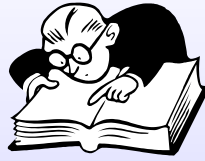




**SaniServ**  
*Technical Information Library*



## *SERVICE MANUALS*

- 1. CIRCUIT AMPACITY**
- 2. INSPECTION & INSTALLATION**
- 3. COMPONENTS: FUNCTION & HANDLING**
- 4. ASSEMBLY & LUBRICATION**
- 5. DISASSEMBLY & CLEANING**
- 6. SANITIZING**
- 7. CHARGING & STARTING**
- 8. MIX HANDLING & CARE**
- 9. REFRIGERATION & COMPRESSORS**
- 10. DRIVE SYSTEMS & DASHER MOTORS**
- 11. ELECTRONIC COMPONENTS**
- 12. MAINTENANCE**
- 13. THEORY OF OPERATION**
- 14. TROUBLE SHOOTING**
- 15. CIRCUIT & SCHEMATICS**

# **CIRCUIT AMPACITY**

# SaniServ

## MINIMUM CIRCUIT AMPACITY & MAXIMUM FUSE SIZE

| MODEL   | VOLTAGE      | MCA                  | MFS |
|---------|--------------|----------------------|-----|
| 108     | 115/60/1     | 15                   | 20  |
| 401EL   | 208/230/60/1 | 15                   | 20  |
| 401N    | 208/230/60/1 | 20                   | 25  |
| 401N    | 208/230/60/3 | 15                   | 20  |
| 401M    | 440/60/3     | 10                   | 10  |
| 404N    | 208/230/60/1 | 20                   | 25  |
| 404N    | 208/230/60/3 | 15                   | 20  |
| 407M    | 115/60/1     | CORD CONNECTED 11 A  |     |
| 407M    | 230/60/1     | 10                   | 10  |
| 408M    | 115/60/1     | CORD CONNECTED 11 A  |     |
| 414N    | 208/230/60/1 | 30                   | 35  |
| 414N    | 203/230/60/3 | 20                   | 25  |
| 414M    | 440/60/3     | 10                   | 10  |
| 424M    | 208/230/60/1 | 30                   | 35  |
| 424M    | 208/230/60/3 | 20                   | 25  |
| 424M    | 440/60/3     | 10                   | 15  |
| 501P    | 208/230/60/1 | 30                   | 40  |
| 501P    | 208/230/60/3 | 20                   | 30  |
| 522P    | 208/230/60/1 | 25                   | 35  |
| 522P    | 208/230/60/3 | 20                   | 25  |
| 527P    | 208/230/60/1 | 30                   | 40  |
| 527P    | 203/230/60/3 | 20                   | 30  |
| 601     | 208/230/60/1 | 15                   | 20  |
| 601     | 208/230/60/3 | 15                   | 15  |
| 608     | 115/60/1     | CORD CONNECTED 11A   |     |
| 611     | 208/230/60/1 | 20                   | 25  |
| 611     | 208/230/60/3 | 15                   | 20  |
| 614     | 208/230/60/1 | 20                   | 25  |
| 614     | 208/230/60/3 | 20                   | 25  |
| 614SAS  | 208/230/60/1 | 20                   | 25  |
| 614SAS  | 208/230/60/3 | 20                   | 25  |
| 624     | 208/230/60/1 | 20                   | 25  |
| 624     | 208/230/60/3 | 20                   | 25  |
| WB700RF | 115/60/1     | CORD CONNECTED 8.3 A |     |

# SaniServ

## **MINIMUM CIRCUIT AMPACITY & MAXIMUM FUSE SIZE**

| <b>MODEL</b>            | <b>VOLTAGE</b>      | <b>MCA</b>                  | <b>MFS</b> |
|-------------------------|---------------------|-----------------------------|------------|
| <b>704</b>              | <b>208/230/60/1</b> | <b>25</b>                   | <b>40</b>  |
| <b>704</b>              | <b>207/230/60/3</b> | <b>20</b>                   | <b>25</b>  |
| <b>704</b>              | <b>440/60/3</b>     | <b>10</b>                   | <b>10</b>  |
| <b>707 &amp; 707 AP</b> | <b>115/60/1</b>     | <b>CORD CONNECTED 11.5</b>  |            |
| <b>707</b>              | <b>208/230/60/1</b> | <b>10</b>                   | <b>10</b>  |
| <b>708</b>              | <b>115/60/1</b>     | <b>15</b>                   | <b>20</b>  |
| <b>709</b>              | <b>208/230/60/1</b> | <b>15</b>                   | <b>20</b>  |
| <b>709</b>              | <b>208/230/60/1</b> | <b>15</b>                   | <b>15</b>  |
| <b>WB7110RF</b>         | <b>115/60/1</b>     | <b>CORD CONNECTED 8.3 A</b> |            |
| <b>714</b>              | <b>208/230/60/1</b> | <b>15</b>                   | <b>20</b>  |
| <b>798</b>              | <b>115/60/1</b>     | <b>CORD CONNECTED 12A</b>   |            |
| <b>824</b>              | <b>208/230/60/1</b> | <b>30</b>                   | <b>35</b>  |
| <b>824</b>              | <b>208/230/60/3</b> | <b>20</b>                   | <b>25</b>  |
| <b>B5A</b>              | <b>208/230/60/1</b> | <b>20</b>                   | <b>25</b>  |
| <b>B 5A</b>             | <b>208/230/60/3</b> | <b>15</b>                   | <b>20</b>  |
| <b>B10A</b>             | <b>208/230/60/1</b> | <b>35</b>                   | <b>45</b>  |
| <b>B10A</b>             | <b>208/230/60/3</b> | <b>20</b>                   | <b>25</b>  |
| <b>B20</b>              | <b>208/230/60/1</b> | <b>55</b>                   | <b>75</b>  |
| <b>B20</b>              | <b>208/230/60/3</b> | <b>35</b>                   | <b>45</b>  |
| <b>B20</b>              | <b>440/60/3</b>     | <b>20</b>                   | <b>25</b>  |

# **INSPECTION & INSTALLATION**

## SECTION #1

### Inspection, Uncrating & Installation

1. Examine the Tip-n-Tell tag. The tag is located on the exterior of the crate. The tag is red with a blue powder material. If the unit has been handled improperly the blue powder material will cover the entire transparent window. If improper handling has been diagnosed do not operate for at least 24 hours after the machine is up-right. When tipped over oil may have seeped into the compressor head and the unit needs time to allow oil to drain back to the crankcase. If operated before the 24 hours period the compressor valves may be destroyed and the equipment life will be sacrificed.
2. Remove the crate and inspect the unit internally and externally for shipping damage. If damage is found record the damage on the bill of lading or file a claim with the shipper immediately. Specific areas of inspection include the external sheet metal, external mounted parts, internal refrigeration tubing, belts and pulleys.

### Legs and Casters:

1. Carefully install legs or casters. Casters are optional and must be purchased. Most floor model machines are somewhat top heavy, therefore be sure unit is secure when tipping for installation of legs or casters.
2. National Sanitation Foundation and local health regulations require the use of legs or casters.
3. Model 707A & 007 have an air inlet in the bottom of the machine base. Do not attempt to operate them without legs.

### Equipment Ventilation

All units require ventilation clearances in order to allow the machines to breathe. Without these clearances the machines cannot be expected to perform normally. Capacity and component service life are sacrificed in those instances where the distance from an object to the machine are less than the clearances specified below.

1. Direct sunlight from outdoor installations or through plate glass windows.
2. Heat generated by appliances such as coffee makers, hot dog cookers, broilers, heat lamps, or the air exhaust of another ice cream maker.
3. Corner installations where air movement is very low.
4. Outdoor installations.

### Clearance on Water Cooled Units

Water cooled units require a minimum of 4" clear all around. In case of multiple machine installations where the machines are next to each other, 8" is required between machines.

### CAUTION

**THE UNIT MUST BE PROTECTED FROM THE ELEMENTS AND IT MUST BE WELL GROUNDED TO PREVENT ACCIDENTAL ELECTRICAL SHOCK!**

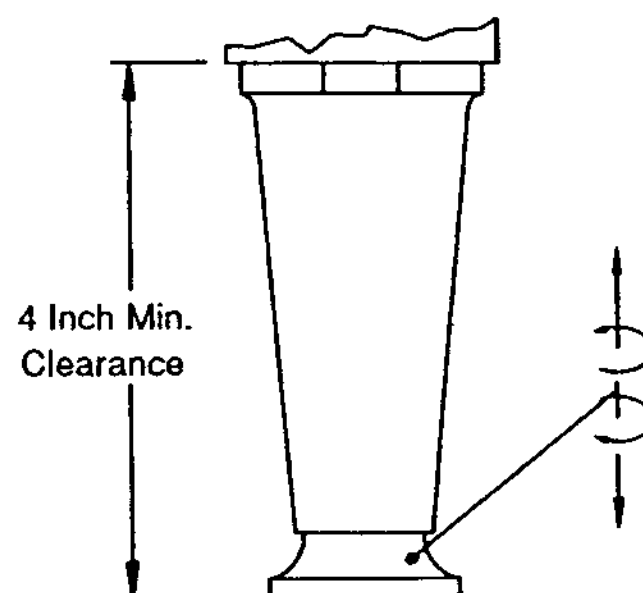


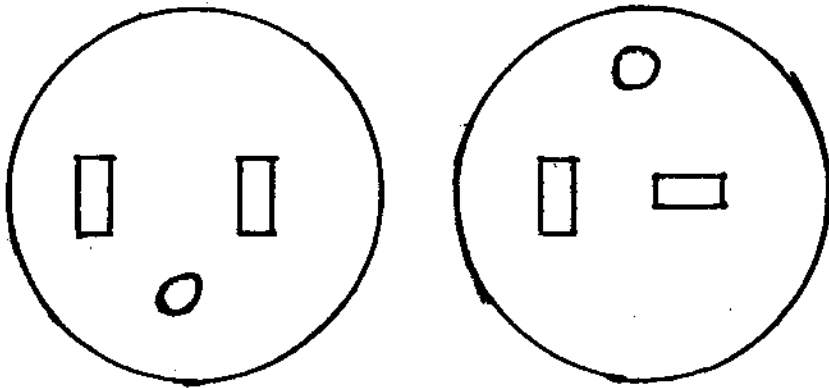
Fig. 1  
Leg Installation

## Facilities Connections

Facilities connections will require connection of a voltage source, or both. Electrical connections are made as follows:

### **Cord Connect Electrical Connection**

Cord connected SaniServ units are 115 volt. These units are equipped with a cord and plug. Cord connected units are primarily model numbers 407 and 707. They are 115 V. 15 Amp units and use the standard 115 volt plug.



**115 VOLT, 15AMP** Plug Cap End View      **230 VOLT, 20 AMP** Plug Cap End View

First, select the circuit breaker or fuse that would be appropriate according to the minimum circuit ampacity (MCA) and maximum fuse size (MFS).

Second, size the wire according to the circuit breaker or fuse selected.

In selecting a circuit breaker or fuse that would be appropriate, it is helpful to understand how the MCA and MFS values are calculated.

MCA+ (Largest motor load X 1.25 + the other concurrent loads.

MFS= (Largest motor load X 2.25) + the other concurrent loads.

If you select a protective device nearest the minimum circuit ampacity this is the maximum protection obtainable for the circuit. This is because it is nearest the running load amperage of the motors. Conversely, a protective device nearest the maximum fuse size is the minimum protection for the circuit.

**Be sure to use time delay (HACR) circuit time delay fuses.**

### **WARNING**

**DO NOT CHANGE OR ALTER THE PLUG SUPPLIED WITH THE MACHINE. THIS MACHINE SHOULD BE INSTALLED AND APPLIED AS IT WAS DESIGNED AND LISTED. IF THE EQUIPMENT IS ALTERED THE U.L. LISTING IS TECHNICALLY VOIDED.**

### **Permanently Connected Electrical Connection**

A permanently connected machine is supplied without a cord or plug. In this case the machine has a field wiring box or boxes. The field wiring box will have six inch long power leads inside in accordance with single phase or three phase power. In addition, there will be a green ground screw for the connection of a ground conductor. In order to properly supply power to the machine refer to the equipment data plate. The data plate is located on the rear of each machine (Example on next page). Refer to the voltage, phase, and cycles, minimum circuit ampacity, maximum fuse or breaker size, and number of circuits necessary.

### **WARNING**

**WHERE TWO SEPARATE FIELD WIRING BOXES ARE USED, DO NOT DAISY CHAINING THESE CONNECTIONS TOGETHER INTO ONE CIRCUIT.**

All units require dedicated circuits. The connection of multiple appliances to one circuit breaker severely limits the ability of the motors to start when the wattage is being used by another appliance.

Avoid high leg installations.

Ensure that all units are properly grounded.

### **Water Connections**

The water line connections on water-cooled machines are located on the back side of the machine. The **IN/OUT** lines are clearly marked and equipped with 3/4" (19 mm) garden hose fittings.

**Note:** These water lines are installed on water-cooled machines only.

Drain connections should be connected to an open gravity drain.

# 400, 600 & FROZEN BEVERAGE SERIES

## Installer's Preoperational Check

THE FOLLOWING ITEMS MUST BE PERFORMED BEFORE ATTEMPTING TO OPERATE THE EQUIPMENT.

1. Remove the left and right panels (Exploded View).
2. Remove the front plate and dasher assembly (Fig. 2a and 2b) by turning the two black plastic knobs on the front plate in a counterclockwise direction. After removing the knobs, pull the front plate off the studs. Grasp the front of the dasher assembly and extract it from the dispenser by pulling it out slowly and straight so the scraper blades are not damaged.
3. Make certain that proper electrical connections have been made.
4. Set the control switch (Fig. 2c) to the "CLEANOUT" position momentarily to verify the direction of rotation of the dasher pulley (Exploded View). It should rotate clockwise as viewed from the rear of the machine.

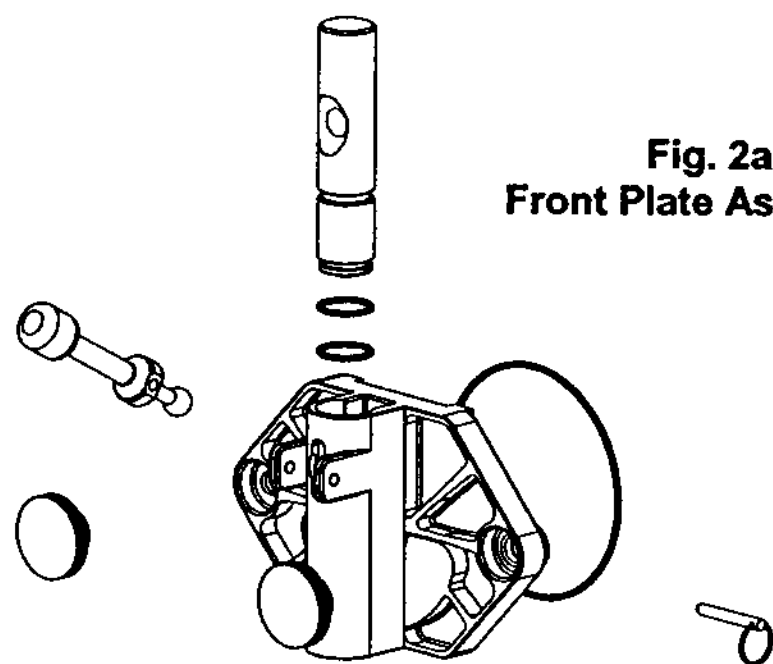


Fig. 2a  
Front Plate Assembly

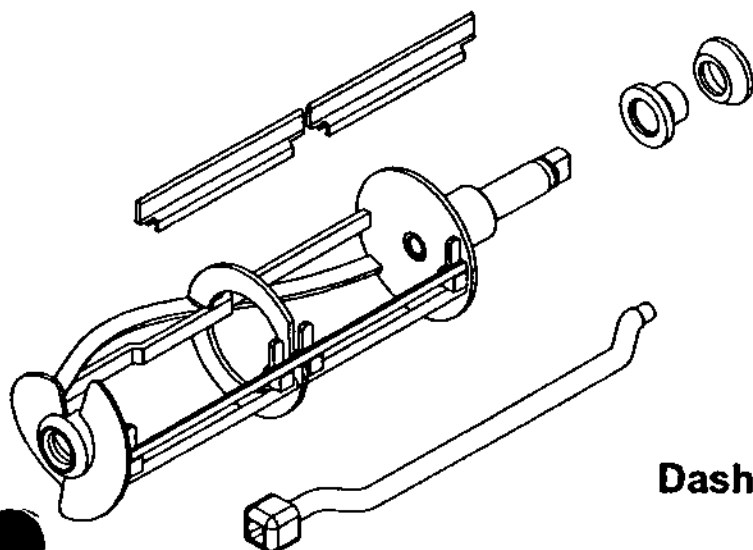


Fig. 2b  
Dasher Assembly

5. On mechanical consistency control units set the control switch to the "CLEANOUT" position for approximately 1-1/2 seconds (a click can be heard) and then move the switch rapidly to the "AUTO" position.

On electronic consistency control units, it is not necessary to select the "CLEANOUT" position prior to the "AUTO" position. Move the control switch directly from the "OFF" position to the "AUTO" position and the unit will start.

On the three phase mechanical consistency control units, set the control switch to "AUTO", then raise the spigot plunger switch to start the refrigeration cycle. Setting the control switch to the "AUTO" position allows both the compressor and dasher motor to start. Check to see that the refrigeration system is operating by feeling the inside of the freezing cylinder. It should turn cold within one minute.

**UNDER NO CIRCUMSTANCES SHOULD THE UNIT**



**BE OPERATED FOR MORE THAN THREE MINUTES WITH THE FREEZING CYLINDER EMPTY. DOING SO WILL RESULT IN DAMAGE TO THE MACHINE.**

6. Set the control switch to the "OFF" position.
7. On models with mechanical consistency control, install the left side panel only - viewed from the front of the machine. The right side panel will not be installed until the consistency control adjustment has been performed. On models with electronic consistency control, install both panels.

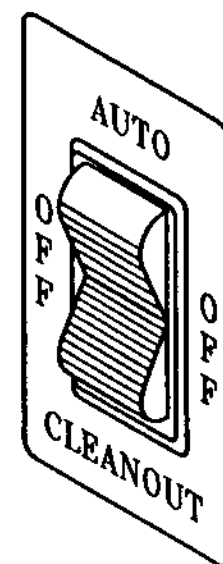


Fig. 2c  
Control Switch

## Installer's Preoperational Check

**THE FOLLOWING ITEMS MUST BE PERFORMED BEFORE ATTEMPTING TO OPERATE THE EQUIPMENT:**

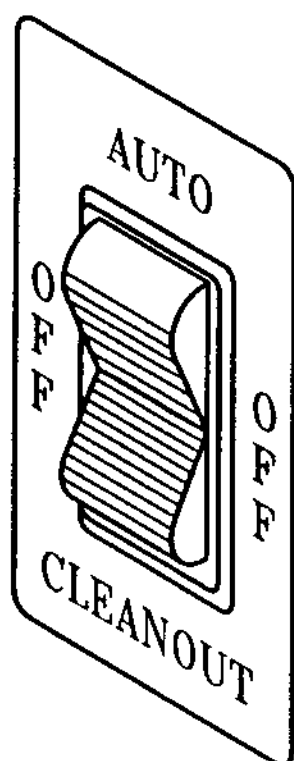
1. Remove the left and right side panels (Exploded View).

2. Remove the front plate (Fig. 3) and both dasher assemblies (Fig. 4) by turning the four black plastic knobs on the front plate in a counterclockwise direction. After removing the knobs, pull the front plate off the studs. Grasp the front of one of the dasher assemblies and remove it from the dispenser by pulling it out slowly and straight so the scraper blades are not damaged. Repeat for the other dasher assembly.

3. Make certain that proper electrical connections have been made.

**NOTE: ON THREE PHASE UNITS MAKE CERTAIN THAT THE PULLEYS ARE TURNING CLOCKWISE WHEN VIEWED FROM THE REAR OF THE UNIT. OTHERWISE, THE COMPRESSOR WILL NOT START BECAUSE THE PHASE IS NOT CORRECT.**

4. Set each control switch (Fig. 2) to the "CLEANOUT" position momentarily to verify the direction of rotation of the dasher pulleys (Exploded View). They should rotate clockwise viewed from the rear of the machine.



**Fig. 2**  
**Control Switch**



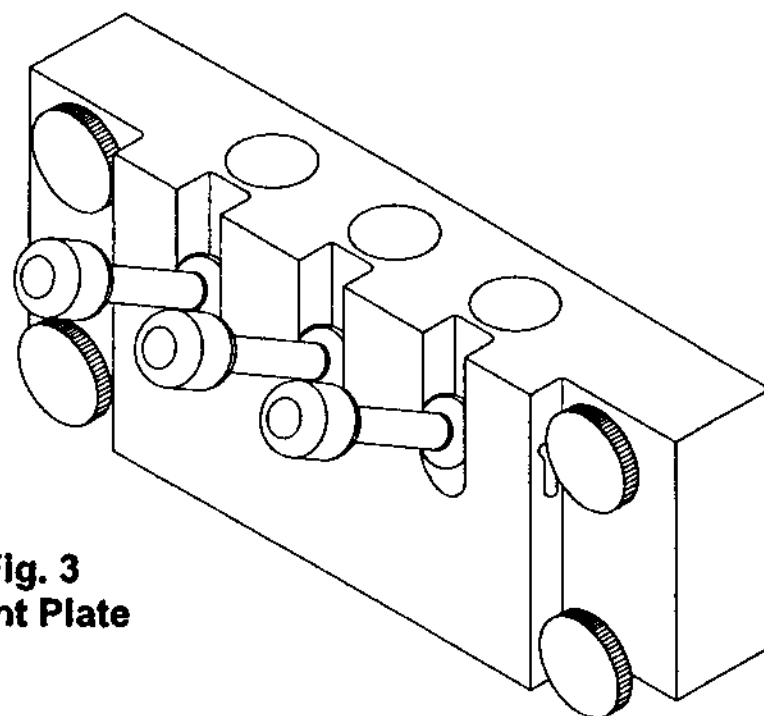
### CAUTION

**UNDER NO CIRCUMSTANCES SHOULD THE UNIT BE OPERATED IN THE "AUTO" POSITION FOR MORE THAN THREE MINUTES WITH EMPTY FREEZING CYLINDERS. DOING SO WILL RESULT IN DAMAGE TO THE MACHINE.**

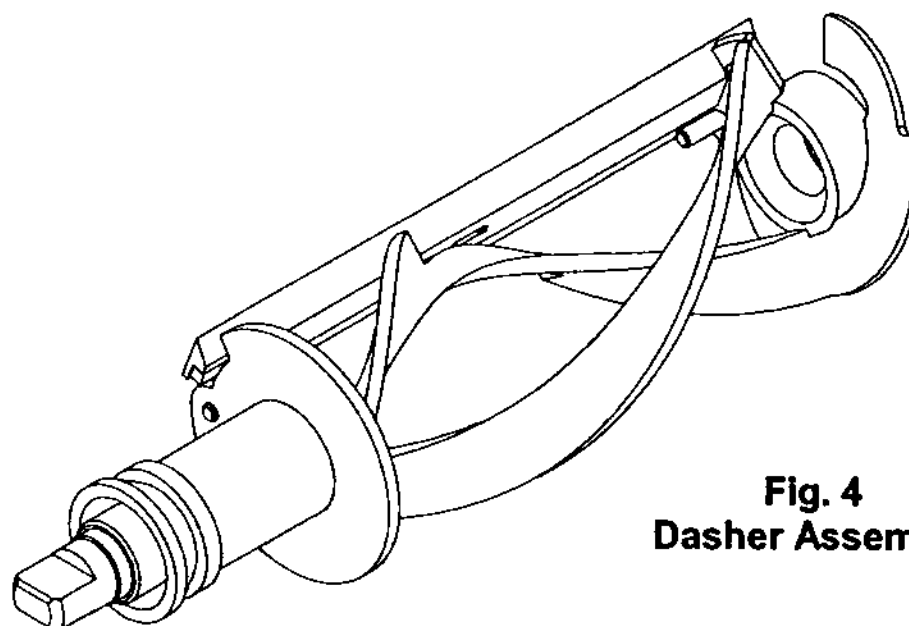
5. Set each control switch to the "AUTO" position. Doing so allows the compressor(s) and dasher motors to start. Check to see that the refrigeration system is operating by feeling the inside of the freezing cylinders. They should turn cold within one minute.

6. Set each control switch to the "OFF" position.

7. Install both side panels.



**Fig. 3**  
**Front Plate**



**Fig. 4**  
**Dasher Assembly**

# Introduction

This manual provides a general system description of the SaniServ Select-A-Shake (SAS) Dispensers. It has been prepared to assist in the training of personnel on the proper installation, operation, and maintenance of the machine. Please read and fully understand the instructions in this manual before attempting to install, operate, or perform routine maintenance on the SAS machines. This manual assumes that you will use a vanilla shake base and add chocolate and strawberry syrups for flavors #2 and #3. Provision is made for a fourth flavor of the day. You may choose a different base or substitute other flavors for chocolate and strawberry. Be certain to use your thickest syrup to make your initial machine setup.

The following sections of the manual must be performed in sequence: Installation, Installer's Preoperational Check, Disassembly & Cleaning, Assembly & Lubrication, Sanitizing, Operation, Syrup Solenoid Valve Adjustment, and Consistency Adjustment.

## Installation

1. Install the casters or optional legs on floor models using the instructions on the shipping crate.

2. Place the machine in the desired location and level the unit by turning the bottom part of each leg clockwise or counterclockwise (Fig. 1). The machine **MUST** be level to operate properly. **THIS UNIT MUST NOT BE OPERATED WITHOUT THE CASTERS OR OPTIONAL LEGS INSTALLED.**

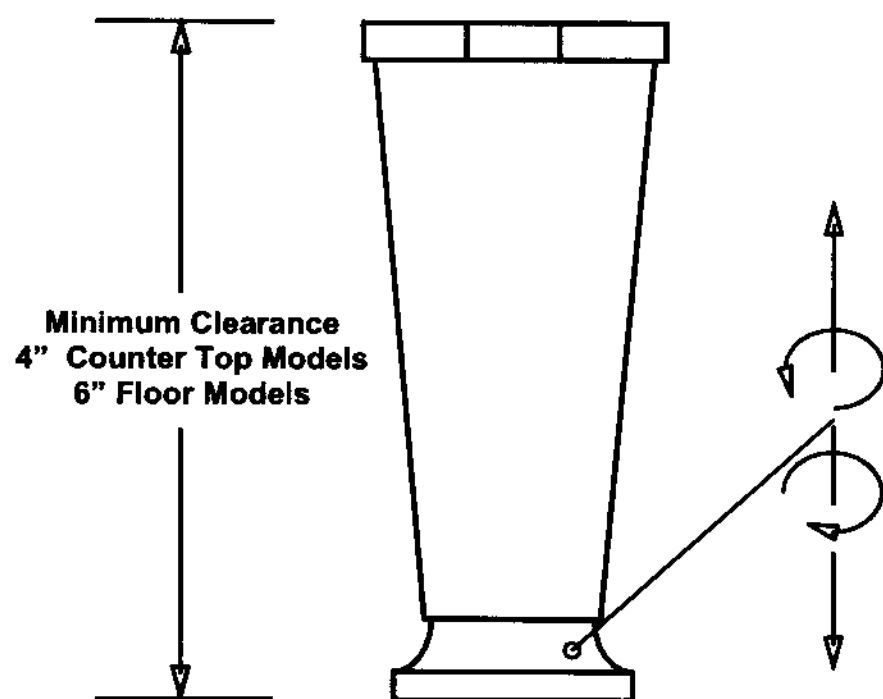


Fig. 1  
Leg Installation

3. Minimum clearance (6") must be maintained at the rear and sides of the machine for adequate ventilation.

4. Electrical and refrigeration specifications are located on the data plate on the rear of the individual machines. Consult local authorities for information regarding plumbing and electrical codes in the area.

**Note: All SaniServ machines should have their own dedicated circuits whether they are cord connected plug-in devices or hard wired units.**

### IMPORTANT

**ALWAYS CHECK ELECTRICAL SPECIFICATIONS ON THE DATA PLATE OF THE MACHINE. DATA PLATE SPECIFICATIONS WILL ALWAYS SUPERSEDE THE INFORMATION IN THIS MANUAL.**

5. The water line connections on water-cooled machines are located on the back side of the machine. The **IN/OUT** lines are clearly marked and have 1/4" male pipe threads fitted with a 3/4" garden hose fitting.

**Note:** These water lines are installed on water-cooled machines only.

### WARNING

**FAILURE TO PROVIDE FOR PROPER EARTH GROUND ACCORDING TO LOCAL APPLICABLE ELECTRICAL CODES COULD RESULT IN SERIOUS ELECTRICAL SHOCK OR DEATH.**

**DO NOT USE EXTENSION CORDS**

**DO NOT TURN MACHINE ON**

6. The hot and cold water supply line fittings for the optional wash-out kit are located on the back panel, left side (facing rear), and both are 3/4" male garden hose.

7. On units with built in CO<sub>2</sub> regulators, connect the CO<sub>2</sub> line or compressed air line to the pressure regulator located inside the syrup compartment. For models with no built in regulator, locate the CO<sub>2</sub> regulator outside the machine. Turn the pressure on and set it to 5 - 20 P.S.I.

8. Install the water (top fitting) and syrup lines to the 1/4 inch stainless steel flare fittings provided on the back of the machine.

# DATA PLATE EXAMPLES

**SaniServ**

451 E. County Line Road  
Mooresville, IN 46158

Model No: A4141N

Part No: 41410N0

Serial No: 04117123123

MFG. Date: 11704

Volts:208-230

PH.: 1

CYC.:60

## Right Barrel

|                                |           |          |
|--------------------------------|-----------|----------|
| Compressor                     | RLA 8.5   | LRA 59.0 |
| Dasher                         | 1 HP      | FLA 6.5  |
| Fan Motor                      | 1/25x2 HP | FLA 1.4  |
| Agitator motor 40watts or less |           |          |
| Refrigerant Charge             | R404a     | 42 oz.   |
| Suction Press.                 | 21-25     |          |
| V                              |           |          |
| Maximum Fuse Size (Amps.):     |           | 35       |
| Minimum Circuit Amps.:         |           | 25       |

## Left Barrel

|                              |     |     |
|------------------------------|-----|-----|
| Compressor                   | RLA | LRA |
| Dasher                       | HP  | FLA |
| Fan Motor                    | HP  | FLA |
| Agitator motor watts or less |     |     |
| Refrigerant Charge           |     | oz. |
| Suction Press.               |     |     |
| Maximum Fuse Size (Amps.):   |     |     |
| Minimum Circuit Amps.:       |     |     |

|                  |       |           |     |      |          |     |      |
|------------------|-------|-----------|-----|------|----------|-----|------|
| Design Pressure: | Right | High Side | 400 | PSIG | Low Side | 200 | PSIG |
|                  | Left  | High Side |     | PSIG | Low Side |     | PSIG |

**COMPONENTS:**

**FUNCTION & HANDLING**

## Components: Function and Handling

### General Information

**Dasher:** Moves product forward to be dispensed. Creates low pressure (vacuum) in the rear to pull in mix/air.

**Scraper Blades:** Scrapes product off cylinder walls.

**Stator Rod:** Acts as a bearing surface. Helps enfold air for overrun. Transmits compression to rear seal. Helps torque system sense torque. Be sure to lubricate.

**Rear Seal:** This part is stationary during operation and must not move. When installed and lubed properly, seals mix in cylinder. When installed and lubed improperly, it causes shafted bearing failure.

**Carburetor Tube:** The carburetor tube is a flow control device that allows product and air to be blended together. The air added to the product is labeled as over-run (see mix section). The over-run helps provide a thick and rich cone. There are four versions of carburetor tubes used.

## WARNING

**THE MISUSE OR NONUSE OF THIS PART WILL RESULT IN FREEZE UP DAMAGE TO THE DASHER, SCRAPER BLADES, OR FREEZING CYLINDER.**

**Front Plate:** The front plate seals the front of the freezing cylinder, and provides a means for dispensing the product. On gravity fed freezers, the front plate indirectly holds the dasher in place via the stator rod. It also provides compression for the rear seal.

### CARBURETOR TUBE

#### HELPFUL HINTS

- Carburetor tubes are not used on slush machines, batch freezers,
- The carburetor tube is a flow control primarily. However, without the device, overrun and equipment performance would be poor.
- This device must be kept clear in its internal mix and air passages. Low overrun or starving of the cylinder may occur.
- Avoid running on the small hole when a product with pulp is used. Also, if a mix is very thick, use the large hole.
- Always place mix inlet hole facing the front of machine.
- Semifrozen product will plug this device. Never place cones or semi-frozen mix into the mix pan.
- Always keep mix above top of the mix inlet hole of this device.
- Do not run the machine without mix and carburetor tube in the mix pan. It may damage your machine!

Dashers

SaniServ manufactures eleven different dashers. The first three shown below operate the bulk of our equipment. The remaining dashers listed are unique to the models shown.

| DASHER P/N | MODEL NO'S                                                                                                                                                | TYPE                                                                                                                           |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| 104991     | 407                                                                                                                                                       | Soft Serve/<br>Gravity Fed<br>Fed Freezer                                                                                      |
| 65413      | 501, 527                                                                                                                                                  | Soft Serve<br>Gravity Fed<br>Freezer                                                                                           |
| 3113-01    | 401, 408, 468, 461,<br>421, 521<br>414, 424, 524, 826,<br><br>601, 608, 668, 611<br>621, 624, 621,<br>621, 624, 007, 614,<br>701, 707, 708, 768,<br>WB700 | Soft Serve<br>Gravity Fed<br>Freezer<br><br>Shake/Gravity<br>(including SAS)<br>Fed Freezer<br>Cocktail/Gravity<br>Fed Freezer |
| 65799      | 522                                                                                                                                                       | 4" Barrel, Soft<br>Serve/Gravity<br>Freezer                                                                                    |
|            |                                                                                                                                                           |                                                                                                                                |
|            |                                                                                                                                                           |                                                                                                                                |
|            |                                                                                                                                                           |                                                                                                                                |
|            |                                                                                                                                                           |                                                                                                                                |
| 107589     | B-5                                                                                                                                                       | Batch Freezer                                                                                                                  |
| 106618     | B-10                                                                                                                                                      | Batch Freezer                                                                                                                  |
| 106852     | B-20                                                                                                                                                      | Batch Freezer                                                                                                                  |
| 107227     | B-48                                                                                                                                                      | Batch Freezer                                                                                                                  |

See Fig. 3, page 6.

Dasher Construction, Components, Associated Materials and Lubrication

Dashers are welded and constructed primarily from ASTM 304 Stainless Steel; other materials include Delrin plastic, Silicone rubber, and Neoprene or Buna-N. Exception: The

Dasher Components

**Front Auger:** Pushes frozen product out the front plate, centers up the dasher at the front of the freezing cylinder by riding on the stator rod and provides support for the spiral dasher tie rod and blade support rod. Note: Not use on Batch Freezers.

**Spiral:** Creates low pressure area which aids in the introduction of new mix and air from the carburetor tube and mix pan. The spiral also pushes finished product forward to be pushed out the front auger.

\*Spirals on Batch Freezers hold the scraper blades.

**Flow Plate:** The flow plate adds strength to the dasher by providing support to the spiral, dasher tie rod blade support rods, and drive shaft. It separates mix from product and directs mix to the freezing cylinder as product is drawn out the front. Note: Not used on Batch Freezers.

**Dasher Tie Rod:** Dasher tie rod adds extra rigidity to the dasher, especially to the blade support rods. Helps keep scrapers from being turned backwards.

*\*This part must be straight from front to back.*

**Blade Support Rod:** The blade support rods adds strength to the dasher and holds the blade(s) in place.  
Blade support rods should be straight from front to back, and if bowed, must be straightened properly. If not straight, proper machine operation can not be obtained. This can also cause front plate wobble or blade breakage.

**Blade Stop:** Commonly called dasher tabs, these tabs hold the scraper blade(s) at the proper angle.

*\*Blade(s) must lay evenly on the tabs.*

**Scraper Blade(s):** Scraper blades scrape product off the freezing cylinder (evaporator). Note: Blades must be sharp with no cracks or chips.

| Blade Part No. |          | Model                                             |             |
|----------------|----------|---------------------------------------------------|-------------|
| 104984-02      | Note A-C | 407                                               | One         |
|                |          | Used/Head                                         |             |
| 104984         | Note A-C | All Soft Serve, Shake & Cocktail Except 522 & 704 |             |
| 107176         | Note D   | 522                                               | 2 Used/Head |
| 108790         |          | 704                                               | 2 Used/Head |
| 107608         |          | B-5                                               | 2 Used/Head |
| 106698         |          | B-10                                              | 2 Used/Head |
| 106914         |          | B-20                                              | 2 Used/Head |
| 107245         |          | B-48                                              | 2 Used/Head |
| 108075         |          | 704                                               | 2 Used/Head |

#### Notes

- Allowable blade wear is approximately 7/64" or half of the blade angle length.
- Part numbers 104984 and 104984-02 should be positioned so that they peak 1/8" to 1/4" above the front auger.
- Scraper blades should be reversed each cleaning for uniform blade wear/life.
- Blade holder for 522 is part number 107177.

**Drive Shaft:** The drive shaft is welded to the flow plate. It provides the connection between the external drive system and the dasher internal to the freezing cylinder. In addition, the rear seal rides on this shaft.

**Rear Seal:** The rear seal is located near the rear of the dasher. It is responsible for sealing the mix in the freezing cylinder during the freezing, dispensing, and cleaning process. There are several different rear seals used in SaniServ as follows:

**GREY silicone rear seal P/N 104916.** Fits 3113-01, 104991, 106278, 65799, 106665, & 106618 dashers. A single o-ring P/N 58917 is used on the tail stock of slush freezers. A single o-ring P/N 58903 is used under the rear seal for the 407 dasher.

**GREY silicone rear seal P/N 106729** (includes P/N 58945 o-ring) fits 65740-01 dasher for 921.

The **GREY** silicone portion of P/N 104916 and 106729 is the same. Only the white delrin portion is different.

Should the seal become cracked, torn, or have chunks out of it, replace it immediately. When new, the seal is not very compressible. However, when worn out, it is very spongy.

O-ring rear seal P/N 58903 fits B-4 batch freezers (quantity of 2 required).

O-ring rear seal P/N 58972 fits B-20 and B-48 batch freezers (quantity of 1 required).

#### Important

- No sanitary lubrication should be placed on the silicone rubber portion of the seal.

- The rear seal on the B-20, and B-48 dashers is an o-ring. The rear seal is a resilient part. When new, the material is not very compressible; however, when old, it is very spongy. Should the rear seal become cracked, torn, or have chips out of it, replace it immediately.

**Stator Rod:** The stator rod is a multifunction function device. It is a bearing surface for the front auger, transmits compression from the front plate to the dasher (for the rear seal), helps enfold air in the mix during freezing, and helps the machine sense torque.

#### Lubrication of Dashers and Lubricants

The stainless steel portions of the dasher do not need lubrication; however, certain areas that contact delrin plastic surfaces do. See (Fig. 3). Use only food approved lubricants, such as Petrogel and Sanilube etc. These lubricants, are colorless, odorless and tasteless. In the presence of mixes, they will take on the same color. Therefore, it is not visible should it be washed into finished product.

#### CAUTION

**DO NOT USE ANY OTHER PETROLEUM BASED PRODUCTS! SANILUBE IS RECOMMENDED FOR COCKTAIL/SLUSH FREEZERS.**

#### Results of Improper Lubrication

**General Information:** The net result of improper lubrication is premature failure of those parts shown to be lubricated on Fig. 3.

**Stator Rods:** Stator rods which are not properly lubricated will be grooved by front auger, and will allow the dasher to strike the evaporator wall. See (Fig. 3). Also see Service Bulletin #8615

**Rear Seals:** Rear seals which are not lubricated properly will lead to shafted bearing failure, eroding of the rear seal surface area, destruction of seal, or all the above.

Any leakage down the drip chute must be resolved immediately. It is an indication of improper installation, or lubrication of the seal.

Those rear seals, with ~~G~~ silicone rubber, should have no lubrication on the ~~G~~ silicone rubber portion of the seal.

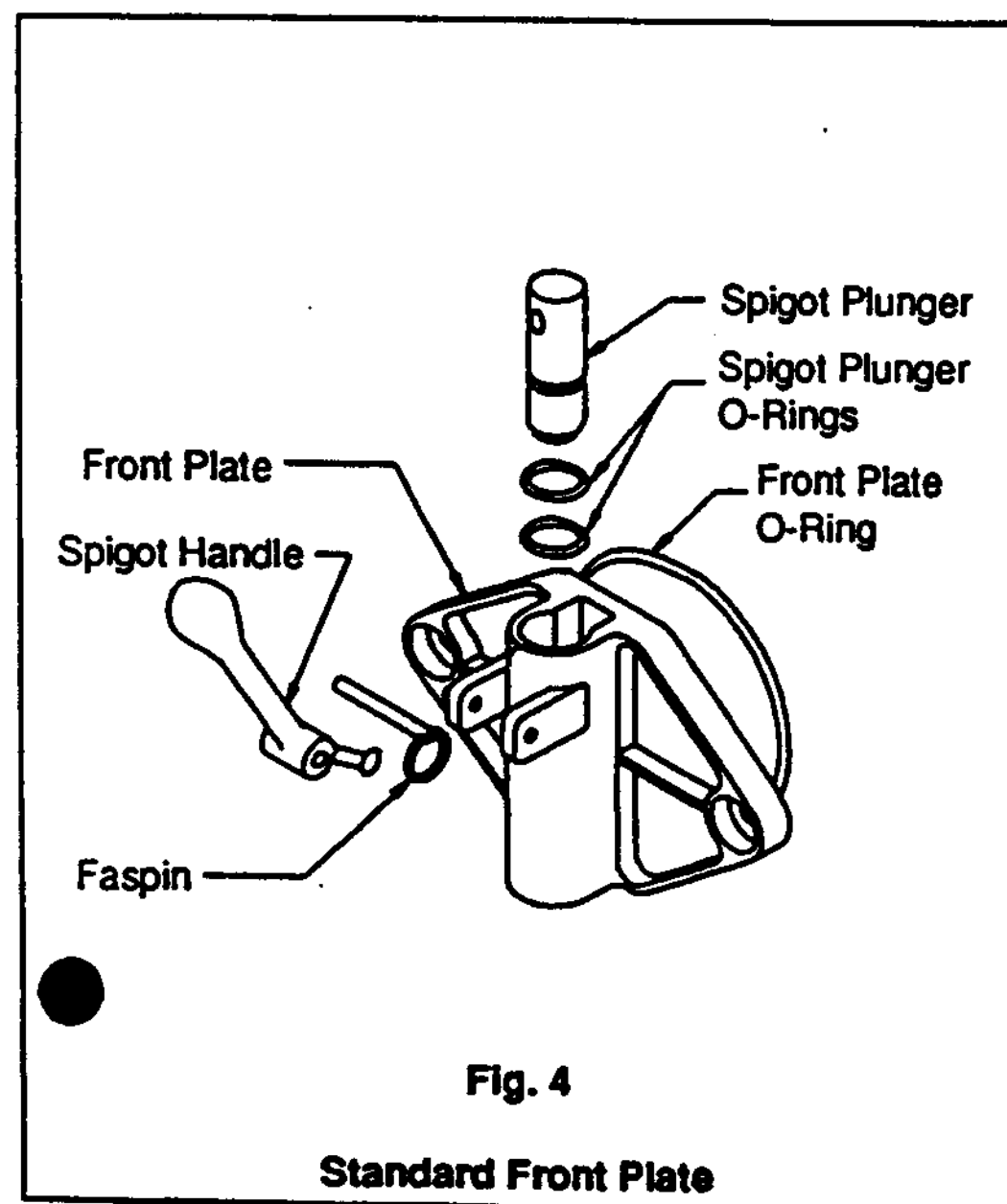
**Dasher Rotation:** All SaniServ dashers turn counter clockwise (facing the front).

## Front Plates

The front plate creates the consumer's first impression of the product they are about to consume. Therefore, proper cleaning and lubrication are a must. Examine the front plate and it's associated parts to understand cleaning and lubrication practices.

The front plate performs three functions:

1. Supports or guides the front of the dasher.
2. Retains product in the freezing environment.
3. Dispenses a serving or batch of product on demand.



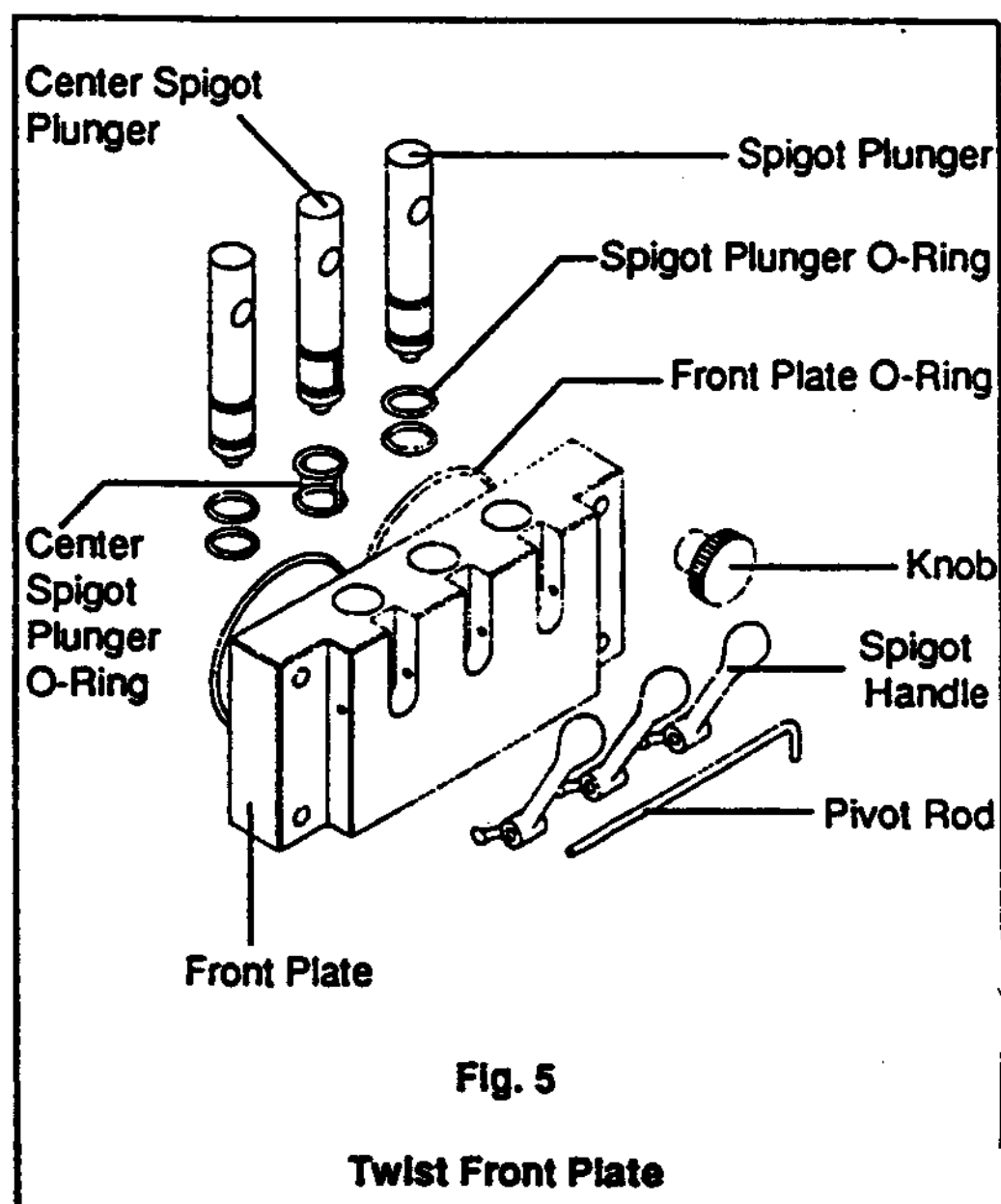
## Cleaning

Refer to (Fig. 4) above for parts breakdown.

1. Drain, rinse and clean the machine as per the instructions in Section #3 cleaning and sanitizing.
2. Remove the knobs which secure the front plate to the freezing cylinder. This will release the front plate and dasher assembly for cleaning, see Section #3 for cleaning and lubrication instructions for dashers.
3. With the front plate free, pull the spigot handles down then half way back. Remove the faspin or pivot rod. Pull the spigot handles free.
4. Pull the spigot plungers straight up to remove them from the front plate o-ring as shown in (Fig. 4).
5. Grasp the spigot plungers by the top. Using a dry cloth, grip the center o-ring, as shown in (Fig. 5 & 8). With the top of the o-ring raised push it forward to remove it. Repeat on all spigot plunger o-rings.

**NOTE:** Twist machines use an H shaped o-ring which can be removed in similar fashion. The H o-ring if turned inside out will resist its original shape. In the proper position the o-ring will lie smooth and uniform. Be sure it is installed right side out or a leak may occur.

6. Hand wash the front plate and associated parts. Use a warm mild soap and water solution. To reach all holes and ports, use the brush provided in the parts kit with the machine.



**DO NOT:** Clean these parts in the dishwasher. High temperatures created in a dishwasher may damage these parts.

**DO NOT:** Use abrasive materials or detergents that may scratch these parts. Rinse all parts thoroughly and air dry to prepare for assembly and lubrication. Do not wipe dry, let air dry.

### Lubrication

1. Read Operator's Manual prior to assembly for related parts lubrication. (Dasher, rear seal, etc.)
2. Lubricate the spigot plungers with petrogel or another food grade lubricant as shown in (Fig. 6).

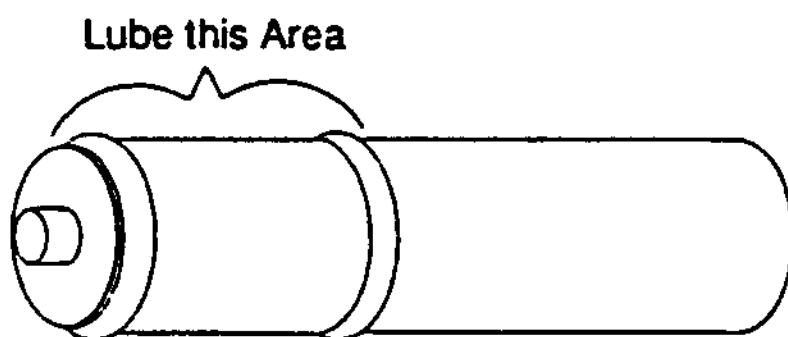


Fig. 6

Spigot Plunger Lubrication

3. With the spigot plungers lubricated reassemble the front plate.

### IMPORTANT

WHEN INSERTING THE SPIGOT PLUNGER WITH THE H O-RING IN THE FRONT PLATE, ROTATE THE PLUNGER 45 DEGREES BEFORE INSERTING, INSERT AND ROTATE BACK AS SHOWN IN FIGURE #4. THIS WILL PREVENT EXCESS WEAR AND TEAR TO THE O-RING AS IT PASSES THE OPENINGS IN THE FRONT PLATE.

4. Front plate o-rings do not require lubrication. Lubrication of the front plate o-ring may cause leakage.
5. Return the assembled front plate to its original position. Start the knobs that secure the front plate.
  - Tighten the securing knobs evenly until snug.
  - Do not over tighten or tighten unevenly. Damage may occur to the front plate.
  - Sanitize as per the instructions in the operator's manual and operate the machine.

**SB #8615**  
**REVISION A**

**SERVICE BULLETIN**

**SUBJECT: Stator Rods (Dasher Assembly)**

To assist you in ordering replacement stator rods, we request that you provide the full unit model number and serial number of each machine. This information allows us to select the proper component for your order. The following information illustrates the importance to this selection.

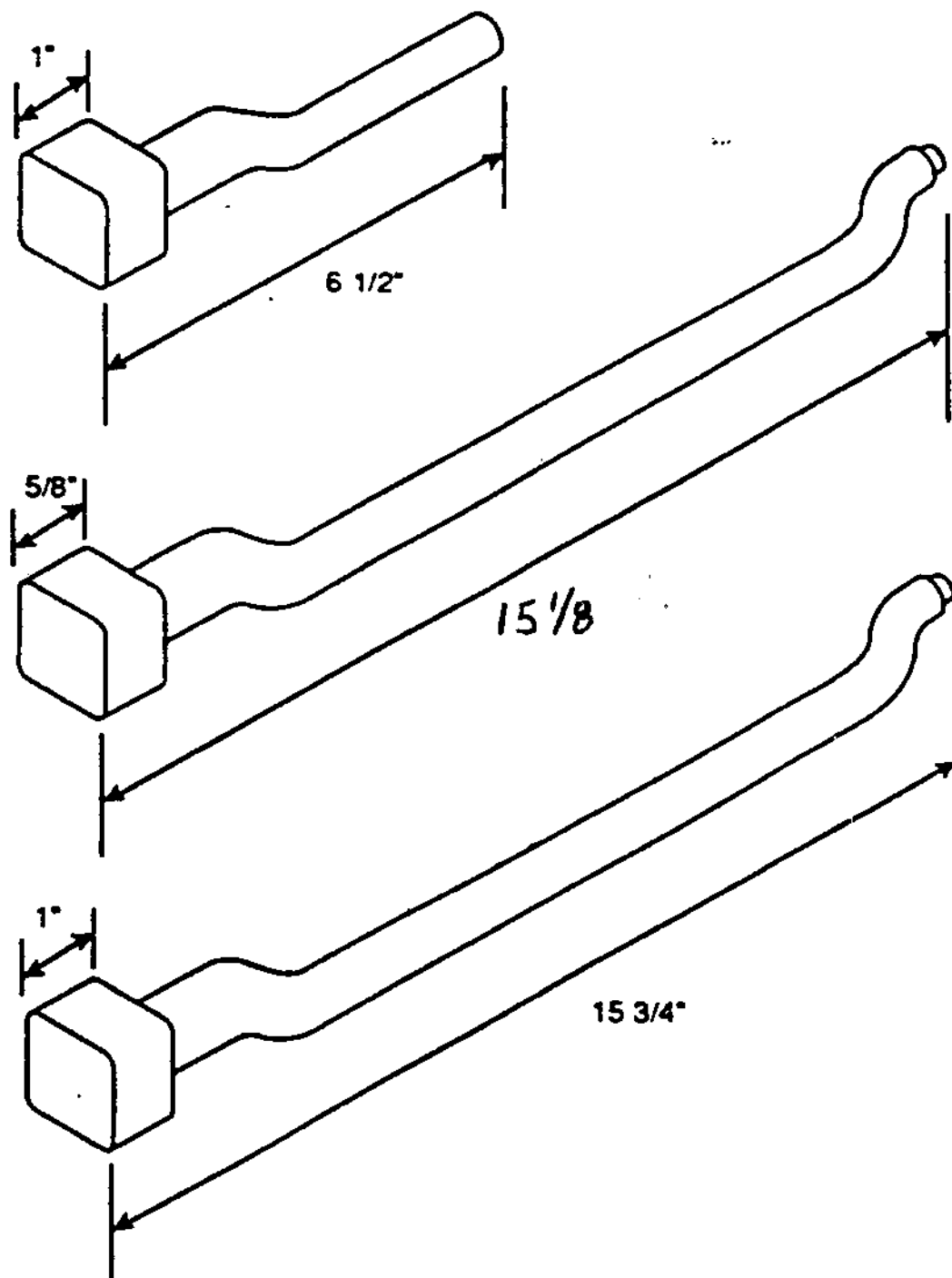
Please be aware that twist machine stator rods are different than the standard soft serve stator rod. Be sure to specify the full details of your machine.

Review the following five (5) types of stator rods:

| Model and Unit Type        | Part Number | Stator Rod Size                |
|----------------------------|-------------|--------------------------------|
| 501 & 527                  | #109297     | Approx. $11\frac{1}{8}$ " Long |
| 522                        | #109296     | Approx. $15\frac{1}{8}$ " Long |
| 407                        | #105531     | Approx. $6\frac{1}{2}$ " Long  |
| All Other Machines (Shake) | # 65633     | Approx. $15\frac{3}{4}$ " Long |
| (Soft Serve)               | # 65633     | Approx. $15\frac{3}{4}$ " Long |

**SPECIAL NOTE:**

From time to time, we receive reports from the service agencies that the technicians attempt to repair a machine, only to discover the stator rod is badly damaged and a replacement is needed. The stator rod in question was damaged because the owner/operator failed to apply adequate lubrication (Petrogel) to the suggested areas. This procedure is described fully in the operators manual. Please continue to inform the owners about their responsibility for preventative maintenance. This care will allow the unit to function properly when they need it most.



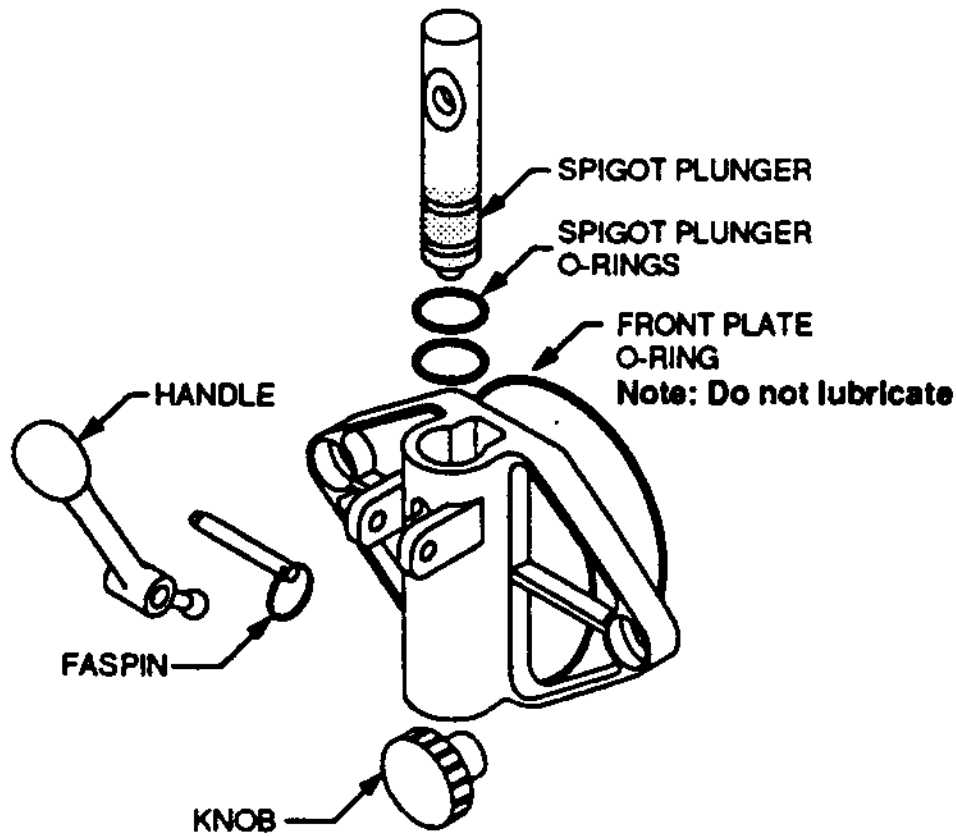
# **ASSEMBLY AND LUBRICATION**

# SaniServ Quick Chart

## Soft Serve, Shake, Combination

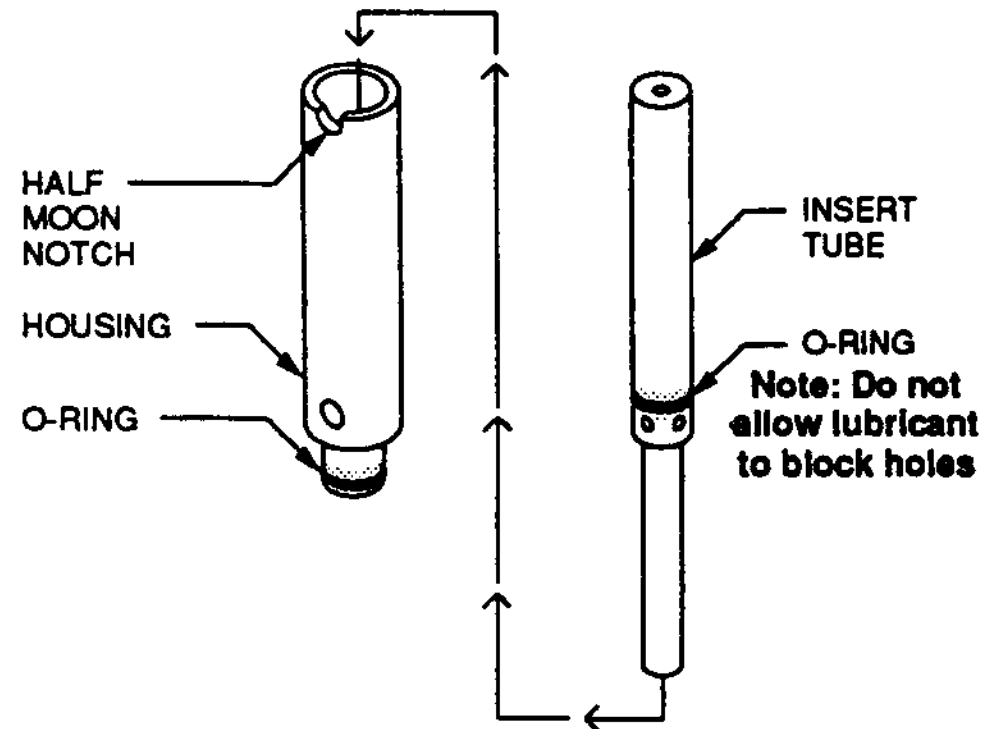
### Front Plate Assembly & Lubrication

Lubricate Shaded Areas Daily



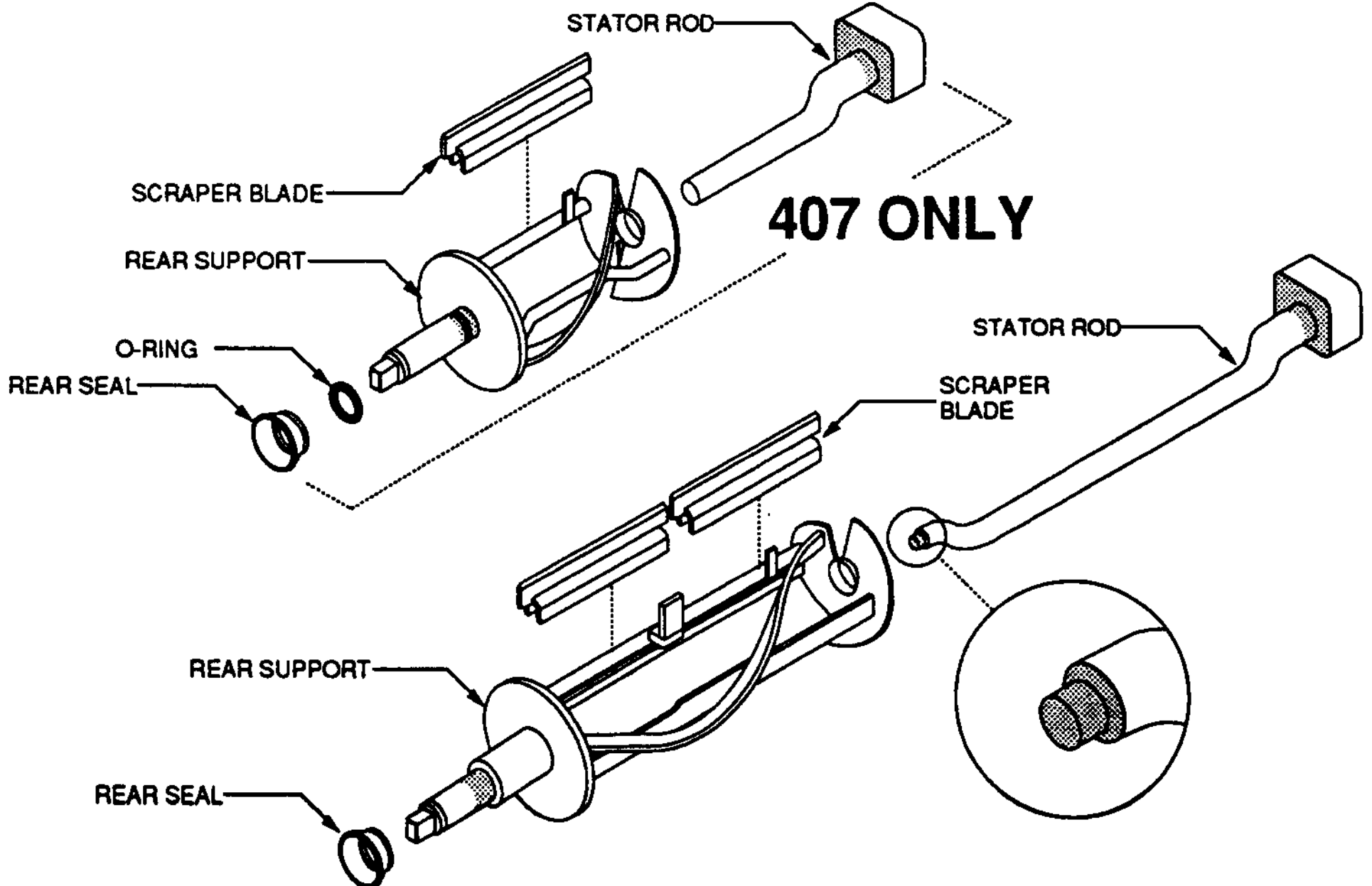
### Carburetor Tube Assembly & Lubrication

Lubricate Shaded Areas Daily



### Dasher Assembly & Lubrication

Lubricate Shaded Areas Daily



Model # \_\_\_\_\_

Serial # \_\_\_\_\_

Date of last tune-up: \_\_\_\_\_

P/N 82094  
Rev. 050191

# Assembly & Lubrication 400 & 600 SERIES

Use only food approved lubricants. Sanigel (SaniServ part number 188490) is recommended and is available from your local authorized SaniServ dealer or distributor. **Lubrication must be performed daily.**

1. Lubricate and assemble the dasher assembly in the following manner:

a. Apply a generous amount of lubricant to the shoulder of the dasher and the area of the shaft where the white plastic portion of the assembled rear seal contacts the shaft (Fig. 12). This is easily performed by running a 1/4" bead of lubricant around the shoulder of the dasher.

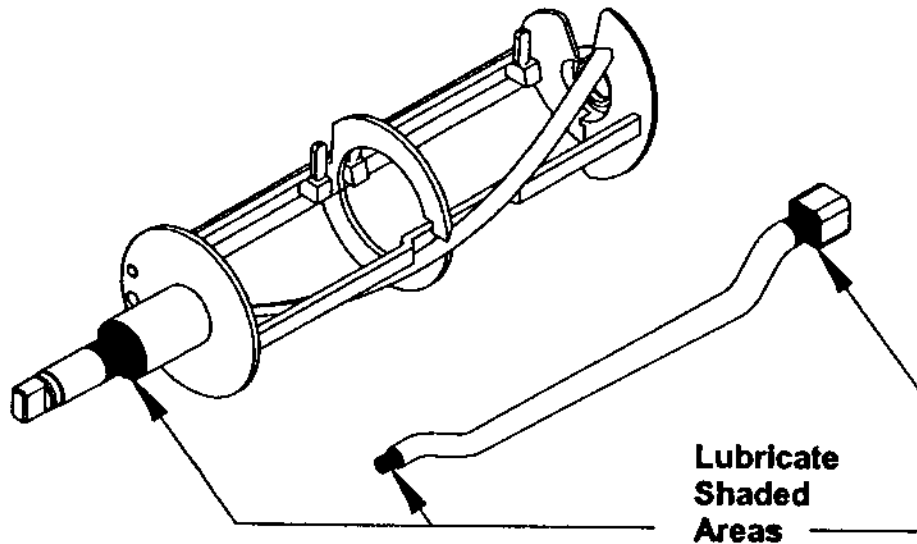


Fig. 12

## Stator Rod and Dasher Lubrication

b. Lubricate the two areas of the stator rod (Fig. 12) and slide the stator rod into the dasher (Fig. 13). Be certain that the end of the stator rod is inserted into the hole at the rear of the dasher (Except on Model 407).

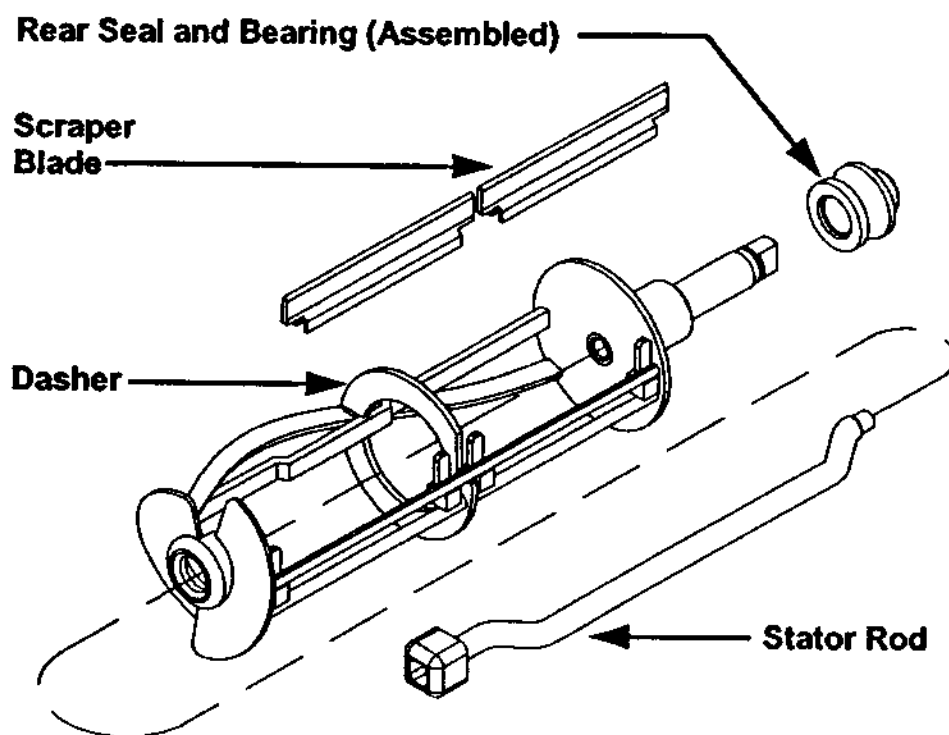


Fig. 13

## Dasher Assembly

c. Assemble and install the rear bearing and seal with the rubber portion toward the rear of the freezing cylinder as indicated in Fig. 13.



**DO NOT LUBRICATE THE BACK SIDE OF THE RUBBER PORTION OF THE SEAL ASSEMBLY. MACHINE COULD BE DAMAGED.**

d. Install the scraper blades on the dasher assembly by holding the blade perpendicular to the tabs (Fig. 14a) and then snapping them over the flat area of the support rod. Then rotate the blade downward in a counterclockwise direction as viewed from the front of the dasher (Fig. 14b).

**Note:** Reverse the blades at each cleaning to maintain sharpness. In addition, the blades are equipped with a wear mark (Fig. 14c). When the blade is worn to this wear mark, they must be replaced.

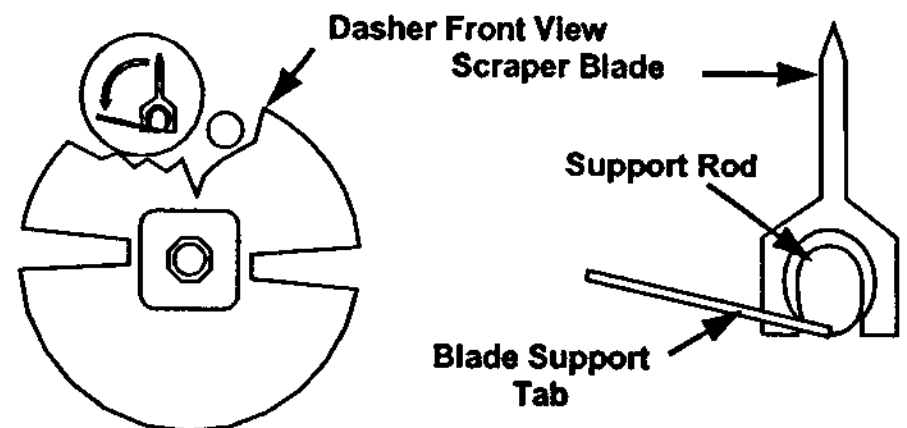


Fig. 14a

## Scraper Blade Installation

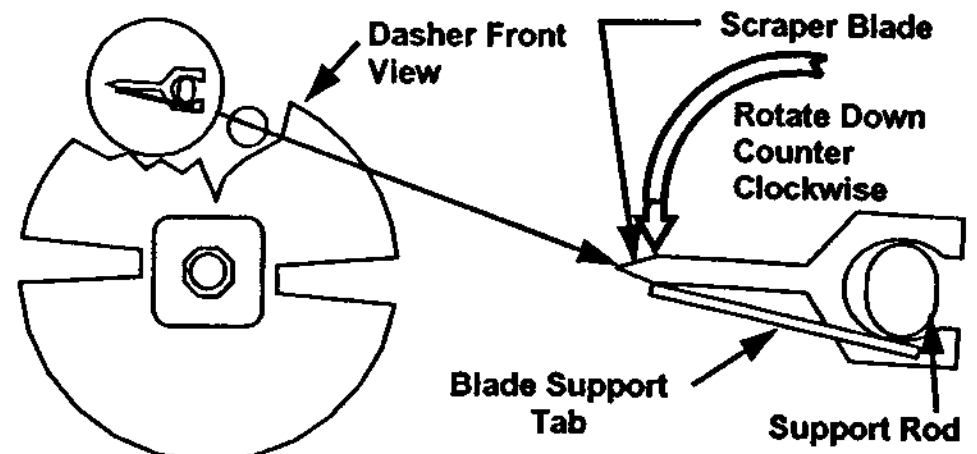


Fig. 14b

## Scraper Blade Installation

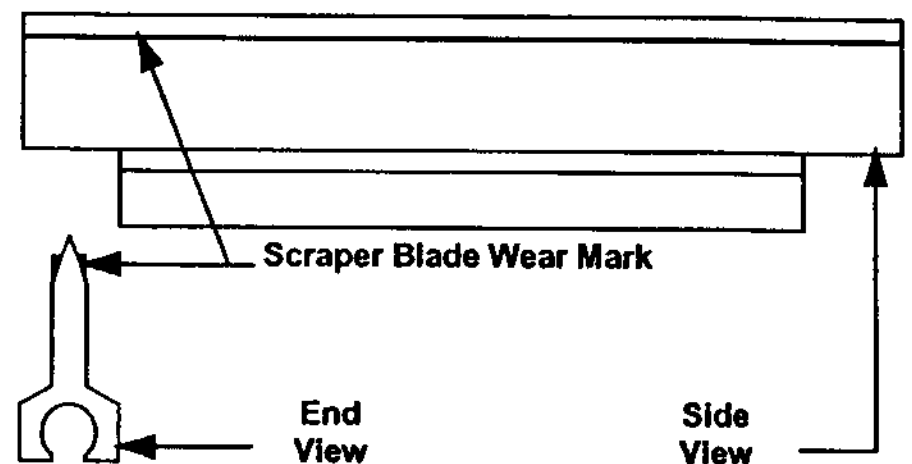
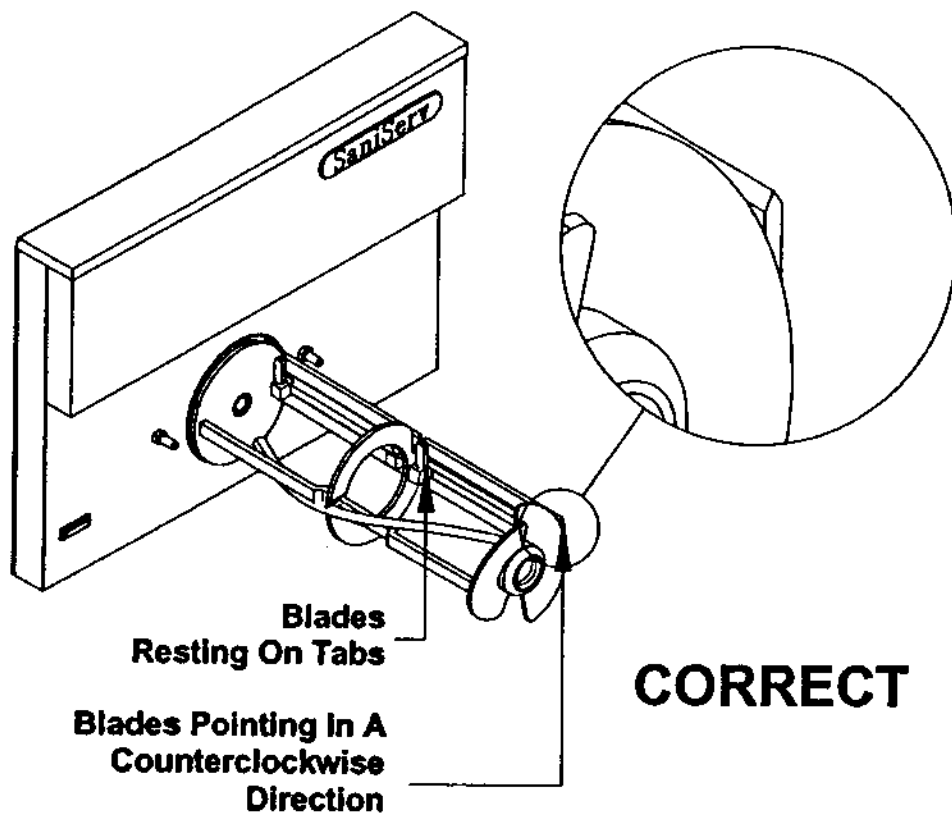


Fig. 14c

## Scraper Blade Wear Mark

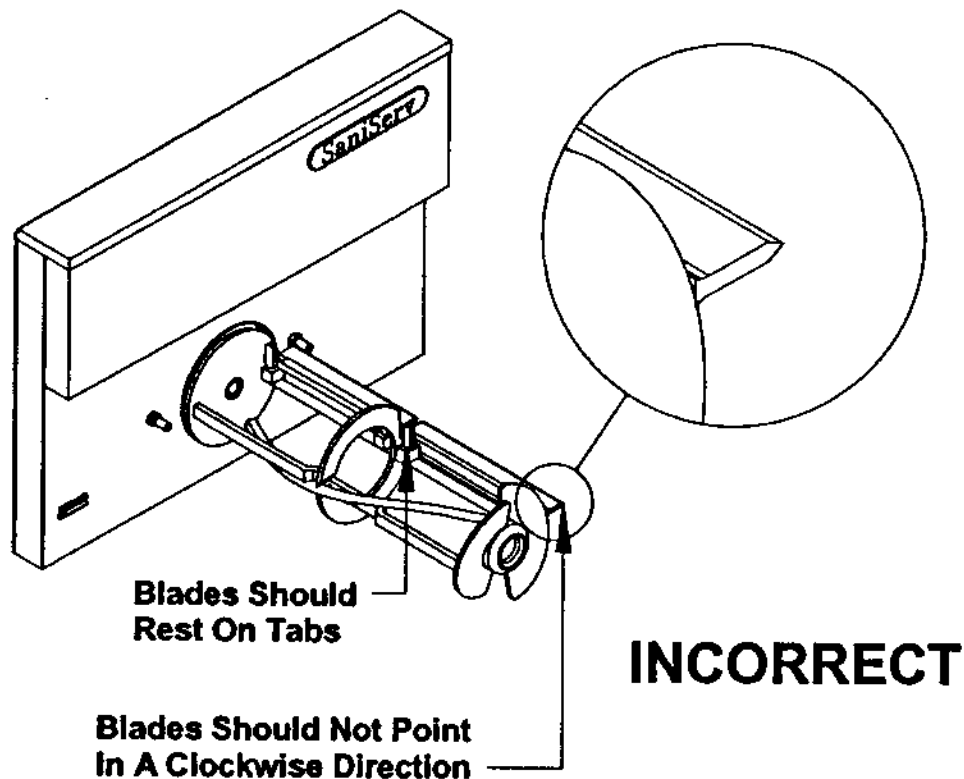
# 400 & 600 SERIES

e. Insert the dasher assembly into the freezing cylinder as far as possible (Fig. 15) being careful not to damage the scraper blades. Damage will occur to the scraper blades and the dispenser will not operate properly if the scraper blades are installed facing in a clockwise direction (Fig. 16).



**Fig. 15**  
**Dasher Installation**

**CORRECT**

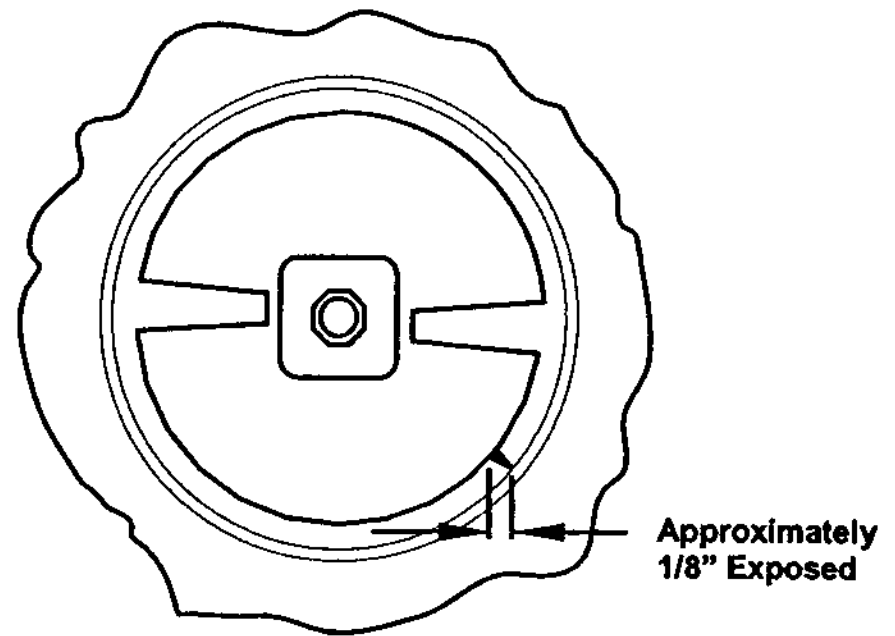


**Fig. 16**  
**Dasher Installation**

**INCORRECT**

**Note:** The stator rod has been deleted from Fig. 15 and Fig. 16 for clarity only. They must be installed for proper machine operation.

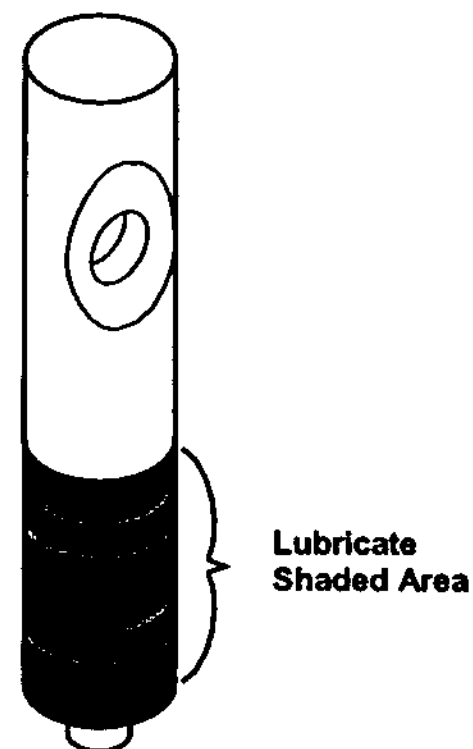
f. While maintaining force against the dasher, rotate it slowly until the tongue of the dasher engages the groove in the drive system at the rear of the cylinder. The outer most portion of the dasher should be recessed approximately  $\frac{1}{4}$ " to  $\frac{3}{8}$ " inside the freezing cylinder. No part of the dasher should extend outside the cylinder. Scraper blades should be visible (Fig. 17) extending approximately  $\frac{1}{8}$ " beyond the dasher.



**Fig. 17**  
**Dasher with Blade (Front View)**

2. Lubricate and assemble the front plate assembly in the following manner:

a. Install the two o-rings on the spigot plunger by rolling them onto the plunger. Seat the o-rings in the grooves. Make certain that they are not twisted. Smooth the lubricant into the grooves and over the sides of the plunger assembly (Fig. 18).



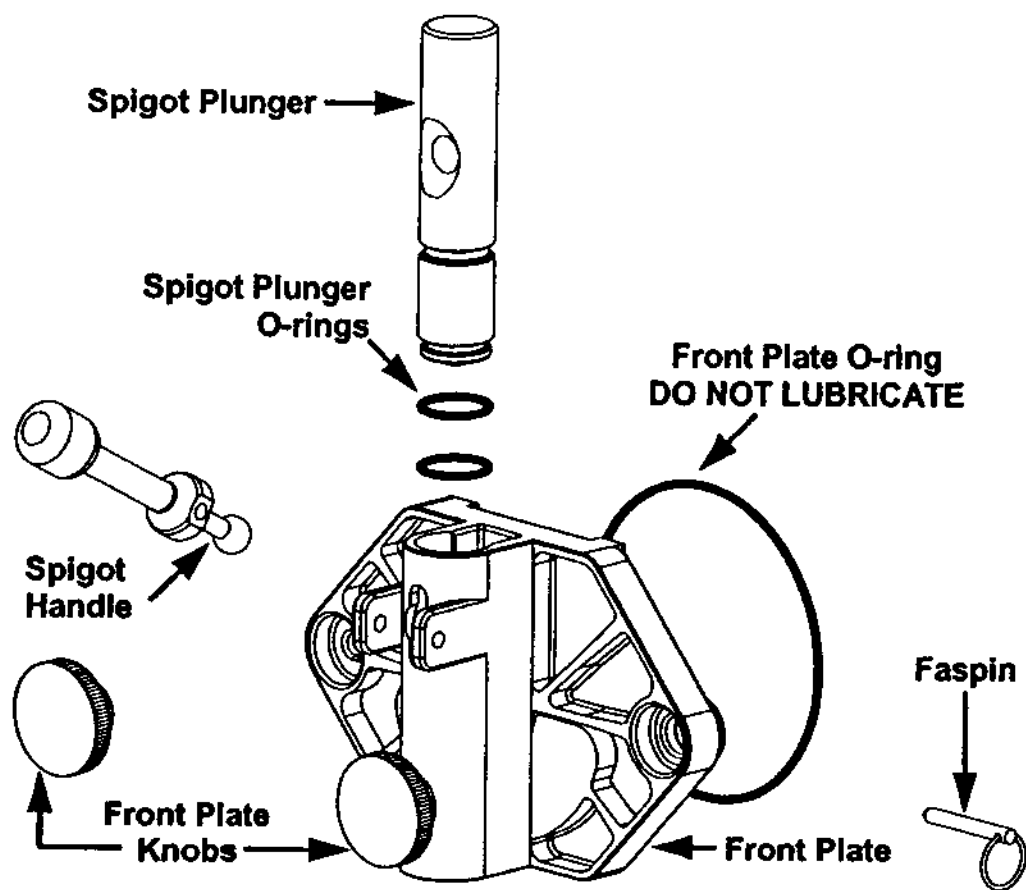
**Fig. 18**  
**Spigot Plunger Lubrication**

- Slide the lubricated spigot plunger into the front plate (Fig. 19) Align the spigot handle slot to the front.
- Insert the spigot handle and secure with the faspin.
- Install the front plate o-ring.

