



Model 2131
SERVICE MANUAL
Manual No. [513501](#)

This manual provides basic information about the machine. Instructions and suggestions are given covering its operation and care.

The illustrations and specifications are not binding in detail. We reserve the right to make changes to the machine without notice, and without incurring any obligation to modify or provide new parts for machines built prior to date of change.

DO NOT ATTEMPT to operate the machine until instructions and safety precautions in this manual are read completely and are thoroughly understood. If problems develop or questions arise in connection with installation, operation, or servicing of the machine, contact Stoelting.



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A Few Words About Safety

Safety Information

Read and understand the entire manual before operating or maintaining Stoelting equipment.

This manual provides the operator with information for the safe operation and maintenance of Stoelting equipment. As with any machine, there are hazards associated with their operation. For this reason safety is emphasized throughout the manual. To highlight specific safety information, the following safety definitions are provided to assist the reader.

The purpose of safety symbols is to attract your attention to possible dangers. The safety symbols, and their explanations, deserve your careful attention and understanding. The safety warnings do not by themselves eliminate any danger. The instructions or warnings they give are not substitutes for proper accident prevention measures.

If you need to replace a part, use genuine Stoelting parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.



Safety Alert Symbol:

This symbol Indicates danger, warning or caution. Attention is required in order to avoid serious personal injury. The message that follows the symbol contains important information about safety.

Signal Word:

Signal words are distinctive words used throughout this manual that alert the reader to the existence and relative degree of a hazard.



The signal word "WARNING" indicates a potentially hazardous situation, which, if not avoided, may result in death or serious injury and equipment/property damage.



The signal word "CAUTION" indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and equipment/property damage.

CAUTION

The signal word "CAUTION" not preceded by the safety alert symbol indicates a potentially hazardous situation, which, if not avoided, may result in equipment/property damage.

NOTE (or NOTICE)

The signal word "NOTICE" indicates information or procedures that relate directly or indirectly to the safety of personnel or equipment/property.

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SECTION 1 INTRODUCTION

1.1 DESCRIPTION

The Stoelting® 2131 counter freezer is gravity fed. The freezer is equipped with fully automatic controls to provide a uniform product. The freezer is designed to operate with almost any type of commercial soft serve or non-dairy mixes available, including ice milk, ice cream, yogurt, and frozen dietary desserts.

The freezer is designed to be used with both barrels in operation. If you desire to use one barrel only, the freezer must be cleaned, sanitized and filled with fresh mix daily. For more information call your authorized Stoelting Serviceman.

This manual is designed to assist qualified service personnel and operators in the installation, operation and maintenance of the Stoelting Model 2131 gravity freezer.

Information Packet Location

Model 2131
F RIGHT SIDE

Figure 1. Model 2131 Freezer

1.2 SPECIFICATIONS

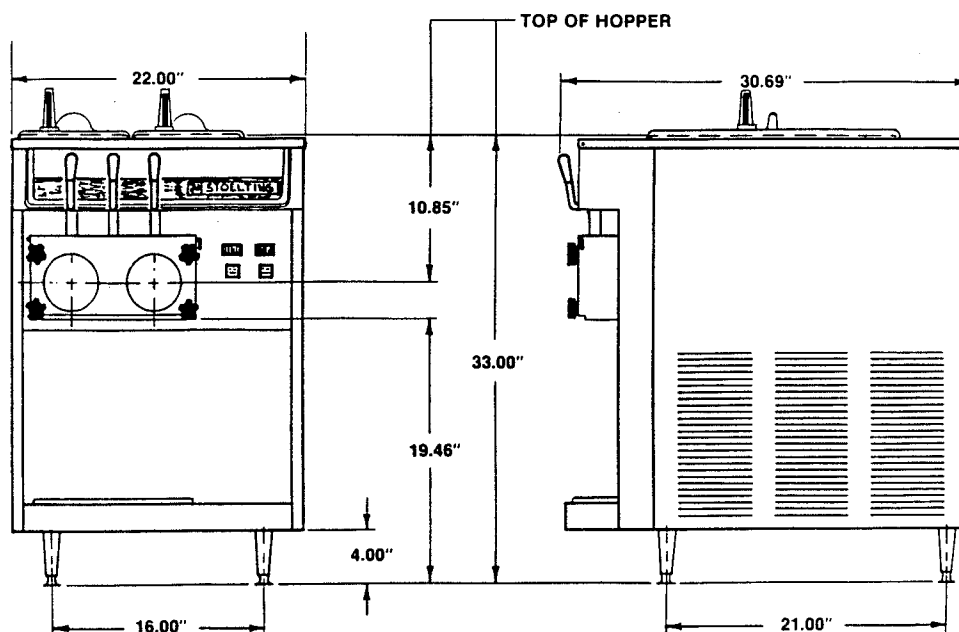


Figure 2. Specifications

**MODEL 2131
COUNTER MODEL
GRAVITY FREEZER**

DIMENSIONS

Freezer: 22" (55.88 cm) wide x 30.69 (78.0 cm) deep x 33" (83.8 cm) high
Crated: 26" (66.04 cm) wide x 34" (86.36 cm) deep x 37" (93.98 cm) high

WEIGHT

Freezer: 340 lbs. (154.2 kg) Crated: 380 lbs. (172.4 kg)

ELECTRICAL

1 phase, 208 and 230 VAC**

Refer to the nameplate located on the side or rear of the freezer for more information.

Automatic safeguard circuit built into electronic control - protects major freezer components under abnormal operating conditions.

**A transformer is required if voltage is over 250 volts or under 208 volts.

COOLING

Air cooled requires minimum 6" (15.2 cm) air clearance on right hand side, 6" (15.2 cm) air clearance on left hand side and 1" (2.54 cm) in the rear. (See Fig. 4.)

Water cooled requires 3/8" I.D. supply line and 3/8" I.D. drain line minimum.

HOPPERS

(2) 3½ gallons (13.25 Liters) refrigerated and insulated.

SECTION 2 INSTALLATION INSTRUCTIONS

2.1 SAFETY PRECAUTIONS

Do not attempt to operate the freezer until the safety precautions and operating instructions in this manual are read completely and are thoroughly understood.

Take notice of all warning labels on the freezer (Fig. 3). The labels have been put there to help maintain a safe working environment. The labels have been designed to withstand washing and cleaning. All labels must remain legible for the life of the freezer.

Labels should be checked periodically to be sure they can be recognized as warning labels.

If danger, warning or caution labels are needed, indicate the part number, type of label, location of label, and quantity required along with your address and mail to

STOELTING, INC.
ATTENTION: Customer Service
502 HWY 67
Kiel, Wisconsin 53042-1600

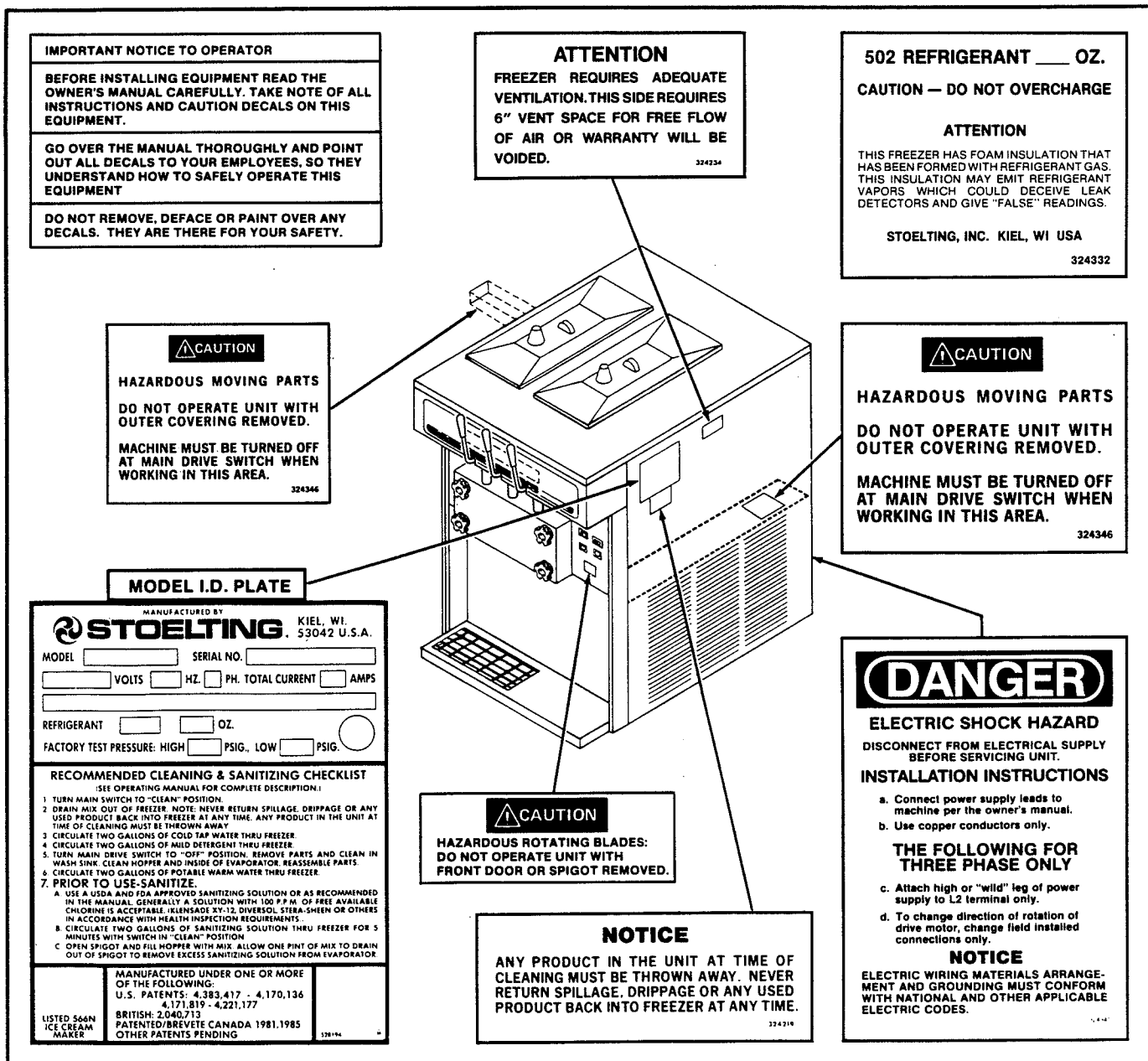


Figure 3. Warning Label Locations

2.2 SHIPMENT AND TRANSIT

The freezer has been assembled, operated and inspected at the factory. Upon arrival at the final destination, the complete freezer must be checked for any damage which may have occurred during transit.

With the method of packaging used, the freezer should arrive in excellent condition. THE CARRIER IS RESPONSIBLE FOR ALL DAMAGE IN TRANSIT, WHETHER VISIBLE OR CONCEALED. **Do not** pay the freight bill until the freezer has been checked for damage. Have the carrier note any visible damage on the freight bill. If concealed damage and/or shortage is found later, advise the carrier within 10 days and request inspection. The customer must place claim for damages and/or shortages in shipment with the carrier. **Stoelting, Inc. cannot make any claims against the carrier.**

2.3 FREEZER INSTALLATION

Installation of the freezer involves moving the freezer close to its permanent location, removing all crating, setting in place, assembling parts, and cleaning.

- A. Uncrate the freezer.
- B. The freezer must be placed in a solid level position.

NOTE

Accurate leveling is necessary for correct drainage of freezer barrel and to insure correct over-run.

- C. Air cooled freezers require correct ventilation. The right side of the freezer is the air intake and **must** have a 6" (15.2 cm) clearance. Air discharges out of the left side of the unit (Fig. 4). **Do not** obstruct the discharge.

Water cooled freezers require a 3/8" I.D. supply line and a 3/8" I.D. drain line minimum. The water lines must be connected in a manner that will comply with local codes.



CAUTION

FAILURE TO PROVIDE ADEQUATE VENTILATION WILL VOID WARRANTY!

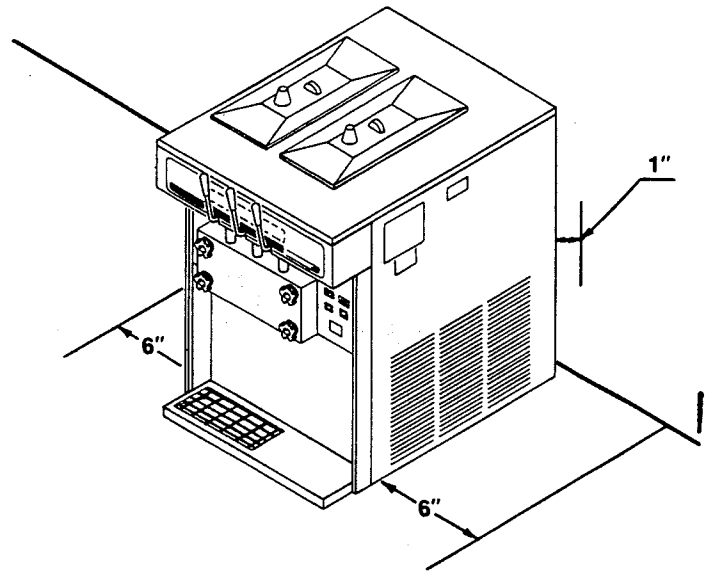


Figure 4.

Space and Ventilation Requirements

- D. Place the CLEAN-OFF-ON switch in the OFF position.
- E. Install the drip tray, covers and other miscellaneous parts on the freezer (Fig. 5).

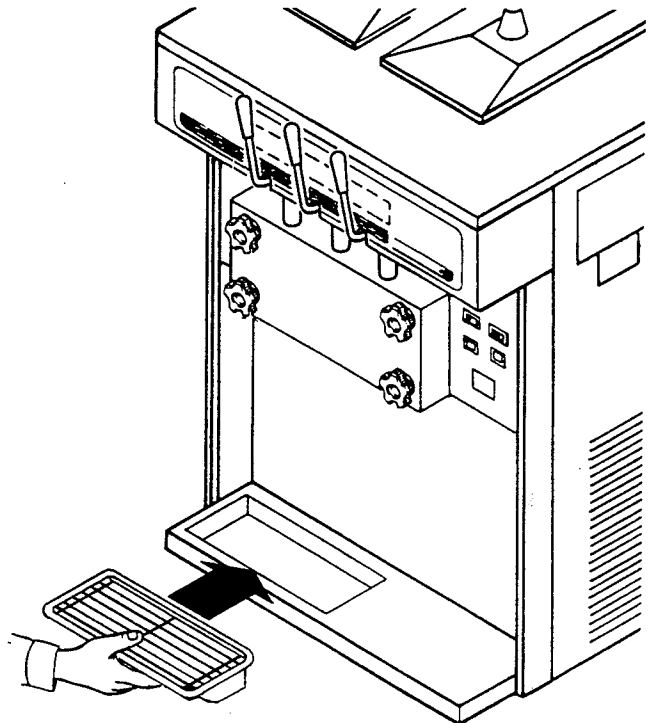


Figure 5. Installing Tray and Cover

2.4 INSTALLING PERMANENT WIRING

Permanent wiring is required by local codes, the following procedure must be performed:

- A. Refer to the name plate at the right side of the freezer for specific electrical requirements. Make sure the power source in the building matches the freezer name plate requirements.



WARNING

ELECTRICAL TECHNICIANS MUST BE CONTINUOUSLY ALERT TO THE PRACTICE OF ALL NECESSARY SAFETY RULES AND PRECAUTIONS WHEN SERVICING THIS EQUIPMENT AS VOLTAGES ARE PRESENT WHICH CAN CAUSE SERIOUS OR FATAL INJURY.

ELECTRICAL WIRING MATERIALS, ARRANGEMENT AND GROUNDING MUST CONFORM WITH NATIONAL AND OTHER APPLICABLE ELECTRICAL CODES.

- B. Remove the left side, right side and back panels. Remove the junction box cover. Bring the wires into the junction box through the access hole in the bottom rear of the freezer.

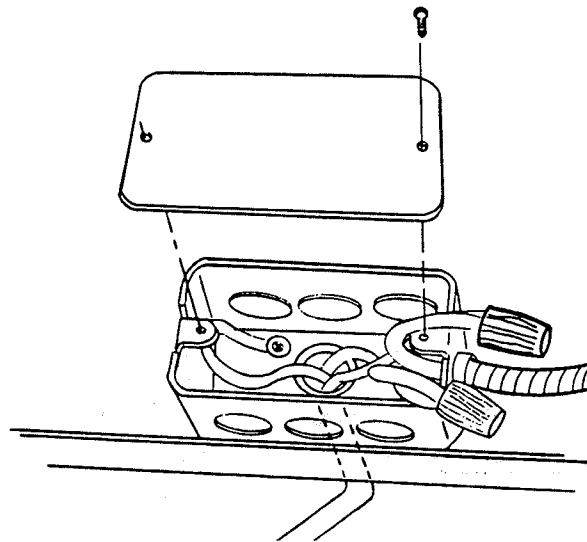


Figure 6. Power Cord Connection

- C. Install permanent wiring according to local code.
- D. Replace the junction box cover.
- E. Replace all panels.

SECTION 3 INITIAL SET-UP AND OPERATION

3.1 OPERATOR'S SAFETY PRECAUTIONS

SAFE OPERATION IS NO ACCIDENT; Observe these rules:

- A. **Know the freezer.** Read and understand the Operating Instructions.
- B. **Notice all warning labels on the freezer.**
- C. **Wear proper clothing.** Avoid loose fitting garments, and remove watches, rings or jewelry which could cause a serious accident.
- D. **Maintain a clean work area.** Avoid accidents by cleaning up the area and keeping it clean.
- E. **Stay alert at all times.** Know which switch, push button or control you are about to use and what effect it is going to have.
- F. **Disconnect electrical cord for maintenance.** Never attempt to repair or perform maintenance on the freezer until the main electrical power has been disconnected.
- G. **Do not operate under unsafe operating conditions.** Never operate the freezer if unusual or excessive noise or vibration occurs.

3.2 OPERATING CONTROLS AND INDICATORS

Before operating the freezer, it is required that the operator know the function of each operating control. Refer to Figure 7 for the location of the operating controls on the freezer.



WARNING

THE CLEAN-OFF-ON SWITCH MUST BE PLACED IN THE OFF POSITION WHEN DISASSEMBLING FOR CLEANING OR SERVICING. THE FREEZER MUST BE DISCONNECTED FROM ELECTRICAL SUPPLY BEFORE REMOVING ANY ACCESS PANEL.

A. SPIGOT SWITCH

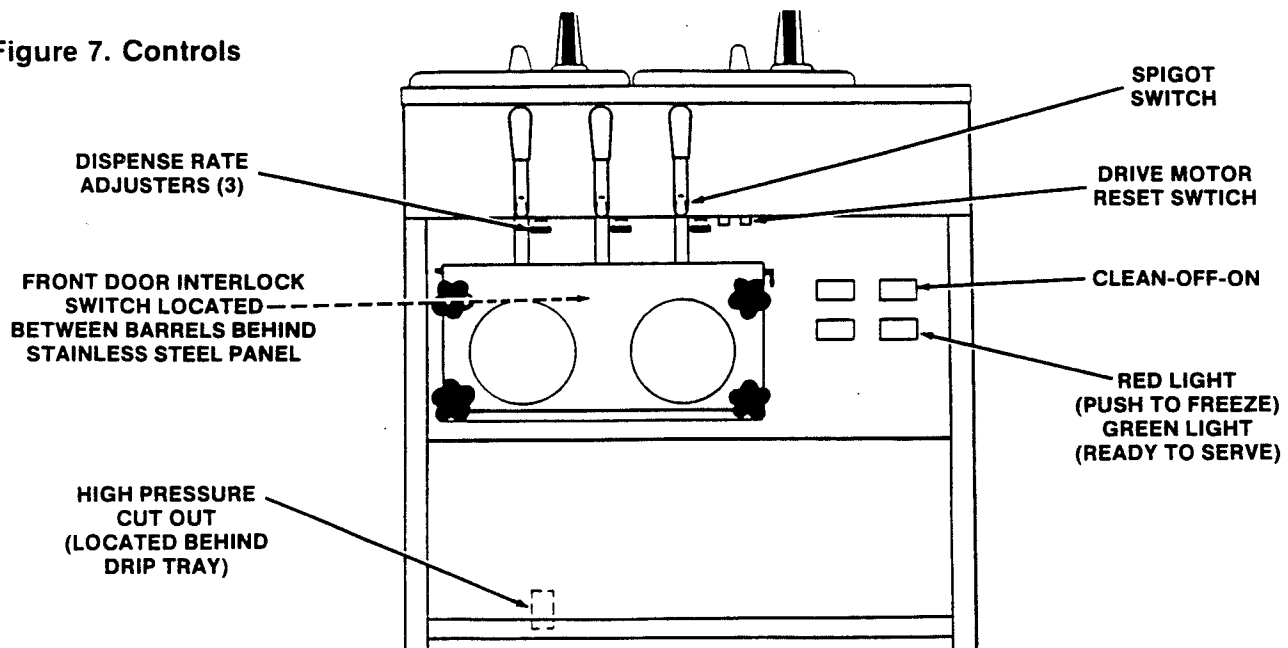
When the spigot handle is opened the SPIGOT switch will start the auger drive and refrigeration systems. When the spigot handle is closed, the drive motor and compressor will remain on until the product in the barrel reaches the proper consistency.

B. CLEAN-OFF-ON SWITCH

The CLEAN-OFF-ON switch is a three position rocker switch used to control the operation of the refrigeration system and auger. When the switch is placed in the CLEAN position, the refrigeration system will be off and the auger **will** rotate for cleaning.

When the switch is placed in the OFF position, the refrigeration system and auger **will not** operate.

Figure 7. Controls



When the switch is placed in the ON position, the refrigeration system and auger **will** operate automatically. The switch should be placed in the ON position for normal operation.

C. PUSH TO FREEZE SWITCH

The illuminating PUSH TO FREEZE switch is used to start the freezing cycle. During initial freeze down, the CLEAN-OFF-ON rocker switch is placed in the ON position. Then the PUSH TO FREEZE switch is pressed until the drive motor and compressor come "ON."

NOTE

After the gearmotor starts, there is a 3 second delay before the compressor starts.

During normal operation, the PUSH TO FREEZE light will remain illuminated red until the freezer shuts off. Then the green PUSH TO FREEZE light will illuminate.

The green light is used to indicate that the product has reached the proper consistency and is ready to be dispensed.

NOTE

Push the PUSH TO FREEZE switch and wait until the green light illuminates before dispensing.

NOTE

Failure to refill hopper immediately may result in operational problems.

D. DRIVE MOTOR RESET SWITCH

The drive motor reset switch is an overload to protect the drive motor from damage due to high amperage draw.

When the lever is down, the circuit is open, push up to reset.

E. HIGH PRESSURE CUT OUT

The high pressure cut out switch is a safety switch designed to protect the compressor from damage due to excessive head pressure. When tripped, the lever will be out, push in to reset.

F. DISPENSE RATE ADJUSTER

The dispense rate adjuster limits the opening of the spigot.

To adjust product dispense rate, turn the adjusting knob clockwise for slower flow and counter-clockwise for faster flow.

G. DOOR INTERLOCK SWITCH

When the door is securely fastened the freezer will operate normally. When the door is removed, the drive and compressor will not run.

3.3 SANITIZING

Sanitizing must be done after the freezer is clean and just before the hopper is filled with mix. **Sanitizing the night before is not effective.** However, you should always clean the freezer and parts after using it.



WARNING

THE UNITED STATES DEPARTMENT OF AGRICULTURE AND THE FOOD AND DRUG ADMINISTRATION REQUIRE THAT ALL CLEANING AND SANITIZING SOLUTIONS USED WITH FOOD PROCESSING EQUIPMENT BE CERTIFIED FOR THIS USE.

When sanitizing the freezer, refer to local sanitary regulations for applicable codes and recommended sanitizing products and procedures. **The frequency of sanitizing must comply with local health regulations.** Mix sanitizer according to manufacturer's instructions to provide a 100 parts per million strength solution. Mix sanitizer in quantities of no less than 2 gallons (7.5 liters) of 120° F water. Allow sanitizer to contact the surfaces to be sanitized for 5 minutes. Any sanitizer must be used only in accordance with the manufacturer's instructions.

⚠ CAUTION
 PROLONGED CONTACT OF SANITIZER
 WITH FREEZER MAY CAUSE CORROSION
 OF STAINLESS STEEL PARTS.

