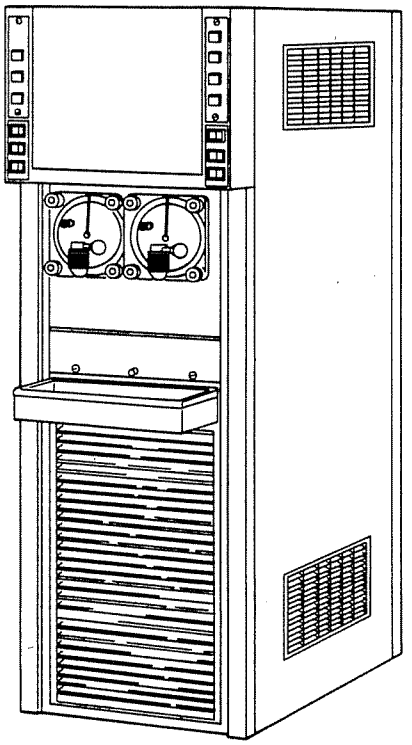
41-6025-xxx
41-6026-xxx

THE CORNELIUS COMPANY

ONE CORNELIUS PLACE - HIGHWAY 10 WEST ❑ ANOKA, MINNESOTA 55303 ❑ PHONE (612) 421-6120 ❑ TELEX 29-0443

SERVICE MANUAL

# FCB Dispenser Post-Mix



Manual Part No. 325151-000
November 8, 1977
Revised: August 8, 1988

THIS DOCUMENT CONTAINS IMPORTANT INFORMATION

This Service Manual must be read and understood before the installation and operation of this dispenser.



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# IMPORTANT

TO THE USE OF THIS MANUAL - THIS MANUAL IS A GUIDE FOR INSTALLING, OPERATING, AND MAINTAINING THIS EQUIPMENT. REFER TO TABLE OF CONTENTS FOR PAGE LOCATION OF DETAILED INFORMATION PERTAINING TO QUESTIONS THAT ARISE DURING INSTALLATION, OPERATION, SERVICE AND MAINTENANCE, OR TROUBLESHOOTING THIS EQUIPMENT.

# SECTION 1

## GENERAL DESCRIPTION

This section gives the description, theory of operation, and design data for the Single-Phase, Two-Flavor Post-Mix Frozen Carbonated Beverage (FCB) Dispensers with Hot Gas Defrost (see Figure 1-1) hereafter referred to as units.

### UNIT DESCRIPTION

The Models 416025 and 416026 are basically identical units and consist of two freeze cylinders containing two beaters belt driven by two electric motors, three refrigeration systems (one for each freeze cylinder and one for the pre-cool plate, a pre-cool plate, two carbonator-blenders, a water pump with motor, a thermostatically controlled hot-gas-defrost system controls, tubing, and fittings necessary to regulate, transfer, and dispense the product. The components are attached to a steel frame and are enclosed in a painted steel cabinet. The cabinet panels are easily removed (one screw on lower center of each panel) to facillitate installation, service, and maintenance. A transparent faceplate, with an integral relief valve and a removable dispensing valve, is mounted at the front of each freeze cylinder. A drip tray, with a cup rest, is located directly below the dispensing valves. Model No. 416026 is equipped with a buck and boost transformer for locations where a low-voltage condition exists and you are unable to get local electrical utility company to increase the voltage or determine the reason for low voltage. This transformer will step up the electrical input voltage by 12 percent of the electrical supply. With a borderline of 191 VAC, this transformer will increase voltage to 215 VAC. This transformer is also available in a kit form for the Model No. 416025. Order Transformer Kit (P/N 511027-000).

**CAUTION !**

Before shipping or relocating unit, syrup systems must be sanitized and flushed with potable water and all water must be purged from syrup and plain water systems. A freezing ambient environment will cause residual water remaining inside unit to freeze resulting in damage to internal components.

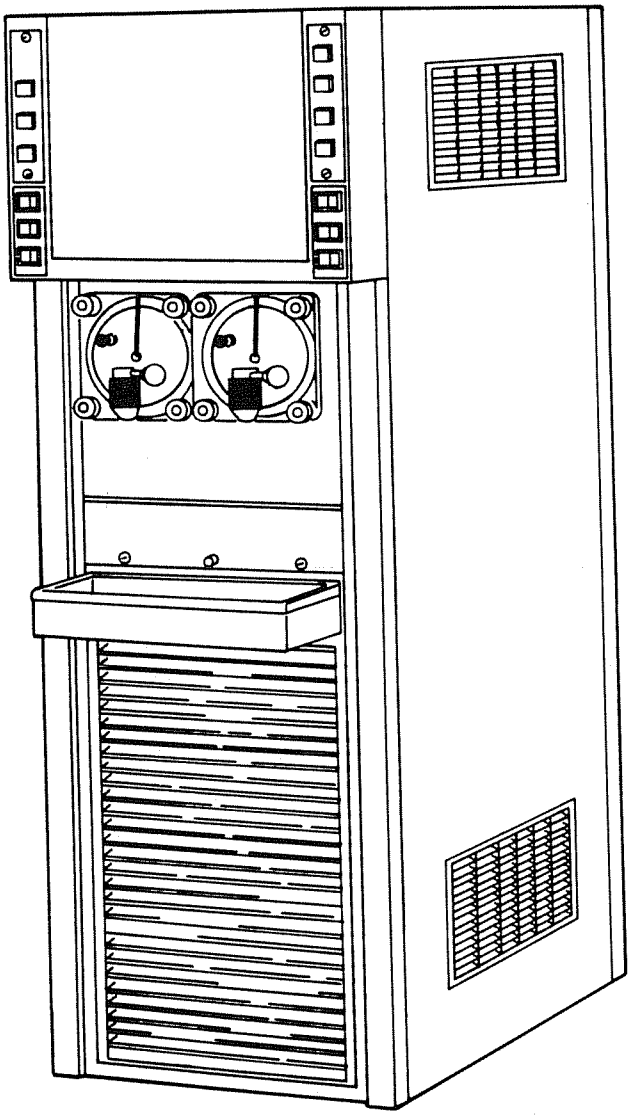


Figure 1-1. FCB Post-Mix Dispenser

TABLE 1-1. DESIGN DATA

| | |
|---|---|
| Model Numbers: | |
| FCB Post-Mix Dispenser w/o Transformer | 416025 |
| FCB Post-Mix Dispenser with Transformer | 416026 |
| Overall Dimensions: | |
| Height | 55-inches |
| Width | 19-1/4 inches |
| Depth Without Drip Tray | 31-1/2 inches |
| Depth With Drip Tray | 37-1/4 inches |
| Shipping Weight (approximate) | 625 pounds |
| Compressor Horsepower: | |
| Cylinder Compressor (each compressor) | 1 H. P. |
| Pre-Cool Compressor | 1 H. P. |
| Refrigeration System: | |
| Refrigerant Type | R-502 |
| Refrigerant Charge | See Nameplate |
| Ambient Operating Temperature | 40°F to 100°F |
| Electrical Requirements: | |
| Operating Voltage: | |
| Model No. 416025 | 230VAC, 60HZ, Single Phase |
| Model No. 416026 | 200VAC, 60HZ, Single Phase |
| Current Draw | 28 Amps |

## THEORY OR OPERATION

A $CO_2$ cylinder delivers carbon dioxide gas ($CO_2$) through secondary $CO_2$ regulators to the soft drink tanks. $CO_2$ forces syrup out of soft drink tanks into carbonator-blender tanks through solenoids and adjustable syrup flow regulators. At the same time, a water pump delivers plain water to each carbonator-blender tank through a solenoid, an adjustable water flow regulator, and a pre-cool plate. Water is cooled before entering the carbonator-blender tanks. On carbonator-blender tank fill cycle, syrup and water solenoids open allowing syrup and plain water to enter tank and after tank has been filled to proper level, solenoids close and water pump cycles off. The carbonator-blender tanks serve two purposes: (1) plain water and syrup enter tank properly proportioned and are blended for desired BRIX and (2) $CO_2$, regulated by secondary $CO_2$ pressure regulators, mixes with syrup-water blend to produce a carbonated drink. From the carbonator-blender tank, product enters freeze cylinder which maintains product at a selected viscosity. The beater in each freeze cylinder is belt driven by an electric motor. Scraper blades attached to each beater scrape product from cylinder walls as it freezes. A transparent faceplate, attached to front of each freeze cylinder, mounts

a dispensing valve and a spring-loaded relief valve that protects freeze cylinder from accidental over-pressure. The relief valve is also used to bleed $CO_2$ from freeze cylinder to atmosphere when filling cylinder and if gas pockets form in cylinder. A viscosity sensing mechanism for each freeze cylinder provides a means of adjusting consistency of product to suit customer preferences.

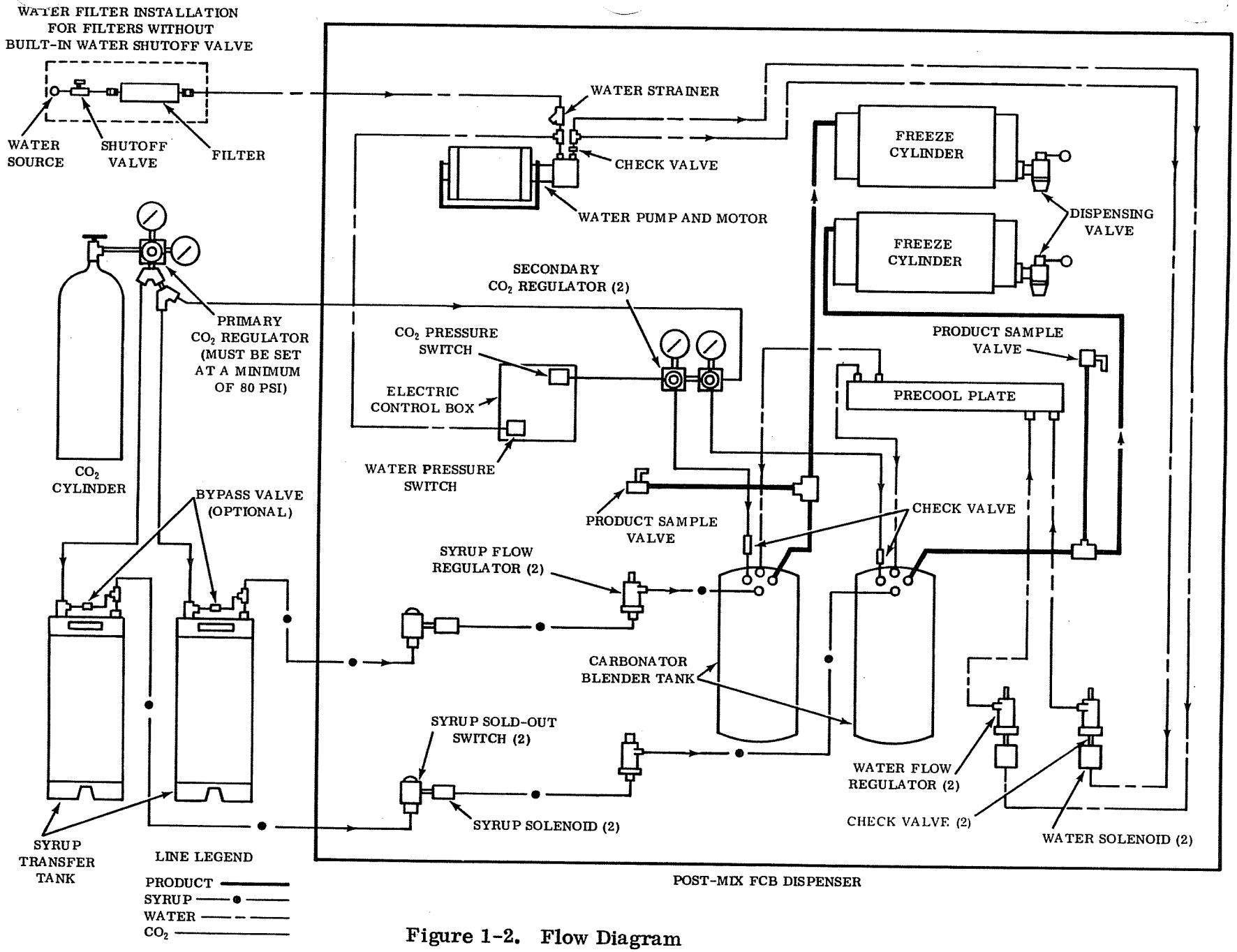



**Figure 1-2. Flow Diagram**

# SECTION II

## INSTALLATION

This section covers unpacking and inspection, identification of LOOSE-SHIPPED PARTS, selecting location, installing unit, preparing unit for operation, and unit operation.

UNPACKING AND INSPECTION (see Figure 4-3)

**NOTE**

The unit was thoroughly inspected before leaving the factory and the carrier has accepted and signed for it. Any damage or irregularities should be noted at the time of delivery and immediately reported to the delivering carrier. Request a written inspection report from the Claims Inspector to substantitate any necessary claim. File the claim with the delivering carrier, not with The Cornelius Company.

