

# AF1

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# AF1 FOR THE INSTALLER

## INTRODUCTION

This manual provides the specifications and the step-by-step procedures for the installation, start-up, operation, maintenance and cleaning of the SCOTSMAN Model AF1 Automatic Flaker Icemaker.

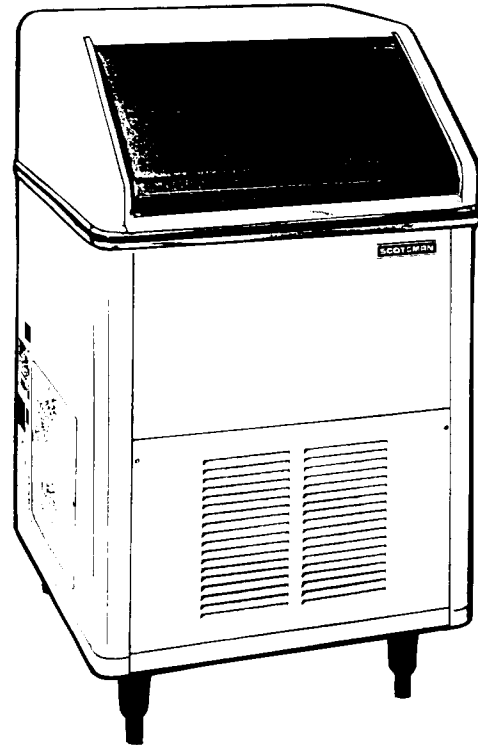
The Model AF1 icemaker is quality designed, engineered and constructed. It is a thoroughly tested icemaking system, providing the utmost in flexibility to fit the users needs.

An attractive sandalwood finish adapts to any decor. Large bin door rises and slides back into cabinet for easy ice access. The AF1 produces hard bits of flaked ice that are slow melting and pure, can be used for iced display purposes and is the ideal ice for health care use.

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

The Scotsman AF1 icemaker stores its own ice supply in a heavily insulated, polyethelene ice storage bin, with a handy ice access door opening at the front.

The standard overall dimensions of the cabinet depth allows the automatic icemaker to be installed in harmony with the existing counter equipment.



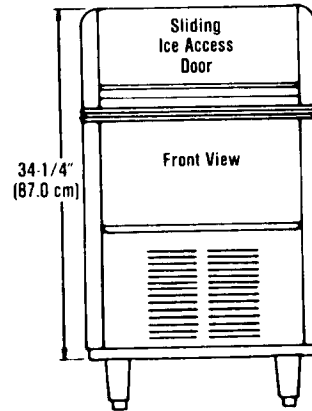
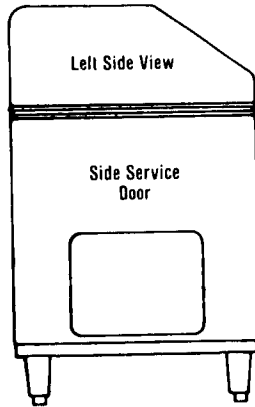
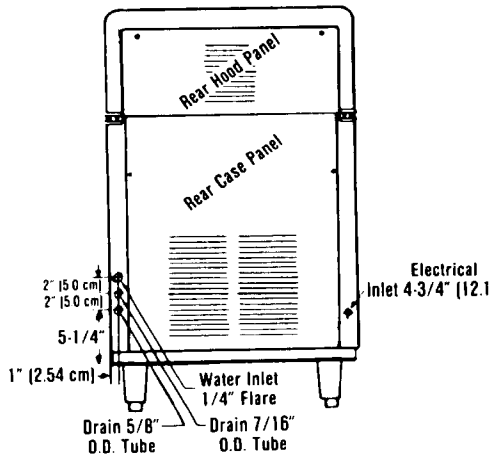
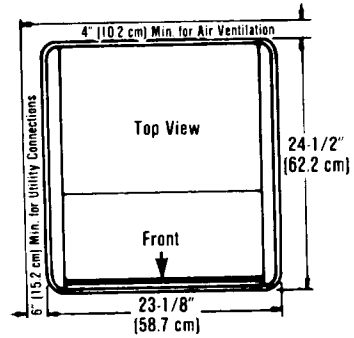
This icemaker has been engineered to our own rigid safety and performance standards. The National Sanitation Foundation (NSF) seal, signifies that it is listed with NSF and that it complies with the materials and construction standards of NSF. In addition, the Underwriters Laboratories, Inc., (UL) Listing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

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

# AF1 FOR THE INSTALLER

## SPECIFICATIONS

**INSTALLATION NOTE:**  
 Allow 6" minimum space  
 at left side and 4"  
 at back for ventilation  
 and utility connections.



**STANDARD LEGS  
 NOW INCLUDED**

### SPECIFICATIONS

Model Number	(Height - w/o Legs) Dimensions H" x W" x D"	Bin Cap.	Cond. Unit	Finish **	Basic Electrical	Comp. H.P.	No. of Wires	Min. Circuit Ampa- city †	Max. Fuse Size	Ship. Wt. lbs./kg.
AF1AE-1D	34 1/4 x 23 1/4 x 24 1/2	55 lbs.	Air	ES	115/60/1	1/4	2	10.7	15	190/86
AF1AS-1D	34 1/4 x 23 1/4 x 24 1/2	55 lbs.	Air	SS	115/60/1	1/4	2	10.7	15	190/86

\*\* (SS) Stainless Steel, (ES) Sandalwood, Leathergrain embossed steel with high gloss baked enamel finish.  
 † Use this value to determine minimum wire size as per National Electric Code Standards.

### IMPORTANT OPERATING REQUIREMENTS

	MINIMUM	MAXIMUM
Air Temperatures . . . . .	50°F (10.0°C)	100°F (38°C)
Water Temperatures . . . . .	40°F (4.4°C)	100°F (38°C)
Water Pressures . . . . .	20 lbs. gauge	120 lbs. gauge
Electrical Voltage Variation		
Voltage rating specified		
on nameplate . . . . .	-10%	+ 10%

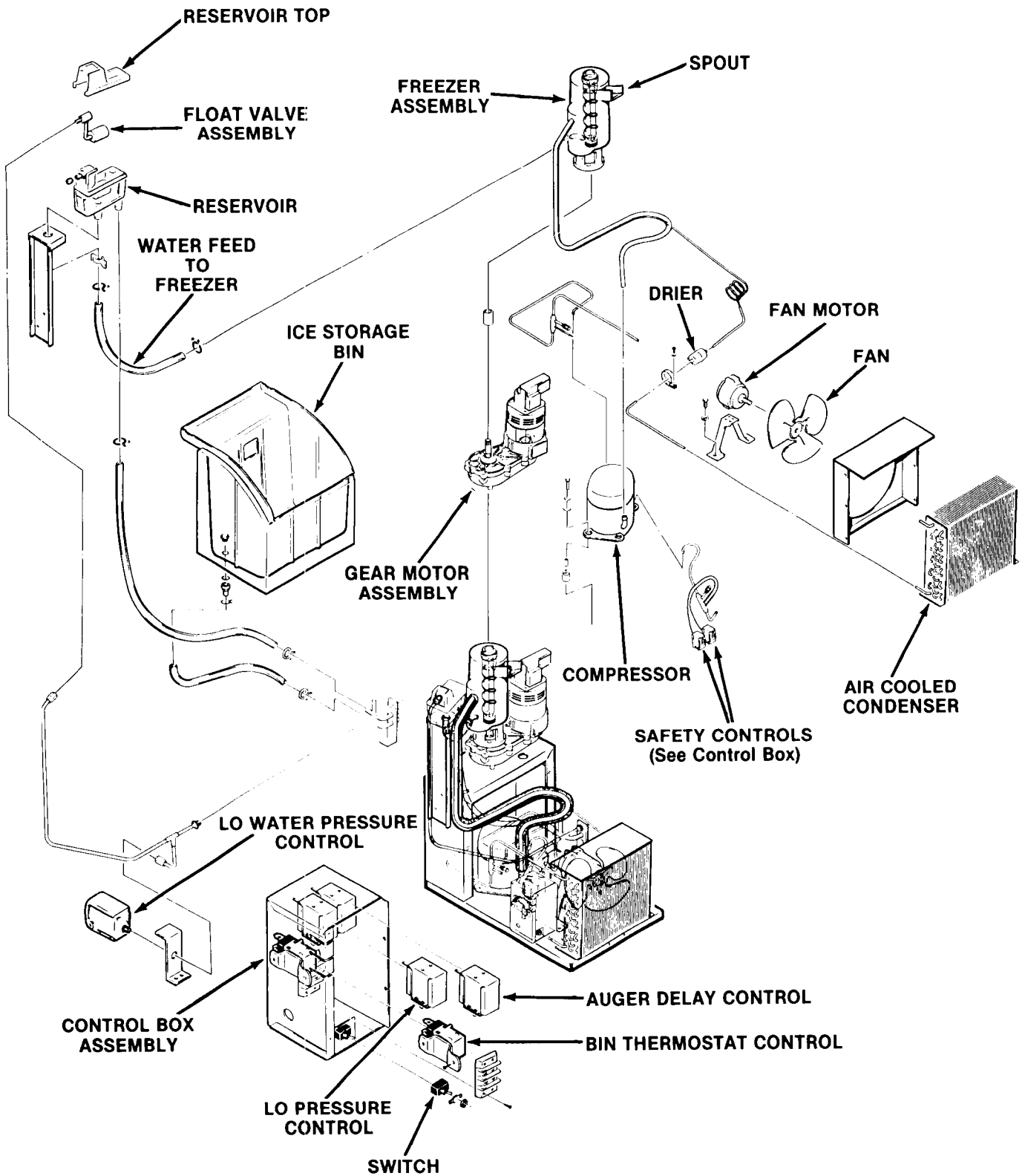
**SEE NAMEPLATE**, for electrical and refrigeration specifications.

**NAMEPLATE** is located on the left side of the cabinet.

Extended periods of operation exceeding these limitations constitutes misuse under the terms of Scotsman Manufacturer's Limited Warranty, resulting in a loss of warranty coverage.

Refrigerant . . . . . R12

# AF1 FOR THE INSTALLER



*AF1 Flaked Icemaker  
Component Location*

# AF1 FOR THE INSTALLER

## LOCATION AND LEVELING

### ////////// WARNING //////////

This icemaker is designed for indoor installations **ONLY** where air temperatures are above 50-degrees F. and below 100-degrees F. and water temperatures are above 40-degrees F. or below 100-degrees F. Extended periods of operation at temperatures exceeding these limitations will constitute misuse, under the terms of the SCOTSMAN manufacturer's limited warranty, resulting in **LOSS** of warranty coverage.