In general, sanitizing may be conducted as follows:

- A. Push the mix inlet regulator into hopper with air inlet (long) tube toward the front of the freezer (Fig. 8).

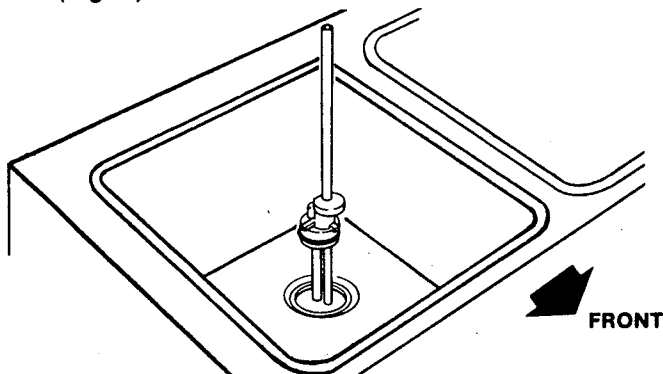


Figure 8. Mix Inlet Regulator

- B. Prepare 2 gallons (7.5 liters) of sanitizing solution following manufacturer's instructions. Pour into hopper with mix inlet regulator in place (Fig. 9).

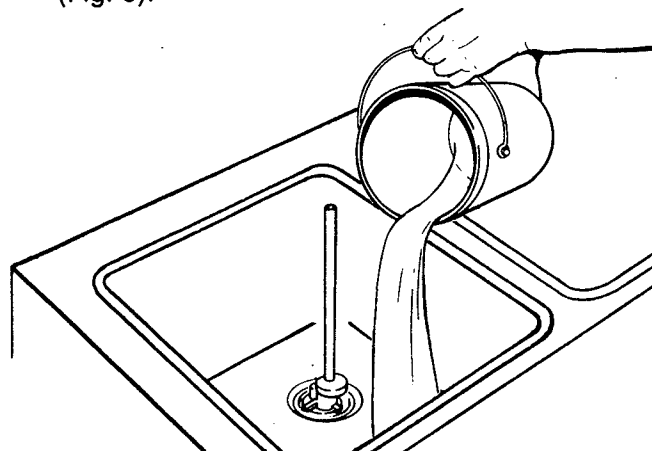


Figure 9. Sanitizing Procedure

- C. Place the CLEAN-OFF-ON rocker switch in the CLEAN position. Check for leaks around the front door seal (Fig. 10).

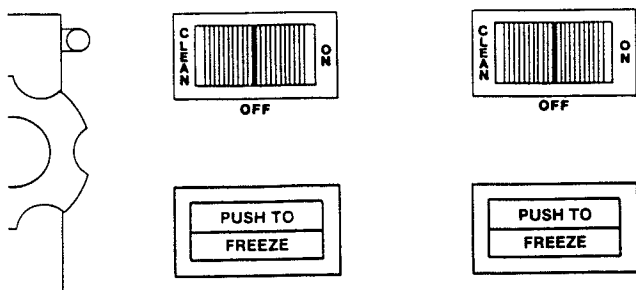


Figure 10. Clean Control

- D. Clean sides of hopper, mix inlet regulator and underside of hopper cover using a sanitized soft bristle brush dipped in the sanitizing solution (Fig. 11).

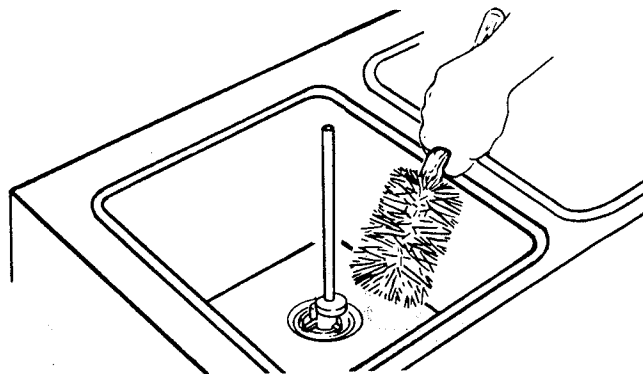


Figure 11. Sanitizing Hopper

- E. After five minutes, place a bucket under the spigots and open all three spigots to drain sanitizing solution. When solution has drained, place the CLEAN-OFF-ON switch in the OFF position. Allow the freezer barrel to drain completely (Fig. 12).

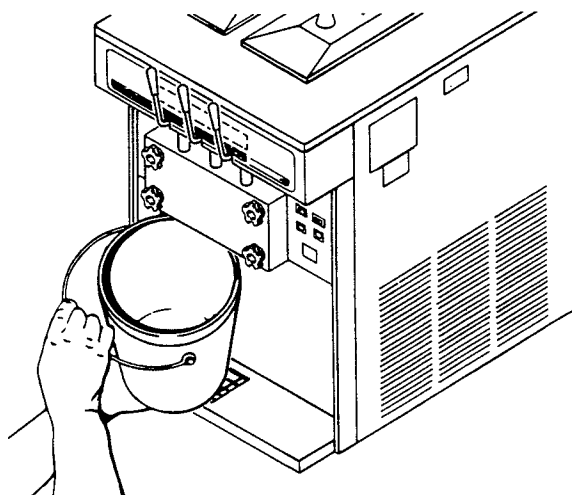


Figure 12. Spigot Opened and Solution Draining

3.4 FREEZE DOWN AND OPERATION

This section covers the recommended operating procedures to be followed for the safe operation of the freezer.

NOTE

If you desire to use one barrel only, refer to cleaning instructions 3.7 on page 13.

- A. Sanitize just prior to use.
 B. Place the CLEAN-OFF-ON switch in the OFF position.

- C. With spigots open, pour approximately 1 gallon (3.8 liters) of mix into the hopper. Allow the mix to flush out about 8 ounces (0.23 liters) of sanitizing solution and liquid mix. Close the spigot.
- D. Fill hoppers with approximately 3 gallons (11.4 liters) of pre-chilled (40° F or 4° C) mix.

⚠ CAUTION

DO NOT OVERFILL THE HOPPER. MIX LEVEL MUST NOT BE HIGHER THAN 2 INCHES (5 CM) FROM THE TOP OF THE AIR INLET TUBE ON THE MIX INLET REGULATOR.

- E. The freezer barrel will automatically fill until it is about 1/2 full (about 3 min.). If freezer barrel does not fill, check for obstruction in the mix inlet regulator. If freezer barrel fills over 1/2 full, check for leaks at the mix inlet regulator "O" Ring or check if the mix inlet regulator was installed correctly or that the freezer is level.

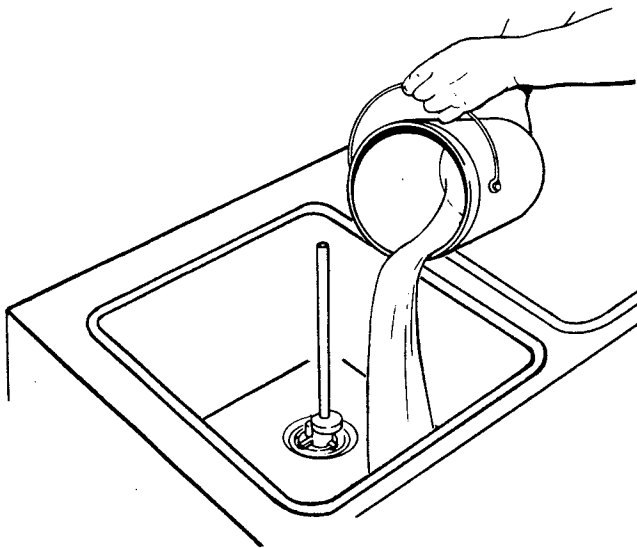


Figure 13. Pouring the Mix

- F. Place the CLEAN-OFF-ON rocker switch in the ON position, then press PUSH TO FREEZE switch until the drive motor and compressor come ON.

NOTE

After the gearmotor starts, there is a 3 second delay before the compressor starts.

- G. After about 6 to 10 minutes the freezer will shut OFF and the green lens will illuminate. The product is ready to serve. Freeze down time may be longer for some frozen diet dessert mixes.
- H. For normal dispensing, move the spigot handle open 60° (Fig. 14).

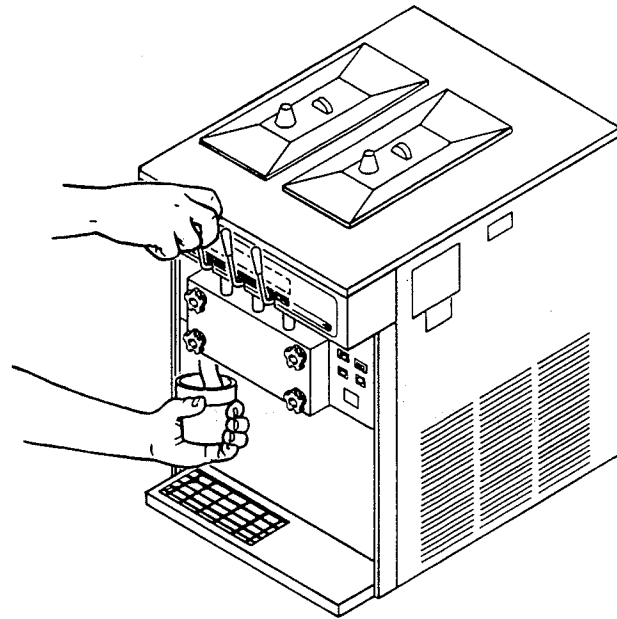


Figure 14. Dispensing Product

⚠ CAUTION

REFRIGERATION IS AUTOMATICALLY ACTIVATED WHEN THE SPIGOT IS OPENED. CLOSE THE SPIGOT COMPLETELY AFTER DISPENSING.

- I. The freezer is designed to dispense the product at a reasonable draw rate. If the freezer is overdrawn, the result is a soft product or a product that will not dispense at all. If this should occur, allow the freezer to run for approximately 30 seconds before dispensing additional product. After a while the operator will sense or feel when the freezer is beginning to fall behind, and will slow down on the rate of draw so as not to exceed the capacity.
- J. **Do not** operate the freezer when the level indicator shows the hopper is empty.

NOTE

The freezer has a standby mode sometimes referred to as a sleep or energy conservation mode. When the freezer is not used, after a preset time, it will enter the standby mode and remain there until someone draws a product or pushes the push-to-freeze switch. In the standby mode, the freezer will keep the product below 45° F. **Standby modes are not to be used in place of cleaning and sanitizing.** Frequency of cleaning and sanitizing is determined by Federal, State, and local regulatory agencies.

3.5 MIX INFORMATION

Mix can vary considerably from one manufacturer to another. Differences in the amount of butter-fat content and quantity and quality of other ingredients have a direct bearing on the finished frozen product. A change in freezer performance that cannot be explained by a technical problem may be related to the mix.

When changing from one type of mix to another such as yogurt to Vitari, you may have to change the mix inlet regulator and/or control settings. Please call your distributor for further information.

Proper product serving temperature varies from one manufacturer's mix to another. Mixes should provide a satisfactory product in the 18° to 20° F (-7° to -6° C) range.

When checking the temperature, stir the thermometer in the frozen product to read the true temperature.

Mix **does not** improve with age. Old mix, or mix that has been stored at too high a temperature, can result in a finished product that is less than satisfactory from the appearance and taste standpoint. To retard bacteria growth in dairy based mixes, the best storage temperature range is between 36° to 40° F (2.2° to 4.4° C).

Some products tend to foam more than others. If excess foam should occur, skim off with a sanitized utensil and discard (Fig. 15). Periodically, stir the mix in the hopper with a sanitized utensil.

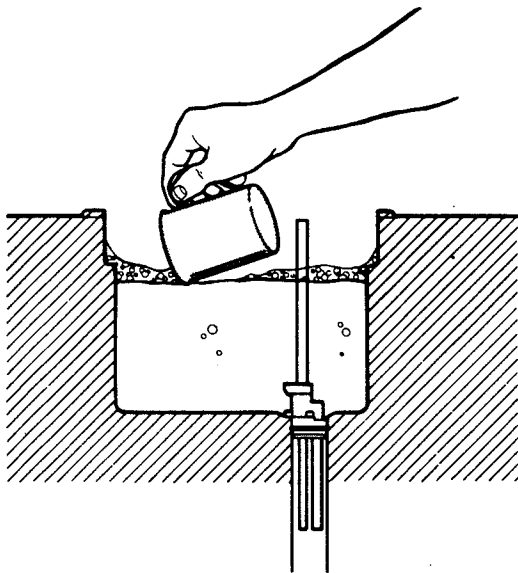


Figure 15. Skimming the Foam

3.6 REMOVING MIX FROM FREEZER

To remove the mix from the freezer, refer to the following steps:

- A. Remove the mix inlet regulator from the hopper by pulling straight up (Fig. 16).

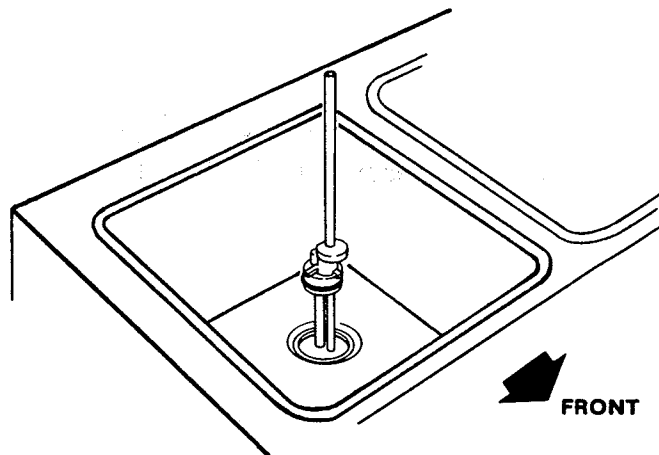


Figure 16. Removing Mix Inlet Regulator

- B. Place the CLEAN-OFF-ON rocker switch in the CLEAN position. Allow the mix to agitate in freezer barrel until the mix has become a liquid.
- C. Drain the liquid mix by opening the spigot. A bucket or container should be placed under the spigot to catch the liquid mix (Fig. 17).

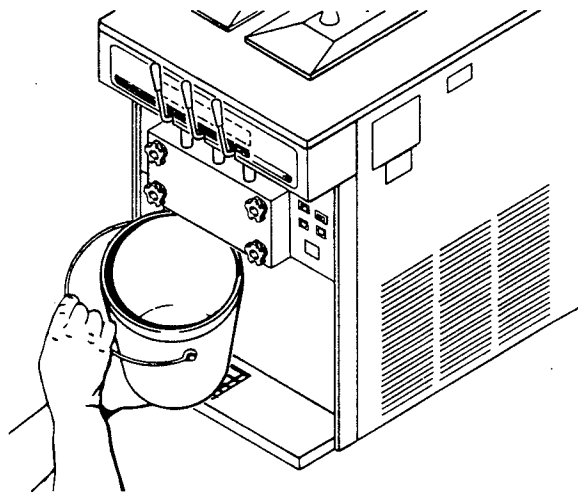


Figure 17. Draining Mix

- D. Place the CLEAN-OFF-ON switch in the OFF position.

3.7 CLEANING THE FREEZER

NOTE

The frequency of cleaning the freezer and freezer parts must comply with local health regulations.

The freezer is designed to be used with both barrels in operation. If you desire to use one barrel only, the freezer must be cleaned, sanitized and filled with fresh mix daily. For more information call your authorized Stoelting Serviceman.

After the mix has been removed from the freezer, the freezer must be cleaned. To clean the freezer, refer to the following steps:

- A. Close the spigot and fill the hoppers with 2 gallons (7.5 liters) of cold tap water.
- B. Place the CLEAN-OFF-ON switches in the CLEAN position.
- C. Allow the water to agitate for approximately five minutes.
- D. Open the spigots to drain the water. Remember to place a bucket or container under the spigots to catch the water. When the water has drained, turn the CLEAN-OFF-ON switches to the OFF position. Allow the freezer barrel to drain completely.
- E. Repeat steps A through D using a mild detergent solution.

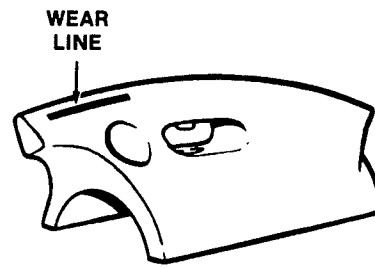
3.8 DISASSEMBLY OF FREEZER PARTS



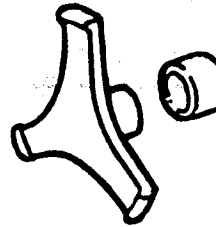
CAUTION

PLACE THE CLEAN-OFF-ON ROCKER SWITCHES IN THE OFF POSITION BEFORE DISASSEMBLING FOR CLEANING OR SERVICING.

Inspection for worn or broken parts should be made at every disassembly of the freezer for cleaning or other purposes. All worn or broken parts should be replaced to ensure safety to both the operator and the customer and to maintain good freezer performance and a quality product. Two normal wear areas are the auger flights and front auger support bushing (Fig. 18). Frequency of cleaning must comply with the local health regulations.



AUGER FLIGHT



FRONT AUGER SUPPORT
AND BUSHING

Figure 18. Auger Flight Wear and Front Auger Support Bushing Wear

To disassemble the freezer, refer to the following steps:

- A. Remove the mix inlet regulators from the hoppers by pulling straight up.
- B. Remove the front door by turning off the circular knobs and then pulling the front door off the studs (Fig. 19).

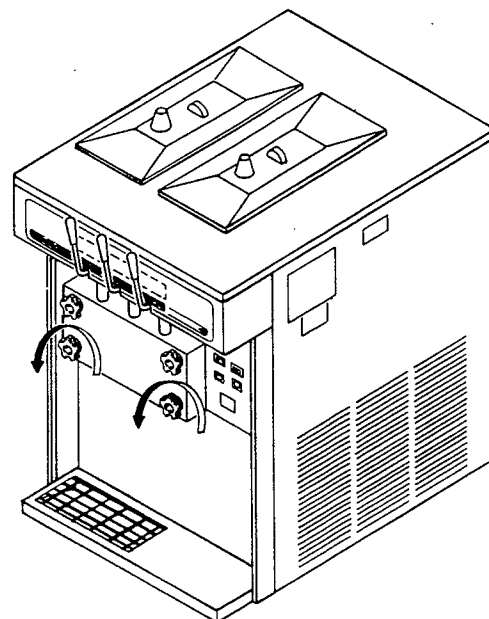


Figure 19. Removing Front Door

- C. Remove rosette caps from the front door. Push the spigot body through the bottom of the front door and remove the spigot body. (Fig. 20)

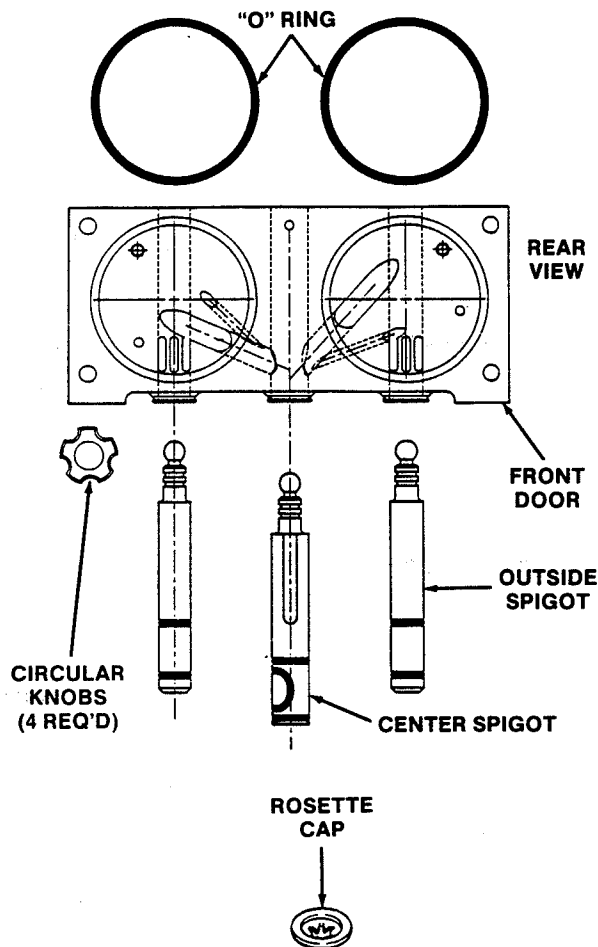


Figure 20. Removing Spigot

- D. Remove the front auger supports and bushings. (Fig. 21).

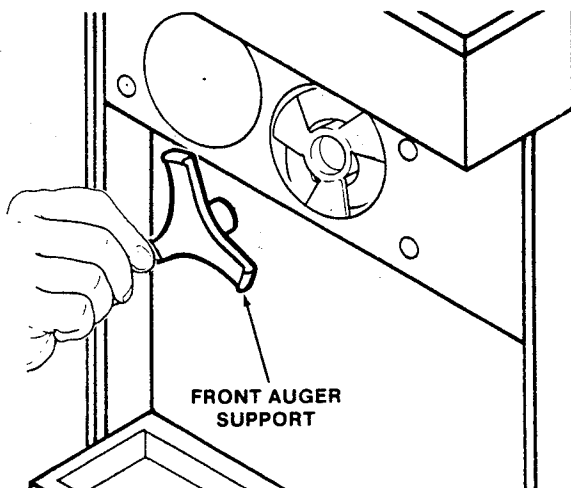


Figure 21. Removing Auger Supports

- E. Remove the auger assemblies from the freezer (Fig. 23). Pull the augers out of the freezer barrel slowly. As the augers are being pulled out, carefully remove each of the plastic flights with springs.
- F. Keep the rear of the auger shafts tipped up once they are clear of the freezer barrels to avoid dropping real seals (Fig. 22).

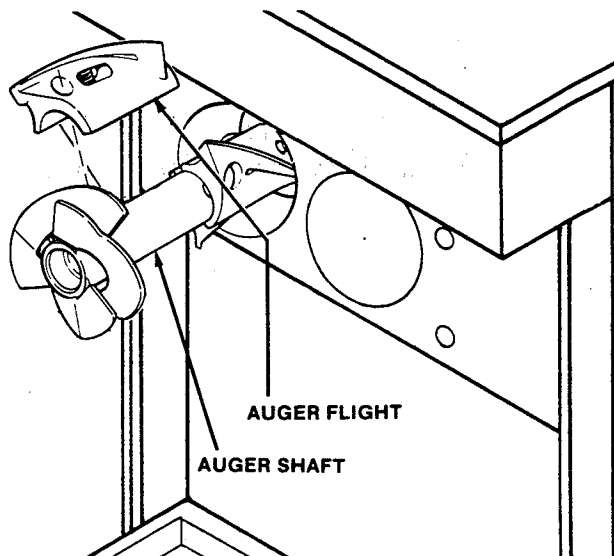


Figure 22. Auger Shafts

- G. Remove the rear seals.
- H. Wipe socket lubricant from the drive end (rear) of the auger with a cloth or paper towel.
- I. Remove all "O" Rings from parts by first wiping off the lubricant using a clean paper towel. Then squeeze the "O" Ring upward with a dry cloth (Fig. 23). When a loop is formed, roll out of the "O" Ring groove.

⚠ WARNING
DO NOT USE ANY TYPE OF SHARP OBJECT TO REMOVE THE "O" RINGS.

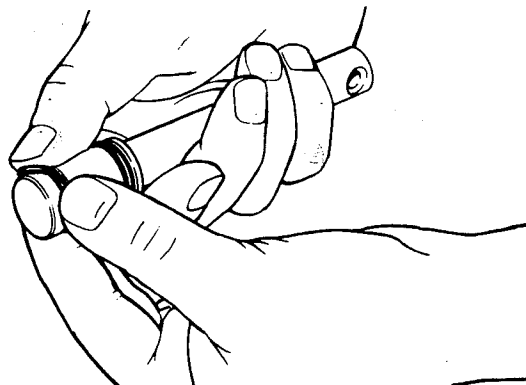


Figure 23. Removing "O" Ring

3.9 CLEANING THE FREEZER PARTS

Place all loose parts in a pan or container and take to the wash sink for cleaning. To clean freezer parts refer to the following steps:

- A. Place all parts in warm mild detergent water and clean with brushes provided. Rinse all parts with clean hot water.