1) After unit has been unpacked, remove shipping tape and other packing material.

2) Remove sides and back panels by removing one screw on lower center of each panel, then lift panels straight up about two inches and pull out. Remove shipping bolts that secure unit to skid, then remove skid.

3) Unpack LOOSE-SHIPPED PARTS. Make sure all items are present and in good condition.

TABLE 2-1. LOOSE-SHIPPED PARTS

| Item No. | Part No. | Name | Quantity |
|---|---|---|---|
| 1 | 322235 | Drip Tray | 1 |
| 2 | 322236 | Cup Rest | 1 |
| *3 (item 23) | 320935 | Beater | 2 |
| *4 (item 2) | 320568 | Scraper Blade | 4 |
| 5 | 186770 | Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in. long | 4 |
| 6 | 343304 | Lock Washer, No. 10 | 4 |
| 7 | 322218 | Drip Tray Support, Left-hand | 1 |
| 8 | 322219 | Drip Tray Support, Right-hand | 1 |
| 9 | 151689 | Spanner Wrench (flow regulators) | 1 |
| 10 | 322859 | Spanner Wrench (dispensing valve) | 1 |
| 11 | 321534 | Dispensing Lever Stop Sleeve | 2 |
| 12 | 511044 | Operators Instructions | 1 |
| 13 | 325216 | Cleaning Brush | 1 |

*Numbers in parentheses are reference to items in Figure 2-1.

INSTALLING LOOSE-SHIPPED PARTS (see Figure 2-1)

1) Remove shipping tape that holds VALVE LEVERS, KNOBS, and VISCOSITY RODS to FACEPLATES (see Figure 2-1). Install DISPENSING LEVER STOP SLEEVES (item 11) on DISPENSING VALVES, then carefully install valve levers and knobs on dispensing valves.

2) Remove four KNURLED NUTS and FLATWASHERS (see Figure 2-1) that secure each faceplate to freeze cylinders. Pull faceplates off freeze cylinders.

3) Position SCRAPPER BLADES (item 4) on nipples at ends of BEATER (item 3) cross arms. Place elongated holes in blades on back end of each beater. Slide beater into one of the freeze cylinders so the slotted hooks engage DRIVE PIN on DRIVE SHAFT as shown in Figure 2-1.

4) Repeat procedure outlined in step 3) preceding to assemble and install beater in other freeze cylinder.

**NOTE**

**Before installing faceplate on each freeze cylinder, check all the items assembled to faceplate for secure mounting, proper lubrication of O-rings, and free movement of spinner and viscosity sensor.**

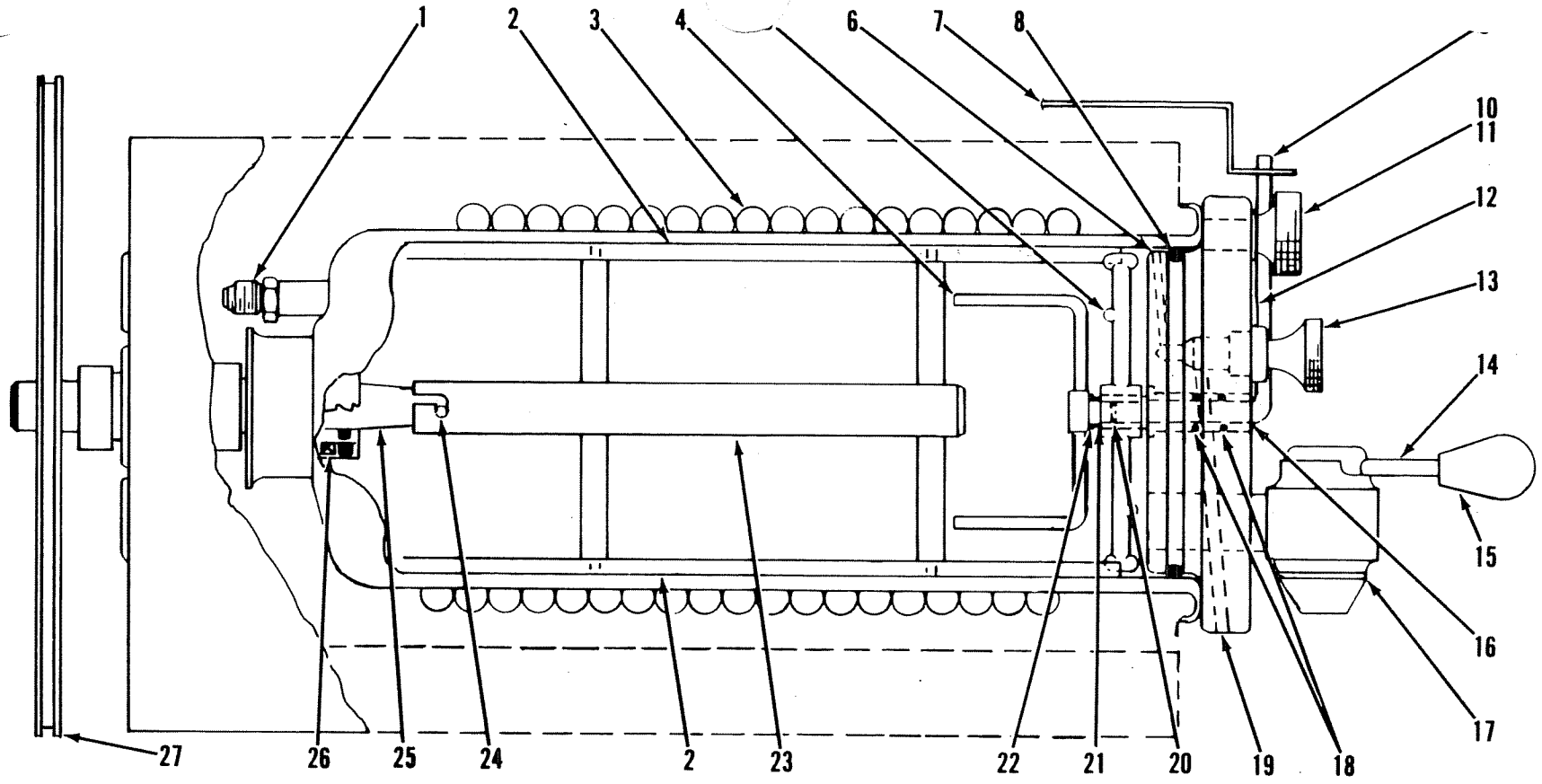
5) Lubricate each faceplate O-ring (see Figure 2-1) with Dow-Corning (DC 111) light grade silicone to facilitate installing faceplates on freeze cylinders. Position each FACEPLATE on freeze cylinders so (a) DISPENSING VALVES faucets face down, (b) free ends of VISCOSITY RODS are in slots of SWITCH ACTUATORS, and SPINNERS clear ends of SCRAPPER BLADES. Secure each faceplate to unit with four KNURLED NUTS and FLAT WASHERS removed in step 2) preceding. Tighten knurled nuts until faceplates touch all the way around on freeze cylinder flanges. DO NOT USE TOOLS TO TIGHTEN KNURLED NUTS.

6) Attach DRIP TRAY SUPPORTS (item 7 and 8) to drip tray panel below dispensing valves with MACHINE SCREWS (item 5) and LOCKWASHERS (item 6) so speed nuts on drip tray supports face inward. Install DRIP TRAY (item 1) on drip tray supports, then place cup rest (item 2) in recess of drip tray.

7) SPANNER WRENCH (item 9) is used to adjust flow regulators inside unit.

8) SPANNER WRENCH (item 10) is used to remove shank nuts securing dispensing valves to face plates.

9) CLEANING BRUSH (item 13) is used to clean faceplates relief valves passages.




1. Product inlet fitting
2. Scraper blade (2)
3. Evaporator coil
4. Viscosity sensor
5. Spinner
6. Relief valve port
7. Switch actuator
8. O-ring
9. Viscosity rod
10. Flat washer (4)
11. Knurled nut (4)
12. Faceplate
13. Relief valve
14. Valve lever
15. Knob
16. Bushing
17. Dispensing valve
18. O-ring (2)
19. Relief valve port
20. O-ring
21. Reducer
22. Teflon washer
23. Beater
24. Drive pin
25. Drive shaft assembly
26. Shaft seal assembly
27. Sheave

NOTE: Numbers in parentheses indicate quantities used, other than one, in each freeze cylinder.

**Figure 2-1. Freeze Cylinder-Cutaway View**

SELECTING LOCATION

## IMPORTANT

AMBIENT TEMPERATURE FOR COOLING UNIT MUST NOT EXCEED 100°F. UNIT OPERATING AMBIENT IN EXCESS OF 100°F WILL AUTOMATICALLY VOID FACTORY WARRANTY AND WILL EVENTUALLY RESULT IN UNIT FAILURE. SEVERAL MEANS ARE AVAILABLE TO ACHIEVE PROPER AMBIENT TEMPERATURE AND AIR CIRCULATION AROUND THE UNIT WHICH ARE WALL AIR INTAKE GRILLES AND CEILING EXHAUST FANS, AIR CONDITIONING, ETC. CONSULT LOCAL CODES.

Locate the unit so the following requirements are satisfied:

1) Near a properly grounded 230 VAC, 60 Hz single-phase electrical circuit with a 30 amp minimum-rated disconnect switch (not furnished) fused at 30 amps (slow-blow). ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES. MAKE SURE UNIT IS PROPERLY GROUNDED.

2) Close to a potable water inlet supply line with a minimum pressure of 12-psi.

## NOTE

Circulating air required to cool the refrigeration system's condenser coils inside the unit is drawn in through grilles on front of the unit and exhausted out through louvered panels on sides and back of the unit. Restricting air circulation through the unit will decrease its cooling efficiency.

3) When installing unit do not allow obstruction to block grilles on front of unit blocking off air intake to inside of unit. If installation dictates only one side or back of unit being unobstructed, allow 18-inches clearance between unit and obstruction. If both sides or one side and back of unit are unobstructed, allow 12-inches clearance. If both sides and back of unit are unobstructed, allow 6-inches clearance.

INSTALLING UNIT

1) Place unit in location meeting requirements of SELECTING LOCATION.

2) After unit has been installed in operating position, make sure front (dispensing valve side) of unit is approximately 1/4-inch higher than the rear to eliminate gas pockets being trapped inside freeze cylinders.

3) To comply with National Sanitation Foundation (NSF) requirements, unit install with base contacting floor must have base sealed to floor with Dow Corning RTV 731 or equivalent.

INSTALLING PRIMARY $CO_2$ REGULATOR ASSEMBLY ON $CO_2$ CYLINDER

**WARNING!**

TO AVOID PERSONAL INJURY AND/OR PROPERTY DAMAGE, ALWAYS SECURE $CO_2$ CYLINDER WITH SAFETY CHAIN TO PREVENT IT FROM FALLING. SHOULD THE VALVE BECOME ACCIDENTALLY DAMAGED OR BROKEN OFF, $CO_2$ CYLINDER CAN BECOME AN UNGUIDED MISSILE.

1) Unscrew protector cap (with chain attached) from $CO_2$ cylinder valve. Open $CO_2$ cylinder valve slightly counterclockwise to blow any dirt or dust from outlet fitting before installing primary $CO_2$ regulator, then close valve.

2) Remove shipping plug from $CO_2$ regulator coupling nut and make sure gasket is in place in nut. Install regulator on $CO_2$ cylinder so gages can be easily read, then tighten coupling nut. DO NOT open $CO_2$ cylinder valve at this time.

CONNECTING SOFT DRINK TANKS $CO_2$ LINES TO PRIMARY $CO_2$ REGULATOR ASSEMBLY (see Figure 1-2)

1) Connect soft drink tanks $CO_2$ lines to primary $CO_2$ regulator.

2) Install gas quick disconnects on ends of soft drink tanks $CO_2$ lines. DO NOT CONNECT $CO_2$ LINES TO TANKS AT THIS TIME.

CONNECTING UNIT INLET SYRUP LINES

1) Route unit inlet syrup lines, labeled No. 1 and No. 2, through hole provided in unit base out to soft drink tanks location.

2) Install liquid disconnects on ends of unit inlet syrup lines. DO NOT CONNECT SYRUP LINES TO TANKS AT THIS TIME.

CONNECTING WATER INLET SUPPLY LINE TO UNIT

**NOTE**

The Cornelius Company recommends that a water shutoff valve and water filter be installed in plain water inlet supply line (see Figure 1-2). A Cornelius Water Filter (P/N 313860-000) and Quick Disconnect Set (P/N 313867-000) are recommended.

1) If fitting connector is not available, tap into water supply line with a 3/8-flare Saddle Valve (P/N 315664-000) or equivalent.

2) Before connecting water inlet supply line to unit, open shutoff valve in water supply line for a period of time to flush out any metal shavings resulting from installing fitting or saddle valve.

