	- Bad door seals	Replace
	- Condenser fan not running	Check fan motor and replace part if needed
Excessive dehydration of food	Covering of food	Advise customer
	Sublimation of ice cubes is normal in no-frost freezers, but should not be a problem in these units equipped with covered ice storage bins	Advise customer
Excessively noisy, but works normally otherwise	Refrigerator not level or sitting firmly on all four corners	Level the unit, lower the level legs if necessary to make sure that unit is firmly on the floor
	Structural weakness in floor	Advise customer
	Compressor mounting defective	Check and replace if necessary
	Poor tubing dress	Adjust tubes so they do not touch
	Compressor operation is noisy due to inherent condition	Advise customer
	Unit base mounting loose	Tighten loose part or parts
	Freezer or condenser fan is noisy May have defective motor	Adjust pan or install foam pad if necessary Replace
	Containers inside refrigerator rattle	Advise customer

7. Specifications

7.1 21’ Dispenser/Non Dispenser

Power Requirement	220 - 240V 50Hz
Operating Amps (max.)	2.0A
Compressor	Tecumseh TP1413YXC
Refrigerant Charge R134a	163g
Compressor	277Cal/hr
Cabinet Liner	High Impact Laminated Polystyrene
Door Liners	High Impact Laminated Polystyrene
Cabinet + Divider Insulation	Foam
Fountain Heater	with ventilator

Temp. Control *Cut / Out (±0.9°C)* *Cut / In (±0.9°C)*	Normal setting -23.3°C -6.11°C
Condenser	-4.44°C
Capillary Tube *Length* *Diameter*	 244cm 0.71mm
Defrost thermostat *Cut / Out (±1.7°C)* *Cut / In (±6.1°C)*	 +3.3°C - 9.4°C
Defrost Timer *Defrost Cycle* *Defrost Time*	 8hrs.± 5mins 21mins. ± 5mins.
Defrost Heater *Ohms* *Watts*	 88.2± 10% 600 ± 10%
Defrost Amps. (Max.)	4.3
Slide Fountain	8.8KΩ ± 10% 2.75W ± 10%
Touch Pad Fountain	19,2KΩ ±10% 2,75W ±10%