CAUTION

DO NOT DAMAGE PARTS BY DROPPING OR ROUGH HANDLING.

- B. Wash the hopper and freezer barrel with warm detergent water and brushes provided (Fig. 24).

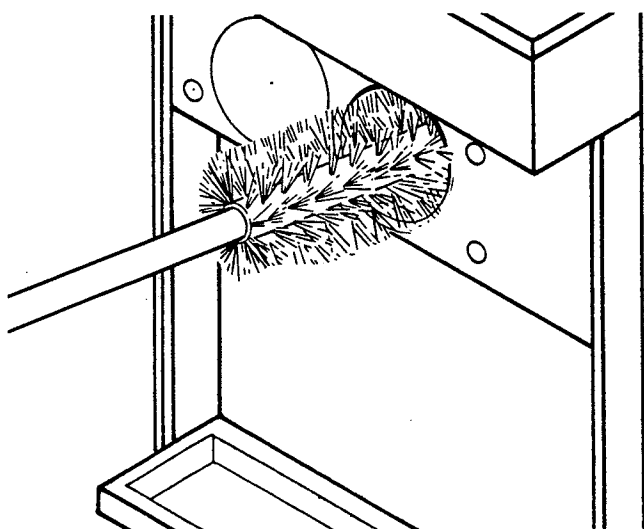


Figure 24. Cleaning Freezer Barrel

- C. Clean the rear seal surfaces from the inside of the freezer barrel with warm detergent water.

IMPORTANT

Clean the auger drive socket located inside the barrel at the rear seal area. Use a clean cloth or paper towel for this purpose.

- D. Clean the drip tray and insert with a soap solution. Rinse with clean hot water.

3.10 SANITIZE FREEZER AND FREEZER PARTS

- A. Use a sanitizer mixed according to manufacturer's instructions to provide a 100 parts per million strength solution. Mix sanitizer in quantities of no less than 2 gallons (7.5 liters) of 120° F water. Allow the sanitizer to contact the surfaces to be sanitized for 5 minutes. Any sanitizer must be used only in accordance with the manufacturer's instructions.

- B. Place all parts in the sanitizing solution, then remove and let air dry.
- C. Using this sanitizing solution and the large barrel brush provided, sanitize the rear of the barrel and drive area by dipping the brush in the sanitizing solution and brushing the rear of the barrel.

3.11 ASSEMBLY OF FREEZER

To assemble the freezer parts, refer to the following steps:

NOTE

Petro-Gel sanitary lubricant or equivalent must be used when lubrication of parts is specified.

NOTE

The United States Department of Agriculture and the Food and Drug Administration require that lubricants used on food processing equipment be certified for this use. Use lubricants only in accordance with the manufacturer's instructions.

- A. Assemble all "O" Rings onto parts dry, **without lubrication**. Then apply a thin film of sanitary lubrication to exposed surfaces of the "O" Rings. Apply a thin film of sanitary lubricant to metal part of rear seal. Also apply a thin film of sanitary lubricant inside the hole on the front of the auger.
- B. Assemble the rear seals onto the augers with the large end to the rear. Be sure the "O" Ring is in place before installing the rear seal.
- C. Lubricate the inside of the auger drive sockets (rear) with a small amount of white socket lubricant. A small container of socket lubricant is shipped with the freezer.
- D. Screw the springs onto the studs in plastic flights. **Springs must be screws into the flights completely** to provide proper tension (Fig. 25).

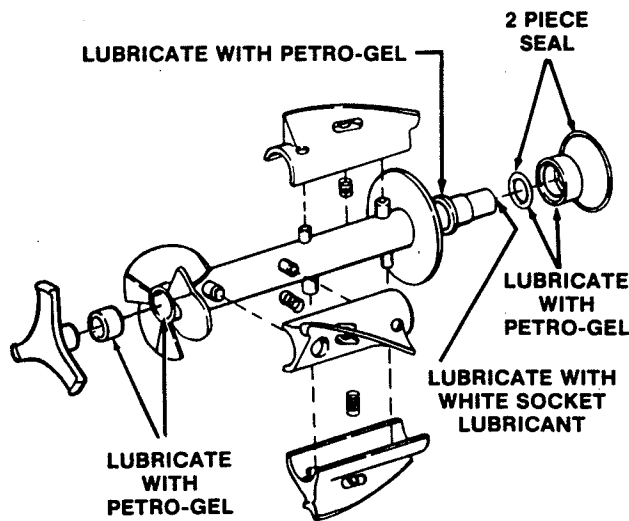


Figure 25. Exploded View of Auger



CAUTION

DO NOT PLACE THE MIX INLET REGULATOR INTO THE HOPPER BEFORE INSTALLING THE AUGER.

- E. Install the two plastic flights onto rear of the auger and insert part way into freezer barrel.
- F. Install the third plastic flight, push the auger into the freezer barrel and rotate slowly until the auger engages the drive shaft.
- G. Install the auger support and bearing into the front of the augers with one leg of the support at 9 o'clock.

NOTE

Apply a small amount of Petro-Gel to the surface of the cam on the spigot handle prior to assembly of handle to the spigot body.

- H. Install the spigot bodies with "O" Rings and spring into the front door from the bottom (Fig. 26). Push straight up until the spigots are in place. Install rosette caps.
- I. Install the front door on the freezer.
- J. Install the circular knobs on the freezer studs.



CAUTION

FINGER TIGHTEN THE CIRCULAR KNOBS EVENLY. DO NOT OVERTIGHTEN KNOBS.

Look for the proper seal between the freezer barrel, "O" Ring, and front doors.

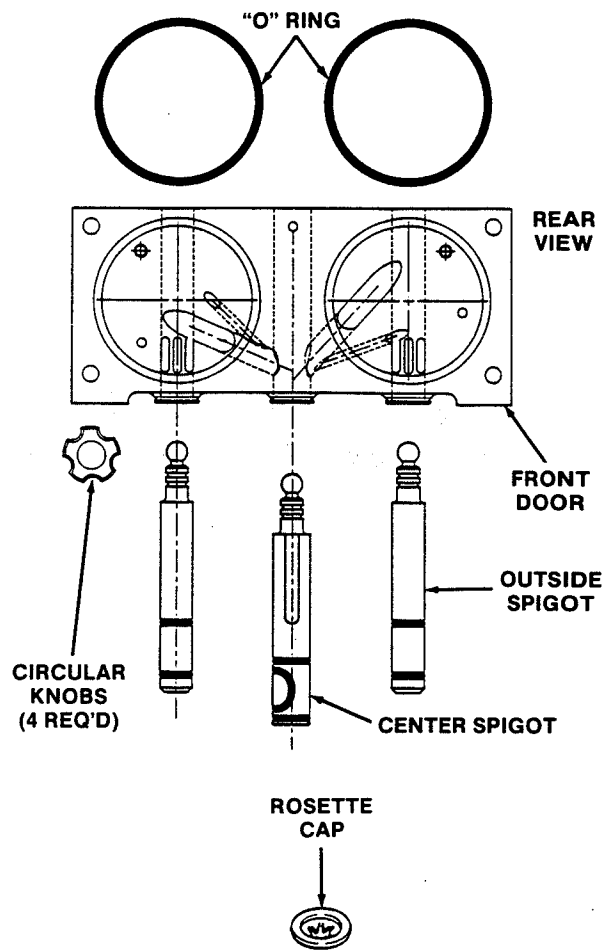


Figure 26. Exploded View of Front Door

- K. Install the mix inlet regulators into the hopper with the air inlet (long) tube toward the front of the freezer (Fig. 27).

NOTE

Refer to page 10 section 3.3 for sanitizing the assembled freezer before filling with mix.

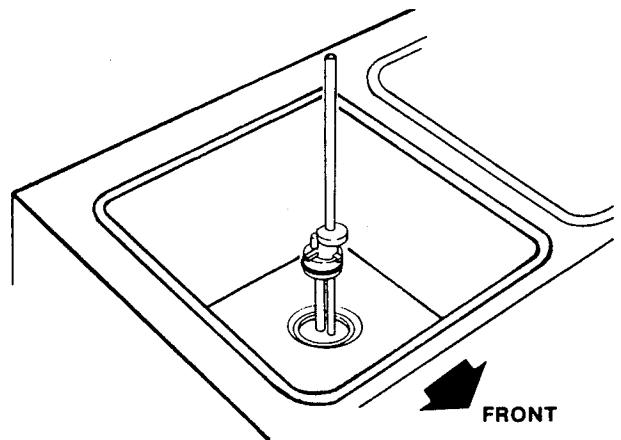


Figure 27. Installing Mix Inlet Regulators

3.12 ROUTINE CLEANING

To remove spilled or dried mix from the freezer exterior, simply wash in the direction of the finish with warm soapy water and wipe dry. **Do not** use highly abrasive materials as they will mar the finish.

3.13 PREVENTIVE MAINTENANCE

It is recommended that a maintenance schedule be followed to keep the freezer clean and operating properly.

WARNING

NEVER ATTEMPT TO REPAIR OR PERFORM MAINTENANCE ON FREEZER UNTIL THE MAIN ELECTRICAL POWER HAS BEEN DISCONNECTED.

A. DAILY

1. The exterior should be kept clean at all times to preserve the lustre of the stainless steel. A mild alkaline cleaner is recommended. Use a soft cloth or sponge to apply the cleaner.

CAUTION

DO NOT USE ACID CLEANERS, STRONG CAUSTIC COMPOUNDS OR ABRASIVE MATERIALS TO CLEAN ANY PART OF THE FREEZER EXTERIOR OR PLASTIC PARTS.

2. Run a sanitized brush down the air inlet regulator tube (Fig. 28).

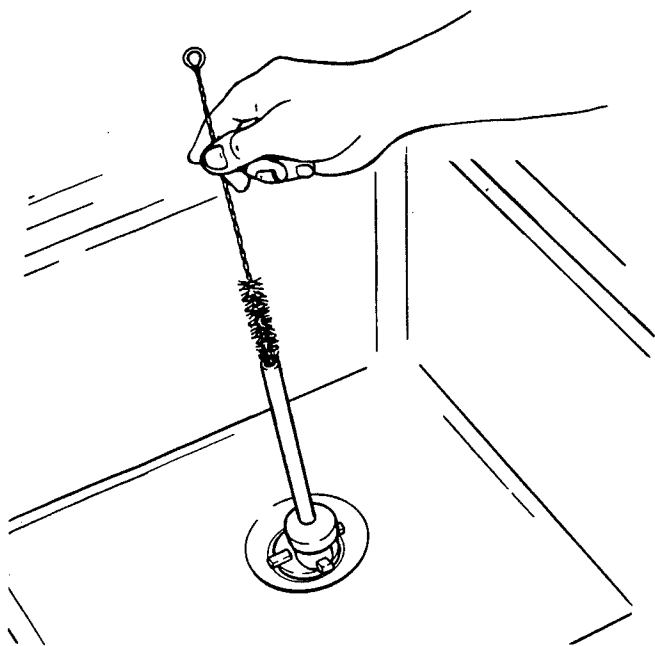


Figure 28. Sanitizing Mix Inlet Regulator

B. WEEKLY

1. Check "O" Rings and rear seal for excessive wear and replace if necessary.

C. MONTHLY

CAUTION

FREEZERS THAT HAVE AIR COOLED CONDENSERS MUST HAVE PROPER AIR CIRCULATION. DO NOT PLACE RIGHT SIDE OF FREEZER ANY CLOSER THAN 6 INCHES (15.2 CM) FROM THE WALL. FAILURE TO CLEAN THE CONDENSER FILTER ON A REGULAR BASIS MAY RESULT IN SERIOUS FREEZER DAMAGE AND COULD VOID FREEZER WARRANTY.

Remove the phillips head screw from the lower side of the right side panel and pull the side panel down and out.

Remove the condenser filter and clean in warm soapy water. Rinse in clean water and shake dry, taking care not to damage the filter in any way.

Replace the condenser filter and side panel.

3.14 EXTENDED STORAGE

Refer to the following steps for storage of the freezer over any long period of shutdown time:

- A. Turn the CLEAN-OFF-ON switch to the OFF position.
- B. Disconnect (unplug) from the electrical supply source.
- C. Clean thoroughly with a warm detergent all parts that come in contact with the mix. Rinse in clear water and dry all parts. **Do not** sanitize.

NOTE

Do not let the cleaning solution stand in the hopper or in the freezer barrel during the shutdown period.

- D. Remove, disassemble and clean the front door, mix inlet regulator and auger parts. Place the auger flights in a plastic bag with a moist paper towel to prevent them from becoming brittle.
- E. On water cooled freezers, shut off and disconnect water supply at rear of freezer; run compressor for 2-3 minutes to open water valve, and blow out all water first through inlet then outlet line, using air or carbon dioxide.

SECTION 4 REPLACEMENT PARTS

4.1 HOW TO ORDER PARTS

To assure receipt of the proper replacement parts, supply your dealer or distributor with the following information:

- A. Model number of equipment.
- B. Serial number of model, stamped on nameplate.
- C. Part number, part name and quantity needed. Common part names and numbers are listed in this manual.

4.2 PUSH TO FREEZE LIGHT/SWITCH LAMP REPLACEMENT

To change a lamp in the PUSH TO FREEZE switch/light follow these simple steps.

- A. Grasp the lens with your thumb and forefinger and pull out.
- B. Remove the faulty lamp by pulling out the lamp puller. (See Fig. 29.)
- C. To install the new lamp, line up the lamp end with the receptical and push fully in.
- D. Reinstall the lens by pushing firmly in. When installed "PUSH TO" must be right side up.

NOTE

LED light bulbs require correct polarity. If the bulb does not illuminate remove the bulb, turn 180° and replace.

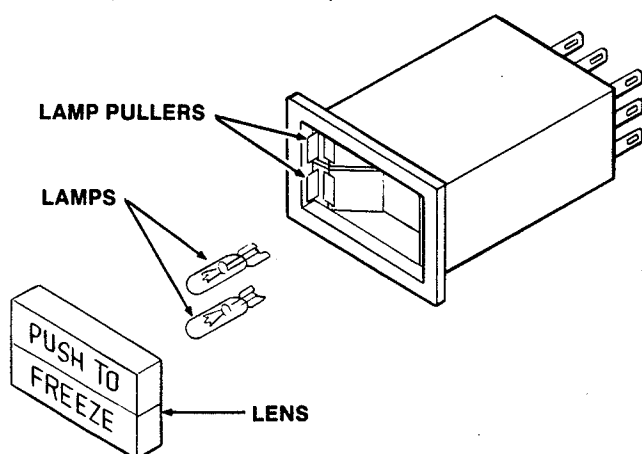


Figure 29. Push To Freeze Light/Switch Assembly

4.3 CLEAN-OFF-ON ROCKER SWITCH REPLACEMENT

- A. Remove side panel.



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

- B. Grasp switch from inside freezer. Then remove retainer clip using a small screwdriver (Fig. 30).
- C. Change electrical wires from failed switch to new one.
- D. Place new switch in proper position and install retainer clip (Fig. 31).

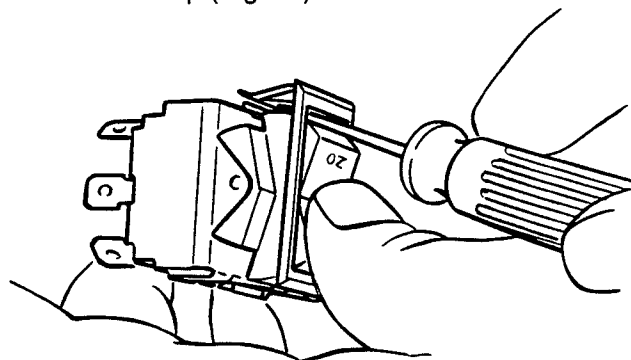


Figure 30. Clean-Off-On Switch Removal

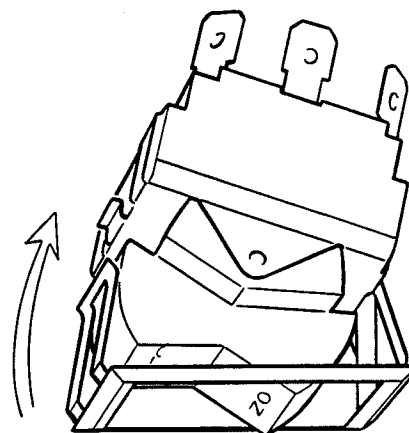


Figure 31. Clean-Off-On Switch Installation

REPLACEMENT DECALS

Part Number	Description
324219	Notice Non-Reuse of Prod. - Decal
324227	Adequate Ventilation - Decal
324332	Compressor - Decal
324346	Caution - Decal
324388	Program Board - Decal
324341	Danger Decal

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NOTE
Some models do not have a bypass valve, fan switch, or liquid line solenoid control.

SECTION 5 REFRIGERATION SYSTEM



WARNING

BOTH SUCTION SIDE SOLENOIDS MUST BE ACTIVATED FOR PROPER PURGING OF SYSTEM. USE POWER CORD PART NUMBER 430119 OR EQUIVALENT FOR DIRECT CONNECTION.

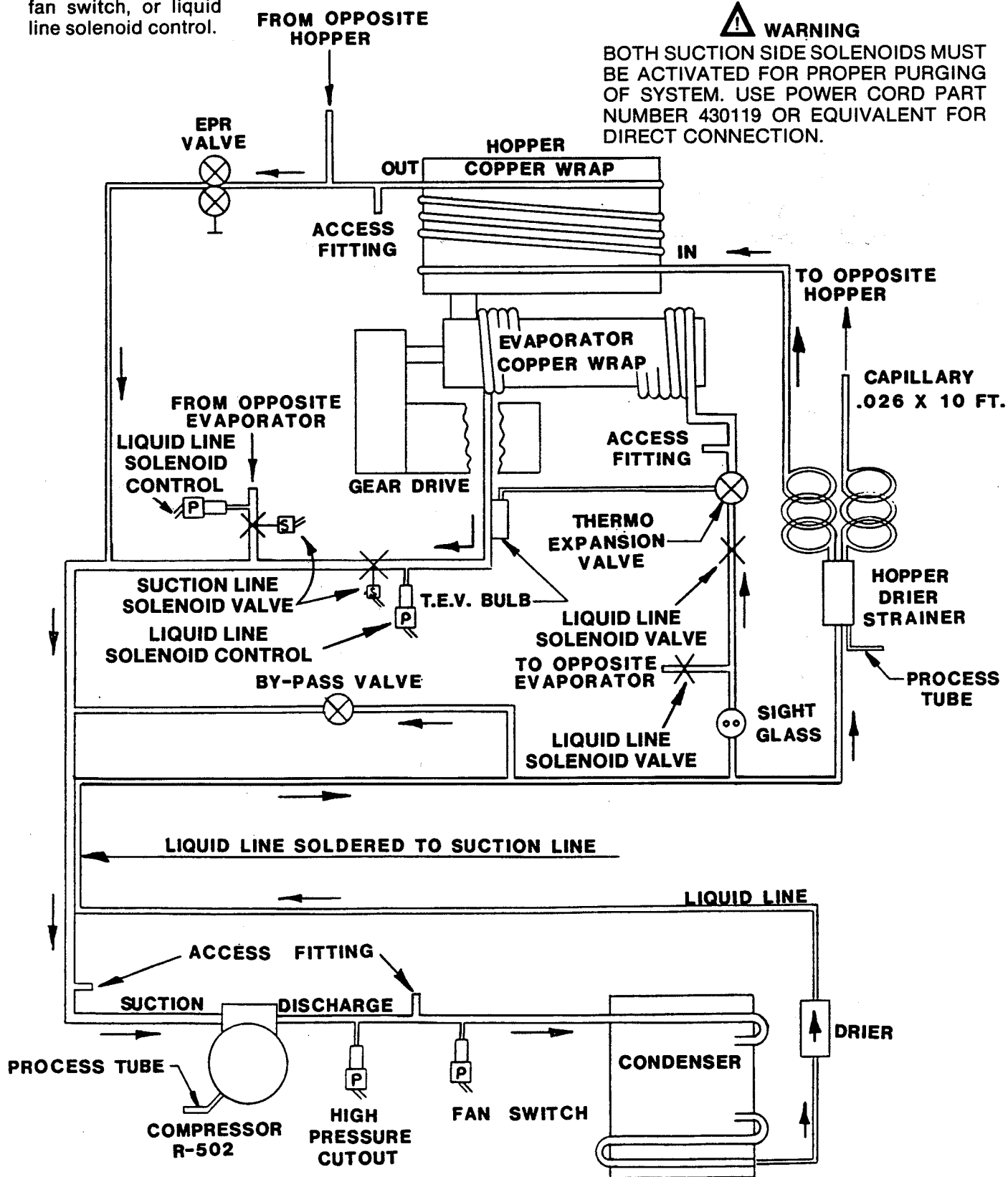


Figure 29. Refrigeration System

5.1 REFRIGERATION SYSTEM

The refrigeration system (Fig. 29) is a dual purpose system.

The system is designed to operate both the hopper and evaporator simultaneously at different temperatures. The system is designed for efficient use with R-502 as the refrigerant. The proper charge is indicated on the nameplate.

The system has a high pressure cutout set to trip at 475 P.S.I.G. The reset can be accessed from under the drip tray.

5.2 COMPRESSOR

The compressor is designed specifically for use with R-502.

A. WINDING TEST

To test the compressor motor windings for possible problems, perform the following steps:



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

1. Remove the Phillips head screw from the bottom of the left side panel and slide the side panel down and out.
2. Remove the compressor terminal cover by inserting a standard screwdriver under the terminal cover retaining clip from the left side of the freezer and gently pry off (Fig. 30).

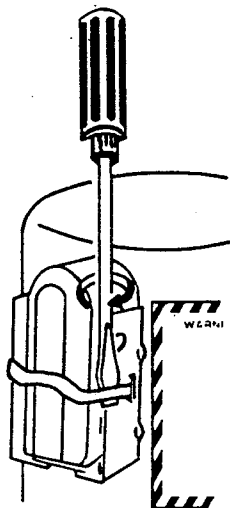


Figure 30. Compressor Terminal Cover

3. Remove retaining clip and cover.

4. Remove wires C, R and S at compressor. Refer to Fig. 31 for compressor connections.

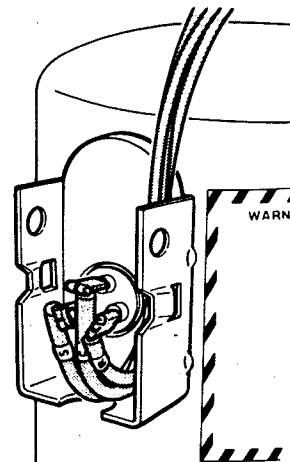


Figure 31. Compressor Connections

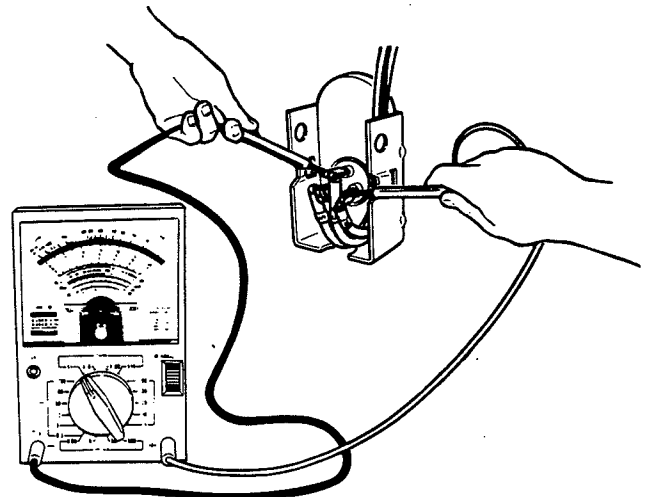


Figure 32. Ohmmeter and Connections

NOTE

The following values are for the Tecumseh Compressor Model AB23 8 ft. For other models or brands consult the Manufacturers Service Data Manual.

5. Connect ohmmeter to terminals C and R. Resistance through the run windings should be 1.01 to 1.17 ohms with ohmmeter set at X1 (Fig. 32).
6. Connect ohmmeter to terminals C and S. Resistance through the start windings should be 4.48 to 5.16 ohms with ohmmeter set at X1.
7. To check if windings are shorted to ground, connect one ohmmeter lead to a bare metal part on the compressor, such as any copper line leading to or from the compressor and checking terminals C, R and S.

NOTE

The compressor is equipped with an internal overload protector. If the compressor is warm and ohmmeter readings indicate an open winding, allow up to one hour for overload to reset.

