

TABLE OF CONTENTS

| | |
|--|-------|
| Photograph & Ice Making Capacity | 1 |
| Table of Contents | 2 |
| Specifications & Dimensions | 3 |
| Installation Instructions | 4 |
| Installation Practice | 5 |
| Typical Installation | 6 |
| Stacking Instructions | 7 |
| Cube Deflector Installation Instructions | 8 |
| Electrical Connections & Characteristics | 9 |
| Installation – Start-Up | 10 |
| Final Check List | 11 |
| Wiring Diagram 115/60/1 Air Cooled | 12 |
| Wiring Diagram 115/60/1 Water Cooled | 13 |
| Electrical Components & Functions | 14 |
| Freezing Cycle Schematic | 15 |
| Harvest Cycle Schematic | 16 |
| Service Analysis Section | 17-18 |
| Maintenance Procedures Section | 19-20 |
| Functional Parts & Maintenance | 21-24 |
| Breakdown of Component Parts: | |
| Air & Water Cooled Right End View | 25 |
| Water Cooled Top View | 26 |
| Water Cooled Front View | 27 |
| Air Cooled Top View | 28 |
| Air Cooled Front View | 29 |
| Cabinet Parts | 30 |
| Freezer Assembly | 31 |
| Freezer & Spray Drive | 32 |
| Complete Pump Assy. | 33 |
| Water Valve Assy. | 34 |
| Control Box Schematic | 35 |
| Motor Compressor – Air & Water | 36 |
| Maintenance and Cleaning Instructions | 37 |
| SCOTSMAN BIN MODEL B550 | |
| Specification & Dimensions | 38 |
| Care of Stainless Steel Liner | 39 |
| Cleaning of Stainless Steel Liner | 40 |

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SCOTSMAN

MC1 SERIES

Capacity: Refer to production chart.

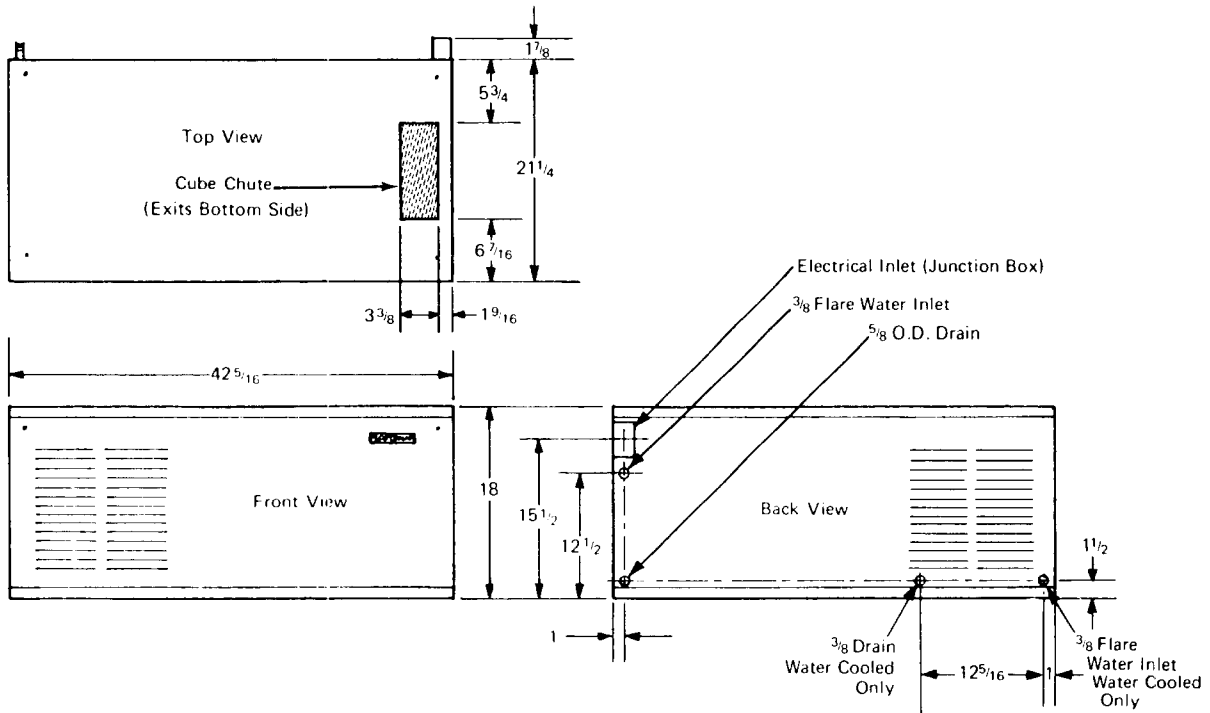
Storage Bin: B200, B550

Stainless Steel Lined

Height: 18"

Width: 42-5/16"

Depth: 23-1/8"



SPECIFICATIONS:

| Model | Condensing Unit | Compressor Horsepower | Finish (P-painted) (SS-Stainless Steel) | Shipping Weight (lbs.) | Basic Electricals | Minimum Wire Sizes (w-wire) (g-gauge) | | | Total Amperages | | |
|--------|-----------------|-----------------------|---|------------------------|--------------------------|---------------------------------------|--------|--------|-----------------|------|------|
| | | | | | | MCL1 | MCM1 | MCS1 | MCL1 | MCM1 | MCS1 |
| MCL1AE | Air | 3/4 | P* | 230 | Air Cooled 115/60/1 | 2w 12g | 2w 12g | 2w 12g | 14.3 | 14.3 | 14.3 |
| MCL1AS | Air | 3/4 | SS | 230 | | | | | | | |
| MCL1WE | Water | 3/4 | P* | 230 | | | | | | | |
| MCL1WS | Water | 3/4 | SS | 230 | | | | | | | |
| MCM1AE | Air | 3/4 | P* | 230 | Water Cooled 115/60/1 | 2w 12g | 2w 12g | 2w 12g | 13.5 | 13.5 | 13.5 |
| MCM1AS | Air | 3/4 | SS | 230 | | | | | | | |
| MCM1WE | Water | 3/4 | P* | 230 | | | | | | | |
| MCM1WS | Water | 3/4 | SS | 230 | | | | | | | |
| MCS1AE | Air | 3/4 | P* | 230 | | | | | | | |
| MCS1AS | Air | 3/4 | SS | 230 | | | | | | | |
| MCS1WE | Water | 3/4 | P* | 230 | | | | | | | |
| MCS1WS | Water | 3/4 | SS | 230 | | | | | | | |

*Painted Models have sandalwood micomatte finish with woodgrain front panel.

Specifications subject to change without notice.

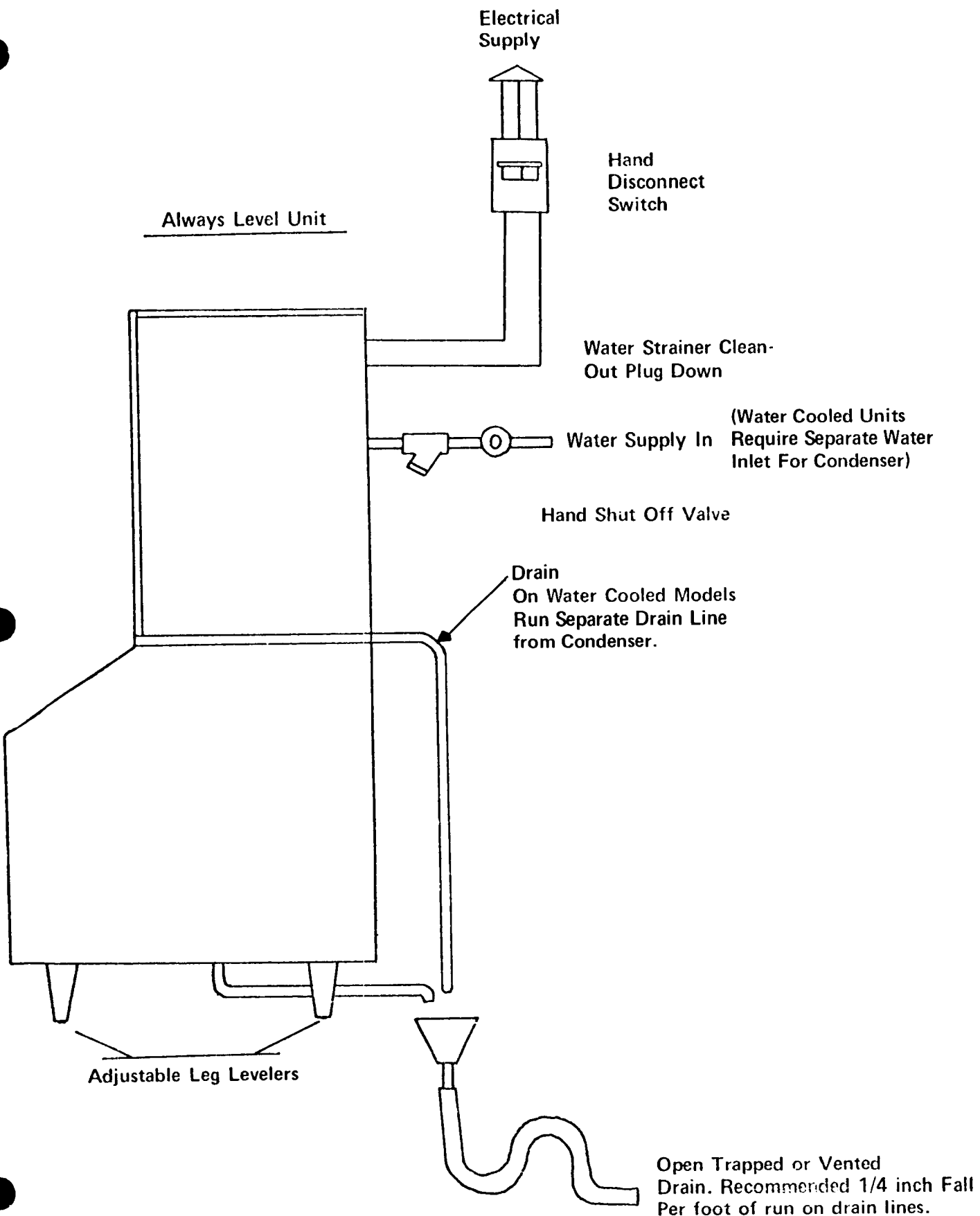
INSTALLATION INSTRUCTIONS

1. Uncrate unit using regular hammer and nail puller.
2. Remove top, front, left and right side panels (held by screws).
3. On base of machine at left and right ends are bolts that hold cuber to crate skid. Loosen the bolts to remove skid and save bolts to mount machine to SCOTSMAN Storage Bins.
4. Place unit on top of bin and secure to bin with two bolts taken out in Step 3.
5. Uncoil bin thermostat bulb and run it down thru machine base by pushing end of bulb thru plastic cap located between sump pump and freezing chamber. Next, take combination cube deflector and bulb holder, which is packed in storage bin, and install on upper right side of bin as described on Page 8 of this manual.

NOTE: Regardless of what type of bin is used, It is essential that bin thermostat bulb be located in area immediately below cube chute opening of machine, in order to prevent ice from backing up into cube chute.

6. Remove shipping tapes and check tubings, wiring, capillary control, lines for rubbing or chafing, refashion as required.
7. Remove junction box from top of cube chute and install on rear of machine. Wires are provided at rear of machine for electrical hookup.
8. Check unit nameplate voltage against building source voltage to be sure they correspond. Caution . . . improper voltage applied to unit will void warranty protection.
9. Make water connection utilizing 3/8" O.D. copper water line.
10. Use clean damp cloth to wipe out storage bin and cabinet exterior.
11. Replace all panels.
12. Check unit to be sure it is level side to side and front to rear.

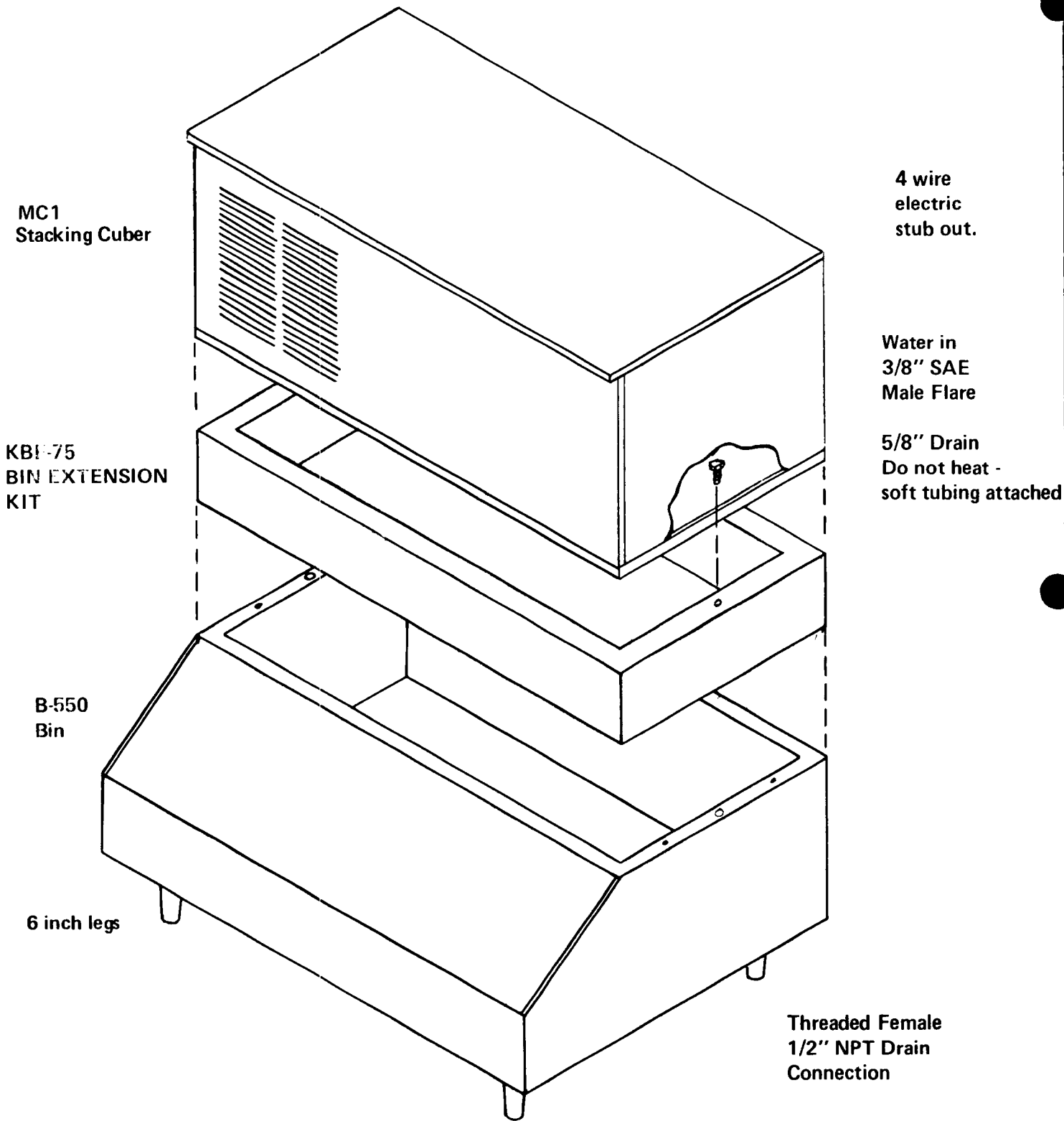
INSTALLATION PRACTICE



Maximum Ambient Air Temperature Recommended – 100° F.
Minimum Ambient Air Temperature Recommended – 50° F.

Air temperatures ranges above or below those listed may cause serious damage to this product.

TYPICAL INSTALLATION



WARNING: THE SCOTSMAN B-550 BIN HAS BEEN SPECIFICALLY ENGINEERED FOR USE WITH THE SCOTSMAN MODULAR CUBERS. USE OF OTHER THAN SCOTSMAN MANUFACTURED BIN MAY RESULT IN COMPONENT FAILURES WITHIN THE MODULAR CUBER.

