

CD450

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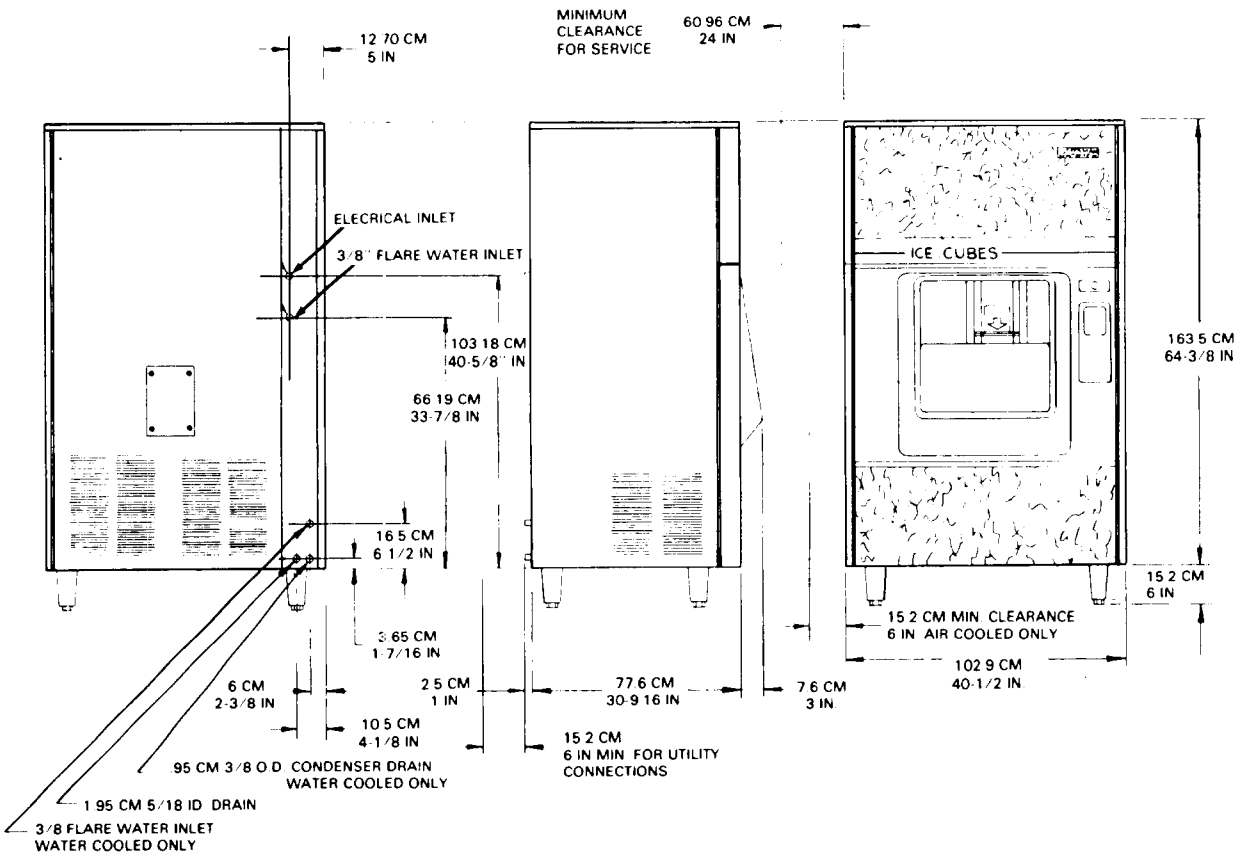
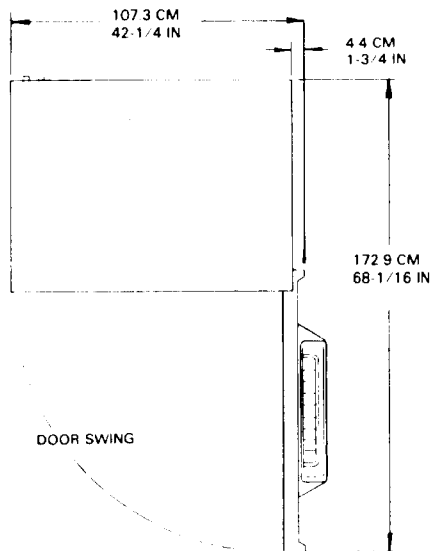
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This icemaker has been engineered to our own rigid safety and performance standards. The National Sanitation Foundation (NSF) seal, signifies that it is listed with the NSF and that it complies with the materials and construction standards of the NSF. In addition, the Underwriters Laboratories, Inc., (UL) Listing Mark signifies that its construction and design have been inspected and tested by them. NSF and UL inspectors also periodically examine production icemakers at the factory, to assure continued compliance.

To retain the safety and performance built into this icemaker, it is important that installation and maintenance be constructed in the manner outlined in this manual.

SPECIFICATIONS MODEL CD450



SPECIFICATIONS (Cont'd)

MODEL CD450

MODEL CD450

Bin Storage: 150 lbs.
 Air-Cooled Model: CD450MA-1A
 Water-Cooled Model: CD450WA-1A
 Electrical: 115/60/1
 Est. Ship. Wt.: 600 lbs.

OPTIONAL LEG KIT

KLP2E: 6-inch metal legs, Black Enamel.
 KLP2S: 6-inch metal legs, Nickel Plated.

OPTIONAL KITS

KLACD20: Low ambient heater.

A27654-001: Portion plate kit, converts ice portion dispensed from 1-3/4 lbs. to 1-1/8 or 7/8 lbs.

EASY ACCESS SERVICE PANELS

OPTIONAL KITS

KCM4: Includes SCOTSMAN coin mechanism, front access security lock, coin box, faceplate and SOLD OUT indicator light. Single quarter dispense.

KCM5: Adapter Kit only, to mount COIN MECHANISM, Inc. 25¢, 50¢, 75¢ accumulator Model 2022-30-C3, or non-accumulator Model 2022-30-C4. Includes faceplate, relay box, electrical circuit for coin block solenoid, labels. Coin mechanisms purchased from COIN MECHANISMS, Inc., not from SCOTSMAN.

KKM1: Key operated kit: includes faceplate, cylinder holder and SOLD OUT indicator light.

MODEL NUMBER	MOTORS	VOL.'S	HP/WATT	FLA	LRA
SERIAL NUMBER	COMP				
	DRIVE				
REFRIGERANT 12 OZ.	FAN				
HEATER WATTS	OTHER				
TEST PRESSURE 140 LO - 235 HI					
A.C. SUPPLY VOLTAGE			WIRES	CYCLES	PHASE
MAXIMUM FUSE SIZE	AMPS	MINIMUM CIRCUIT CAPACITY			
QUEEN PRODUCTS DIVISION A DIVISION OF KST THERMO KING 5100 INDUSTRIAL BLVD. • BERTHA, MN 55007					

SEE NAMEPLATE shown at left, located on upper left part of rear panel, for electrical and refrigeration specifications.

Open Upper Door Assembly to locate the Model Serial Number plate, shown below, on the chassis front left vertical upright panel, just below the ON-OFF toggle switches.

MODEL NUMBER	QUEEN PRODUCTS DIVISION A DIVISION OF KST THERMO KING 5100 INDUSTRIAL BLVD. • BERTHA, MN 55007
SERIAL NUMBER	

We reserve the right to make product improvements at any time. Specifications and design are subject to change without notice.

SECTION I

GENERAL INFORMATION & INSTALLATION

I. INTRODUCTION

This manual provides the specifications and the step-by-step procedures for the installation, start-up, operation, and the maintenance and cleaning for the SCOTSMAN Model CD450 Cube Ice Dispenser.

The Model CD450 Cube Ice Dispensers are quality designed, engineered and constructed, and thoroughly tested icemaking and dispensing systems, providing the utmost in flexibility to fit the needs of a particular user. Separate sections detail more specifically: General Information & Installation; Start Up Operation; Principles of Operation; Adjustment and Removal and Replacement Procedures; Maintenance and Cleaning Instructions; Service Diagnosis; Wiring Diagrams; and, the Illustrated Assemblies and Parts Lists.

All Model CD450 Cube Ice Dispensers are shipped from the factory with a Push Button Switch installed and a full Cover Plate covering the opening in the Sink and Dispenser panel, to the right of the Ice Chute. Three optional kits are available and any kit(s) ordered will be shipped with the Dispenser, to be installed at the time selected by the user and location service personnel, in accordance with kit installation instructions.

DESCRIPTION

An attractive cabinet of Sandalwood enamel finish, cork pattern vinyl upper Door and lower Door bottom panel and a Sienna Accent strip on the upper Door. Also, an optional stainless steel cabinet finish is available. Both cabinets have up-to-date styling and easily removable panels for easy access to electrical and mechanical components.

SEALED REFRIGERATION SYSTEM

To provide quiet efficient operation of the icemaker, Compressor motor is internally spring-mounted. The Compressor motor is covered by a five year warranty.

SELF-CONTAINED STORAGE BIN

These Dispensers store their own ice supply in a specially designed rotor bin and automatically dispenses a controlled portion of SCOTSMAN ice cubes through a transparent sealed ice delivery chute by gravity, upon demand by push button, key or coin operation.

OVERALL DIMENSIONS

The standard overall dimensions of the Dispenser depth, height, etc., allows the

Dispenser to be installed in harmony with the existing counter equipment.

II. UNPACKING AND INSPECTION

1. Call your authorized SCOTSMAN Distributor or Dealer, for proper installation. He's listed under ICE MAKING EQUIPMENT AND MACHINERY in the Yellow Pages of the telephone book.
2. Visually inspect the exterior of the shipping container and skid and any severe damage noted should be reported to the delivery carrier; and a concealed damage claim filed subject to internal inspection, with the carrier representative present.
3. Remove shipping tape from doors, panels and grill, removing plug lock keys and 5/16-inch Allen hex key for unlocking and removing Left Side Panel.
4. Unlock and remove both plug locks from upper part of the Left Side Panel; then, insert the 5/16-inch Allen hex key in the front hex socket screw and rotate the hex-key 1/2-turn COUNTERCLOCKWISE, to UNLOCK position.
5. Use the Allen hex key to remove the rear hex socket screw; then, pull open the left end of the Upper Door and next pull top of the Left Side Panel out slightly and LIFT the Panel UP and OFF of the alignment pins, at the bottom of the Cabinet and remove the Panel.
6. Unscrew two Wing Screws located behind the vertical front panel part of the Chassis, which attach the left end of the Upper Door and Lower Door assemblies to the Chassis. Rotate both doors to OPEN, left to right.
7. Remove all internal support packing and shipping tape and inspect for any concealed damage. Notify carrier of any concealed damage claims, as stated in step 2, above.
8. Check that refrigerant lines do not rub or touch lines or other surfaces, and that fan blades, if any, move freely.
9. Check that the Compressor is snug on all mounting pads.
10. Use clean damp cloth or disposable paper wiper to wipe clean all interior surfaces of the Dispenser and the exterior surfaces of the Cabinet.
11. SEE NAMEPLATE located on the upper left rear vertical panel part of the Chassis, just above the inlet water tube fitting and check that the location source voltage corresponds with the voltage specified on the nameplate.

