DIAGNOSTICS & TROUBLESHOOTING DIAGNOSTICS

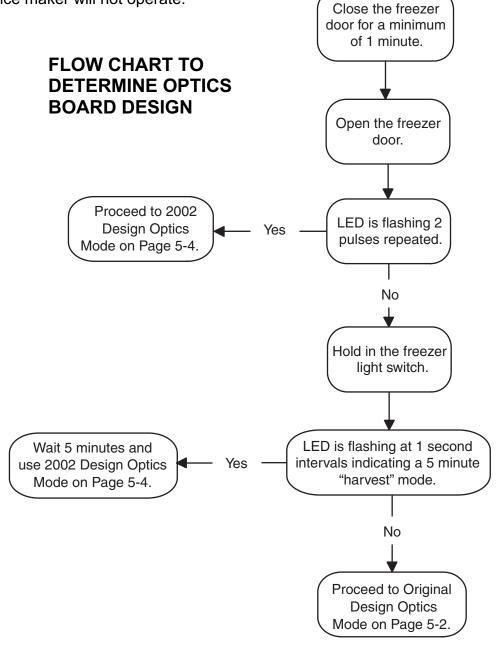
OPTICS DIAGNOSTICS MODE

Diagnostics are used to determine whether the optics circuits are operating properly. If the optics circuits are malfunctioning, the ice maker will not operate.

The optics system consists of an emitter board and a receiver board. The emitter board transmits a beam of infrared light that is detected by the receiver. If the beam of light is interrupted, the ice maker will not operate.

The optics system can have one of two types of optics board designs installed: the original design, or the 2002 design.

Use the following flow chart to determine which of the board designs are installed. Once this is determined, you will be directed to perform the appropriate optics diagnostics procedure.

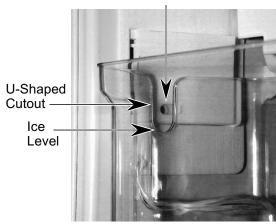


OPTICS DIAGNOSTICS FOR ORIGINAL DESIGN BOARDS KIT #4388635 SUBS TO #4389102 EMITTER—PART #2198585 RECEIVER—PART #2198586

To initiate an optics check, perform the following steps:

- 1. Open the freezer door.
- Remove enough ice from the ice bin so that the ice level is at least one inch below the U-shaped cutouts in the bin.

Infrared Emitter Beam



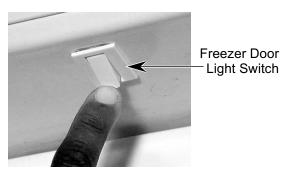
3. Make sure the ice maker manual shutoff slide is in the "ON" (open) position on the infrared receiver module.

Manual Shutoff
Slide
Infrared Receiver
Sensor

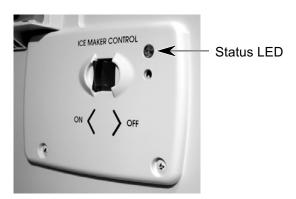


4. Close the freezer door for a minimum of 10 seconds.

Open the freezer door and activate the freezer door switch 3 times. NOTE: This step must be completed within 10 seconds of opening the freezer door.



- 6. Close the freezer door within 20 seconds of completing step 5.
- 7. Wait for a minimum of 5 seconds, and a maximum of 50 seconds, then open the freezer door and view the status LED on the infrared receiver module for the error code. NOTE: You will have 60 seconds to open the freezer door, and 2 seconds from then to view the LED output code.



If you observe two LED pulses (flashes), perform the following steps.

- Open the freezer door and remove the ice bin from the door.
- 2. Make sure the ice maker manual shutoff slide is in the "on" (open) position.
- 3. Tape the spring-loaded emitter door to the emitter cover in the "down" position.
- 4. Close the freezer door for at least 10 seconds.

- Open the freezer door and actuate the freezer door switch 3 times. NOTE: This step must be completed within 10 seconds of opening the freezer door.
- 6. Close the freezer door within 20 seconds of completing step 5.
- 7. Wait for a minimum of 5 seconds, and a maximum of 50 seconds, then open the freezer door, and view the status LED on the infrared receiver module for the error code. NOTE: You will have 60 seconds to open the freezer door, and 2 seconds from then to view the LED output code.

If the LED still flashes twice, there could be dirt or frost on the optics, something could be blocking the infrared beam path, or the optics may be defective. Clean the optic elements and repeat the previous test.

