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SCOTSMAN®



MODEL SM-18

HOME ICE CUBE MAKER

SPECIFICATIONS

Size: 15" wide 20-1/2" deep
33-1/8" high.

Weight: 85 pounds

Cabinet: Steel

Finish: Baked on enamel

Color: Sandalwood, micomatte

Storage Bin: Polyethylene

Door: Swings to right

Door Latch: Magnetic Gasket
4 Sides

Lower Compartment Panel:
Removable by pulling outward
at top.

Requirements:

Power: 115 volts - 60 Hertz Single Phase

Water: 1/4" cold water line

Drain: Required for water Outlet.

Power Consumption:

3.0 Amperes

Wire Size:

18 Gauge

Fuse Size — Maximum:

15 Amperes

Refrigerant Metering
Device:

Capillary Tube

Cubes per Harvest:

8

Harvest Means:

Warm Water

Compressor Make:
Compressor Specs:

Danfoss
1/8 H.P. 115/60/1

Compressor Model:

411L0052

Cycle Time:

24 minutes

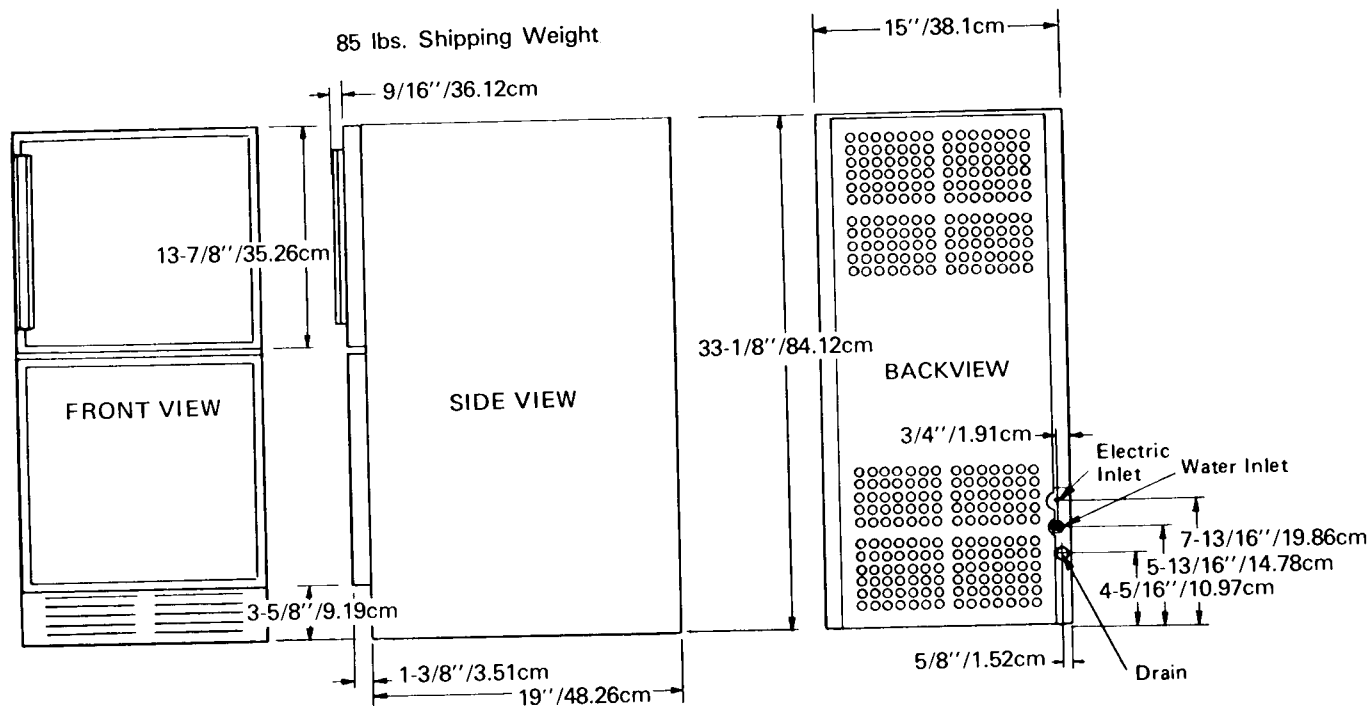
Refrigerant Charge:

5 oz. R-12.

MODEL SM-18

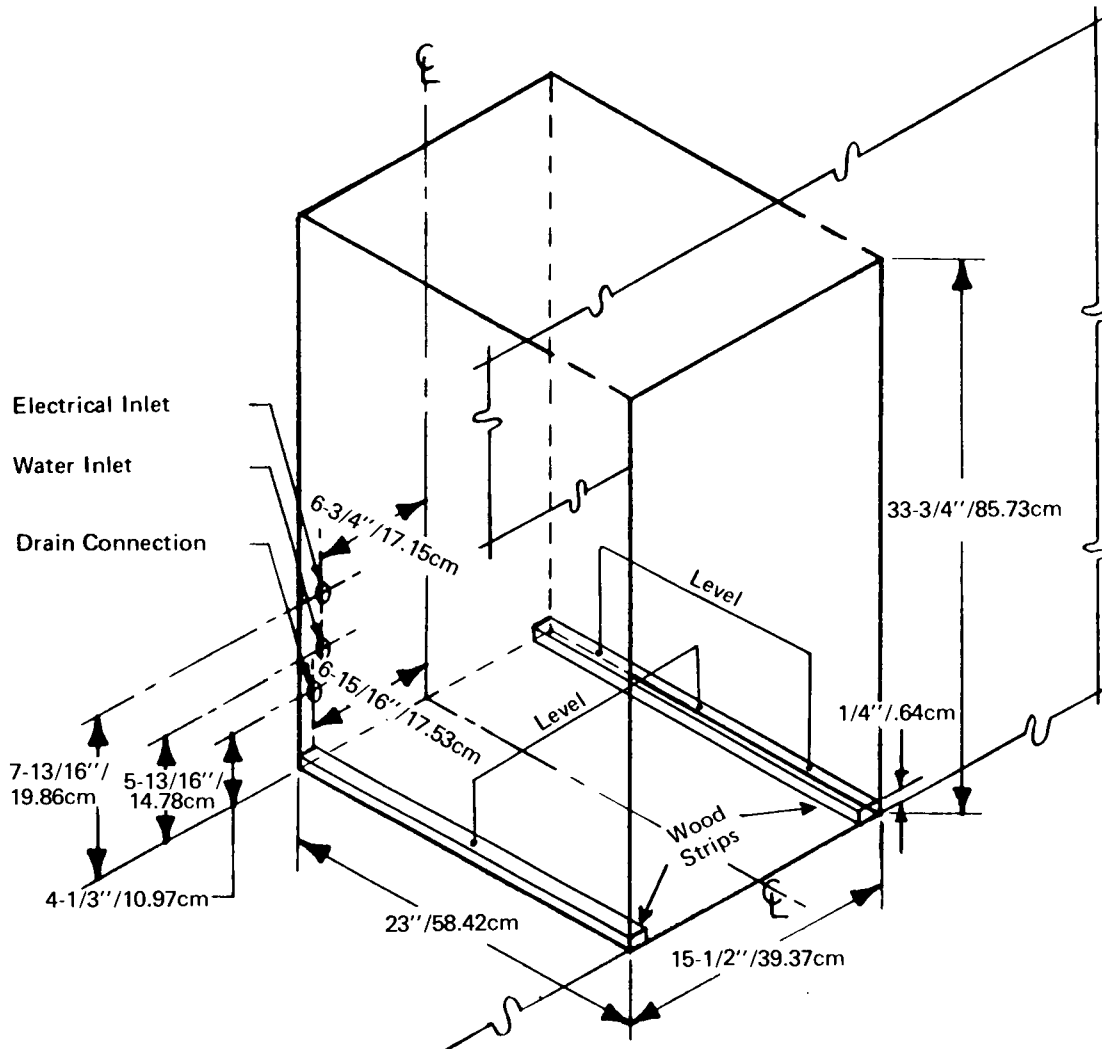
Daily Ice Capacity is directly related to condenser water temperature, ambient temperature, and age of machine. Under normal conditions the SM-18 will make up to 18 pounds of ice in 24 hours.

To keep your SCOTSMAN HOME ICEMAKER performing at it's maximum capacity, it is necessary to perform periodic maintenance as outlined on page 12 of this manual.



DIMENSIONAL DRAWING FOR BUILT-IN INSTALLATIONS

NOTE: AS SOME SERVICE PROCEDURES REQUIRE ACCESS TO THE ENTIRE UNIT, IT IS **IMPORTANT** TO ALLOW ENOUGH SPACE TO REMOVE THE MACHINE FROM THE INSTALLATION. PLEASE KEEP THIS IN MIND WHILE INSTALLING YOUR SM18W-1 HOME ICE CUBE MAKER.



MODEL SM-18 RECESSED

To recess the Model SM-18 into a cabinet, provide an opening 33-3/4 inches high, 15-1/2 inches wide and 23 inches deep.

The above dimensions allow 4 inches at the back of the Ice Maker for electric cord, water line and drain line.

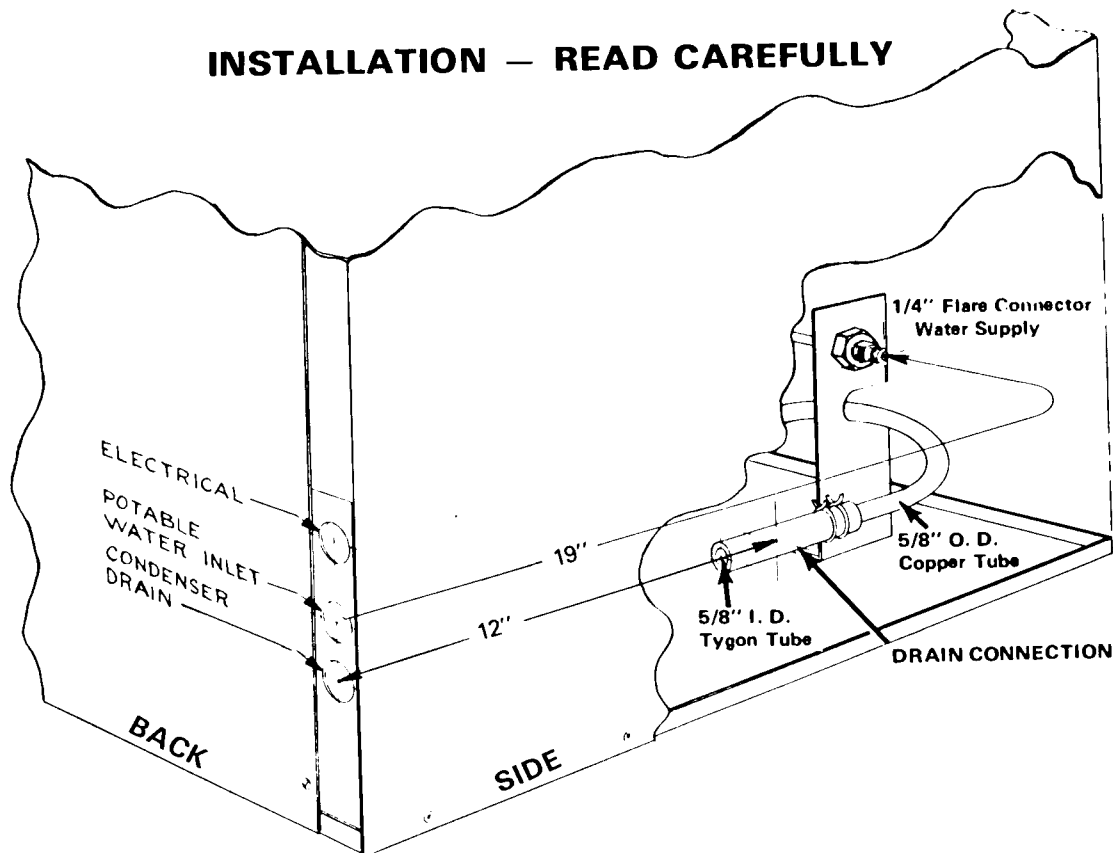
Requirements: For either recessed or freestanding installation.

Power: 115 volts, 60 cycle, single phase

Water: 1/4 inch flare connector provided on the Ice Maker.

Drain: Installation of an adequate drain is necessary. See page 9 and 10 for complete instructions.

INSTALLATION — READ CAREFULLY

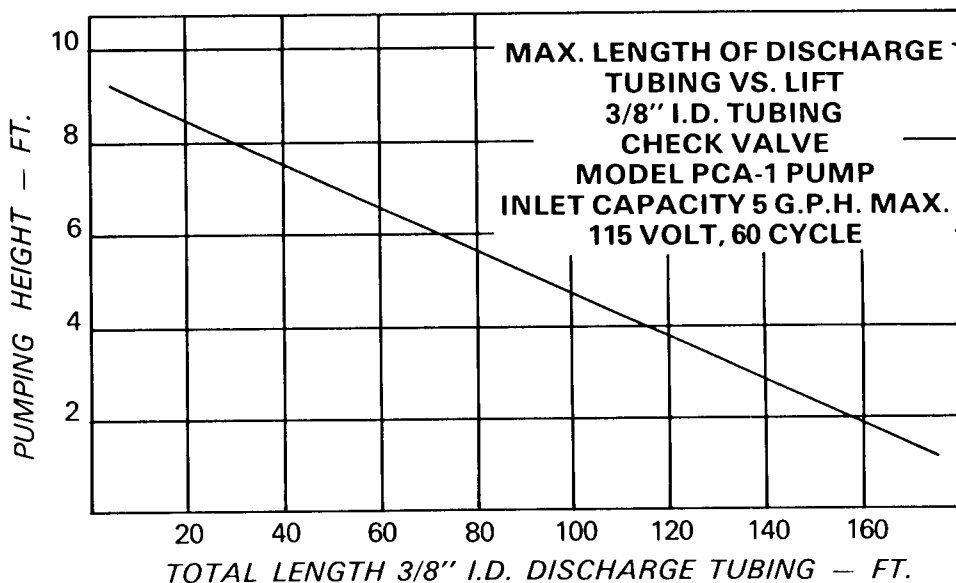


- STEP ONE:** Locate the unit on a solid level floor or base with access to electrical power, a water supply and a drain. Level, if necessary as shown on page 6.
- STEP TWO:** Remove the front panel, located below the ice storage door, by pulling outward on the top of the panel. This exposes the water and drain line connections.
- STEP THREE:** The ice maker should be on a separate electrical circuit. It is suggested an electrician be contacted to insure this circuit has a maximum fusing of 15 amps and is properly grounded. Low voltage from overloaded circuits can cause premature failure of cuber electrical components. A solid ground wire from cuber frame or grounding screw to an "earth" ground such as a cold water line should also be installed.
NOTE: Failure to ground the unit properly may result in an electrical shock hazard which could cause severe or fatal shock injury.
- STEP FOUR:** A 1/4 inch flare connector is provided at the front of the icemaker for the cold water supply. The supply line should not be smaller than 1/4 inch O.D. copper. A shut off valve conveniently located in the water line is recommended. The water supply line should be directed thru the opening in the back of the icemaker marked "Potable Water Inlet." as shown in the above drawing.
- STEP FIVE:** **INSTALLATION OF UNIT DRAIN.**
Instructions for proper drain hookup are contained on page 9 and 10 of this manual. Any parts which malfunction due to improper drain installation will not be eligible for one year parts exchange program.
- NOTE:** For under counter installation, allow approximately 19 inches of 1/4 inch water line and 12 inches of drain line (measured from the back of the ice maker) to direct thru the openings at the rear. Final connections are to be made after icemaker is in position.