CAUTION

Improper voltage supplied to the icemaker will void your parts replacement program.

12. Fill in all spaces in the Manufacturer's Registration Card including: Model Number and Serial Number taken from Model-Serial Nameplate located on the upper part of the vertical front panel part of the Chassis. Forward the completed, self addressed, registration card to the SCOTSMAN factory.

III. LOCATION AND LEVELING

CAUTION

This Cuber Dispenser is NOT designed for outdoor installations where air temperatures are below 50-degrees F., or above 100-degrees F. and the water temperature is below 40-degrees F. or above 100-degrees F. Extended periods of operation at temperatures exceeding these limitations will constitute misuse, under the terms of the SCOTSMAN Manufacturer's limited warranty, resulting in LOSS of warranty coverage.

1. Position the Dispenser in the selected permanent location.

NOTE

Prior consideration for location site shall include:

1. Minimum room temperature 50-degrees F. and maximum room temperature 100-degrees F.
2. Water inlet temperatures: Minimum 40-degrees F. and Maximum 100-degrees F.
3. Well ventilated location for Air-Cooled model, advising user to frequently clean Condenser, located directly behind the Sink Assembly.
4. SERVICE ACCESS: Adequate space for all service connections, through the rear of the Cabinet. A six-inch minimum clearance at rear, side and front louvered panels, for routing cooling air drawn into and exhausted out of the compartment, to maintain proper condensing operation on Air-Cooled Models. A 15-inch clearance at the LEFT side for service access.

2. Level the Dispenser in both the left-to-right and front-to-rear directions.

IV. ELECTRICAL CONNECTIONS

WARNING

This icemaker-dispenser requires a SOLID EARTH GROUND that meets the national, state and local electrical code requirements. To prevent possible SEVERE ELECTRICAL SHOCK INJURY to individuals, or extensive

damage to equipment, install an approved SOLID EARTH GROUND wire to the icemaker-dispenser. SEE wiring diagram.

SEE NAMEPLATE for current requirements to determine wire size to be used for electrical hookup.

Be certain the Dispenser is connected to its own electrical circuit and individually fused. The maximum allowable voltage variation should not exceed ten percent of the nameplate rating, even under starting conditions. Low voltages can cause erratic operation and may be responsible for serious damage to the overload switch and motor windings.

All external wiring should conform to the national, state and local electrical code requirements. Usually an electrical permit and services of a licensed electrician will be required.

V. WATER SUPPLY AND DRAIN CONNECTIONS

A. AIR-COOLED MODELS: The recommended supply line is 3/8-inch O.D. copper tubing. Connect to cold water supply line with standard plumbing fittings, with a shutoff valve installed in an accessible place between the water supply and the Dispenser.

Install the optional mesh strainer with the cleanout plug down. Locate the strainer in the water supply line, between the shutoff valve and the Dispenser with the arrow on the strainer, in the direction of the water flow. The strainer protects against large particles of rust, scale, etc., which may be loosened in the water supply pipe, at the time of installation.

CAUTION

DO NOT operate this unit when the water supply is OFF, or is below 20 PSI, the recommended water pressure. Position the Master Switch to the OFF position, until proper water supply is resumed.

The Icemaker in this Dispenser will not operate properly when water supply temperatures are below 40-degrees F. or above 100-degrees F.

B. WATER-COOLED MODELS: On Water-Cooled models a separate connection, to the Condenser is required. A 3/8 inch O.D. copper tubing is provided for a separate water inlet line to be connected and a separate drain line to be connected.

NOTE

The WARNING in the text above for the Air-Cooled models equally applies for the Water-Cooled models. In both type installations, water supply must be installed to conform with local plumbing codes. In some cases, a plumbing permit and services of a licensed plumber will be required.

C. DRAIN CONNECTIONS: All drains are gravity type and must be 1/4-inch fall per foot on horizontal runs. The drains to be installed to conform with local code. The drain receptacle should be an open, trapped or vented construction.

Recommended Bin drain is 5/8-inch O.D. copper tubing, should be vented and run separately. Run a separate drain line to 3/8-inch O.D. drain tube from the Water-Cooled Condenser, on Water-Cooled models.

VI. OPTIONALS — KIT INSTALLATION

Install kits ordered with the Model CD450:

1. KCM5 — When installed, converts CD450 into a coin-operated ice dispenser. All parts included in Kit except the Coin Mechanism, order from:

COIN MECHANISM, INC.
817 Industrial Drive
Elmhurst, Ill. 60126
(312) 279-9150

Select one of two Coin Mechanisms listed below:

P/N 2022-30-C4: A 24-volt Coin Mechanism WITHOUT ACCUMULATOR. Single quarter dispense.

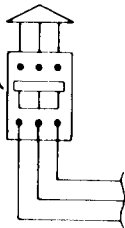
P/N 2022-30-C3: A 24-volt Coin Mechanism WITH ACCUMULATOR. Multiple quarter dispense.

2. KCM4 — When installed, converts CD450 into a coin-operated ice dispenser, requiring a single quarter. All parts included in the Kit, including coin mechanism.
3. KKM1 — When installed, converts CD450 into a key-operated ice dispenser, such as a motel key. All parts included in the kit, except the Key Cylinder and Key, furnished by motel.
4. KLACD20: Low ambient heater.
5. A27654-001: Portion plate kit, converts ice portion dispensed from 1-3/4 lbs. to 1-1/8 or 7/8 lbs.

VII. FINAL CHECK LIST

1. Is the Dispenser level? (IMPORTANT)
2. Is the Dispenser in a room where ambient temperatures are a minimum of 50-degrees F. all year around?
3. Is there at least six inches clearance behind and around the cabinet for proper air circulation? And 15 inches clearance on LEFT side for service access?
4. All shipping tape, support packing, etc., been removed?
5. Have all kits, if any, been installed and tested?
6. Have all electrical and piping connections been made?
7. Has the electrical power supply wiring been properly connected and the voltage tested and checked against the nameplate rating? Has proper Chassis-to-earth ground been installed?
8. Is the water supply line shutoff valve installed and opened and has the inlet water supply pressure been checked to ensure a minimum of 20 PSIG?
9. Have the Compressor hold down bolts been checked to be sure the Compressor is snug on the mounting pads?
10. Check all refrigerant lines and conduit lines to guard against vibration and possible failure?
11. Has the Dispenser been wiped clean, with clean damp cloth or disposable paper wipers, including the storage bin?
12. Has the owner/user been given the User Manual and instructed on how to operate the icemaker-dispenser and the importance of periodic maintenance?
13. Has the owner/user been given the name and telephone number of the Authorized SCOTSMAN Distributor or Service Agency serving him?
14. Has the Manufacturer's Registration Card been properly filled out? Check for correct Model and Serial Numbers from nameplate; then, mail the completed card to the SCOTSMAN factory.

HAND DISCONNECT SWITCH



TO CONTROL BOX

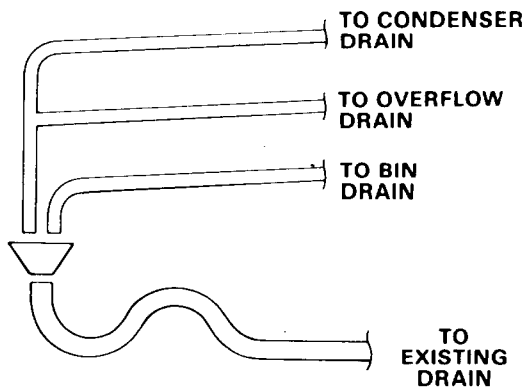
HAND SHUTOFF VALVE

WATER SUPPLY IN

OPTIONAL WATER STRAINER (CLEANOUT PLUG DOWN)

TO WATER INLET CONNECTION

DRAIN LINES



OPEN, TRAPPED OR VENTED DRAIN. RECOMMENDED 1/4-INCH FALL PER FOOT OF RUN ON DRAIN LINES.

WARNING

THIS ICEMAKER IS NOT DESIGNED FOR OUTSIDE INSTALLATION AND WILL NOT OPERATE IN AMBIENT TEMPERATURES BELOW 50-DEGREES F., NOR ABOVE 100-DEGREES F.

THIS ICEMAKER WILL NOT OPERATE WHEN WATER TEMPERATURES ARE BELOW 40-DEGREES F., NOR ABOVE 100-DEGREES F.

77 116A

Figure 1-1. Installation Practice.

SECTION II

OPERATING INSTRUCTIONS

I. START UP

1. Unlock and remove Lock Plugs, two places, at the top of the Left Side Panel.
2. Using Allen wrench provided, remove the Hex Socket Screw inside the top left hole, in the top of the Left Side Panel. The Screw will remain inside after it is unscrewed.
3. Rotate Allen wrench provided, 1/4-turn COUNTERCLOCKWISE, to unlock the right top part of the Left Side Panel.
4. Pull the top of the Left Side Panel OUT slightly, away from the Cabinet, then lift the Panel UP and OFF of the two alignment pins in the Cabinet, at the bottom.
5. Pull out the left end of the Upper Door Assembly, and rotate the Door to OPEN, left to right.
6. Unscrew two Wing Screws located behind the vertical front panel part of the Chassis, attaching the Lower Door Assembly to the left side of the Cabinet; then, rotate the Door to OPEN, left to right.
7. OPEN the water inlet line shutoff valve.
8. Check that the Master ON-OFF toggle switch and the Compressor ON-OFF toggle switch are OFF, on the front, upper left panel strip of the Chassis.
9. Rotate the shaft of the Timer & Switch Assembly, protruding through the hole in the front Cover of the Control Box, CLOCKWISE, to start the Timer for filling the reservoir sump, in the Freezing Chamber, with water. The control Box is located in the front, left lower section of the Chassis, to the left of the Drivemotor.

NOTE

Slowly rotate the shaft CLOCKWISE, until the actuator arm on the microswitch drops off of the outer cam, into the cam slot. An audible click can be heard, but in a noisy area, look at the cam and switch to observe the event. See A, Figure 2-1.

10. Move the Master ON-OFF toggle switch, to the ON position.

NOTE

Observe that the Water Inlet Solenoid Valve OPENS and inlet water flows from the valve through tubing to the top of the Freezing Chamber, where the water flows around the inverted ice cube cups and drains through holes in the Platen Assembly and into the Reservoir. Excess water in the Reservoir is overflowed through the stand pipe. This cycle will take about three minutes, then the Timer will CLOSE the Water Inlet Solenoid Valve.