////////////////////////////////////

## NOTE

*Regular maintenance will require access to the back of the machine. Any restrictions to the back will hamper routine maintenance efforts.*

*Well ventilated location, advising user to frequently clean air-cooled condenser, located directly behind the front service door.*

*CONVENIENCE: Placed for practical, efficient use and access of ice.*

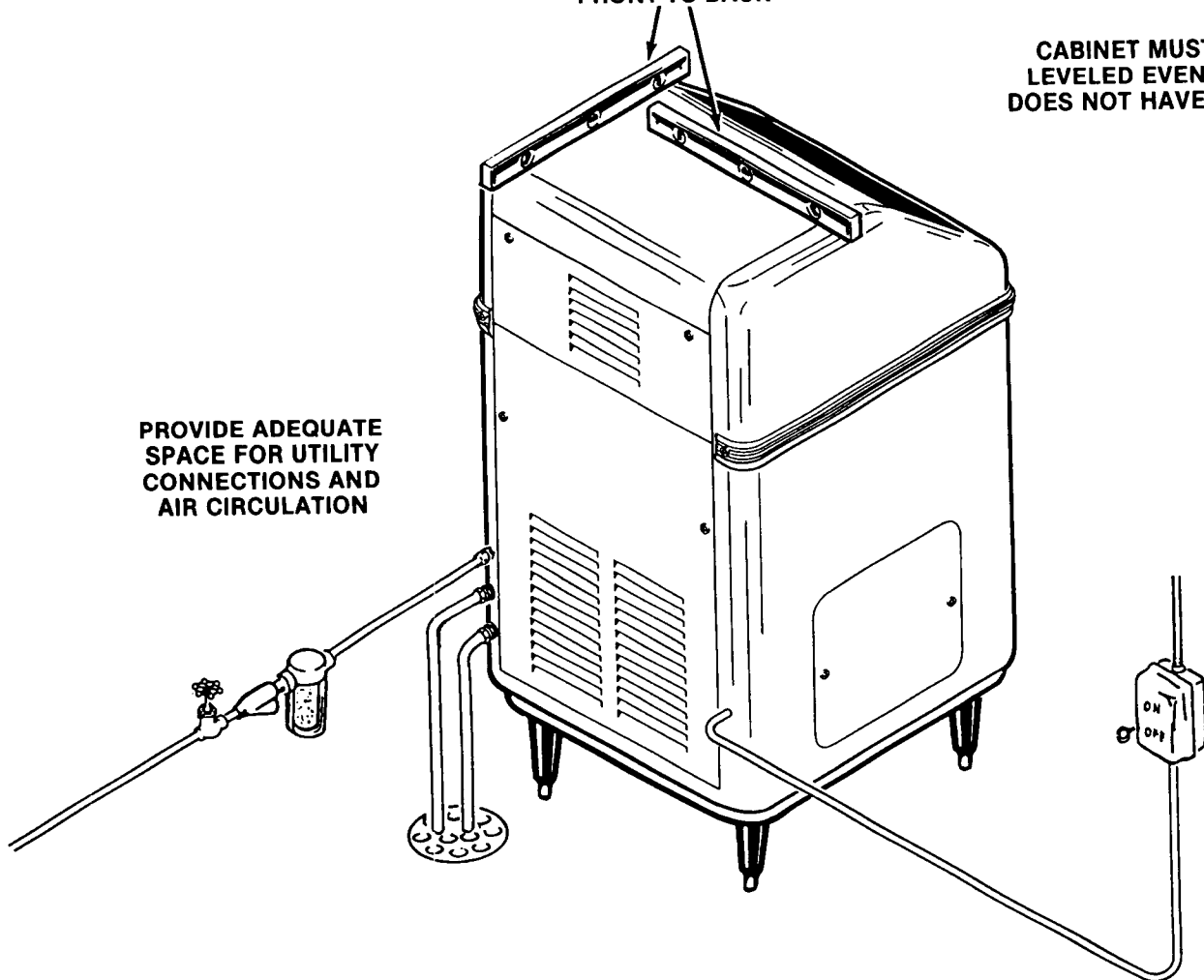
*SERVICE ACCESS: Adequate space for all service connections, located at the rear of the cabinet. A six-inch minimum clearance at back and left side panel, for routing cooling air drawn into and exhausted out of the compartment to maintain proper condensing operation on air-cooled models, and for service access.*

1. Position the cabinet in the selected location.
2. Level the cabinet in both the left-to-right and front-to-back directions. The leveling legs can be adjusted with an open end wrench.

ICEMAKER MUST  
BE LEVEL  
LEFT-TO-RIGHT  
FRONT-TO-BACK

CABINET MUST BE  
LEVELED EVEN IF IT  
DOES NOT HAVE LEGS.

PROVIDE ADEQUATE  
SPACE FOR UTILITY  
CONNECTIONS AND  
AIR CIRCULATION



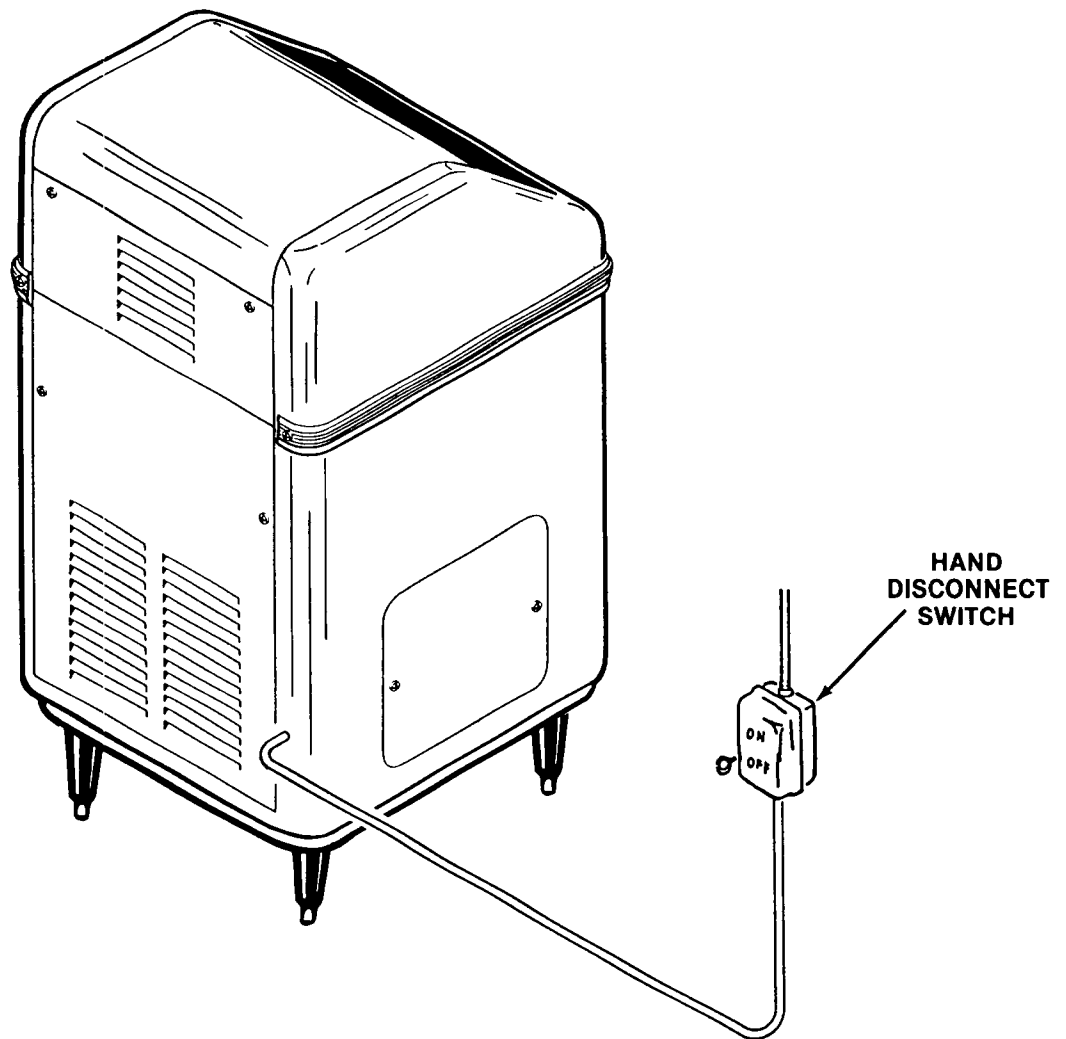
# AF1 FOR THE ELECTRICIAN

## ELECTRICAL CONNECTIONS

SEE NAMEPLATE for current requirements to determine wire size to be used for electrical hookup. The AF1 icemaker requires a solid earth ground wire.

All external wiring should conform to the national and state electrical codes. A local electrical permit and services of a licensed electrician may be required.

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



# AF1 FOR THE PLUMBER

## WATER SUPPLY AND DRAIN CONNECTIONS

The recommended water supply line is a 1/4-inch O.D. copper tubing with a minimum pressure of 20 PSIG. A 1/4-inch flare fitting is provided at the water inlet. Connect to cold water supply line with standard plumbing fittings, with a shut off valve installed in an accessible place between the water supply and the cabinet.

### CAUTION

This icemaker is equipped with a low water pressure safety device, which in the event of interruptions or low water pressure, the icemaker will automatically stop to prevent damage. It will restart automatically when water pressure is restored.

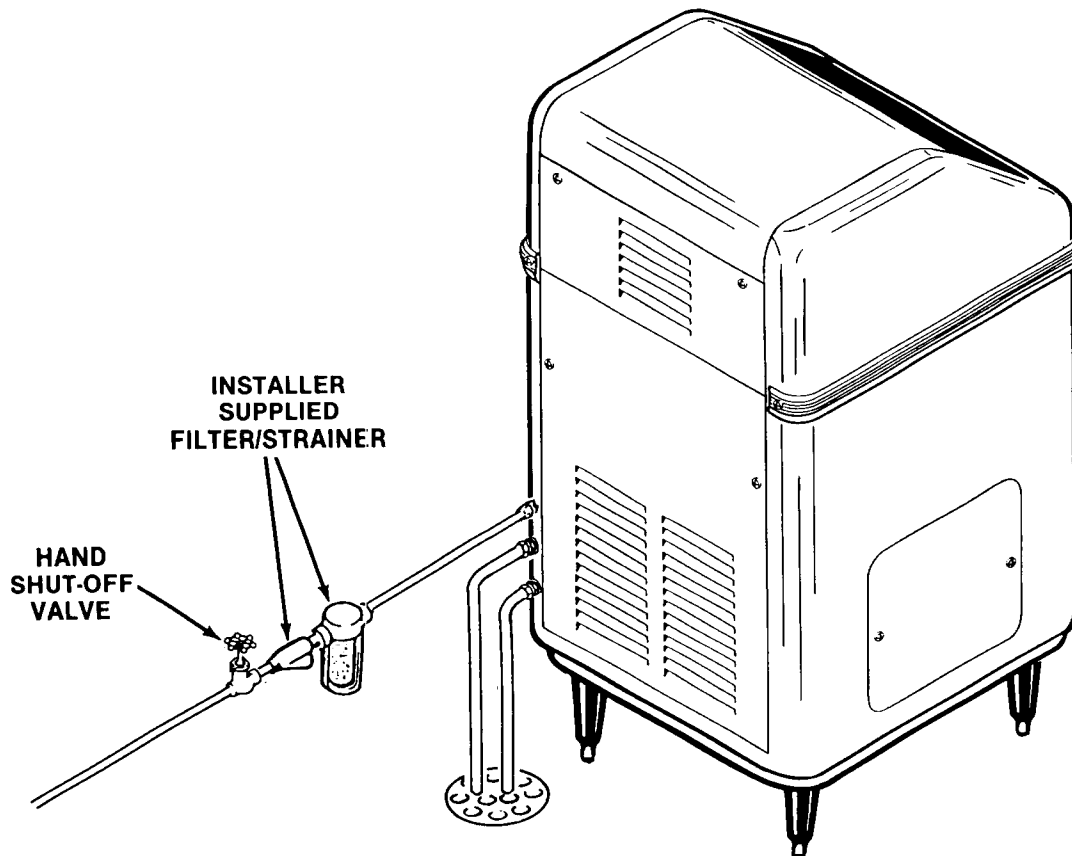
### CAUTION

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

*Install to conform with the local plumbing codes. In some cases, a plumbing permit and services of a licensed plumber will be required.*

Recommended bin drain is a 5/8-inch O.D. copper tubing and should be vented and run separately. Connect a 7/16-inch I.D. tube from the water-cooled condenser, on water-cooled models.