3) Route 3/8-inch I. D. water inlet supply line through hole in bottom of unit base and connect to 1/4 NPT by 5/8-18 90° elbow on water strainer located on water pump. DO NOT OPEN WATER INLET SUPPLY LINE SHUTOFF VALVE AT THIS TIME.

CONNECTING ELECTRICAL POWER CIRCUIT TO UNIT

WARNING

MAKE SURE BOTH UNIT POWER SWITCHES AND 30 AMP MINIMUM-RATED DISCONNECT SWITCH (NOT FURNISHED) ARE IN THE OFF POSITION.

Model No. 416025 Without Step-up Transformer.

IMPORTANT

VOLTAGE ACROSS $L_1$ AND $L_2$, WITH ALL THREE COMPRESSORS RUNNING MUST BE BETWEEN 215 and 253 VAC. A STEP-UP TRANSFORMER IS AVAILABLE IN CASES WHERE A LOW-VOLTAGE CONDITION EXISTS AND YOU ARE UNABLE TO GET THE LOCAL ELECTRICAL UTILITY COMPANY TO INCREASE THE VOLTAGE OR DETERMINE THE REASON FOR LOW VOLTAGE. THIS TRANSFORMER WILL STEP UP THE ELECTRICAL INPUT VOLTAGE BY 12 PERCENT OF THE ELECTRICAL SUPPLY. WITH A BORDERLINE 191 VAC, THIS TRANSFORMER WILL INCREASE VOLTAGE TO 215 VAC. IF TRANSFORMER IS REQUIRED, ORDER TRANSFORMER KIT (P/N 511027-000).

1) Remove control box cover.

WARNING

THIS UNIT MUST BE ELECTRICALLY GROUNDED TO AVOID POSSIBLE FATAL ELECTRICAL SHOCK OR SERIOUS INJURY TO THE OPERATOR. A GREEN SCREW, WITH LOCK WASHER, IS PROVIDED INSIDE THE CONTROL BOX TO CONNECT GROUND WIRE ELECTRICALLY GROUNDING THE UNIT.

2) Voltage across $L_1$ and $L_2$, with all three compressors operating, must be between 215 and 253 VAC. Connect 230 VAC, 60 HZ, single phase electrical power from 30 amp minimum-rated disconnect switch (not furnished) fused at 30 amps (slo-blow) to $L_1$ to $L_2$ terminals on right-hand-side (as viewed from rear of unit) contactor. Use No. 8 AWG wire, or larger, depending upon line length, in suitable conduit or BX sheath. Connect ground wire under green screw and lockwasher provided inside control box. ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL ELECTRICAL CODES.

3) Install unit control box cover.

4) Install unit sides and back panels by reversing removal procedure.

Model No. 416026 With Step-up Transformer.

1) Remove junction box cover.

WARNING

THIS UNIT MUST BE ELECTRICALLY GROUNDED TO AVOID POSSIBLE FATAL ELECTRICAL SHOCK OR SERIOUS INJURY TO THE OPERATOR. MAKE SURE INCOMING POWER CORD TO UNIT GROUND WIRE IS CONNECTED TO UNIT POWER CORD GROUND WIRE INSIDE JUNCTION BOX.

2) Voltage across $L_1$ and $L_2$ terminals of contactor inside control box must be a minimum of 215 VAC with all three compressors operating. Connect 191 to 229 VAC, 60 Hz, single phase electrical power from 30 amp minimum-rated disconnect switch (not furnished) fused at 30 amps (slo-blow) to unit power cord inside unit junction box. Use No. 10 AWG wire, or larger, depending upon line length, in suitable conduit or BX sheath. MAKE SURE POWER SOURCE GROUND WIRE IS CONNECTED TO UNIT GREEN GROUND WIRE INSIDE JUNCTION BOX. ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL ELECTRICAL CODES.

3) Install unit junction box cover.

4) Install unit sides and back panels by reversing removal procedure.

PREPARATION FOR OPERATION

1) Make sure both POWER switches are pressed to "OFF" position. Turn on electrical power to unit at disconnect switch. OUT OF $CO_2$ and OUT OF WATER warning lights will go on.

2) Open $CO_2$ cylinder valve slightly to allow lines to slowly fill with gas, then open valve fully to back-seat valve. Back seating valve prevents leakage around valve shaft.

3) Adjust $CO_2$ cylinder primary $CO_2$ regulator as instructed.

4) Loosen two screws securing unit front access panel, then lift panel from unit.

5) Check secondary $CO_2$ regulators located behind front access panel which should read 25 to 30-psig for best textured product. If adjustment is necessary, adjust as instructed.

6) Open water inlet supply line shutoff valve. OUT OF WATER warning light should go out. Check for leaks and tighten loose connections.

7) Sanitize unit as instructed.

OPERATION

1) Connect $CO_2$ and syrup lines to soft drink tanks.

2) Bleed faceplate relief valves for approximately 5-seconds to remove trapped air from inside freeze cylinders.

3) Press both POWER SWITCHES to WASH position. Both beater motors and precool compressor will start. Precool compressor will cool cold plate so water is precooled when filling carbonator-blender tanks. When precool compressor cycles off, press both POWER switches to "OFF" position.

4) Adjust product BRIX on both systems as instructed.

5) Press both SYRUP switches to "AUTO" position. Open faceplates relief valves to bleed air from freeze cylinders and to fill cylinders with product.

6) If necessary, adjust product viscosity (product consistency) as instructed.

7) If necessary, adjust product carbonation as instructed.

8) Install unit front access panel by reversing removal procedure.

# SECTION III

OPERATORS INSTRUCTIONS

This section describes operating controls and indicators, dispensed product conditions, operating characteristics, unit operation, replenishing syrup supply, product flavor change, checking $CO_2$ supply, operators daily cleaning of unit, and sanitizing requirements.

## OPERATING CONTROLS AND INDICATORS

### POWER SWITCHES

The two POWER switches (see Figure 4-1), located on front of the unit, are three-position electrical switches labeled WASH, OFF, and AUTO. The WASH position of the switches is used to operate the freeze cylinders beaters without refrigeration during flushing or sanitizing. The AUTO position is used during normal operation. The switch is placed in the OFF position for service and maintenance.

### SYRUP SWITCHES

The two SYRUP switches (see Figure 4-1), located on front of unit, are three position electrical switches labeled FILL, OFF, AUTO. The FILL position, spring-loaded to return to OFF position, is used when filling syrup system during replenishing, changeover, or sanitizing. The switch is to be in AUTO position during normal operation and in OFF position for service and maintenance. The syrup and water solenoids and carbonator-blender will not operate when switch is placed in OFF position.

### DEFROST SWITCHES

The two DEFROST switches (see Figure 4-1), located on front of unit, are two-position momentary-contact switches spring-loaded to return to OFF position when released. The switches actuate the defrost solenoids to permit hot gas to enter freeze cylinder refrigerant coils to defrost product in cylinders. A light included in each switch remains on until thermostatically controlled defrost cycle is complete.

### PRODUCT VISCOSITY (PRODUCT CONSISTENCY) CONTROLS

The two viscosity controls (see Figure 4-1), located above the faceplates, control viscosity (product consistency) of the product dispensed. If a viscosity adjustment is desired, adjust as instructed.

### FACEPLATE RELIEF VALVES

The faceplate relief valves (see Figure 4-1), located in each faceplate, is a spring-loaded valve that protects freeze cylinder from accidental over-pressure. The relief valve is also used to manually bleed $CO_2$ gas from freeze cylinder to atmosphere during filling and if gas pockets form in cylinder during operation.

PRODUCT SAMPLE VALVES

The product Sample Valves (see Figure 1-2), located behind front access panel, are manually operated lever-type ball valves used to check product BRIX. Turn valve lever to line up with attached line to open valve and at 90° angle with line to close valve.

PRECOOL THERMOSTAT CONTROL

The precool thermostat control (see Figure 4-2), located at the left behind front access panel, is used to control precool cold plate temperature. The thermostat is factory adjusted to maintain cold plate temperature between 38°F and 40°F (depending on ambient, water inlet temperature, and other variables) and should not normally require adjustment. If adjustment is necessary, adjust as instructed.

PRIMARY $CO_2$ REGULATOR

The primary $CO_2$ regulator (see Figure 1-2) controls $CO_2$ pressure to soft drink tanks and unit secondary $CO_2$ regulators located behind front access panel. If necessary to adjust primary $CO_2$ regulator, adjust as instructed.

SECONDARY $CO_2$ REGULATORS

The two secondary $CO_2$ regulators (see Figures 1-2 and 4-2), located behind front access panel, control $CO_2$ pressure in the carbonator-blenders. If necessary to adjust secondary $CO_2$ regulators, adjust as instructed.

WATER FLOW REGULATORS

The water flow regulators (see Figures 1-2 and 4-2), located in their respective systems, are adjustable regulators that control the water flow rate. The water flow regulators are factory adjusted at $1.5 \pm 0.05$ oz/sec and should not normally require adjustment. If adjustment is necessary, adjust as instructed.

SYRUP FLOW REGULATORS

The syrup flow regulators (see Figure 1-2 and 4-2), located in their respective systems, are adjustable regulators that control the syrup flow rate for desired BRIX of dispensed product. Adjust syrup flow regulators for desired BRIX as instructed.

DISPENSING VALVES

Dispensing valves (see Figure 4-1), located on faceplates on front of unit, are operated one at a time or simultaneously to deliver product to the customer.

WARNING LIGHTS

The warning lights (see Figure 4-1), located on unit front panel, are self-explanatory and are labeled as follows:

**NOTE**

The terms "left" and "right" designate locations when viewing unit from front (dispensing valve side) of unit.

Out of Syrup.

One OUT OF SYRUP light for each dispensing system. The light on right panel is for the right-side system and light on left panel is for the left-side system.

Out of Water.

Common to both dispensing systems and located on left panel.

Out of $CO_2$.

Common to both dispensing systems and located on right panel.

Beater Stopped.

One for each freeze cylinder. The light on right panel is for right-side cylinder and light on left panel is for left-side cylinder.

Pre-Cool Too Cold.

Common to both dispensing systems and located on right panel.

DISPENSED PRODUCT CONDITIONS

"OVERRUN", AS APPLIED TO FROZEN CARBONATED BEVERAGES

Overrun Defined.

Overrun is product expansion that takes place in the frozen carbonated drink. It is caused primarily by $CO_2$ gas breakout and secondary by freezing.

Overrun is a Variable.

The percentage or degree of overrun depends on a number of factors. The specific syrup, BRIX, low dispensing volume, carbonation level in liquid product, and freezing, all affect overrun. After these factors have been considered, desired viscosity control setting can be made on the unit. The unit viscosity control adjusts product texture from very wet to light.

Specific Product Ingredients Affect Overrun.

Each syrup has its own specific formulation or makeup. Baume, an important ingredient factor, may fall within an extremely wide range. Fruit flavors contain citric acids that colas do not. Colas also differ in ingredients from one brand to another. Each product formulation has its own peculiarities regarding the way the product will absorb carbonation and the way it will release carbonation.

BRIX Affects Overrun.

Sugar in a carbonated drink is like anti-freeze in water. The higher the BRIX in a product, the greater resistance the product has to freezing. Conversely, in products with lower BRIX, freezing takes place at higher temperatures than for high-BRIX products. Thus, BRIX affects overrun because the amount of sugar in a drink has a direct bearing on the product's freezing characteristics.

Low Dispensing Volume Affects Overrun.

When a unit sits idle for a period of time and no drinks are dispensed, the $CO_2$ gas in the system takes a "set". When the first few drinks are drawn off after an idle period, the $CO_2$ gas has less tendency to break out as the drink is dispensed. The result is these casual drinks have less overrun than drinks dispensed during peak-use periods.

Carbonation Level in Liquid Product Affects Overrun.

The higher the specific carbonation level in a given product, the greater the potential for carbonation breakout in the frozen carbonated form of that drink. For example, drinks with 3.0 volume of carbonation will have more gas breakout in frozen carbonated form, and more overrun, than will drinks that contain 2.0 volumes of $CO_2$ gas.

Freezing Affects Overrun.

Freezing causes approximately a 10 percent expansion in the dispensed frozen carbonated drink. The degree of freezing is limited because the finished drink is intended to be sipped through a straw. This is not possible if the product is too "solid".

OPERATING CHARACTERISTICS

The product consistency can be varied by the viscosity control and secondary $CO_2$ regulator setting from a high overrun light drink to a wet heavy drink. The length of the freezing cycle and the amount of $CO_2$ present in the product combine to create the drink dispensed. The dispensed product will have a normal variance due to the following conditions:

1) If some time has elapsed since the last drink was drawn from the particular freeze cylinder and the compressor has not cycled on, the drink dispensed will have a tendency to be wetter, have slightly less overrun than normal for the setting, and will not mound up as high. See Drawing 1.

6) Make sure POWER and SYRUP switches are in AUTO positions.

7) Place cup under dispensing valve, then dispense cup full of product.

8) Make sure product viscosity (product consistency) is as desired. If not, adjust as instructed.