**CAUTION**

**DO NOT LUBRICATE THE FRONT PLATE O-RING  
LUBRICANT WILL MAKE THE FRONT PLATE LEAK**

# 400 & 600 SERIES

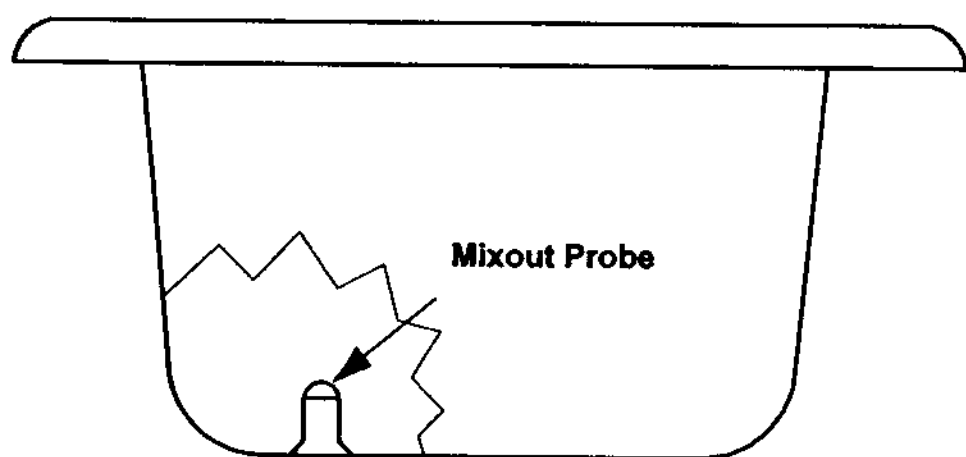


**Fig. 19**  
**Front Plate Assembly**

e. Align the front plate to the freezing cylinder, place the square pocket on the back side of the front plate over the end of the stator rod, and secure the front plate assembly to the machine with the two plastic knobs. Turn both of the knobs in a clockwise direction simultaneously. Tighten the knobs evenly. **DO NOT** tighten one knob all the way down and then the other. Doing so may result in front plate breakage. Only moderate force is required. **DO NOT** over tighten. Set the spigot plunger to the closed position.

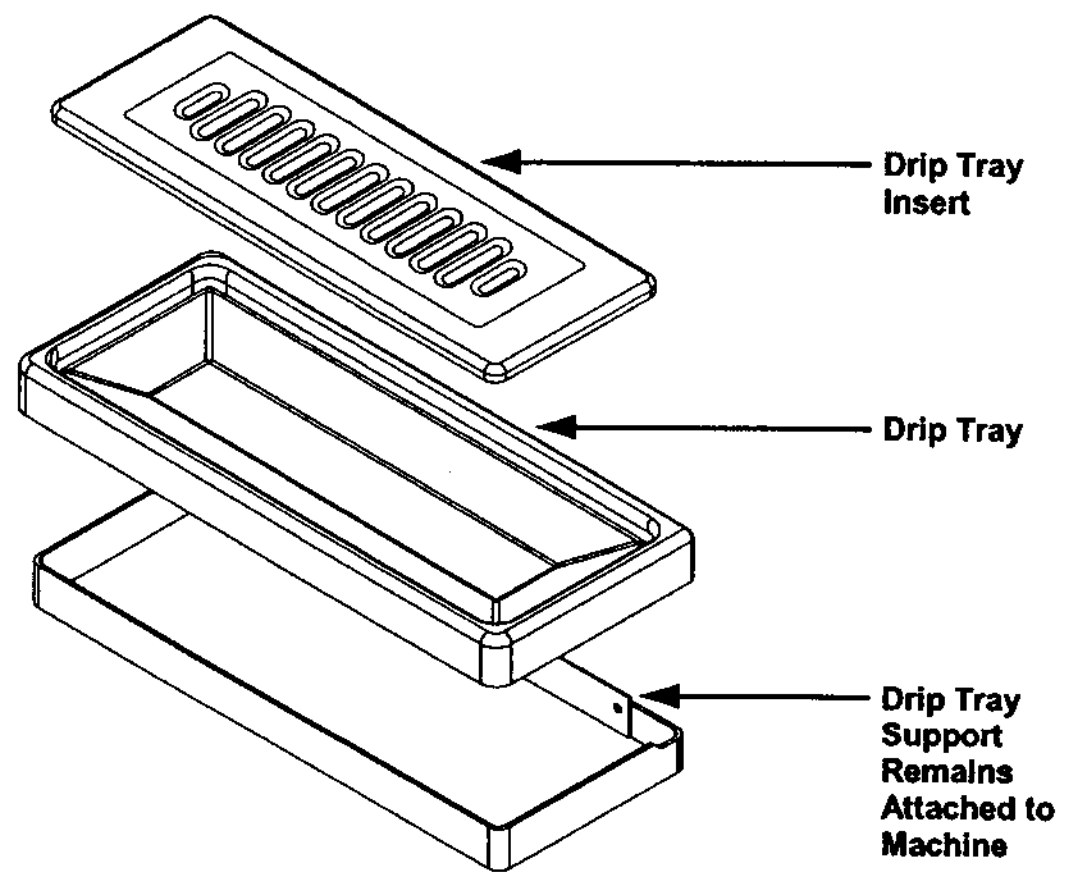
## IMPORTANT

3. **DO NOT** apply lubrication to the Mix out probe located in the mix pan - see Fig. 20.



**Fig. 20**  
**Mix Pan Assembly**

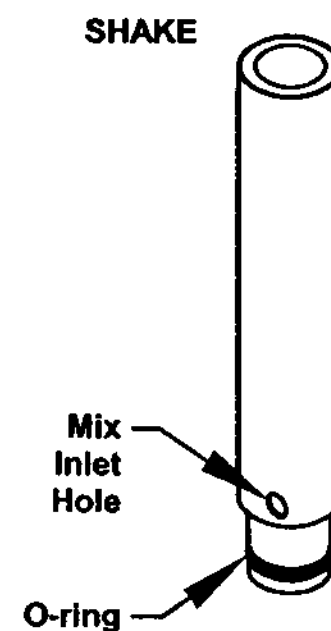
4. Install the drip tray and drip tray insert (Fig. 21).



**Fig. 21**  
**Drip Tray Assembly**

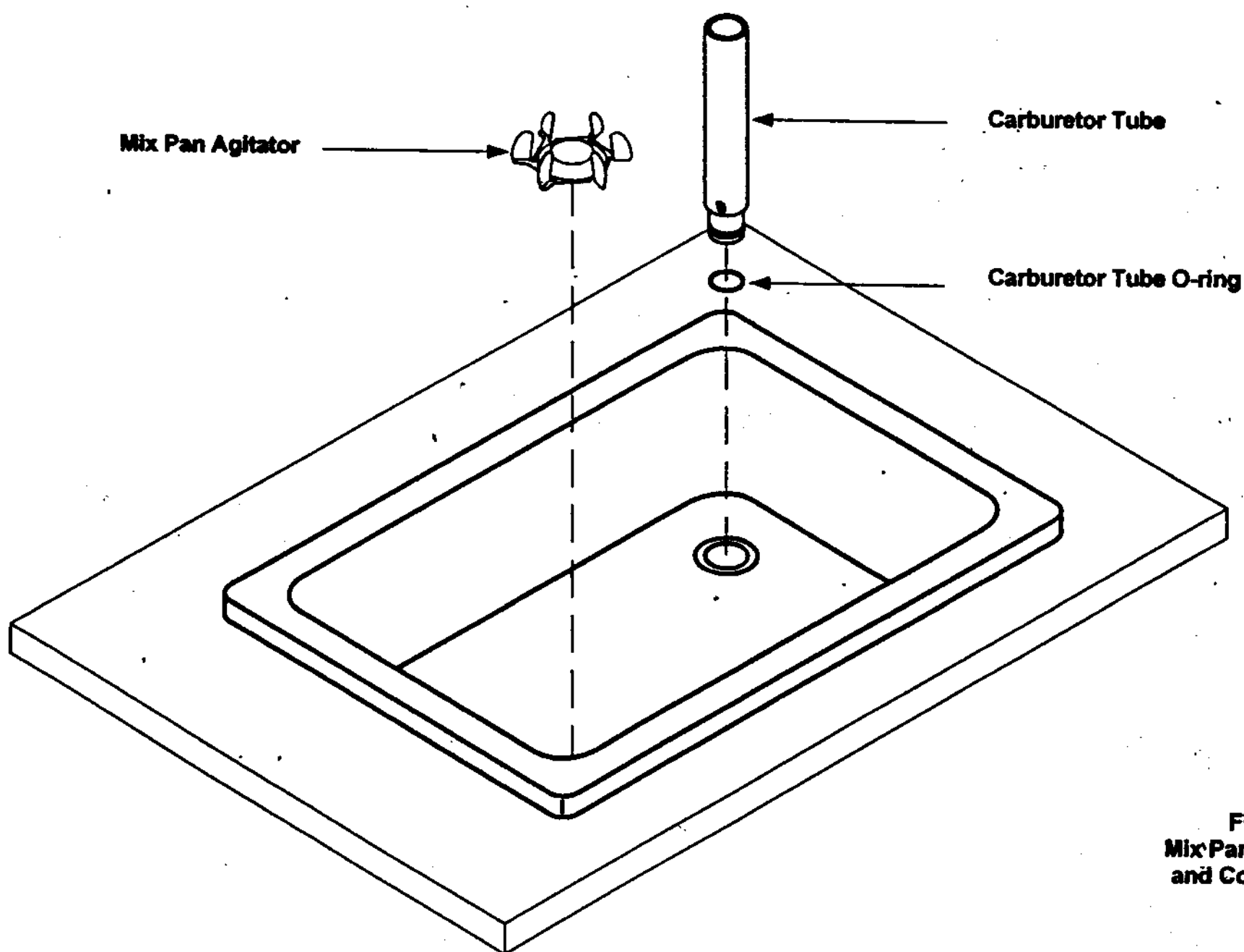
5. Install the o-rings on the shake carburetor assembly (Fig. 22). Apply lubricant sparingly over both o-rings. Install the insert tube in the housing tube with a gentle twisting motion. Place the assembled carburetor tube in the bottom of the mix pan for sanitizing. **Lubricant MUST NOT BLOCK** the mix inlet hole on the carburetor tube.

**Fig. 22**  
**Carburetor Tube Assembly**



**Note:** There is **NO** carburetor tube used on the frozen beverage side of the machine.

3. Apply a small amount of SaniGel (p/n 1150) on the bottom of the mix pan agitator. On countertop models place the lubricated mix pan agitator in the right front corner of the mix pan as you face the machine front. On floor models place the lubricated mix pan agitator in the right rear corner of the mix pan. Position the agitator until you feel the magnets of the agitator engage the magnets of the drive system beneath the mix pan - see Fig. 38.



**Fig. 38**  
**Mix Pan Assembly**  
**and Components**

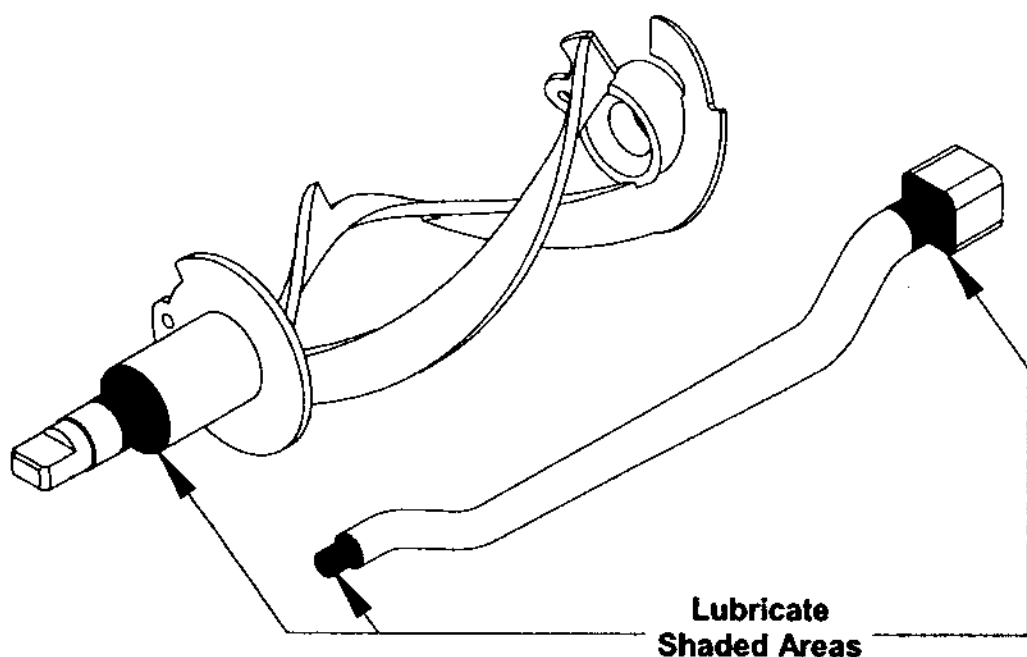
# 500 SERIES

## Assembly and Lubrication

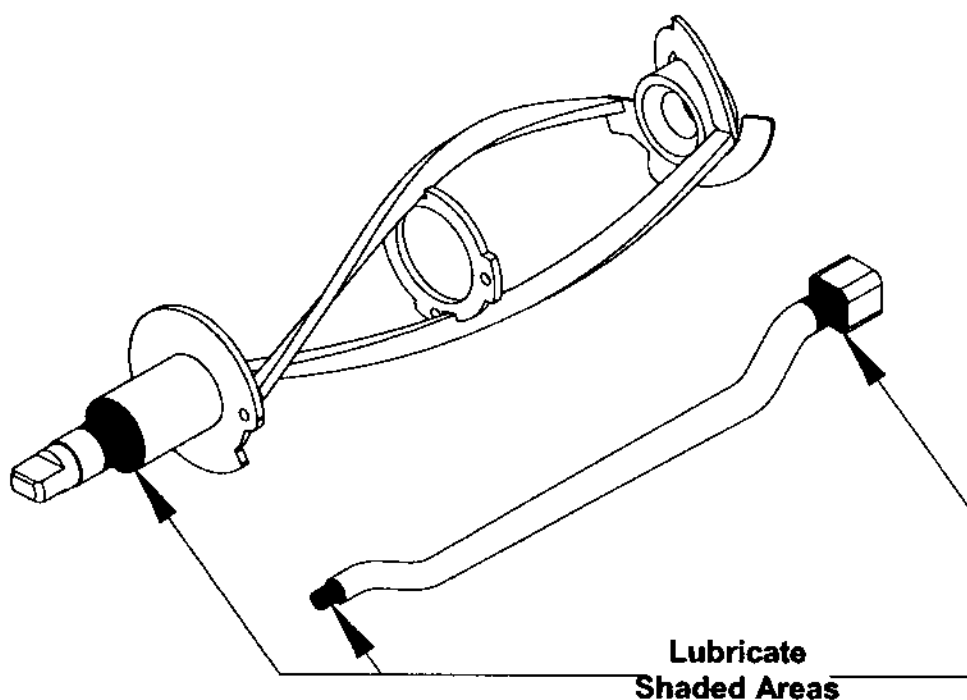
Lubricants **MUST** be approved for food contact. Sanigel (SaniServ part number 1150) is recommended and is available from your local authorized SaniServ dealer or distributor. **Lubrication must be performed daily.**

1. Lubricate and assemble the dasher assemblies in the following manner:

- a. Apply a generous amount of lubricant to the shoulders of the dashers and the area of the shafts where the white plastic portion of the assembled rear seal contacts the shafts (Fig. 15). This is easily performed by running a 1/4" bead of lubricant around the shoulder of each dasher.



**Fig. 15a**  
**501 & 527 Stator Rod and Dasher Lubrication**



**Fig. 15b**  
**522 Stator Rod and Dasher Lubrication**

- b. Lubricate the two shaded areas of the stator rods and slide the stator rods into the dashers. Make certain that the ends of the stator rods are inserted into the holes at the rear of the dashers.

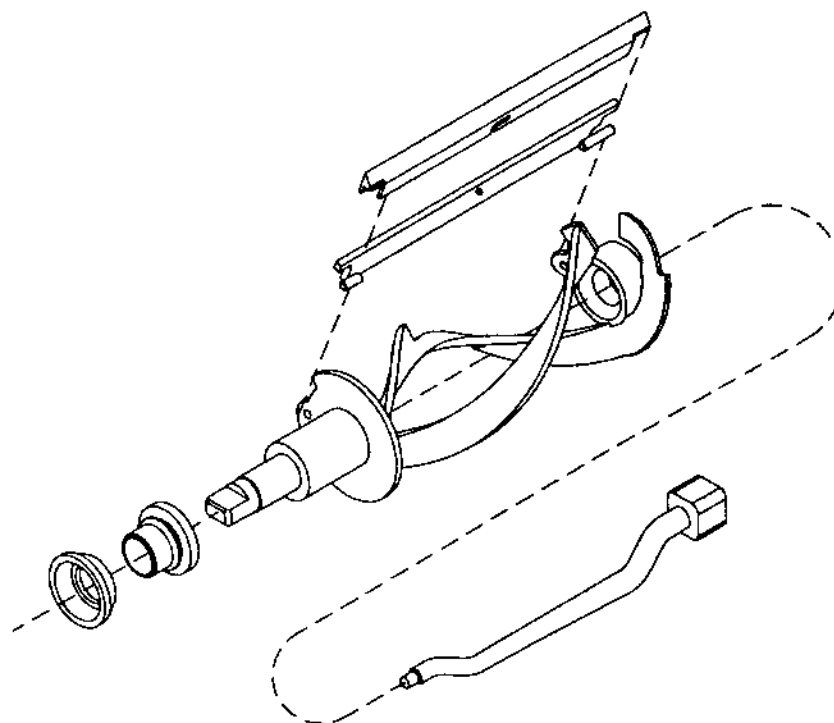
- c. Assemble and install the irreversible rear seals with the rubber portions toward the rear of the freezing cylinders as indicated in Fig. 16.

**Note:** The front plates cannot be installed if the rear seal assemblies have been improperly put together or slipped upon the shafts backwards.

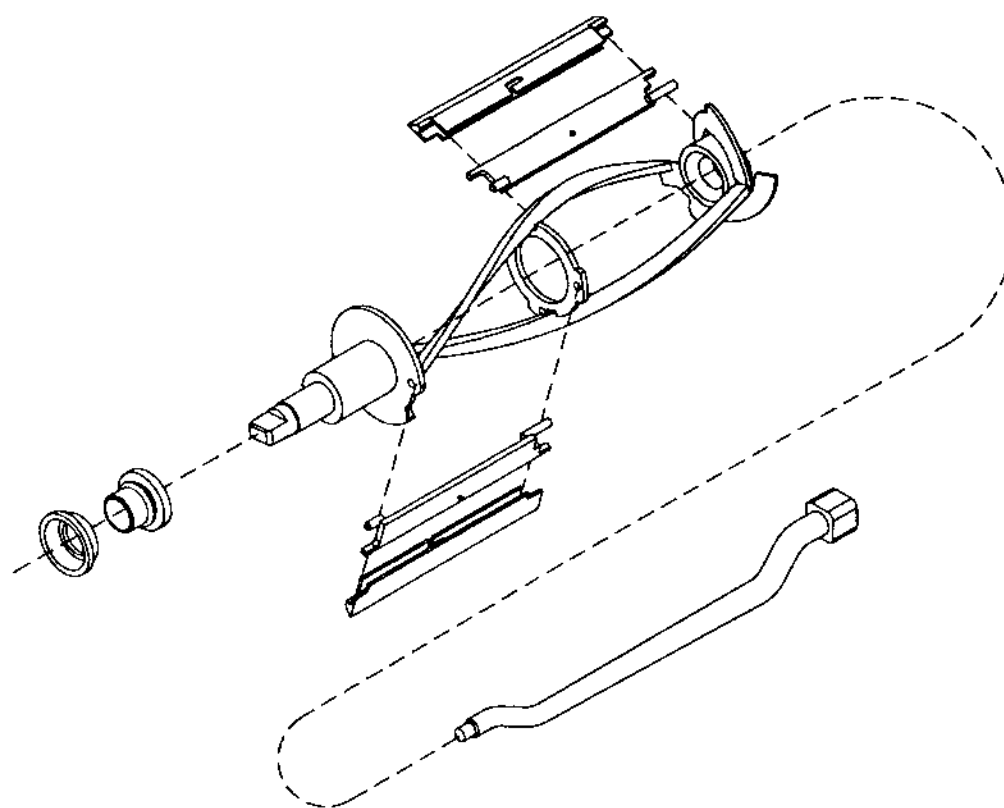


**CAUTION**

**DO NOT LUBRICATE THE REAR (RUBBER) PORTION OF THE REAR SEAL ASSEMBLY**



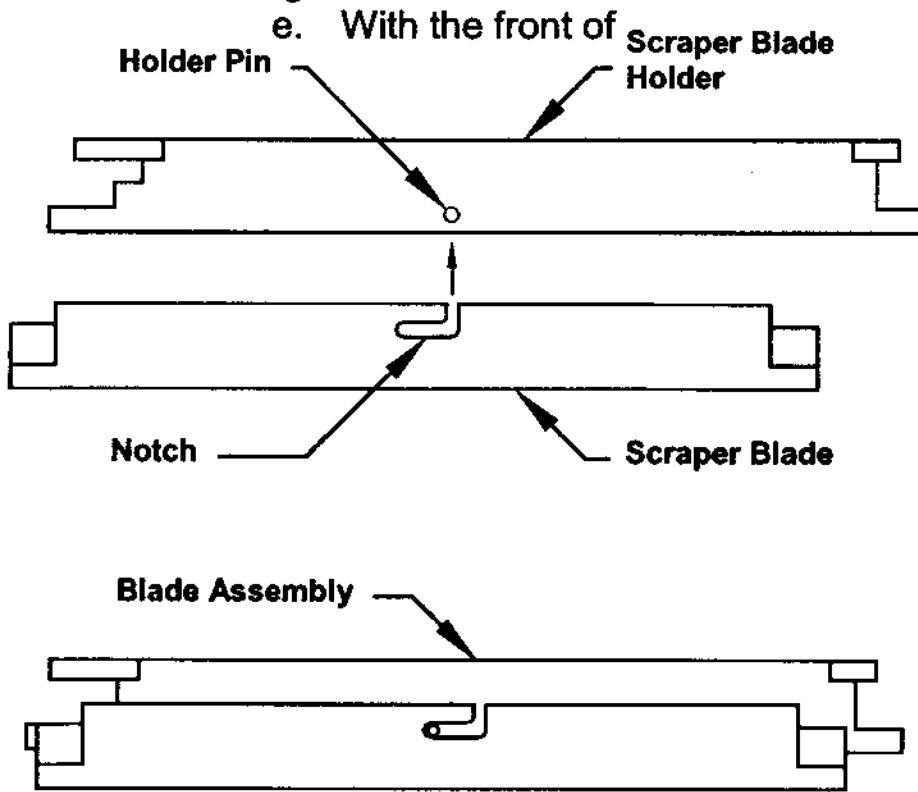
**Fig. 16a**  
**501 & 527 Stator Rod and Dasher Assembly**



**Fig. 16b**  
**522 Stator Rod and Dasher Assembly**

# 500 SERIES

- d. Place the scraper blades over the scraper blade holders so the holder pins fit into the blade notches as shown in Fig. 17.

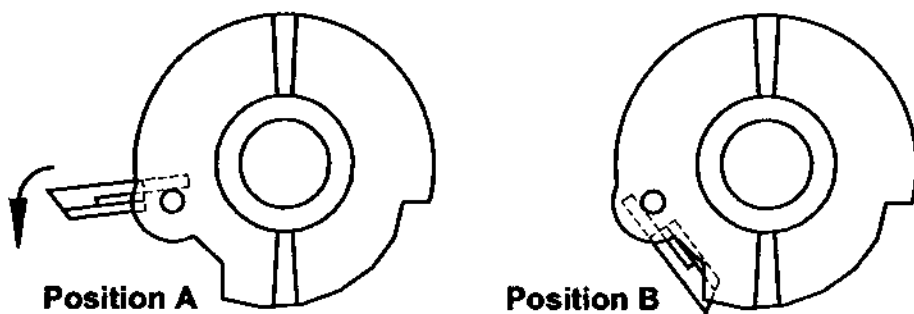


**Fig. 17**  
**Scraper Blade Assembly**

each dasher facing the installer, slide the scraper blade holder (**Long pin to front**) forward into the front of the dasher. Push the short pin back into the mating hole in the rear of the dasher assembly. This procedure must be performed with the blade in the correct position - Fig. 18 Position A. Then rotate the blade and lock it into place (Fig. 18 Position B).

On model 522 repeat this procedure to mount the rear blades between the center and the rear of the dasher assemblies.

- f. Insert the dasher assemblies into the freezing



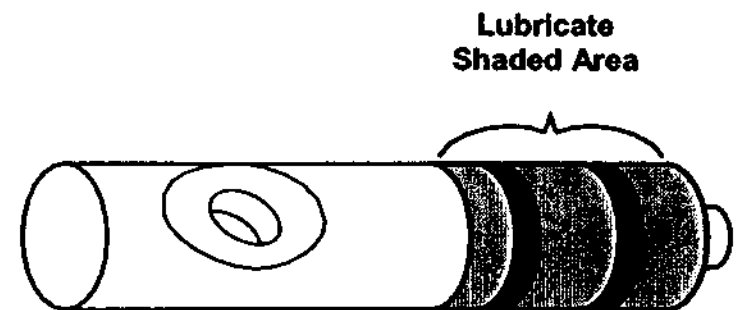
**Fig. 18**  
**Dasher (Front View)**

cylinders as far as possible being careful not to damage the scraper blades.

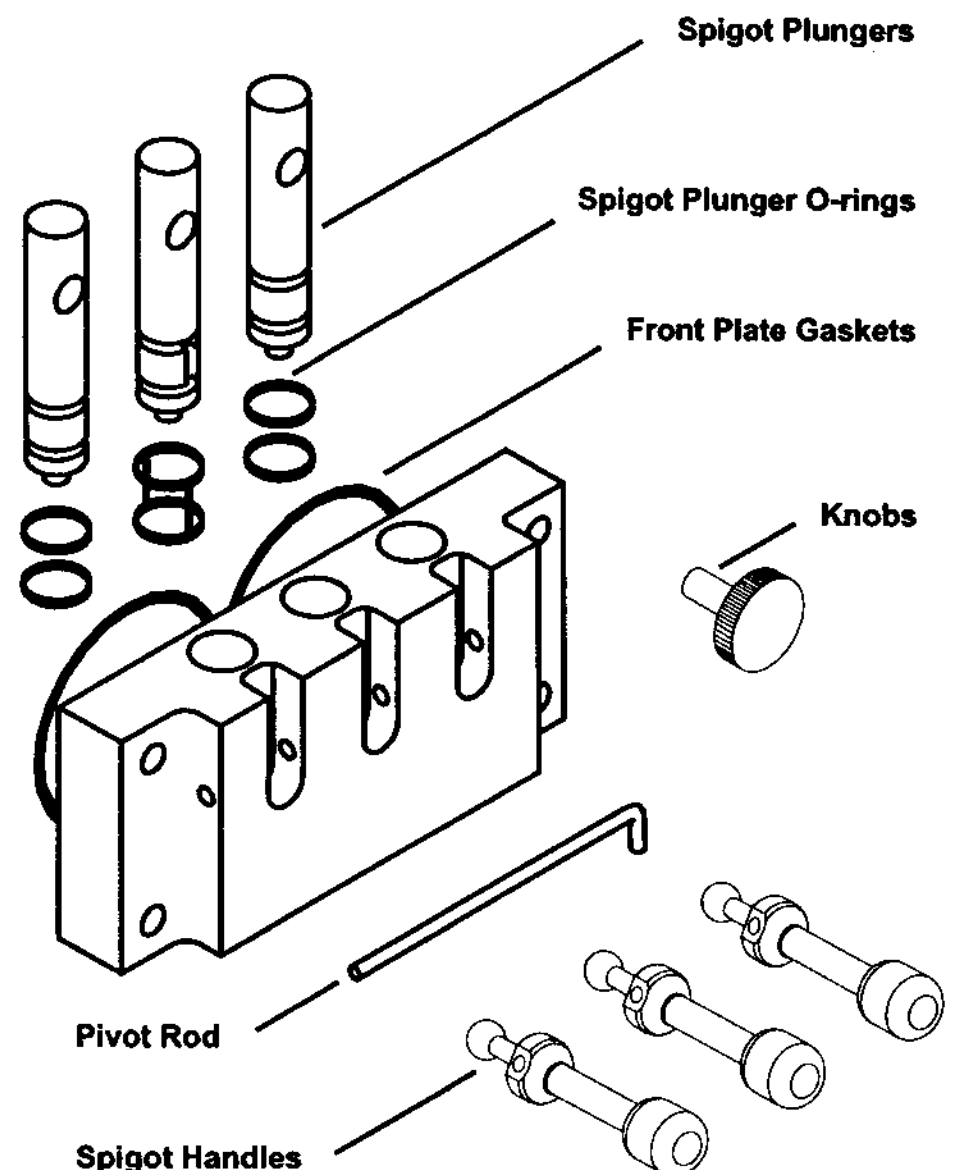
- g. While maintaining force against each dasher, rotate it slowly until the tongue of the dasher engages the groove in the drive system at the rear of each freezing cylinder. The outermost portion of each dasher should be recessed approximately 1/4" to 1/8" inside each freezing cylinder. No part of the dashers should extend out side of the cylinders.

2. Lubricate and assemble the front plate assembly in the following manner:

- Install the two o-rings on each spigot plunger (double o-ring on the plunger with vertical grooves) by rolling them onto the plunger. Seat the o-rings in the grooves making certain that they are not twisted. Smooth the lubricant into the grooves and over the sides of the plunger assemblies (Fig. 19).
- Slide the lubricated spigot plungers into the front plate (Fig. 20) making certain that the spigot handle slots are aligned to the front of the front plate. The spigot plunger with the double o-ring must be installed in the center cylinder of the front plate.
- Insert the spigot handles and secure them with the pivot rod.

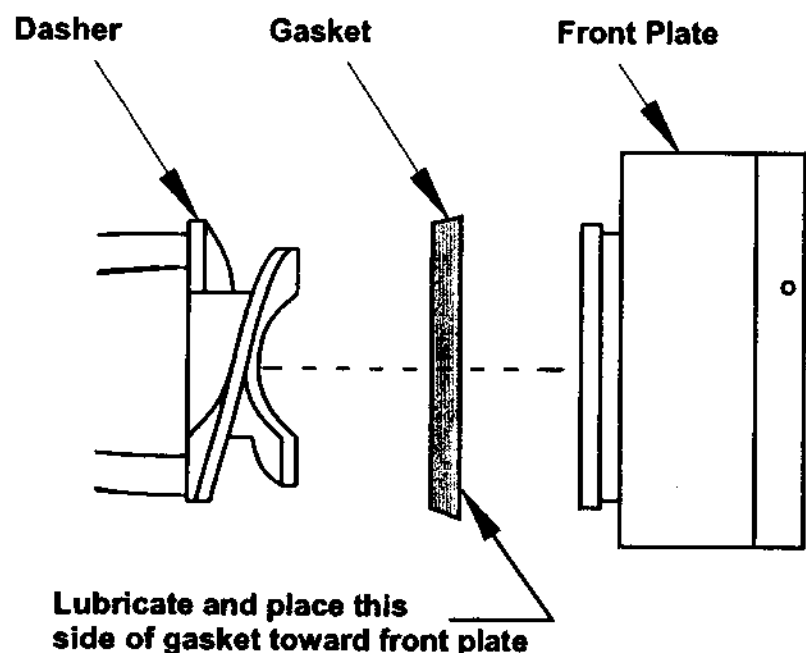


**Fig. 19**  
**Spigot Plunger Lubrication**



# 500 SERIES

- d. Install the gaskets on the front plate with the thicker edge of the gasket next to the rear of the front plate as shown in Fig. 21. Then lubricate the outer surface of the gaskets.

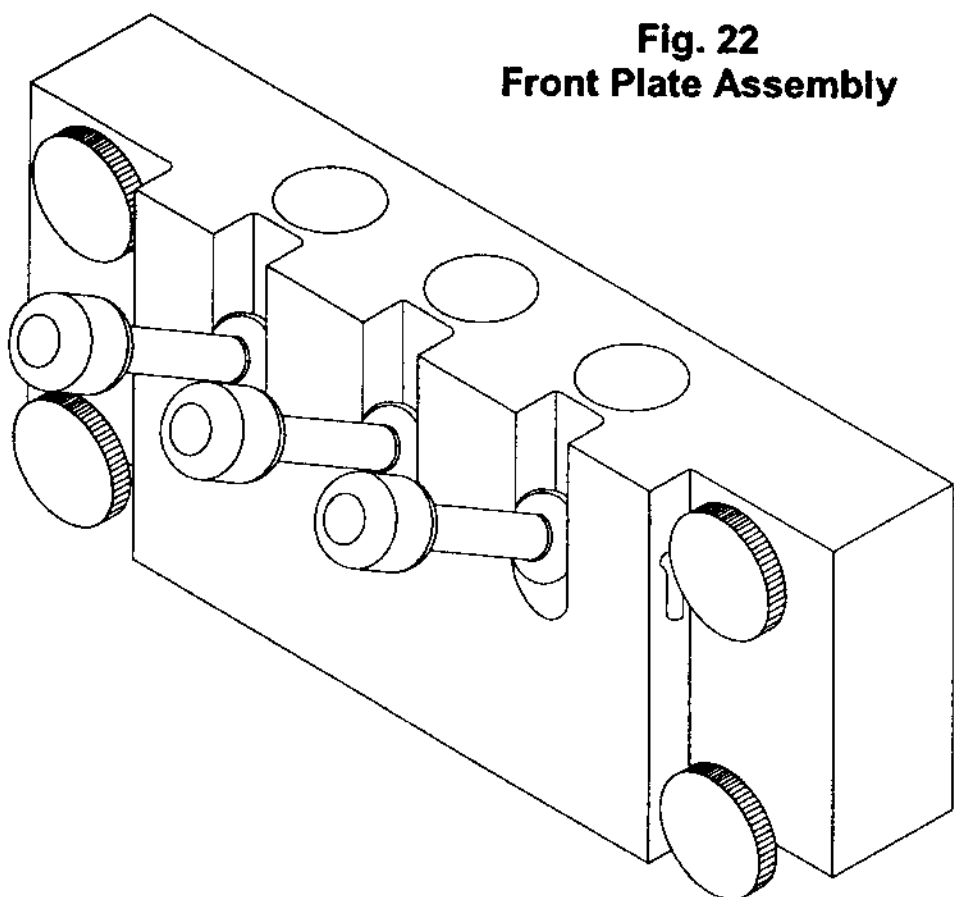


- e. Apply SaniGel to

**Fig. 21**  
**Front Plate Gasket Installation**

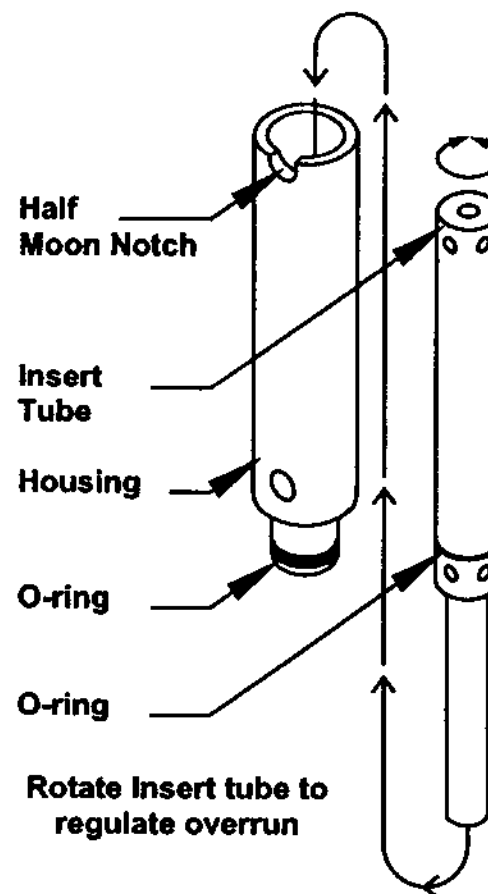
the bottom of each mix pan agitator and place the agitators in the mix pan corners making certain the magnets engage the field of the magnetic drive beneath each mix pan.

- f. Install the front plate assembly with the four plastic knobs. Turn the knobs in a clockwise direction and be certain to tighten them evenly. **DO NOT** tighten one knob all the way down and then another. Doing so may result in front plate breakage. Only moderate force is required. **DO NOT** overtighten. Set all spigot plungers to the closed position as shown in Fig. 22.



**Fig. 22**  
**Front Plate Assembly**

3. Install the o-rings on each insert tube and housing tube of the carburetor assemblies (Fig. 23). Apply a lubricant (SaniGel p/n 1150 recommended) sparingly over both o-rings. Install the insert tube in the housing tube with a gentle twisting motion. Place the assembled carburetor tubes in the bottom of the mix pans for sanitizing. Be certain that lubricant does not block the mix inlet holes on the carburetor tubes.

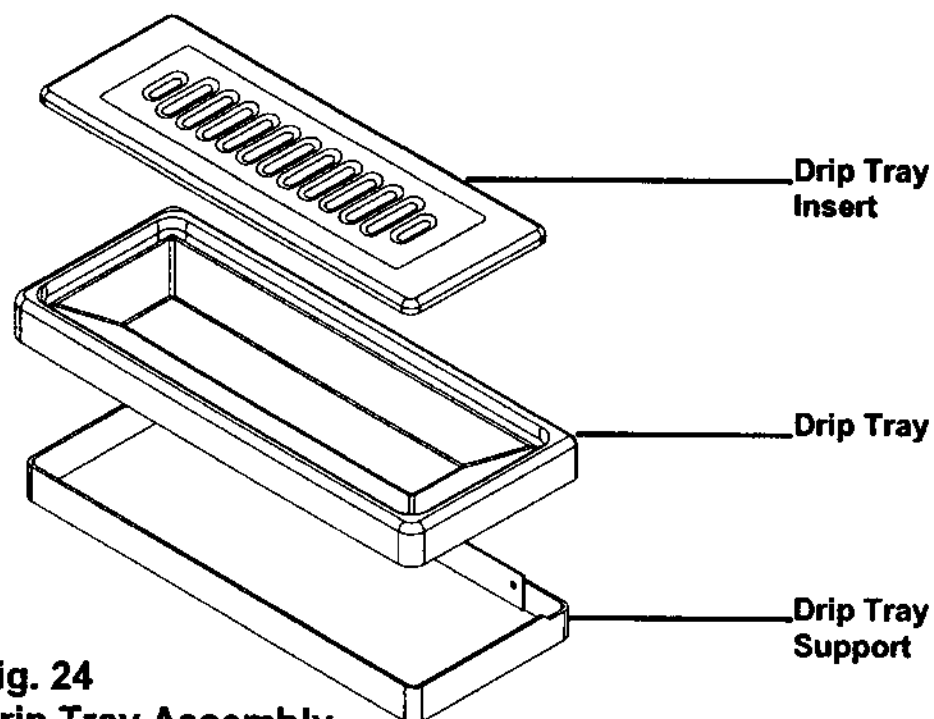


4. Install the drip tray and drip tray insert (Fig. 24) on the

**Fig. 23**  
**Carburetor Tube Assembly**

front of the machine.

5. Proceed directly to the "Sanitizing" section of this



**Fig. 24**  
**Drip Tray Assembly**

manual.

# Assembly & Lubrication

## Irreversible Rear Seal

The rear seal assembly components have been designed to eliminate the possibility of putting the parts together incorrectly or installing the rear seal assembly onto the dasher backwards.

The bearing (hard polymer portion) has a diameter larger than the inside diameter of the mating rear seal (rubber portion) to make it all but impossible to join the two pieces incorrectly.

Also, the long hollow barrel on the rear bearing makes it impossible to install the rear seal assembly backwards onto the dasher and still be able to install the face plate onto the machine.

**Note:** To comply with sanitation regulations, the rear seal assembly must be taken apart, and the individual parts must be cleaned separately every time the machine is cleaned.

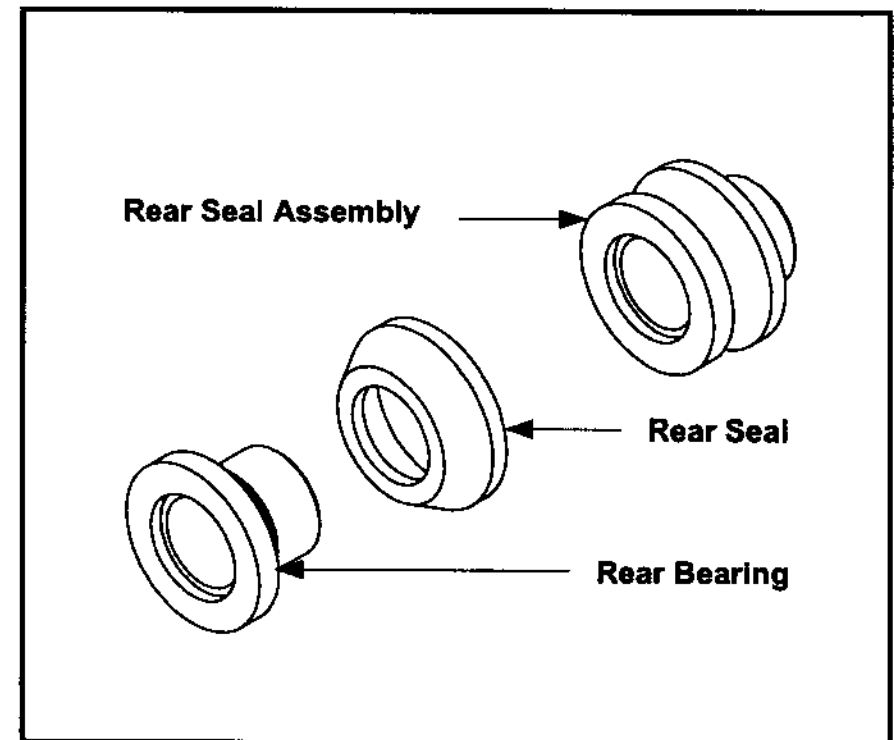


Fig. 21  
Rear Seal Assembly

## Correct Installation Position

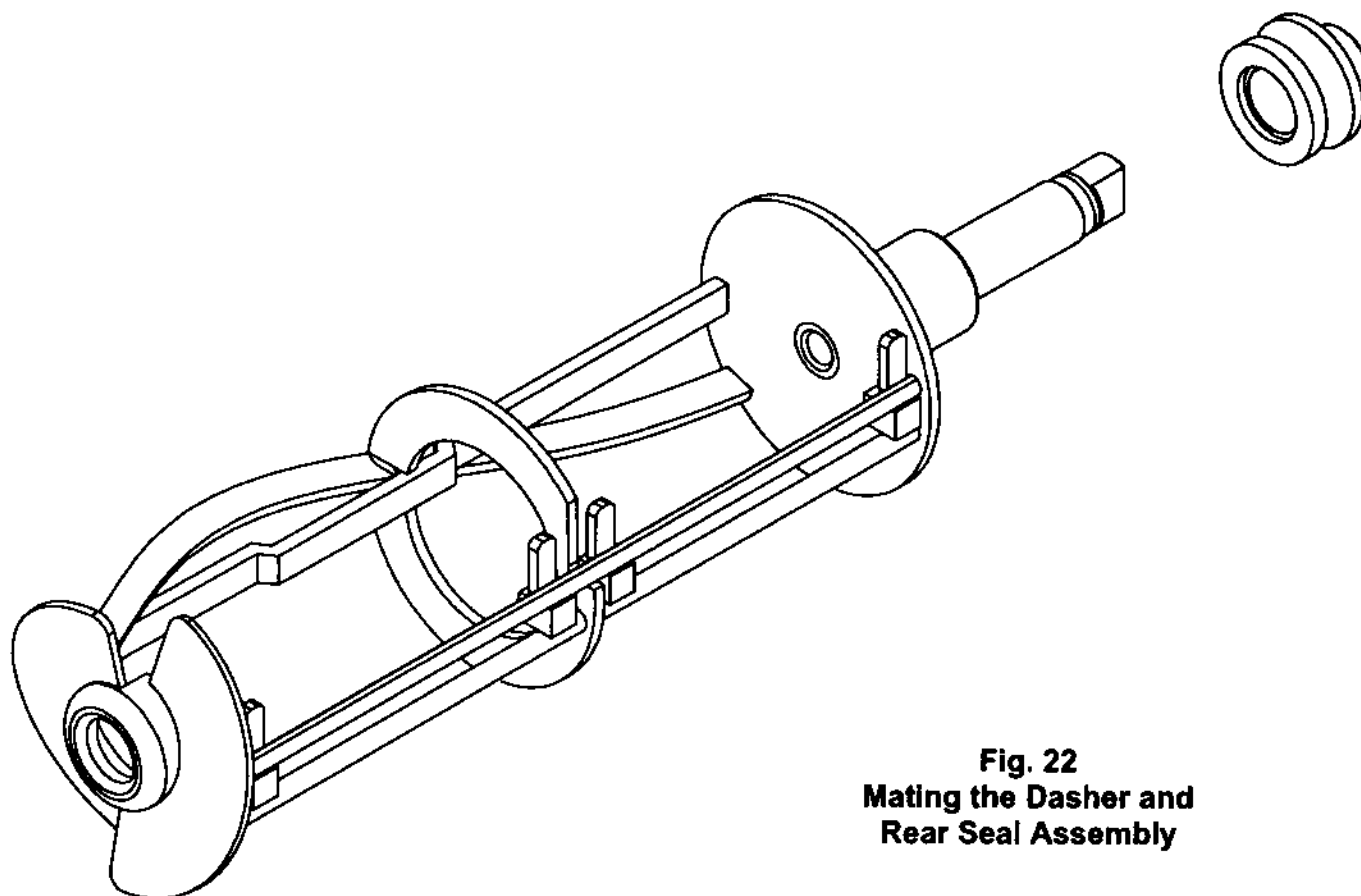


Fig. 22  
Mating the Dasher and  
Rear Seal Assembly

## 601 & 614 SAS Series

Use only food grade lubricants recognized for use by your local health authority. SaniGel (SaniServ part number 1150) is recommended and is available from your parts supplier. **Lubrication must be performed daily.**

1. Assemble and lubricate the dasher assembly in the following manner:

a. Apply a generous amount of lubricant to the shoulder of the dasher and the area of the shaft where the white plastic portion of the assembled rear seal contacts the shaft (Fig. 23). This is easily performed by running a 1/4 inch bead of lubricant around the shoulder of the dasher.

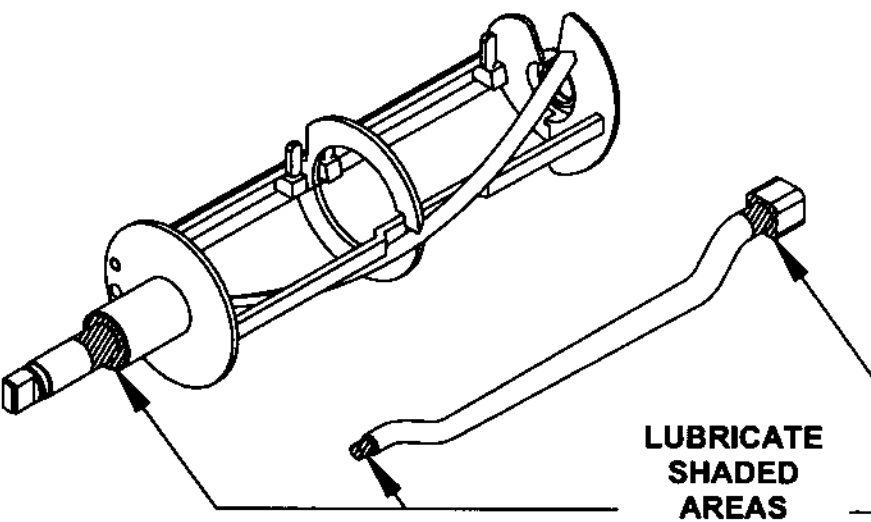


Fig. 23  
Stator Rod and Dasher Lubrication

b. Lubricate the two areas of the stator rod (Fig. 23) and slide the stator rod into the dasher. Ensure that the end of the stator rod is inserted into the hole at the rear of the dasher.

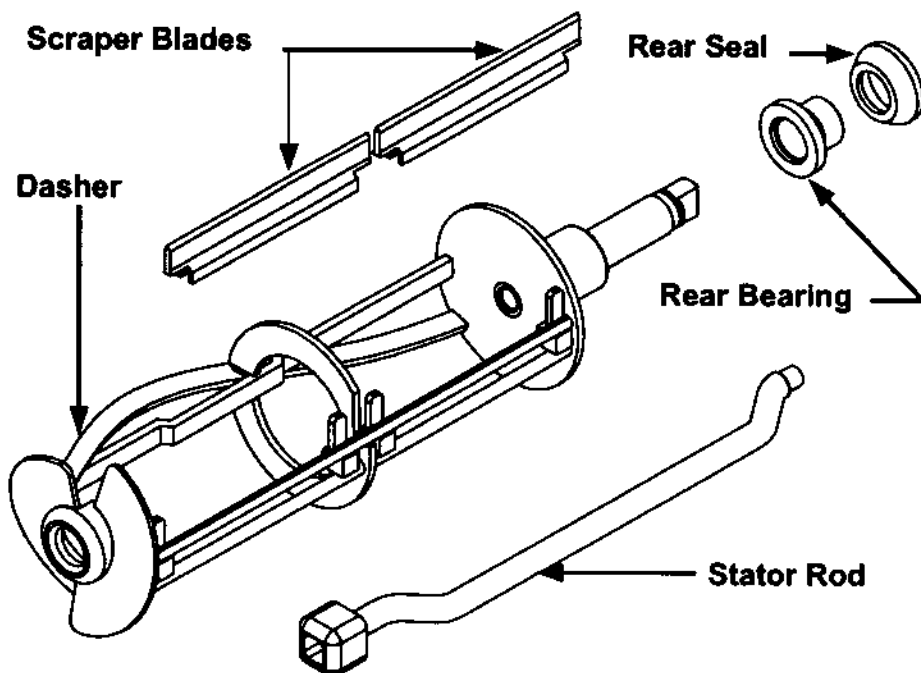


Fig. 24  
Dasher Assembly

c. Install the rear bearing and seal assembly so that the rubber portion is facing the rear wall of the freezing cylinder and the white plastic bearing will rest against the shoulder on the dasher. (Fig. 24).

### DO NOT LUBRICATE THE RUBBER PORTION OF THE REAR SEAL ASSEMBLY

d. Install the scraper blades on the dasher assembly by holding the blades perpendicular to the tabs - Fig. 25a - and then snapping them over the flat area of the support rod. Then rotate the blades downward in a counterclockwise direction as viewed from the front of the dasher - Fig. 25b. **Note:** Reverse the blades each cleaning to maintain sharpness. In addition, the blades are equipped with a wear mark - Fig. 25c. When the blades are worn to this mark, they must be replaced with SaniServ part number 104984.

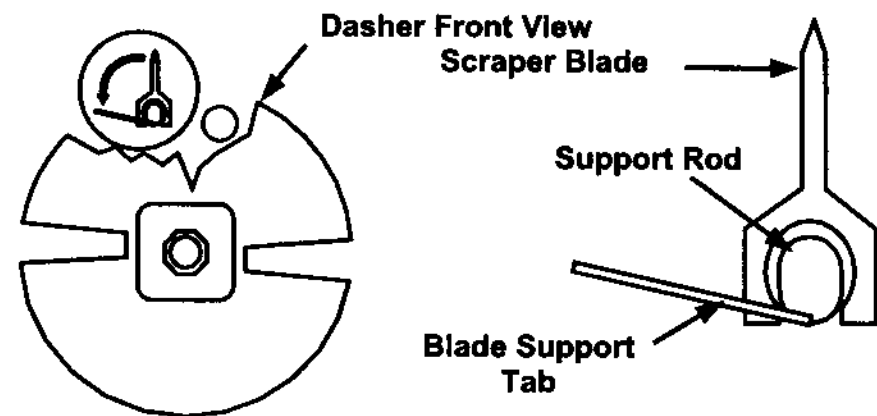


Fig. 25a  
Scraper Blade Installation

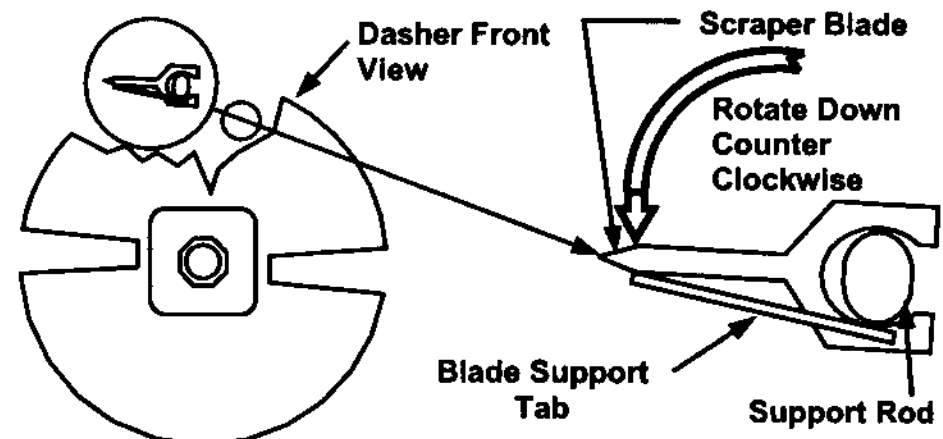


Fig. 25b  
Scraper Blade Installation

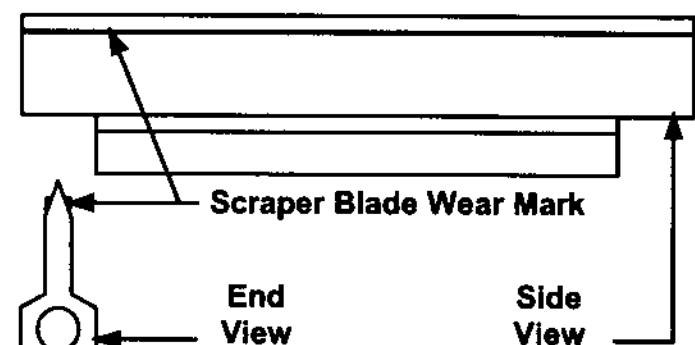


Fig. 25c  
Scraper Blade Wear Mark

e. With the Auto/Cleanout switch set to the "OFF" position, insert the dasher assembly into the freezing cylinder as far as possible being careful not to damage the scraper blades. Damage will occur to the scraper blades and the machine will not operate properly if the scraper blades are installed facing in a clockwise direction - item "B" Figs. 26a, 26b.

*INCORRECT*

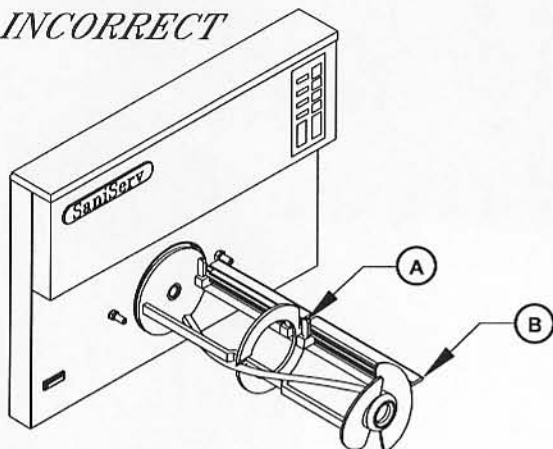


Fig. 26a  
Scraper Blade Installation

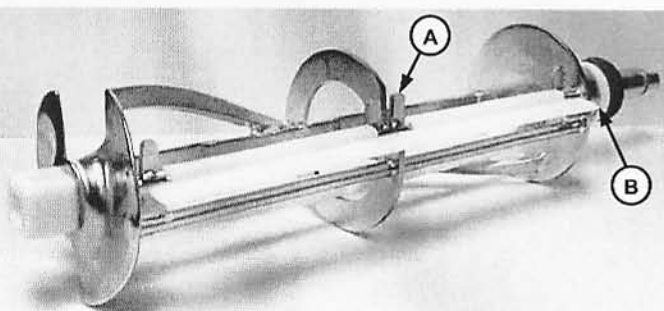


Fig. 26b  
Scraper Blade Installation

*CORRECT*

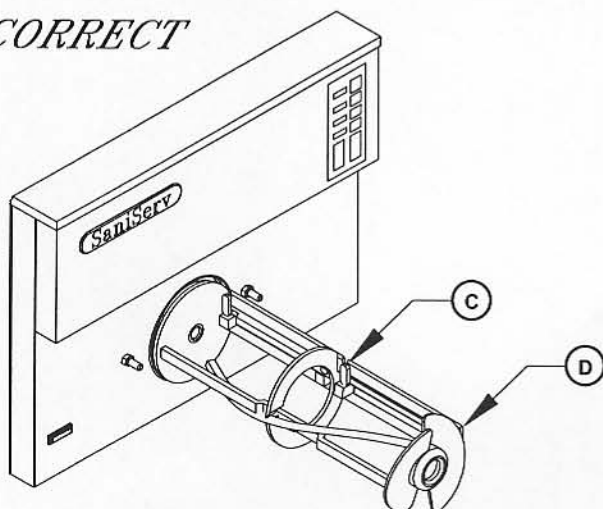


Fig. 26c  
Scraper Blade Installation

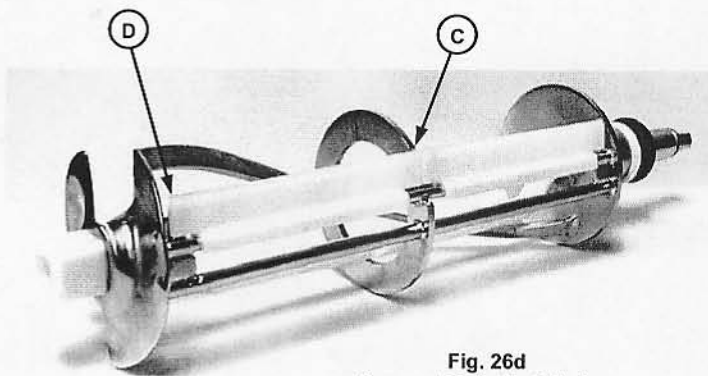


Fig. 26d  
Scraper Blade Installation

The blades must rest against the tab - item "A". Proper blade installation is shown in Figs. 26c and 26d with the blades pointing in a counter clockwise direction - item "D" and resting upon the tab - item "C".

**Note:** The stator rod has not been displayed in Fig. 26a and Fig. 26c for clarity only. The stator rod **MUST** be installed for proper machine operation.

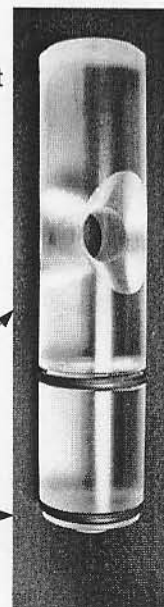
f. While gently pushing against the dasher toward the rear of the machine, rotate the dasher slowly until the tongue of the dasher engages the groove in the drive system at the rear of the freezing cylinder. The outer most portion of the dasher should be recessed approximately 1/4" to 3/8" inside the freezing cylinder. No part of the dasher should extend outside the freezing cylinder. Scraper blades should be visible, extending approximately 1/8" beyond the dasher's diameter when viewed from the front of the dasher.

2. Lubricate and assemble the front plate assembly in the following manner:

a. Install the two o-rings on the spigot plunger by rolling them onto the plunger. Seat the o-rings in the grooves ensuring that they are not twisted. Smooth the lubricant into the grooves and over the sides of the plunger assembly (Fig. 27).

Lubricate Between the Arrows

Fig. 27  
Spigot Plunger and O-Rings



## 601 & 614 SAS Series

- b. Slide the lubricated spigot plunger into the front plate (Fig. 28) ensuring the spigot handle slot is aligned to the front.

**DO NOT LUBRICATE THE FRONT PLATE O-RING BECAUSE LUBRICATION WILL CAUSE LEAKS**

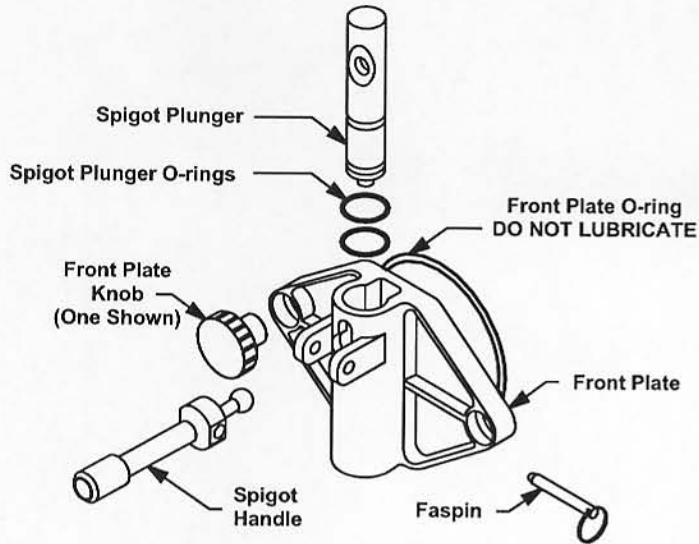


Fig. 28  
Front Plate Assembly

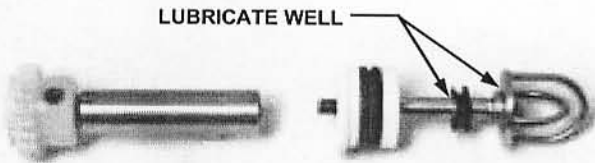


Fig. 29  
Spinner and Drive Assembly

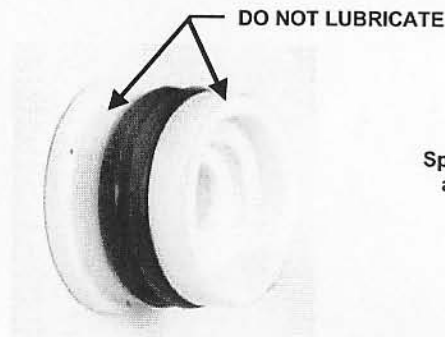


Fig. 30  
Spinner Bearing  
and O-Rings

- c. Insert the spigot handle and secure it with the fastpin.

- d. Install the front plate o-ring on the back of the front plate.



**CAUTION**

**DO NOT LUBRICATE FRONT PLATE O-RING**

- e. Install two o-rings onto the shaft bearing - Fig. 30.

**Note: The same o-ring is used for the following:**  
**Spigot plunger (2)**  
**Spinner shaft bearing (2) - Fig. 30**

- f. Apply a generous portion of lubricant to the back side of the spinner blade plate, then slip the shaft seal onto the shaft flat end first, bellows cup end last - see Figs. 29 and 31.



**CAUTION**

**BE CERTAIN TO KEEP ALL LUBRICATION AWAY FROM THE TWO O-RINGS BETWEEN THE ARROWS IN FIG. 30. THE BEARING MUST BE "DRY" INSERTED INTO THE MIXING BLOCK OR THE BEARING MAY SPIN IN THE MIXING BLOCK.**

- g. Lubricate the shaft and insert it through the small end of the spinner shaft bearing making certain that the bellows cup end of the shaft seal seats into the end of the spinner shaft bearing.

- h. Screw the shaft threads clockwise into the drive assembly until hand tight.

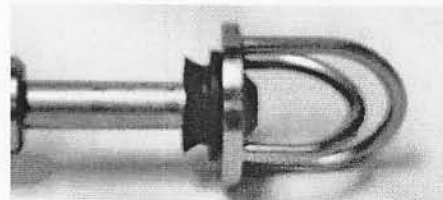
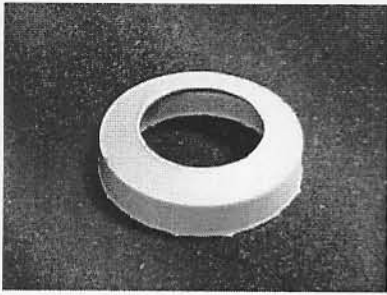


Fig. 31  
Spinner and  
Shaft Seal

## 601 & 614 SAS Series



**Fig. 32a**  
Gasket

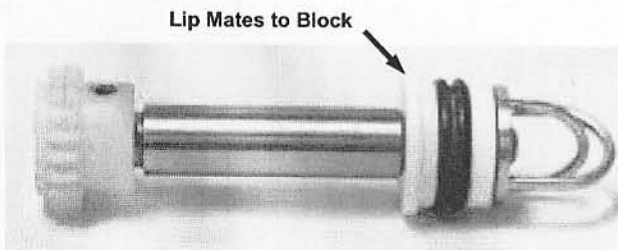
i. Install the gasket (Fig. 32a) onto the top of the mixing block and apply a thin film of sanitary lubricant such as SaniGel (SaniServ part number 1150) only to the top surface - Fig. 32b.

j. With a twisting motion insert the spinner and drive assembly into the bottom hole on the back of the mixing block until the lip on the spinner shaft bearing seats securely against the back of the mixing block - Fig. 33.

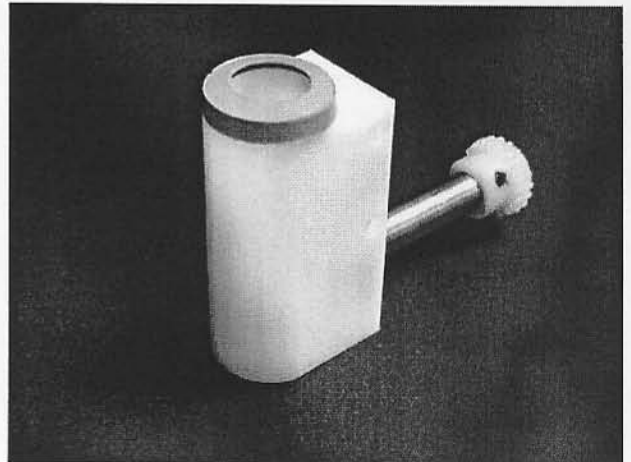
Lightly Lubricate Top Surface



**Fig. 32b**  
Mixing Block and Gasket



**Fig. 33**  
Spinner and Drive Assembly



**Fig. 34**  
Mixing Block and Spinner Assembly

## 601 & 614 SAS Series

k. Remove the check valve assembly serving as a sanitary protective cover over the nipples on the syrup manifold mounted to the front of the machine. Set the check valve assembly aside to be cleaned and sanitized as soon as possible so it will be ready for use the next time the machine is disassembled. Install a freshly sanitized check valve assembly on the syrup manifold nipples.

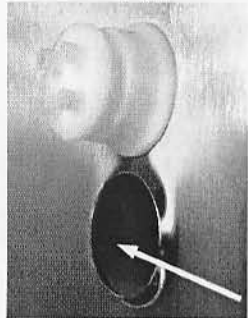


Fig. 35a  
Syrup Manifold  
Without Valve Assembly

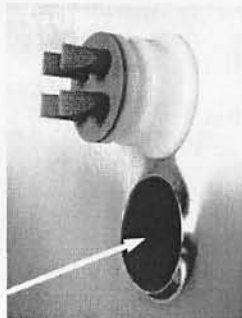


Fig. 35b  
Syrup Manifold  
With Valve Assembly

l. Insert the mixing block and drive assembly (Fig. 36) through the hole in the front of the machine beneath the syrup manifold and check valve assembly.

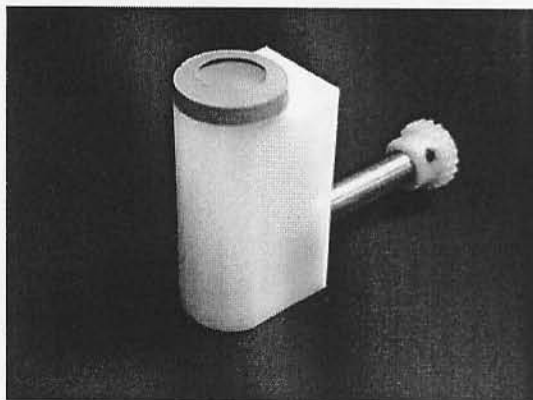


Fig. 36  
Mixing Block and Spinner Assembly

m. Align the check valve assembly on the syrup manifold with the holes in the back side of the mixing block. Guide the drive gear through the hole in the machine face just beneath the syrup manifold - Fig. 37a, 37b. Carefully seat the mixing block assembly onto the front of the SAS machine and secure with the two faspins.

n. Nudge the spigot switch up with the top of the face plate and swing the face plate into position over the face plate studs. Make certain the stator rod knob seats into the face plate pocket. Secure the front plate assembly to the front plate mounting studs with the two plastic knobs. Simultaneously, turn both knobs in a clockwise direction. Tighten the knobs evenly. **DO NOT** tighten one knob all the way down and then the other. This may result in front plate breakage. Only moderate force is required. Do not overtighten. Set the spigot plunger to the closed position.

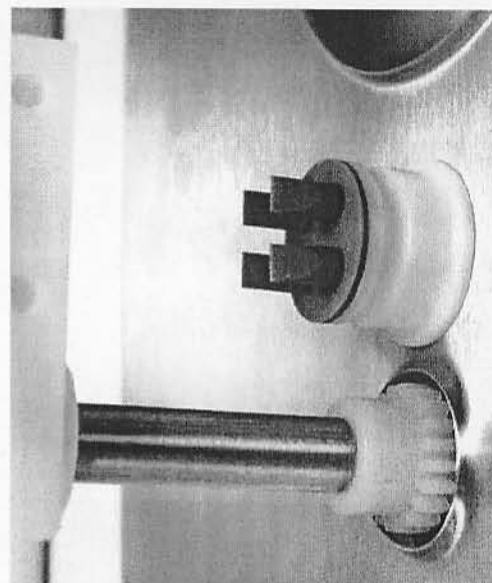


Fig. 37a  
Spinner Drive  
Through  
Machine

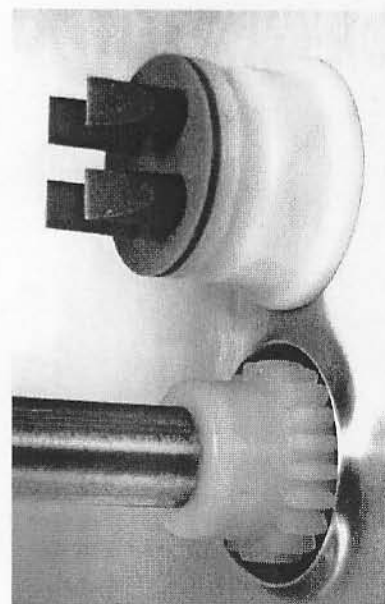
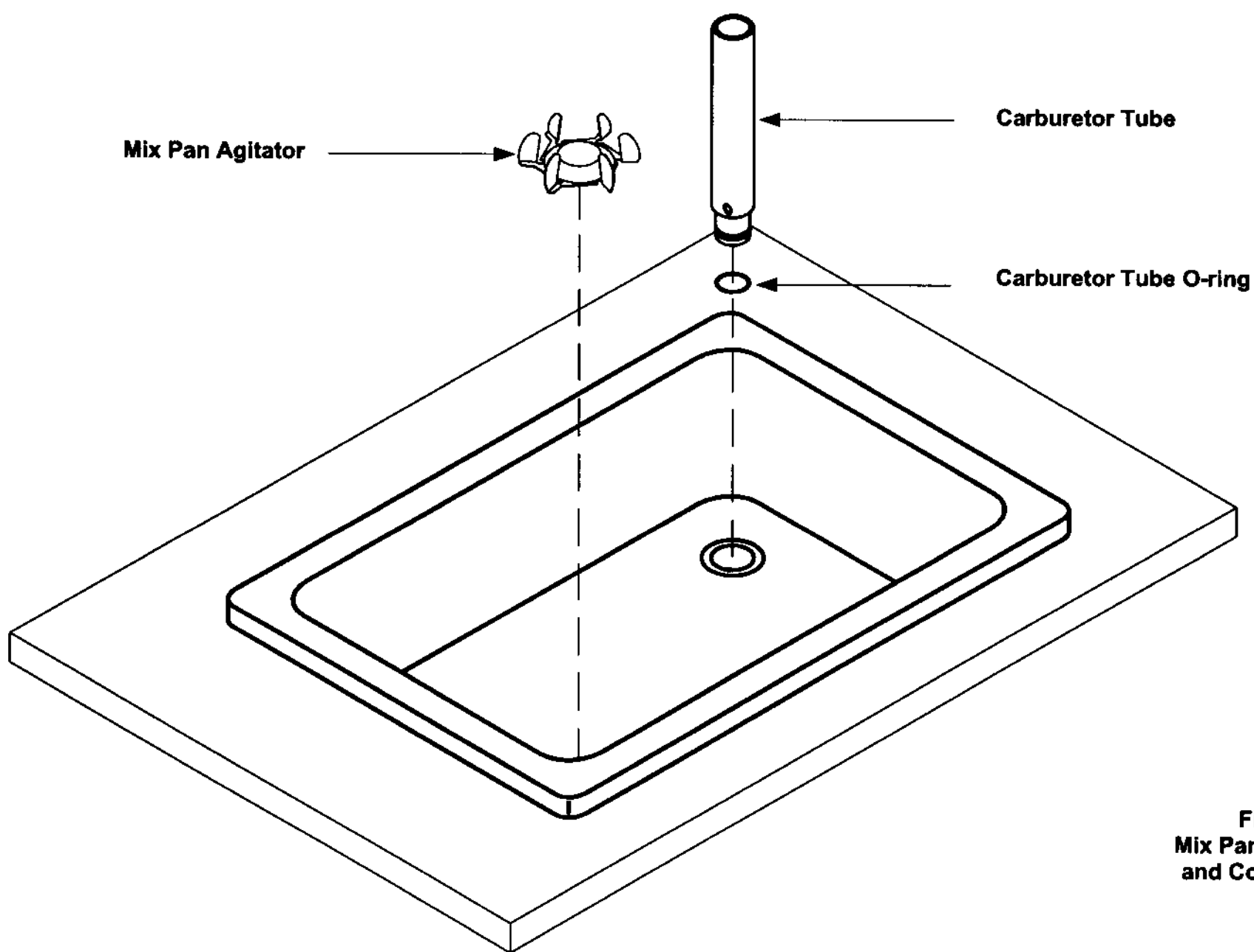


Fig. 37b  
Spinner Drive  
Through Machine  
Close up

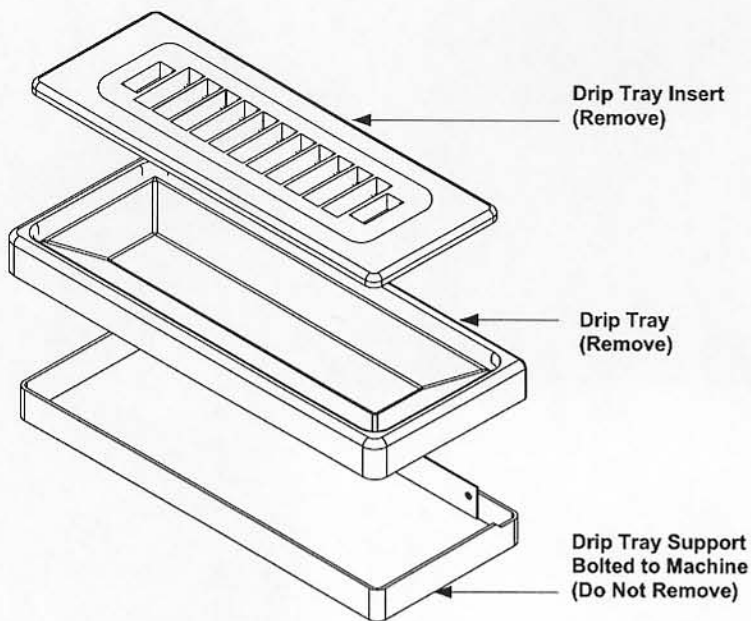
## 601 & 614 SAS Series

3. Apply a small amount of SaniGel (p/n 1150) on the bottom of the mix pan agitator. On countertop models place the lubricated mix pan agitator in the right front corner of the mix pan as you face the machine front. On floor models place the lubricated mix pan agitator in the right rear corner of the mix pan. Position the agitator until you feel the magnets of the agitator engage the magnets of the drive system beneath the mix pan - see Fig. 38.



**Fig. 38**  
**Mix Pan Assembly**  
**and Components**

## 601 & 614 SAS Series



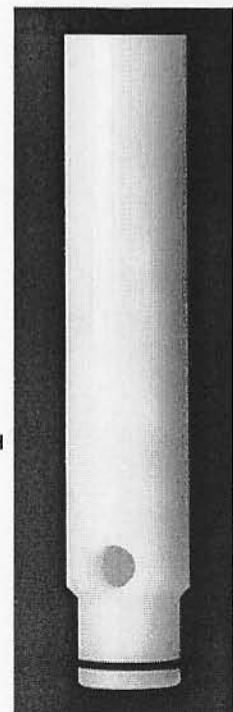
**Fig. 39**  
**Drip Tray Assembly**

4. Install the drip tray and drip tray insert (Fig. 39).
5. Install the o-ring onto the carburetor tube - Fig. 40.  
Apply lubricant sparingly over the o-ring and place the assembly in the bottom of the mix pan for sanitizing.
6. Proceed directly to the "Sanitizing" section of this manual.

**DO NOT FILL MIX INLET HOLE WITH LUBRICANT**

Mix Inlet Hole →

Lubricated O-ring →



**Fig. 40**  
**Carburetor Tube Assembly**

# Assembly and Lubrication

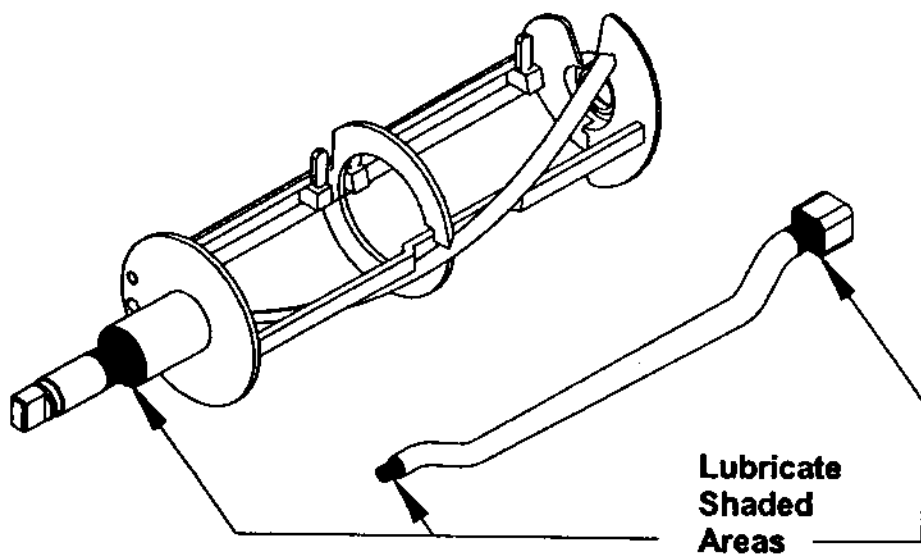
## FROZEN BEVERAGE

Use a food grade lubricant\* ONLY. Sanigel (SaniServ part number 1150) is recommended and is available from the factory or your local authorized SaniServ dealer or distributor. **Lubrication must be performed daily.**

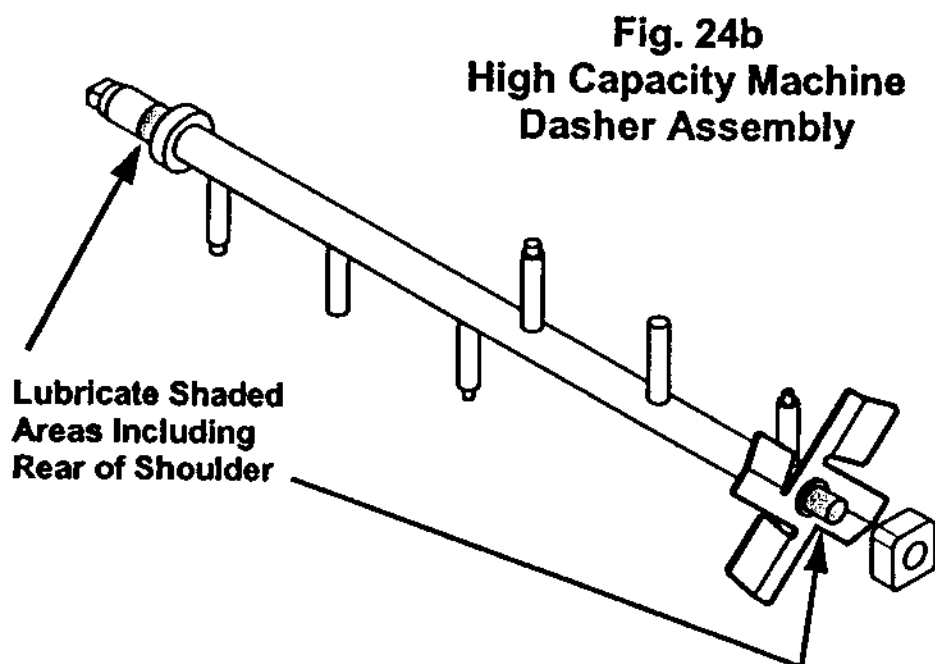
\* The SaniServ recommended product is a colorless to white, odorless, tasteless food contact lubricant accepted by the United States Food and Drug Administration (FDA) with a USDA rating of H1 and certified for food contact by NSF International. Its useful temperature range is -15°F - 210°F (-26°C - 99°C) with a melt point of 93°C using ASTM D566 and a Saybolt viscosity of 55 at 210°F (99°C) when measured using ASTM D445. The four ball wear scar diameter is 0.49 mm.

1. Lubricate and assemble the dasher assembly in the following manner:

- a. Apply a generous amount of lubricant to the shoulder of the dasher and the area of the shaft where the white plastic portion of the assembled rear seal contacts the shaft (Fig. 24). This is easily performed by running a 1/4" (6 mm) bead of lubricant around the shoulder of the dasher.
- b. Lubricate the two areas of the stator rod (Fig. 24a) and slide the stator rod into the dasher (Fig. 25). Make certain that the end of the stator rod is inserted into the hole at the rear of the dasher.



**Fig. 24a**  
Stator Rod and Dasher Lubrication



**Fig. 24b**  
High Capacity Machine  
Dasher Assembly



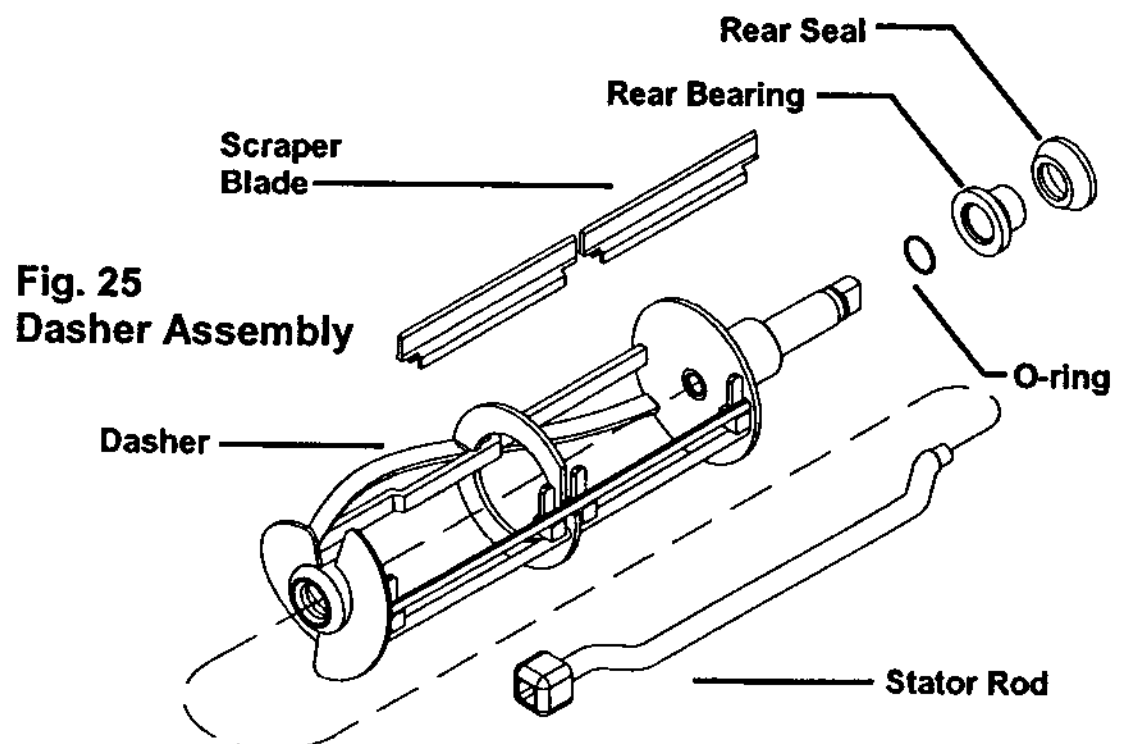
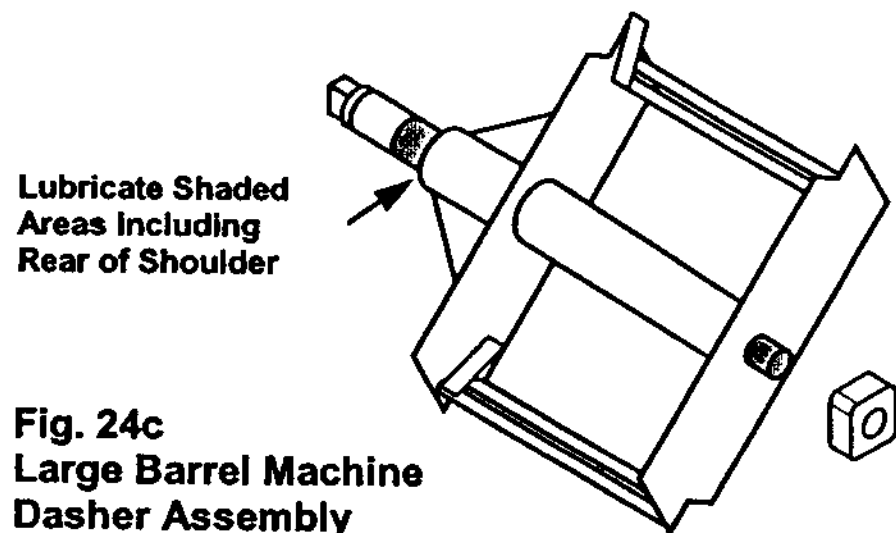
- c. Assemble and install the rear seal with the rubber portion toward the rear of the freezing cylinder as indicated in Fig. 25.