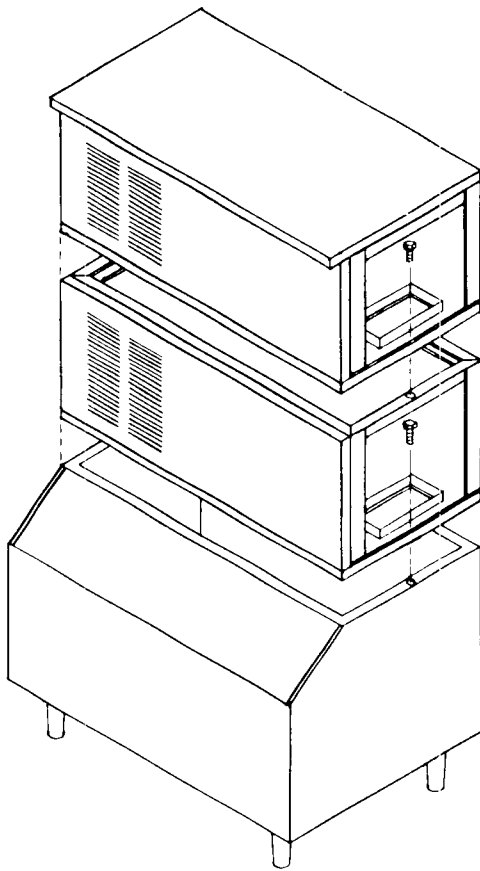


FIG. 1

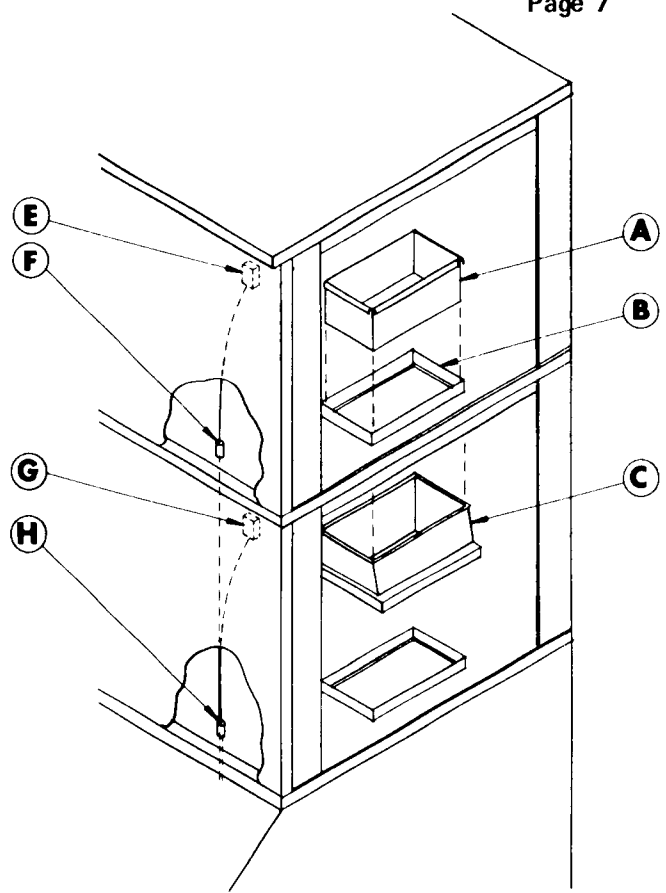


FIG. 2

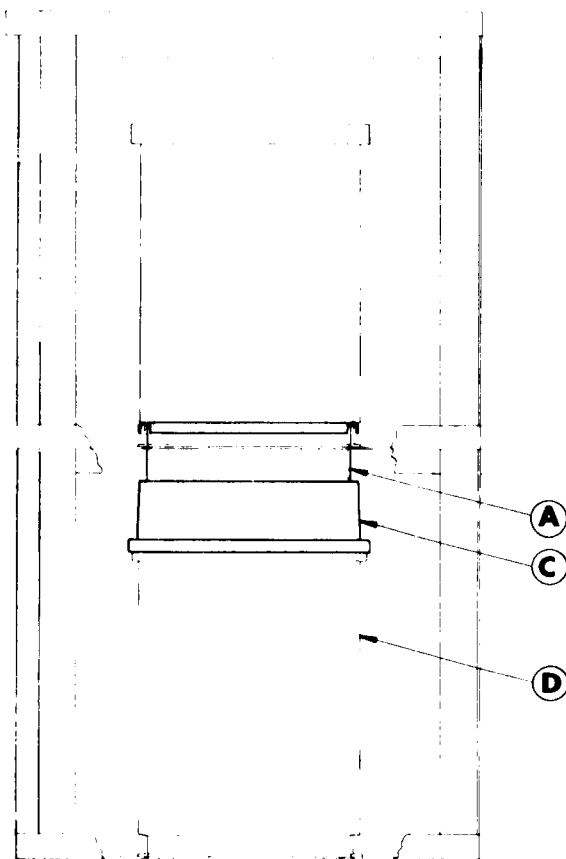


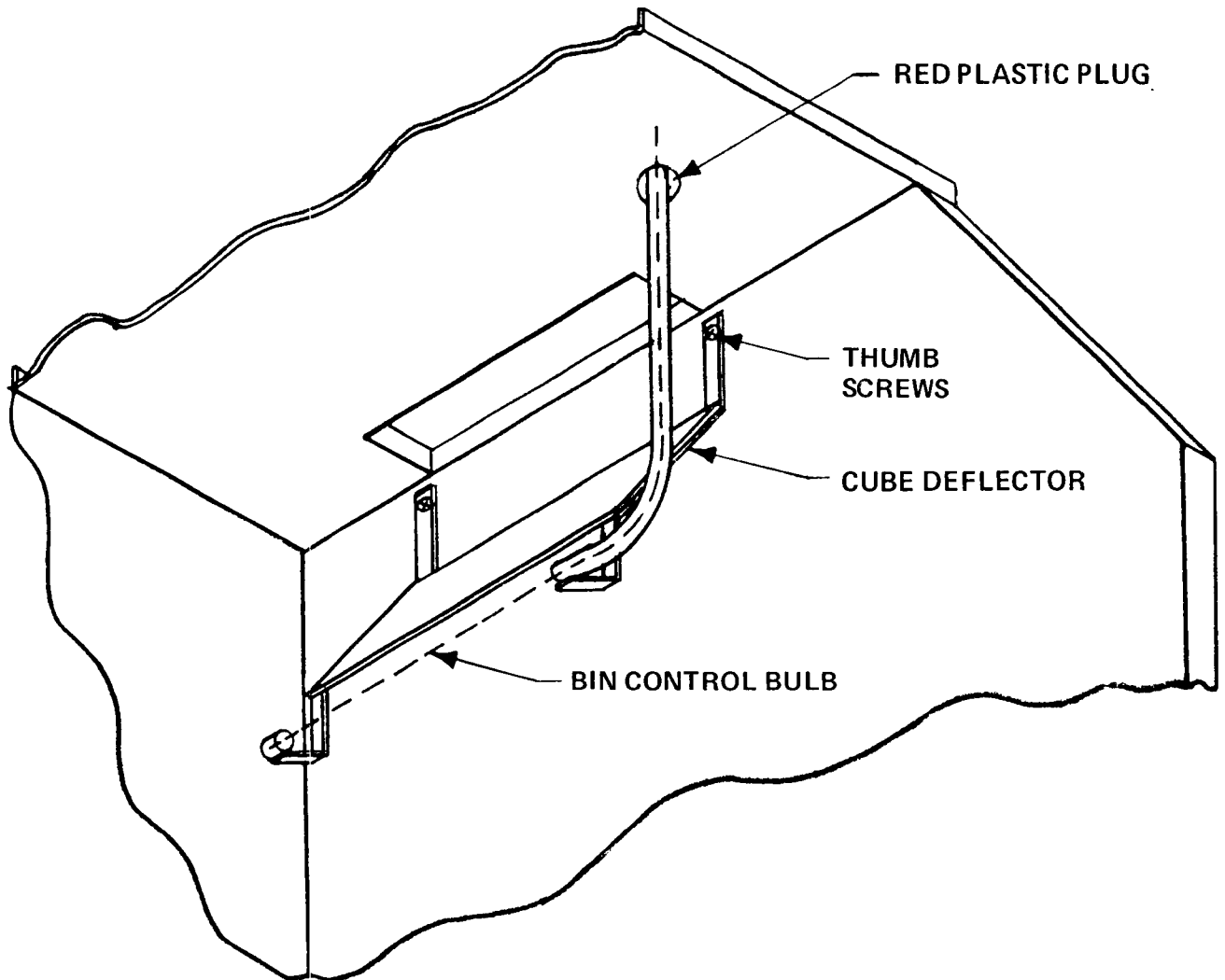
FIG. 3
COMPLETED INSTALLATION

KSC1

STACKING KIT INSTRUCTIONS

1. Remove all panels from both machines. (Top panel of bottom machine may be set aside, as it is not used when machines are stacked) Remove cube chutes from both machines.
2. After mounting bottom cuber to storage bin, place upper machine directly on frame of lower machine. Bolt together with same bolts and holes used in holding machine to crate skid. Fig. 1
3. Insert stainless steel (A) thru cube opening (B) in base of upper cuber. Place stacking kit cover (C) over sleeve as shown and push to top of sleeve. (See Fig. 2)
4. Replace cube chute (D) in bottom cuber and slide cover (C) down over cube chute, as shown in Fig. 3.
5. Route upper machine thermostat bulb (E) thru cap (F) and together with lower machine thermostat bulb (G) push thru cap (H) and feed tubes into combination cube deflector and bulb holder at right side of bin. This will provide two independent ice making systems.
6. Run separate water, drain, and electrical supplies. Test and check out added cuber, ice making, thermostat function, etc.
7. Install cube chute & cover on top machine, and replace panels on both machines.

INSTALLATION INSTRUCTIONS
BIN THERMOSTAT IN BIN



CUBE DEFLECTOR INSTALLATION INSTRUCTIONS
For B200 and B550 Bins, and KBE2 and KBE75 Bin Extension.

1. Install Cube Deflector on upper right side of bin as shown using thumb screws and lockwashers supplied.
2. Push end of bin control bulb through red plastic plug and route bin control bulb as shown by dashed line.
3. When bin extension is used, cube deflector is mounted onto the extension in same manner as noted on items No. 1 and No. 2.

ELECTRICAL CONNECTIONS AND CHARACTERISTICS

| 115 volts, 60 cycle, single phase | Air Cooled | Water Cooled |
|-----------------------------------|---------------------|---------------------|
| Compressor | 11.6 Amperes | 11.6 Amperes |
| Sump Motor | 1.3 ea. Amperes | 1.3 ea. Amperes |
| Fan-Air Cooled Models | .80 Amperes | NONE |
| Spray Bar Motor | .60 Amperes | .60 Amperes |
| TOTAL – Full Load Amperes | 14.3 Amperes | 13.5 Amperes |

This unit should be wired to 35 Amp. circuit. Be certain that the Super Cubers are on their own circuit and individually fused. The maximum allowable voltage variation should not exceed 10 per cent of the nameplate rating even under starting conditions. Low voltage can cause erratic operation, and may be responsible for serious damage to the overload switches and motor windings.

All external wiring should conform with National, State and local code requirements. Check the voltage on the line before connecting the machine.

14 Gauge wire will be adequate for short runs. For runs exceeding 10 feet, go to next heavier gauge. NOTE: All Scotsman cubers require a neutral wire and a solid earth ground wire.

WATER SUPPLY AND DRAIN CONNECTIONS

WATER SUPPLY – Air Cooled Models

The recommended water supply line is 3/8" OD copper tubing for air-cooled units. Connect to a cold water supply line with regular plumbing fittings with a shut-off valve installed in an accessible place between supply line and machine. The water strainer supplied with the unit should be mounted with clean-out plug down. Locate the strainer next to the machine and the arrow in the direction of the flow.

A 3/8" male flare fitting is provided on right rear corner for convenience in hookup.

WATER SUPPLY – Water Cooled Models

Water cooled models have separate inlet water supply for the water cooled condenser.

When choosing the water supply for this cuber, consideration should be given to:

- A. Length of run.
- B. Water clarity and purity.
- C. Adequate supply pressures.

Since water is the most important single ingredient in producing ice, you cannot over emphasize the three items mentioned above. Low water pressure (below 30 pounds) may cause malfunction of the three way water valve. Water containing excessive minerals will tend to produce cloudy colored cubes and scale build up on parts in the water system.

Heavily chlorinated water can be controlled using charcoal or carbon filters.

DRAIN: The recommended drain from the bin is 5/8 inch OD copper tubing. Must be run to an open trapped and vented drain. If drain is a long run, allow 1/4 inch pitch per foot. Drain must be installed to conform with local code. Run separate line for condenser discharge water on water-cooled models. Water supply must be installed to conform with local code. In some cases a licensed plumber and/or a plumbing permit will be required.

INSTALLATION – START UP

1. After water and electrical hookup is complete, turn time clock knob (protruding thru control box cover) clockwise until you hear the micro-switch actuator arm click into the cam slot. Turn master switch on. (Compressor switch should remain in off position.) At completion of harvest cycle (Approx. 3 minutes after harvest was started), rotate knob clockwise until once again harvest is initiated. At this point compressor switch should be placed in "ON" position. Unit is now ready for automatic operation.

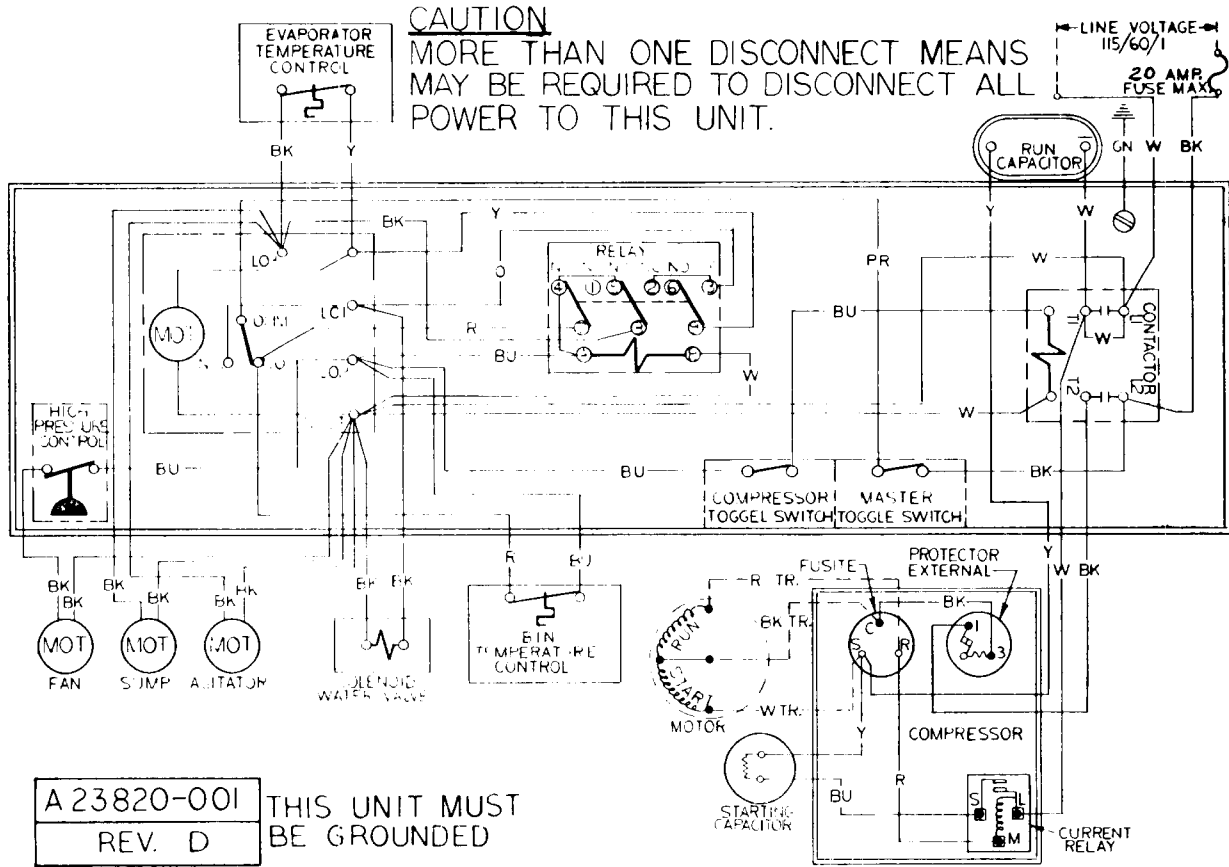
NOTE: All cubers have two manual on-off switches. One is for motor compressor only during cleaning operation, one is master switch for complete unit.