## REPLENISHING SYRUP SUPPLY

Syrup supply should be checked daily and replenished as necessary.

## PRODUCT FLAVOR CHANGE

Change product flavor as instructed.

## CHECKING $CO_2$ SUPPLY

Make sure $CO_2$ cylinder shutoff valve is fully opened and regulator assembly 2000-psi gage indicator is not in shaded ("change $CO_2$ cylinder") portion of dial. If so, $CO_2$ cylinder is almost empty and must be replaced.

## CLEANING AND SANITIZING

### DAILY CLEANING

Daily; or more often if necessary, wash all external surfaces of unit, rinse with clean water, then wipe dry with clean soft cloth. DO NOT USE ABRASIVE CLEANERS. Remove and wash drip tray, rinse with clean water, then install drip tray on unit.

### SANITIZING

The unit should be sanitized every 90 days and before and after storage periods following parent company requirements and sanitizer manufacturers recommendations.

## CLEANING CONDENSER COILS

**NOTE**

Circulating air required to cool the refrigeration systems condenser coils inside the unit is drawn in through grilles on front of unit and exhausted out through louvered panels on sides and back of unit. Restricting air circulation through the unit will decrease its cooling efficiency.

Condenser coils must be cleaned periodically as instructed.

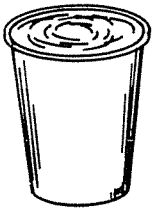
## LUBRICATION

Beater drive motors must be lubricated once a year as instructed.

**NOTE**

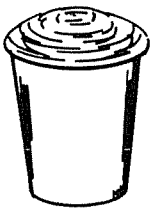
If an attempt is made to eliminate the drink described above by turning the viscosity control thumbwheel in, a cylinder freeze-up may be expected under casual draw conditions.

2) If product is drawn from the freeze cylinder quite regularly, its consistency will be maintained at whatever setting was made within the normal variance of the compressor off and on cycle. See Drawing 2.



DRAWING 1

DRAWING 2



DRAWING 3

3) If product is drawn continuously from the freeze cylinder and the rate is approaching the capacity of the dispensing unit, the overrun of the drink will increase just prior to the point the capacity is exceeded, and the drink dispensed will turn slightly wetter.

**NOTE**

When wet drinks are caused by exceeding the capacity of the dispensing unit, do not attempt to make drinks drier or stiffer by adjusting the viscosity control thumbwheel. Adjustments made under these conditions cause cylinder freeze-ups under casual draw.

OPERATING UNIT

1) Make sure both OUT OF SYRUP warning lights are out indicating ample syrup supply is available. If light is on, replenish syrup supply.

2) Make sure OUT OF WATER warning light is not on indicating water supply is available to unit. If light is on, open water inlet supply line shutoff valve.

3) Make sure OUT OF $CO_2$ warning light is off indicating ample $CO_2$ supply is available. If light is on, replenish $CO_2$ supply.

4) Make sure BEATER STOPPED warning lights are not on which indicates beaters are not operating.

5) Make sure PRE-COOL TOO COLD light is not on indicating a precool plate freeze-up condition. If light is on, adjust precool thermostat as instructed.

## ADJUSTMENTS

### WATER FLOW RATE

The water flow regulators, which control water flow rate into carbonator-blenders, are factory adjusted and normally do not require further adjustment. If adjustment should become necessary, adjust as instructed.

### $CO_2$ REGULATORS

#### Primary $CO_2$ regulator.

The primary $CO_2$ regulator regulates $CO_2$ pressure to the soft drink tanks and the secondary $CO_2$ regulators inside the unit. If necessary to adjust primary $CO_2$ regulator, adjust as instructed.

#### Secondary $CO_2$ Regulators.

The secondary $CO_2$ regulators regulate $CO_2$ pressure to the carbonator-blenders. If necessary to adjust secondary $CO_2$ regulators, adjust as necessary.

### BRIX

BRIX is the water-to-syrup mixture of the dispensed product. If necessary to adjust BRIX of dispensed product, adjust as instructed.

### VISCOSITY

The viscosity (stiffness) of the dispensed product was adjusted at the factory but may be varied to the customers preference. If necessary to adjust viscosity, adjust as instructed.

### PRODUCT CARBONATION

Carbonation of dispensed product can also be varied to the customers preference. If necessary to adjust product carbonation, adjust as instructed.

## WATER STRAINER SCREEN AND CHECK VALVES MAINTENANCE

**WARNING !**

THE WATER PUMP WATER STRAINER SCREEN AND CHECK VALVE AND THE WATER FLOW REGULATOR ASSEMBLIES CHECK VALVES MUST BE INSPECTED AND SERVICED AFTER ANY DISRUPTIONS (PLUMBING WORK, EARTHQUAKE, ETC.) TO THE WATER SUPPLY SYSTEM, AND AT LEAST ONCE A YEAR UNDER NORMAL CIRCUMSTANCES. A WATER PUMP WITH NO SCREEN OR A DEFECTIVE SCREEN IN THE STRAINER WOULD ALLOW FOREIGN PARTICLES TO FOUL THE CHECK VALVES. $CO_2$ GAS COULD THEN BACK FLOW INTO THE WATER SYSTEM AND CREATE A HEALTH HAZARD IN THE WATER SYSTEM.

**Service water strainer screen and check valves as instructed.**

# SECTION IV

SERVICE AND MAINTENANCE

This section describes service and maintenance to be performed on the unit.

## IMPORTANT

ONLY QUALIFIED PERSONNEL SHOULD SERVICE INTERNAL COMPONENTNS OR ELECTRICAL WIRING.

PREPARING UNIT FOR SHIPPING OR RELOCATING

**CAUTION !**

**Before shipping or relocating unit, syrup systems must be sanitized and flushed with potable water and all water must be purged from syrup and plain water systems. A freezing ambient environment will cause residual water remaining inside unit to freeze resulting in damage to internal components.**

PERIODIC INSPECTION

1) Make sure $CO_2$ cylinder valve is fully open and $CO_2$ cylinder regulator assembly 2000-psi gage indicator is not in shaded ("change $CO_2$ cylinder") portion of dial. If so, $CO_2$ cylinder is almost empty and must be replaced.

2) Make sure soft drink tanks contain sufficient amount of syrup for unit operation.

3) Circulating air required to cool the refrigeration systems condenser coils inside the unit is drawn in through grilles on front of unit and exhausted out through louvered panels on sides and back of unit. Make sure grilles and panels are not obstructed and refer to CLEANING CONDENSER COILS in this section.

REMOVAL OF SIDES AND BACK PANELS, UPPER AND LOWER FRONT GRILLES, FRONT ACCESS PANEL, AND DRIP TRAY (see Figure 4-1)

Instructions for removal of sides and back panels, upper and lower front grilles, front access panel, and drip tray for service and maintenance is as follows: Install removed parts by reversing removal procedure.

1) Remove sides and back panel by removing one screw on lower center of each panel, then lift panels straight up about two inches and pull out.

2) Remove upper front grille by removing screw and flat washer securing top of grille, then lift grille up and out.

3) Remove lower front grille by pulling top of grille out, then pull grille up and out of unit.

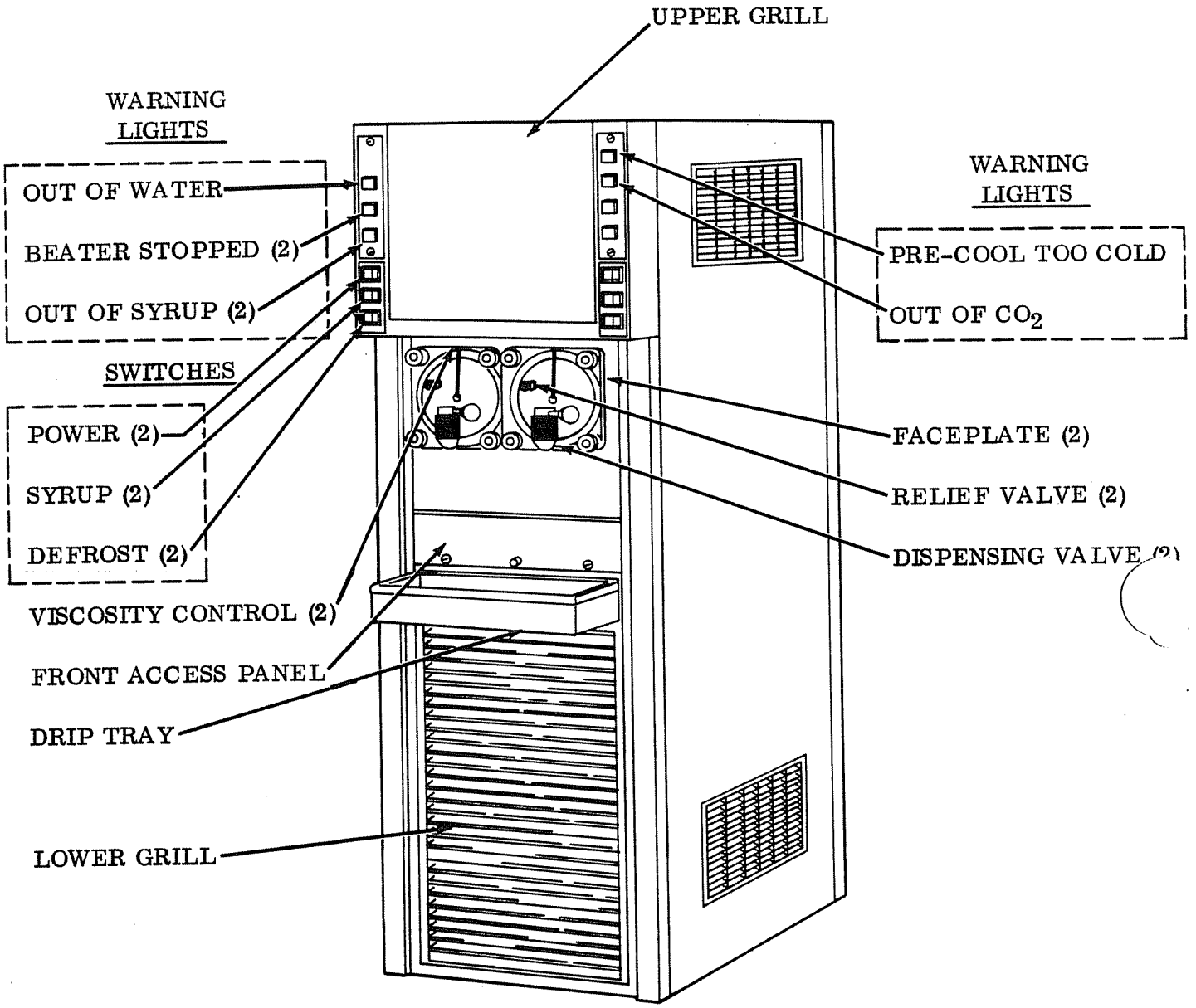



Figure 4-1. Operating Controls

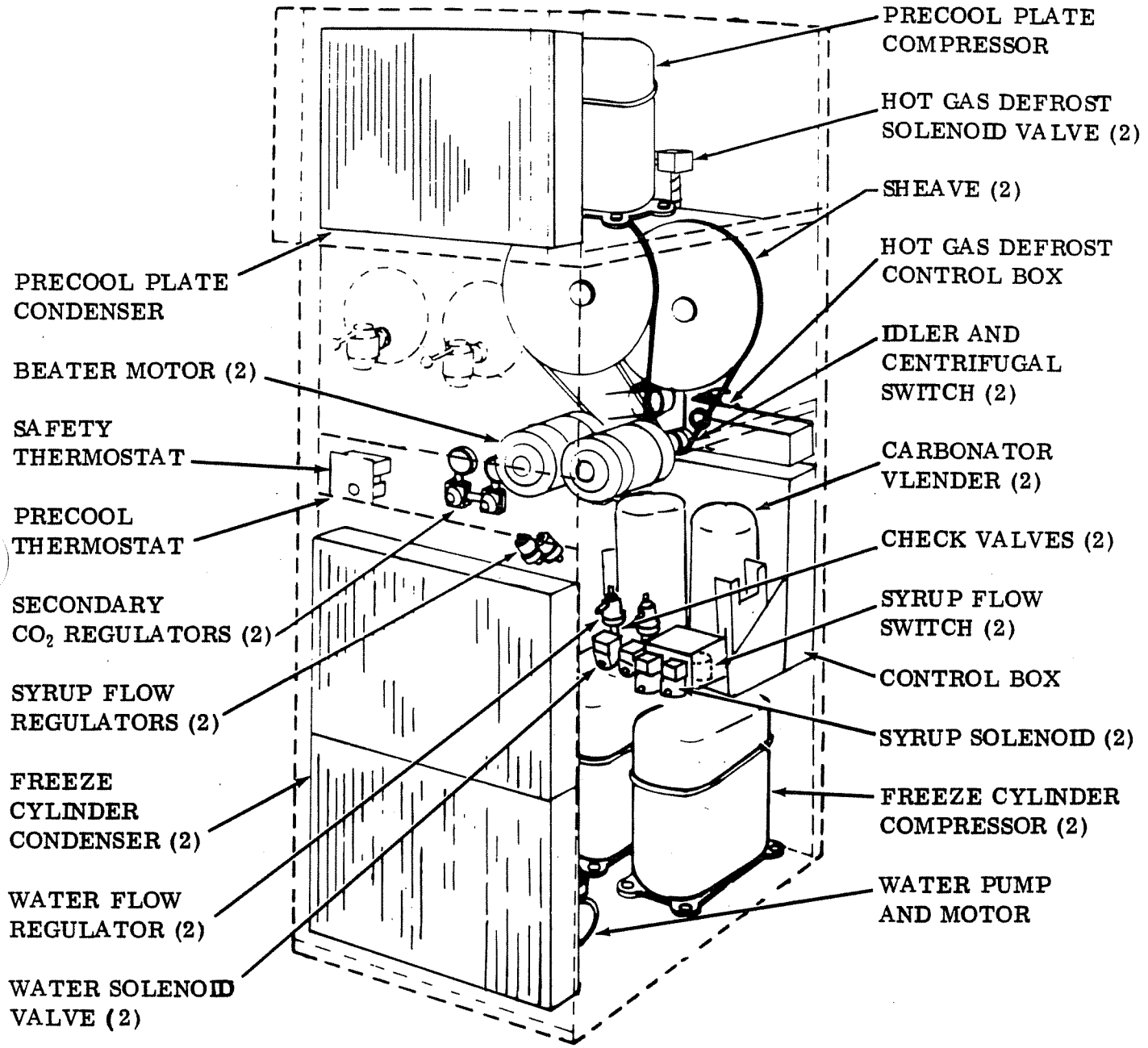



**Figure 4-2. Unit Internal Components**

4) Remove front access panel by loosening two screws securing panel, then pull panel out of unit.