INSTALLATION INSTRUCTIONS — SM18PW-1 (With Condensate Pump)

The Model SM18PW-1 Home Ice Maker is equipped with a condensate pump. THIS MAKES YOUR ICE MAKER ADAPTABLE TO INSTALLATIONS WHERE A GRAVITY DRAIN IS NOT AVAILABLE. Follow the instructions listed below carefully to insure proper operation.

1. Run the 3/8" I.D. flexible plastic tubing from the rear of the machine to your drain location.
2. Check chart below for max. length of drain line and lift.
3. Start the machine according to the instructions in the Service Manual.
4. The pump is equipped with a safety switch which will stop the ice-maker if the pump malfunctions and the reservoir is not pumped out. This safety switch is connected to the control box by the yellow cord.



HOW TO USE THE CHART

The chart provides a simple ratio between the amount of vertical lift (head) in your installation compared to the maximum length of discharge tubing (run) needed. Figures derived assume an inlet capacity of five gallons per hour maximum. It is also assumed that 3/8" I.D. Flexible plastic tubing will be used.

NOTE: A relatively short pumping cycle is normal for a unit of this type. This in no way denotes a defective unit nor is short cycling harmful to the unit as long as the check valve is functional.

WARNING: DO NOT REMOVE FLUTED PLASTIC FITTING AND/OR CHECK VALVE FROM THE PUMP. REMOVAL OF EITHER WILL AUTOMATICALLY VOID THE WARRANTY.

It can easily be seen, then, that, with a head (vertical rise) of 6', (for example) the maximum total length of discharge tubing to be used on the "run" (vertical plus horizontal) would be slightly less than 70'.

DRAIN INSTALLATION

IMPORTANT: To insure a properly functioning machine an adequate drain is necessary. Two different drain installations are acceptable. These are as follows:

1. Where a drain exists which is not higher than the opening in the back of the ice maker labeled "Condenser Drain", a gravity drain is adequate. At no time can the drain tube be raised higher than the cabinet hole. If the drain tube is run thru the floor behind the unit, provide a 7/8" hole at least 2-1/2 inches behind the back panel of the machine. This will prevent a kink from forming in the line. Proper drain installation requires the use of 5/8" OD copper tube or 5/8" I.D. flexible plastic tubing. It is important to insure that the plastic tubing does not kink. Allow 1/4" pitch per foot on drain lines over 4 ft. long. **DO NOT** plumb the drain line into the sewer in any air tight manner. It is extremely important to provide an air gap between the unit drain and any external drain. This prevents sewer gas from backing into the unit and also eliminates most air locks. An air lock will cause water to back up into the bin and melt the ice stored there.

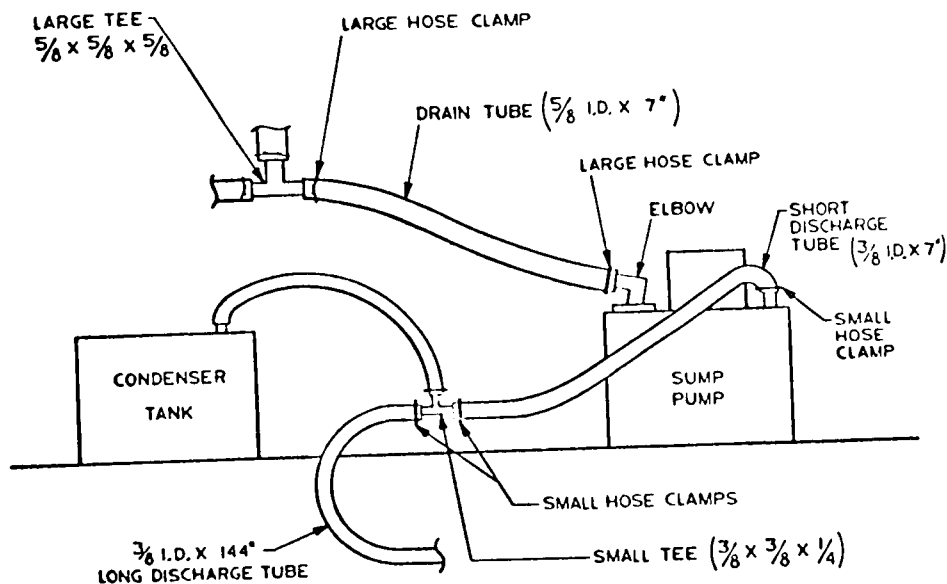
SPK 18H INSTALLATION INSTRUCTIONS

Mounting Instructions:

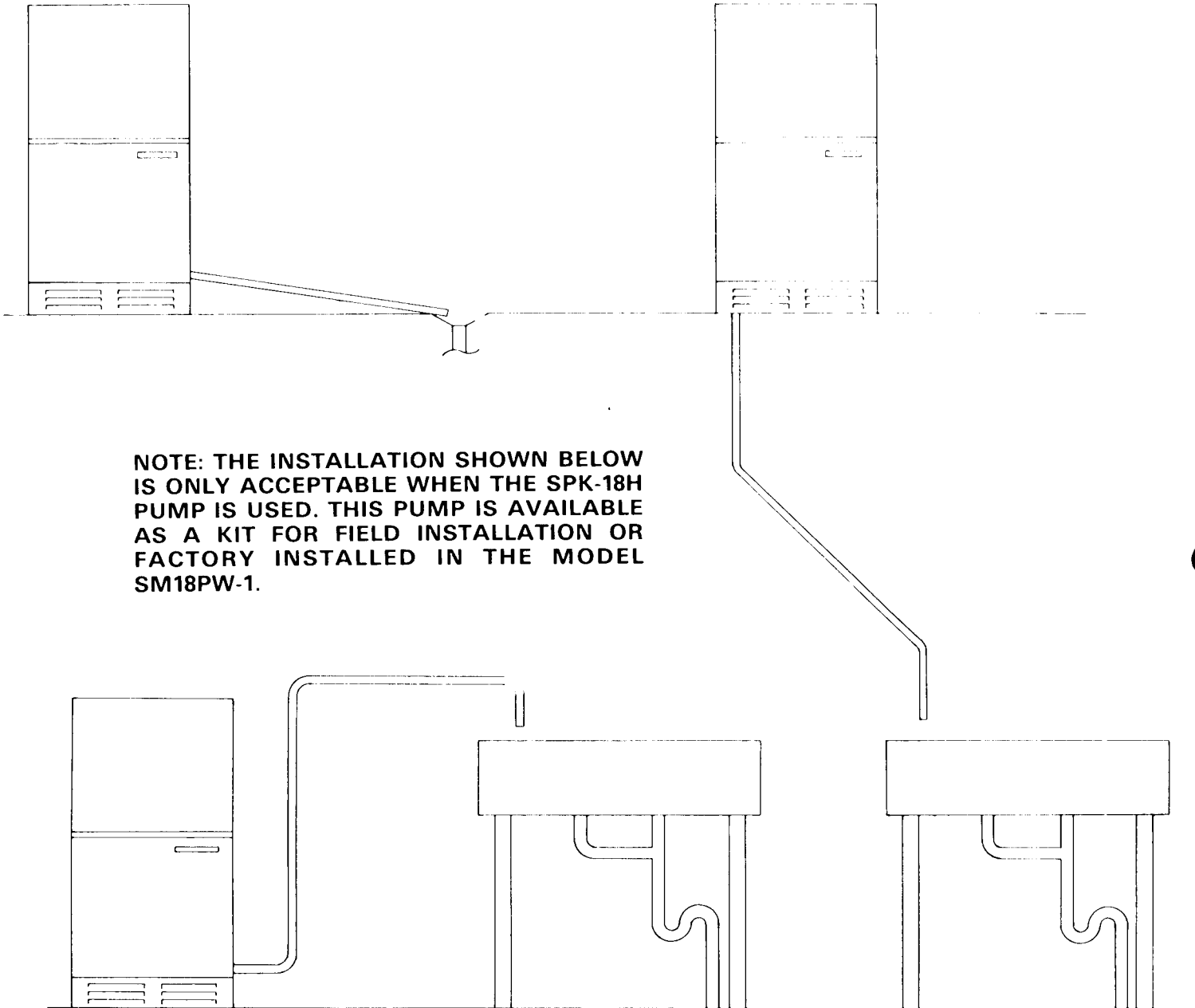
1. Remove the 5/8" O.D. hook shaped drain tube completely from the unit by disconnecting the two hose clamps just below the bin drain.
2. Connect the large tee (5/8" x 5/8" x 5/8") with 7" long drain tube and elbow to tubes from which drain tube was removed. Secure with hose clamps at all joints. See sketch for details regarding part descriptions.
3. Place pump to the immediate right of water inlet supporting bracket in the front of the unit with the pump discharge tube end nearest the front. The water inlet tube must be dismantled from the bracket and allowed to be self supported above the pump. Elbow from drain tube should be placed in tank inlet.
4. Connect long and short discharge tubes (3/8" I.D.) to small tee and connect short tube to pump discharge. To small diameter leg of tee, connect 1/4" I.D. tube from condenser outlet. Secure all joints with hose clamps. Run long discharge tube out the back of the unit.

Auxiliary Safety Switch Wiring Instructions:

1. Disconnect electrical supply.
2. Remove Black (BLK) wire connecting on-off toggle switch to bin temperature control.
3. Connect leads from safety switch (yellow cord) to the terminals of the toggle switch and temperature control from which black wire was removed. Inspect terminals to insure proper spacing between terminals and also between terminals and control box. Adjust if necessary.



DRAIN INSTALLATION



NOTE: THE INSTALLATION SHOWN BELOW IS ONLY ACCEPTABLE WHEN THE SPK-18H PUMP IS USED. THIS PUMP IS AVAILABLE AS A KIT FOR FIELD INSTALLATION OR FACTORY INSTALLED IN THE MODEL SM18PW-1.

NOTE: SCOTSMAN DOES NOT SUGGEST THE INSTALLATION OF ANY DRAIN LINE RUN DIRECTLY OUTSIDE TO A LAWN, DRIVEWAY, FLOWER BED, ETC. CONNECT THE UNIT DRAIN TO AN EXISTING DRAIN LINE ACCORDING TO THE DRAIN INSTALLATION INSTRUCTIONS.

START-UP PROCEDURE

WARNING: NEVER RUN THE UNIT WITHOUT THE WATER TURNED ON. THIS COULD DAMAGE THE MACHINE.

1. Turn on the cold water supply to the machine.
2. Turn on the electrical power.
3. Push the lever of the Off-On switch to your left. The machine will now automatically produce ice in about thirty minutes.

In normal operation the compressor will operate approximately 22 minutes to freeze a batch of cubes. It will then remain off for about 2 minutes while the ice cubes are falling from the freezer to the storage bin. The compressor will then automatically start and the cycles will be repeated until the storage bin has filled.

The normal storage bin capacity is 26 pounds of ice (about 700 cubes) or when the cubes touch the thermostat capillary tube on the right hand side of the bin. The bin is considered full when cubes are ten inches above the bottom of the bin. When the machine is initially installed, the unit will operate continuously for approximately 36 to 48 hours or until the ice storage bin has been filled. Once the storage bin has been filled, the unit will cycle on the bin control to maintain a full bin of ice.

When the cuber is first started it may be necessary for the unit to complete two cycles (about 48 minutes) before usable ice is produced.

This is due to the lack of water in the system for making cubes.

If cubes are required the first cycle it will be necessary to take the following steps:

1. Push lever of the ON-OFF switch to the OFF position. Disconnect electrical power.
NOTE: Failure to Disconnect the electrical power may result in severe or fatal shock injury.
2. Remove control box cover.
3. Revolve the cam on the timer motor clockwise until the micro switch plunger is positioned in the "V" slot of the metal cam or on the lobe of the plastic cam.
4. Replace control box cover.
5. Reconnect electrical power.
6. Lift plastic curtain and pour three cups of water into the plastic reservoir.
7. Push lever of the ON-OFF switch to the ON position.

NOTE: The metal cam assembly on the timer motor consists of two discs which can be adjusted to lengthen or shorten the harvest cycle by releasing the locking nut and moving the outside disc to increase or decrease the slot opening. The normal setting for the harvest cycle is No. 2, which is two minutes. The unit is in the harvest cycle when the plunger on the micro switch is in the slot between the metal discs. The plastic cam is not adjustable. When making adjustments, power should be disconnected.

To check the cuber for proper operation, follow the steps in the Service Check List on pages 30, 31, and 32.

CLEANING AND CARE

Cabinet Exterior:

Clean with warm water and soap. Waxing is not required but is permissible on metal parts. Do not apply wax on the rubber gasket around the door opening or on plastic parts.

Machine Compartment:

Do not attempt to clean this area unless the off-on switch is turned off — lever pushed to the right. Use a vacuum cleaner or dust cloth but clean carefully to avoid damage to wires and delicate parts. DO NOT REMOVE the cover on the control box unless the power supply is disconnected. **NOTE:** Failure to disconnect the electrical power prior to removing the control box cover may result in severe or fatal shock injury.

Storage Bin:

Use only warm water and soap. The chemicals in some cleaning agents will damage plastic.

Freezing Unit and Water System:

All water contains some minerals and impurities, scale, iron etc. Cleaning schedule should be timed accordingly. The following procedure should be used to clean the interiors of the freezer, tanks and water lines.