If the LED does not flash, the ice maker may have been in a harvest, preventing the diagnostics from being performed. Look at the ice maker to make sure the ejector is at the home position. If it is, wait 3 minutes, and try running test again. If the LED still does not flash, the optics boards may be defective.

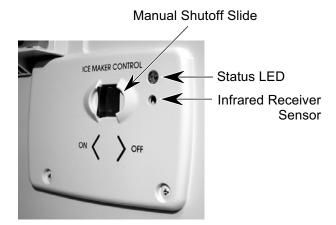
OPTICS DIAGNOSTICS FOR 2002 DESIGN BOARDS KIT #4389102 EMITTER—PART #2220398 RECEIVER—PART #2220402

To initiate an optics check, perform the following steps:

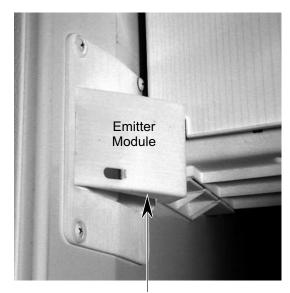
- 1. Open the freezer door.
- 2. View the status LED. It should flash twice, pause for 1 second, and repeat the cycle for as long as the door is open.

NOTES:

- If the LED is not flashing, the ice maker may be in the 5 minute "harvest" mode.
 If so, push in on the freezer door switch with your finger, and observe the LED.
 It should begin to flash at 1 second intervals, and continue to flash for as long as you hold the door switch.
- If the LED does not flash, as described above, the original style optics boards may be installed. Perform the steps, shown in Chart A, on page 5-6.
- 3. Check the ice maker manual shutoff slide and make sure that it is in the "ON" (open) position on the infrared receiver module.



4. Close the flapper door on the emitter module so that the infrared beam has a clear path to the receiver board.



Door Shown In The Open Position

5. Make sure that the door switch is not pushed in, and view the status LED. With the flapper door on the emitter module held closed, and the ice maker not in the 5 minute "harvest" mode, the status LED should be on steady. This indicates that the optics circuits are operating properly. If the status LED continues to flash, refer to the "Troubleshooting Chart" on page 5-9.

COMPONENT DIAGNOSTICS MODE

AWARNING



Electrical Shock Hazard Voltage is present during these tests.

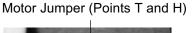
NOTE: The optics must be working properly to test the ice maker. If the optics test fails, you will not be able to force a harvest and check the ice maker. Refer to the Troubleshooting Chart on page 5-10 for additional servicing information.

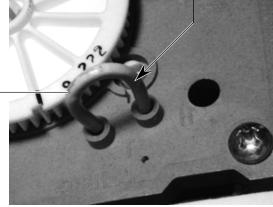
IMPORTANT: If the freezer temperature is not cold enough to allow the ice maker bimetal to close, a jumper must be installed on the ice maker at test points T and H, and the test rerun.

- 1. Run an optics check as described in the previous section.
- 2. Disconnect power to the unit.

- Slide the ice maker out of the mounting rails and leave the wiring harness connected.
- 4. Jumper the thermostat, as shown below.
- 5. Connect power to the unit.
- 6. Remount the ice maker, making sure that the water fill tube is inside the fill cup.
- 7. Make sure there is a clear path across the bin for the infrared beam to travel to the receiver sensor.
- 8. Close the freezer door and wait 5 seconds to allow the optics relay to close.
- 9. Open the freezer door and you will see the ejector bar moving. Remove the thermostat jumper prior to the ejector blades reaching the 10:00 position, or else you will not see the water fill. The mold should be warm due to the heater operation.
- 10. Disconnect the power immediately after the water fill.
- 11. With the freezer door closed, reconnect the power.
- 12. Wait for a minimum of 5 seconds, and a maximum of 50 seconds, then open the freezer door, and view the status LED for the output codes, as shown in Chart C, on page 5-7.







OPTICS DIAGNOSTICS MODE CHARTS

NOTES:

- 1. Optics Diagnostics will not respond:
 - For 5 minutes after the ice maker begins a "harvest" cycle. To reset the control, wait until the ice maker "parks," then unplug the refrigerator for 5 seconds, and repeat the test.
 - While the control board is running self-checks. Reset the control, as above.
- 2. The ice maker control must be in the "ON" position.
- 3. The ice bin must be on the door and the ice level below the notched openings.