11. Repeat step 9.

NOTE

During START UP, advancing two harvest cycles, with the Compressor OFF, allows a check that: the Water Inlet Solenoid Valve operates; the inlet water can be observed flowing; the Reservoir is filled in the preparation for the freezing cycle, and; checks the function of the overflow and drain.

12. When the second harvest cycle is completed, move the COMPRESSOR ON-OFF toggle switch to the ON position.
13. Check that the ends of all the plastic parts of the Curtain Assembly hang down and do not swing back inside the freezer, blocking ice cubes or catching and stopping spray bar.
14. Check operation of the Freezing Cycle:
 - a. Compressor is in operation.
 - b. Agitator Drive Motor Assembly is operating and the Spray Bar oscillates back and forth.

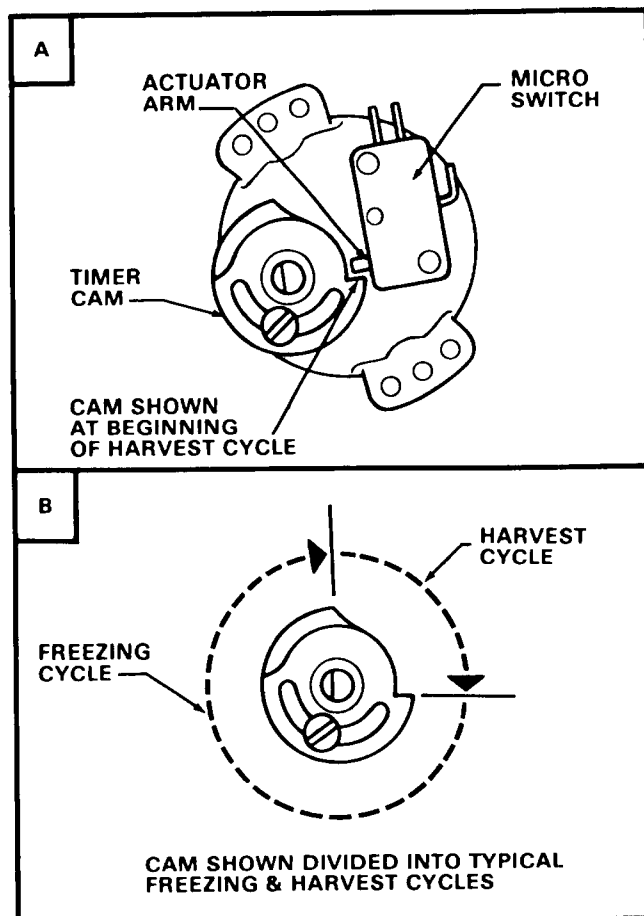


Figure 2-1. Timer Cam Positions.

- c. Water Pump is operating and water is being sprayed through the nozzles on the oscillating Spray Bar, into the inverted ice cube cups. Check that there are no plugged nozzles.
- d. Icemaking process begins: feeling inside ice cube cups reveals cold temperatures and very shortly ice begins to form.

NOTE

Freezing time, in a 70-degree F. ambient atmosphere, will range between 16 to 22 minutes. Longer time, for temperatures above 70-degrees F. and shorter time required when temperatures are below 70-degrees F. Average complete cycle range is about 18 to 24 minutes.

WARNING

DO NOT operate this Icemaker when the water supply is shut OFF, or is BELOW the recommended 20 PSIG water pressure. Move the Master ON-OFF toggle switch to OFF, immediately.

15. Observe first ice cube harvest:

NOTE

Normal cube size is with a one-quarter inch depression in the crown.

Check texture of ice cubes: when partially cloudy throughout, suggests icemaker operating short of water, near end of freezing cycle, or possibly an extreme problem water condition, wherein filtering or purifying equipment is recommended. Contact SCOTSMAN — Queen Products Division, Service Department, Albert Lea, Minnesota, for further details.

16. With the icemaker in the Harvest Cycle, hold ice against the Bin Thermostat Control bulb to test shutoff, which should cause the icemaker to shut OFF at the end of the Harvest Cycle.

NOTE

Within minutes after the ice is removed from the sensing bulb, the bulb will warm up and cause the icemaker to restart. This control is factory set and should not be reset until testing is performed. Normal setting is about 35-degrees F. CUT-OUT and 39-degrees F. CUT-IN.

17. Install refrigerant service gauges on the high side and low side Schrader valve fittings and check the Compressor head pressure and back pressure.

NOTE

Compressor head pressure after 20 minutes of Freezing Cycle, at 70-degrees F. ambient temperature, will be about 135 PSIG. The back pressure equalizes during hot gas defrost and gradually pulls down to about four PSIG, just before Harvest cycle. Higher ambient temperatures and dirty Condenser will cause higher pressure.

18. Remove refrigerant service gauges; then, replace panels and close all doors.
19. Thoroughly explain to the owner/user the significant specifications of the Icemaker, the start up and operation, going through the procedures in the operating instructions. Answer all questions about the Icemaker, by the owner; and, inform the owner of the name and telephone number of the authorized SCOTSMAN Distributor, or Service Agency serving him.

SECTION III

PRINCIPLES OF OPERATION — How It Works

I. FREEZING CYCLE

Water from the sump in the Reservoir is pumped through the oscillating Spray Bar Assembly, which consists of a spray bar and 12 jets, through which water is sprayed into the inverted cube molds of the Freezer Assembly Evaporator. See Figure 3-1. At the beginning of the Freeze Cycle the electrical circuit is completed to the Compressor, Water Pump, and the coil of the Finish Relay. The Water Pump operates continuously during the Freeze cycle through contacts of the Finish Relay. In Water-Cooled models water also flows through the Condenser and out the drain. While in the Condenser water removes heat from the refrigerant and allows the refrigerant to condense from a gas to a liquid.

Refrigerant is compressed in the Compressor and discharged into the Condenser as a high pressure, high temperature gas. The refrigerant is cooled and condensed by either air or water and condenses to a high pressure, high temperature liquid. This liquid refrigerant then passes through a small capillary tube where the temperature and pressure of the liquid refrigerant are lowered. The low

pressure, low temperature liquid refrigerant, then enters the Evaporator. The refrigerant is warmed by water being sprayed against the Evaporator and begins to boil off, to become a gas. The refrigerant next travels through the Accumulator where any remaining liquid refrigerant then returns to the Compressor as a low pressure, low temperature gas and the cycle starts again.

During the Freezing Cycle, both the Water Inlet Solenoid Valve and the Hot Gas Solenoid Valve are CLOSED.

When the ice cubes are about 3/4 formed, the Cube Size Control Bulb located on the suction line will sense the temperature at which it is preset to CLOSE. This will complete the electrical circuit to the Timer. The Timer then controls the remainder of the cycle.

The Timer will keep the Icemaker operating in the Freeze Cycle for the next six minutes. This will give the cubes time to fully form. After six minutes, the timer will switch the Icemaker into the Harvest Cycle, through the contacts of the Timer Assembly microswitch.

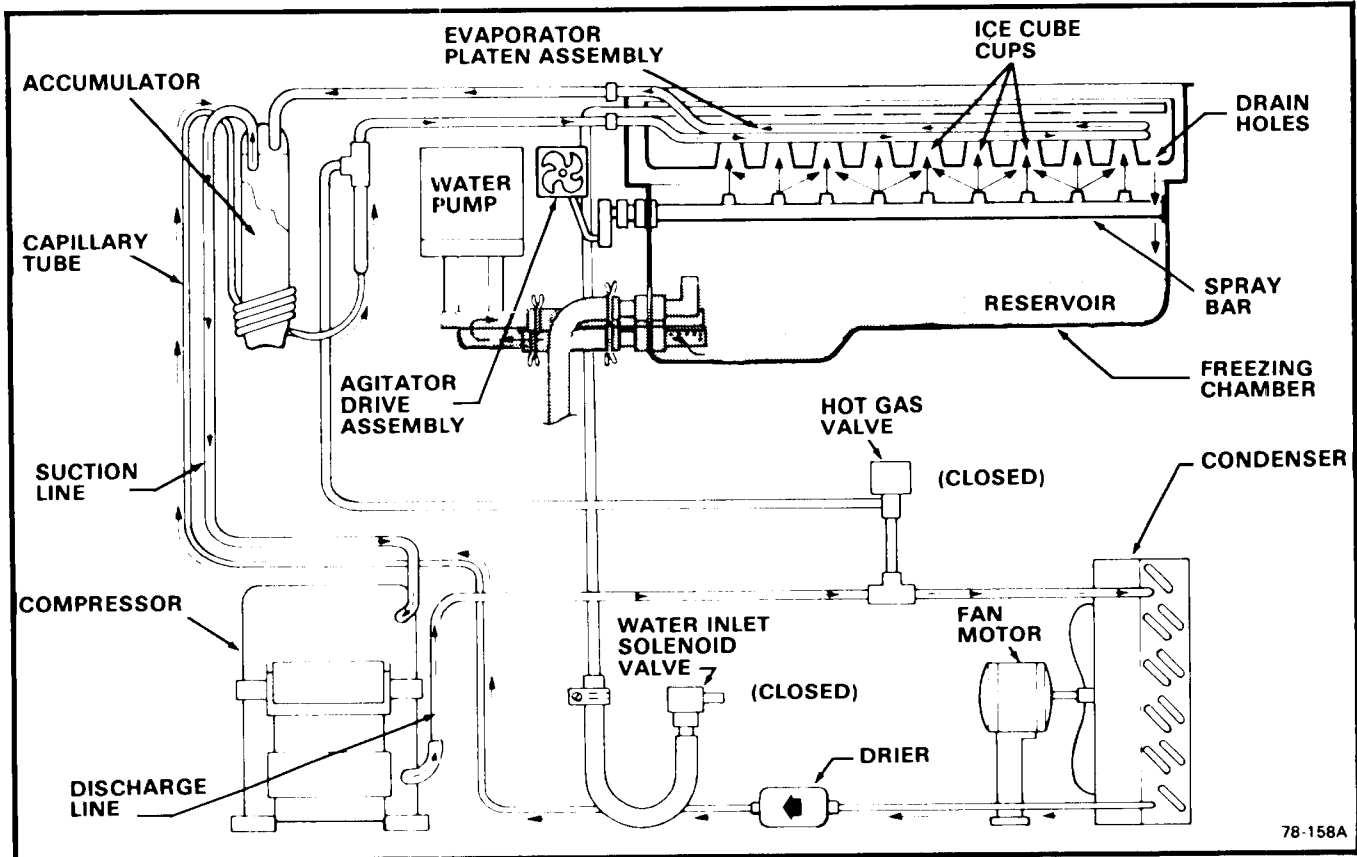
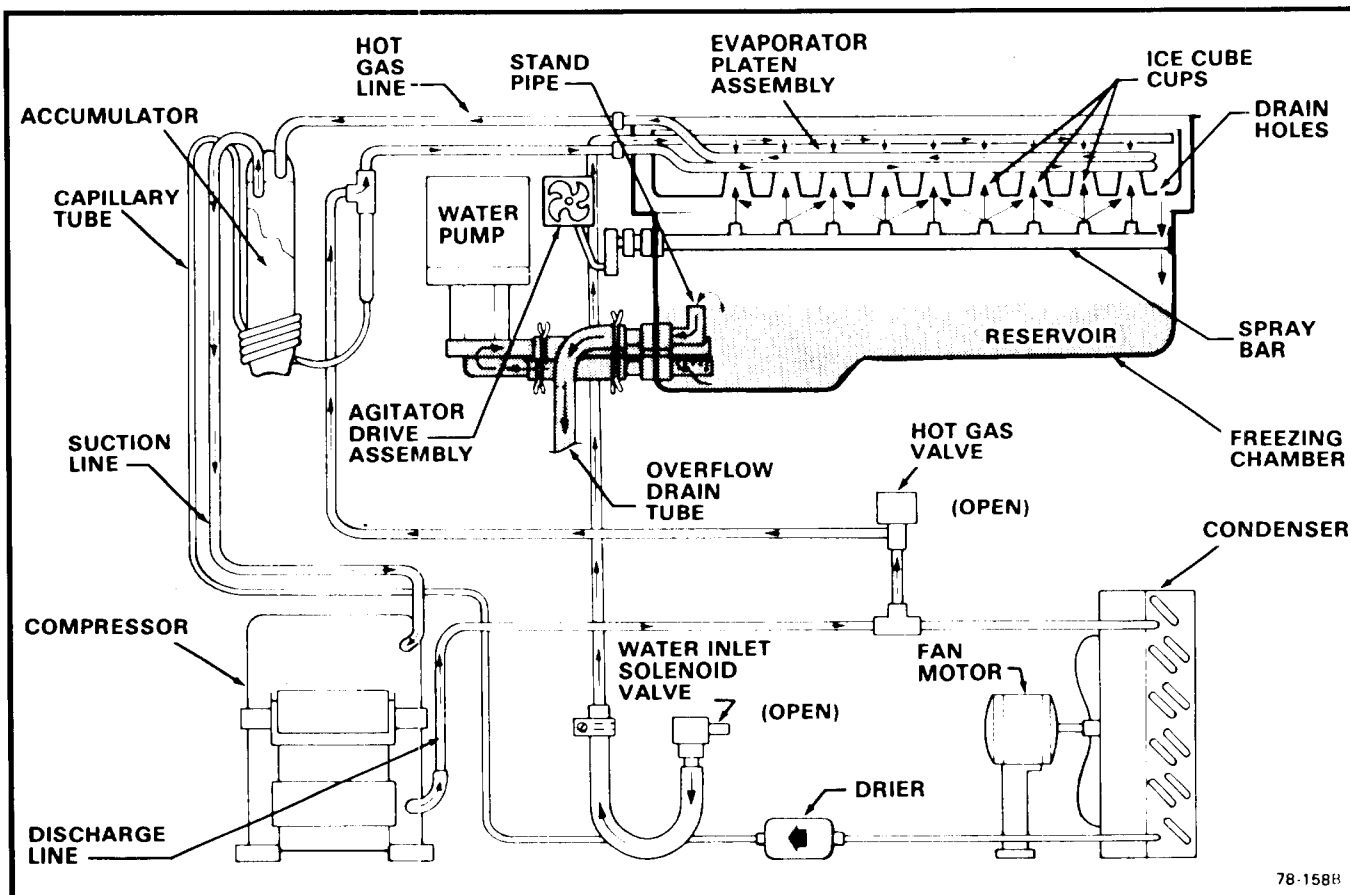