2. When both switches are thrown "on", water inlet solenoid will be energized allowing water to enter cuber, thru warm water tank, 3 way water valve and up into back side of freezer cup section. This will "fill" icemaker for the freezing cycle - Check operation of spray bar drive motor thru hood top panel. Spray bar motor should be running during harvest cycle.
3. NOTE: WATER PUMP OPERATES DURING THE DEFROST CYCLE.
Factory tests prove faster defrosts and increased ice capacity by letting this pump operate continually.
4. Time clock dial does not rotate at the end of the harvest cycle; it is started later by the cube size thermostat control located in the control box.
5. Freezing time will be approximately 20 to 30 minutes in a 70 degree ambient. (Longer if above, and shorter if below.) Average complete cycle time is 25 - 35 minutes.
6. Watch first cube harvest and check to make sure that plastic curtain has not been damaged in shipment. Also that curtain does not swing back into freezer and catch on spray bar.
7. Check size of cubes made: If too small, after a second cycle, adjust cube size control to lower or colder setting - until desired cube size is reached. Normal cube size is with a 1/4" depression in crown.
8. Check texture of cubes made: Partially cloudy cubes throughout suggest unit running short of water near end of freezing, or possibly an extremely bad water condition, which would indicate use of filtering or purifying equipment. Contact SCOTSMAN - Queen Products Division, Ice Machine Service Department, Albert Lea, Minnesota, for further details.
9. With unit on harvest cycle, take a handful of cubes made and hold on storage bin thermostat bulb. Should cut unit off at end of harvest cycle. Remove ice, unit should cut back on automatically in 3 or 4 minutes. Thermostat is factory set at 35 degrees out, 39 degrees in.
10. Install gauges and check head and back pressure: air-cooled models, head pressure after twenty minutes of freezing cycle at 70 degrees ambient will be approximately 125 pounds PSI. The back pressure starts out at approximately 50 pounds PSI and gradually pulls down to approximately 4 pounds PSI just before harvest cycle. Higher ambients and dirty condenser will cause higher pressures. Water-cooled models have water regulating valves factory set at 135 pounds PSI: check reading and adjust if necessary. Back pressure will operate the same as on air-cooled models.
11. Remove gauges, replace control box cover and all service panels.
12. Instruct owner on how to operate and clean machine.

FINAL CHECK LIST

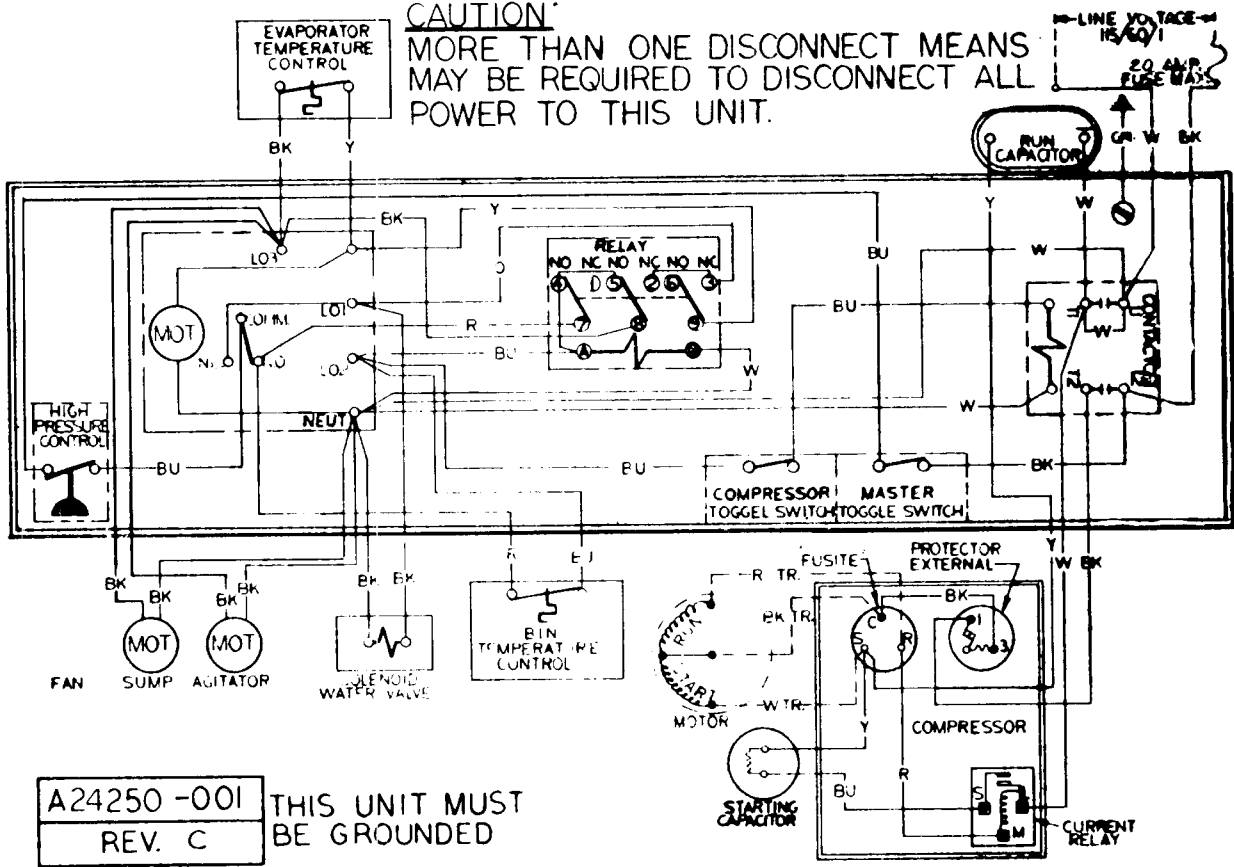
1. Is the unit level? (IMPORTANT)
2. Have all electrical and piping connections been made?
3. Has the voltage been tested and checked against the nameplate rating?
4. Have the compressor hold-down bolts been checked to insure the compressor is snug to its mounting pads?
5. Is the water supply valve open and the electric power properly hooked up?
6. All masking tape removed from doors, panels and inner freezer curtain?
7. Is the unit clean? Has storage bin been wiped clean with cold water cloth?
8. Has the owner been given the operating manual, and has he been instructed on how to operate the machine?
9. Have the installation and warranty cards been filled out? Check for correct model and serial numbers from serial plate on unit then promptly mail card to factory.
10. Check all refrigerant and conduit lines to guard against vibrations and possible failure.
11. Is there 4" clearance behind and around unit for proper air circulation?
12. Is unit in a room where ambient temperatures are minimum 50° F. even in winter months?
13. Has water supply pressure been checked to insure at least a minimum pressure of 30 pounds?

WIRING DIAGRAM
115/60/1
Air Cooled



WIRING DIAGRAM
115/60/1
Water Cooled

CAUTION:
 MORE THAN ONE DISCONNECT MEANS
 MAY BE REQUIRED TO DISCONNECT ALL
 POWER TO THIS UNIT.



A24250 -001
 REV. C

THIS UNIT MUST
 BE GROUND

ELECTRICAL COMPONENTS AND FUNCTIONS

1. Bin Temperature Control: Purpose to maintain a supply of ice in storage.
2. Compressor Toggle Switch: Control compressor ON-OFF only.
3. Master Toggle Switch: Manual ON-OFF of whole machine.
4. High Pressure Control: On at 140 PSI OFF at 120 PSI.
5. Magnetic Contactor: To provide across the line starter of ample carrying capacity.
6. Relay: Function to hold unit in freezing and harvest cycles once they have started. This insures full cubes everytime a harvest occurs and prevents short cycling on bin thermostat.
7. Evaporator Temperature Control: Controls size of ice cube produced by machine. To increase cube size turn control to right. To decrease cube size, turn knob to left.
8. Timer: Function is to control harvest and part of freezing cycle. Timer is energized when reverse acting cube size control closes. Timer continues freezing cycle for 12 minutes and then switches unit into harvest cycle which runs for 3 minutes.

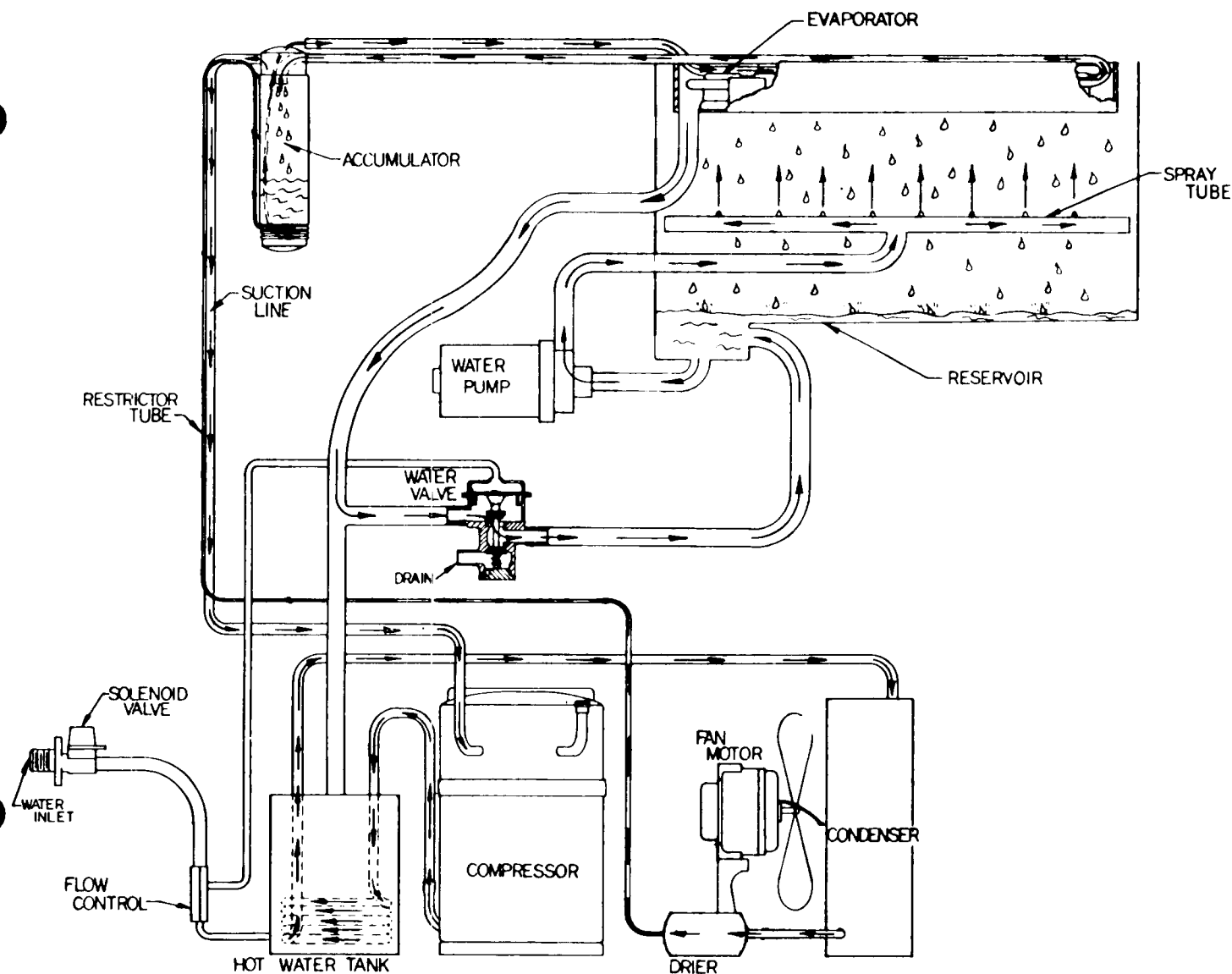
FREEZING CYCLE

As the freezing cycle starts, electrically the components operating are the compressor and fan motor, recirculating water pump and the sprayer tube drive motor.

The refrigerant circuit which equalized at about 50 pounds gauge during the "off" or harvest cycle, thru the capillary refrigerant control, now rises rapidly to 125 - 135 pounds head pressure. The suction or low side pressure starting at 50 pounds pulls down fairly quickly to about 25 pounds at which point the ice cubes are starting to form a thin shell in cube cups. Continuing from 25 pounds slowly on down towards the finished cube pressure of approximately 5 pounds takes an average of 20-30 minutes.

During this portion of the freezing cycle the electrical brain is the reverse acting, cube size thermostat. This thermostat electrically is holding the freezing cycle components "live". When the ice cubes are about 3/4 formed, the decreasing suction pressure and temperature, activate the temperature sensing bulb of the reverse acting, cube size control, closing its contacts. This does not interrupt the freezing cycle, the closing of the cube size thermostat contacts electrically transfers the finishing of the freezing cycle to the finishing clock motor or timer as it is sometimes called. One full revolution of the timer dial is 15 minutes as is noted by the numerals on the dial. However, of the total 15 minutes on the timer dial, 3 minutes are used for the defrost or harvest cycle.

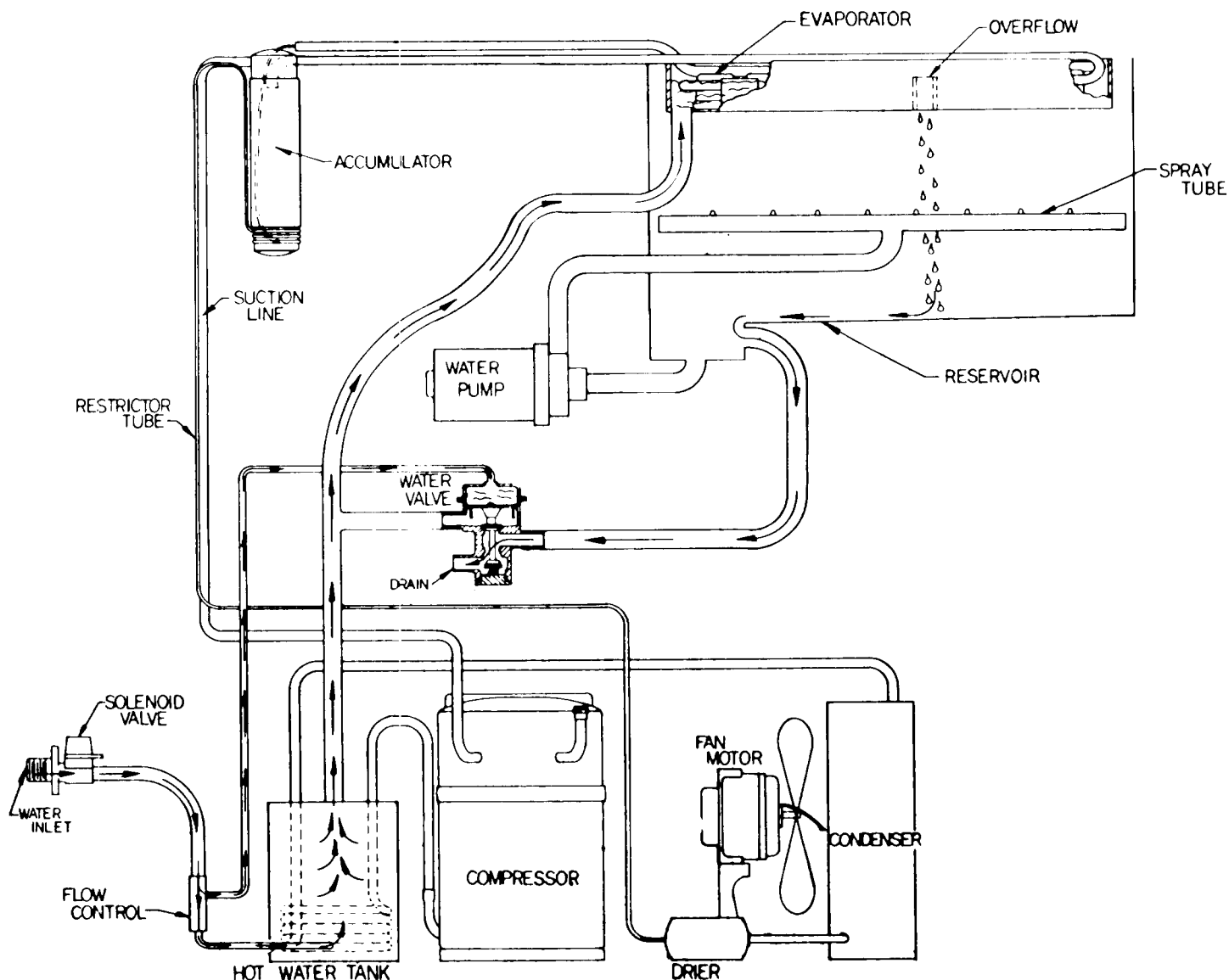
This means then that after the cube size contacts close they activate the timer motor. This control takes over and continues freezing cycle for another 12 minutes with timer dial now turning. When the 12 minutes are completed an offset in the timer dial allows a micro switch with activating arm riding on that cam to drop into the slot, electrically stopping the freezing cycle and starting the 3 minutes harvest cycle - The clock motor continues thru harvest cycle. A notch on the timer dial now lifts micro switch arm up on dial, electrically stopping harvest cycle and starts back into a new freezing cycle.