**DO NOT LUBRICATE THE RUBBER PORTION OF THE REAR SEAL. LUBRICATION ON THE REAR SEAL WILL DAMAGE THE MACHINE.**

- d. Install the o-ring on the rear of the dasher shaft.

**DO NOT LUBRICATE DASHER O-RINGS**

- e. Install the front bearing on the dasher of the large barrel and the high capacity machines.

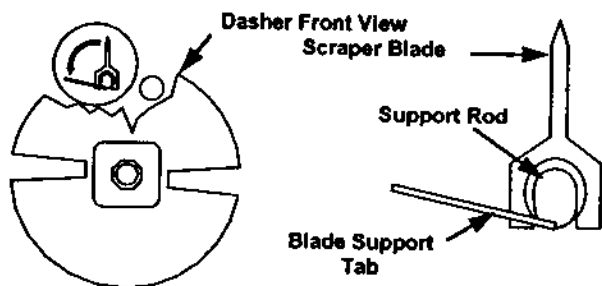


**Fig. 25**  
Dasher Assembly

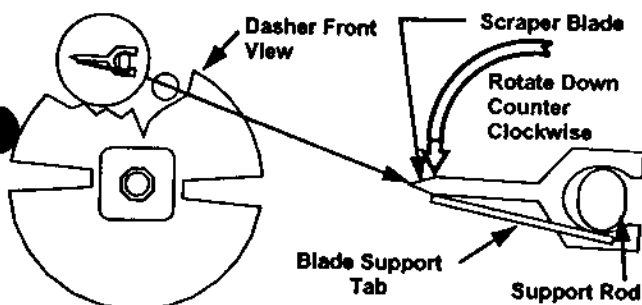
# FROZEN BEVERAGE

- f. Install the scraper blades onto the dasher assembly by holding the blades perpendicular to the tabs (Fig. 26) and then snapping them over the flat area of the support rod. Then rotate the blades downward in a counterclockwise direction as viewed from the front of the dasher (Fig. 27). **BE CERTAIN THAT THE SCRAPER BLADES REST UPON THE DASHER TABS ON ALL DASHERS EXCEPT HIGH CAPACITY MACHINE DASHERS. THOSE BLADES REST UPON PINS.**

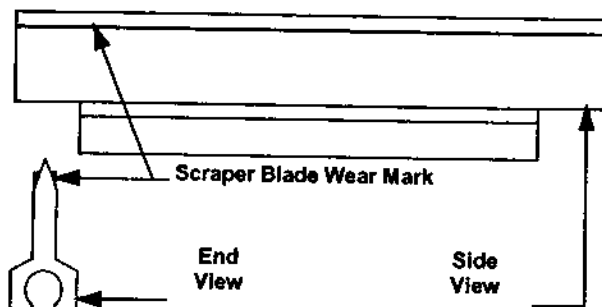
**Note:** Reverse the blades at each cleaning to maintain sharpness. In addition, the blades are equipped with a wear mark (Fig. 28). When the blade is worn to this wear mark, it must be replaced.



**Fig. 26**  
Scrapper Blade Installation

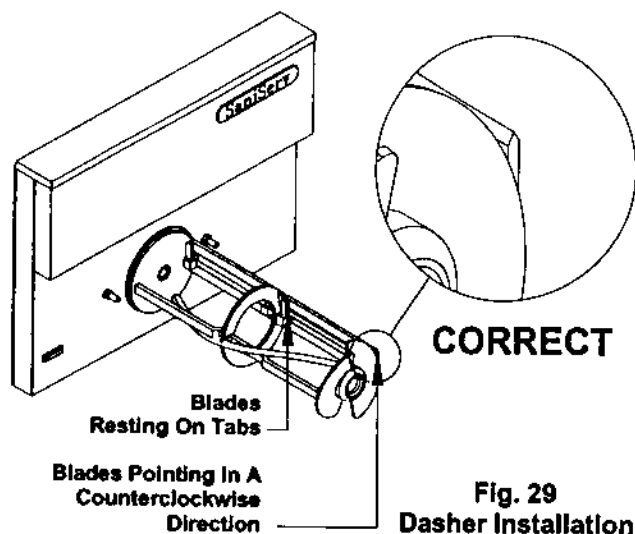


**Fig. 27**  
Scrapper Blade Installation

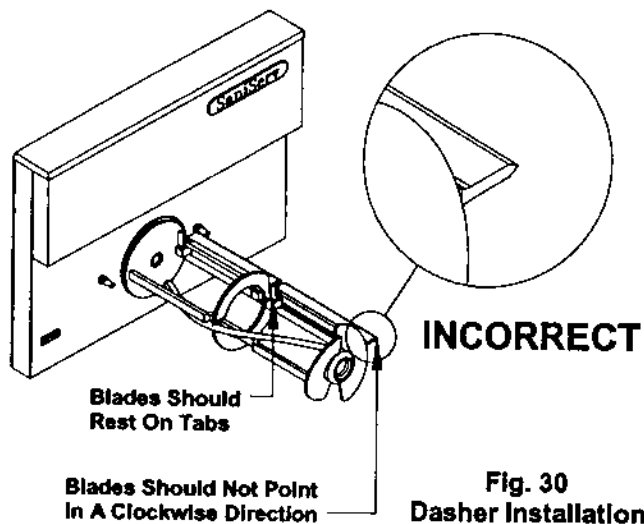


**Fig. 28**  
Scrapper Blade Wear Mark

- g. Insert the dasher assembly into the freezing cylinder as far as possible (Fig. 29) being careful not to damage the scraper blades. Damage will occur to the scraper blades and the dispenser will not operate properly if the scraper blades are installed facing in a clockwise direction (Fig. 30).



**Fig. 29**  
Dasher Installation

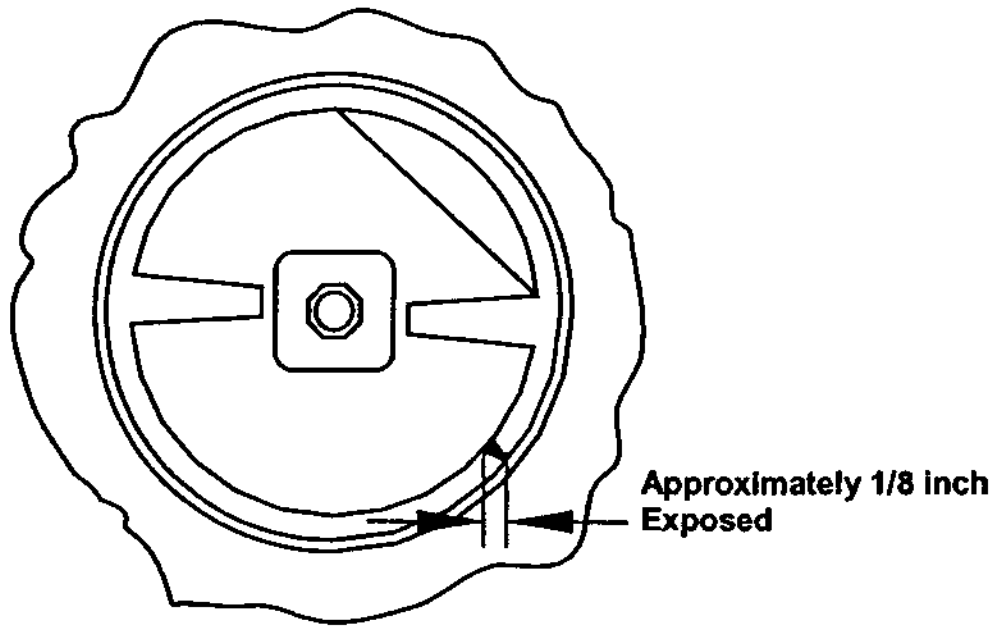


**Fig. 30**  
Dasher Installation

**Note:** The stator rod has been deleted from Fig. 29 and Fig. 30 for clarity only. The stator rod must be installed for proper machine operation.

- h. While maintaining force against the dasher, rotate it slowly until the tongue of the dasher engages the groove in the drive system at the rear of the cylinder. The outer most portion of the dasher should be recessed approximately 1/4" (6 mm) to 3/8" (10 mm) inside the freezing cylinder. No part of the dasher should extend outside the cylinder. Scraper blades should be visible, extending approximately 1/8" (3 mm) beyond the dasher (Fig. 31).

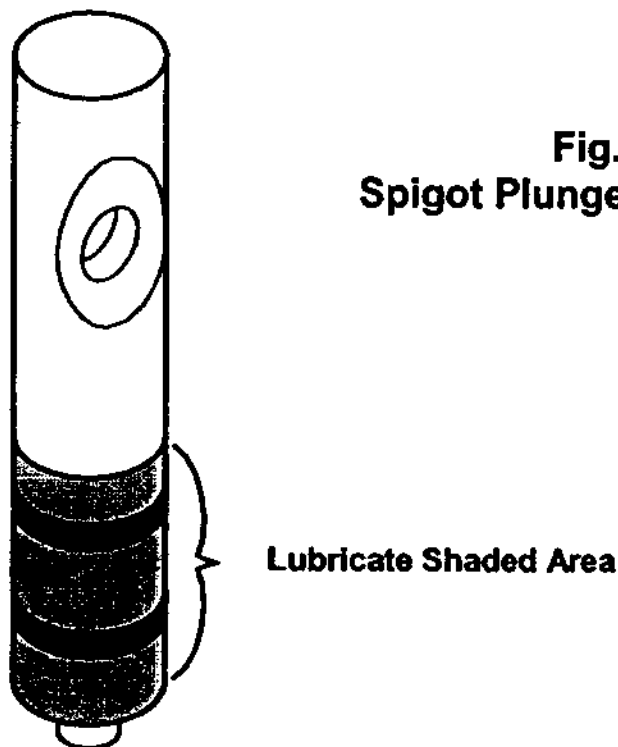
# FROZEN BEVERAGE



**Fig. 31**  
**Dasher with Blade (Front View)**

2. Lubricate and assemble the front plate assembly in the following manner:

- a. Install the two o-rings on the spigot plunger by rolling them onto the plunger. Seat the o-rings in the grooves. Be certain that they are not twisted. Smooth the lubricant into the grooves and over the sides of the plunger assembly (Fig. 32).

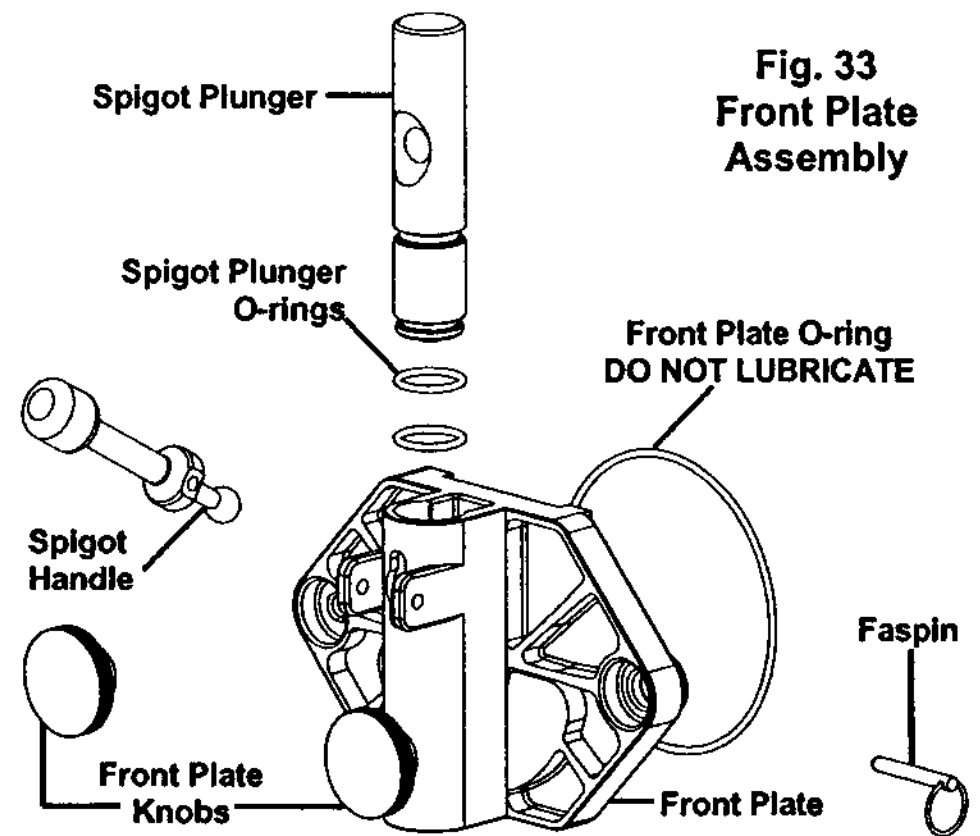


**Fig. 32**  
**Spigot Plunger Lubrication**

- b. Slide the lubricated spigot plunger into the front plate (Fig. 33) making certain that the spigot handle slot is aligned to the front.
- c. Insert the spigot handle and secure with the faspin.
- d. Install the front plate o-ring.

## DO NOT LUBRICATE THE FRONT PLATE O-RING

- e. Secure the front plate assembly with the two plastic knobs. Simultaneously, turn the knobs in a clockwise direction. Tighten the knobs evenly. **DO NOT** tighten one knob all the way down and then the other. Doing so may result in front plate breakage. Only moderate force is required. **DO NOT** over tighten. Close the spigot plunger.

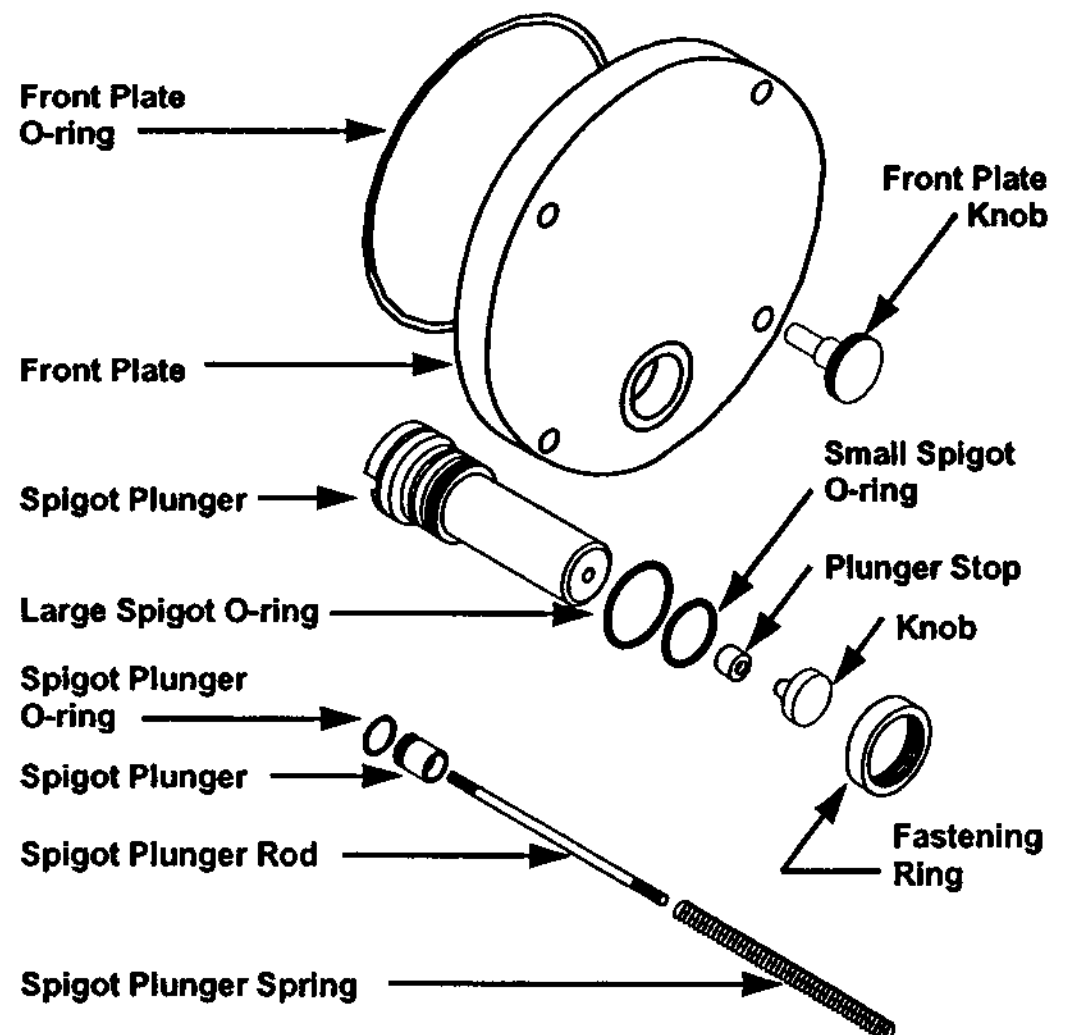


**Fig. 33**  
**Front Plate Assembly**

3. The high capacity machine front plate is lubricated and assembles in the same manner.

4. Assemble the large barrel machine front plate in the following manner:

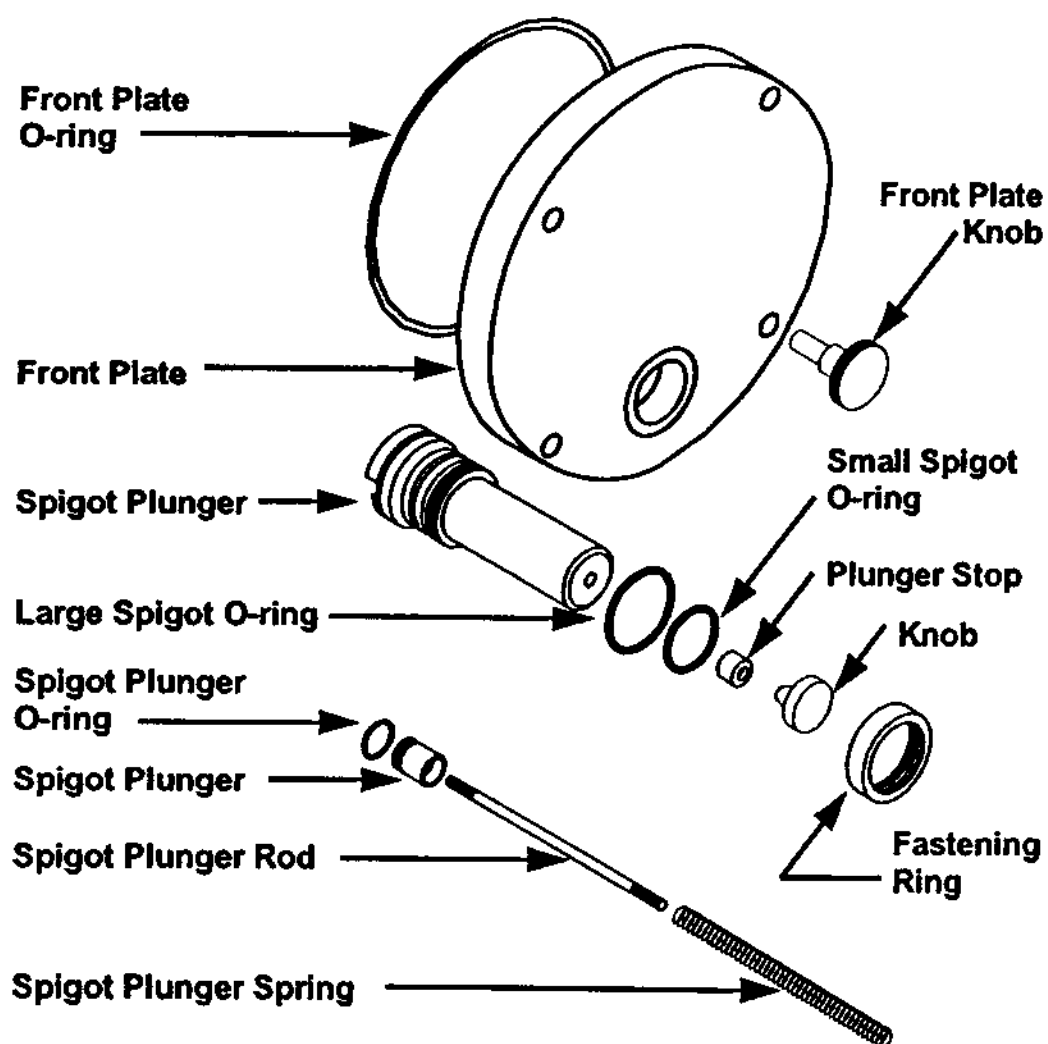
- a. Screw the spigot rod (turn clockwise) into the spigot plunger.
- b. Place the o-ring on the spigot plunger, then smooth food grade lubricant into the grooves and around the o-ring (Fig. 34).



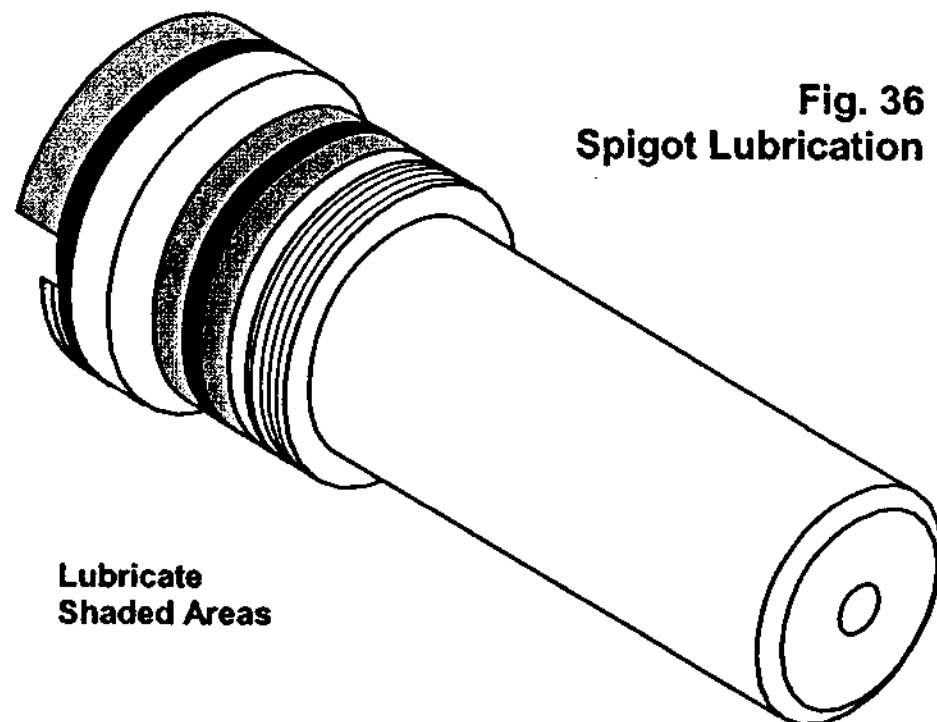
**Fig. 34**  
**Large Barrel Machine**  
**Front Plate Assembly**

# FROZEN BEVERAGE

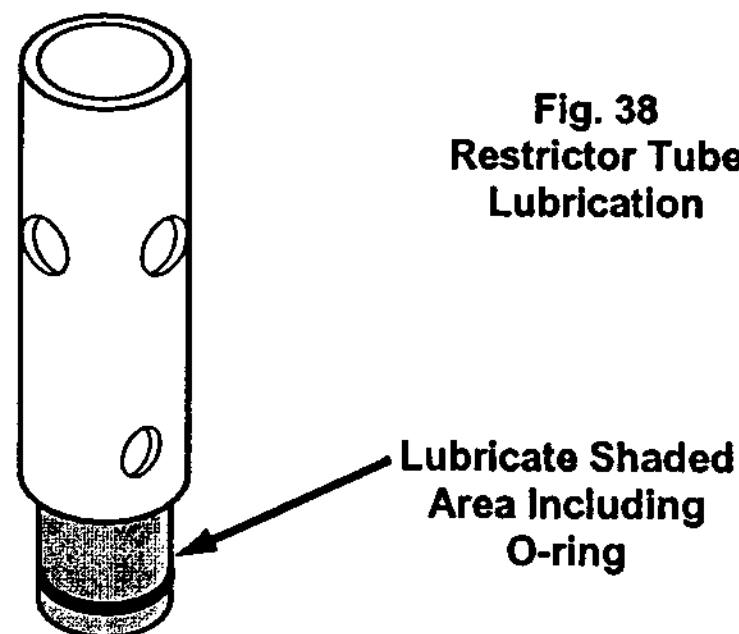
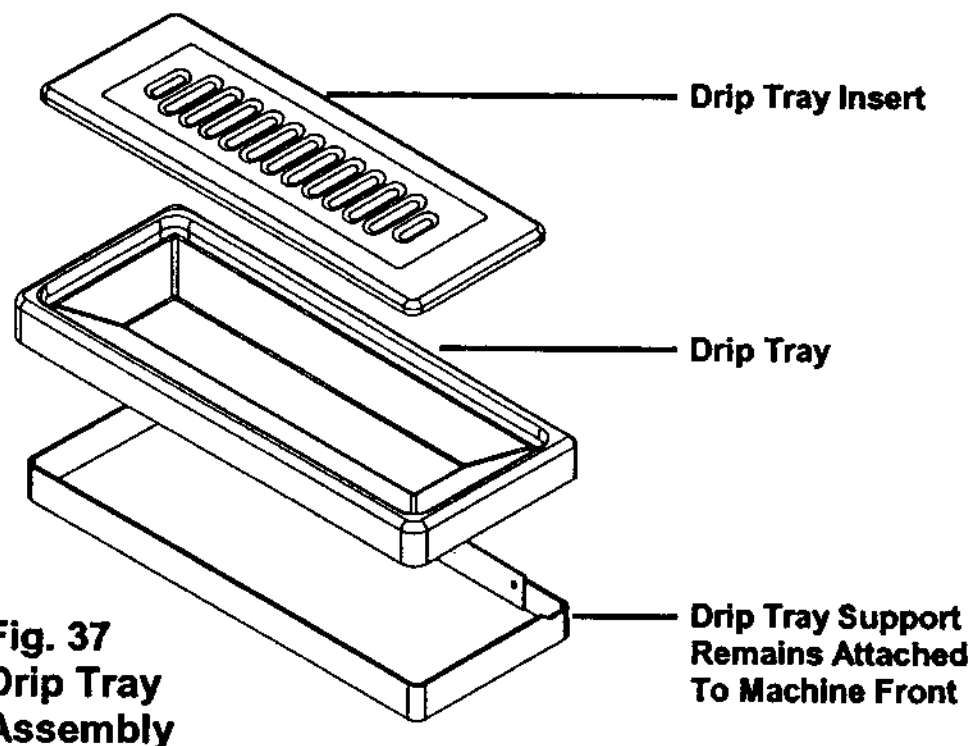
- c. Put the spigot spring over the spigot rod, then push this assembly into the spigot.
- d. Screw the spigot stop clockwise about halfway down the threads on the spigot rod. Tighten the spigot knob on the rod, then screw the spigot stop back against the knob to secure it in place.
- e. Install the small spigot o-ring onto the front of the spigot and roll it into position.
- f. Place the large spigot o-ring onto the back of the spigot and roll it into place, then smooth food grade lubricant into the grooves and around **BOTH** the large and the small spigot o-rings (Fig. 36).
- g. Push the spigot assembly through the back of the front plate assembly and align the o-ring slot of the spigot plunger with the o-ring slot of the front plate.
- h. Place the fastening ring over the spigot assembly turning clockwise to tighten. Note: Make certain the spigot assembly remains aligned with the front plate assembly.
- i. Install the front plate o-ring on the back of the front plate. **DO NOT LUBRICATE O-RING.**



**Fig. 35**  
Large Barrel Machine  
Front Plate Assembly



5. Install the drip tray and drip tray insert (Fig. 37).
6. Install the o-ring on the restrictor tube (Fig. 38) if removable. Apply lubricant sparingly over the o-ring. Place the restrictor tube in the bottom of the mix pan for sanitizing. Make certain that lubricant does not block the mix inlet hole on the restrictor tube.



7. Proceed to the "Sanitizing" section of this manual.

# **DISASSEMBLY & CLEANING**

## Disassembly & Cleaning

**CONSULT YOUR LOCAL HEALTH AGENCY FOR CLEANING AND SANITIZING REQUIREMENTS.**

This unit does not come presanitized from the factory. Before serving product, the dispenser must be disassembled, cleaned, lubricated, and sanitized. These instructions are general guidelines only. Cleaning and sanitizing procedures must conform to local health agency requirements.

### Emptying Machine

Prior to the disassembly and cleaning of parts, the machine must be emptied of product. Use the following procedures (Steps 1 through 3). If this is first time operation, disregard these steps.

**DO NOT INSERT ANY OBJECTS OR TOOLS INTO**



**WARNING**

**THE MIX INLET HOLE, CARBURETOR TUBE HOLE, OR FRONT PLATE DISPENSING HOLE WHILE THE MACHINE IS RUNNING. DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT.**

1. Remove the carburetor tube (Fig. 3) from the mix inlet hole and lay in the bottom of the mix pan.

2. Set the control switch to the "CLEANOUT" position and dispense all product from the freezing cylinder by pulling downward on the spigot handle (Fig. 4) to empty the machine.

3. Set the control switch to the "OFF" (center) position. Close the spigot handle before proceeding to cleaning.

Shake  
Carb Tube



**Note: There is NO carburetor tube used on the frozen beverage side of the machine.**

**Fig. 3**  
**Carburetor Tubes**

### Disassembly and Cleaning Procedure

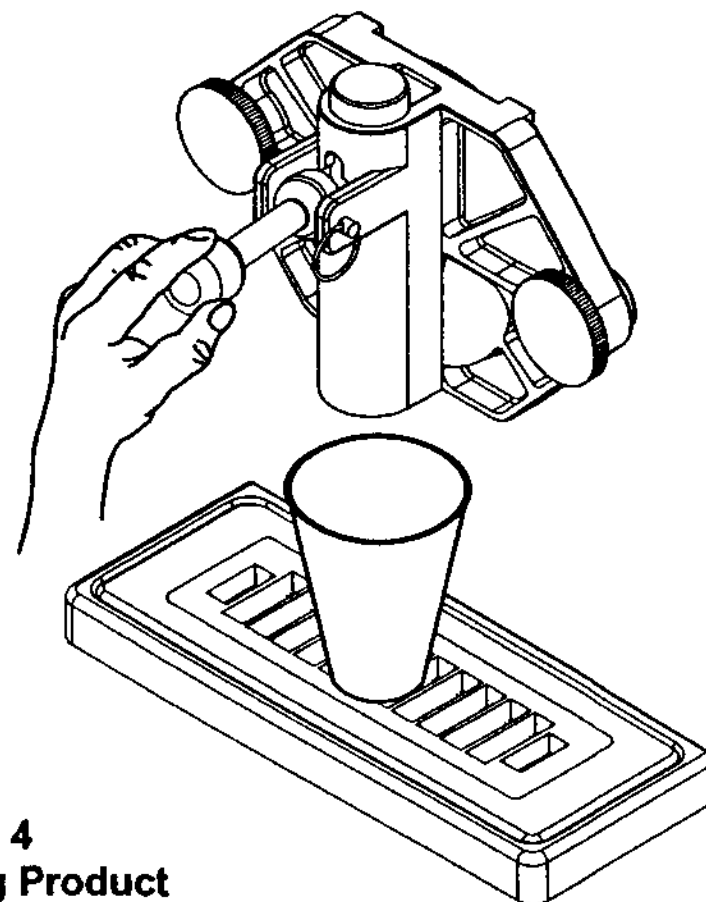
1. Fill the machine with cold water and set the control switch to the "CLEANOUT" position. **DO NOT** use hot water which could damage the machine. Let the machine agitate briefly and drain the water by pulling downward on the spigot handle. After the machine is empty, set the control switch to the "OFF" position. Repeat the above procedure as necessary to make certain that all product is removed from the machine.

2. Prepare a suitable detergent and water solution at a temperature of 125° to 130° F. **DO NOT** use an abrasive detergent on any part of the dispenser.

**IMPORTANT**

**DO NOT USE HOT WATER  
DOING SO COULD DAMAGE YOUR MACHINE**

3. Fill the mix pan with the cleaning solution. Make certain that the machine is "OFF". Clean the mix pan thoroughly with a brush as the solution drains into the freezing cylinder. Clean the mix inlet tube and the carburetor tube holes with the brush provided.



**Fig. 4**  
**Dispensing Product**

# 400 & 600 SERIES

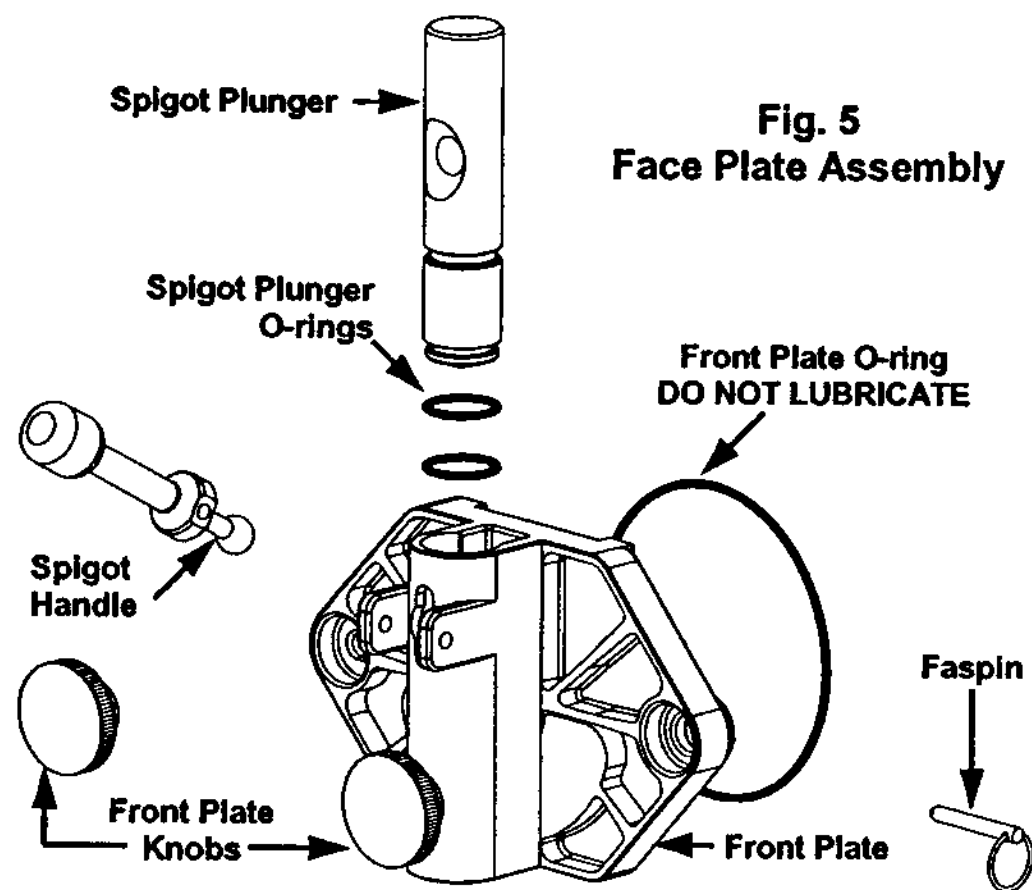
4. Set the control switch to the "CLEANOUT" position and agitate for approximately 1 - 2 minutes and then drain the water by opening the spigot. After the unit is empty, set the control switch to the "OFF" position.

5. Remove the front plate by turning the black plastic knobs in a counterclockwise direction (Fig. 5). Disassemble the front plate in the following manner:

## IMPORTANT

**DO NOT USE ANY TOOLS OR SHARP OBJECTS TO REMOVE ANY O-RINGS FROM THIS MACHINE. SHARP OBJECTS WILL DAMAGE THE O-RINGS.**

- Remove the faspin and spigot handle.
- Remove the front plate o-ring.
- With the spigot handle removed, push the spigot plunger out the top of the front plate.
- Remove the o-rings from the spigot plunger by grasping the part with one hand and with a dry cloth in the other hand, squeeze the o-ring upward. When a loop is formed, grasp the o-ring with the other hand and roll it out of its groove and off the part (Fig. 6).

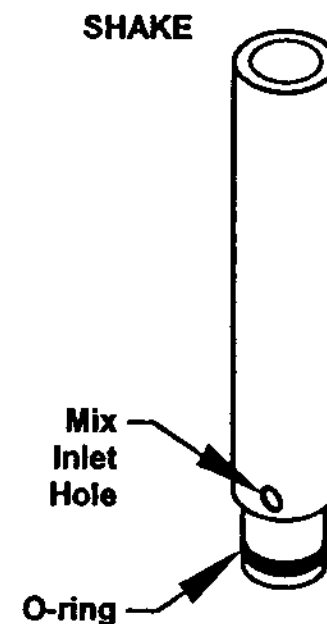


**Fig. 5**  
**Face Plate Assembly**

**Fig. 6**  
**O-Ring Removal**

6. Remove the carburetor tube (Fig. 7) from the mix pan. Disassemble and clean in the following manner:

- On shake carb tubes, remove the o-ring from the bottom of the tubes.
- Clean the inside of the tube with the brush.



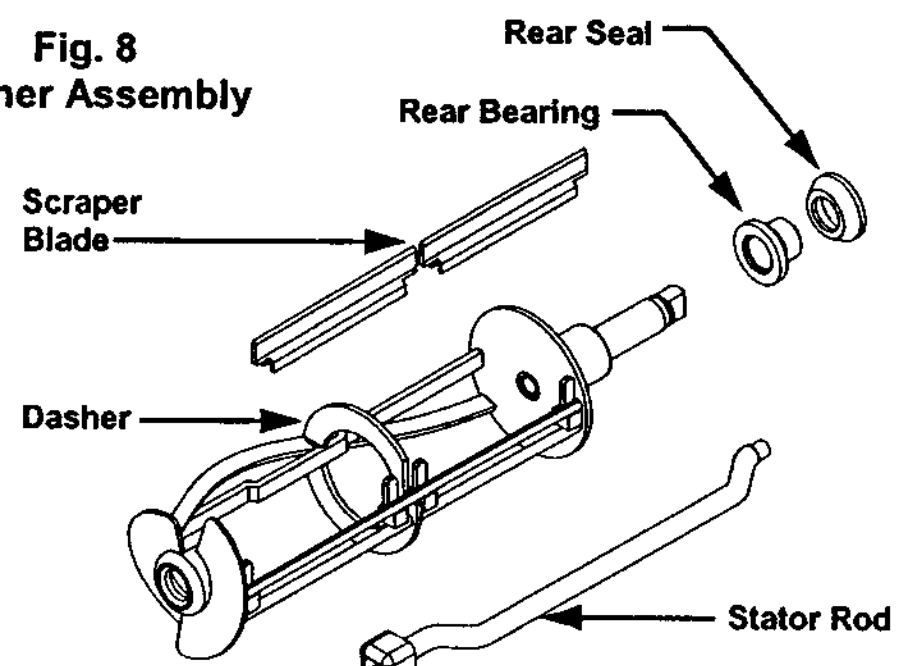
**Fig. 7**  
**Carburetor Tube Assembly**

7. Remove the dasher assembly (Fig. 8) being careful not to damage the scraper blades, then disassemble in the following manner:

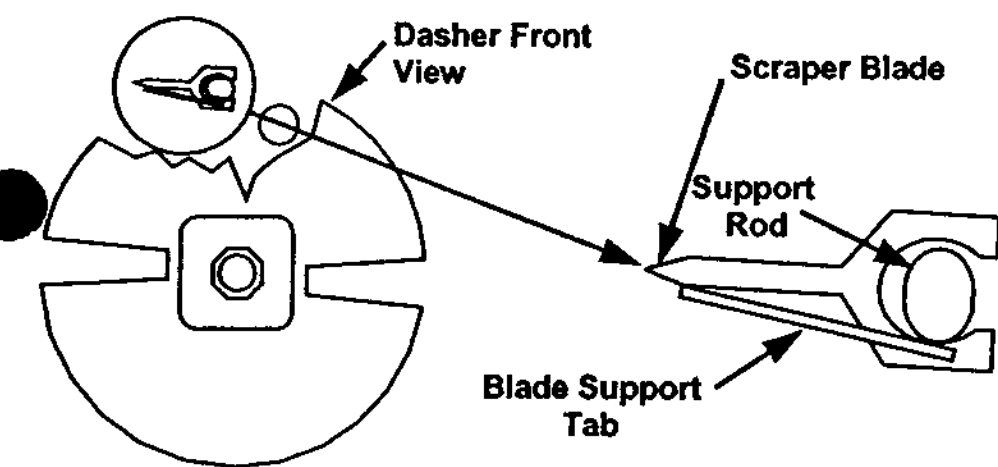
- Remove and take apart the rear seal assembly.
- Remove the stator rod from the dasher.
- Remove the blades from the dasher (Fig. 9a) by first rotating blade upward (Fig. 9b) and then unsnapping one end from the support rod.

**BLADES MUST BE REMOVED FOR CLEANING.**

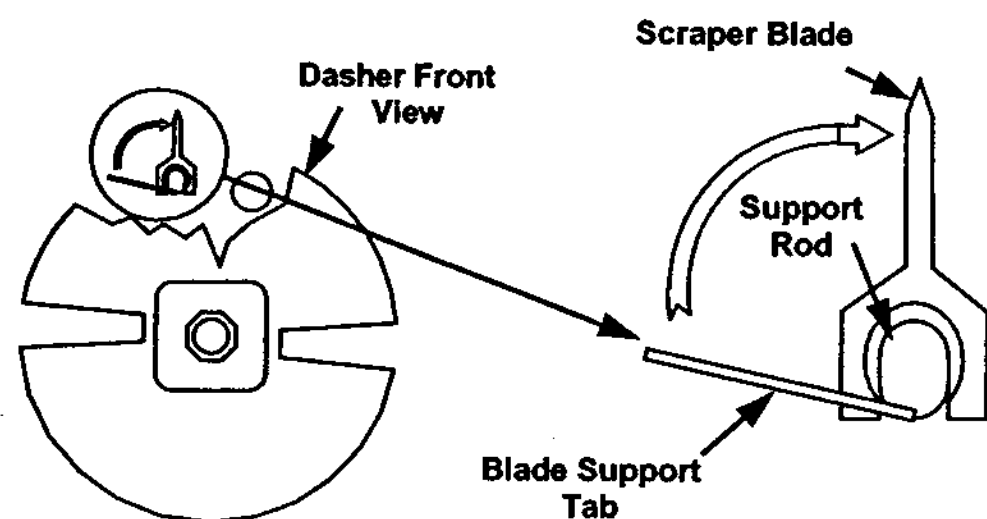
**Fig. 8**  
**Dasher Assembly**



# 400 & 600 SERIES

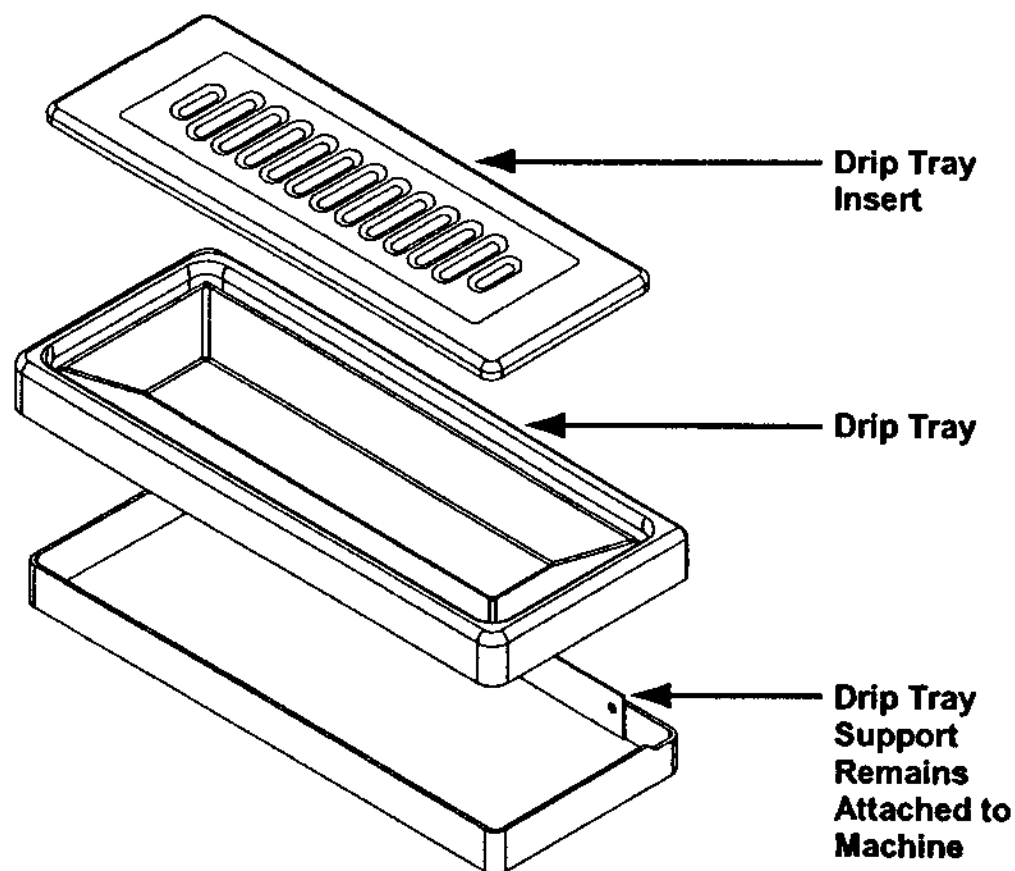


**Fig. 9a**  
**Scraper Blade Removal**



**Fig. 9b**  
**Scraper Blade Removal**

8. Remove the mix pan lid (See Exploded View), drip tray and drip tray insert (Fig. 11).
9. Place all parts into a three partition sink consisting of:
  - a. In one partition, mild detergent solution
  - b. In a second partition, clear rinse
  - c. In a third partition, sanitizing rinse consisting of 200 parts per million (ppm) chlorine residual or the ppm your local health agency requires if different.



**Fig. 11**  
**Drip Tray Assembly**

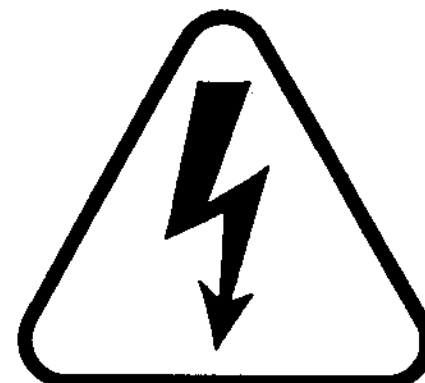
10. Use the small diameter brush to clean all holes and ports in the parts. **DO NOT** use an abrasive detergent.
11. After thoroughly washing the parts in the detergent solution, rinse them in the rinse water. Place the parts in the sanitizing solution for five (5) minutes and then air dry to prepare for assembly and lubrication. **DO NOT** wipe dry.
12. The remainder of the machine including the mix pan and freezing cylinder must be cleaned in place using a mild detergent solution. Clean the exterior with a damp cloth. **DO NOT** use an abrasive cleaner on exterior panels.



**WARNING**

**WHEN CLEANING THE MACHINE, DO NOT ALLOW EXCESSIVE AMOUNTS OF WATER AROUND ANY ELECTRICALLY OPERATED COMPONENTS OF THE MACHINE. ELECTRICAL SHOCK OR DAMAGE TO THE MACHINE MAY RESULT.**

**ELECTRICAL  
SHOCK HAZARD**



# 500 SERIES

## Disassembly and Cleaning

**CONSULT YOUR LOCAL HEALTH AGENCY FOR LOCAL CLEANING AND SANITIZING REQUIREMENTS.**

This unit does not come pre-sanitized from the factory. Before serving product, the dispenser must be disassembled, cleaned, lubricated, and sanitized. Please be aware that these instructions are general guidelines. Cleaning and sanitizing procedures must conform to local Health Authority requirements.

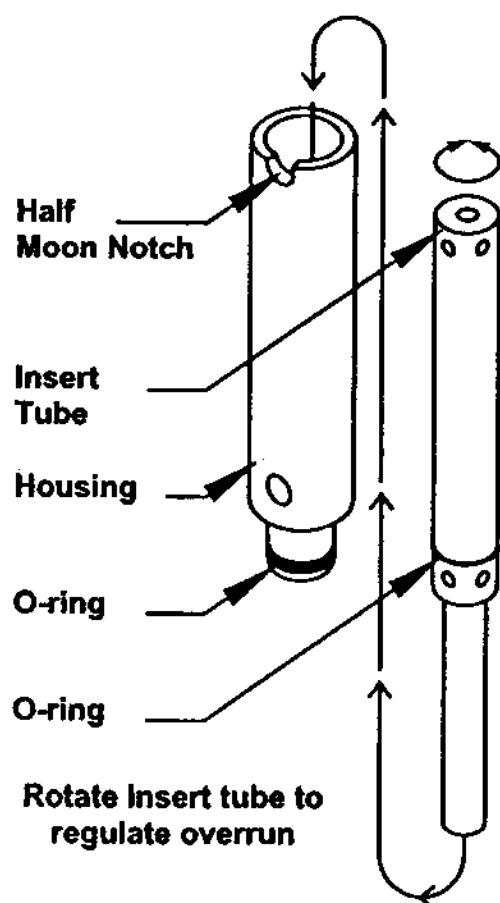
### Emptying Machine

Prior to the disassembly and cleaning of parts, the machine must be emptied of product. Use the following procedures (Steps 1 through 3). If this is first time operation, disregard these steps.



**DO NOT INSERT ANY OBJECTS OR TOOLS INTO THE MIX INLET HOLE, CARBURETOR TUBE HOLE, OR FRONT PLATE DISPENSING HOLE WHILE THE MACHINE IS RUNNING. DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT.**

1. Remove the carburetor tubes (Fig. 5) from the mix inlet holes and lay in the bottom of the mix pans.
2. Set each control switch (Fig. 2) to the "CLEANOUT" position and dispense all product from the freezing cylinder by pulling downward on the spigot handle (Fig. 6) to empty the machine.
3. Set each control switch to the "OFF" (center) position. Close the spigot handles before proceeding to cleaning.



**Fig. 5**  
**Carburetor Tube Assembly**

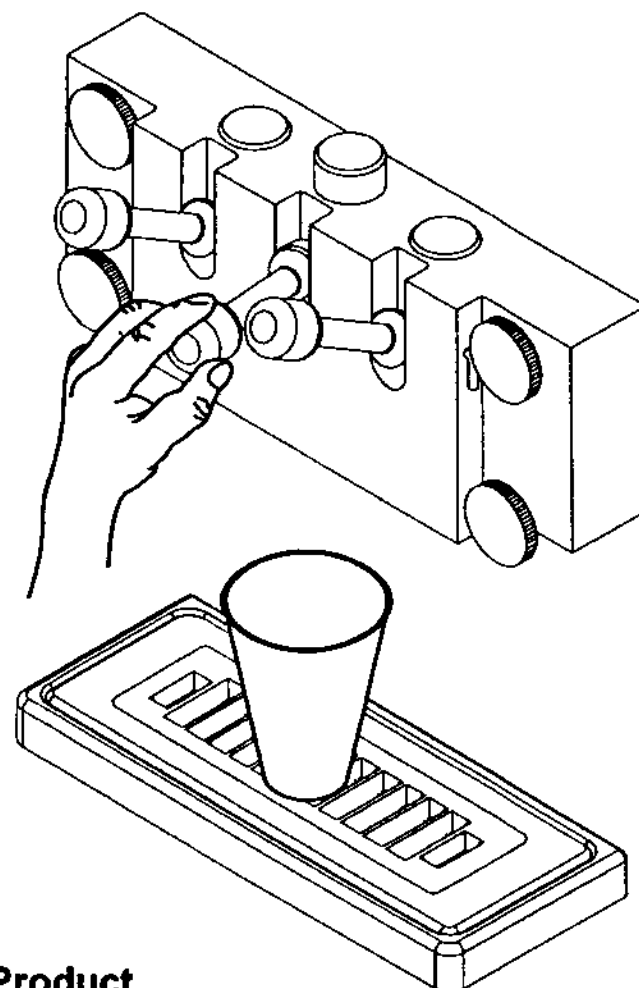
### Disassembly and Cleaning Procedure

1. Fill the machine with cold water and set the control switches to the "CLEANOUT" position. **DO NOT** use hot water which could damage the machine. Let the machine agitate briefly and drain the water by pulling downward on the spigot handle. Repeat the above procedure as necessary to make certain all product is removed from the machine. After the machine is empty, set each control switch to the "OFF" position.
2. Prepare a suitable detergent and water solution at a temperature of 125°F. to 130°F. **DO NOT** use an abrasive detergent on any part of the dispenser.



**DO NOT USE HOT WATER.  
DOING SO MAY DAMAGE THE MACHINE.**

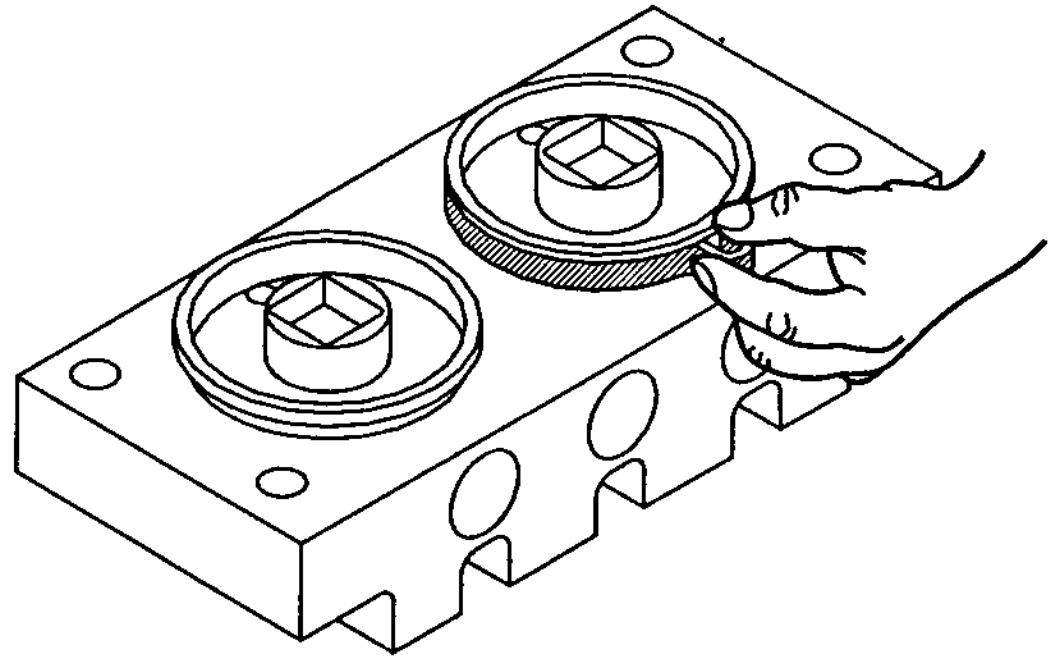
3. Fill each mix pan with the cleaning solution. Make certain that the machine is "OFF". Clean the mix pans thoroughly with a brush as the solution drains into the freezing cylinders. Clean the mix inlet tubes and the carburetor tube holes with the brush provided.



**Fig. 6**  
**Dispensing Product**

# 500 SERIES

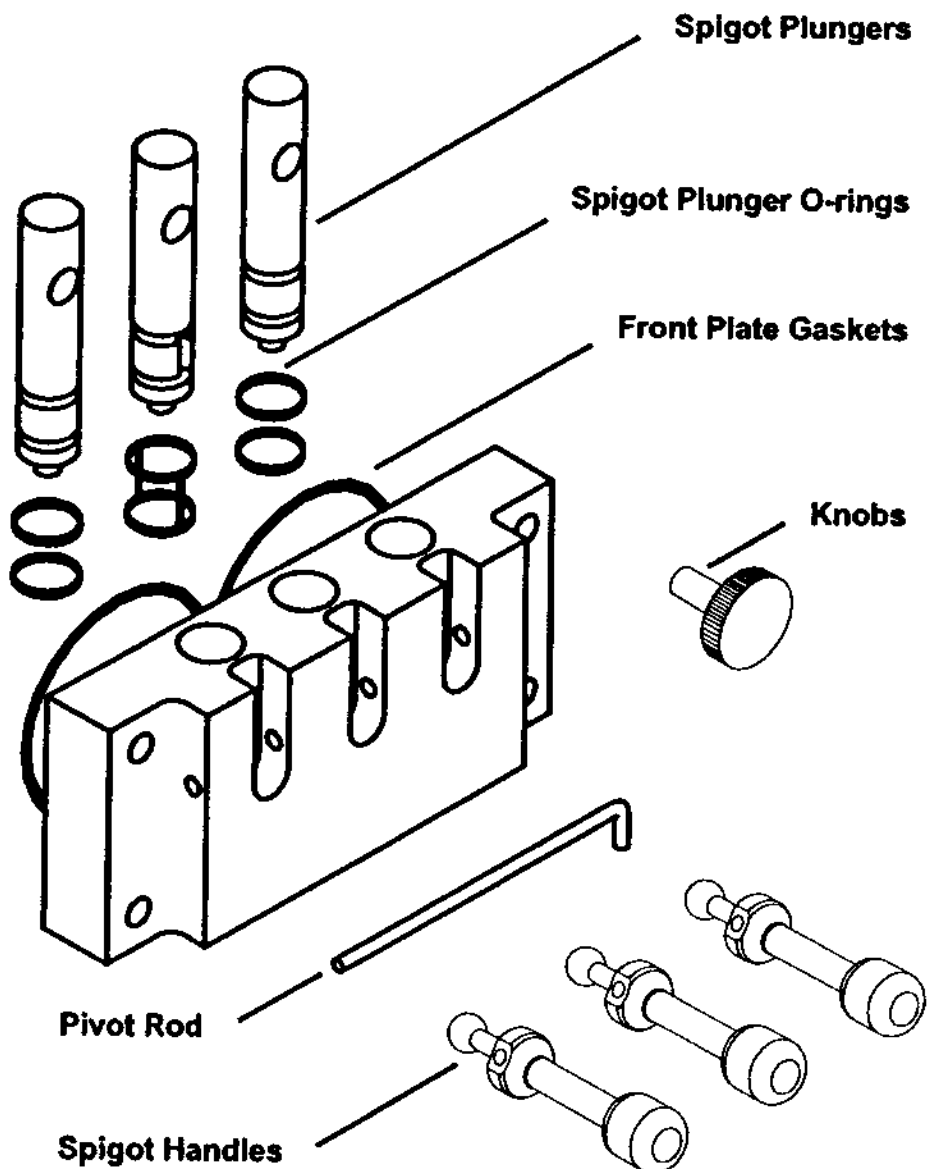
4. Set each control switch (Fig. 2) to the "CLEANOUT" position and agitate for approximately 1 - 2 minutes and then drain the water by opening the spigots (Fig. 6). After the unit is empty, set the control switches to the "OFF" position.
5. Remove the front plate by turning the four black plastic knobs in a counterclockwise direction (Fig. 7).
6. Disassemble the front plate in the following manner:
  - a. Remove the pivot rod and spigot handles.
  - b. Push the spigot plungers out of the top of the front plate assembly.
  - c. Remove both front plate gaskets by placing your thumb and forefinger as shown in Fig. 8 and squeeze until a loop is formed. Then roll each gasket out of its groove.
  - d. Remove the o-rings from the spigot plungers by grasping the part with one hand and with a dry cloth in the other hand, squeeze each o-ring upward. When a loop is formed, grasp the o-ring with the other hand and roll it out of its groove and off of the part (Fig. 9).



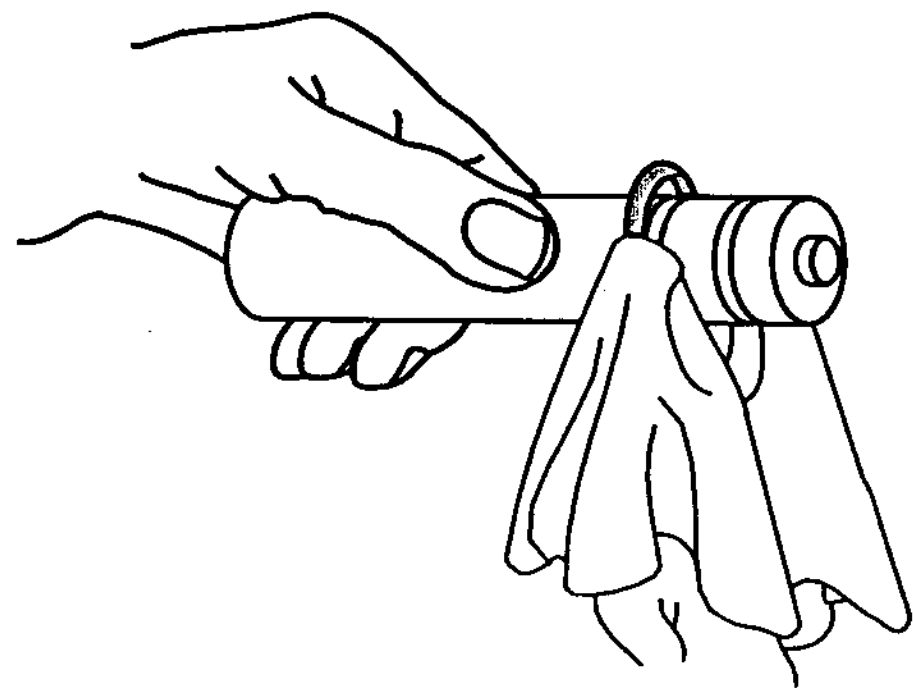
**Fig. 8**  
**Front Plate Gasket Removal**

## IMPORTANT

**DO NOT USE ANY TOOLS OR SHARP OBJECTS TO REMOVE ANY O-RINGS FROM THIS MACHINE. SHARP OBJECTS WILL DAMAGE THE O-RINGS.**



**Fig. 7**  
**Front Plate Assembly**



**Fig. 9**  
**Spigot Plunger O-ring Removal**

# 500 SERIES

7. Remove the dasher assemblies (Fig. 10) being careful not to damage the scraper blades.
  - a. **For 501 and 527 models only:** Remove the blades and blade holders from the dasher assemblies - Fig 10a - by rotating the blades downward, then by pulling the short pins out of the rear supports. Slide the scraper blades off of the scraper blade holders.
  - b. **For 522 models only:** Remove the blades and blade holders from the dasher assemblies - Fig 10b - by rotating the front blades downward, then by pulling the short pins out of the center supports. To remove the rear blades, rotate the blades downward, then pull the short pins out of the rear supports. Slide the scraper blades off of the scraper blade holders.

## IMPORTANT

### BLADES MUST BE REMOVED FOR CLEANING.

- c. Remove and take apart the two piece rear seal assemblies shown below.
- d. Remove the stator rods from the dashers.

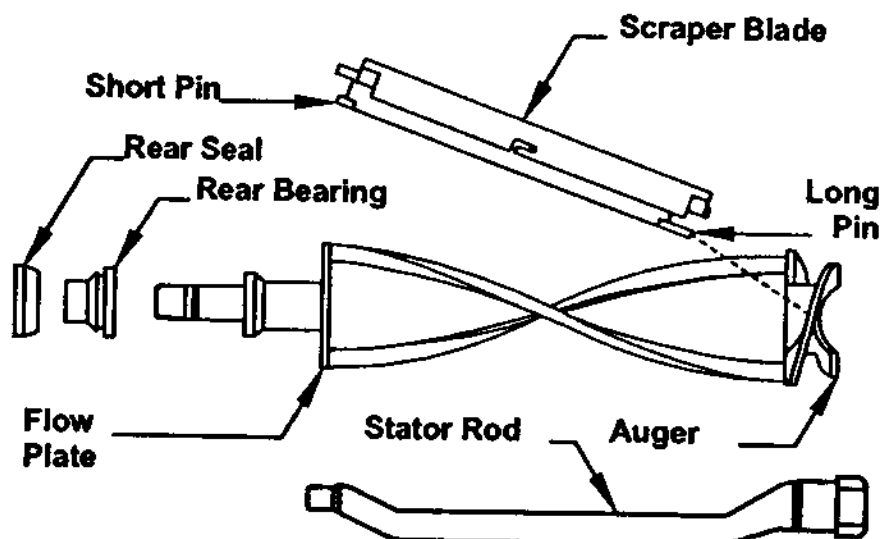


Fig. 10(a)  
501 & 527 Dasher Assembly

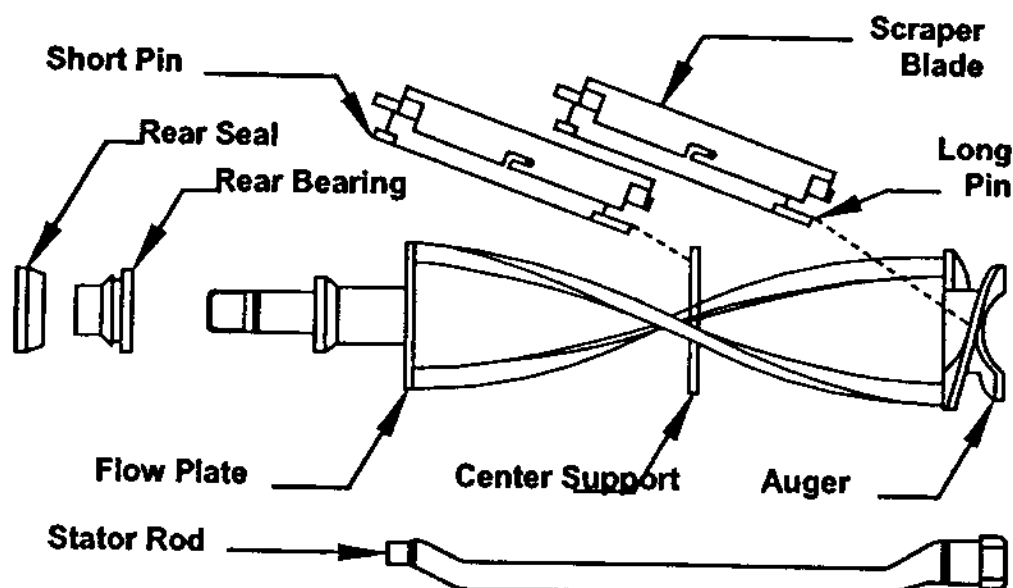


Fig. 10(b)  
522 Dasher Assembly

8. Remove the carburetor tubes (Fig. 11) from the mix pans. Disassemble and clean in the following manner:
  - a. Remove the insert tubes from the housings and remove the o-rings from the bottoms of the insert tubes in the same manner as the spigot plunger o-ring removal (Fig. 9).
  - b. Remove the o-rings from the bottoms of the housing tubes using the same procedure.
  - c. Clean the inside of both tubes with the brush provided.

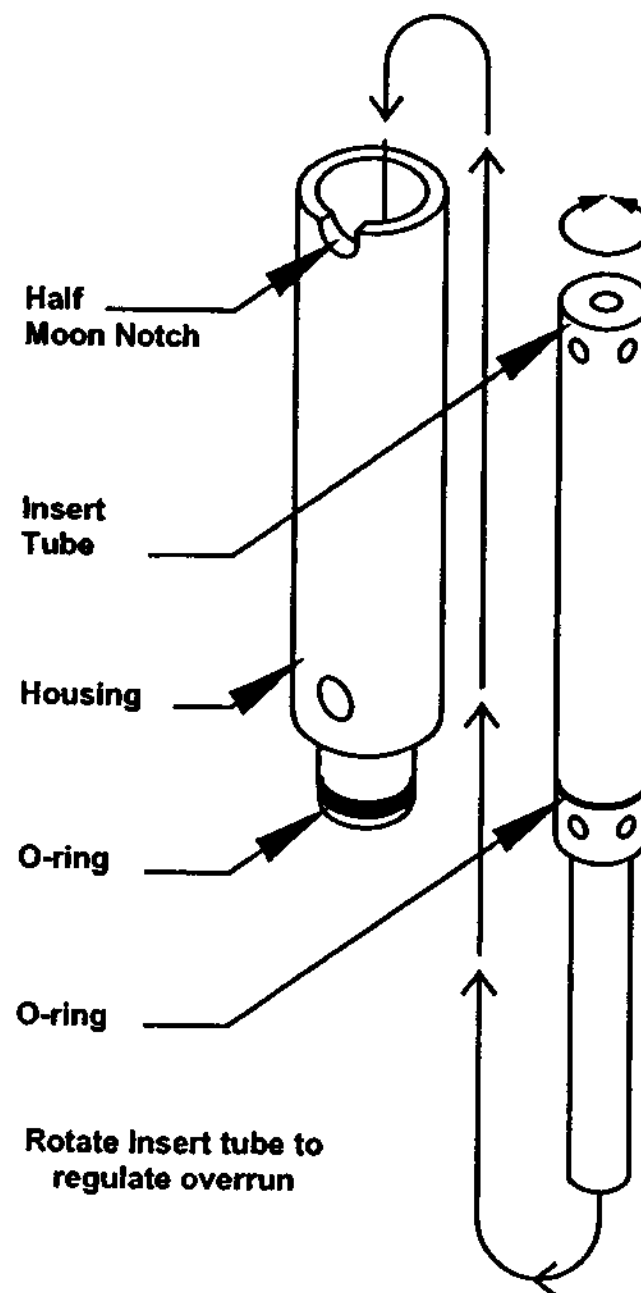


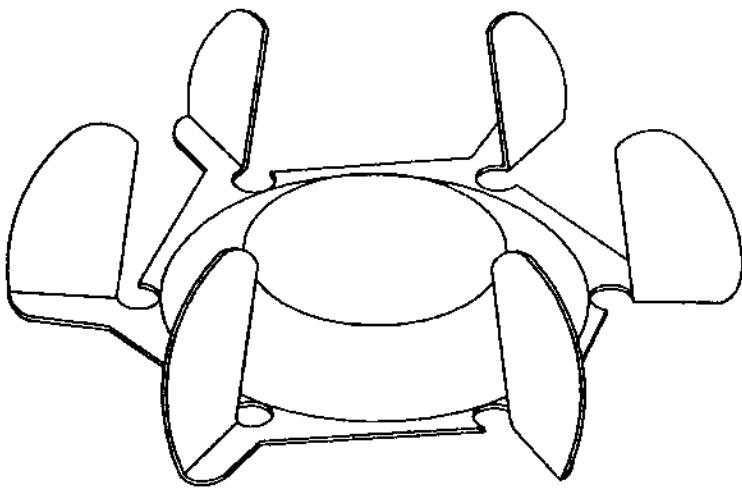
Fig. 11  
Carburetor Tube Assembly

# 500 SERIES

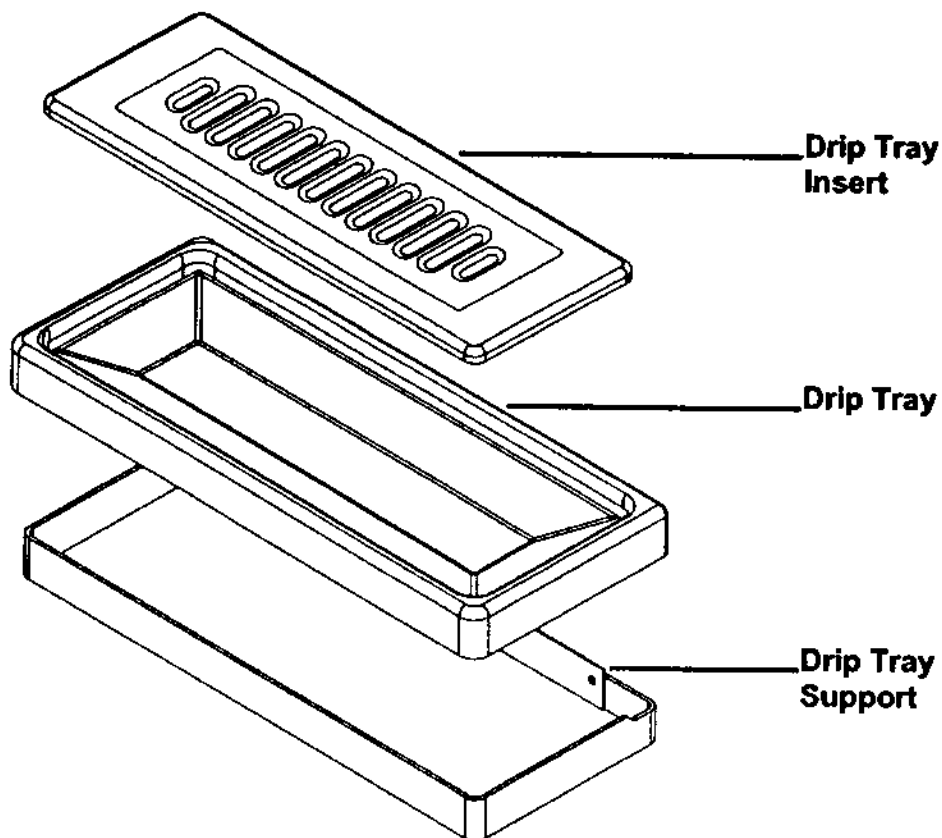
9. Remove the mix pan lids, mix pan agitators (Fig. 12), drip tray and drip tray insert (Fig. 13).

10. Place all loose parts including the front plate, all front plate components (Fig. 14) and all dasher components in a three partition sink filled with the following solutions:

- In one partition, mild detergent solution.
- In a second partition, clear rinse.
- In a third partition, sanitizing rinse consisting of 200 parts per million (PPM) chlorine residual or what is required by your local Health Authority.



**Fig. 12**  
**Mix Pan Agitator**



**Fig. 13**  
**Drip Tray Assembly**

11. Use the small diameter brush to clean all holes and ports in the parts. **DO NOT** use an abrasive detergent.

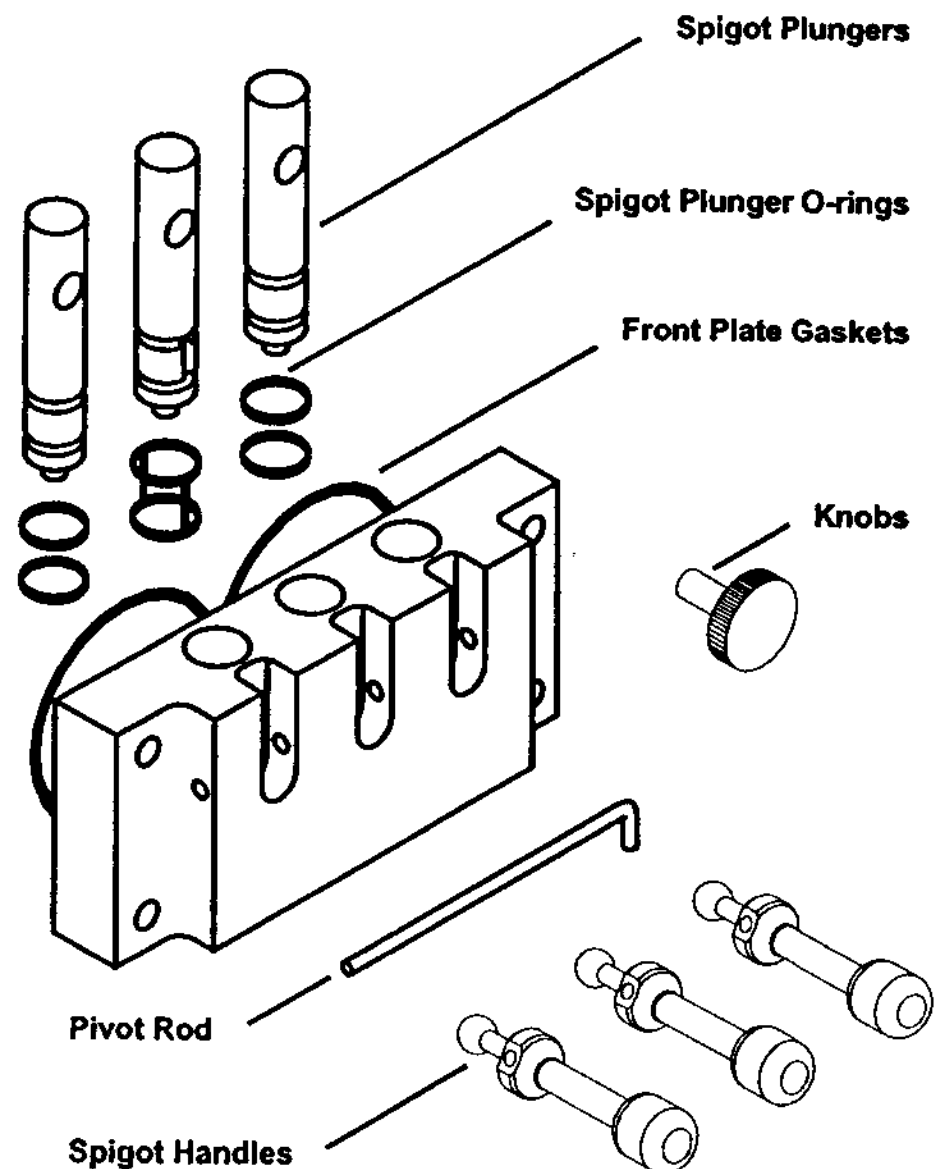
12. After thoroughly washing the parts in the detergent solution, rinse them in the rinse water. Place the parts in the sanitizing solution for at least five (5) minutes or whatever resident (contact) time is required by your local Health Authority, and then air dry to prepare for assembly and lubrication. **DO NOT** wipe dry.

13. The remainder of the machine including the mix pans and freezing cylinders must be cleaned in place using a mild detergent solution. Clean the exterior with a damp cloth. **DO NOT** use an abrasive cleaner on exterior panels.

**WHEN CLEANING THE MACHINE, DO NOT ALLOW**



**EXCESSIVE AMOUNTS OF WATER AROUND ANY ELECTRICALLY OPERATED COMPONENTS OF THE MACHINE. ELECTRICAL SHOCK OR DAMAGE TO THE MACHINE MAY RESULT.**



**Fig. 14**  
**Front Plate Assembly**

# Disassembly & Cleaning

## CONSULT YOUR LOCAL HEALTH AGENCY FOR CLEANING AND SANITIZING REQUIREMENTS.

This unit **does not** come pre-sanitized from the factory. Before serving any product, the dispenser must be disassembled, cleaned, lubricated, and sanitized. Please be aware that these instructions are general guidelines. Cleaning and sanitizing procedures must conform to local health agency requirements.

SaniServ **STRONGLY** recommends that this equipment be cleaned **DAILY**.

### Emptying Machine

Prior to the disassembly and cleaning of parts, you must first empty the machine of product. Use the following procedures (Steps 1, 2 and 3). If this is the first time operation, disregard these steps.



**DO NOT INSERT ANY OBJECTS OR TOOLS INTO THE MIX INLET HOLE OR FRONT PLATE DISPENSING HOLE WHILE THE MACHINE IS RUNNING. DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT.**

1. Remove the carburetor tube from the mix inlet and lay it down in the mixpan.
2. Set the Auto/Cleanout switch to the "**CLEANOUT**" position. Dispense all product from the freezing cylinder by pulling downward on the spigot handle (Fig. 4).
3. Set the Auto/Cleanout switch to the "**OFF**" (center) position. Close the spigot handle before proceeding to the disassembly and cleaning procedure.

### Disassembly and Cleaning Procedure

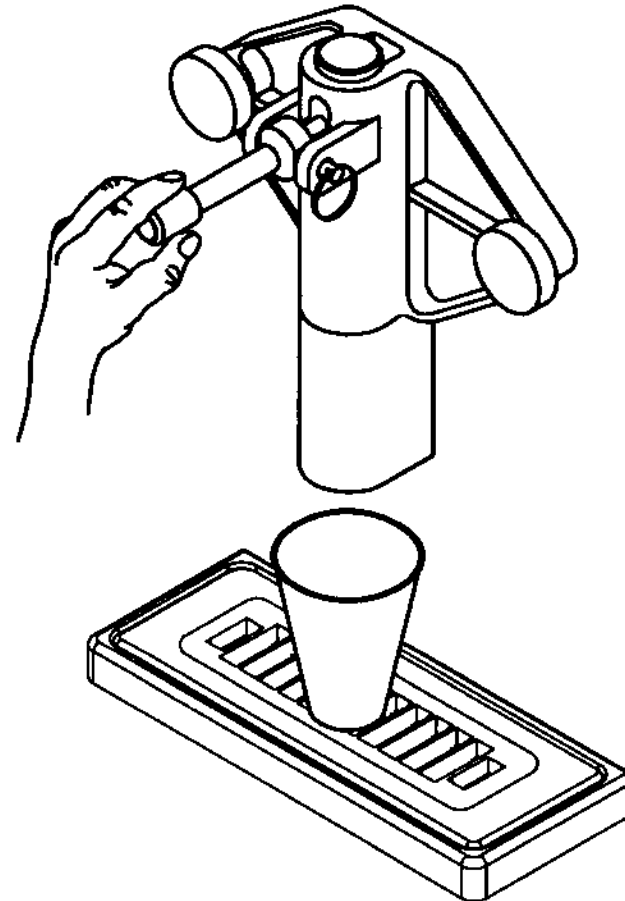
1. Fill the machine with cold water and set the Auto/Cleanout switch to the "**CLEANOUT**" position. **DO NOT** use hot water which could damage the machine. Let the machine agitate briefly and drain the water by pulling downward on the spigot handle. After the machine is empty, set the Auto/Cleanout switch to the "**OFF**" position. Repeat the above procedure as necessary to ensure all product is removed from the machine.

2. Prepare a suitable detergent and warm water solution at approximately 130°F. **DO NOT** use an abrasive detergent on any part of the machine.



**DO NOT USE HOT WATER,  
THIS MAY DAMAGE THE MACHINE**

3. Fill the mix pan with the cleaning solution. Ensure that the machine is "**OFF**". Clean the mix pan thoroughly with a brush as the solution drains into the freezing cylinder. Clean the mix inlet hole with the brush provided.



**Fig. 4**  
**Emptying Product**

4. Set the Auto/Cleanout switch to the "**CLEANOUT**" position and agitate for approximately 1 - 3 minutes, and then drain the solution by opening the spigot handle. When the machine is empty, set the control switch to the "**OFF**" position.

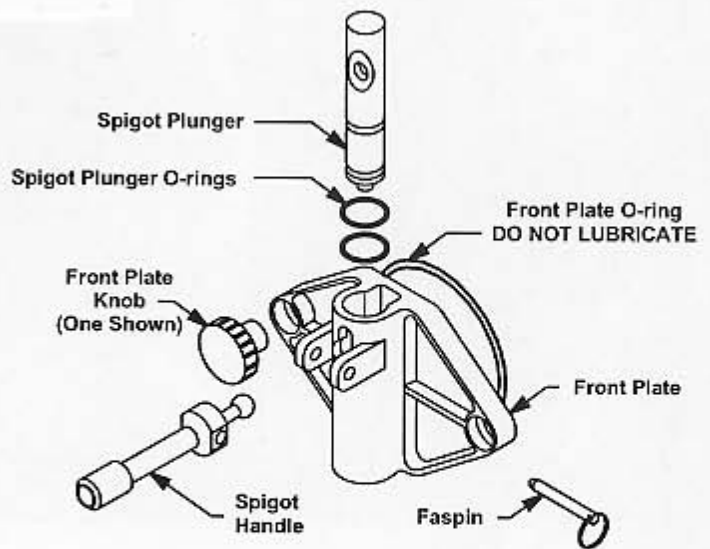
**CAUTION**

**DO NOT USE ANY TOOLS OR SHARP OBJECTS TO REMOVE ANY O-RINGS FROM THIS MACHINE. THIS WILL RESULT IN DAMAGE TO THE O-RINGS OR MATING PARTS.**

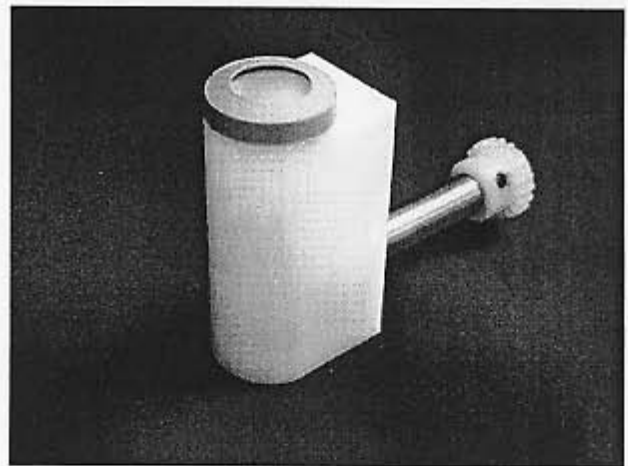
5. Remove the front plate assembly (Fig. 5) by turning the black plastic knobs in a counterclockwise direction. Remove the mixing block pins, then pull the mixing block assembly (Fig. 6b) off of the syrup manifold attached to the front of the machine. The mixer drive assembly will remain attached to the mixing block, and the check valve assembly will remain on the syrup manifold attached to the machine face.

**Disassemble the front plate as follows:**

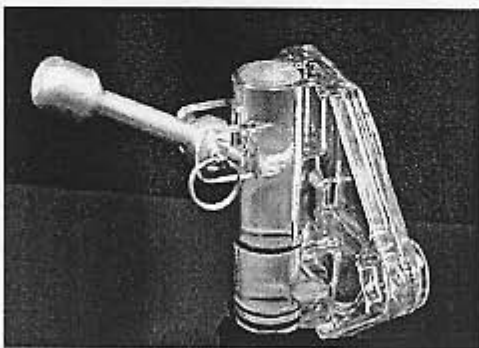
- Remove the faspin and then the spigot handle.
- Remove the front plate o-ring.
- With the spigot handle removed, push the spigot plunger up and out the top of the front plate.
- Remove the o-rings from the spigot plunger by grasping the plunger with one hand and with a dry cloth in the other hand, squeeze the o-ring upward. When a loop is formed, grasp the o-ring with the other hand and roll it out of its groove and off of the plunger (Fig. 7).