— Chart A — Diagnostics Chart For Original Design Optics Boards

OPT	ICS DIAGNOSTICS PROCEDURE FOR	ORIGINAL DESIGN BOARDS			
STEP #	STATUS LED	POSSIBLE CAUSES	ACTION		
1. Open the freezer door (make sure that the freezer door has been closed for a minimum of 10 seconds prior to opening the door).					
Activate the door switch 3 times. Push the button in completely for 1 second each time.	2 pulses, repeated once, indicates the optics are blocked, or defective. Clear the optics path, and repeat the "Optics Diagnostics Procedure." Replace both boards, if necessary.		If there is no light, unplug the refrigerator for 5 seconds, and repeat the test. If there is still no light, replace both optics boards.		
3. Close the freezer door for a minimum of 5 seconds for a maximum of 50 seconds.					
Open the freezer door and immediately view the diagnostics "status" LED.					

— Chart B — Diagnostics Chart For 2002 Design Optics Boards

	OPTICS DIAGNOSTICS PROCED	URE FOR 2002 DESIGN BOARDS	
STEP #	STATUS LED	POSSIBLE CAUSES	ACTION
	Two (2) pulses followed by a one (1)second delay (repeated).	The flapper door on the emitter is blocking the beam.	Go to Step 2.
	()	The optics are faulty.	Go to Step 2.
1. Open the freezer door.	No lamp.	Ice maker is in the "harvest" mode. The harvest mode consists of a five (5) minute period that starts when the bimetal closes, and the ice maker begins to run.	To confirm, press in and hold the freezer door switch. If in the "harvest" mode, the Status LED will flash once every second.
		Faulty Status LED, or original style boards are installed.	Replace the receiver and emitter boards, or perform the steps in Chart A.
Press in the emitter flapper door to unblock the optics beam.	Two (2) pulses followed by a one (1) second delay (repeated).	The Optics are faulty.	Replace the emitter and receiver boards.
	LED is on steadily.	The Optics are working properly.	Close the freezer door.

COMPONENT DIAGNOSTICS MODE CHART

— Chart C — Component Diagnostics Mode For Original & 2002 Design Boards

COMPONENT DIAGNOSTICS MODE (RUN OPTICS DIAGNOSTICS PROCEDURE FIRST)

- 1. Disconnect the power supply.
- 2. Slide the ice maker out and remove the cover.
- 3. Jumper holes "T" and "H" to bypass the bimetal and start a harvest.
- 4. Reconnect the power supply.
- 5. Close the freezer door to align the optics and a harvest cycle will begin in 5 seconds.
- 6. Open the freezer door and observe the ice maker. A "harvest" should be in progress.

NOTE: If holes "T" and "H" are properly jumpered and the ice maker will not run, stop the test, and check the ice maker.

- 7. Remove the jumper before the fingers reach 10:00. Reinstall the ice maker, or be prepared to catch the water fill during step 8.
- 8. Disconnect power immediately after the water fill.
- 9. With the freezer door closed, reconnect the power supply.
- 10. Wait 5 seconds, to a maximum of 50 seconds, then open the freezer door, and watch the Status LED for one of the following codes.

Status LED Output Codes

4 PULSES, repeated once, indicates the relay is defective. Replace both the emitter and receiver boards.

3 PULSES, repeated once, indicates the optics and relay are okay, but the ice maker is not being sensed, or will not operate. If this happens:

- Check the bail arm switch to make sure it is On.
- · Check the ice maker circuit and the connections back to the receiver board and neutral.
- Check the ice maker components.

2 PULSES, repeated once, indicates the optics are blocked, or defective. Clear the optics path, and repeat the "Optics Diagnostics Procedure." Replace both boards, if necessary.

STEADY LIGHT for 5 seconds indicates the relay and optics are okay, and the receiver senses the ice maker.

NO LIGHT: Unplug the refrigerator for 5 seconds, and repeat the test.