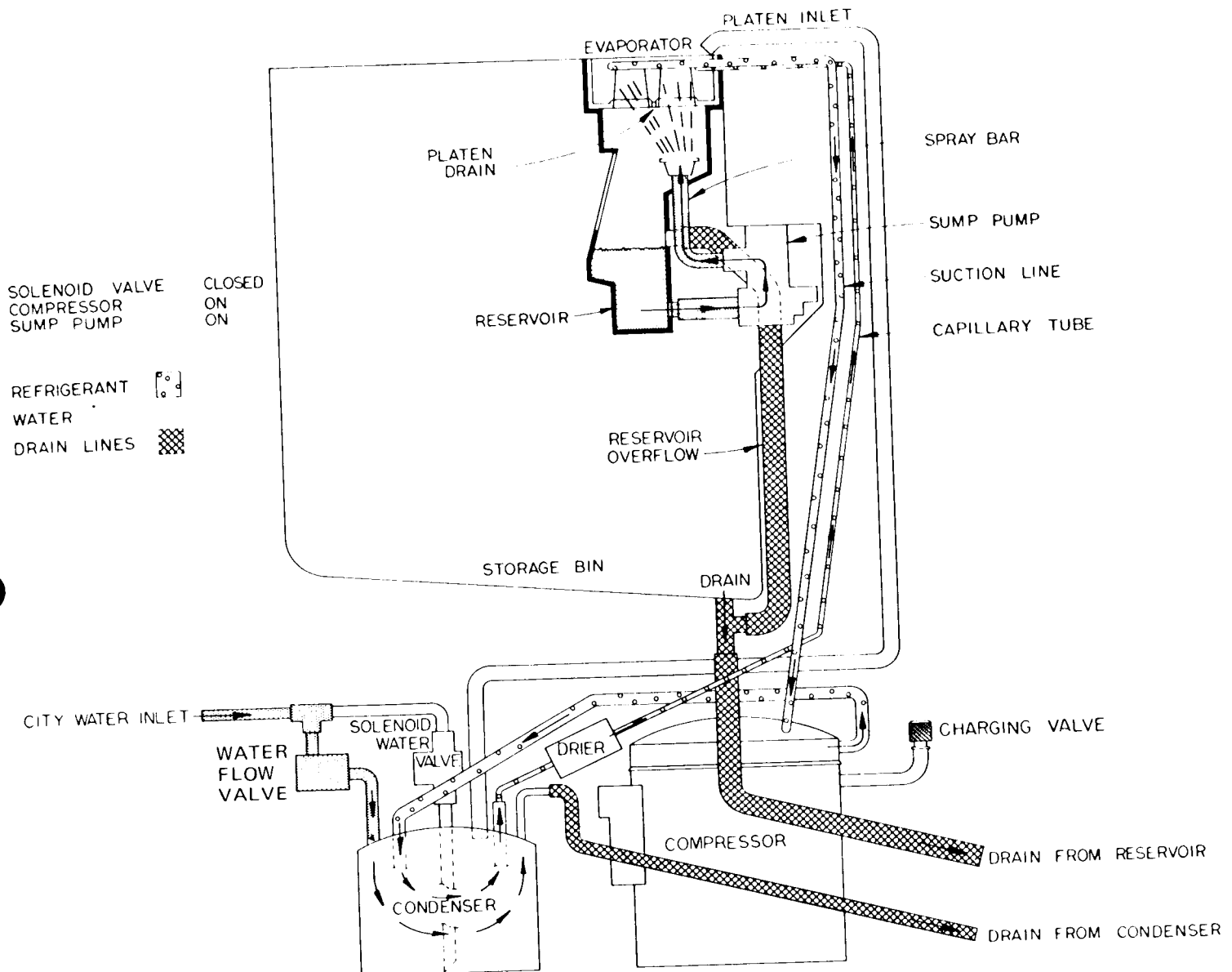
1. Remove all cubes from the storage bin.
2. With the unit operating and the water spraying from the jets behind the plastic curtain (freezing cycle), slowly pour three (3) ounces of Scotsman Ice Machine Cleaner into the trough or reservoir below the jets. (See page 13 for location of reservoir).
3. Let the machine operate in the normal manner for one hour, then wait for a harvest cycle (when the cubes fall out of the freezer and into the storage bin.)

At this time turn the machine off. (See off-on switch on page 13).

4. Pour a gallon of warm water over the cubes that have been made during the cleaning cycle. This will melt the cubes and clean the drain.
5. Dispose of any surplus cubes that are left in the storage bin.
6. Use a gallon or more of clean, cold water and flush out the interior surfaces of the freezer and storage bin.
7. Wipe all the interior surfaces and turn machine on for normal operation.
8. Scotsman Ice Machine Cleaner is a mild food grade acid. Ordinary care in its use is adequate. All cubes made with this solution should be discarded as they have an acidulent taste.

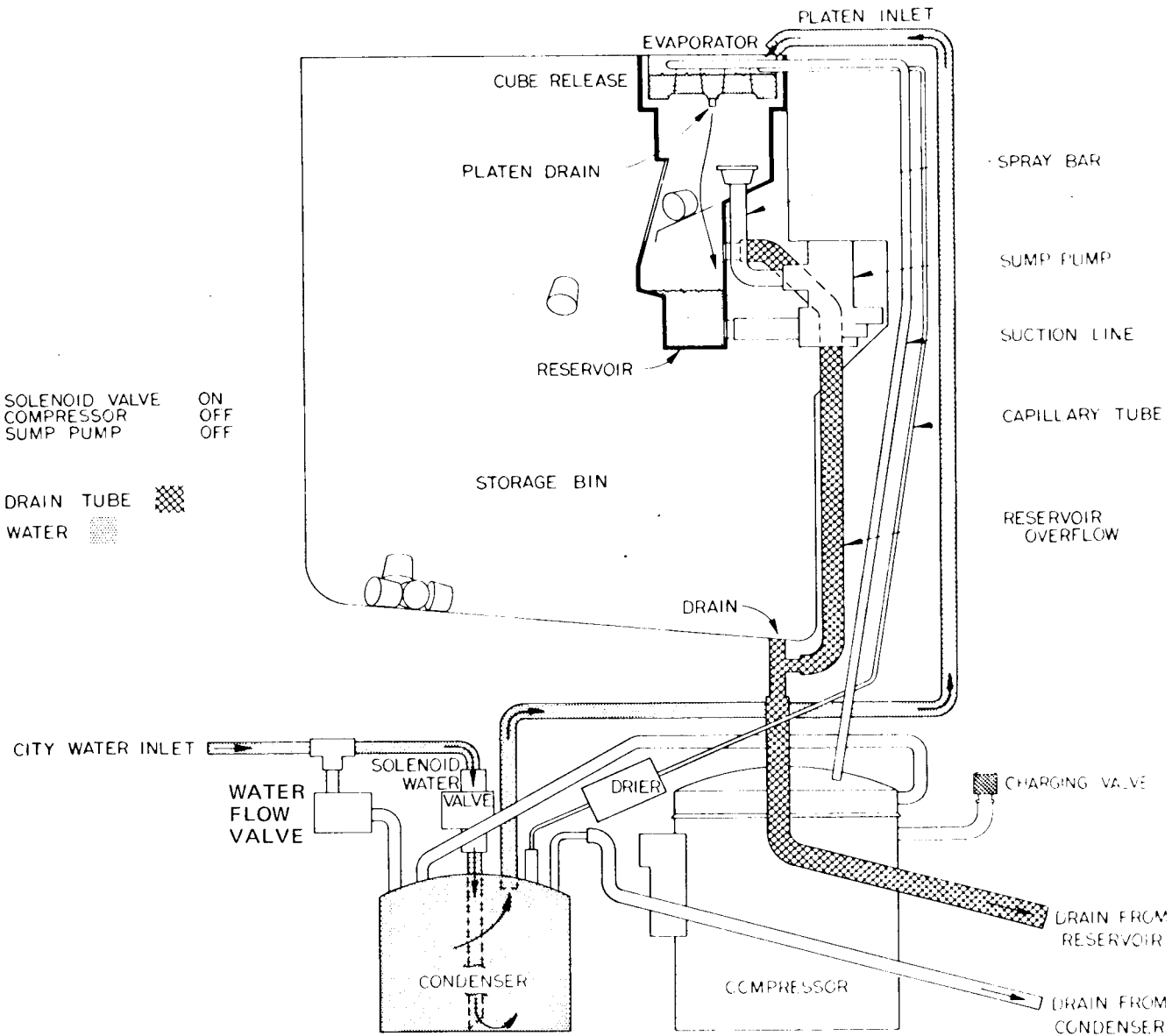
CAUTION: Contains phosphoric and Hydroxyacetic acids. These compounds are corrosive and may cause burns. If swallowed DO NOT induce vomiting. Give large amounts of water or milk. Call physician immediately. In case of external contact, flush with water. Keep out of reach of children.

OUTLINE OF REFRIGERATION AND WATER SYSTEM FREEZING CYCLE



1. Solenoid Water Valve is closed preventing fresh (city) water from entering Condenser which also stops the flow of water from the Condenser into the top of the Evaporator.
2. Water that has drained from the Evaporator (Platen) into the Reservoir is now pumped into the Spray Jet and sprayed to the underside of the Evaporator to make ice cubes.
3. The cold water that entered the Condenser is now the medium used for condensing hot refrigerant into a liquid. This water becomes warm and is used in the next harvest cycle to release the cubes.

SM18W-1 OUTLINE OF REFRIGERATION AND WATER SYSTEM HARVEST CYCLE



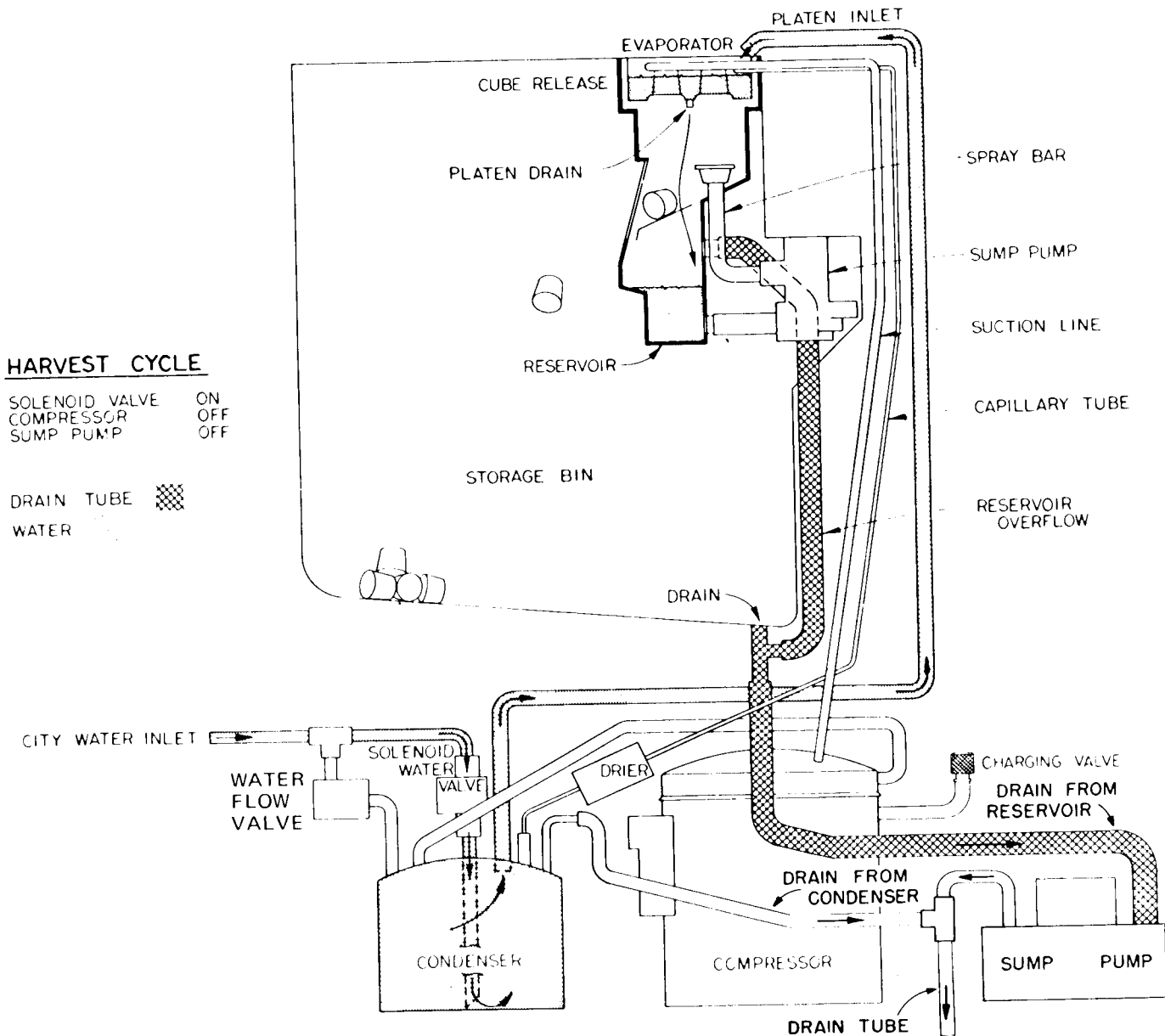
1. An electrically operated solenoid Water Valve allows fresh potable water to enter the Condenser. The incoming cold water forces the hot water from the top of the Condenser into the Evaporator. The hot water releases the cubes to free fall into a storage bin. In the Evaporator there is a water holding vessel, that also holds the cups in place, that is called the Platen. In this Platen there is a small hole. As water comes into the Platen, water is also slowly being released from the Platen thru this small hole. The water from the Evaporator (Platen) is collected in the Reservoir. There is an overflow tube in the Reservoir to control the quantity of water to be stored. The water in the Reservoir is being saved for the next cycle (FREEZING) to be used in making ice cubes.