Figure 3-1. Freezing Cycle



78-158B

1. On Air-Cooled Models, the Water Pump Motor and Fan Motor may cycle intermittently during the Harvest Cycle.
2. On Water-Cooled Models, the Water Pump Motor is OFF during the Harvest Cycle.

Figure 3-2. Harvest Cycle.

II. HARVEST CYCLE

When the Timer switches the Icemaker into the Harvest Cycle, hot gas being discharged from the Compressor is diverted through the Hot Gas Solenoid Valve into the Evaporator. During this cycle, the hot gas circulates from the Compressor to the Evaporator and back again, bypassing the Condenser and capillary tube. In the electrical circuit, the Compressor is operating and both the Water Inlet Solenoid Valve and the Hot Gas Solenoid Valve are energized.

See Figure 3-2. Opening the Water Inlet Solenoid Valve allows a fresh water supply to be discharged into the top of the Platen Assembly. The finished ice cubes are released from the Evaporator by the warming effect of the hot gas flowing through the Evaporator tubes and the water flow around the ice molds. The released ice cubes drop onto the slanted Front Cube Chute and into the ice storage bin. At the end of the two minute Harvest Cycle, the Timer cam will push the actuator arm of the microswitch IN. IF the Bin Thermostat is still

CLOSED, a whole new cycle will begin. If the Bin Thermostat is OPEN, the Icemaker will shut OFF at this time.

III. DISPENSING SYSTEM

A. **STANDBY** — In the STANDBY mode the refrigeration system is in automatic operation, ice is being made and deposited in the ice storage Bin; or, the bin is filled with ice and the icemaking system is shutdown. The electrical circuit in the 24-volt dispensing control circuit has Cam-1 switch OPEN. Relay-C is not energized and the Door safety switch is CLOSED, which makes 24-volts available to the Vend Circuit.

B. **ICE DISPENSE** — Pushbutton: when the pushbutton is pushed IN, CLOSING the contacts of the VEND Switch, contacts 6-2 of Relay-C are energized and CLOSE, which starts the Bin Rotor Drivemotor. As the Rotor turns, Cam-1 switch CLOSES providing a carryover cycle for the Drivemotor so it is no longer necessary to keep the VEND pushbutton pushed IN.

Ice is deposited in the Ice Delivery Chute. If the Ice Delivery Chute is not immediately pushed down, to dispense the ice, the Bin Rotor will continue to turn past the ice chute opening, then STOP, in the STANDBY mode.

If, at any time during the Dispense Cycle, the Ice Delivery Chute is OPENED, thereby OPENING the Door Safety Switch, the rotating of the Bin Rotor will be STOPPED and remain STOPPED until the Ice Delivery Chute is returned to the CLOSED position.

C. ICE DISPENSE — Coin Operated/KCM5 Kit: With the KCM5 Kit installed, the Coin Mechanism is equipped with a 24-volt Coin Block solenoid.

The FREE VEND toggle switch, on the Relay Box included in the Kit, must be in the COIN OPERATION position.

When a coin is inserted into the Coin Mechanism the Coin switch is momentarily actuated, causing Relay-D to be pulsed, CLOSING Contacts 4-7, holding Relay-7 in the energized position through Cam-2 switch on the Drivemotor. This also CLOSES Contacts 3-9 of the Relay-D, which energizes and CLOSES 2-6 of Relay-D energizing the Drivemotor, rotating the Bin Rotor, and as Cam-1 switch CLOSES it provides a carryover cycle for the Drivemotor, after which Cam-2 switch OPENS dropping out Relay-D, removing the coin credit.

As the Bin Rotor continues to rotate, ice is deposited in the Ice Delivery Chute, the Rotor turns until Cam-1 switch is OPENED, ending the Dispense Cycle.

NOTE

1. If, in the very short period of time after the coin is inserted into the Coin Mechanism, and before Cam-1 switch CLOSES, the Ice Delivery Chute door is OPENED, thereby removing electrical power from the Vend circuit, credit will be lost and NO ICE will be dispensed.
2. If electrical power is removed from the CD450, the Coin Block solenoid is DE-ENERGIZED, thereby preventing the Coin Mechanism from accepting coins.
3. When the FREE VEND switch is in the COIN OPERATION position, the Vend switch is electrically removed from the Vend circuit. With the FREE VEND switch in the FREE VEND position, the Vend switch will be functional, without the use of coins or key.

D. ICE DISPENSE — Coin Operated/KCM4 Kit: The principles of operation are the same as for the KCM5 Kit installation, EXCEPT, NO COIN BLOCK solenoid is provided with the KCM4 Kit.

E. ICE DISPENSE — Key Operated/KKM1 Kit: The Principles of operation are the same as for the KCM5 Kit installation, EXCEPT, the Key switch, provided in the kit, replaces the Coin switch and this kit does NOT have a COIN BLOCK solenoid.

IV. COMPONENT DESCRIPTIONS

A. BIN THERMOSTAT CONTROL. The Bin Thermostat Control is located just below the Elapsed Time indicator on the front, upper left panel strip of the Chassis. The sensing capillary tube of the control is coiled in the Bulb Holder, located on the left wall of the ice storage bin. The Control functions to automatically SHUT OFF the Icemaker, when the ice storage bin is filled and ice contacts the capillary tube. It also signals the RESTART of the Icemaker when the capillary tube starts to warm up after ice has been removed from the bin. Factory settings are 35-degrees F. CUT-OUT and 40-degrees F. CUT-IN. ALWAYS CHECK a replacement Bin Thermostat Control BEFORE installing the Control in the Cuber. Prepare a container of ice and water and insert a thermometer. As temperature indications on the thermometer decrease to 35-degrees F., insert the capillary tube of the Bin Thermostat Control and determine temperature of CUT-OUT when an audible click is heard in the Control. Slowly add hot water to container and check audible click in the Control for CUT-IN while observing increase in temperature of water to 40-degrees F. Refer to procedure IV-I to adjust Bin Thermostat Control.

NOTE

The Bin Thermostat Control is wired through the holding relay and will not CUT-OUT the Icemaker until the end of the Harvest Cycle. Altitude adjustment should ONLY be performed on Icemakers installed at 2,000-foot level locations and ABOVE, and adjust only in increments of one-fourth turn of screw at a time.

B. COMPRESSOR CONTACTOR

A single-pole contactor is used to supply current to the Compressor; and, is wired so any control in the pilot circuit, such as the Bin Thermostat and High Pressure Control, etc., will cause the contactor coil to be de-energized, when the control contact OPENS, thereby breaking the circuit to the Compressor through the contactor points.

C. CUBE SIZE CONTROL

The temperature sensing Cube Size Control affects the length of the Freezing Cycle prior to initiating the Finishing Timer. The Cube Size Control closes its contacts when the Evaporator reaches a preset temperature, starting the Finishing Timer. A variation in either ambient air or incoming water temperature will affect the efficiency of the refrigeration system. This will vary the length of time it takes the Evaporator to reach the temperature at which the Cube Size Control is preset to CLOSE; which, in turn, will affect the overall cycle time.

NOTE

Be sure to refer to procedure IV-II, Adjustment of the Cube Size Control, BEFORE attempting to adjust the control.