HARVEST CYCLE

At the end of the freezing cycle the time clock operated switch opens compressor, and fan motor circuit, and closes circuit to time clock motor, spray drive motor and solenoid operated inlet water valve. Inlet water pressure at bottom of hot water tank now forces heated water out the top of tank through warm water tubing and into back side of evaporator cup section. At the same time the surplus water from the preceding batch of ice cubes goes through three way water valve and off to drain. Water from the hot water tank flows into the rubber platen holding the evaporator cups and by conduction on back of cups causes the formed ice cubes to defrost or drop out. The platen-evaporator cavity is normally filled to the overflow level in 2 or 2-1/2 minutes. The amount of water running over the overflow pipe is controlled by the size of the flow control orifice and the length of the harvest time setting on the time clock past the overflow point. Over-flow water goes down the drain also.

Meanwhile, cubes released drop by gravity and are mechanically ejected thru curtained opening into ice storage bin by sprayer tube which is being actuated by drive motor. At the completion of harvest cycle, the micro-switch on the timer now drops points holding defrost components in cycle and switches to freezing cycle set of contacts. Timer completes harvest cycle when micro-switch roller lifts out of rear cam slot. Timer clock motor now stops and will not start again until cube size thermostat control closes once more. Electrically harvest cycle components cease, freezing cycle components start up. Chilled defrost water from the upper cavity now flows by gravity back through the three way valve, to the reservoir where the water pump continually recirculates it through sprayer tube to produce the next batch of cubes.



| SYMPTOM | POSSIBLE CAUSE | SUGGESTED CORRECTION |
|--------------------------------------|---|---|
| Unit will not run. | Blown fuse Bin thermostat set improperly Switch in Off position Inoperative master switch Timer contacts open | Replace fuse & check for cause of blown fuse. Replace. Turn switch to On Position. Replace switch Replace timer micro-switch |
| Compressor cycles intermittently | Low voltage Dirty condenser Air circulation blocked Inoperative condenser fan motor Non-condensable gases in system. | Check circuit for overloading. Check voltage at the supply to the building. If low, contact the power company. Clean with vacuum cleaner, air or stiff brush. (DO NOT use wire brush.) Allow sufficient air space all around unit. Check to see if defective, If defective, replace. Purge the system. |
| Cubes too small | Cube size control set too high Partially restricted capillary tube Moisture in system Shortage of water Shortage of refrigerant | Lower the setting. Turn towards colder. Blow charge, add new gas & drier, after evacuating system with suction pump. Same as above. See remedies for shortage of water. Check for leaks and recharge. |
| Cloudy cubes | Shortage of water Dirty water supply Accumulated impurities | See remedies for shortage of water. Use water softener or water filter. Use SCOTSMAN Ice Machine Cleaner. |
| Shortage of water | Water spraying out through plastic curtain. Three-Way water valve leaking Water entering hot water tank too slowly Partial restrictions in water strainer. | Hang curtain in proper position. Check the valve for foreign matter. Check valve seats and replace if necessary. Check pressure at source - 30 lb. required. Dirt in solenoid and flow control - blow out. Clean Strainer. |
| Irregular size cubes and some cloudy | Some jets plugged Shortage of water Unit not level | Clean jets. See Shortage of Water Water overflowing air vent holes on low side burning cubes. Level as required. |

| SYMPTOM | POSSIBLE CAUSE | SUGGESTED CORRECTION |
|------------------------------|--|---|
| Cubes too large | Cube size control turned too cold | Turn setting on cube size control dial towards warmer |
| Decreased ice capacity | Inefficient compressor Leaky water valve High head pressure Non-condensable gas in the system Poor Air circulation or excessively hot location Overcharge of refrigerant Partially restricted cap tube | Replace. Replace or repair. Dirty condenser. Clean. Bad fan motor. Replace. Purge the system. Relocate the unit, or provide for ventilation by cutting openings. Correct the charge. Purge off slowly. Purge & replace charge and drier |
| Hole washed inside cube | Water over the top of the cube cups during harvest. | Level unit. |
| Poor harvests | Too short defrost time Restriction in incoming water line. Insufficient quantity of hot water Solenoid valve not opening the water valve Air vent holes in upper cube cups plugged | Check and adjust harvest cycle. Timer should be set at number 3. Check water feed line strainer and flow reducing valve. Do not remove flow control washers. Cold ambient - must be 50° minimum. Faulty fan control on air cooled models. Solenoid binding or burned out. Replace. Clean out holes. |
| Unit won't Harvest. | Insufficient water pressure to energize 3/way water valve | Machine requires minimum of 30 lbs. flowing water pressure. NOTE: If 3 way water valve does not energize, the harvest water will by-pass the evaporator and flow directly down the drain |
| Excessive Water in Unit base | Cube chute not positioned correctly. Water tubing leaking (Check during freeze & harvest cycle) | Reposition so that bottom edge of cube chute rests inside of cube guide soldered to the base. Check. Tighten or replace. |

MAINTENANCE PROCEDURES SECTION

WARNING: ALL STEPS LISTED BELOW SHOULD ONLY BE STARTED WHEN WATER AND ELECTRICAL SUPPLY ARE OFF TO PREVENT ACCIDENTS.

- A. To remove cabinet top.
 - 1. Remove 4 screws in top of panel.
 - 2. Lift panel off unit.
- B. To remove cabinet front.
 - 1. Remove 2 screws in top front of panel.
 - 2. Tip top of panel back approximately 6" and lift up.
- C. To remove end panels.
 - 1. Remove 2 screws from top of panel.
 - 2. Tip top of panel back 6" and lift up.
- D. To remove 3/way water valve.
 - 1. Remove right end panel.
 - 2. Remove cube chute. (Tip top of cube chute out and lift up. When reinstalling be sure cube chute is inside of guide arrangement soldered to base.)
 - 3. Drain water from freezer sump tank. (Drain tube is connected to plug on sump pump motor.)
 - 4. Disconnect all lines to valve.
 - 5. Remove 2 screws mounting valve to frame.
- E. To remove water pump.
 - 1. Remove right end panel and front panel.
 - 2. Remove cube chute. (Tip top of cube chute out and lift up. When reinstalling, be sure cube chute rests inside of guide soldered to base.)
 - 3. Drain water from freezer sump tank. (Drain tube is connected to plug on pump.)
 - 4. Trace electrical leads to control box and disconnect.
 - 5. Disconnect hose clamps at pump body.
 - 6. Remove mounting bolt and mounting strap.
 - 7. Remove Pump.

NOTE: Screw clamps should be installed on pump discharge tube when unit is reassembled.

- F. To remove water inlet solenoid valve.
 - 1. Remove right end panel.
 - 2. Disconnect electrical leads.
 - 3. Disconnect water inlet line from machine.
 - 4. Remove valve.
- G. To remove flow control.
 - 1. Remove front panel and left end panel.
 - 2. Drain hot water tanks by removing drain caps on bottom of flow controls.
 - 3. Replace complete flow control to include brass housing.

NOTE: This machine will not function properly with the flow washers removed. Flow washers are rated at 1/2 GPM.

- H. To remove agitator motor.
 - 1. Remove front panel, right end panel and top panel if possible.
 - 2. Trace leads to control box and disconnect.
 - 3. Remove cube chute (Tip top of cube chute out and lift up. When reinstalling be certain cube chute rests inside of guide soldered to base.)
 - 4. Reach in thru curtained opening and remove spray bar by lifting upward releasing bar from center hub. Next remove drive fork from drive shaft attached to motor. (NOTE: Drive fork has left hand threads and must be removed with drive extension to motor if top panel is not removed from unit.)

5. Remove 4 screws holding drive motor to freezer top.
6. Remove drive motor.

I. To remove Cube size control.

1. Remove front panel and right end panel.
2. Remove 2 screws mounting control to corner gusset.
3. Trace capillary tube to suction line and peel back insulating tape.

NOTE: Do not make any adjustments on new control until control bulb has been reinsulated to suction line.

J. To remove bin control.

1. Remove front panel and right end panel.
2. Remove 2 screws holding control to corner gusset.
3. Trace capillary tube to insure new control capillary tube is routed in same manner.

NOTE: Do not attempt to adjust this control. If storage bin is not filling to the capillary or is filling above the capillary into the cube chute, the control should be replaced.

K. To remove plastic curtain.

1. Remove right end panel.
2. Remove plastic cube chute. (Tip top of chute out and lift up. When reinstalling be certain cube chute rests inside of cube guide soldered to the base.)
3. Pull off 3 retainer clips holding curtain in place.

NOTE: When reinstalling curtain be certain the side with the extruding point is positioned towards the left of opening. Also, that the edge of the curtain lines up with the upper edge of the freezer opening.

L. To remove spray bars.

1. Remove right end panel.
2. Remove cube chute. (Tip top of cube chute out and lift up.)
3. Remove plastic curtain (see item K.)
4. Reach thru ice opening and feel for spray bar.
5. Follow spray bar to center hub, turn spray bar so one end points towards curtain opening.
6. Lift straight up on spray bar, then out after spray bar comes off center hub.

FUNCTIONAL PARTS AND MAINTENANCE

PART NAME: Spray Bar Assembly

NUMBER: A23917-1

FUNCTION: This tube acts as a water distributor for the ice cube cups. The tube has jets over its length. Supply water is forced into the jet tubes by the sump pump and is directed upward in a continuous stream. Drive motor thru drive shaft rotates the spray bars to get a full coverage spray.

REPAIRABLE: Yes, jets replaceable.

MAINTENANCE:

All jets should be cleaned by running Scotsman Ice Machine Cleaner through unit. This step will eliminate hand cleaning. Partially plugged jets will produce cloudy or partial cubes. Wholly plugged jet will not produce a cube in cube cups it normally covers.

PART NAME: Spray Tube Drive Linkage

NUMBER: Parts listed in parts section.

FUNCTION: Drive spray tubes during freezing cycle to produce clear cubes and also drive spray tubes during harvest cycle to eject cubes thru ice opening.

REPAIRABLE: No. replace defective parts.

MAINTENANCE:None.

PART NAME: Relay – Ameco or Potter Brumfield – 2 P.D.T.

NUMBER: 12-1598

FUNCTION: Relay is used as a by-pass on the bin thermostat when it tries to cut unit off on a full bin of cubes during a freezing cycle. This insures full cubes every time a harvest occurs and prevents short cycling on bin thermostat.

SETTING: Factory set.

REPAIRABLE: No. Replace when inoperative.

MAINTENANCE:Check electrical connections.

PART NAME: Bin Thermostat

NUMBER: 11-353-3

FUNCTION: To automatically cut machine off when ice level in storage bin reaches thermobulb. Automatically starts machine when ice level in bin falls below bulb location.

SETTING: Factory set.

REPAIRABLE: No. Replace when inoperative or out of adjustment.

MAINTENANCE:Check capillary for cracks or worn spots due to vibration.

PART NAME: Inlet Water Solenoid
NUMBER: 12-1434-1
FUNCTION: During freezing cycle this valve is closed, keeps water from entering heat exchanger tank and also from leaking out of tank.
During harvest or defrost cycle this valve opens and allows inlet water to pass thru flow control orifice and thence to push warm water out of heat exchanger tank into back of cup molds, performing the defrost.
SETTING: Factory set.
REPAIRABLE: Yes
MAINTENANCE: Flush control each six months.

PART NAME: Fan Motor
NUMBER: 12-1681-1
FUNCTION: Maintain proper head pressures by circulating air across air cooled condenser.
REPAIRABLE: No.
MAINTENANCE: None.

PART NAME: Water Regulating Valve (Water cooled models only)
NUMBER: 11-198 – Penn Type V46AA-12
FUNCTION: To maintain constant head pressures by regulating amount of incoming water thru water cooled condenser.
REPAIRABLE: No. however, valve can be flushed out.
MAINTENANCE: None.

PART NAME: Hot Water Tank
NUMBER: A23926-001
FUNCTION: This hot water tank has coils of copper tubing inside thru which the high temperature refrigerant gas flows thus heating the water in the tanks for use during the harvest cycle. During the harvest cycle this hot water is forced into the upper portion of the evaporator to harvest the batch of ice produced during the freezing cycle.
REPAIRABLE: No, however, tank can be flushed out.
MAINTENANCE: Tanks require no maintenance.

PART NAME: Hermetic Motor Compressor.
NUMBER: 18-2400
FUNCTION: Circulates and retrieves refrigerant throughout entire system.
MAINTENANCE: Keeps clean and free of dust, grease, etc.

PART NAME: Contactor

NUMBER: 12-820-1

FUNCTION: Across the line contactor used to provide protection for hi voltage compressor only. Contactor is wired so any of the controls in pilot circuit such as bin thermostat will cause contactor holding coil to drop contact points when actuated. There are no overloads or resets on this control.

SETTINGS: Factory set, no adjustments necessary.

REPAIRABLE: No. Replace.

MAINTENANCE: Check control for loose electrical connections and blow free any dust, dirt, etc.

PART NAME: Reverse Acting Temperature Control

NUMBER: 11-351-3

FUNCTION: Reverse acting temperature control, closes on temperature decrease, opens on temperature rise. Control determines length of freezing cycle and by the same token, the cube size. A lower setting on control will produce larger cubes, a higher setting, smaller cubes. This control actuates time clock motor, Part No. A-23712-1, which then takes over balance of freezing cycle (12 minutes) and also defrost period 3 minutes.

SETTINGS: Adjustable by screw driver slot.

REPAIRABLE: No. Replace when inoperative.

MAINTENANCE: Check electrical connections. Blow points free of dust, dirt, lint, etc.

PART NAME 3 Way Valve

NUMBER: A21029

FUNCTION: To route water for freezing and harvest cycles. Incoming water pressure during harvest flexes rubber diaphragm against valve stem assy which opens and closes necessary ports. Stem is spring loaded for return to position during freezing cycle.

SETTING: None.

REPAIRABLE: Yes, diaphragm, "O" ring and spring replacable.

MAINTENANCE: Flush during maintenance cleaning.

PART NAME: Sump Pump

NUMBER: 12-1849-01

FUNCTION: Recirculating pump used to pump supply water in reservoir to jet tubes during freezing cycle. and harvest cycle.

SETTING: None

REPAIRABLE: Yes, see parts breakdown.

MAINTENANCE: Flush out reservoir and sump pump intake with Scotsman ice machine cleaner.

PART NAME: Agitator Drive Motor – Merkle Korff

NUMBER: 12-1824-1

FUNCTION: This motor is used to drive the linkage mechanism which in turn drives the rotating jet spray tubes. This provides a constant spray movement to all the inverted cube molds and by so doing also aerates the water producing clear, solid Scotsman cubes. Also ejects cubes thru ice opening during harvest cycle.

SETTING: No settings on motor.

REPAIRABLE: Yes - to some extent. Not recommended although front bearings and windings could possibly be replaced by electric motor shop. Normally replace motors.

MAINTENANCE: Oil every six months or less as use indicates. Use SAE 20 oil. There are two wick oil cups on the motor and a gear case slotted screw which has to be removed to add or change oil in gear case proper. Drive linkage should be inspected to insure free movement with no bindings or drag on drive motor.

PART NAME: Time-Finishing Clock – Manufactured by Queen Products Div.

NUMBER: A23712-1

FUNCTION: Heart of cyclematic control system is the reverse acting cube size control, No. 11-351-3, and the time clock it actuates. All electrical components are connected to the time clock terminal board and are shunted by means of a double pole single throw micro-switch to either the freezing cycle or harvest cycle. Micro-switch is in turn actuated by a brass cam that is directly connected to the electric timer clock motor. Timer has 15 minute cycle, 12 minutes on freezing cycle after being cut on by lo temperature control and 3 minutes on defrost cycle.