SM18PW-1 (With Condensate Pump)

OUTLINE OF REFRIGERATION AND WATER SYSTEM

HARVEST CYCLE

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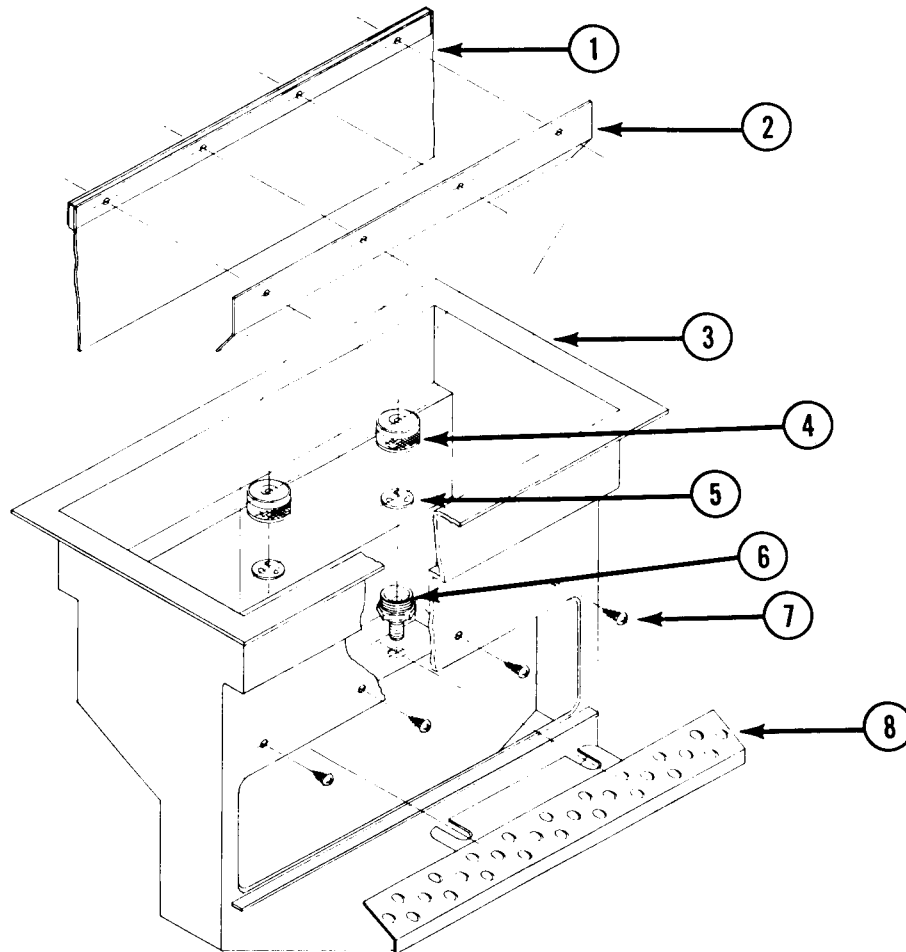
1. The operation of the SM18PW-1 (with condensate pump) is identical to the standard SM18W-1 except for the final drain sequence. Instead of relying on a gravity drain, this unit collects the drain water in the condensate pump. When enough water is collected, a float switch activates the pump motor. This water is pumped to wherever the drain line is installed.

2. After the water is pumped out of the sump the float switch shuts off the motor. The pump will normally operate several times during harvest and a few times during the early part of the freezing cycle.

3. The pump is equipped with a safety switch which will stop the icemaker if the pump malfunctions and the reservoir is not pumped out. This safety switch is connected to the control box by the yellow cord.

4. See page 8 for installation instructions for the SM18PW-1.

BIN INSERT ASS'Y

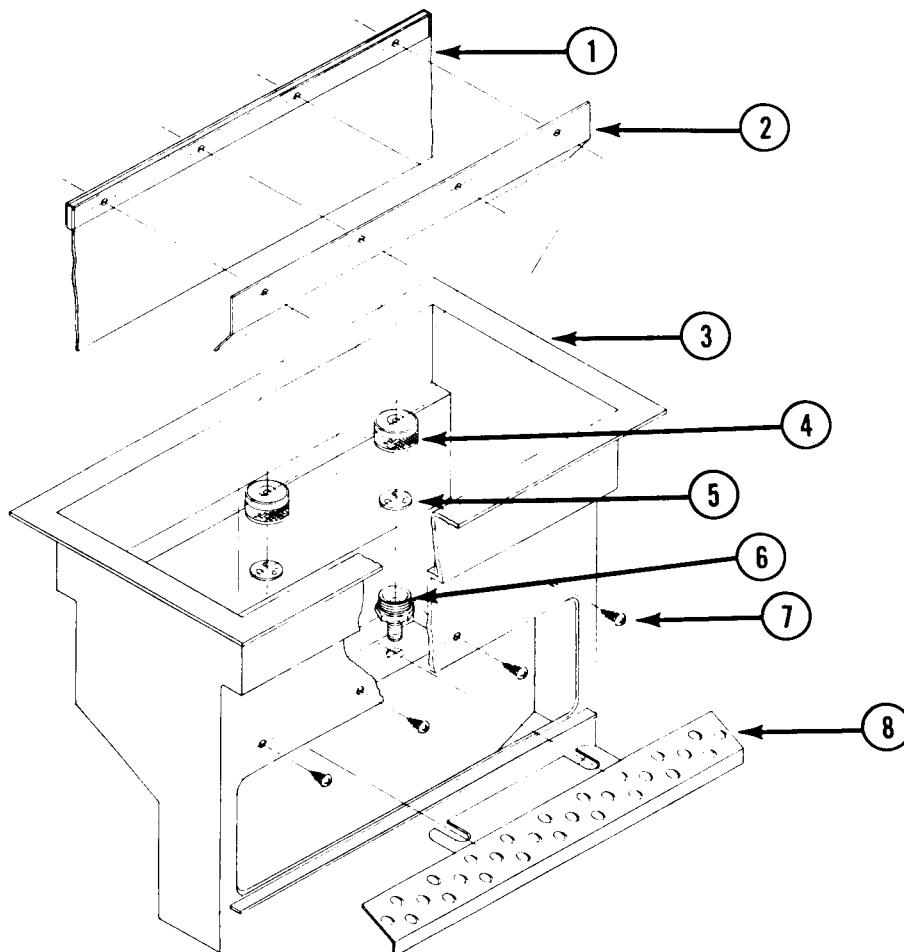


ITEM NO.	PART NO.	DESCRIPTION
1.	2-2053-01	Curtain
2.	A24155-1	Curtain Stiffner
3.	2-1923	Bin Insert
4.	2-1841	Jet Top
5.	A9543	Spinner
6.	2-1840	Spray Jet
7.	3-1404-16	Screws
8.	A-22518	Cube Chute

WARNING: When removing jet top (4), be careful not to drop the small spinner (5). If dropped into the sump, the spinner may damage the water pump.

NOTE: The unit will not make ice properly if the spinners are not in place.

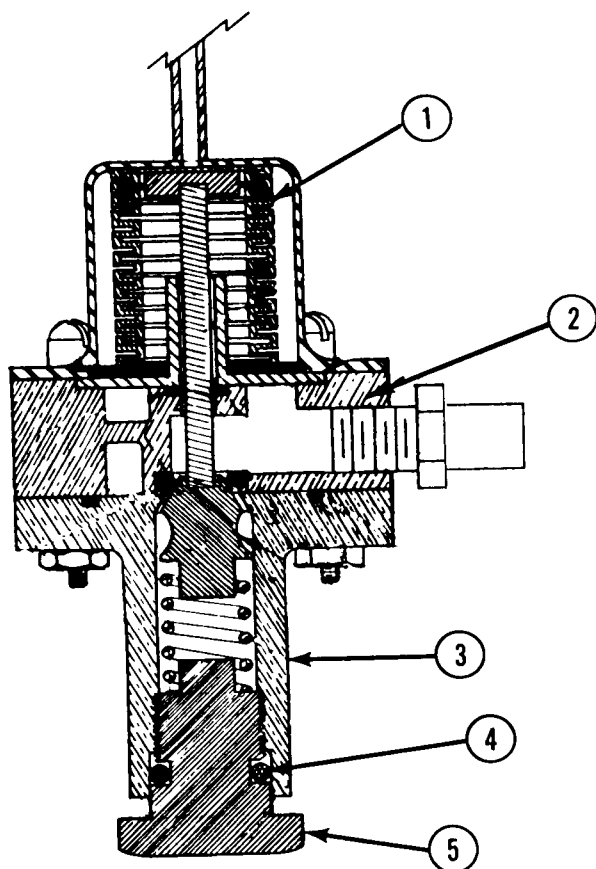
BIN INSERT ASS'Y



ITEM NO.	PART NO.	DESCRIPTION
1.	2-2053-01	Curtain
2.	A24155-1	Curtain Stiffner
3.	2-1923	Bin Insert
4.	2-1841	Jet Top
5.	A9543	Spinner
6.	2-1840	Spray Jet
7.	3-1404-16	Screws
8.	A-22518	Cube Chute

WARNING: When removing jet top (4), be careful not to drop the small spinner (5). If dropped into the sump, the spinner may damage the water pump.

NOTE: The unit will not make ice properly if the spinners are not in place.



WATER FLOW VALVE

A19180

ITEM NO.	PART NO.	DESCRIPTION
1.	A-19382	Bellows Assembly
2.	2-1656	Upper Housing
3.	2-1657	Lower Housing
4.	13-617-10	O-Ring
5.	2-1654	Adjustment Nut

WATER FLOW VALVE SERVICE INFORMATION

This page has a cut-away view of the water flow valve showing the location of each part of the valve and also lists the part numbers.

Four screws are used to hold brass bellows assembly to the plastic body. By removing these screws the entire valve can be disassembled.

Damage can result to the valve if the fittings are tightened too severely. A good grade thread sealer should be used and the fitting tightened only enough to prevent water leakage. Any time the water flow valve has been disassembled or repaired, it must be readjusted to its proper setting as follows:

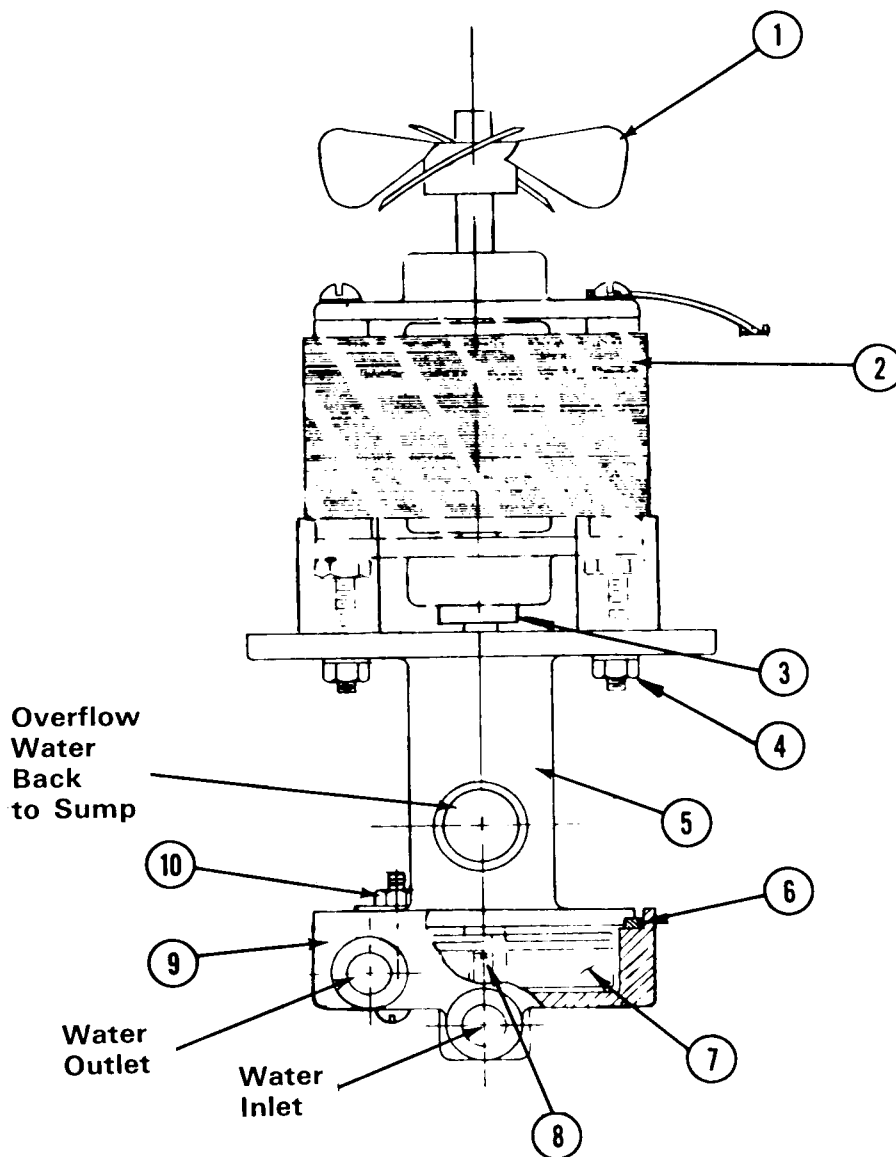
Wait approximately 15 minutes of the second freezing cycle, then check the temperature of the discharge water leaving the small black drain line on the condenser tank. The temperature of the discharge water should be 104 degrees Fahrenheit. If the temperature is higher, turn the adjustment nut, item number 5 counterclockwise to decrease the discharge water temperature. If the discharge water temperature is less than 104 degrees Fahrenheit, turn the adjustment nut clockwise to increase the temperature.

One full turn of the adjustment nut will change the temperature of this discharge water approximately 12 to 16 degrees Fahrenheit.

If a water leak should occur around the adjustment nut, it can be corrected by removing the adjustment nut and "O" Ring from the valve and applying a light coating of rubber lubricant to the "O" Ring.

This valve is spring loaded, therefore the four screws holding the valve should be loosened before installing the adjustment nut in the plastic valve body.