D. FINISHING TIMER - Timer & Switch Assembly

The function of the Finishing Timer begins when activated by the Cube Size Control. The Timer controls an eight minute dual function: six minutes are programmed to finish freezing the ice cubes and the final two minute portion is for the defrost operation and harvest of the ice cubes. All electrical circuitry is connected through the printed circuit board and the Finishing Timer and shunted by the single-pole, double-throw microswitch to either the Freezing Cycle or the Harvest Cycle. The microswitch is actuated by a Cam Assembly directly connected to the Timer Motor. The Timer Cam can be adjusted to vary the defrost time, as required.

E. HIGH PRESSURE CONTROL - Water-Cooled Model

The High Pressure Control, a safety control, is factory set at 190 PSIG. The Control functions as a precautionary device, to shut OFF electrical power to the Icemaker, should a loss of water occur to the water-cooled Condenser. In addition to being a manual reset Control, there is an adjusting screw for raising or lowering the CUT-IN pressure.

F. HIGH PRESSURE FAN CONTROL - Air-Cooled Model

The High Pressure Fan Control functions only during the harvest cycle, to maintain

head pressure. As an automatic reset device, the Control is mechanically connected to the refrigerant system high side; and, electrically has the Condenser Fan Motor wired into control contacts. The control settings CLOSE at 150 PSIG and OPEN at 130 PSIG. During defrost, the Control will usually cycle once, causing the Fan Motor to briefly operate during this time.

G. HOT GAS SOLENOID VALVE

The Hot Gas Solenoid Valve functions only during the harvest cycle, to divert the hot discharge gas from the Compressor, by-passing the Condenser and capillary tube, for direct flow to the Evaporator Platen Assembly to release ice cubes from the inverted ice cube molds. The Hot Gas Solenoid Valve is comprised of two parts, the Body & Plunger and the Coil & Frame assemblies. Installed in the discharge line of the Compressor, the energized solenoid coil lifts the valve stem within the valve body to cause the hot discharge gas to be diverted when the Finishing Timer has advanced to the start of the harvest cycle.

H. FINISH RELAY

The multi-function, three-pole, double-throw, plug-in relay is installed directly into a receptacle on the printed circuit board in the Control Box. The relay functions, in part, to by-pass the Bin Thermostat, to prevent the Icemaker from shutting OFF, when a filled-bin condition occurs, during the Freezing Cycle. The by-pass action serves to ensure full-sized ice cubes with each harvest cycle; and, to prevent short cycling on the Bin Thermostat. The relay also redirects the current flow through the High Pressure Fan Control to the Condenser Fan Motor during the harvest cycle.

I. SPRAY BAR ASSEMBLY

The oscillating Spray Bar Assembly is designed to channel recirculating water to twelve water jets for uniformly spraying the water into the inverted ice cube cup molds.

NOTE

Refer to procedure V-III, CLEANING - Icemaker; and, for problems requiring removal of parts refer to procedure IV-XII-A for details for removing Spray Bar Assembly and associated parts.

J. WATER INLET SOLENOID VALVE

The Water Inlet Solenoid Valve functions only during the Harvest Cycle, when it is energized to permit incoming water, to flow through a dual Flow Control tee at a total one gallon-per-minute rate through the Defrost Tubes onto the top of the plastic Platen Assembly, assisting in the harvest of ice cubes. The water drains through holes in the Platen Assembly into the Reservoir in the

lower section of the Freezing Chamber; and there, the water is recirculated through the Water Pump for return to the Spray Bar Assembly.

K. WATER REGULATOR VALVE - Water-Cooled Models

The Water Regulator Valve functions to maintain a constant head pressure, by regulating the amount of incoming water flow through the Condenser, on water-cooled models. The valve operates through the refrigerant system high side pressure. Rotating the adjusting screw, located on top of the valve, can INCREASE or DECREASE the operating head pressure.

NOTE

When installing a replacement Water Regulator Valve, be sure the replacement valve is installed with the arrow positioned in the direction of the water flow.

REFRIGERANT CHARGE

MODEL	CD450 Refig. Chg.
Air-Cooled	27 oz. R-12 (Approx.)
Water-Cooled	27 oz. R-12 (Approx.)

NOTE

Always CHECK NAMEPLATE on individual Icemaker for specific refrigerant charge, BEFORE charging the refrigeration system. The above listed refrigerant charges are approximate charges for the CD450 Cuber Dispenser, however it is important to CHECK NAMEPLATE for each Icemaker, especially when there are different Compressors.

SECTION IV

ADJUSTMENT AND REMOVAL AND REPLACEMENT PROCEDURES

The procedures provided in this Section are arranged in alphabetical order to make specific Adjustment and Removal and Replacement information easy to locate.

Read the instructions thoroughly before performing any Adjustment or Removal and Replacement Procedures.

I. ADJUSTMENT OF THE BIN THERMOSTAT CONTROL

The control for the Bin Thermostat is the Temperature Control, located just below the Elapsed Time Indicator on the front, upper left panel strip of the Chassis.

WARNING

The adjusting screws on the Temperature Control device have very sensitive response to adjustment. DO NOT attempt to adjust the screw until after thoroughly reading and understanding the following instructions and illustrations. Over-adjusting or erratic guessing, can foul the instrument and cause ultimate delay and part replacement, WHICH COULD HAVE BEEN PREVENTED.

Adjustment for ALTITUDE CORRECTION should only be performed for installations at 2000-feet and ABOVE. Carefully adjust only in one-fourth turn of screw at a time. NO ALTITUDE CORRECTION adjustments should be performed BELOW the 2000-foot level.

See Figure 4-1 for location and direction of rotation, clockwise (CW) or counterclockwise (CCW), of the adjusting screw on the Temperature Control, in the particular Control Box the adjustment is to be performed.

II. ADJUSTMENT OF THE CUBE SIZE CONTROL

CAUTION

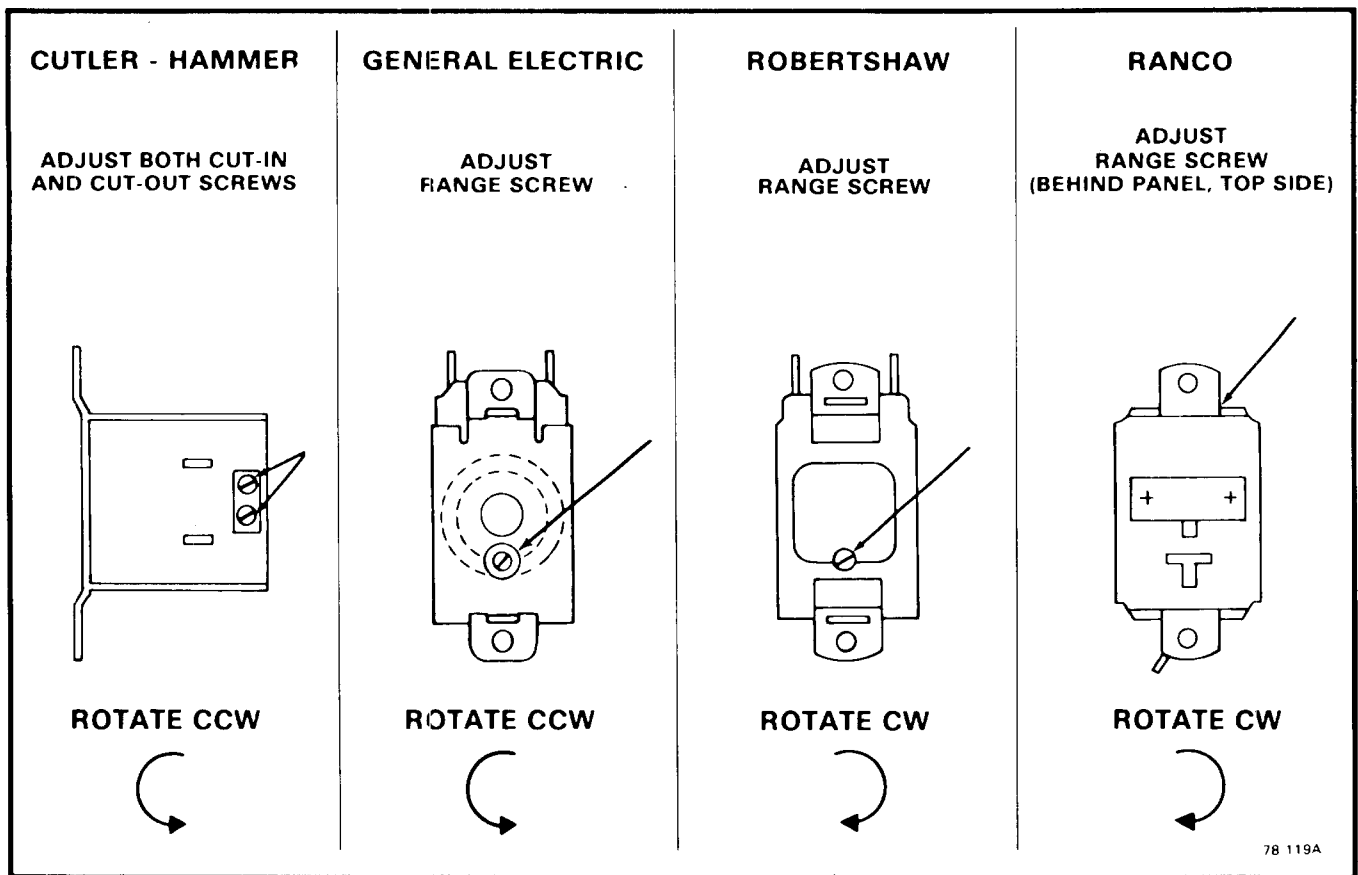
BEFORE performing actual adjustment to the Cube Size Control, check other possible causes for cube size problems, refer to Section VI, SERVICE DIAGNOSIS for problem review and analysis.

DO NOT perform adjustment when a new Cube Size Control is installed, until the control bulb has been properly installed in the tube well, on the refrigerant tube of the Platen Assembly and the Icemaker has progressed through several complete freezing and harvest cycles, to observe size and quality of ice cubes and whether or not a cube size problem exists.

Adjustment on the Cube Size Control is performed to either cause larger sized ice cubes or smaller sized ice cubes to be produced.

A. IF ICE CUBES ARE SHALLOW SIZE (Indentation is too deep):

1. Locate the Cube Size Control just below the Bin Thermostat Control.



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Figure 4-1. Adjustment of the Temperature Control.

2. Rotate the adjusting screw one-eighth of a turn **CLOCKWISE** toward **COLDER**.
3. Observe size of ice cubes in next two ice cube harvests and repeat step 2 above, in one-eighth turn increments, until proper ice cube size is achieved.

B. IF ICE CUBES ARE OVERSIZE (Indentation is too full):

1. Locate the Cube Size Control under the left Section of the Gasket Support bracket above the front opening of the Freezing Chamber.
2. Rotate the adjusting screw one-eighth of a turn **COUNTERCLOCKWISE** toward **WARMER**.
3. Observe size of ice cubes in next two ice cube harvests and repeat step 2 above, in one-eighth turn increments, until proper ice cube size is achieved.