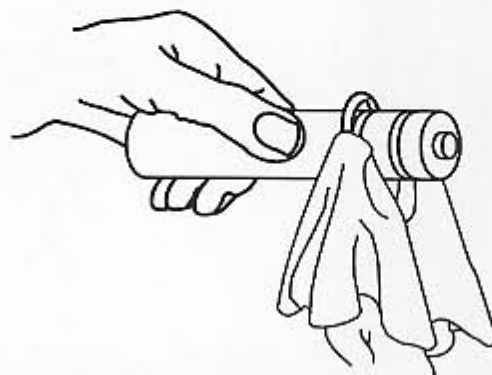
**Fig. 6a**  
**Front Plate Assembly**



**Fig. 6b**  
**Mixing Block and Spinner Drive**



**Fig. 5**  
**Front Plate Assembly**



**Fig. 7**  
**O-Ring Removal**



Fig. 8a  
Mixing Block and Spinner Drive

6. Remove the spinner drive assembly (Fig. 9a) from the mixing block by grasping the drive shaft and with a twisting motion pull the drive assembly away from the mixing block. Pull the gasket from the top of the mixing block.

Fig. 8b shows the top side of the gasket.



Fig. 8b  
Mixing Block Gasket



Fig. 8c  
Back Side of Gasket



Fig. 8d  
Gasket Inside Out

For cleaning, flip the gasket over (Fig. 8c) and turn inside out (Fig. 8d) to provide access for the cleaning brush to reach all crevices of the gasket.

7. Disassemble the drive assembly by firmly grasping the drive shaft and unscrewing it counterclockwise from the mixing blade. Separate the bearing and remove the two o-rings.



**CAUTION**

**NEVER LUBRICATE THE TWO O-RINGS ON THE BEARING - Fig. 9a**

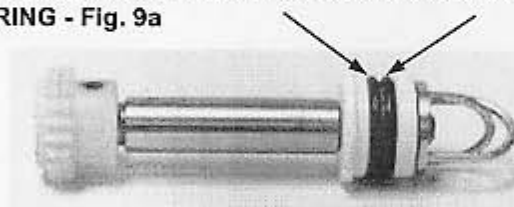


Fig. 9a  
Spinner and Spinner Drive Assembly



Fig. 9b  
Spinner and Spinner Drive Assembly



Fig. 10  
Shaft Seal

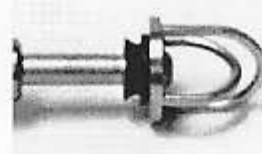


Fig. 11  
Spinner and Shaft Seal

Carefully remove the shaft seal noting which seal face is in contact with each mating component. The flat surface of the seal **MUST** seat against the metal mixer blade. The bellows shaped side of the seal **MUST** seat against the plastic bearing face.

**NOTE: The seal and mating surfaces must always be well lubricated for proper machine operation and extended seal life.**

Set aside the drive shaft and attached drive gear. This assembly is not in the food path and does not require cleaning or sanitizing.



Fig. 12  
Drive Gear and Drive Shaft

**CAUTION**

8. Remove the dasher assembly (Fig. 13) being careful not to damage the scraper blades, then disassemble in the following manner:

- Remove and take apart the rear seal assembly.
- Remove the stator rod from the dasher.
- Remove the blades from the dasher assembly - Fig. 14a - by first rotating the blade upward - Fig. 14b and then unsnapping one end from the support rod.

**BLADES MUST BE REMOVED FOR CLEANING.**

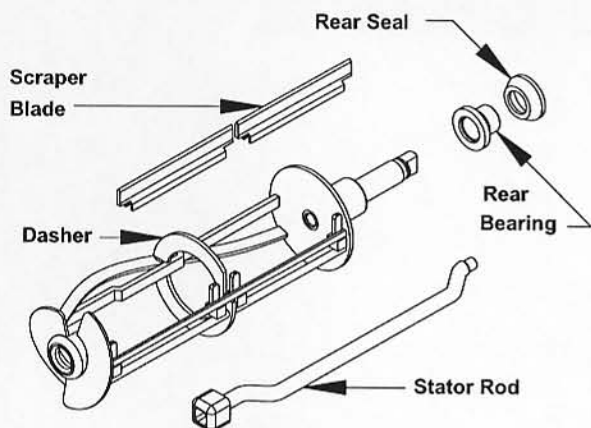


Fig. 13  
Dasher Assembly

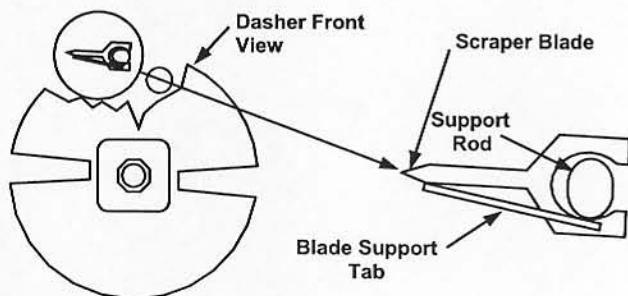


Fig. 14a  
Scraper Blade Removal

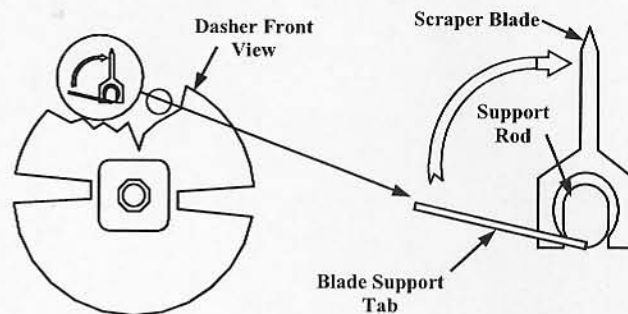


Fig. 14b  
Scraper Blade Removal

9. Carefully remove the check valve assembly which remained on the syrup manifold attached to the front of the SAS machine and place them with the rest of the small parts you have removed.



Fig. 15  
Check Valve Assembly



Fig. 16  
Syrup Manifold with Check Valve Assembly

Immediately place a sanitized check valve assembly over the syrup and water nipples on the syrup manifold to prevent contamination of the syrup and water nipples during the machine cleaning, lubricating and sanitizing operations.

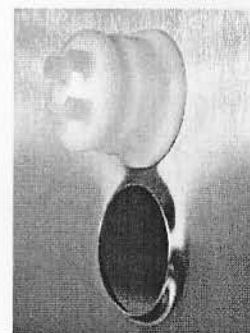


Fig. 17  
Syrup Manifold without  
Check Valve Assembly

## 601 & 614 SAS Series

10. Remove the mix pan lid, mix pan agitator, drip tray and drip tray insert (Fig. 18).

11. Place all removed parts including the mix pan agitator in a three partition sink containing the following:

- In one partition, mild detergent solution which is at approximately 130°F.
- In a second partition, clear rinse water.
- In a third partition, sanitizing rinse consisting of 200 parts per million (ppm) chlorine residual unless another chlorine residual is specified by your local health authority.

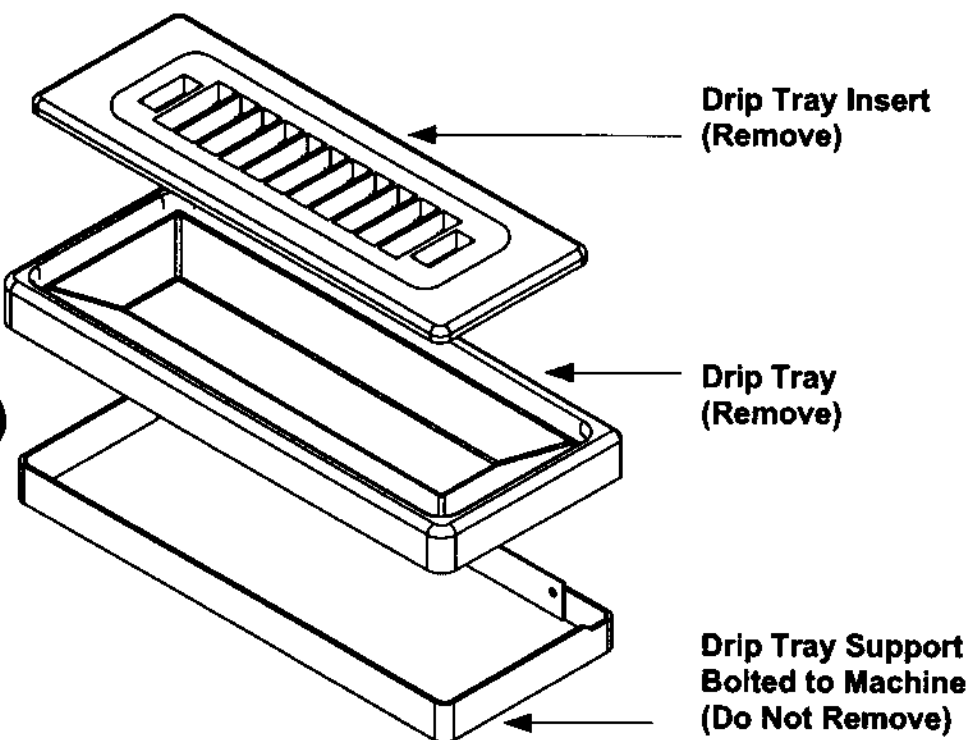


Fig. 18  
Drip Tray Assembly

12. Use the small diameter brush to clean all holes and ports in the parts. **DO NOT** use an abrasive detergent.

13. After thoroughly washing the parts in the detergent solution, rinse them in the rinse water. Place the parts in the sanitizing solution for five (5) minutes or the contact time that is mandated by your local health authority. **Local health authority rules always take precedence over SaniServ suggested practice.**

Air dry the parts to prepare for assembly and lubrication.

**DO NOT WIPE THE PARTS DRY**

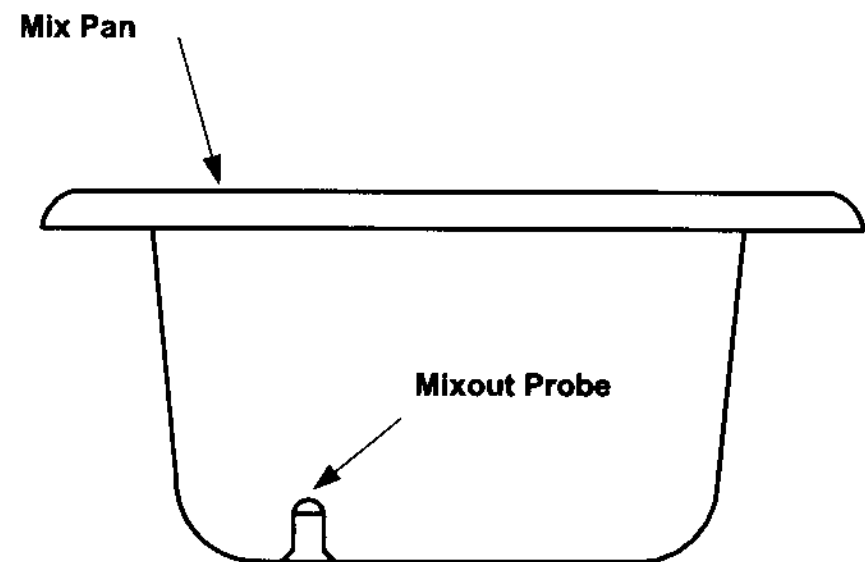


Fig. 19  
Mix Pan and Mix Out Probe

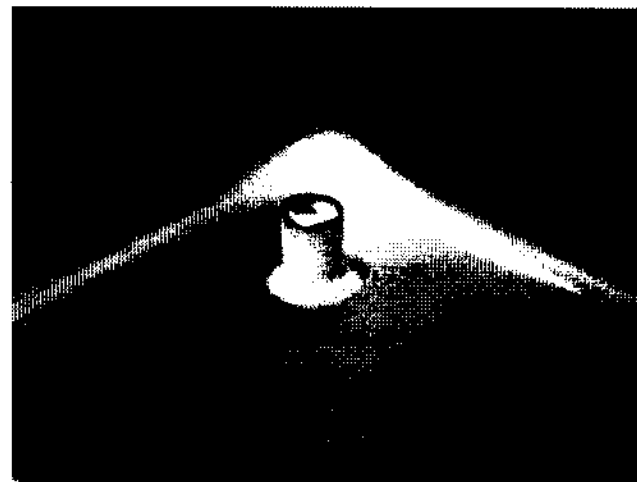


Fig. 20  
Mix Out Probe

14. The remainder of the machine including the mix pan, the mixout probe mounted in the bottom of the mix pan (see Fig. 20), and the freezing cylinder must be cleaned in place using a mild detergent solution.

Clean the exterior of the machine with a damp cloth.

**DO NOT** use an abrasive cleaner on exterior panels.



**WHEN CLEANING THE MACHINE, DO NOT ALLOW EXCESSIVE AMOUNTS OF WATER AROUND ELECTRICALLY OPERATED COMPONENTS OF THE MACHINE.**

**ELECTRICAL SHOCK OR DAMAGE TO THE MACHINE MAY RESULT.**

# Disassembly and Cleaning

## FROZEN BEVERAGE

**CONSULT YOUR LOCAL HEALTH AGENCY FOR LOCAL CLEANING AND SANITIZING REQUIREMENTS.**

This unit does not come pre-sanitized from the factory. Before serving product, the dispenser must be disassembled, cleaned, lubricated, and sanitized. Please be aware that these instructions are general guidelines. Cleaning and sanitizing procedures must conform to local Health Authority requirements.

### Emptying Machine

Prior to the disassembly and cleaning of parts, the machine must be emptied of product. Use the following procedures (Steps 1 through 3). If this is first time operation, disregard these steps.

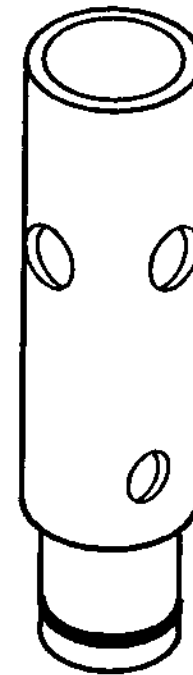


**DO NOT INSERT ANY OBJECTS OR TOOLS (FIG. 7) INTO THE MIX INLET HOLE, RESTRICTOR TUBE HOLE, OR FRONT PLATE DISPENSING HOLE WHILE THE MACHINE IS RUNNING. DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT**

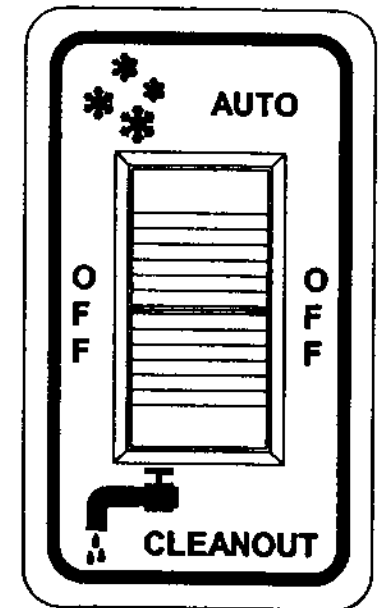
1. Remove the restrictor tubes (Fig. 8) from the mix inlet holes and lay in the bottom of the mix pans. Note: Some units have these tubes welded in place

2. Set each control switch (Fig. 9) to the "CLEANOUT" position and dispense all product from the freezing cylinder by pulling downward on the spigot handle (Fig. 10) to empty the machine.

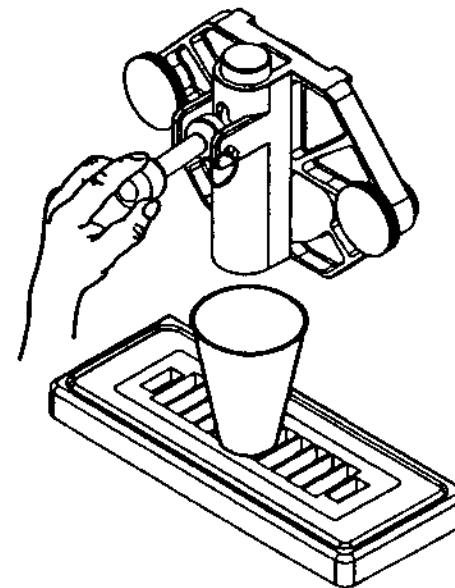
3. Set each control switch (Fig. 9) to the "OFF" (center) position. Close the spigot handle(s) (Fig. 10) before proceeding to cleaning.



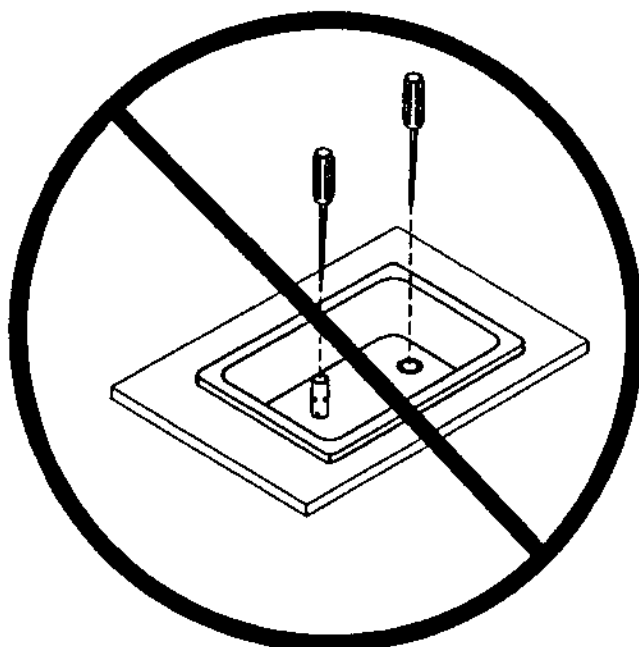
**Fig. 8**  
**Restrictor Tube**



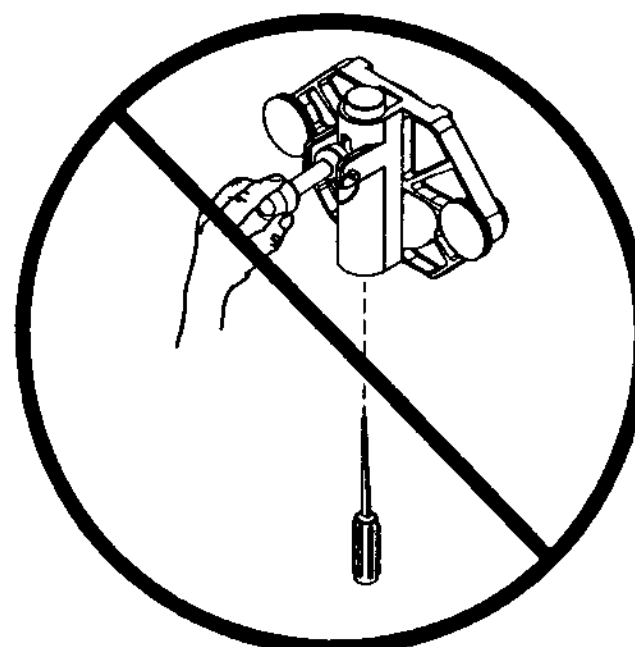
**Fig. 9**  
**Control Switch**



**Fig. 10**  
**Dispensing Product**



**Fig. 7**  
**Do Not Insert Objects or Tools**



# FROZEN BEVERAGE

## Disassembly and Cleaning Procedure

1. Fill the machine with cold water and set each control switch (Fig. 11) to the "CLEANOUT" position. **DO NOT** use hot water which could damage the machine. Let the machine agitate 1 to 2 minutes, then drain the water by pulling downward on the spigot handle (Fig. 12). Repeat the above procedure as necessary to make certain all product is removed from the machine. After the machine is empty, set each control switch to the "OFF" position.

2. Prepare a suitable detergent and water solution at a temperature of approximately 125°F. (52°C.) to 130°F. (55°C.). For best cleaning results select a concentrated anti-bacterial dishwashing detergent containing biodegradable anionic and nonionic surfactants. **Avoid detergents containing phosphates. DO NOT** use an abrasive detergent on any part of the dispenser.

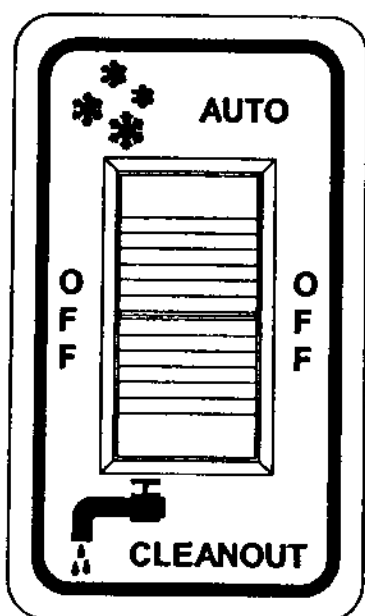


**CAUTION**

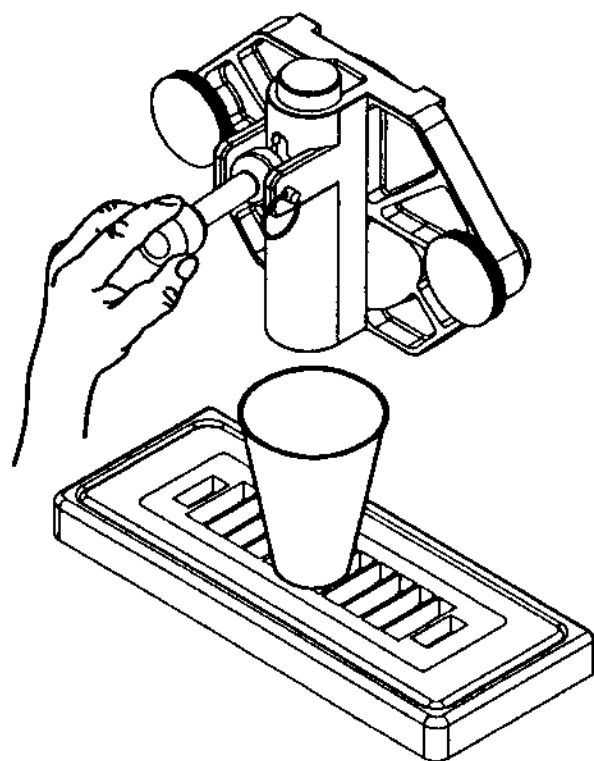
**DO NOT USE HOT WATER.  
DOING SO MAY DAMAGE THE MACHINE.**

3. Make certain that the machine is "OFF". Fill the mix pan(s) with the cleaning solution. Clean the mix pan(s) thoroughly with a brush as the solution drains into the freezing cylinder(s). Clean the mix inlet tube(s) and the restrictor tube holes with the brush provided.

4. Set the control switch (Fig. 11) to the "CLEANOUT" position and agitate for approximately 1 to 2 minutes and then drain the water by pulling down on the spigot handle (Fig. 12). After the unit is empty, set each control switch to the "OFF" position.



**Fig. 11**  
**Control Switch**



**Fig. 12**  
**Dispensing Product**

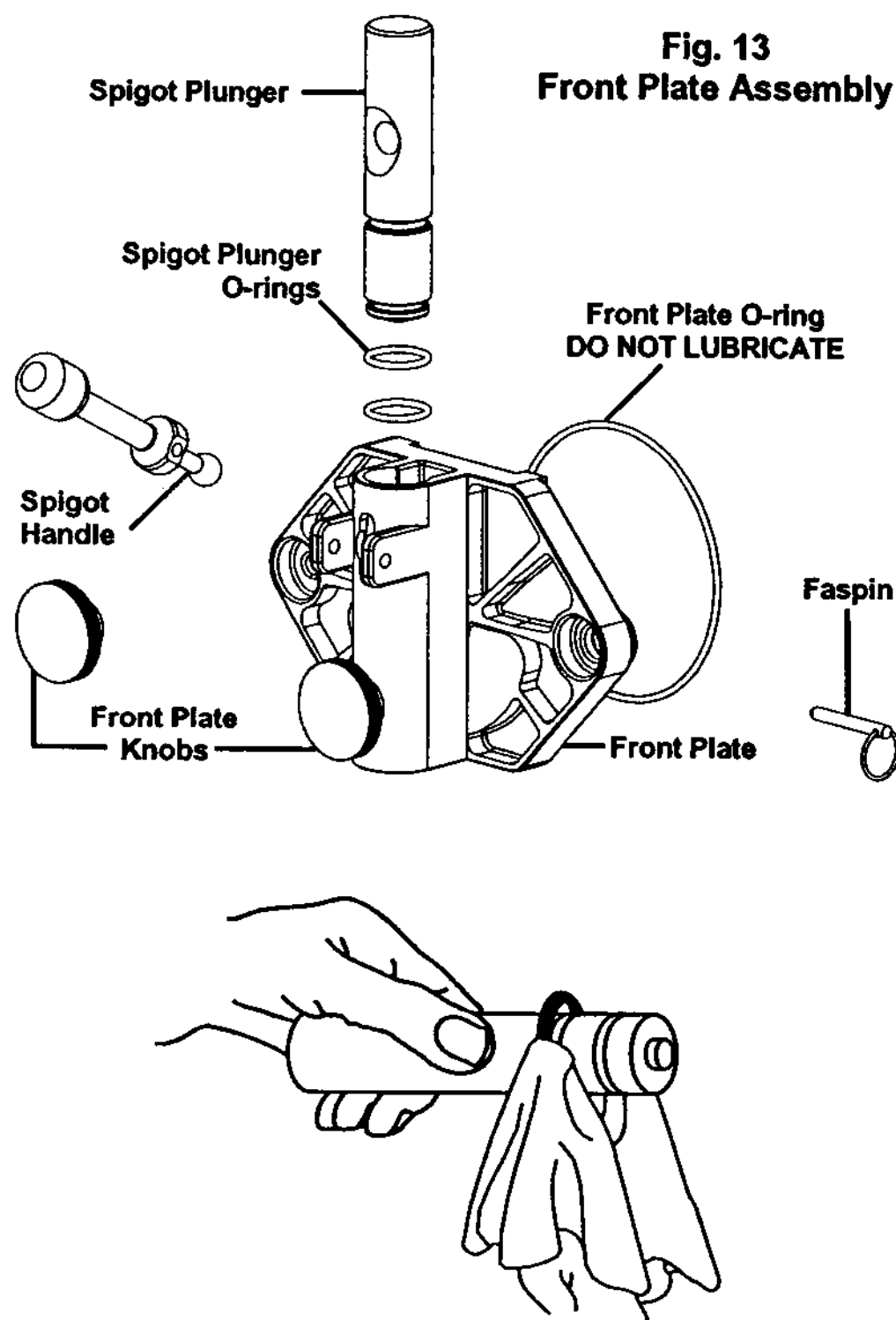


**CAUTION**

**DO NOT USE ANY TOOLS OR SHARP OBJECTS TO REMOVE ANY O-RINGS FROM THIS MACHINE. SHARP OBJECTS WILL DAMAGE THE O-RINGS.**

5. Remove the front plate by turning the black plastic knobs in a counterclockwise direction (Fig. 13). Disassemble the front plate in the following manner:

- Remove the faspin and spigot handle.
- Remove the front plate o-ring.
- With the spigot handle removed, push the spigot plunger out the top of the front plate and remove all lubricant from the spigot plunger.
- Remove the o-rings from the spigot plunger by grasping the part with one hand and with a dry cloth in the other hand, squeeze the o-ring upward. When a loop is formed, grasp the o-ring with the other hand and roll it out of its groove and off the spigot plunger (Fig. 14).



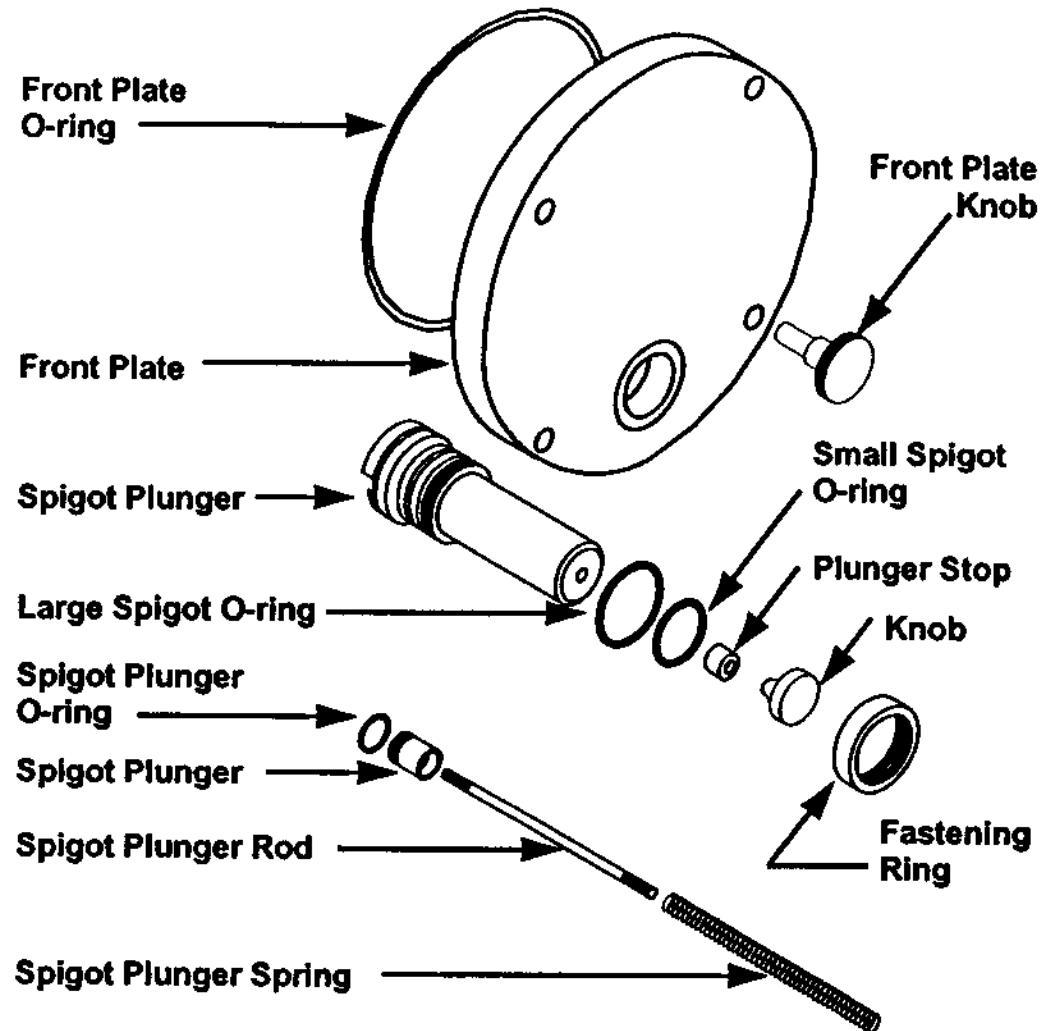
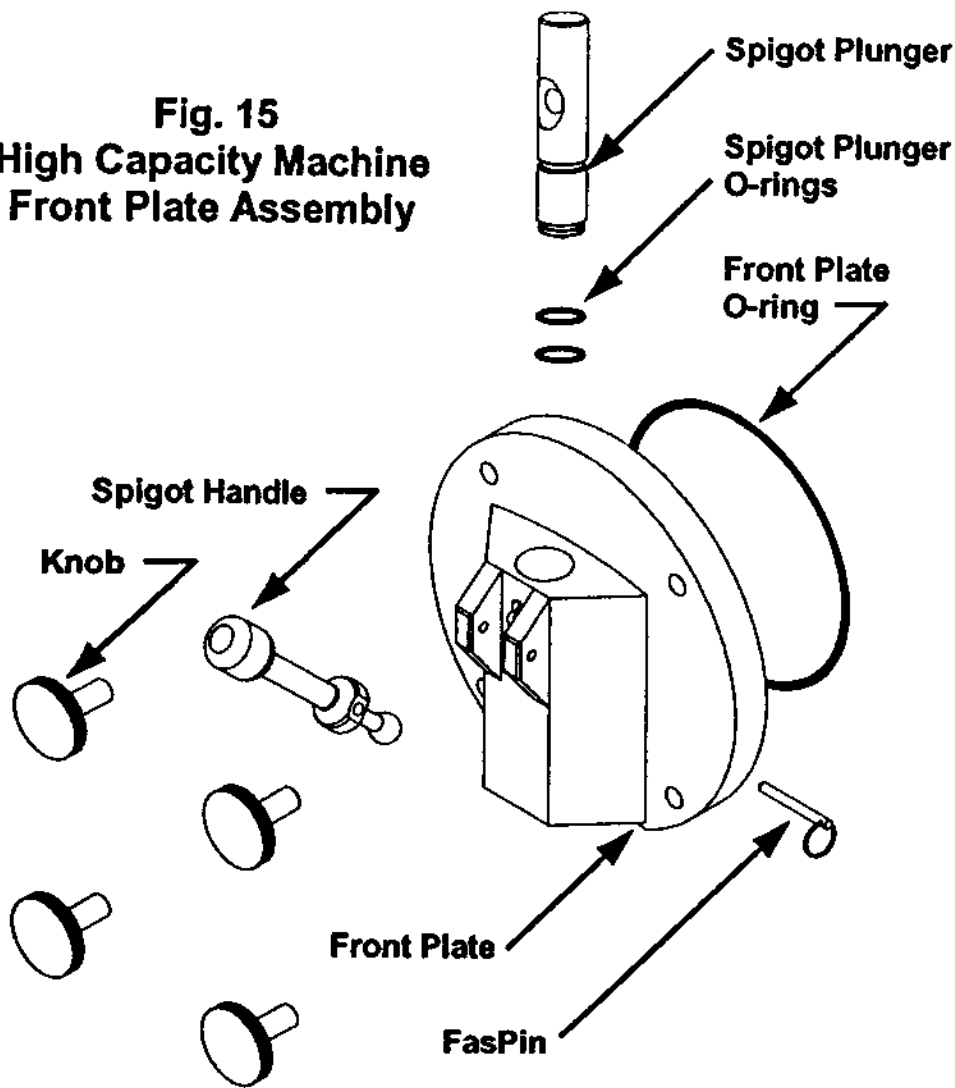
**Fig. 13**  
**Front Plate Assembly**

**Fig. 14**  
**O-Ring Removal**

# FROZEN BEVERAGE

6. The front plate for the high capacity series machines (Fig. 15) is disassembled in the same manner as the front plate shown in Fig. 13.

**Fig. 15**  
**High Capacity Machine**  
**Front Plate Assembly**



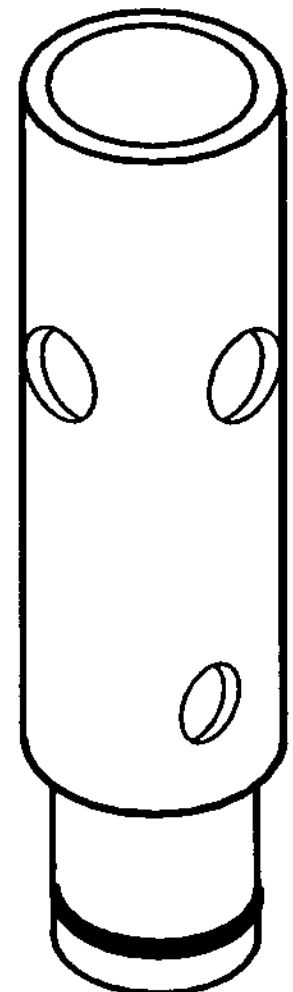
**Fig. 16**  
**Large Barrel Machine**  
**Front Plate Assembly**

7. Disassemble the large barrel machine front plate (Fig. 16) in the following manner:

- Remove the fastening ring from the spigot assembly by turning it in a counterclockwise direction.
- Push the spigot assembly out the back of the front plate and remove the front plate o-ring.
- Remove the small spigot o-ring in the same manner as removing the spigot plunger o-rings (Fig. 16) and slide it off the front of the spigot.
- Remove the large spigot o-ring and slide it off the rear of the spigot.
- Remove the spigot knob and spigot stop, then slide the spigot rod out the rear of the spigot.
- Slide the spigot spring off the spigot rod, then by turning the rod counterclockwise, remove it from the spigot plunger.
- Remove the spigot o-ring from the spigot plunger.

8. Remove the restrictor tube (Fig. 17) from the mix pan and remove the o-ring in the same manner used to remove the o-rings from the spigot plunger. Clean the inside of the tube with the brush provided.

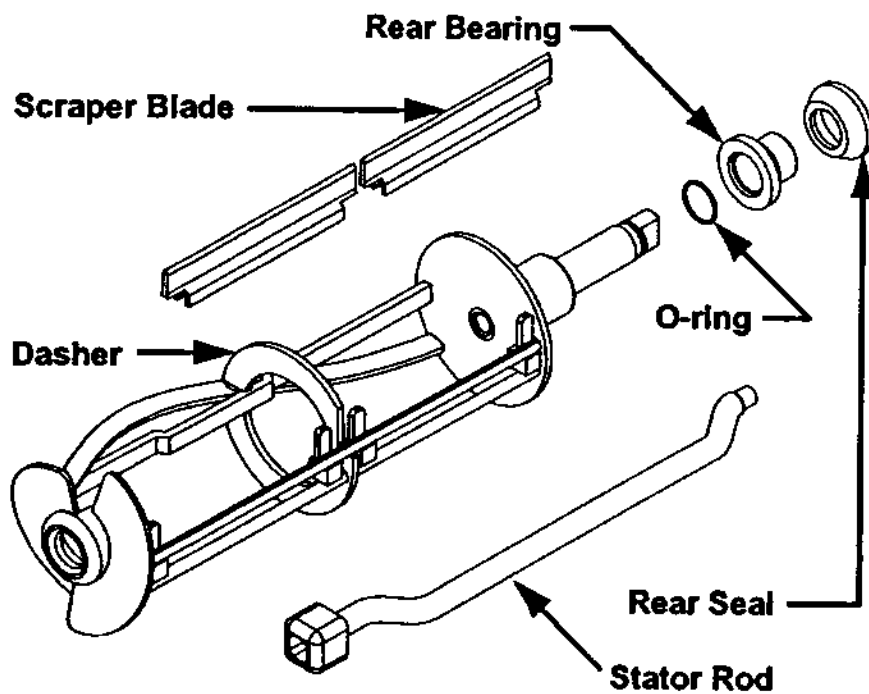
**Fig. 17**  
**Restrictor Tube**



# FROZEN BEVERAGE

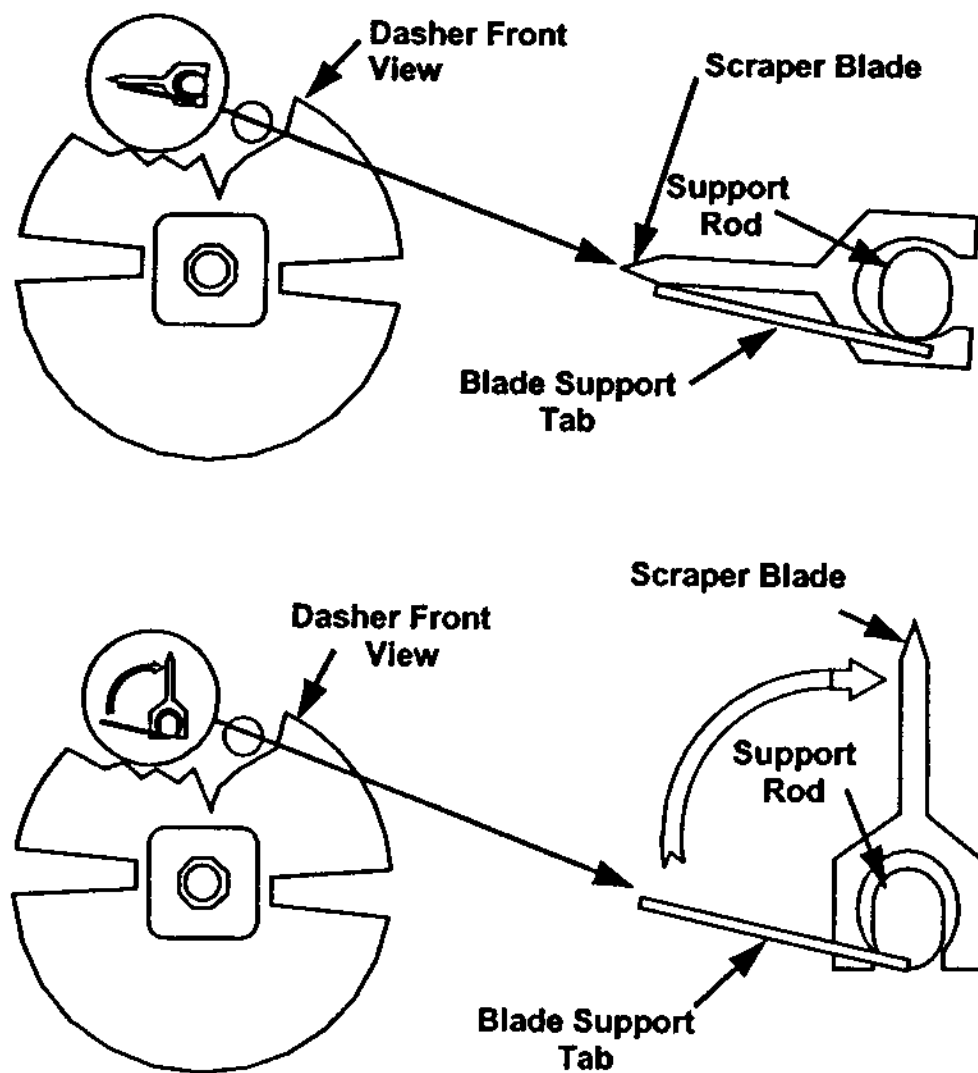
9. Remove the dasher assembly (Fig. 18) being careful not to damage the scraper blades, then disassemble in the following manner:

- Remove and take apart the rear seal assembly.
- Remove the stator rod from the dasher.
- Remove the blades from the dasher (Fig. 18) by first rotating blade upward (Fig. 19) and then unsnapping one end from the support rod.
- Remove o-ring from the rear of the dasher.



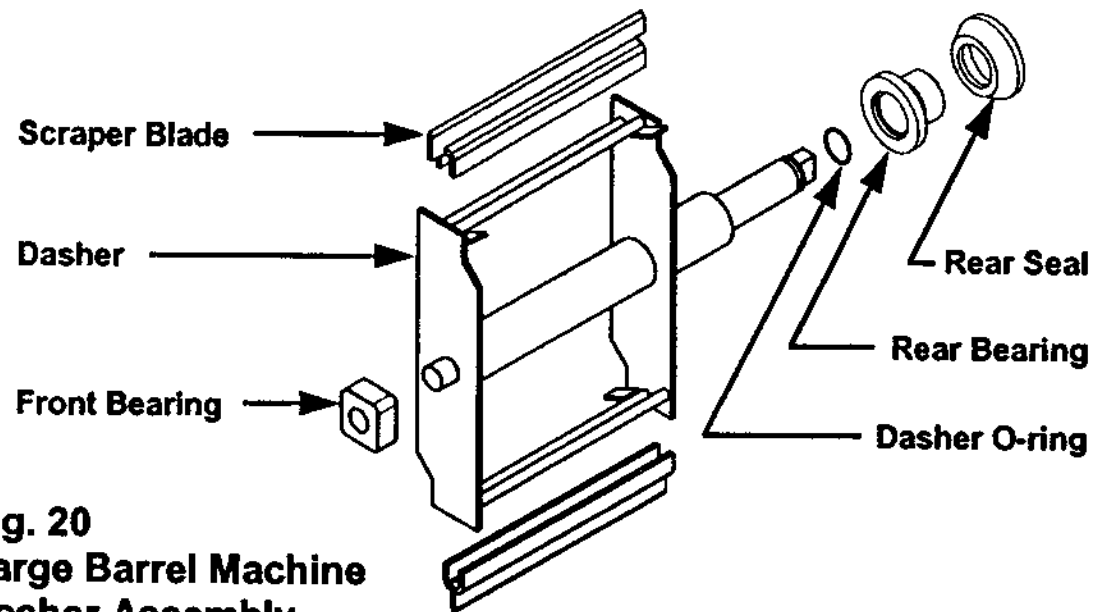
**Fig. 18**  
**Dasher Assembly**

**BLADES MUST BE REMOVED FOR CLEANING**

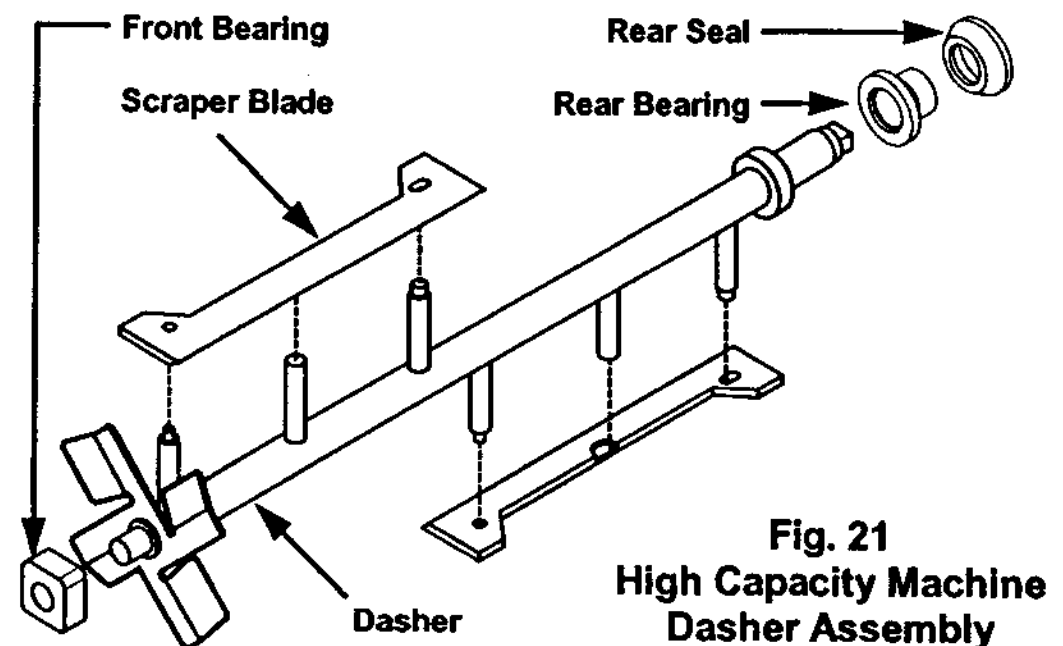


**Fig. 19**  
**Scraper Blade Removal**

Dashers in the high capacity and large barrel machines have no stator rods, but both have front bushings (Fig. 20 and Fig. 21).

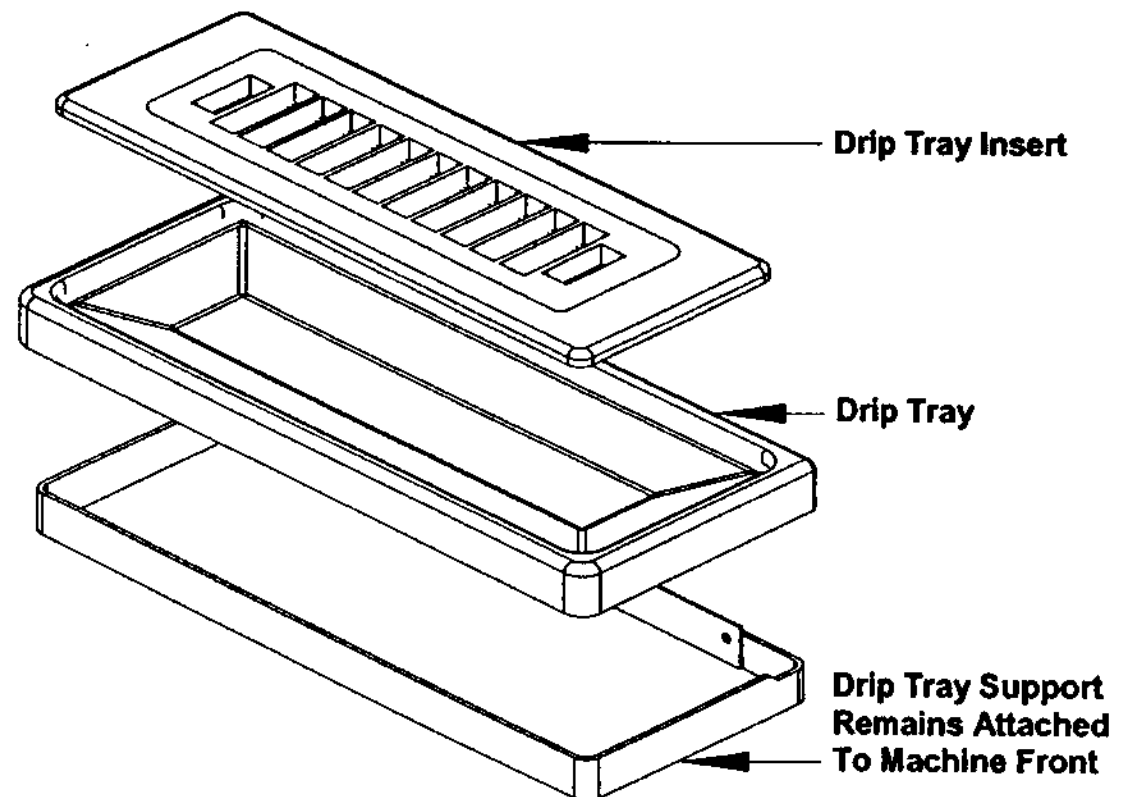


**Fig. 20**  
**Large Barrel Machine**  
**Dasher Assembly**



**Fig. 21**  
**High Capacity Machine**  
**Dasher Assembly**

10. Remove the mix pan lid, drip tray and drip tray insert (Fig. 22).



**Fig. 22**  
**Drip Tray Assembly**

# FROZEN BEVERAGE

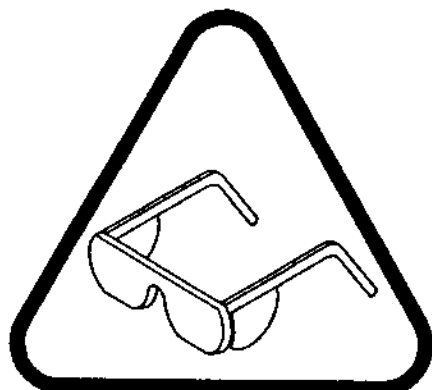
11. For best cleaning results select a concentrated anti-bacterial dishwashing detergent containing biodegradable anionic and nonionic surfactants.  
**NOTE: Avoid detergents containing phosphates.**



**CAUTION**

**WEAR SAFETY GLASSES  
- DO NOT SPLASH  
DETERGENT SOLUTION  
IN EYES**

Be certain to follow the manufacturer's mixing instructions when adding the dishwashing detergent concentrate to water.



12. Place all parts in a three partition sink filled with the following solutions:
- In one partition, detergent solution diluted to the manufacturer's suggested concentration for use.
  - In a second partition, clear rinse water.
  - In a third partition, sanitizing rinse solution which will produce a 200 parts per million (PPM) Chlorine residual or whatever Chlorine residual is required by your Local Health Authority.

13. Use the brushes to clean all holes and ports in the parts (Fig. 23).

**DO NOT use an abrasive detergent**



**CAUTION**

14. After thoroughly washing the parts in the detergent solution, rinse them in the clear rinse water. Place the parts in the sanitizing solution for at least five minutes or whatever your Local Health Authority requires, and then air dry the parts before for assembly and lubrication.

**DO NOT ALLOW THE PARTS TO SOAK IN  
SANITIZER FOR SEVERAL HOURS.**



**CAUTION**

**DO NOT WIPE THE PARTS DRY - AIR DRY ONLY.**

15. The remainder of the machine including the mix pan and freezing cylinder must be cleaned in place using a mild detergent solution followed by a clear rinse. Clean the exterior with a damp cloth.

**DO NOT use an abrasive cleaner on the exterior of the machine or on any of the panels (guards).**



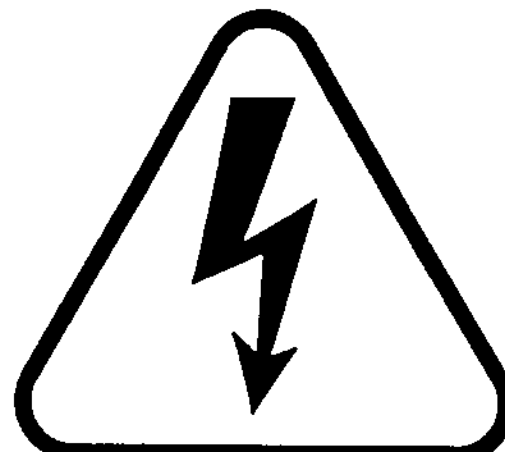
**CAUTION**

**WHEN CLEANING THE MACHINE, DO NOT ALLOW  
EXCESSIVE AMOUNTS OF WATER AROUND ANY  
ELECTRICALLY OPERATED COMPONENTS OF THE**

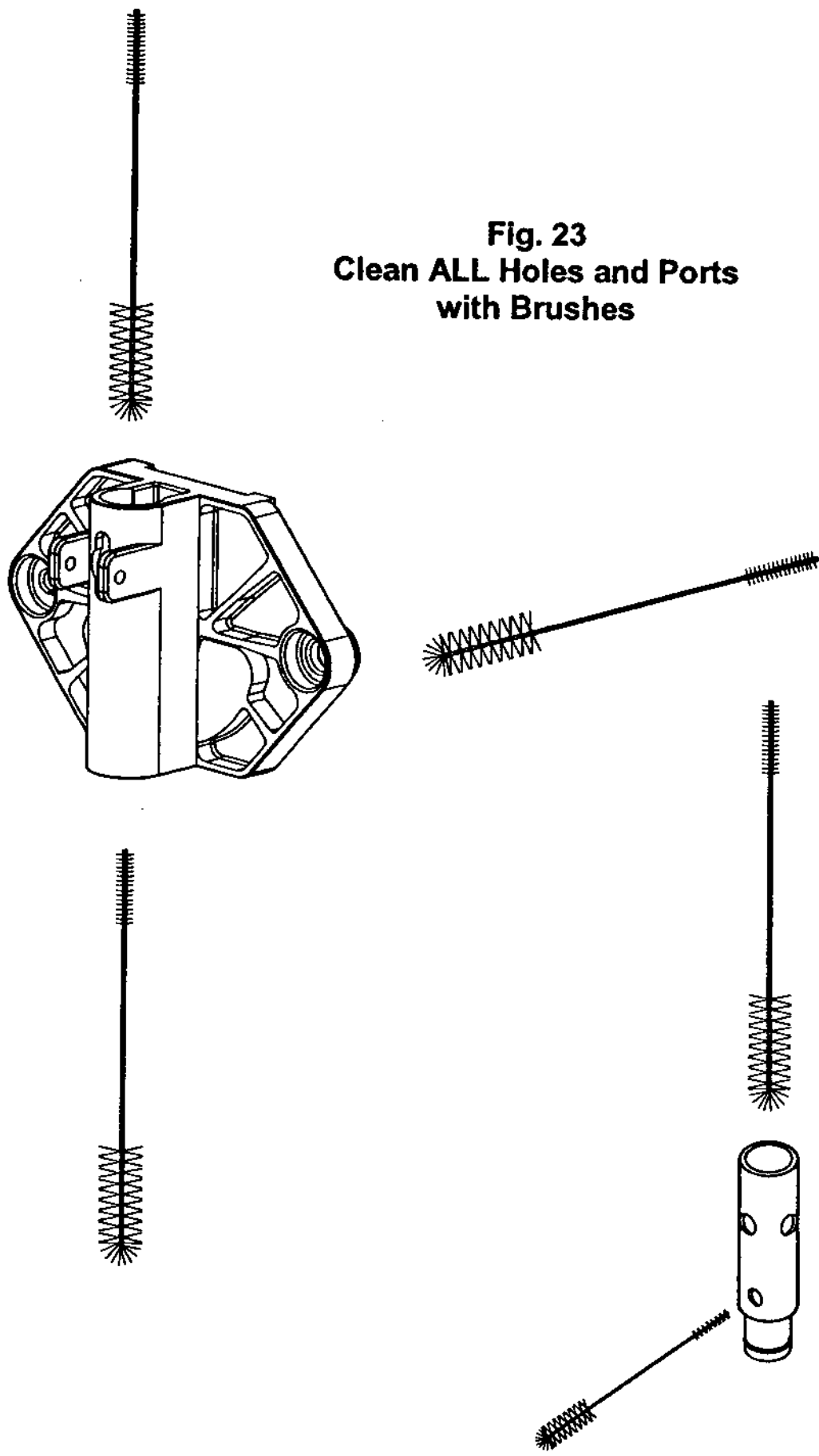


**WARNING**

**MACHINE. ELECTRICAL SHOCK OR DAMAGE TO  
THE MACHINE MAY RESULT.**



**Fig. 23  
Clean ALL Holes and Ports  
with Brushes**



**SANITIZING**

# 400 & 600 SERIES

6. Proceed directly to the "Sanitizing" section.

## Sanitizing

Prior to operation, the machine must be sanitized. The unit must have already been cleaned and lubricated.

**Note: Sanitize immediately before use, not several hours before or the previous evening.**

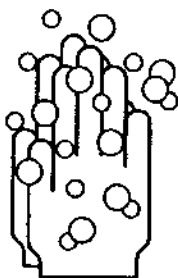
1. Wear eye protection. Wash hands with a suitable antibacterial soap.

2. Prepare 2 to 3 gallons of sanitizing solution equivalent to 200 ppm chlorine residual - check local requirements.

3. Pour the solution into the mix pan.

4. Using a sanitary brush, wipe the solution onto the sides of the mix pan, over the mix out probe, and the underside of the lid.

5. Set the control switch to the "CLEANOUT" position and let the unit agitate for approximately 3 to 5 minutes.  
**NOTE: DO NOT set the control switch to the "AUTO" position. Doing so would freeze the sanitizing**



### WARNING

**DO NOT INSERT ANY TOOLS OR OBJECTS INTO THE MIX INLET HOLE, CARBURETOR TUBE HOLE, OR THE DISPENSING HOLE IN THE FRONT PLATE. DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT.**

6. Set the control switch to the "OFF" position and drain the solution from the machine. Proceed directly to the "Operation" section of this manual.

### IMPORTANT

**DO NOT RINSE OUT THE MACHINE**

## Operation

Always start with a cleaned and sanitized dispenser as per previous instructions. Use only fresh mix when charging the units. Following these instructions is critical to the maximum operating efficiency of the machine.

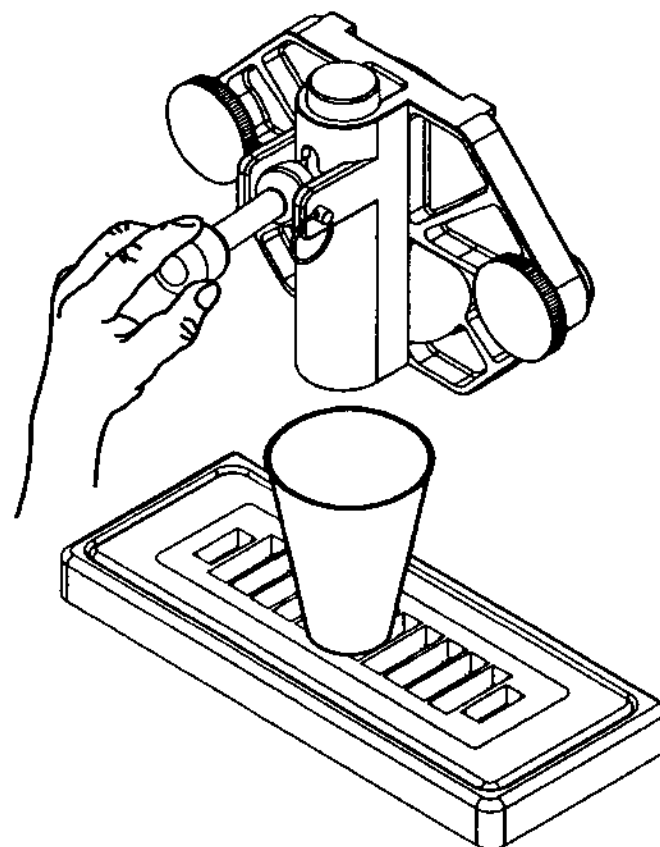
1. Remove the carburetor tube from the bottom of the mix pan and set aside in a sanitary location.

2. Using approximately one half to one gallon of fresh product mix, chase the sanitizing solution from the mix pan by pouring behind any remaining solution which will then drain through the machine. Doing so will ensure that sanitizing solution will not remain in the machine to freeze or be served to the customer. Open the spigot plunger and dispense enough of the liquid to purge the system of sanitizing solution (Fig. 24).

3. Once the sanitizer solution has been purged from the machine, fill the mix pan full of product mix.

**NOTE: DO NOT POUR SHAKE OR SOFT SERVE PRODUCT MIX DIRECTLY ONTO THE MIX PAN AGITATOR WHEN YOU FILL THE MACHINE.**

4. Install the carburetor tube into the hole in the mix pan with a gentle twisting motion. Turn it to the closed position (Fig. 25). **Note: On combination machines, the shake side is on the right and the soft serve side is on the left (facing the machine).**



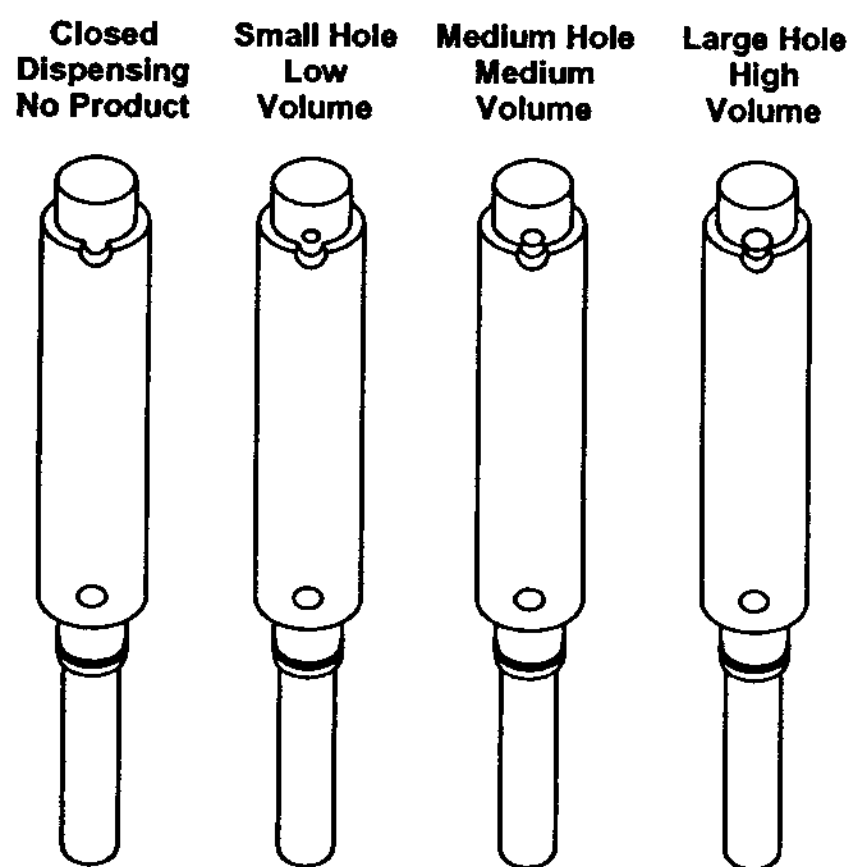
**Fig. 24**  
**Dispensing Product**

# 400 & 600 SERIES

5. On mechanical consistency control machines, set the control switch (Fig. 26) to the "CLEANOUT" position for approximately 1-1/2 seconds (a click can be heard) and then move the switch rapidly to the "AUTO" position.

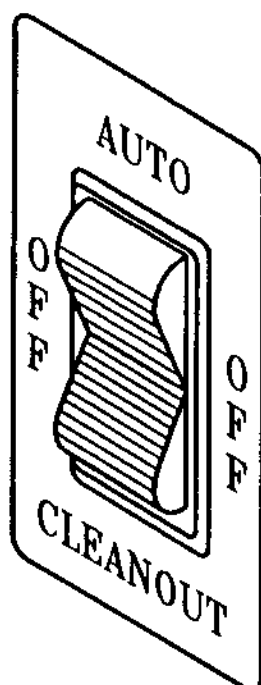
On electronic consistency control machines, it is not necessary to select the "CLEANOUT" position prior to the "AUTO" position. Simply move the control switch directly from the "OFF" position to the "AUTO" position and the unit will start.

On three phase mechanical consistency control units, set the control switch to "AUTO", then raise the spigot plunger to start the refrigeration cycle.



**Fig. 25**  
**Carburetor Tube Positions**

**Fig. 26**  
**Control Switch**



6. After the dispenser cycles off, open the carburetor tube to the desired position.

**Note:** Proper use of the carburetor tube will increase overrun. It is normally best to operate the unit with the medium hole of the insert tube showing through the hole of the carburetor tube. If you dispense heavily from the unit, a scraping sound may be heard from the freezing cylinder. If this occurs, change to the larger hole. When business has subsided, change to the smaller hole.

## CAUTION

**WHEN DISPENSING PRODUCT, MAKE CERTAIN ONE OF THE HOLES IN THE CARBURETOR TUBE IS OPEN AT ALL TIMES. IF ONE IS NOT OPEN, THE FLOW OF MIX WILL BE RESTRICTED. IF THIS HAPPENS, THE PRODUCT MIX COULD FREEZE TOO HARD CAUSING DAMAGE TO THE MACHINE.**

**ALSO, LUBRICANT BLOCKING THE HOLES IN THE CARBURETOR TUBES WILL CAUSE DAMAGE.**

7. Allow the compressor to cycle 3-4 times dispensing a sample of the product after each cycle to check for consistency. If the machine is not dispensing the product at the desired consistency after four full cycles, refer to the Consistency Control Section of this manual. Initial pull-down time is 12-15 minutes, but may vary due to product mix and ambient conditions.

8. Replace the mix pan lid and always operate the machine with the lid on the mix pan reservoir.

## IMPORTANT

**NOTE: WHEN REFILLING THE MIX PAN DURING DAILY OPERATION, DO NOT POUR SHAKE OR SOFT SERVE MIX DIRECTLY ONTO THE MIX PAN AGITATOR.**

If the agitator stops turning during machine operation,

- turn off the machine
- reposition the agitator with a sanitized utensil - see sanitizing instructions for sanitizing procedure
- follow the instructions for starting the machine.

# 500 SERIES

## Sanitizing

Prior to operation, the machine must be sanitized. The unit must have already been cleaned and lubricated.

**Note:** Sanitize immediately before use, not several hours before or the previous evening.

1. First, wash hands with a suitable antibacterial soap.
2. Prepare approximately 2 - 3 gallons of sanitizing solution equivalent to 200 ppm chlorine residual or what is required by your local Health Authority.
3. Pour the solution into the mix pans.
4. Using a sanitary brush, wipe the solution onto the undersides of the mix pan lids, the sides of the mix pans, and over the mixout probes (Fig. 25).
5. Set each control switch (Fig. 26) to the bottom "CLEANOUT" position and let the unit agitate for approximately three to five minutes.

**NOTE:** DO NOT set the control switches to the top "AUTO" position. Doing so would freeze the sanitizing solution and may result in damage to the machine.

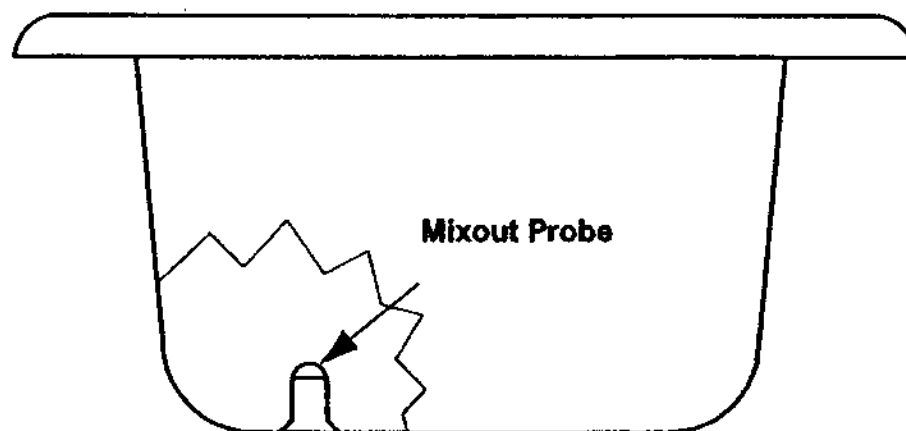


### CAUTION

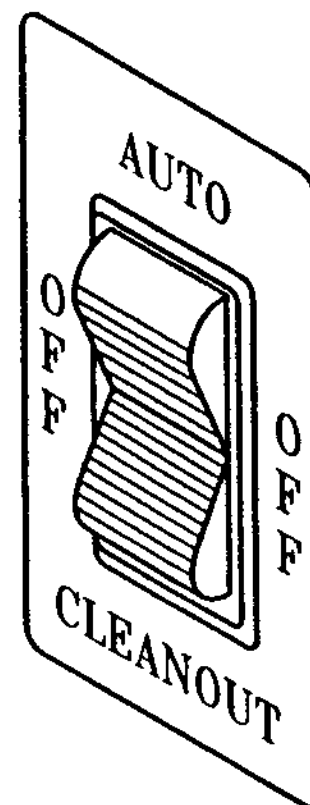
**DO NOT INSERT ANY TOOLS OR OBJECTS INTO THE MIX INLET HOLES, CARBURETOR TUBE HOLES, OR THE DISPENSING HOLES IN THE FRONT PLATE. DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT.**

6. Set each control switch (Fig. 26) to the center "OFF" position and drain the solution from the machine. Proceed directly to the "Operation" section of this manual.

**DO NOT RINSE OUT THE MACHINE**



**Fig. 25**  
**Mix Pan Reservoir Mixout Probe**

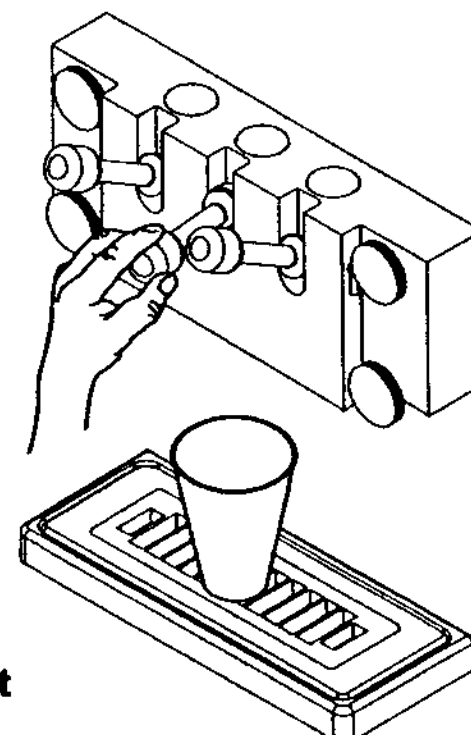


**Fig. 26**  
**Control Switch**

## Operation

Always start with a cleaned and sanitized dispenser as per previous instructions. Use only fresh mix when charging the units. Following these instructions is critical to the maximum operating efficiency of the machine.

1. Remove the carburetor tubes from the bottom of the mix pans and set aside in a sanitary location.
2. Open the spigot plungers to purge the system of sanitizing solution (Fig. 27). Using approximately one half to one gallon of product, chase the sanitizing solution from each mix pan by pouring behind any remaining solution which will then drain through the machine. Doing so will make certain that sanitizing solution will not remain in the machine to freeze or to be served to the customer.
3. Close all spigot plungers and add mix until the freezing cylinders stop bubbling.



**Fig. 27**  
**Dispensing Product**

# 500 SERIES

4. Install the carburetor tubes into the holes in the mix pans with a gentle twisting motion. Turn the inserts to the closed position (Fig. 28).

5. Fill the mix pans with fresh mix. Do not open the carburetor tubes at this time. Be sure to keep mix in the mix pans at all times to avoid starving the freezing cylinders. The machine will not start without mix in the mix pans.

6. Start the machine by setting each control switch (Fig. 29) to the top "AUTO" position. The dasher motors and the compressor(s) will be activated.

7. After the dispenser cycles off, open the carburetor tubes to the desired position.

**Note:** Proper use of the carburetor tubes will increase overrun. It is normally best to operate the unit with the medium holes of the insert tubes by aligning the medium holes with the half moon at the top of the carburetor housings. If a scraping sound is heard when you dispense heavily from the unit, turn the unit off, remove the carburetor tubes until the freezing cylinders stop bubbling, replace the carburetor tubes set to a larger hole and restart the machine. When business has slowed down, change back to the smaller holes.

**IF PRODUCT MIX IS RESTRICTED, THE PRODUCT**



**CAUTION**

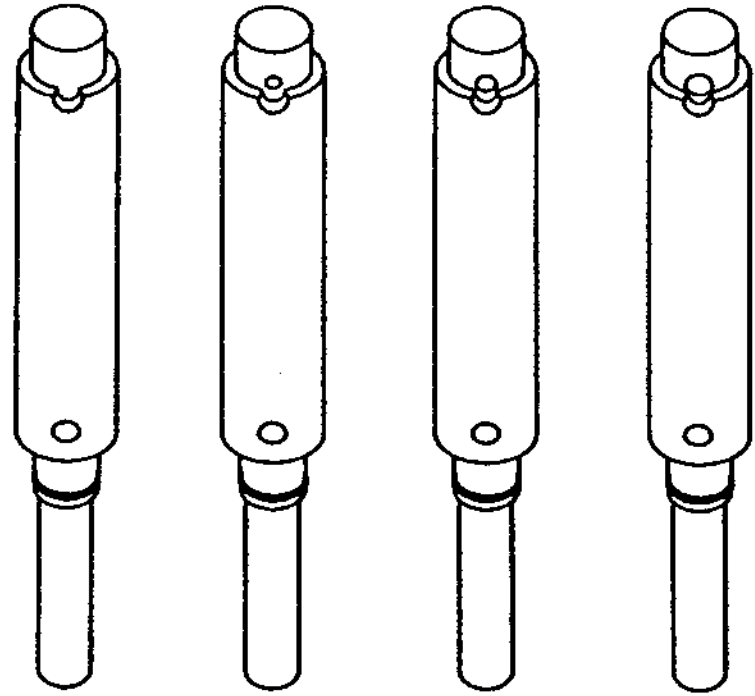
**COULD FREEZE TOO HARD CAUSING DAMAGE TO THE MACHINE. BE CERTAIN ONE OF THE HOLES IN EACH CARBURETOR TUBE IS OPEN AT ALL TIMES. NOTE: LUBRICANT BLOCKING THE CARBURETOR TUBE HOLES WOULD CAUSE THE SAME RESULT.**

Closed  
Dispensing  
No Product

Small Hole  
Low Volume

Medium Hole  
Medium Volume

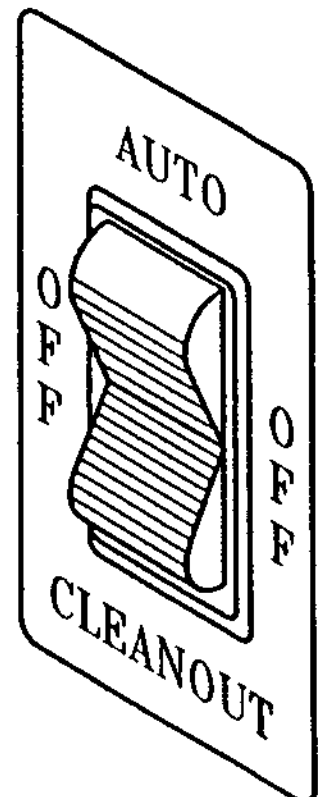
Large Hole  
High Volume



**Fig. 28**  
**Carburetor Tube Insert Positions**

8. Allow the compressor(s) to cycle 3-4 times dispensing a sample of the product after each cycle to check for consistency. If the machine is not dispensing the product at the desired consistency after four full cycles, refer to the Consistency Control Section of this manual. Normal initial pulldown time is 12 -15 minutes, but it may vary due to the nature of your product and ambient conditions.

9. Replace the mix pan lids, and always operate the machine with the lids on the mix pan reservoirs.



**Fig. 29**  
**Control Switch**

# Sanitizing

## FROZEN BEVERAGE

Prior to operation, the machine must be sanitized. The unit must have already been cleaned and lubricated.

**Note: Sanitize immediately before use, not several hours before or the previous evening.**

1. First, wash hands with a suitable antibacterial hand soap. For best results select a concentrated anti-bacterial hand soap containing biodegradable anionic and nonionic surfactants.

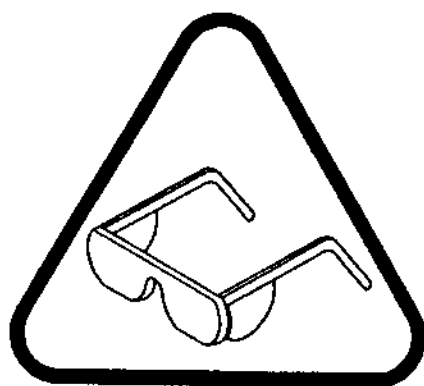
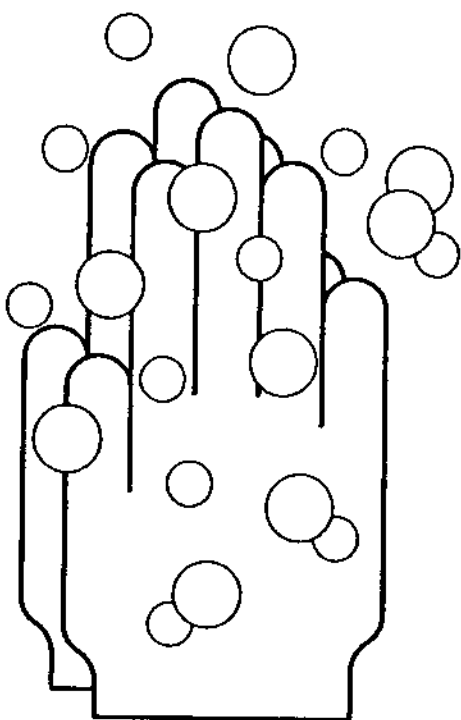
2. Prepare approximately 2 to 3 gallons (8 to 12 liters) of sanitizing solution equivalent to 200 ppm chlorine residual or the residual required by your local health agency.

3. Carefully pour the solution into the mix pan.

4. Using a sanitary brush, wipe the solution onto the sides of the mix pan, over the mixout probe in the bottom of the mix pan, and the underside of the mix pan lid.

5. Set the control switch (Fig. 39) to the "CLEANOUT" position and let the unit agitate for approximately three to five minutes.

**NOTE: DO NOT** set the control switch to the "AUTO" position. Doing so would freeze the sanitizing solution and may result in damage to the machine.



### WARNING

**DO NOT INSERT ANY TOOLS OR OBJECTS INTO THE MIX INLET HOLE, RESTRICTOR TUBE HOLE, OR THE DISPENSING HOLE IN THE FRONT PLATE. DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT (FIG. 40)**

6. Set the control switch to the "OFF" position and drain the solution from the machine. Proceed directly to the "Operation" section of this manual.

**DO NOT RINSE OUT THE MACHINE  
DO NOT ALLOW SANITIZING SOLUTION TO**

### WARNING

**REMAIN IN THE MACHINE FOR SEVERAL HOURS. DOING SO COULD DAMAGE THE MACHINE.**

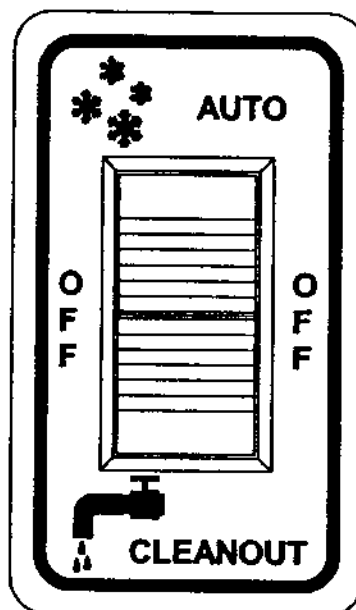


Fig. 39  
Control Switch

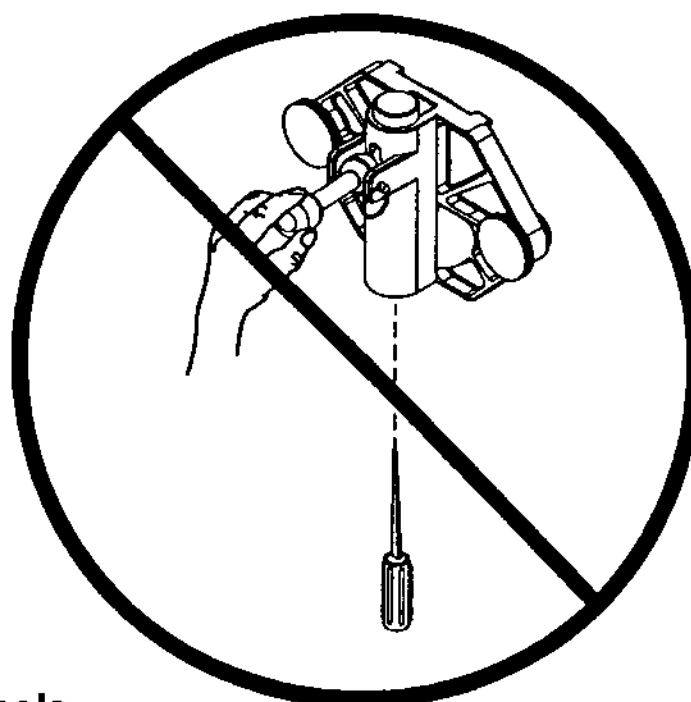
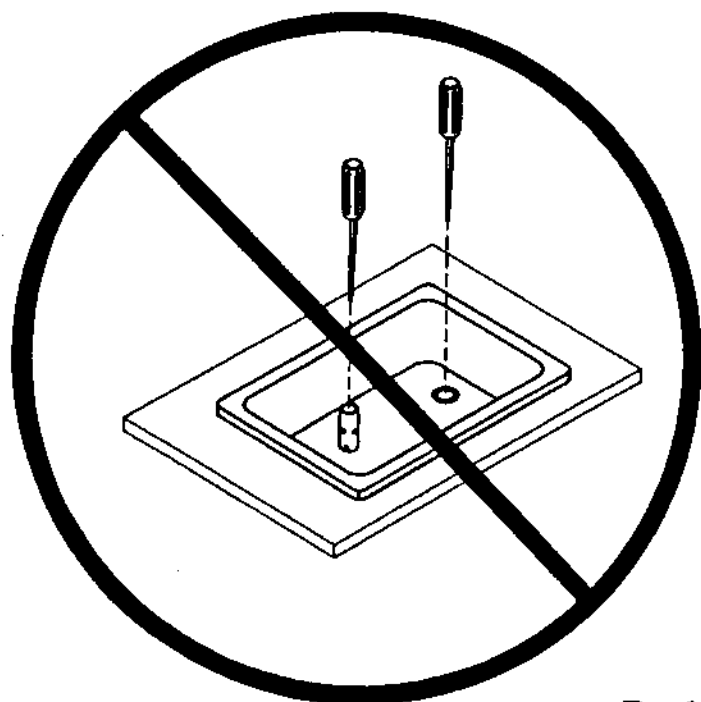


Fig. 40  
Do Not Insert Objects or Tools

# Sanitizing

Prior to operation, the machine must be sanitized. The unit must have already been cleaned and lubricated. Sanitize immediately before usage, not several hours before or the previous evening. SaniServ recommends that this equipment be sanitized **daily**.

## CONSULT YOUR LOCAL HEALTH AUTHORITY FOR SANITIZING FREQUENCY AND PROCEDURES

1. First and always, wash your hands with a suitable antibacterial soap.
2. Prepare approximately 2-3 gallons of sanitizing solution equivalent to 200 parts per million chlorine residual or as required by your local health agency.
3. Pour the solution into the mix pan.
4. While the solution is draining into the freezing cylinder, use a sanitary brush to wipe the solution onto the sides of the mix pan, on the mixout probe, and the under side of the mix pan lid.
5. Set the Auto/Cleanout switch to "**CLEANOUT**" position and let the machine agitate for approximately three to five minutes.

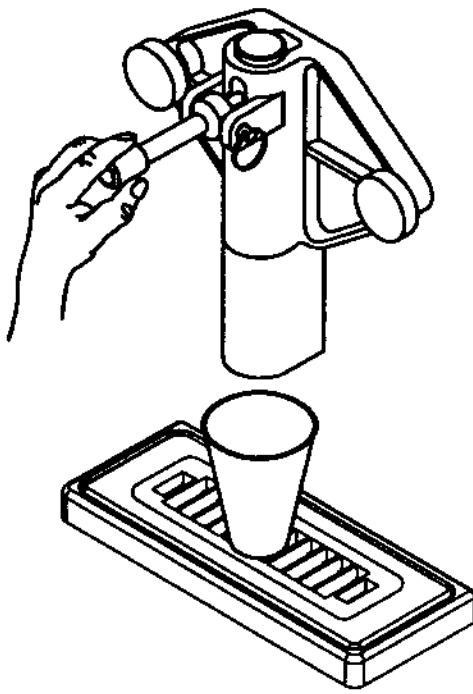


Fig. 41  
Dispensing Product

**DO NOT** set the Auto/Cleanout switch to the "**AUTO**" position. This would freeze the sanitizing solution and may result in damage to the machine.



**DO NOT INSERT ANY TOOLS OR OBJECTS INTO THE MIX INLET HOLE OR INTO THE DISPENSING HOLE IN THE FRONT PLATE.**

**DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT.**

6. Set the Auto/Cleanout switch to the "**OFF**" position and drain the solution from the machine. Proceed directly to the "**Operation**" section of this manual.

**DO NOT RINSE OUT THE MACHINE**

## Sanitizing Syrup Tanks and Accessories

SaniServ recommends cleaning and sanitizing syrup accessories at least once per week. Consult your local health authority for your community's requirements.

1. Empty your syrup tanks in a sanitary manner. Wash the tanks with detergent solution and thoroughly rinse. Then, prepare two (2) gallons of sanitizing solution equivalent to 200 p.p.m. chlorine residual or as required by your local health agency for each syrup tank container utilized.
2. With the large brush provided, clean and sanitize the inlet ports on the CO<sub>2</sub> and syrup line connectors.
3. Connect the CO<sub>2</sub> line (white) to the inlet (in side) of the tank and then connect the syrup connector (black) to the outlet (out side) of the tank.

**Note:** The syrup lines are numbered 2, 3, and 4. These numbers correspond to the Flavor/Control switch (Fig. 23) and the solenoid numbers 2, 3, and 4 respectively.

4. Set the Auto/Cleanout switch to the "**CLEANOUT**" position. Depress the #2 syrup button on the Flavor/Control switch. Press and hold the purge switch located beneath the left side of the front control panel for approximately 30 seconds. This will flush lines and accessories with sanitizing solution. Repeat this process for each flavor utilized by depressing the corresponding syrup button.

