




**Model F431**

**OWNER'S MANUAL**


Manual No. 513604 Feb. 2005, Rev. 1



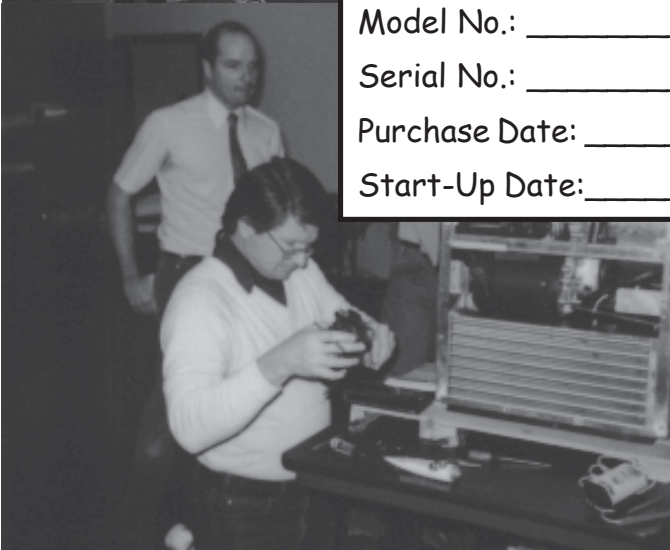
# Need Parts or Service?



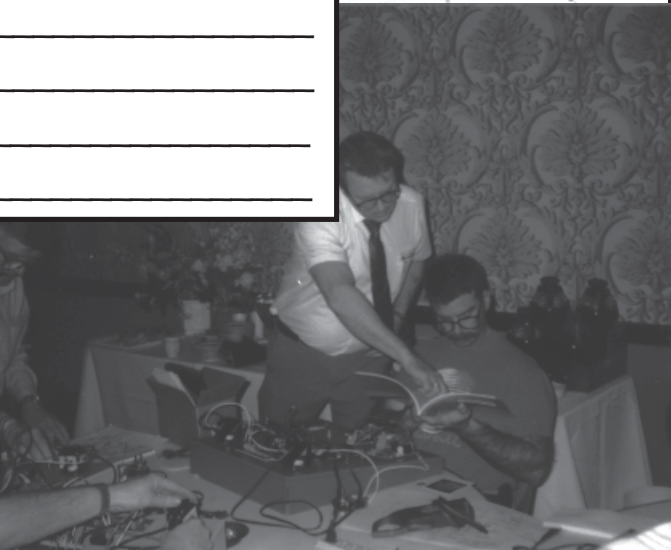
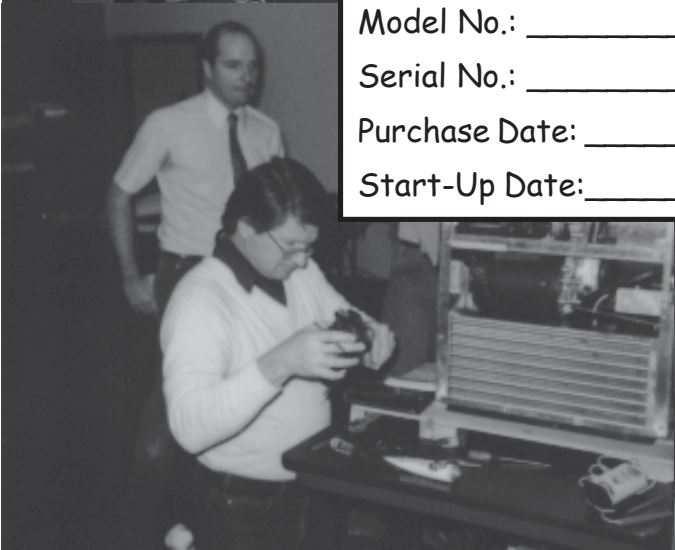
We stock the parts you need.  
Our Technicians are factory trained and are certified in the Stoelting Technicare program.



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Model No.: \_\_\_\_\_  
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Start-Up Date: \_\_\_\_\_





STOELTING® OWNER'S MANUAL  
FOR  
MODEL F431  
CAB MODEL SOFT-SERVE PRESSURIZED FREEZER

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

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

**DO NOT ATTEMPT** to operate the freezer 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 freezer, contact the company at the location listed below.

**STOELTING, LLC**  
502 Hwy 67  
Kiel, WI 53042-1600

**Tele: 920-894-2293**

**Fax: 920-894-7029**



## ***A Few Words About Safety***

### **Safety Information**

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

This Owner's 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.

### **NOTICE**

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





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## SECTION 1 INTRODUCTION

### 1.1 DESCRIPTION

The Stoelting F431 floor model freezer is pressure 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.

This manual is designed to assist qualified personnel and operators in the installation, operation and maintenance of the Stoelting Model F431 pressure freezer.



Figure 1. Model F431 Freezer

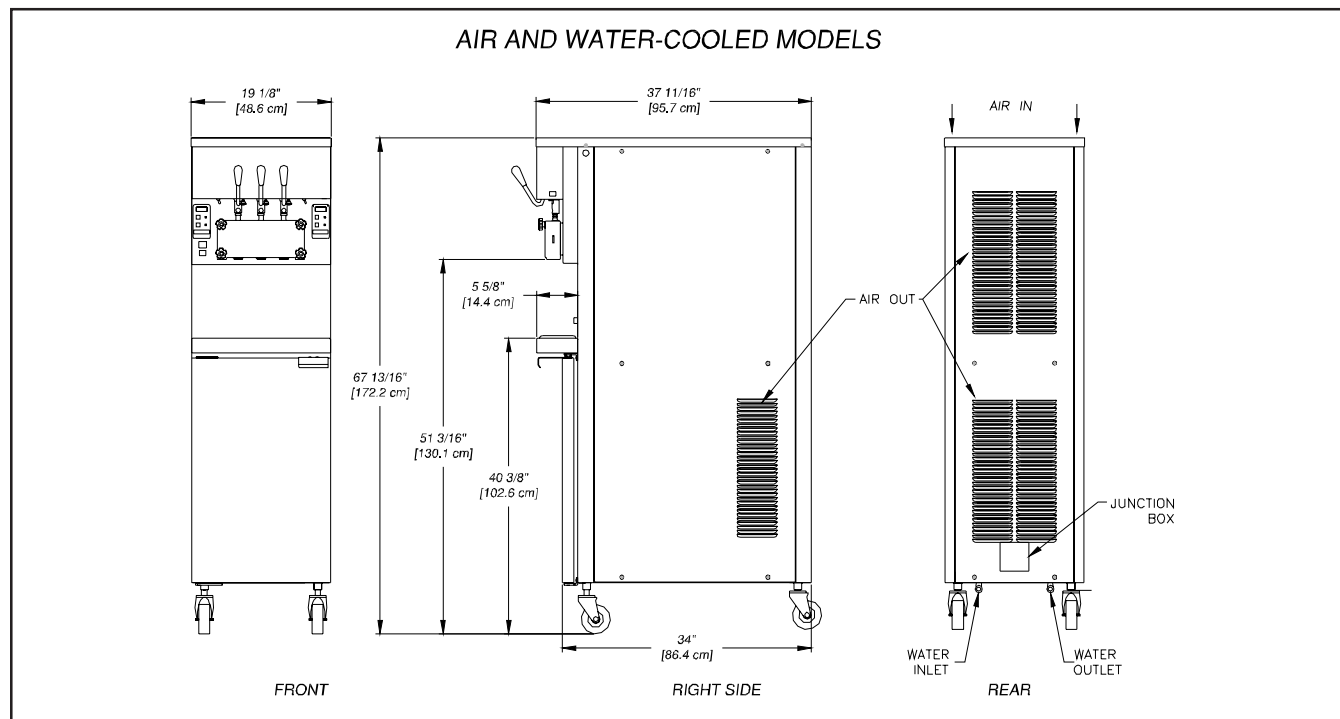


Figure 2. Specification

## 1.2 SPECIFICATIONS

	<b>MODEL F431</b>
<b>DIMENSIONS</b>	Width: 19 1/2" (49,5 cm)    Depth: 38 1/4" (97,1cm)    Height: 67" (170,2 cm)
<b>WEIGHT</b>	500 lbs. ( 226,8 kg)                      650 lbs. w/Crate ( 294,8 kg)
<b>ELECTRICAL</b> (2 separate power sources required.)	30 Amp maximum fuse or HACR circuit breaker.
<b>REFRIGERANT</b>	R404A
<b>COMPRESSOR</b>	11,000 B.T.U.H.
<b>DRIVE MOTOR</b>	(2) 3/4 HP each
<b>COOLING</b>	Air cooled. In top, out back and sides. Requires 6" (16cm) back clearance, 3" (8cm) left and right side clearance and 20" (51cm) top clearance.

## SECTION 2 INSTALLATION INSTRUCTIONS

### 2.1 SAFETY PRECAUTIONS

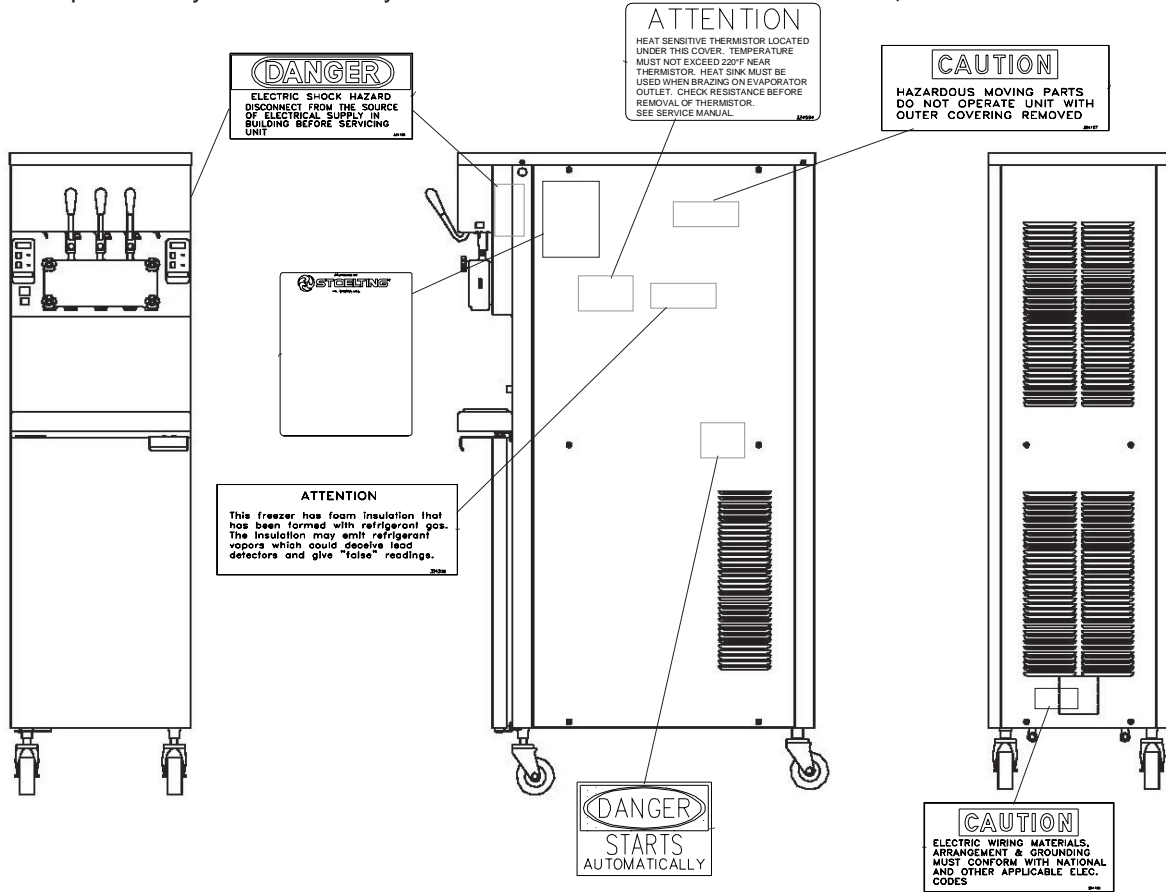
Do not attempt to operate the freezer until the safety precautions and operating instructions in the manual are read completely and are thoroughly understood.

Take notice of all warning labels on the freezer (see Figure 2). The labels have been put there to help you 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 have not been

painted over, rubbed off, fallen off, and can be recognized as warning labels.