III. ADJUSTMENT OF THE TIMER & SWITCH ASSEMBLY

The Timer & Switch Assembly is factory set, so that one complete revolution of the cam on the Timer represents eight minutes. Six minutes comprise the freezing cycle event during cam rotation, and the final two minutes program the defrost and harvest cycle. Rotating the shaft of the Timer Cam, **CLOCKWISE** will allow

positioning the actuator arm of the microswitch on the cam at the selected start position for either the freezing cycle or harvest cycle, as required, during the **START UP** procedures and in the **CLEANING** instructions. Rotating the shaft **COUNTERCLOCKWISE** will unscrew the shaft from the threaded stud on the Timer Cam.

To Adjust the Timer Switch Assembly:

- A. HARVEST CYCLE:** Slowly rotate the shaft of the Timer & Switch Assembly, located in the hole in the front of the Control Box Cover, **CLOCKWISE**, until the actuator arm on the microswitch drops off of the outer cam into the cam slot. An audible click can be heard, but in a noisy area, look at the cam and switch to observe the event. See Figure 4-2.
- B. FREEZING CYCLE:** Slowly rotate the shaft of the Timer & Switch Assembly, located in the hole in the front of the Control Box Cover, **CLOCKWISE**, until the actuator arm on the microswitch rides up out of the cam slot to the start of the surface of the outer cam.

IV. ADJUSTMENT OF THE WATER REGULATOR ASSEMBLY — WATER-COOLED MODELS

The correct Compressor head pressure on Water-Cooled Models is 135 PSIG. Adjusting the Water Regulator Valve increases or decreases the rate of flow of water, through the

Water-Cooled Condenser; which increases or decreases the affected temperature/pressure of the Compressor head pressure. INCREASED water flow, results in DECREASED or LOWER head pressure; while, DECREASED water flow, results in INCREASED or HIGHER head pressure.

To adjust the Water Regulator Assembly:

- A. To INCREASE the Head Pressure: Rotate the adjusting Screw, on the Water Regulator Assembly COUNTERCLOCKWISE.
- B. To DECREASE the Head Pressure: Rotate the adjusting Screw, on the Water Regulator Assembly CLOCKWISE.

WARNING

Be sure the electrical power supply and the water supply are OFF, BEFORE starting any of the following REMOVAL AND REPLACEMENT procedures as a precaution to prevent possible personal injury or damage to equipment.

V. REMOVAL AND REPLACEMENT OF THE AGITATOR DRIVEMOTOR ASSEMBLY

- A. To remove the Agitator Drivemotor Assembly:
 1. Remove the Left Side Panel.

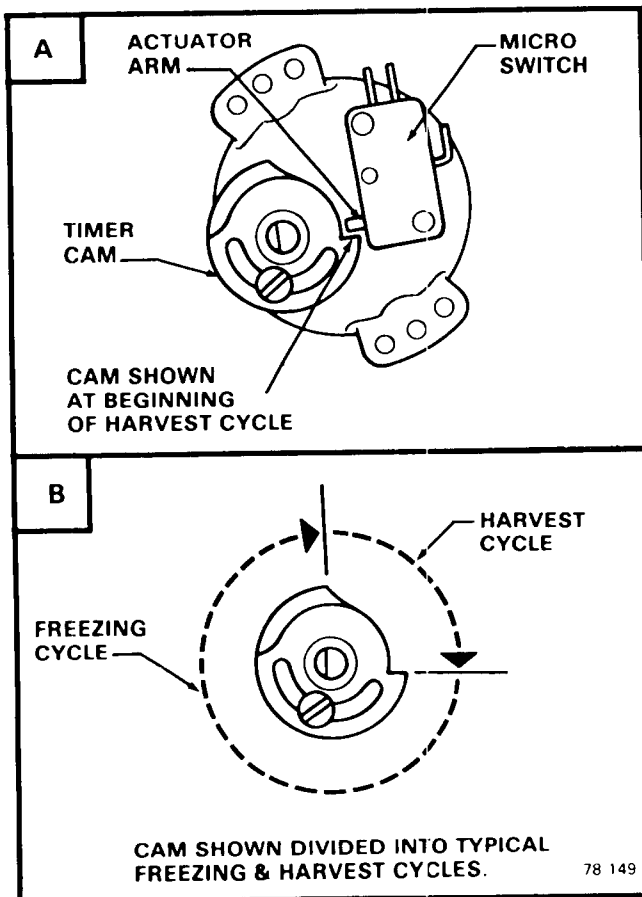


Figure 4-2. Adjustment of the Timer & Switch Assembly.

2. Unsnap one end of the Linkage Assembly; then, remove four screws, lockwashers and the Agitator Drivemotor Assembly from the mounting bracket on the wall of the Cabinet.

- B. To replace the Agitator Drivemotor Assembly, reverse the removal procedure.

VI. REMOVAL AND REPLACEMENT OF THE COMPRESSOR ASSEMBLY

NOTE

Always install a replacement Drier, any time the sealed refrigeration system is opened. Do not replace the Drier until all other repair or replacement has been completed.

- A. To remove the Compressor Assembly:

1. Remove the Left Side Panel.
2. Loosen two Wing Screws to unlock the Lower Door Assembly and rotate the Door to OPEN, left to right.
3. Disconnect the electrical leads in the Compressor Junction Box, from the Control Box.
4. Bleed off or blow the refrigerant charge through the Schrader valve.
5. Unsolder and disconnect both the suction line and the discharge line from the Compressor.
6. Unsolder the process header tube from the Compressor and retain for installation on the replacement Compressor.
7. Remove four bolts, washers, mounting sleeves and grommets attaching the Compressor to the Chassis base.

NOTE

Thoroughly evacuate the system to remove moisture and non-condensables.

- B. To replace the Compressor Assembly, reverse the removal procedure.

VII. REMOVAL AND REPLACEMENT OF THE CONDENSER ASSEMBLY — AIR-COOLED MODELS

NOTE

Always install a replacement Drier, any time the sealed refrigeration system is opened. Do not replace the Drier until all other repair or replacement has been completed.

- A. To remove the Condenser:

1. Remove the Left Side Panel.
2. Bleed off or blow the refrigerant charge through the Schrader valve.
3. Unsolder and disconnect both the refrigerant inlet and outlet tubes at the Condenser.

4. Remove two screws and lockwashers attaching the Condenser to the Chassis base; then, remove the Condenser from the CD450.

NOTE

Thoroughly evacuate the system to remove moisture and non-condensables.

- B. To replace the Condenser, reverse the removal procedure.

VIII. REMOVAL AND REPLACEMENT OF THE CONDENSER — WATER-COOLED MODELS

NOTE

Always install a replacement Drier, any time the sealed refrigeration system is opened. Do not replace the Drier until all other repair or replacement has been completed.

- A. To remove the Condenser:

1. Remove the Left Side Panel.
2. Bleed off or blow the refrigerant charge through the Schrader valve.
3. Disconnect both the water inlet and outlet lines at the Condenser.
4. Unsolder and disconnect both the refrigerant inlet and outlet tubes at the Condenser.
5. Remove three screws and lockwashers attaching the Condenser to the Chassis base; then, remove the Condenser from the CD450.

NOTE

Thoroughly evacuate the system to remove moisture and non-condensables.

- B. To replace the Condenser, reverse the removal procedure.

IX. REMOVAL AND REPLACEMENT OF THE DRIER

NOTE

Always install a replacement Drier, any time the sealed refrigeration system is opened. Do not replace the Drier until all other repair or replacement has been completed.

- A. To remove the Drier:

1. Remove the Left Side Panel.
2. Remove screw and Drier Brace attaching the Drier to the Condenser, or Drier Strap.
3. Bleed off or blow the refrigerant charge through the Schrader valve.

4. Unsolder the refrigerant lines at each end of the Drier, remove the Drier and separate the Drier from the Drier Brace.

- B. To replace the Drier:

CAUTION

1. If the factory seal is broken on the replacement Drier, exposing it to the atmosphere more than a few minutes, the Drier will absorb moisture from the atmosphere and lose substantial ability for moisture removal.
 2. Be sure the replacement Drier is installed with the arrow positioned in the direction of the refrigerant flow.
-

1. Remove the factory seals from the replacement Drier and install the Drier in the refrigerant lines, with the arrow positioned in the direction of the refrigerant flow.
2. Install the Drier Brace on the Drier.
3. Solder the Drier into the refrigerant lines, two places.
4. Purge the system and check for leaks.
5. Thoroughly evacuate the system to remove moisture and non-condensables.
6. Charge the system with refrigerant, by weight. SEE NAMEPLATE.
7. Replace the Left Side Panel and locks.

X. REMOVAL AND REPLACEMENT OF THE DRIVEMOTOR ASSEMBLY

- A. To remove the Drivemotor Assembly:

1. Remove the Left Side Panel.
2. Loosen two Wing Screws to unlock the Lower Door Assembly and rotate the Door to OPEN, left to right.
3. Disconnect electrical leads to the Drivemotor Assembly, including Cam Switches.
4. Remove four nuts and lockwashers attaching the Drivemotor Assembly and Motor Mount to the sloped, front wall of the Cabinet and remove the Drivemotor Assembly, including the Motor Mount.

- B. To replace the Drivemotor Assembly, reverse the removal procedure.

CAUTION

BEFORE installing the replacement Drivemotor Assembly, rotate the Bin Rotor so the ice discharge opening in the Bin rotor is fully past the ice chute opening, looking from the front of the cabinet and rotating CLOCKWISE.

The ice chute opening should be **CLOSED**. Check that the **Cam Switch** on the **Drivemotor** was made to click, just as the actuator arm moved off of the outer rim, into the beginning of the slot of the **Cam**. This should cause both the ice discharge opening in the **Bin Rotor** and the **Cam slot position**, to appear in the area of between one and two o'clock, as viewed from the front of the **Cabinet**. Then, install and secure the **Drivemotor Assembly** in the **Cabinet**.

XI. REMOVAL AND REPLACEMENT OF THE FAN MOTOR ASSEMBLY -- AIR-COOLED MODELS

A. To remove the Fan Motor Assembly:

1. Remove the Left Side Panel.
2. Disconnect the two electrical leads of the Fan Motor from inside the Control Box Assembly.
3. Remove the screws and lockwashers from each leg of the Fan Motor Mount and remove the Fan Motor and Mount from the Chassis base.
4. Remove the nut from the end of the Fan Motor shaft and remove the Fan Blade.
5. Remove four screws securing the Fan Motor to the Fan Motor Mount and separate the Fan Motor from the Mount.