If drain is a long run, allow a 1/4-inch per foot fall.



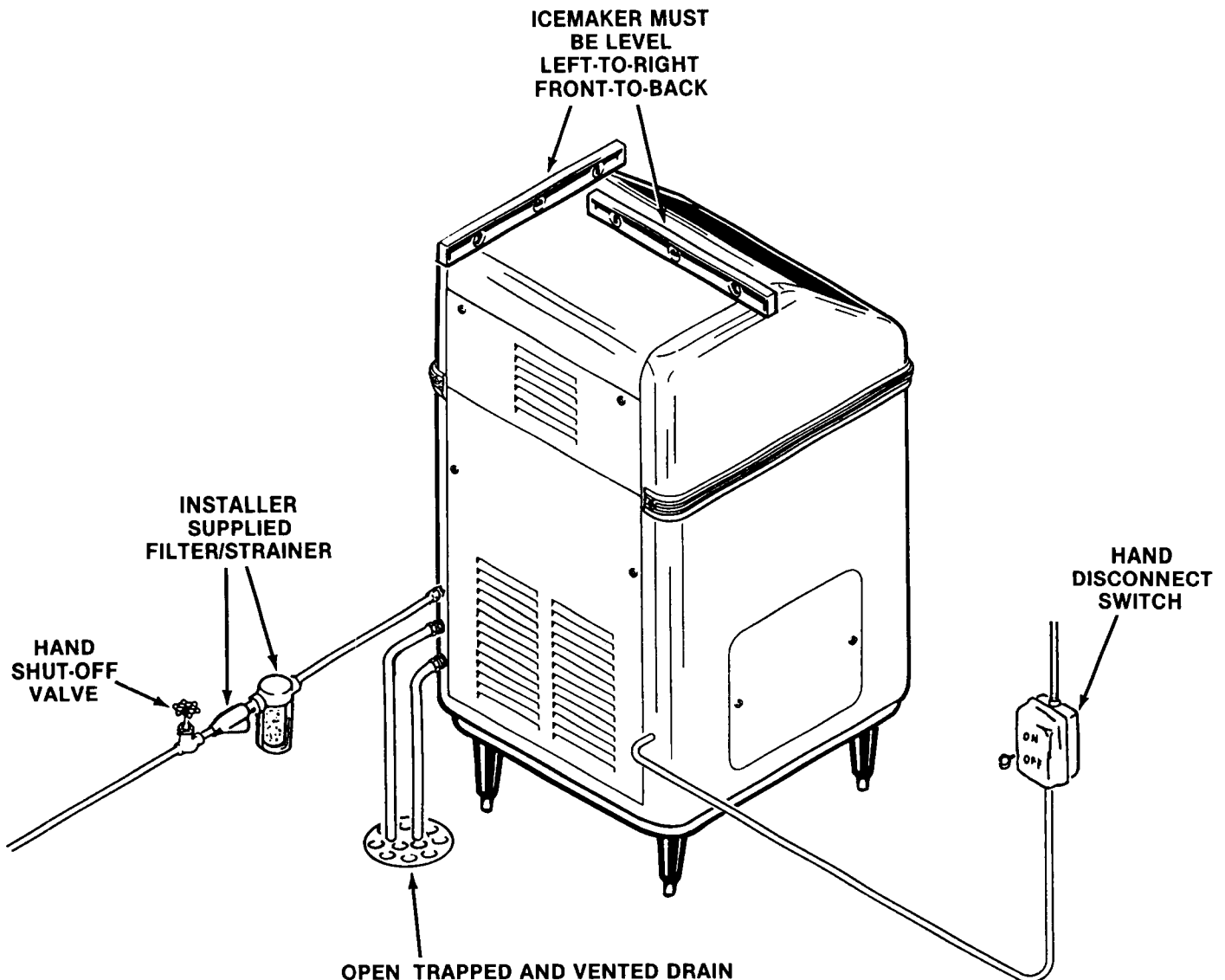
OPEN, TRAPPED OR VENTED DRAIN



# AF1 FOR THE INSTALLER

## FINAL CHECK LIST

1. Is the cabinet in the room where ambient temperatures are within the minimum and maximum temperatures specified?
2. Is there at least six inches clearance behind the cabinet for proper air circulation?
3. Has water supply pressure been checked to insure a minimum of 20 PSIG and a maximum of 120 PSIG operating pressure?
4. Is the cabinet level?
5. Have all electrical and piping connections been made?
6. Is the water supply line shut-off valve installed and electrical wiring properly connected?
7. Have the compressor hold-down nuts been checked to be sure the compressor is snug on the mounting pads?
8. Check all refrigerant lines and conduit lines, to guard against vibration or rubbing and possible failure.
9. Have the bin and cabinet been wiped clean?
10. Has the Manufacturer's Registration Card been properly filled out? Check for correct model and serial numbers from Serial nameplate, then mail the completed card to the SCOTSMAN factory.
11. Has the owner/user been given the User Manual and instructed on how to operate the icemaker.
12. Has the owner been given the name and telephone number of the authorized SCOTSMAN Service Agency serving him?





# AF1 START-UP

## OPERATING INSTRUCTIONS

### START UP

1. Remove screws and the front and back panels.
2. OPEN the water supply line shutoff valve.
3. Observe the water filling operation.
  - a. Water flows into water reservoir.
  - b. Float moves up as water rises.
  - c. Water flows through water feed line to bottom of freezer assembly.
  - d. Float stops water flow, when water level reaches the molded horizontal line, on the body of the water reservoir.
4. Check all internal water connections for leaks.
5. Set the Master ON-OFF toggle switch to ON position to start the automatic icemaker operation.
6. Observe that ice begins dropping into the ice storage bin.
7. Let the system operate until ice covers the bottom of the bin. Check for any excess noises beyond normal compressor noise.
  - a. Fan noises, when air-cooled: Blades touching other surfaces; blades bent or out-of-balance.
  - b. Vibrating type, from touching lines.
  - c. Chattering: Lack of water in freezer.
  - d. Compressor loose at one or more holddown bolts.

### CAUTION

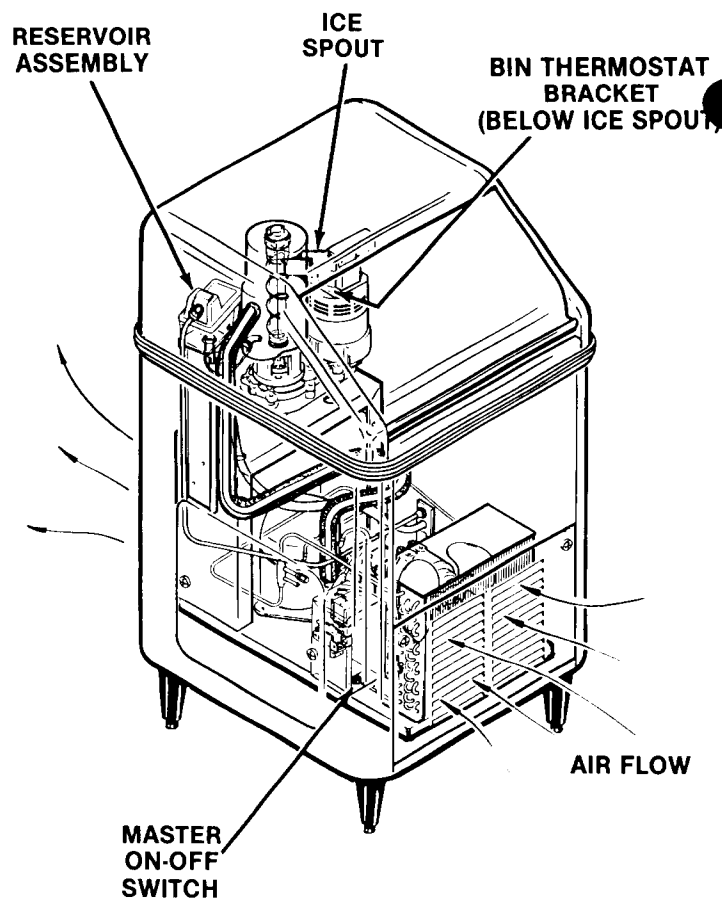
This icemaker is equipped with a low water pressure safety device, which in the event of interruptions or low water pressure, the icemaker will automatically stop to prevent damage. It will restart automatically after the water pressure is restored.

8. Place ice on the ice storage bin thermostat control bulb, to test shut-off. Less than one minute is about normal for bulb shut off function to cause the compressor to stop.