If you are in need of replacement labels, indicate the part number, type of label, location of label, and quantity required along with your name and address and mail to:

**Stoelting, LLC**  
**Commercial Products**  
**502 Hwy. 67**  
**Kiel, WI 53042**



**Figure 3. Warning Label Locations**

ITEM	STOELTING PN	QTY		DESCRIPTION
		-03	-04	
1	324801	2	2	DECAL - MIX LOW
2	324798	2	2	DECAL CLEAN-OFF-SERVE SWITCH
3	324141	1	1	DECAL CAUTION-ROTATING BLADES
4	723526	1	1	TAG READ MANUAL & ALL DECALS
5	324346	3	3	DECAL HAZARDOUS MOVING PARTS
6	324393	1	1	DECAL STOELTING SWIRL LOGO
7	324800	1	1	DECAL - CAB ON/OFF
8	324799	2	2	PUMP ON/OFF
9	324208	2	2	DECAL REFRIG LEAK CHECK
10	324509	1	1	DECAL CLEANING (SS & SHAKE)
11	324103	2	2	DECAL CAUTION-ROTATING SHAFT
12	324686	4	4	DECAL DANGER AUTOMATIC START
13	324107	2	2	DECAL CAUTION MOVING PARTS
14	324125	7	7	DECAL ELECT SHOCK HAZARD
15	324151	2	2	DECAL FIELD CONNECTIONS
16	324198	-	2	DECAL ATTENTION INSTALLER
17	130000	2	2	BAG, ENVELOPE FRONT LOADING
18	324584	1	1	DECAL, ADEQUATE VENTILATION (3")
19	324158	2	2	DECAL COPPER CONDUCTORS ONLY
20	324106	2	2	DECAL CAUTION WIRING MAT'L
21	324107	4	4	DECAL CAUTION MOVING PARTS
22	324566	2	2	DECAL - WIRED ACCORDING TO
23	324015	-	2	DECAL 2X1-1/4 BLK ON WHITE
24	723552	2	2	TAG, CAUTION - SUPPLY VOLTAGE
26	324804	1	1	DECAL - GM HEADER (STOELTING SWIRL)
26	324803	1	1	DECAL - GM HEADER (STOELTING LOGO)
26	324806	1	1	DECAL, A&W HEADER FOR U431 & 4231
27	324346	2	2	DECAL-CAUTION HAZARDOUS MOVING
28	324797	2	2	DECAL, STANDBY/SERVE SWITCH
29	324242	1	1	DECAL, TEMPERATURE CONTROL
30	324200	2	2	DECAL, MANUAL RESET
31	.	.	.	.
32	324014	2	2	DECAL, ARROW
33	314796	2	2	DECAL, FREEZING

## 2.2 SHIPMENT AND TRANSIT

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

With the method of packaging used, the equipment 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 ten days and request inspection. The customer must place claim for damage and/or shortages in shipment with the carrier. **Stoelting, Inc. cannot make any claims against the carrier.**

## 2.3 FREEZER INSTALLATION

### **! WARNING**

Installation must be performed by a qualified electrician/refrigeration specialist. Incorrect installation may cause personal injury, severe damage to the machine and will void factory warranties.

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. Install the four casters. Turn the threaded end into the freezer until zero threads are showing. To level, turn out casters no more than 1/4" maximum, then tighten all jam nuts.
- C. 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 overrun.

### **CAUTION**

#### **Risk of product damage**

Air cooled condenser requires proper ventilation. Failure to provide adequate ventilation will void factory warranties.

- D. The freezer must have a minimum of 3" (7,5cm) of space on all sides and 10" (25cm) at the top for proper circulation. A minimum of 6" (15cm) clearance is required in high ambient conditions.

## 2.4 INSTALLING PERMANENT WIRING

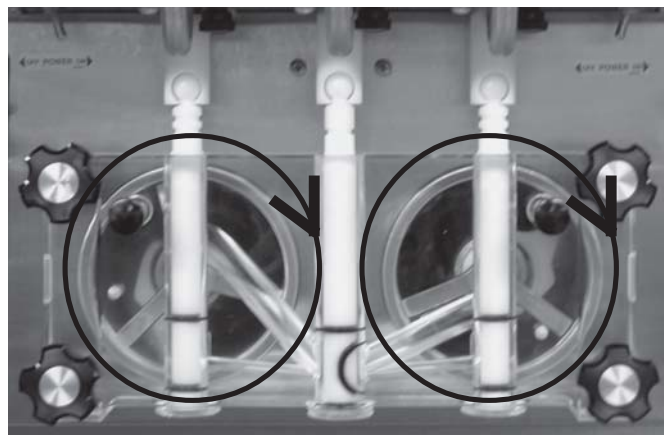
If, permanent wiring is required by local codes, the following procedure must be performed:

### **! WARNING**

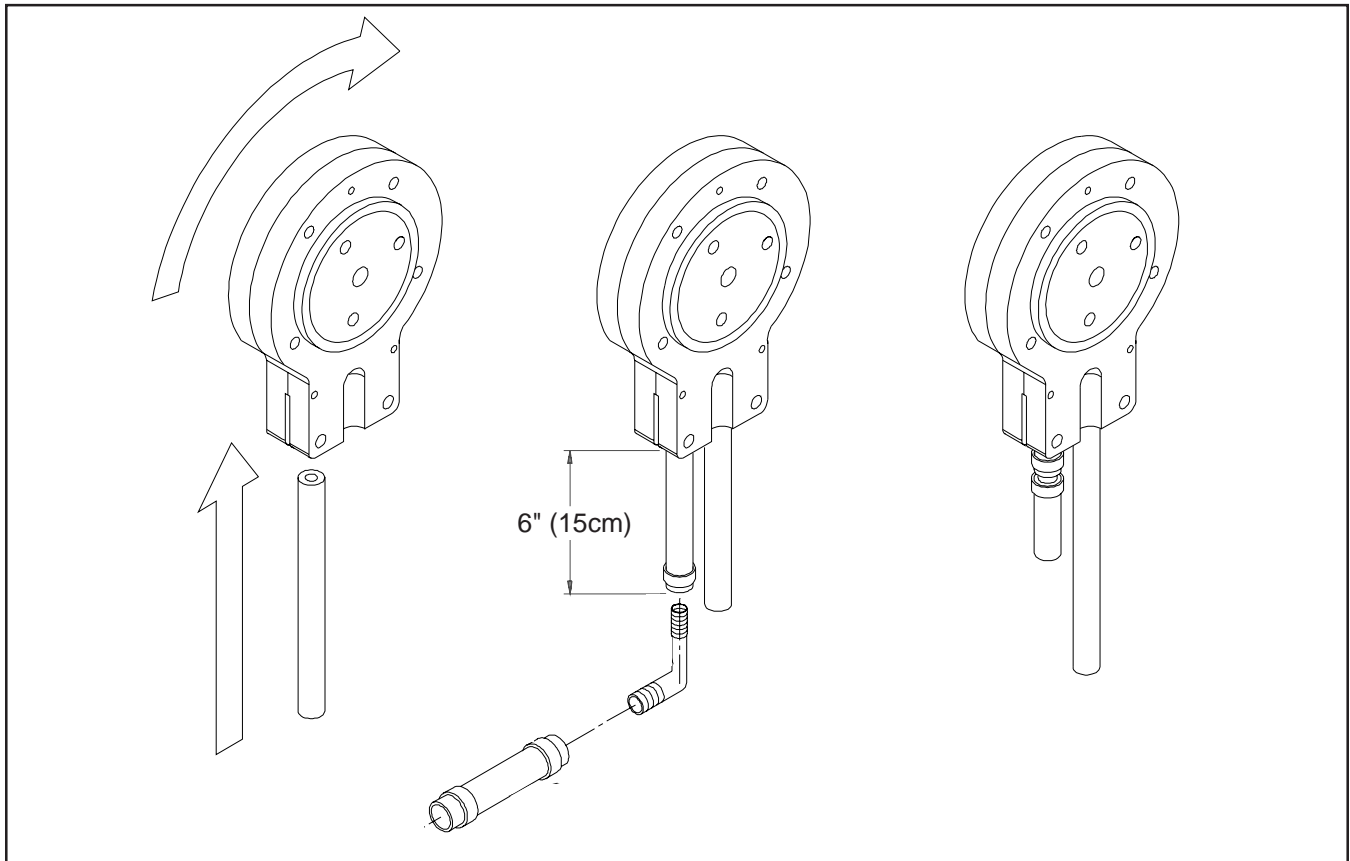
#### **Hazardous voltage**

High voltage will shock, burn or cause death. Turn off and lock out main power disconnect before installing wiring. Do not operate machine with cabinet panels removed.

- A. Refer to the nameplate at the rear of the freezer for specific electrical requirements. Make sure the power source in the building matches the freezer nameplate requirements. Bring the wires into the junction boxes through the access holes in the bottom rear of the freezer.
- B. Remove the lower back panel and the two junction box covers located at the bottom of the freezer.
- C. Install permanent wiring according to local code.
- D. Check the auger shaft rotation by placing the Main Freezer Power Switch in the ON position, placing both Freezing Cylinder OFF/ON switches in the ON position and then pressing the Clean Switch on each of the control panels. Auger shaft rotation is clockwise as viewed through the clear plastic front door. If the rotation is not clockwise, turn main electrical power OFF. Then reverse L1 and L3 electrical power lines to the junction box (three phase only). Re-check auger shaft rotation (see Figure 4).



**Figure 4. Auger Rotation**



**Figure 5. Mix Hose Installation**

## 2.5 MIX PUMP

### A. Mix Pump Hose Installation

Follow the steps below to install the mix pump hose.

1. Turn pump on.
2. Feed one end of mix pump hose into the entering or pick-up hose side (left) of black cover.
3. Gently push the hose into the black cover until it begins to feed.
4. Allow the hose to feed itself thru the pump until 6" (15cm) remains on the entering side.
5. Turn pump off.
6. Connect mix pump hose to the elbow fitting (located on the left side of the mix line manifold) using small hose clamp. Be careful not to twist the mix hose.
7. Turn pump on.
8. Allow remaining 6" (15cm) of tubing to feed thru pump until hose adapter prevents further feeding.

9. Turn pump off.

10. Connect free end of mix pump hose to 3-way Tee as shown in Figure 6. When all connections are complete the 3-way Tee must be lower than the black pump housing (see Figure 6).

### CAUTION

#### Risk of product damage

Air/mix Tee must remain below the black cover/clamp. If Tee is above the pump, mix will drain to the air compressor resulting in pump damage.

### B. Mix Pick-up Hose Installation

The F431 freezer may be connected to standard mix containers or prepacked mix bags. One, 5 gallon mix bag may be connected to each freezing cylinder or two, 2 1/2 gallon bags may be connected on each side. Follow the instructions below that match your configuration.

#### When Using One Mix Container Per Side:

1. Connect 2 inch (5cm) length of 3/8 inch (9,5mm) I.D. plastic food grade tubing to the mix pick-up assembly. Secure with hose clamps. Then place assembly thru hole in cover and install retaining clip (see Figure 6 and 7).

2. Connect free end of tubing to mix check valve. Observe direction of check valve flow arrow. Secure with hose clamp. Connect 24 inch (61cm) length of 3/8 inch (9,5mm) I.D. plastic food grade tubing to free end of check valve and secure with hose clamp.
3. Connect elbow fitting to free end of tubing. Connect opposite end of elbow to 1/4 inch I.D. tan tubing on the left side of pump head. Secure with hose clamps (see Figure 5 and 6).

**When Using Bag Connection System (BCS) with Two Bags Per Side (optional kit #2183189):**

1. Connect 3/8 inch (9,5mm) I.D. plastic food grade tubing to a bag adapter. Secure with hose clamps. This bag adapter will connect to the bag nearest the front of the freezer.
2. Slide the hose clip over free end of 3/8 inch (9,5mm) I.D. plastic food grade tubing. Attach free end of tubing to a manifold adapter. Secure with large hose clamp or equivalent. Push the manifold adapter into the left port of the mix inlet manifold and secure with retaining clip. (see Figure 9).
3. Connect 3/8 inch (9,5mm) I.D. plastic food grade tubing to a bag adapter. Secure with hose clamps. This bag adapter will connect to the bag nearest the back of the freezer.
4. Attach free end of tubing to a manifold adapter. Secure with large hose clamp or equivalent. Push the manifold adapter into the right port of the mix inlet manifold and secure with retaining clip. (see Figure 9).
5. Place two mix bags into each mix container as shown in Figure 10 (left mix container shows two bag configuration).
6. Connect the bag adapter attached to the left side of the manifold to the mix bag in the front of the mix container (nearest the cabinet door). Connect the bag adapter attached to the right side of the manifold to the mix bag in the back of the mix container (see Figure 10).

**When Using Bag Connection System (BCS) with One Bag Per Side (optional kit):**

1. Connect 3/8 inch (9,5mm) I.D. plastic food grade tubing to a bag adapter. Secure with hose clamps.
2. Connect free end of 3/8 inch (9,5mm) I.D. plastic food grade tubing to mix check valve. Observe direction of check valve flow arrow. Secure with hose clamp. Connect 3/8 inch (9,5mm) I.D. plastic food grade tubing to free end of check valve and secure with hose clamp.
3. Connect elbow fitting to free end of tubing. Connect opposite end of elbow to 1/4 inch I.D. tan tubing on the left side of pump head. Secure with hose clamps (see Figure 5 and 6).
4. Place one mix bag into each mix container as shown in Figure 10 (right mix container shows one bag configuration).
5. Connect the bag adapter to the mix bag. (see Figure 10).