TROUBLESHOOTING CHART A Original Optics Design

CORRECTIVE ACTION	Move ice maker slide control to ON (open).	Clean dirt from optics.	Realign ice bin cutouts with optics path.	Remove enough ice from bin to clear path.	Clean frost from lenses.	Tape emitter door closed and retest. If optics tests okay, the ice bin and/or its mounting are at fault.	Close freezer door and retest.	Replace emitter and receiver boards and retest.	Wait 5 minutes until "harvest" cycle is complete and retest.	Retest and view LED within 2 seconds of opening freezer door.	Close freezer door, wait for at least 5 seconds, and retest.	Correct wiring and retest.	Make sure ice maker is "parked." Unplug refrigerator for 5 seconds to reset optics control and retest.	Replace emitter and receiver boards and retest.	required.
POSSIBLE CAUSE	Ice maker slide control turned OFF (closed). Move	Ice maker slide control turned OFF (closed). Dirt on optics. Misaligned ice bin. Ice in bin blocking optics path. Frost on optics lenses. Ice bin not closing optics emitter door properly. Freezer door not completely closed during Optics Test. Failed optics.						Ice maker is in "harvest" cycle.	LED was not viewed within 2 seconds of Retes opening freezer door.	Freezer door was not closed for a minimum of Close 5 seconds before starting test.	Incorrect wiring at emitter or receiver board. Corre	Optics performing self-tests (will not Make perform diagnostic tests during this time).	LED is defective.	Ice maker control circuit is functioning normally. None required.	
RESULT	2 LED pulses, repeated.						5 second LED on steady.								
TEST	Optics Diagnostic Mode (optics test only) No L														

TROUBLESHOOTING CHART B 2002 Optics Design

TEST	RESULT	POSSIBLE CAUSE	CORRECTIVE ACTION
	2 LED pulses, repeated.	Ice maker slide control turned OFF (closed).	Move ice maker slide control to ON (open).
		Dirt on optics.	Clean dirt from optics.
		Frost on optics lenses.	Clean frost from lenses.
		Flapper door is open and is blocking the	Hold the emitter door closed, and the status LED should be
		emitter beam.	on steady.
		Failed optics.	Replace emitter and receiver boards and retest.
Optics Diagnostic Mode (optics test only)	No LED pulses.	Ice maker is in 5 minute "harvest" cycle.	To verify, press in on door switch. Status LED should flash at 1 second intervals.
		Incorrect wiring at emitter or receiver board.	Correct wiring and retest.
		Optics performing self-tests (will not perform diagnostic tests during this time).	Make sure ice maker is "parked." Unplug refrigerator for 5 seconds to reset optics control and retest.
		LED is defective.	Replace emitter and receiver boards and retest.
	5 second LED on steady.	5 second LED on steady. Flapper door is held closed.	Normal with flapper door closed.

TROUBLESHOOTING CHART C Component Diagnostics Mode

TEST	RESULT	POSSIBLE CAUSE	CORRECTIVE ACTION
	4 LED pulses, repeated once.	Defective emitter relay.	Replace emitter and receiver boards and retest.
		Ice maker in "home" position and bimetal is open.	Install jumper in ice maker holes "T" and "H" and retest.
		Ice maker bail arm switch in OFF position.	Bail arm not used in these models but switch must be ON.
		Ice maker is unplugged.	Plug in ice maker and retest.
-	o LED puises, repeateu.	Thermal fuse in ice maker harness is open.	Replace ice maker harness and retest.
Ice Maker Control		Incorrect wiring at emitter or receiver board.	Correct wiring and retest.
1100		Problem with ice maker.	See "Ice Maker Checks."
	2 LED pulses.	Optics boards defective.	Replace emitter and receiver boards and retest.
	5 second LED on steady.	Ice maker control circuit is functioning normally.	None required.
	No LED pulses.	Optics performing self-tests (will not perform diagnostic tests during this time).	Make sure ice maker is "parked." Unplug refrigerator for 5 seconds to reset optics control and retest.
		Optics check not run before testing ice maker.	Run optics test and recheck ice maker.
		Freezer door not closed after Optics test.	Close freezer door to start harvest.
		Optics path not clear.	Clear optics path.
	Ind power applied to ice Imaker module	Optics test failure.	Replace emitter and receiver boards and retest.
		Ice maker is unplugged.	Plug ice maker in.
		Thermal fuse in ice maker harness is open.	Replace ice maker harness.
		Wiring harness or door switch problem.	Check continuity in wiring harness and door switch.
	Ejector bar does not move.	Motor has failed.	Replace ice maker module.
Ice Maker Chacke	Heater is not on	Thermostat jumper not making contact.	Reposition jumper.
	ביינים יסונים יי	Heater has failed.	Replace ice maker.
		Thermostat jumper was left installed past 11:00 position.	Remove jumper by 10:00 position of ejector bar.
	No water fill.	Water valve is unplugged.	Connect harness to valve.
		Customer's water supply is problem.	Check for proper water supply.
		Frozen water fill tube.	Defrost the water fill tube and check for seeping valve.
		Water valve has failed.	Replace water valve.
	Ejector bar does not stop at "home" position.	Thermostat jumper not removed.	Remove thermostat jumper.