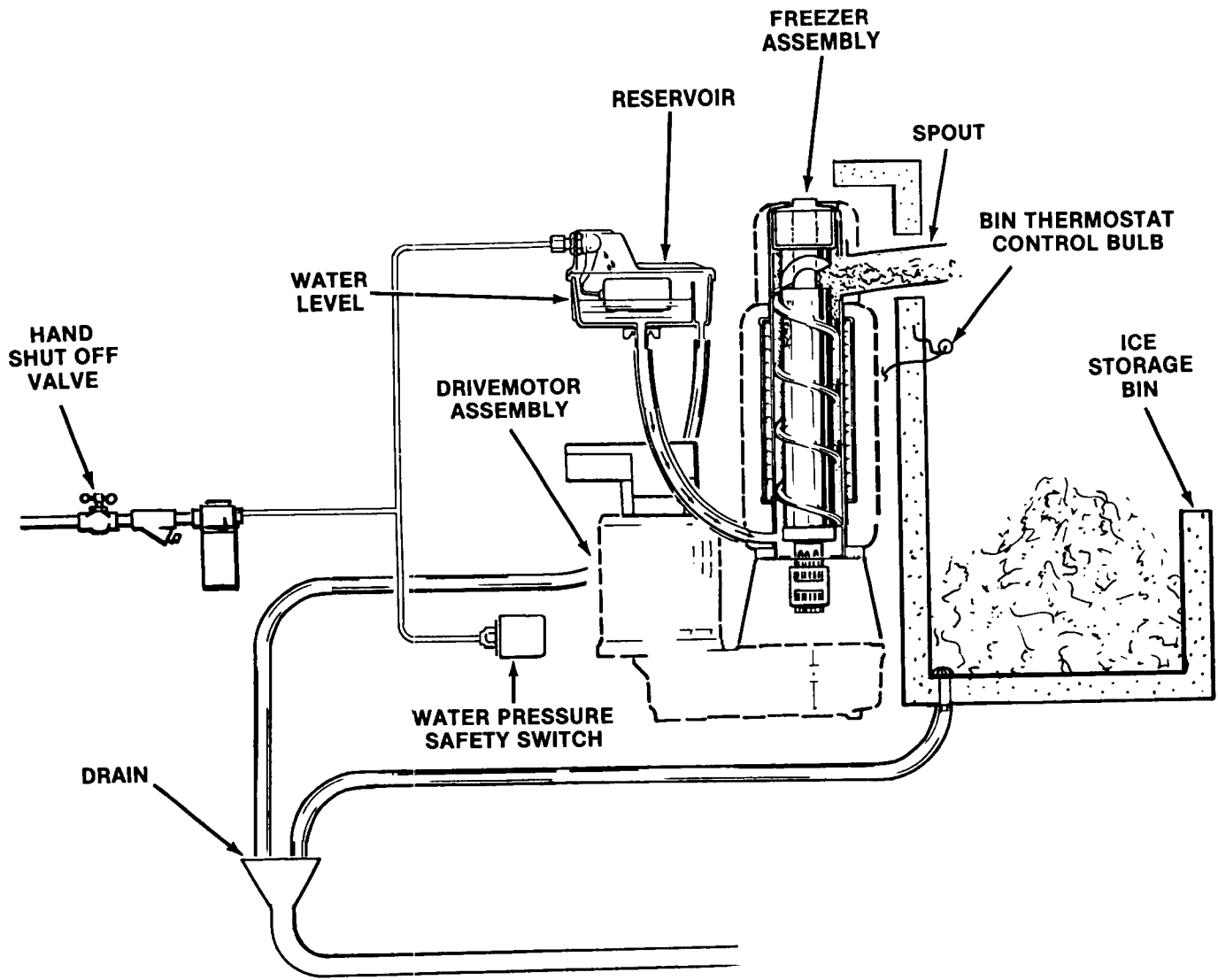
### NOTE

*Within minutes after the ice is removed from the sensing bulb, the bulb will warm up and cause the icemaker to restart. This control is factory set and should not be reset until testing is performed. Normal setting is 35-degrees F. CUT-OUT and 45-degrees F. CUT-IN, to prevent short cycling.*

9. Thoroughly explain to the owner/user the significant specifications of the icemaker, the start up and operation, going through the procedures for the operating instructions. Answer all questions about the icemaker, by the owner; and, inform the owner of the name and telephone number of the authorized SCOTSMAN Distributor or Service Agency serving him.



# AF1 START-UP



# AF1 OPERATION

## ICEMAKER OPERATION

The water supply flows from the building source through the inline water strainer, enters at the inlet fitting and on to the water reservoir. The water reservoir functions to maintain a constant water level inside the freezer assembly. Water from the water reservoir enters at the bottom of the freezer assembly and is changed into ice by low temperatures inside the freezer.

A stainless steel auger within the freezer is powered by the drivemotor assembly, a direct-drive gearmotor, and the rotating auger carries the ice upward to the end of the auger.

Excess water is pressed out of the ice, as it is pushed out through the spout opening and into the ice storage bin.

Setting the Master ON-OFF toggle switch to ON starts the automatic and continuous icemaking process. When the ice storage bin has been filled with ice, up to the level of the bin thermostat control capillary bulb, the icemaking process shuts OFF.

As ice is removed from the ice storage bin, the bulb warms up, restarting the automatic icemaking process.

Factory settings are 35-degrees F. CUT-OUT and 45-degrees F. CUT-IN.

Altitude adjustment should ONLY be performed on icemakers installed at 2000-foot level locations and ABOVE and adjust only in increments of one-fourth turn of screw at a time.

## ELECTRICAL/REFRIGERATION

The AF1 icemakers are designed to operate on standard electrical supply 115 volts, 60 Hertz, single phase. Other voltage requirements are available on special order. Therefore, always CHECK NAMEPLATE for electrical information BEFORE proceeding with electrical wiring connection to the icemaker.

Cold ambient temperatures and interruptions in water supply are conditions that can cause excessively hard ice and overloads within the freezer assembly, which is directly transmitted to the drivemotor; and in turn, will cause speed reduction or ultimate freezeup.

When the drivemotor is slowed to a pre-determined RPM, a sensing switch mounted on top of the motor is designed to open the electrical circuit to the compressor. The compressor stops operating, no more ice is produced and the drivemotor continues to operate rotating the auger to clear the overload and gradually build up to full speed.

At a pre-determined higher RPM drivemotor speed, the speed sensing switch closes the electrical circuit to the compressor, causing the normal icemaking process to continue.

There are two safety controls in the control box. The low refrigerant pressure control, an automatic reset, non-adjustable control, is used to electrically open at zero to four PSIG to stop the entire icemaker. The auger delay switch, a single-pole double-throw (SPDT) switch, functions as a control device to allow the drivemotor to rotate the auger to clear the freezing chamber while the compressor circuit is OFF.

Refer to the appropriate wiring diagram and trace circuitry and control functions, as described in the following paragraph.

As shown on all SCOTSMAN wiring diagrams, the controls are in the ICEMAKING MODE. Thus, the auger delay 1-2 contacts are CLOSED. At STARTUP, the 1-2 contacts are OPEN and the 3-2 contacts are CLOSED. As the icemaker begins to operate, the low side pressure starts to decrease from the stabilized or at-rest pressure. As soon as the pressure is reduced to 20 PSIG, the 3-2 contacts OPEN and the 1-2 contacts CLOSE.

This removes the operating controls, such as the bin thermostat, from the drivemotor circuit. If one of the operating controls OPENS, it will SHUT OFF the compressor circuit. The drivemotor will operate until the low side pressure increases to 32 PSIG. Then, the 1-2 contacts OPEN and SHUTS OFF the drivemotor, usually within one to two minutes, depending upon ambient conditions. The brief period of time allows the auger to transport all the ice out of the freezing chamber. Consequently, when called on to STARTUP again, there is no ice load to start up against. Again, on STARTUP, the 1-2 contacts are OPEN and the 3-2 contacts are CLOSED.

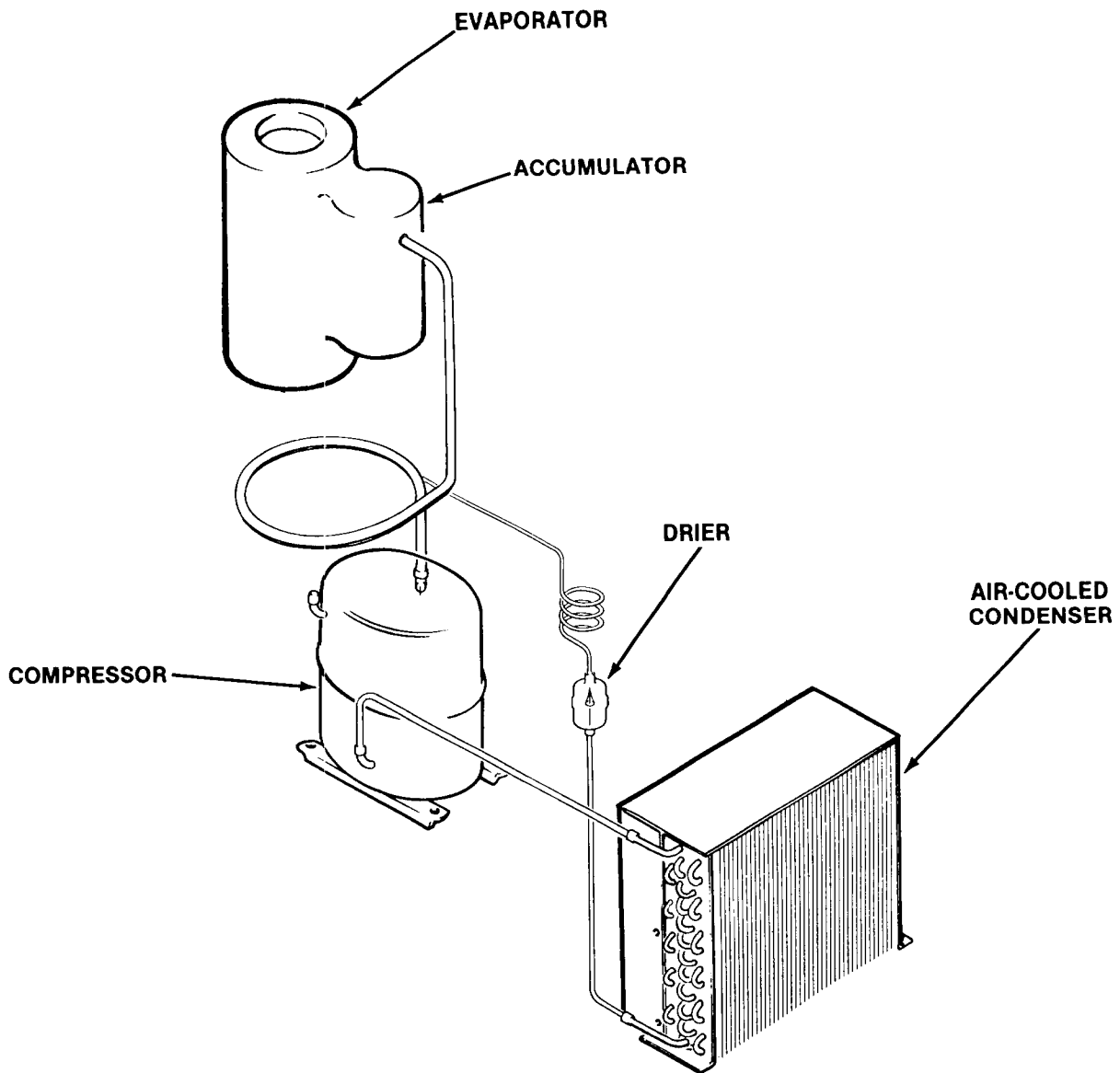
# AF1 OPERATION

On all models, a low-water pressure switch functions to discontinue the icemaking process whenever inlet water pressure is reduced to below 10 PSIG. The switch will automatically restart the icemaking process when the water pressure is increased to 20 PSIG.

The head pressure is normal about 130 PSIG, however it will vary depending upon ambient air temperature.

Suction pressure should be 13 PSIG with proper refrigerant charge. Suction pressure will vary about two PSIG plus or minus, depending upon ambient temperatures and inlet water supply temperatures to the freezer assembly.

When charging the system with refrigerant, always CHECK NAMEPLATE for specific refrigeration charge for individual icemaker.