5.3 CONDENSERS

The air cooled condenser is a copper tube and aluminum fin type. Condensing is totally dependent upon air flow. A plugged condenser or restrictions in the louvered grill will restrict air flow. This will lower the capacity of the system and damage the compressor.

The condenser must be kept clean of dirt and grease. The freezer **MUST** have a minimum of 6" (15.2 cm) of ventilation on the right and left sides of the unit for free flow of air (Fig. 33). Make sure the freezer is not pulling over 100°F (37°C) air from other equipment in the area.

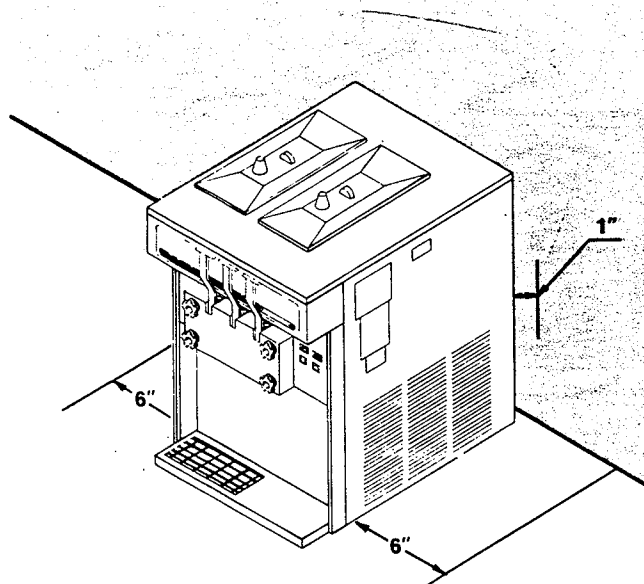


Figure 33. Space and Ventilation Requirements

The condenser filter and condenser require periodic cleaning. To clean, refer to the following procedures.

NOTE

On some models the rear condenser fan will not run until head pressure exceeds 275 P.S.I.G.



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

1. Remove the Phillips head screw from the bottom of the right side panel and slide the side panel down and out.
2. To remove the condenser filter slide up and out. Visually inspect for dirt. If the filter is dirty, shake or brush excess dirt off the filter and wash in warm soapy water. Once the filter is clean, rinse thoroughly in warm, clear water and shake dry, taking care not to damage the filter in any way.
3. Visually inspect the condenser for dirt by shining a light through the coil from the back (inside) of the condenser (Fig. 34).

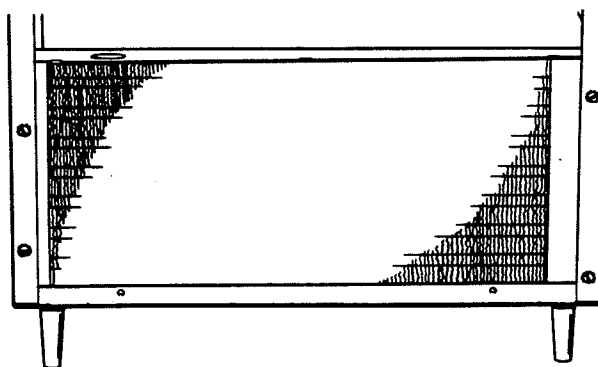


Figure 34. Condenser

4. If the condenser is dirty, place a wet towel over the front (outside) of the condenser.
5. Using compressed air or a CO² tank, blow out the dirt from the back (inside) of the condenser. Most of the dirt will cling to the wet towel.

NOTE

This procedure will result in a very loud noise.

6. An alternative method of cleaning the condenser is to use a condenser brush and vacuum.

NOTE

If the condenser is not kept clean, loss of refrigeration efficiency will result, causing extended run time or soft product consistency.

Water cooled condensers need an unrestricted supply of cold clean water.

5.4 EVAPORATOR

An T.X.V. (Thermostatic Expansion Valve) (Fig. 35) is used to meter the refrigerant to the evaporator. The self-regulating T.X.V. is preset at the factory to approx. 20 P.S.I.G. at 75°F (21.1°C) ambient temperature.

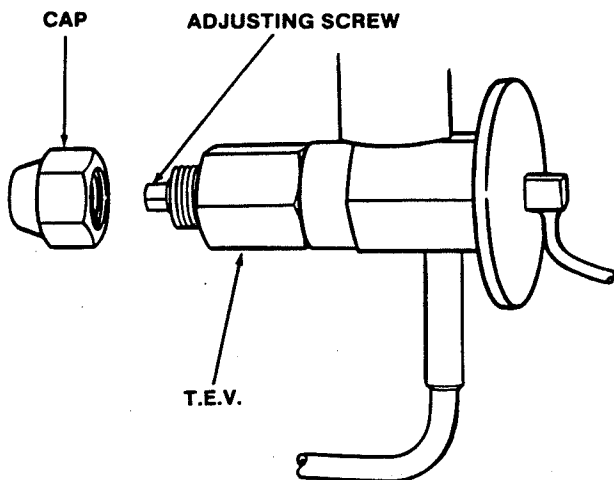


Figure 35. T.X.V.

A. T.X.V. ADJUSTMENTS

To determine whether or not the T.X.V. is in need of adjustment, perform the following procedures:

NOTE

There are two T.X.V.'s, one for each side.



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

1. Remove the Phillips head screw from the bottom of the left side panel and slide the panel down and out. (Fig. 36).

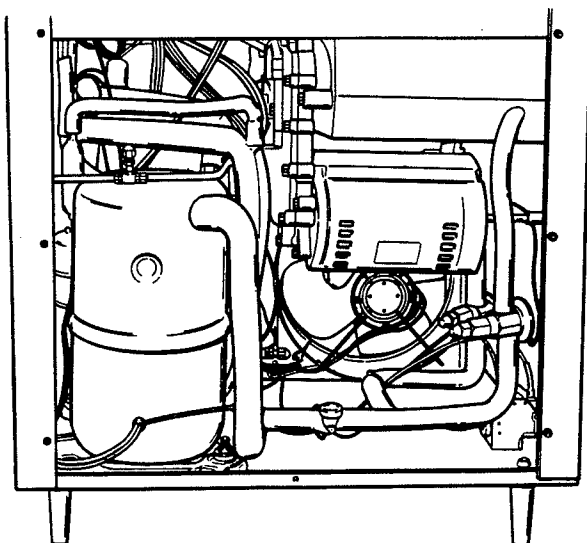


Figure 36. Panel Removed

2. Remove the cap from the low side Schrader valve and install a 0 to 100 P.S.I.G. gauge.
3. Plug the freezer in, start the refrigeration cycle and read the pressure.
4. The proper gauge reading should be approx. 20 P.S.I.G. at 75°F (21.1°C) ambient temperature at the end of pull down. If the readings are not within these parameters, continue following these steps:

NOTE

Before performing the following procedures be absolutely certain it is necessary to adjust the T.X.V.

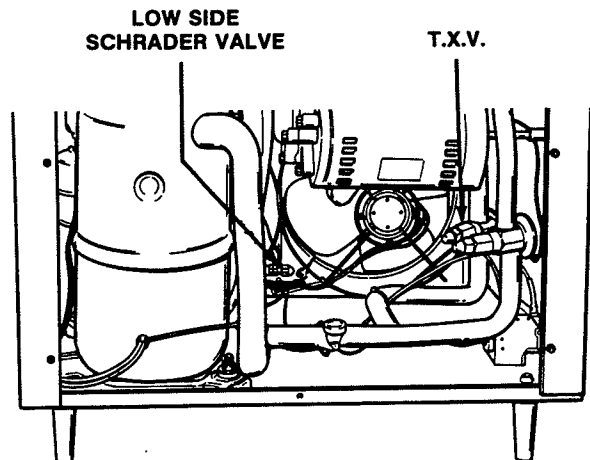


Figure 37. T.X.V.

5. Remove the cap on the T.X.V. and, using a service wrench, turn the valve stem 1/4 (90°) turn counterclockwise for more cooling or clockwise for less cooling (Fig. 37).
6. Should the reading still not reach 20 P.S.I.G., repeat step 7 until the correct reading is obtained.
7. Once the 20 P.S.I.G. reading is obtained, replace the cap on the T.X.V., remove the pressure gauge and replace the low side Schrader valve cap.

B. T.X.V. REMOVAL



CAUTION

IF THE T.X.V. IS EVER REPLACED, A HEAT SINK (WET CLOTH) MUST BE USED TO PREVENT DAMAGE TO THE VALVE.



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

1. Assuming the left side panel is removed, perform the following procedures for removing the T.X.V.
2. Remove bulb from suction line exiting from the evaporator.
3. Blow refrigerant charge and leave a port open to prevent pressure build-up during T.X.V. removal.

⚠ WARNING

BOTH SUCTION SIDE SOLENOIDS MUST BE ACTIVATED FOR PROPER PURGING OF SYSTEM. USE POWER CORD PART NUMBER 430119 OR EQUIVALENT FOR DIRECT CONNECTION.

4. Remove any insulation from the T.X.V. and immediate surrounding lines.
5. Remove or push pack any foam insulation from surrounding lines.
6. Apply a heat sink (wet cloth) to the valve dome (Fig. 38).
7. Unsweat the suction line and liquid line from T.X.V. and remove T.X.V. with heat sink.

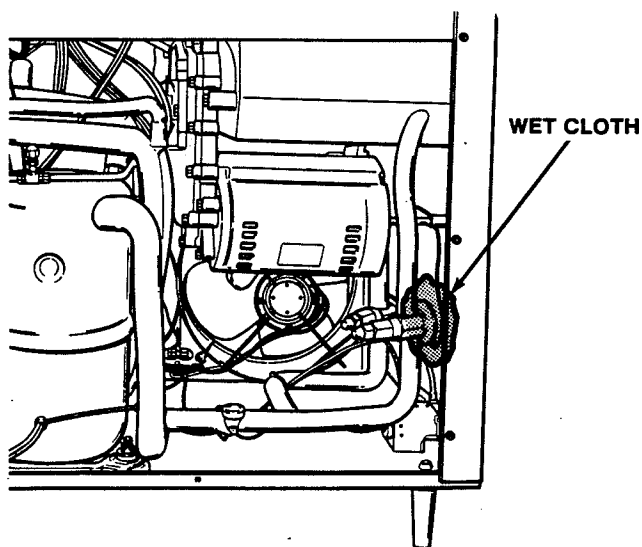


Figure 38. Removal of T.X.V. and Wet Cloth

C. T.X.V. REPLACEMENT

To replace the T.X.V., perform the following procedures:

⚠ CAUTION

WHEN REPLACING THE T.X.V., A HEAT SINK (WET CLOTH) MUST BE USED TO PREVENT DAMAGE TO THE VALVE.

1. Position the T.X.V., with heat sink, so the liquid line and suction line correspond with the proper valve ports.
2. Braze the liquid line and suction line to the T.X.V. using appropriate brazing material.
3. Remove the heat sink from the T.X.V.
4. Replace any foam insulation to the surrounding lines.
5. Replace any insulation to the T.X.V. and immediately surrounding areas.

NOTE

The liquid line from the condenser is welded to the suction line to provide a heat exchange to help protect the compressor from liquid slugging. This also assures that sub-cooled liquid is being supplied to the expansion devices.

6. Once the T.X.V. is installed, the refrigeration system must be purged and evacuated to 50 microns of mercury for approximately 30 minutes.

NOTE

The T.X.V. bulb should ALWAYS be mounted on the top of the horizontal line, with the capillary end facing the flow of refrigerant. Good contact between the bulb and the suction line is necessary for proper operation of the valve. The bulb must also be well insulated.

7. Install bulb on suction line exiting the evaporator.
8. Break the vacuum to (0 P.S.I.G.) with R-502 and, with an open port, replace filter drier using the appropriate brazing material (Fig. 39).

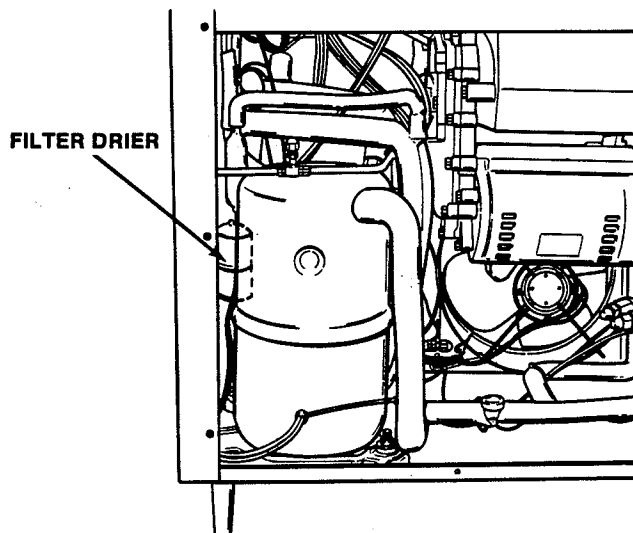


Figure 39. Filter Drier

9. Once the filter drier has been replaced, repeat the evacuation and recharging procedures.

5.5 HOPPER

A parallel refrigeration circuit feeds the hoppers. A capillary tube is used to meter the refrigerant to each hopper. An E.P.R. (Evaporator Pressure Regulating) valve is used to control the refrigerant flow at the outlets. The E.P.R. valve controls the hopper pressure so, during heavy dispensing periods, hopper temperatures will not drop and freeze the mix in the hopper. The adjustable E.P.R. valve is preset at the factory. If the hopper temperature is too cold or too warm, an E.P.R. valve adjustment may be necessary.

A. E.P.R. VALVE ADJUSTMENT

To adjust the E.P.R. valve, refer to the following procedures:

1. Remove the Phillips head screw from the bottom of the left side panel and remove the side panel by sliding down and out.
2. Remove the cap from the E.P.R. Schrader valve (Fig. 40).

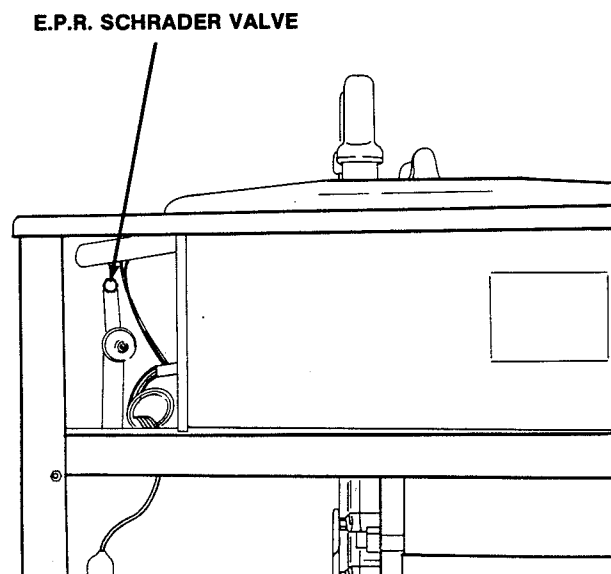


Figure 40. Schrader Valve Location

3. Install a 0-100 P.S.I.G. gauge into the E.P.R. Schrader valve.

4. Start the refrigeration cycle and read the pressure.

NOTE

The ideal E.P.R. valve setting (60-62 P.S.I.G.) will not allow mix to freeze to the walls of the hopper.

5. If the pressure gauge reading does not fall between the 60-62 P.S.I.G. parameters, proceed with the following steps:
6. Remove the right side panel, loosen the locknut on the E.P.R. valve and, using a small screwdriver, turn the valve stem 1/4 (90°) turn counterclockwise for more cooling or clockwise for less cooling (Fig. 41).

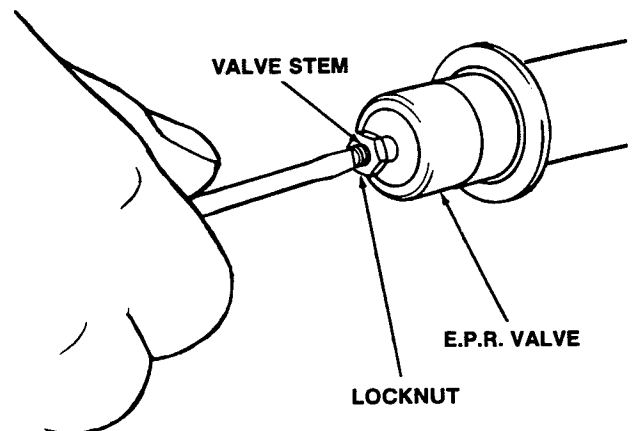


Figure 41. E.P.R. Valve Adjustment

7. Allow the system to level out for three to five minutes before taking another pressure reading.
8. Should the readings still fall between 60-62 P.S.I.G., repeat steps 6 and 7 until the correct reading is obtained.
9. Once the 60-62 P.S.I.G. reading is obtained, tighten the locknut snugly, remove the pressure gauge and replace the E.P.R. Schrader valve cap.
10. Replace the side panel.

NOTE

The compressor ON and OFF times can also affect the temperature of the hopper. Procedures for adjusting compressor ON and OFF times will be discussed in Section 6.

B. E.P.R. VALVE REMOVAL



CAUTION

IF THE E.P.R. VALVE IS EVER REPLACED, A HEAT SINK (WET CLOTH) MUST BE USED TO PREVENT DAMAGE TO THE VALVE.

1. Assuming the left side panel is removed for adjusting the E.P.R. valve, perform the following procedures for removing the E.P.R. valve.



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

2. Remove the Phillips head screw from the bottom of the right side panel and remove the panel by sliding down and out. Remove the 8 Phillips head screws from the back panel and remove by sliding down and out.
3. Blow refrigerant charge and leave a port open to prevent pressure build-up during E.P.R. valve removal.



WARNING

BOTH SUCTION SIDE SOLENOIDS MUST BE ACTIVATED FOR PROPER PURGING OF SYSTEM. USE POWER CORD PART NUMBER 430119 OR EQUIVALENT FOR DIRECT CONNECTION.

4. Remove foam insulation from surrounding lines.
5. Apply a heat sink (wet cloth) to the E.P.R. valve.
6. Unsweat the hopper evaporator outline and the line leading to the low side of the main system from the E.P.R. valve.
7. Remove the E.P.R. valve with the heat sink.

C. E.P.R. VALVE REPLACEMENT

To replace the E.P.R. valve, perform the following procedures:



CAUTION

WHEN REPLACING THE E.P.R. VALVE, A HEAT SINK (WET CLOTH) MUST BE USED TO PREVENT DAMAGE TO THE VALVE.

1. Position the E.P.R. valve, with heat sink, so the hopper evaporator outlet line and the line leading to the low side of the main system correspond with the proper valve ports (Fig. 42).

APPLY HEAT SINK
(WET CLOTH)
HERE

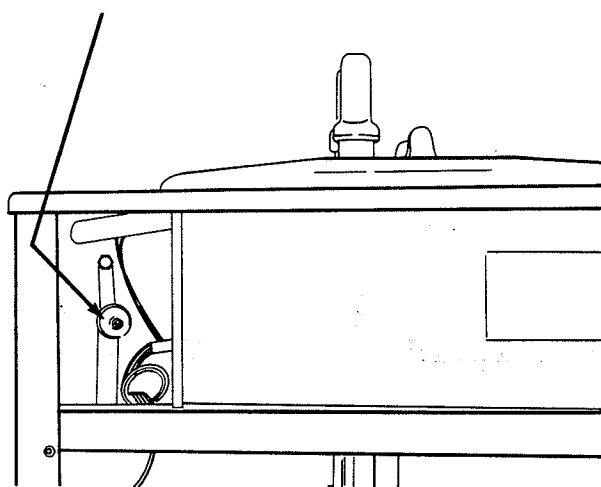


Figure 42. E.P.R. Valve and Lines

2. Braze the lines to the E.P.R. valve using the appropriate brazing material.
3. Remove the heat sink from the E.P.R. valve.
4. Replace any foam insulation to the surrounding lines.
5. Once the E.P.R. valve is installed, the refrigeration system must be purged and evacuated to 50 microns of mercury for approximately 30 minutes.
6. Break the vacuum to (0 P.S.I.G.) with R-502 and, with an open port, replace filter drier using the appropriate brazing material (Fig. 43).

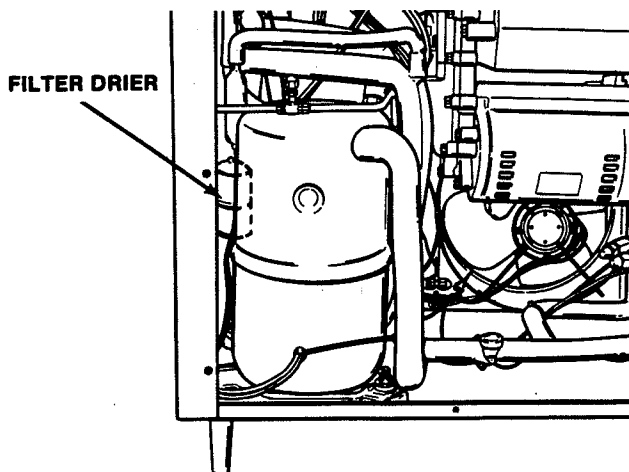


Figure 43. Filter Drier

7. Once the filter drier has been replaced, repeat the evacuation and recharge (step 5).

5.6 CAPILLARY TUBES

Capillary tube replacement may be necessary if the correct hopper cooling can not be obtained.

A. CAPILLARY TUBE REMOVAL



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

1. Remove the Phillips head screw from the bottom of the left side panel and pull the side panel down and out.
2. Remove the Phillips head screw from the bottom of the right side panel and remove the panel by sliding down and out. Remove the Phillips head screws from the back panel and remove by sliding down and out.
3. Blow refrigerant charge and leave a port open to prevent pressure build-up during capillary tube drier assembly removal.



WARNING

BOTH SUCTION SIDE SOLENOIDS MUST BE ACTIVATED FOR PROPER PURGING OF SYSTEM. USE POWER CORD PART NUMBER 430119 OR EQUIVALENT FOR DIRECT CONNECTION.

4. Unsweat capillary tube drier assembly at the drier inlet and at the hopper inlets located at the rear of the hopper.

NOTE

Before unsweating the capillary tubes at the hopper inlets, it will be necessary to remove the foam insulation from the capillary tube at that connection.

5. Remove the capillary tube drier assembly.

B. CAPILLARY TUBE REPLACEMENT

1. Position the capillary tube drier assembly so the large diameter tube is in position to be brazed first using the appropriate brazing material.
2. Position the smaller diameter tubes at the back of the hopper and braise the tubes to the hopper inlets using the appropriate brazing material. (Fig. 44).
3. Replace the foam insulation to the hopper inlet connections.
4. Once the capillary tube drier assembly is installed, the refrigeration system must be purged and evacuated to 50 microns of mercury for approximately 30 minutes.

5. Break the vacuum to (0 P.S.I.G.) with R-502 and, with an open port, replace filter drier using the appropriate brazing material (Fig. 43).
6. Once the filter drier has been replaced, repeat the evacuation and recharging procedures (steps 5 and 6).

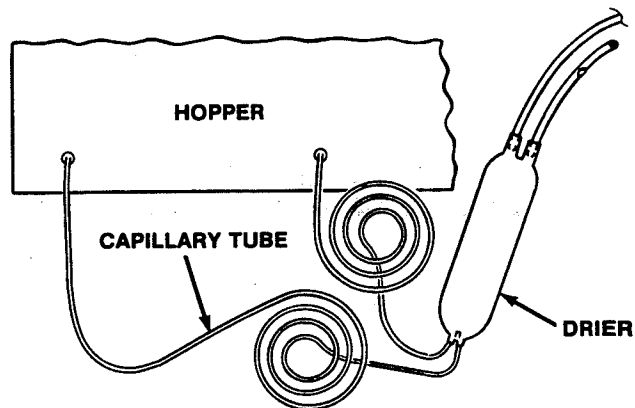


Figure 44. Capillary Tube and Drier Assembly

5.7 SOLENOID VALVE

Some models have suction line and liquid line solenoid valves. To check for leaking valve seats, follow the procedure outlined below. NOTE: Freezer barrels must not contain frozen product for this test. To check the suction line solenoid valve seats, we must keep the liquid line solenoids open. Use power cord, Part #430119, or equivalent, for direct connection. Then attach a low side pressure gauge to the access fitting after the expansion valve. Force the opposite side to run. If the pressure drops on the side not calling for refrigeration, the valve seat leaks and should be replaced. Repeat the procedure for the other side.