TROUBLESHOOTING THE MOTOR

AWARNING



Electrical Shock Hazard
Disconnect power before servicing.
Replace all panels before operating.
Failure to do so can result in death or electrical shock.

NOTE: Refer to the "Motor Failure Modes Chart" at the bottom of the page.

- 1. Motor does not hum or rotate.
 - a) 1, 2, 3, 5, 6.
 - b) Make sure refrigerator is plugged in.
 - c) Make sure freezer door is completely closed.
 - d) Make sure selection button is in UN-LOCK position.
 - e) Wait 1 minute after an ice jam occurs for motor's surge protector to automatically reset.

- f) Disconnect/reconnect the 6-pin harness to the motor 3 5 times to remove any oxidation buildup on the connector pins.
- g) Check power in the circuit (see "Checking The Switch Pack on page 5-14).
- 2. Motor hums but does not rotate.
 - a) Clear ice jam in ice bin.
 - b) Possible broken gear inside motor assembly.
- 3. Motor starts but heats rapidly.
 - a) 2, 3, 5.
- 4. Motor runs too hot after extended operation.
 - a) 3, 4, 6, 9.
- 5. Reduction in power—motor overheats. a) 2, 5, 6.
- 6. High no-load speed (30 RPM is nominal). a)2
- 7. Excessive noise (mechanical). a) 2, 7, 8.
- 8. Jerky operation—severe vibration. a) 2.

Motor Failure Modes Chart

- 1. Open circuit in connection to line (e. g. house fuse is blown or motor is defective).
- 2. Defective motor.
- 3. Overloaded motor (mechanical failure in load).
- 4. Ventilation blocked.
- 5. Wrong connection to motor.
- 6. Improper or low line voltage.
- 7. Poor alignment between motor and load (e. g. loose motor mounting).
- 8. Amplified motor noise due to mounting conditions.
- High ambient temperature.

AWARNING

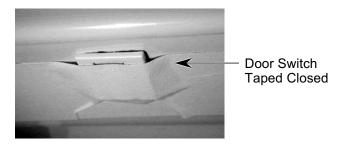


Electrical Shock Hazard Voltage is present during these tests.

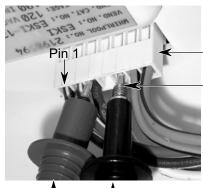
CHECKING THE MOTOR

To check voltages* at the motor for crushed or cubed ice operation:

- 1. Open the freezer door and remove the ice bucket from the door.
- 2. Tape the door switch closed.



* Voltage readings may vary, depending on the supply voltage, and the type of test equipment being used. NOTE: When you are instructed to make a reading at the motor connector, press the tips of the red and black test leads into the indicated harness connector slots so they touch the bare metal wire connectors. Reach around the front of the door and press the ice dispenser lever to activate the dispenser switch.



Motor Harness Connector

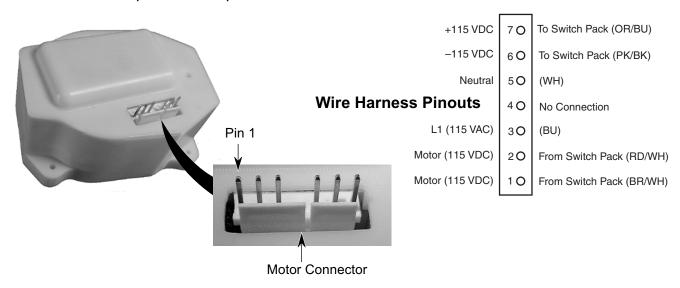
Press Tips Into Connector Slots Against Bare Wire Terminals To Check Voltages



Press The Ice / Dispenser Lever

- 3. Press the **Unlocked** button on the ice and water dispenser front panel.
- 4. Touch the AC meter test leads to wire harness pins 3 and 5, then press the ice dispenser lever. The meter should read 115 VAC.
- Touch the DC meter's black test lead to wire harness pin 6, and the red test lead to pin 7, then press the ice dispenser lever. The meter should read +115 VDC ±10%.
- 6. Press the **Crushed** ice button on the ice and water dispenser front panel.