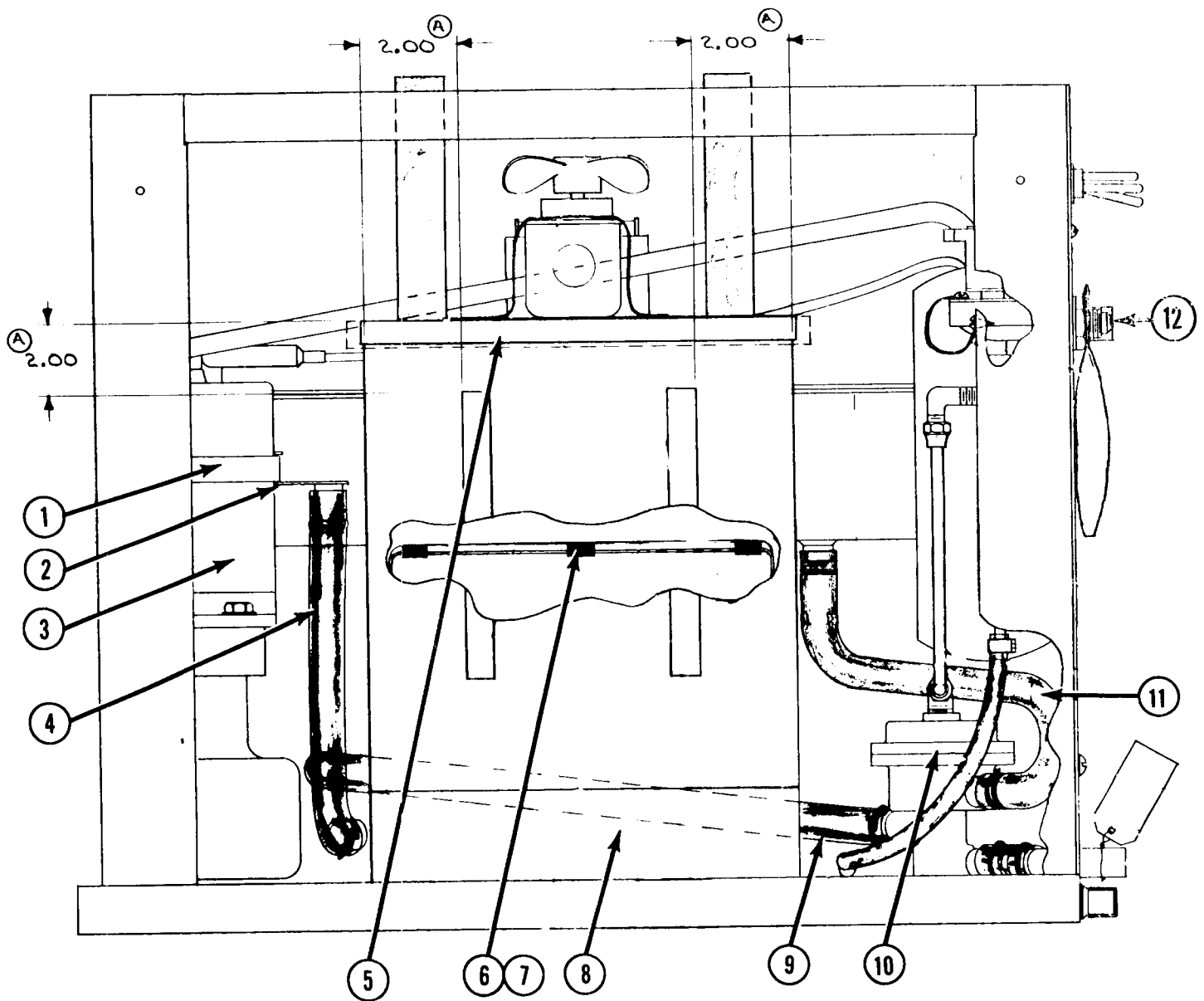
The cam assembly on the timer consists of two brass discs which can be adjusted to lengthen or shorten the defrost cycle.

SETTING: Normal setting for defrost is on No. 3 which is 3 minutes.

REPAIRABLE: Yes. Micro-switch, Part No. 12-1721-50 is replaceable.

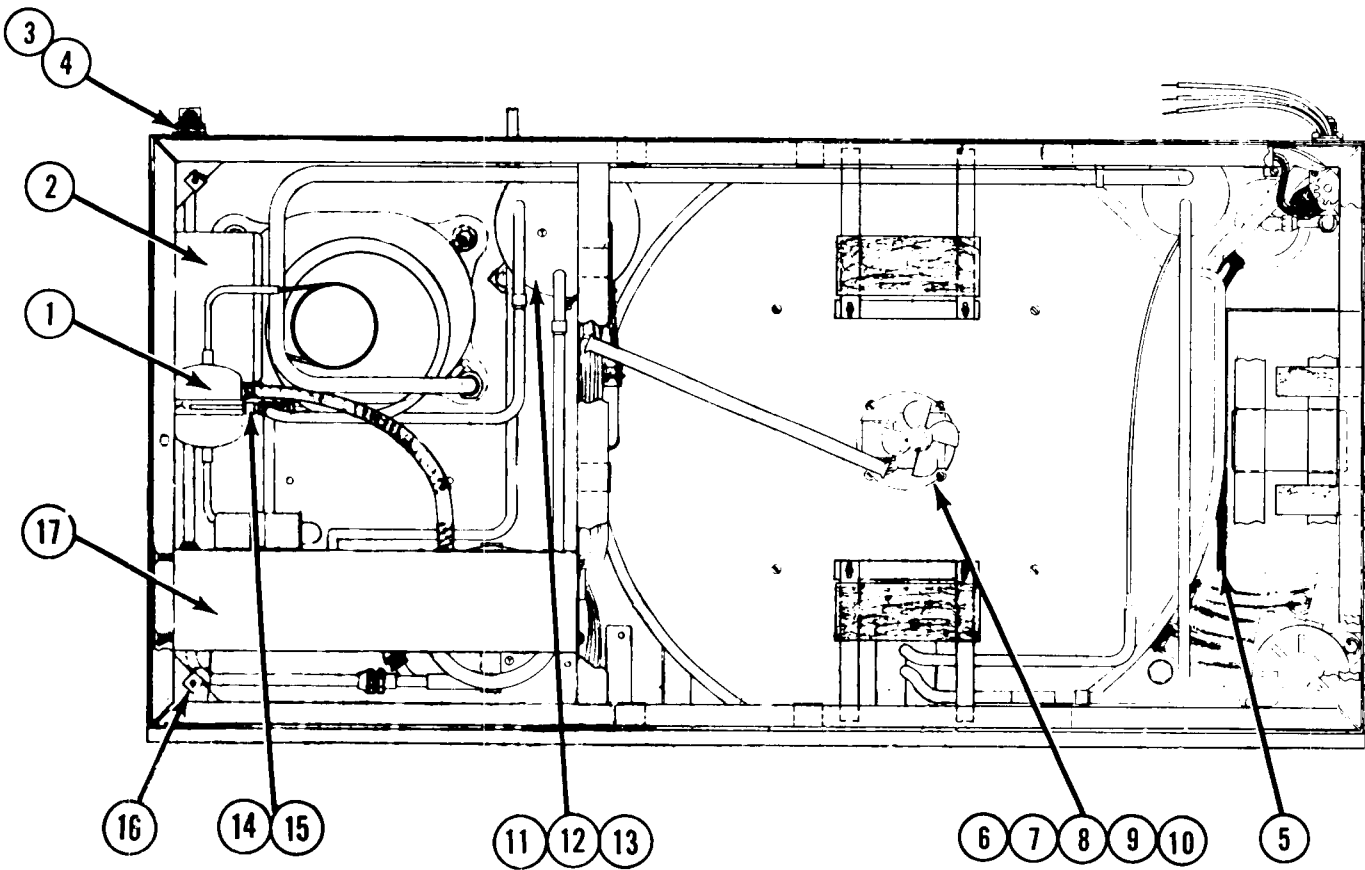
MAINTENANCE: Check all electrical connections, blow contact points free of dust, dirt, etc.

MC1 RIGHT END VIEW



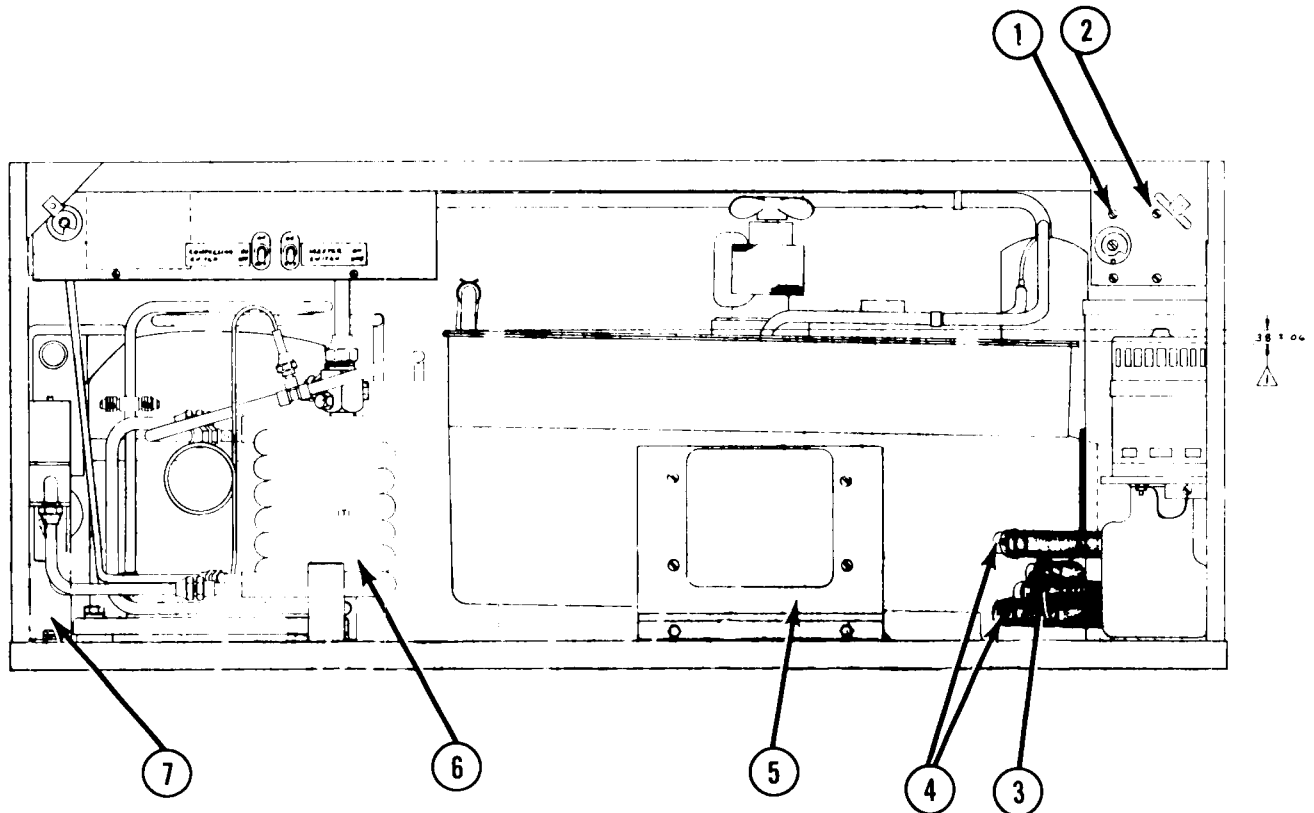
| ITEM NO. | PART NO. | DESCRIPTION |
|----------|------------|-------------------|
| 1. | 2-706 | Clamp |
| 2. | A24056-1 | Tube Bracket |
| 3. | 12-1849-01 | Water Pump |
| 4. | A20250-01 | Tube |
| 5. | 2-2075-1 | Cover, Cube Chute |
| 6. | 3-1526-1 | Curtain Clips |
| 7. | 2-2038-1 | Curtain Assy. |
| 8. | 2-2073-1 | Cube Chute |
| 9. | 5-501-01 | Tube |
| 10. | A21029-02 | 3 Way Valve |
| 11. | 5-509-1 | Tube Platen Drain |
| 12. | 12-1434-01 | Solenoid Valve |

MC1 WATER COOLED
Top View



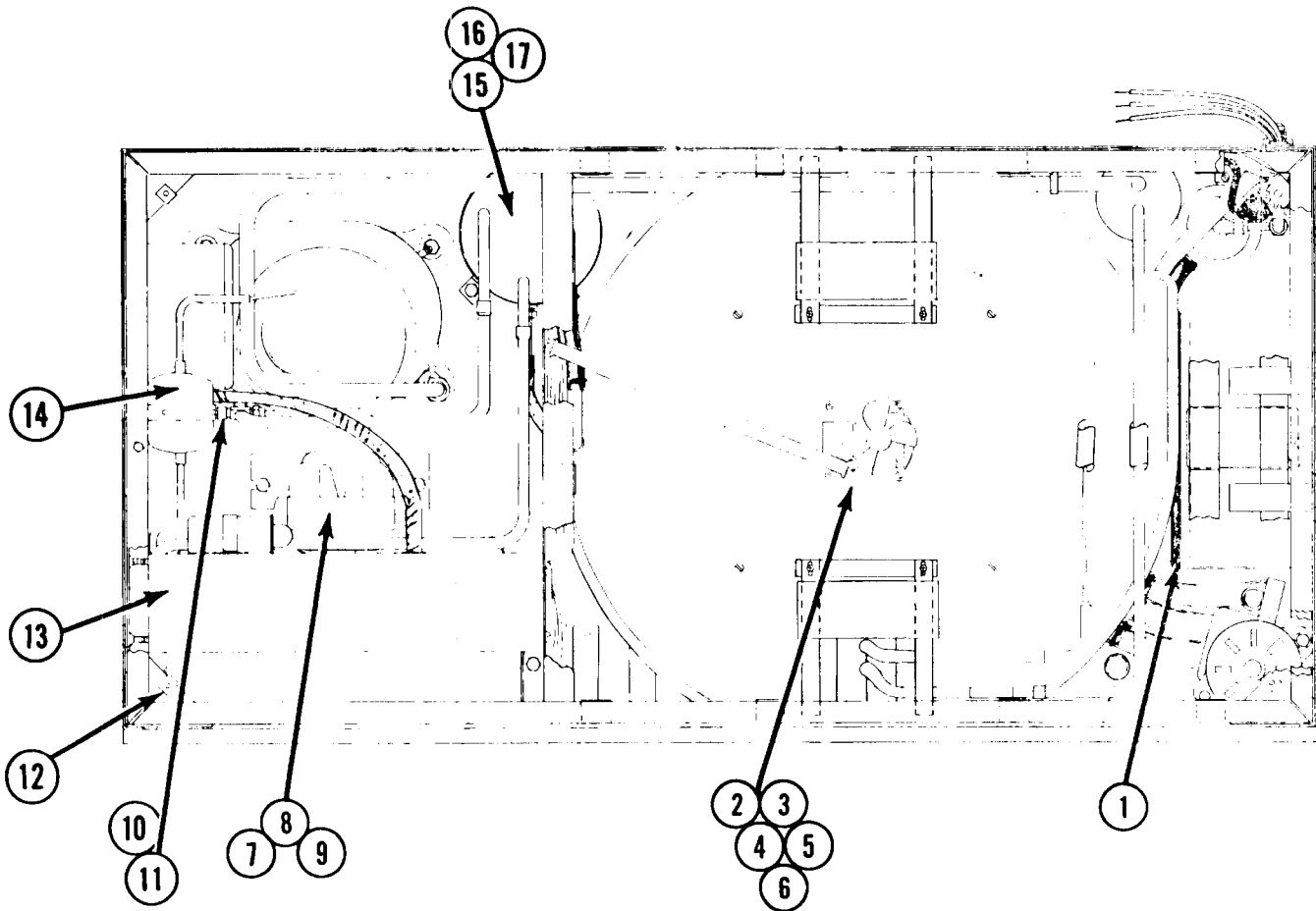
| ITEM NO. | PART NO. | DESCRIPTION |
|----------|----------------------|--------------------|
| 1. | 2-544-1 | Drier |
| 2. | 18-2400-1 | Compressor |
| 3. | 3-1409-6 | Fiber Washer |
| 4. | 3-1394-1 | Pal Nut |
| 5. | 13-595-00 | Gasket |
| 6. | 12-1824-1 | Agitator Motor |
| 7. | A23830-1 | Drive Shaft |
| 8. | S6900 | Drive Arm Assy. |
| 9. | 3-1403-6 | Screw |
| 10. | 13-176 | Drive Motor Gasket |
| 11. | A19233 | Bracket Tank |
| 12. | 3-571 | Screw |
| 13. | A23790-01 | Tank Assy. |
| 14. | 16-560 | Valve Core |
| 15. | 16-563 | Valve Cap |
| 16. | 3-1423-2 | Speed Nut |
| 17. | See separate listing | Control Box |