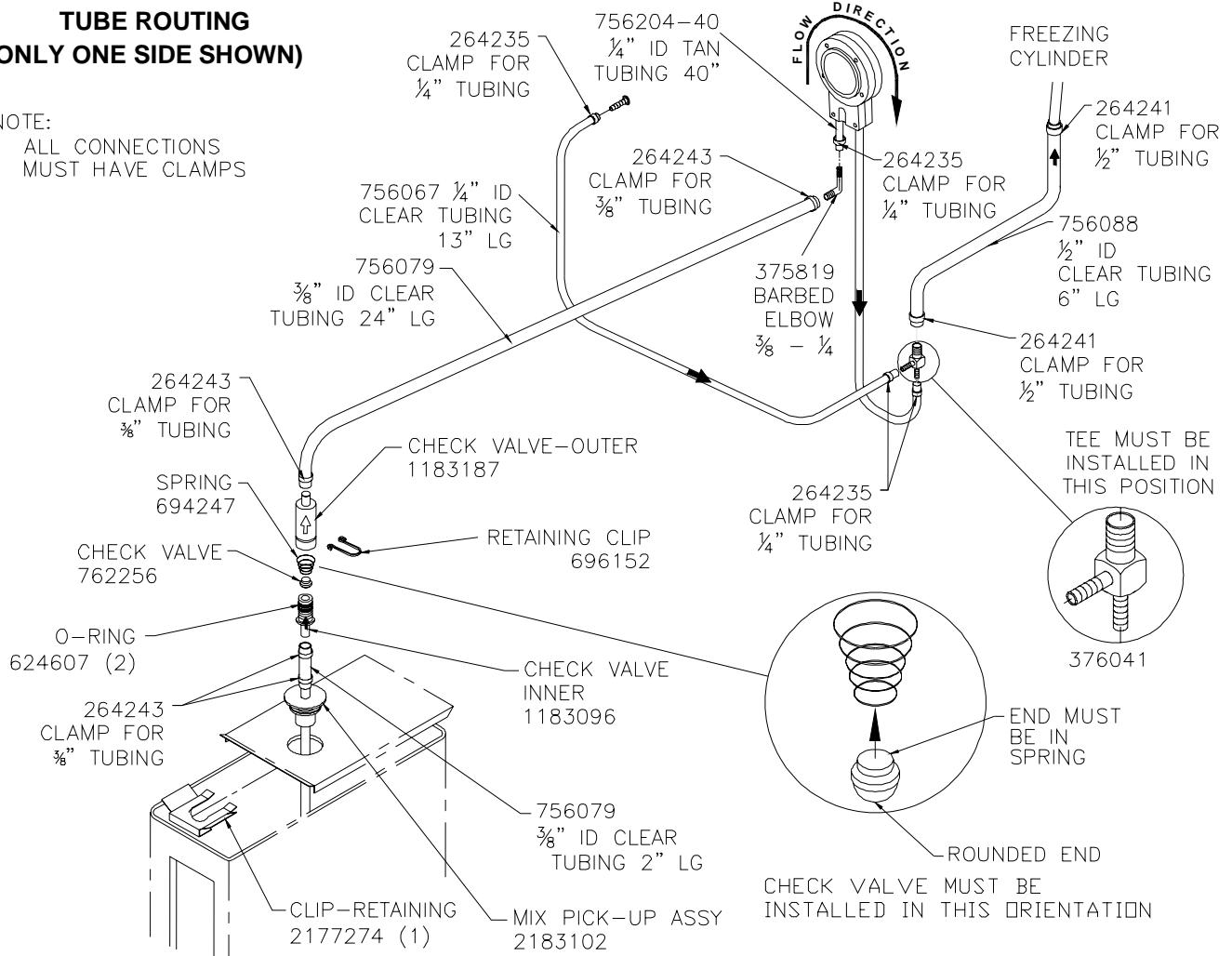
**When Using Two Mix Containers or Bag Connection Systems (BCS) on one Side (optional kit #2183189):**

1. The F431 can be configured to operate with only one freezing cylinder turned on. This may be done if only one flavor is being dispensed during slow times. In this case, running only one freezing cylinder will help minimize product breakdown, while reducing mix container filling or mix bag replacement.
2. Connect two mix containers or two mix bags as described above, but connect both containers to the mix line manifold of the freezing cylinder you will be using.



**TUBE ROUTING  
(ONLY ONE SIDE SHOWN)**

NOTE:  
ALL CONNECTIONS  
MUST HAVE CLAMPS



**Figure 6. Mix Pump Connections for Standard Mix Container**



**Figure 7. Connecting Mix Pick-up Assembly**

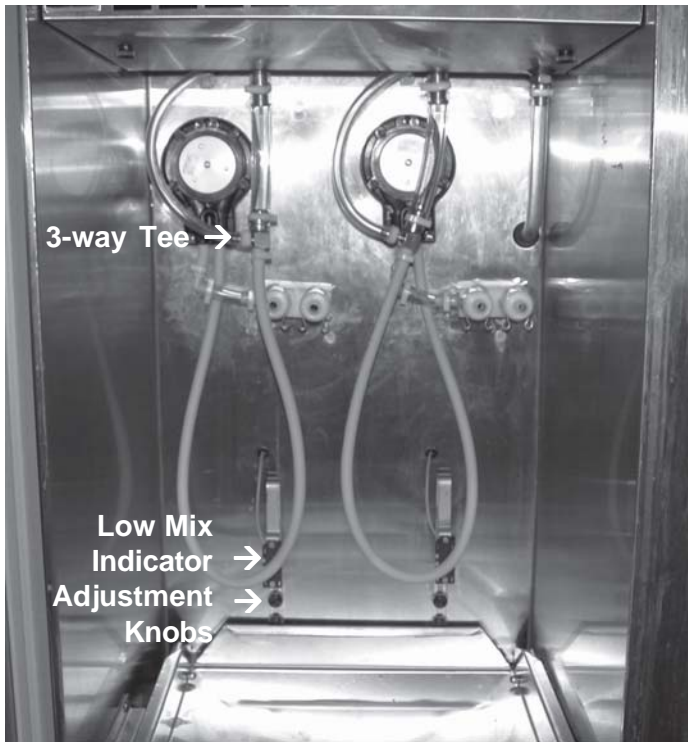


Figure 8. Connecting Pump Hose to BCS Manifold



Figure 10. Connecting BCS Mix Bags (two bag connection on left, one bag connection on right)



Figure 9. Completed BCS Hose Assembly

**C. Mix Low level Indicator Adjustment**

The sensitivity of the "Mix Low" indication that displays on the control panel can be adjusted to operator preference. If more advanced notice of low mix is required, simply loosen the black adjustment knobs located on the sensor brackets at the back of the freezer cabinet, and slide the bracket upwards. If the "Mix Low" message appears while there is still sufficient mix in the container, slide the bracket downward. Be sure to tighten the adjustment knobs after properly positioning the sensor (see Figure 8).

## SECTION 3 INITIAL SET-UP AND OPERATION

### 3.1 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 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 power 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 this 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 11 for the location of the operating controls on the freezer. For the information regarding error codes displayed on the control panel, refer to the troubleshooting section of this manual.

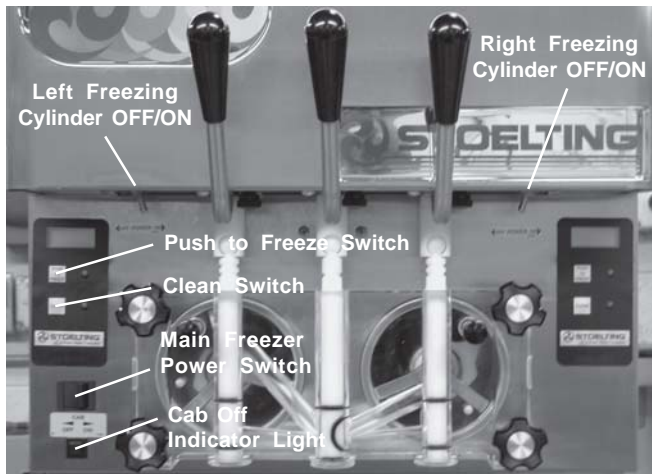


Figure 11. Operating Controls

### ! WARNING

#### Hazardous voltage

The Main Freezer Power 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. Failure to disconnect power before servicing could result in death or serious injury.

#### A. Spigot Switch

The Spigot switch will automatically actuate the auger drive and refrigeration systems when the spigot is opened to dispense product. When the spigot is closed, the drive motor and compressor will remain "on" until the product in the freezing cylinder reaches the proper consistency.

#### B. Freezing Cylinder Off-On Switch

The Freezing Cylinder Off-On switches are two position toggle switches used to supply power to the left or right freezing cylinder control circuit. When the switch is in the OFF position, the refrigeration system and auger will not operate. When the switch is in the ON position, the freezer can be run in the freezing mode or cleaning mode. The freezer will be in the sleep mode until a switch is activated.

#### C. Main Freezer Power Switch

The Main Freezer Power switch is a two position rocker switch. that supplies power to the freezing cylinder circuits and the lower cabinet refrigeration system. When the switch is placed in the ON position, the lower cabinet refrigeration system will run until the preset temperature is reached; then cycle ON and OFF to maintain that temperature. Power to individual freezing cylinders can then be controlled with the Freezing cylinder OFF/ON switches.

#### D. Cab Off Indicator Light

A flashing light indicates the Main Freezer Power Switch is in the OFF position, and no refrigeration is being supplied to the cab. Place the Main Freezer Power Switch switch in the ON position for cab refrigeration.

#### E. Pump Switch

The pump motor switches are the two toggle switches located in the upper lefthand side of the refrigerated cab. When a switch is placed in the OFF position, the pump **will not** run. When the switch is placed in the ON position, the pump **will** run until the preset pressure is reached, then cycle ON and OFF as product is drawn to maintain that pressure.

#### F. Push To Freeze Switch

The PUSH TO FREEZE switch is a membrane or "snap" switch used to start the freezing cycle. During initial freeze down, the The Main Freezer Power switch and Freezing Cylinder Off-On switch are placed in the ON position. Next, the PUSH TO FREEZE switch is pressed and held until the drive motor and compressor turn on.

#### NOTE

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

### G. Amber Light

During the normal operation, the amber light next to the PUSH TO FREEZE switch will illuminate after the freezer has been idle for the preset cycles. Before drawing product, press the PUSH TO FREEZE switch. A horizontal status bar on the LCD display will begin to fill the screen as product freezes down. Wait until at least six bars are displayed or the green light is illuminated before dispensing.

#### NOTE

If the freezer shuts off and alternating green and amber lights flash on the control panel, the freezer is running in the "cab only" mode (both freezing cylinders are turned off) or the freezer is in an error condition. Note the display on the LCD screen. If the screen displays an error, turn the Freezing Cylinder Off/On switch to the OFF position, correct the problem and place the Freezing Cylinder Off/On switch to the ON position. (Refer to Troubleshooting in Section 4).

### H. Green Light

The green light is used to indicate that the product has reached the proper consistency and is ready to be dispensed. The light begins to flash at 98% of consistency.

### I. Clean Switch

The CLEAN switch is a membrane, or "snap" switch. When the switch is pushed, the freezing cylinder's refrigeration system will be OFF and the auger will rotate for cleaning. The CLEAN message will display on the LCD screen. When the switch is pushed again, the auger will stop and the amber light will flash indicating the freezer is in the CLEAN mode. To exit the CLEAN mode turn the Freezing Cylinder Off/On switch to the OFF position. If the freezer is left in CLEAN for more than 30 minutes, it will go in error.

### J. Drive Motor Overload

The internal drive motor overload will trip if the drive motor is overloaded. It will reset after approximately 10-12 minutes. If the drive motor continues to trip, refer to Troubleshooting in Section 4.

### K. Mix Low Light Indicator

A MIX LOW message will appear on the LCD display to alert the operator of a low mix condition. The message will display when there is approximately one gallon of mix left in the mix container or when one bag of theBCS is empty. When the MIX LOW message is displayed, refill the container or replace the bag immediately.

### L. Dispense Rate Adjusters

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. It takes at least five complete turns of the adjusting knob to make a noticeable difference in the dispense rate.

### M. High Head Pressure Cut Out

If the head pressure exceeds 445 PSIG (28 bar), the high head pressure cutout will trip. The reset button can be accessed from the top left corner on the right side panel of the freezer.

### N. Front Door Safety Switch

The front door safety switch prevents the auger from turning when the front door is removed. The switch is open when the door is removed and closed when the door is properly installed.

### O. Menu Navigation Buttons

The Menu Navigation Buttons allow the user to display information regarding the freezer's status of operation as well as adjust product consistency.

**Selection Button (SEL)** The SEL button is not functional in the normal operation mode. This button is only used by service technicians for freezer calibration.

**Set Button (SET)** Pressing this button will save a change made to the product consistency setting. Refer to Section 4 for consistency adjustment procedures.

**Left Arrow Button (←)** Pressing any button on the control panel will automatically illuminate the display. The backlight will turn off several seconds after use. To keep the display constantly light, press and hold the left (←) button for five seconds. The backlight function can be reset to normal operation in the same manner.

**Up Arrow Button (↑)** Pressing this button will change the value of the product consistency. Refer to Section 4 for consistency adjustment procedures.



### 3.3 IMPORTANT INFORMATION REGARDING CLEANING AND SANITIZING

Soft serve and shake freezers require special consideration when it comes to food safety and proper cleaning and sanitizing.

The following information specifically covers issues for cleaning and sanitizing frozen dessert freezers. This information is meant to *supplement* a comprehensive food safety program.

#### Soil Materials Associated with Frozen Dessert Machines

MILKFAT/BUTTERFAT – As components of ice-cream/frozen custard mix, these soils will accumulate on the interior surfaces of the machine and its parts. Fats are difficult to remove and help attribute to milkstone build-up.

MILKSTONE – Is a white/gray film that forms on equipment and utensils that come in contact with dairy products. These films will accumulate slowly on surfaces because of ineffective cleaning, use of hard water, or both. **Milkstone is usually a porous deposit, which will harbor microbial contaminants and eventually defy sanitizing efforts.**

Once milkstone has formed, it is very difficult to remove. Without using the correct product and procedure, it is nearly impossible to remove a thick layer of milkstone.  
(NOTE: general-purpose cleaners DO NOT remove milkstone.) ***This can lead to high bacteria counts and a food safety dilemma.***

#### **IT IS BEST TO CONTROL MILKSTONE ON A DAILY BASIS BEFORE IT CAN BECOME A SIGNIFICANT FOOD SAFETY PROBLEM.**

In addition to food safety, milkstone can cause premature wear to machine parts which can add to costs for replacement parts or possibly more expensive repairs if worn machine parts are not replaced once they have become excessively worn.

#### Important Differences Between Cleaning and Sanitizing

##### **CLEANING vs. SANITIZING**

It is important to distinguish between cleaning and sanitizing. Although these terms may sound synonymous, they are not. BOTH are required for adequate food safety and proper machine maintenance.

##### **CLEANING**

- Is the removal of soil materials from a surface.
- Is a prerequisite for effective sanitizing.

##### **NOTE**

An UNCLEAN surface will harbor bacteria that can defy sanitizing efforts.

Bacteria can develop and resist sanitizing efforts within a layer of soil material (milkstone). ***Thorough cleaning procedures that involve milkstone removal are critical for operators of frozen dessert machines.***

##### **SANITIZING**

- Kills bacteria.
- Can be effective on clean surfaces only.
- **DOES NOT** clean or remove milkstone.