- Touch the DC meter's black test lead to wire harness pin 1, and the red test lead to pin 2, then press the ice dispenser lever. The meter should read +115 VDC ±10%.
- 8. Press the **Cube** ice button on the ice and water dispenser front panel.
- Touch the DC meter's red test lead to wire harness pin 1, and the black test lead to pin 2, then press the ice dispenser lever. The meter should read +115 VDC ±10%.
- 10. Remove the tape from the door switch.



AWARNING

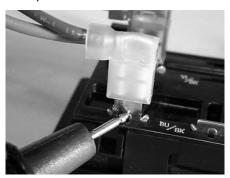


Electrical Shock Hazard Voltage is present during these tests.

CHECKING THE SWITCH PACK

To check voltages at the switch pack:

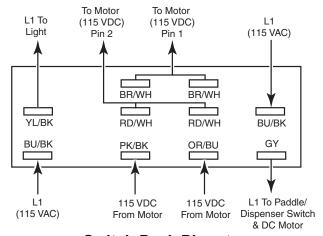
NOTE: All of the wires must be connected to the pins on the switch pack to obtain the following readings, including the wire to the pin being measured. Also, the freezer door light switch must be in the closed (taped down) position before performing any voltage checks. When measuring a voltage, lift the wire connector partially off the switch terminal, and touch the meter test lead probe to the terminal (see below).



- To check the Light On and Light Off switches, press the Light button on the ice and water dispenser front panel, and the dispenser housing light should turn on. If the light does not turn on:
 - a) Check switch pack pins BU/BK and YL/ BK using an AC voltmeter. The meter should read 115 VAC if the switch is open, or 0 VAC if the switch is closed.
 - b) Disconnect the BU/BK and YL/BK wires from the **Light** switch terminals. Check the switch continuity with an ohmmeter. The continuity should change when the **Light** switch is pressed on and off.

- The Locked/Unlocked switch allows AC voltage to be sent to the motor through the ice dispenser lever switch when it is in the Unlocked position. If the Unlocked switch is defective, the dispenser lever will not operate the motor. To check the switch:
 - a) Check pins BU/BK and GY using an AC voltmeter. The meter should read 115 VAC if the switch is open, (Locked), or 0 VAC if the switch is closed (Unlocked).
 - b) Disconnect the BU/BK and GY wires from the Lock/Unlocked switch terminals. Check the switch continuity with an ohmmeter. The continuity should change when the switch is changed from Locked to Unlocked.





Switch Pack Pinouts

- 3. To check to make sure that DC voltage is being supplied to the switch pack:
 - a) Press the **Unlocked** button.
 - b) Touch the DC voltmeter's black test lead to PK/BK and the red test lead to OR/BU, then press the ice dispenser lever. The meter should read +115 VDC ±10%.
- To check the **Crushed** and **Cube** ice switches:
 - a) Press the Unlocked and the Crushed buttons on the ice and water dispenser front panel.
 - b) Touch the DC voltmeter's black test lead to BR/WH and the red test lead to RD/WH, then press the ice dispenser lever. The meter should read +115 VDC ±10%.
 - c) Press the **Unlocked** and the **Cube** buttons on the ice and water dispenser front panel.

d) Touch the DC voltmeter's black test lead to RD/WH and the red test lead to BR/ WH, then press the ice dispenser lever. The meter should read +115 VDC ±10%.

AWARNING



Electrical Shock Hazard
Disconnect power before servicing.
Replace all panels before operating.
Failure to do so can result in death or electrical shock.

Continuity Tests

Refer to the chart below to perform the ice dispenser switch pack continuity tests. All of the tests are performed with power disconnected from the unit, and the wires disconnected from the terminals of the switch under test.

Switch Pack Setup	Continuity Readings
Light Interlock Switch With Switch Closed	Terminal BK to BU/BK
Ice Dispenser "Unlock" Selected	Terminal BU/BK to GY
Ice Lever Switch With Dispenser Pushed In	Terminal GY to BU
Dispenser Light Switch With Light On Selected	Terminal BU/BK to YL/BK
Crushed Ice Selected	Terminals OR/BU to RD/WH
	& PK/BK to BR/WH
Cubed Ice Selected	Terminals OR/BU to BR/WH
	& PK/BK to RD/WH

AWARNING

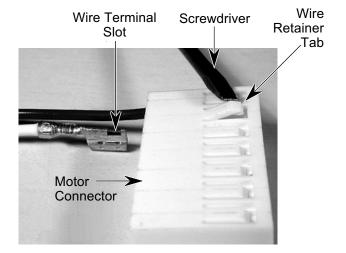


Electrical Shock Hazard
Disconnect power before servicing.
Replace all panels before operating.
Failure to do so can result in death or electrical shock.