MC1 WATER COOLED
Front View



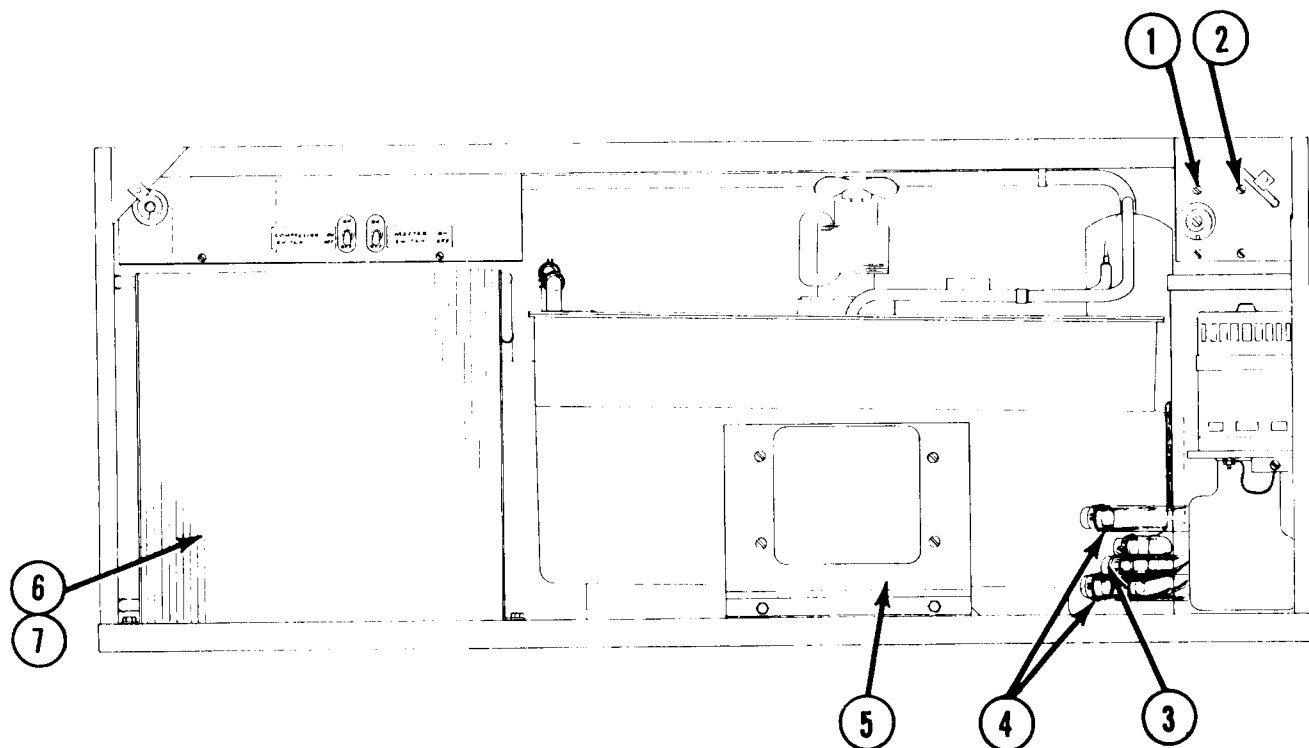
| ITEM NO. | PART NO. | DESCRIPTION |
|----------|----------------------------|-----------------------------|
| 1. | 11-345-2 | MCL & MCM Cube Size Control |
| | 11-351-3 | MCS Cube Size Control |
| 2. | 11-353-03 | Bin Control |
| 3. | 2-179 | Screw Type Hose Clamp |
| 4. | 2-2013-4 | Spring Hose Clamp |
| 5. | See Separate Parts List | Freezer Assy. |
| 6. | 18-3305-01 | Condenser Assy. |
| 7. | 11-198 | Water Regulator |

MC1 AIR COOLED
Top View



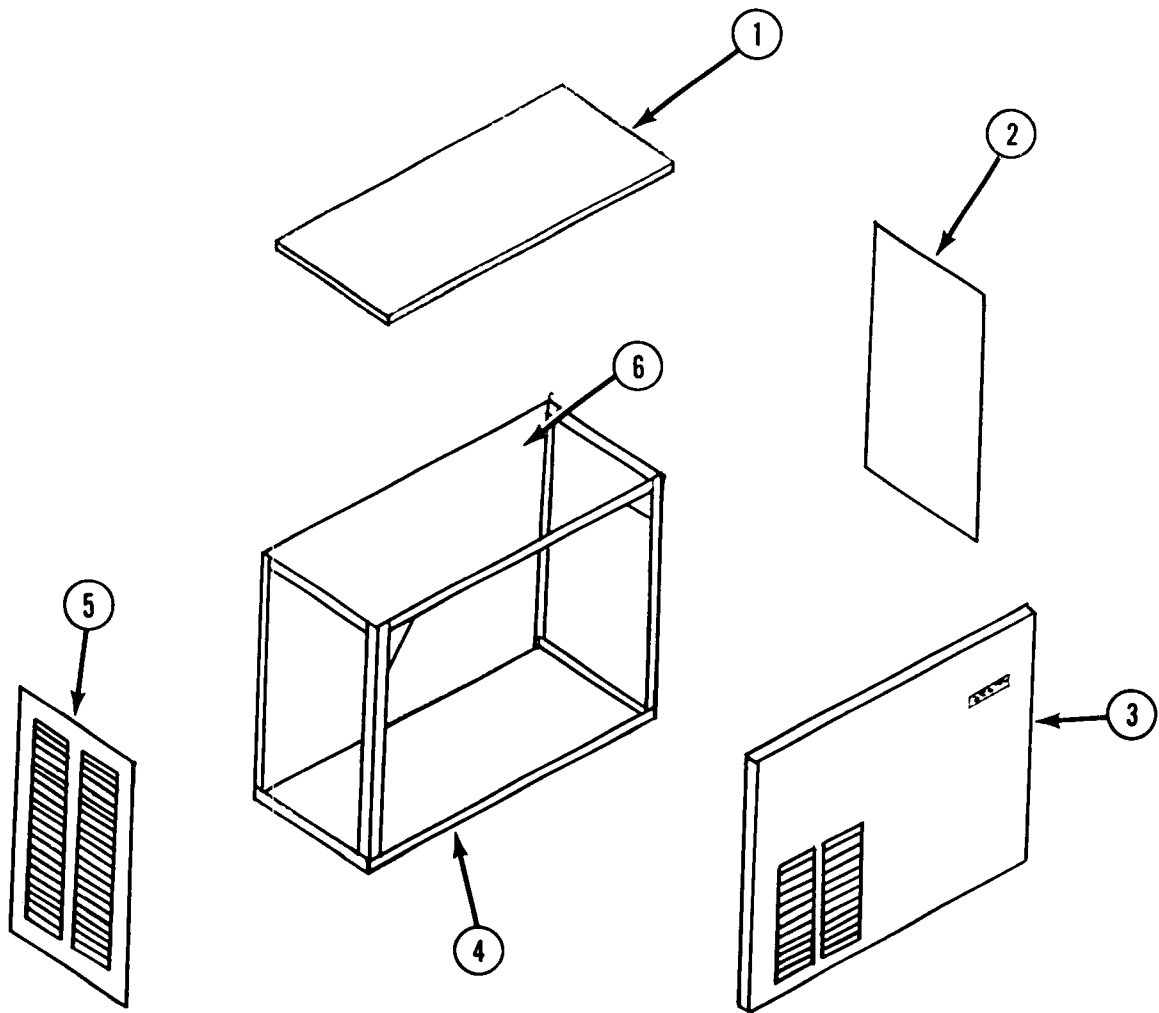
| ITEM NO. | PART NO. | DESCRIPTION |
|----------|----------------------------|--------------------|
| 1. | 13-595-00 | Gasket |
| 2. | 12-1824-1 | Agitator Motor |
| 3. | A23830-1 | Drive Shaft |
| 4. | 3-1403-6 | Screw |
| 5. | 13-176 | Drive Motor Gasket |
| 6. | S6900 | Drive Arm Assy |
| 7. | 12-1681-1 | Fan Motor |
| 8. | 18-625 | Fan Blade |
| 9. | 18-388 | Fan Motor Bracket |
| 10. | 16-560 | Valve Core |
| 11. | 16-563 | Valve Cap |
| 12. | 3-1423-02 | Speed Nut |
| 13. | See separate Parts List | Control Box |
| 14. | 2-544-1 | Drier |
| 15. | A19233 | Tank Bracket |
| 16. | 3-571 | Screw |
| 17. | A23790-1 | Tank Assy. |

MC1 AIR COOLED
Front View



| ITEM NO. | PART NO. | DESCRIPTION |
|----------|-----------------------------|-----------------------------|
| 1. | 11-345-2 | MCM & MCL Cube Size Control |
| 2. | 11-351-3 | MCS Cube Size Control |
| 2. | 11-353-3 | Bin Control |
| 3. | 2-179 | Screw Type Hose Clamp |
| 4. | 2-2013-4 | Spring Hose Clamp |
| 5. | See Separate Parts List. | Freezer Assy. |
| 6. | 18-394 | Condenser |
| 7. | A23825-1 | Shroud |

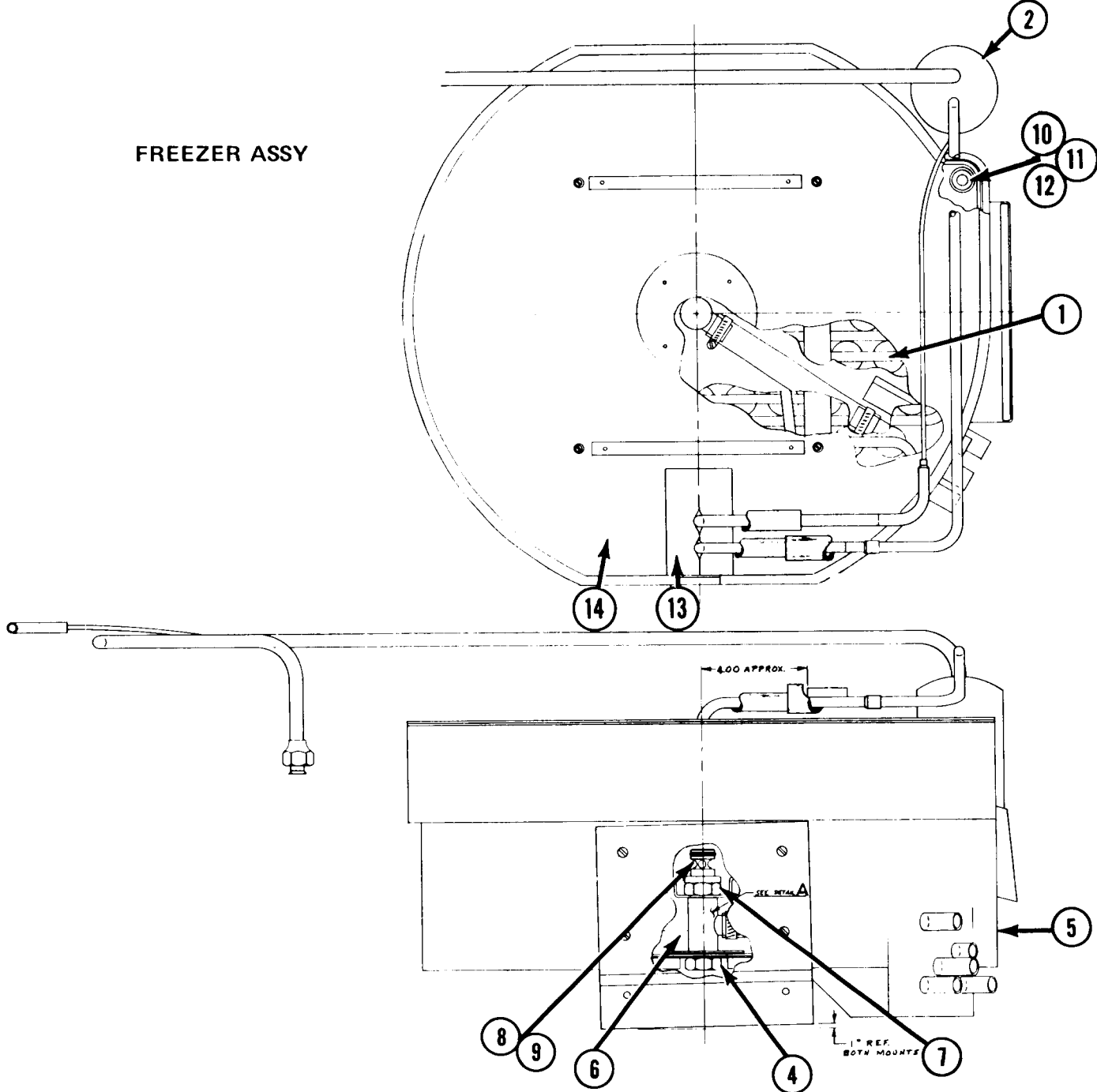
CABINET PARTS



| | Enamel | Stainless Steel |
|----------------------|------------------|-----------------|
| 1. Top Panel | A23784-001 | A23784-002 |
| 2. Panel, Right Side | A23783-001 | A23783-002 |
| 3. Panel, Front | A23785-001 Vinyl | A23785-002 |
| 4. Cabinet Assy. | A23770-001 | A23770-001 |
| 5. Panel left side | A23782-001 | A23782-002 |
| 6. Back Panel | Fixed | A24833-001 |

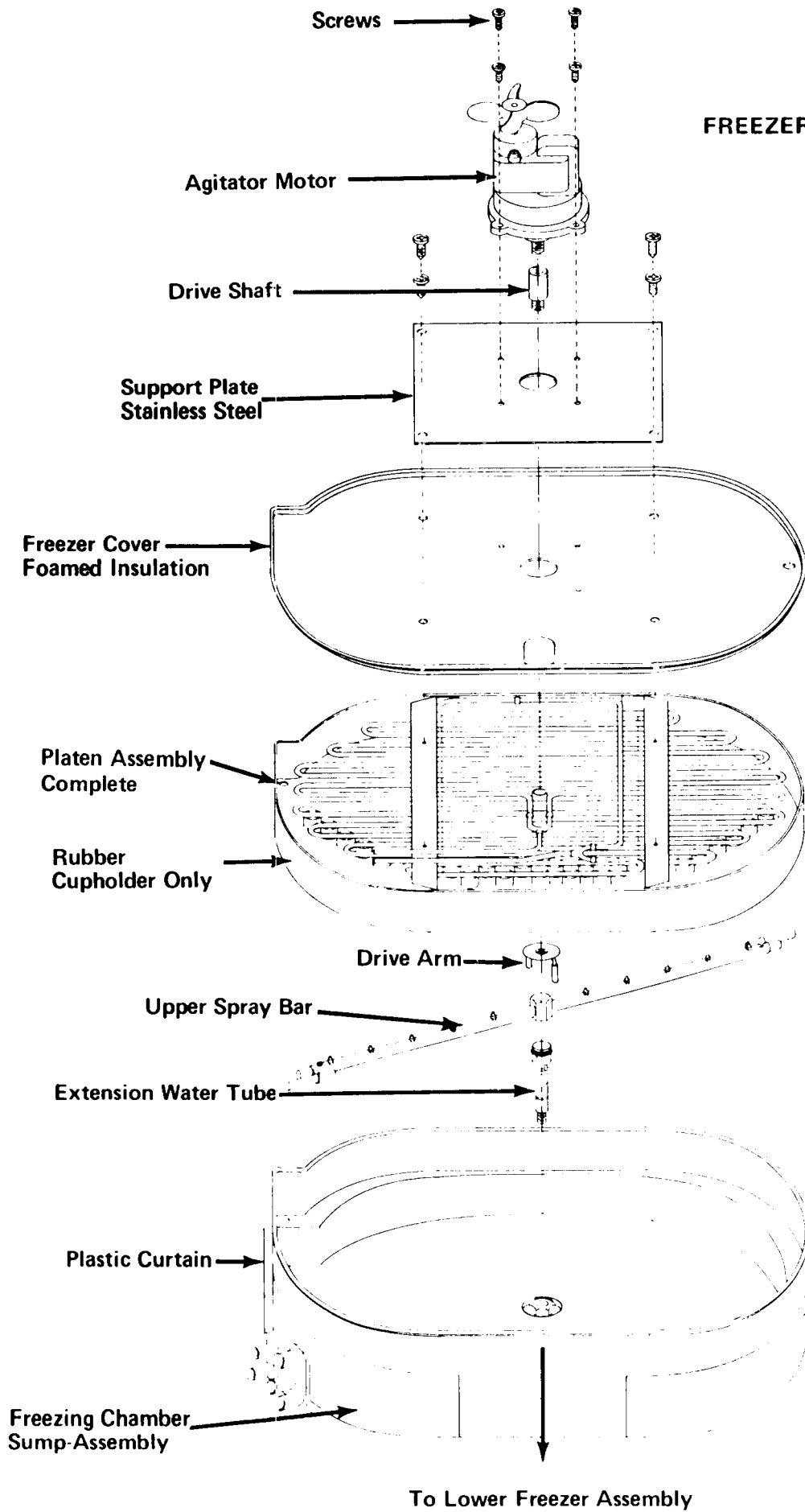
*Panel Conversion Kit (Enamel to Stainless Steel) (Kit Includes Items 1, 2, 3, 5 and 6) – Part No. SPK-MC1