##### **NOTE**

**Using a SANTITIZER on an unclean surface** will not guarantee a clean and safe frozen dessert machine.

#### Proper Daily Maintenance: The Only Way to Assure Food Safety and Product Quality

Proper daily maintenance can involve a wide variety of products and procedures. Overall, the products and procedures fall into three separate categories. *(Please note that this is a brief overview intended for informational purposes only.)*

1. **CLEANING** – This involves draining mix from the freezer barrel and rinsing the machine with water. Next, a cleaner is run through the machine. Then, the machine is disassembled and removable parts are taken to the sink for cleaning.
2. **MILKSTONE REMOVAL** – Since almost all cleaners do not have the ability to remove milkstone, the use of a delimer becomes necessary. Although this procedure may not be needed on a daily basis, it will usually follow the cleaning procedure. It requires letting a delimer solution soak in the machine for an extended period of time. Individual parts are also soaked in a deliming solution for an extended period of time (more about delimers in *Additional Information*).
3. **SANITIZING** – After the machine has been cleaned and contains no milkstone, the machine is reassembled. Then a FDA-approved sanitizing solution is run through the machine to kill bacteria. The machine is then ready for food preparation.

As a recommended cleaner and sanitizer for your frozen dessert machine, STERA-SHEEN has proven to be one of the best daily maintenance products for:

- **CLEANING** – Thorough removal of all solids including butterfat and milk fat.
- **MILKSTONE REMOVAL** – Complete removal of milkstone.
- **SANITIZING** – FDA-approved no rinse sanitizer for food contact surfaces.

### Additional Information

#### **THE USE OF DELIMERS**

A delimer is a strong acid that has the ability to dissolve milkstone. This type of chemical may become necessary once high levels of milkstone have developed. While these products are very effective for removing HIGH levels of milkstone, they are not ideal for two reasons:

1. **PRODUCT SAFETY** – Strong acids are dangerous chemicals. Carefully follow safety instructions provided with delimer products.
2. **MACHINE DAMAGE** – Strong acids will attack metal and rubber causing premature wear of parts. The use of a delimer needs to be closely monitored to avoid damage to machine surfaces and parts.

With proper daily use of STERA-SHEEN or it's equivalent, there is no need for the use of a *DELIMER*.

#### **DO NOT USE BLEACH**

- BLEACH HAS ABSOLUTELY **NO** CLEANING PROPERTIES.
- BLEACH IS CORROSIVE. It can and will damage components of the machine causing premature wear and metal corrosion.

#### **GENERAL PURPOSE CLEANERS**

General purpose cleaners **do not** have the ability to remove milkstone. Milkstone will become a problem *if not remedied* with additional products and procedures.

#### **THE USE OF CHLORINE TEST STRIPS**

“Test strips” are used to determine concentrations of active chlorine in sanitizing solutions. To use the strips, tear off a small portion and submerge it into the sanitizing solution. Then, compare the color change to the color key on the side of the test strip dispenser to determine the approximate chlorine concentration.

The ideal concentration of chlorine needs to be 100 ppm (as stated by the FDA).

#### **NOTE**

Follow the directions on the container for proper concentration.

There are two main factors that contribute to falling chlorine concentrations in a sanitizing solution.

1. **PRODUCT USE** – As the chlorine in the solution is being used, chlorine concentrations fall.
2. **TIME** – As time passes, small amounts of chlorine “evaporate” from the solution. (That is why you can smell it.)

Sanitizing solutions *should not* be allowed to fall below 100 ppm chlorine. New solutions should be mixed once old solutions become ineffective.

### **3.4 DISASSEMBLY OF FREEZER PARTS**



#### **WARNING**

**Moving machinery can grab, mangle and dismember. Place the ON-OFF toggle switch in the OFF position before disassembling for cleaning or servicing. Placing the ON-OFF toggle switch in the ON position during cleaning or servicing may result in serious personal injury.**

Before using the freezer for the first time, complete freezer disassembly, cleaning and sanitizing procedures will need to be followed. Routine cleaning intervals and procedures must comply with the local and state health codes. 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 (see Figure 12).

To disassemble the freezer, refer to the following steps:



**Figure 12. Auger Flight Wear & Front Auger Support Bushing Wear**

### A. Disassembly Of Front Door

1. Remove the front door by turning off the circular knobs and then pulling the front door off the studs.
2. Remove the air bleed valve by unscrewing the knob while holding the valve stem from behind. Remove the compression spring and push air bleed valve through the rear of the front door.
3. Remove the spigot through the bottom of the front door (see Figure 13). Remove all O-rings from spigots and air bleed valve.

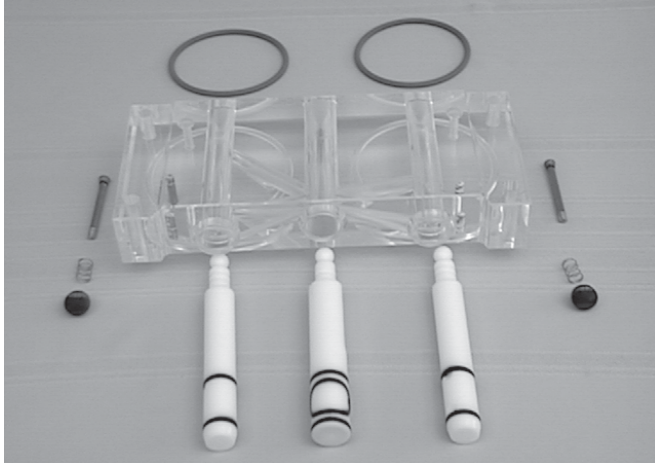


Figure 13. Front Door Disassembly

### B. Disassembly Of Auger

1. Remove the front auger support by pulling it straight out of the freezer barrel.
2. Remove the plastic bearing from the front auger support.
3. Remove the auger by pulling slowly and rotating out of the freezer barrel. As the auger is withdrawn, remove each plastic flight and spring from the auger. Be careful not to scratch inside of freezer barrel when removing flights or auger. Remove the spring from each auger flight.



Figure 14. Auger Flight Removal

4. Keep the rear of the auger tipped up once it is clear of the freezer barrel.
5. Wipe spline lubricant off hex end of auger with a paper towel. Remove the rear seal. Figure 15.

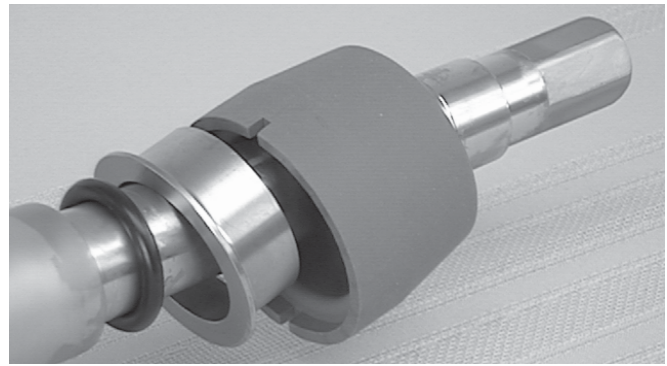


Figure 15. Rear Seal Removal

### 3.5 CLEANING DISASSEMBLED PARTS

Disassembled freezer parts require complete cleaning, sanitizing and air drying before assembling. Local and state health codes will dictate the procedure required. Some state health codes require a four sink process (pre-wash, wash, rinse, sanitize, air dry), while others require a three sink process (without the pre-wash step). The following procedures are a general guideline only. Consult your local and state health codes for procedures required in your location.

- A. To clean the freezer parts, disassemble all parts. (Refer to section 3.4 for the disassembly of freezer parts.)
- B. Place all front door and auger parts in clean 90° to 110°F (32°C to 43°C) water and wash thoroughly (four sink procedure only).
- C. Place all parts in 90° to 110°F (32°C to 43°C), mild detergent water and wash thoroughly.
- D. Rinse all parts with clean 90° to 110°F (32°C to 43°C) water.
- F. Sanitize all freezer parts following procedures outlined below.

### 3.6 SANITIZING 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 of 90° to 110°F (32°C to 43°C) 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 for 5 minutes, then remove and let air dry completely before assembling in freezer.

### 3.7 CLEANING THE FREEZER

#### CAUTION

##### Risk of Product Damage

Do not use acid cleaners, strong caustic compounds or abrasive materials to clean any part of the freezer exterior or plastic parts.

The exterior should be kept clean at all times to preserve the lustre of the stainless steel. A good grade of stainless steel has been used on the freezer to ease clean-up. To remove spilled or dried mix, simply wash the exterior in 90° to 110°F (32°C to 43°C), soapy water and wipe dry.

Do not use highly abrasive materials as they will mar the finish. A mild alkaline cleaner is recommended. Use a soft cloth or sponge to apply the cleaner. For best results, wipe in the direction of the grain of the steel.

- A. Clean the rear seal surface from inside of the freezer barrel.
- B. Using this sanitizing solution and the large barrel brush provided, sanitize the barrel by dipping the brush in the sanitizing solution and brushing the inside of the barrel.
- C. Remove the rear drip tray by pulling from side panel. Clean and replace drip tray.

### 3.8 ASSEMBLING FREEZER

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

#### NOTICE

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

#### NOTICE

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.
- B. Lubricate rear seal area on auger shaft with a thin layer of sanitary lubricant. Install the rear seal O-ring. Lubricate outside of rear seal O-ring with sanitary lubricant.
- C. Install stainless steel rear seal adapter into rear seal dry (without lubricant). Lubricate inside surface of rear seal adapter and install onto auger shaft. **DO NOT** lubricate outside of rear auger seal (see Figure 16).

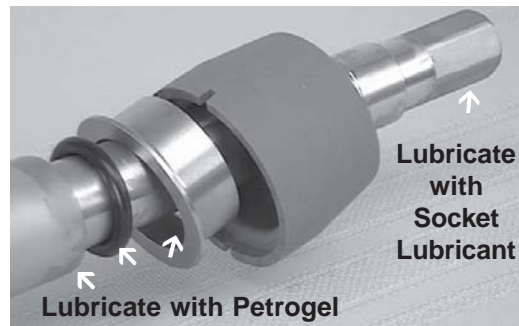


Figure 16. Rear Seal Lubrication

- C. Lubricate the hex drive end of auger 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. **Spring must be screwed into the flights completely** to provide proper tension (see Figure 17).



Figure 17. Spring Installation

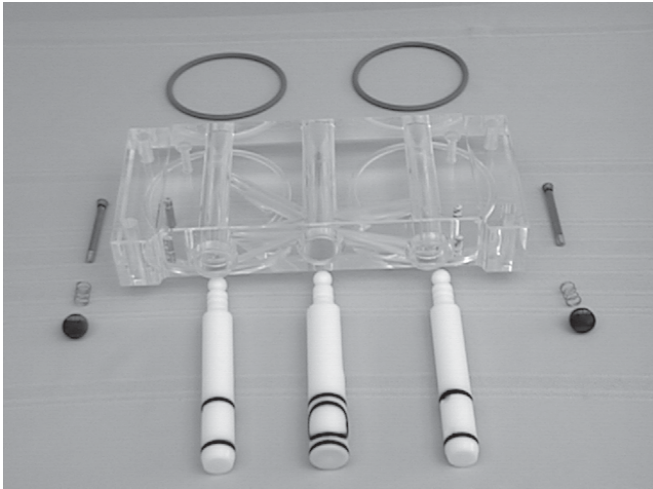
- E. Install first flights to bottom of auger, rotate, add successive flights from bottom as the auger is pushed slowly into the freezer barrel. Carefully engage auger with drive socket in speed reducer by rotating auger slowly and pushing on end of auger.
- F. Apply a thin film of sanitary lubricant to the inside and outside of the front auger support bearing, then place on the front of the auger. Assemble the front auger support onto the auger bearing.

#### NOTICE

Position the front support on auger so legs do not interfere with the pin on the back of the front door assembly. Front door must push auger in slightly when it is being tightened to prevent the rear seal from leaking.



- G. Assemble O-rings onto the spigot dry, without lubrication. Then apply a thin film of sanitary lubricant to the outside of the O-rings and spigot bodies.
- H. Install the spigots through the bottom of the front door ( see Figure 18).




**Figure 18. Front Door Assembly**

- I. Assemble the air bleed valve O-ring onto the air bleed valves. Position the O-ring in groove close to the wide part. Apply a thin film of sanitary lubricant to the O-rings.
- J. Insert the air bleed valves from the back of the front door. Install compression springs onto air bleed valves, then screw knobs on finger tight.
- K. Apply a thin film of sanitary lubricant to the door seal O-rings, and fit into the grooves on the rear of the front door.
- L. Place the front door assembly on the mounting studs and push front door against the freezer carefully.
- M. Secure front door assembly by placing the knobs on the studs and alternately tighten opposite corners until **finger tight only**. Do **not** overtighten. Proper O-ring seal can be observed through the transparent front door.
- N. Move the spigot handles to the closed position.

### 3.9 SANITIZING

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

 <b>WARNING</b>
<p>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.</p>

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 of 90°F to 110°F (32°C to 43°C) 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.

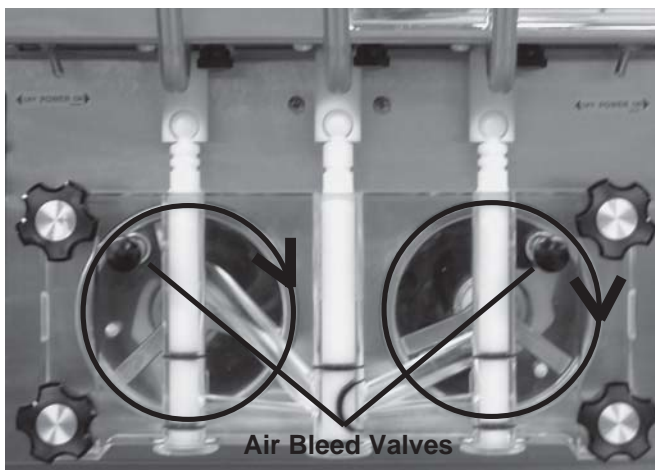


Figure 19. Air Bleed Valves

<b>CAUTION</b>
<p><b>Risk of Product Damage</b> Avoid prolonged contact of sanitizer with freezer parts. Prolonged contact of sanitizer with freezer may cause corrosion of stainless steel parts.</p>

- A. Prepare 3 gallons of sanitizing solution following manufacturer's instructions, and pour into storage container.
- B. Place the mix pump switch in the ON position and open air bleed valve on the front door by pushing valve in and holding (see Figure 19).