SERVICING THE HARNESS & MOTOR CONNECTOR

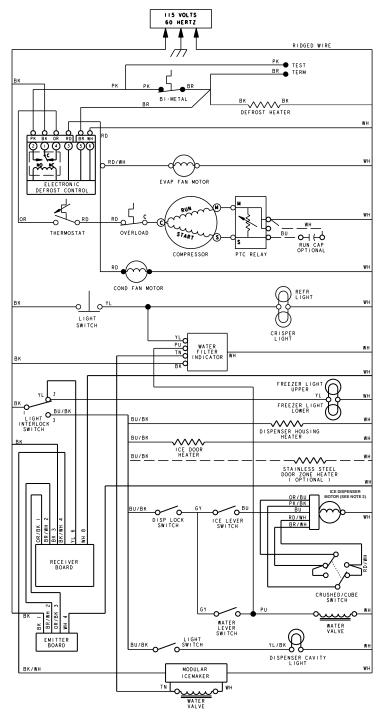
Both the motor connector and the wire harness are serviceable. To remove a wire from the motor connector:

1. Use a small screwdriver or knife and lift the wire retainer tab far enough to slide the wire terminal out of the connector. 2. To install a wire terminal, position the terminal with the slot facing the retainer tab, and slide it into the connector. Press down on the retainer tab to lock it in place.



WIRING DIAGRAMS & STRIP CIRCUITS

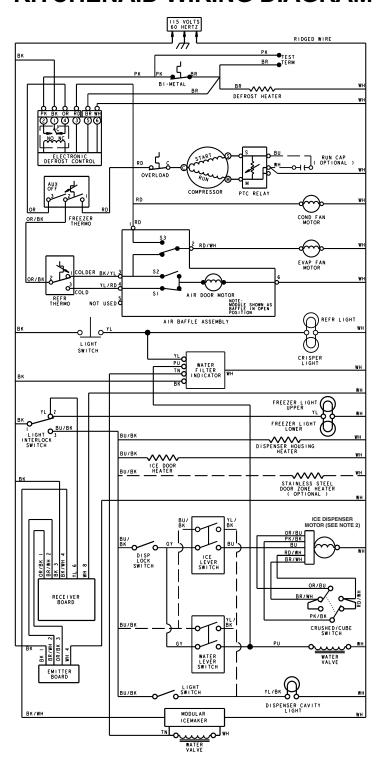
WHIRLPOOL WIRING DIAGRAM



- 1. Freezer door is open, ice dispenser selection in Cubed mode, and dispenser lock switch in Locked position.
- 2. The dispenser has a built-in inverter board which converts the 115 VAC to 115 VDC. The OR/BU wire is the positive (+) side of the DC signal, and the PK/BK wire is the negative (-) side. The BR/WH and RD/WH wires switch polarity, depending on the crushed/cubed switch position, (see the following table).

	BR/WH	RD/WH
Crushed	_	+
Cubed	+	_

KITCHENAID WIRING DIAGRAM

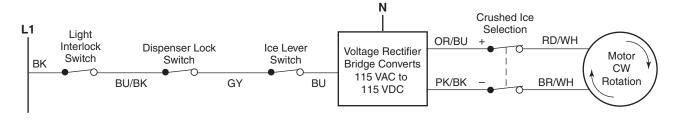


- 1. Freezer door is open, ice dispenser selection in Cubed mode, and dispenser lock switch in Locked position.
- 2. The dispenser has a built-in inverter board which converts the 115 VAC to 115 VDC. The OR/BU wire is the positive (+) side of the DC signal, and the PK/BK wire is the negative (–) side. The BR/WH and RD/WH wires switch polarity, depending on the crushed/cubed switch position, (see the following table).