To check the liquid line solenoid valve seats, we must first disconnect one of the electrical lines from each of the liquid line solenoids. Protect the terminal end of the disconnected electrical line with a piece of electrical tape. Then, connect low side pressure gauges to the access fittings after the expansion valves. Force the left and right sides to run by turning the Clean-Off-On switch to the On position and opening the spigots. The gauges should show approximately 9" of vacuum after one minute. If the gauge does not reach 1" of vacuum in one minute and hold, you may have a leaking solenoid valve seat or leaking valves in the compressor. You can determine which solenoid valve is leaking by watching the pressure rise in each of the barrels. The barrel with the greatest pressure rise would have the leaking solenoid valve seat. If the rise is even, it may be the compressor's valves.

A. SUCTION LINE AND SOLENOID REMOVAL

1. Remove the Phillips head screw from the bottom of the left side panel and remove the side panel by sliding down and out. Remove the Phillips head screws from the back panel and remove back panel by sliding down and out.
2. Identify (mark) and disconnect the two electrical wires. (Fig. 45).
3. Remove the retainer from the top of the solenoid and pull the magnetic coil off.

NOTE

The retainer may be a screw, nut, or clip.

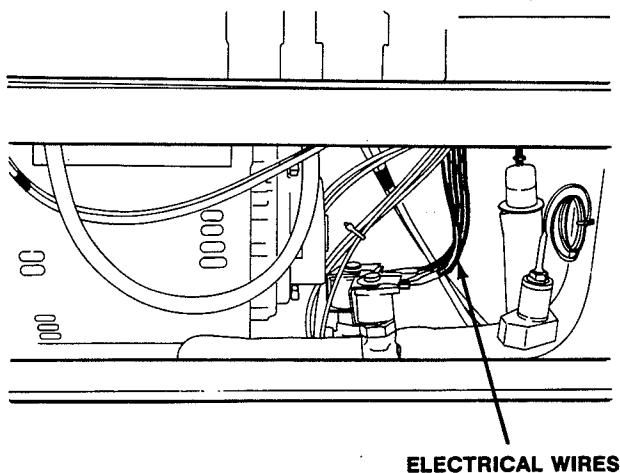


Figure 45. Solenoid Replacement

B. SUCTION LINE AND SOLENOID REPLACEMENT

To replace the solenoid, perform the following procedures:

NOTE

To replace the solenoid, it does not require that the solenoid valve body be removed. This is a very remote possibility. The valve seats also can be replaced without taking the body out of the system.

1. Push the magnetic coil on the solenoid body and replace the retainer.
2. Connect the two electrical wires.

C. LIQUID LINE SOLENOID VALVE REMOVAL



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

1. Remove the screw from the bottom of the left side panel and pull the panel down and out.

2. Blow refrigerant charge and leave a port open to prevent pressure build-up during capillary tube drier assembly removal.
3. Disconnect the two wires from the solenoid coil.
4. Remove the screw holding the coil to the solenoid body and remove the coil.
5. Apply a heat sink (wet cloth) to the valve body and unsweat the two joints. Remove the valve body.

D. LIQUID LINE SOLENOID VALVE REPLACEMENT

1. Position the new valve with the arrow pointing toward the direction of flow or expansion valve.
2. Apply a heat sink (wet cloth) to the valve body.
3. Braze the two joints using the appropriate brazing materials.
4. Once the valve is installed, the refrigeration system must be purged and evacuated to 50 microns of mercury for approximately 30 minutes.
5. Break the vacuum (0 P.S.I.G.) with 502. With an open port, replace the filter drier using the appropriate brazing material.
6. Once the filter drier has been replaced, repeat the evacuating and recharging procedures.
7. Replace the left side panel.

5.8 BYPASS VALVE

Some models have a safety valve put in the refrigeration system to prevent high differential pressures across the compressor. If a surge occurs the valve will bypass the excess pressure to the low side of the system. This valve is factory set and sealed. It never needs adjustment. If you determine the valve is causing a problem, first check to see if the seal has been broken. If the seal has been broken check for proper adjustment. The proper setting is 1/4 turn open (counterclockwise). From the closed position (full clockwise). To gain access to the bypass valve remove the Phillips head screw from the left and right side panels and slide the panels down and out. Remove the Phillips head screws from the back panel and slide down and out.

A. BYPASS VALVE REMOVAL



CAUTION

IF THE BYPASS VALVE IS REPLACED A HEAT SINK (WET CLOTH) MUST BE USED TO PREVENT DAMAGE TO THE VALVE.

1. Assuming the two side panels and back panels have been removed, perform the following procedures for removing the bypass valve. (Fig. 46).

2. Blow refrigerant charge and leave a port open to prevent pressure build-up during bypass valve removal.



WARNING

BOTH SUCTION SIDE SOLENOIDS MUST BE ACTIVATED FOR PROPER PURGING OF SYSTEM. USE POWER CORD PART NUMBER 430119 OR EQUIVALENT FOR DIRECT CONNECTION.

3. Apply a heat sink (wet cloth) to the bypass valve.
4. Unsweat the inlet and outlet line from the system.
5. Remove the bypass valve with the heat sink.

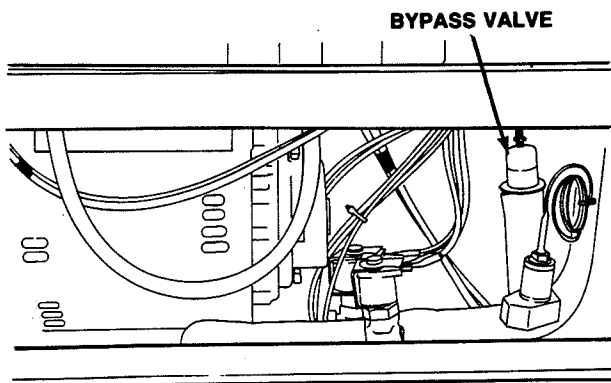


Figure 46. Bypass Valve Replacement

B. BYPASS VALVE REPLACEMENT

To replace the bypass valve perform the following procedures:



CAUTION

WHEN REPLACING THE BYPASS VALVE A HEAT SINK (WET CLOTH) MUST BE USED TO PREVENT DAMAGE TO THE BYPASS VALVE.

1. Position the bypass valve with the heat sink so the ports match with the proper lines.
2. Braze the lines to the bypass valve using the appropriate brazing material.
3. Remove heat sink from the bypass valve.
4. Once the bypass valve is installed the refrigeration system must be purged and evacuated to 50 microns of mercury for approximately 30 minutes.
5. Break the vacuum to (0 P.S.I.G.) with R-502 and with an open port, replace the filter drier using the appropriate brazing material.
6. Once the filter drier has been replaced repeat the evacuation and recharge (Step 5).

5.9 WATER VALVE

Before making any adjustments check for adequate water supply.

A. WATER VALVE ADJUSTMENT

To determine whether or not the water valve is in need of adjustment, perform the following procedures:



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY BEFORE SERVICING.

1. Remove the Phillips head screw from the right side and slide the panel down and out.
2. Remove the cap from the high side Schroeder valve and install a 0 to 500 P.S.I.G. gauge.
3. Connect the freezer to the electrical supply, start the refrigeration cycle, and read the pressure.
4. The proper gauge reading should be approximately 215 to 220 P.S.I.G.

To adjust the water valve, turn the adjustment screw counterclockwise to increase head pressure and clockwise to decrease head pressure.

B. WATER VALVE REMOVAL



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY BEFORE SERVICING.

Assuming the right side panel is removed, perform the following procedures for removing the water valve.

1. Turn off and disconnect the water supply and drain. Blow out the water lines with compressed air or CO₂.
2. Blow the refrigerant charge and disconnect the capillary tube.
3. Remove the water line from the valve.
4. Remove the two screws holding the water valve to the frame and remove the valve.

C. WATER VALVE REPLACEMENT

To replace the water valve, perform the following procedures:

1. Position the water valve and attach to the frame using the two screws.
2. Connect the water line to the valve.
3. Connect the capillary tube.
4. Evacuate the system and recharge to name plate specifications.
5. Connect the water supply line and turn on the water.
6. Check for leaks.
7. Replace the side panel and connect to the source of electricity.

SECTION 6

6.1 CONTROL SYSTEM

The control system is the "brain" of the freezer. To understand how to service the freezer, it is essential to understand how the control system operates. The control system used on the Model 2131 has two consistency controls.

The Type 2 control system monitors the consistency (firmness) of the product (mix) in the freezer evaporator. As the product freezes, the drive motor develops a higher torque (resistance) because of the freezing of the product in the evaporator. The energy used to operate the drive motor is in direct proportion to the torque. As the drive motor torque increases, so does the energy required to operate the motor. The program module senses the energy usage and shuts off the drive motor when the pre-programmed energy value is reached.

When servicing the freezer, keep in mind the Type 2 control system monitors product consistency. To minimize the beating of the product in the evaporator, the program module will switch to the IDLE mode after the preset number of cycles are completed. In the IDLE mode, only the compressor and condenser fan run to keep the product in the hopper and evaporator refrigerated and every eighth consecutive cycle the drive motor will run for a few seconds. In this IDLE mode, a servable consistency will not be held.

NOTE

Excessive agitation will beat over-run out of the product, causing a grainy, unservable texture.

To gain complete access to the front control box and its components, perform the following procedures:

1. Remove the two-Phillips head screws from the bottom of the decorative panel and pull the panel down and out.
2. Remove the two Phillips head screws from the inside cover, allowing the entire box to be accessed. (Fig. 47).

PROGRAM MODULE FRONT
POWER BOARD BACKSIDE

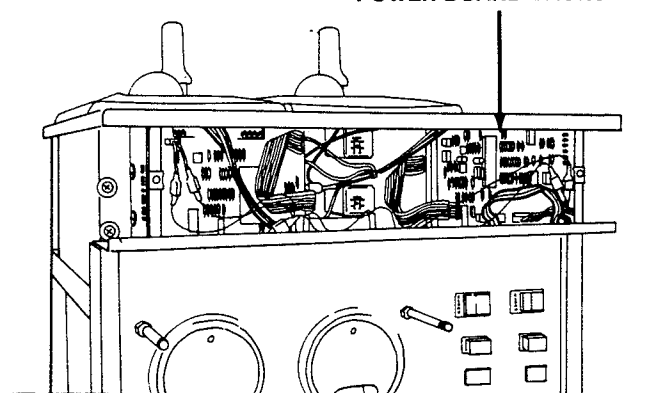


Figure 47. Control Box

The front control box and its components are now completely accessible and any necessary testing and adjusting can now be done.

NOTE

Sub-sections 6.2 through 6.6 will deal specifically with the control system.

To gain complete access to the side electrical box, remove the Phillips head screw from the bottom of the right side panel and pull the panel down and out. (Fig. 48).

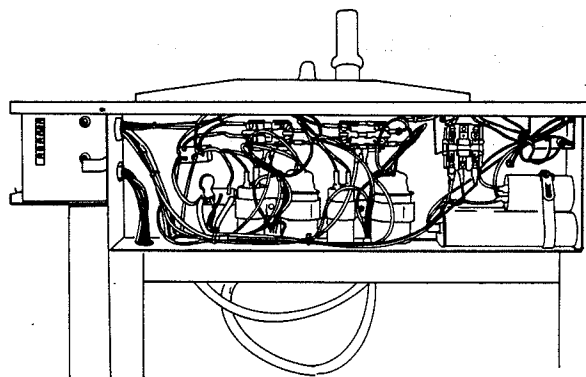


Figure 48. Side Electrical Box

6.2 POWER BOARD

The power board is where the actual sensing of the drive motor energy usage occurs (Fig. 49).

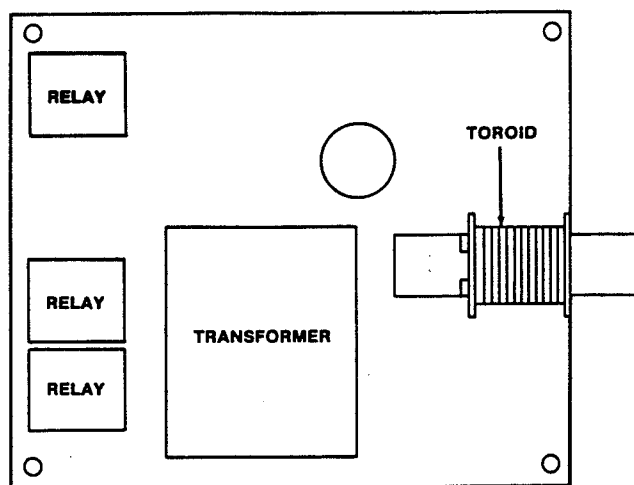


Figure 49. Power Board

The power board also supplies energy to the program module and sends electronic signals associated with the drive motor power. The 230/12 transformer and associated circuitry is used to supply 12 volts DC to operate the program module. There are two relays to transfer power to the compressor and drive motor contactors. If the power board has a third relay it is used to control the liquid line solenoid. After 24 consecutive idle cycles the relay will close causing the solenoid valve to open.

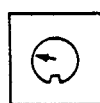
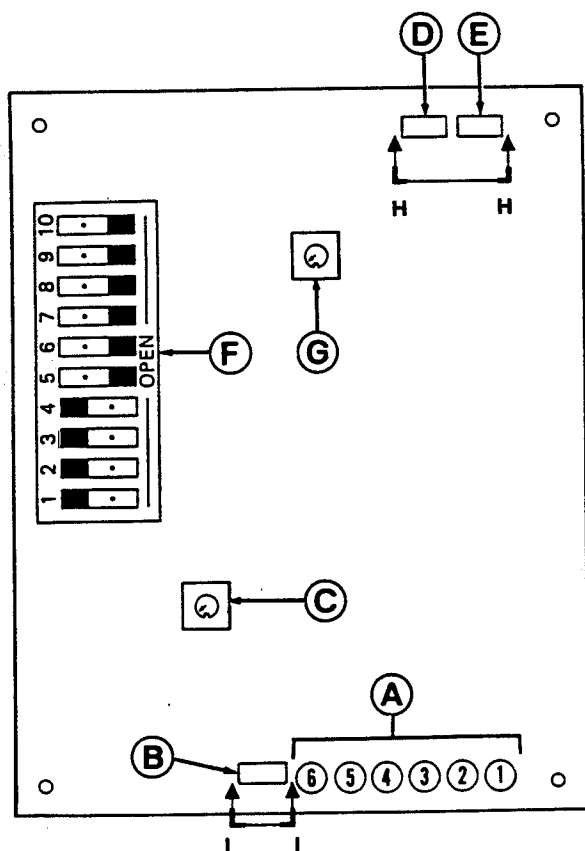
6.3 PROGRAM MODULE

The program module receives electronic signals from the power board. The electronic signals are used to control the operation of the drive motor, compressor and indicator lights on the freezer. Refer to Fig. 50 for a description of each indicator light and adjustable control on the program module.

A. INDICATOR LIGHTS

The program module has six L.E.D. indicator lights (Item A, Fig. 49) to aid in the rapid troubleshooting and adjusting of the freezer. A description of each indicator light is given below.

1. The POWER ON indicator light, when illuminated, indicates that the program module is receiving 12 volts DC from the power board.



VIEW H-H

SCALE = 2:1



VIEW I-I

SCALE = 2:1

Figure 50. Program Module

2. The DRIVE MOTOR indicator light, when illuminated, indicates that power is supplied to the drive motor contactors through a relay on the power board.
3. The COMPRESSOR indicator light, when illuminated, indicates that power is supplied to the compressor contactors through a relay on the power board.

A. Indicator Lights

1. Power On
2. Drive motor
3. Compressor
4. Consistency
5. Error
6. Test Light

- B. Fine Consistency Adjustment
- C. Coarse Consistency Adjustment
- D. Freezer OFF Time Adjustment
- E. Compressor ON Time Adjustment
- F. Dip Switch
- G. Motor Adjustment

4. The CONSISTENCY indicator light, when illuminated, indicates the consistency of the product in the evaporator has not reached the consistency setting. The indicator light will begin to flash as the consistency setting is being reached. This is the current being used by the drive motor as compared to the setting of the coarse and fine potentiometers. When the CONSISTENCY indicator light is off, the consistency setting has been reached. This indicator light can be used as an aid when making adjustments to the consistency adjusting potentiometer.

NOTE

The consistency light is always on EXCEPT when the consistency is being or has been reached, then will go off momentarily and then come back on.

5. The ERROR indicator light, when illuminated, indicates that a malfunction condition exists. Two error conditions can illuminate the indicator light. The first condition is a high torque error. If the drive motor is allowed to develop excessive torque for 15 seconds, the freezer will shut off and the ERROR indicator light will illuminate. The second condition is a low torque error. If the drive motor fails to develop minimum torque in 15 minutes, the freezer will shut off and the ERROR indicator light will illuminate. The high and low torque error is used to protect the system from damaging components if something is wrong or being misused. When the ERROR indicator light is illuminated, the error

condition can be reset by placing the CLEAN-OFF-ON switch in the OFF position. Then place the switch in the ON position and press the PUSH TO FREEZE switch.

NOTE

The PUSH TO FREEZE switch will flash when in the ERROR condition.

6. The TEST indicator light is controlled by the tenth position on the Dip Switch (Item F, Fig. 49). When this switch is open, the control operates normally. When this switch is closed, the control is in the TEST mode. The TEST mode is used for calibration of ON and OFF times starting in the OFF cycles, of the IDLE mode. During this mode, all power outputs are off. An L.E.D. associated with the TEST mode illuminates to indicate the time the compressor is on. This ON time is registered in real time, 1 second = 1 second. The amount of time the L.E.D. is off represents 1/10 of the OFF time at ambient temperature of 90°F (32.2°C) of the program module.

- B. The FINE CONSISTENCY adjustment (Item B, Fig. 49) is used to make fine adjustments to the product consistency. This adjustment is made via an adjusting potentiometer.

- C. The COARSE CONSISTENCY adjustment (Item C, Fig. 49) is used to make rough adjustments to the product consistency. This adjustment is made via an adjusting potentiometer.

1. For most field adjustments, only the FINE consistency potentiometer will need to be adjusted. To make the product firmer, turn the FINE adjusting screw 1/8 (45°) of a turn clockwise. To make the product softer, turn the FINE adjusting screw 1/8 (45°) of a turn counterclockwise.

NOTE

When making consistency adjustments, the evaporator MUST contain fresh product. If the product has been in the evaporator for more than 30 minutes, dispense approximately two pints of the product immediately prior to checking the consistency.



CAUTION

NEVER TURN THE ADJUSTING SCREW MORE THAN 1/8 (45°) OF A TURN AT A TIME.

2. Dispense approximately 16 ounces (.47 liters) of the product and check the consistency. If the consistency of the product is still not correct, repeat step 1 until the correct product consistency is obtained.

3. If the FINE CONSISTENCY adjusting screw is turned as far as possible and more adjustment is needed, turn the FINE adjusting screw back to the middle position.
4. Turn the COARSE adjusting screw 1/30 (12°) of a turn clockwise for a firmer product or 1/30 (12°) of a turn counterclockwise for a softer product.

NOTE

A very small adjustment to the COARSE CONSISTENCY adjusting screw will make a big difference in the product consistency. Therefore NEVER turn the COARSE adjusting screw more than 1/30 (12°) of a turn at a time. It is possible to set the COARSE adjustment so high that the motor full load current will be exceeded which can lead to motor failure or excessive trip out on error.

5. Use the FINE CONSISTENCY adjusting screw to reach the desired product consistency after one adjustment of the COARSE CONSISTENCY has been completed and product has been tested.

- D. The FREEZER OFF TIME adjustment (Item D, Fig. 49) is used to set the freezer OFF time. To increase the freezer OFF time, turn the adjusting screw 1/30 (12°) of a turn clockwise. To decrease the OFF time, turn the adjusting screw 1/30 (12°) of a turn counterclockwise. The OFF time is ambient compensated to allow the freezer to run uniformly at different ambient temperatures. The program module will sense the ambient temperature and automatically increase the OFF time as the room temperature decreases or decrease the OFF time as the room temperature increases.

- E. The COMPRESSOR ON TIME adjustment (Item E, Fig. 49) is used to set the refrigeration ON (run) time. To change the refrigeration ON time, turn the ON time adjusting screw 1/30 (12°) of a turn clockwise to increase ON time or 1/30 (12°) of a turn counterclockwise to decrease the ON time.

NOTE

ON time has no effect on drive motor run time during idle. For proper off and on times turn to page 60.

- F. The DIP SWITCH (Item F, Fig. 49) is a ten position, programmable switch. The DIP SWITCH control has the ability to be user programmed to select the sequence and mode and operation for eight consecutive idle cycles after either the PUSH TO FREEZE or spigot switch has been activated. This is accomplished by the first eight of the ten positions. The function of the eight positions is as follows: Each

one of the switches (positions) represents one programmed cycle. As an example; switch #1 represents the first programmed cycle, switch #2 represents the second programmed cycle, etc. If the switch is in the closed position, both the auger drive motor and the compressor will switch on and shut off at consistency. If the switch is in the open position, only the compressor will run. As the control is running through the eight programmed cycles and subsequent idle cycles, intermittent agitation is necessary. Every eighth consecutive idle cycle in which the product has not reached consistency, the drive motor will switch on for 10 to 12 seconds while the compressor is running (Fig. 51).

NOTE

Error conditions are not monitored in OPEN Idle Positions.

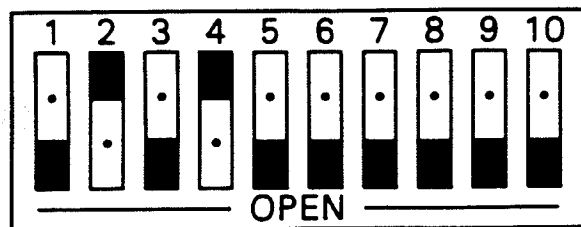


Figure 51. Programmed Idle Cycles

The ninth position on the DIP SWITCH is for the repeat cycle. When this switch is in the open position, the sequence of events is to go through the eight programmed idle cycles once and then to the idle cycles in which only the compressor switches on with intermittent agitation. If the repeat cycle switch is in the closed position, the sequence of events is to go through the eight programmed idle cycles, go back to the first programmed cycle and go through the eight programmed idle cycles again. This sequence will repeat itself indefinitely until interrupted by opening the spigot switch, cutting the power or an error condition (Fig. 52).

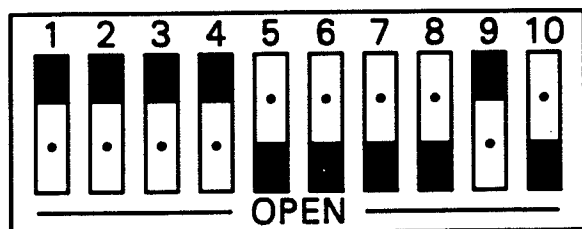


Figure 52. Repeat Cycle

The tenth position on the DIP SWITCH is used for the test mode. When this switch is open, the control operates normally. When this switch is closed, the control is in the test mode. The test mode is used for calibration of ON and OFF time of the corresponding cycles of the idle mode. During this mode all power outputs are off. An L.E.D. associated with the test mode illuminates to indicate the time the compressor is running. This ON time is in real time, 1 second = 1 second. The amount of time the L.E.D. is off represents 1/10 of the OFF time of the compressor at an assumed 90°F (32.2°C) ambient temperature. (Fig. 53).

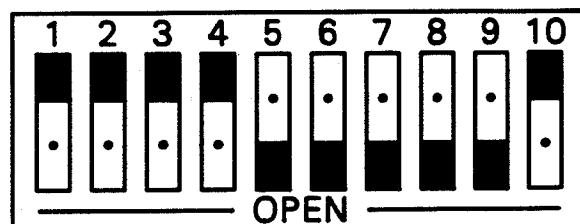


Figure 53. Test Mode

6.4 PLUG IN RELAYS

The 8 pin plug in relays when activated will send power to the refrigeration solenoids and the compressor contactor. The lower relay is for the left solenoid valve and the upper relay is for the right solenoid valve.

The function of the relays is to isolate control of the refrigeration solenoid valves and to combine the control of the one compressor contactor. (Fig. 54).