**Note:** The #1 flavor button does not employ a solenoid or syrup connection and therefore does not need to be flushed.

5. Set the Auto/Cleanout switch to the "**OFF**" position.



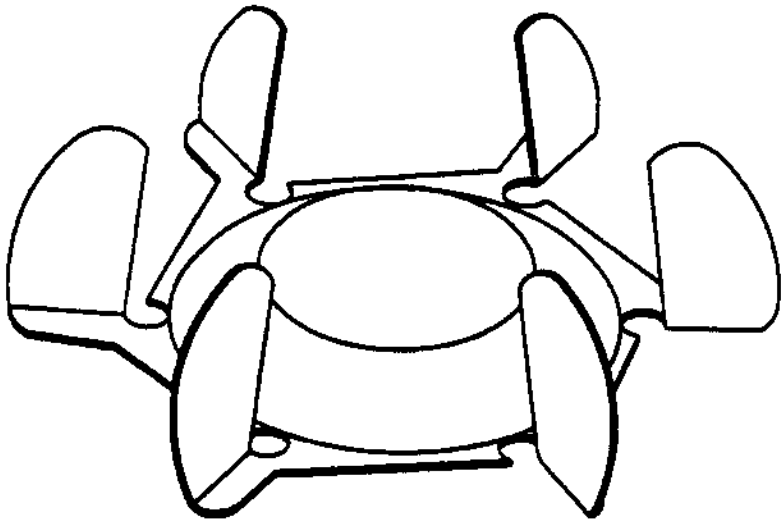
**DO NOT OPEN THE DISPENSING SPIGOT WHILE SANITIZING SYRUP LINES AND ACCESSORIES. USE ONLY A FREE FLOWING SYRUP.**

6. Disconnect the syrup and CO<sub>2</sub> lines and remove the sanitizing solution from the tanks. Fill the tanks with syrup and reconnect the syrup tanks.

**Note:** CO<sub>2</sub> pressure **must** be relieved by activating the safety valve before the lid can be opened on the syrup tanks.

## MIX PAN STIRRING SYSTEM

An impeller shown below is inserted into the outboard rear corner of each mix pan.



Apply a small amount of SaniGel to the flat surface centered on the bottom side of each impeller. Position the impellers until you feel the magnets in the impeller engage the drive system beneath the mix pan.

**DO NOT POUR MIX ONTO THE IMPELLER WHEN YOU FILL THE MACHINE WITH SOFT SERVE MIX.**

If the impeller stops spinning during operation of the machine,

1. turn off the machine,
2. reposition the impeller with a sanitized utensil - see sanitizing instructions for sanitizing procedure,
3. follow the instructions for starting the machine.

## CLEANING AND SANITIZING INSTRUCTIONS

Treat the impeller as any other small parts such as the scraper blades. Follow the same cleaning and sanitizing instructions.

# **CHARGING AND STARTING**

## Charging and Starting

### Mix Charging

#### Gravity Fed Soft Serve/Yogurt/Shake/Slush

**Mix Quantity:** Mix will fill approximately 2/3 full in the freezing cylinder as follows:

| Model      | Quarts |
|------------|--------|
| 407        | 1.5    |
| 501,527    | 1.78   |
| 522        | 2.5    |
| 707        | 5      |
| All Others | 3.5    |

**Mix Charging Methods:** Two mix charging methods may be used. (1 ) Fill freezing cylinder until it stops bubbling. Place carburetor tube in unit (turn it off), and start machine. Open carburetor tube after pull down or (2 ) Fill freezing cylinder half full. Place carburetor tube in unit (turn it off), and start machine. Open carburetor tube after pull down.

**Note:** Failure to open carburetor tube will lead to damaged components in the freezing cylinder.

### Starting

#### Gravity Fed Soft Serve/Yogurt/Shake/Slush (Electromechanical Torque Sensing)

See "Charging" in this section before starting. There are three ways to start up and run a unit:

1. Place unit in "CLEANOUT" mode, wait 1 1/2 seconds for the audible click, push the switch into "AUTO" without stopping in off. Note: This does not work on three phase units.
2. Place unit in "AUTO" and lift the spigot switch for 1 1/2 seconds.
3. Place unit in "AUTO" for 10 minutes. Note: Most freezers will freeze down in approximately 12-15 minutes. (Shake and slush takes about 8-10 minutes).

#### Gravity Fed Soft Serve/Yogurt (Electronic Consistency Control)

Place the unit in "AUTO" and the unit will start immediately provided there is enough mix to cancel the mix out system.

### Batch Freezers

See "Charging" in this section before starting.

1. Turn on the power supply.
2. If refrigeration system is water cooled, ensure that water is turned on.
3. After having cleaned the machine as indicated under daily cleaning, place into the fill opening the proper amount of mix. For sanitary reasons, always replace lid during operation.
4. Turn the main switch to the "Dasher/Refrigeration" position. Note: "Dasher/Refrigeration" position activates dasher operation and refrigeration. "Dasher" activates dasher only.
5. Set the timer by turning the knob CLOCKWISE to the required time, then the compressor will start. The timer is adjustable from 0 to 15 minutes and must be set each time the freezer is used to obtain the desired product consistency. When the preset time has elapsed, the compressor stops and the indicator light goes off. At this point, if the product has not reached the required consistency, reset the timer for additional minutes until the desired consistency is achieved. The setting of the timer is variable from one product to the other. On the first run of mix, the average rate is 10-12 minutes. After the first

run, the average rate is approximately 8-10 minutes. Time based on approximate mix in temperature of 40 degrees F.

Time will vary depending on the amount of mix in the cylinder. When the timer expires, the compressor and indicator light will shut off. If the product has not reached the required firmness, additional time can be added. Note: Do not manually set the timer back to zero. This could damage the timer. If the product has reached desired consistency, turn control switch to "CLEANOUT".

6. When the product has reached the desired consistency, it is ejected by loosening the drain door knob in a counter clockwise and opening the drain door on the front of the machine.

## **CAUTION**

**DO NOT INSERT ANY TOOL OR OBJECTS IN THE FUNNEL INLET HOLE OR DISPENSING HOLE WHILE THE MACHINE IS RUNNING. DAMAGE TO THE MACHINE OR PERSONAL INJURY MAY RESULT.**

**DO NOT RUN THE COMPRESSOR WHEN THERE IS NOT MIX IN THE FREEZING CHAMBER OR IF THE CHAMBER IS FILLED WITH WATER. THIS WILL CAUSE DAMAGE TO THE MACHINE.**

**A. Wash out the mix can.**

**B. Run one gallon of cold water through the machine to rinse out the mix.**

**C. Rinse this solution from the machine.**

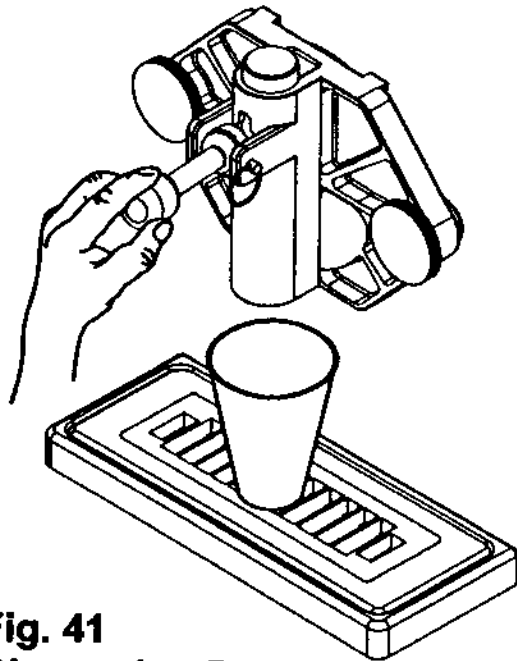
**D. Repeat process until unit is free of product.**

# Operation (Filling and Starting) FROZEN BEVERAGE

Always start with a cleaned and sanitized dispenser as per previous instructions. Use only fresh mix when filling the units. Following these instructions is critical to the maximum operating efficiency of the machine.

1. Remove the restrictor tube from the bottom of the mix pan and set aside in a sanitary location.

2. Using approximately 1/2 to 1 gallon (2 to 4 liters) of product mix, chase the sanitizing solution from the mix pan by pouring behind any remaining solution which will then drain through the machine. Doing so will make certain that sanitizing solution will not remain in the machine to freeze or be served to the customer. Open the spigot plunger (Fig. 41) and then dispense enough of the liquid to purge the system of sanitizing solution.



**Fig. 41**  
**Dispensing Product**

3. Fill the freezing cylinder until the mix comes out of the recirculation hole on units with two mix inlet holes or until the freezing cylinder stops bubbling on units with only one mix inlet hole.

4. Install the removable restrictor tube with a gentle twisting motion into the front hole if the mix pan has two mix inlet holes. For units with only one hole, simply insert the restrictor tube in the only mix inlet hole.

5. Fill the mix pan with chilled, properly mixed product. Keep the mix level in the mix pan at least one inch (25 mm) deep at all times to avoid starving the freezing

cylinder. A MIXOUT light (Fig. 42) located on the front of the machine (one per freezing cylinder) is activated when the mix solution drops to a potentially damaging level.

6. Set the control switch to the "AUTO" position to start the machine.

7. Allow the compressor to cycle 3 or 4 times dispensing a sample of the product after each cycle to check for consistency. If the machine is not dispensing the product at the desired consistency after four full cycles, refer to the Consistency Control Section of this manual. Initial pull-down time is 12-15 minutes, but it may vary due to product and ambient conditions.

8. Replace the mix pan lid and always operate the machine with the lid on the mix pan reservoir.

**Note:** SaniServ dispensers are designed to run frozen beverage products having a Brix (sugar content) range of 12.5 to 14 with a dispense temperature of 26°F to 28 °F (-3.3°C to -2.2°C).

Brix reading is taken by placing a small sample of normally diluted concentrate on the viewer of a refractometer. If a refractometer is not available, contact the mix supplier.

**Do not use a mix with a Brix reading of less than 12.5. Doing so may result in serious damage to the machine.**

If the Brix reading is above 14.0 or the alcohol content is too high, the freezing point of the solution may be too low to form slush.

**DO NOT ATTEMPT TO MAKE FROZEN BEVERAGE USING ARTIFICIALLY SWEETENED PRODUCT.**

**Fig. 42**

**MIXOUT Light**



## MACHINE OPERATIONS WITH ELECTRONIC CONSISTENCY CONTROL

### Control Switch Positions

**"CLEANOUT" Position:** The dasher motor operates continuously and the compressor will not come on. The mix out level sensor will turn on the "MIXOUT" light (Fig. 41b) but will not activate the beeper.

**"AUTO" Position:** The dasher motor operates continuously. Upon machine start up the compressor will run until proper product consistency is reached. Then the compressor will shut off. Approximately every 10 minutes thereafter, the machine will test the product

consistency, and the compressor will cycle on if it is needed. If the liquid level sensor detects a low level condition, it will flash the "MIXOUT" light and activate the beeper for three minutes or until the mix pan is filled to satisfy the mix level probe. If the beeper is activated for more than three minutes, the light will begin to glow continuously, the beeping tone will slow down, and the machine will no longer dispense product.

**IF THE COMPRESSOR SHUTS DOWN BUT THE LED'S DO NOT FUNCTION, THE PRODUCT CONSISTENCY IS NOT PROPERLY ADJUSTED.**

# Operation

1. Remove the carburetor tube from the bottom of the mix pan and place into a sanitary location.

2. Open the spigot plunger to purge the system of sanitizing solution (Fig. 42). Pour fresh shake mix in a front corner of the mix pan to "chase" the sanitizing solution down into the freezing cylinder. Pour behind any remaining solution which will then drain through the machine. Continue this procedure until you are certain that only shake mix is draining from the spigot. This will ensure that sanitizing solution will not remain in the machine to freeze or be served to the customer. Close the spigot handle.

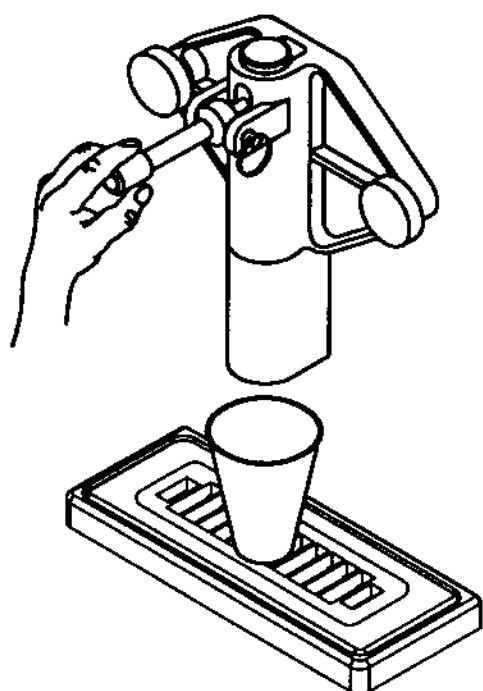


Fig. 42  
Purging Sanitizer

3. Fill the mix pan with prechilled, properly mixed product.



**CAUTION**

## DO NOT POUR SHAKE MIX DIRECTLY ONTO THE MIX PAN AGITATOR AS YOU FILL THE MACHINE

Keep the product level in the mix pan at least one inch above the bottom of the mix pan to avoid starving the freezing cylinder. A "MIXOUT" light is activated by the mixout probe to indicate a low product level in the pan.

4. Wait for the product to stop bubbling and then with sanitized hands, install the carburetor tube into the mix inlet hole in the mix pan with a gentle twisting motion.

5. To start the machine set the Auto/Cleanout switch (Fig. 43) to the "AUTO" position.



**CAUTION**

**WHEN DISPENSING PRODUCT, ENSURE THAT LUBRICANT DOES NOT BLOCK THE INLET HOLE IN THE CARBURETOR TUBE. THE FLOW OF MIX WOULD BE RESTRICTED. THIS COULD RESULT IN FREEZE-UP OF THE MACHINE**

6. Allow the compressor to cycle 3-4 times dispensing a sample of the product after each cycle to check the consistency. If the machine is not dispensing the product at the desired consistency after four full cycles, refer to the Torque Adjustment section of this manual or call your authorized SaniServ service technician. Initial pull-down time is 7-8 minutes, but may vary due to product and ambient conditions.

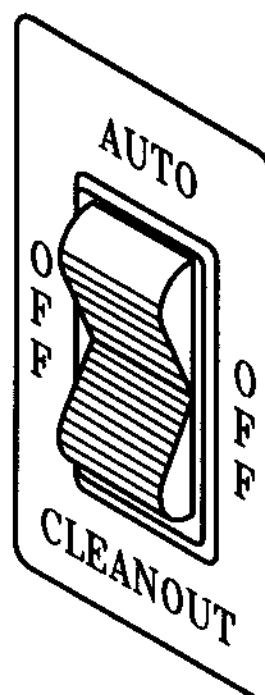


Fig. 43  
Auto/Cleanout  
Switch

7. Replace the mix pan lid onto the mix pan. **Always operate the machine with the lid on the mix pan reservoir.**

8. The mix pan agitator only turns when the Auto/Cleanout Switch is in the "AUTO" position. If the Mix pan agitator stops turning during machine operation:

- Turn off machine.
- Reposition the mix pan agitator using a sanitized utensil - see page 19 paragraph 3. For proper sanitizing procedure see sanitizing instructions.
- Follow instructions for starting the machine - step 5 at left.

## 601 & 614 SAS Series

### Dispensing

For initial start-up only, follow the instruction in the Syrup Solenoid and Torque Adjustment sections of the manual before proceeding with operation.

1. With the Auto/Cleanout switch in the "AUTO" position, select the desired flavor by pressing #1 (vanilla), #2 (chocolate), #3 (strawberry), or #4 (optional flavor) on the Flavor/Control switch - Fig. 44a. Release immediately and the red indicator light adjacent to the selection will illuminate.

2. Place a cup beneath the dispensing spigot and depress the spigot handle - Fig. 44b.

3. Dispense the desired amount of product into the cup and firmly close the spigot handle.

**Note:** If the handle is closed gradually, the flow of syrup may be interrupted resulting in inadequate mixing.

4. After the spigot handle is closed, the spinner assembly will stop. Allow approximately 3 seconds for any remaining shake mix to dispense from the front plate assembly before removing the serving cup.

5. Place a rinse water cup under the dispensing spigot, depress and hold the spinner rinse button. Water will flush through the front plate assembly for the length of time the button is depressed.

6. When the water is clear, release the button. The spinner and water flow will stop.

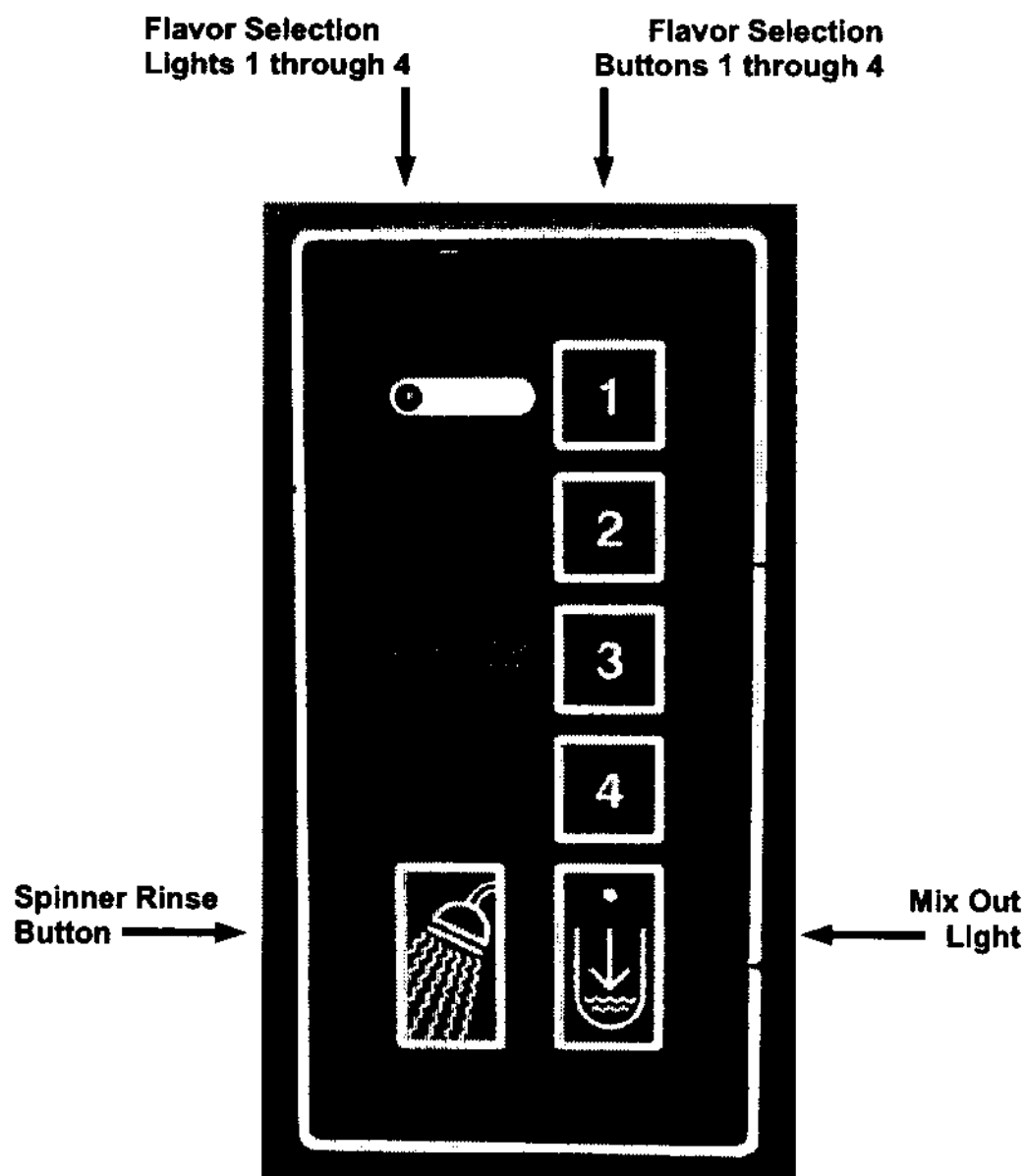


Fig. 44a  
Keypad

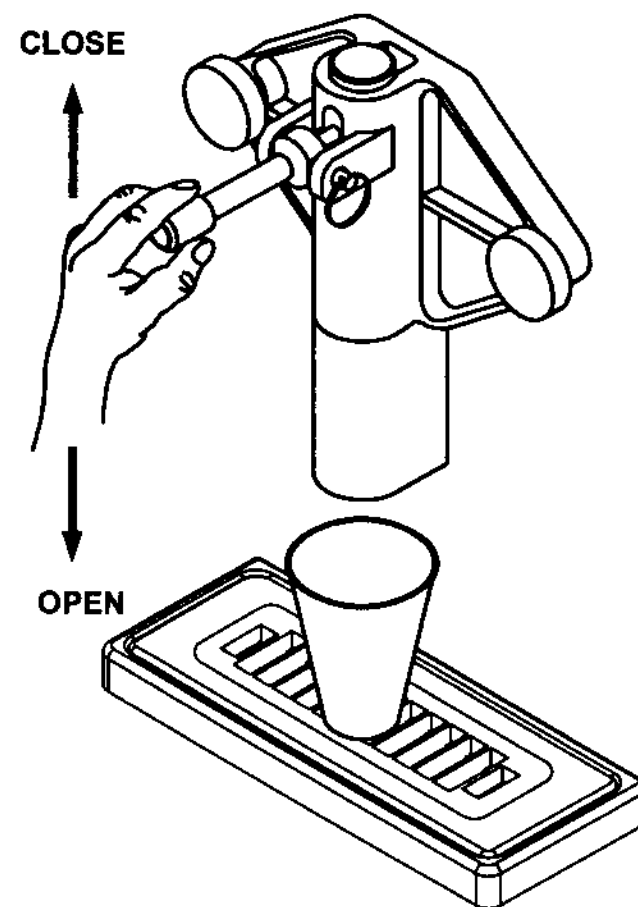


Fig. 44b  
Dispensing Product

# Syrup Solenoid Adjustment

All SAS machines are equipped with four (4) solenoid valves (Fig. 45) located behind an access panel on the right side panel facing the machine. The solenoid valve on the lower right is nonadjustable and is utilized to control water flow for the spinner rinse. The other three solenoid valves are adjustable and are utilized to regulate the amount of syrup injected into the vanilla shake base. These solenoid valves are chocolate (#2), strawberry (#3), and optional flavor (#4).

**Note:** The #1 button, vanilla, does not employ a solenoid valve because vanilla is the shake base. Each of the three syrup solenoid valve screws will need to be adjusted to accept varying syrup consistencies. Free flow syrups are readily available and are specially formulated for use in this equipment. **DO NOT USE ANY SYRUP WITH PULP OR FIBROUS INGREDIENTS. USE ONLY FREE FLOWING SYRUPS.**



**WARNING**

## DO NOT OPERATE MACHINE WITH SIDE PANELS REMOVED

Water flow is regulated by the water pressure regulator. **Note:** The right side panel (facing front of machine) must be removed to adjust. This flow should be set one time to allow a small amount of water to dispense from the front plate assembly while the spinner rinse button is depressed.

### Calibration

1. Ensure that the syrup tanks have been filled with two gallons of syrup each. Ensure that the CO<sub>2</sub> and syrup connectors have been connected to the tanks. Adjust the CO<sub>2</sub> valve to 5 - 20 P. S. I.



**WARNING**

**DO NOT EXCEED 30 P.S.I.**

2. With the Auto/Cleanout switch in the "CLEANOUT" position, depress and hold the Spinner Rinse button on the Flavor/Control switch. A moderate amount of water should dispense from the spigot. To adjust the flow, turn the water pressure regulator clockwise to increase the flow or counterclockwise to decrease the flow.

**Note:** The water valve has no pressure gauge and is adjusted for adequate water flow through the front plate. No further adjustment should be necessary.

3. Set the Auto/Cleanout switch to the "CLEANOUT" position. Turn the thickest syrup solenoid valve adjustment screw to the wide open position. Depress the thickest syrup button on the Flavor/Control switch - typically #2, chocolate syrup.

4. Press and hold the red purge button until syrup dispenses from the spigot. Release the purge button. This purges any remaining air and sanitizer from the lines and accessories.

5. Hold the purge button for 15 - 20 seconds. The amount of syrup dispensed should be 1 to 1-1/4 ounces. This can be easily measured with a brix cup.

6. To increase the flow of syrup, increase the CO<sub>2</sub> pressure and repeat the 15 - 20 second syrup draw.

7. To decrease the syrup flow, reduce the CO<sub>2</sub> pressure at the regulator, turn off the CO<sub>2</sub> gas, relieve the pressure in the tank by pulling the safety pop-off valve, turn the CO<sub>2</sub> gas back on and recheck the CO<sub>2</sub> pressure. Repeat the 15 - 20 second syrup draw.

## IMPORTANT

### EACH TIME THE PRESSURE IS LOWERED, RELIEVE THE TANK PRESSURE

8. Test each of the remaining syrups by using the 15 - 20 second draw. Turn the adjusting screw on the solenoid valve counterclockwise to increase the flow of syrup. To decrease the flow, turn the adjustment screw on the solenoid valve clockwise.

**Note:** CO<sub>2</sub> is adjusted **ONLY** on the thickest syrup.

**Note:** When adjusting the solenoid valves, turn the adjusting screw 1/4 turn at a time and perform the measurement procedure.

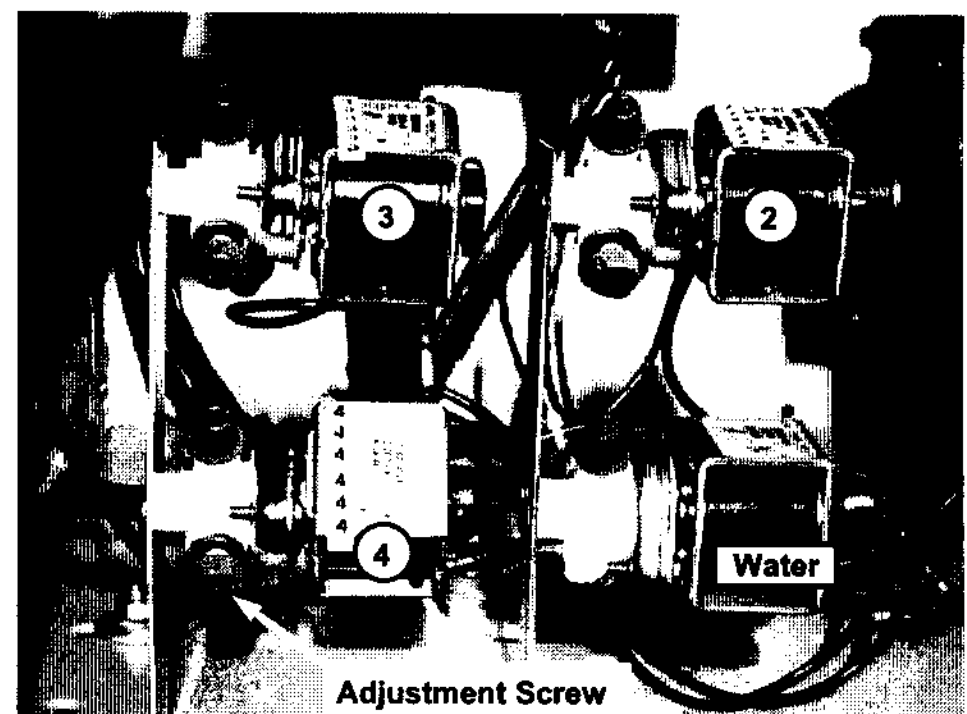


Fig. 45  
Solenoid Valve Array

# Helpful Hints

## FROZEN BEVERAGE

**Closed Hours/Shut-Down:** If the machine is turned off during closed hours, to resume operation:

1. Set the control switch to the **"CLEANOUT"** position.
2. Dispense two quarts (2 liters) of product into a sanitized pitcher and pour it back into the mix pan. Doing so serves as a mixing process to eliminate any overnight separation.

**NOTE: NEVER POUR FROZEN PRODUCT INTO THE MIX PAN. LET IT MELT FIRST.**

3. Set the control switch to the **"AUTO"** position and resume operation.

**Mixing:** Make certain that the product is prepared per label instructions. The machine is designed to operate with frozen product base having a brix range of 12.5 to 14.0. To ensure consistency and quality, use a mixing container large enough to hold 5 gallons (20 liters) with 1 gallon (4 liter) markings to allow accurate mixing of the frozen beverage base. Stir well before adding to the mix solution to the mix pan. Refrigerate the base after diluting. Keep the empty gallon bottles with their lids or caps installed and refill them with diluted base for easy access during busy operating periods.

**Filling:** Always fill the machine at the start of each day. Fresh prechilled mix will produce the best results.

**Mix Pan Lid:** Be sure to leave the lid in place on top of the machine to prevent any foreign materials from contaminating the mix.

**Drip Tray:** This should be removed daily and cleaned to remove residue (Fig. 37).

**Front Plate:** This component (Fig. 33) is the plastic device from which the product is dispensed. It is designed and made for strength and durability. However, through improper use, it can be damaged. Use the following information for proper care.

1. Do not lubricate the large o-ring on the rear of the front plate. If lubricated, it will not seal properly and product will leak from the front plate (Fig. 33).
2. Do not over tighten the knobs.
3. Always tighten the front plate knobs evenly. Do not attempt to turn one knob all the way down and then the other(s). Doing so will bind the front plate and result in breakage.
4. Improper installation of the stator rod can cause breakage. The stator rod must be properly seated in the dasher before installing the front plate. If the stator rod is improperly installed, subsequent tightening of the knobs will break the front plate.
5. Do not attempt to wash the front plate or any other machine components in a dishwasher.

**Mix Out Light:** When the mix out light comes on, fill the mix pan. The mix pan must be filled immediately to prevent air from entering the freezing cylinder. If air enters the freezing cylinder, it will create the condition known as "starving the machine", causing freeze-up and vibration. If this condition occurs, set the control switch to the **"OFF"** position and add mix to the mix pan. Allow the freezing cylinder to refill and return the control switch to the **"AUTO"** position.

# 400, 500 & 600 SERIES

## Helpful Hints

**Front Plate:** This component is the plastic device from which the product is dispensed. It is designed and manufactured for strength and durability. However, through improper use, the front plate can be damaged. Use the following information for proper care:

- a. Do not over tighten the knobs.
- b. Always tighten knobs evenly. Do not attempt to turn one knob all the way down and then one of the other three knobs. Doing so will bind the front plate and could result in breakage.
- c. Improper installation of the stator rods can cause breakage. The stator rods must be properly seated in the dasher before installing the front plate. If the stator rods are improperly installed, subsequent tightening of the knobs will break the front plate.
- d. **DO NOT** attempt to wash the front plate or any other components in a dishwasher.

**Mix Out Light:** When the mix out light comes on, the mix pan is low on mix. The mix pan must be filled with fresh product mix immediately to prevent air from entering the freezing cylinder starving the machine and causing freeze-up and vibration. If this condition occurs, set the selector switch to the "OFF" position. Remove the carburetor tube and add mix to the low mix pan until the freezing cylinder stops bubbling. Replace the carburetor tube with a gentle twist, then return the control switch to the "AUTO" position.

**Filling:** Always fill the machine with fresh product at the start of each day.

**Drip Tray:** This should be removed daily and cleaned to remove residue.

**Mix Pan Lid:** Be certain to leave the lid in place on top of the machine to prevent any foreign materials from contaminating the mix.

**Mixing:** Make certain that the product mix is prepared according to label instructions.

**Sanitizing:** Do not soak plastic parts in sanitizer overnight. Doing so can cause the plastic parts to become brittle and lead to premature failure.

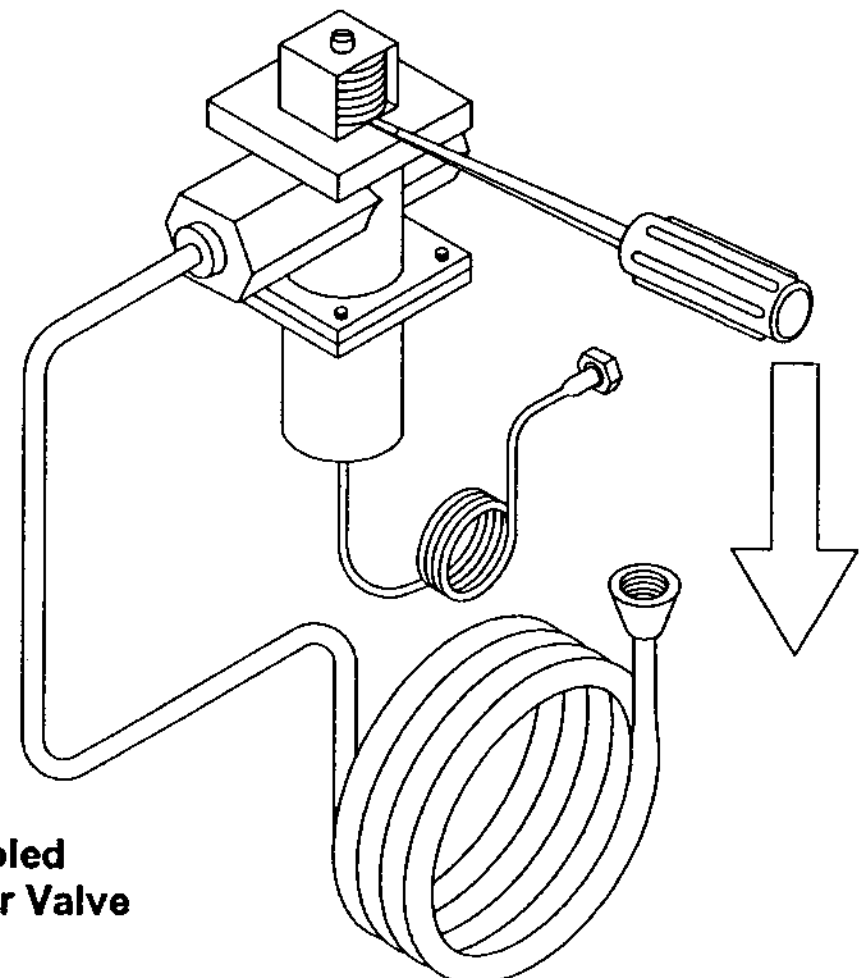
**Mix Pan Agitator:** If the mix pan agitator stops turning during operation of the machine, turn off the machine, reposition the agitator with a sanitized utensil, and follow the instructions for starting the machine.

### **DO NOT POUR SOFT SERVE MIX DIRECTLY ONTO THE AGITATOR WHEN YOU FILL THE MACHINE.**

Treat the mix pan agitators as any other small parts such as the scraper blades. Follow the same cleaning and sanitizing instructions.

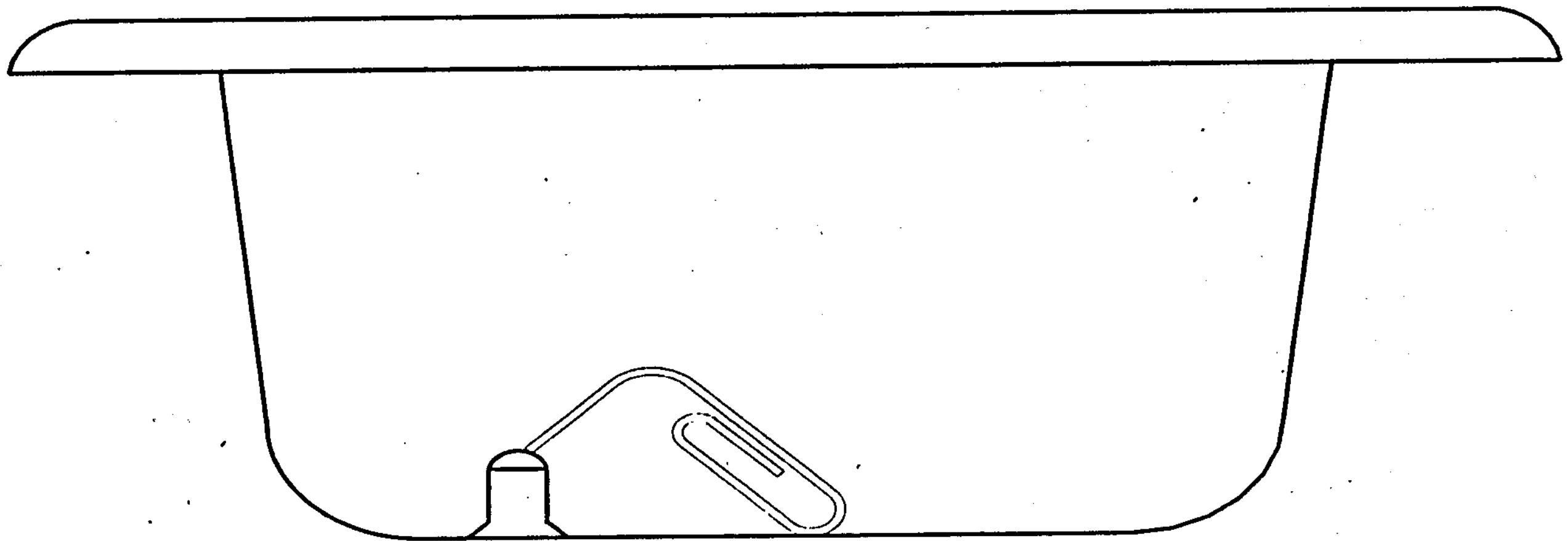
**Winter Storage:** To protect the unit during seasonal shut-down, it is important that the dispenser be stored in the proper manner. Use the following procedures:

1. Turn off **ALL** power to the machine.
2. Wash all parts that come in contact with the mix with a warm mild detergent solution. Rinse in clear water and dry parts thoroughly.
3. Store the loose parts such as the mix pan components, front plate parts, and the dasher assembly parts outside of the machine.
4. Do not lay heavy objects on the plastic or rubber parts.
5. Cover the machine and all loose parts to protect them from dust or other contaminants while in storage. Place the machine in a dry location.
6. **On water-cooled units, disconnect the water lines. Use compressed air to blow out all remaining water in the condenser. Insert a screwdriver (Fig. 27) to open the water valve.** **Note: Failure to purge the machine of water can result in severe damage to the cooling system. This task should be performed by a qualified service technician.**



**Fig. 27**  
**Water-Cooled**  
**Condenser Valve**

**WHEN FROST CHECKING THE EVAPORATORS ON MACHINES THAT ARE  
EQUIPPED WITH ELECTRONIC CONTROL BOARDS YOU MUST USE A  
PAPER CLIP OR EQUIVALENT AND SHORT THE MIX PROBE TO MIX PAN.  
(AS SHOWN BELOW)**



# **MIX HANDLING & CARE**

### Mix: Handling and Care

Soft serve, shake, and slush products are packaged in a variety of ways to preserve freshness until use. To ensure a quality finished product, proper mix handling is important. Soft serve and shake mix are generally packaged frozen, liquid or powdered.

#### Frozen Mix

1. Check expiration date to ensure the mix has not exceeded its shelf life. Thaw the product in a refrigerator until it is a complete liquid. (About 72 hours).
2. Do not thaw at room temperature, in warm water, or in a microwave. This may set the stage for bacterial growth.
3. Do not introduce already frozen or semifrozen product into a soft serve or shake machine's mix pan. This may cause inconsistent operation or damage to the machine in the form of a freeze up.
4. Do make sure the product is thawed and mixed completely, especially yogurt, before introduction to a clean sanitized machine.

#### Powdered Mix

Powdered Mix should be mixed as per the label instructions, the day before the product is frozen. This allows the mix to absorb all water in the mixture, and chill to the proper mix temperature.

Introduction of a well mixed, 40 degree Fahrenheit product into the soft serve or shake machine will yield a rich, smooth consistent product.

Note: Poor mix handling is responsible for many service calls. Introduction of a warm or poorly handled mix can cause inefficient operation of the machine. This may generate unnecessary service calls on the machine.

Soft serve and shake products are formulated to absorb air upon being frozen. This introduction of air to a product (overrun) is not only important for taste, but for profit. See overrun for more information.

#### Refrigerated Mix

Check expiration date to ensure the mix has not exceeded its shelf life.

### General Handling of Soft Serve Mix

All soft serve mix is delicate in how they are handled in a soft serve freezer. Furthermore, all dairy based products are highly perishable. In order to keep mixes in good condition, they should be stored in a refrigerator. The temperature should be maintained between 33-38 degrees F. The maximum temperature should never exceed 45 degrees F, and when mix is allowed to exceed 50 degrees F., it will spoil quickly. The problem is the bacteria contained in the mix. The bacteria called coliform or coli, originates from human waste. As a side note, this is why operators must clean hands with antibacterial soap or sanitizing solution (separate from that used to clean the machine). In general the standard bacteria plate limit count is 50,000 per gram while the coli count usually is 10 per gram. For every hour above the 50 degrees temperature level, the bacterial level doubles.

Mix should be rotated properly so that the mix with the oldest shelf life is selected and used first. This way old mix is not introduced into the machine which can lead the operator to blame the machine for the difficulty.

Concerning the cleaning and sanitizing of machines, follow the sanitizing procedures and policies outlined by the local health authorities, but if none are available, follow those outlined in section #3 of this manual. They are the same as in the operators manual. In addition, there is no substitute for cleanliness, and a machine that is cleaned daily can be expected to serve better product. Cleanliness should also be considered for any and all utensils used in connection with handling. Sanitize them too!

SaniServ equipment will operate with any of the mixes currently designed for a soft serve freezer; however, mixes behave differently from mix to mix, flavor to flavor, and dairy to dairy. That is, the ideal freezing temperatures and viscosity, as well as, the pull down time will vary somewhat. However, mixes are all alike in that as they freeze, they will take on air (overrun). The amount of air that each takes on is variable. Some of the controlling variables are as follows:

- Type and ingredients in the mix.
- Age and storage temperatures of the mix when frozen.
- Amount of re-run used in fresh mix.
- Condition of scraper blades.
- Condition of the refrigeration system.
- Ambient temperature around the machine.
- Temperature of the product (if too cold).
- Product demand out of the machine.

Under normal ambient temperatures, most mixes will take on 35% to 50% overrun. Overrun is important for two reasons as follows:

## • Profitability

- **Physical Product Stability** (to stand on a cone or in a cup). An operator who can sell two to three quarts per hour, and has followed the above information, can be expected to have a good operating machine with plenty of repeat business.

The problem comes from installations where a machine is either too large, or there is no business. Regardless of the brand name, ice cream makers are made to make and dispense product. The hardest thing to do is to make the freezer sit idle because of the delicate nature of soft serve products. They must be churned and refrigerated to maintain consistency, and the net result is that the product will begin to lose air. None of the mixes or flavors will lose it at exactly the same rate. In general products can be expected to live in the freezing cylinder as follows:

- Ice milk approximately 2-4 hours.
- Ice cream approximately 2 hours.
- Yogurt approximately 2 hours.
- Fruit base approximately 1 hour.

Refer now to SB #8618 for review of the symptoms associated with product breakdown. See also SB #8607 and #8611.

Another effective method of analyzing situations outlined above is by equating the production of the machine to a use factor:

- Number of gallons served/day, compared to
- Number of hours store open times minimum production capability, gallons per hour.

Improve the situation above by using:

- Take Out Program (hard pack).
- Rerun
- Novelties

## Take Out Program

Packaging of products in pint or quart containers is a popular way to increase the business. A storage freezer is required, preferably a glass door merchandiser.

## Rerun

Rerun is the process of drawing out finished product (into a sanitized container with a cover) for the purpose of allowing it to thaw for reuse. It is very important that after the thawing process, the foam must be scraped off and discarded. This mix can be placed into the machine the next day; however, only fresh mix should be loaded into the

freezing cylinder. Place the rerun in a proportion of 70% fresh to 30% rerun. Some states outlaw this because if there is a bacteria problem, it self perpetuates by daily mixing and rerun. Therefore, if it is allowed, break the cycle once every two to three days.

## Novelties

Novelties, when advertised properly, can increase business, and the operator is only limited to his/her imagination. Ice cream cookies, cakes and pies are very popular. In the event that a merchandising cabinet is not economical, there are fake food manufacturers who can duplicate your novelty for display purposes, and menu boards as well.

The three methods above have been around for a long time, and are well known in our industry. However, when a first time owner operator doesn't know about the above, or doesn't market his product correctly further difficulty can result.

First, they will complain that the machine does not work properly. Naturally you would explain how to help them with the above recommendations. Then, after they have a freezer full of the products, they call you again, or they call you and thank you for your help.

## Frozen Beverage Mix

---

### Brix

The amount of dissolved sugar in percent by weight. Example: 10 lbs. of product with a brix of 12.5 indicated that the product contains 1.25 lbs. of dissolved sugar.

Sugar in a product acts as an antifreeze. It is this property, and the mixing action of your machine that allows a product to slush rather than freeze solid.

Accurate measurements of sugar in products is a must. Damage will occur to a frozen beverage machine due to low brix of sugar. Accurate measurements of sugar can be made with the use of a refractometer.

### Refractometer

Measurements of the sugar level should always be taken in a liquid state. Dissolved sugar in a liquid will refract light in varied degrees, depending upon the amount of dissolved sugar. Note: The refractometer must be calibrated to zero with water prior to use.

A refractometer measures the light refraction which gives you an accurate measurement of sugar content.

Service Bulletin

Subject: Product Temperatures

Various surveys show that 90% of the service related calls can be traced to actual mix activities or operator activities. When discussing the problems with the operator or mix supplier, it is important to use the correct approach. All too often, an attitude is adopted that attributes mix problems to inferior ingredients. However, all of the same problems can be found in mixes that were compounded from the finest ingredients obtainable and processed in the most modern and sanitized mix plant. Consequently, it is important not to condemn the mix, but to seek a solution to the problem by jointly working with the operator and the mix supplier.

One of the most important ways to determine what a machine is doing or not doing, is to take product samples and record the respective temperatures.

Product temperatures can quickly determine if a problem exists with a machine or caused by other related activities. Draw three servings of product, each serving should be 4 to 5 ounces each. These samples should be in a small container. Insert a thermometer, stir occasionally to prevent pocketing of melted product. Add all three servings together and divide by three to determine an average temperature.

Temperature sample of soft serve ice cream

|          |          |          |   |            |
|----------|----------|----------|---|------------|
| Test #1  | Test #2  | Test #3  | = | Final Ave. |
| 18.6° F. | 18.0° F. | 17.6° F. | = | 18.06° F.  |

This test illustrates the refrigeration section is functioning properly and the problem must be traced elsewhere. More often than not, is a case where the business has slow periods during the day and night. These slow periods cause the mix to lose the air content from the mix. By testing the product temperatures, you will assist the machine in introducing revitalized mix from the fill pan hopper to the freeze chamber. By doing this, air is recharged into the revitalized mix and the product will stand up on the next batch of samples. To be sure, take three additional samples, again recording temperatures, and observe condition of sample.

|                         | RANGE        | IDEAL        |
|-------------------------|--------------|--------------|
| Soft Serve              | 17 F to 21 F | 18 F to 19 F |
| Yogurt                  | 14 F to 21 F | 16 F to 18 F |
| Sherbets                | 17 F to 21 F | 18 F to 20 F |
| Italian Ice             | 18 F to 26 F | 19 F to 22 F |
| Sorbet                  | 17 F to 21 F | 18 F to 19 F |
| Frozen Beverages        | 24 F to 28 F | 24 F to 26 F |
| Milk Shakes             | 24 F to 28 F | 26 F to 28 F |
| Fruit Based Soft Serve  | 18 F to 23 F | 18 F to 23 F |
| Frozen Carbonated Drink | 24 F to 26 F | 24 F to 26 F |
| Slush Fluid Drink       | 25 F to 29 F | 27 F to 29 F |

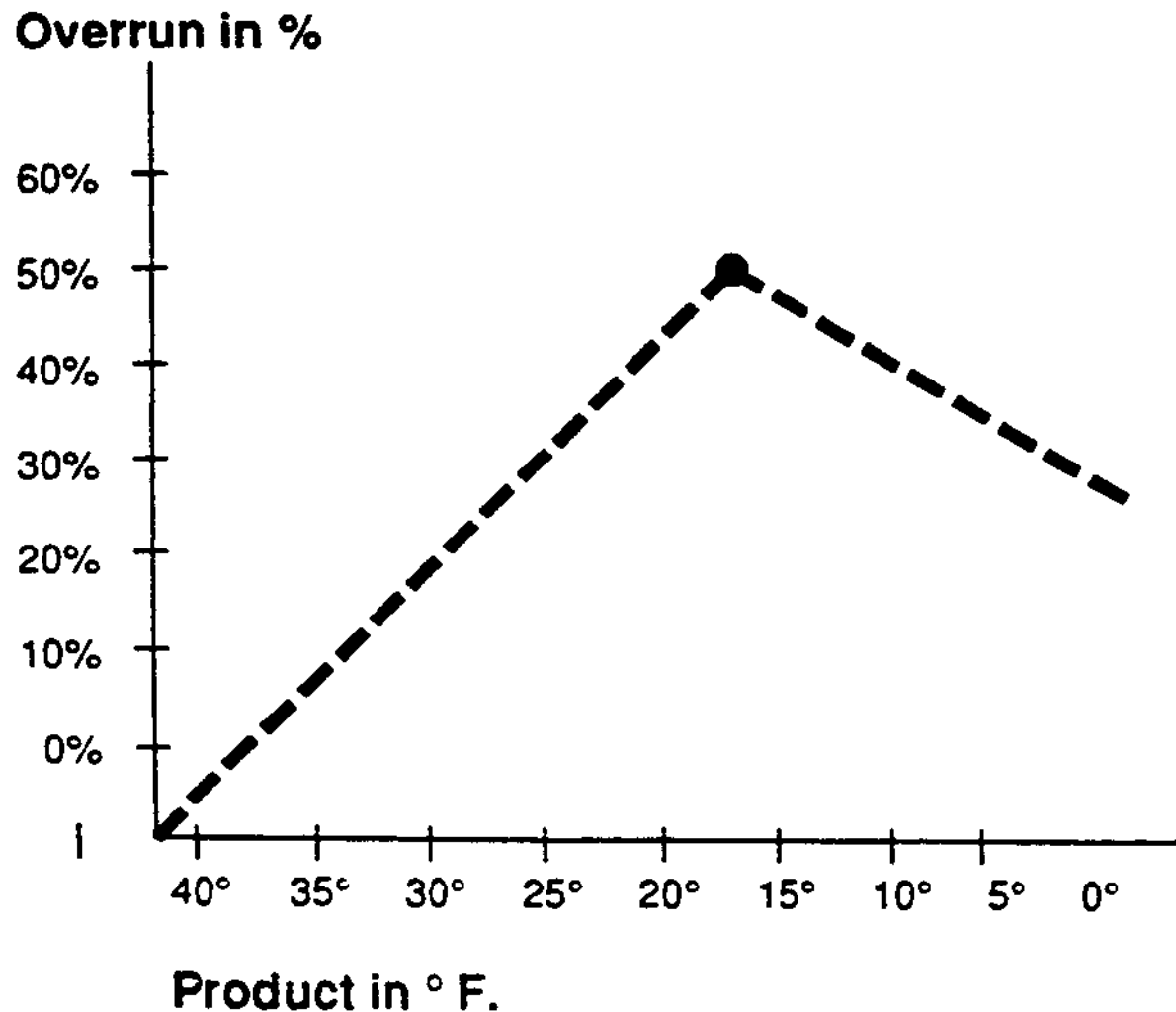
A pocket thermometer and a watch are two of the most important tools in determining product serving temperature. If desired, product temperatures are being obtained and compressor running cycles are within the recommended time frame, the refrigeration system is doing its job. For example, the operator calls complaining that the product is wet, loose and will not stand up. The only way that this can be properly diagnosed is to first determine required temperature for a dry, fir, product with the specific mix they are using. If the finished product is determined to be the same temperature as that of the mix producer, it will be almost certain that the problem is not mechanical. To be sure, a further check can be made of the machine's running time. The normal recovery time for a unit is 5 to 8 minutes after four servings of 4 ounces each has been drawn from the machine. Even under the most extreme conditions, the unit should not operate beyond 15 minutes. At this point, if the product temperatures and running cycles are correct, then it is 100% sure that the problem is related to the mix or can be attributed to the operator.

Other problems could be incorrect assembly of parts and/or loading the machine improperly. Recheck operating procedures. If product temperatures are higher than normal, then most likely a mechanical problem does exist. The exception is the possibility of the operator out drawing the capacity of the machine. In this case, higher than normal temperatures would be noticed only during specific times.

# Overrun

**Definition:** The amount of air incorporated into a product at a given temperature.

**Overrun/Temperature Graph**



## Rules:

1. Use the same size cup for both measurements.
2. Always tare weight the cup or in other words, neglect the weight of the cup.
3. Always fill the cup level to the top.

**Formula to calculate overrun:**

$$\frac{\text{Raw Mix Weight} - \text{Product Weight}}{\text{Product Weight}} \times 100 = \% \text{ Overrun}$$

**Example:**

#1  $\frac{(16 \text{ oz. cup raw mix weight}) - (8 \text{ oz. cup product weight})}{(8 \text{ oz. cup product weight})} \times 100 = 1.0 \text{ or } 100\% \text{ Overrun}$

#2  $\frac{(16 \text{ oz. cup raw mix weight}) - (10 \text{ oz. cup product weight})}{(10 \text{ oz. cup product weight})} \times 100 = .60 \text{ or } 60\% \text{ Overrun}$

**REFRIGERATION**

**&**

**COMPRESSORS**

## SECTION #6

### REFRIGERATION LAWS ENERGY

The following energy laws are a few of the more important laws to be understood as applied to soft serve makers. It is not intended to be the last word on refrigeration, but it is intended to be a helpful reference.

1. Energy cannot be created nor destroyed, however its form can be changed and/or moved from place to place.
2. Energy always moves from hot to cold.
3. Anytime a fluid is boiled to a vapor it soaks up heat.
4. Anytime a vapor is condensed to a liquid it gives up heat. In SaniServ machines that fluid is R-404a..

**NOTE:** With respect to 3 and 4 above energy is moved by alternately boiling and condensing a fluid in a closed circuit.

5. Refrigerants correspond to pressure/temperature saturation as follows:

- A. Raise pressure, raise boiling point. (On the high pressure side of the system).
- B. Lower pressure, lower boiling point. (On the low pressure side of the system).

For Example: The boiling point of refrigerants commonly used in soft serve makers is as follows:

At Design Pressure for Soft Serve/Yogurt:

R-404A 21-23 p.s.i.g. Boils at approx: -10 degrees F.

At Design Pressure for Cocktail/Slush/Shake

R-404A 31-33 p.s.i.g. Boils at approx. 0 Degrees F.

### Refrigeration System Mode of Operation

Using the diagram provided (see schematic in this section) and the refrigeration laws above, trace the refrigerant flow through the closed circuit.

As the refrigerant exits the compressor it is a high pressure gas. The refrigerant then flows to the condenser. A condenser can be either air or water cooled. As the refrigerant passes through the condenser under high pressure the cool air or water contacts the refrigerant tubing. At this point three refrigeration laws come into effect:

1. If the pressure is raised the boiling point is raised. Since the refrigerant is hot and under high pressure it has a high boiling point. (Even though it is already a gas). Now that the refrigerant has contacted a cooler surface it will cool below the boiling point to condense into a liquid.
2. Anytime a fluid is condensed it gives up heat. (Heat given up to air or water). The condenser is designed to condense all the refrigerant to liquid by the end of its travel through the condenser.
3. As the refrigerant exits the condenser at room temperature liquid it continues on to the filter drier where any foreign particles and moisture in the system are trapped. At this point in the cycle the high pressure liquid refrigerant flows to the metering device. SaniServ utilizes two different metering devices on the bulk of its equipment.

### A.X.V. (Automatic Expansion Valve) 0-50 PISG adjustable with two separate bodies:

1/4" SAE flare x 3/8" SAE flare- Part Number 71035  
3/8" SAE flare x 1/2" SAE flare- Part Number 71402

Larger Batch Freezers use thermostatic valves. See Parts Breakdown in Section #10.

### CAPILLARY TUBE

Each of the above devices performs the same function yet they are different. The automatic expansion valve can be set to hold a constant pressure on its discharge side. It will correct itself in

# REFRIGERATION LAWS

## (Continued)

the event of changes in load or environment.

The capillary tube is a small ID tubing measured and cut to restrict the amount of liquid which can pass. Thus creating a pressure drop. After the high pressure refrigerant passes through a me-

If the pressure is lowered the boiling point is lowered. As the liquid refrigerant passes through the metering device the flow is greatly reduced. In addition the compressor is pulling vapor to itself which lowers the pressure and excites the liquid to boil.

Energy always moves from hot to cold. Refrigerant R-404a boils at 0 F when at 31 PSIG, which is the pressure of slush and shake machines. It boils at -10 F at 21 PSIG, which is the operating pressure for soft serve machines.

The refrigerant, now a low pressure liquid, enters the evaporator. As the refrigerant travels through the evaporator coil the mix which is initially 40 F. causes the refrigerant to boil.

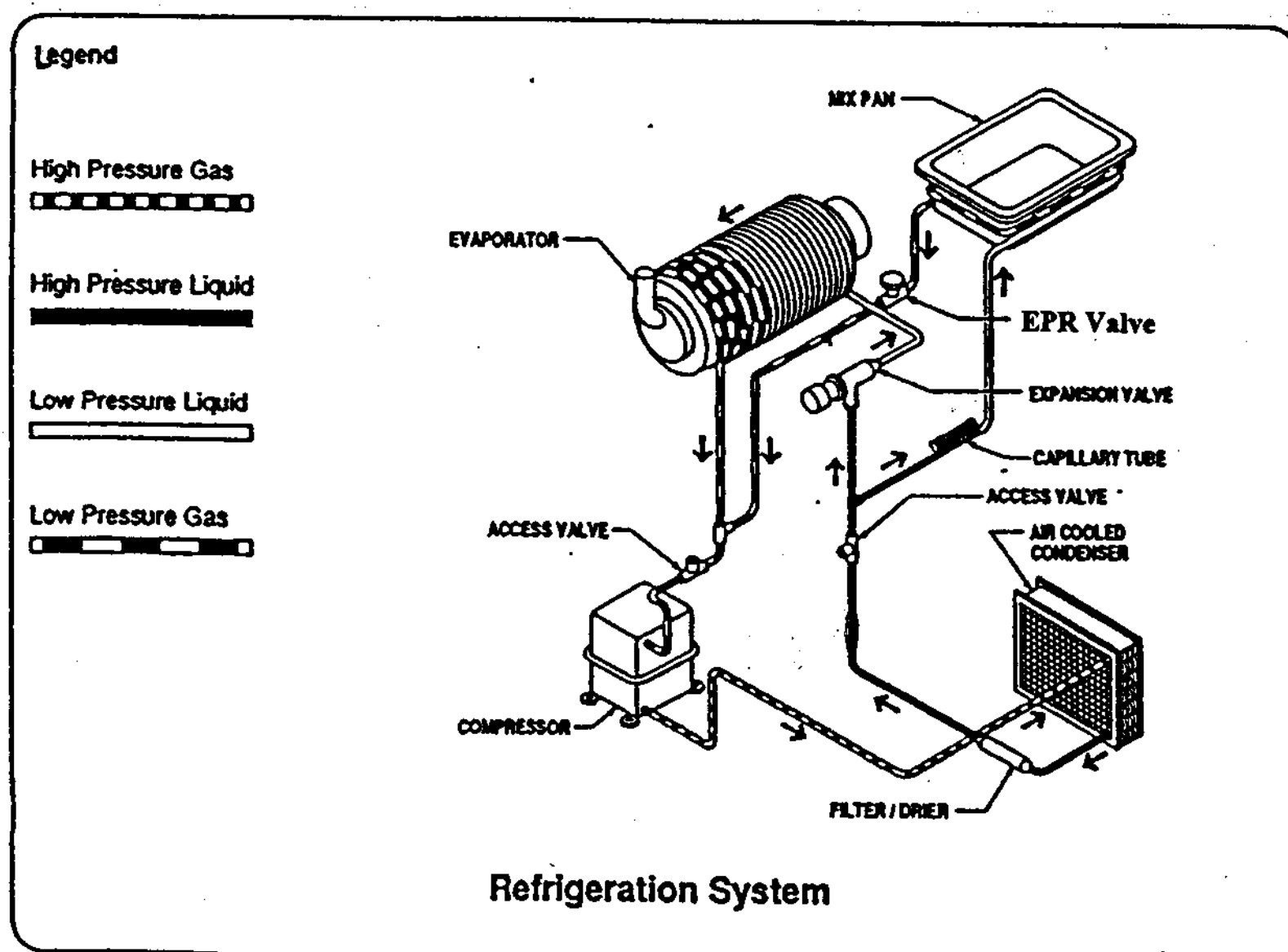
When a fluid boils it soaks up heat. Therefore, as the refrigerant passes through the evaporator the refrigerant boils, removing heat from the product. The evaporator is sized and designed to transfer enough heat to raise the temperature of the refrigerant greatly above the boiling point. This is referred to as "superheat." The refrigerant, now a gas, is drawn back to the compressor where the cycle is repeated until the product is at serving consistency.

## OTHER COMPONENTS:

Some of the components that are shown on the diagram, but are not discussed in the mode of operation are:

1. Access Valves: These valves allow direct access to the system for service.
2. Solenoid Valves: Open during compressor operation (see check valve) to direct fluid where needed and when needed and prevent flow at other times.
3. Check Valve: A valve that restricts refrigerant flow in one direction (used with solenoid valve). When the cooling cycle and the compressor stops this valve will prevent flow in the opposite direction.
4. Flow Control for the mix pan is an EPR (Evaporator Pressure Regulator).

EPR: Set at 62-67 PSIG for the R-404A systems. This valve maintains constant temperature in the mix pan while the system pressure may be varying.



TYPICAL HEAT LOAD DATA FOR  
SOFT SERVE MACHINES

AIR COOLED

A typical freezing cylinder has a cooling capacity of 9600 BTUH/hr and will reject approximately 12,500 BTU/hr into the restaurant. This heat load must be added to the restaurant's air conditioning load.

A typical dispensing machine has 2 freezing cylinders per machine and will reject 25,000 BTU/hr into the restaurant.

ADDITIONAL HEAT LOAD

| <u>Number of<br/>Machines</u> | <u>Additional<br/>Heat Load, BTUH</u> | <u>Additional<br/>Load, Tons</u> |
|-------------------------------|---------------------------------------|----------------------------------|
| 1                             | 25,000                                | 2.1                              |
| 2                             | 50,000                                | 4.2                              |
| 3                             | 75,000                                | 6.3                              |

WATER COOLED

This heat gain can be eliminated by using water cooled equipment. The 12,5000 BTU/hr of heat is absorbed by water flowing through a water cooled condenser. City water flows through the condenser and its temperature is raised by 20°F. The water is then dumped down the sewer.

Water required per cylinder is 1.25 gal/min.

Gallons per hour =  $1.25 \times 60 \text{ min} = 75$

Gallons per day (50% operation) =  $75 \times 12 \text{ hours} = 900$

Gallons per year =  $900 \times 365 = 328,500$

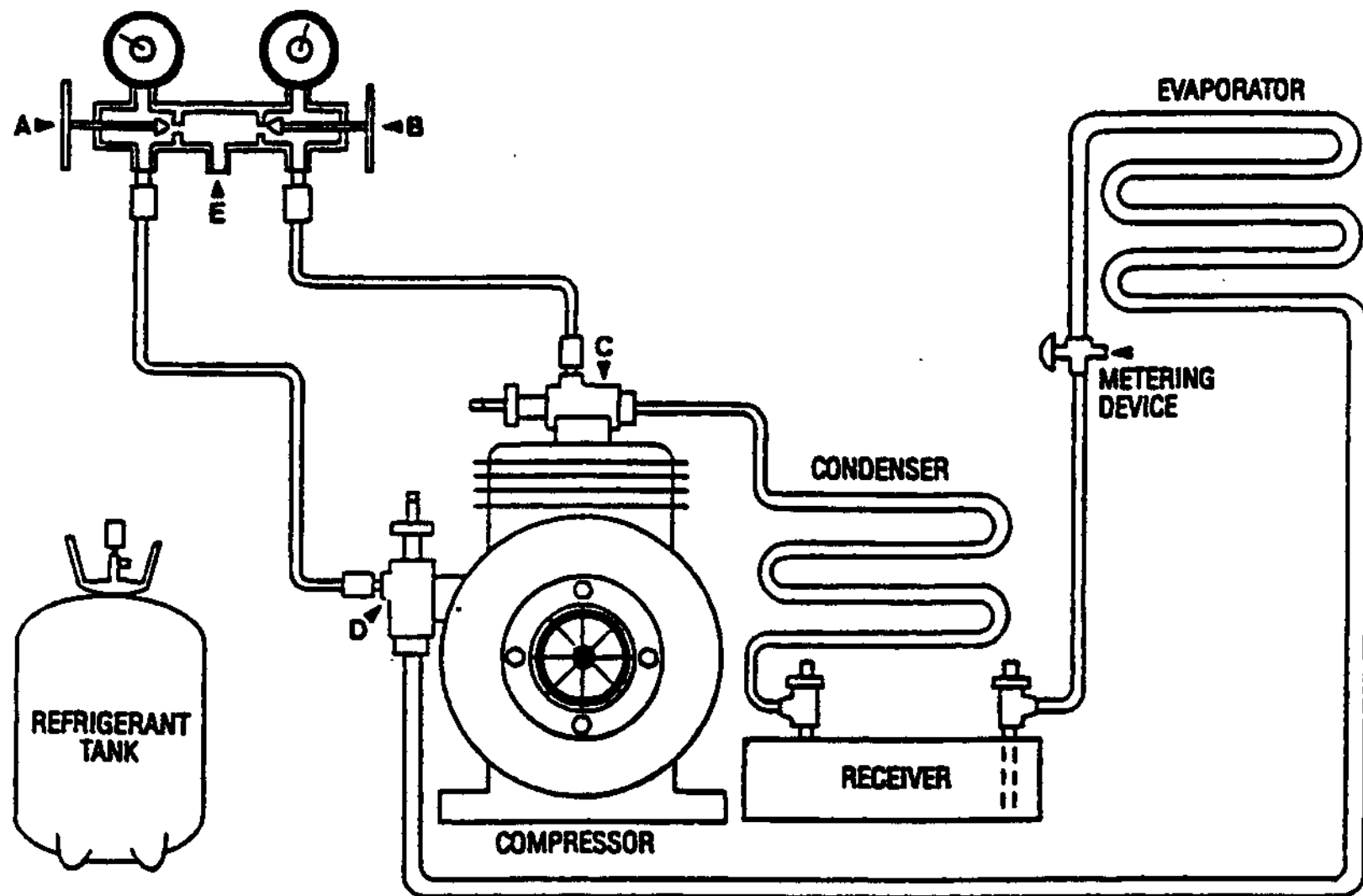
Gallons per machine =  $328,000 \times 2 \text{ cylinders} = 656,700$

# TESTING MANIFOLDS...

The Testing Manifold is a multi-purpose service tool which enables the serviceman to quickly diagnose problems in a refrigeration system, and, if indicated, to charge or purge refrigerant and add oil.

Now, for the first time, he can draw a vacuum on a system and break that vacuum with refrigerant without the risk of air and moisture re-entering the system! This bonus feature is made possible by the addition of a new evacuation flow valve which is operated by the depressor in the end of the charging hose.

Since the testing manifold allows the serviceman to watch both the suction and pressure gauges simultaneously, it saves considerable time on almost any service which must be performed on a refrigerating unit.



## 2. To Observe Operating Pressures

Valve A—Closed  
Valve B—Closed  
Valve C—Back seat cracked open  
Valve D—Back seat cracked open

## 3. To Charge Refrigerant Through Compressor

Connect Refrigerant Drum to E  
Valve A—Open  
Valve B—Closed  
Valve C—Back seat cracked open to monitor high side pressure  
Valve D—Closed and front seated to charge gas only.

## 4. To Purge Receiver

Connect Purge Line to E  
Valve A—Closed  
Valve B—Open  
Valve C—Back seat cracked open

## 1. To evacuate and charge unit

Valve A—Open  
Valve B—Open  
Valve C—Open, back-seated  
Valve D—Mid position

## To Charge Refrigerant Into High Side

Connect Refrigerant Drum to E  
Valve A—Closed  
Valve B—Open  
Valve C—Mid position

## 6. To Build Up Pressures in Low Side for Control Setting or to Test for Leaks

Seal E with Seal Cap  
Valve A—Open  
Valve B—Open  
Valve C—Back seat cracked open  
Valve D—Mid position

## To Charge Oil Through the Compressor

Connect Oil Supply to E  
Valve A—Open  
Valve B—Closed  
Valve C—Open, back-seated  
Valve D—Closed, front seated

## REFRIGERANT CHART

| MODEL                                                                                    | REFRIGERANT |       | PRESSURES (PSIG) |            |
|------------------------------------------------------------------------------------------|-------------|-------|------------------|------------|
|                                                                                          | TYPE        | AMT.  | SUCTION          | EPR        |
| <b>SOFT SERVE/YOGURT FREEZERS</b>                                                        |             |       |                  |            |
| 401                                                                                      | R-404a      | 30oz. | 21-23psig.       | 61-67psig. |
| 404                                                                                      | R-404a      | 42oz. | 21-23psig.       | 61-67psig. |
| 407                                                                                      | R-404a      | 11oz. | 21-23psig.       | 61-67psig. |
| 408                                                                                      | R-404a      | 30oz. | 21-23psig.       | 61-67psig. |
| 414                                                                                      | R-404a      | 42oz. | 21-23psig.       | 61-67psig. |
| 421                                                                                      | R-404a      | 30oz. | 21-23psig.       | 61-67psig. |
| 424                                                                                      | R-404a      | 42oz. | 21-23psig.       | 61-67psig. |
| <b>TWIST FREEZERS</b>                                                                    |             |       |                  |            |
| 501                                                                                      | R-404a      | 37oz. |                  | 61-67psig. |
| 522                                                                                      | R-404a      | 42oz. | 21-23psig.       | 61-67psig. |
| 527                                                                                      | R-404a      | 37oz. |                  | 61-67psig. |
| 501/527 SUCTION: One side running = 17psig per side.<br>Both sides running = 21-23 psig. |             |       |                  |            |
| <b>SHAKE FREEZERS</b>                                                                    |             |       |                  |            |
| 601                                                                                      | R-404a      | 30oz. | 30psig.          | 50psig.    |
| 601SAS                                                                                   | R-404a      | 30oz. | 30psig.          | 50psig.    |
| 614                                                                                      | R-404a      | 42oz. | 30psig.          | 50psig.    |
| 608                                                                                      | R-404a      | 30oz. | 30psig.          | 50psig.    |
| 611                                                                                      | R-404a      | 30oz. | 30psig.          | 50psig.    |
| 614SAS                                                                                   | R-404a      | 42oz. | 30psig.          | 50psig.    |
| 624                                                                                      | R-404a      | 42oz. | 30psig.          | 50psig.    |
| <b>SLUSH &amp; COCKTAIL FREEZERS</b>                                                     |             |       |                  |            |
| 108                                                                                      | R-404a      | 26oz. | 30-33psig.       | 61-67psig. |
| 401EL                                                                                    | R-404a      | 26oz. | 30-33psig.       | 61-67psig. |
| A704                                                                                     | R-404a      | 48oz. | 30-33psig.       | N/A        |
| W704                                                                                     | R-404a      | 40oz. | 30-33psig.       | N/A        |
| 707                                                                                      | R-404a      | 13oz. | 30-33psig.       | N/A        |
| 708                                                                                      | R-404a      | 26oz. | 30-33psig.       | N/A        |
| 709                                                                                      | R-404a      | 26oz. | 30-33psig.       | N/A        |
| 714                                                                                      | R-404a      | 42oz. | 30-33psig.       | N/A        |
| 724                                                                                      | R-404a      | 42oz. | 30-33psig.       | N/A        |
| 798                                                                                      | R-404a      | 18oz. |                  | 70psig.    |
| 798 SUCTION: One side running = 26-30psig.<br>Both sides running = 42-44 psig.           |             |       |                  |            |

**HIGH SIDE GAGE PRESSURE SHOULD CORRESPOND TO AMBIENT TEMPERATURE PLUS 32 DEGREES FAHRENHEIT.**

10/5/2004  
RJT

# COMPRESSORS

Jan -04

| COMPRESSORS |                                                   |                 |          |     |    |    |         |      |      |                |    |      |      |        |        |         |     |  |  |
|-------------|---------------------------------------------------|-----------------|----------|-----|----|----|---------|------|------|----------------|----|------|------|--------|--------|---------|-----|--|--|
|             |                                                   | STANDARD VOLT   |          |     |    |    |         |      |      | ALTERNATE VOLT |    |      |      |        |        |         |     |  |  |
|             | Stock #                                           | Manufacturer's  | MFG      | HP  | PH | HZ | VOLTS   | RLA  | LRA  | VOLTS          | HZ | RLA  | LRA  | BTU    | BTU    | MFD     | MFD |  |  |
|             |                                                   | Model Number    |          |     |    |    |         |      | SFA  |                |    |      | SFA  | 0 Deg  | Minus  | Start   | Run |  |  |
|             |                                                   |                 |          |     |    |    |         |      |      |                |    |      |      |        | 10 Deg | Cap     | Cap |  |  |
| 1           | 75736                                             | CS14K6E-PFV-230 | Copeland | 2   | 1  | 60 | 208/230 | 12.4 | 61   | 200            | 50 | 12.4 | 61   | 7940   | 5560   | 250     | 35  |  |  |
| 2           | 75741                                             | RS97C2E-TFC-214 | Copeland | 1   | 3  | 60 | 208/230 | 7    | 35   |                |    |      |      | 6370   | 4500   |         |     |  |  |
| 3           | 75742                                             | CS14K6E-TF5-230 | Copeland | 2   | 3  | 60 | 208/230 | 9.1  | 55   | 200/240        | 50 | 9.1  | 55   | 9370   | 6560   |         |     |  |  |
| 4           | 75743                                             | RS97C1E-CAZ-214 | Copeland | 1   | 1  | 50 | 220-240 | 8.86 | 36   |                |    |      |      | 5430   | 3840   | 88-106  | 30  |  |  |
| 5           | 75748                                             | CS14K6E-PFJ     | Copeland | 2   | 1  | 50 | 220-240 | 12.5 | 58   |                |    |      |      | 7940   | 5560   | 220     | 35  |  |  |
| 6           | 75753                                             | AJA7494ZXD      | Tecumseh | 1   | 1  | 60 | 208/230 | 8.9  | 54   |                |    |      |      | 6325   | 4450   |         |     |  |  |
| 7           | 75757                                             | AVA2490ZXT      | Tecumseh | 2   | 3  | 60 | 208/230 | 7.4  | 65.1 | 200/240        | 50 | 7.4  | 65.1 | 15,800 | 11,400 |         |     |  |  |
| 8           | 75758                                             | AVA2490ZNX      | Tecumseh | 2   | 1  | 60 | 200/230 | 11.4 | 106  | 200/240        | 50 | 11.4 | 106  | 15,850 | 11,400 |         |     |  |  |
| 9           | 75763                                             | RS64C1E-CAA-214 | Copeland | 1   | 1  | 60 | 115     | 15.2 | 59   |                |    |      |      | 4560   | 3380   | 75-86   | 30  |  |  |
| 10          | 75768                                             | NRD1-040E-CFB   | Copeland | 3   | 1  | 60 | 230     | 27.7 | 115  |                |    |      |      | 26300  | 20200  | 330     | 40  |  |  |
| 11          | 75769                                             | NRD1-032E-TFC   | Copeland | 3   | 3  | 60 | 230     | 16.3 | 82   | 200/220        | 50 | 16.3 | 82   | 27100  | 20700  |         |     |  |  |
| 13          | 75774                                             | NRD1-032E-TFD   | Copeland | 3   | 3  | 60 | 460     | 8.4  | 41   | 380/400        | 50 | 8.4  | 41   | 27100  | 20700  |         |     |  |  |
| 14          | 75794                                             | AKA9451ZXA      | Tecumseh | 1   | 1  | 60 | 115     | 9.4  | 50   | 100            | 50 | 9.4  | 50   | 3275   | NOTE   |         |     |  |  |
| 15          | 75827                                             | AFE13C3EIAA-201 | Copeland | 1/2 | 1  | 60 | 115     | 6.4  | 33   |                |    |      |      | 2300   | 1740   | 189-227 |     |  |  |
| 16          | 75837                                             | AFE13C3EIAV201  | Copeland | 1/2 | 1  | 60 | 208     | 4.2  | 21.7 |                |    |      |      | 2300   | 1740   |         |     |  |  |
| 17          | 75839                                             | RS55C2E-CAA-250 | Copeland | 3/4 | 1  | 60 | 115     | 13.2 | 60   |                |    |      |      | 3510   | 2510   | 189-227 | 25  |  |  |
|             |                                                   |                 |          |     |    |    |         |      |      |                |    |      |      |        |        |         |     |  |  |
|             | NOTE: This compressor doesn't operate at -10 deg. |                 |          |     |    |    |         |      |      |                |    |      |      |        |        |         |     |  |  |

| MODELS, COMPRESSORS |     |     |     |     |     |     |     |     |     |     |     |     |     |      |     |     |       |     |     |     |     |     |     |    |      |     |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-------|-----|-----|-----|-----|-----|-----|----|------|-----|
| VOLTAGE             | 407 | 408 | 401 | 404 | 414 | 424 | 501 | 527 | 522 | 601 | 608 | 614 | 624 | 7000 | 704 | 707 | 708   | 709 | 714 | 724 | 798 | 808 | 824 | B5 | B10  | B20 |
| 100/115-60-1        |     | 9   |     |     |     |     |     |     |     |     | 14  |     |     |      |     | 15  | 14,17 |     |     |     |     |     |     |    |      |     |
| 208/230-60-1        | 16  | 6   | 6   |     |     |     |     |     |     | 6   |     |     |     |      |     | 16  |       | 6   | 1   | 1   | 1   |     | 1   | 6  |      |     |
| 208/230-60-3        |     |     | 2   |     |     |     |     |     |     | 2   |     |     |     |      | 7   |     |       | 2   |     |     |     |     |     | 2  |      | 10  |
| 230-60-3            |     |     |     |     |     |     |     |     |     |     |     |     |     |      |     |     |       |     |     |     |     |     |     |    |      |     |
| 440-60-3            |     |     |     |     |     |     |     |     |     |     |     |     |     |      |     |     |       |     |     |     |     |     |     |    |      | 13  |
| 200/230-60/50-1     |     |     | 4   | 1,5 | 1,5 | 1,5 | 1   | 1,5 | 1   | 4   |     | 1,5 | 1   |      | 8   |     |       | 4   |     |     |     |     |     | 4  | 8,12 |     |
| 200/240-50/60-3     |     |     |     | 3   | 3   | 3   | 3   | 3   | 3   |     |     | 3   | 3   |      |     |     |       |     | 3   | 3   |     |     |     |    | 7    | 11  |

|                 |    | MODELS (COMPRESSORS) |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
|-----------------|----|----------------------|---------|---------|------------|-----------|------------|------------|---------|---------|---------|---------|---------|---------|---------|------------|------------|------------|-----------|---------|-----------|---------|---------|-----------|---------|---------|---------|---------|---------|---------|---------|------------|------------|---------|---------|---------|-----------|---------|---------|---|---|----|
| VOLTAGE         |    | 4070070              | 4071070 | 4075070 | 40800M0    | 40810M0   | 40110N0    | 40111N0    | 40130N0 | 40131N0 | 40150N0 | 40151N0 | 4041070 | 4041170 | 4043070 | 4043170    | 4045070    | 41410N0    | 41411N0   | 41430N0 | 41430N0-W | 41430N0 | 41450M0 | 42410M0   | 42411M0 | 42430M0 | 42431M0 | 42450M0 | 5011070 | 5011170 | 5013070 | 5013170    | 5015070    | 5271070 | 5271170 | 5273070 | 5273170   | 5275070 | 5275170 |   |   |    |
| 115-60-1        |    |                      |         |         | 9          | 6         | 6          | 6          |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 208/230-60-1    |    |                      | 16      | 16      |            | 6         |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 208/230-60-3    |    |                      |         |         |            |           |            |            | 2       | 2       |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 230-60-3        |    |                      |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 440-60-3        |    |                      |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 200/230-60/50-1 |    |                      |         |         |            |           |            |            |         |         | 4       | 4       | 1       | 1       |         |            | 5          | 1          | 1         |         |           |         | 5       | 1         | 1       |         |         |         | 5       | 1       | 1       |            |            | 1       | 1       | 1       |           |         | 5       | 5 |   |    |
| 200/240-60/50-3 |    |                      |         |         |            |           |            |            |         |         |         |         |         |         | 3       | 3          |            |            |           | 3       | 3         | 3       |         |           |         | 3       | 3       |         |         |         |         | 3          | 3          |         |         |         | 3         | 3       |         |   |   |    |
| VOLTAGE         |    | 5221070              | 5221170 | 5223070 | 5223170    | 5225070   | 6011075    | 6013075    | 60110M0 | 60111M0 | 60130M0 | 60131M0 | 60110M2 | 60130M2 | 60150M0 | 60800M0-AP | 60800M0-HE | 60801M0-HE | 60800M0-S | 61410M0 | 61411M0   | 61430M0 | 61431M0 | 6143075-P | 6141075 | 6143075 | 6145075 | 62410M0 | 62411M0 | 62430M0 | 62431M0 | 7000-STNLS | 7110-RF-02 | 7041051 | 7041151 | 7043051 | 7043051-F | 7041151 | 7043151 |   |   |    |
| 100/115-50/60-1 |    |                      |         |         |            |           |            |            |         |         |         |         |         |         |         | 14         | 14         | 14         | 14        |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 208/230-60-1    |    |                      |         |         |            |           | 6          |            | 6       | 6       |         |         | 6       |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 208/230-60-3    |    |                      |         |         |            |           |            | 2          |         |         | 2       |         |         | 2       |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         | 7         | 7       |         |   | 7 |    |
| 230-60-3        |    |                      |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 440-60-3        |    |                      |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 200/230-60/50-1 | 1  | 1                    |         |         | 1          |           |            |            |         |         |         |         |         |         | 4       |            |            |            |           | 1       | 1         |         |         |           | 1       |         | 5       | 1       | 1       |         |         |            |            | 8       | 8       |         |           |         | 8       |   |   |    |
| 200/240-50/60-3 |    |                      |         | 3       | 3          |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           | 3       | 3       | 3         |         | 3       |         |         |         | 3       | 3       |            |            |         |         |         |           |         |         |   |   |    |
| VOLTAGE         |    | 7070050              | 7071050 | 7075050 | 7070050-AP | 7080018-C | 7080020-HE | 7080140-HE | 7091040 | 7091140 | 7093040 | 7095040 | 7141040 | 7143040 | 7141140 | 7143140    | 7141045    | 7143045    | 7241020   | 7241120 | 7243020   | 7980010 | 7980015 | 82410M0   | 82430M2 | B5A162  | B5A362  | B5W362  | B5A15   | B10A16  | B10A36  | B10W16     | B10W36     | B10A152 | B20A16  | B20W16  | B20A36    | B20W36  | B20W353 |   |   |    |
| 100/115-50/60-1 | 15 |                      |         | 15      |            | 17        | 14         | 14         |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 208/230-60-1    |    |                      | 16      |         |            |           |            |            | 6       |         |         |         | 1       |         | 1       |            | 1          |            | 1         | 1       |           | 1       | 1       | 1         |         | 6       |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 208/230-60-3    |    |                      |         |         |            |           |            |            |         | 2       | 2       |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         | 2       | 2       |         |         |         |            |            |         |         |         | 10        | 10      |         |   |   |    |
| 230-60-3        |    |                      |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   |    |
| 440-60-3        |    |                      |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |   |   | 13 |
| 200/230-60/50-1 |    |                      |         |         |            |           |            |            |         |         |         | 4       |         | 4       |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         | 4       | 8       |            |            |         | 12      |         |           |         |         |   |   |    |
| 200/240-50/60-3 |    |                      |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            | 3          |           |         | 3         |         |         |           | 3       |         |         |         |         |         | 7       | 7          | 7          |         |         |         |           | 11      | 11      |   |   |    |

# SaniServ

## Service Bulletin

**SB082698**

Date: August 28,1998

To: All Distributors  
From: Eric Detty/Service Manager  
Subj: Compressor Retrofit

SaniServ has been notified by Bristol that they will no longer manufacture their R502 2 HP compressors. Therefore SaniServ has chosen to replace the compressors with Copelands 2 HP R404-A. Attached are instructions for field exchange of these compressors.

Parts required for this exchange are as follows:

**Original Compressor****Replacement Compressor**

75636 Bristol R502 1 phase

75736 Copeland R404-A 1 phase  
75740 Start Kit

75640 Bristol R502 3 phase

75742 Copeland R404-A 3 phase

Note: Both 1 and 3 phase Copeland compressors require 188434 retrofit kit which includes the warning label indicating conversion to R404-A. The warning label must be applied near the original data plate on the rear of the machine.

If you have any questions, please contact Eric at ex. 121

Thank You!

**SaniServ**

2020 Production Dr.  
Indianapolis IN  
46241-4325

317/247-0460  
Telex:276064  
FAX 317/247-5130

# **Instructions For Field Exchange of R502 2HP Bristol Compressors With R404a 2HP Copeland Compressors**

## **Kit Contents:**

| <b>Description</b>               | <b>SS P/N</b> | <b>Qty</b> | <b>Use</b>                      |
|----------------------------------|---------------|------------|---------------------------------|
| Label, Warning R404a             | 9705          | 1          | Apply beside or below dataplate |
| Instructions, R502 to R404a, 2HP | 82232         | 1          |                                 |
| Bolt, 1/4-20 x 2                 | 60179         | 1          | Drier clamp                     |
| Nut, 1/4-20                      | 60002         | 1          | Drier clamp                     |
| Bolt, 3/8-16 x 1-1/4             | 60153         | 1          | Hole where receiver was         |
| Nut, 3/8-16                      | 60011         | 1          | Hole where receiver was         |
| Washer, Lock, 3/8                | 60227         | 1          | Hole where receiver was         |
| Drier                            | 71010         | 1          | Replace drier                   |
| Bushing, Copper                  | 63109         | 1          | Into EI                         |
| EI, Street, 3/4                  | 63387         | 1          | Into compressor suction port    |
| Kit, Mounting                    | 75584         | 1          | Compressor mounting             |
| Bolts, 5/16-18 x 2               | 60042         | 4          | Compressor mounting             |
| Nuts, Flanged, 5/16-18           | 60014         | 4          | Compressor mounting             |

This guide details the exchange of a 3 phase 2 HP Bristol R502 compressor with a 3 phase 2 HP Copeland R404a compressor.

It is very important to follow the refrigerant purging instructions to minimize cross contamination of the refrigerants and residual oil.

Single phase units are replaced following these same instructions, but it is also necessary to replace the start components.

For twist machines with a single compressor, set the suction pressure on each side at 15 - 17 psig with only that side running. When both sides are running, the suction pressure should then read 21 - 25 psig. For machines with one compressor per evaporator, set the suction pressure at 21 - 25 psig.