- C. Let sanitizing solution fill the freezer barrel to air bleed valve, then close the valve by pulling out to lock in place.
- D. Place the Freezing Cylinder Off-On toggle switch in the ON position then press the CLEAN switch.



Figure 20. Clean Control

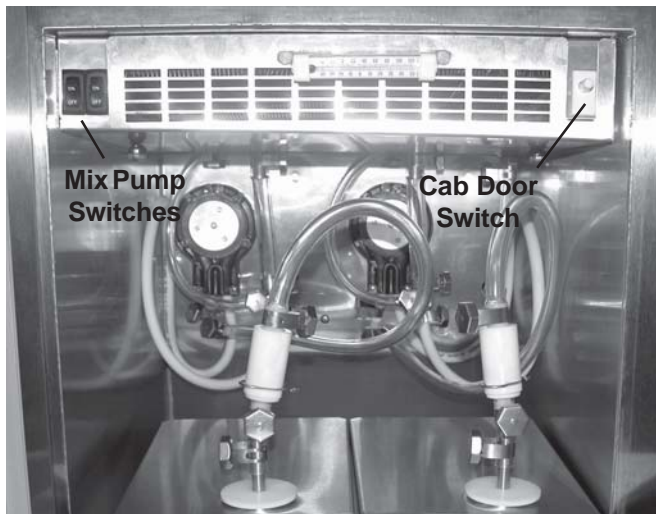
- E. Check for leaks when the freezing cylinder is first pressurized with sanitizing solution.
  - 1. Check for leaks at the front door seals.
  - 2. Check the drain located above the center of the Drip Tray for leaks coming from the rear of the Rear Auger Seal.
  - 3. Check inside the cab unit for leaks at hose connections.
- F. Using a sanitized soft bristle brush or equivalent, dipped in sanitizing solution, clean mix container.
- G. After five minutes, open spigot to expel sanitizing solution. Drain all solution from freezer using all three spigots.
- H. When solution has drained, press the CLEAN switch to stop the auger and place Freezing Cylinder Off-On toggle switch in the OFF position. Allow the freezer barrel to drain completely.

The freezer is now sanitized and ready for adding mix.

### 3.10 INITIAL FREEZE DOWN AND OPERATION

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

- A. Sanitize just prior to use according to instructions outlined in this manual.
- B. If using standard mix containers, prepare the desired amount of mix and then fill each storage container with approximately 2.5 gallons or more of mix. Attach mix inlet probes to container. Place mix containers in the refrigerated cabinet. If drawing from a BCS system, place bags into mix container, remove the cap and push out all of the air. Insert adaptor into the bags.



**Figure 21. Refrigerated Cabinet**

- C. Place the mix pump switch in the ON position. The mix pump switch is located in the upper left hand corner, inside the refrigerated cabinet (see Figure 21). Immediately open the spigot and let approximately 8 ounces of liquid mix with sanitizing solution drain out of the spigot.
- D. Close the spigot and open the air bleed valve on the front door by pushing the valve in and holding. Allow the barrel to fill until the mix level is 1/2" (2.7 cm) below air bleed valve, then release valve and pull closed to lock in place.
- E. Place the OFF-ON switch in the ON position, then press and hold the PUSH TO FREEZE switch until the freezer starts.

**NOTE**

After the Drive Motor starts, there will be a 3 second delay before the Compressor starts.

- F. After about 6 to 10 minutes the freezer will shut off and the green lens will illuminate. SERVE will be displayed on the LCD screen. The product will be ready to serve. Freeze down time may be shorter for some frozen diet dessert mixes. High ambient temperatures may extend freeze down time.
- G. The refrigeration is automatically actuated when the spigot is opened. For normal dispensing, move the spigot handle fully open. This position provides excellent control over the product and aids in making desired shaped portions. Spigot Rate Adjusters are located under the Header Panel, to the immediate right of each Spigot Handle. Turning the Spigot Rate Adjuster clockwise will increase the dispense rate (see Figure 22).

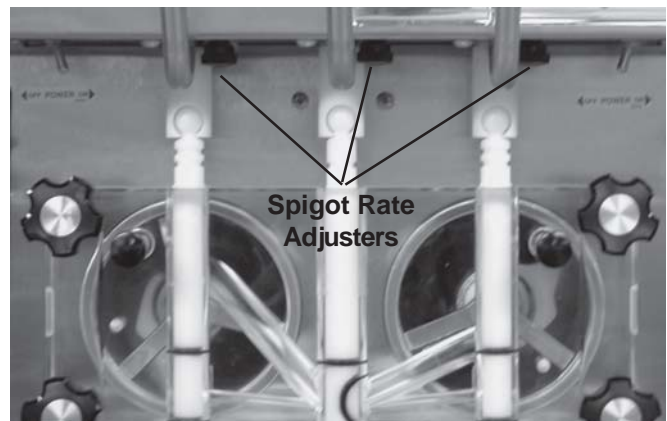
The freezer is designed to dispense the product at a reasonable draw rate. If the freezer is overdrawn, the result will be a soft product and air pops. If this should occur, allow the freezer to run for approximately 30

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 freezer's capacity.

**Do not** operate the freezer when the MIX LOW light is on or with less than 1-3/4" (4.4 cm) of mix in the mix container. Refill the mix container immediately.

**NOTE**

The freezer has a standby and sleep mode. When the freezer is not used, after a preset number of freezing cycles, it will enter the stand by mode ( followed by sleep mode) and remain there until someone draws a product or pushes the push-to-freeze switch. In the sleep mode, the freezer will keep the product below 45°F (7.2°C). Sleep 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.



**Figure 22. Dispensing Product**

**3.11 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.

Proper product serving temperature varies from one manufacturer's mix to another. Mixes should provide a satisfactory product in the 17° to 20°F (-7° to -6°C) range. Diet and low-carb mixes typically freeze to proper consistency at higher temperatures.

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).

### 3.12 OPERATION OF MIX PUMP

The mix pump switch is located in the upper left hand corner, inside the refrigerated cabinet. When the pump switch is placed in the ON position, the mix pump motor will be actuated to pump mix into the freezer cylinder. When the set pressure is reached, the mix pump will shut off automatically. When the switch is placed in the OFF position, the mix pump will be inoperative.

#### NOTE

The mix pump motor is equipped with an internal overload that will “trip”, disabling the pump when the motor is overloaded. Consult the trouble shooting section for corrective information. The internal overload will automatically reset after cooling. If the condition continues, contact a qualified service person.

### CAUTION

#### Risk of Product Damage

Mix pump hose must be repositioned every 1 -2 weeks or 60 hours of operation. Failure to comply will result in reduced mix pump liquid capacity, dispense stoppage, popping, and possible mix pump hose leakage. Hose leakage may damage the pump roller assembly and void the factory warranty.

- A. Mix Operation: The peristaltic mix pump contains one continuous mix pump hose. When looking at the face of the peristaltic mix pump, the left side of the hose is the suction or pickup. The right side of the hose is the discharge. Mix is drawn up the suction side of the hose and transferred thru the discharge side to the freezer (see Figure 23).
- B. Air Operation: The air compressor operates whenever the peristaltic mix pump is running. Air enters thru a check valve on the piston downstroke. The air is discharged thru a second check valve, on the piston upstroke. The air and mix join at the tee and then travel to the freezer.

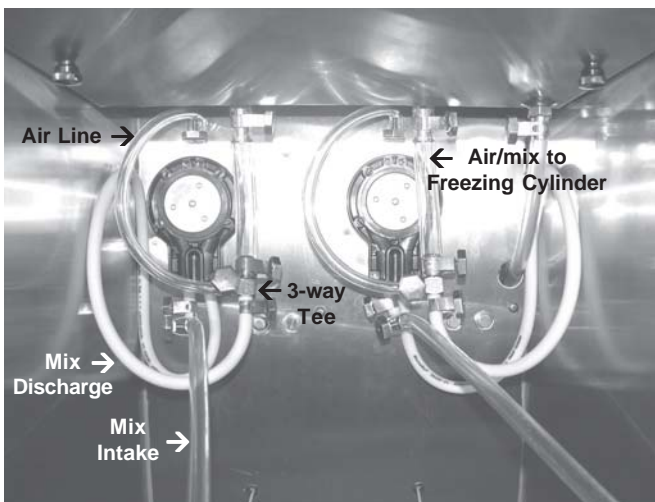


Figure 23. Mix Pumps

- C. The over-run adjustment is preset at the factory. If an adjustment becomes necessary, refer to Section 4.

#### NOTICE

Any cleaning procedure must always be followed by sanitizing before filling freezer with mix. (Refer to section 3.3)

### 3.13 MIX PUMP CLEANING

The mix pump is approved for CIP (clean in place) and is thoroughly cleaned as cleaning solutions are pumped thru the freezer. We recommend completely disassembling the pump and connecting tubing every 14 days for inspection of parts to confirm the CIP has been properly performed. If any residue is detected clean or replace those parts as outlined below.

1. Place the OFF-ON switch in the ON position and press the CLEAN switch. Allow the auger to agitate for 5 to 10 minutes.
2. Remove suction tube from mix container. Draw off the mix remaining in freezer barrel.
3. Pump 2 gallons (7.5 liters) of cold potable water thru freezer until water at spigot is free of mix.
4. Pump 2 gallons (7.5 liters) of 90° to 110°F (32°C to 43°C) detergent solution water thru freezer. The use of soft water is recommended, along with dishwashing detergents such as “Joy,” “Dawn,” or equivalent.
5. Place mix pump switch in OFF position. Open spigot to relieve remaining pressure.
6. Press the CLEAN switch to stop the auger and place the OFF-ON toggle switch in the OFF position.

### 3.14 DISASSEMBLY AND INSPECTION OF REMOVABLE PARTS

Inspection of removable parts should be made whenever maintenance is performed or pump requires disassembly.

### WARNING

#### Hazardous Moving Parts

Revolving pump head can grab, mangle, and cause serious crushing injury. The Power switch must be placed in the OFF position for cleaning and power must be disconnected when disassembling or servicing.

### CAUTION

#### System Under Pressure

Never disconnect hoses from freezer or pump without first opening spigot to relieve pressure.

### NOTE

If the mix lines or air line is difficult to remove, soften with a rag soaked in hot water. Hose connections may be sprayed with Haynes Sanitary Lubricant for ease of removal. Do not loosen or remove the mix pump cover wingnuts. Maintain the mix pump hose in its operational condition.

1. Loosen clamp and remove air hose from pump compressor.
2. Loosen clamp and disconnect mix pump hose. Remove the pickup hose, mix check valve and pickup hose adapter (and bag adapter if applicable) as an assembly from mix container.
3. Completely disassemble both hose assemblies and check valve. Place hoses, tee, check valve assembly, and pickup hose adapter in 90° to 110°F (32°C to 43°C), mild detergent water and wash thoroughly. Use soft bristle brushes to clean inside of fittings. Rinse all parts in clean 90° to 110°F (32°C to 43°C) water (see Figure 24 and 25).
4. Carefully inspect each part for wear or damage. Replace worn or damaged parts.
5. Wash feed tube and air tube with 90° to 110°F detergent water and brushes provided. Rinse with clean, 90° to 110°F water (See Figure 26 and 27).
6. Prepare two gallons (7.5 liters) of sanitizing solution using a USDA certified grade sanitizing solution. Sanitize all removed parts, then air dry.
7. Check Hose Service Record decal to determine if hose reposition or replacement is required at this time.
8. Reassemble both hose assemblies per the diagram located on the inside of the cab door. Reconnect assemblies to the pump and discharge hose, using the clamps. (Refer to Section 2.5 Mix Pump).
9. Sanitize assembled freezer as per instructions outlined in Section 3.9.



Figure 24. Removable Parts



Figure 25. Removable Parts for optional BCS

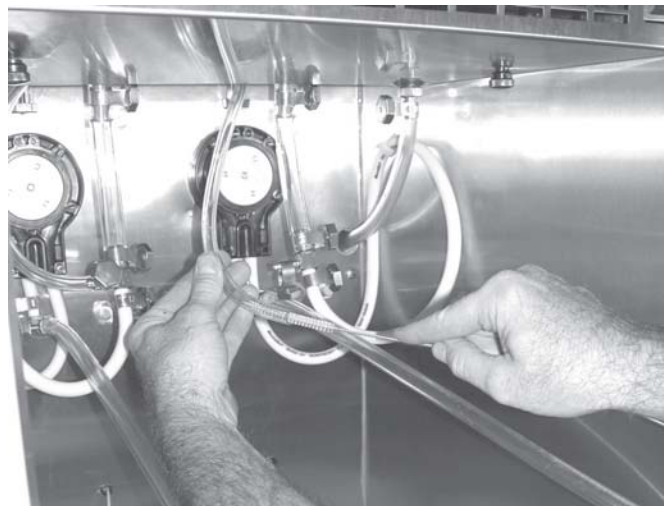


Figure 26. Cleaning Air Tube

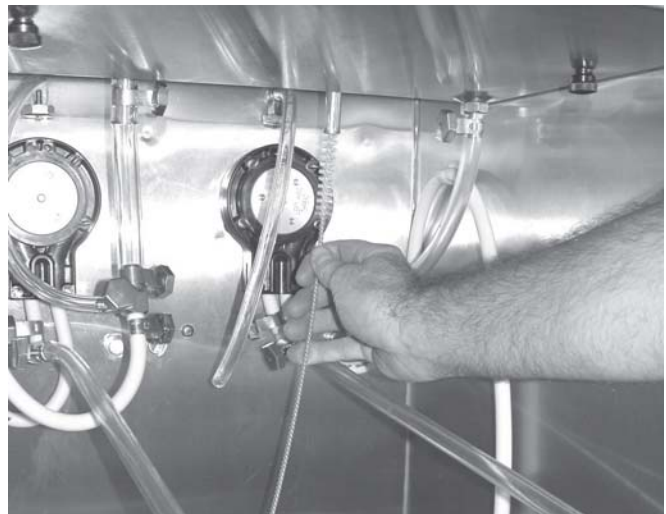


Figure 27. Cleaning Feed Tube

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## SECTION 4 MAINTENANCE INSTRUCTIONS

### 4.1 PRODUCT CONSISTENCY ADJUSTMENT

The freezer's control system monitors the consistency (firmness) of the product (mix) in each freezing cylinder. The program module senses the consistency of the product and shuts off the drive motor and refrigeration system when the pre-programmed consistency is reached. The control panels on the front of the freezer allow the operator to adjust each freezing cylinder to create the desired product consistency.