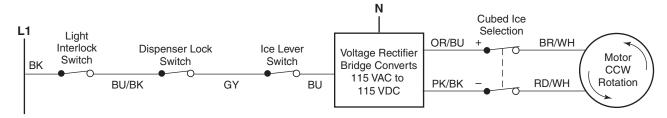
	BR/WH	RD/WH
Crushed	_	+
Cubed	+	_

STRIP CIRCUITS

CRUSHED MODE

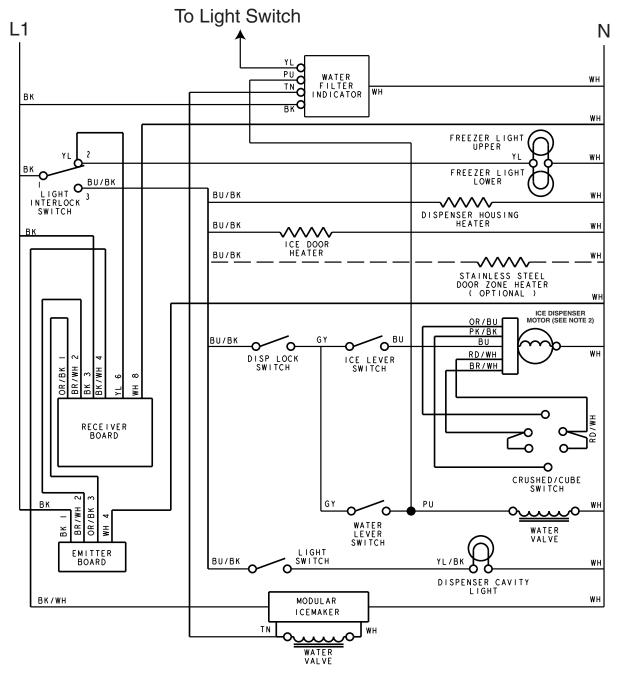


CUBED MODE



CONFIRMATION OF LEARNING EXERCISES

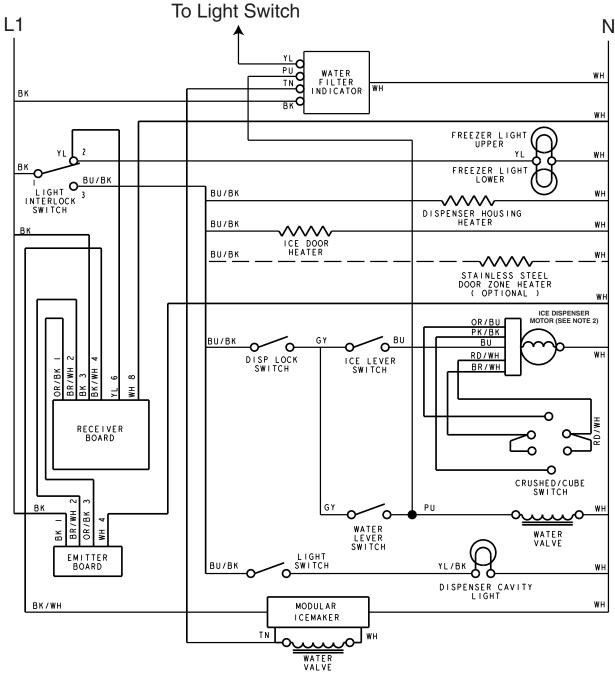
1. Trace the circuit for the crushed ice operation by closing the necessary switches. Refer to the Wiring Diagram NOTES at the bottom of the page.



- 1. Freezer door is open, ice dispenser selection in Cubed mode, and dispenser lock switch in Locked position.
- 2. The dispenser has a built-in inverter board which converts the 115 VAC to 115 VDC. The OR/BU wire is the positive (+) side of the DC signal, and the PK/BK wire is the negative (–) side. The BR/WH and RD/WH wires switch polarity, depending on the crushed/cubed switch position, (see the following table).

	BR/WH	RD/WH
Crushed	_	+
Cubed	+	_

2. Trace the circuit for the cubed ice operation by closing the necessary switches. Refer to the Wiring Diagram NOTES at the bottom of the page.



- 1. Freezer door is open, ice dispenser selection in Cubed mode, and dispenser lock switch in Locked position.
- 2. The dispenser has a built-in inverter board which converts the 115 VAC to 115 VDC. The OR/BU wire is the positive (+) side of the DC signal, and the PK/BK wire is the negative (–) side. The BR/WH and RD/WH wires switch polarity, depending on the crushed/cubed switch position, (see the following table).

	BR/WH	RD/WH
Crushed	_	+
Cubed	+	1