# AF1 COMPONENT DESCRIPTION

## BIN THERMOSTAT CONTROL

The bin thermostat is located on the left side of the control box. The sensing capillary tube is routed from the control out the side of the control box up and into the bin thermostat bracket. The bin thermostat control functions to automatically shut OFF the icemaker, when the ice storage bin is filled and ice contacts the capillary tube. It also signals the RESTART of the icemaker, when the capillary tube starts to warm up, after ice has been removed from the bin.

Bin thermostat control adjustment should ONLY be performed on icemakers installed in extreme warm or cold locations and adjust only in increments of one eighth turn at a time.

AUGER DELAY SWITCH, a single-pole double throw (SPDT) switch, allows the gearmotor to rotate the Auger and clear the freezing chamber after the bin ice level switch circuit to compressor is OFF. When the icemaker restarts, the gearmotor starts in a no load condition, preventing excessive loading of gearmotor and bearings.

## COMPRESSOR START RELAY

The compressor start relay completes the circuit to the compressor from the start capacitor to provide enough energy to start the compressor. When the compressor motor has started, the compressor relay opens and removes the start capacitor from the circuit.

## WATER RESERVOIR

The water reservoir, with a float valve assembly, maintains a constant water supply within the freezer assembly. The water level in the reservoir is the same water level as in the freezer. The correct water level in the freezer is level with the top of the auger flights. The water level in the freezer can be adjusted by raising or lowering the water reservoir with the bracket.

WATER PRESSURE SAFETY SWITCH installed in the potable water inlet line is set to electrically open at 10 PSIG and stop the entire icemaker. The AUTOMATIC RESET will restart the icemaking process when water pressure rises to 20 PSIG.

REFRIGERANT LO PRESSURE CONTROL is factory set to automatically SHUT DOWN the icemaker if the low-side pressure drops below 4 PSIG.

## FREEZER ASSEMBLY

Evaporator coils surround a cylindrical tube which is filled with water. As ice forms on the interior wall, it is lifted by a rotating auger which moves the ice to the ice breaker at the top of the cylinder where it is forced through the ice delivery chute.

## ICE BREAKER ASSEMBLY

The ice breaker assembly, bolted to the top of the freezer, contains the bearing and seal for the top of the auger. Flaked ice created by the freezer is carried by the auger to the ice breaker assembly and the flaked ice is pushed by the auger through the hole in the side of the freezer and falls into the bin.

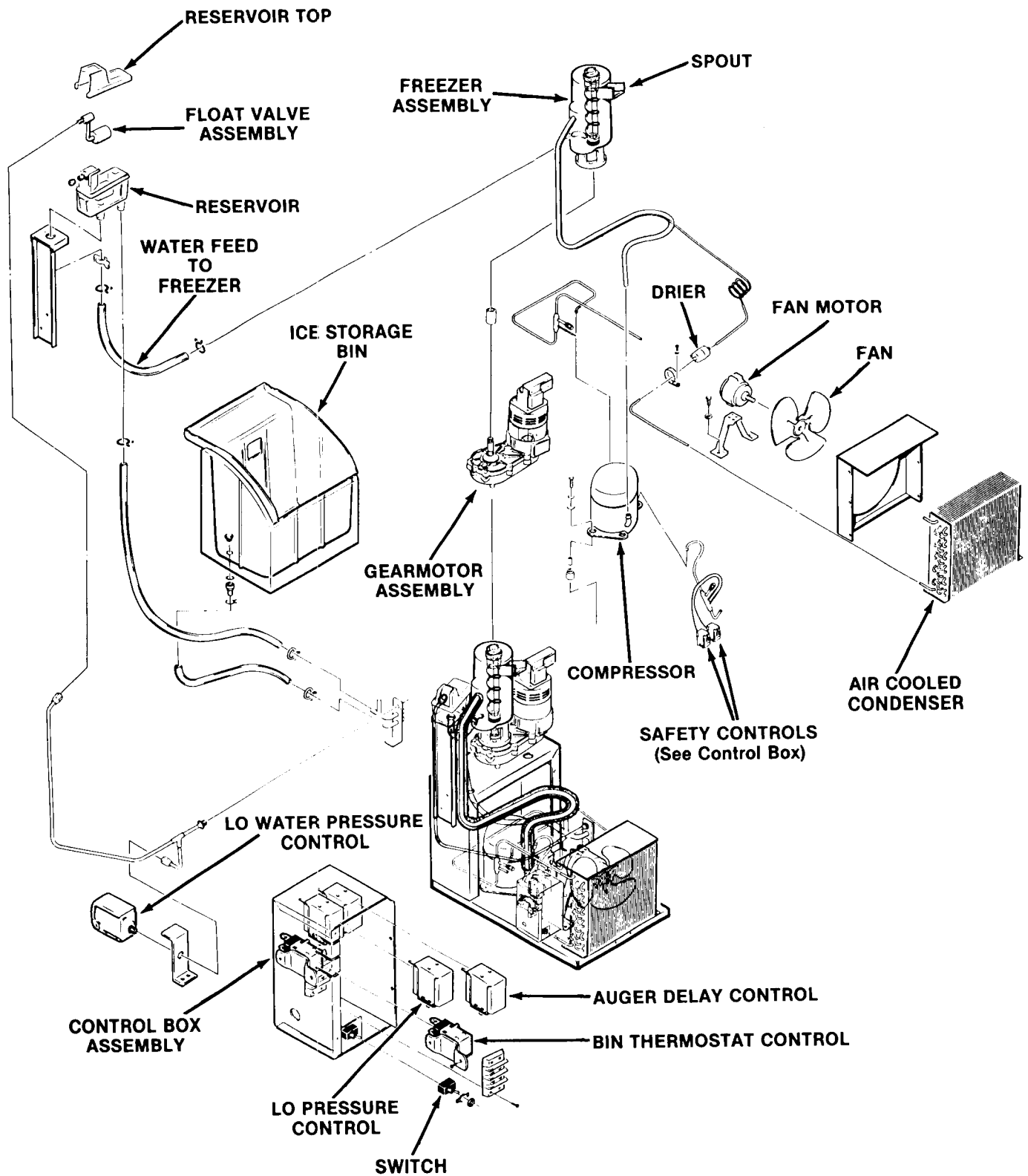
## AUGER

The highly-polished stainless steel auger inside the freezer assembly, is rotated by the gearmotor and pushes ice to the top of the freezer.

## LOWER WATER SEAL

The highly precision two-part water seal located at the bottom of the freezer, seals the bottom of the freezer assembly to contain water. The rotating part of the lower water seal is attached to the bottom of the auger and the stationary part of the seal is pressure fit into the bottom of the freezer assembly tube. Anytime condition of the lower water seal is in question, replace the seal.

# AF1 COMPONENT DESCRIPTION





# AF1 MAINTENANCE & CLEANING INSTRUCTIONS



A Scotsman Ice System represents a sizable investment of time and money in any company's business. In order to receive the best return for that investment, it MUST receive periodic maintenance.

It is the USERS RESPONSIBILITY to see that the unit is properly maintained. It is always preferable; and less costly in the long run, to avoid possible down time by keeping it clean, adjusting it as needed and by replacing worn parts before they can cause failure. The following is a list of recommended maintenance that will help keep your machine running with a minimum of problems.

Maintenance and Cleaning should be scheduled at a MINIMUM of twice per year.



## GENERAL

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

## ICEMAKER MAINTENANCE

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

1. Check and clean optional water line strainers or water purification equipment.
2. Remove screws and lower and upper panels from the cabinet to gain access.
3. Remove cover from water reservoir and depress the float to insure that a full stream of water enters the reservoir.
4. Check that the icemaker cabinet is level, in side-to-side and front-to-back directions.
5. Check that the water level in the water reservoir is below the overflow.

### NOTE

*It is not abnormal for some water to emerge out the spout with ice during normal ice production.*

6. Clean the water reservoir and interior of the freezer assembly, using a solution of SCOTSMAN Ice Machine Cleaner. Refer to CLEANING — ICEMAKER.
7. Remove auger. See page 25. Check bearings for wear and auger for stains.

### NOTE

*Cleaning requirements vary according to local water conditions and individual user operation. Visual inspection of the auger before and after cleaning will indicate frequency and procedure to be followed in local areas.*

8. Check drivemotor operation: Check amp draw, noise, oil leaks.
9. Check operation of the centrifugal sensing switch:  
Switch will OPEN between 850-950 RPM and the compressor STOPS, with the drivemotor operating. Switch will CLOSE between 1100-1250 RPM and the compressor will RESTART, with drivemotor building back up to normal operating speed.
10. Clean the air-cooled condenser, using vacuum cleaner, whisk broom or brush. Instruct customer to clean frequently and to be sure icemaker and fan motor are OFF.
11. Check that fan blades move freely, are not touching any surfaces and are not bent or out of balance.
12. Check for refrigerant leaks.
13. Check for water leaks. Tighten drain line connections. Pour water down bin drain to be sure that drain line is open and clear.
14. Check the quality of ice. Ice should be wet when formed, but will cure rapidly to normal hardness in the bin.
15. Check the bin thermostat control bulb.

### NOTE

*Place ice on the ice storage bin thermostat control bulb, to test shut-off. Less than one minute is about normal for bulb shut off function to cause the compressor to stop.*

# AF1 MAINTENANCE & CLEANING INSTRUCTIONS

## ICEMAKER CLEANING

1. Remove screws and the front and top panels.
2. Set the master ON-OFF toggle switch to OFF.
3. Remove all ice from the ice storage bin.
4. Remove screws and lower and upper panels of the cabinet to gain access.
5. Remove the reservoir cover and block the float in the water reservoir up to stop water flow.
6. Disconnect the tube between the water reservoir and the bottom of the freezer assembly and drain water from the reservoir and tube. Reconnect the tube.

## WARNING

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

## WARNING

7. Prepare cleaning solution: Mix 4 ounces of SCOTSMAN Ice Machine Cleaner with one quart of hot water.
8. Slowly pour the cleaning solution into the water reservoir.
9. Set the master ON-OFF toggle switch to ON.
10. Continue to slowly pour the cleaning solution into the water reservoir, maintain level just below the reservoir overflow.
11. Continue icemaking, using the cleaning solution, until all the solution is used up and the water reservoir is almost empty. DO NOT allow the icemaker to operate with empty reservoir.
12. Set the master ON-OFF toggle switch to OFF.
13. Wash and rinse the water reservoir.
14. Remove the block from the float in the water reservoir.
15. Set the master ON-OFF toggle switch to ON.
16. Continue icemaking for at least 15 minutes, to flush out any cleaning solution. Check ice for acid taste - continue icemaking until ice tastes sweet.
17. Set the master ON-OFF toggle switch to OFF.