FREEZER ASSY

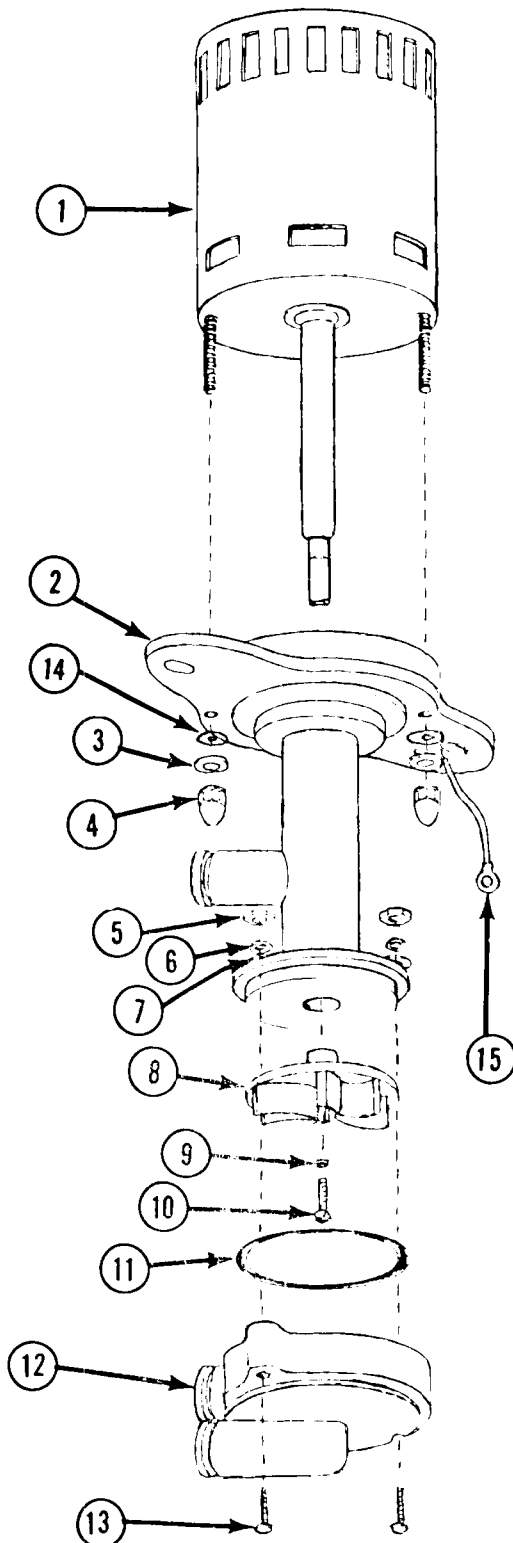


| ITEM NO. | NAME | MCL1 | MCM1 | MCS1 |
|----------|------------------------|------------|-----------|-----------|
| 1. | Freezing Chamber Assy. | A24129-01 | A23880-01 | A23803-01 |
| 2. | Heat Exchanger | A23881-01 | A23881-01 | A23796-01 |
| 3. | Spray bar | A23917-01 | SAME | SAME |
| 4. | Bottom Plug | A24515-01 | | |
| 5. | Foamed Sump Tank | A24054-001 | | |
| 6. | Inlet Housing | A24521-01 | ON | ON |
| 7. | Upper Nut | A23819-01 | | |
| 8. | Jet Bearing Shaft | A19508 | ALL | ALL |
| 9. | O'Ring | 13-617-25 | | |
| 10. | Freezer Hot Water Tube | A16238-01 | MODELS | MODELS |
| 11. | Fiber Washer | 3-1409-03 | | |
| 12. | Adaptor Plug | S7434 | | |
| 13. | Grommet | 13-772-1 | | |
| 14. | Freezer Cover | A24187-01 | | |

FREEZER — SPRAY DRIVE



COMPLETE PUMP ASSY. — 12-1849-1



| ITEM NO. | PART NO. | DESCRIPTION |
|----------|--------------------------|--|
| 1. | 12-1849-50 12-1849-49 | Motor 115/60 or 50/1 Motor 230/50 or 60/1 |
| 2. | 12-1849-51 | Pump Body |
| 3. | 12-1849-52 | Lockwasher |
| 4. | 12-1849-53 | Nut (Acorn) |
| 5. | 12-1849-54 | Nut (Hex) |
| 6. | 12-1849-55 | Lock Washer |
| 7. | 12-1849-56 | Washer |
| 8. | 12-1849-57 | Impeller |
| 9. | 12-1849-58 | Lockwasher |
| 10. | 12-1849-59 | Screw |
| 11. | 12-1849-60 | "O" Ring Seal |
| 12. | 12-1849-61 | Pump Housing |
| 13. | 12-1849-62 | Screw |
| 14. | 12-1849-63 | Washer |
| 15. | 12-1849-64 | Ground Wire |

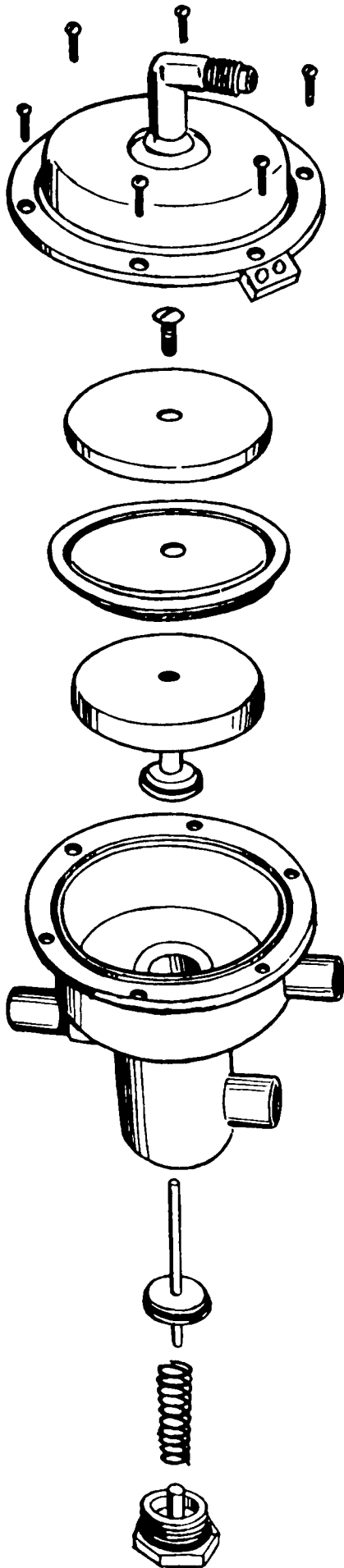
CORRECT DISASSEMBLY PROCEDURE

1. Remove nuts (5), lock washers (6), washers (7) and screws (13)
2. Remove Housing (12)
3. Remove screw (10) and lock washer (9)
4. Remove Impeller (8) and "O" ring (11)
5. Remove cap nuts (4), lock washers (3), ground lead (15) and washer (14)
6. Remove body (2)

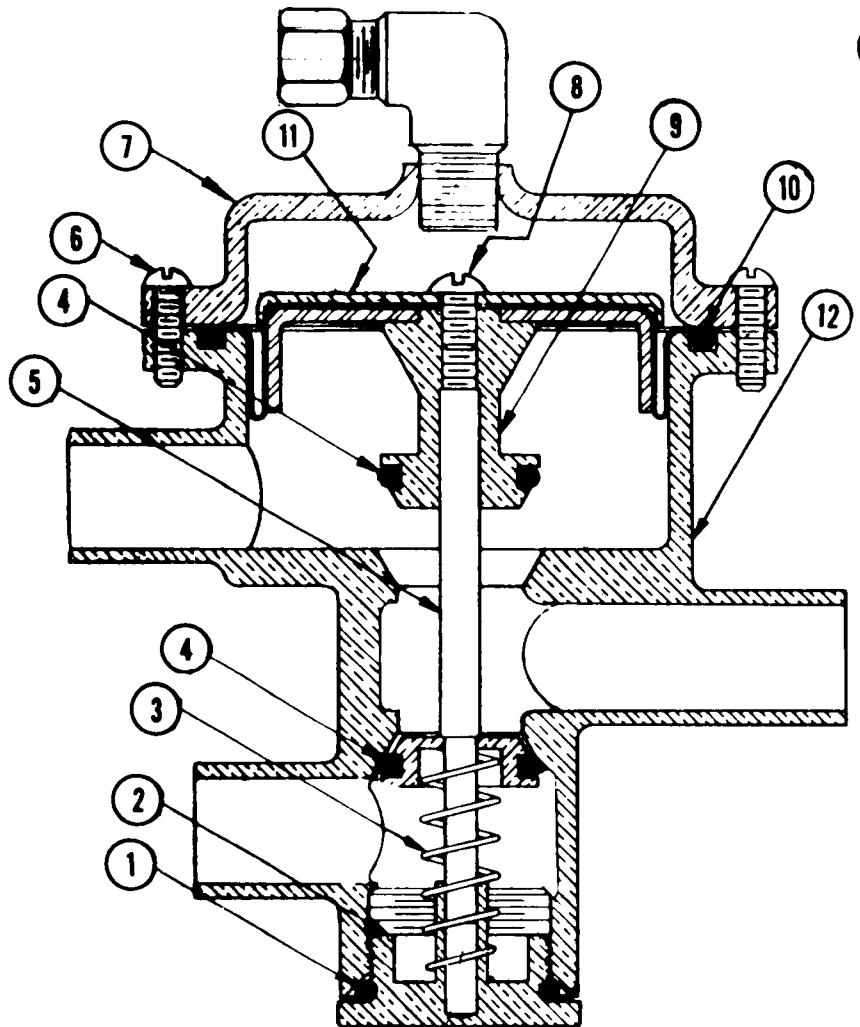
CORRECT ASSEMBLY PROCEDURE

1. Assemble body (2) to motor (1)
2. To motor studs, assemble washers (14), ground lead (15) lock washers (3) and cap nuts (4)
3. Put "O" ring (11) on body (2)
4. Assemble impeller (8) onto motor shaft and fasten with lock-washer (9) and screw (10)
5. Push housing (12) over "O" ring (11) onto body (2)
6. Fasten housing (12) with screws (13), washers (7), lock washers (6) and nuts (5)

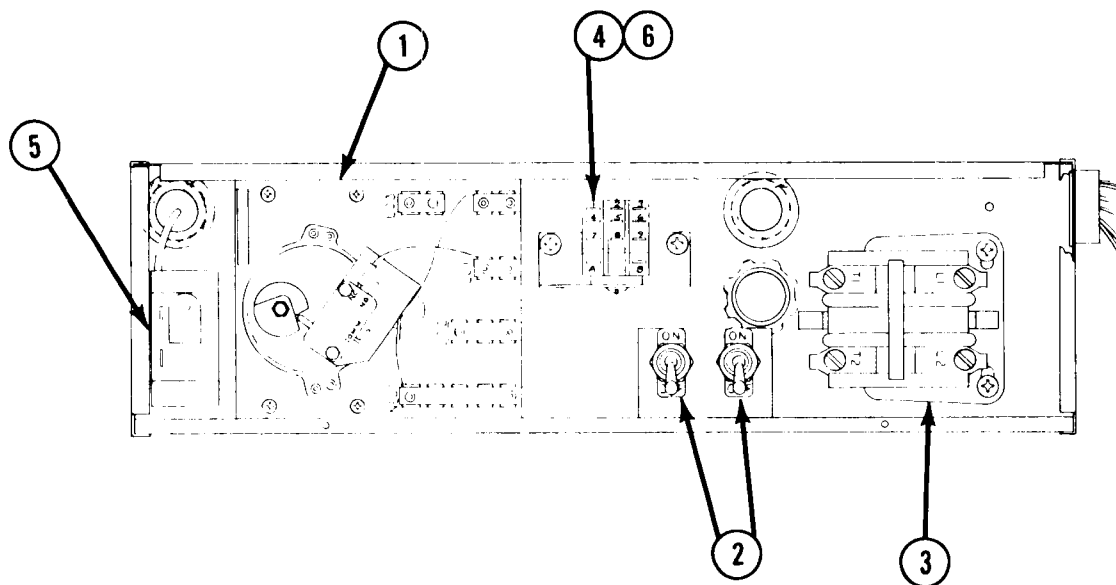
WATER VALVE ASSEMBLY
A21029 (Less Top Fitting)



- | | | |
|-----|-------------|-------------------|
| 1. | 13-0617-22 | O-Ring |
| 2. | 02-1766-00 | Valve Cap Bottom |
| 3. | 02-1545-00 | Spring |
| 4. | 13-0617-01 | O-Ring |
| 5. | A-17942-000 | Lower Plunger Rod |
| 6. | 03-1465-00 | Screws (6) |
| 7. | 2-1765-00 | Valve Top Cover |
| 8. | 03-1506-01 | Screw |
| 9. | A-17941-000 | Upper Plunger |
| 10. | 13-606-00 | Upper Diaphragm |
| 11. | A-18312-00 | Diaphragm Cover |
| 12. | 02-1764-00 | Valve Body |

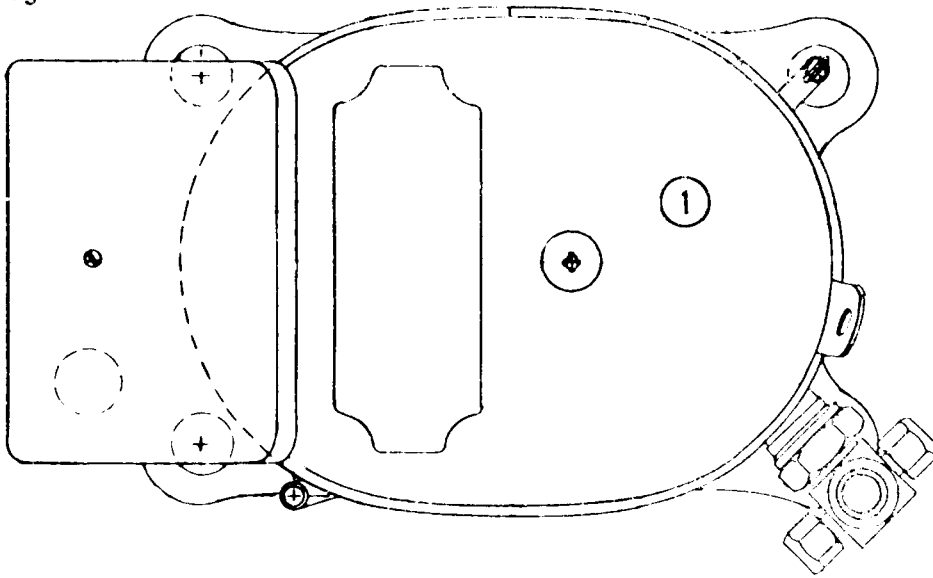


CONTROL BOX ASSY.