- Place the Main Freezer Power and Freezing Cylinder OFF/ON switches in the ON position.
- Press the SET button on the Control Panel once. Fine Adj will appear on the LCD screen.
- Press the up arrow button (↑) until the desired consistency setting is displayed. The higher the number, the greater the product consistency. The control may be set from 1 to 9. Each time the up arrow (↑) button is pressed, the value will increase by 1 until the value reaches 9, then restart at 0. The 0 setting cannot be set.
- Press the SET button once to save the setting change and return to the current mode display.



Figure 28. Product Consistency Control

### 4.2 LOCKING OUT CONTROL PANEL

The IntelliTec control has a tamper proof mode to prevent unauthorized use. When set, all buttons on the control panel are disabled. To lock out the control panel:

- Press and hold the PUSH TO FREEZE button for 5 seconds.
- While still holding the PUSH TO FREEZE button, press the CLEAN button once.
- Release both buttons. An astrisk (\*) will appear after the word MODE on the display, indicating that the control is in the lock out mode.
- To unlock the control panel, repeat steps A, B and C.

### 4.3 OVERRUN ADJUSTMENT

The product when served is a combination of air and mix. Overrun is a measure of the amount of air blended into the mix.

Overrun can be expressed in terms of the amount of weight loss for a given volume. For example, if a pint of liquid mix weighs 18 ounces (510 grams) and a pint of frozen product with air added weighs 12 ounces (340 grams), the overrun is said to be 50 percent "18 oz. (510 grams) - 12 oz. (340 grams) = 6 oz. (170 grams)",  $(6 / 12) \times 100 = 50\%$ .

The overrun can be checked by placing a one pint container on an ice cream scale and zeroing out the scale. Then fill a one pint container with frozen product. The container should be filled over the top and leveled with a straightedge. The product should not contain any air pockets. When weighed on an ice cream scale, one pint (473 milliliters) of product should weigh 12 to 13 ounces (340 to 368,5 grams).

The mix pump has been preset at the factory to produce a product with approximately 40% overrun. Because of differences in mix formulation, temperatures and barometric pressure, this figure may vary. It will be necessary for approximately 2 gallons (7,5 liters) of mix to be pumped thru the freezer before changes in the product are noticeable due to adjustments in overrun.

Overrun is controlled by the length of the air compressor piston stroke within the piston cylinder. Lengthening the stroke within the cylinder will increase overrun. Conversely, shortening the stroke will decrease overrun. To perform an overrun adjustment, refer to the following procedure:

- Turn the mix pump switch to the OFF position. Disconnect both power sources/circuit breakers.
- Remove the lower back panel from freezer.
- On air compressor side of pump, locate the long/slender piston rocking arm. The rocking arm downward travel is limited by a stationery cam. On the face of the cam there is an overrun setting indicator plate numbered 3 thru 8 and an adjustment knob. Figure 29.

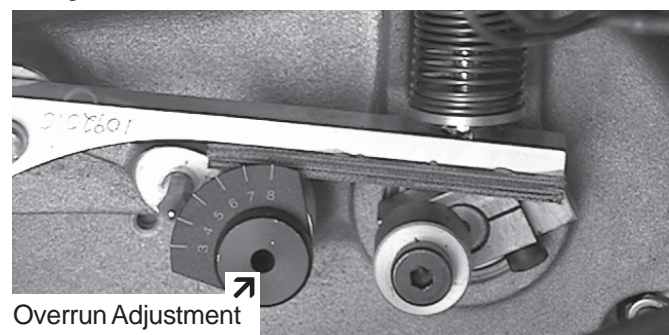


Figure 29. Overrun Adjustment

- D. The overrun setting is indicated by a pointed pin.
- E. To adjust overrun, loosen the allenhead screw (located within the center of the adjustment knob) with the 5/32" (4mm) allen wrench provided. Rotate the adjustment knob counterclockwise to a higher number for higher overrun, or clockwise to a lower number for lower overrun. Each number multiplied by 10 represents the overrun percentage (ie: #4 = 40% overrun).
- F. Tighten the allen screw, then place the wrench back in its clip. Replace the lower back panel and secure with the four screws. Turn the mix pump power switch to the ON position.

#### 4.4 MIX PUMP HOSE REPOSITION (every one or two weeks.)

##### NOTE

Mix pump hose must be repositioned every 1 - 2 weeks. Failure to comply will result in reduced mix pump liquid capacity, dispense stoppage, popping, and possible mix pump hose leakage.

1. Run cleaning solution through pump.
2. Turn pump off and relieve any pressure by opening the spigot.
3. Grasp the pick-up hose end of the mix pump hose with one hand and turn the pump on. Pull down on the pick-up hose end until 12 to 14" (30-1/2 to 35-1/2cm) of tubing has reverse fed through the pump, then turn the pump off.
4. Loosen small clamp at the pick-up hose adapter and (Viewed from Back) disconnect mix pump hose.
5. Cut 7-1/2" (19 cm) off the end of the mix pump hose.
6. Reconnect mix pump hose to adapter.
7. Continue normal operation. Mix hose will automatically reposition itself with adapter near black cover.

##### NOTE

Each hose is long enough for 3 repositions before replacement is required. Record each event on Hose Service Record decal.

#### 4.5 MIX PUMP HOSE REPLACEMENT

##### NOTE

Mix pump hose must be replaced when tubing cannot be further repositioned (every four to eight weeks). Failure to comply will result in hose failure and possible pump damage. See Section 2.5 for instructions on mix pump hose replacement.

#### 4.6 DRIVE BELT TENSION ADJUSTMENT

To check belt tension, refer to Figure 30 and follow the steps below:



#### WARNING

##### Hazardous Voltage and Moving Parts

Never attempt to repair or perform any maintenance on freezer until all main electrical power to freezer has been disconnected. Failure to disconnect electrical power before servicing may result in serious injury or death.

- A. Remove either side and back panels.
- B. Press firmly on one belt. Figure 30.
- C. When the tension is properly adjusted, the belt should deflect approximately 3/8" (about the width of the belt).

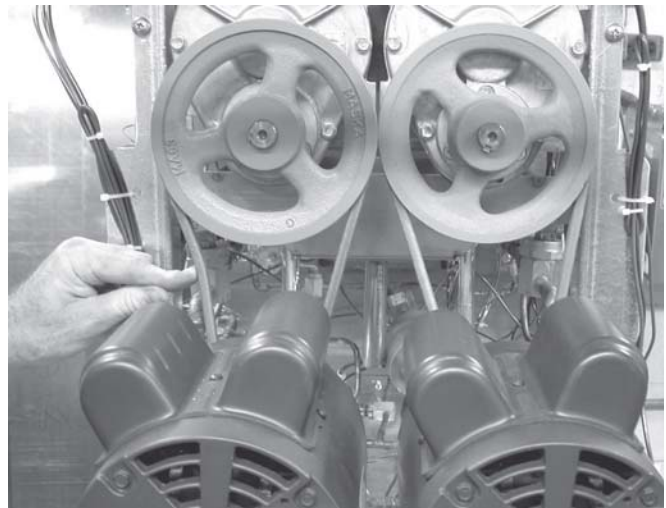


Figure 30. Belt Adjustment

- D. If an adjustment is necessary, remove the side panel. Turn the jack screw located on the motor bracket, clockwise to increase belt tension or counterclockwise to decrease belt tension.





**Figure 31. Removing Condenser Filter**

**NOTE**

Belt life will be increased if new drive belts are tightened after two or three weeks of operation.

**4.7 CONDENSER CLEANING**

The condenser requires periodic cleaning. To clean the condenser, refer to the following steps:


- A. Lift the condenser filter off the freezer cover panel. Visually inspect the condenser filter for dirt (see Figure 31).
- B. If the condenser filter is dirty, vacuum or brush clean, rinse with clean water and allow to dry before replacing on freezer.

**NOTE**

If the condenser is not kept clean, loss of refrigeration efficiency will result.

**4.8 PREVENTATIVE MAINTENANCE**

It is recommended that a preventative maintenance schedule be followed to keep the freezer clean and operating properly. The following steps are suggested as a preventative maintenance guide.

 <b>WARNING</b>
<p><b>Hazardous Voltage and Moving Parts</b>            Never attempt to repair or perform any maintenance on freezer until all main electrical power to freezer has been disconnected. Failure to disconnect electrical power before servicing may result in serious injury or death.</p>

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

**A. Daily Checks**

Check for any unusual noise or condition and repair immediately.

**B. Monthly Checks**

- 1. Check drive belts for wear and tighten belts if necessary. (Refer to Section 4.5.)
- 2. Check the condenser for dirt. (Refer to Section 4.6).

**4.9 EXTENDED STORAGE**

Refer to the following steps for winterizing the freezer or for storing the freezer over any long period of shutdown time.

- A. Clean thoroughly with warm detergent all parts that come in contact with mix. Rinse in clear water and dry all parts. Do not sanitize.

**NOTE**

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

- B. Remove, disassemble, and clean the front door, auger shaft, and mix pump. Leave disassembled during the shutdown period.
- C. Place plastic auger flights in a plastic bag with a moist paper towel. This will prevent flights from becoming brittle if exposed to dry air over an extended period of time (over 30 days).
- E. Place the mix pump ON-OFF switches, Left and Right Freezing Cylinder switches and the Main Freezer Power switch in the OFF position.
- F. Disconnect from the source of electrical supply in the building.

**4.10 ERROR CODES**

The following error condition codes will display on the control panel when the freezer is experiencing a problem. The error condition code directs you to the system location of the malfunction.

ERROR CODE	MALFUNCTION
01	Program Board
02	High Torque Error
03	Extended Run Time Error
04	Clean Error
05	Freezing Cylinder Sensor
06	(not used on F431 models)
07	Drive Motor Current
08	Cab Sensor
09	High Pressure Cutout

Any error causing condition must be corrected, then the power turned off, and back on before the freezer will return to normal operation.

## 4.11 TROUBLESHOOTING

### ERROR CONDITION CODE 01

If the control panel displays a program board error (Error Code 01), place the Freezing Cylinder Off-On Switch in the Off position, wait 10 seconds, and return the switch to the On position. If the Control Panel still displays the error condition code, call your Authorized Stoelting Distributor for further assistance.

### ERROR CONDITION CODE 02

If the control panel displays a high torque error (Error Code 02), the controller has sensed that the product in the freezing cylinder has reached 125% of set consistency for 10 or more seconds. This condition may be caused if the product consistency adjustment has been set too high. To remedy this condition, place the Freezing Cylinder Off-On Switch in the Off position, wait until the product in the freezing cylinder has had adequate time to thaw to a reasonably soft consistency, and return the switch to the On position. Follow the Product Consistency Adjustment procedures at the beginning of this section and reduce the Fine Adjustment value by a few points. If the Control Panel still displays the error condition code, call your Authorized Stoelting Distributor for further assistance.

### ERROR CONDITION CODE 03

Extended run time errors (Error Code 03) are often times caused by the mix running too low in the freezer's mix container, or if a restriction is preventing the mix from entering the freezing cylinder. Check the mix level on the affected freezing cylinder. If the level mix is low, add mix. Look for ice crystals in the liquid mix container. Ice crystals can clog the mix inlet system, and prevent mix from entering the freezing cylinder. If you find ice crystals in the mix, check the temperature of the walk-in cooler where the mix is stored and the temperature of the freezer's cab. If the freezer's cab is below 34°F (1°C), call your Stoelting Authorized Distributor for assistance in adjusting the freezer cab temperature.

Check the condition of the neoprene hose running through the mix pump head. If it shows signs of wear, rotate or replace it as outlined in Section 2.5 of this manual.

Excessive compressor run time may also occur if the condenser filter is dirty, or if the condenser is obstructed. Check the top of the freezer, to be sure nothing has been placed on top of the condenser.

After the cause of the problem is found and remedied, place the Freezing Cylinder Off-On Switch in the Off position, wait 10 seconds, and return the switch to the On position. If the Control Panel still displays the error condition code, call your Authorized Stoelting Distributor for further assistance.

### ERROR CONDITION CODE 04

If the freezer is left in the Clean Mode for more than 20 minutes, the control panel will display a Clean Error (Error Code 04). This condition does not reflect a problem with the freezer itself. The Clean Error has been programmed into the controller as a safeguard to protect the freezer from potential damage caused by the freezer being accidentally left in the clean mode. To remedy the Clean Error, place the Freezing Cylinder Off-On Switch in the Off position, wait 10 seconds, and return the switch to the On position. If the Control Panel still displays the error condition code, call your Authorized Stoelting Distributor for further assistance.

### ERROR CONDITION CODE 05

If the control panel displays a Freezing Cylinder Sensor error (Error Code 05), place the Freezing Cylinder Off-On Switch in the Off position, wait 10 seconds, and return the switch to the On position. If the Control Panel still displays the error condition code, call your Authorized Stoelting Distributor for further assistance.

### NOTE

When the freezer encounters a Freezing Cylinder Sensor Error, the freezer will automatically be switched to run on pre-configured timing cycles. This mode will allow you to continue serving product until the freezer can be serviced.