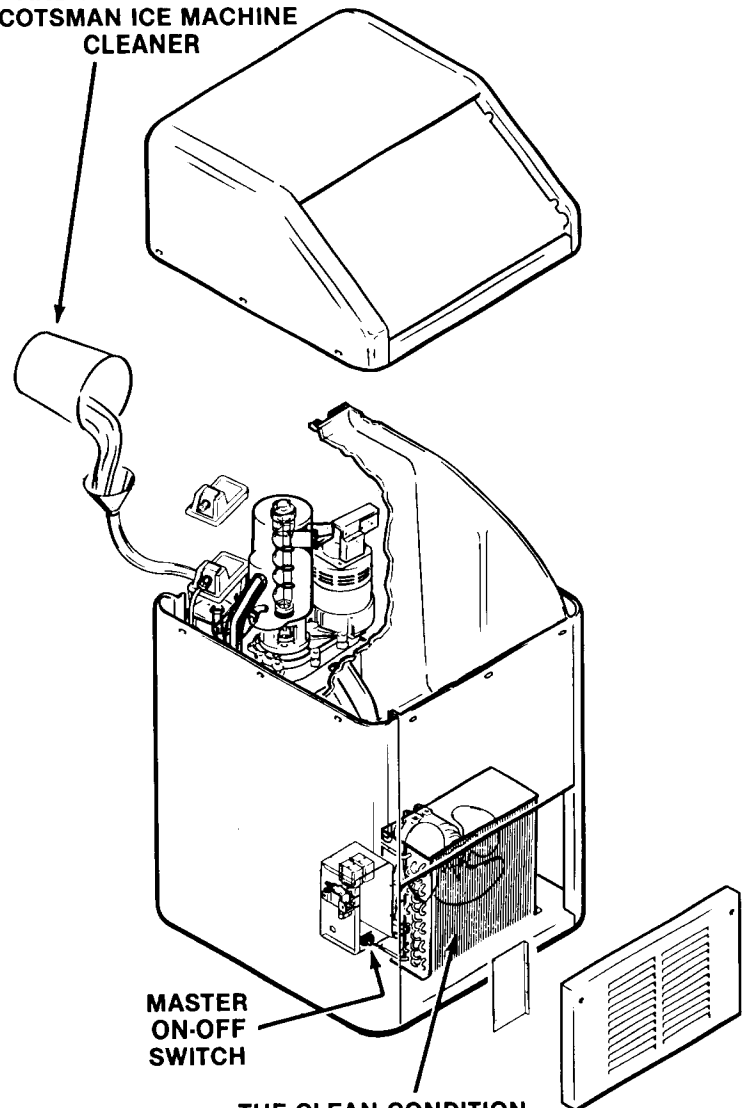
## CAUTION

**DO NOT use ice produced from the cleaning solution. Be sure none remains in the bin.**

## CAUTION

18. Remove all ice from the ice storage bin.
19. Add HOT water to the ice storage bin and thoroughly wash and rinse all surfaces within the bin.
20. Clean and sanitize the ice storage bin each week.

**CLEAN RESERVOIR AND FREEZER WITH SCOTSMAN ICE MACHINE CLEANER**



**MASTER ON-OFF SWITCH**

**THE CLEAN CONDITION OF THE AIR-COOLED CONDENSER DIRECTLY AFFECTS ICE PRODUCTION. CLEAN AIR-COOLED CONDENSER FREQUENTLY.**

# AF1 SERVICE DIAGNOSIS

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Unit will not run	Blown Fuse	Replace fuse and check for cause of blown fuse
	Thermostat set too high	Adjust thermostat. Refer to Adjustment, Bin Thermostat page 20.
	Loose electrical connection	Check wiring
	Switch in OFF position	Turn switch to ON
	Inoperative master switch	Replace switch
Low water pressure	Low water pressure	Restore water pressure
	Low on refrigerant	Leak check, evacuate & recharge
Compressor cycles intermittently	Low voltage	Check for overloading
	Dirty condenser	Clean
	Air circulation blocked	Remove blockage
	Inoperative condenser motor	Replace
	Non-condensable gases in system	Purge off, evacuate & recharge
	Low on refrigerant	Leak test, evacuate, and charge
Making wet ice	Surrounding air temperature	Correct or move unit to cooler location
	Under or over-charge of refrigerant.	Recharge with proper amount
	High water level in water reservoir	Lower to horizontal molded line on the reservoir
	Inoperative master switch	Replace switch
	Low water pressure	Restore water pressure
Low ice production	Loss of refrigerant, under or over-charge of refrigerant	Check and recharge with proper amount of refrigerant
	Dirty or plugged condenser	Clean condenser
	Low water level in water reservoir	Adjust to horizontal molded line on the reservoir
	Partial restriction in capillary tube or drier	Moisture in system. Remove charge and drier. Replace and recharge system
	Inlet water strainer partially plugged	Remove screen and clean.
	Corroded or stained worm shaft due to water condition	Remove worm shaft and clean
Gear motor noise.	Low on oil, bad bearings or bad gears.	Remove case cover to check for proper oil level. See Removal & Replacement.

# AF1 SERVICE DIAGNOSIS

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Machine runs but makes no ice	Loss or under-charge of refrigerant	Check for leaks and recharge
	Drive gearmotor or drive coupling stripped	Check. Repair and/or replace
	Water not entering freezing chamber	Plugged strainer or supply line. Check and clean. Air lock in gravity feed line. Check and remove air lock.
	Moisture in system	Check and remove charge and drier. Replace and recharge.
	Water seal leaking	Replace seal
Water leaks	Defective water seal	Replace
	Gravity feed line leaking	Check hose clamps
	Storage bin drain & connecting fittings	Check and repair
	Water level in reservoir too high	Adjust to horizontal molded line on the reservoir
Excessive noise or chattering	Mineral or scale deposits on auger and inner freezing chamber walls	Remove and manually polish auger, polish inner chamber walls of freezer barrel For lighter concentrations use Scotsman Ice Machine Cleaner periodically
	Low suction	Add gas to raise suction pressure
	Intermittent water supply	Check & Clean strainer. Check gravity feed line for air lock. Remove air lock
	Water level in reservoir too low	Adjust to horizontal molded line on the reservoir
	Gear motor loose on frame Gear motor end play or worn bearings	Tighten Repair or replace
Machine continues to run with full storage bin	Storage bin thermostat not properly set or defective.	Reset or replace. 35° cut-out, 45° cut-in. Check operation with handful of ice

# AF1 ADJUSTMENT PROCEDURES

Read the instructions thoroughly before performing any adjustment or removal and replacement procedures.

## ADJUSTMENT OF THE BIN THERMOSTAT CONTROL

The control for the bin thermostat is the temperature control, located on the upper part of the retainer wall.

Above 2000 ft. only.

To adjust the bin thermostat control:

1. Hold a handful of ice against the capillary bulb in the ice storage bin.
2. Slowly rotate in the appropriate direction, the adjusting screw on the temperature control device until the icemaker shuts OFF.
3. Remove ice from the capillary bulb; then, place warm hand on the capillary bulb to restart the icemaker.
4. Place handful of ice against the capillary bulb and observe that the icemaker should shut OFF.

### ////////////////////// WARNING ////////////////////////

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

### //////////////////////

## ADJUSTMENT OF THE LEG LEVELERS

When the icemaker is equipped with legs, the cabinet must be leveled in the front-to-back and side-to-side directions. This adjustment should be performed during initial installation of the cabinet and anytime the cabinet is moved from the original location to another site.

1. Using a 1-1/8" open-end wrench and a carpenter's bubble level, rotate the threaded leveler in each leg to RAISE or LOWER the cabinet until the cabinet is level in the front-to-back direction.
2. Repeat for leveling in the side-to-side direction.

3. Recheck both the front-to-back and the side-to-side leveling and repeat adjustments, as necessary.

## ADJUSTMENT OF THE WATER RESERVOIR FLOAT

The correct water level in the water reservoir should be at the level of the raised molded line, on the side of the body of the water reservoir. When the water line level is above or below the raised molded line, adjustment can be performed to raise or lower the water level by bending the metal arm of the float, inside the water reservoir.

To adjust the water reservoir float:

1. To RAISE the water level:  
Hold one end of the metal arm of the float and slightly bend the float up.
2. To LOWER the water level:  
Hold one end of the metal arm of the float and slightly bend the float DOWN.
3. To perform MAJOR adjustment:  
When repair or replacement has been performed and the water level line between the water reservoir and the freezer assembly has been substantially altered:

- a. Loosen the three screws and lockwashers which attach the reservoir bracket and water reservoir to the freezer mount.

Move the reservoir bracket UP or DOWN to properly position the water reservoir at the correct water line level within the freezer. The proper water level within the freezer is 1/2" - 3/4" below the top of the auger.

When proper water level within the freezer is adjusted, re-tighten screws attaching the water reservoir bracket to the freezer mount.

# AF1 REMOVAL AND REPLACEMENT PROCEDURES

## REMOVAL AND REPLACEMENT OF THE SLIDE-OUT CHASSIS

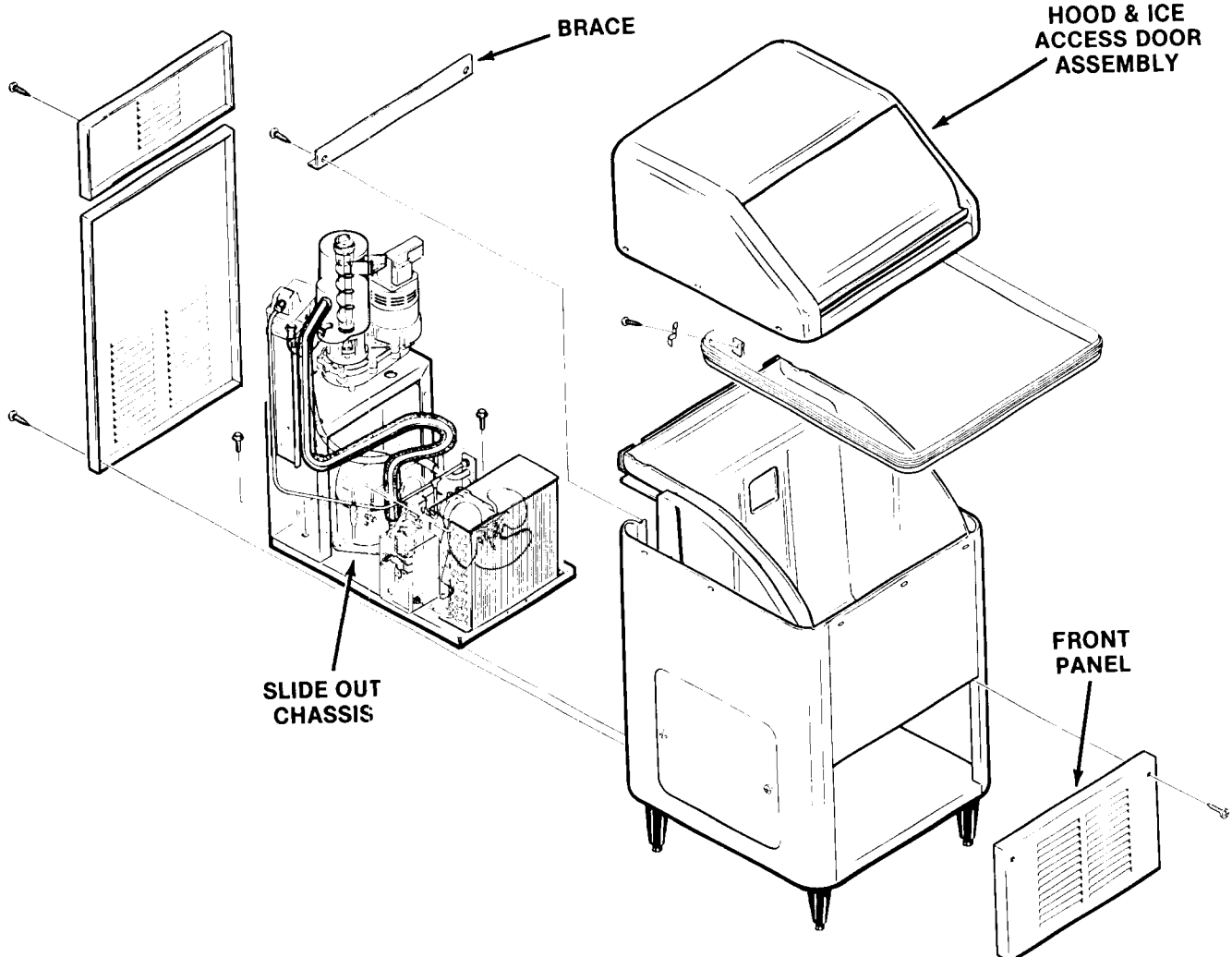
### WARNING

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

1. Disconnect or shut OFF electrical power to the icemaker at the building source.
2. Shut OFF water supply to the icemaker.
3. Remove screws and remove front panel and back panels. Remove screws located at the back of the icemaker and remove trim, hood and ice access door assembly.
4. Remove screws and remove control box cover and disconnect electrical leads connected to the icemaker from the building source.