B. To replace the Fan Motor Assembly, reverse the removal procedure.

XII. REMOVAL AND REPLACEMENT OF THE FREEZING CHAMBER ASSEMBLY

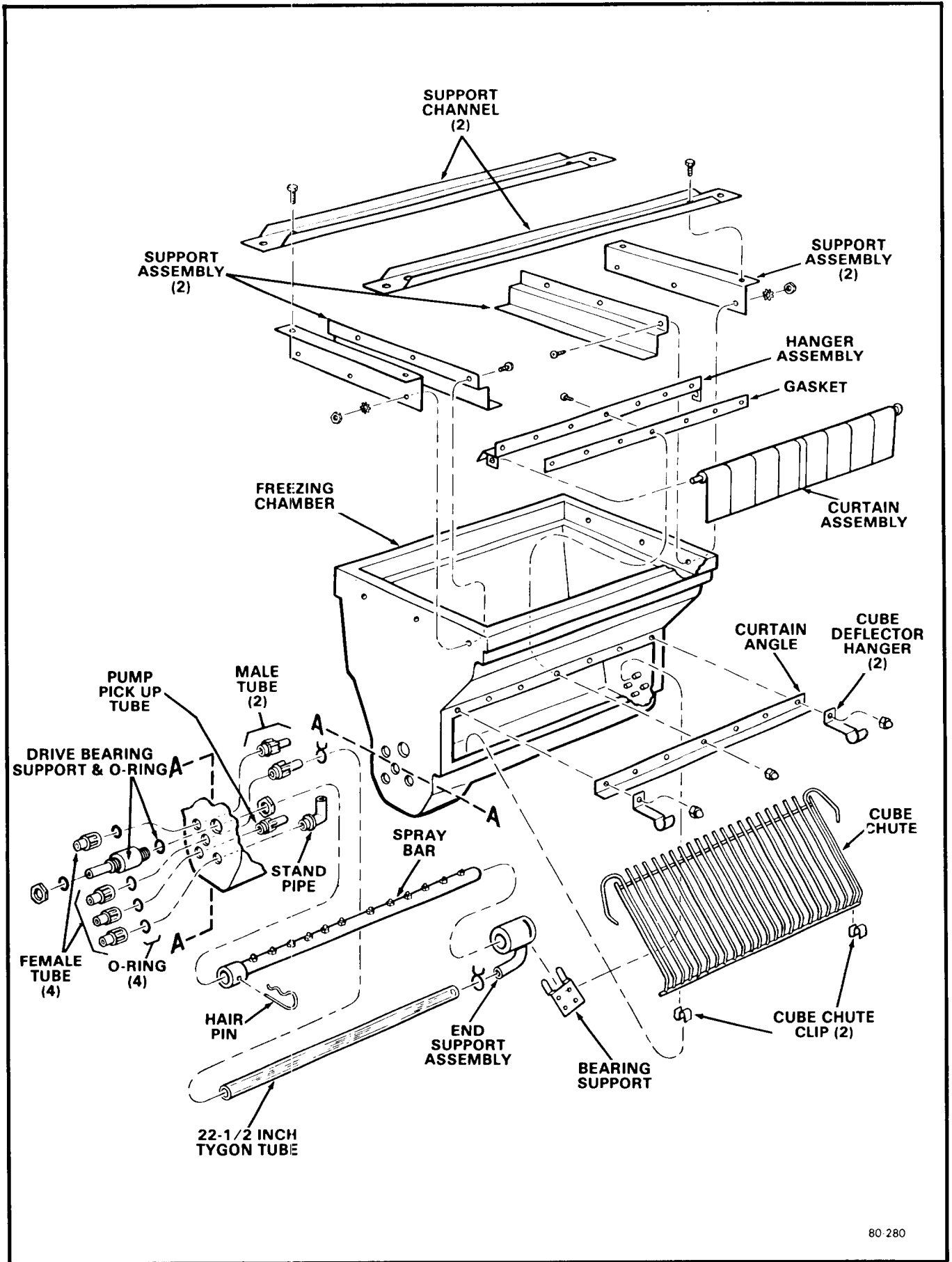
NOTE

Always install a replacement Drier any time the sealed refrigeration system is opened. Do not replace the Drier until all other repair or replacement has been completed.

A. To remove the Freezing Chamber Assembly: (See Figure 4-3)

1. Remove the Left Side Panel.
2. Remove the Top Panel.
3. Rotate the Upper Door Assembly to OPEN, left to right.
4. Slide the Styrene Sheet off the top of the Platen Assembly; then, remove the Defrost Tubes from the Platen area.
5. Carefully remove the coiled capillary bulb from the Bulb Holder Clips attached to the inlet line of the Platen Assembly; and position out of the work area.
6. Bleed off or blow the refrigerant charge through the Schrader valve.

7. Unsolder both the inlet and outlet refrigerant lines at the Platen Assembly and lift the Platen Assembly out of the top of the Freezing Chamber.
 8. Remove the Cube Deflector from the front of the Freezing Chamber.
 9. Unsnap the end of the Linkage Assembly connected to the shaft of the Drive Bearing Support.
 10. Remove hose clamps connecting Tygon tubes to four Female tubes at the lower left section of the Freezing Chamber; then, work each tube loose, allowing any water to drain into the Bin.
 11. Remove the Curtain Assembly from the Hanger Assembly.
 12. Remove the Cube Chute from inside the Freezing Chamber.
 13. Remove the End Support Assembly from the Bearing Support; then, remove hose clamps at each end of the Tygon tube and detach from the Bearing Support and the Male Tube.
 14. Remove the Hair Pin connector and disconnect the left end of the Spray Bar Assembly from the Drive Bearing Support and remove the End Support Assembly from the other end of the Spray Bar.
 15. Remove four screws attaching the two Support Channels to the top of the Cabinet and remove the Freezing Chamber Assembly from the Cabinet.
 16. Remove four screws and the two Support Channels from the two Freezing Chamber Support Assemblies.
 17. Remove six nuts, lockwasher, washers and screws and separate two Freezing Chamber Support Assemblies, and the left and right Platen Support Angles from the top of both sides of the Freezing Chamber.
 18. Remove seven screws and cap nuts and separate the two Cube Deflector Hangers, The Curtain Angle, Hanger Assembly and the Curtain Hanger Gasket from the inner and outer surfaces of the upper parts of the front opening of the Freezing Chamber.
 19. Unscrew four Female Tubes and O-Rings from the left outside of the Freezing Chamber, connected to two Male Tubes, one Pump Pickup tube and one Stand Pipe, installed from inside the Freezing Chamber.
 20. Unscrew the Hex Nut, inside the Freezing Chamber, and remove the Drive Bearing Support and O-Ring from the Freezing Chamber. Inspect and replace any O-Ring with cuts, tears, or is badly worn.
- B. To Replace the Freezing Chamber Assembly, reverse the removal procedure.



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Figure 4-3. Freezing Chamber — Exploded View.

XIII. REMOVAL AND REPLACEMENT OF THE GRILL AND DRAIN TRAY ASSEMBLY

A. To remove the Grill and Drain Tray Assembly:

1. Remove the Left Side Panel.
2. Loosen two Wing Screws to unlock the Lower Door Assembly and rotate the Door to OPEN, left to right.
3. Remove the Wing Nut and Spacer to detach the Grill and Drain Tray Assembly from each other.
4. Remove the Grill from the front of the Lower Door Assembly.
5. Remove the Drain Tray Assembly from the rear of the Lower Door Assembly.

B. To replace the Grill and Drain Tray Assembly, reverse the removal procedure.

XIV. REMOVAL AND REPLACEMENT OF THE WATER PUMP ASSEMBLY

A. To remove the Water Pump Assembly:

1. Remove the Left Side Panel.
2. Remove hose clamps connecting Tygon tubes to four Female Tubes at the lower left section of the Freezing Chamber; then, work each tube loose, catching any draining water in rags, under the tubes.
3. Remove two nuts, lockwashers and screws and lift the Water Pump Assembly from the Pump Brackets.

B. To replace the Water Pump Assembly, reverse the removal procedure.

XV. REMOVAL AND REPLACEMENT OF THE WATER REGULATOR ASSEMBLY — WATER-COOLED MODELS

NOTE

Always install a replacement Drier, any time the sealed refrigeration system is opened. Do not replace the Drier until all other repair or replacement has been completed.

A. To remove the Water Regulator Assembly:

1. Remove the Left Side Panel.
2. Bleed off or blow the refrigerant charge through the Schrader valve.
3. Unsolder the capillary tube from the Water Regulator Assembly, where connected at the process header.
4. Disconnect the water inlet at the rear of the Water Regulator.
5. Disconnect the Condenser water inlet tube at the front of the Water Regulator.
6. Remove the Pal Nut and separate the Water Regulator from the rear of the Cabinet.

NOTE

Thoroughly evacuate the system to remove moisture and non-condensables.

B. To replace the Water Regulator Assembly, reverse the removal procedure.

SECTION V

MAINTENANCE & CLEANING INSTRUCTIONS

I. GENERAL

The periods and procedures for maintenance and cleaning are given as guides and are not to be construed as absolute or invariable. Cleaning especially will vary, depending upon local water conditions and the ice volume produced; and, each icemaker must be maintained individually, in accordance with its own particular location requirements.

II. ICEMAKER

THE FOLLOWING MAINTENANCE SHOULD BE SCHEDULED AT LEAST TWO TIMES PER YEAR ON THIS ICEMAKER-DISPENSER. CALL YOUR AUTHORIZED SCOTSMAN SERVICE AGENCY.

1. Check and clean the optional wire mesh strainer, when installed.
2. Check that the Dispenser is level, in the side-to-side and front-to-rear directions.
3. Clean the water system evaporator, Freezing Chamber reservoir and Spray Bar, using a solution of SCOTSMAN Ice Machine Cleaner. Refer to V-III CLEANING - Icemaker.

NOTE

Cleaning requirements vary according to local water conditions and individual user operation. Continuous check of the clarity of ice cubes and visual inspection of the water spray bar and jets, before and after cleaning will indicate frequency and procedure to be followed in local areas.

4. Remove and clean Spray Bar Assembly, checking individual spray nozzles, then replace Spray Bar Assembly.
5. Check that the Curtain Assembly is properly installed, the Cube Chute in place and the Cube Deflector moves freely.
6. Check and tighten all screws and all electrical connections.
7. Check Hot Gas Solenoid Valve for correct operation and high pressure controls for cut-in and cut-out pressures.
8. With the Icemaker and Fan Motor OFF, on Air-Cooled Models, clean the Condenser using vacuum cleaner, whisk broom or brush. Instruct owner-user to clean Condenser frequently. DO NOT USE A WIRE BRUSH.
9. Check for water leaks and make corrections.

10. Check that Fan Blades move freely, do not touch any surfaces, are not bent or out of balance.
11. Check for refrigerant leaks, tighten line connections.
12. Pour water down Bin drain line to check that drain line is open and clear.
13. Check size, condition and texture of ice cubes. Perform adjustments as required. Refer to procedure II-I-15.
14. Check Bin Thermostat Control Bulb to test shutoff. With the Icemaker in the harvest cycle, place ice against the Bulb, which should cause the Icemaker to shut OFF at the end of the Harvest Cycle.