### ERROR CONDITION CODE 07

If the control panel displays a Drive Motor Current error (Error Code 07), place the Freezing Cylinder Off-On Switch in the Off position, wait 10 seconds, and return the switch to the On position. If the Control Panel still displays the error condition code, call your Authorized Stoelting Distributor for further assistance.

### ERROR CONDITION CODE 08

If the control panel displays a Cab Sensor error (Error Code 08), place the Freezing Cylinder Off-On Switch in the Off position, wait 10 seconds, and return the switch to the On position. If the Control Panel still displays the error condition code, call your Authorized Stoelting Distributor for further assistance.

## ERROR CONDITION CODE 09

Error 09 conditions are usually caused by insufficient cooling at the freezer's condenser. If the control panel displays a High Pressure Cutout error (Error Code 09), turn the freezer power off. Press the High Pressure Cutout Reset Switch located on the upper, left hand corner of the left side panel. There is a round, black boot covering the reset switch. Pressing in the center of the boot will reset the switch.

In air cooled condenser models, check the air filter to make sure it is clean (see section 4.6). Replace the filter as required. Check for proper air clearance around the freezer. The freezer must have a minimum of 3" (7,5cm) of space on all sides and 10" (25cm) at the top for proper circulation. A minimum of 6" (15cm) clearance is required in high ambient conditions.

On water cooled condenser models, check for proper waterflow through the condenser coil. After the cause of the error is determined and corrected, turn on the Main Freezer Power Switch and place the Freezing Cylinder switch to the on position. If the Control Panel still displays the error condition code, call your Authorized Stoelting Distributor for further assistance.

## ALTERNATING FLASHING CONTROL PANELLIGHTS

When the Main Freezer Power Switch is placed in the ON position and the left Freezing Cylinder OFF/ON switch is left in the OFF position, the green and amber control panel lights will flash in alternating sequence. This indicates that the storage cabinet is being refrigerated, but the left freezing cylinder is not receiving power. Placing the left Freezing Cylinder OFF/ON switch in the ON position will return the freezing cylinder to the SLEEP mode. Pressing the PUSH TO FREEZE button will begin the freezing cycle.

The Troubleshooting Tables on the following three pages list the common problems that can occur to the freezer.

## FREEZER

PROBLEM	FREEZER POSSIBLE CAUSE	REMEDY
Drive motor (auger) "kicks-out", or does not run.	<ol style="list-style-type: none"> <li>1. Power to freezer is off.</li> <li>2. Drive motor overloaded.</li> <li>3. Low line voltage.</li> <li>4. Product too hard.</li> <li>5. Front door not installed securely.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check power to freezer.</li> <li>2. Wait 15-20 min. for Thermo overload to reset.</li> <li>3. Check, must be +/-10% of nameplate voltage.</li> <li>4. Raise overrun and/or decrease product consistency. (See Section 4.2 or 4.1)</li> <li>5. Install front door securely.</li> </ol>
Compressor does not operate.	<ol style="list-style-type: none"> <li>1. Power to freezer if off.</li> <li>2. Drive motor overloaded.</li> <li>3. Low line voltage.</li> <li>4. Compressor internal overload is cut-out.</li> <li>5. Front door not installed securely.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check power to freezer.</li> <li>2. Wait 15-20 min. for Thermo overload to reset.</li> <li>3. Check, must be +/-10% of nameplate voltage.</li> <li>4. Check condenser and clean air filter (See Sect. 4.6)</li> <li>5. Install front door securely.</li> </ol>
Product too soft.	<ol style="list-style-type: none"> <li>1. Product consistency setting is too low.</li> <li>2. Product break down.</li> <li>3. Freezer in Sleep mode.</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase Fine Adj. setting. (See Section 4.1)</li> <li>2. Fill with fresh product.</li> <li>3. Press Push to Freeze button.</li> </ol>
Freeze-up. (Product will not dispense easily.)	<ol style="list-style-type: none"> <li>1. Product consistency setting is too high.</li> <li>2. Low overrun setting.</li> <li>3. Low pump pressure.</li> <li>4. Large air pocket in freezing cylinder.</li> <li>5. Auger turning counter-clockwise.</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease Fine Adj. setting. (See Section 4.1)</li> <li>2. Raise overrun. (See Section 4.2)</li> <li>3. Check pump pressure.</li> <li>4. Purge air from freezing cylinder.</li> <li>5. Change rotation to clockwise.</li> </ol>
Rear auger seal leaks.	<ol style="list-style-type: none"> <li>1. Rear auger seal not lubricated.</li> <li>2. Seal or O-ring missing or installed incorrectly.</li> <li>3. Worn or scratched shaft.</li> </ol>	<ol style="list-style-type: none"> <li>1. Lubricate seal. (See Section 3.8)</li> <li>2. Check. (See Section 3.8)</li> <li>3. Replace shaft.</li> </ol>
Spigot leaks.	<ol style="list-style-type: none"> <li>1. Spigot parts are not lubricated.</li> <li>2. Chipped or worn O-rings.</li> <li>3. O-rings on spigot installed wrong.</li> <li>4. Nicks or scratched on front door where spigot is located.</li> </ol>	<ol style="list-style-type: none"> <li>1. Lubricate. (See Section 3.8)</li> <li>2. Replace O-rings.</li> <li>3. Remove spigot and check O-rings.</li> <li>4. Replace front door.</li> </ol>
Drive belt slipping or squealing.	<ol style="list-style-type: none"> <li>1. Drive belt tension not correct.</li> <li>2. Worn belt.</li> <li>3. Consistency setting is too high.</li> <li>4. Low overrun.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust belt tension. (See Section 4.5)</li> <li>2. Replace belt.</li> <li>3. Adjust consistency. (See Section 4.1)</li> <li>4. Check for air leak.</li> </ol>
Mix temperature too warm in cab.	<ol style="list-style-type: none"> <li>1. System low on refrigerant.</li> <li>2. Temperature control set too warm.</li> </ol>	<ol style="list-style-type: none"> <li>1. Add refrigerant. (Refrig. Service)</li> <li>2. Contact your local Stoelting Distributor.</li> </ol>
Mix temperature too cold in cab.	<ol style="list-style-type: none"> <li>1. Temperature control set too cold.</li> </ol>	<ol style="list-style-type: none"> <li>1. Contact your local Stoelting Distributor.</li> </ol>

# MIX PUMP

## 1. PUMP MOTOR DOES NOT RUN

Power to pump is off.	Supply power to pump.
Low voltage.	Check for low line voltage.
Mix pump hose jammed inside black cover/clamp.	Disconnect pump from power source. Remove four cover/clamp thumb screws. Separate cover/clamp halves and remove outer half. Remove jammed hose. Re-install cover/clamp and tighten four thumb screws securely. Allow motor thermal overload to reset. See Sec. 2.5 for hose replacement. Do not use jammed portion of hose.
Pump motor overloaded.	Allow internal thermal overload to reset; determine overload cause and repair.
Pressure switch on pump is defective.	Contact your local Stoelting Distributor.
Defective motor/capacitor	Contact your local Stoelting Distributor.
Defective toggle switch.	Contact your local Stoelting Distributor.

## 2. PUMP OPERATES BUT CYLINDER WILL NOT FILL

NOTE 1: A PROPERLY WORKING PUMP WILL FILL AN 8 OZ. CUP WITH MIX IN ABOUT 9 SECONDS.

NOTE 2: IMMEDIATELY AFTER A "BAG CHANGE" THE PUMP MAY BE UNABLE TO RE-ESTABLISH IT'S PRIME WITH THE SYSTEM AT OPERATING PRESSURE. IN THIS CASE, TURN THE PUMP OFF. DRAW 2-3 PINTS TO REDUCE SYSTEM PRESSURE TO ZERO. TURN PUMP ON. PURGE REMAINING AIR IN MIX BAG AND PICK-UP HOSE.

**IMPORTANT: Before connecting the pick-up hose to the mix bag, purge the mix bag of air to the extent possible.**

Out of Mix.	Replenish mix supply.
Mix pump hose kinked inside black cover/clamp.	Follow mix pump hose jammed repair. (See #1 above.)
Hoses assembled incorrectly.	Refer to diagram for correct hose connections.
Mix pump hose service life is exceeded.	Reposition/replace mix pump hose. See Sec. 2.5.
Mix pump hose not connected to freezer.	Connect mix pump hose to freezer.
Ice crystals in mix.	Completely thaw mix prior to use.
Mix bag drawn against adapter.	Assure bag is clear of pick-up tube.
Foreign objects in mix.	Clear blockage. Use fresh mix.
Mix Check Valve is installed backwards.	Observe flow arrow for proper orientation.

## 3. OVERRUN TOO LOW OR NO OVERRUN

Overrun setting too low.	Increase overrun setting.
Air leak.	Tighten all hose clamps.
Air compressor not pumping air.	Contact local Stoelting Distributor.

## 4. OVERRUN TOO HIGH

Mix pump hose service life is exceeded.	Reposition/replace mix pump hose.
Out of mix.	Replenish mix supply.
Overrun setting too high.	Decrease overrun setting.
Pick-up leg of mix pump hose is collapsing.	See Section 2.5.

NOTE: ALSO SEE "2" ABOVE.

<b>5. REPLACEMENT MIX PUMP HOSE WON'T FEED THROUGH PUMP</b>	
Feeding hose into discharge hole of mix pump cover.	Feed hose into pick-up side of cover.
Hose ends not cut squarely.	Carefully cut hose end off squarely (no tails).
Force feeding too quickly.	Gently and slowly assist feeding of hose up into pick-up hose side of cover.
Pump motor not running.	Turn on motor switch. Also see Item 1 above.
<b>6. AIR EXITING MIX PICK-UP HOSE</b>	
Pickup tube check valve missing.	Contact local Stoelting Distributor.
<b>7. DISPENSED PRODUCT AIR "POPS"</b>	
Overrun setting too high.	Reposition/replace mix pump hose.
Mix pump hose service life is exceeded.	Reposition/replace mix pump hose.
Overdrawing the freezer's capacity.	Reduce dispense rate.
Recent "mix-out" condition.	Open spigot fully and allow excess air to "belch" out.
NOTE: ALSO SEE 2 & 4 ABOVE.	
<b>8. MIX LEAKAGE FROM PUMP</b>	
<b><i>CAUTION: To prevent mix pump damage from dried mix deposits, immediately disassemble and clean pump.</i></b>	
Mix pump hose service life is exceeded.	Remove mix pump hose. Disconnect pump from power source. Remove mix pump cover/clamp. THOROUGHLY rinse three squeeze rollers using a spray bottle filled with hot water. Thoroughly clean all mix from pump. See Sec. 2.5 for hose replacement.
<b>9. PUMP HAS POOR CAPACITY</b>	
NOTE: See 2, 4, 6 & 7.	
<b>10. PUMP IS NOISY/SQUEAKING</b>	
NOTE: THE ACTION OF THE AIR COMPRESSOR ROCKING ARM CREATES A REPETITIVE CLICKING SOUND DURING OPERATION. THIS IS NORMAL.	
<b>11. MIX IN AIR HOSES</b>	
Air/mix tee above black cover/clamp.	Air/mix tee must be below black cover/clamp.
Air leak.	Tighten all hose clamps.
Mix hose on wrong air/mix tee fitting.	Refer to diagram for correct hose connections.

## SECTION 5 HOW TO ORDER REPLACEMENT PARTS

### 5.1 HOW TO ORDER REPLACEMENT PARTS

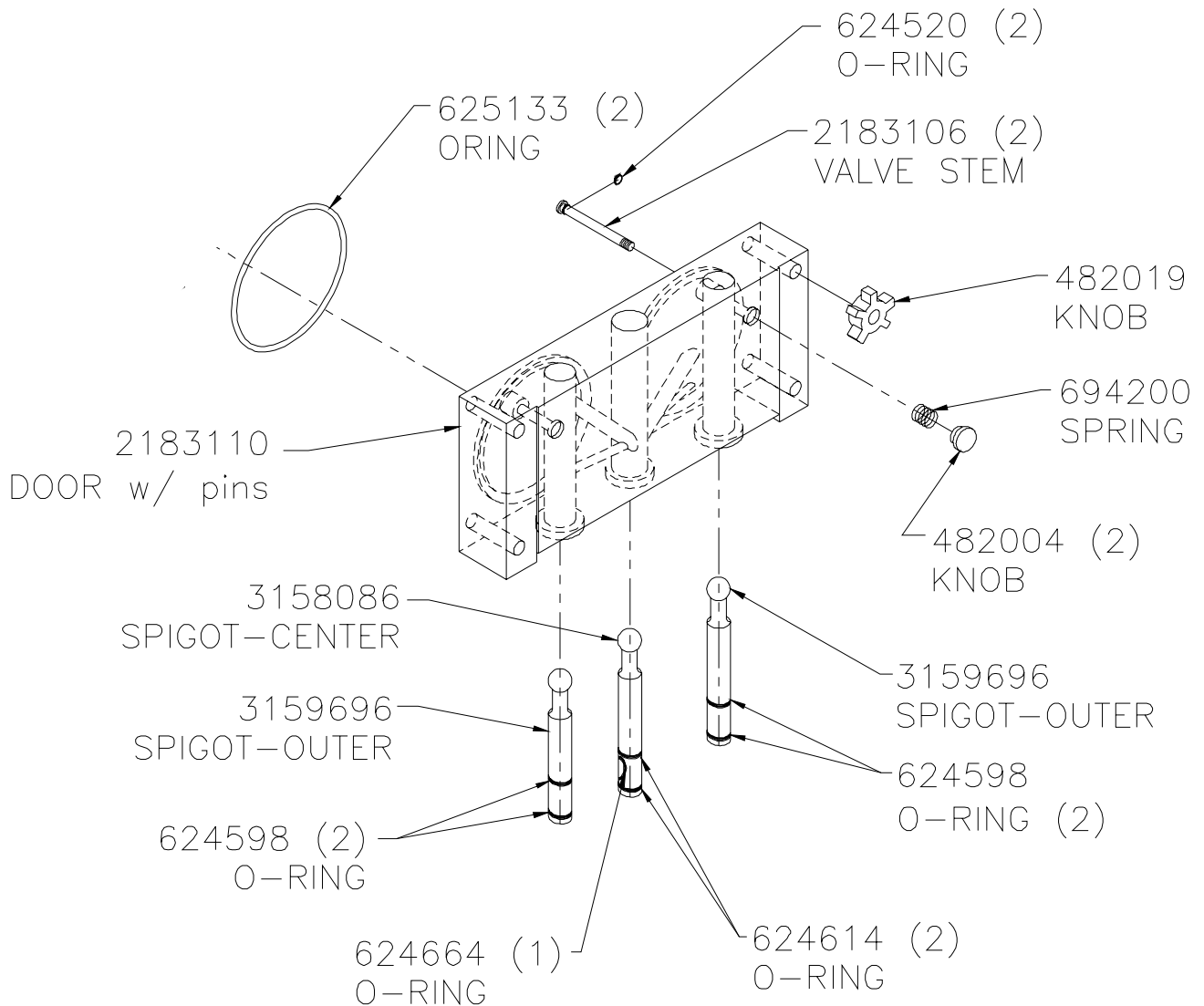
To assure the receipt of the proper replacement parts, supply your Stoelting Authorized Distributor with the following information:

- A. Model number of equipment.
- B. Serial number of model (stamped on nameplate)
- C. Part number, part name, and quantity needed.