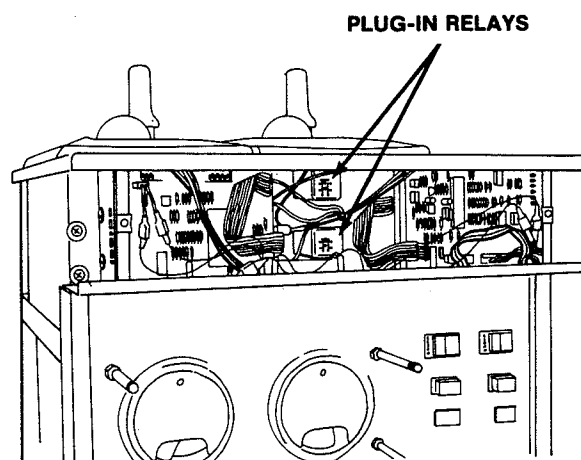


Figure 54. Plug In Relays

6.5 CONTACTORS

The contactors are mounted in the side electrical box. There are three contactors, two to start the drive motors and one to start the compressor and condenser fan.

The control modules send an electronic signal to trigger the contactors. The electronic signal tells the relays when to operate the contactor for the compressor and condenser fan. A separate signal is used to control the drive motor contactor. The signals to the contactors are staggered so the drive motor will always start and stop two to three seconds before the compressor and condenser fan. By staggering the stopping and starting of the drive motor, maximum starting torque is available and voltage spikes are reduced. The contactors are electronically isolated from the program module. This feature is very important in case of an electrical short or component failure.

6.6 DRIVE MOTOR

The drive motors are designed specifically for, and are common to all freezers in the 2000 Series. The drive motors are used to rotate the auger assemblies. The start and run capacitors are located in the electrical control box. An internal, normally closed, centrifugal switch starts the drive motor. The drive motor is equipped with a manual reset overload protector. The reset button is located on the motor endbell and is accessible by removing the side panels (Fig. 55). A tripped overload may also illuminate the error indicator light on the program module. If the overload trips, allow the drive motor approximately one hour to cool before resetting.

DRIVE MOTOR ENDBELL

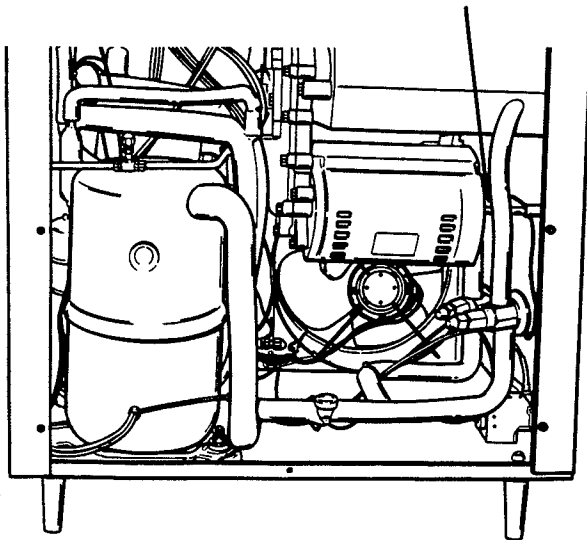


Figure 55. Overload Reset

6.7 SEQUENCE OF OPERATION

The freezer sequence of operation can be monitored by observing the six L.E.D. indicator lights on the program module. The following steps describe the sequence of operation:

- A. The freezer must be cleaned, sanitized, and hopper filled with mix as outlined in Section 3.
- B. With the freezer plugged into the power source, place the CLEAN-OFF-ON switch in the ON position.
- C. The first (POWER ON) and fourth (CONSISTENCY) L.E.D. indicator lights should be illuminated.
- D. To start the freezing cycle, press the red PUSH TO FREEZE switch on the front of the freezer.
- E. The second (DRIVE MOTOR) L.E.D. indicator light will illuminate and the drive motor will start.
- F. Approximately three seconds later, the third (COMPRESSOR) L.E.D. indicator light will illuminate and the compressor and fan will start.

NOTE

At this time the first four L.E.D. indicator lights will be illuminated.

- G. As the consistency of the product in the evaporator becomes firmer, the fourth (CONSISTENCY) L.E.D. indicator light will begin to flicker. After a period of time the light will go out. Approximately 10 seconds later the drive motor will stop and the second (DRIVE MOTOR) L.E.D. indicator light will go out.

NOTE

Keep in mind drive motor current is being sensed, not temperature.

- H. Approximately three seconds later the third (COMPRESSOR) L.E.D. indicator light will go out. Then the compressor and fan motor will stop and the fourth (CONSISTENCY) L.E.D. indicator light will illuminate.
- I. The green READY TO SERVE light on the front of the freezer will illuminate. The product is now ready to be dispensed.

NOTE

At this time the freezer is in the STAND-BY mode. The first (POWER ON) and fourth (CONSISTENCY) L.E.D. indicator lights are illuminated.

- J. If the spigot is not opened, the freezer OFF time is controlled by the setting of the OFF timer.

- K. Once the preset OFF time has expired, the freezer will operate on the preset cycles.
- L. After the freezer has cycled through the preset cycles and the spigot has not been opened or the PUSH TO FREEZE switch has not been pressed, the freezer will go into the IDLE mode.

NOTE

Consistency is NOT controlled during the IDLE mode unless called for by a closed dip switch.

- M. When the freezer is in the IDLE mode, the red PUSH TO FREEZE switch on the front of the freezer will illuminate and the compressor and fan motor will run for the preset time.
- N. When the freezer is in the IDLE mode, the drive motor will operate occasionally for a short time to mix the product and keep the product temperature uniform.
- O. At the end of the ON time setting, the third (COMPRESSOR) L.E.D. indicator light will go out and the compressor and fan motor will stop.
- P. The freeze will continue to cycle in the IDLE mode until the PUSH TO FREEZE switch is pressed, or the spigot is opened to draw the product.
- Q. When the spigot is opened to draw the product or the PUSH TO FREEZE switch is pressed, the freezer cycles will start over.
- R. If the fifth (ERROR) L.E.D. indicator light illuminates during operation, there is a high or low torque error. When the ERROR indicator light is illuminated, the PUSH TO FREEZE light will flash. The error condition can be reset by placing the CLEAN-OFF-ON switch in the OFF position. Then place the switch in the ON position and press the PUSH TO FREEZE switch.
- S. The sixth (TEST) L.E.D. is controlled by the tenth position on the Dip Switch. When the switch is in the open position the control operates normally. When the switch is closed, the L.E.D. will illuminate for the amount of time the compressor is running. The amount of time the L.E.D. is off represents 1/10 of the compressor off time.

6.8 SPIGOT SWITCHES

The spigot switches, located at the bottom of the header panel, are proximity switches, operated by a magnet in the spigot handles. The switch opens when the spigot handle is open (dispensing

product) and closes when the spigot handle comes within 1/2 inch (12.5 mm) of the switch. The switch sends an electronic signal to the program module when the spigot handle has been opened, thus activating the freezing cycle.

A. SPIGOT SWITCH REMOVAL

To remove a spigot switch, perform the following procedures:



WARNING

DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

1. Remove the two Phillips head screws from the bottom of the decorative panel and slide the side panel down and out.
2. Disconnect the spigot switch at the two spade type connectors.
3. Snip off the two spade type connector from the spigot switch.
4. Push spigot switch down and out. (Fig. 56).

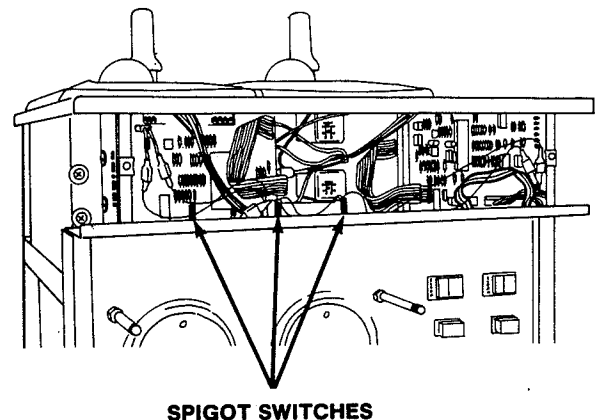


Figure 56. Replacing Spigot Switch

B. SPIGOT SWITCH INSTALLATION

To install a replacement spigot switch perform the following procedures:

1. Insert wires through the hole in the front of the freezer and push spigot switch up into place.
2. Attach two spade type connectors.
3. Connect the wires to the proper connectors.
4. Install the top front decorative cover.

6.9 LIGHT SWITCH REPLACEMENT

The PUSH TO FREEZE light/switch and the ready light both can be replaced if necessary. To replace, perform the following procedures:



WARNING
DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

Some models use a PUSH TO FREEZE switch that contains two lights. The red light indicates PUSH TO FREEZE and the green light indicates the product is ready to serve.

1. To replace the switch you must first remove the right side panel.
2. Remove the necessary wiring.
3. Remove the two retaining clips using a common screwdriver.
4. Push switch through the front panel.

5. You can now remove the switch assembly.

6. Connect the wires to the replacement switch and push into position.

NOTE

LED light bulbs require correct polarity. If the bulb does not illuminate remove the bulb, turn 180° and replace.

6-10. LIQUID LINE SOLENOID PRESSURE SWITCH

The liquid line solenoid valve is controlled by a pressure switch and/or power board relay. When product is drawn, the drive and compressor are activated. As the suction pressure drops below the set point, the solenoid opens allowing the evaporator to refrigerate. When the drive and compressor stop, the suction pressure will rise above the set point, and the solenoid will close. If the freezer is allowed to idle 24 consecutive cycles, the solenoid relay on the power board will activate holding the solenoid open. To replace the liquid line solenoid pressure switch, use standard electrical and refrigeration practices.

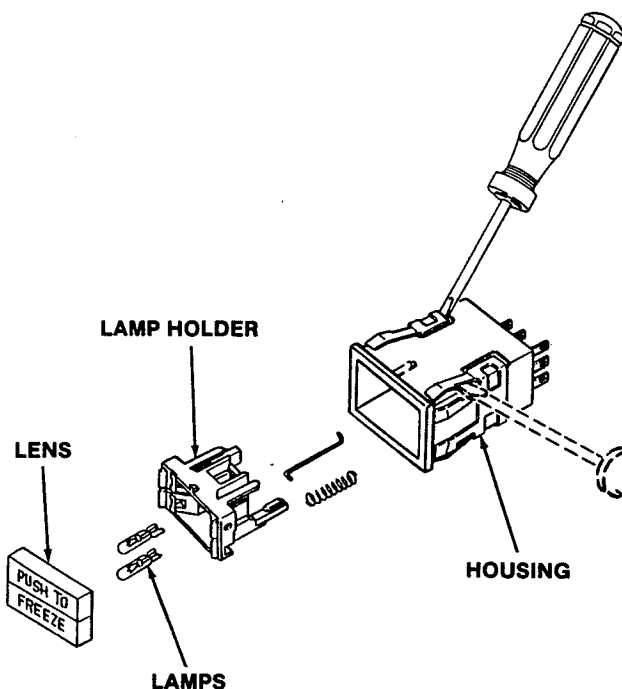


Figure 57. Light Switch Removal

SECTION 7 MAJOR COMPONENT REMOVAL AND INSTALLATION

7.1 PREPARATION FOR COMPONENT REMOVAL

The procedures set forth in this section **MUST** be followed completely and in the order in which they appear.

To remove any or all of the major components of the freezer, the following steps must be performed first.

 **WARNING**
DISCONNECT FREEZER FROM ELECTRICAL SUPPLY SOURCE BEFORE SERVICING.

1. Remove the Phillips head screw from the bottom of each side panel and remove the side panels by pulling down and out.
2. Remove the six Phillips head screws from the back panel and remove the back panel by pulling down and out.

7.2 CONDENSER FAN MOTOR REMOVAL

After the ELECTRICAL SUPPLY HAS BEEN DISCONNECTED and the two previous steps have been completed, the fan motor can be removed by performing the following procedures:

1. Disconnect and identify (mark) the wires leading from the fan motor to the capacitor on the right side of the freezer. The wires **MUST** be identified for proper installation of the fan motor later.
2. Loosen the socket head screw and remove the fan blade.
3. Remove the four hex nuts securing the fan motor to the frame.
4. Remove the fan motor through the side of the freezer (Fig. 58).

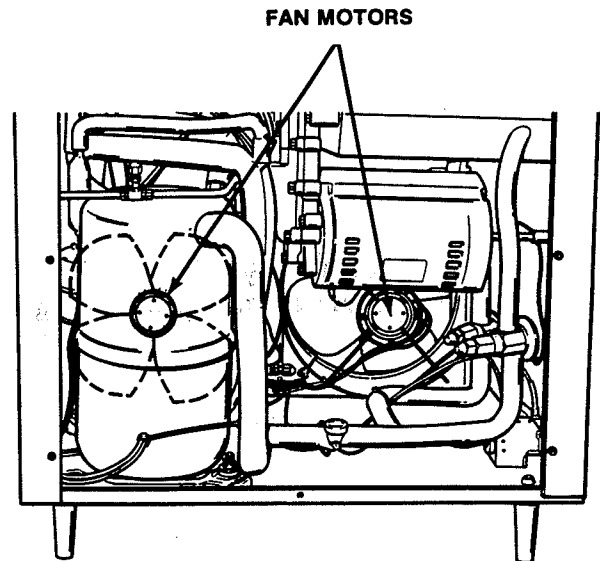


Figure 58. Fan Motor Removal

7.3 DRIVE MOTOR REMOVAL

After the ELECTRICAL SUPPLY HAS BEEN DISCONNECTED, and the side panels have been removed (7.1), the drive motors can be removed by performing the following procedures:

1. Disconnect the drive motor wire assembly at the Molex connector on the electrical control box.
2. Cut the shipping strap on the drive motor and slide forward (1/2 H.P drive only) (Fig. 59).

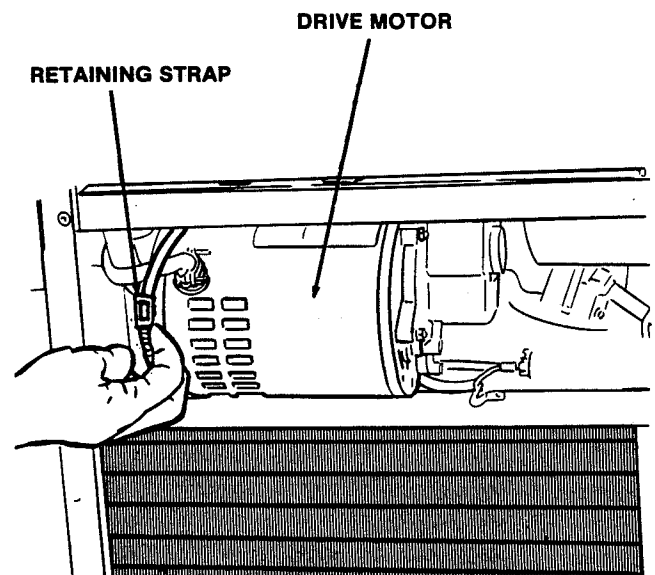


Figure 59. Drive Motor and Retaining Clamp

3. Remove the three socket head screws that secure the drive motor gear box (Fig. 60).

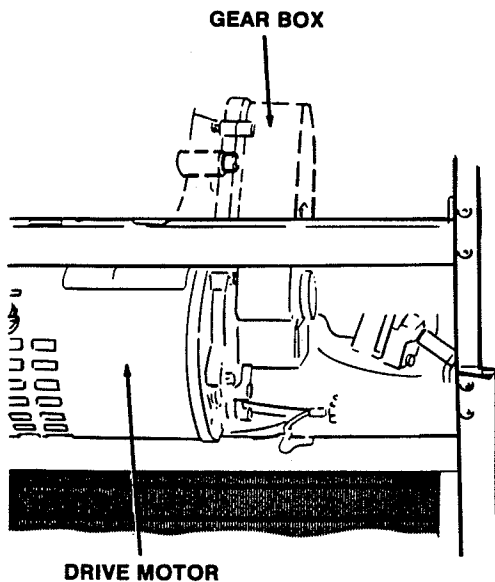


Figure 60. Drive Motor and Gear Box

4. Firmly grasp the drive motor and remove through the side of the freezer (Fig. 61).

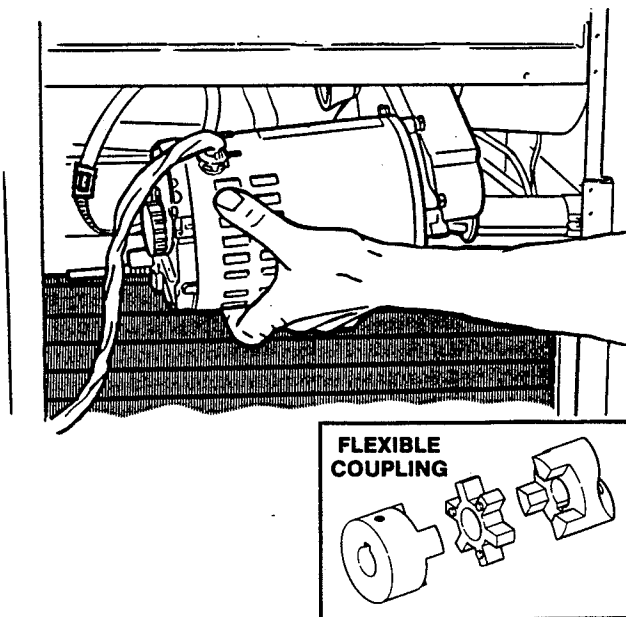


Figure 61. Drive Motor Removal

7.4 DRIVE MOTOR OIL SEAL REMOVAL 1/2 H.P.

After removal of the drive motor assembly, the gear box can be removed and the drive motor disassembled for inspection and/or repair. Perform the

following procedures for removal of the gear box from the drive motor and disassembly of the drive motor.

1. Remove the screws attaching the gear box to the drive motor and remove the drive motor. (See Fig. 62).
2. Mark the end bell and motor case for references when reassembling.

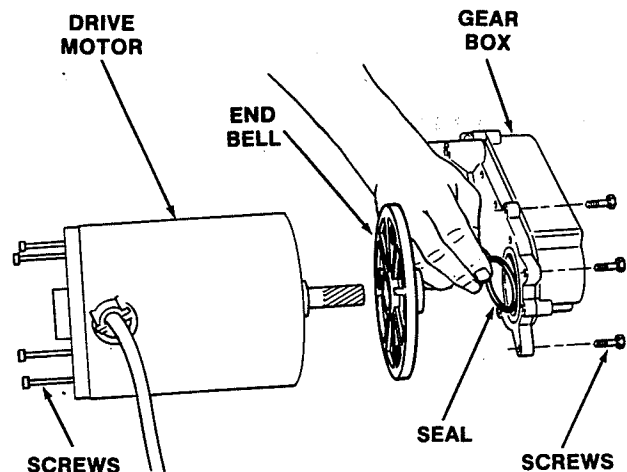


Figure 62. Gear Box and Seal

3. Remove the 4 retaining bolts and slide off the end bell.
4. Check the drive motor shaft for wear at the seal area. If the shaft is worn, replace the shaft.
5. Remove the wave washers.
6. Place the end bell with the inside facing down.
7. Using a common screwdriver and a hammer tap the old seal out as shown in Fig. 63.

NOTE

The 3/4 H.P. drive motor assembly has a flexible coupling joining the motor to the gear box. The motor does not have a replaceable oil seal.

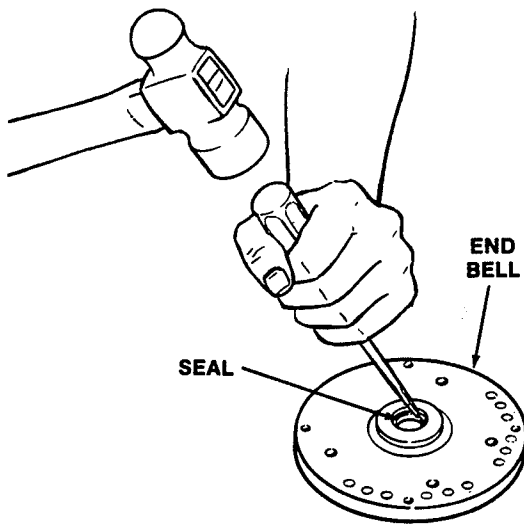


Figure 63. Removing Seal from End Bell

7.5 COMPRESSOR REMOVAL

After the ELECTRICAL SUPPLY HAS BEEN DISCONNECTED, and the panels have been removed (7.1), the compressor can be removed by performing the following procedures:

1. Remove the compressor terminal cover by inserting a standard screwdriver under the terminal cover retaining clip from the left side of the freezer and gently pry off (Fig. 64).

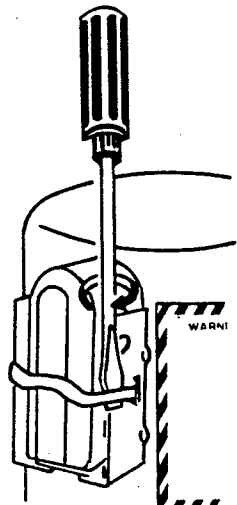


Figure 64. Compressor Terminal cover

2. Identify and remove the three wires from inside the compressor electrical box (Fig. 65).

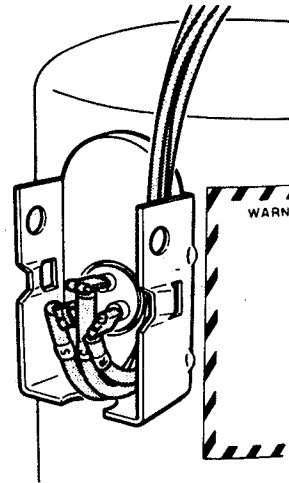


Figure 65. Compressor Connections

3. Blow refrigerant charge and leave a port open to prevent pressure build-up during compressor removal.
4. Remove six inches of insulating tubing on the suction line going to the compressor and unsweat the suction and discharge line from the compressor.
5. Remove the four nuts and washers from the base of the compressor.
6. Remove the compressor through the left side of the freezer.
7. Remove the four rubber compressor mounts from the old compressor.

NOTE

Rubber mounts are not always furnished with replacement compressors.

8. Check the compressor for a burn-out condition using an acid test kit. **If acid is found, clean out the system per the compressor manufacturer's instructions.**
9. Plug all open ports of the old compressor.

NOTE

A compressor returned to the company with any open ports will void the warranty. **ALWAYS** plug any open ports on a compressor that has been removed.

7.6 COMPRESSOR INSTALLATION

After the ELECTRICAL SUPPLY HAS BEEN DISCONNECTED, all panels have been removed, and the old compressor has been removed, the replacement compressor can be installed by performing the following procedures:

1. Before the replacement compressor can be installed the entire refrigeration system must be thoroughly purged.



CAUTION

IF ACID HAS BEEN FOUND IN THE SYSTEM, CLEAN OUT PER COMPRESSOR MANUFACTURER'S INSTRUCTIONS.

2. Install the four rubber compressor mounts on the replacement compressor.
3. Remove all plugs from the replacement compressor.
4. Install the replacement compressor into the freezer, fitting the base over the four studs.
5. Install the four washers and nuts onto the studs and tighten securely.
6. Leaving a port open to prevent pressure build-up, braze the suction and discharge line to the compressor.
7. Connect the wires in the compressor electrical box and install the electrical box cover and retainer.
8. Purge and evacuate the refrigeration system to 50 microns of mercury for approximately 30 minutes.
9. Break the vacuum to (0 P.S.I.G.) through the low side Schrader valve with R-502.
10. Remove the old filter drier and install a new filter drier using the appropriate brazing material (Fig. 66).
11. Purge and evacuate the refrigeration system to 50 microns of mercury for approximately 30 minutes.
12. Accurately charge the system with R-502 per the amount indicated on the specifications tag located on the top front of the right side panel.
13. Leak check all fittings and connections.
14. Replace the six inches of insulating tubing to the suction line.

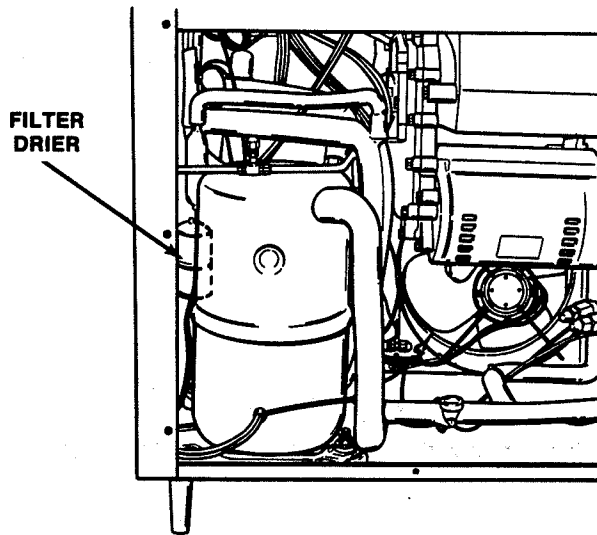


Figure 66. Filter Drier

7.7 DRIVE MOTOR OIL SEAL INSTALLATION

Should installation of a new oil seal be necessary, perform the following procedures:

NOTE

Gear box must be assembled and installed onto the drive motor before the drive motor is installed into the freezer.