A-22536-21 WATER PUMP COMPLETE



ITEM NO.	PART NO.	DESCRIPTION
1.	2-1719	Fan Blade
2.	12-1714-1	Motor
3.	13-690	Rubber Washer
4.	3-1417-14	Lockwasher
	3-1406-2	Nut
5.	2-1711	Water Pump Body
6.	13-617-7	O-Ring
7.	2-1712	Impeller
8.	3-1417-14	Lockwasher
	3-1403-5	Screw
9.	2-1710	Pump Base
10.	3-1403-60	Screw
	3-1408-23	Washer
	3-1406-2	Nut

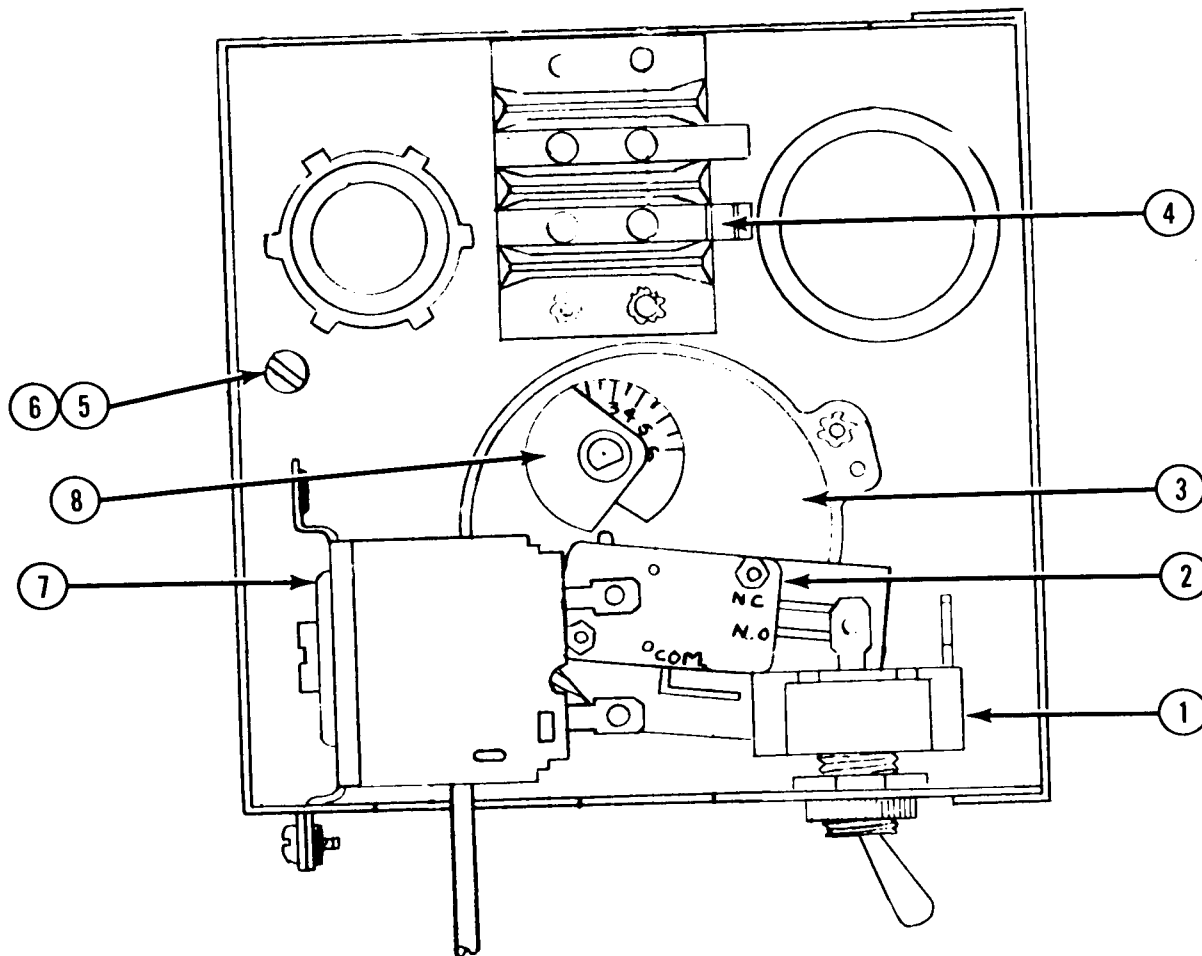
ITEM NO.	PART NO.	DESCRIPTION
*11.	13-687	Gasket, Water Pump (Installed Between Pump & Bin)
*12.	A20564-1	Water Pump Tube
*13.	A20564-2	Water Pump Tube
*14.	A20565-1	Water Pump Tube

* Not Shown

CONTROL BOX ASSEMBLY

(115/60/1)

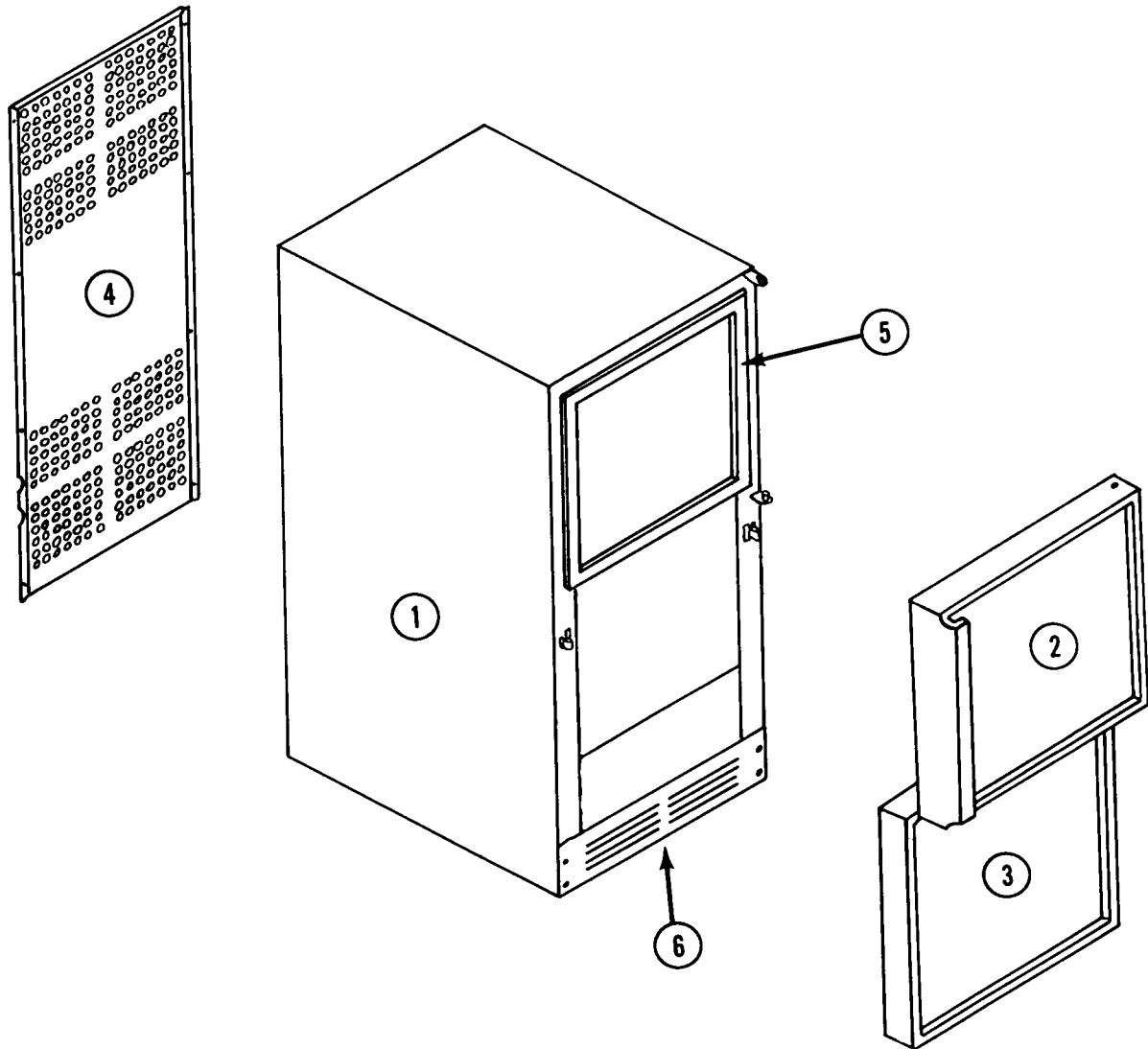
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ITEM NO.	PART NO.	DESCRIPTION
1.	12-426-1	Toggle Switch
2.	12-1721-50	Micro Switch
3.	12-1713-1	Timer Assembly Complete Switch & Cam Included
4.	12-1444	Terminal Board
5.	3-1403-5	Ground Screw
6.	3-1417-14	Ground Washer
7.	11-366	Bin Thermostat
8.		Cam Assembly, Shown in harvest cycle position.

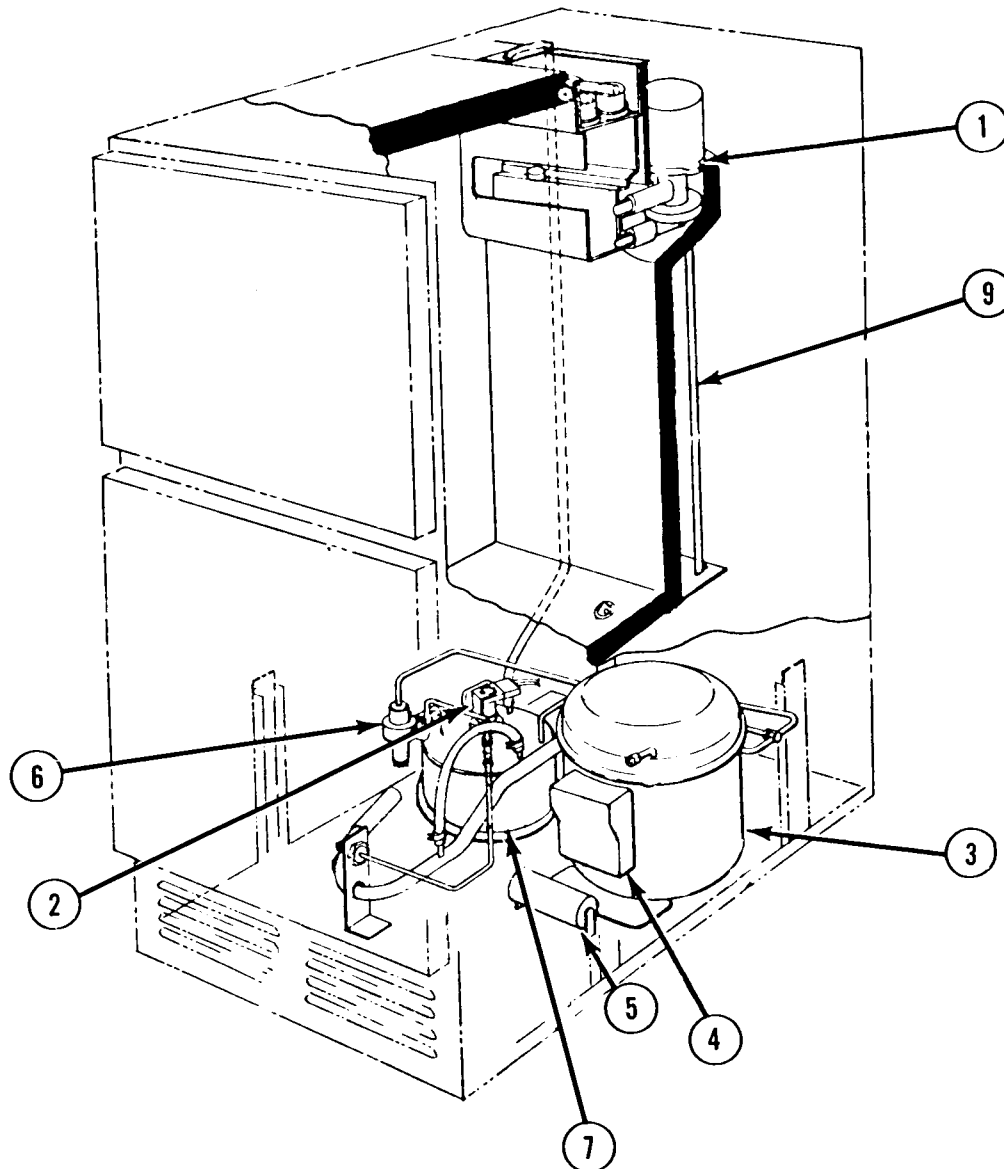
NOTE: The bin thermostat (7) is only an automatic "ON" and "OFF" switch. Adjusting this control WILL NOT affect the size or quality of the cubes.

CABINET PARTS (Sandalwood Finish)



ITEM NO.	PART NO.	NAME
1.	A-18592	Cabinet Assembly
2.	A-24289-1	Access Door Complete
3.	A23586-1	Front Service Door
4.	A18595	Rear Service Panel
5.	13-634	Gasket (magnetic)
6.	A18767	Kick Plate

INTERNAL COMPONENTS

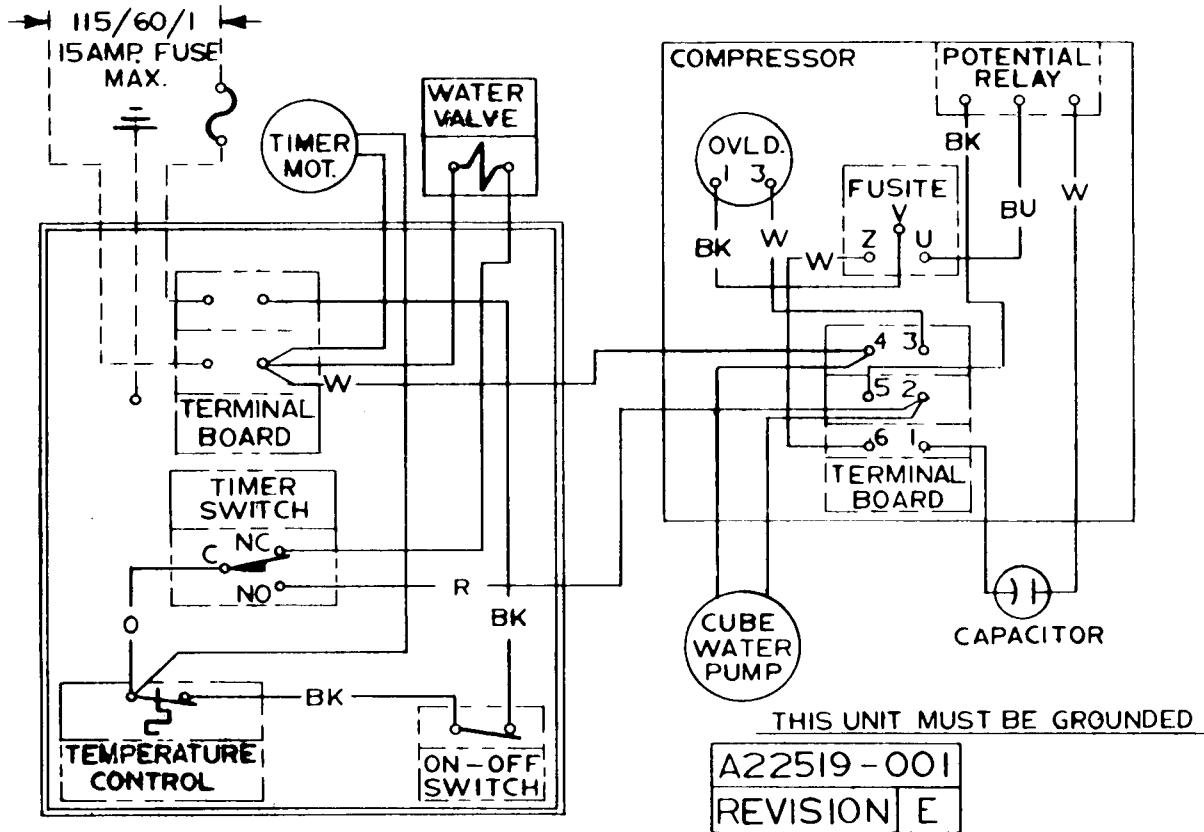


ITEM NO.	PART NO.	DESCRIPTION
1.	A-22536-21	Water Pump Assy. 115 V - 50/60 hertz
2.	12-1434-2	Water Solenoid 115 V - 50/60 hertz
3.	18-2150-1	Compressor 115 V - 50/60 hertz
4.	18-2150-7	Compressor Junction Box
5.	18-2151-1	Capacitor 115 V - 50/60 hertz
6.	A19180	Water Flow Valve
7.	A19272	Condenser
8.	2-831	Drier (Replacement differs from originals)
9.	A23013	Storage Bin
*10.	13-635	Rubber Cup Holder
*11.	A19319	Evaporator Assy Complete
*12.	2-1667	Evaporator Cover Plastic
*13.	A19588	Top Insulation