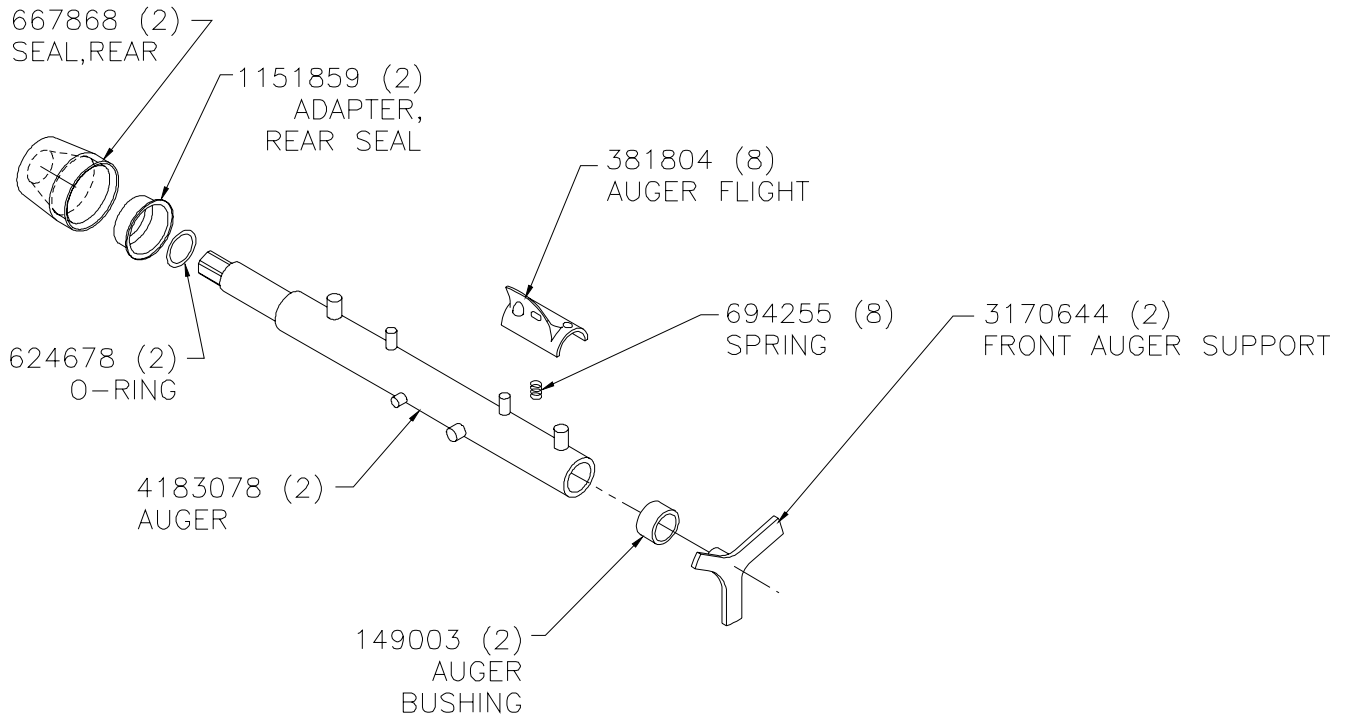
### 5.2 PARTS LIST AND REFERENCE DRAWINGS

The following lists and drawings will aid the user when ordering parts or servicing.

#### FRONT DOOR PARTS



## AUGER PARTS



## MISCELLANEOUS PARTS

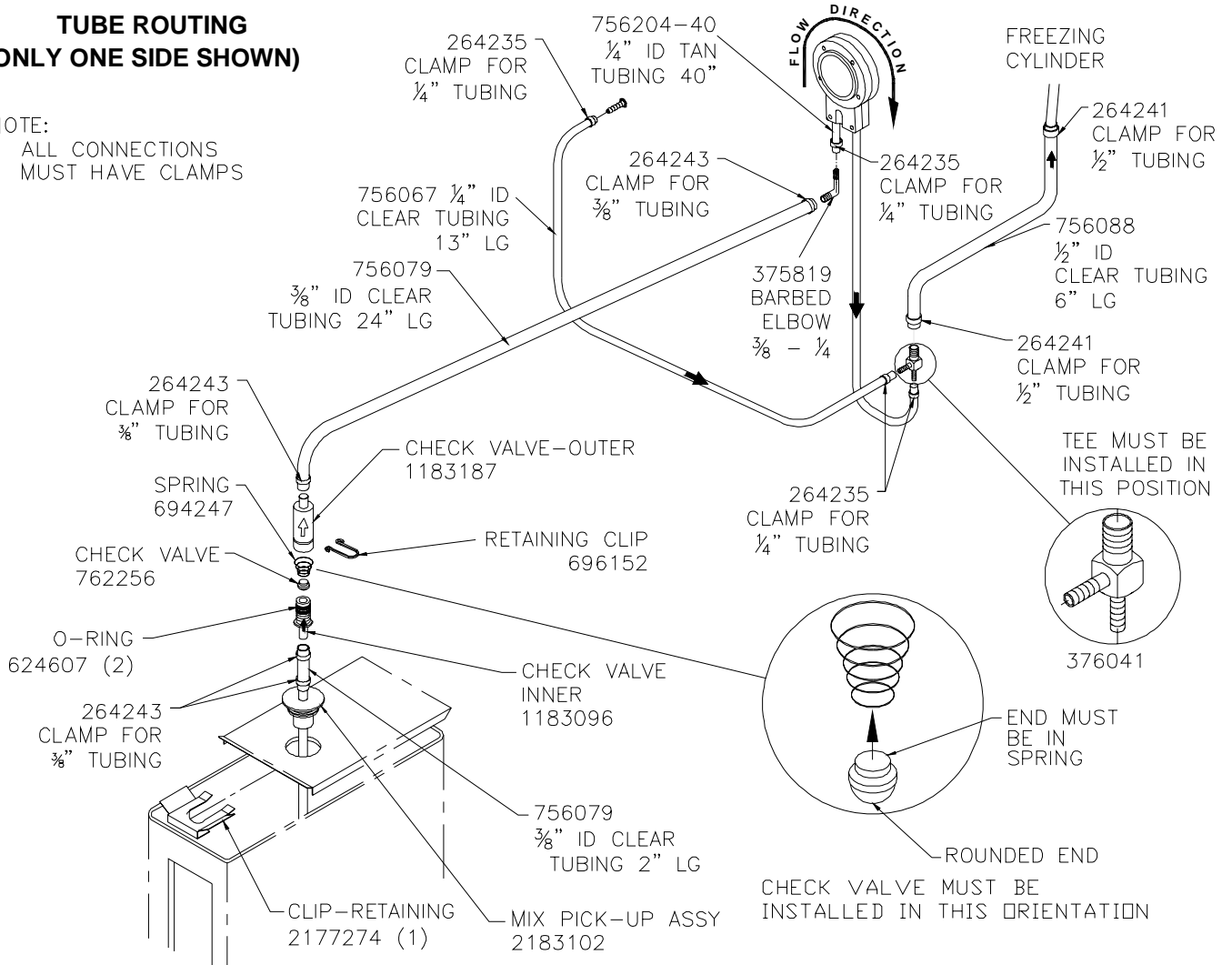
<u>Description</u>	<u>Part No.</u>
Haynes Spray 12 oz.(340 grams) -----	508017
Petro-Gel Tube 4 oz. (113 grams) -----	508135
Spline Lubricant 2 oz. (57 grams) -----	508048
Brush 4"x 8"x16" (10cm x 20cm x 40,5cm) -----	208135
Brush 2.5"x 4"x12" (6,5cm x 10cm x 30,5cm) ----	208146
Brush .25"x 4"x14" (.6cm x 10cm x 35,5cm) ----	208380
Brush 1"x3.5"x18" (2,5cm x 9cm x 45,5cm) -----	208465
Drip Tray -----	744273
Drip Tray Grid -----	417006



**MIX PUMP PARTS**

**TUBE ROUTING  
(ONLY ONE SIDE SHOWN)**

NOTE:  
ALL CONNECTIONS  
MUST HAVE CLAMPS



## DECALS

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
2	324200	H.P. Manual Reset
2	324798	Clean-Off-Serve
2	324797	Standby/Serve
1	324800	Cab Off-On
2	324799	Pump Off On
1	324141	Caution, Haz. Rot. Blade - Front Panel
1	324509	Cleaning - Right Side
2	324014	Auger Rotation - Evap. Enclosure Rear
4	324686	Danger - Start Auto, on Evap. Support between belts & motors support brkt.
1	723525	Winterizing, Attach to water hose near bottom
2	324106	Caution - Elec. Wiring Mat'ls must conform between water couplings, one rear panel bottom
2	324346	Caution - Haz. Mov. Parts, on inside of mtr support brkt @ rear
3	324107	Caution - Haz. Mov. Parts, on cond. bkt. rear & (2) on evap. enclosure sides
2	324208	Attn - Ref. Lk Chk, on evap. enclosure sides
2	723552	Tag - Supply volt., inside J-Box
1	723517	Card - Inside one J-Box
2		ID Tags, Back Panel Top
1	324548	Add. Vent Back Panel Ctr Top
1		Made in U.S.A. - Back panel
2	324103	Caution - Rot. Shaft, on gearbox support bracket
2	324151	Field Connections, J-Box cover, outside
3	324125	Danger Elec.Shock, J-Box covers outside, back panel bottom
1	324242	Warm/Cold, @ T-Stat
2	324565	Night/Serve - Temp. Control Bracket
2	324158	Use copper cond. only, inside both J-boxes
2	324566	Wired According to, on elec. schematic envelope
2	130000	Elec. Schematic Envelope
1	324065	Water Inlet - Back panel above inlet coupling
1	324803	Header Panel Decal (Stoelting Logo)
1	324804	Header Panel Decal (Stoelting Swirl)
1	324806	Header Panel Decal (A & W Logo)



## **WARRANTY SOFT SERVE / SHAKE FREEZERS**

**1. Scope:**

Stoelting, LLC warrants to the first user (the “Buyer”) that the freezer cylinders, hoppers, compressors, drive motors, speed reducers, auger and auger flights of Stoelting soft serve / shake freezers will be free from defects in materials and workmanship under normal use and proper maintenance appearing within five (5) years, and that all other components of such equipment manufactured by Stoelting will be free from defects in material and workmanship under normal use and proper maintenance appearing within twelve (12) months after the date that such equipment is originally installed.

**2. Disclaimer of Other Warranties:**

**THIS WARRANTY IS EXCLUSIVE; AND STOELTING HEREBY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.**

**3. Remedies:**

Stoelting’s sole obligations, and Buyer’s sole remedies, for any breach of this warranty shall be the repair or (at Stoelting’s option) replacement of the affected component at Stoelting’s plant in Kiel, Wisconsin, or (again, at Stoelting’s option) refund of the purchase price of the affected equipment, and, during the first twelve (12) months of the warranty period, deinstallation/reinstallation of the affected component from/into the equipment. Those obligations/remedies are subject to the conditions that Buyer (a) signs and returns to Stoelting, upon installation, the Checklist/Warranty Registration Card for the affected equipment, (b) gives Stoelting prompt written notice of any claimed breach of warranty within the applicable warranty period, and (c) delivers the affected equipment to Stoelting or its designated service location, in its original packaging/crating, also within that period. Buyer shall bear the cost and risk of shipping to and from Stoelting’s plant or designated service location.

**4. Exclusions and Limitations:**

This warranty does not extend to parts, sometimes called “wear parts”, which are generally expected to deteriorate and to require replacement as equipment is used, including as examples but not intended to be limited to o-rings, auger seals, auger support bushings and drive belts. All such parts are sold

**AS IS.**

Further, Stoelting shall not be responsible to provide any remedy under this warranty with respect to any component that fails by reason of negligence, abnormal use, misuse or abuse, use with parts or equipment not manufactured or supplied by Stoelting, or damage in transit.

**THE REMEDIES SET FORTH IN THIS WARRANTY SHALL BE THE SOLE LIABILITY STOELTING AND THE EXCLUSIVE REMEDY OF BUYER WITH RESPECT TO EQUIPMENT SUPPLIED BY STOELTING; AND IN NO EVENT SHALL STOELTING BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER FOR BREACH OF WARRANTY OR OTHER CONTRACT BREACH, NEGLIGENCE OR OTHER TORT, OR ON ANY STRICT LIABILITY THEORY.**