5. Disconnect potable water supply and drain tubes connected to the icemaker.
6. Remove corbin clamp and disconnect the bin drain tube from water service bracket.
7. Remove screws and remove brace from upper back of icemaker.
8. Unthread from bin thermostat bracket and feed bin thermostat capillary tube through grommet at the back wall of the bin.
9. Remove three cap screws extending through the slide-out chassis into the cabinet base.
10. Push slide-out chassis through the cabinet back opening to remove the slide-out chassis from the cabinet.

To replace the slide-out chassis, reverse the removal procedure.



# AF1 REMOVAL AND REPLACEMENT PROCEDURES

## //////////////////// WARNING //////////////////////

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

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### REMOVAL AND REPLACEMENT OF THE COMPRESSOR ASSEMBLY

To remove compressor refer to SLIDE-OUT CHASSIS PROCEDURE and remove chassis from cabinet.

1. Remove two screws and the cover from the compressor junction box.
2. Disconnect the electrical leads at the compressor junction box, that originate in the control box and fan motor.
3. Bleed off or blow the refrigerant charge through the Schrader valve.
4. Unsolder the suction line from the compressor.
5. Unsolder the discharge line from the compressor.
6. Unsolder the process header tube from the compressor and retain for installation on the replacement compressor.
7. Remove four bolts, lockwashers and washers which secure the compressor to the chassis mounting base.
8. To replace the compressor assembly, reverse the removal procedure.
9. To replace the compressor assembly, reverse the removal procedures.
10. When recharging the system with refrigerant, always check the nameplate for the specified refrigerant charge.

### REMOVAL AND REPLACEMENT OF THE CONDENSER — AIR-COOLED MODELS

To remove the condenser refer to SLIDE OUT CHASSIS PROCEDURES and complete all steps.

1. Bleed off or blow the refrigerant charge through the Schrader valve.
2. Remove one screw and disconnect the drier brace and drier from the condenser shroud.
3. Unsolder and disconnect the condenser inlet tube at the condenser.
4. Unsolder and disconnect the condenser outlet tube at the condenser.
5. Remove three screws, lockwashers and washers securing the condenser to the chassis base.
6. Remove four screws that attach the control box to the condenser.
7. Remove the condenser from the chassis base.
8. To replace the condenser, reverse the removal procedure.
9. When recharging the system with refrigerant, always check nameplate for the specified refrigerant charge.

### REMOVAL AND REPLACEMENT OF THE SAFETY CONTROLS, LOW PRESSURE, AND AUGER DELAY

To remove the controls, refer to the slide-out chassis procedure and complete all steps.

1. Bleed off or blow the refrigerant charge through the Schrader valve.
2. Unsolder the control capillary tube from its corresponding process header.
3. Replace the control and solder the capillary tube to its corresponding process header.
4. Follow the Removal and Replacement Procedure of the liquid line drier.

### NOTE

*Always install a replacement drier, anytime the sealed refrigeration system is opened. Do not replace the drier until all other repair or replacement has been completed.*

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

# AF1 REMOVAL AND REPLACEMENT PROCEDURES

## //////////////////// WARNING //////////////////////

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

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### REMOVAL AND REPLACEMENT OF THE DRIER

**NOTE:** Always install a replacement drier, anytime the sealed refrigeration system is opened. Do not replace the drier until all other repair or replacement has been completed.

To replace the drier:

1. Remove screws and remove back panel.
2. Bleed off or blow the refrigerant charge through the Schrader valve.
3. Remove attaching hardware and drier brace or strap from the drier.
4. Unsolder refrigeration lines at both ends of the drier.

To replace the drier:

## //////////////////// CAUTION //////////////////////

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

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1. Remove the factory seals from the replacement drier and install the drier in the refrigerant lines with the arrow positioned in the direction of the refrigerant flow.
2. Solder the drier into the lines, two places.
3. Secure drier with the drier brace or strap.
4. Purge the system and check for leaks.
5. Thoroughly evacuate the system to remove moisture and non-condensables.
6. Charge the system with refrigerant, by weight. SEE NAMEPLATE.

### REMOVAL AND REPLACEMENT OF THE WATER PRESSURE SWITCH ASSEMBLY

To remove the low water pressure switch assembly:

1. To remove the condenser refer to SLIDE OUT CHASSIS PROCEDURES and complete all steps.
2. Disconnect electrical leads in the control box from the low pressure switch.
3. Unscrew the flare nut fitting and disconnect the low pressure control and washer from the bracket.

To replace the low water pressure control assembly, reverse the removal procedure.



# AF1 REMOVAL AND REPLACEMENT PROCEDURES

## ////////// WARNING //////////

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

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### REMOVAL AND REPLACEMENT OF THE FAN MOTOR ASSEMBLY — AIR-COOLED MODELS

#### NOTE

*Before beginning this procedure, observe the fan blade position on the shaft of the fan motor and mark the fan blade so it will be correctly positioned during reassembly. Direction of air flow should be toward the fan motor.*

To remove the fan motor assembly:

1. Disconnect the electrical supply to the icemaker at the circuit breaker or fuse box.
2. Remove two screws and the lower left front panel.
3. Remove plastic trim, screws, and aluminum trim.
4. Remove screws and left front bracket. Remove upper front left panel.
5. Disconnect the electrical lead from the fan motor at the compressor control box.
6. Remove two screws securing the motor bracket to the chassis base and remove the fan motor and motor bracket from the chassis.
7. Remove the nut from the end of the fan motor shaft and remove the fan blade.
8. Remove four screws securing the fan motor to the motor bracket and separate the motor from the bracket.

To replace the fan motor assembly, reverse the removal procedure.

### REMOVAL AND REPLACEMENT OF THE WATER RESERVOIR ASSEMBLY

Pull out icemaker or gain access to the back panel.

#### NOTE

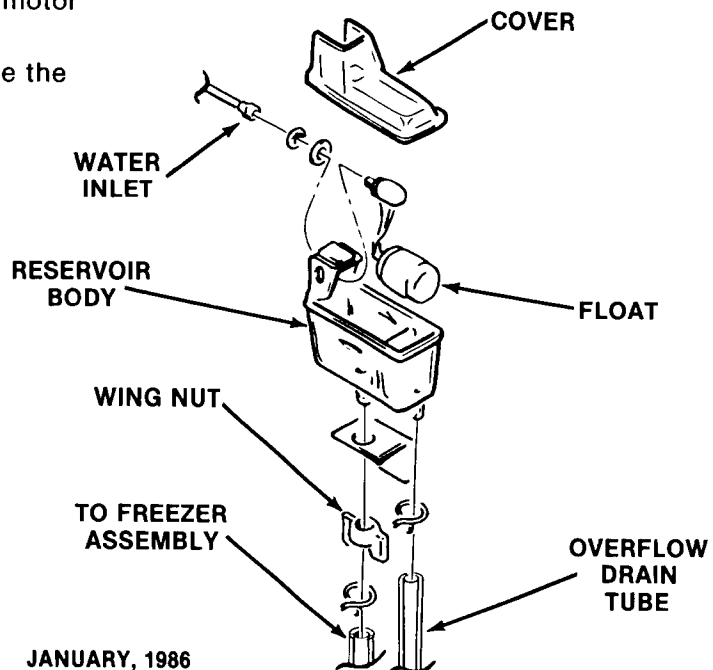
*Be prepared with container to catch water left in lines disconnected in next steps, to prevent draining water on parts, components, electrical lines, etc.*

1. Disconnect the water inlet tube from the water reservoir assembly.
2. Remove two Corbin clamps and two tubes from the bottom of the water reservoir assembly.
3. Unscrew and remove the wing nut from the bottom of the water reservoir assembly.
4. Lift and remove the water reservoir assembly from the mounting bracket.

To replace the water reservoir assembly, reverse the removal procedure.

#### NOTE

*Check that the installed replacement water reservoir assembly float moves freely. Bend metal arm of float to adjust, as necessary. The correct water level in the water reservoir is the point of the raised molded line, on the side of the body of the water reservoir.*



# AF1 REMOVAL AND REPLACEMENT PROCEDURES

## REMOVAL AND REPLACEMENT OF THE AUGER, WATER SEAL, BEARINGS AND ICE BREAKER

Auger, water seal, bearing and ice breaker are located in the freezer assembly. To gain access to the freezer assembly, refer to CHASSIS REMOVAL PROCEDURE.

### ICE BREAKER AND AUGER REMOVAL

1. Remove permagum and two screws from the side of the freezer.
2. Pull up on cap hook located in the top of the freezer assembly to remove ice breaker with bearing set, auger and the top portion of the lower water seal.
3. Remove snap ring and cap and remove the bolt from the ice breaker and auger assembly to separate the ice breaker assembly from the auger. The bearings may be replaced or the ice breaker and bearings may be replaced as an assembly.