**1. DISCONNECT POWER.**  
Remove side panels.



**2. Remove lower front panel.**



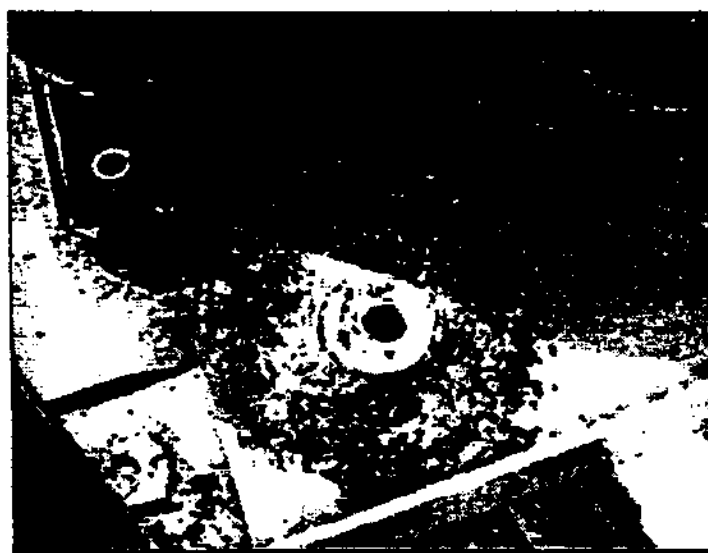
**3. Reclaim the R502 refrigerant,**  
cut the refrigeration lines and  
unbolt the compressor.



**4. Note the size difference between**  
the Bristol R502 compressor on the  
right and the Copeland R404a  
compressor on the left.



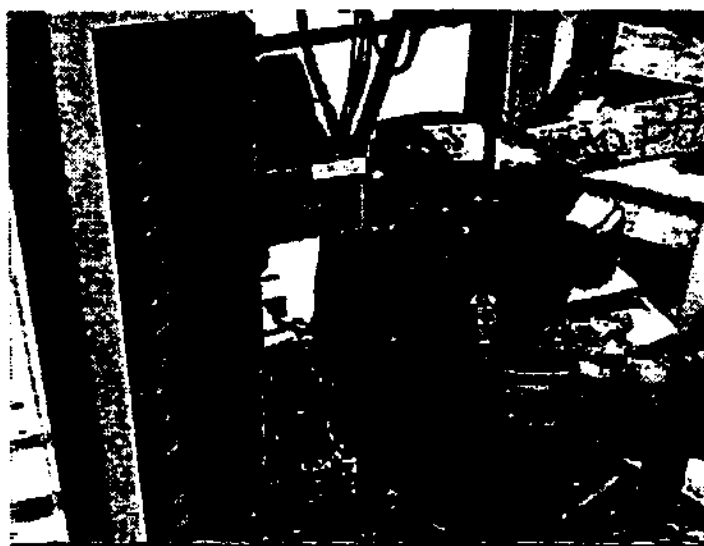
**5. Placement of the Copeland compressor**  
is blocked by the receiver.



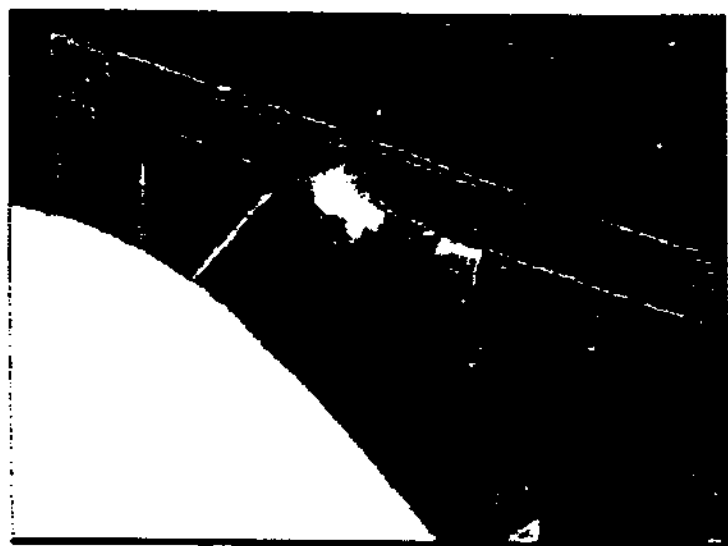
**6. Remove the receiver and fill the hole**  
in the bottom pan with the 3/8 bolt, nut  
and washer placing the washer inside.  
**THIS IS A UL SAFETY ISSUE!**



7. Remove the original filter drier.



8. Blow out the condenser from the top with dry Nitrogen until oil stops coming out. Repeat this operation with the expansion valve and evaporator - enter liquid line, exit suction line.



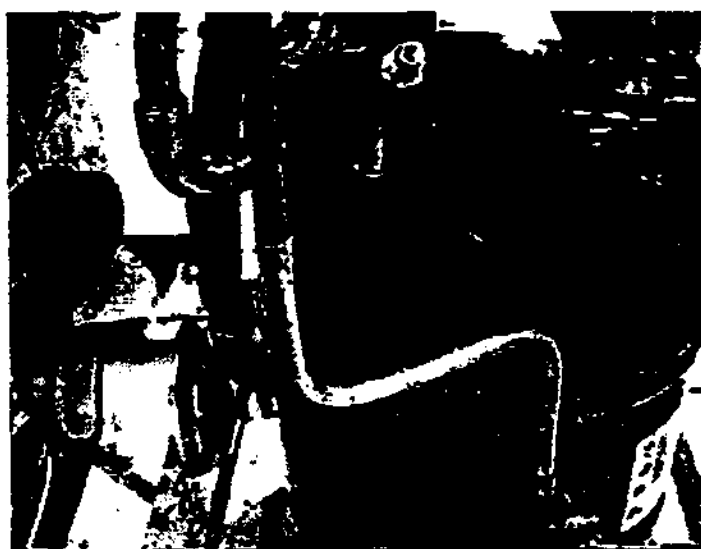
9. Install new filter drier. A new bolt and nut are included for the clamp.



10. Install the suction line bushing and elbow provided.



11. Complete the tubing of the compressor.



12. Install the compressor's Schrader valve, complete all refrigeration lines, pull a vacuum, recharge with 42 oz. of R404a, leak check and test performance.  
**APPLY WARNING LABEL**

Did You Place The  
R404a Warning Label  
Beside the Dataplate?

# WARNING

## R404a

This equipment has been field retrofitted  
with R404a refrigerant.

Refrigerant Charge: 42 oz.

Suction Pressure: 21 - 25 psig

**DRIVE SYSTEMS  
&  
DASHER MOTORS**

### Dasher Drive Systems

The dasher drive system is that part of the unit which turns the dasher; it consists mainly of the dasher motor, drive belt(s), pulleys and shafted bearing assembly. The following reference material will be helpful in explaining the components used to drive and control; the variation in equipment, and service information used to diagnose field related difficulty.

**Dasher Motors:** There are numerous motors and motor manufacturers used in this equipment.

1. Gravity fed soft serve freezers use motors ranging from 1/2 HP to 1 1/4 HP; however, the primary motor is 1 HP.
2. Gravity fed, shake and cocktail freezers use 1/2 HP, except the model 624; it uses 1 HP dasher motors.
3. Pressure fed soft serve freezer uses 2 HP dasher motors.
4. Batch freezers use motors ranging from 1 HP to 5 HP.

Refer to Service Bulletin 8720 for motor wiring. Most motors (1 phase) have an internal overload switch (auto reset).

**Torque Control:** Most of the soft serve, shake, and cocktail dispensers use an electromechanical torque control system.

**How it Works:** Refer to Torque System Diagram on the following page.

Facing the rear of the machine, the drive system rotates clockwise as shown.

The soft serve mix changes resistance against the dasher as it removes frozen product from the evaporator walls. This frozen product is incorporated with the remaining mix in the freezing chamber to produce the finished product.

As the product thickness increases, so does the amount of torque necessary to turn the dasher through the product. This increased resistance will straighten the drive belt between points A and D. The reaction of the torque arm is to move in the direction indicated by point C.

When the product reaches consistency, the system creates enough torque to move the torque arm out and deactivates the torque switch ending the freeze cycle, indicated by point B.

**Alignment:** It is very important that the pulleys be aligned properly. To check alignment, remove power from the unit, and rotate dasher pulleys a few revolutions in each direc-

tion. The belt should travel over torque and idler pulleys without any left to right, or right to left misalignment motion.

If idler pulleys require adjustment, it is necessary to reform the arm slightly with an adjustable wrench. If it is necessary to realign dasher or motor pulleys, be sure to place Loctite on the set screw afterwards. Be sure to tighten the key way set screw first and the set screw second.

**Maintenance and Adjustment:** Refer to Service Bulletin # 8606 in Section #8. In addition to the above, and while power is off, pull the torque arm until the torque switch is depressed, and you hear the audible "click". Release the arm and listen for the "click" back. Repeat this several times; be aware that if the switch action is not smooth and repetitive, the refrigeration may stay on or off.

The torque switch, which is mounted horizontally, should switch about midway in its travel.

#### Belts: Types and Use

**Ice Cream:** Soft ice cream makers primarily use multivée, 10 groove belts with the following exceptions:

- Model 407 uses a 6 groove belt.
- Model 921 uses a cogged belt.
- Batch freezers use both multivée and type "A" belts. Matched "A" belts should be purchased as a matched set.

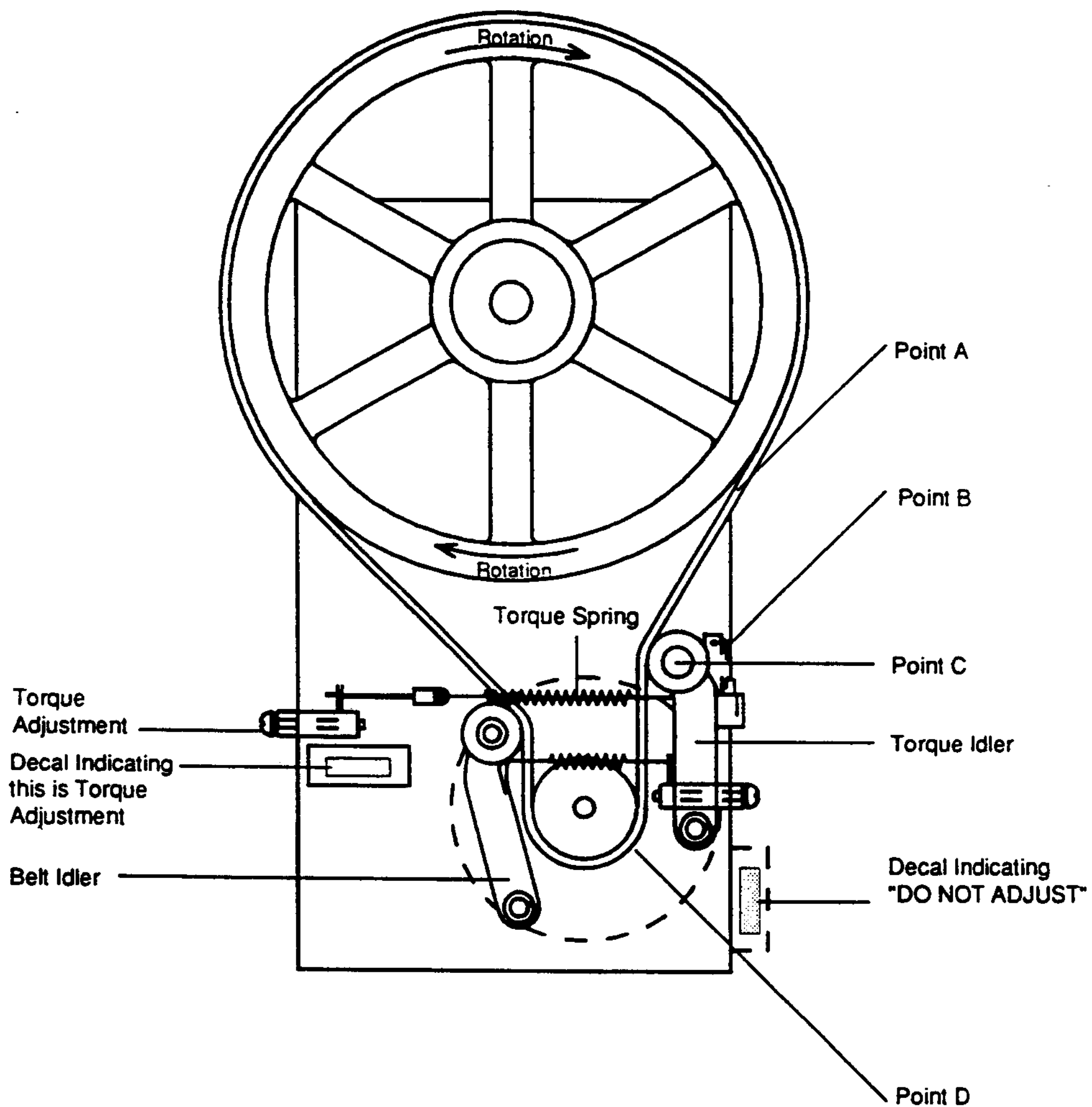
**Shake and Cocktail:** Shake and cocktail freezers primarily use multivée, 6 groove belts with the following exceptions: Model 621 and 624 use a 10 groove belt. Note: Refer to drive and belt guide for belt numbers.

#### Maintenance:

Belts should be inspected once per season. Any erosion of multivees, cracks or other deterioration is a good cause to change the belts.

Belt squeal may be the result of, or a combination of the following:

- Improper torque setting
- Torque or idler arm seized
- Electrical difficulty (torque switch, contactor, timer/relay circuit, AOC switch)
- Motor height/belt tension wrong
- Wrong belt



## Torque System

If the previous items are okay, then apply lava soap to the pulley side of the belt.

Multivee groove belts will deposit belt chards on the equipment base; this is normal, and may be observed within 15-30 minutes of operation.

### **Torque Control Components**

**Torque Arm:** Senses product thickness via the belt tension between the motor and drive pulleys.

**Idler Arms:** Takes up the slack on the belt as the torque arm moves from side to side with the changing thickness of the product. Spring tension and length differs from machine to machine depending on the application of the equipment. To identify the proper spring for the machine application, see Torque Control Spring Color Code and Suction Pressure Chart (P/N 81900) in Section #9 of this manual.

**Torque Switches:** The purpose of the torque switch is to signal the end of the freezing cycle. The torque switch (P/N 70008) can be utilized two ways.

1. **Horizontal Mount:** This application is seen on the diagram. In the horizontal application, the switch is wired normally closed. As the torque arm passes over the switch, the circuit is broken, ending the freezing cycle.
2. **Vertical Mount:** In the vertical application, the switch is wired normally open (held closed). As the torque increases due to product thickness, the torque arm moves out, opening the circuit, ending the freezing cycle.

**Note:** This type switch is also used in the spigot tower to start the machine during product demand.

**Pulley Alignment:** It is very important that the pulleys be aligned properly. To check alignment, remove power from the unit and rotate dasher pulleys a few revolutions in each direction. The belt should travel over torque and idler pulleys without any left to right or right to left misalignment motion.

If idler pulleys require adjustment, it is necessary to reform the arm slightly with an adjustable wrench.

If it is necessary to realign dasher or motor pulley, be sure to place "Loctite" on the set screw afterwards.

### **Maintenance and Adjustment**

Refer to Service Bulletin #SB8606 in Section #8 of this manual. In addition to the above, and while power is off, pull the torque arm until the torque switch is depressed and you will hear an audible "click". Release the arm and listen for the "click" back. Repeat this several times; be aware that if the switch action is not smooth and repetitive, the refrigeration may stay on or off. Check also the belt idler movement. It must move with the variation in spring pressure.

The torque switch, which is mounted horizontally, should switch about midway in its travel.

### **CAUTION**

**EXTREME CARE SHOULD BE EXERCISED TO KEEP HANDS AND TOOLS AWAY FROM MOVING PARTS.**

**Service Bulletin SB #8923**  
**September 14, 1989**  
**Subject: Torque Switch Maintenance & Repair**

The purpose of this service bulletin is to familiarize service personnel as to the following aspects of torque switch operation:

- W**hat the torque switch does.
- H**ow they are mounted.
- H**ow they are wired.
- H**ow the switch arms should be formed.
- H**ow they should be checked.

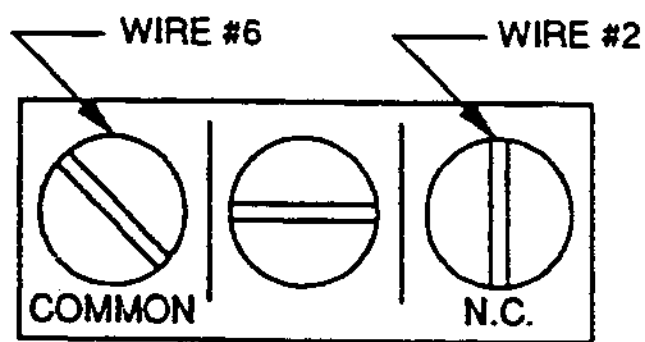
The torque switch's primary function is to shut off the machine when the product (ice cream, yogurt, shake, slush) reaches the proper consistency.

Torque switches are physically mounted with two screw fasteners, but more importantly, the switch bodies are mounted in two different ways:

### Vertically or Horizontally

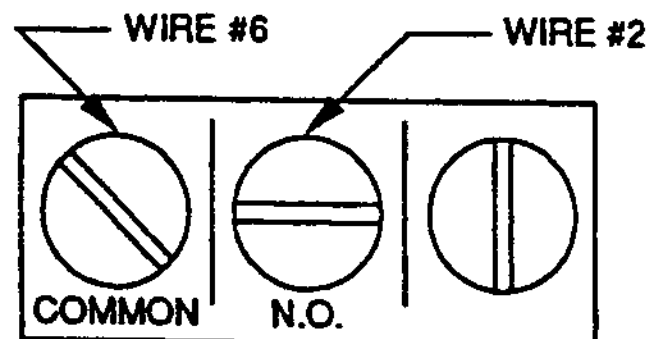
Because of this difference in the mounting of the switch body, the torque switches are wired differently as follows:

1. Horizontally Mounted: Wires connected as shown (Fig. 1).



**Fig. 1**  
Horizontal Mount

2. Vertically Mounted (Fig. 2).

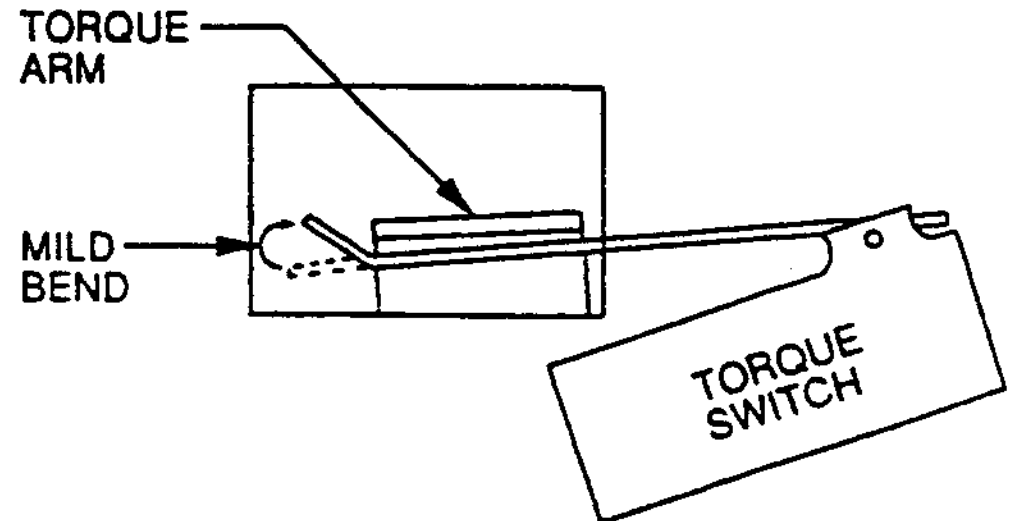


**Fig. 2**  
Horizontal Mount

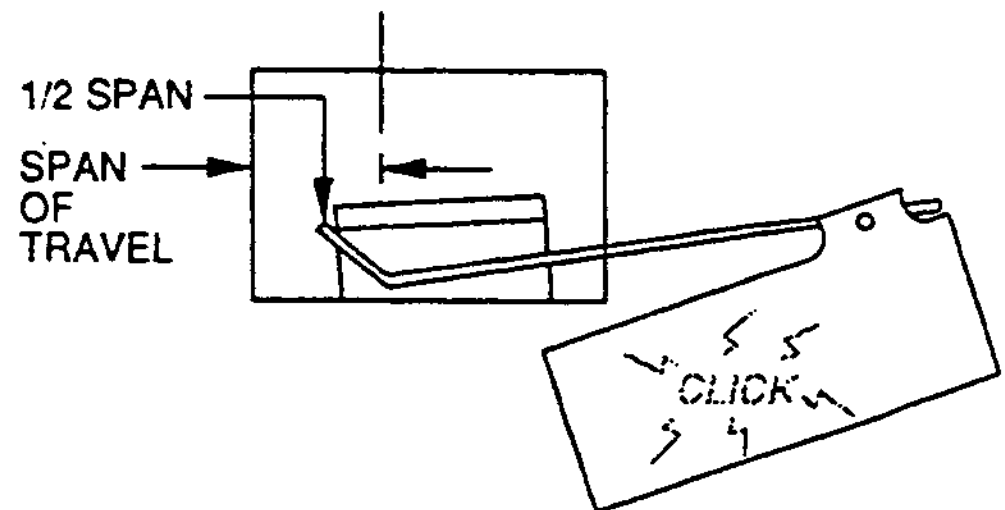
**Note:** This switch is held closed when in its normal position.

### Forming Torque Switch Arm

1. Horizontally Mounted Torque Switches:
  - a. Do not preform torque switch arm.
  - b. Mount torque switch in its screw mount.
  - c. Form a mild bend (Fig. 3) upwards over the torque arm.
  - d. The torque switch (Fig. 4) should "click" open approximately half way through the span of travel.

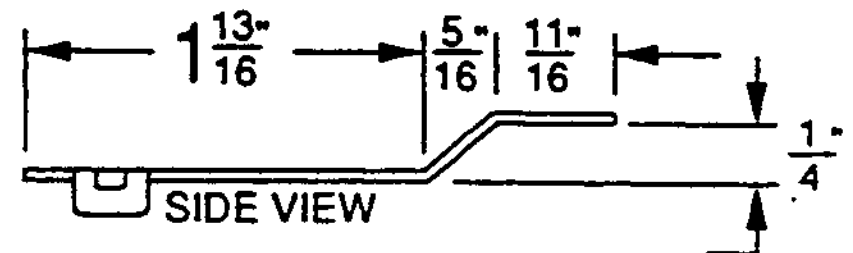


**Fig. 3**  
Forming Torque Switch Arm



**Fig. 4**  
Torque Arm Switching

2. Vertically Mounted Torque Switches (Fig. 5):



**Fig. 5**  
Vertically Mounted Torque Switch

Torque switches should be checked on all initial starts, PM programs, or any time service is rendered to the machine

The best method of checking the switches:

1. Shut off power to the unit.
2. Grasp the torque arm and pull it in the direction that would satisfy the switch.
3. Listen for the click of the torque switch as you pull and release the torque arm. It should switch both ways.
4. Pull and release several times while listening for the switch to click. If at any time you do not hear the switch click both ways, examine the switch arm, the torque arm, and the torque adjustment.

# Consistency Adjustment

400 & 600 SERIES

Your SaniServ unit is equipped with either an Electronic or Mechanical Consistency Control System. Use the following information that pertains to your particular machine to adjust the consistency of the product.



SEVERE  
ELECTRICAL  
SHOCK HAZARD



**WARNING**

USE EXTREME CAUTION. ELECTRICAL SHOCK HAZARD EXISTS EVEN WHEN THE UNIT IS IN THE "OFF" POSITION. DISCONNECT THE MACHINE FROM ALL OF ITS POWER SOURCES BEFORE PERFORMING ADJUSTMENTS ON THE MACHINE. PERSONAL INJURY OR DAMAGE TO THE MACHINE COULD RESULT IF THIS PRECAUTION IS NOT OBSERVED. ALL PANELS SHOULD BE REPLACED AND ALL POWER SOURCES SHOULD BE RESTORED BETWEEN EACH CONSISTENCY ADJUSTMENT.



HAND PINCH OR  
ENTRAPMENT  
HAZARD

## Mechanical Consistency Control System

Adjustments to the mechanical consistency control system can be made by the owner. Should any problems exist when making adjustments, however, it is strongly recommended that a serviceman trained on SaniServ equipment be contacted. **DO NOT** attempt to make repairs on the machine.

The mechanical control system is a very simple method of controlling the consistency of the finished product. The machine operates without a temperature control. Refrigeration is controlled by measuring the torque on the dasher motor and the consistency of the product. The tension of a spring against the torque idler determines how long the unit will run by activating a limit switch which turns the compressor on and off. The longer the compressor runs, the harder the product. The less it runs, the softer the product. This directly relates to product temperature.

Initial adjustments have been performed at the factory. However, to satisfy individual preferences, the following adjustments may be required:

1. Remove the right side panel as viewed from the front of the machine.
2. Using a regular straight screwdriver, turn the mechanical consistency or torque adjustment screw (Fig. 28) clockwise to make the product harder and counterclockwise to make the product softer. Do not adjust more than two turns each time. Do not attempt to adjust the belt idler screw on the left side of the machine marked "Do Not Adjust".



**WARNING**

EXTREME CARE SHOULD BE EXERCISED TO KEEP HANDS AND TOOLS AWAY FROM MOVING PARTS. PERSONAL INJURY COULD RESULT.

3. Replace panels, restore power, wait until the compressor cycles off, then check the consistency of the product.

4. Repeat steps 2 and 3 until the desired product consistency is obtained.

5. Install the right side panel, and the machine is ready for continuous operation.

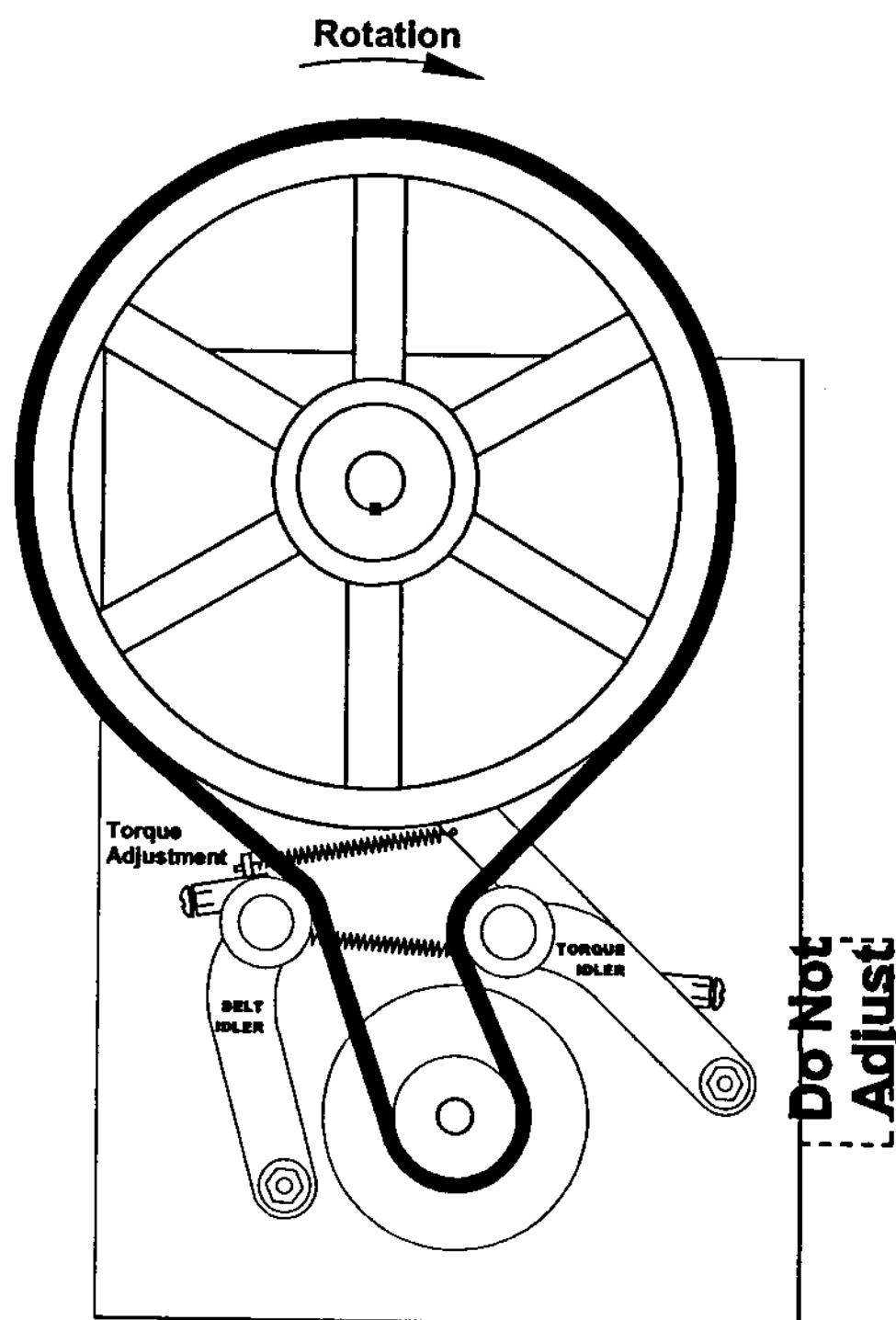


Fig. 28  
Mechanical  
Consistency Control

**NOTE:** If product does not freeze to a hard enough consistency, the problem may not be in the machine. To verify, use a standard thermometer to obtain the temperature of the product. The problem is **NOT** in the machine if the temperature is between 17° and 22° F. Check to see that the product mix was prepared to the manufacturer's recommendation.

# Electronic Consistency Control System 400 & 600 SERIES

Adjustments to the Electronic Consistency Control System can be made by the owner. Should any problems arise when making adjustments, SaniServ recommends that a serviceman trained on SaniServ equipment be contacted. **DO NOT** attempt to make repairs on the machine.

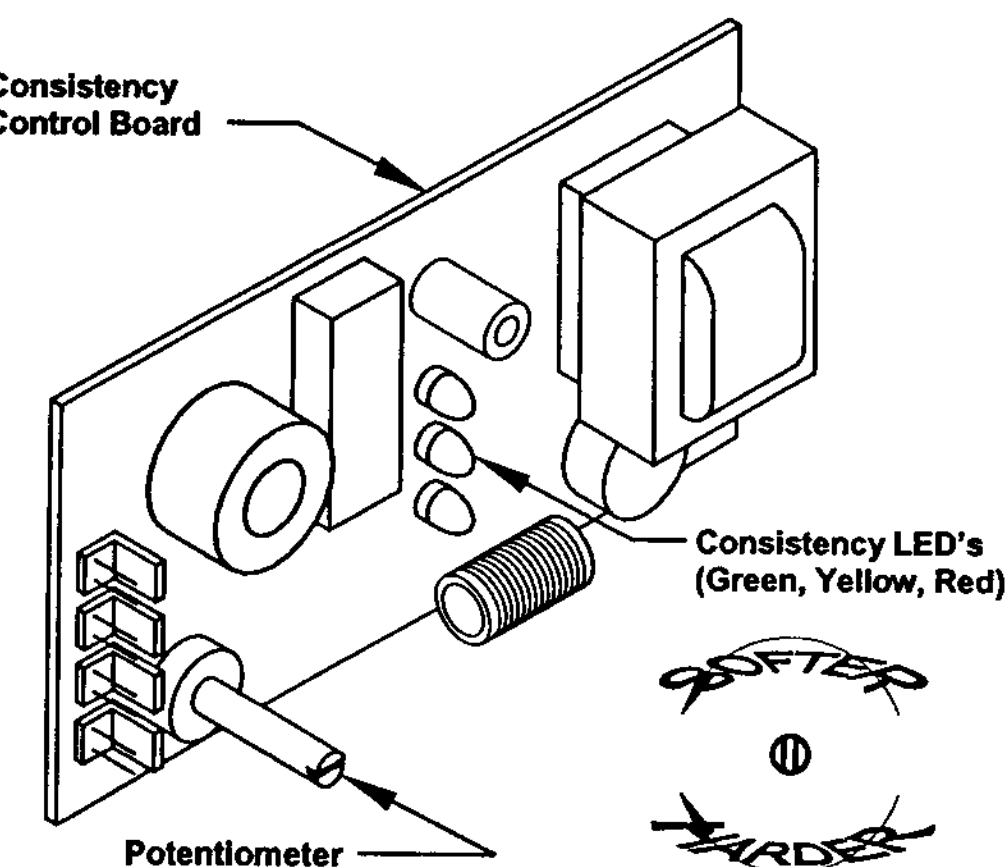


Initial adjustments have been performed at the factory. However, to satisfy individual preferences the following adjustments may be required:

## WARNING

**USE EXTREME CAUTION. ELECTRICAL SHOCK HAZARD EXISTS EVEN WHEN THE UNIT IS IN THE "OFF" POSITION. WHEN THE WIRING BOX COVER IS REMOVED, DO NOT TOUCH ANYTHING IN THE WIRING BOX EXCEPT THE POTENTIOMETER.**

1. Remove the wiring box cover (Exploded View).
2. Using a small slotted and insulated screwdriver, turn the potentiometer (Fig. 29) clockwise to make the product harder or counterclockwise to make the product softer. **Note: The potentiometer is very sensitive. Adjust in small increments.**
3. Set the control switch to the "AUTO" position. The unit will not operate if the mix pan is empty.



**Fig. 29**  
**Electronic Consistency Control**

4. Locate the three LED's - green, yellow, and red - Fig. 29. These are used as a reference point to adjust for proper consistency. Initially, all of the LED's are off. This indicates that the mix is too thin. The compressor will now come on.

5. Allow the unit to operate until the mix is the proper consistency then slowly adjust the potentiometer counter clockwise until the green LED turns on. As the mix reaches the proper consistency, the green, then the yellow, then the red LED will come on. Two seconds after the red LED is illuminated, the compressor will shut off.

## IMPORTANT

**IF UNDISTURBED, THE UNIT UPON INITIAL PULL DOWN WILL RUN 15 MINUTES MAXIMUM. IF THE UNIT SHUTS DOWN BUT THE LED'S DO NOT FUNCTION, THE CONSISTENCY IS NOT PROPERLY ADJUSTED.**

## Electronic Consistency Control Operation

1. **"CLEANOUT" Position:** The dasher motor operates continuously, the compressor will not come on. The mix out probe activates the mix out light but will not activate the buzzer.
2. **"AUTO" Position:** When product is dispensed, the dasher motor will automatically come on and the compressor will run as required by the consistency of the product. The machine will remain running until the product has reached proper consistency, at which time the dasher motor and compressor will stop running. If product has not been dispensed for approximately 10 minutes, the dasher motor will come on and the control board will sense the product consistency. The compressor will come on if required to maintain product consistency. If the product is correct, the dasher motor will stop.

When product mix is low in the mix pan, the "mix out" light will flash and the buzzer will beep for three minutes or until the mix pan is filled. If the pan has not been filled by the end of the three minute period, the mix out light will glow continuously, the beeping will become a continuous tone, and the machine will not dispense product until mix is added.

**NOTE:** If product does not freeze to a hard enough consistency, the problem may not be that of the machine. To verify, use a standard thermometer to obtain the temperature of the product.

The problem is not in your machine if the product temperature is between 17° and 22° F. Check to see that the product was prepared to the manufacturer's recommendations.

# Consistency Adjustment

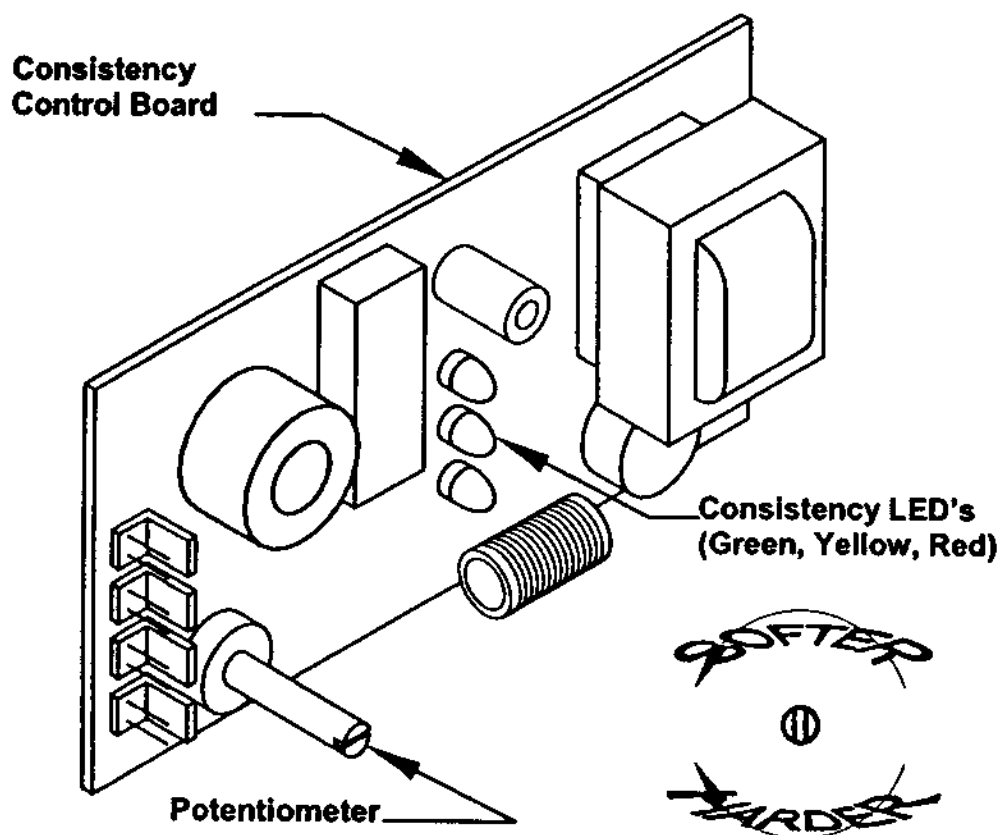
Adjustments to the Electronic Consistency Control System can be made by the owner. Should any problems arise when making adjustments, it is recommended that a serviceman trained on SaniServ equipment be contacted. **DO NOT** attempt to make repairs on the machine. Initial adjustments have been performed at the factory. However, to satisfy individual preferences, the following adjustments may be required:

## INITIAL SET-UP AND ADJUSTMENT

### WARNING

**USE EXTREME CAUTION. ELECTRICAL SHOCK HAZARD EXISTS EVEN WHEN THE UNIT IS IN THE "OFF" POSITION. DISCONNECT THE MACHINE FROM ITS POWER SOURCE - OR SOURCES ON SOME EQUIPMENT - BEFORE PERFORMING ANY MAINTENANCE ON THE UNIT. PERSONAL INJURY OR DAMAGE TO THE MACHINE COULD RESULT IF THIS PRECAUTION IS NOT OBSERVED.**

1. Remove the wiring box cover (Exploded View).
2. Using a small insulated flat bladed screwdriver, set the consistency controls (potentiometers) to the twelve o'clock position (Fig. 30). Turn the potentiometers either clockwise to make the product harder or counterclockwise to make the product softer. Restore power.
3. Set each control switch to the "AUTO" position. If the unit is equipped with the "RUN/STANDBY" switch option, set the "RUN/STANDBY" switches to "RUN". The unit will not operate if the mix pans are empty.
4. The three LED's (green, yellow, and red) in Fig. 30 are used as a reference point to adjust for proper consistency. Initially, all of the LED's are off. This indicates that the mix is too thin. The compressor will now come on.



**Fig. 30**  
**Consistency Control Board**

5. Allow the unit to operate until the mix is the proper consistency, then slowly and carefully adjust the control counterclockwise until the green LED turns on. As the mix reaches the proper consistency, the green, then the yellow, then the red LED will come on. Two seconds after the red LED is illuminated, the compressor will shut off. Replace the wiring box cover.

### IMPORTANT

**IF UNDISTURBED, THE UNIT UPON INITIAL PULL DOWN SHOULD RUN 15 MINUTES MAXIMUM. IF THE UNIT SHUTS DOWN BUT THE LED'S DO NOT FUNCTION, CALL FOR SERVICE.**

## ELECTRONIC CONSISTENCY CONTROL OPERATION

1. **"CLEANOUT" Position:** The dasher motor operates continuously, the compressor will not come on. The mix out probe activates the mix out light but will not activate the beeper.
2. **"AUTO" Position:** When product is dispensed, the dasher motor will automatically come "ON" and the compressor will run as required by the consistency of the product. The unit will remain running until the product has reached proper consistency, at which time the machine will automatically turn off. If product has not been dispensed for approximately 10 minutes, the machine will come on periodically to sense the product consistency and cycle off when the product is correct.

When product is low in the mix pan, the "mixout" light will flash and the beeper will sound for three minutes or until the mix pan is refilled. If the pan has not been refilled by the end of the three minute period, the mix out light will glow continuously, the beeping will become a continuous tone, and the machine will not dispense product until mix is added.

**Note:** If the product does not freeze to a hard enough consistency, the problem may not be with the machine. To verify, measure the temperature of the product. The problem is not in the machine if the product temperature is between 17 °F. and 22 °F. Prepare fresh product according to the manufacturer's recommendations.

# Consistency Adjustment

## FROZEN BEVERAGE

**WARNING:** Adjustments to mechanical and electronic consistency control systems should be made **ONLY** by trained service personnel. Power must be removed from the machine before panels (guards) or protective covers are removed. Once the panels (guards) are removed, an adjustment is made, protective panels (guards) are replaced, power is restored to the machine, and the consistency setting is tested. This process is repeated as necessary until the desired product consistency is obtained.

The mechanical control system is a very simple method of controlling the consistency of the finished product. The machine operates without a temperature control. Refrigeration is controlled by measuring the torque on the dasher motor and the consistency of the product. The tension of a spring against the torque idler determines how long the unit will run by activating a limit switch which turns the compressor on and off. The longer the compressor runs, the harder the product. The less it runs, the softer the product. Run time and belt tension directly relate to product temperature.

Initial adjustments have been performed at the factory. However, to satisfy individual product preferences, the following adjustments may be required:

1. Remove power, then remove the right side panel (guard) as viewed from the front of the machine.
2. Using a regular straight flat blade screwdriver, turn the mechanical consistency (torque adjustment) screw (Fig. 43) clockwise to make the product harder or counterclockwise to make the product softer. Do not adjust more than one turn each time.

### CAUTION

Do not attempt to adjust the belt idler screw (s) marked "Do Not Adjust".

### WARNING

**EXTREME CARE SHOULD BE EXERCISED TO KEEP HANDS AND TOOLS AWAY FROM MOVING PARTS. PERSONAL INJURY COULD RESULT.**

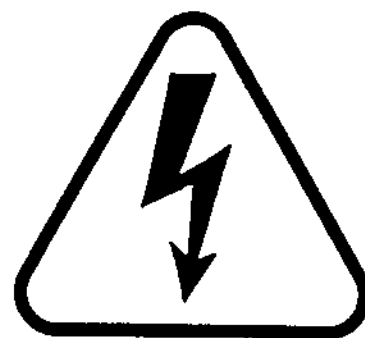
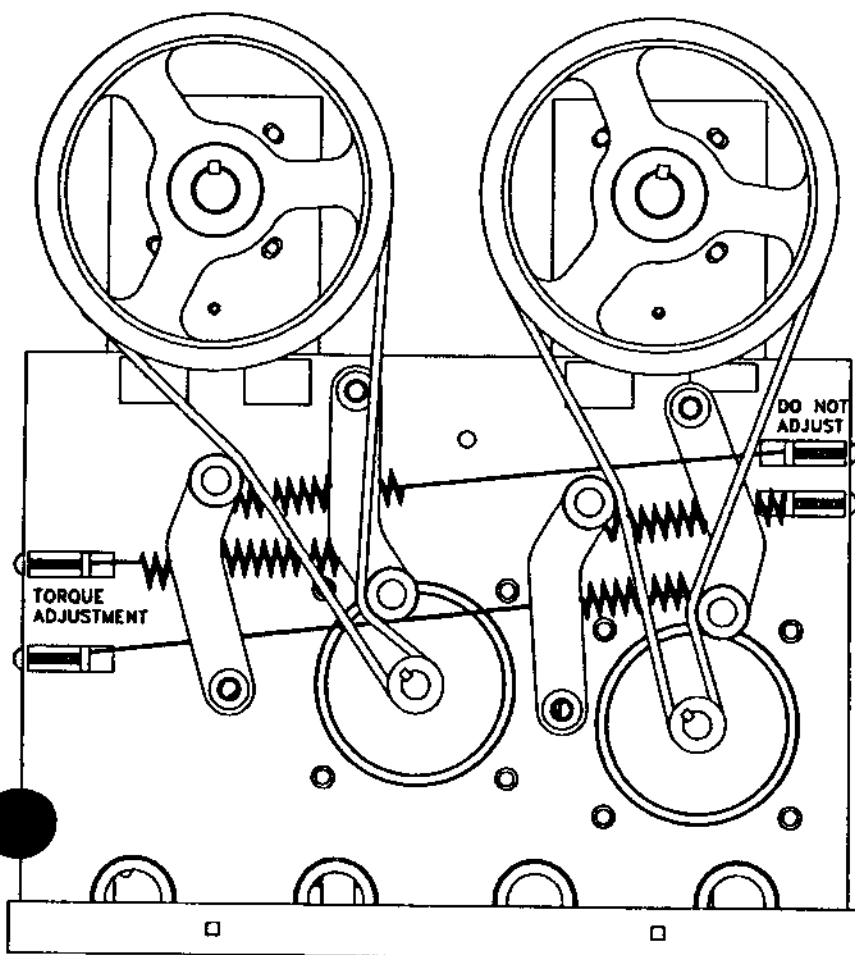
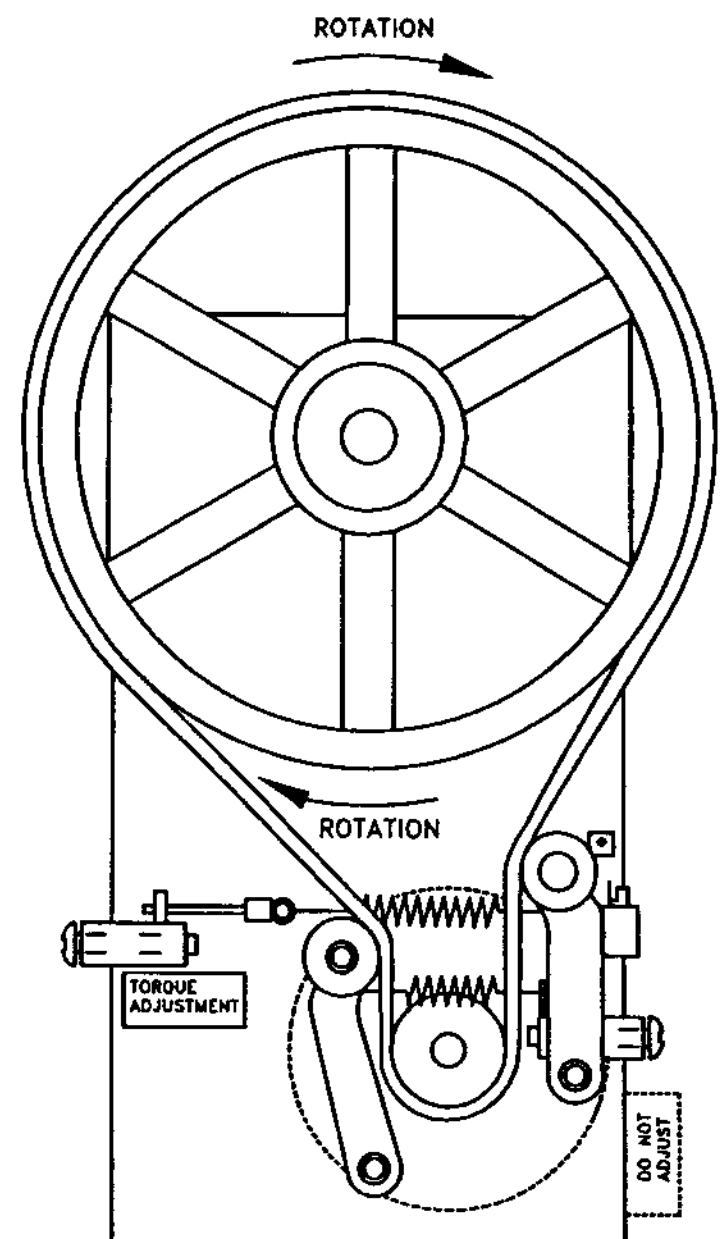


Fig. 43  
Mechanical Consistency Control

3. Replace the side panel (guard), restore power, and start the machine. Wait 10 - 15 minutes or until the compressor cycles off, then check the consistency of the product.
4. Repeat steps 1, 2 and 3 until the desired product consistency is obtained.

### IMPORTANT

**NOTE:** If product does not freeze to a hard enough consistency, the problem may not be in the machine. To verify, use a thermometer to measure the product temperature. The problem is **NOT** in the machine if the temperature of non-alcoholic product is between 26°F. and 28°F. (-3.3°C. and -2.2°C.). Product with alcohol is usually 19°F. to 22°F. (-7.2°C. to -5.6°C.). Make certain the product mix was prepared to the manufacturer's recommendation.



# Consistency Adjustment **FROZEN BEVERAGE**

FOR TWIN BARREL MACHINES FEATURING A SINGLE DASHER MOTOR AND A JACK SHAFT



**WARNING**

## DISCONNECT POWER BEFORE PROCEEDING

1. Remove the right side panel (guard) as viewed from the front of the machine.
2. Using a flat blade screwdriver, turn the mechanical consistency (torque adjustment) screw "A" in Fig. 46 counterclockwise to make the product softer and clockwise to make the product harder. Do not adjust more than one turn each time. Do not attempt to adjust the belt idler screws "B" in Fig. 46 on the left side of the machine as viewed from the front of the machine. These screws are marked "DO NOT ADJUST".

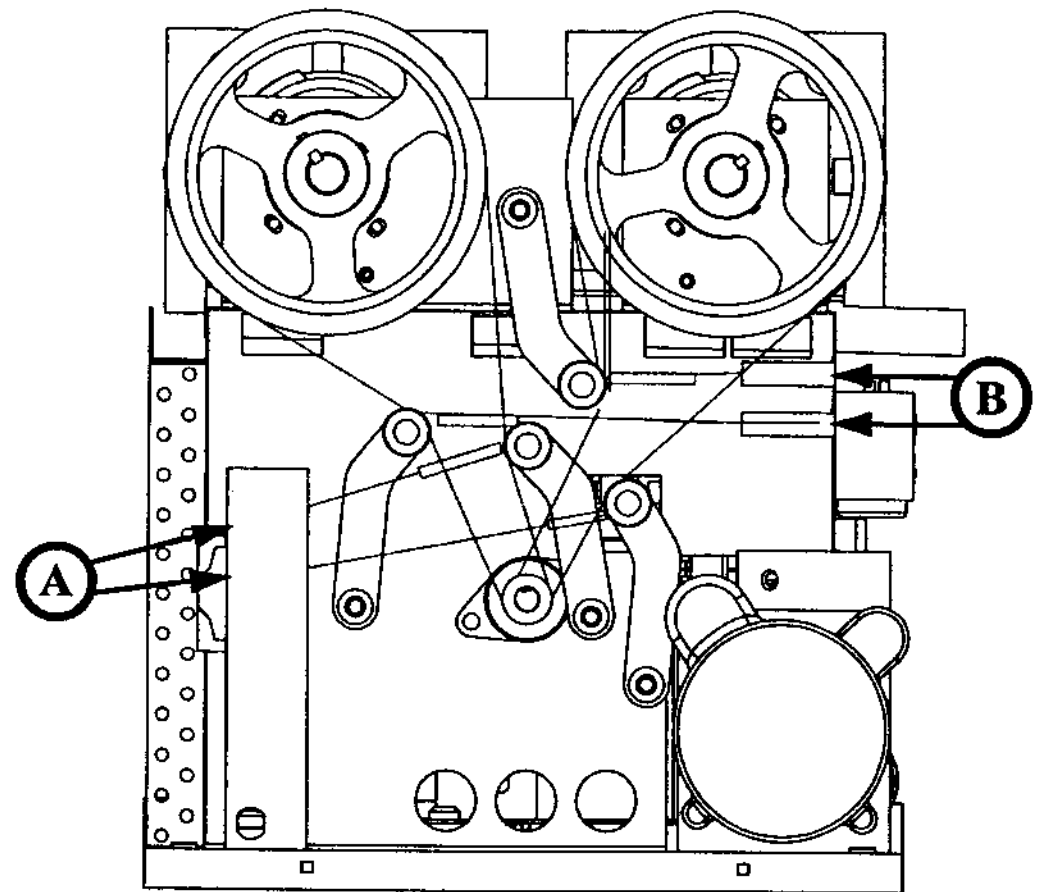


**WARNING**

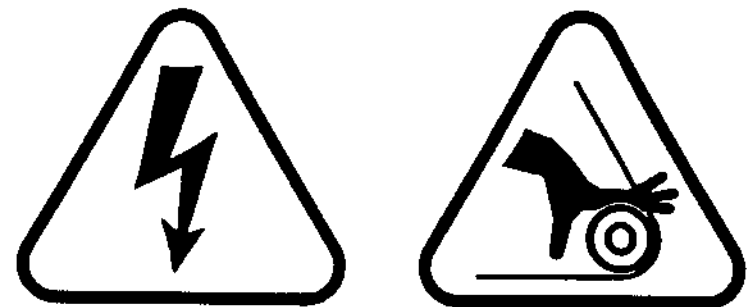
**EXTREME CARE SHOULD BE EXERCISED TO KEEP HANDS AND TOOLS AWAY FROM MOVING PARTS. PERSONAL INJURY COULD RESULT. NEVER MAKE ADJUSTMENTS TO THE MACHINE WHILE THE UNIT IS OPERATING.**

3. Replace the side panel (guard), restore power, turn on the machine and allow it to operate 10 - 15 minutes before checking the consistency of the slush.
4. Repeat steps 2 and 3 until the desired consistency is obtained.

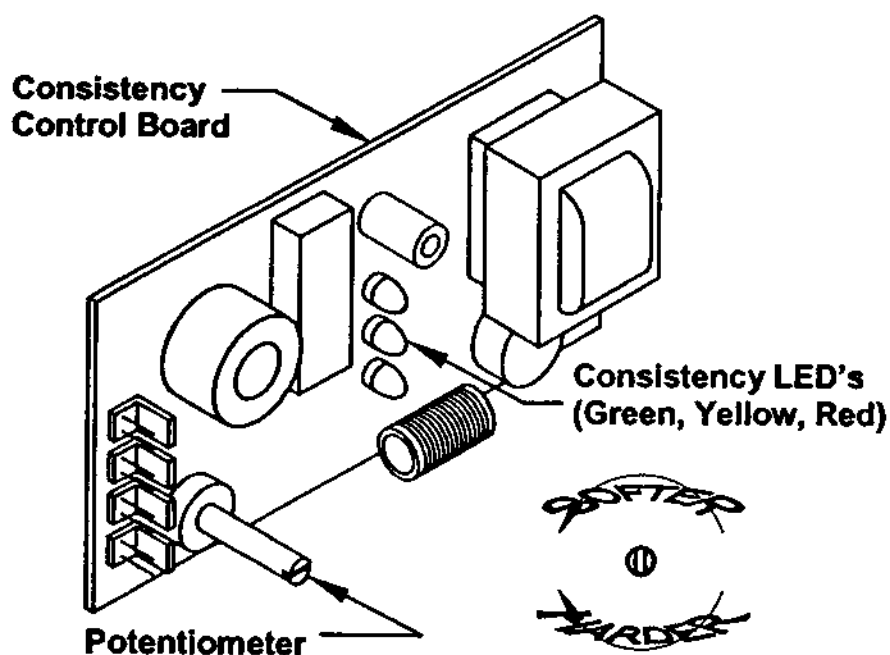
**Note:** When viewing the machine from the front, the top screw adjusts the right side, and the bottom screw adjusts the left side.



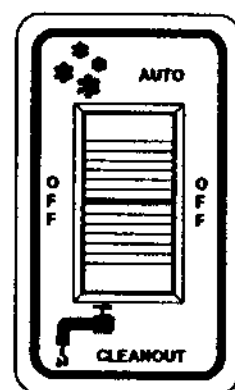
**Fig. 46**  
**Mechanical Consistency Control**



## MACHINES WITH ELECTRONIC CONSISTENCY CONTROL



**Fig. 45**  
**Electronic Consistency Control**



**Fig. 44**  
**Control Switch**

potentiometer clockwise for thicker product or turn it counterclockwise for thinner product.

2. Restore power to the unit and set the control switch (Fig. 44) to the "AUTO" position. The unit will not operate if the mix pan is empty.

3. The three LED's (green, yellow, and red) are used as reference points to adjust for proper consistency. Initially, all of the LED's are off. This indicates that the mix is too thin. The compressor will now come on.

4. Allow the unit to operate until the mix is of the proper consistency; then turn the consistency control potentiometer counter clockwise in very small increments - it is very sensitive - until the green LED turns on. As the mix reaches the proper consistency, the green, then the yellow, then the red LED will come on. Two seconds after the red LED is illuminated, the compressor will shut off.



1. **DISCONNECT THE POWER.** Remove the wiring box cover (Exploded View) and use a small slotted and insulated screwdriver to set the consistency control to the twelve o'clock position (Fig. 45). Turn the

# **SaniServ**

## **Service Bulletin**

**SB062698**

Date: June 26, 1998

To: All Distributors  
From: Eric Derry/Service Manager  
Subj: Belt Alignment

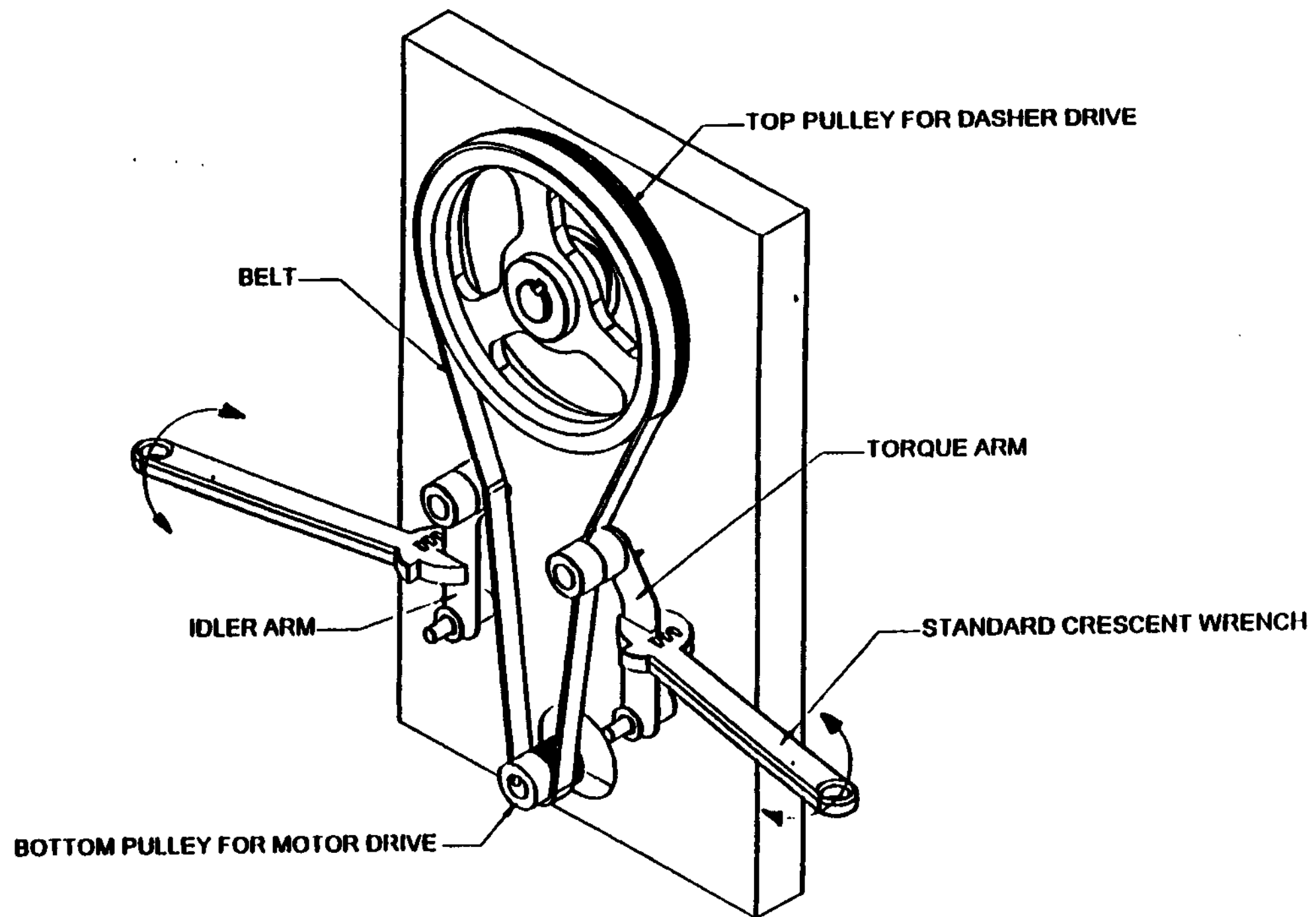
Distributors have ask how they can prolong belt life, prevent belt noise and prevent belts from coming off the pulleys. We often find this is a result of belt alignment. Below I have listed some simple steps to check or correct belt alignment.

1. First and foremost you must disconnect power to the machine.
2. With the side panels removed, take a straight edge and place it across the outside of the top and bottom pulley making sure the two pulleys are straight with each other. If the pulleys need adjusting you will have to loosen the allen set screws on the back side of the pulley. Note: Always reapply locktight to the threads of the allen set screws, we have found that these can back thread themselves during operation if locktight is not applied.
3. Rotate the top pulley a half a turn both clockwise and counter clockwise while watching the belt travel over the idler arm bearing and the torque arm bearing. If you find that the belt pushes in or away from the machine while rotating the pulley, then you must align that particular bearing.
4. To align torque and idler bearings, use a standard 8-12 inch crescent adjustable wrench and adjust the wrench so that it slides over the base of the torque and or idler arm. By moving the wrench left or right you can change the side to side angle of the bearing. By placing a screwdriver through the hole of the end of the adjustable wrench and twisting up and or down with the screw driver, you can change the up and down angle of the bearing. Do this in small increments, rotating the pulley after each adjustment and evaluate your progress. You may need to repeat this process several times.

The idea is so that when your rotating the top pulley clockwise or counter clockwise, the belt should not travel left or right on the torque arm bearing or the idler arm bearing, it should stay centered (run true). If you allow the belt to continue to travel left or right, it could prematurely wear the belt (create a lot of belt dust), it force the belt off, it could create belt noise and it could build up rubber on the torque or idler arm bearing. A good example of this would be like the alignment on your vehicle. If you notice the vehicle pulling to the left or right it more than like is related to the front end alignment. If this in not corrected it will tend to wear your tires.

4. The rear of the dasher motor will have a rubber saddle under for support and proper motor angle. The motor should be level (square) with the base of the machine.

Thank You!



# SaniServ

## DRIVE AND BELT GUIDE

| MODEL         | BELT # | QTY | MOTOR # | QTY |
|---------------|--------|-----|---------|-----|
| 108           | 58887  | 1   | 75699   | 1   |
| 401EL         | 58887  | 1   | 75272   | 1   |
| 401N          | 58880  | 1   | 75256   | 1   |
| 404N          | 58889  | 1   | 75256   | 1   |
| 407M          | 58888  | 1   | 75272   | 1   |
| 408M          | 58880  | 1   | 75320   | 1   |
| 414N          | 58880  | 1   | 75256   | 1   |
| 424M          | 58891  | 1   | 75682   | 1   |
| 501P          | 58891  | 2   | 75256   | 2   |
| 522P          | 58891  | 2   | 75256   | 2   |
| 527P          | 58852  | 2   | 75256   | 2   |
| 601           | 58887  | 1   | 75272   | 1   |
| 601 BK        | 58887  | 1   | 75272   | 1   |
| 601 SAS       | 58891  | 2   | 75682   | 2   |
| 608           | 58887  | 1   | 75699   | 1   |
| 608 AP        | 58887  | 1   | 75699   | 1   |
| 611           | 58887  | 1   | 75272   | 1   |
| 614           | 58887  | 1   | 75256   | 1   |
| 614 SAS       | 58887  | 1   | 75272   | 1   |
| 624           | 58891  | 2   | 75256   |     |
| WB700RF       | 58885  | 1   | 75272   | 1   |
| 704 / 704F    | 58887  | 1   | 75272   | 1   |
| 707           | 58887  | 1   | 75272   | 1   |
| 707 AP        | 58887  | 1   | 75272   | 1   |
| 709           | 58887  | 1   | 75272   | 1   |
| WB7110        | 58885  | 1   | 75272   | 1   |
| 714           | 58887  | 1   | 75272   | 1   |
| 724           | 58897  | 2   | 75272   | 2   |
| 798 / outback | 109076 | 2   | 75819   | 2   |
| 824           | 58891  | 2   | 75682   | 2   |
| B5            | 58891  | 1   | 75256   | 1   |
| B10           | 58855  | 2   | 75364   | 1   |
| B20           | 58848  | 3   | 75372   | 1   |
| CYCLONE       | n/a    | n/a | 75684   | 1   |
| GHZ114        | n/a    | n/a | 951023  | 1   |
| GZH228        | n/a    | n/a | 951023  | 2   |
| GZH342        | n/a    | n/a | 951023  | 3   |

NOTE: BK = BURGER KING  
 SAS= SELECT-A-SHAKE  
 AP = APPLEBEE'S

# SaniServ

## TORQUE AND IDLER SPRING CHART

| MODEL<br>SPRING | TORQUE<br>NUMER   | PART<br>SPRING | IDLER ARM<br>NUMBER | PART     |
|-----------------|-------------------|----------------|---------------------|----------|
| 108             | SILVER            | 64040          | BROWN               | 64515    |
| 401EL           | BLUE              | 64040-02       | BROWN               | 64515    |
| 401M            | N/A               | N/Z            | YELLOW              | 64504    |
| 404             | N/A               | N/A            | YELLOW              | 64504    |
| 407             | YELLOW            | 64504          | BROWN               | 64515    |
| 414             | N/A               | N/A            | YELLOW              | 64504    |
| 424             | YELLOW            | 64505          | BROWN               | 64515    |
| 501P            | N/A               | N/A            | YELLOW              | 64504    |
| 522P            | N/A               | N/A            | YELLOW              | 64504    |
| 527P            | N/A               | N/A            | YELLOW              | 64504    |
| 601             | BLUE              | 64040-02       | BLUE                | 64040-02 |
| 608             | BLUE              | 64040-02       | BLUE                | 64040-02 |
| 611             | BLUE              | 64040-02       | BLUE                | 64040-02 |
| 614             | BLUE              | 64040-02       | BLUE                | 64040-02 |
| 624             | BROWN             | 64515          | BROWN               | 64515    |
| WB700RF         | BROWN             | 64515          | BROWN               | 64515    |
| 704             | N/A               | N/A            | BROWN               | 64515    |
| 707             | BLUE              | 64040-02       | BROWN               | 64515    |
| 709             | BLUE              | 64040-02       | BROWN               | 64515    |
| WB7110          | BROWN             | 64515          | BROWN               | 64515    |
| 714             | BLUE              | 64040-02       | BROWN               | 64515    |
| 724             | SILVER            | 64040          | BLUE                | 64040-02 |
| 798             | BLUE              | 64040-02       | BLUE                | 64040-02 |
| 824             | LFT YLW / RT BRWN | 46504/64515    | BROWN               | 64515    |
| B5              | N/A               | N/A            | YELLOW              | 64504    |

**B10 /B20 NO SRINGS USED**

# MOTORS

Jan-04

| MOTORS |         |                             |                 |       |    |               |                                                                 |         |          |                |    |         |      |     |      |  |
|--------|---------|-----------------------------|-----------------|-------|----|---------------|-----------------------------------------------------------------|---------|----------|----------------|----|---------|------|-----|------|--|
|        |         |                             |                 |       |    | STANDARD VOLT |                                                                 |         |          | ALTERNATE VOLT |    |         |      |     |      |  |
|        | Stock # | Manufacturer's              | Manufacturer    | HP    | PH | RPM           | HZ                                                              | VOLTS   | FLA      | LRA            | HZ | VOLTS   | FLA  | LRA | S.F. |  |
|        |         | Model Number                |                 |       |    |               |                                                                 |         |          | SFA            |    |         |      | SFA |      |  |
|        |         |                             |                 |       |    |               |                                                                 |         |          |                |    |         |      |     |      |  |
| 1      | 75256   | 1101007455                  | Franklin        | 1     | 1  | 1725/1425     | 60                                                              | 115/230 | 12.8/6.4 | 13.8/6.9       | 50 | 208/230 | 7.6  | 8   | 1.15 |  |
| 2      | 75272   | 4101260400                  | Franklin        | 1/2   | 1  | 1725/1425     | 60                                                              | 115     | 6.8      | 8.2            | 50 | 208-240 | 3.4  | 4.1 | 1.25 |  |
| 3      | 75284   | 4301007407                  | Frank/ AO Smith | 1/2   | 3  | 1725/1425     | 60                                                              | 208-230 | 1.25     | 2.3            | 50 | 208-230 | 1.25 | 2.3 | 1.25 |  |
| 4      | 75337   | 1201340400                  | Franklin        | 1     | 1  | 950           | 50                                                              | 220     |          |                |    |         |      |     |      |  |
| 5      | 75339   | 410505400                   | Franklin        | 1     | 1  | 1725          | 60                                                              | 100     | 8.5      | 9.7            |    |         |      |     | 1.25 |  |
| 6      | 75371   | *M3704                      | Baldor          | 3     | 3  | 1140          | 60                                                              | 208-230 | 9.6      |                |    | 460     | 4.8  |     | 1.15 |  |
| 7      | #75364  | L3706                       | Baldor          | 3     | 1  | 1140          | 60                                                              | 115     | 29       |                |    | 230     | 14.5 |     | 1.00 |  |
| 8      | 75382   | 1101007405                  | Franklin        | 1/2   | 1  | 1140/950      | 60                                                              | 115     | 8.6      | 10.2           | 50 | 220-240 | 4.3  | 5.1 | 1.15 |  |
| 9      | 75399   | L3609T                      | Baldor          | 3     | 1  | 1725          | 60                                                              | 115     | 28       |                |    | 230     | 14   |     | 1.00 |  |
| 10     | 75579   | 1302330102                  | Franklin        | 1     | 3  | 1140/950      | 60                                                              | 208-230 | 3.8      |                |    | 460     | 1.9  |     | 1.15 |  |
| 11     | 75624   | *M3708T-M15B                | Baldor          | 3     | 3  | 1140          | 60                                                              | 208-230 | 16.2     |                | 50 | 460     | 8.1  |     | 1.15 |  |
| 12     | 75641   | 1301007120                  | Franklin        | 1     | 3  | 1725/1425     | 60                                                              | 208-230 | 1.8      | 3.2            | 50 | 380-460 | 1.6  | 3.2 | 1.15 |  |
| 13     | 75682   | 1201730400                  | Franklin        | 1 1/4 | 1  | 1140          | 60                                                              | 208-230 | 8.9      | 9.4            |    |         |      |     | 1.15 |  |
| 14     | 75699   | 4201007401                  | Franklin        | 1/2   | 1  | 1725/1425     | 60                                                              | 115     | 4.8      | 6              | 50 | 208-240 | 2.4  | 3   | 1.25 |  |
| 15     | 75819   | 4501007426                  | Franklin        | 1/4   | 1  | 1075          | 60                                                              | 115     | 2.6      | 3.2            |    | 208-230 | 1.3  | 1.6 | 1.35 |  |
|        |         |                             |                 |       |    |               |                                                                 |         |          |                |    |         |      |     |      |  |
|        |         | * MOTORS NOT FOUND IN STOCK |                 |       |    |               | NOTE: Locked rotor amps not generally available. Service Factor |         |          |                |    |         |      |     |      |  |
|        |         | # Same as 75372             |                 |       |    |               | Amps are used on most motors.                                   |         |          |                |    |         |      |     |      |  |

| MODELS (MOTORS) |    |    |     |     |     |     |     |     |     |     |     |     |     |      |     |      |     |     |     |     |     |     |     |     |     |    |     |        |
|-----------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|--------|
| VOLTAGE         | PH | HZ | 407 | 408 | 401 | 404 | 414 | 424 | 501 | 527 | 522 | 601 | 608 | 614  | 624 | 7000 | 704 | 707 | 708 | 709 | 714 | 724 | 798 | 808 | 824 | B5 | B10 | B20    |
| 100             | 1  | 50 |     |     |     |     |     |     |     |     |     |     |     |      |     |      |     |     |     |     |     |     |     |     |     |    |     |        |
| 115             | 1  | 60 | 2   | 1   | 1   | 1   | 1   |     | 1   | 1   | 1   | 2   | 14  | 1,2  | 1   | 2    | 2   | 2   | 14  | 2   | 2   | 2   | 15  | 8   |     | 1  |     |        |
| 230             | 1  | 60 | 2   | 1   | 1   | 1   | 1   |     | 1   | 1   | 1   | 2   |     | 1,2  | 1   | 2    | 2   | 2   |     | 2   | 2   | 2   |     |     |     | 1  |     |        |
| 208/230         | 1  | 60 |     |     |     |     |     | 13  |     |     |     |     | 14  |      |     |      |     |     | 14  |     |     |     | 15  | 8   | 13  |    |     |        |
| 220/240         | 1  | 50 | 2   | 1   | 1   | 1   | 1   | 4   | 1   | 1   | 1   | 2   | 14  | 1,2  | 1   | 2    | 2   | 2   | 14  | 2   | 2   | 2   |     | 8   |     | 1  |     |        |
| 460             | 3  | 60 |     |     | 12  | 12  | 12  | 10  | 12  | 12  | 12  |     |     | 12   | 12  |      |     |     |     |     |     |     |     |     | 10  | 12 | 6,7 | 6,7,11 |
| 208/230         | 3  | 60 |     |     | 12  | 12  | 12  | 10  | 12  | 12  | 12  | 3   |     | 3,12 | 12  |      |     |     |     | 3   | 3   |     |     |     | 10  | 12 | 6,7 | 6,7,11 |

|                 |   | MODELS (MOTORS) |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
|-----------------|---|-----------------|---------|---------|------------|-----------|------------|------------|---------|---------|---------|---------|---------|---------|---------|------------|------------|------------|-----------|---------|-----------|---------|---------|-----------|---------|---------|---------|---------|---------|---------|---------|------------|------------|---------|---------|---------|-----------|---------|---------|----|--|---|--|
| VOLTAGE         |   | 4070070         | 4071070 | 4075070 | 40800M0    | 40810M0   | 40110N0    | 40111N0    | 40130N0 | 40131N0 | 40150N0 | 40151N0 | 4041070 | 4041170 | 4043070 | 4043170    | 4045070    | 41410N0    | 41411N0   | 41430N0 | 41430N0-W | 41431N0 | 41450N0 | 42410M0   | 42411M0 | 42430M0 | 42431M0 | 42450M0 | 5011070 | 5011170 | 5013070 | 5013170    | 5015070    | 5271070 | 5271170 | 5273070 | 5273170   | 5275070 | 5275170 |    |  |   |  |
| 100-1-50        |   |                 |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 115-1-60        | 2 |                 |         |         | 1          | 1         |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 230-1-60        |   | 2               |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 208/230-60-1    |   |                 |         |         |            |           | 1          | 1          |         |         |         |         | 1       | 1       |         |            |            | 1          | 1         |         |           |         |         | 13        | 13      |         |         |         |         |         |         |            |            | 1       | 1       |         |           |         |         |    |  |   |  |
| 220/240-50-1    |   |                 |         | 2       |            |           |            |            |         |         | 1       | 1       |         |         |         |            | 1          |            |           |         |           |         | 1       |           |         |         |         |         | 4       | 1       | 1       |            |            | 1       |         |         |           |         | 1       | 1  |  |   |  |
| 460-3-60        |   |                 |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 208/230-50/60-3 |   |                 |         |         |            |           |            |            | 12      | 12      |         |         |         |         | 12      | 12         |            |            |           | 12      | 12        | 12      |         |           |         | 10      | 10      |         |         |         |         | 12         | 12         |         |         |         |           | 12      | 12      |    |  |   |  |
|                 |   | 5221070         | 5221170 | 5223070 | 5223170    | 5225070   | 6011075    | 6013075    | 60110M0 | 60111M0 | 60130M0 | 60131M0 | 60110M2 | 60130M2 | 60150M0 | 60800M0-AP | 60800M0-HE | 60801M0-HE | 60800M0-S | 61410M0 | 61411M0   | 61430M0 | 61431M0 | 6143075-P | 6141075 | 6143075 | 6145075 | 62410M0 | 62411M0 | 62430M0 | 62431M0 | 7000-STNLS | 7110-RF-02 | 7041051 | 7041151 | 7043051 | 7043051-F | 7041151 | 7043151 |    |  |   |  |
| 100-1-50        |   |                 |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 115-1-60        |   |                 |         |         |            |           |            |            |         |         |         |         |         |         |         | 13         | 13         | 13         | 13        |         |           |         |         |           |         |         |         |         |         |         |         | 2          | 2          |         |         |         |           |         |         |    |  |   |  |
| 230-1-60        |   |                 |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 208/230-60-1    | 1 | 1               |         |         |            |           | 2          | 3          | 2       | 2       | 3       |         | 2       | 3       | 2       |            |            |            |           | 1       | 1         |         |         |           | 2       |         |         | 1       | 1       |         |         |            |            | 2       | 2       |         |           |         | 2       |    |  |   |  |
| 220/240-50-1    |   |                 |         |         |            | 1         |            |            |         |         |         | 2       |         |         |         |            |            |            |           |         |           |         |         |           |         |         | 2       |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 460-3-60        |   |                 |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 208/230-50/60-3 |   |                 |         | 12      | 12         |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           | 12      | 12      | 3         |         | 3       |         |         |         |         | 12      | 12         |            |         |         |         |           | 2       | 2       |    |  | 2 |  |
| VOLTAGE         |   | 7070050         | 7071050 | 7075050 | 7070050-AP | 7080018-C | 7080020-HE | 7080140-HE | 7091040 | 7091140 | 7093040 | 7095040 | 7141040 | 7143040 | 7141140 | 7143140    | 7141045    | 7143045    | 7241020   | 7241120 | 7243020   | 7980010 | 7980015 | 82410M0   | 82430M2 | B5A162  | B5A362  | B5W362  | B5A15   | B10A16  | B10A36  | B10W16     | B10W36     | B10A152 | B20A16  | B20W16  | B20A36    | B20W36  | B20W353 |    |  |   |  |
| 100-1-50        |   |                 |         |         |            |           |            |            |         |         |         |         |         | %       |         | %          |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 115-1-60        | 2 |                 |         | 2       | 14         | 14        | 14         |            | 2       |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         | 7       |         | 7       |            |            |         | 7       | 7       |           |         |         |    |  |   |  |
| 230-1-60        |   |                 |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 208/230-60-1    |   | 2               |         |         |            |           |            |            | 2       |         |         |         | 2       |         | 2       |            | 2          |            | 2         | 2       | 2         | 15      | 15      | 13        |         | 1       |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 220/240-50-1    |   |                 |         | 2       |            |           |            |            |         |         |         | 2       |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         | 1       |         |            |            |         | 9       |         |           |         |         |    |  |   |  |
| 460-3-60        |   |                 |         |         |            |           |            |            |         |         |         |         |         |         |         |            |            |            |           |         |           |         |         |           |         |         |         |         |         |         |         |            |            |         |         |         |           |         |         |    |  |   |  |
| 208/230-50/60-3 |   |                 |         |         |            |           |            |            |         | 3       |         |         |         |         |         |            |            | 3          |           |         |           |         |         | 10        |         | 12      | 12      |         |         | 6       |         | 6          |            |         |         |         |           | 6       | 6       | 11 |  |   |  |

% NOT LISTED

# MOTOR WIRING CONNECTIONS

Jan-04

|   | P/N   | MFG #      | VOLTS | PH | HZ | HP  | RPM  | Term<br>Nos. | Intern<br>Wires | Wire<br>Ext. | VOLTS | Term<br>Nos. | Intern<br>Wires | Wire<br>Ext. |
|---|-------|------------|-------|----|----|-----|------|--------------|-----------------|--------------|-------|--------------|-----------------|--------------|
| 1 | 75256 | 1101007455 | 115   | 1  | 60 | 1   | 1725 | L1           | n/a             | 1            | 230   | L1           | n/a             | 1            |
|   |       | Franklin   |       |    |    |     |      | 3            | n/a             | 17           |       | 3            | n/a             | 17           |
|   |       |            |       |    |    |     |      | 4            | violet/omg      |              |       | 4            | blu/omg         |              |
|   |       |            |       |    |    |     |      | 5            | n/a             |              |       | 5            | violet          |              |
|   |       |            |       |    |    |     |      | L2           | blue/red        | 22           |       | L2           | red             | 22           |
| 2 | 75272 | 4101260400 | 115   | 1  | 60 | 1/2 | 1725 | L1           | n/a             | 1            | 230   | L1           | n/a             | 1            |
|   |       | Franklin   |       |    |    |     |      | 3            | violet/violet   | 17           |       | 3            | violet/violet   | 17           |
|   |       |            |       |    |    |     |      | 4            | viol/org        |              |       | 4            | blu/omg         |              |
|   |       |            |       |    |    |     |      | 5            | n/a             |              |       | 5            | violet          |              |
|   |       |            |       |    |    |     |      | L2           | blu/red         | 22           |       | L2           | red             | 22           |
|   |       |            |       |    |    |     |      |              |                 |              |       |              |                 | Jumpered     |
| 3 | 75641 | 1301007120 | 230   | 3  | 60 | 1   | 1725 | L1           | 1,12,6,7        | 31           | 460   | L1           | 1,12            | 4,7          |
|   |       | Franklin   |       |    |    |     |      | L2           | 2,10,4,8        | 32           |       | L2           | 2,10            | 5,8          |
|   |       |            |       |    |    |     |      | L3           | 3,11,5,9        | 33           |       | L3           | 3,11            | 6,9          |
| 4 | 75699 | 4201007401 | 115   | 1  | 60 | 1/2 | 1725 | L1           | ungrounded      | 1            | 230   | L1           | n/a             | 1            |
|   |       | Franklin   |       |    |    |     |      | 3            | n/a             | 17           |       | 3            | n/a             | 17           |
|   |       |            |       |    |    |     |      | 4            | viol/omg        |              |       | 4            | blu/omg         |              |
|   |       |            |       |    |    |     |      | 5            |                 |              |       | 5            | violet          |              |
|   |       |            |       |    |    |     |      | L2           | blu/red         | 22           |       | L2           | red             | 22           |
| 5 | 75819 | 4501007426 | 115   | 1  | 60 | 1/4 | 1075 | L1           | n/a             | 1            | 230   | L1           | n/a             | 1            |
|   |       | Franklin   |       |    |    |     |      | 3            | cust conct      |              |       | 3            | cust conct      |              |
|   |       |            |       |    |    |     |      | 4            | violet          | 17           |       | 4            | black           | 17           |
|   |       |            |       |    |    |     |      | 5            | n/a             |              |       | 5            | violet          |              |
|   |       |            |       |    |    |     |      | L2           | black           | 22           |       | L2           | n/a             | 22           |

# **ELECTRONIC COMPONENTS**

## Service Bulletin

## Subject: Testing Procedures for the Repeat Cycle Timer, Solid State Timer Relay Module

Soft Serve - Shake - Twist

Should it be necessary to troubleshoot and test the operation of these timer/relay modules, there are two test methods. If you have these components in a machine, follow test method #2. If no machine is available, use test method #1.

## Test #1

1. First, establish the correct part numbers located on the side of each component. By identifying these part numbers, you will be able to obtain the operating voltage of the module. Make certain that the supplied electrical power is tested for the correct voltage level.

2. TGKD1600S/45CA2JS 115VAC  
TGKD2600S/45CA2JS1 220VAC

Connect jumper wire to pin number 1 & 3.  
Connect pin number 2 to hot side of line voltage  
Connect pin number 3 to neutral side of line voltage

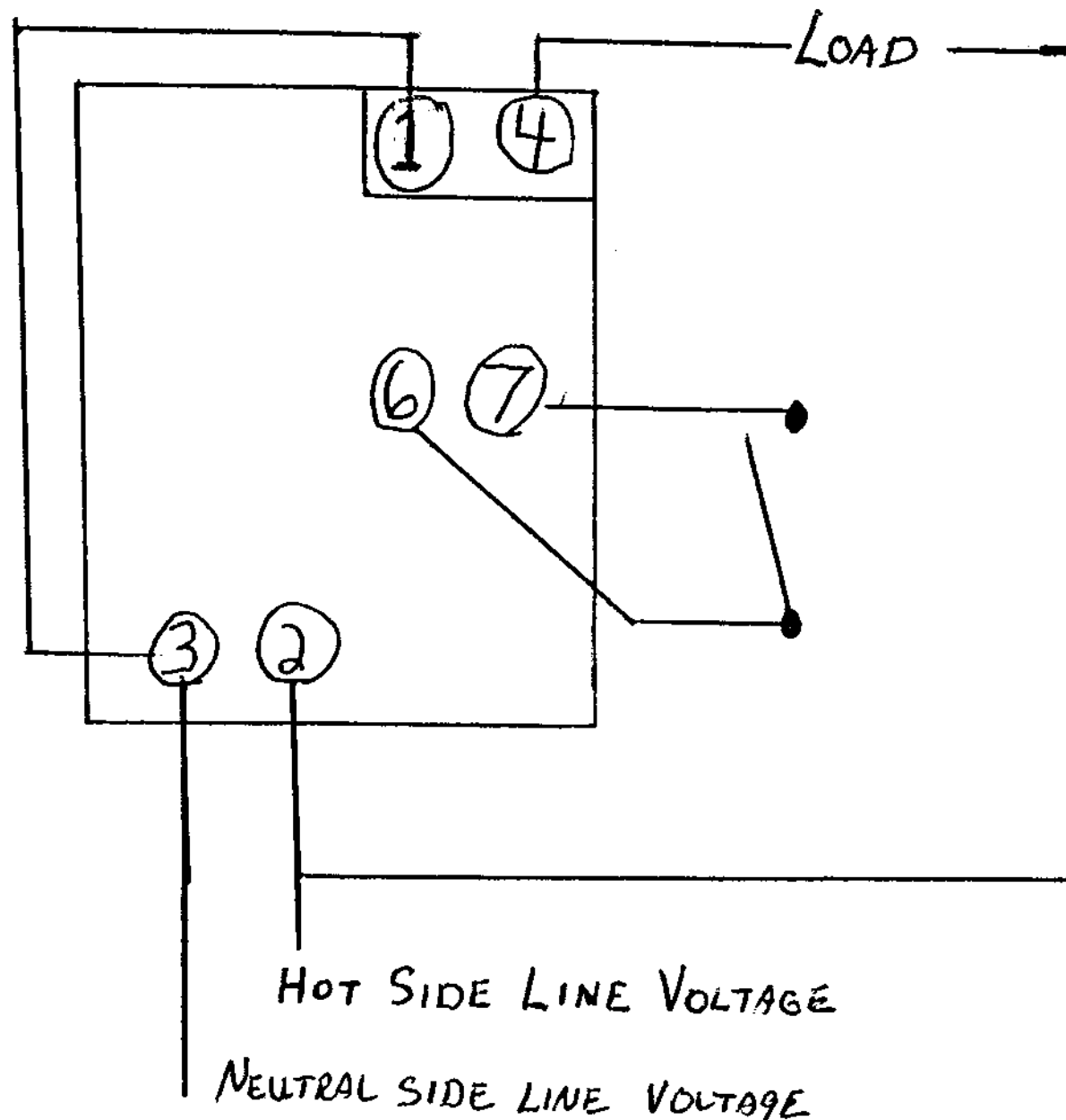
3. Choose a suitable load for the timer test. The load can be a light bulb, a relay contactor, a buzzer alarm, or any other device to indicate the module is functional.