NOTE

Within minutes after the ice is removed from the sensing bulb, the bulb will warm up and cause the Icemaker to restart. This control is factory set and should not be reset until testing is performed. Normal setting is about 35-degrees F. CUT-OUT and 40-degrees F. CUT-IN.

III. CLEANING — Icemaker

1. Perform steps 1 through 6 of procedure II-I to gain access to the internal parts of the Dispenser.
2. Check that the Master ON-OFF toggle switch and the Compressor ON-OFF toggle switch are OFF on the front, upper left panel strip of the Chassis.
3. Rotate the shaft of the Timer & Switch Assembly, located in the hole in the front of the Control Box Cover, CLOCKWISE, until the actuator arm on the microswitch rides up out of the cam slot, to the outer surface of the cam, then stop. This is the START position for the Freezing Cycle. See Figure 5-1.

WARNING

SCOTSMAN Ice Machine Cleaner contains Phosphoric and Hydroxyacetic acids. These compounds are corrosive and may cause burns, if swallowed. DO NOT induce vomiting. Give large amounts of water or milk. Call physician immediately. In case of external contact, flush with water. KEEP OUT OF THE REACH OF CHILDREN.

4. Prepare cleaning solution: Mix eight ounces of SCOTSMAN Ice Machine Cleaner with six pints of fresh, potable warm water.

5. Carefully pour the cleaning solution into the Sump Assembly.
6. Immediately move the Master ON-OFF toggle switch, to the ON position.
7. Allow the system to operate for about twenty minutes.

NOTE

No ice cubes will be made, because the COMPRESSOR ON-OFF toggle switch, is OFF.

8. At the end of twenty minutes, rotate the shaft of the Timer/Switch Assembly, CLOCKWISE, to start a second Harvest Cycle. Repeat procedure to effect four complete Harvest Cycles. See Figure 5-1.

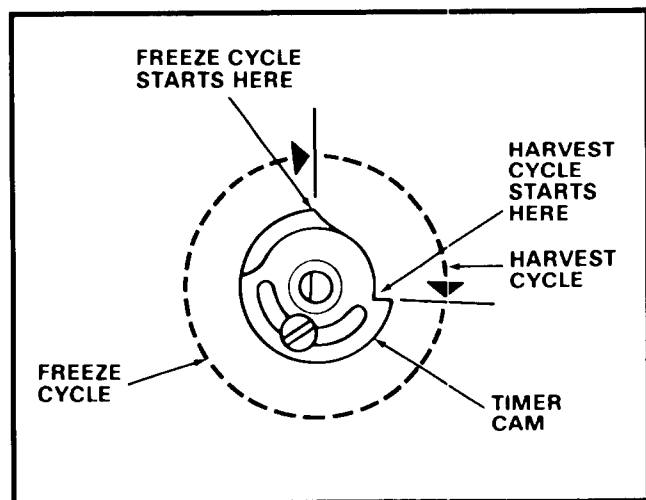


Figure 5-1. START Positions for the Freeze/Harvest Cycles.

NOTE

During each Harvest Cycle, fresh inlet water is introduced into the water system and acts to rinse all water-related parts and to wash away most mineral concentration through the Reservoir overflow drain.

9. Move the Compressor ON-OFF toggle switch to the ON position.
10. Check each ice cube harvest, until the ice cubes are clear and the acid taste is eliminated.

CAUTION

DO NOT use ice cubes produced from the cleaning solution. Be sure none remains in the Bin.

11. Add hot water to the bin to melt the ice cubes, or, remove and discard all ice cubes.

NOTE

Prior to the next step, be sure to note the position of the ice discharge opening on the Rotor, in relation to the Cam notch on the Drivemotor, so the Rotor can be replaced in identical position.

12. Unscrew the hand-tightened, large Cap Nut and washers and carefully remove the Bin Rotor from inside the Bin.
13. Scrub and clean all areas of the Bin Rotor with ordinary cleaning powder, such as Bon-Ami and Water. **DO NOT USE CLEANERS WITH BLEACHING AGENTS, CHLORINE, ETC.**
14. Rinse thoroughly with clear water, then, wash with the prepared SCOTSMAN Ice Machine Cleaner and hot water solution and use the solution to clean the interior walls of the Bin.
15. Sanitize the Bin Rotor and the interior walls of the Bin, then, replace the cleaned and sanitized Bin Rotor in the Bin, in the reverse order of removal. Refer to procedure V-IV Sanitizing.

IV. SANITIZING

Sanitizing is an important phase of the icemaking and dispensing operation. The following sanitizing procedure should be performed after every repair or replacement of parts in the CD450, in or through which ice is formed, stored, dispensed and water is flowed or drained. Additional requirements for performing the sanitizing procedure should be followed in accordance with the requirements of the local Health Authorities.

NOTE

Contact your local Health Authorities and obtain their approval of the sanitizer you intend to use when sanitizing the CD450.

Prior to performing the sanitizing procedure, it is assumed the cleaning procedure V-III, has been completed.

WARNING

Read WARNING thoroughly BEFORE preparing sanitizing solution, in next step.

1. STERILEX 3-Q SANITIZING TABLETS

DANGER: KEEP OUT OF REACH OF CHILDREN. Tablets may be harmful or fatal if swallowed. May cause skin irritation or eye damage. Avoid prolonged skin contact. Do not get in eyes. In case of contact, flush with plenty of water. If irritation persists get medical attention. Avoid contamination of food.

FIRST AID: If tablets are swallowed, drink promptly a large quantity of milk, egg whites or gelatin solution. Avoid alcohol.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed. Rinse empty carton container thoroughly with water and discard. Always follow your health department regulations.

2. MICRO-QUAT

DANGER: Causes high damage and skin irritation. Do not get in eyes, on skin, or on clothing. Protect eyes when handling concentrated product. Harmful if swallowed. Avoid contamination of food.

FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. For eyes, call a physician. Remove and wash contaminated clothing before reuse. If swallowed, drink promptly a large quantity of milk, egg whites or gelatin solution or if these are not available, drink a large quantity of water. Call a physician immediately.

1. Prepare a sanitizing solution using a quaternary ammonium sanitizing compound.

NOTE

1. Carefully follow directions and observe all precautions on the sanitizing compound container.
2. One *Sterilex 3-Q sanitizing tablet per three quarter yields 200 ppm active quaternary; or, one-third ounce of *Mikro-Quat to one gallon of water yields 235 ppm active quaternary.
3. The taste of ice and water will not be affected by

the sanitizing of parts using the above mixed sanitizing solutions. Rinsing of parts is not required with this relatively mild solution, but air drying of the parts is suggested before reassembly.

2. Immerse all parts, earlier removed and cleaned, in the sanitizing solution; or, if too large for the container of sanitizing solution, thoroughly wash the solution over all surfaces of all parts.
3. Drain all parts and allow to air dry.
4. Wash down the interior walls of the Bin with sanitizing solution and allow to air dry; then, replace the Bin Rotor when removed during sanitizing.
5. Pour some of the sanitizing solution into the Drain Tray Assembly, of the Lower Door Assembly, and into the Bin drain.
6. Clean and sanitize the interior bin parts and surfaces each week.

**Sterilex 3-Q sanitizing tablets are distributed by Pittsburgh Chemical Laboratory, Inc., Pittsburgh, PA 15222, and may be obtained through most restaurant supply houses.*

**Mikro-Quat, is manufactured by Economics Laboratory, Inc., Osborn Building, St. Paul, MN 55102, and may be obtained from them through their Magnus Division, The Klenzade division, or from restaurant supply houses.*

SECTION VI

SERVICE DIAGNOSIS

The Service Diagnosis Section is for use in aiding the serviceman in diagnosing a particular problem for pin-pointing the area in which the problem lies, thus an ever available reference for proper corrective action.

The following charts list corrective actions for the causes of known symptoms of certain problems that can occur in the Icemaking-Refrigeration System.

I. ICEMAKING - REFRIGERATION SYSTEM

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Irregular size cubes and some cloudy.	Some jets plugged. Shortage of water. Unit not level. Water overflowing vent holes on low side, burning cubes.	Clean jets. See Shortage of water CORRECTION. Level cabinet, as required.
Cubes too large.	Cube Size Control set too cold.	Rotate Cube Size Control dial toward WARMER.
Cubes too small.	Cube Size Control set too warm. Partially restricted capillary tube. Moisture in system. Shortage of water. Loss of refrigerant.	Rotate Cube Size Control dial toward COLDER. Blow refrigerant charge; replace drier; evacuate system; add refrigerant charge. Same as above CORRECTION. See Shortage of water CORRECTION. Check for refrigerant leaks, correct leaks; recharge system.
Cloudy Cubes.	Shortage of water. Dirty water supply. Accumulated impurities.	See Shortage of water SYMPTOM. Install water filter or softener. Use SCOTSMAN Ice Machine Cleaner.
Shortage of water.	Water spraying out through curtain. Water solenoid not opening. Water leak in sump area. Partial restrictions in water strainer.	Hang curtain in proper position. Repair or replace solenoid. Locate leak and repair or correct condition. Clean or replace strainer.
Shortage of water in upper freezing chamber.	Defective lower seal in upper freezing chamber.	Replace lower seal.

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Decreased ice capacity.	Defective compressor. Leaky water valve. High head pressure, result of dirty condenser or faulty Fan Motor. Non-condensable gas in the system. Poor circulation or extreme hot location. Overcharge of refrigerant. Hot gas solenoid valve leaking. Partially restricted capillary tube.	Replace compressor. Repair or replace valve. Clean condenser. Repair or replace Fan Motor. Purge the system. Relocate the cabinet; or provide ventilation by cutting openings. Slowly purge off to correct charge. Replace valve. See Cubes too small CORRECTION.
Poor harvests.	Too short defrost time. Restriction in water inlet line. Hot gas solenoid does not open. Plugged air vent holes in upper part of cube cups.	Check and adjust harvest cycle. Check Timer two-minute setting. Check strainer and flow check valve. DO NOT remove flow control washers. Binds or burned out. Replace. Clean out air vent holes.
Icemaker does not harvest.	Water pressure too low.	Check for 20 PSI flowing water.
Compressor cycles intermittently.	Low voltage. Dirty condenser. Air circulation blocked. Defective Fan Motor. Non-condensable gases in system.	Check for circuit overload. Check building supply voltage, if low, contact power company. Clean condenser with vacuum cleaner or brush. NO WIRE BRUSH. Locate cabinet with adequate air space for proper air flow. Replace Fan Motor. Purge the system.
Icemaker will not operate.	Blown fuse in line. Master switch in OFF position. Faulty Master switch. Timer contacts open.	Replace fuse and check for cause. Set switch to ON position. Replace switch. Replace Timer microswitch.
Hole washed inside ice cube.	Water over the top of cube cups during harvest cycle.	Check and re-level the cabinet.