1. Place the end bell on a solid surface inside facing up.
2. Clean the seal area and remove any burrs.
3. Place the new seal in the end bell smooth side up.

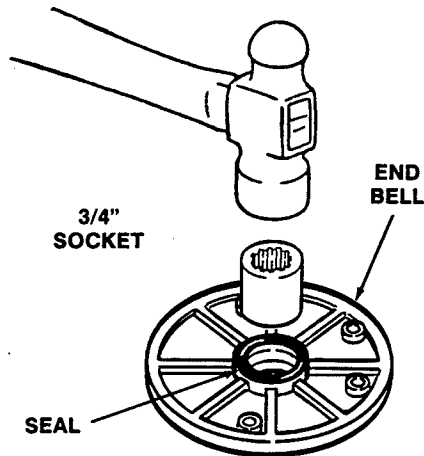


Figure 67. Installing New Seal

4. Use an object that is the same size as a 3/4" socket and a hammer to tap in the new seal. (See Fig. 67.)
5. Cover the gear portion of the drive motor shaft with masking tape and lubricate.
6. Carefully slide the end bell over the shaft and line up the reference marks.
7. Install and tighten the four bolts.
8. Remove the masking tape from the drive motor shaft.
9. Position the gear box onto the drive motor by inserting the splined driveshaft into the gear box and installing the four fastening screws. Tighten securely. (See Fig. 68.)

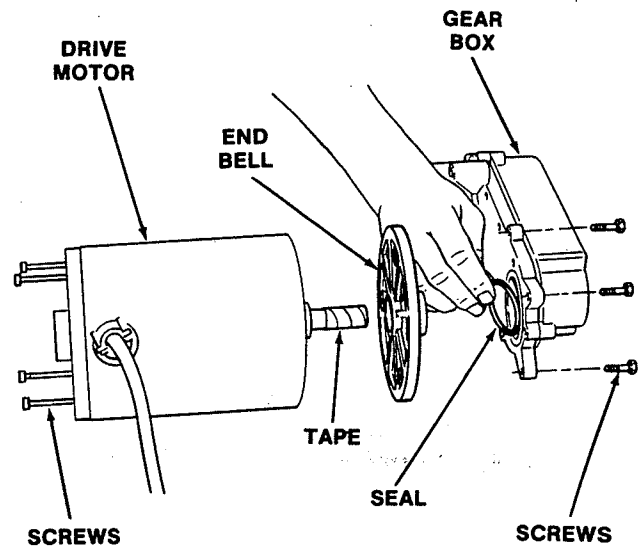


Figure 68. Gear Box and Seal

7.8 DRIVE MOTOR INSTALLATION

After the ELECTRICAL SUPPLY HAS BEEN DISCONNECTED, and the side panels have been removed, the drive motors can be replaced by performing the following procedures:

1. Position the replacement drive motor into the freezer through the side so the gear box drive lug fits into the opening in the rear of the evaporator.
2. Install the three socket head screws into the drive motor gear box and tighten securely (Fig. 69).

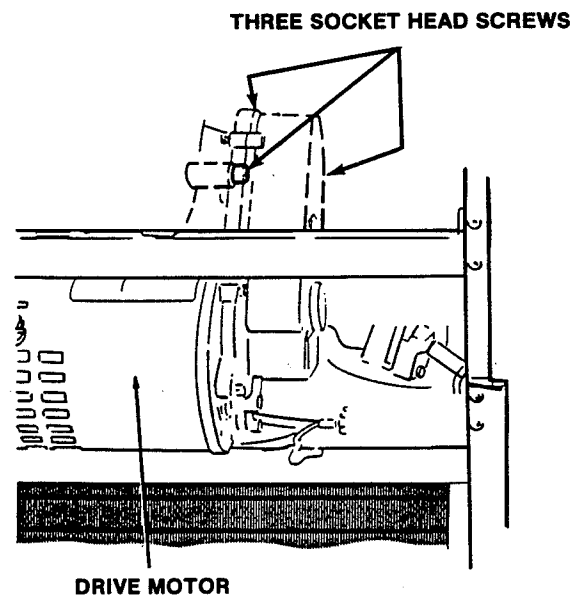


Figure 69. Drive Motor and Gear Box

3. Slide the retaining bracket over the front of the drive motor and past the wire assembly. Tighten snugly.
4. Connect the drive motor wire assembly to the electrical control box at the proper Molex connector.

7.9 CONDENSER FAN MOTOR INSTALLATION

After the ELECTRICAL SUPPLY HAS BEEN DISCONNECTED, and all panels have been removed, the fan motor can be installed by performing the following procedures:

1. Install the fan motor through the side of the freezer (Fig. 70) and position inside the wire frame with the fan blade in place.
2. Install the four hex nuts and tighten securely.
3. Connect the wires to the fan motor leading from the compressor.

7.10 FINAL ASSEMBLY OF FREEZER

Upon completion of the removal and installation of any or all of the major components of the freezer, the panels can be replaced by performing the following procedures:

1. Position the back panel into place and install the six Phillips head screws through the back panel and tighten securely.
2. Position the louvered right side panel into place and install the Phillips head screw through the bottom of the side panel and tighten securely.
3. Position the left side panel into place and install the Phillips head screw through the bottom of the side panel and tighten securely.
4. The freezer electrical supply can now be connected.

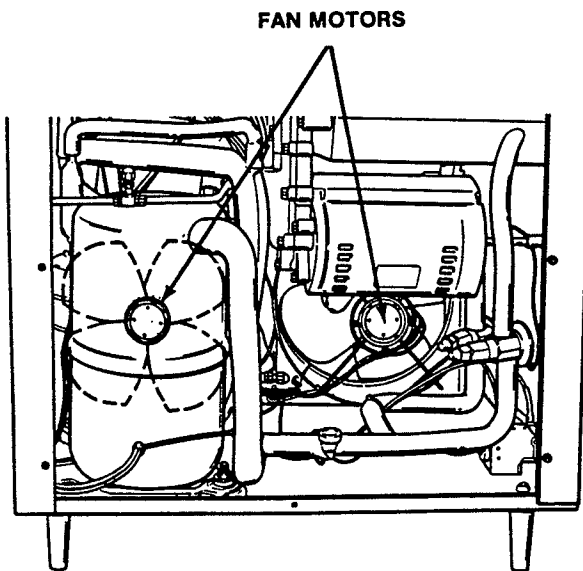


Figure 70. Fan Motor Installation

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SECTION 8 TROUBLESHOOTING

Troubleshooting can be difficult. The TROUBLESHOOTING INDEX on the preceding page gives a list of possible problems. To make a repair to a problem, Make reference to the cause and correction on the page indicated.

This list of problems, causes and corrections will only give an indication of where a possible problem can be and what repairs are needed. Normally, more or other repair work is needed beyond the recommendations in the list.

Remember that a problem is not normally caused by only one part, but by the relation of one part with other parts. This list is only a guide and can not give all possible problems and corrections. The technician must find the problem and its source, then make the necessary repairs.

In the event the Troubleshooting Guide does not help to correct the service problem, the factory Service Department should be contacted. Write or call:

**STOELTING, INC.
P.O. BOX 127
KIEL, WISCONSIN 53042-0127**

**Tele: 414-894-2293
(800-558-5807)
TWX: 510-388-9511**

8.1 FREEZER WILL NOT START

Cause	Correction
Freezer is unplugged	Plug in freezer.
Blown fuse or tripped circuit breaker in building	Check for blown fuse or tripped circuit breaker in building and replace.
Transformer fuses on power board are blown	Check fuses.
CLEAN-OFF-ON switch has a loose wire or is defective	Check, repair or replace switch.

8.2 COMPRESSOR WILL NOT START

Cause	Correction
Line disconnect, switch open	Close start or disconnect switch.
Overload protector tripped	Will reset after cooling.
Compressor contactor failure	Replace contactor.
Wiring improper or loose	Check wiring against diagram.
High pressure cutout tripped	Reset high pressure cutout.

8.3 COMPRESSOR WILL NOT START - HUMS BUT TRIPS ON OVERLOAD PROTECTOR

Cause	Correction
Improperly wired	Check wiring against diagram.
Low voltage to unit	Determine reason and correct.
Start capacitor defective	Replace start capacitor
Relay failing to close	Determine reason and correct. Replace relay if necessary.
Compressor motor has a winding open or shorted	Replace compressor.
Internal mechanical trouble in compressor	Replace compressor.

8.4 COMPRESSOR STARTS, BUT DOES NOT SWITCH OFF OR START WINDING

Cause	Correction
Improperly wired	Check wiring against diagram.
Low voltage to unit	Determine reason and correct.
Relay failing to open	Determine reason and correct. Replace relay if necessary.
Run capacitor defective	Determine reason and replace.
Excessively high discharge pressure	Check for restrictions.
Compressor motor has a winding open or shorted.	Replace compressor.
Internal mechanical trouble in compressor	Replace compressor.

8.5 COMPRESSOR STARTS AND RUNS, BUT SHORT CYCLES ON OVERLOAD PROTECTOR

Cause	Correction
Low voltage to unit	Determine reason and correct.
Run capacitor defective	Replace run capacitor.
Excessive discharge pressure	Check ventilation, restrictions in cooling medium, restrictions in refrigeration system.
Suction pressure too high	Check for overcharge. Adjust or replace expansion valve.
Compressor too hot - return gas hot	Check refrigerant charge (fix leak), add refrigerant if necessary.
Compressor motor has a winding shorted	Replace compressor

8.6 COMPRESSOR START CAPACITOR OPEN, SHORTED OR BLOWN

Cause	Correction
Relay failure	Replace relay.
Prolonged operation on start cycle due to low voltage to unit	Determine reason and correct.
Prolonged operation on start cycle due to improper relay	Replace relay.
Excessive short cycling	Determine reason and correct.
Improper capacitor	Determine correct size and replace.
Loose wires	Locate and correct.

8.7 COMPRESSOR RUN CAPACITOR OPEN, SHORTED OR BLOWN

Cause	Correction
Improper capacitor	Determine correct size and replace.
Excessively high line voltage (110% of rated max.)	Contact your local power company.

8.8 COMPRESSOR RELAY DEFECTIVE OR BURNED OUT

Cause	Correction
Incorrect relay	Check and replace.
Incorrect mounting angle	Remount relay in correct position.
Line voltage too high or too low ($\pm 10\%$)	Contact your local power company.
Excessive short cycling	Determine reason and correct.
Relay being influenced by loose vibrating mounting	Remount rigidly.
Incorrect run capacitor	Replace with proper capacitor.

8.9 UNIT OPERATES LONG OR CONTINUOUSLY

Cause	Correction
Shortage of refrigerant	Fix leak, add refrigerant.
Mix in hopper too warm	Refrigerate mix before adding to hopper.
Restriction in refrigeration system	Determine location and remove.
Filter dirty	Clean or replace filter.
Dirty condenser	Clean condenser.
Bypass valve defective	Replace bypass valve.
Liquid line solenoid not opening	Check liquid line solenoid.

8.10 UNIT NOISY

Cause	Correction
Loose parts or mountings	Find and tighten.
Tubing rattle	Reform to be free of contact.
Bent fan causing vibration	Replace fan.
Fan motor bearings worn	Replace motor.
Internal compressor spring broken	Replace compressor.

8.11 DRIVE MOTOR WILL NOT RUN, BUT COMPRESSOR RUNS

Cause	Correction
Drive motor overload is tripped	Wait one hour and press drive motor reset button.
Drive motor start or run capacitor is defective	Check and replace capacitor if necessary.
Molex connector on wire harness is loose	Check, repair or replace Molex connector.
Drive motor is defective	Replace drive motor.

8.12 DRIVE MOTOR HIGH OR LOW TORQUE ERROR (FREEZER SHUTS DOWN WHEN RUNNING)

Cause	Correction
Spigot handle is not closed completely	Close spigot completely after dispensing.
Mix inlet regulator is plugged	Unplug, using small sanitized brush.
Consistency setting is too firm	Adjust consistency potentiometer on program module.
Refrigerant is low or leaking	Check refrigerant charge. Add if necessary.
Spigot switch has a loose wire or is defective	Check spigot switch and repair or replace.
PUSH TO SERVE switch has a loose wire or is defective	Check switch and repair or replace.
Large voltage changes	Check supply voltage.
Interruptions in power supply	Check power supply.
Plug in relay defective	Replace relay.
Solenoid valve defective	Replace solenoid.
Blocked condenser	Clean condenser.

8.13 COMPRESSOR WILL NOT RUN, BUT DRIVE MOTOR RUNS

Cause	Correction
Power module defective	Replace power module
Plug in relay defective	Replace plug in relay
Contactor defective	Replace contactor
Program module defective	Replace program module
Compressor problem	Refer to subsections 8.1 through 8.9.

8.14 PRODUCT DISPENSES SLOWLY OR NOT AT ALL

Cause	Correction
No mix or warm mix in hopper	Put pre-chilled mix into hopper.
Mix inlet regulator is plugged	Unplug, using small sanitized brush.
Freezer is being overdrawn	Slow down rate of draw.
Auger flights are worn	Replace auger flights.
Auger flights spring is missing	Replace auger flight spring.
Consistency setting is too soft	Adjust consistency potentiometer.
Refrigerant is low or leaking	Check refrigerant charge. Add if necessary.
ON and OFF timers need to be adjusted	Adjust ON and OFF time potentiometers on program module.

8.15 PRODUCT IS TOO SOFT

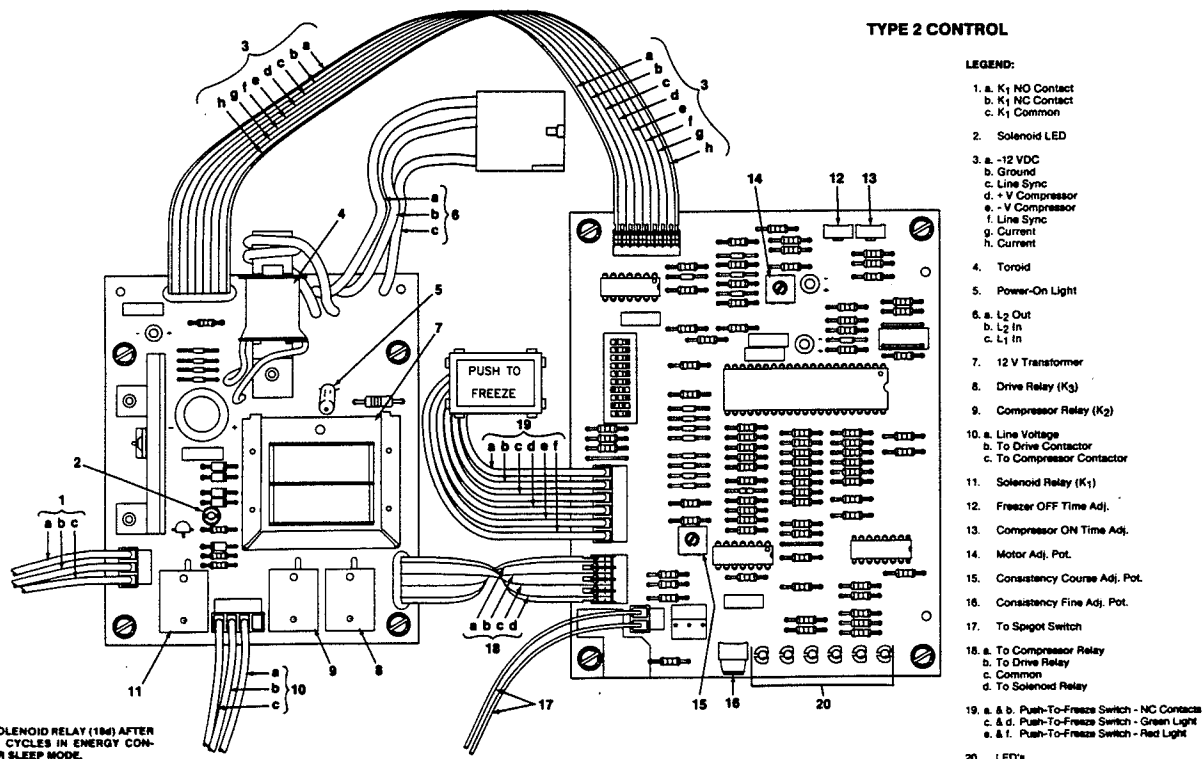
Cause	Correction
Warm mix in hopper	Use pre-chilled mix in hopper.
Ambient temperature is above 100°F (37.7°C)	Move or direct hot air away from freezer.
Freezer is being overdrawn	Slow down the rate of draw.
Condenser is dirty	Clean condenser.
Fan is stuck or motor is defective	Check, repair or replace.
Consistency setting is too soft	Adjust consistency potentiometer on program module.
Refrigerant is low or leaking	Check refrigerant charge. Add if necessary.
ON and OFF timers need to be adjusted	Adjust ON and OFF timer potentiometers on program module to factory specification.
Expansion valve is defective	Check, adjust or replace expansion valve.

8.16 HOPPER TEMPERATURE IS TOO COLD OR TOO WARM

Cause	Correction
Warm mix in hopper	Use pre-chilled mix in hopper.
E.P.R. valve needs adjusting	Make appropriate adjustment.
ON and OFF timers need to be adjusted	Adjust ON or OFF time potentiometer on program module to factory specification.
Refrigerant low or leaking	Check refrigerant supply. Add if necessary.

8.17 LOW OVER-RUN

Cause	Correction
Legs are loose or freezer is not level	Check legs, level top of freezer.
Frozen mix in hopper	Do not put frozen mix in hopper.
Mix inlet regulator air tube is plugged	Unplug by using small sanitized brush.
Mix inlet regulator "O" Ring is worn or missing	Check and replace if necessary.
Mix inlet regulator is being removed during freezing	Do not remove mix inlet regulator during freezing.
Little or no usage	Clean freezer, use new mix.
Freezer is being overdrawn	Slow down the rate of draw.
Auger flights are worn	Replace auger flights.
Auger flight spring is missing	Replace auger flight spring.



8.18 QUICK REFERENCE SPECIFICATIONS GUIDE

On Time	18-22 seconds real time or in test mode
Off Time	12 minutes real time @ 70°F (21.1° C) ambient temperature or 52-56 seconds in test mode @ any ambient temperature, 68-72 seconds "O" model.
Hopper Pressure (E.P.R.)	59-61 P.S.I.G.
Low Side Pressure (Soft Serve)	16 to 20 P.S.I.G. @ 75°F (23.88° C) ambient temperature
High Side Pressure	215-220 P.S.I.G. @ 75°F (23.88° C) ambient temperature
Voltage (2131)	208 or 230 VAC*
Voltage (2131-302)	208 or 230 and 220/240 VAC*
Amperage (Running)	16 Amps
*A transformer is required if voltage is over 250 volts or under 200 volts.	

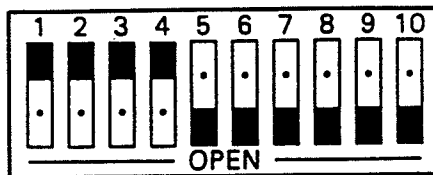


Figure 71.
Factory Programmed Dip Switch System
(Dark Side is Activated Side)

The Model 2131 freezer is a twin twist freezer that is designed to be used with both barrels in operation. If the customer desires to use one barrel because of low volume, such as over the winter months, one of three options may be used. Option two and three must be performed by a Stoelting authorized serviceman.

1. **CLEANING.** Clean the freezer daily and fill with fresh mix.
2. **ADJUST PROGRAM BOARD.** Adjust every other dip switch one through eight to the ON position (closed). NOTE: This adjustment will contribute to product breakdown requiring the customer to purge the barrel every morning.

3. **ADJUST PROGRAM BOARD.** Set the ON time to 30 seconds and the OFF time to 47 seconds in the test mode on the side to be used.



CAUTION

ANY ADJUSTMENTS MADE TO THE PROGRAM BOARD MUST BE RETURNED TO ORIGINAL FACTORY SPECIFICATIONS BEFORE RESUMING NORMAL OPERATION USING BOTH BARRELS. FAILURE TO DO SO WILL CAUSE FREEZING PROBLEMS. IF YOU HAVE ANY QUESTIONS CONCERNING THIS MATTER, PLEASE WRITE OR CALL OUR SERVICE DEPARTMENT.

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NOTE

The parts and wiring diagrams illustrated on the following pages represent current models only at the time of printing this manual.

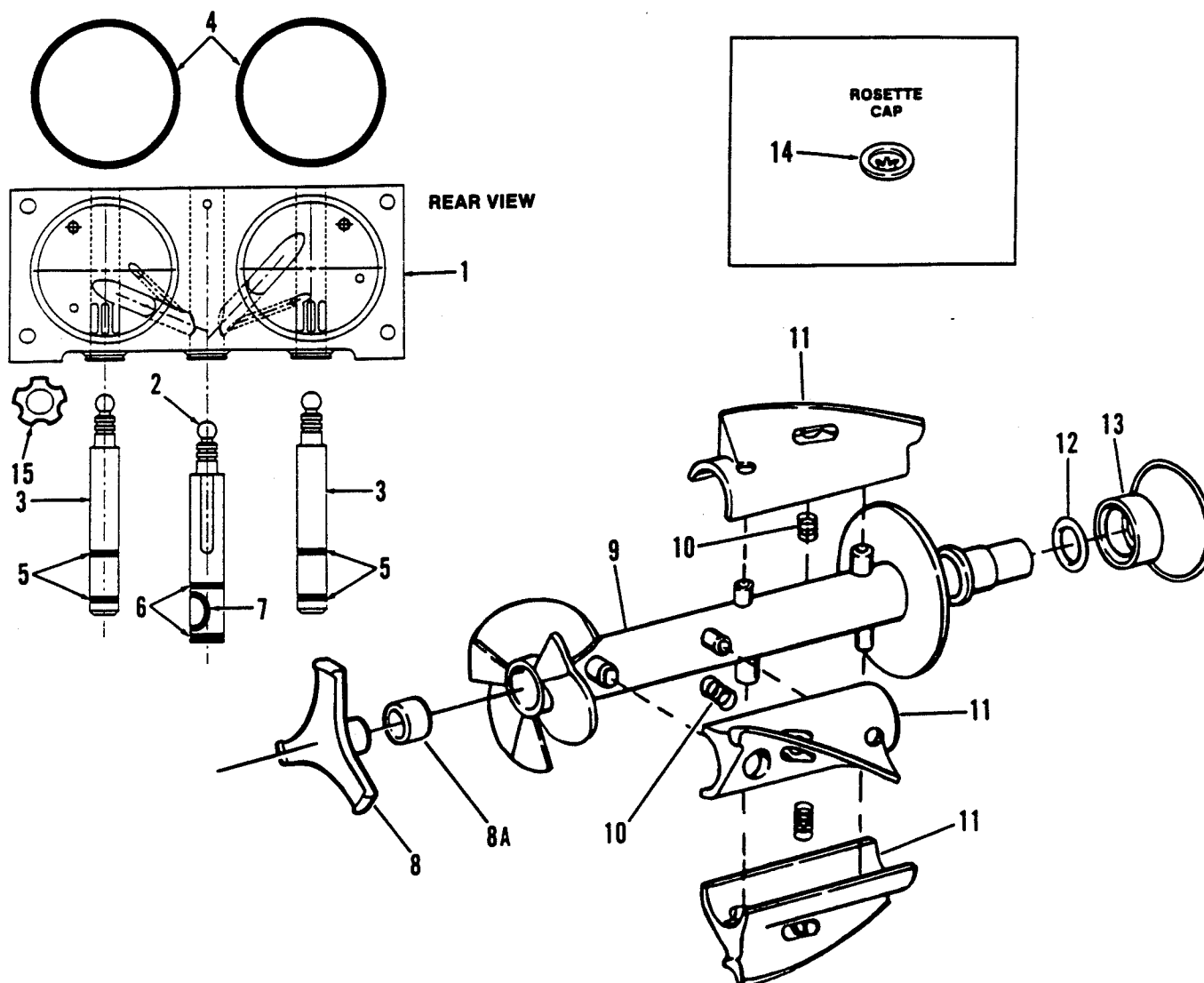
For your convenience, a wiring diagram decal has been affixed to the electrical box or electrical box cover for your model.