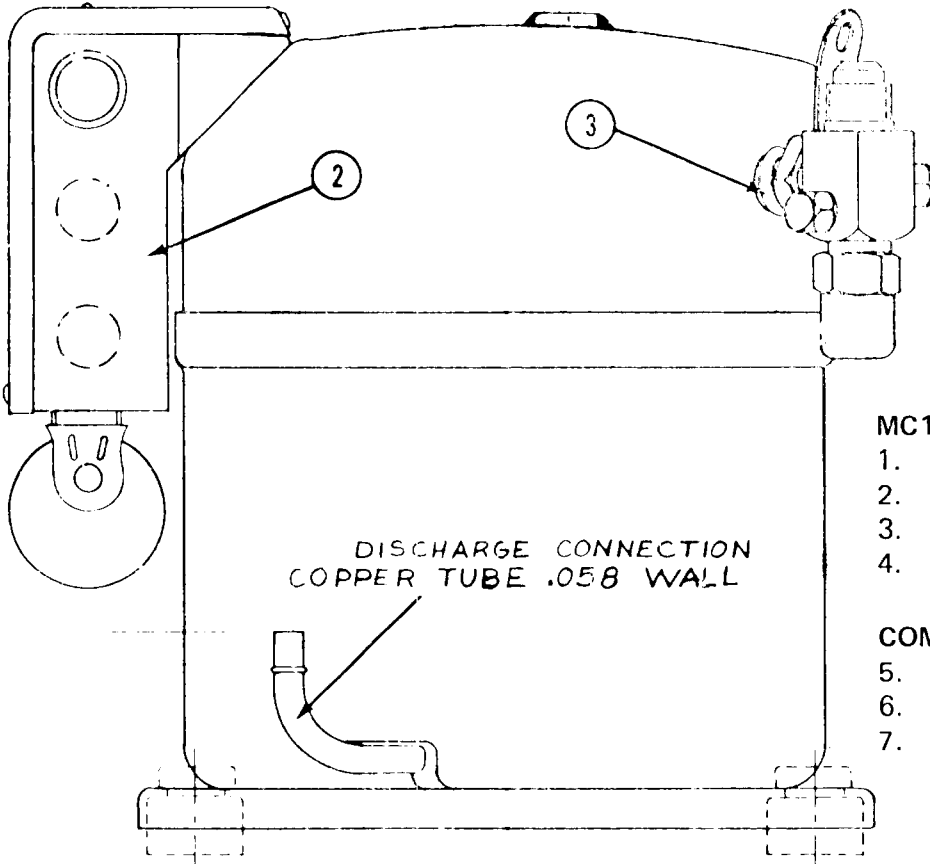


| ITEM NO. | PART NO. | DESCRIPTION |
|----------|------------|---------------------------------|
| 1. | A23712-01 | Timer |
| 2. | 12-426-01 | Toggle Switch |
| 3. | 12-820-01 | Contactor |
| 4. | 12-1598-00 | Holding Relay |
| 5. | 11-357 | Pressure Control – Water Cooled |
| | 11-365 | Pressure Control – Air Cooled |
| 6. | A23965-01 | Relay Bracket |

Control Box -- A24251-001 -- Water Cooled 115/60/1
 A23821-001 -- Air Cooled 115/60/1



MOTOR COMPRESSOR
Air and Water
115/60/1 3500 RPM



MC1-1 (115/60/1)

- | | | |
|----|-------------|-----------------|
| 1. | 18-2400-001 | Compressor |
| 2. | 18-1902-17 | Run Capacitor |
| 3. | 18-2410-00 | Potential Relay |
| 4. | 18-2420-00 | Start Capacitor |

COMMON TO ALL COMPRESSORS

- | | | |
|----|-----------------|-----------------------------|
| 5. | 18-2201-30 | Rotolock Valve |
| 6. | 18-2300-29 | Valve Seal |
| 7. | 18-2200-27 & 28 | Mounting sleeves & grommets |

18-2420-00 -- General Electric No. 35F1441BC8 Copeland No. 014-0008-69, 282-340 MFD, 110 VAC 60 CPS.

18-1902-17 -- Copeland No. 014-0001-00, 370 Volt, 10 MFD.

18-2410-00 -- Copeland No. 040-0098-01

MAINTENANCE INSTRUCTION FOR SCOTSMAN SUPER CUBERS

THE FOLLOWING MAINTENANCE SHOULD BE SCHEDULED EACH (6) SIX MONTHS ON ALL SCOTSMAN SUPER CUBERS. CALL YOUR AUTHORIZED SCOTSMAN SERVICE DEPARTMENT.

1. Clean air-cooled condenser. This is to be done frequently with the machine shut off.
2. Clean water system and evaporator, sump tank and screen, using Scotsman Ice Machine Cleaner or equivalent.
3. Remove jet tube and manually clean jets by unscrewing jets.
4. Check curtain assembly.
5. Tighten all electrical connections.
6. Tighten all bolts.
7. Check water supply. Check water pressure flow through flow control. Clean water strainer.
8. Oil jet tubes drive motor three (3) places. Use SAE 20 oil - 3 oil cups.
9. Oil Condenser fan motor. Punch sealed cap or remove screws where possible.
10. Check for refrigeration leaks with halide torch.
11. Check for water leaks. Tighten drain line connections.
12. Check size and condition of cubes. Adjust as required.
13. Check to insure bleed tube on top of hot water tanks are open. Clean with 3/16" drill bit.

PROCEDURE FOR USE OF SCOTSMAN ICE MACHINE CLEANER

1. Remove front panel, right side panel, and cube chute.
2. Locate control box with time clock knob protruding thru cover. Turn master and compressor switches to off position.
3. Start unit thru harvest cycle manually. This is done by slowly turning time clock knob clockwise until you hear the micro-switch actuator arm drop into the cam slot.
4. Locate and remove defrost water tube which protrudes thru each freezing chamber cover at top left of freezing chamber.
5. For each freezing chamber, dilute 16 ozs. of Scotsman Ice Machine Cleaner in 11 pints of fresh potable water in a clean container. Pour this cleaning solution into freezing chamber thru defrost tube hole. Replace defrost tubes and IMMEDIATELY TURN ON MASTER SWITCH.
6. Let unit operate normally for 20 minutes into the freezing cycle. No ice will be made because the compressor is not in operation.
7. At the end of this time, rotate the timer knob until the harvest cycle starts again. Allow the machine to run normally thru this harvest cycle. When the harvest has been completed, then rotate knob manually thru the freeze cycle until the harvest cycle starts once again. Do this 3 times. Cube chute and curtain(s) should be washed in solution of household bleach and water (1 oz. of bleach in 1 gal. of water)
8. Turn the compressor switch back on. Use a damp cloth to wipe off curtain(s) and cube chute. Place cube chute and curtain(s) in position.
9. Check each new batch of cubes until they are clear and until acid taste has been removed from cubes.
10. Pour hot water in storage bin to melt the cubes and thereby clean the bin and drains with the same solution that has just cleaned the unit.
11. Replace all doors.
12. Unit is now ready for continued automatic operation.

SCOTSMAN[®] ICE MACHINES

PRODUCT NAME:

SCOTSMAN[®] BIN MODEL B550 SERIES

SERIES B550

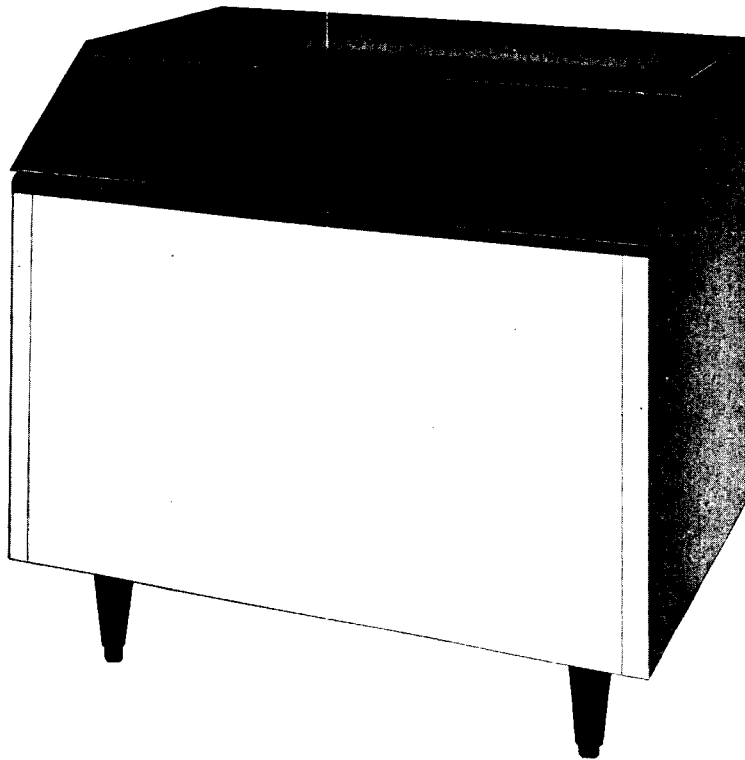
Use with MC1 and MC2 series cubers or MF3, MF4 and MF5 series flakers. Holds up to 550 pounds of Scotsman ice. Width: 42-1/4", Depth: 30-1/2", Height: (With legs) 38" to 38-3/4", Height: (Without legs) 32". Hinged door opening 9-3/4" x 39". Drain fitting 1/2 NPT.

MANUFACTURER:

QUEEN PRODUCTS DIVISION
KING-SEELEY THERMOS CO.
ALBERT LEA, MINNESOTA 56007

B550: Heavy-gauge steel with sandalwood micomatte finish, stainless steel interior. Shipping weight: 193 lbs.

B550SS: Heavy-gauge stainless steel inside and out, chrome-plated legs. Shipping weight: 193 lbs.



NOTE: Optional Bin Extension Kit Model KBE75 adds approximately 75 lbs. of ice storage. Width 42-1/4", Depth 21", Height 6".

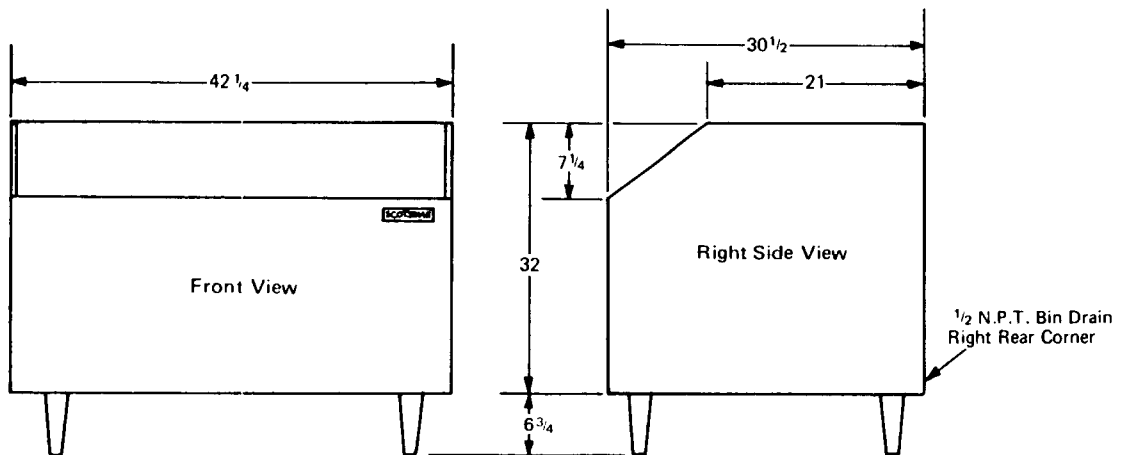
Optional insulated stainless steel top kit KBT1 provides cover for bin or extension kit. Also provides base for mounting MF model flakers. Width 42-1/4", Depth 21", Height 1-5/8".

PARTS LIST FOR B550

- | | |
|------------------------------|----------|
| 1. Cube deflector Assy | A24146-1 |
| 2. Thumb screws for mounting | 3-727 |
| 3. Gasket, machine to bin | 19-503-4 |
| 4. Bin Door Assy. | A23997-1 |
| 5. Door frame fab assy. | A23992-1 |



DRAIN IN RIGHT REAR CORNER



Specifications subject to change without notice.

CARE OF STAINLESS STEEL STORAGE BIN LINERS

All commercial grades of stainless steel will corrode or rust when in contact with certain chemicals or salts. **One element that attacks stainless readily, is chlorine**, and most compounds of chlorine, such as hydrochloric acid, and certain salts containing chlorine. The "speed" with which this corrosion takes place depends on the concentration of the chlorine, and the length of time it is left in contact with the stainless steel.

ICE BIN LINER RUSTING

In many ice bin applications, a rust stain, or brown deposit, will appear at the top of the side and rear walls of the bin liner, and also on any exposed stainless parts inside the bin, which do not normally get covered with ice; such as stainless steel door back pans. The lower portions of the liner walls usually stay clean if the bin is being used regularly, due to the "washing" action of the ice and meltage water draining down these walls. This brown staining on the liner may appear more rapidly in some installations than other, depending on the way the ice is being made in the ice machine, and the water conditions.

This staining or rusting, can come from basically two sources:

1. **Foreign materials** — For example, many ice machine casings are made of painted steel. If this steel should be exposed at the joint where the ice machine sits on the bin, it could rust, and the rust stain could "drip" down the liner walls. Also, particles of plain steel could fall down into the bin and, in turn, start rusting.
2. **Materials expelled during ice making** — Practically all icemakers produce clear ice by "freezing out the impurities" normally found in tap water. Chlorine gas, other gases and solids, are expelled during the making of ice. Being heavier than air, these foreign materials drop down into the bin through the same opening that the ice enters the bin. (This oftentimes explains why this staining is more noticeable on an installation where the opening on the bottom of the ice machine is quite large). **The chlorine gas will combine with water vapor and condense on the liner walls as a mild hydrochloric acid.** Above the normal ice level, this never gets removed by the action of the ice, and will eventually form a brown stain.

CLEANING OF A STAINLESS STEEL BIN LINER

Because the brown staining or rusting is due to expelled material during ice-making, every bin liner should be cleaned periodically, to prevent this staining from causing pitting of the stainless steel. The time between cleanings will depend on the water conditions, type of ice machine, etc. It may be necessary only every 3 to 6 months.

1. **General Cleaning** -- When the staining is light, it can usually be removed by washing with ordinary cleaning powder, such as Bon-Ami, or Copper-Glo, and water. (Do not use cleaners that contain bleaching agents, as most of these are compounds of chlorine.) After cleaning, rinse thoroughly with clear water.

It may be necessary to use a stainless steel wool to remove bad stains. DO NOT USE plain steel wool, as the steel particles will get imbedded in the liner and cause more serious rusting.

2. **Cleaning of heavy deposits**—If the liner has not been cleaned for a long time, and heavy deposits and pitting have occurred, a chemical cleaner may be necessary. Several of these are as follows:

Oakite No. 33, Oakite Products, Inc., 19 Rector St., New York, N.Y. Texo No. 12, and Texo-NY, Texo Corp., 2200 Dana Ave. Cincinnati 7, Ohio. Metalprep No. 10, Nelson Chem. Co., 6564 Benson St., Detroit 7, Mich, Dilac, Diversey Corp., 1820 Roscoe St., Chicago 13, Illinois.

A solution of one part cleaner and two parts water is used. First, wash the bin liner thoroughly with water and soap as described above. Then simply swab the solution on the area to be cleaned, and allow to stand for about 20 minutes. Rinse with clear water. If this doesn't completely remove the deposit, repeat the procedure.

Synthetic rubber gloves should be used by the operator, and goggles and aprons are advisable even though the solution is relatively nonhazardous.

These cleaners may possibly harm paint, wood, or fabrics, They will probably cause a dull grey color on galvanized steel and should not be allowed to remain long in contact with rubber. Therefore, provision should be made to avoid contact with such materials when cleaning stainless.

3. **Protection of Stainless Steel against further staining** — After the stainless steel has been cleaned, installations where the staining is recurring so frequently, the surface should be rejuvenated. This process restores the characterisitc to the surface of the stainless, that best prevents corrosion.

First, be sure that the liner is clean and is thoroughly rinsed with water. Then use a nitric acid solution of two parts water to one part nitric acid (by volume). Swab this on the liner and allow to stand for about 30 minutes. Rinse the liner with clean water. This will then provide maximum corrosion resistance.