5) Remove drip tray by pulling straight off unit.

## LUBRICATION

### BEATER DRIVE MOTORS

Beater drive motors must be lubricated once a year.

### VISCOSITY SENSOR, DISPENSING VALVE O-RINGS, AND BEATER SHAFT SEAL ASSEMBLIES

**NOTE**

If both freeze cylinders will be serviced at one time, shut off $CO_2$ supply to unit and relieve systems $CO_2$ pressure through faceplates relief valves. If only one freeze cylinder will be serviced, remove front access panel and turn applicable secondary $CO_2$ regulator adjusting screw to the left (counterclockwise) until gage reads 0-psig. Relieve applicable system $CO_2$ pressure through faceplate relief valve.

Lubricate the viscosity sensor and dispensing valve O-Rings (see Figure 2-1) and beater shaft seal assemblies (see Figure 4-3) each time the unit is sanitized as follows:

**NOTE**

Item numbers in parenthesis in this paragraph are in reference to Figure 2-1.

1) Remove KNURLED NUTS (item 11), and FLAT WASHERS (item 10) to remove faceplate assembly.

2) Unscrew RELIEF VALVE (item 13) from FACEPLATE (item 12).

3) Hold VISCOSITY ROD (item 9) and unscrew VISCOSITY SENSOR (item 4) from FACEPLATE (item 12). Pull SPINNER (item 5), O-RING (item 20), and TEFLON WASHER (item 22) from viscosity rod. Remove viscosity rod from faceplate. Remove REDUCER (item 21) from viscosity sensor.

4) Remove BUSHING (item 16) and O-RINGS (item 8) from FACEPLATE (item 12). Carefully remove O-RINGS from bushing.

5) Carefully remove large O-RING (item 8) from FACEPLATE (item 12).

6) Unscrew KNOB and LEVER assembly (item 15 and item 14) from DISPENSING VALVE (item 17). Press valve with caged O-Ring down and out of dispensing valve body. Carefully remove caged O-Ring from valve.

7) Wash all parts in warm water. Remove all traces of syrup and lubricant, especially from faceplate, O-Rings, and dispensing valve. If parts are excessively coated, wipe clean with paper towel to remove syrup and lubricant, expecially from caged O-Ring and dispensing valve. Use BRUSH (item 13, table 2-1) to clean faceplates relief valve passages.

8) Submerge all parts in four percent solution of approved sanitizing agent for time recommended by sanitizer manufacturer.

9) Remove parts from sanitizing solution and place on clean paper towels.

**NOTE**

Use Dow-Corning DC-111 (P/N 321471-000) light grade silicone lubricant.

10) Lubricate caged O-Ring. Carefully install caged O-Ring on valve from straight end (opposite tapered end). Lubricate grooves in which O-Ring rides to fill in all void areas around O-Ring. Carefully install valve with caged O-Ring in dispensing valve body. Screw KNOB and LEVER assembly (item 15 and item 14) in DISPENSING VALVE (item 17). Wipe off all excess lubricant.

11) Lubricate two viscosity sensor bushing O-RINGS (item 18). Carefully install O-Rings on BUSHING (item 16). Carefully press bushing with O-Rings into center hole of FACEPLATE (item 12) from back side.

12) Install threaded end of VISCOSITY ROD (item 9) through BUSHING (item 16) in FACEPLATE (item 12) from outer end. Apply lubricant all around O-Ring seat in counterbore of bushing. Carefully install O-RING (item 20) in bushing counterbore.

13) Install REDUCER (item 21) in VISCOSITY SENSOR (item 4). Assemble SPINNER (item 5), TEFLON WASHER (item 22), and viscosity sensor on VISCOSITY ROD (item 9). Do not overtighten viscosity sensor.

14) Screw RELIEF VALVE (item 13) into FACEPLATE (item 12).

15) Service the beater shaft seal assemblies (see Figure 4-3) as follows:

**NOTE**

Use Dow-Corning DC-111 (P/N 321471-000) light grade silicone lubricant.

a. Pull BEATER (item 23) and SCRAPER BLADES (item 2) from freeze cylinder.

b. Pull Shaft seal assembly (Figure 4-3) from freeze cylinder socket using seal puller, (Cornelius P/N 322063-000) from front side. Disassemble shaft seal assembly and discard O-Rings.

c. Remove old lubricant from plastic sleeve and stainless steel seal retainer with paper towels. Do not scrape the sleeve. Wash sleeve, retainer, and socket at back of freeze cylinder in warm water.

**NOTE**

If the old lubricant cannot be removed from the plastic sleeve by washing, use a nylon "pot and pan" scrubber (3M Co. "Scotchbrite", or equivalent) to remove the residue. Do not scrape the sleeve. Replace any sleeve that has rough edges in the O-Ring sealing areas.

d. Install No. 1 stationary O-Ring in groove of plastic sleeve and No. 2 stationary O-Ring in inner groove of stainless steel seal retainer. Lubricate both O-Rings.

e. Install new "running" O-Rings No. 3 and No. 4 in outergrooves of stainless steel seal retainer, then lubricate O-Rings with generous amount of special light grade silicone grease.

f. Slide stainless steel seal retainer in plastic sleeve until "running" O-Ring No. 3 is just covered by plastic sleeve, as shown in View B of Figure 4-3.

g. Carefully place shaft seal assembly over beater drive shaft and locate slots of seal retainer on drive shaft pin. Then, carefully and simultaneously, push and turn plastic sleeve to locate locking tabs on sleeve in notches of freeze cylinder retainer. When tabs are seated in notches, press assembly firmly in place.

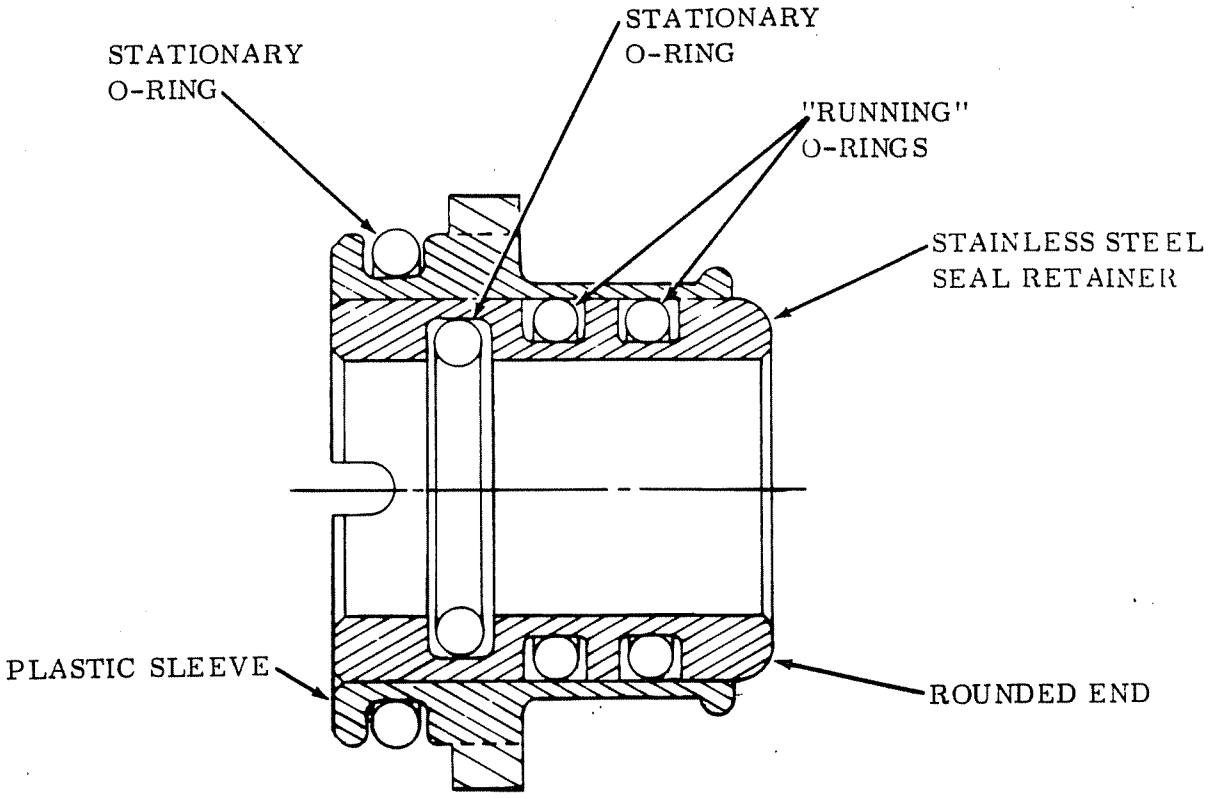
h. Position SCRAPPER BLADES (item 2) on nipples at ends of beater cross arms. Place elongated holes in blades on back of BEATER (item 23). Slide beater into freeze cylinder so slotted hooks engage DRIVE PINS (item 24) on DRIVE SHAFT (item 25). Turn beater clockwise to lock in place.

i. Position large O-RING (item 8) on FACEPLATE (item 12). Install faceplate on unit so dispensing valve spout faces down and VISCOSITY ROD (item 9) is positioned in slot of SWITCH ACTUATOR (item 7). Lubricate O-RING (item 8) with water to facilitate faceplate installation. Tighten knurled nuts until faceplate touches freeze cylinder all around flange. DO NOT USE TOOLS TO TIGHTEN KNURLED NUTS.

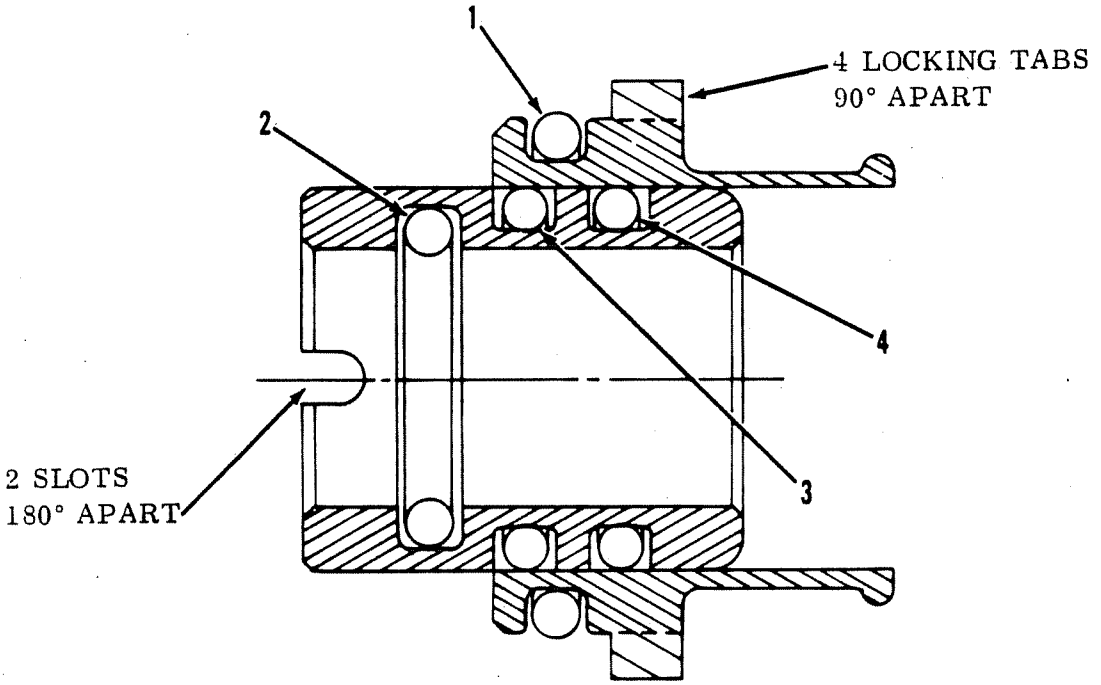
## CLEANING CONDENSER COILS

**NOTE**

Circulating air required to cool the refrigeration systems condenser coils inside the unit is drawn in through grilles on front of unit and exhausted out through louvered panels on sides and back of unit. Restricting air circulation through the unit will decrease its cooling efficiency.