If the wiring decal on your model is missing or has been damaged please contact the Stoelting, Inc. Service Dept. for a replacement.

9.1 HOW TO ORDER PARTS To assure receipt of the proper replacement parts, supply your dealer or distributor with the following information:

- A. Model number of equipment.
- B. Serial number of model, stamped on nameplate.
- C. Part number, part name and quantity needed. Common part names and numbers are listed in this manual.

9.2 SPIGOT, FRONT DOOR AND AUGER ASSEMBLY



Part Number	Ref. No.	Description	Qty.
2158068	1	Front Door Only	1
3158086	2	Center Spigot	1
3158085	3	Outside Spigot	2
625133	4	"O" Ring Front Door	2
624600	5	"O" Ring Outside Spigot	4
624614	6	"O" Ring Center Spigot	2
624664	7	"O" Ring Center Spigot	1
3151923	8	Front Auger Support	1
149003	8A	Auger Bushing	1
3132189	9	Auger (2131-38 A & B) - Rec. Drive	1
4151828	9	Auger (2131-38 C & D) - Hex Drive	1
694255	10	Auger Spring	3
381804	11	Auger Flight	3
624678	12	"O" Ring Shaft Seal (1147669, 5 Pack)	1
666786	13	Inner Auger Seal	1
232732	14	Rosette Cap	1
482019	15	Circular Knob	4

Figure 72. Spigot, Front Door and Auger Assembly

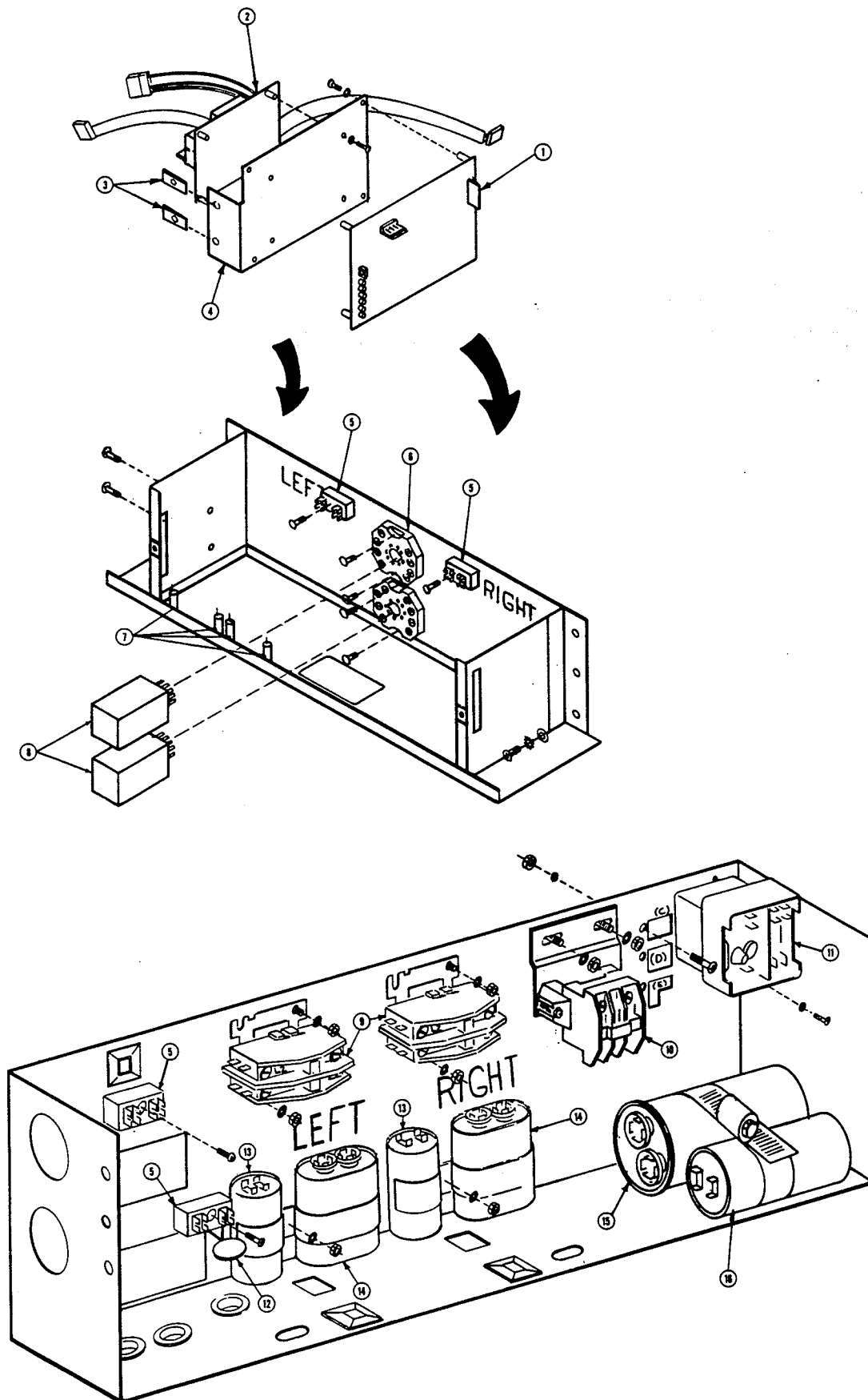


Figure 73. Electrical Assembly

9.3 ELECTRICAL ASSEMBLY

Part Number	Ref. No.	Description	Qty.
521719	1	Program Module	2
521720	2	Power Module (Ser. #0-3477)	2
521721	2	Power Module (Ser. #3478 & Up)	
538928	3	Tinnerman Clips	2
3140465	4	Control Bracket	1
732010	5	Terminal Block	4
688058	6	Relay Socket	2
718186	7	Spigot Switch	5
618160	8	Relay - Plug In	2
295017	9	Drive Contactors	2
295005	10	Compressor Contactor	1
618136	11	Relay Motor Start - Tecumseh	1
618142	11	Relay Motor Start - Copeland	1
618143	11	Relay - Bristol	
1141400	12	Varistor	1
231045	13	Capacitor Start - Drive	2
231062	14	Capacitor Run - Drive	2
231044	15	Run Capacitor - Bristol	
231057	15	Capacitor Run - Tecumseh/Copeland	1
231058	16	Capacitor Start - Copeland	1
231050	16	Start Capacitor - Bristol	
231022	16	Capacitor Start - Tecumseh	1

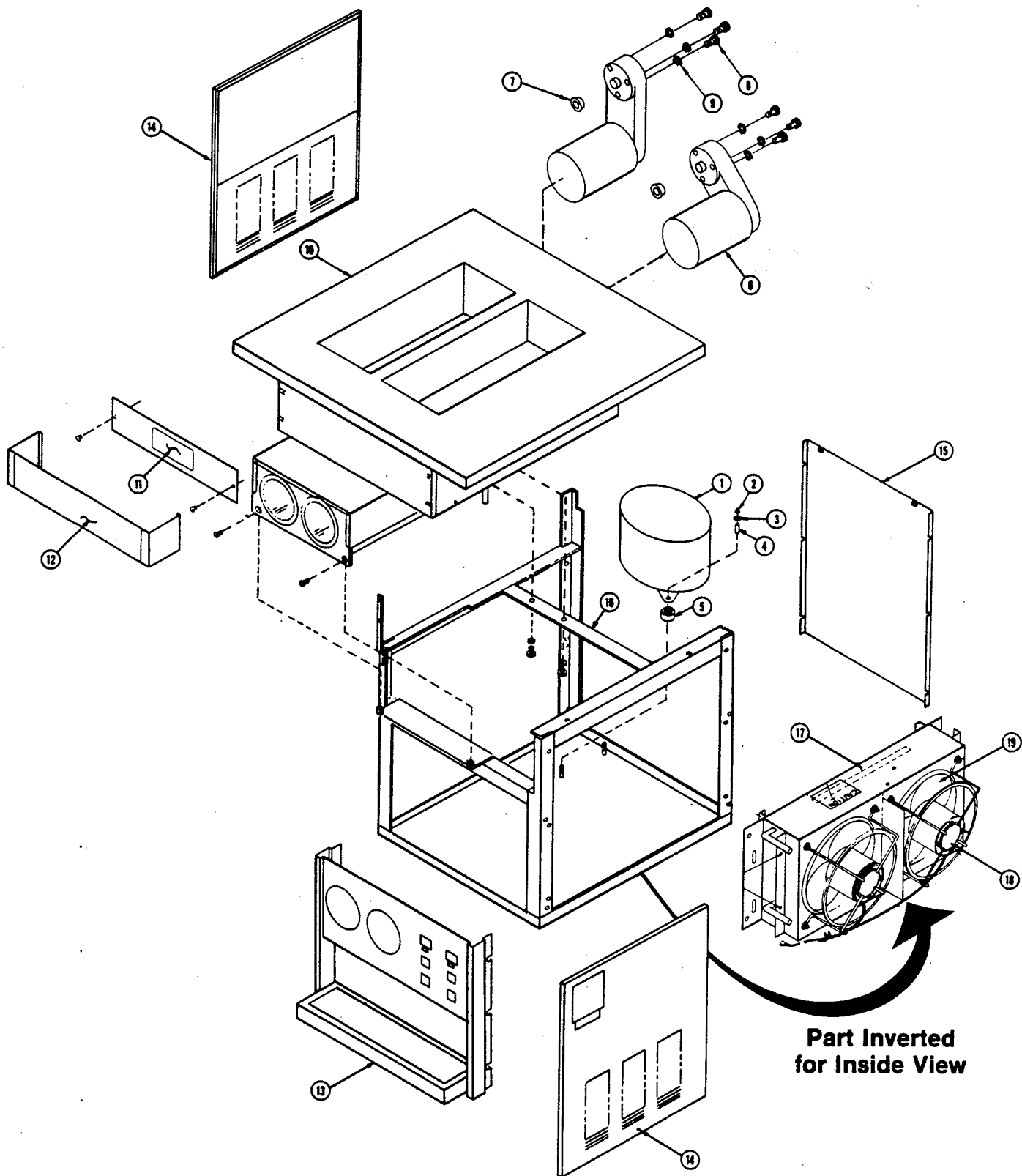


Figure 74. Exploded View

9.4 PARTS LIST

Part Number	Ref. No.	Description	Qty.
282378-01	1	Compressor - Copeland	1
282406-01	1	Compressor - Tecumseh	1
282412-01	1	Compressor - Bristol	1
538351	2	Nut	4
766483	3	Washer	4
684019	4	Sleeve	4
422062	5	Grommet	4
2149285*	6	Gear Motor Assembly (2131-38 A & B)	2
2151855	6	Gear Motor Assembly (2131-38 C & D)	
666789	7	Seal Rear Evaporator (2131-38 A & B)	2
666793	7	Seal Rear Evaporator (2131-38 C & D)	
644604	8	Screw Socket	6
766982	9	Washer Shake Proof	6
4144322	10	Hopper and Evaporator (2131-38 A & B)	1
4151823	10	Hopper and Evaporator (2131-38 C & D)	
324388	11	Decal	1
1144389	12	Decal Header Panel	1
4151671	13	Front Shroud Weldment	1
2149020	14	Side Panel	1
2151908	14	Side Panel - LH (2131-38 C & D)	
2149072	15	Back Panel	1
4152622	16	Frame Weldment	1
284043	17	Condenser - Air	1
522285	18	Fan Motor - Condenser	2
162067	19	Fan Blade	2
NOT SHOWN			
615204		Refrigerant (R-502)	18 oz.
M820322		Adhesive (Armstrong 520)	AR
524091		Cable Tie Mount	1
739016		Ty-Rap, 5-1/2"	1
368102		Condenser Filter	1
508044		Lube Kit, Gear Box - V.W.	1
508135		Petro-Gel	1
1106373		Spline Lube	1
417006		Grid - Drip Tray	1
744225		Front Tray without Logo	1
2149243-01		Mix Inlet Regulator	1
324105		Decal - Danger	1
324141		Decal - Caution, Rotating Blades	1
324234		Decal - Adequate Ventilation	1
208135		Brush, 4" dia.	1
208381		Brush, 3/8" dia.	1
208401		Brush, 1" dia.	1
208467		Brush, 5/16" dia.	1
232732		Rosette Gap	1
508045		Lube Kit, Gear Box - Groove	
284041		Condenser - Water (2131-18)	
763181		Water Valve (2131-18)	
522812		Fan Motor - Comp. Cool (2131-18)	
162060		Fan Blade - Comp. Cool (2131-18)	
670004		Oil Seal Leason End bell (2149285)	

AR = As Required

* When ordering specify gear box manufacturer

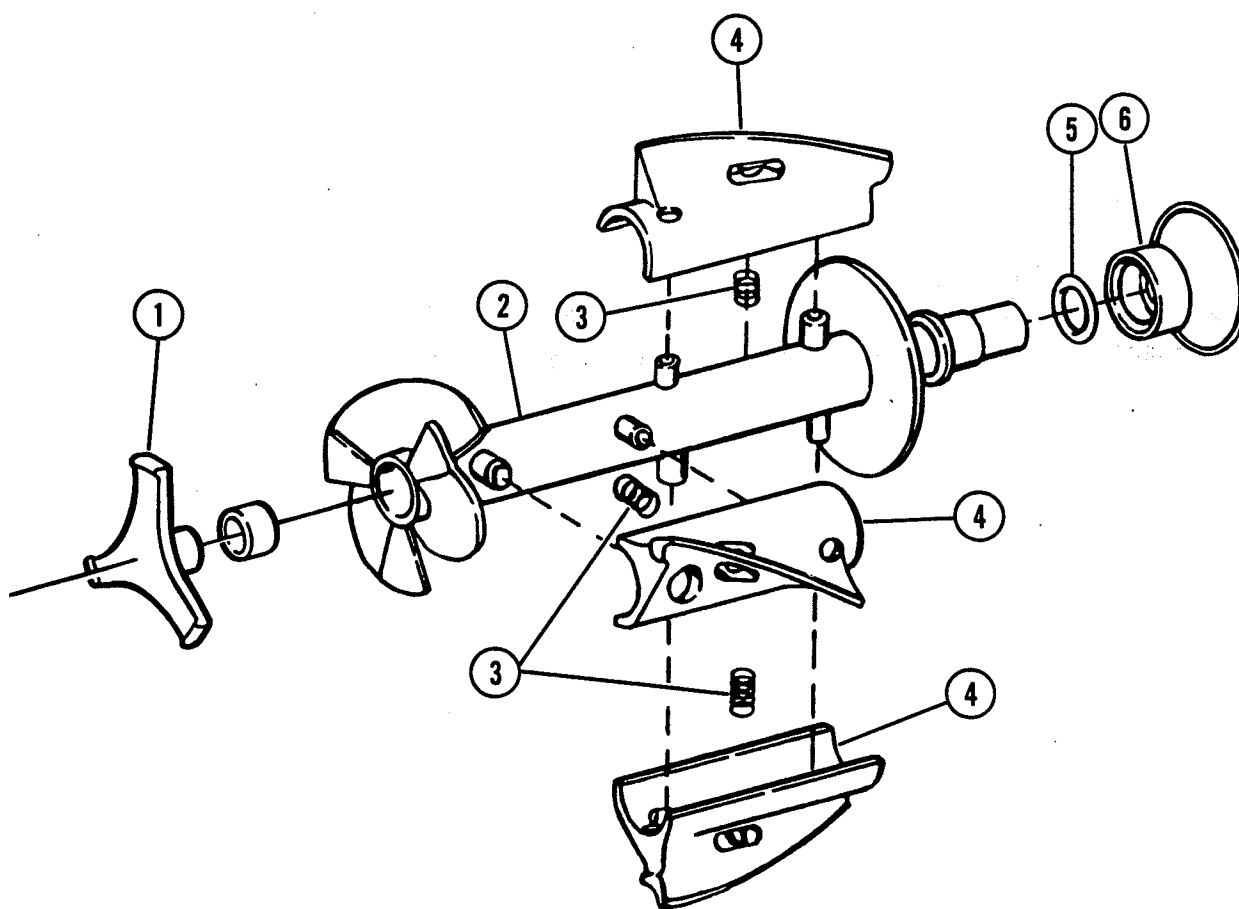
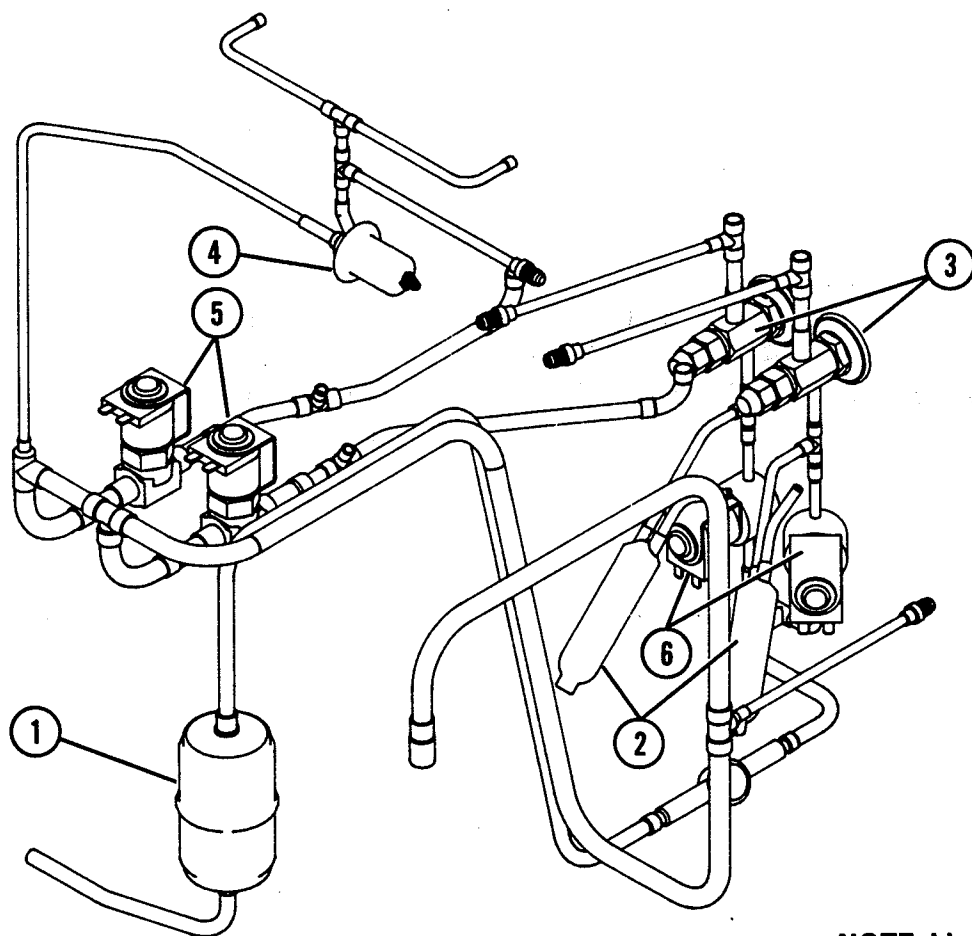


Figure 75. Auger Shaft Assembly

9.5 AUGER SHAFT ASSEMBLY

Part Number	Ref. No.	Description	Qty.
3151923	1	Front Auger Support	1
149003		Auger Bushing	
3132189	2	Auger (2131-38 A & B) - Rec. Drive	1
4151828	2	Auger (2131-38 C & D) - Hex Drive	1
694255	3	Auger Spring	3
381804	4	Auger Flight	3
624678	5	"O" Ring, shaft seal area (1147669 5-Pack)	1
666786	6	Inner Rear Seal	1



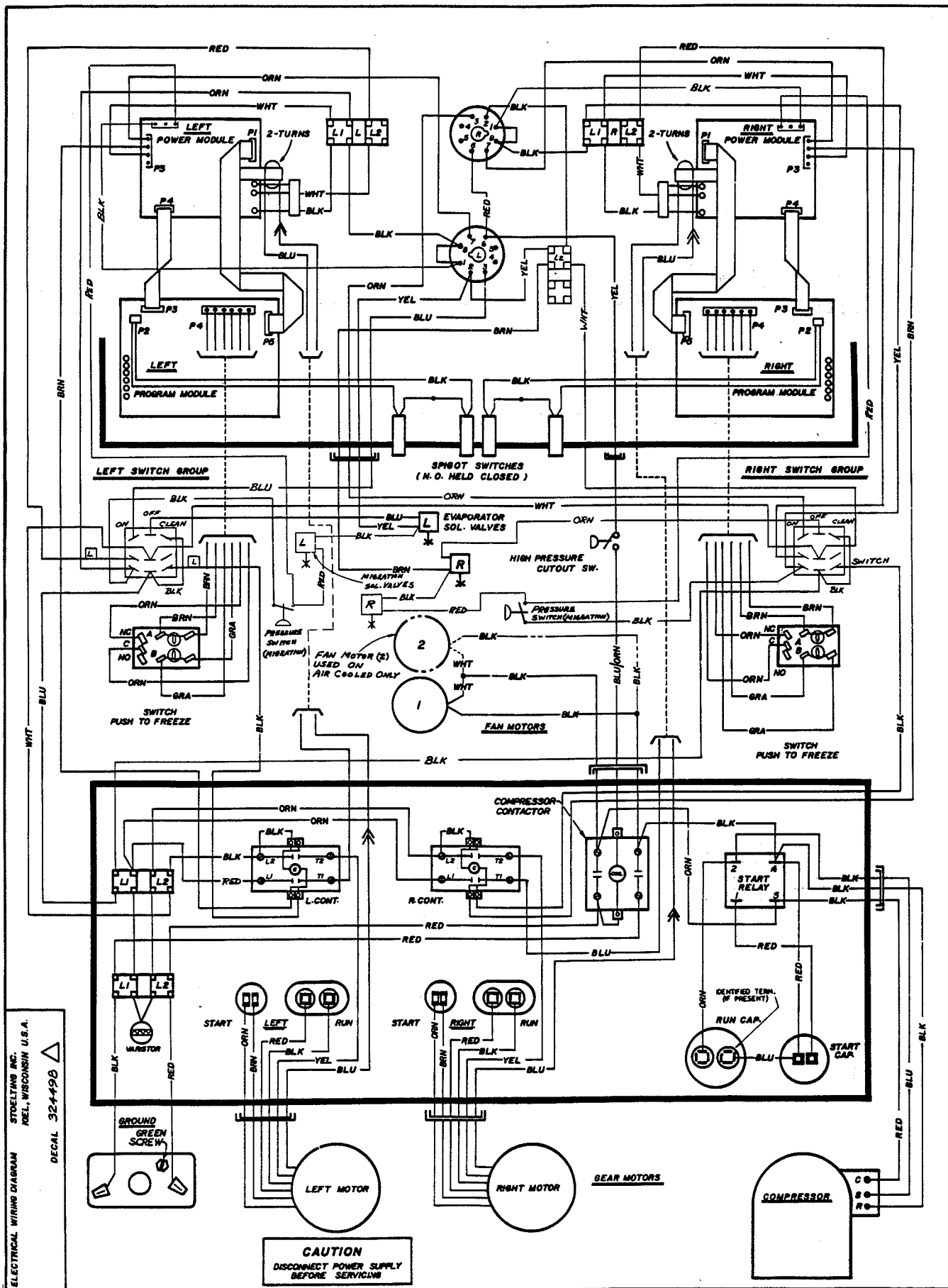
NOTE: Liquid line solenoids are used on the Model 2131C only.

Figure 76. Refrigeration Assembly

9.6 REFRIGERATION ASSEMBLY

Part Number	Ref. No.	Description	Qty.
342023	1	Dryer	1
342021	2	Dryer	2
762410	3	Expansion Valve	2
762956	4	EPR Valve	1
763423	5	Solenoid Valve	2
763422	6	Solenoid Valve	2

Figure 76. Model 2131C Wiring Diagram
208/230V, 1 Phase, 60 Hz



ELECTRICAL WIRING DIAGRAM
STOLTEMAN INC.
MEL, WISCONSIN U.S.A.

DECAL 324498