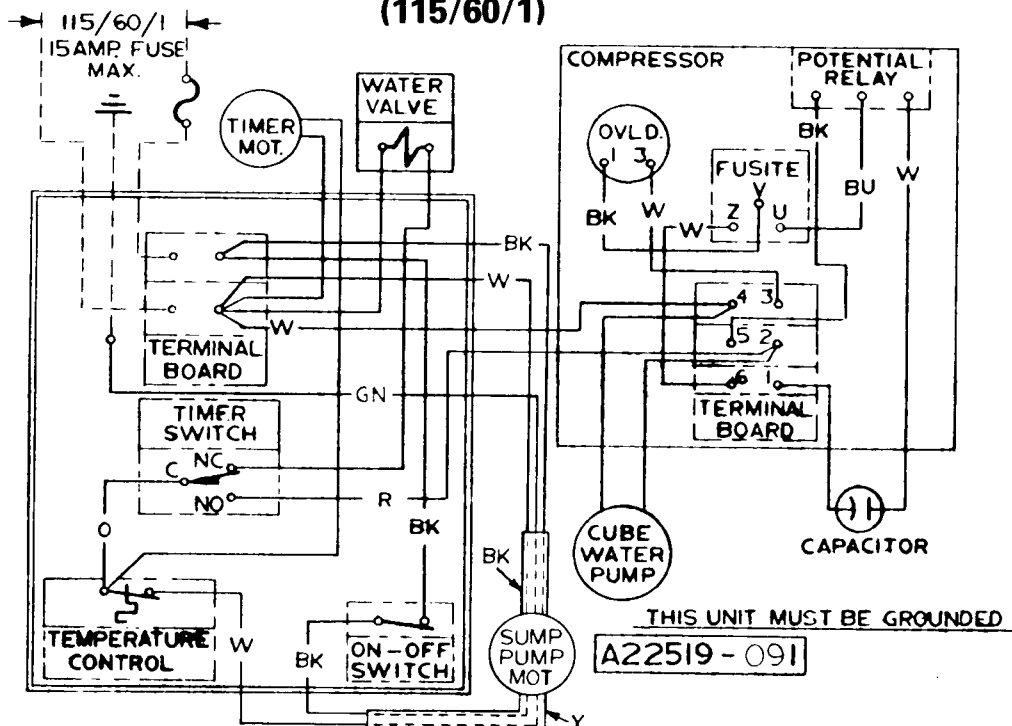
* Not Shown

NOTE: If special voltages are used,
please specify in electrical parts orders.

SM-18W-1
WIRING DIAGRAM
(115/60/1)



WIRING DIAGRAM
SM18PW-1
(With Condensate Pump)
(115/60/1)

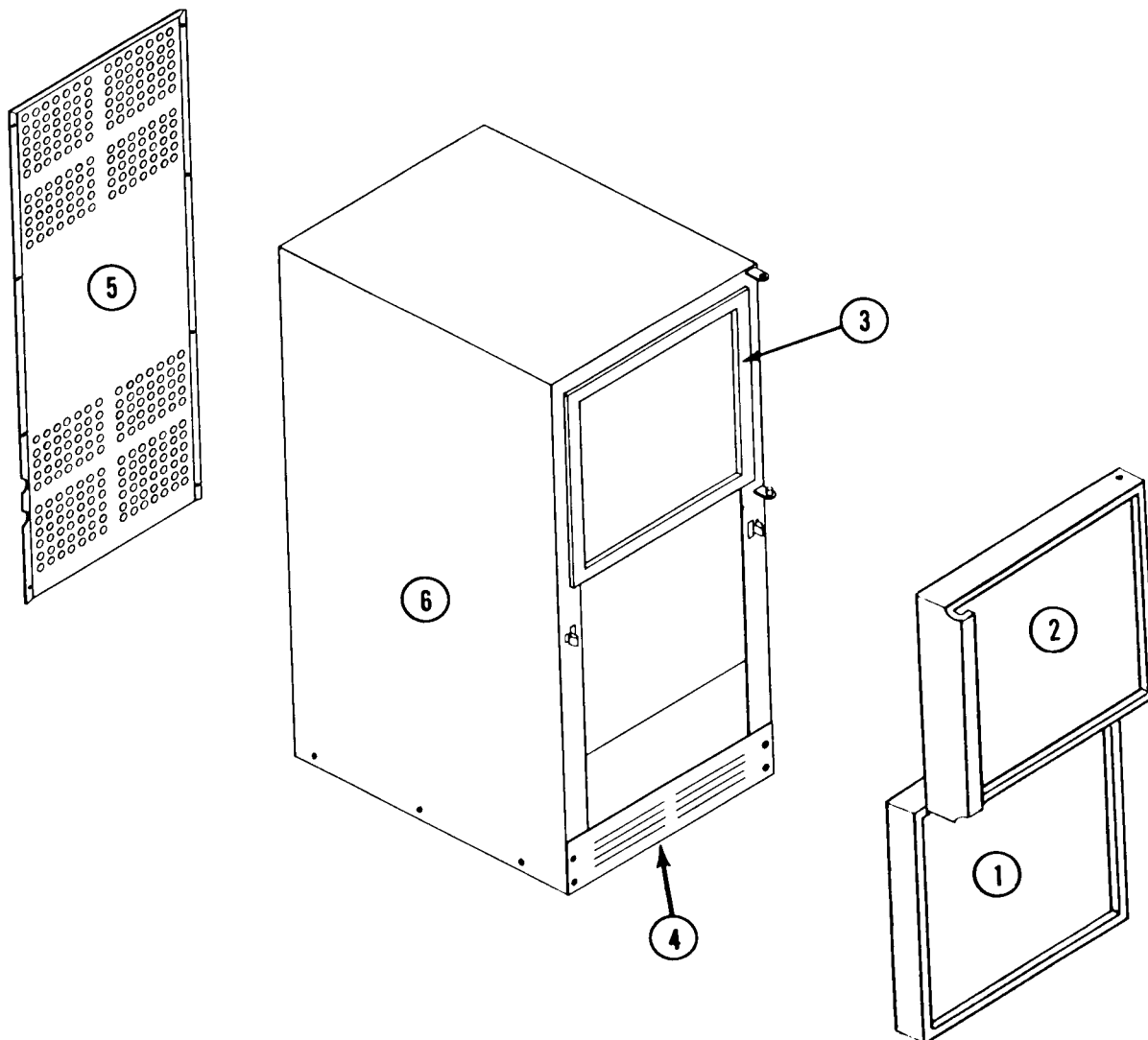


MAINTENANCE INSTRUCTIONS

WARNING: DISCONNECT ELECTRICAL AND WATER SUPPLY BEFORE SERVICING MACHINE. FAILURE TO DISCONNECT ELECTRICAL POWER MAY RESULT IN SEVERE OR FATAL SHOCK INJURY.

Cabinet Removal.

1. Remove lower door by pulling forward at both top corners.
2. Remove upper door by taking out the hinge screw at the top right hand corner and lifting up and forward.
3. Remove 8 screws (2 on each side) from under the door gasket. It is not necessary to remove the gasket from the cabinet.
4. Remove the 4 screws in the kickplate.
5. Remove the 9 screws in the back panel. Also remove the 4 screws in the brace behind the water pump.
6. Remove the 6 screws (3 on each side) from the lower edge of the cabinet.
7. Remove the cabinet by lifting straight up.



TIMER MOTOR REPLACEMENT

WARNING: DISCONNECT THE ELECTRICAL SUPPLY BEFORE SERVICING MACHINE. FAILURE TO DISCONNECT ELECTRICAL POWER MAY RESULT IN SEVERE OR FATAL SHOCK INJURY.

1. Remove lower service panel.
2. Push the toggle switch to the "OFF" position.
3. Remove the control box cover.
4. The timer motor is riveted to the control box. To remove it, you must drill out these rivets.
5. Remove the electrical connections from the malfunctioning timer and replace them on the new part.
6. Mount the new timer motor in the control box with sheet metal screws.
7. Check the timer motor for proper operation. The machine should make ice for 22 minutes and harvest for 2 minutes. These times are \pm 15 seconds.

NOTE: A bad micro-switch may be replaced without changing timer motors. Remove the small mounting nuts and electrical connections. Install the new micro-switch and check for proper operation.

BIN THERMOSTAT REPLACEMENT

WARNING: DISCONNECT THE ELECTRICAL POWER BEFORE SERVICING MACHINE. FAILURE TO DISCONNECT ELECTRICAL POWER MAY RESULT IN SEVERE OR FATAL SHOCK INJURY.

1. Follow steps 1 thru 7 for cabinet removal. (see p. 23)
2. Remove the two pieces of tape-on insulation from the capillary tube on the right hand side of the bin.
3. Push the end of the capillary tube through the hole into the bin.
4. Pull the tube out of the bin through the forward hole.
5. Remove the mounting screw holding the thermostat to the control box.
6. Remove the spade connections and replace them on the new control.
7. Remount the new thermostat in the control box and position the capillary tube.
8. Re-assemble the machine and check the operation of the thermostat by placing an ice cube against the capillary tube. Holding ice against the capillary tube will shut the unit off. Warming the capillary tube with your hand will turn the unit back on.

NOTE: The capillary tube should run parallel and 1/4" away from the bin wall for proper operation.

IMPORTANT: The bin thermostat is not eligible for warranty replacement if the capillary tube has been cut.

WATER PUMP REPLACEMENT

WARNING: DISCONNECT ELECTRICAL SUPPLY BEFORE SERVICING MACHINE. FAILURE TO DISCONNECT ELECTRICAL POWER MAY RESULT IN SEVERE OR FATAL SHOCK INJURY.

1. Follow steps 1 thru 7 for Cabinet Removal. (see p. 23)
2. Remove the two water pump electrical leads from terminals in compressor junction box.
3. Remove 3 hose clamps and hoses from behind bin insert.
4. Remove the 2 screws which hold the water pump in place.
5. Lift out the pump and pull the wire leads out of the protective conduit. NOTE: Attach a cord to the leads before removing them from the control box. After the leads are pulled thru the conduit, the cord can be used to pull the new leads thru.
6. To install the replacement pump, follow previous steps in reverse. WARNING: Do not kink the three water tubes. Any obstruction will cause rapid failure of motor.

WATER FLOW VALVE REPLACEMENT

WARNING: DISCONNECT ELECTRICAL AND WATER SUPPLY BEFORE SERVICING MACHINE. FAILURE TO DISCONNECT ELECTRICAL POWER MAY RESULT IN SEVERE OR FATAL SHOCK INJURY.

1. Follow steps 1 thru 7 for cabinet removal. (see p. 23)
2. Slowly release the refrigerant by loosening the high side flare nut on the flow valve capillary tube.
3. Separate the valve from the water inlet and outlet lines by removing the compression nuts.
4. Install the new valve and evacuate the refrigeration system. NOTE: Use a good grade thread sealer and do not over tighten. Too much pressure on the fittings will crack the valve.
5. Recharge the machine with the proper amount of refrigerant listed on the serial number plate.
6. If it is necessary to adjust the replacement valve, see the following procedures for the proper method before making this adjustment.
NOTE: If the bellows is in good condition on the malfunctioning valve, it is not necessary to release your present refrigerant charge. Simply remove the screws holding the bellows to the plastic body and leave the old bellows attached to the machine. Then attach the plastic body of the new valve and replace the water lines according to the previous instructions. By using this method, it is not necessary to evacuate or recharge the refrigerant system.

WATER FLOW VALVE ADJUSTMENT

1. Set the timer in the control box to the harvest position. To do this, turn the brass cam clockwise until the plunger on the micro switch is in the V-shaped slot on the cam. NOTE: USE A 1/4" NUT DRIVER TO TURN CAM.
2. Connect the electrical and water supply to the machine. Push the toggle switch in the control box to the "ON" position.
3. Wait until approximately 15 minutes of the SECOND cycle has passed.
4. At this time, check the condenser water outlet temperature. This must be done near the end of the freeze cycle by disconnecting the 1/4" plastic water line at the copper drain tube.
5. This temperature should be approximately 104 degrees Fahrenheit. If the water is below 104 degrees, turn the adjustment nut located on the bottom of the water flow valve clockwise. If the temperature is higher, turn the nut counter-clockwise.
6. One full turn of this adjustment nut will change the water temperature approximately 12 degrees.

INLET WATER SOLENOID REPLACEMENT

WARNING: DISCONNECT ELECTRICAL AND WATER SUPPLY BEFORE SERVICING MACHINE. FAILURE TO DISCONNECT ELECTRICAL POWER MAY RESULT IN A SEVERE OR FATAL SHOCK INJURY.