VIEW A




VIEW B

**Figure 4-3. Installing Shaft Seal Assembly in Freeze Cylinder**

Periodically clean condenser coils as follows:

1) Turn POWER switches to OFF position.

2) Remove upper and lower front grilles as instructed.

3) Vacuum or wipe coils with clean cloth or if available, use low compressed air to blow dust out of coils.

4) Install upper and lower front grilles on unit.

5) Turn POWER switches to ON position.

## ADJUSTMENTS

### WATER FLOW RATE

The two black water flow regulators (see Figures 1-2 and 4-2) are factory adjusted for a water flow rate of 1.5 $\pm$ 0.05 ounces per second and normally do not require adjustment. However, if adjustment is necessary, proceed as follows:

1) Remove screws on lower centers of side panel, then lift side panels straight up about two inches and pull out to remove.

2) Loosen two screws and lift front access panel from unit.

3) Disconnect electrical power from unit.

4) Press applicable SYRUP switch to OFF position.

5) Disconnect unit inlet syrup line from applicable soft drink tank.

6) Dispense from applicable freeze cylinder until carbonator-blender tank is empty.

7) Note pressure setting on applicable secondary $CO_2$ regulator gage, then turn adjusting screw on $CO_2$ regulator out (counterclockwise) until gage reads 0-psi. Pull up on applicable blender tank relief valve to release $CO_2$ pressure from system.

8) Disconnect line from outlet side of water flow regulator. Connect line (long enough to reach outside unit) with 7/16-20 fitting to outlet of water flow regulator, then route line to outside of unit.

9) Connect electrical power to unit.

10) Press applicable SYRUP switch to AUTO position to start water pump. When steady stream of water is flowing from added length of line, catch water in container graduated in ounces for exactly 10-seconds. Press SYRUP switch to OFF position. In 10-seconds, 14 to 16 ounces of water should have been dispensed.

11) If adjustment is necessary, loosen jam nut on water flow regulator and turn adjusting screw out (counterclockwise) to reduce water flow rate or turn screw in (clockwise) to increase flow rate. Tighten jam nut and tap on regulator to register adjustment.

12) Repeat steps 10) and 11) until proper water flow rate is achieved.

13) Remove added length of line from outlet side of water flow regulator. Connect line disconnected from water flow regulator in step 8) preceding.

14) Turn secondary $CO_2$ regulator adjusting screw in (clockwise) until gauge registers pressure noted in step 7) preceding.

15) Install front access panel on unit and secure with two screws.

16) Install side panels on unit and secure with screws.

17) Connect unit inlet syrup line to soft drink tank.

18) Press SYRUP switch to AUTO position.

19) Pull relief valve on faceplate to bleed air from system and fill freeze cylinder with product.

## $CO_2$ REGULATORS

Primary $CO_2$ Regulator. (see Figure 1-2)

Adjust primary $CO_2$ regulator by turning regulator adjusting screw to the right (clockwise) until regulator pressure gage reads 80-psi.

Secondary $CO_2$ Regulators. (see Figures 1-2 and 4-2)

1) Loosen two screws securing front access panel, then pull panel out of unit.

2) Adjust secondary $CO_2$ regulators by turning regulator adjusting screw to the right (clockwise) until gages read 25 to 30-psig.

3) Install front access panel and secure with two screws.

## BRIX, VISCOSITY, AND CARBONATION

BRIX Adjustment. (see Figure 4-2)

Perform the following to adjust BRIX of dispensed product.

1) Loosen two screws and lift front access panel from front of unit.

2) Check secondary $CO_2$ regulators located behind front access panel which should read 25 to 30-psi for bext textured product. If adjustment is necessary, adjust as instructed.

3) Pull product sample valve from inside unit.

4) Place SYRUP switch in OFF position.

5) Open product sample valve and take a sample (approximately 6-ounces) of product in cup or glass. Check the product BRIX with a temperature compensated hand-type refractometer. BRIX should read 12.5 $\pm$ 0.5. If BRIX is not within tolerance, adjust syrup flow regulator.

> **NOTE**
>
> Temperature compensated type refractometers are available from The Cornelius Company (P/N 511004-000).

6) To adjust syrup flow regulator, loosen jam nut on regulator and turn screw to the left (counterc lockwise) no more than 1/8 turn to reduce flow rate; or turn screw to the right (clockwise) no more than 1/8 turn to increase flow rate. Tighten jam nut, then lightly tap flow regulator to register adjustment.

7) Dispense from dispensing valve to purge all product from carbonator-blender tank. Open sample valve to purge all product from line and valve.

8) Place SYRUP switch in AUTO position for approximately 2 to 3 seconds to run new product sample into blender tank, then place switch in OFF position.

9) Repeat step 5) preceding to check product sample for BRIX.

10) Repeat steps 7) through 9) until proper BRIX setting is achieved.

11) Perform steps 4) through 9) to adjust BRIX on other system.

12) Install front access panel on unit and secure with two screws.

13) Place SYRUP switch in AUTO position.

Viscosity Adjustment.

The viscosity (stiffness) of the product to be dispensed is set at the factory but can be varied to the customers preference as follows:

1) When freeze cylinder compressor cycles off, draw several cups of product from dispensing valve.

2) Check product for viscosity. If stiffer (more viscous) product is desired, loosen hex nut behind viscosity control thumbwheel and turn the wheel (above faceplate on front of unit) to the right (clockwise) to increase viscosity. When wheel is turned in this direction, spring tension in control mechanism increases and causes compressor to run longer. Tighten lock nut after each adjustment.

**NOTE**

When making a viscosity control adjustment, do not adjust the thumbwheel more than necessary to obtain the desired product. The probability of cylinder freeze-ups increases when the thumbwheel is tightened excessively.

3) When adjustment for stiffer product is made, allow freeze cylinder compressor to cycle on and off three or four times before rechecking.

4) Turn viscosity control thumbwheel to the left (counterclockwise) to decrease viscosity. When wheel is turned in this direction, spring tension in control mechanism decreases and reduces time compressor will run. When adjustment for less viscous product is made, resultant effect of adjustment is not known until compressor cycles on and off three or four times. Tighten lock nut after each adjustment.

Product Carbonation Adjustment.

Carbonation of dispensed product can also be varied to suit consumer preference by adjusting the unit secondary $CO_2$ regulators as follows:

1) Loosen two screws and lift access panel from front of unit.

2) Read $CO_2$ pressure on each secondary $CO_2$ regulator pressure gage.

3) To lower $CO_2$ pressure, turn regulator adjusting screw to the left (counterclockwise) until pressure gage reads 15-psi below desired reading, then turn adjusting screw to the right (clockwise) until gage reads desired pressure. Do not set pressure below 25-psi.

4) To raise $CO_2$ pressure, turn regulator adjusting screw to the right (clockwise) until gage reads desired pressure. Do not set pressure higher than 30-psi. Make sure primary regulator on $CO_2$ cylinder is set at 80-psi.

5) Install front access panel on unit and secure with two screws.

SANITIZING SYRUP SYSTEMS

The unit should be sanitized every 90 days and before and after storage periods following parent company requirements and sanitizer manufacturer's recommendations. Either or both dispensing systems can be sanitized at the same time. An economic practice is to arrange any syrup changeover to coincide with the sanitizing operation. Proceed as follows:

1) Disconnect inlet ($CO_2$) and outlet (syrup) lines from applicable soft drink tank.

2) Press applicable POWER switch to OFF position.

3) Connect $CO_2$ line and unit inlet syrup line to a clean empty soft drink tank, then open dispensing valve and dispense all product from freeze cylinder. As product level lowers in freeze cylinder, partially close dispensing valve to avoid spurting. OUT OF SYRUP light will go on during this time. Close dispensing valve when cylinder is empty.

4) Remove front access panel. Extend applicable product sample valve from unit. Open valve slowly and drain product from line and valve, then close valve.

5) Disconnect inlet ($CO_2$) and outlet (syrup) lines from empty soft drink tank.

**WARNING!**

DO NOT ATTEMPT TO REMOVE SOFT DRINK TANK COVER UNTIL $CO_2$ IS BLED FROM TANK THROUGH RELIEF VALVE ON TANK COVER.

6) Pull up on soft drink tank cover relief valve to release $CO_2$ pressure from tank.

**WARNING!**

IF POWDER TYPE SANITIZER IS USED, IT MUST BE THOROUGHLY DISSOLVED WITH WATER PRIOR TO ADDING TO SOFT DRINK TANK.

**NOTE**

The sanitizing solution is used in a more concentrated form because it will be diluted approximately four-to-one in the carbonator-blender tank.

7) Refer to sanitizer manufacturer's directions and mix (four times normal strength) two quarts or more, depending upon length of unit inlet syrup lines, sanitizing solution in clean soft drink tank. Install and secure tank cover.

8) Connect $CO_2$ line to inlet fitting and unit inlet syrup line to outlet fitting of soft drink tank containing sanitizing solution.

9) Press and hold SYRUP switch in FILL position until OUT OF SYRUP light goes out, then release switch. Press SYRUP switch to AUTO position. Carbonator-blender water pump will start to dilute sanitizing solution to proper ratio in carbonator-blender tank.

10) After water pump cycles off, completely fill freeze cylinder with sanitizing solution by repeatedly pulling and releasing relief valve knob on faceplate of freeze cylinder and until sanitizing solution comes out of relief valve port. Open dispensing valve until sanitizing solution flows from valve, then close valve. Open product sample valve until sanitizing solution flows from valve, then close valve.

11) Press POWER switch to WASH. Allow sanitizing solution to remain in unit for contact time recommended by sanitizer manufacturer.

12) When sanitizing solution contact time has elapsed, open dispensing valve and allow carbonator-blender water pump to cycle on and off until OUT OF SYRUP light goes on and carbonator-blender water pump shuts off. Continue dispensing until freeze cylinder is empty. As sanitizing solution level lowers in freeze cylinder, partially close dispensing valve to avoid spurting. Close dispensing valve. Press and hold SYRUP switch in FILL position to purge sanitizing solution out of line, then release switch. Open product sample valve to purge remaining sanitizing solution out of carbonator-blender tank, product sample valve line, and product sample valve, then close valve. Disconnect inlet ($CO_2$) line from soft drink tank, then release tank $CO_2$ pressure by pulling up on relief valve on tank cover.

13) Remove soft drink tank cover. Pour one half gallon of warm (104°max) potable water into tank, then install tank cover.

14) Connect inlet ($CO_2$) line to soft drink tank containing warm water.

15) Press and hold applicable SYRUP switch to FILL position until OUT OF SYRUP light goes out, then release switch. Press SYRUP switch to AUTO position to start carbonator-blender water pump.

16) Press POWER switch to OFF position. Completely fill freeze cylinder with water by repeatedly pulling and releasing relief valve knob on faceplate of freeze cylinder and until water comes out of relief valve port, then release knob. Press POWER switch to WASH position.

17) Open dispensing valve and allow carbonator-blender pump to cycle on and off until OUT OF SYRUP light goes on and carbonator-blender water pump shuts off. Continue dispensing until freeze cylinder is empty. As water level lowers in freeze cylinder, partially close dispensing valve to avoid spurting. Close dispensing valve. Pull relief valve knob on faceplate to purge water from relief valve port, then release knob. Press POWER switch to OFF position.

18) Press and hold SYRUP switch in FILL position to purge water out of line, then release switch. Open product sample valve to purge remaining water out of carbonator-blender tank, product sample valve line, and product sample valve, then close valve.

19) Disconnect inlet ($CO_2$) and outlet (syrup) lines from empty soft drink tank.

20) Refer to VISCOSITY SENSOR, DISPENSING VALVE O-RINGS AND BEATER SHAFT SEAL ASSEMBLIES under LUBRICATION and perform procedure to lubricate viscosity sensor, dispensing valve O-Rings, and beater shaft seal assemblies.

21) Connect $CO_2$ and syrup lines to soft drink tank containing syrup.