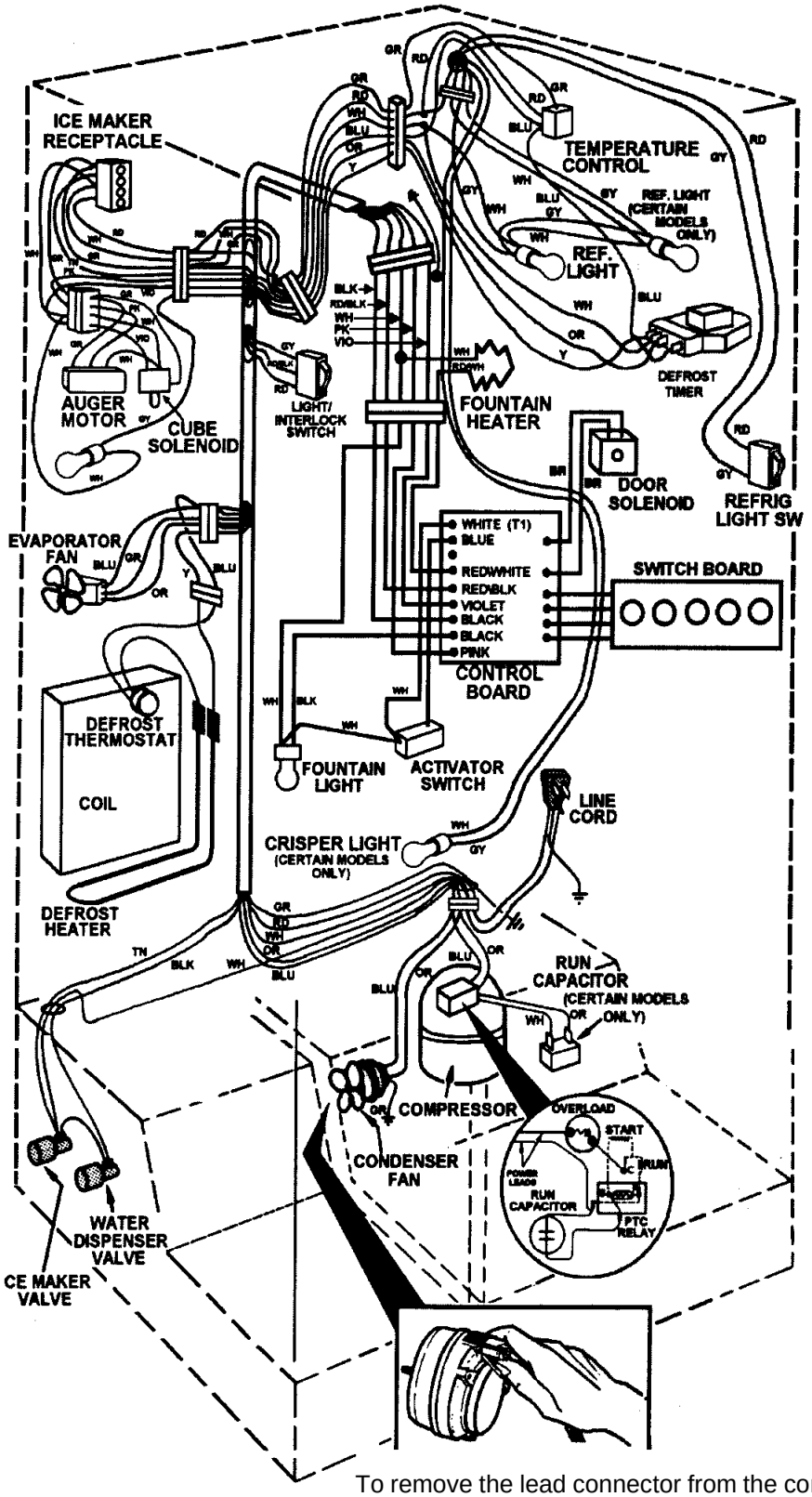
Performance Test Data

The laboratory test data in this chart was obtained under the following conditions: (1) mains supply of 230V AC, 50 Hz, (2) no door openings, (3) no load, (4) customer control(s) set at mid-point. The pressures and wattages shown were taken: (a) during a normal running cycle, (b) no sooner than 5 minutes after compressor start-up. In the home, measurements will vary depending upon environmental and usage conditions.

	21.1 °C Ambient	**32.2 °C Ambient**	**43.3 °C Ambient**
Operating Time in % ±5% Freezer Temp. in °C±1.7°C	35% -18°C	50% -18°C	100% -23%
KWH / 24 hours	1.45kWh±0.2	2.30kWh±0.2	4.10kWh±0.2
Suction pressure (±1bar)	-0.34bar/-31.6°C	-0.24bar/-28.9°C	-0.14bar/-23.3°C
High Side Pressure (±1bar)	9.3bar/40.5°C	11bar/46.6°C	-18.3bar/65.6°C
Running Watts during running compressor ±15%	165W	180W	200W

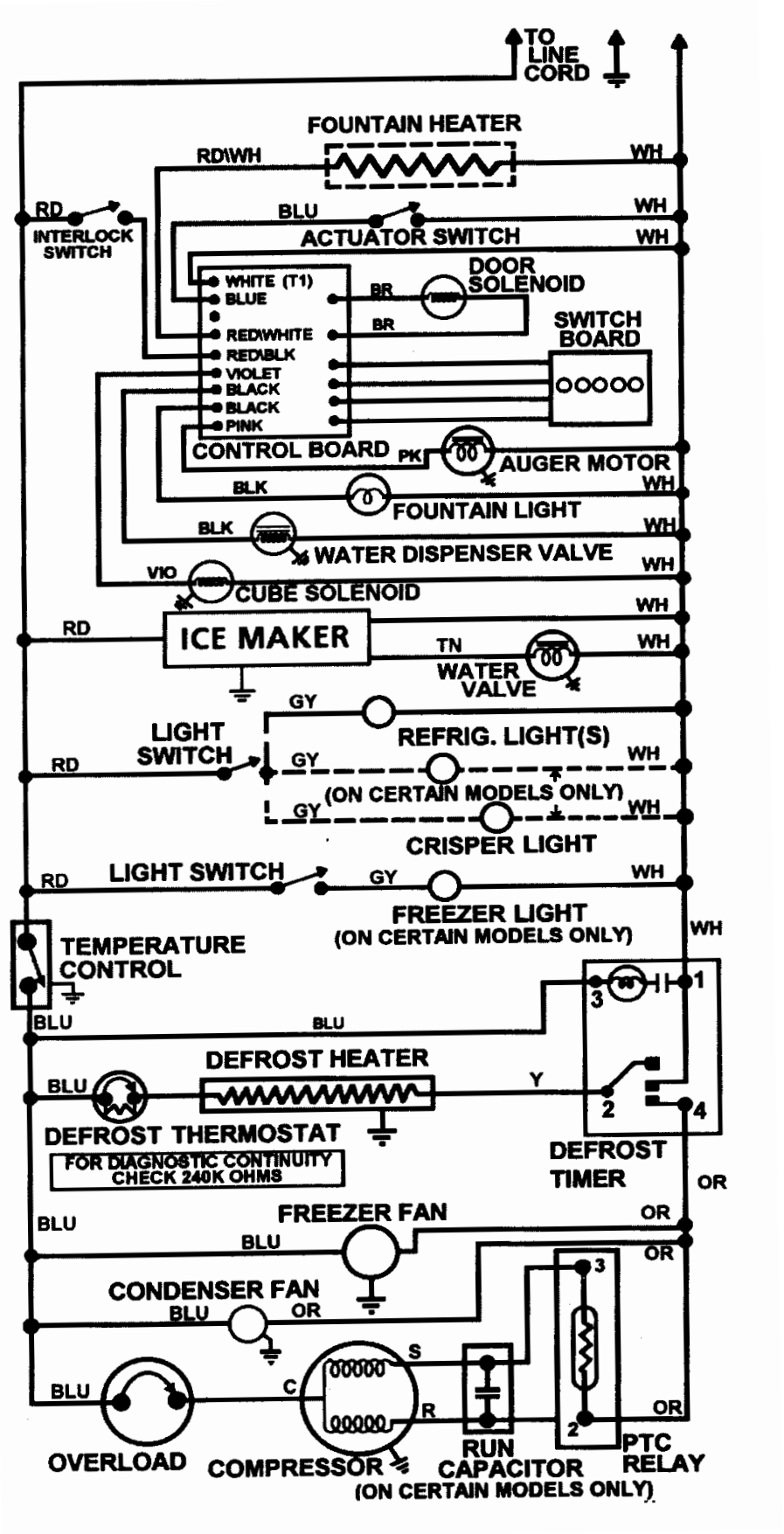
8. Wiring diagrams

8.1 Schematic Wiring Diagram



To remove the lead connector from the condenser fan motor, grasp the connector with your thumb inserted between the connector and the locking lever as shown and pull the connector.

8.2 Wiring diagram



8.3 Refrigerant Flow