1. Follow steps 1 thru 7 for cabinet removal. (see p. 23)
2. Disconnect the electrical leads by lifting the protective rubber cap on top of the solenoid and removing the two spade clips.
3. Remove the water inlet line from the valve.
4. Unscrew the valve from the condenser tank.
5. Reverse the previous steps to replace the valve. (Use a good grade thread sealing compound or tape)

CONDENSER TANK REPLACEMENT

WARNING: DISCONNECT THE ELECTRICAL AND WATER SUPPLY BEFORE SERVICING MACHINE. FAILURE TO DISCONNECT ELECTRICAL POWER MAY RESULT IN SEVERE OR FATAL SHOCK INJURY.

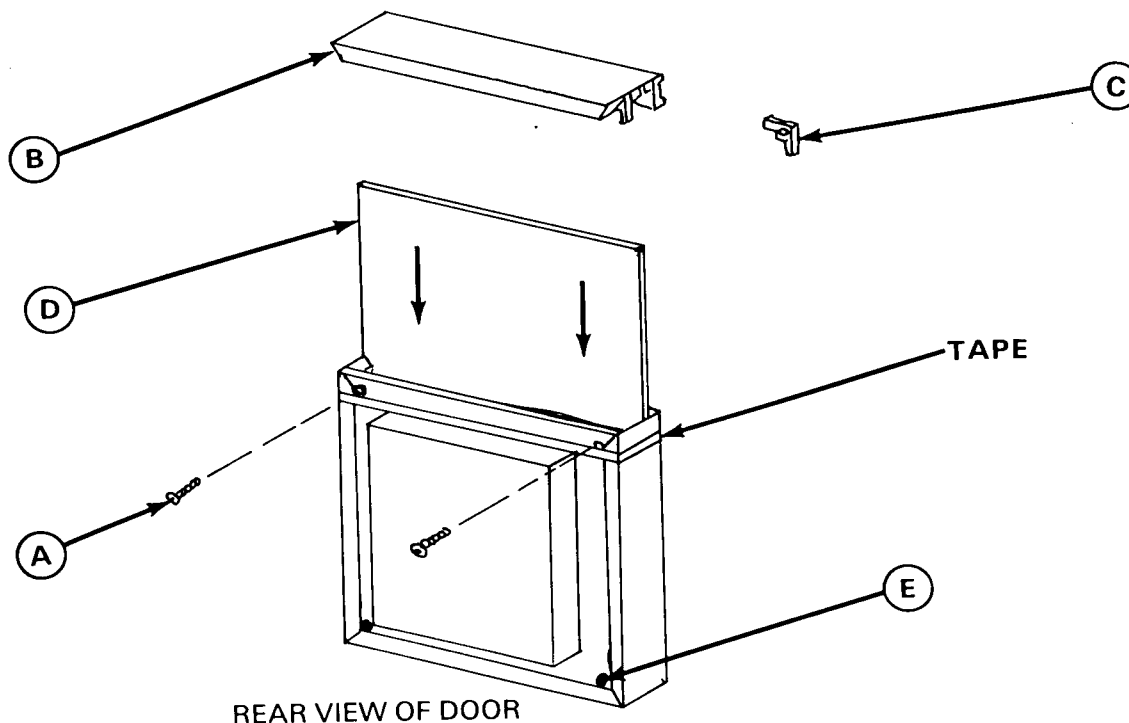
1. Follow steps 1 thru 7 for cabinet removal. (see P 23)
2. Remove the inlet and outlet water fittings from the water flow valve.
3. Follow steps 2 thru 4 for inlet water solenoid removal. (see above)
4. Remove the rubber plug from the lower back portion of tank to drain the water.
5. Remove the 1/4" plastic hose from the condenser outlet line located on the top right side of the tank.
6. Slowly release the refrigerant from the system.
7. Cut the refrigerant lines at the condenser tank.
8. Remove the two screws holding the tank to the base of the machine.
9. Lift out tank and mount the replacement.
10. Solder the refrigerant lines and evacuate the system.
11. Replace components by reversing the appropriate steps.
12. Recharge the machine with the proper amount of refrigerant listed on the serial number plate.

NOTE: In most cases, it is easier to repair a small leak than to replace the entire tank.

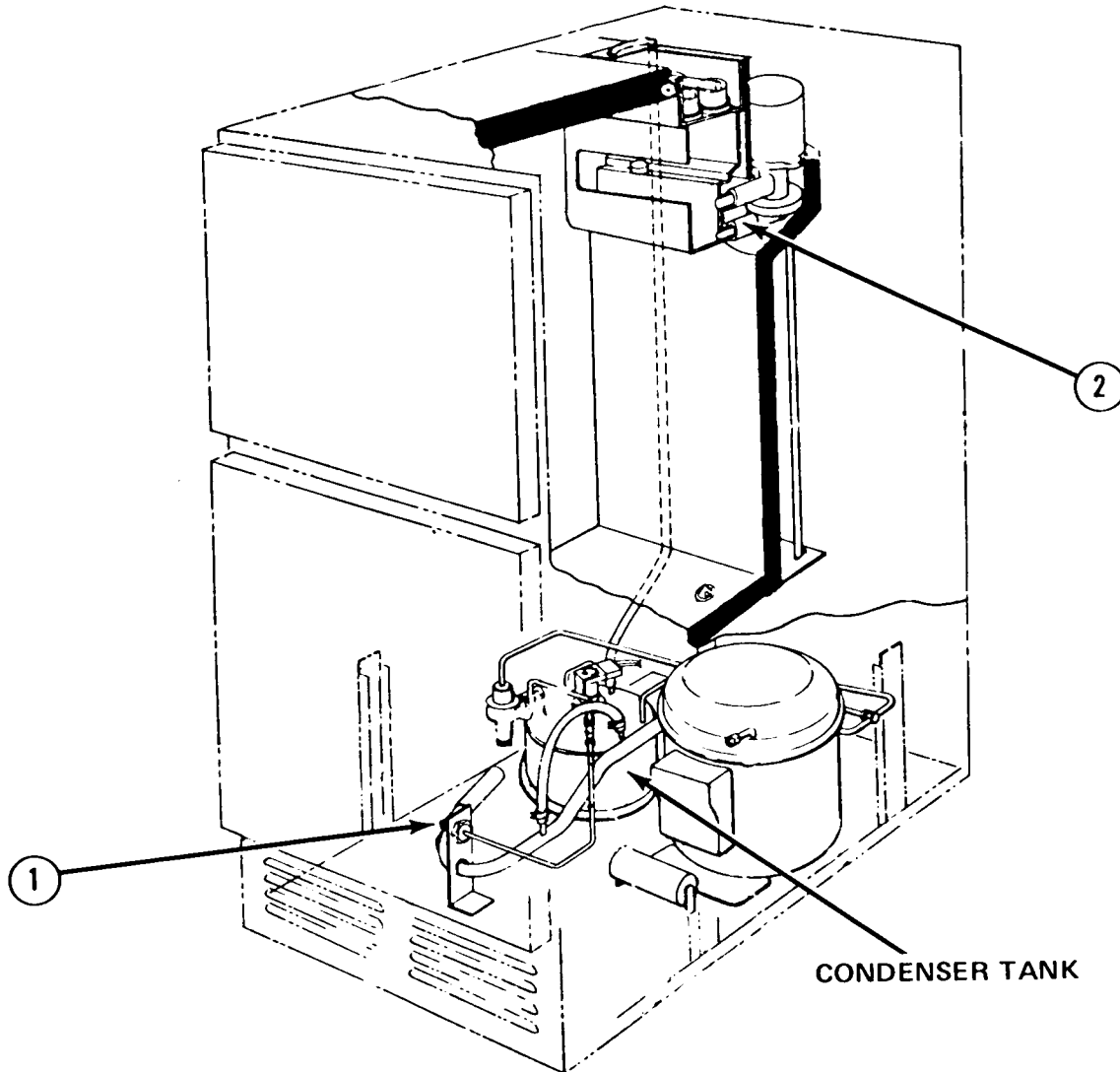
INSTRUCTIONS FOR CHANGING DECORATOR PANELS

1. Door must be removed from machine prior to disassembly.
2. To simplify reassembly and protect door from damage, place tape around back side of door as indicated by drawing. Do not remove tape until door has been reassembled and is ready to be reinstalled on the machine.
3. Remove two screws from back of panel "A". Do not remove two lower screws E. Lower panels do not have screw E.
4. Lift handle from door applying even pressure on both sides exercising care so that handle is removed perpendicular to sides "B". DO NOT FOLD SIDES OF DOOR DOWN. DO NOT DISASSEMBLE DOOR PAST THIS POINT.
5. Set handle aside being careful not to misplace corner gussets "C".
6. Insert 1/4" thick decorator panel into channel in front of door "D". Panel size: Upper panel 13-7/16 x 14-5/8. Lower panel 14-5/8 x 14-5/8. Note the vinyl wood grain panel can be replaced with stainless steel or other metal panel by simply sliding the original panel out and replacing with new panel. In the case of the lower service door, the rubber like sealant must be removed from panel.
7. Reassemble door in reverse manner removing tape AFTER two screws "A" have been replaced.
8. Re-install door on machine.

NOTE: Lower door is disassembled in same manner.



**For Winter Storage or when Temperatures May
Fall Below Freezing**



1. Allow unit to operate until it is in the freezing portion of the cycle.
2. Turn the on-off switch to off.
3. Turn off water supply and disconnect water line from machine.
4. Remove rear access panel.
5. To drain the condenser tank, remove the rubber cap at the bottom rear of the tank.
6. Turn the on-off switch to on.
7. With the machine running during the freeze cycle, blow air into the water inlet fitting, item no. 1. Air should blow thru to the machine drain and expell the water from the condenser tanks coil. Do not allow machine to operate more than 3 minutes with water supply shut off. Do not do this during the harvest cycle.
8. Remove the lower hose from the water reservoir, item no. 2.
9. Shut machine off. Unit is now ready for storage.

SERVICEMAN'S INFORMATION

Models SM-18 Ice Cube Makers have been designed for ease of service and maintenance.

Average head pressure is 135 lb. gauge at the start of the freezing cycle. It gradually pulls down to 125 lb. at end of cycle. Cuber is water cooled and the water regulating valve is factory set to maintain 135 lb. head pressure setting. Should you find it necessary to increase or decrease the head pressure setting, this is easily accomplished by turning the adjustment nut on the bottom side of the water flow valve. See Item No. 6 on Page 21. Clockwise to increase - Counterclockwise to decrease head pressure.

Suction pressure at the start of the freezing cycle will be around 50 lb. gauge, since the compressor is shut off during the harvest or defrost cycle. The capillary tube refrigerant control allows the system to equalize during this time, therefore both gauges would read the same. After one minute of the freezing cycle, head pressure climbs to 135 lb. gauge, suction pressure pulls down gradually from 50 lb. to approximately 5 lb. at end of freezing cycle.

Within the Condenser there are two (2) tubes soldered together in parallel. One tube leads from the Compressor, coiled within the condenser, to the Evaporator. The other tube is connected to a Pressure actuated valve, coiled within the Condenser, and out to a drain source.

If the pressure should build up to a certain limit within the Refrigeration Circuit, the water flow valve (Page 17) will open and allow a small quantity of cold (city) water to circulate, to bring the pressure down, and be released as waste water.

RECAP:

Cold potable (city) water enters a water tight container, the Condenser. The water within this container (Condenser) is heated because it is used as the cooling medium in the Condenser. This water is forced by entry of new cold potable water into the Evaporator where this hot water releases the cubes. The same water is allowed to escape the Evaporator (Platen) thru a small drain hole into the Platen. The same water, used as a condensing medium and cube release is now pumped thru a spray jet to make ice cubes.

The same water is used three different times (Condensing medium, cube release and to make ice cubes). All we do is change the temperature of the same quantity of water to suit the needs for adequate refrigeration.

An independent water circuit, completely isolated from the potable water circuit, is used as an auxiliary Condenser coolant if the need arises.

SM18W-1 SERVICE CHECK LIST

This check list is designed to provide a step-by-step method of diagnosing common service problems encountered while servicing the SM18W-1 Scotsman Home Ice Maker. Water leaks or electrical short circuits should be obvious and repairable prior to following this check list. FOR YOUR CONVENIENCE, A SERVICE DATA SHEET IS PROVIDED WITH THIS CHECK LIST. PLEASE FILL IN THE REQUIRED INFORMATION.

NOTE: It is not necessary to remove the control box cover when following these procedures. Always disconnect the electrical power before taking the cover off.

1. Start the unit. The unit must complete two cycles (48 minutes) prior to checking steps six and seven. This is the time required to stabilize the refrigerant system.
2. Check the water spray through both jets. Clean or replace jet tops and spinners. The unit will not make ice properly if the spinners are not in place. Plugged jets will cause cloudy, partial cubes.
3. Check the curtain to insure it hangs properly. If water leaks by the curtain, the sump will run dry and cause cloudy, partial cubes.
4. Check the water pump hoses for leaks or kinks.
5. Time the complete freezing cycle. List the times on the Data Sheet.
6. Approximately 15 minutes after the beginning of the freezing cycle, check the temperature of the compressor suction line. This is the top 1/4" copper line soldered to the back of the compressor housing. The line should be cool to the touch, approximately 50°. If the line is too cold, an overcharge of refrigerant is indicated. A warmer temperature will mean the unit is undercharged and indicate a possible refrigerant leak which must be repaired.
7. Also, check the temperature of the condenser discharge water at this 15 minute point in the freezing cycle. To check this water temperature disconnect the 1/4" plastic line from the copper drain tube. The temperature of the water at this time should be 104 degrees. If the water temperature is higher, loosen the adjustment nut on the bottom of the water flow valve. Turn the nut "IN" if the water temperature is lower than 104 degrees. One full turn of this adjustment nut will vary the temperature approximately 12-16 degrees.

8. As you near the end of the freezing cycle, recheck the spray jets. A water leak is indicated if both jets do not provide a full spray completely through the freezing cycle.
9. Be sure to note the elapsed time at the end of the freezing cycle. The unit should freeze ice for 22 minutes and harvest for 2 minutes.
10. As the unit begins to harvest, lift the curtain and observe the right hand side of the freezing chamber. Within 1 to 3 seconds you should see a small 1/8" diameter flow of water falling into the chamber. One of two possibilities is indicated if this small stream of water fails to appear at the proper time. Either the unit is not getting water because of restriction in the line, or the hole is plugged. A plugged hole will cause clear, partial cubes.