22) Press and hold SYRUP switch in FILL position until OUT OF SYRUP light goes out, then press switch to AUTO position to start carbonator-blender water pump. Press POWER switch to AUTO position.

**CAUTION !**

Do not relieve cylinder pressure too fast or product will foam excessively in freeze cylinder and loose carbonation.

23) After water pump cycles off, intermittently pull and release relief valve knob on faceplate of applicable freeze cylinder. This bleeds $CO_2$ from cylinder and allows product to enter and fill cylinder.

24) Position product sample valve back in unit, then install front access panel.

25) Product will be ready for dispensing in approximately 10 minutes.

YEARLY (OR AFTER WATER SYSTEM DISRUPTION)

**WARNING !**

THE WATER PUMP WATER STRAINER SCREEN AND CHECK VALVE AND THE WATER FLOW REGULATOR ASSEMBLIES CHECK VALVES MUST BE INSPECTED AND SERVICED AFTER ANY DISRUPTIONS (PLUMBING WORK, EARTHQUAKE, ETC.) TO THE WATER SUPPLY SYSTEM, AND AT LEAST ONCE A YEAR UNDER NORMAL CIRCUMSTANCES. A WATER PUMP WITH NO SCREEN OR A DEFECTIVE SCREEN IN THE STRAINER WOULD ALLOW FOREIGN PARTICLES TO FOUL THE CHECK VALVES. $CO_2$ GAS COULD THEN BACK FLOW INTO THE WATER SYSTEM AND CREATE A HEALTH HAZARD IN THE WATER SYSTEM.

SERVICING WATER PUMP WATER STRAINER SCREEN. (see Figure 4-4 and 6-20)

1) Close (counterclockwise) $CO_2$ cylinder valve, then close shutoff valve in inlet water supply line to unit.

2) Press both POWER switches to OFF position.

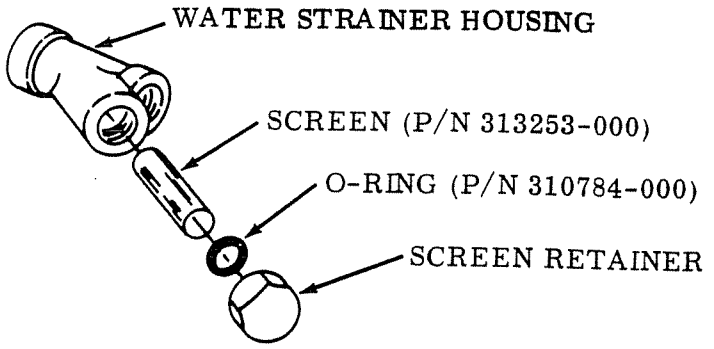
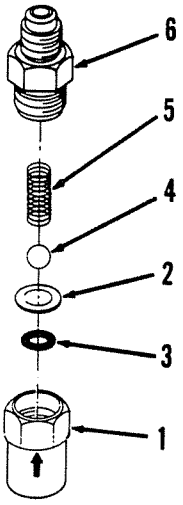



Figure 4-4. Water Strainer




| Index No. | Part No. | Name |
|---|---|---|
| 1 | 317963 | Housing |
| 2 | 312415 | Flat Washer, Stainless Steel |
| 3 | *312418 | Ball Seat (quad ring) |
| 4 | 312419 | Ball |
| 5 | 312196 | Spring |
| 6 | 317965 | Retainer |

*Install new ball seat at each servicing.

Figure 4-5. Check Valve

3) Remove both sides and rear panels by removing one screw on lower center of each panel, then lift panels straight up about two inches and pull out.

4) Loosen screen retainer and pull screen retainer and screen from water pump water strainer housing.

5) Pull screen from screen retainer. Clean any sediment from screen retainer and port in water strainer housing.

6) Inspect screen for holes, restrictions, corrosion, and other damage. Discard damaged screen.

7) Check O-Ring on screen retainer. Replace worn or damaged O-Ring (P/N 310784-000).

> **NOTE**
>
> A screen should always be used, otherwise particles could foul the check valves.

8) Install good or new screen (P/N 313253-000) in screen retainer, then screw screen retainer into water strainer housing and tighten only fingertight.

9) Proceed to SERVICING WATER PUMP CHECK VALVE.

SERVICING WATER PUMP CHECK VALVE. (see Figure 4-5 and 6-20)

1) Service water pump water strainer screen before servicing water pump check valve.

2) Disconnect swivel nut tee fitting from top of check valve. Unscrew check valve from adapter fitting in water pump outlet.

3) Disassemble check valve as shown in Figure 4-5.

4) Wipe each part with clean lint-free cloth. Inspect each part, especially the ball for burrs, nicks, corrosion, deterioration, and damage. Discard ball seat and any damaged or suspicious parts and replace with new parts during assembly.

5) Assemble check valve as shown in Figure 4-5. ALWAYS INSTALL NEW BALL SEAT (QUAD RING) (P/N 312418-000).

6) Install check valve on water pump outlet adapter fitting, then connect swivel tee fitting to top of check valve.

SERVICING WATER FLOW REGULATORS CHECK VALVES

1) Service water pump water strainer screen and water pump check valve before servicing water flow regulators check valves.

2) Disconnect line from water flow regulator assembly (see Figure 4-2 and 6-14)

3) Remove water flow regulator assembly and connector fitting from top of check valve.

4) Unscrew check valve from elbow fitting on water solenoid valve.

5) Disassemble check valve as shown in Figure 4-5.

6) Wipe each part with clean lint-free cloth. Inspect each part, especially the ball for burrs, nicks, corrosion, deterioration, and other damage. Discard ball seat and any damaged or suspicious parts and replace with new parts during assembly.

7) Assemble check valve as shown in Figure 4-5. ALWAYS INSTALL NEW BALL SEAT (QUAD RING)(P/N 312418-000).

8) Install check valve water solenoid valve elbow fitting.

9) Install water flow regulator assembly and connector fitting on check valve outlet.

10) Connect line to water flow regulator assembly.

11) Open inlet water supply line and $CO_2$ cylinder shutoff valves to unit. Check for leaks and tighten any loose connections.

12) Install both sides and rear panels by reversing removal procedure.

13) Press both POWER switches to AUTO position.

## REPLENISHING SYRUP SUPPLY

**NOTE**

Sugar free diet type syrups cannot be used with this unit.

Although syrup replenishment can be accomplished as desired, the applicable syrup supply must be replenished when the OUT OF SYRUP light goes on.

**NOTE**

The following instructions are applicable only when replenishing syrup. Refer to SYRUP FLAVOR CHANGE when changing syrup flavors.

1) Press applicable POWER switch to OFF position.

2) Disconnect inlet ($CO_2$) and outlet (syrup) lines from soft drink tank.

3) Check soft drink tank quick disconnects for sticky or restricted operation. Clean disconnects in warm water.

4) Connect $CO_2$ and syrup lines to full soft drink tank.

5) Press applicable SYRUP switch to FILL position until OUT OF SYRUP light goes out, then press SYRUP switch to AUTO position.

6) If freeze cylinder is not full of product, leave POWER switch in OFF position. Repeatedly pull and release faceplate relief valve knob to slowly bleed $CO_2$ from freeze cylinder and allow product to fill cylinder. Do not relieve pressure too fast or "break out" will occur. When cylinder is full, press POWER switch to AUTO.

## REPLENISHING $CO_2$ SUPPLY

**NOTE**

When indicator on primary $CO_2$ cylinder regulator assembly 2000-psi gage is in shaded ("change $CO_2$ cylinder") portion of the dial, $CO_2$ cylinder is almost empty and should be changed.

When the OUT OF $CO_2$ warning light on the front of the unit goes on, make sure the $CO_2$ cylinder valve and the $CO_2$ regulators are open. If the valve and regulators are open and the OUT OF $CO_2$ warning light is on, replace the $CO_2$ cylinder as follows:

1) Fully close (clockwise) $CO_2$ cylinder valve.

2) Slowly loosen $CO_2$ regulator assembly coupling nut allowing $CO_2$ pressure to escape, then remove regulator assembly from empty $CO_2$ cylinder.

3) Unfasten safety chain and remove empty $CO_2$ cylinder.

**WARNING!**

TO AVOID PERSONAL INJURY AND/OR PROPERTY DAMAGE, ALWAYS SECURE $CO_2$ CYLINDER WITH SAFETY CHAIN TO PREVENT IT FROM FALLING. SHOULD THE VALVE BECOME ACCIDENTALLY DAMAGED OR BROKEN OFF, $CO_2$ CYLINDER CAN BECOME AN UNGUIDED MISSILE.

4) Position $CO_2$ cylinder and secure with safety chain.

5) Make sure gasket is in place inside $CO_2$ regulator coupling nut, then install regulator on $CO_2$ cylinder.

6) Open (counterclockwise) $CO_2$ cylinder valve slightly to allow lines to slowly fill with gas, then open valve fully to back-seat valve. (Back-seating valve prevents leakage around valve shaft).

7) Check $CO_2$ connections for leaks. Tighten loose connections.

## SYRUP FLAVOR CHANGE

**NOTE**

Either or both syrup flavors can be changed at the same time. This allows dispensing to continue on one system while a syrup changeover is being made on the other dispensing system.

1) Refer to SANITIZING SYRUP SYSTEMS, steps 1) through 19), and perform sanitizing procedure on syrup system where syrup flavor change will be made.

2) Refer to VISCOSITY SENSOR, DISPENSING VALVE O-RINGS, AND BEATER SHAFT SEAL ASSEMBLIES under LUBRICATION and perform procedure to lubricate viscosity sensor, dispensing valve O-Rings, and beater shaft seal assemblies.

3) If both faceplates were serviced, restore $CO_2$ supply to unit. If only one faceplate was serviced, turn applicable secondary $CO_2$ regulator adjusting screw to the right (clockwise) until gage reads 25 to 30-psig. Install front access panel.

4) Connect $CO_2$ and syrup lines to soft drink tank containing new flavor syrup.

5) Press and hold SYRUP switch in FILL position until OUT OF SYRUP light goes out, then press switch to AUTO position to start carbonator-blender water pump. Press POWER switch to AUTO position.

**CAUTION !**

Do not relieve cylinder pressure too fast or product will foam excessively in freeze cylinder and lose carbonation.

6) After water pump cycles off, intermittently pull and release relief valve knob on freeze cylinder faceplate. This bleeds $CO_2$ from cylinder and allows product to enter and fill cylinder.

7) If necessary adjust BRIX, viscosity (stiffness) of product dispensed, and product carbonation as instructed.

## RECOMMENDED EQUIPMENT AND PROCEDURE

## FOR INSTALLING REFRIGERATION COMPRESSOR KIT

Read and understand these instructions thoroughly before proceeding to install refrigeration compressor kit.

**IMPORTANT**

ONLY QUALIFIED PERSONNEL SHOULD INSTALL REFRIGERATION COMPRESSOR KIT.

USE CAUTION

Read and understand the CORNELIUS WARRANTY before any repairs are performed on the refrigeration system.

1) If the compressor is within warranty period, contact The Cornelius Company Service Department, One Cornelius Place, Highway 10 West, Anoka, Minnesota 55303 Phone (612) 421-6120 for compressor return shipment instructions.

2) DO NOT change compressor until you know it is inoperative. Refer to trouble-shooting guide included in these instructions.

3) DO NOT "frost line" charge refrigeration systems. Use charge listed on unit serial plate.

4) DO NOT use line tapping valves or poppet type valves for system processing. They cause restriction during evacuation and are prone to leak.

5) USE only type and amount of refrigerant specified on unit serial plate to charge system. DO NOT USE "USED" REFRIGERANT.

## TROUBLESHOOTING

Before a compressor is replaced, a few simple checks should be made to confirm that the compressor is actually at fault. The following is a list of symptoms, probable causes, and test procedures to be considered before proceeding to replace the compressor.

### COMPRESSOR COOLS BUT IS VERY NOISY, EXPECIALLY WHEN STOPPING AND STARTING

Probable Cause - Compressor cools, but is very noisy, expecially when stopping and starting. This is either a broken suspension spring or loose crank shaft extension.

Remedy - Compressor must be changed.

### COMPRESSOR COOLS, BUT IS MODERATELY NOISY; LOUD ENOUGH TO BE NOTICED, BUT NO SHARP BANGS OR CLATTERING

Probable Cause - Compressor cools and is moderately noisy, loud enough to be somewhat annoying, but no sharp bangs or clattering.

Remedy - This is probably a discharge or suction tube rattling inside the compressor. If noise level can be tolerated, compressor need not be changed. The noise will not affect the performance or shorten compressor life.

### COMPRESSOR OPERATES BUT REFRIGERATION SYSTEM DOES NOT COOL

Probable Cause - Look for a refrigerant leak or oil at tubing joints. If compressor is moderately noisy and no leaks are evident, it is probably a broken valve inside compressor.

Remedy - Compressor must be changed.