### REMOVAL AND REPLACEMENT OF THE FREEZER ASSEMBLY

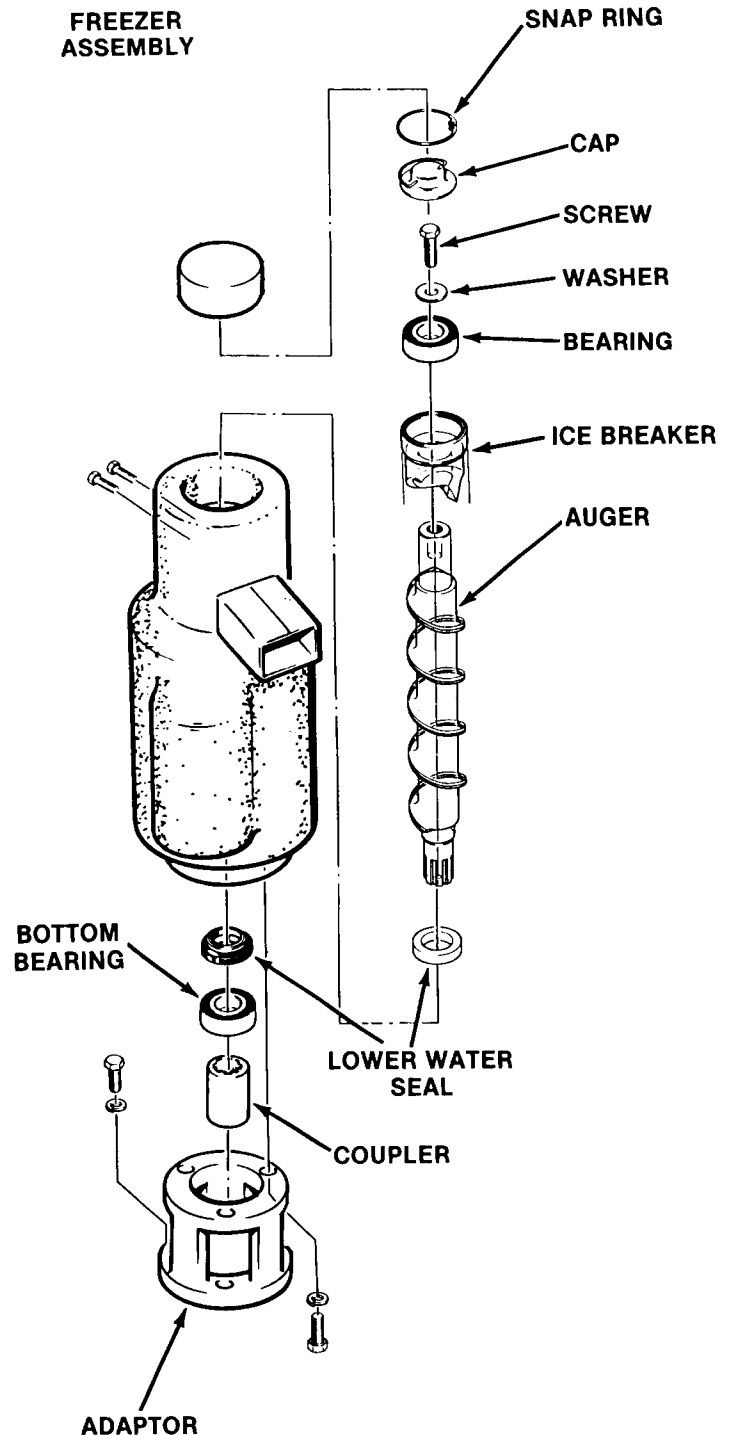
To remove the freezer assembly refer to SLIDE OUT CHASSIS and complete all steps.

1. Remove Corbin clamp and Tygon tube from the freezer assembly that connects to the water reservoir assembly.
2. Bleed off or blow the refrigerant charge through the Schrader valve.
3. Follow steps on removal and replacement of the auger, water seal, bearings and ice breaker.
4. Unsolder the suction line from the compressor.
5. Unsolder the capillary line at the drier.
6. Remove three screws, lockwashers and washers which attach the bottom of the freezer assembly to the drivemotor assembly.
7. Lift the freezer assembly up and off of the drivemotor assembly.

To replace the freezer assembly, reverse the removal procedure.

#### NOTE

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



# AF1 REMOVAL AND REPLACEMENT PROCEDURES

## WATER SEAL INSTALLATION

Inspect the water seal in its package. Do not use if mating surfaces are scratched or cracked.

1. Remove auger, unbolt freezer from adaptor stand. Drive out old bottom bearing and water seal from the top down.
2. Remove old rotating half of water seal from auger and clean the auger at the seal mounting area.
3. Apply Scotsman part number 19-0529-01 RTV silicone rubber to the auger shoulder before pushing on the water seal. Place just enough silicone on to the auger, so that when the water seal is placed on the auger, the gap between the auger shoulder and water seal is completely filled with silicone.

The silicone must be allowed to "set-up" or dry on the surface before any water can be added to the freezer.

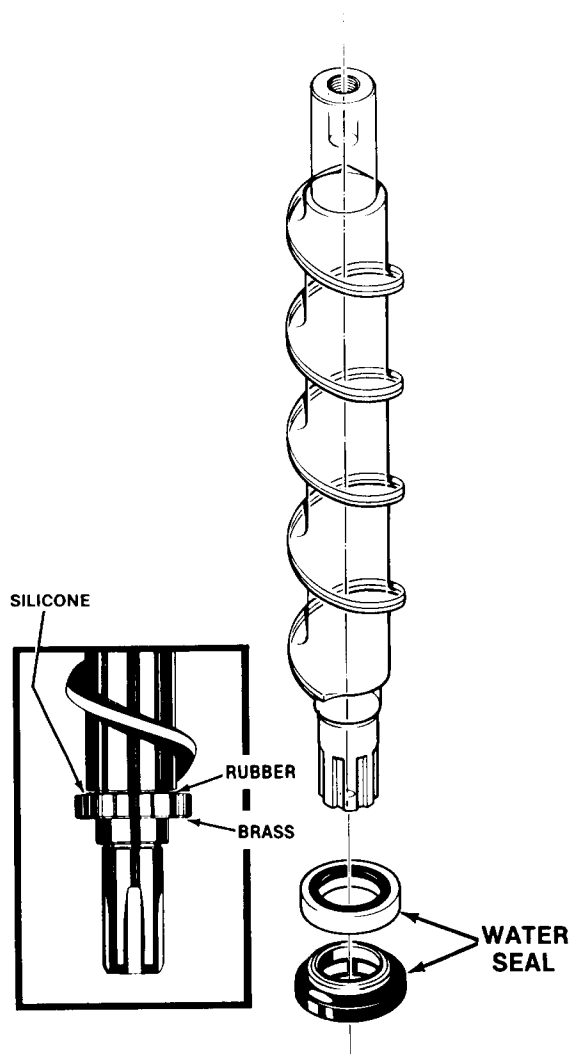
### ////////////////////// WARNING ////////////////////////

**If any silicone gets onto the mating surfaces of the water seal, the seal is ruined, and cannot be used.**

### //////////////////////

4. Clean the inside of the evaporator at the bottom bearing and water seal mounting area. Lubricate the outside edge of the stationary seal with food grade lubricant to aid installation.
5. Carefully push the stationary part of the water seal up into the bottom of the evaporator. It must go in straight and must not be pushed in beyond 1/4" past the bottom of the freezer.

6. Install new bottom bearing, push it into the freezer under the new water seal. It must be pushed in straight, but do not push it in past 1/8" from the bottom of the evaporator tube.
7. Mount the adaptor stand to the bottom of the freezer. Hand tighten the three cap screws until the stand flange is tight against the bottom bearing. Then, tighten the cap screws in a rotating pattern to insure proper alignment.
8. The top bearing should also be changed at this time. Be sure to mount the top bearing/bearing retainer assembly onto the auger **first** before installing the auger into the freezer tube.
9. Install the auger and test the unit.



# AF1 REMOVAL AND REPLACEMENT PROCEDURES

## REMOVAL AND REPLACEMENT OF THE DRIVEMOTOR ASSEMBLY

To remove the drivemotor assembly:

1. Perform all steps in slide out chassis procedures to gain access for removal of the drivemotor assembly.
2. Remove the three screws, lock washers from bottom of freezer assembly which fasten the freezer to the drivemotor assembly.
3. Remove the drivemotor cover and disconnect the three electrical wire leads.
4. Remove three bolts, lockwashers and washers which attach the drivemotor to the freezer mount at the rear of the chassis.
5. Lift the drivemotor from the freezer mount.

To replace the drivemotor assembly, reverse the removal procedure.

## REBUILDING THE 1/10 HORSEPOWER DRIVEMOTOR GEAR REDUCER ASSEMBLY

### DRIVEMOTOR PARTS

To replace the centrifugal switch and mechanism or the motor winding or the motor rotor, removal of the gearbox assembly is not necessary.

### ////////////////////// WARNING ////////////////////////

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

### ////////////////////////////////////

1. Remove cover from the top of the centrifugal switch assembly and remove the electric wires from the microswitch. To replace just the centrifugal switch, remove two machine screws retaining the switch and remove the switch. To replace, reverse the procedure to this point.
2. If the motor is to be removed, the next step is to remove the four screws holding down the plastic switch assembly housing and lift the housing off of the motor top.
3. Remove the centrifugal switch mechanism from the rotor by unscrewing the machine screw at the top of the rotor.
4. The motor and housing may now be removed. Lift off the motor fan housing, and pull off the plastic fan. The next part to be removed is the motor winding. Disconnect the electrical leads of the motor from its control box location and lift off the winding.

6. The rotor is all that remains of the motor in the gear motor assembly. Use a pry bar to carefully pry up the rotor. (The only thing holding it in is the tight fit of the bottom rotor bearing into the top of the gear case.) To replace any of the above parts, reverse the disassembly procedure.

### DRIVEMOTOR DIS-ASSEMBLY

After removal of the drivemotor gear reducer from the unit, inspect the internal parts of this gearmotor:

1. Place gearbox on a flat surface, covered with rags to absorb any spilled lubricant.
2. Using a punch, drive the roll pins out of the casing.
3. Remove the four capscrews on the top of the gear case and the two under the motor.
4. Pry the two cases apart.

When inspecting the internal parts, look for:

- \* Condition and quantity of lubricant. (The proper oil level is near the top of the output (biggest) gear.) 5 oz. capacity) Use Scotsman Gear Case Oil, P/N A25835-001.
- \* Bearing condition
- \* Gear and gear shaft condition
- \* Woodruff key between output gear and shaft.
- \* Grease seals, back to back
- \* Vent hole

Be sure to count and retain the spacer washers as they come out of the gearbox.

Replace the parts as required, using the part numbers found in the parts list section of this manual. Replace the gears into a CLEAN bottom gearcase, replacing the spacer washers in the same quantity as they were upon disassembly. If no count was kept, refer to the parts illustration.

### NOTE

*Some bearing grease should be placed in all bearings before assembly to insure proper lubrication upon start-up.*

# AF1 REMOVAL AND REPLACEMENT PROCEDURES

## DRIVEMOTOR ASSEMBLY

To reassemble:

1. Set top gearcase on gears and spacers and oil. Be sure O-ring is in place.
2. Drive rollpins back into locating holes.
3. Replace capscrews into gearcase covers and torque (8 capscrews) at 80-90 inch pounds.
4. Bench test the gearmotor assembly.

Test for noise, amp draw (must not be in excess of icemaker nameplate for gearmotor) and oil leaks.

Return gearbox to the unit. Be certain all mounting surfaces are clean and reassemble gearbox to chassis and freezer assembly.

If the freezer water seal begins to leak, removal of the auger is required in order to replace the top and bottom bearing and water seal. AT THE SAME TIME, it would be recommended to remove the gearmotor assembly, open it up and inspect it.