NOTE: If the hole is plugged you must remove the cabinet and clean the top of the freezer assembly.

11. Between 15 to 25 seconds after the unit begins the harvest cycle, a large stream of water should appear next to the small one. This is the overflow tube which maintains the proper level of water during harvest. The unit is receiving an adequate supply of water if this tube overflows at the proper time.
12. Approximately 3 minutes after the beginning of the next freezing cycle, raise the curtain and check for water flowing through the small 1/8" hole. If this stream of water is still running, the electric solenoid is struck open. This will cause clear, partial cubes and can be corrected by replacing the solenoid.
13. During the latter part of the harvest cycle, check the bottom of the bin for water backing up through the drain fitting. If this water appears, the drain line is plugged, kinked or improperly installed. This water will melt all of the ice produced and the bin will remain empty until the drain is corrected.
14. Check the bin thermostat by placing an ice cube against the silver capillary tube on the right side of the storage bin. The unit should shut off within a few seconds. Now warm the capillary tube with your hand. The unit should start operating again.
15. Inspect the cubes that are dropped into the bin during the last harvest cycle. There should be eight full size, clear cubes. The cubes appear to be cracked internally. These cracks are due to the temperature change occurring during harvest and will disappear after a short time in the storage bin.

The procedure listed above should give a clear indication of the type of service required to correct a problem on an SM18W-1, Scotsman Home Ice Maker. If you have further questions, contact the address listed below.

Consumer Service Department
Scotsman Ice Systems
505 Front Street
Albert Lea, Minnesota 56007
Phone: 507/373-3961

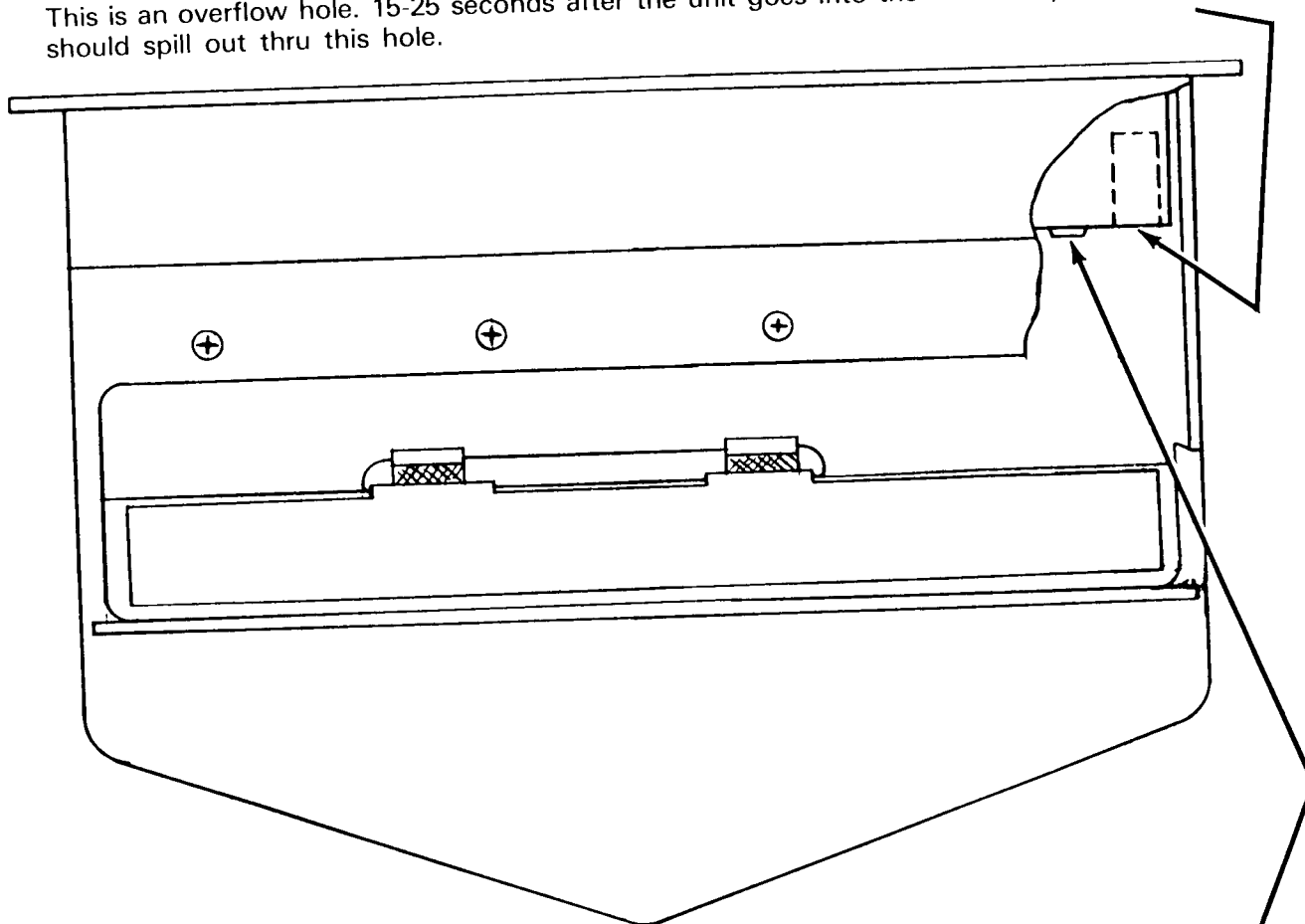
SERVICE DATA SHEET

1. Did you clean the spray jets? yes no
2. Did you clean or replace the spinners? yes no
3. Are both jets spraying a full, even cone? yes no
4. Is the curtain in good condition and hanging properly? yes no
5. Starting time of the freezing cycle. _____
6. Finish time of the freezing cycle. _____
7. Total length of the freezing cycle. (Line 6 - Line 5) _____
8. Is the compressor running? yes no
9. Is the water pump running? yes no
10. What temperature is the condenser discharge water at 15 minutes into the freezing cycle? _____
11. What temperature is the suction line at 15 minutes into the freezing cycle?
_____ Cool _____ Frosted _____ Warm
12. Did water flow through the 1/8" hole in 1-3 seconds? yes no
13. Did water overflow the larger hole in 15-25 seconds? yes no
14. Did water stop flowing through 1/8" hole 3 minutes after the beginning of the next freezing cycle? yes no
15. Did the unit harvest eight full size cubes? yes no
16. Are the cubes clear? yes no
17. Does any water back up through the bin drain during the harvest cycle? yes no
18. Does the unit shut off when a cube is held against the silver capillary tube in the bin? yes no

SERVICE INSTRUCTIONS

(Water flow in freezer)

This is an overflow hole. 15-25 seconds after the unit goes into the harvest cycle, water should spill out thru this hole.



This is a dribbler hole. As soon as the unit goes into the harvest cycle, water should flow out thru this hole. This is a straight stream of water thru and orifice approximately 1/8" in diameter and will continue about 3 minutes into the freeze cycle.

Shut off the unit approximately 3 minutes after the end of the Harvest Cycle. If water is still draining thru the dribbler hole, it is an indication that the inlet water solenoid is stuck open. Replace or clean the solenoid to return the unit to proper operation.

SERVICE ANALYSIS

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Machine does not make ice	Fuse In Power Line Blown	Check fuses in the house fuse box. Other loads on the same line may have caused fuse to blow. Use a 15 amp circuit and fuse.
	On-Off Switch In Off Position	The lever of the switch should be pushed to your left for "on" position.
	Water Supply Turned Off	Slightly loosen water connection in the front of the machine. If no water is present the water supply has been turned off.
	Timer does not run	Check cam for rotation of clock.
	Wiring broken or connection off	Check electrical circuitry.
	Solenoid on defrost tank may be defective	Check for power to solenoid coil.
	Compressor does not run	Any of the following may be the cause. Starting relay, overload, capacitor or defective compressor.
	Water pump not operating	Clean or replace pump.
Low ice capacity	High Room Or Water Temperature	Provide ventilation to the unit. Decrease temperature as much as possible. If water supply pipe to the machine is very warm have plumber check installation.
	Unit connected to hot water line	Connect to cold water line.
	High head pressure	Defective water valve. Check for inadequate water supply. Air in the system-purge. Adjust water flow valve.
	Leaky water valves	Clean, repair or replace valves.
	Partially restricted capillary tube	Purge or replace charge and drier.

SERVICE ANALYSIS

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SYMPTOM	POSSIBLE CAUSE	CORRECTION
Cubes too large	Timer too slow or stops	Replace timer motor.
	Timer switch defective	Replace switch.
	Cam on timer loose	Tighten cam Locking nut.
Machine noisy during harvest cycle.	Excessive incoming water pressure	Install pressure regulator in incoming water line. Set water pressure at 25 lbs.
Cubes cloudy	Spray Jets Dirty	Clean (see page 12).
	Shortage Of Water	Check water supply for partially closed valves or supply line, low water pressure, (See instructions under "Cuber Runs Short of Water") or plastic curtain not hanging properly.
	Machine Not Level	Level.
	Dirty water supply	Connect water supply to water softener and/or filter.
Cubes too small	Accumulation Of Dirt In Water System	Clean with Scotsman Ice Machine Cleaner.
	Restricted Capillary Tube	Purge and recharge. If necessary replace capillary tube.
	Moisture & air in system	Purge - recharge - replace drier. Use 2-831 drier.
	Shortage of water	Check water supply (See if Cuber runs out of water)
	Shortage of refrigerant	Charge unit properly. (See serial number plate for correct charge)
Cuber runs short of water	Unit connected to hot water line	Connect to cold water.
	Water Sprays Out Curtains	Clean spray jets. Be sure plastic curtain hangs properly.
	Water valves leaking	Check and repair valves if necessary.
	Water enters hot water line too slowly	Clean water lines.
	Water leaking from pump hoses.	Check clamp and hoses. Replace if necessary.

SERVICE ANALYSIS

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Compressor cycles intermittently	<p>Low voltage</p> <p>Water line plugged to condenser</p> <p>Insufficient water supply</p> <p>Water valve sticking or defective</p> <p>Air in the system</p>	<p>Minimum voltage to be 10% less than normal rating.</p> <p>Clean.</p> <p>Check water lines (see if Cuber runs short of water)</p> <p>Clean and replace</p> <p>Purge and recharge.</p>
Cubes pile up in freezer	Curtain or cube chute out of place or improperly installed.	Check position of curtain and chute. Correct or replace.
Poor harvest cycle.	<p>Too short defrost time</p> <p>Water temperature too low</p> <p>Restriction in incoming water</p> <p>Water valve sticking, not opening, or out of adjustment.</p> <p>Air vent holes in ice cups plugged</p>	<p>Check timer - replace if necessary. Adjust timer switch.</p> <p>Check incoming water temperature. Should not be less than 50 degrees F.</p> <p>Clean water lines.</p> <p>Clean, replace or adjust valve.</p> <p>Clean small holes in top of the cups. See page 12 on cleaning.</p>
Excessive Bin Meltage	<p>Drain line plugged</p> <p>Drain not installed properly. Line does not have proper gravity flow so water backs up into bin.</p>	<p>Clear line of obstruction.</p> <p>See instructions on page 9 and 10 for proper installation instructions.</p>
Cubes burned (too large grooves melted in the sides of the cubes)	<p>Machine not level</p> <p>Overflow tube restricted.</p>	<p>Level properly.</p> <p>Remove cabinet and clean platen assembly.</p>

CUSTOMER INFORMATION

The information below answers the most frequently asked questions concerning the operation of the SM18 Home Ice Maker. Please take the time to read this page completely.

1. **NORMAL OPERATION:** The SM18 runs on a 24 minute cycle controlled by a time clock in the control box. The unit makes ice for 22 minutes and uses the remaining 2 minutes to defrost the cubes and drop them into the storage bin. 8 cubes are produced during each cycle. When the unit runs 24 hours, it will complete 60 cycles for a total of 480 cubes.
2. **BIN MELTAGE:** The ice storage bin is not refrigerated. The cubes remain separated rather than frozen into large chunks because the bin temperature remains slightly above freezing. To prevent rapid melting of the ice the storage bin is completely covered with a layer of molded foam insulation approximately 2" thick. The unit will run about 2 hours everyday to replace bin meltage plus the length of time necessary to replace the days ice consumption.
3. **EXCESSIVE BIN MELTAGE:** If the unit is making ice properly but the bin remains almost empty, the drain is not operating correctly. Any type of trap, kink or air lock in the drain line will cause water to back up into the storage bin at irregular intervals. This water will melt all or part of the ice supply in the bin. This situation can occur after the initial installation or after the unit has been moved for relocation, cleaning, service, etc. To correct the problem, check the drain to insure it is installed according to the instructions in this manual.
4. **WATER CONSUMPTION:** In tests at the factory and in the home, the SM18 has used approximately 1 gallon of water per batch of ice. The unit produces a batch of cubes every 24 minutes or 60 batches per 24 hours. This means that the unit will use approximately 60 gals. of water per day while running constantly. However, the unit automatically shuts off when the bin fills with ice so running time will vary from day to day. Water consumption will depend on the length of running time but will average about 15-20 gallons per day over a 7 day week. Comparitively, a dishwasher uses 15 gals. per batch, a clothes washer uses 45-55 gals. per batch and a commode uses 5 - 7-1/2 gals. per flush.

ACCESSORY PARTS AVAILABLE

NOTE: TWO 1/4" PIPE THREAD X 1/4" COMPRESSION FITTINGS ARE REQUIRED FOR INSTALLATION. P/N 11-621-3.

Water Pressure Regulator Part No. 11-200.

Installation of a pressure regulator in the incoming water line will minimize any objectional or excessive noise emitted during the harvest cycle. This valve comes preset from the factory at 25 lbs. Excessive water pressure will not harm the machine, however, it may be the cause of objectional noises.

Water Strainer Part No. 16-162

Installation of a water strainer in an easily accessible area will greatly simplify service if a machine is installed on a water supply system that may have sand or sediment in the water. The machine comes equipped with a strainer screen in the water solenoid valve which is adequate for the majority of installations, however, if sand or sediment could be a problem, installation of this water strainer from a service standpoint is highly recommended. The diagram below shows the direction of water flow. The cleaning plug must be in a downward position slanting up into the incoming water. Notice the arrow stamped on each strainer to show correct flow direction.