**CAUTION**

THE LOAD YOU CHOOSE MUST BE RATED FOR THE LINE VOLTAGE THAT IS BEING USED TO TEST THE PARTICULAR MODULE IN QUESTION.

4. Connect one electrical line of your load tester to the neutral side of the line voltage. Then connect the other electrical line of your load tester to pin #4 of the module.
5. You are now ready to test the module. Begin by momentarily disconnecting the wire between pins #6 and #7 of the module. Your load tester should energize; that is, light up, buzz or signal whatever, for as long as pin #6 and pin #7 remain disconnected.
6. Now, reconnect pin #6 and pin #7 together. The load tester should shut off, and the internal timing cycle has begun. Let the timer sit idle for 10 minutes. At the end of 10 minutes, the load tester should switch "ON" by itself for 15 seconds, then off again, for another 10 minutes. The timing cycle will reset anytime you disconnect pin #6 or pin #7.

**Special Note:** If anyone of these steps did not produce the correct results, the timer is probably inoperative or has malfunctioned. If everything else checks out, the problem is somewhere else in the machine.



**Test #2:**

Any deviation in behavior of the components detailed above indicated the component being tested is bad.

**Note:** This test must be performed by a Qualified Technician.

## CAUTION

### ELECTRICAL SHOCK HAZARD DISCONNECT ALL POWER BEFORE SERVICING.

To determine which component is defective, proceed through complete test in numerical order. This is an on board test.

#### 1. Spigot Switch

- A. Verify that the spigot switch is good by use of an ohmmeter.
- B. Verify that the spigot switch is opening as you lift spigot arm and reclosing when released. (Spigot switch is closed while at rest).
- C. The spigot switch is wired into the timer terminals #6 and #7, and interrupts the time sequence.
- D. If activating the spigot switch does not cause the machine to start, then proceed to the solid state relay. If the relay checks good, the timer is bad. See 3A below.
- E. If spigot switch checks good, but machine is rapid cycling on torque, proceed to test timer.

#### 2. 10 Minute Recycle Timer:

- A. Turn machine to auto mode. With power on, the machine will start up in 10 minutes on its own. Verify this time.
- B. If machine starts immediately when switched into the auto mode, turn off power, disconnect the wire at terminal #1 of the timer, and repower up. If machine stays off, the timer is bad; if machine restarts on power up, proceed to check out the solid state relay. See 3B below.

| SaniServ<br>P/N | # on the timer     | Description                                                                          |
|-----------------|--------------------|--------------------------------------------------------------------------------------|
| 70531           | TGKD1600S/45CA2JS  | 120V 20 AMP 10 MIN OFF/15 SEC. ON RECYCLE TIMER. WITH SPIGOT SWITCH TERMINALS 6 & 7. |
| 70532           | TGKD2600S/45CA2JS1 | 230 V 20 AMP 10 MIN OFF/15 SEC. ON RECYCLE TIMER WITH SPIGOT SWITCH TERMINALS 6 & 7. |
| 70533           | THC2155C           | 90-260V 1 AMP. 1.5 SEC TIME DELAY                                                    |
| 70526           | TGM105SC2JN        | 120V 20 AMP SET 5 SEC. DELAY ON BREAK (DOB) CONTACTS BETWEEN TERMINALS 8 & 9.        |
| 70529           | TGM205SC2J         | 230 V 20 AMP SET 5 SEC. DELAY ON BREAK (DOB) CONTACTS BETWEEN TERMINALS 8 & 9.       |

#### 3- SOLID STATE RELAY

- B. (From 2B above) Remove the output wire on terminal #1 of the relay. On power up, in the auto mode, the unit should not start. If it does start, check the Auto/Off/Cleanout switch with an ohmmeter.

**SB #8614**  
**REVISION A**

**SERVICE BULLETIN**

**SUBJECT: Testing Procedures for the 1.5 Second Time Delay Relay (Solid State)**

**SOFT SERVE - SHAKE - TWIST UNITS**

This bulletin deals with the testing procedures for the compressor time delay relay that is found on soft serve/shake equipment. This device allows the dasher motor to reach operating speed before the compressor attempts to start. The delay consists of 1.5 seconds, at which time, you will hear the audible click of the contactor pulling into the circuit starting the compressor.

**Test #1:**

Should it be necessary to troubleshoot and test the operation of the 1.5 Second Time Delay Relay outside of the machines, please follow these instructions:

1. First, establish the correct part number located on the side of the component. By identifying the part number, you will be able to obtain the operating voltage of the solid state device. Make certain that the supplied electrical power is tested for the correct voltage level. The machine data plate must match the component operating voltage, as well as, the supplied electrical current from the power source.
2. Show part numbers and voltage description of component.

70533 THC2155C

90-260V 1 AMP. 1.5 SEC  
TIME DELAY, DELAY ON  
MAKE

3. Choose a suitable load for the (1.5 Second) delay relay test. The load can be a light bulb, relay contactor, a buzzer alarm, or any other device to indicate the condition of the relay.

**CAUTION**

**THE LOAD YOU CHOOSE MUST BE RATED FOR THE LINE VOLTAGE THAT IS BEING USED TO TEST THE PARTICULAR TIME DELAY RELAY (1.5 SECONDS).**

Note: Should the timer not delay 1.5 seconds, but close immedietly, the timer is defective.

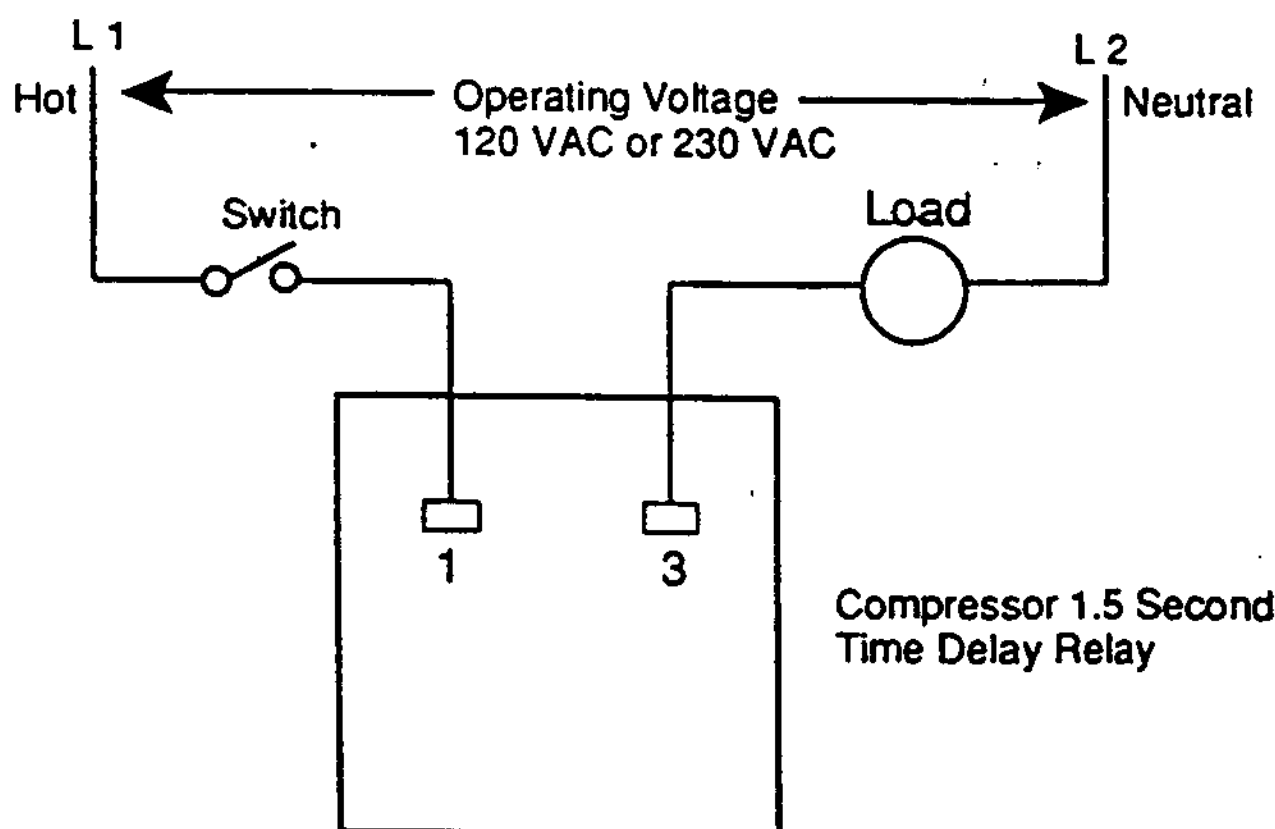
4. Refer to the diagram below.
5. Connect one side of load to neutral, connect the other side to pin #3 on the time delay relay.
6. Upon connecting pin #1 to L1 or the hot side of power, load should energize 1.5 seconds later. If the load will not energize at all, make sure the load works by itself and then, try the test again. If the load still will not energize, the delay relay is faulty and should be replaced.

**summation:** If everything checks out okay from this test procedure, the delay relay, (1.5 seconds) is operable and the trouble is elsewhere.

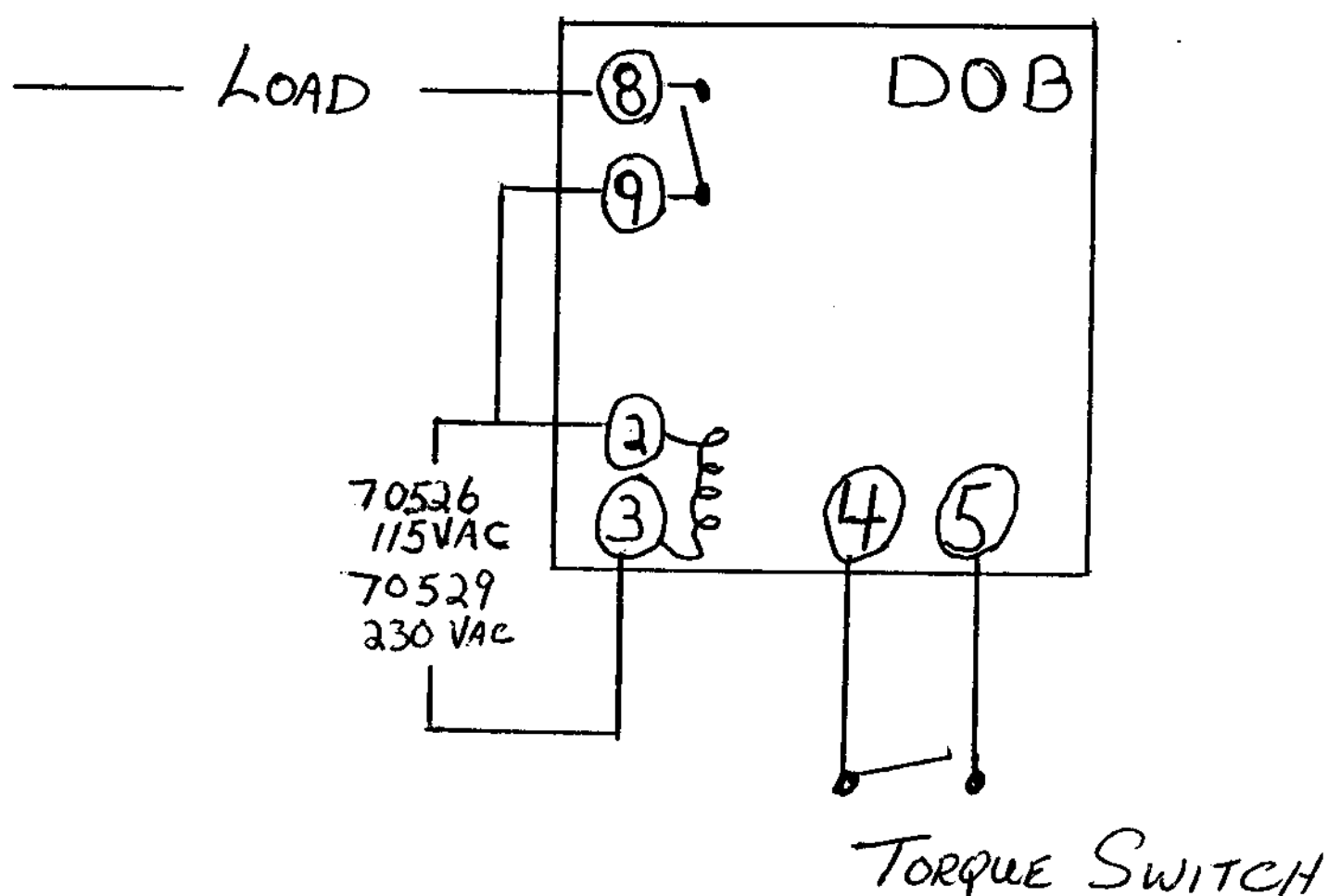
**Test #2**

Should it be necessary to test the timer on board the unit, please follow the instructions as follows:

1. Should the timer fail in the open mode, the compressor contactor will not pull in. Shut off power, jump the terminals together, and repower up. If the contactor pulls in, the timer is bad.
2. Should the timer cause the contactor to chatter, follow the above test procedure.



The DOB (Delay On Break) timer is used to prevent the torque switch from short cycling. The DOB is fixed at a 5-second delay. The contacts are **Normally Open but Held Closed by the Torque Switch**. As the product thickens, the torque switch opens, the DOB delays for 5 seconds and then the contacts between terminals 8 and 9 open thus cycling the unit off. There are two DOB timers. They are both identical to another with the exception one is **230VAC 20 AMP (Part Number 70529)** and the other is **115VAC 20AMP (Part Number 70526)**. The Drawing below applies to both.



## Service Bulletin #9127

March 11, 1991

### Subject: Torque Time Delay Timer

The purpose of this bulletin is to identify part numbers, part use, location, wiring, and testing.

| Part # | Model #<br>Used         | Volts | Component<br>Marking | Notes                                                                                         |
|--------|-------------------------|-------|----------------------|-----------------------------------------------------------------------------------------------|
| 70369  | 709<br>601SAS<br>611SAS | 230   | TSB622               | DOB Timer                                                                                     |
| 70375  | 708H                    | 115   | TSB422               | DOB Timer                                                                                     |
| 70331  | -----                   | ----- | VTP2E                | Potentiometer<br>(1 Megohm + or - 10%) used<br>on both timers, variable for .5<br>to 20 secs. |

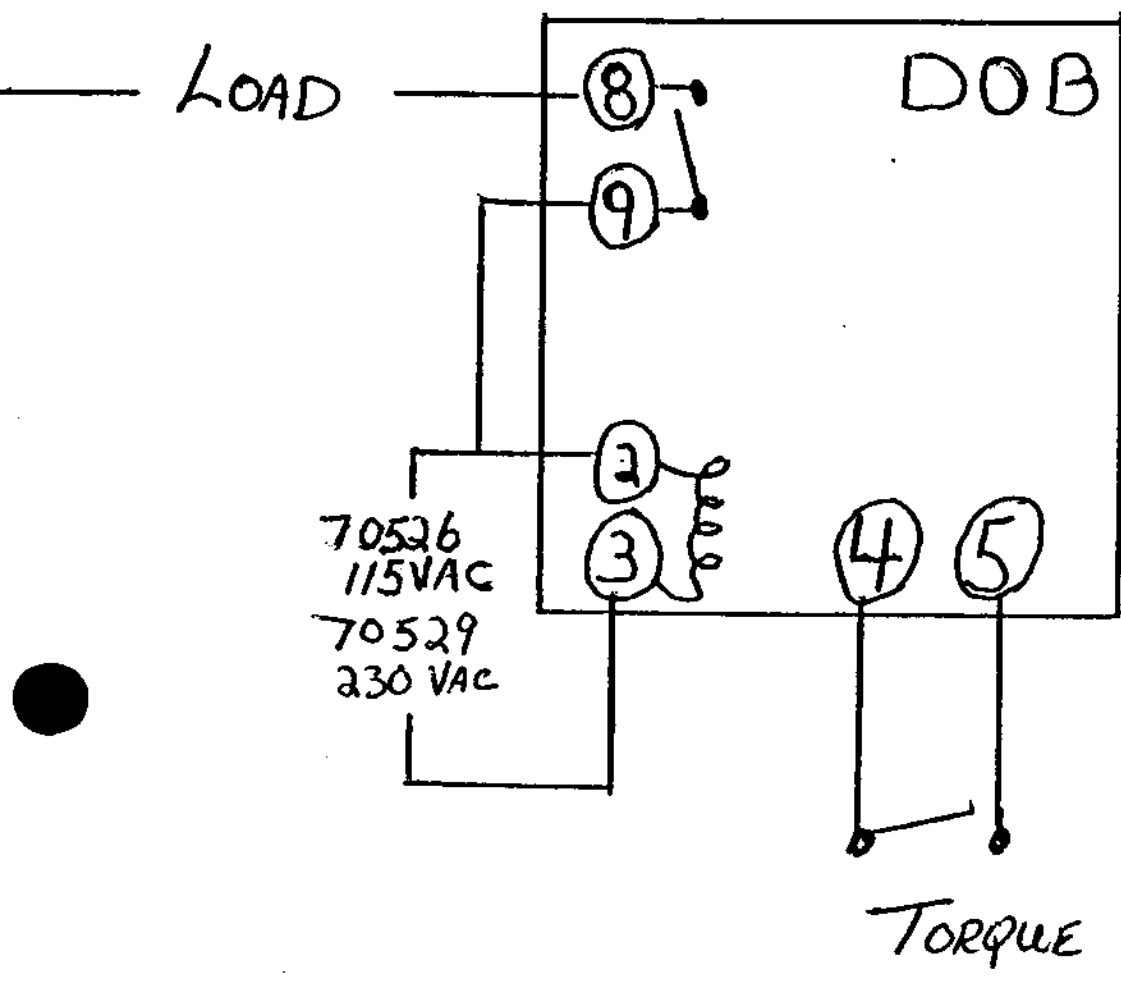
#### Component Use:

These components are used in electromechanical torque circuits. They are used to cause the torque control system to ignore a momentary opening of the torque switch. This would cause the compressor to either rapid short cycle or prematurely shut down. In the latter case, the product would not reach the consistency to serve, instead the timer will not allow shut down until it sees a sustained torque signal, and is variable between 5 to 20 seconds.

Note: These components may be used in addition to the electromechanical torque control systems where symptoms described above can not be stopped by way of mechanical adjustments.

#### Timer Function

On initial application of voltage, between terminals 2 & 3, a triac will allow current to pass between terminals 9 & 2. When the torque switch opens, the timer will delay, for 5 SECONDS, thus shutting off current to the compressor contactor (Fig. 1).



#### Testing

The easiest method to check the timer is on board the machine.

#### Test Method #1

The component may fail one of several ways:

##### Symptom A: Compressor contactor will not energize.

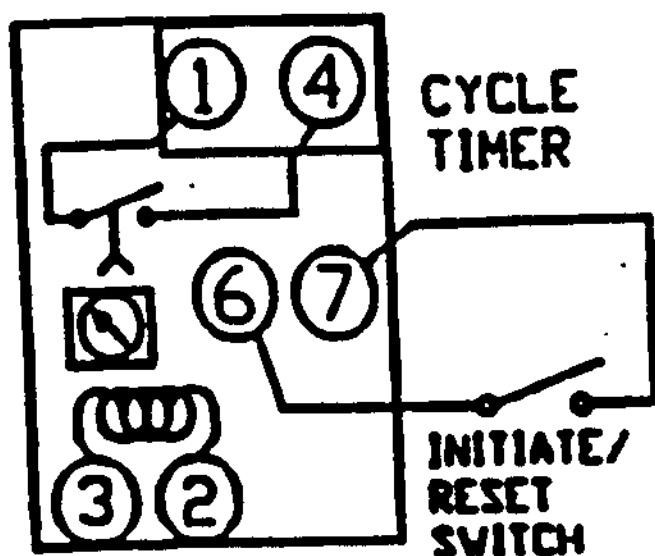
1. MAKE SURE TORQUE SWITCH IS CLOSED BEFORE GOING TO NUMBER 2
2. Jump wires at terminal #8 & 9
3. Attempt restart:
  - If unit starts and runs, replace timer.
  - If unit doesn't start, check other components in series with this timer.

##### Symptom B: Compressor contactor will not de-energize:

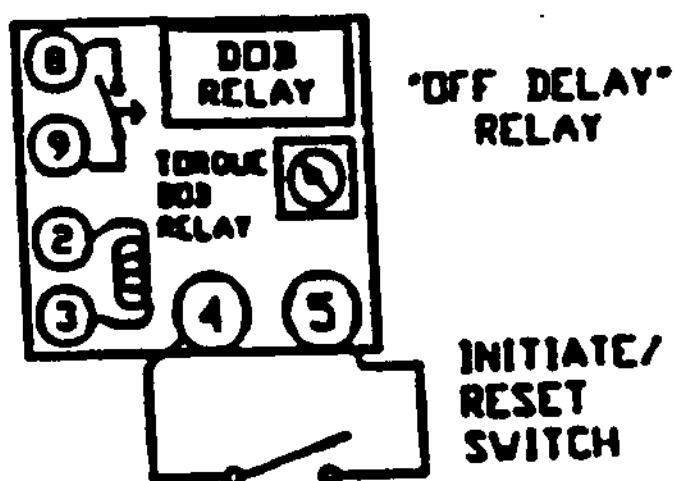
1. Check torque arm operation.
2. Check torque switch. See SB #8923. (DRIVE SECTION)

##### Symptom C: Compressor Contactor Chatters:

Jump wires at terminals #8 & 9. If condition stops, replace timer. If condition continues check 1.5 second timer if used, check dasher motor wiring if motor has been serviced recently, or check recycle timer assembly if used (Fig. 2).



**OPERATION** APPLY SUPPLY VOLTAGE TO COIL (3,2), WITH THE INITIATE SWITCH CLOSED. THE "OFF TIME" PERIOD BEGINS. WHEN THIS PERIOD ELAPSES (FIXED AT 600 SECONDS) THE RELAY CONTACTS CLOSE, BEGINNING THE "ON TIME" PERIOD (ADJUSTABLE FROM 15 TO 45 SECONDS). WHEN THE INITIATE SWITCH IS OPEN, THE RELAY IS IN THE "ON TIME" MODE.



**OPERATION** APPLY SUPPLY VOLTAGE (TO COIL). CLOSE INITIATE SWITCH, RELAY TRANSFERS AND THE CONTACTS CLOSE (8,9). OPEN THE INITIATE SWITCH AND TIMING BEGINS (ADJUSTABLE FROM 6 SECONDS TO 60 SECONDS). WHEN THE TIME IS EXPIRED THE CONTACTS WILL OPEN AGAIN.

**March 15, 1990**

## **ELECTRONIC SOLID STATE CONSISTENCY CONTROL**

The purpose of this service bulletin is to advise the different board numbers for the respective model numbers, a theory of operation, a troubleshooting procedure, and recommendations for handling.

### **I. Board Numbers vs. Model Numbers:**

|                       |                           |                                                     |
|-----------------------|---------------------------|-----------------------------------------------------|
| SaniServ P/N<br>70513 | Franklin P/N<br>223445902 | Model No.<br>401, 414,<br>single and three<br>phase |
| 70514                 | 223445912                 | 501, 522, 527<br>single and three<br>phase          |
| 70573                 | 223445903                 | 704<br>single and three<br>phase.                   |

1. The Franklin Electric part number can be found on the board next to the torque LED's.
2. Do not substitute boards to other model numbers than those referred to above.

### **II. Theory of Operation:**

1. When initially switching from "OFF" to "AUTO", the unit will start immediately, provided there is enough mix to cancel the "MIX OUT" light.

Note: The former electromechanical torque system will wait 10 minutes before it starts when switched from "OFF" to "AUTO", and it did not differentiate mix in the mix pan.

2. After the "MIX OUT" light has been triggered, from normal operation, a beeper will signal the operator for three minutes. If no mix has been added, the unit will stop all functions, except the beeper will slow down, and the mix out light will be on. The spigot switch will also be ignored.
3. In the optional night mode, the refrigeration and dasher will run every 10 minutes for 45 seconds. (NOTE: The former circuit logic was every 10 minutes for 15 seconds). The circuit is simpler now because it requires 2 wires, a female connector, a decal, and a spst switch. In this mode the spigot switch will be ignored.
4. Should the unit refrigerate for a period of 15 minutes without sensing torque, it will shut down and restart in 10 minutes. The unit will repeat this function indefinitely if " does not sense torque.
5. The solid state control has integral function LEDs (Light Emitting Diode) for rapid analysis of whatever function is occurring. The control has two LEDs which indicate

power to the dasher and compressor contactors, and they are located on the lower right side of the control. The left LED is the compressor, and the right side LED is the dasher (both green). The LEDs located on the left side of the board are listed below from the top to bottom as they are on the control.

NT: This is the night mode LED. This LED works when the unit is in the optional night mode.

SP: This is the spigot switch LED. This LED works in the auto mode when the mix level is above the "mix out" or until the three minute audio/visual warning for mix out has been exceeded. (NOTE: If the mix is not added, the control will ignore any spigot draw from the unit, that is, it will not start and run.

FL: This is the mix out float LED. This LED works in the auto, cleanout, and night mode when the mix is low.

CL: This is the cleanout LED. This LED works in the cleanout mode.

All the above LEDs are green. There are three remaining LEDs which are green, yellow, and red. These will be explained in the next section.

The electronic consistency control board is located behind the front electrical box panel, and to make adjustments, it will be necessary to remove the panel. While each machine has been tested and adjusted at the factory, some small adjustment may be necessary. The adjustment is performed by turning a potentiometer. The potentiometer is indicated on the lower left hand side of the board, and has a screw head/thumb screw. The screw head slot should be set about 12:00. The potentiometer adjusts as follows:

Colder: Turn Clockwise

Warmer: Turn Counterclockwise

If the product is at desired temperature and consistency, but has not shut down on torque, some adjustment is necessary. Observe the three LEDs in the middle of the board.

They are green, yellow, red, and are located on the upper middle portion of the board. As the potentiometer is turned counterclockwise, the lights will indicate the motor is approaching torque. In sequence, the torque lights will come on as follows:

First-Green      Second-Yellow      Third-Red

Each light will flash as it comes on until that torque level is exceeded. When the red light is fully on, the unit will go off in approximately one to two seconds.

## **I. Troubleshooting the SaniServ Solid State Consistency Control:**

### **1. Machine will not run in AUTO or CLEANOUT.**

A. Verify that line voltage is present.

B. In AUTO mode, check the FL and NT LED's.

1. If the FL LED is on, add mix or check the condition of the float switch.
2. If the NT LED is on, switch the night switch to day mode or check the condition of the night switch.

C. In AUTO mode, raise the spigot and observe the SP LED.

1. If the SP LED is not on, check all power connections and wiring, measure voltage L1 to L2 on the control.
  - If proper voltage is present, replace the electronic controller. \*
  - If voltage is not present, check fuses, switches, wiring etc.
2. If the SP LED is on, observe the Dasher (D2) LED.
  - If the Dasher LED does not turn on, replace the electronic controller. \*
  - If the dasher LED does turn on, check connections to the contactor.

### **2. Dasher running continuous in AUTO mode.**

A. Turn AUTO/CLEANOUT switch off, then back on. Observe that the dasher contactor opened and closed. Replace the contactor if it remained closed when power was off.

B. If the CL LED or SP LED's are not on, replace the electronic controller. \*

C. If the CL LED is on, remove power and check the wiring to the cleanout switch.

D. If the SP LED is on, remove power and check the wiring to the spigot switch.

### **3. Compressor running continuous.**

A. Turn to CLEANOUT. If the compressor still runs:

1. Turn the AUTO/CLEANOUT switch off, then back on. Observe that the Compressor contactor opened and closed. Replace the contactor if it remained closed when power was off.
2. If the contactor is OK, replace the electronic controller. \*

B. If the Compressor turned off in CLEANOUT, turn to AUTO and check the Load LED's.

1. Red Load LED is not on: Adjust the consistency control to desired product consistency.
2. Red Load LED is on: Replace the electronic controller.\*

### **4. Compressor will not turn on in AUTO mode.**

A. Check the Load LED's.

1. Load LED's are all on: Adjust the consistency control to desired product consistency.
2. Load LED's are not all on: Check the CL LED.
  - CL LED not on: Replace the electronic controller.\*
  - CL LED on: Disconnect power and check the cleanout switch and wiring.

### **5. No Mixout lamp or sound after dasher has started.**

A. Check the FL LED.

1. FL LED is on: Replace the electronic controller.\*
2. FL LED is not on:
  - Verify that the mix float has been installed.
  - Disconnect power and check the float switch and associated wiring.

### **6. Mix out lamp will not turn on.**

A. Check wiring and polarity of the lamp and wiring.

B. Replace the electronic controller. \*

\* When replacing an electronic controller, visually inspect the control for burned clad or blackened components caused by a lead wire shorting to ground. Correct the problem before replacing with a new control.

## **IV. Recommendations For Handling:**

1. Before removing the control from the bag, ground yourself to the machine momentarily to discharge static electricity.

2. Do not handle the board by its individual components. Only handle the board by its edges.

3. If the control has been in cold environments (below 50 degrees F) leave the component in its container, sealed, until it is warmer up to room temperature.

4. If removing a control for replacement, place the control in the static free bag and mark the bag with masking tape and ink. Write the model number and serial number of the machine on the tape.

# VISUAL BOARD ANALYSIS

(All symptoms are considered to be in "AUTO" mode with power on.)

○ D4  
○ D3 ○ D14  
○ D2 ○ D13  
○ D1 ○ D5 ● D10 ○ D9

On full time —

Difficulty: Defective TRIAC.

Remedy: Replace PCB.

NT ○ D4  
SP ○ D3 ● D14  
FL ○ D2 ● D13  
CL ○ D1 ● D5 ○ D10 ● D9

On when —  
product softens

Difficulty: Dasher on full time.

Remedy: Replace PCB.

Note #1: Check dasher motor condition.

Note #2: Check dasher motor condition.

## IMPORTANT

**ON 3 PHASE UNITS, CHECK ROTATION  
AND/OR MOTOR POLARITY BEFORE JUDGING  
PCB BOARD TO BE DEFECTIVE.**

NT ○ D4  
SP ● D3 ● D14  
FL ○ D2 ● D13  
CL ○ D1 ● D5 ○ D10 ● D9

On when —  
product softens

Difficulty: Dasher on full time.

Remedy:

#1 - Misadjusted or defective spigot switch.

#2 - De-energize unit and remove red 2 pin  
connector at spigot switch on power up,  
if light stays on, replace PCB.

NT ● D4  
SP ○ D3 ○ D14  
FL ○ D2 ○ D13  
CL ○ D1 ○ D5 ○ D10 ○ D9

Difficulty: Unit will not run.

Remedy:

#1 - Check run/standby switch.

#2 - De-energize unit and remove red 2 pin  
connector at NT on power up, if light  
stays on, replace PCB.

NT ○ D4  
SP ○ D3 ○ D14  
FL ○ D2 ○ D13  
CL ○ D1 ○ D5 ○ D10 ○ D9

Difficulty: Unit will not run.

Remedy:

#1 - Verify power to board.

#2 - Check overload in dasher motor.

NT ○ D4  
SP ○ D3 ○ D14  
FL ● D2 ○ D13  
CL ○ D1 ○ D5 ● D10 ○ D9

Difficulty: Unit will not run.

Remedy:

#1 - Fill mix pan.

#2 - Check float switch.

#3 - De-energize unit and remove red 2 pin  
connector at float switch.

| MODE                                 | AUTO/CLEANOUT SWITCH    | FLOAT SWITCH            | SPIGOT SWITCH   | NIGHT SWITCH          | MIXOUT LAMP                   | BUZZER     | DASHER              | COMPRESSOR          |
|--------------------------------------|-------------------------|-------------------------|-----------------|-----------------------|-------------------------------|------------|---------------------|---------------------|
| INITIAL POWER-UP                     |                         |                         |                 |                       |                               |            |                     |                     |
| AUTO MODE;<br>LOW MIX LEVEL          | Auto<br>"CL" LED Off    | Closed<br>"CL" LED On   | Ignored         | Ignored               | On                            | Off        | Off<br>locked out   | Off<br>locked out   |
| AUTO MODE;<br>NORMAL MIX LEVEL       | Will respond to         | Open<br>"FL" LED Off    | Will respond to | Will respond to       | Off                           | Off        | Normal run          | Normal run          |
| CLEANOUT MODE                        | Cleanout<br>"CL" LED On | Controls<br>Mixout Lamp | Ignored         | Ignored               | Controlled by<br>float switch | Off        | On<br>"D" LED On    | Off<br>locked out   |
| AUTO MODE                            | Auto<br>"CL" LED Off    |                         |                 |                       |                               |            |                     |                     |
| NORMAL MIX LEVEL                     | Will respond to         | Open<br>"FL" LED Off    | Will respond to | Will respond to       | Off                           | Off        | Normal run          | Normal run          |
| LOW MIX LEVEL<br>FIRST THREE MINUTES | Will respond to         | Closed<br>"FL" LED On   | Will respond to | Will respond to       | Flashing                      | Rapid beep | Normal run          | Normal run          |
| LOW MIX LEVEL<br>AFTER THREE MINUTES | Will respond to         | Closed<br>"FL" LED On   | Ignored         |                       | On                            | Slow beep  | Off<br>locked out   | Off<br>locked out   |
| NIGHT MODE                           | Ignored                 | Controls<br>Mixout Lamp |                 | Closed<br>"NT" LED On | Controlled by<br>float switch | Off        | See timing<br>below | See timing<br>below |
| CLEANOUT MODE                        | Cleanout<br>"CL" LED On | Controls<br>Mixout Lamp | Ignored         | Ignored               | Controlled by<br>float switch | Off        | On<br>"D" LED On    | Off<br>locked out   |

#### TIMINGS

##### AUTO MODE - NORMAL RUN

Spigot closed will turn on the dasher motor. If product consistency is soft, the compressor will turn on and run until proper consistency is achieved. If product consistency is hard, the dasher will run for 15 seconds then turn off.

If no product is dispensed for 10 minutes, the dasher will turn on and run for 15 seconds. If product is soft, the compressor will turn on and run until proper consistency is achieved or until the Run Time Limit.

The Run Time Limit on the compressor is 15 minutes after product is dispensed. Dispensing product will reset the 15 minute timer.

##### NIGHT MODE

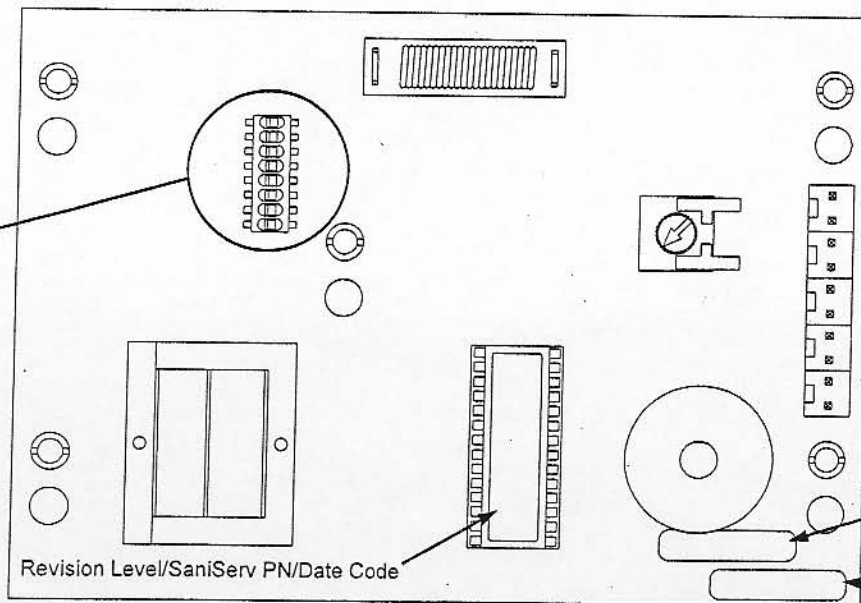
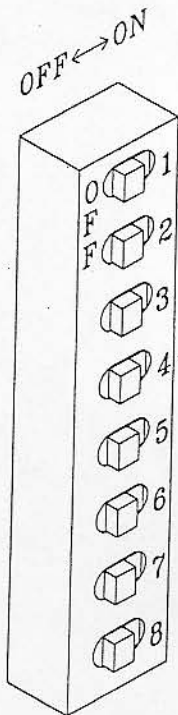
Off time: 10 minutes

Run time: 45 seconds or less if the product consistency is hard.

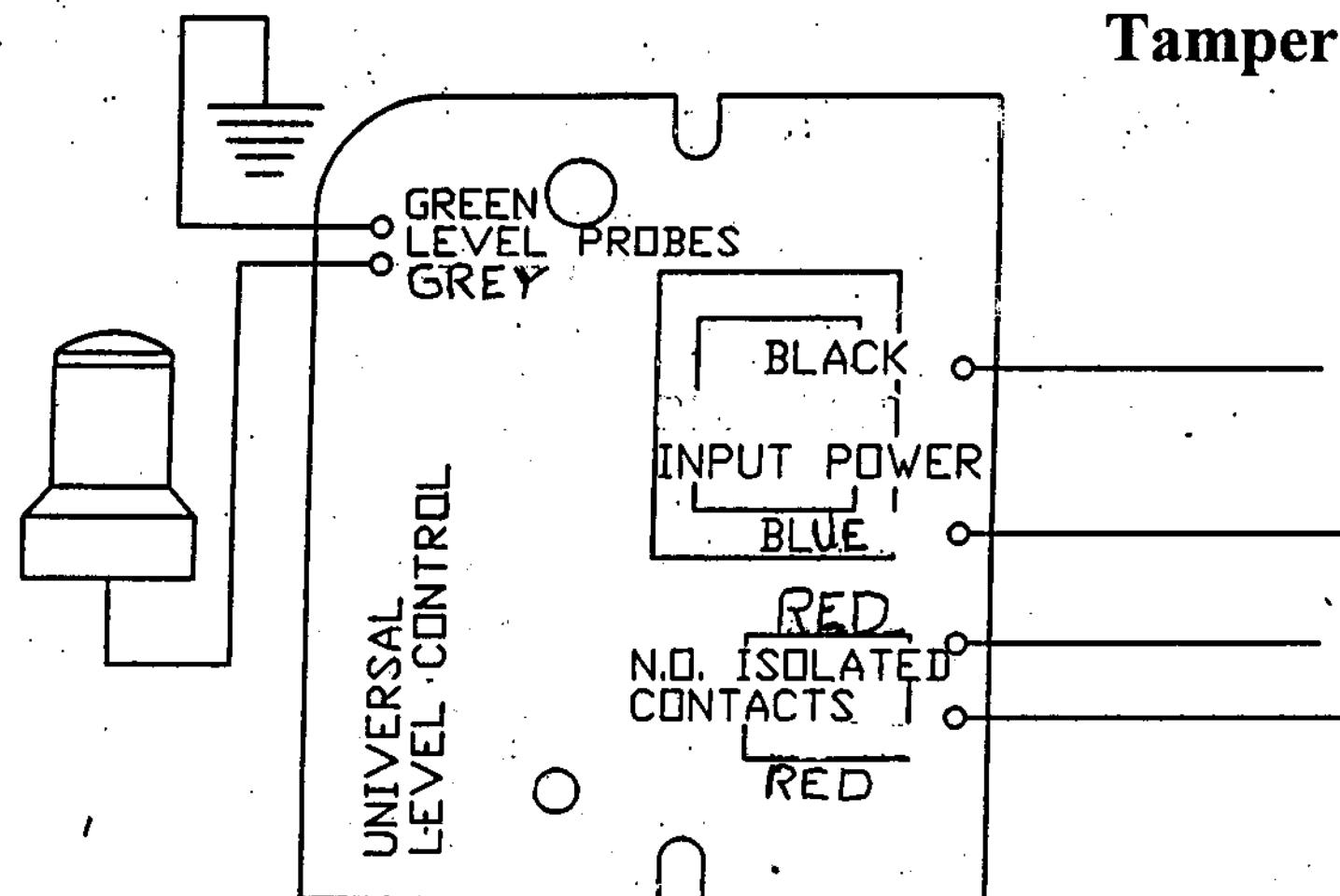
| CONTROL BOARD          |                        |                         | MACHINE            |     | MOTOR                 |                       |      |       |    |    | CONTROL BOARD           | DIP SWITCH SETTINGS |     |     |     |     |     |     |     |
|------------------------|------------------------|-------------------------|--------------------|-----|-----------------------|-----------------------|------|-------|----|----|-------------------------|---------------------|-----|-----|-----|-----|-----|-----|-----|
| FORMER FRANKLIN PART # | FORMER SANISERV PART # | CURRENT SANISERV PART # | SANISERV MACHINE # |     | FRANKLIN MOTOR PART # | SANISERV MOTOR PART # | HP   | VOLTS | HZ | PH | CURRENT FRANKLIN PART # | DIP SWITCH NUMBER   |     |     |     |     |     |     |     |
|                        |                        |                         |                    |     |                       |                       |      |       |    |    |                         | SW1                 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 |
| 223145912              | 70399                  | 70513                   | 414/401/461        | J/N | 1102410400            | 75256                 | 1.00 | 230   | 60 | 1  | 223445902               | OFF                 | ON  | OFF | OFF | OFF | OFF | ON  | ON  |
| 223145932              | 70436                  | 70513                   | 414/401/461        | J/N | 1301007120            | 75641                 | 1.00 | 230   | 60 | 3  | 223445902               | OFF                 | OFF | OFF | OFF | OFF | ON  | OFF | OFF |
| 223145942              | 70427                  | 70513                   | 414/401/461        | J/N | 1102410400            | 75256                 | 1.00 | 220   | 50 | 1  | 223445902               | OFF                 | OFF | OFF | ON  | OFF | OFF | ON  | ON  |
| 223145954              | 70489                  | 70513                   | 414/401/461        | J/N | 1102410400            | 75256                 | 1.00 | 240   | 50 | 1  | 223445902               | ON                  | OFF | OFF | OFF | OFF | OFF | ON  | OFF |
| 223150912              | 70407                  | 70514                   | 501/522/527        | K/N | 1201730400            | 75682                 | 1.25 | 230   | 60 | 1  | 223445912               | OFF                 | OFF | OFF | OFF | ON  | OFF | ON  | OFF |
| 223150912              | 70407                  | 70514                   | 501/522/527        | K/N | 1201007400            | 75687                 | 1.25 | 220   | 50 | 1  | 223445912               | OFF                 | OFF | OFF | OFF | ON  | OFF | ON  | OFF |
|                        |                        | 70513                   | 501/522/527        | K/N | 1301030103            | 75373                 | 1.25 | 230   | 60 | 3  | 223445902               | OFF                 | OFF | OFF | ON  | OFF | OFF | OFF | OFF |
| 223150932              | 70419                  | 70513                   | 522                | J   | 1301030103            | 75373                 | 1.25 | 230   | 60 | 3  | 223445902               | OFF                 | OFF | OFF | ON  | OFF | OFF | OFF | OFF |
|                        | 70407                  | 70514                   | 522                | J   | 1201730400            | 75682                 | 1.25 | 230   | 60 | 1  | 223445912               | OFF                 | OFF | OFF | OFF | ON  | OFF | ON  | OFF |
| 223150982              | 70479                  | 70513                   | 522                | J   | 1301030103            | 75373                 | 1.25 | 220   | 50 | 3  | 223445902               | OFF                 | OFF | OFF | OFF | ON  | OFF | OFF | OFF |
| 223150992              | 70480                  | 70513                   | 522                | J   | 1301030103            | 75373                 | 1.25 | 240   | 50 | 3  | 223445902               | OFF                 | OFF | OFF | OFF | OFF | ON  | OFF | OFF |
| 223195912              | 70437                  | 70513                   | 501/527            | J   | 1091175400            | 75340                 | 0.50 | 230   | 60 | 1  | 223445902               | OFF                 | OFF | ON  | OFF | OFF | OFF | ON  | OFF |
| 223195962              | 70477                  | 70513                   | 501/527            | J   | 1091175400            | 75340                 | 0.50 | 240   | 50 | 1  | 223445902               | OFF                 | OFF | ON  | OFF | OFF | OFF | ON  | OFF |
|                        |                        | 70513                   | 501/522/527        | P   | 1102410400            | 75256                 | 1.00 | 230   | 60 | 1  | 223445902               | OFF                 | ON  | OFF | OFF | OFF | OFF | ON  | OFF |
|                        |                        | 70573                   | 704                |     | 4101260400            | 75272                 | 0.50 | 230   | 60 | 1  | 223445903               | OFF                 | ON  | OFF | OFF | OFF | OFF | ON  | OFF |
|                        |                        | 70573                   | 704                |     | 4101260400            | 75272                 | 0.50 | 230   | 60 | 3  | 223445903               | OFF                 | ON  | OFF | OFF | OFF | OFF | ON  | OFF |

## SaniServ Electronic Consistency Control Conversion Chart

Locate the model number and electrical specifications of your machine from the chart above. Determine the correct switch settings under the "DIP SWITCH SETTINGS" column of the chart. Adjust the individual switches to the "ON" or "OFF" positions as indicated under the "DIP SWITCH SETTINGS" column for each switch. CAUTION: Use a ball point pen or a screw driver to change DIP Switch setting - NEVER USE A LEAD PENCIL



# Tamper Proof Mix-Out Board



Tamper-Proof Mix Out Control Board  
Wiring is the same for either voltage

230 Volt Part Number 70598  
115 Volt Part Number 70599

## Trouble Shooting:

### **If light stays on:**

- Loose ground from frame to tamper-proof mix-out board. Tighten ground wire.
- Bad connection between the bottom of probe and control board. Run jumper wire from top of probe to control board
- Contact welded shut on tamper-proof mix-out board. Ohm out contacts.

### **Light will not turn on:**

- No power to control board. Check wiring diagram and source of power
- Contacts in tamper-proof control board will not close when confirm continuity has broken between probe and mix-pan. Replace tamper-proof control board.
- Contacts are closing but no power through contacts to power light. Check source of power through two red wires of contacts.
- Mix-out light bad. Replace.

## Process of operation:

The tamper-proof control board reads continuity between the top of the probe, through the product, to the side of the mix-pan which is grounded. When the product level drops below the probe, continuity is lost thus closing the contacts in the tamper-proof mix-out board. The mix-out light will illuminate.

### SHAKE OPERATION

- 1) Initial Start-up:
  - a) Set Dip Switch
  - b) Turn unit to "AUTO". If mix probe is satisfied, the dasher will start and the dasher LED on the board will illuminate. If the probe is not satisfied, the unit will not start.
  - c) Two seconds after the dasher starts, the board will sense torque and turn on the compressor and LED if required.
  - d) When torque is satisfied, the dasher and compressor will turn off and a 5-minute timer will begin timing. At the end of the five minutes, the dasher will start and run for 15 seconds or until torque is satisfied.
- 2) There are two potentiometers. The pot with a stem is the consistency adjustment for both shake and slush modes. Turning it clockwise will increase product thickness, counter clockwise will decrease product thickness. Adjust in small increments until correct consistency is met. The flat pot is for "off-time" adjustment. In the SHAKE MODE the "off-time" pot **should be turned completely counter clockwise to the left**. At this point the (off-time) pot is set in the shake mode.
- 3) Dispense Product
  - e) When the spigot switch is activated, the dasher will turn and run as long as the spigot switch is activated. The board will begin sensing torque after two seconds and cycle the compressor as required.
  - f) The dasher will turn off when the spigot switch is deactivated or torque is satisfied, and the 5-minute off time will begin.
- 4) Low Mix Condition:
- 5) When low mix is detected, a beeper will beep and the mix-out light will flash. After this condition exists for three minutes, the beep will stop and the light will be on continuous. The compressor and dasher will turn off and the spigot switch will be disabled. In this condition the dasher and compressor will cycle every five minutes for a period of 45 seconds or until torque is satisfied, whichever comes first. Normal operation will be resumed automatically when mix is replenished.

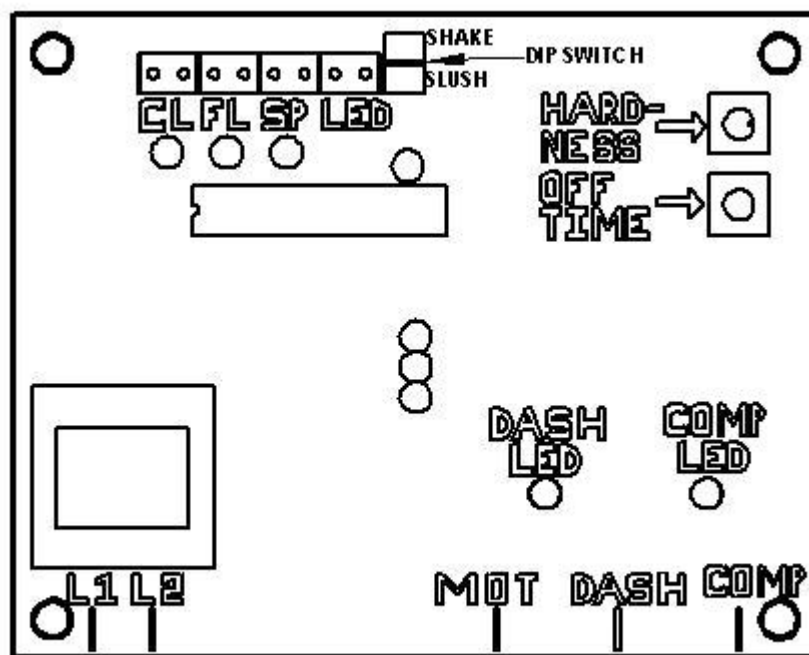
### SLUSH OPERATION

- 1) Set Dip Switch
- 2) Auto: The dasher operates continuously and the compressor cycles on torque.
- 3) Low Mix Condition: When low mix is detected, a beeper will beep and the mix-out light will flash. After this condition exists for three minutes, the beep will stop and the light will be on continuous. The compressor will be disabled. When the mix is replenished, the unit will revert to normal operation automatically.
- 4) There are two potentiometers. The pot with a stem is the consistency adjustment for both shake and slush modes. Turning it clockwise will increase product thickness, counter clockwise will decrease product thickness. Adjust in small increments until correct consistency is met. The flat pot is for "off-time" adjustment. At initial start-up in the SLUSH MODE, the "off-time" pot should be turned to the maximum clockwise position. When the desired consistency is reached and the compressor has turned off, draw a 16-oz portion of product and immediately turn the "off-time" pot counter clockwise until the compressor starts. The "off-time" is now set in the slush mode.

## SLUSH / SHAKE CONSISTENCY BOARD BOARD DESCRIPTION

A dipswitch is located on the board and is labeled shake/slush. Slide the switch to the position representing the product to be dispensed.

The board has four 2-pin connectors for the spigot switch, mix probe, cleanout and "mix low" light. All but the "mix out" light have corresponding LED's next to the connectors. There are LED's for the dasher and the compressor denoting that the board is calling for them to run. **Note: In the slush mode the dasher light will not illuminate because the dasher is wired direct through the auto-cleanout switch.** The dasher turns all the time regardless if the control switch is in the Cleanout or Auto position. It also has the traditional "Christmas Tree" cluster of red, yellow and green LED's denoting the state of product consistency. A flashing yellow LED indicates that power is applied to the board.



# **MAINTENANCE**

# 400, 600 & FROZEN BEVERAGE SERIES Routine Maintenance (Owner-Operator)

## WARNING

**DISCONNECT THE MACHINE FROM ITS POWER SOURCE(S) BEFORE PERFORMING ANY ROUTINE MAINTENANCE. PERSONAL INJURY OR DAMAGE TO THE MACHINE COULD RESULT IF THIS PRACTICE IS NOT OBSERVED.**

**Daily:** Inspect the machine for signs of product leaks past seals and gaskets. If proper assembly does not stop leaks around gaskets or seals, check for improper lubrication and worn or damaged parts. Replace parts as needed.

**Periodically:** Inspect the scraper blades (Fig. 47) to see that they are straight and sharp. If worn, damaged or warped, the blades will not scrape the cylinder walls correctly and the freezing capacity will be reduced. Clean the drip chute assembly (Fig. 48) with warm water and detergent solution.

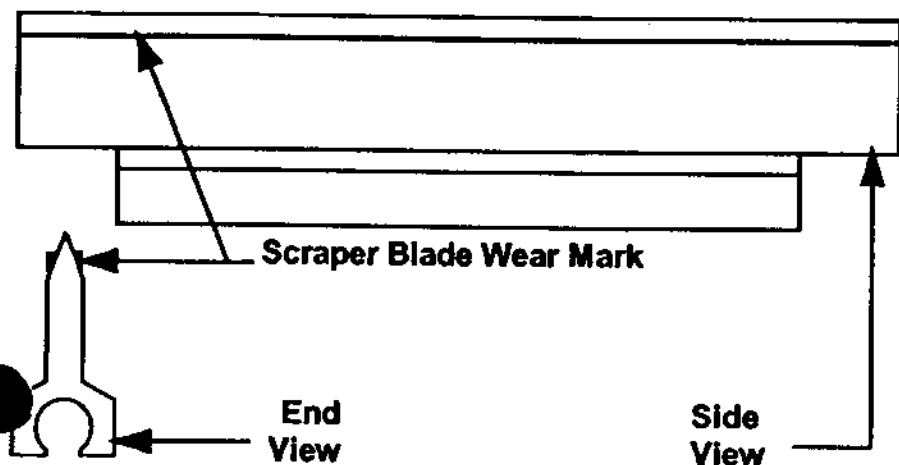


Fig. 47  
Scraper Blade Wear Mark

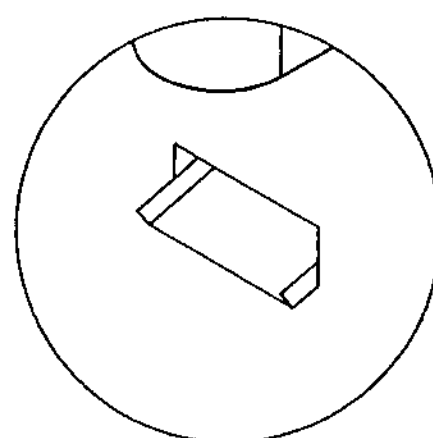
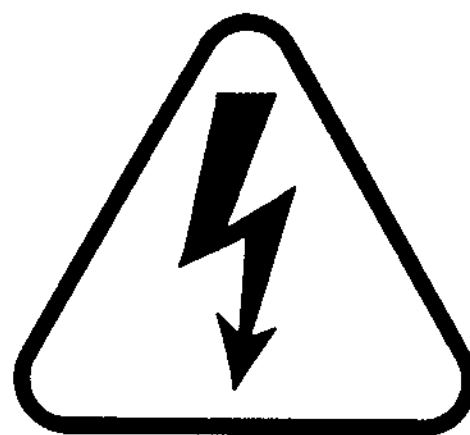
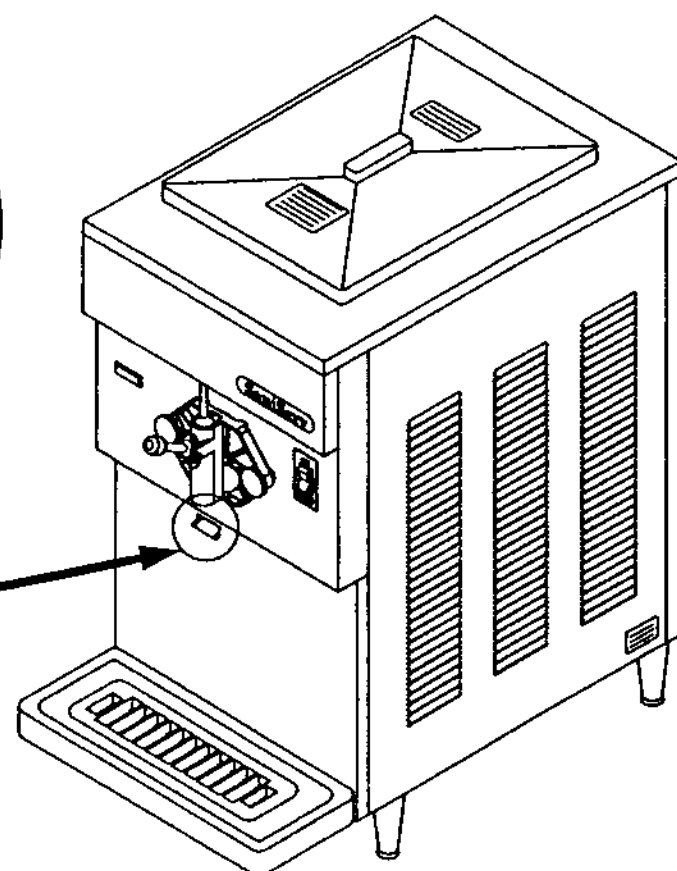


Fig. 48  
Drip Chute



## Routine Maintenance (Trained Service Technician)



## WARNING

**CONDENSER FINS ARE VERY SHARP  
USE EXTREME CAUTION WHEN CLEANING**

**Quarterly:** Thoroughly clean the condenser fins on all air-cooled machines. Remove all lint and dust with a vacuum cleaner or compressed air (Fig. 49) to clean fins. A dirty condenser greatly reduces refrigeration capacity and efficiency. When using compressed air, place a damp cloth on the opposite side of the condenser to catch the flying dirt or lint.

**Annually:** Check the belts for signs of wear or cracking. Remove panels and clean all parts inside of the machine including the base, side panels, fan blades, condensers,

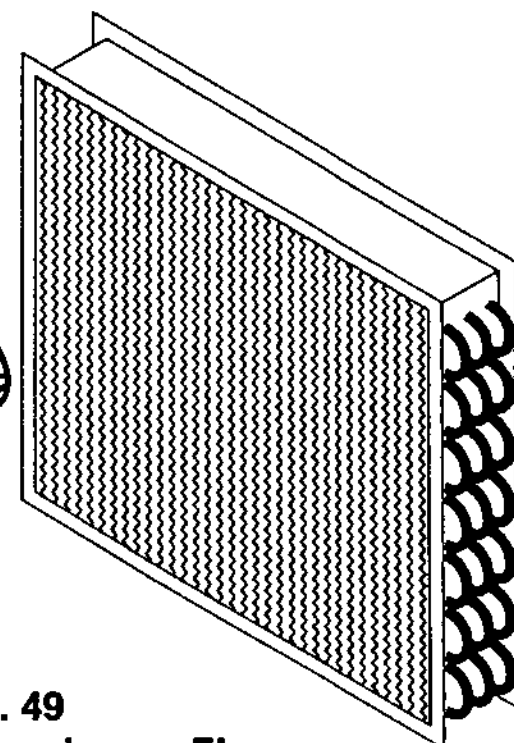
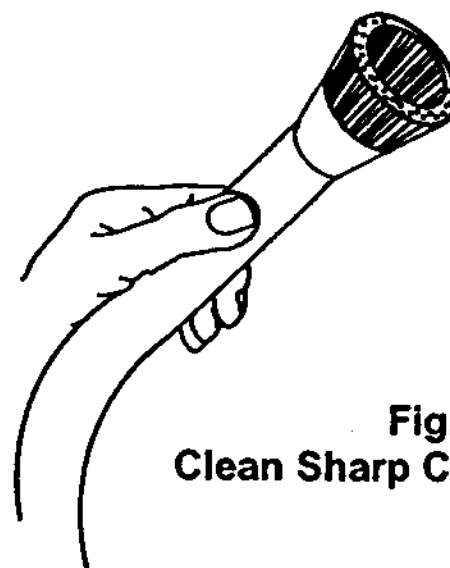


Fig. 49  
Clean Sharp Condenser Fins



# Routine Maintenance (Trained Service Technician)



## ⚠ WARNING

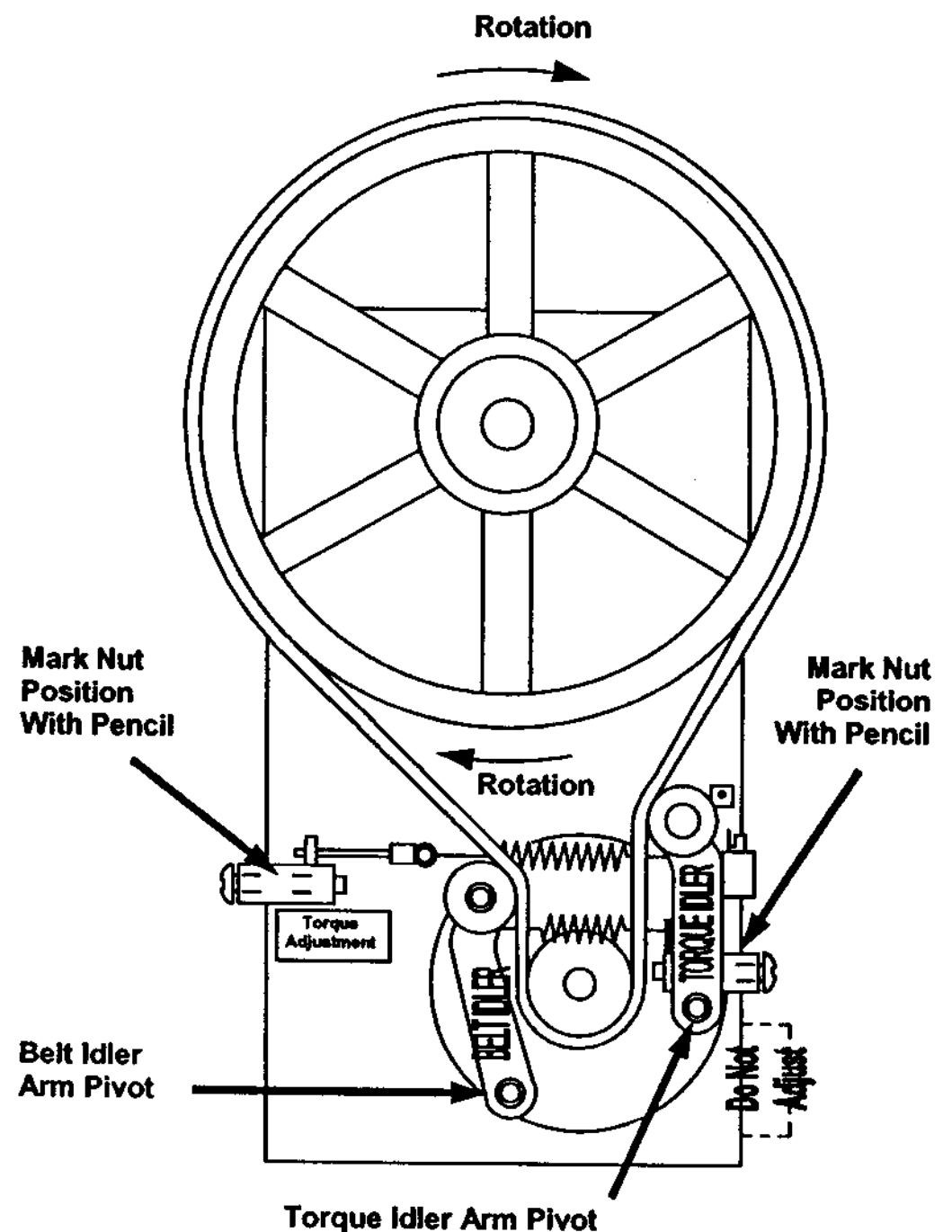
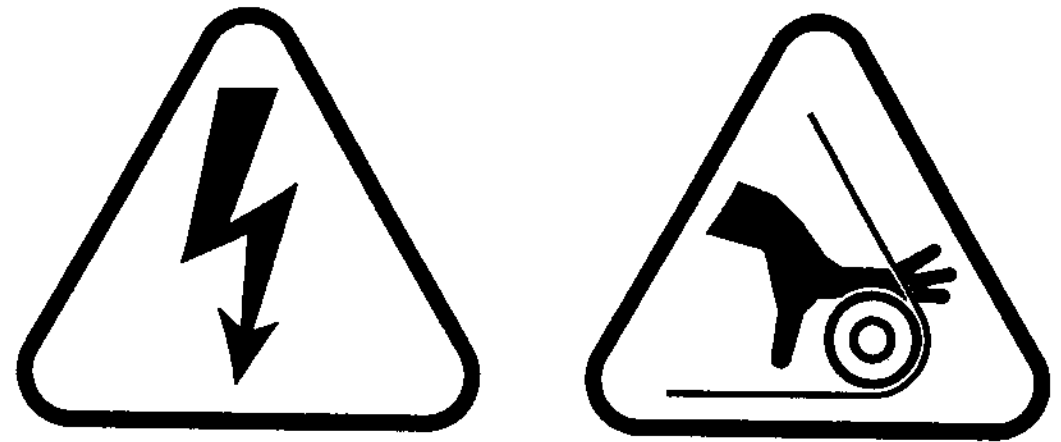
### HAZARDOUS MOVING PARTS

**Semiannually:** It is advisable to clean and lubricate the idler arms (Fig. 50) to ensure their smooth operation. Use the following procedures:

1. Make certain that **ALL** power to the dispenser is off.
2. Remove both side panels first, then remove the rear panel of the machine.
3. Use a pencil to mark the position of the nut (Fig 50) on the side of the belt idler arm spring adjustment mechanism. Relieve the tension on the spring by turning the adjustment screw near the label which warns: **DO NOT ADJUST**. Disconnect the spring from the belt idler arm by placing needle nose pliers on one end of the spring and pulling the end out of the retainer.
4. Remove the nut from the pivot point of the belt idler arm assembly.
5. Remove the belt idler arm and inspect the pivot point sleeve. These areas should be free of rust, debris, or dried lubricant. If any of these substances are found, they must be removed.
6. Clean and polish the sleeve surface with a fine grade of emery cloth.
7. Reinstall the belt idler arm.

**NOTE: BE CERTAIN NOT TO OVERTIGHTEN THE LOCKING NUT. ON SOME UNITS IT IS POSSIBLE TO OVERTIGHTEN THE LOCKING NUT AND CAUSE THE IDLER ARMS TO BIND. THE ARMS SHOULD MOVE FREELY.**

8. Repeat the process for the torque idler arm.
9. Install the belt making certain that there is no grease on the belt or pulleys. Step to the side of the unit and view the belt to determine whether or not it is properly aligned (straight from top to bottom).
10. Reinstall the blue torque idler arm spring and the brown belt idler arm spring and turn the adjustment screws returning the adjustment nuts to the pencil marks you placed on the side of each adjustment mechanism in step 3 above.
11. Repeat steps 3 - 9 for the other side if your machine has two freezing cylinders and then place the unit back into operation. Check the product for proper consistency and adjust as required. When the consistency is right, replace the rear and both side panels.



**Fig. 50**  
**Spring Adjustment Mechanism**

# 500 SERIES

## Routine Maintenance (Owner-Operator)



**WARNING**

**DISCONNECT THE MACHINE FROM ITS POWER SOURCE(S) BEFORE PERFORMING ANY ROUTINE MAINTENANCE. PERSONAL INJURY OR DAMAGE TO THE MACHINE COULD RESULT IF THIS PRACTICE IS NOT OBSERVED.**

**Daily:** Inspect the machine for signs of product leaks past seals and gaskets. If proper assembly does not

stop leaks around gaskets or seals, check for improper lubrication and worn or damaged parts. Replace parts as needed.

**Periodically:** Inspect the scraper blades to see that they are straight and sharp. If worn, damaged or warped, the blades will not scrape the cylinder walls correctly and the freezing capacity will be reduced.

The drip chute assembly which catches seepage from around the rear seal should be cleaned with warm water and detergent solution (Fig. 31).



## Routine Maintenance (Trained Service Technician)



**WARNING**

**CONDENSER FINS ARE VERY SHARP  
USE EXTREME CAUTION WHEN CLEANING**

**Quarterly:** Thoroughly clean the condenser fins on all air-cooled machines. Remove all lint and dust with a vacuum cleaner or compressed air to clean fins. A dirty condenser greatly reduces refrigeration capacity and efficiency. When using compressed air, place a damp cloth on the opposite side of the condenser to catch the flying dirt or lint.

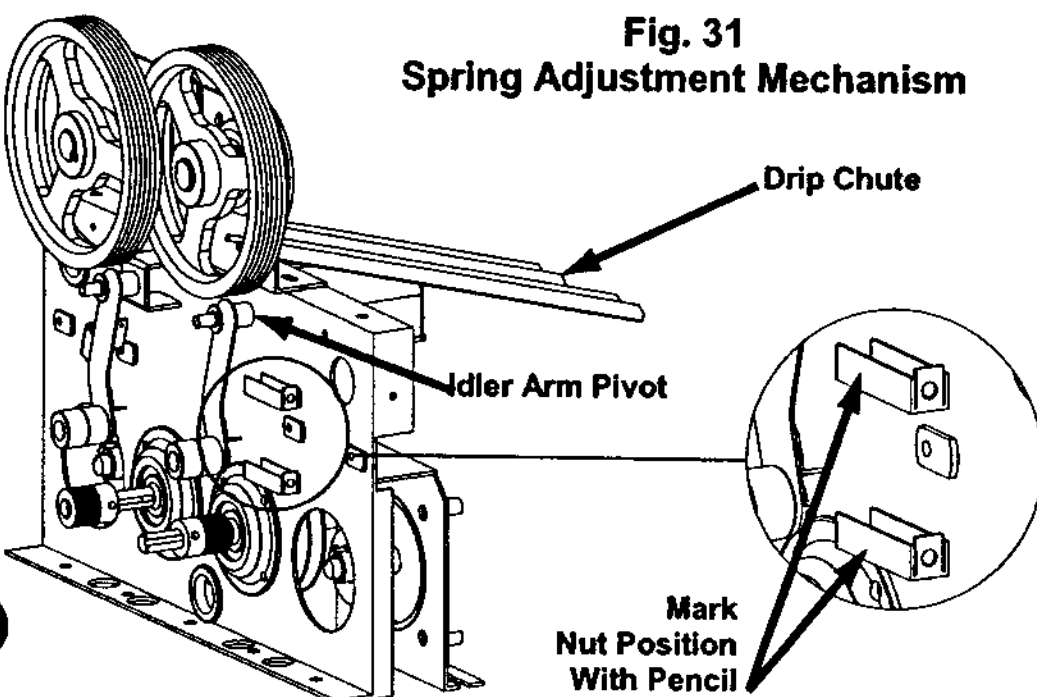
**Annually:** Check the belts for signs of wear or cracking. Remove panels and clean all parts inside of the machine including the base, side panels, fan blades, condensers, etc.

**Semiannually:** It is advisable to clean and lubricate the idler arms (Fig. 31) to ensure their smooth operation. Use the following procedures:

**Note:** Twist units have two separate idler arm assemblies (one for each side). For convenience and simplicity, complete the following maintenance on one side of the system before proceeding to the other.

1. Make certain that **ALL** power to the dispenser is off.

**Fig. 31  
Spring Adjustment Mechanism**



**WARNING**

**HAZARDOUS MOVING PARTS**

2. Remove both side panels first, then remove the rear panel of the machine.

3. On the side of the spring adjustment mechanism use a pencil to mark the position of the nut (Fig 32). Relieve the tension on the yellow spring by turning the adjustment screw near the label which warns: **DO NOT ADJUST**. Disconnect the spring from the belt idler arm by placing needle nose pliers on one end of the spring and pulling the end out of the retainer.

4. Remove the nut from the pivot point of the idler arm assembly.

5. Remove the idler arm and inspect the pivot point sleeve. These areas should be free of rust, debris, or dried lubricant. If any of these substances are found, they must be removed.

6. Clean and polish the sleeve surface with a fine grade of emery cloth.

7. Reinstall the idler arm.

8. Install the belt making certain that there is no grease on the belt or pulleys. Step to the side of the unit and view the belt to determine whether or not it is properly aligned (straight from top to bottom).

9. Install the yellow spring and turn the adjustment screw returning the adjustment nut to the pencil mark you placed on the side of the adjustment mechanism in step 3 above.

10. Repeat steps 3 - 9 for the other side and then place the unit back into operation. Check the product for proper consistency and adjust as required. When the consistency is right, replace the rear and both side panels.

# **THEORY OF OPERATION**

# Theory of operation:

## Models Effected:

**601, 608. 408, 424, 614, 624 & 824**

There are no thermostats in the machine and therefor the machine does not know temperature. The machine manufactures product via product thickness not temperature. This is known as **electro mechanical torque control**. As the machine runs the product will start to thicken and create a load on the belt drive system. There are two spring-loaded idlers on the belt drive system. One of the idlers (torque arm) rides on a torque switch. As the product thickens the torque arm travels away from the torque switch. When the torque switch opens, the compressor will delay shutting off via the DOB (Delay On Break) timer. The DOB timer is wired in conjunction with the torque switch and is used to prevent short cycling. Once 5 seconds has elapsed the compressor and dasher motor will cycle off. The spring tension on the torque arm can be adjusted via the torque adjustment screw. When tighten to the right it will increase the tension thus making the product thicker and colder. When loosened to the left it will thin and raise the temperature.

When the machine cycles off, it will remain off until one of the following happens. If product is not drawn from the machine it will remain off for approximately 10 minutes. After the 10 minutes the cycle timer will close it's contacts for 15 seconds and will start the dasher motor. **Note: The cycle timer is a fixed 10 minute off, fixed 15 second on.** The system will then look at the torque switch and confirm if it needs to refrigerate. If the consistency of the product has thinned enough to make the torque switch call, the circuit will complete, the compressor will start and product will freeze until the consistency is thick enough to open the torque switch again. If the product has not thinned enough to make the torque switch call the dasher motor will shut off. At this time you're in the 10-minute off period again

If product is drawn from the machine, a spigot switch resting on the spigot lever will open and tell the contacts in the cycle timer to close and start the dasher motor. The contacts will remain closed for the period of time the spigot lever is calling. The system will look at the torque switch and confirm if it needs to refrigerate. Since you have drawn frozen product from the barrel and introduced liquid product into the barrel the consistency will thin enough to make the torque switch call, the compressor will start and product will freeze until the consistency is thick enough to open the torque switch again. If the product has not thinned enough to make the torque switch call, the dasher motor will shut off. At this time it returns back to the 10 minute off period.

# Theory of operation:

## Models effected:

401,414,501, 527,522

First and foremost there are no thermostats in the machine. The unit operates off of product consistency. Unlike the electro mechanical torque system, these machines read viscosity via an electronic control board (**electronic torque control**). The control board is reading the amperage draw of the motor. Depending upon where the potentiometer is set will determine the shut off point. A pre-determined amperage rating cannot be determined due to the vast ranges of voltage, product types and customers opinion of thick or thin product. There is no need to use an amperage meter to set the product thickness. It is better to use the temperature of the product or consult the customer's preference of product thickness.

As the product freezes, the load increases on the dasher motor and the amperage goes up. Once the amperage reaches the set point the machine will cycle off. If product is not drawn, the machine will remain off for a period of 10 minutes. After the 10 minute off time the control board will start the dasher motor and read the amperage. If the amperage has dropped below the desired set point, the compressor will start. The product will freeze until enough amperage is created to reach the set point again and the machine will cycle off.

If product is drawn during the off cycle, the spigot switch will start the dasher motor. As frozen product is being dispensed, liquid product is being introduced into the barrel thus thinning the consistency. This will allow the amperage to drop below the desired set point and cause the compressor to cycle on. The machine will run until the amperage reaches the set point again and cycle the machine off.

# Theory of Operation

## Models effected:

798

The model 798 is unique in that it is a dual barrel slush machine. The dasher motors and compressor run continuously. There is one compressor that refrigerates both barrels. The use of refrigerant solenoids via the torque switches are used to determine refrigerant to the barrel and the mix-pans. When neither barrel calls for refrigerant, all the refrigerant is pumped to the mix-pans to prevent the compressor from pulling into a vacuum. The EPR valves are installed to allow the mix-pans to refrigerate the product, not freeze the product in the mix-pans.

There are no thermostats in the machine and therefor the machine does not know temperature. The machine manufactures product via product thickness not temperature. This is known as **electro mechanical torque control**. As the machine runs the product will start to thicken and create a load on the belt drive system. There are two spring-loaded idlers on the belt drive system. One of the idlers (torque arm) rides on a torque switch. As the product thickens the torque arm travels away from the torque switch. The spring tension on the torque arm can be adjusted via the torque adjustment screw. When tighten to the right it will increase the tension thus making the product thicker and colder. When loosened to the left it will thin and raise the temperature.

When the torque switch opens the refrigeration solenoid will close and not allow refrigerant to that individual barrel. Over a period of time the product in the barrel will start to thin and relax the belt tension thus making the torque switch call and opening the refrigeration solenoid. The product will thicken until consistency is meet and the torque switch is opened again. The spring tension on the torque arm can be adjusted via the torque adjustment screw. When tighten to the right it will increase the tension thus making the product thicker and colder. When loosened to the left it will thin and raise the temperature.

When product is drawn from the machine, frozen product will be dispensed from the barrel and liquid product introduced into the barrel. The liquid product will thin the consistency thus relaxing the belt tension and allowing the torque switch to call for refrigeration. The refrigeration solenoid will open and allow refrigerant to the barrel.

# Theory of operation:

## Models effected:

707

The model 707 is one of the most simplistic machines available. There are no thermostats in the machine and therefor the machine does not know temperature. The machine manufactures product via product thickness not temperature. This is known as electro mechanical torque control. As the machine runs the product will start to thicken and creates a load on the belt drive system. There are two spring-loaded idlers on the belt drive system. One of the idlers (torque arm) rides on a torque switch. As the product thickens the torque arm travels away from the torque switch. When the torque switch opens, the compressor will cycle off. Once the product thins enough to make the torque switch call, the compressor will cycle on. The spring tension on the torque arm can be adjusted via the torque adjustment screw. When tighten to the right it will increase the tension thus making the product thicker and colder. When loosened to the left it will thin and raise the temperature.

The dasher motor will run continually thus utilizing the re-circulating top cover. As the dasher turns it acts as pump and forces product toward the front of the barrel. In the front of the mix-pan there is a welded one-piece restrictor tube. The restrictor tube allows a small portion of the frozen product from the barrel to be re-circulated back into the mix-pan. The small portion of frozen product chills the liquid product in the mix-pan and also re-circulates it. A refrigerated mix-pan is not used because the recirculating slush is more than sufficient to chill the product.

You will not find and timers, relays, or contactors in this machine.

# Theory of operation:

## Models effected:

708,709,714 & 724

There are no thermostats in the machine and therefor the machine does not know temperature. The machine manufactures product via product thickness not temperature. This is known as **electro mechanical torque control**. As the machine runs the product will start to thicken and create a load on the belt drive system. There are two spring-loaded idlers on the belt drive system. One of the idlers (torque arm) rides on a torque switch. As the product thickens the torque arm travels away from the torque switch. When the torque switch opens, the compressor will delay shutting off via the DOB (Delay On Break) timer. The DOB timer is wired in conjunction with the torque switch and is used to prevent short cycling. Once 5 seconds has elapsed the compressor will cycle off. The spring tension on the torque arm can be adjusted via the torque adjustment screw. When tighten to the right it will increase the tension thus making the product thicker and colder. When loosened to the left it will thin and raise the temperature.

The dasher motor will run continually thus utilizing the re-circulating top cover. As the dasher turns it acts as pump and forces product toward the front of the barrel. In the front of the mix-pan there is a welded one-piece restrictor tube. The restrictor tube allows a small portion of the frozen product from the barrel to be re-circulated back into the mix-pan. The small portion of frozen product chills the liquid product in the mix- pan and also re-circulates it. A refrigerated mix-pan is not used because the re-circulating slush is more than sufficient to chill the product.

# Theory of Operation

## Models effected:

407

There are no thermostats in the machine and therefor the machine does not know temperature. The machine manufactures product via product thickness not temperature. This is known as **electro mechanical torque control**. As the machine runs the product will start to thicken and create a load on the belt drive system. There are two spring-loaded idlers on the belt drive system. One of the idlers (torque arm) rides on a torque switch. As the product thickens the torque arm travels away from the torque switch. When the torque switch opens, the compressor and dasher motor will cycle off. The spring tension on the torque arm can be adjusted via the torque adjustment screw. When tighten to the right it will increase the tension thus making the product thicker and colder. When loosened to the left it will thin and raise the temperature.

When the machine cycles off, it will remain off until one of the following happens. If product is not drawn from the machine it will remain off for approximately 10 minutes. After the 10 minutes the cycle timer will close it's contacts for 15 seconds and will start the dasher motor. **Note: The cycle timer is a fixed 10 minute off, fixed 15 second on.** The system will then look at the torque switch and confirm if it needs to refrigerate. If the consistency of the product has thinned enough to make the torque switch call, the circuit will complete, the compressor will start and product will freeze until the consistency is thick enough to open the torque switch again. If the product has not thinned enough to make the torque switch call the dasher motor will shut off. At this time you're in the 10-minute off period again

If product is drawn from the machine, a spigot switch resting on the spigot lever will open and tell the contacts in the cycle timer to close and start the dasher motor. The contacts will remain closed for the period of time the spigot lever is calling. The system will look at the torque switch and confirm if it needs to refrigerate. Since you have drawn frozen product from the barrel and introduced liquid product into the barrel the consistency will thin enough to make the torque switch call, the compressor will start and product will freeze until the consistency is thick enough to open the torque switch again. If the product has not thinned enough to make the torque switch call, the dasher motor will shut off. At this time it returns back to the 10 minute off period.

# **Theory of operation:**

## **Models effected:**

### **Batch Freezers B5, B10 & B20**

These units are designed to make batch product. Product is manufactured and immediately dispensed into a container where it is usually blast frozen and hand dipped.

Like our other equipment these units do not sense temperature. They freeze product for a pre-determined amount of time. The control switch on the front of the machine will say OFF, DASHER & DASHER/REFRIGERATION. When turned to dasher only the dasher motor will run. When turned to dasher/refrigeration the dasher motor and compressor will run as long as the 15-minute timer has been pre-set. Depending on the type of product and the customers desired product thickness would determine how much time is applied to the timer. Typically customers will operate their machines 12-15 minutes.

When the time elapses, the dasher motor will continue to run but the compressor will shut off. At this time you will dispense the product from the machine as a whole batch, not just a single serving. Once the batch has been completely dispensed, you can add more products to make more batches or turn the machine off for cleaning.

Additional time will make the product thicker and colder, less time will make the product thinner and warmer.

# Theory of operation:

## Models effected:

704

First and foremost there are no thermostats in the machine. The unit operates off of product consistency. Unlike the electro mechanical torque system, these machines read viscosity via an electronic control board (**electronic torque control**). The control board is reading the amperage draw of the motor. Depending upon where the potentiometer is set will determine the shut off point. A pre-determined amperage rating cannot be determined due to the vast ranges of voltage, product types and customers opinion of thick or thin product. There is no need to use an amperage meter to set the product thickness. It is better to use the temperature of the product or consult the customer's preference of product thickness.

As the product freezes, the load increases on the dasher motor and the amperage goes up. Once the amperage reaches the set point, the compressor will cycle off. If product is not drawn, the machine will remain off for a minimum fixed time of two minutes. After the fixed two minute time has elapsed and if the amperage has dropped below the set point, the compressor will come on. Please Note: The dasher motor runs continuously.

# Theory of operation:

## **Models effected:**

**WB700 & WB7110**

These units have remote refrigeration and remote product fill. A condensing unit is placed on the roof of the facility or in a back room away from the dispensing head. Product is typically placed in a walk-in cooler in the back of the room and pumped via Co2, electric pump, bag-n-box or brix pump.

There are three switches on the front of the machine (fill, dasher, refrigeration).

## **Fill Mode:**

There are two probes in the mix pan (high and low) that work through the continuity of the product. When the product drops below the lower probe the product solenoid will open and the source of the product will pump the product into the mix-pan until the product level reaches the high probe. At this time the product solenoid will close. If product does not fill the mix-pan to the higher probe after 4.5 minutes the refrigeration solenoid will not be allowed to open therefor the product will not freeze.

## **Dasher:**

The dasher runs continually regardless of the fill mode or refrigeration mode.

## **Refrigeration Mode:**

There are no thermostats in the machine and therefor the machine does not know temperature. The machine manufactures product via product thickness not temperature. This is known as electro mechanical torque control. As the machine runs the product will start to thicken and creates a load on the belt drive system. There are two spring-loaded idlers on the belt drive system. One of the idlers (torque arm) rides on a torque switch. As the product thickens the torque arm travels away from the torque switch. When the torque switch opens, the refrigeration solenoid will close and the condensing unit will start to pump down to 10 lbs. and cycle off. Once the product thins enough to make the torque switch call, the refrigeration solenoid will open. The pressure at the condensing unit will rise to 20 lbs. and cycle the compressor back on and freeze the product to the correct consistency. The spring tension on the torque arm can be adjusted via the torque adjustment screw. When tighten to the right it will increase the tension thus making the product thicker and colder. When loosened to the left it will thin and raise the temperature. Note: There are no timers or relays in this unit.

# Theory of operation:

## Models effected:

601SAS & 614SAS

This unit is unique in that it produces 4 flavors of milk shakes out of one machine. There are no thermostats in the machine and therefore the machine does not know temperature. The machine manufactures product via product thickness not temperature. This is known as **electro mechanical torque control**. As the machine runs the product will start to thicken and create a load on the belt drive system. There are two spring-loaded idlers on the belt drive system. One of the idlers (torque arm) rides on a torque switch. As the product thickens the torque arm travels away from the torque switch. When the torque switch opens, the compressor will delay shutting off via a 5-second delay built into the control board. This delay prevents short cycling. Once 5 seconds has elapsed the compressor and dasher motor will cycle off. The spring tension on the torque arm can be adjusted via the torque adjustment screw. When tighten to the right it will increase the tension thus making the product thicker and colder. When loosened to the left it will thin and raise the temperature.

When the machine cycles off, one of the following happens. If product is not drawn from the machine it will remain off for approximately 10 minutes. After the 10 minutes elapses the control board will close it's contacts for 15 seconds and will start the dasher motor. **Note: The control board is a fixed 10 minute off, fixed 15 second on.** The system will then look at the torque switch and confirm if it needs to refrigerate. If the consistency of the product has thinned enough to make the torque switch call, the circuit will complete, the compressor will start and product will freeze until the consistency is thick enough to open the torque switch again. If the product has not thinned enough to make the torque switch call the dasher motor will shut off. At this time you're in the 10-minute off period again

If product is drawn from the machine, a spigot switch resting on the spigot lever will open and tell the contacts in the control board to close and start the dasher motor. The contacts will remain closed for the period of time the spigot lever is calling. The system will look at the torque switch and confirm if it needs to refrigerate. Since you have drawn frozen product from the barrel and introduced liquid product into the barrel the consistency will thin enough to make the torque switch call, the compressor will start and product will freeze until the consistency is thick enough to open the torque switch again. If the product has not thinned enough to make the torque switch call, the dasher motor will shut off. At this time it returns back to the 10 minute off period.

## **Continued Theory Of Operation 601SAS & 614SAS:**

Three syrup tanks will be remoted and pressurized by Co2 or compressed air. Three flavors of syrups (Example: strawberry, chocolate, banana) will be forced by the pressure to the machine. A vanilla base product will be used in the shake machine. On the front of the machine will be a selector pad that allows you to select one of the four flavors offered. When product is drawn, the spigot lever will open the selected syrup solenoid and the syrup will be injected into the vanilla base product. The product and syrup will be blended in the mixing head before dispensed into the cup. **Example:** Operator selects a strawberry shake. Vanilla product dispenses from the barrel into the mixing head. At this time strawberry syrup is injected into the vanilla base and blended thus giving the customer a uniform strawberry shake. Each syrup solenoid is adjustable to provide the correct amount of syrup blended into the vanilla base.

# Theory of Operation

## **Models effected: 707J**

First and foremost there are no thermostats in the machine. The unit operates off of product consistency. Unlike the electro mechanical torque system, these machines read viscosity via an electronic control board (**electronic torque control**). The control board is reading the amperage draw of the motor. Depending upon where the potentiometer is set will determine the shut off point. A pre-determined amperage rating cannot be determined due to the vast ranges of voltage, product types and customers opinion of thick or thin product. There is no need to use an amperage meter to set the product thickness. It is better to use the temperature of the product or consult the customer's preference of product thickness.

As the product freezes, the load increases on the dasher motor and the amperage increases. Once the amperage reaches the set point, the compressor only will shut off. When product is drawn from the machine the consistency will change and the amperage will drop below its set point and the compressor will cycle on. If product is not drawn, the consistency will eventually thin to the point the amperage drops and cycles the compressor back on. There is also a flat potentiometer that controls the off time. This is used to set the reaction time (compressor on) after one 12-oz drink has been drawn. This provides quicker recovery times. If the amperage does not drop enough to cycle the compressor on, a built in 3-minute timer will override the amperage mode and cycle the compressor on.

The dasher motor will run continually thus utilizing the recirculating top cover. As the dasher turns it acts as a pump and forces product toward the front of the barrel. Located in the front of the mixpan there is a welded one-piece restrictor tube. The restrictor tube allows a small portion of the frozen product from the barrel to be recirculated back into the mixpan. This small portion of frozen product chills the liquid product in the mixpan and recirculates. A refrigerated mix-pan is not used because the recirculating slush is more than sufficient to chill the product.

If the unit senses a mix-low condition, the mix-out light will flash and an audible alarm will beep. If the product is not replenished within 3 minutes, the compressor will be disabled and will not cycle on until the product is added. The compressor will not come on when there is no product in the mixpan. Also, if water is used as a substitute for product, the sensing probe will sense the difference and will not activate the compressor.

**Note: Never use water to test the machine in the auto position, damage can occur.**

# Theory of Operation

## **Models effected: 798J**

The model 798 is unique in that it is a dual barrel slush machine. The dasher motors and compressor run continuously. There is one compressor that refrigerates both barrels. The use of refrigerant solenoids via the electronic control boards determines the amount of refrigerant to the barrels and the mix-pans. When neither barrel calls for refrigerant, all the refrigerant is pumped to the mix-pans to prevent the compressor from pulling into a vacuum. The EPR valves are installed to allow the mix-pans to refrigerate the product, not freeze the product in the mix-pans.

Unlike the electro mechanical torque system, this machine reads viscosity via an electronic control board (**electronic torque control**). The control board is reading the amperage draw of the motor. Depending upon where the potentiometer is set will determine the cycle point. A pre-determined amperage rating cannot be determined due to the vast ranges of voltage, product types and customers opinion of thick or thin product. There is no need to use an amperage meter to set the product thickness. It is better to use the temperature of the product or consult the customer's preference of product thickness. Note: There are no thermostats used.

When the amperage of the dasher motor is below the set point of the potentiometer, the electronic control board will call for refrigeration and activate the refrigeration solenoid thus opening the path for refrigerant to the barrel. Once consistency is met via the set point of the potentiometer, the electronic control board will disable the refrigeration solenoid thus closing the path of refrigerant to the barrel not allowing the product to over freeze. When the product consistency begins to thin, the amperage of the dasher motor will drop and the electronic control board will engage the refrigeration solenoid and the freezing process starts over. There is also a flat potentiometer that controls the off time. This is used to set the reaction time (compressor on) after one 12-oz drink has been drawn. This provides quicker recovery times. If the amperage does not drop enough to cycle the compressor on, a built in 3 minute timer will override the amperage mode and cycle the compressor on.

If the unit senses a mix-low condition, the mix-out light will flash and an audible alarm will beep. If the product is not replenished within 3 minutes, the compressor will be disabled and will not cycle on until the product is added. The compressor will not come on when there is no product in the mixpan. Also, if water is used as a substitute for product, the sensing probe will sense the difference and will not activate the compressor.

**Note: Never use water to test the machine in the auto position, damage can occur.**

# Theory of Operation

## **Models effected: 708J**

First and foremost there are no thermostats in the machine. The operates via product viscosity. Unlike the electro mechanical torque system, these machines read viscosity via an electronic control board (**electronic torque control**). The control board is reading the amperage draw of the motor. Depending upon where the potentiometer is set will determine the shut off point. A pre-determined amperage rating cannot be determined due to the vast ranges of voltage, product types and customers opinion of thick or thin product. There is no need to use an amperage meter to set the product thickness. It is better to use the temperature of the product or consult the customer's preference of product thickness.

As the product freezes, the load increases on the dasher motor and the amperage goes up. Once the amperage reaches the set point, the compressor only will shut off. When product is drawn from the machine the consistency will change and the amperage will drop below its set point and the compressor will cycle on. If product is not drawn, the consistency will eventually thin to the point the amperage drops and cycles the compressor back on. There is also a flat potentiometer that controls the off time. This is used to set the reaction time (compressor on) after one 12-oz drink has been drawn. This provides quicker recoveries. If the amperage does not drop enough to cycle the compressor on, a built in 3-minute timer will override the amperage mode and cycle the compressor on.

The dasher motor will run continually thus utilizing the re-circulating top cover. As the dasher turns it acts as pump and forces product toward the front of the barrel. In the front of the mix-pan there is a welded one-piece restrictor tube. The restrictor tube allows a small portion of the frozen product from the barrel to be re-circulated back into the mix-pan. The small portion of frozen product chills the liquid product in the mix- pan and also re-circulates it. A refrigerated mix-pan is not used because the recirculating slush is more than sufficient to chill the product.

If the unit senses a mix-low condition, the mix-out light will flash and an audible alarm will beep. If the product is not replenished within 3 minutes, the compressor will be disabled and will not cycle on until the product is added. The compressor will not come on when there is no product in the mixpan. Also, if water is used as a substitute for product, the sensing probe will sense the difference and will not activate the compressor.

**Note: Never use water to test the machine in the auto position, damage can occur.**

# Theory of Operation

## Models effected: 608J

First and foremost there are no thermostats in the machine. The unit operates off of product consistency. Unlike the electro mechanical torque system, these machines read viscosity via an electronic control board (**electronic torque control**). The control board is reading the amperage draw of the motor. Depending upon where the potentiometer is set will determine the shut off point. A pre-determined amperage rating cannot be determined due to the vast ranges of voltage, product types and customers opinion of thick or thin product. There is no need to use an amperage meter to set the product thickness. It is better to use the temperature of the product or consult the customer's preference of product thickness.

As the product freezes, the load increases on the dasher motor and the amperage increases. Once the amperage reaches the set point, the compressor and dasher motor will shut off. When product is drawn from the machine the dasher motor starts and the electronic control board checks the consistency. As frozen product is being drawn from the barrel, liquid product is entering the barrel from the mixpan. The consistency will change and the amperage will drop below its set point, thus the compressor will cycle on. When product is not drawn, a built in 10-minute cycle timer will cycle the unit back on and check the consistency. The product will have thinned enough for the amperage to drop below the set point therefor, the compressor will cycle on and the refrigeration process will repeat.

If the unit senses a mix-low condition, the mix-out light will flash and an audible alarm will beep. If the product is not replenished within 3 minutes, the compressor and dasher motor will be disabled. Both will remain off for a period of 10 minutes and then the electronic control board will cycle both the compressor and dasher motor on for 45 seconds or until consistency is reached (which ever one come first). After the 45 second run time, the machine will return to the 10 minute off time unless product has been added to the mixpan. If product is never added to the mixpan the machine will repeat the 10 minute off 45 second on sequence until product is added.

The compressor will not come on when there is no product in the mixpan. Also, if water is used as a substitute for product, the sensing probe will sense the difference and will not activate the compressor.

**Note: Never use water to test the machine in the auto position, damage can occur.**

# **TROUBLE SHOOTING**

## Service Bulletin

### Subject:

### The Machine - The Product - The Operator

The following information is intended to help sales people, as well as, service people in becoming a troubleshooter. By applying this information, you can logically form a visual scenario and separate the variances in the three diagrammatic categories..

#### The Machine

If an individual approached service from a standpoint of isolating the problem, he can expedite the call. By finding out what is operating, it can be determined what is not. The freezer has four separate systems which are interconnected:

Refrigeration Systems  
Electrical System  
Drive System  
Torque System

**Refrigeration System:** To converse with machine owner it is important to have a working knowledge of the refrigeration system as we produce it. Know how the freezer functions, why the pressures are as they are, what the normal range of pressures are by unit.

**Electrical System:** The electrical system is covered by the wiring diagram by freezer model. There is nothing complicated in the wiring of our freezer. However, many people will call before the wiring is traced. Often, the problem is crossed wiring or field modification of existing wiring.

**Drive System:** Our drive system is very basic. The only thing out of the norm is the number 17 wire, which comes from the winding side of the thermal protector, and does not allow the compressor to operate if the motor is off on thermal protection.

**Torque System:** Our torque systems sense the variance in product viscosity. Anything which functions erratically or transfers varying degrees of resistance affects the belts and torque control assembly. This includes the dasher, blades, torque arms, torque cables, and brackets and belts. The most important thing to know is why and how it works.

### Product

The products used in freezers will be widely varied — almost unbelievably varied, and too numerous to explain individually. However, an open mind must be kept on what

may or may not be run in a freezer. To do this, products must be categorized into separate groups:

dairy products and non-dairy,  
(soft serve or semisolid)

Soft serve is a general term; it may mean fresh or powdered from imitation to 20% butterfat or higher. Soft serve product must take air, or have overrun, sometimes referred to as swell, or yield. Overrun is the percentage of volumetric increase in a product. It is determined by two factors:

1. The ability of a product to hold air; at maximum, a product will only take 2.5 times the amount of solids in the mix.
2. The available air present in the barrel to freeze around, as determined by the function of the carburetor tube. Soft serve products are dispensed at 18 to 22 degrees F., and served as cones or sundaes.

The basic problems from a service standpoint are product breakdown and product separation. The single most important function of a soft serve product is its ability to hold air or maintain overrun. Overrun is important to give a smooth, creamy texture.

The problem with soft serve products is inherent in the product itself. Soft serve is a blend of water, solids, both fat and nonfat, emulsifiers, stabilizers and sugar. A freezer adds air as a final ingredient and freezes the blend, effectively changing the physical state of the product, under agitation. When the product is served promptly, there is no problem. However, continuous agitation and freezing of the product begins to separate the individual elements of the mix; the product loses its ability to hold air, becomes wet looking, and grainy. While the separation begins immediately, it normally takes a couple of hours to get to an unacceptable level.

Therefore, it is necessary to explain that a soft serve freezer is actually a dispenser. If product is not dispensed at regular intervals, the product will break down. To bring things into perspective, it is necessary to instruct operators to refrain from starting a freezer until they anticipate some usage of the product. Always start the freezer with fresh mix. To substantiate your advice, ask them to start the freezer up with fresh mix the next time they have the problem of soft product; they will find the freezer is functioning properly.

All powdered mixes require proper procedure in mixing. They should be mixed in advance and refrigerated to 40 degrees, then mixed again before putting it into the freezer. The normal problems associated with powdered mixes are: product breakdown, improper mixing ratios or not mixed in advance and refrigerated prior to using. Dry particles float and block off the carburetor tube, which can cause machine damage.

By law, for a product to be called ice cream, it must be 10% butterfat or higher. Products having less than 10% butterfat are referred to as ice milk and may also have a greasy fatty tendency. Ice milk will hold up longer than higher butterfat product mix.

The largest, single problem with yogurts is related to handling prior to usage in the freezer. Fresh yogurt has a tendency to settle in transit. Yogurt products must be totally mixed prior to usage. Because of the limited quantity of producers, many times the yogurt products are delivered frozen; in this instance, the product must be totally thawed and stirred vigorously prior to usage. Failure to do so will lead to equipment damage.

Frozen desserts, ices, waterbased products: The largest, single problem with products of this type is improper mixing of the product. Some water base frozen desserts will require the suction pressure of the freezer be raised. Check operator manual for instructions, and readjustment of the torque control system.

## **The Operator**

Expedite a service call by knowing your equipment and know the correct application. This may save service labor cost.

Isolate each function - this will tell you what is working and what is not. Use deductive reasoning.

Know the mix functions and applications.

Listen to your customer over the phone, it may save you a field trip, and save the customer labor costs.

Ask questions, That is the only way you can develop the full picture.

Identify the product temperature and how long the unit operated. Identify how long the mix has been in the unit and how often product is drawn from the machine.

Review these and separate the problems. Become a troubleshooter.

- A - Mix Function**
- B - Torque System**
- C - Electrical System**
- D - Refrigeration System**
- E - Carburetor Tube Functions**
- F - Dasher Assembly**

# Troubleshooting

## **If product will not freeze to proper consistency:**

1. Check for properly mixed product. Replace product as necessary.
2. Check for dull scraper blades ensuring they have been rotated. Replace as necessary.
3. Check condenser for dirt or obstructions. Be certain to maintain a minimum of 6" clearance for proper air flow. See Quarterly Maintenance.
4. Ensure compressor and fan will run.
5. Check consistency adjustment and belt wear. Adjust and replace as necessary.

## **Unusual Noises Audible From Blending System:**

1. Check the spinner assembly for proper assembly. Correct as needed.
2. Inspect shaft bearing. Be certain the shaft and bearing through bore are both well lubricated. Replace if damaged or call for service technician as necessary.

## **If squeaking or chirping noises are heard:**

1. Check for properly mixed product. Replace as necessary.
2. Check belt tension. Replace if worn.
3. Check rear seal. Replace if necessary.

## **Inadequate Syrup Blending:**

1. Check product consistency. Adjust torque as necessary to obtain a suitable product.
2. Check syrup tank level. Refill as necessary.
3. Check CO<sub>2</sub> pressure at the regulator. Verify 5 - 20 P.S.I. Replace CO<sub>2</sub> supply as necessary.
4. Inspect syrup check valve assembly at the back of the mixing block. Clean as necessary.

## **If equipment leaks:**

1. Check o-rings and seals. Replace as necessary.
2. Check for proper lubrication. Lubricate per instructions. Be certain face plate o-ring in **NOT** lubricated.

## **If unit freezes up:**

1. Check for restricted carburetor tube flow. Check for lubricant blocking the mix inlet hole.
2. Check for sufficient product in the mix pan. Add mix if it is too low.
3. Determine if you are using rerun mix. Change to new mix.
4. Determine if there is water in the mix. Replace with new mix.
5. Determine if you are using a flat product mix. Replace with new mix.
6. Check for machine damage from previous freeze-up. Check freezing cylinder, dasher, blades, etc.
7. See if the freezing cylinder surface is too cold. Check suction pressure.
8. Check for missing scraper blades, or dasher assembly parts. Check these assemblies carefully.
9. See if the mix pan is too cold. Adjust the mixpan EPR valve as needed.
10. Check for a sticking spigot switch. Replace or adjust as needed.

## **Inadequate Syrup Flow:**

1. Check CO<sub>2</sub> and syrup connectors on syrup tanks. Secure and/or clean as necessary.
2. Check for clogged solenoid valves. Refer to Sanitizing Procedure, Syrup Tanks and Accessories.

**Note:** It may be necessary to fully open the solenoid valve adjustment screw during sanitizing and then recalibrate. Refer to Syrup Solenoid Valve Calibration.

## **If Mix Out Light will not light:**

1. Call SaniServ authorized service technician.

## **If compressor does not run:**

1. Check Torque Control.
2. Inspect the condenser for dirt or obstruction. See Quarterly Maintenance.
3. Check for proper clearance around machine. Always maintain 6" for proper airflow.

## 601 & 614 SAS Series

**Filling:** Always fill the machine and check the syrup tank levels at the start of each day. Fresh prechilled product will produce the best results.

Do not pour shake mix directly onto the mix pan agitator. If you do, it is possible to break the magnetic coupling between the agitator and the drive system beneath the pan. If that happens, it is necessary to reposition the mix pan agitator in a sanitary manner - see page 19 paragraph 3.

**Mix Out Light:** When the mix out indicator light flashes, add product to the mix pan. This light is an integral part of the membrane switch which also activates an audible beeper.

**Note:** The SAS machine will shut down completely if the mix out condition is not satisfied within three minutes.

The mix pan must be filled immediately to prevent air from entering the freezing cylinder. Air in the freezing cylinder will starve the machine and cause freeze-up and vibration. If this condition occurs, turn the Auto/Cleanout switch to the "OFF" position, remove and set aside the carburetor tube in a sanitary manner, and add product to the mix pan. Allow the freezing cylinder to refill. Replace the carburetor tube in a sanitary manner and return the Auto/Cleanout switch to the "AUTO" position.

**Mix Pan Lid:** Be sure to leave the lid in place on top of the mix pan to prevent any foreign materials from contaminating the mix.

**Mixing:** Ensure that the product is prepared per label instructions.

**Flavor/Control Switch:** This switch is employed to select the desired flavor of shake - Fig. 49.

The #1 button is vanilla and will not inject syrup. Vanilla shake is dispensed directly from the freezing cylinder.

Button #2 is for chocolate and will inject chocolate syrup into the vanilla base.

Button #3 will inject strawberry.

Button #4 will inject any optional flavor.

The Flavor/Control switch assembly also features a mixer rinse button denoted by the icon which looks like a shower head.

**Syrup Solenoid Valve Adjustment Tips:** The section covering valve adjustment indicated a syrup draw time of 15 - 20 seconds to dispense 1 to 1-1/4 ounces of syrup. Perhaps a more accurate method to tailor the valve calibration to your application follows:

1. Prepare the machine to dispense your own shake product making certain the consistency is correct.
2. Select your most common serving size - 16 ounce, for example.
3. Measure the draw time of your selected serving.
4. Use that measured time as the draw time to dispense the 1 to 1-1/4 ounces of syrup.
5. Adjust the syrup flow up or down to obtain the exact taste your customers have learned to expect and appreciate from your operation.
6. Recheck consistency of your most popular flavor. Remember, warm syrup will decrease the shake consistency (thickness).
7. Repeat for each flavor.

Once you have calibrated the syrup solenoid valves using your most common serving, all other serving sizes should be correct.

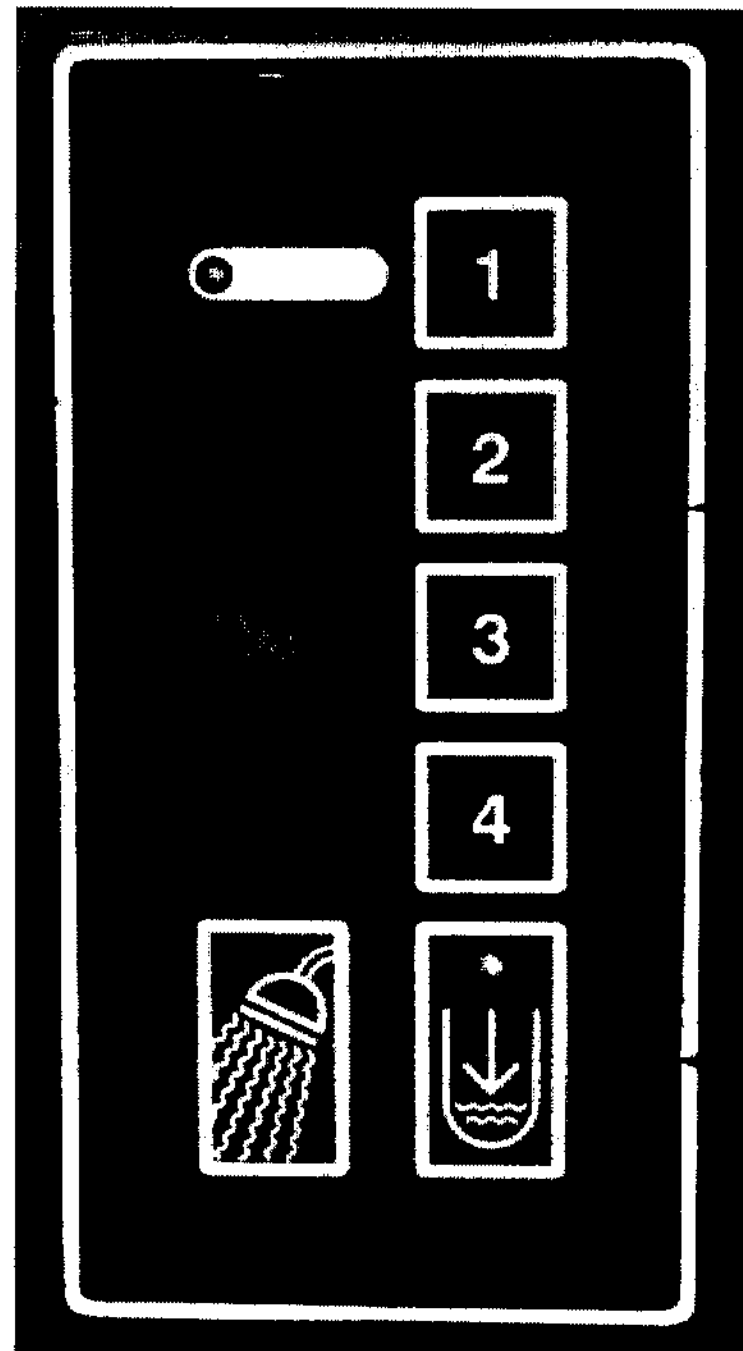


Fig. 49  
Keypad

**SERVICE BULLETIN**

---

**SUBJECT:**

**Helpful Hints On Causes To Broken Front Plate Assemblies.**

**Front Plate Breakage**

The following information may assist you with your unit. We have received reports that front plates will break during start-up procedures, as well as, during the normal operation of the machine. As you know, these parts are not warranted due to breakage. Care must be taken with the front plate, as not to install it improperly or lubricate it improperly.

1. Recent reports from the field reveal that the large (front plate) o-ring is being installed with lubricant (petrogel). This practice will, in fact, lead to breakage! Once the o-ring is lubricated, it will not seat and seal properly. As the leaking product mix begins to drip from the front plate, the operator begins to tighten the two knobs. This will result in overtightening and breakage of the front plate. The operators manual clearly states, "Do not lubricate the o-ring". This reminder is to make you aware of what will happen if you lubricate the front plate o-ring. Exception: Model 522 front plate o-rings are to be lubricated.
2. We continue to receive information from our field service agencies that customers/operators tighten the front plate fastening plastic knobs unevenly, resulting in binding and breakage. Once the front plate is in position, gradually tighten each of the knobs evenly. Do not attempt to run one of the knobs down and secure it before starting the other knob. Both need to be done simultaneously and tightened in the same manner. Knobs need only to be snug.
3. We have been advised that some customer/operators are installing the spigot handle into the plunger and front plate backwards (upside down). The handle can be installed in this manner, but if done, it will provide too much leverage against the faspin and plunger resulting in front plate cracks. The handle should only be installed in the manner described in the operators manual.
4. From time to time, we receive word that stator rods are also causing front plate breakage. The operators manual clearly states that the stator rod must be properly seated prior to attempting to install the front plate. If the stator rod is improperly installed, it will chip away at the front plate socket. Moreover, if the stator rod is not properly seated and the front plate is installed, the

tightening knobs will finalize the breakage. Care must be taken in the assembly of the complete dasher components.

5. Care must also be taken when seating the dasher assembly into the rear of the freezing chamber. The dasher shank must slip into the bearing assembly completely. If the dasher is not firmly seated, it will cause the front plate to bind during the front plate installation.
6. Front plate breakage will also occur when the evaporator freeze chamber is too cold and the product mix becomes too hardened, resulting in front plate damage and dasher failure. The evaporator must function within the design limitation set up for your machine. Failure to observe these design criteria will also cause additional damage to the machine.

## **Service Bulletin**

---

### **Subject:**

1. **Factory Setting for Torque Adjustment Screw and Belt Idler Arm Screw.**
2. **Helpful Hints on Idler Arm Maintenance.**

### **Factory Setting for Torque Adjustment Screw and Belt Idler Arm Screw.**

All units are tested before shipment to the distributor/dealer. The reason for this test is to evaluate the operation of the machine, to perform final adjustments and calibrate the torque control system. This will ensure that the machine arrives at your customer's location and only requires minor adjustments to meet localized conditions.

Should you find it necessary to perform additional adjustments you may wish to consult the operator's manual, as well as, the information contained herein.

It is important to review the settings of all machines before attempting to make adjustments to the torque control system. Such inspections often reveal that the operators have improperly reset the torque adjustment screws, resulting in erratic machine operation.

To accomplish this inspection, you must first turn **OFF** all electrical power to the unit. Now proceed to remove the left and right side panels. After doing so, you are now ready to make the following observation.

### **Torque Adjustment Screw Setting**

On inspection, you should find the torque screw at, or near the original factory setting. From the head of the screw to the retaining clip that the spring attaches, should be 1 1/4" to 1 1/2" distance. Depending upon the product mix, additional small amounts of adjustment may be necessary. Once the unit is producing the desired product temperature, no additional adjustments should be required. However, every time the operator changes the type of product mix, i.e. yogurt, soft serve, sorbet, and/or fruit based products, additional changes may be necessary. Some may be warmer, some may be colder.

Flavors also require different temperatures. Chocolate may require a few degrees lower temperature than vanilla.

To make additional changes to the product temperature, you will need to turn the torque adjustment screw clockwise

for colder, and counterclockwise for warmer. Such adjustments should be in increments of two full 360 degree turns. By adjusting the screw two full turns, it will affect the temperature of the product approximately 1 degree F. Note: 527 and 501, left side torque adjustments are 3/4" to 1" from the head of the screw to the retaining clip.

### **Belt Idler Arm Adjustment Screw (Do Not Adjust Label):**

The factory setting for this screw should be 3/4" distance from the head of the screw to the retaining clip that secures the belt idler arm spring. Any adjustment to this screw will only cancel previous adjustment to the torque adjustment screw. Thus, causing the unit to be out of calibration. For fruit based products, the belt idler adjustment should be tightened all the way.

**Special Note:** After the final adjustment has been made to the unit, it is suggested that a seal be applied to the torque adjustment screw and the idler arm screw. This seal can be created by painting the head and threads of the screws with fingernail polish, or quality paint from a model airplane kit. This seal will identify to the operator that attempts to adjust the machine after your set up and demonstration. If you have a multiple team that services our machine, you may wish to consider multiple coded colors that will identify each serviceman.

### **Idler Arm Maintenance**

After the first six months of machine operation, and every six months thereafter, it is advisable to disconnect both idler arms from their respective springs. Once disconnected, remove the nut from the pivot point of the idler arm. Mark the individual idler arms so that you will know the correct way to reinstall after performing the maintenance. Now, remove the two idler arms and inspect the pivot point sleeve. This area should be free of rust, paint, and product mix. If any of these substances are found, it is advisable to obtain a fine grade of emery cloth and polish the sleeve surface. Also, sand the surface of the pivot stud, making sure the stud is highly polished. After this has been accomplished, make sure the stud is highly polished. After this has been accomplished, it is advisable to apply 30 weight oil, no seize, or other good lubricant, to the stud surface, as well as, the pivot sleeve surface.

Reinstall the idler arms being careful not to apply grease to the belt's surface. The torque spring and the belt idler arm spring. It may not be necessary to readjust the screws.

Place the unit into operation and observe the product temperature.

## Service Bulletin

### Subject: Product Temperatures

Various surveys show that 90% of the service related calls can be traced to actual mix activities or operator activities. When discussing the problems with the operator or mix supplier, it is important to use the correct approach. All too often, an attitude is adopted that attributes mix problems to inferior ingredients. However, all of the same problems can be found in mixes that were compounded from the finest ingredients obtainable and processed in the most modern and sanitized mix plant. Consequently, it is important not to condemn the mix, but to seek a solution to the problem by jointly working with the operator and the mix supplier.

One of the most important ways to determine what a machine is doing or not doing, is to take product samples and record the respective temperatures.

Product temperatures can quickly determine if a problem exists with a machine or caused by other related activities. Draw three servings of product, each serving should be 4 to 5 ounces each. These samples should be in a small container. Insert a thermometer, stir occasionally to prevent pocketing of melted product. Add all three servings together and divide by three to determine an average temperature.

#### Temperature sample of soft serve ice cream

|          |          |          |   |            |
|----------|----------|----------|---|------------|
| Test #1  | Test #2  | Test #3  | = | Final Ave. |
| 18.6° F. | 18.0° F. | 17.6° F. | = | 18.06° F.  |

This test illustrates the refrigeration section is functioning properly and the problem must be traced elsewhere. More often than not, is a case where the business has slow periods during the day and night. These slow periods cause the mix to lose the air content from the mix. By testing the product temperatures, you will assist the machine in introducing revitalized mix from the fill pan hopper to the freeze chamber. By doing this, air is recharged into the revitalized mix and the product will stand up on the next batch of samples. To be sure, take three additional samples, again recording temperatures, and observe condition of sample.

|                         | RANGE        | IDEAL        |
|-------------------------|--------------|--------------|
| Soft Serve              | 17 F to 21 F | 18 F to 19 F |
| Yogurt                  | 14 F to 21 F | 16 F to 18 F |
| Sherbets                | 17 F to 21 F | 18 F to 20 F |
| Italian Ice             | 18 F to 26 F | 19 F to 22 F |
| Sorbet                  | 17 F to 21 F | 18 F to 19 F |
| Frozen Beverages        | 24 F to 28 F | 24 F to 26 F |
| Milk Shakes             | 24 F to 28 F | 26 F to 28 F |
| Fruit Based Soft Serve  | 18 F to 23 F | 18 F to 23 F |
| Frozen Carbonated Drink | 24 F to 26 F | 24 F to 26 F |
| Slush Fluid Drink       | 25 F to 29 F | 27 F to 29 F |

A pocket thermometer and a watch are two of the most important tools in determining product serving temperature. If desired, product temperatures are being obtained and compressor running cycles are within the recommended time frame, the refrigeration system is doing its job. For example, the operator calls complaining that the product is wet, loose and will not stand up. The only way that this can be properly diagnosed is to first determine required temperature for a dry, fir, product with the specific mix they are using. If the finished product is determined to be the same temperature as that of the mix producer, it will be almost certain that the problem is not mechanical. To be sure, a further check can be made of the machine's running time. The normal recovery time for a unit is 5 to 8 minutes after four servings of 4 ounces each has been drawn from the machine. Even under the most extreme conditions, the unit should not operate beyond 15 minutes. At this point, if the product temperatures and running cycles are correct, then it is 100% sure that the problem is related to the mix or can be attributed to the operator.

Other problems could be incorrect assembly of parts and/or loading the machine improperly. Recheck operating procedures. If product temperatures are higher than normal, then most likely a mechanical problem does exist. The exception is the possibility of the operator out drawing the capacity of the machine. In this case, higher than normal temperatures would be noticed only during specific times.

**SERVICE BULLETIN**

---

**SUBJECT: Evaluating Customer/Equipment Problems**

This bulletin will provide the reader with a basic procedure in evaluating customer complaints with SaniServ equipment. This will be accomplished by dividing the problem into three (3) basic categories. They are, in the order of their importance:

1. Mix Problems
2. Operational Problems
3. Mechanical Problems

Problems will always be related to one, or even a combination of the above three (3) categories and it is essential that the reader of this bulletin draw a distinct dividing line between them. Otherwise, endeavoring to find a solution in one category when the problem really lies in another, will only result in unnecessary expense to the owner/operator of the equipment, and/or the evaluator of the problem.

1. **Is it the mix?** Problems related to the mix are, in turn, always reflected in the appearance or taste of the product. Some defects in ice cream are:

- A. Sandy or grainy texture.
- B. Free ice crystals.
- C. Butter churning.
- D. Weak, sloppy product that will not stand up firm at designated temperatures.
- E. Foamy product, containing too much air or, heavy soggy product containing too little air.

When discussing the defects in product with either the owner/operator or mix supplier, it is important to use the correct approach. Too many times, the attitude adopted attributes the reason for these defects to inferior ingredients. However, all of these defects can be noted in mixes that were compounded from the finest ingredients obtainable and processed in the most modern, sanitary mix plants. Consequently, it is important not to condemn the mix, but to seek a solution to the problem by jointly working with the owner/operator and the mix supplier.

2. **Is it operational?** When working out a suspected operational problem, it is best to request the operator to actually go through the assembly and installation of the various parts, then load with mix and draw a few servings. If the operator is simply asked to outline the

procedure, they will generally tell you only what they want you to hear. By personally observing the methods in operational practice and comparing them against the recommended procedures, as outlined in the Operation Manual for that exact model machine, small differences may often come to light that are the answer to the problem. It is particularly important to do this, if the complaint concerns the taste of the product or high bacteria count in either mix or product. An owner/operator may follow careful sanitization practices, insofar as cleaning equipment, but will use an unsterilized container to transfer mix from the delivery can/bag/box container to the machine, or they may allow some unsterilized utensil to come in contact with the mix after it is placed in the machine. Good sanitization practice is often a difficult subject with an operator, but the service engineer should assume this responsibility and condemn unsanitary practices whenever they are observed. Praise the operation where you can, but condemn where you must! A simple approach that will strike home is to explain how the life expectancy of many parts/components of the equipment will be adversely affected unless good cleaning and sanitizing procedures are used. If the owner/operator sees that it will cost them money, they will correct the situation.

3. **Is it mechanical?** There are too many makes, models and variations to go into detailed examination in this bulletin. But, the exact service manuals and operator manuals cover the basic functions of each portion of the system. Review these and become familiar with the total function of the equipment. Once this is understood, diagnostic evaluation procedures can be used. It is difficult to test mechanical/electrical operations without a product load in the freezing cylinder. If testing is being done in one's shop or sales office, the same mix that is being used by the owner/operator should also be used in the testing procedures. Often, obtaining mix and the same cleaning equipment means extra labor and expense, but will be well worth it in the final analysis. Running, as well as, off-cycles are important with this evaluation. Even the best soft serve and milk shake mixed are limited to the amount of whipping they can stand before breaking down and showing evidence of some of the defects mentioned previously.

Consequently, before arriving at conclusions regarding the mix, it is wise to determine if the machines cycles are within factory recommendations. Long running cycles, when no product is being drawn from the machine, indicates either a freezing cylinder full of very heavy, low overrun product, or a malfunction in some part of the refrigeration system. More often than not, it is the loss of air from the mix.

A secondary effect of a full cylinder of low overrun product is a great increase in friction of heat, caused by turning of the dasher in the mass of product. Under this condition, the torque control system cannot recognize the consistency of the product, thus causing it not to shut

off the refrigeration function. Some cases result in freeze up and damage to the dasher. There are also cases where the friction heat is greater than the refrigeration system's ability to remove it. This can easily be mistaken for a malfunction in the refrigeration or control system. A quick check method is to shut down the machine, clean it, sanitize it, and put new mix into the machine. Start it up and it should cycle off within 8 to 12 minutes.

A good evaluator/trouble shooter can, by logical deduction, diagnose the function and purpose of all parts of the system, but a few minutes reading the Operator and Service Manual for that machine will also make the job easier.

When there are doubts as to the cause of a problem, answers to the following questions should be sought first... "What should be expected from the mix?", "What should be expected from the refrigeration system and its components?", and "What should be expected from the owner/operator?". Answers to these questions will often provide clues to the cause of the problem.

## **REMEMBER:**

Always separate the problem into one of these possible categories:

1. Is it mix?
2. Is it operational?
3. Is it mechanical?

Once direction is known, corrective steps then become relatively simple.

## TROUBLESHOOTING GUIDE INDEX \*

1. Unit will not start.
2. Unit dasher motor starts but compressor does not.
3. Unit will not start via spigot but will start, run and make sellable product if started by "Auto/Cleanout" switch.
4. When lifting spigot switch, dasher starts but compressor contactors chatter.
5. Compressor runs in "Cleanout" mode.
6. Dasher starts immediately if switching to "Auto".
7. Unit runs, but never makes finished product.
8. Unit runs, but pulldown time is long. More than 15-17 minutes.
9. Unit runs, makes product, dasher runs constantly compressor cuts on and off.
10. Unit runs, makes finished product, won't shut off, not short cycling, eventually freezes up.
11. Unit runs and makes finished product initially. However after a period, product goes soft, appears grainy and is cold (within proper range).
12. Unit runs, makes finished product, then melts down.
13. Belts jump pulley.
14. Dasher bent or broken scraper blades.
15. Dasher strikes barrel.
16. Front plate leaking or broken.
17. Front plate on twist machine bleeds over.
18. Front plate wobbles.
- 19.
- 20.
21. Mix pan freeze up.
22. Mix pan refrigerated mix too warm.
23. Rear seal leaks.

**DANGER**

**ELECTRIC SHOCK HAZARD.**  
**EQUIPMENT IS TO BE EVALUATED AND/OR SERVICED BY A QUALIFIED SERVICE TECHNICIAN.**  
**DO NOT OPERATE EQUIPMENT WITH PANELS REMOVED.**

\*Troubleshooting for standard machines starts on page 9-1, visual machines on page 9-9.  
 \*\*Copeland and Tecumseh electrical and service handbooks should be considered as an addendum to this troubleshooting list. Contact your local wholesaler.

# Troubleshooting Guide

| Symptom                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Probable Cause               | Remedy                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Unit will not start.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1. Blown fuse.               | 1. Inspect and/or replace fuse.                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2. Tripped circuit breaker.  | 2. Reset breaker. Use HAC & R type breakers.                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3. Low voltage.              | 3. Check voltage at main power terminal block in unit. Voltage should be (+) or (-) 10% of data plate rating. Check integrity of connectors.                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4. Incorrect power cord.     | 4. Compare wire ampacity with fuse or breaker size.                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5. Auto/Cleanout switch.     | 5. Check continuity thru all 3 poles of switch.                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6. Dasher overloaded.        | 6. Cool off via fan; restart unit and define cause of overload.                                                                                                                                                                    |
| <b>Note:</b><br>(a) Three phase units must be started by turning Auto/Cleanout switch to "Auto" and then lifting spigot switch. Maintain switch in up position for 1 1/2 seconds minimum.<br>(b) Three phase dasher motors have externally mounted overload devices located in the electrical enclosure and fastened to the bottom of dasher contactor or directly to electrical box wall. Overload is preset to a value equal to motor's marked full load amperage. Overload is not to be adjusted beyond 125% of motor's marked full load amperage. Overload is an automatic reset device.<br>(c) Under no circumstances should machine start when switching from "Off" to "Auto".<br>(d) Ensure that unit connected to a dedicated circuit. |                              |                                                                                                                                                                                                                                    |
| 2. Dasher motor starts but compressor does not.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1. Torque switch.            | 1. Check for proper action on switch then check switch contacts via ohmmeter.                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2. 1.5 second timer.         | 2. Temporarily jump out timer and attempt to restart.                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3. Contactor.                | 3. Check contactor coil and contacts.                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4. Dasher motor wiring.      | 4. If dasher motor is miswired, contactor will not energize.                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5. Compressor.               | 5. Check start components and compressor. Refer to compressor manufacturer's handbook for details. Note: 1 1/2 second timer may be left out temporarily, but must be replaced.                                                     |
| 3. Unit will not start via spigot but will start, run and make salable product if started by "Auto/Cleanout" switch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1. Spigot switch.            | 1. Check switch for proper action; then check switch contacts. Switch should be electrically closed when spigot is at rest.                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2. Ten minute recycle timer. | 2. Remove wire temporarily from terminal #6 or #7 of timer. Timer should activate machine via solid state relay. If not, check relay operation. If relay is bad, timer cannot operate. If relay is found to be good, timer is bad. |

| Symptom                                                                 | Probable Cause                                                                                                                                | Remedy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4. Lift spigot switch, dasher starts but compressor contactor chatters. | 1. 1.5 second timer.<br>2. Improper power supply.<br>3. Recycle ten minute timer.<br>4. Solid state relay.<br>5. Three phase dasher overload. | 1. Temporarily jump out timer and attempt restart.<br>2. Ensure unit is connected to a dedicated circuit with correct supply cord and voltage.<br>3. Temporarily jump wires on terminals #1 and #4. Turn to "Auto" and check for chatter. If chatter persists, see<br>4. Temporarily jump wires on terminals #1 and #2. Turn to "Auto" and check for chatter.<br>5. Check relay setting. Set at dasher motor FLA or FLA x 1.25 maximum.                                                                                                   |
| 5. Compressor runs in "Cleanout" mode.                                  | 1. "Auto/Cleanout" switch.                                                                                                                    | 1. Check switch contacts via ohmmeter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 6. Dasher starts immediately if switching to "Auto".                    | 1. Spigot switch.<br>2. 10 minute recycle timer (spins).<br>3. "Auto/Cleanout" switch.                                                        | 1. Check switch for proper action; then check switch contacts. Switch should be electrically closed when spigot is at rest.<br>2. Pull wire at #1 terminal; then satisfy torque switch manually.<br>3. Check continuity thru switch poles.                                                                                                                                                                                                                                                                                                |
| 7. Unit runs, but never makes finished product.                         | 1. Refrigeration system.<br>2. Check condenser.<br>3. Check suction pressure.<br>4. Dasher.                                                   | 1. Check compressor operation via amp meter, volt meter, and gauges.<br>2. Water-cooled requirements are approximately 1 to 1 1/2 GPM/HP. Air-cooled units, check to ensure fins are clean fan(s) are running.<br>3. See suction pressure chart.<br>4. Check dasher motor and belts.<br><br>Check dasher rotation. Note: All SaniServ dashers run counter clockwise from front.<br><br>Check dasher scraper blades. They must be straight and sharp with no cracks or chips. Blade cutting edges must point counter clockwise from front. |

| Symptom                                                            | Probable Cause                                                | Remedy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8. Unit runs, but pull down time is long. More than 15-17 minutes. | 1. Scraper blades.                                            | 1. Scraper blades may be too dull, improperly aligned, or installed improperly. Blades should peak between 1/8" to 1/4" above front auger. Note: Rotate blades after each cleaning for even wear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                    | 2. Temperature surroundings too high or improper ventilation. | 2. Machines will perform best in an air-conditioned atmosphere. Allow at least 6" clearance around each side of unit. If the machine is in a corner, air circulation may be too poor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                    | 3. Suction pressure incorrect.                                | 3. Suction pressures outside normal settings will cause poor performance. See suction pressure chart.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                    | 4. Mix.                                                       | 4. Mix, at or near expiration date, will not firm up like fresh mix. Use fresh mix.<br><br>Some mixes do not thicken as well as others. Therefore it is necessary to cause torque system to be more sensitive at a servable temperature and consistency. Tighten "DO NOT ADJUST" screw using caution. Extensive adjustment pre-loads torque system causing higher motor starting torque and additional running amperage.<br><br>Mix which has been frozen, thawed and refrozen will not firm up as well as fresh mix.                                                                                                                                                                                           |
|                                                                    | 5. Torque adjustment.                                         | 5. After 15 minutes of run time, draw out three small samples of product and average temperatures. If product is correct consistency and temperature, turn torque adjustment screw counterclockwise until shutoff. Draw off half of barrel volume. While in "Cleanout" pull carburetor tube(s) and allow fresh mix to enter barrel, restart refrigeration. Sample product temperature after shut off.<br><br>Check adjustment screw. Initial setting should be between 1 1/4" to 1 1/2" from bottom of screw head to spring retaining clip.<br><br>Note: Fruit based products require that the belt idler adjustment marked "DO NOT ADJUST" be tightened to maximum.                                            |
|                                                                    | 6. Torque idler frozen and cannot activate torque switch.     | 6. While power is off, pull idler arm and torque arm in the direction extending spring of each arm. Although spring will offer resistance, arms should move and should not be frozen in place. If cleaning and lubrication are needed, remove belt and nut holding arm in place. Remove arm and pivot and clean with a light grade of sandpaper, lubricate with molybdenum disulfide antisieze compound. Reinstall arm and belt.                                                                                                                                                                                                                                                                                |
|                                                                    | 7. Torque switch.                                             | 7. With power off, pull torque arm out. Listen for audible click of switch. Release torque arm and listen again for audible click. This sound is switch opening and closing. It must do both. Notice position of torque arm as switch contacts break. If torque switch body is horizontally mounted, switch point should occur in middle of allowable travel. If adjustment is needed, carefully change pitch of bend on switch arm. Ensure that torque switch is tight in its mounting. This can affect switch point. Reminder: Torque switch breaks power to contactor when unit reaches torque (product consistency). Switch position (initial and final) determines whether compressor will start and stop. |

| Symptom                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Probable Cause                                                                                                                                                                                    | Remedy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9. Unit runs, makes product, dasher runs constantly, compressor cuts on and off.                                                                                                                                                                                                                                                                                                                                                                                             | <ol style="list-style-type: none"> <li>1. Spigot switch.</li> <li>2. Timer.</li> <li>3. Relay.</li> <li>4. Auto/Cleanout Switch.</li> </ol>                                                       | <ol style="list-style-type: none"> <li>1. Check switch for proper action; then check switch contacts. Switch should be electrically closed when spigot is at rest. Replace if bad or adjust switch arm.</li> <li>2. Pull wire at terminal #1; then satisfy torque switch manually. Unit should shut down. However, if dasher continues to run, timer is not causing dasher to run. See possible cause #3 below.</li> <li>3. Pull wire at terminal #1; then satisfy torque switch manually. Unit should shut down. However, if dasher continues to run, relay is not causing dasher to run.</li> <li>4. Check poles on the switch via ohmmeter. Wire #12 powers dasher during "Cleanout" mode and also transmits power through contactor. If continuity is found with switch in "Off" or "Auto" position replace switch.</li> </ol> |
| 10. Unit runs, makes finished product, won't shut off, not short cycling, eventually freezes up.                                                                                                                                                                                                                                                                                                                                                                             | <ol style="list-style-type: none"> <li>1. Torque adjustment.</li> <li>2. Torque idler frozen and cannot activate torque switch.</li> <li>3. Torque Switch.</li> <li>4. Starved barrel.</li> </ol> | <ol style="list-style-type: none"> <li>1. Refer to situation #8.</li> <li>2. Refer to situation #8.</li> <li>3. Refer to situation #8.</li> <li>4. Ensure that barrel of unit is not starved for mix. This would not provide enough resistance to satisfy torque. Pull carb tube and watch for excessive bubbling. This indicates a starved barrel.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p>Note:</p> <p>(a) Ensure carburetor tube mix inlet is not plugged with petrogel. Clean and lubricate daily.</p> <p>(b) Ensure carburetor tube is set such that mix inlet tube faces front of unit.</p> <p>(c) Never allow finished product to be placed in mix pan. This plugs mix inlet holes.</p> <p>(d) Never run mix below top of the carburetor tube mix inlet hole.</p> <p>(e) Never run refrigeration without mix in the mix pan and carburetor tube installed.</p> |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 11. Unit runs and makes finished product initially. However, after a period, product goes soft, appears grainy and is cold (within proper range).                                                                                                                                                                                                                                                                                                                            | <ol style="list-style-type: none"> <li>1. Product breakdown.</li> </ol>                                                                                                                           | <ol style="list-style-type: none"> <li>1. Turn unit to "Cleanout", turn carb tube to closed position. Dispense 1 to 1 1/2 quarts of product. Remove carb tube and allow mix to fill freezing cylinder until it stops bubbling. Reinsert carb tube and turn on flow to proper adjustment. Restart refrigeration and allow 10-12 minutes to cycle off. Proper product consistency should be obtained at this time.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                        |
| 12. Unit runs, makes product then melts down.                                                                                                                                                                                                                                                                                                                                                                                                                                | <ol style="list-style-type: none"> <li>1. 10 minute recycle timer.</li> </ol>                                                                                                                     | <ol style="list-style-type: none"> <li>1. Verify that unit will restart on its own (when in "Auto" mode every 10 minutes. If it does not restart, check solid state relay also. If solid state relay checks good, timer is bad. See also service bulletin SB8612 and SB8616.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Symptom | Probable Cause | Remedy |
|---------|----------------|--------|
|---------|----------------|--------|

- 13. Belts jump pulley.**
1. Operation of unit, no carb tube or mix in mix pan.
  2. Torque or belt idler pulley alignment.
  3. Bearing failure.
1. Operation of unit is detrimental to belts and scraper blade life. The ratio of mix to available cooling surface is changing at an unknown rate. This occurs prior to night shut down with operators who are extremely waste conscious. With unit in "Cleanout" mode, dispense product into pints, quarts, or into a rerun bucket.
  2. While power to unit is off, rotate dasher pulleys a few revolutions in each direction. Belt should travel over torque idler pulley without any left to right or right to left misalignment motion. Align pulleys with an adjustable wrench.  
  
Ensure that motor and dasher pulley are in alignment. Adjust by loosening motor pulley with a 5/32 screw wrench set. Realign as necessary.
  3. Observe torque and idler pulleys for restricted movement or noise. Replace as necessary.  
  
Observe shafted bearing on dasher pulley for restricted movement or noise. Replace as necessary. Note: Belt shards are not cause for alarm. This is normal.

- 14. Dasher bent and/or scraper blades broken.**
1. Unit ran starved for mix.
  2. Unit ran with watered down mix or improperly handled mix.
  3. Suction pressure too low
  4. Torque setting too tight.
  5. Unit ran with broken down product to freeze up.
1. See notes in problem #10.
  2. When using powdered mix, make it on previous day. Mix components exactly as mix manufacturer recommends, refrigerated overnight, restir before using.  
  
Never attempt to stretch mix volume by adding water.  
  
Yogurt: (1) Always thaw 72 hours before using. (2) Always stir or shake well before using. (3) Never allow any frozen particles to be placed into the mix pan.
  3. See recommended suction pressures on the torque control spring color code chart in this manual. Correct to proper setting before reinstalling dasher.
  4. Refer to item #8 torque adjustment. If torque setting is fully tightened, it may not be possible for the machine to reach torque.
  5. Product must be drawn from the machine on some regular basis.

- 15. Dasher strikes barrel.**
1. Worn stator rod from improper lubrication.
1. Replace stator rod and review lubrication information in operators manual. An improperly lubricated stator rod will cause dasher to grind a groove into stator rod. This will allow dasher to strike evaporator wall. This condition can be heard and will polish both interfering surfaces to a bright finish.

| Symptom                               | Probable Cause                                                              | Remedy                                                                                                                                                                                                                                                                        |
|---------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16. Front plate broken or leaking.    | 1. Improper lubrication                                                     | 1. Lubricate spigot o-rings only. Never lubricate large front plate o-ring. Clean o-rings with mild soap solution at high temp.                                                                                                                                               |
|                                       | 2. Improper installation.                                                   | 2. Install and seat stator rod. Be sure that stator rod is in place.<br><br>Install front plate and evenly tighten front plate knobs simultaneously. Improper tightening can damage front plate.<br><br>Never clean front plate in dishwashers or an electric sink sanitizer. |
|                                       | 3. Cracked or defective front front plate o-ring.                           | 3. Inspect o-ring and replace as necessary.                                                                                                                                                                                                                                   |
| 17. Front plate on twist bleeds over. | 1. Cracked, worn, broken, or improper installation of center spigot o-ring. | 1. Inspect o-ring and replace as necessary.<br><br>2. Center spigot o-ring must be well lubricated and placed in center spigot hole of front plate.                                                                                                                           |
| 18. Front plate wobbles.              | 1. Front plate loose.                                                       | 1. Evenly tighten front plate knobs. Do not torque knobs to extent that front plate is distorted.                                                                                                                                                                             |
|                                       | 2. Product too cold                                                         | 2. Torque adjustments set too tight will cause unit to freeze products to a temperature and consistency that is undesirable. This puts undue forces on stator rods and front plates. Check SB8607 for proper product temperatures.                                            |
|                                       | 3. Bent dasher.                                                             | 3. See section on bent dashers. This problem must be resolved, not only for front plate wobble, but for performance and longevity of other moving parts.                                                                                                                      |

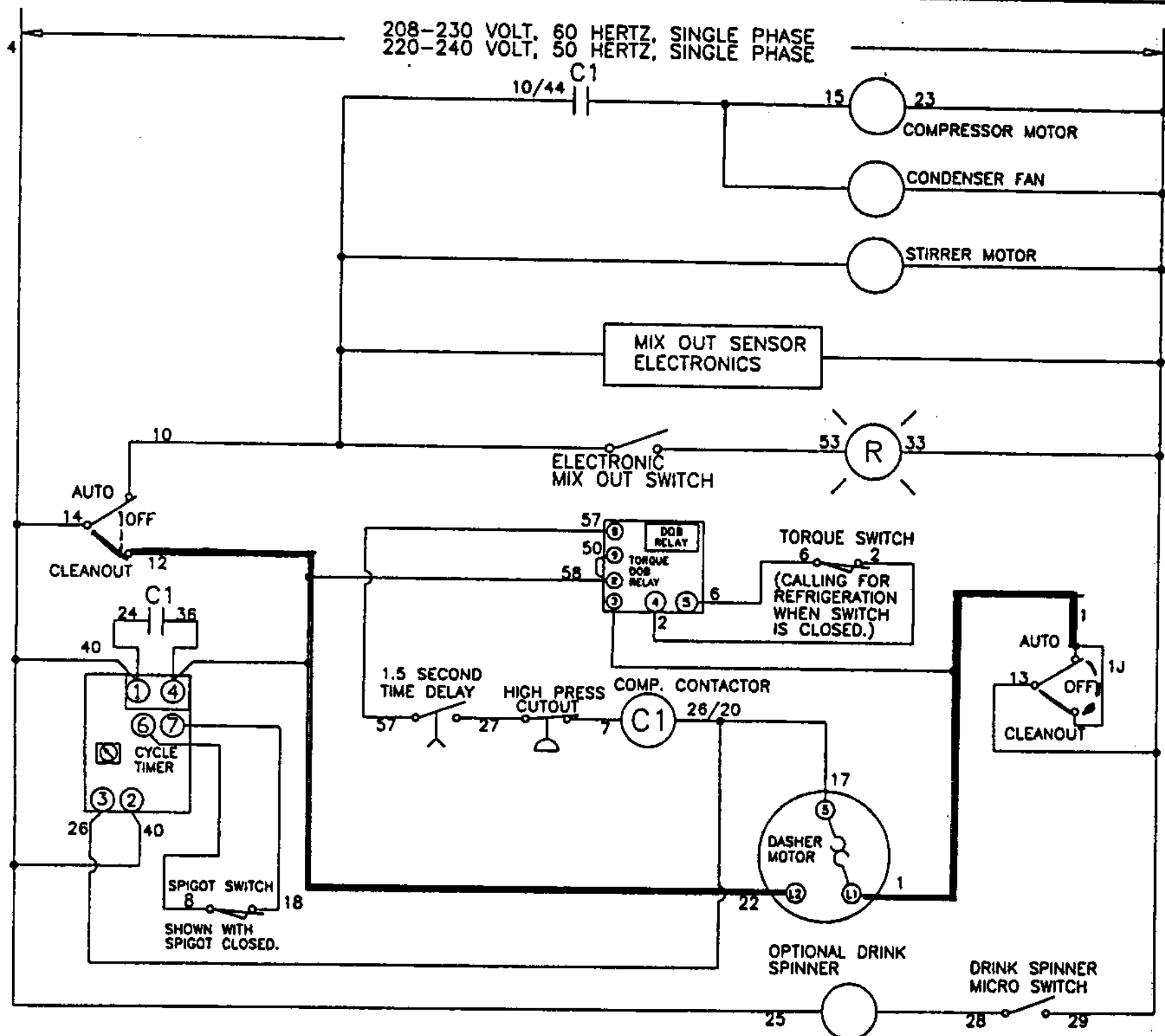
| Symptom                                | Probable Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Remedy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 21. Mix pan freeze up.                 | 1. Needle valve adjustment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>1. There will always be a certain amount of frozen mix found on side of mix pan. However, quantity of refrigeration to mix pan may be controlled by needle valve. A clockwise adjustment will allow less refrigerant to enter mix pan evaporator. Counterclockwise adjustment will allow more. Mix pan needle valves are set at approximately 1/8 turn open.</p> <p>a. Do not open greater than 1/4 turn. Mix pan freeze up will occur.</p> <p>b. Frozen mix build up most likely occurs during two distinct periods. (1) Low or no draw periods. At this time, if the finished product becomes overbeaten, the machine cannot sense torque. Therefore it will run for long periods of time trying to recover. Since the mix pan refrigeration runs in parallel to the barrel, frozen mix may build up on the walls. (2) High production output. At this time, if the refrigeration does not cycle off on torque due to production output, frozen mix may build up on the walls.</p> |
| 22. Mix pan refrigerated mix too warm. | <p>1. Needle valve set to closed position.</p> <p>2. Capillary tube plugged.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>1. Open to 1/8 turn. If valve is opened to maximum with no results, see "Capillary Tube" below.</p> <p>2. Blow refrigerant charge. Unsweat cap tube and inspect cap tube ends for restriction. Follow good refrigeration practices to reassemble after repair.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 23. Rear seal leaks.                   | 1. Improper installation or lubrication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>1. Check seal for proper installation and/or lubrication. This seal is a stationary seal. A seal that is improperly lubed (lubrication on <del>G</del> polysilicone) will spin and leak. The spinning seal will leave a mirror finish on rear of evaporator barrel. If left to spin, it will erode enough of wall surface so that nothing will seal.</p> <p>Use only food approved lubricants.</p> <p>Lubrication: See operator's manual.</p> <p>Install seal such that the white delrin is in intimate contact with the dasher.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                        | 2. Defective rear seal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2. Defective rear seals may be torn, cracked, or very flimsy. Replace as necessary.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                        | 3. Improper cleaning frequency.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3. Follow local board of health regulations. Most dictate that ice cream makers be cleaned and sanitized once each 24 hours of operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                        | <p>Note:</p> <p>(a) Petrogel is difficult to remove from <del>G</del> polysilicone. Mild soap at high temperature may cut away the lubricant. Seals may wear out and become flimsy and sponge like. Discard and replace seals as necessary.</p> <p>(b) It is critical to bearing life that the cause for a leaky rear seal be found and cured quickly. Do not use Vaseline as a lubricant, use only food grade lubricants. Food grade lubricants are colorless, odorless, and tasteless. They also resist being washed away by mix.</p> <p>(c) The cause for a leaky rear seal just be found and corrected or shaftted bearing will also be lost due to infiltrated mix.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

# **CIRCUIT LOGICS & SCHEMATICS**

## NORMAL OPERATION

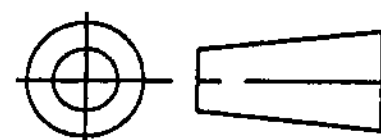
ORIGINAL

P/N 81197-2 REV. Q



IF IN DOUBT, ASK

## PROJECTION



THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF SANI SERV MFG. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR MANUFACTURE OR SALES OF APPARATUS WITHOUT PERMISSION



CAD FILE NUMBER  
81197-20

UNLESS OTHERWISE  
SPECIFIED  
TOLERANCES

| DECIMAL   | FRACTIONAL |
|-----------|------------|
| XX ±0.015 | XX ±1/64"  |
| XX ±0.010 | ANGULAR    |

REMOVE ALL BURRS AND  
BREAK ALL SHARP EDGES  
DO NOT SCALE DRAWING

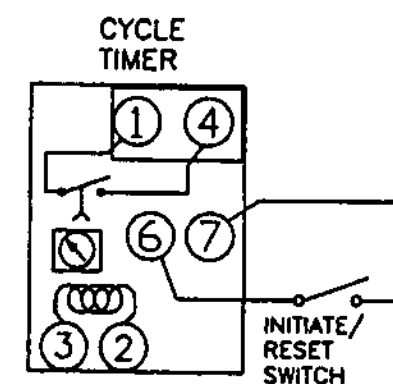
**SaniServ**  
MANUFACTURING CORP.

TITLE: WIRING DIAGRAM 208-230V/60HZ/1Ø

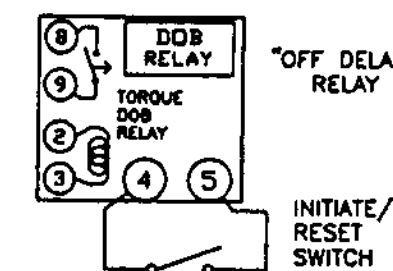
|              |          |
|--------------|----------|
| MODEL: F-115 | USED ON: |
|--------------|----------|

|                    |           |               |
|--------------------|-----------|---------------|
| 2 LINE             |           |               |
| DRAWN: BENNY DUKES | CHKD: RSR | DATE: 6/22/88 |

|               |   |              |                  |
|---------------|---|--------------|------------------|
| BENNETT DUKES |   | RSR          | 9/22/98          |
| SCALE:        | = | 2 SHEET OF 2 | P/N 81197-2 REV. |



OPERATION: APPLY SUPPLY VOLTAGE TO COIL (3,2). WITH THE INITIATE SWITCH CLOSED, THE "OFF TIME" PERIOD BEGINS. WHEN THIS PERIOD ELAPSES (FIXED AT 800 SECONDS) THE RELAY CONTACTS CLOSE, BEGINNING THE "ON TIME" PERIOD (ADJUSTABLE FROM 15 TO 45 SECONDS). WHEN THE INITIATE SWITCH IS OPEN, THE RELAY IS IN THE "ON TIME" MODE.



OPERATION: APPLY SUPPLY VOLTAGE (TO COIL). CLOSE INITIATE SWITCH, RELAY TRANSFERS AND THE CONTACTS CLOSE (8,9). OPEN THE INITIATE SWITCH AND A 5 SECOND TIMER BEGINS TIMING. WHEN THE TIME IS EXPIRED THE CONTACTS WILL OPEN.

MATERIAL DESC:

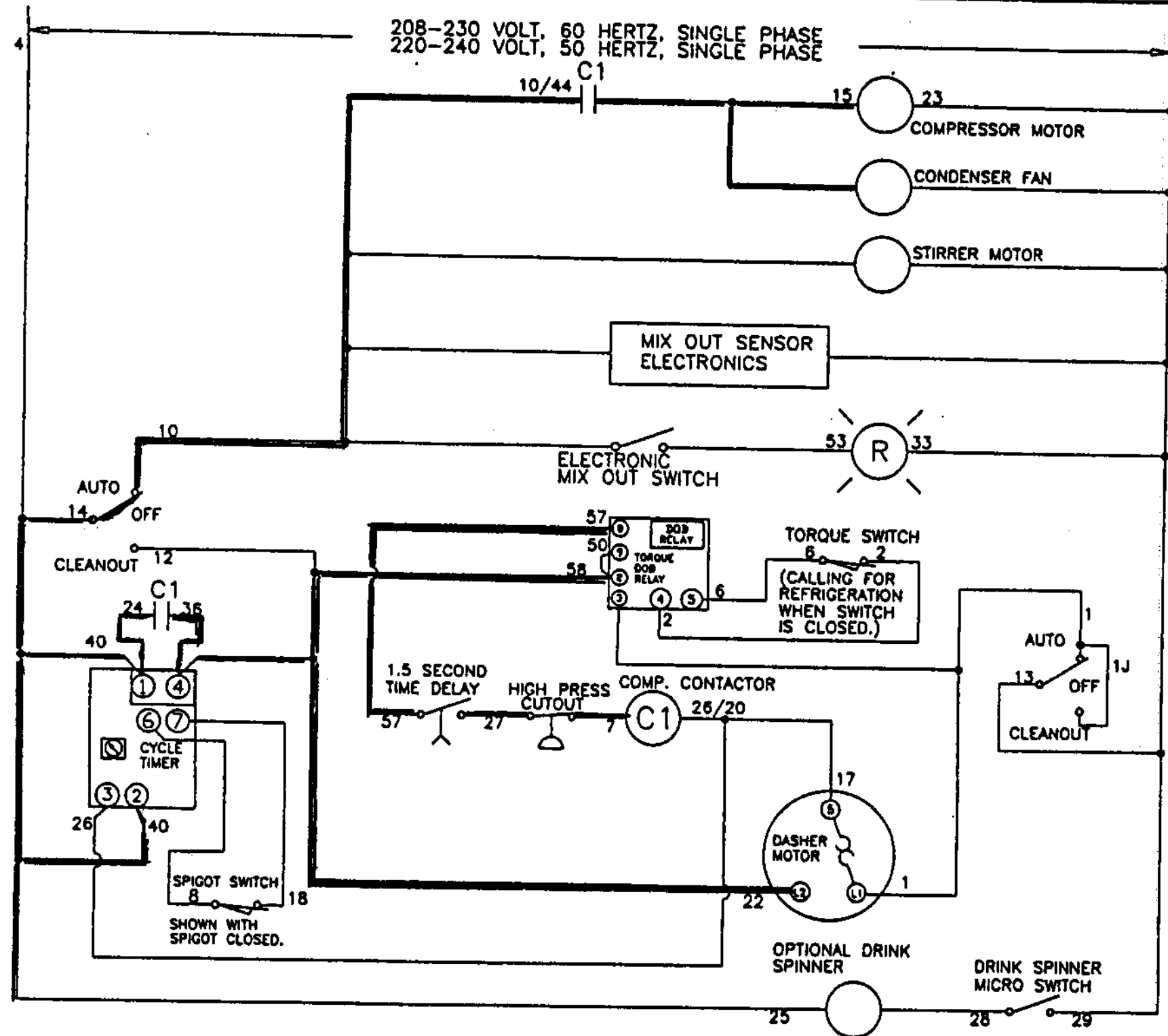
MAT'L. STK. NO:

UNIT OF MEASURE: INCHES

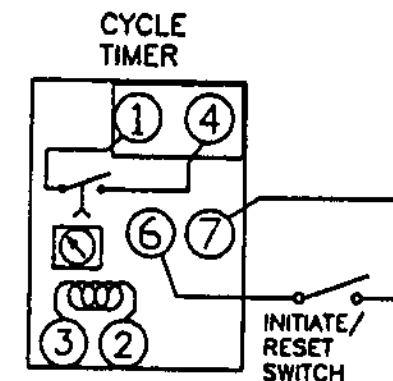
# SPIGOT START

## NORMAL OPERATION

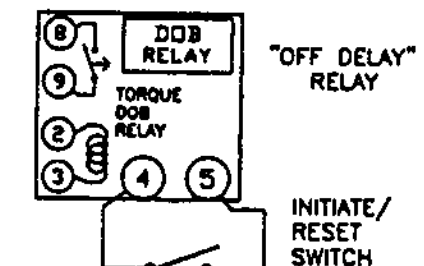
ORIGINAL



| REV. | ECN  | DATE     | REVISION CHANGE                   | ENG. | D  |
|------|------|----------|-----------------------------------|------|----|
| K    | 0465 | 9/22/88  | ADD OPTIONAL SPINNER              | BD   | B  |
| L    | 0624 | 7/26/89  | ADD MULTI-PRODUCTS STIRRER        | BD   | B  |
| M    | 0761 | 8/27/89  | REROUTE WIRE #17, ADD #20         | BD   | BI |
| N    | 0751 | 8/10/89  | ADD MIXOUT SENSOR                 | BD   | BI |
| P    | 1121 | 5/21/01  | ADD HE SWITCH, CHANGE WIRE COLORS | RSR  | CI |
| Q    | 1215 | 11/28/01 | ADDED 50HZ                        | JMP  | CI |



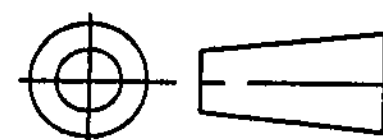
OPERATION: APPLY SUPPLY VOLTAGE TO CON. (3,2). WITH THE INITIATE SWITCH CLOSED, THE "OFF TIME" PERIOD BEGINS. WHEN THIS PERIOD ELAPSES (FIXED AT 600 SECONDS) THE RELAY CONTACTS CLOSE, BEGINNING THE "ON TIME" PERIOD (ADJUSTABLE FROM 15 TO 45 SECONDS). WHEN THE INITIATE SWITCH IS OPEN, THE RELAY IS IN THE "ON TIME" MODE.



OPERATION: APPLY SUPPLY VOLTAGE (TO COIL). CLOSE INITIATE SWITCH, RELAY TRANSFERS AND THE CONTACTS CLOSE (8,9). OPEN THE INITIATE SWITCH AND A 5 SECOND TIMER BEGINS TIMING. WHEN THE TIME IS EXPIRED THE CONTACTS WILL OPEN.

IF IN DOUBT, ASK

PROJECTION



|                                                                                                                                                                                |            |                                            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------|--|
| THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF SANI SERV MFG. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR MANUFACTURE OR SALES OF APPARATUS WITHOUT PERMISSION |            | 2020 PRODUCTION DRIVE                      |  |
| CAD FILE NUMBER                                                                                                                                                                | 81197-20   | SaniServ                                   |  |
| UNLESS OTHERWISE SPECIFIED TOLERANCES                                                                                                                                          |            | MANUFACTURING CORP. INDIANAPOLIS, IN. 4624 |  |
| DECIMAL                                                                                                                                                                        | FRACTIONAL | TITLE: WIRING DIAGRAM 208-230V/60HZ/1Ø     |  |
| XX ±0.015                                                                                                                                                                      | XX ±1/64"  | MODEL: E-LINE                              |  |
| XX ±0.010                                                                                                                                                                      | XX ±1/80"  | DRAWN: BENNY DUKES                         |  |
| XX ±0.005                                                                                                                                                                      | XX ±1/160" | CHECKED: RSR                               |  |
| REMOVE ALL BURRS AND BREAK ALL SHARP EDGES DO NOT SCALE DRAWING                                                                                                                |            | DATE: 9/22/98                              |  |
| SCALE: -                                                                                                                                                                       |            | P/N 81197-2                                |  |
| 2 SHEET OF 2                                                                                                                                                                   |            | REV.                                       |  |

MATERIAL DESC:

MAT'L. STK. NO:

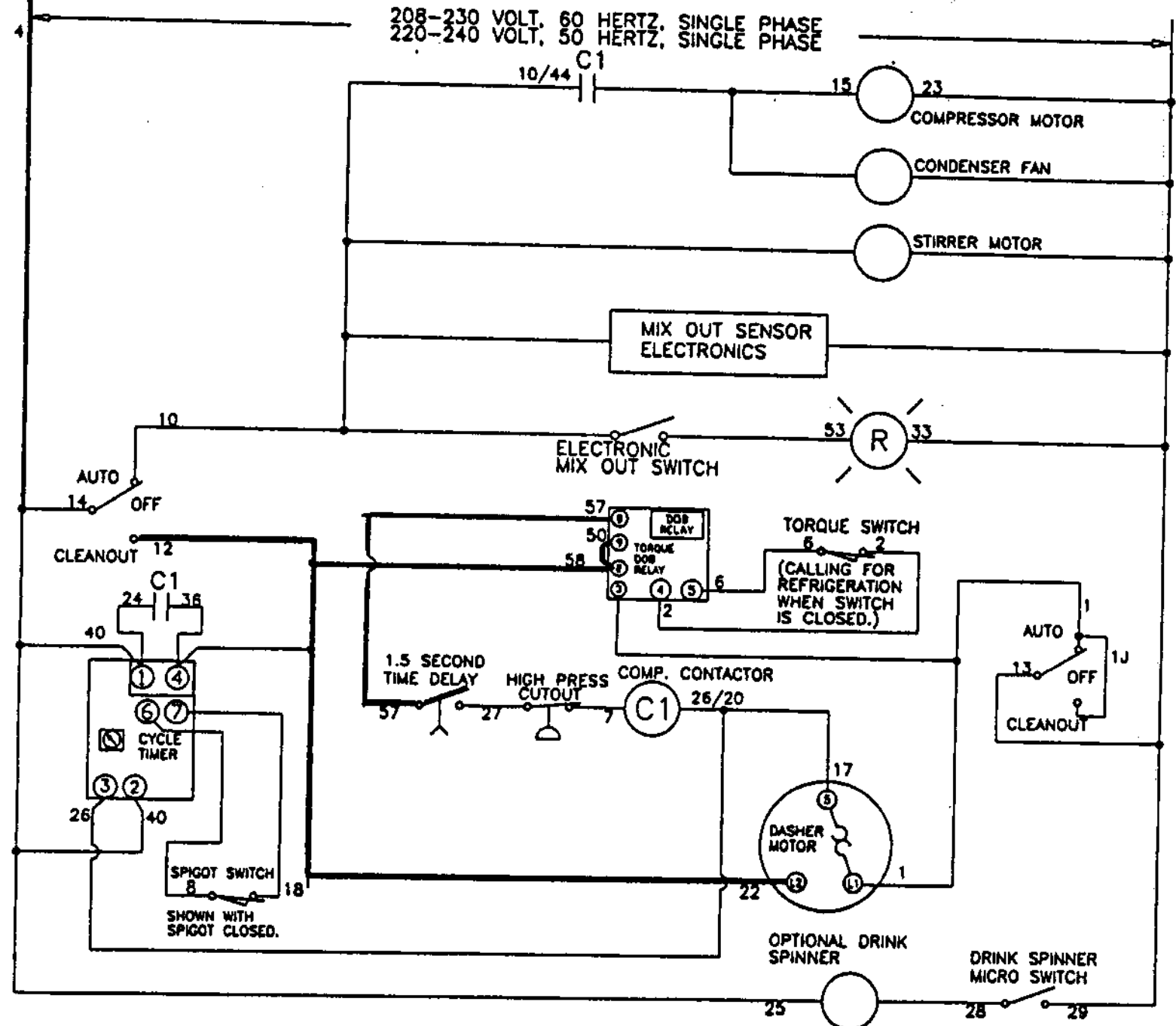
UNIT OF MEASURE: INCHES

# TIMER/RELAY OR SPIGOT SWITCH FAILURE

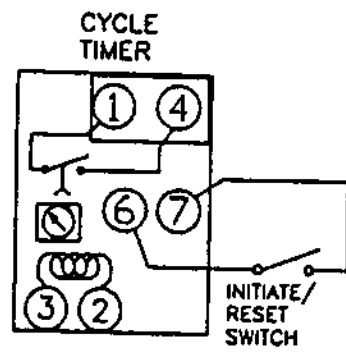
RESULT: RAPID STOP START

REV. Q  
P/N 81197-2

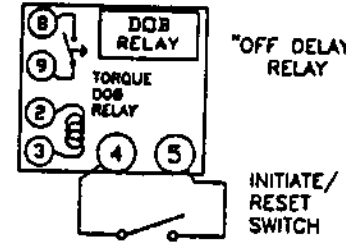
ORIGINAL



| REV. | ECN  | DATE     | REVISION CHANGE                   | ENG. | D |
|------|------|----------|-----------------------------------|------|---|
| K    | 0465 | 9/22/98  | ADD OPTIONAL SPINNER              | BD   | E |
| L    | 0624 | 7/26/98  | ADD MULTI-PRODUCTS STIRRER        | BD   | E |
| M    | 0761 | 8/27/98  | REROUTE WIRE #17, ADD #20         | BD   | B |
| N    | 0751 | 9/10/98  | ADD MIXOUT SENSOR                 | BD   | B |
| P    | 1121 | 5/21/01  | ADD MC SWITCH, CHANGE WIRE COLORS | RSR  | C |
| Q    | 1215 | 11/28/01 | ADDED 50HZ                        | JMP  | C |



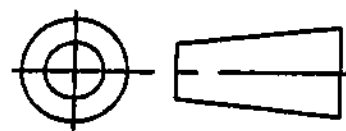
OPERATION: APPLY SUPPLY VOLTAGE TO COIL (3,2). WITH THE INITIATE SWITCH CLOSED, THE "OFF TIME" PERIOD BEGINS. WHEN THIS PERIOD ELAPSES (FIXED AT 600 SECONDS) THE RELAY CONTACTS CLOSE, BEGINNING THE "ON TIME" PERIOD (ADJUSTABLE FROM 15 TO 45 SECONDS). WHEN THE INITIATE SWITCH IS OPEN, THE RELAY IS IN THE "ON TIME" MODE.



OPERATION: APPLY SUPPLY VOLTAGE TO COIL. CLOSE INITIATE SWITCH, RELAY TRANSFERS AND THE CONTACTS CLOSE (8,9). OPEN THE INITIATE SWITCH AND A 5 SECOND TIMER BEGINS TIMING. WHEN THE TIME IS EXPIRED THE CONTACTS WILL OPEN.

IF IN DOUBT, ASK

PROJECTION



UNIT OF MEASURE: INCHES

THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF SANISERV MFG. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR MANUFACTURE OR SALES OF APPARATUS WITHOUT PERMISSION

|                                          |              |                                                        |      |
|------------------------------------------|--------------|--------------------------------------------------------|------|
| CAD FILE NUMBER<br>81197-20              |              | SaniServ<br>MANUFACTURING CORP. INDIANAPOLIS, IN. 4624 |      |
| TITLE<br>WIRING DIAGRAM 208-230V/60HZ/1Ø |              | 2020 PRODUCTION DRIVE                                  |      |
| MODEL<br>E-LINE                          | USED ON:     |                                                        |      |
| DRAWN: BENNY DUKES                       | CHKD: RSR    | DATE: 9/22/98                                          |      |
| SCALE: -                                 | 2 SHEET OF 2 | P/N 81197-2                                            | REV. |

MATERIAL DESC:

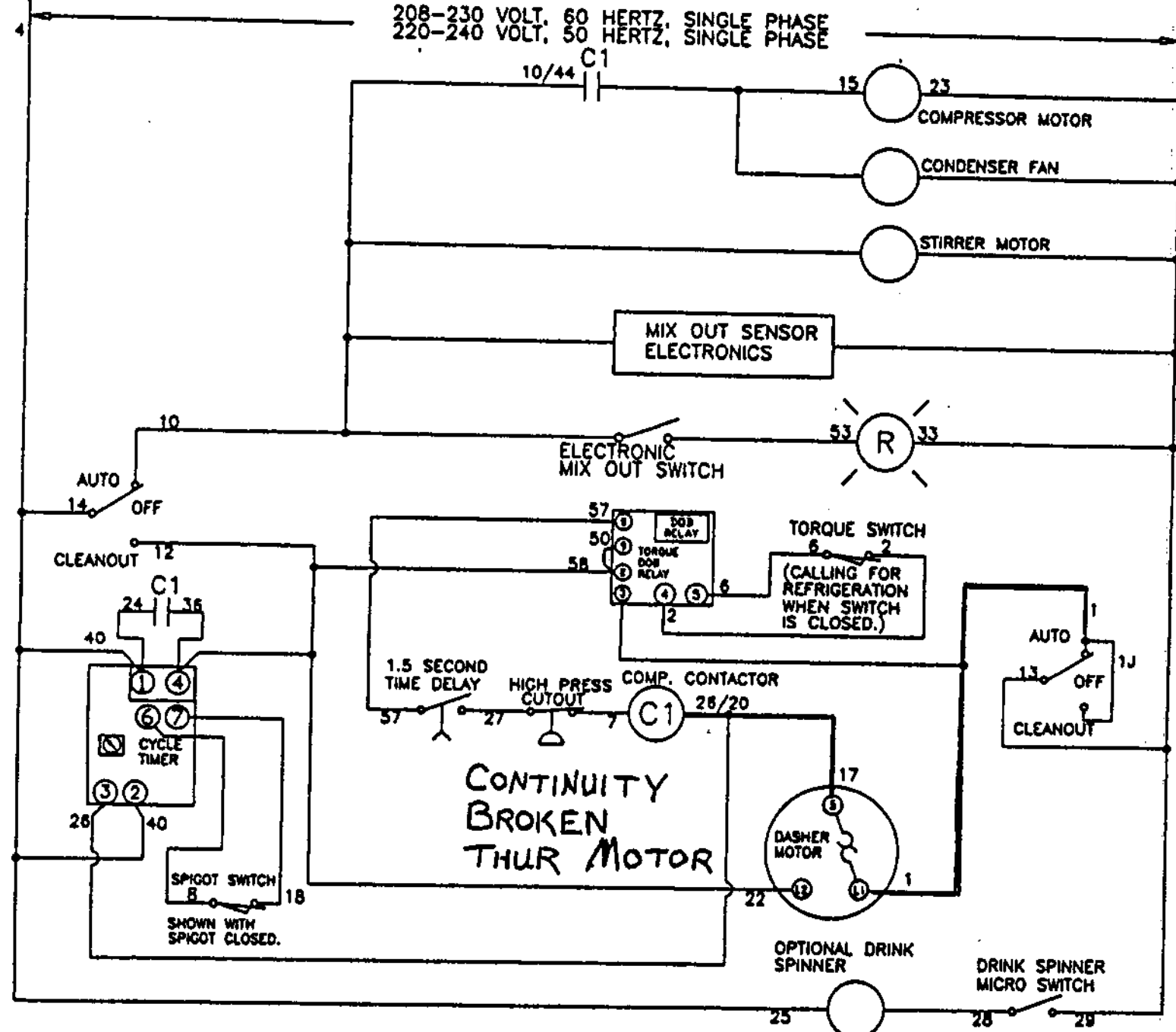
MAT'L. STK. NO:

# DASHER OVERLOAD:

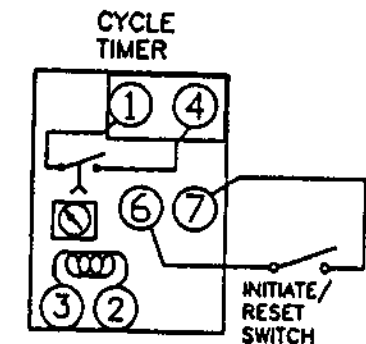
RESULT: TOTAL SYSTEM SHUTDOWN WHEN THERMAL-OVERLOAD IS TRIPPED.  
OVERLOAD WILL RESET AUTOMATICALLY WHEN ALLOWED TO COOL.

REV. Q  
P/N 81197-2

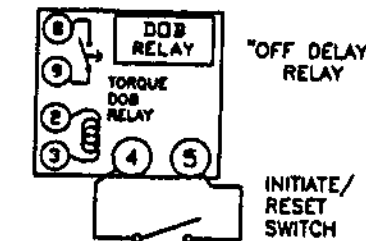
ORIGINAL



| REV. | ECN  | DATE     | REVISION CHANGE                   | ENG. | D' |
|------|------|----------|-----------------------------------|------|----|
| K    | 0465 | 9/22/88  | ADD OPTIONAL SPINNER              | BD   | B  |
| L    | 0624 | 7/26/88  | ADD MULTI-PRODUCTS STIRRER        | BD   | B  |
| M    | 0761 | 8/27/88  | REROUTE WIRE #17, ADD #20         | BD   | B  |
| N    | 0751 | 8/10/88  | ADD MIXOUT SENSOR                 | BD   | B  |
| P    | 1121 | 5/21/01  | ADD HE SWITCH, CHANGE WIRE COLORS | RSR  | C  |
| Q    | 1215 | 11/26/01 | ADDED 50HZ                        | JMP  | C  |



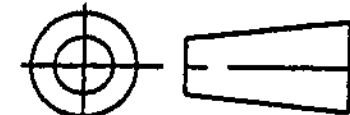
OPERATION: APPLY SUPPLY VOLTAGE TO COIL (3,2). WITH THE INITIATE SWITCH CLOSED, THE "OFF TIME" PERIOD BEGINS. WHEN THIS PERIOD ELAPSES (FIXED AT 600 SECONDS) THE RELAY CONTACTS CLOSE, BEGINNING THE "ON TIME" PERIOD (ADJUSTABLE FROM 15 TO 45 SECONDS). WHEN THE INITIATE SWITCH IS OPEN, THE RELAY IS IN THE "ON TIME" MODE.



OPERATION: APPLY SUPPLY VOLTAGE (TO COIL). CLOSE INITIATE SWITCH. RELAY TRANSFERS AND THE CONTACTS CLOSE (8,9). OPEN THE INITIATE SWITCH AND A 5 SECOND TIMER BEGINS TIMING. WHEN THE TIME IS EXPIRED THE CONTACTS WILL OPEN.

IF IN DOUBT, ASK

PROJECTION



THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF SANI SERV MFG. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR MANUFACTURE OR SALES OF APPARATUS WITHOUT PERMISSION.

CAD FILE NUMBER: 81197-20

UNLESS OTHERWISE SPECIFIED TOLERANCES:

|          |            |
|----------|------------|
| DECIMAL  | FRACTIONAL |
| XX .0001 | XX 1/64"   |
| XX .0010 | XX 1/16"   |
| XX .0050 | XX 1/32"   |
| XX .0100 | XX 1/16"   |

REMOVE ALL BURRS AND BREAK ALL SHARP EDGES DO NOT SCALE DRAWING

**SaniServ** 2020 PRODUCTION DRIVE  
MANUFACTURING CORP. INDIANAPOLIS, IN. 4624

TITLE: WIRING DIAGRAM 208-230V/60HZ/1Ø

MODEL: E-LINE USED ON:

DRAWN: BENNY DUKES CHD. RSR DATE: 9/22/98

SCALE: - 2 SHEET OF 2 P/N 81197-2 REV.

MATERIAL DESC:

MAT'L. STK. NO:

UNIT OF MEASURE: INCHES