COMPRESSOR STARTS AND OPERATES FOR A FEW SECONDS, THEN STOPS

Probable Cause - Compressor running too hot due to condenser coil fins plugged with dust, lint, and grease restricting cooling air flow through the condenser coil.

Remedy - Clean condenser coil fins with vacuum cleaner, low-pressure compressed air, or a soft brush, then allow compressor to cool and restart.

COMPRESSOR WILL NOT START

1) Check line voltage across "T" terminals on contactor. Cannot be more than 15% below nominal voltage.

2) Check for loose or disconnected wires.

3) Check control circuit; contactor must pull in.

4) Visually examine start capacitor for signs of excessive heat (blown up). If none visible, check for open by connecting test cord and checking amp draw. If no current is drawn (or very little), capacitor is open and must be replaced.

5) If capacitor is blown, look for a defective start relay, or low voltage.

6) Shorted or grounded motor windings.

7) If all above checks have been made and compressor still will not start, increase starting capacitor value by about 15% and try to start. This can be done two ways:

**IMPORTANT**

THE SUBSTITUTE CAPACITOR MUST HAVE A VOLTAGE RATING EQUAL TO OR GREATER THAN THE EXISTING START CAPACITOR.

a. Remove existing capacitor and replace with one having a 15% greater MFD rating or (step b).

b. Wire a capacitor that has 15% of the MFD rating in parallel with the existing capacitor.

c. Try to start compressor.

8) If all above will not make compressor run, label "stuck", and replace.

ELECTRICAL CHECK

Single-Phase Compressor.

Compressor starts but will not operate for more than a few seconds.

Inoperable Start Relay - To check start relay, remove wire from No. 1 terminal on start relay and touch to No. 2 terminal. Start compressor and immediately remove wire from No. 2 terminal. If compressor starts and operates, problem is in the start relay.

Remedy - Replace start relay.

Low Voltage - Remove compressor terminal cover and connect voltmeter test leads between "C" (top terminal) and "R" (lower right terminal). Start compressor a minimum of 200 VAC must be present to operate compressor.

Remedy - If less than 200 VAC is present, either upgrade unit power source or install Step-Up/Step-Down Transformer Kit (P/N 511027-000).

**WARNING !**

TO AVOID ELECTRICAL SHOCK EVEN AFTER ELECTRICAL POWER HAS BEEN DISCONNECTED FROM UNIT, RUN CAPACITORS MUST BE DISCHARGED BY MOMENTARILY TOUCHING BOTH CAPACITOR TERMINALS AT THE SAME TIME USING AN INSULATED SCREWDRIVER.

Inoperative Run Capacitor - Inspect capacitor for bulges, cracks, or any external deformation. If found, assume the capacitor is inoperable. If none of the mentioned conditions are found, disconnect electrical wires from capacitor. Connect test cord to capacitor terminals. Connect ammeter to one wire of test cord. Plug test cord into electrical outlet and observe amp reading. For 230 VAC input into capacitor, amp reading should be between 1 and 3 amps. If less than or greater than these values, the capacitor is open or shorted and should be replaced.

Remedy - Replace run capacitor.

Grounded or Shorted Motor Windings - Disconnect all electrical wires from compressor terminals. Set ohmmeter on 100,000 ohm scale. Touch one lead to copper line or bare metal of compressor. Touch other lead to each of the compressor terminals in succession. Continuity must not be indicated. If an ohmmeter reading is obtained, the compressor is grounded and must be replaced. To check for shorted windings, set ohmmeter on 10 ohm scale. Attach one lead to "C" (top terminal on compressor). Touch other lead to "R" (lower right

terminal). The reading should be approximately 1 to 1-1/2 ohms. Leave one lead on "C" terminal and touch other lead to "S" (lower left terminal). The reading should be 3-1/2 to 5 ohms. Leave one lead on "S" terminal and touch other lead to "R" terminal. This reading should be exactly the sum of the first two readings obtained. If the resistance readings do not fall within these limits, the compressor is "shorted" or has an "open" winding and must be replaced.

Remedy - Replace compressor.

EQUIPMENT AND SUPPLIES NEEDED

1) Oxy-fuel (acetylene, propane, etc.) torch with tip size No. 2 or 3.

2) Vacuum pump - preferably a high vacuum type capable of at least a 50-micron blank off pressure. Alternate: A pump capable of 28.5-in. HD minimum.

3) Adequate gaging matched to the pump's capability.

4) Charging cylinder - visual indicating type with a refrigerant R-12 and R-502 scale and temperature correction curve or a closed container with an accurate scale. Charging equipment must be able to deliver the correct charge within 1/4-ounce. USE A PRE-MEASURED CHARGE ONLY.

5) Pinch-off tool - used to seal process lines after recharging.

6) Normally used hand tools - pliers, screwdrivers, etc.

7) Brazing alloy - use a phosphorous bearing copper-silver alloy for copper-to-copper connections such as "phos-copper" or "Silfos". These alloys have about 15% silver content. Use a high (50%) silver alloy such as "Easy-Flow" and flux for copper-to-steel joints. NEVER USE "SOFT" OR "HARD" SOLDER.

COMPRESSOR REPLACEMENT PROCEDURE (see Figure 4-6)

Clean condenser coil fins of any foreign matter or blockage. Make sure unit has enough air flow through the condenser coil to insure proper operation. Inadequate air flow will cause premature compressor failure.

**WARNING!**

TO AVOID POSSIBLE FATAL ELECTRICAL SHOCK OR SERIOUS INJURY, DISCONNECT ELECTRICAL POWER FROM UNIT BEFORE PROCEEDING TO INSTALL COMPRESSOR KIT.

1) Disconnect electrical power from unit.

2) Tag electrical wires for identification, then disconnect electrical wires from compressor terminals.

3) Break low-side suction process line (located on compressor) and high-side discharge process line (located on dual inlet drier) at crimp, and allow refrigerant to exhaust slowly to atmosphere.

4) Cut or split rubatex insulation covering suction line and cap tube.

5) Apply heat shields, as necessary, on electrical wiring and lines adjacent to compressor joints for protection against burning.

6) Unsolder cap tube from suction line for a distance of 12 to 15-inches. Cut out 4-inches of suction line in preparation to install new filter dryer (P/N 511031-000) provided with kit. BE CAREFUL NOT TO CUT OR CRIMP CAP TUBE.

7) Clean lines with emery cloth or wire brush until "shiny". Do not allow chips or sand from cloth to enter tubes. Do NOT cool tubes with water or allow water or moisture to enter system.

## IMPORTANT

NOTE ARROW ON FILTER DRYER INDICATING FLOW DIRECTION THROUGH FILTER. NEW DRIER TO BE INSTALLED IN SUCTION LINE BETWEEN ACCUMULATOR AND COMPRESSOR WITH INLET PORT OF DRIER ON ACCUMULATOR SIDE OF CONNECTION.

8) Install new filter dryer in suction line. TO INSTALL NEW DRIER IN PRE-COOL SYSTEM, TWO 1/2-IN. TO 3/8-IN. REDUCERS (P/N 511033-000) ARE PROVIDED IN KIT AND MUST BE USED TO MAKE CONNECTIONS.

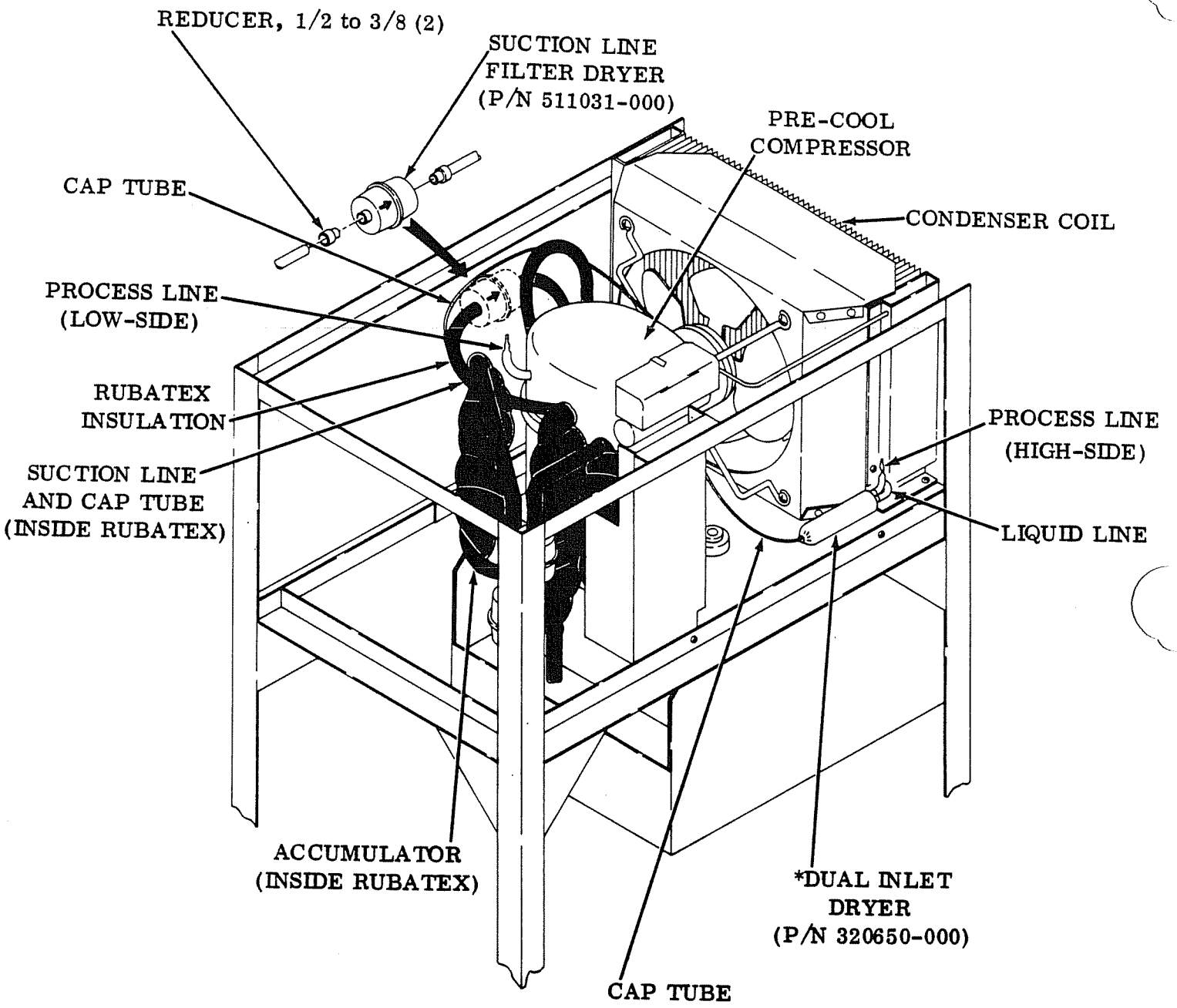
9) Remove compressor mounting clips or bolts.

10) Heat joints and remove suction and discharge lines from compressor.

11) Clean lines with emery cloth or wire brush until "shiny". Do not allow chips or sand from cloth to enter tubes. Do NOT cool tubes with water or allow water or moisture to enter system.

12) Install new compressor and insert suction and discharge lines in compressor.

13) Replace dual inlet strainer drier with new dual inlet strainer drier (P/N 320650-000) (supplied with kit) in a horizontal position; insert liquid, process, and cap tube lines.




*DUAL INLET DRYER TO BE INSTALLED IN HORIZONTAL POSITION AS SHOWN.

Figure 4-6. Installing Dryers

**CAUTION !**

DUAL INLET STRAINER DRYER MUST BE INSTALLED IN A HORIZONTAL POSITION TO AVOID PREMATURE COMPRESSOR FAILURE.

**NOTE 1**

Cap tube must not be cut off more than 2-inches. (NOTCH WITH FILE AND BREAK OFF.)

**NOTE 2**

Cap tube must not be inserted into drier opening more than 1/2-inch.

**NOTE 3**

Drier must not be uncapped more than 10 minutes before brazing into system.

14) Connect "dry" nitrogen (-75°F dewpoint minimum) to suction process line and open discharge process line to purge system. DO NOT PURGE WITH $CO_2$.

15) Purge system at least 10 minutes with dry nitrogen prior to brazing.

16) Adjust nitrogen flow until a very small amount (less than 1-psi) of nitrogen is flowing through refrigeration system.

17) While nitrogen is slowly flowing through refrigeration system, braze all but the last joint.

18) Disconnect dry nitrogen from refrigeration system, then braze the last joint.

19) Clean all flux from braze joints with cold water.

20) When brazing is complete, pressurize system to saturation with clean dry refrigerant of type specified on unit serial plate.

21) Leak-check system including newly brazed joints. If joint is suspected of a leak, tape envelope made of poly over joint to trap leaking refrigerant. Wait 10 minutes, then use leak detector to check air inside envelope for traces of refrigerant.

22) Exhaust refrigerant and evacuate. If high-vacuum pump is used, evacuate to at least 200-microns (preferably 100-microns) prior to charging.

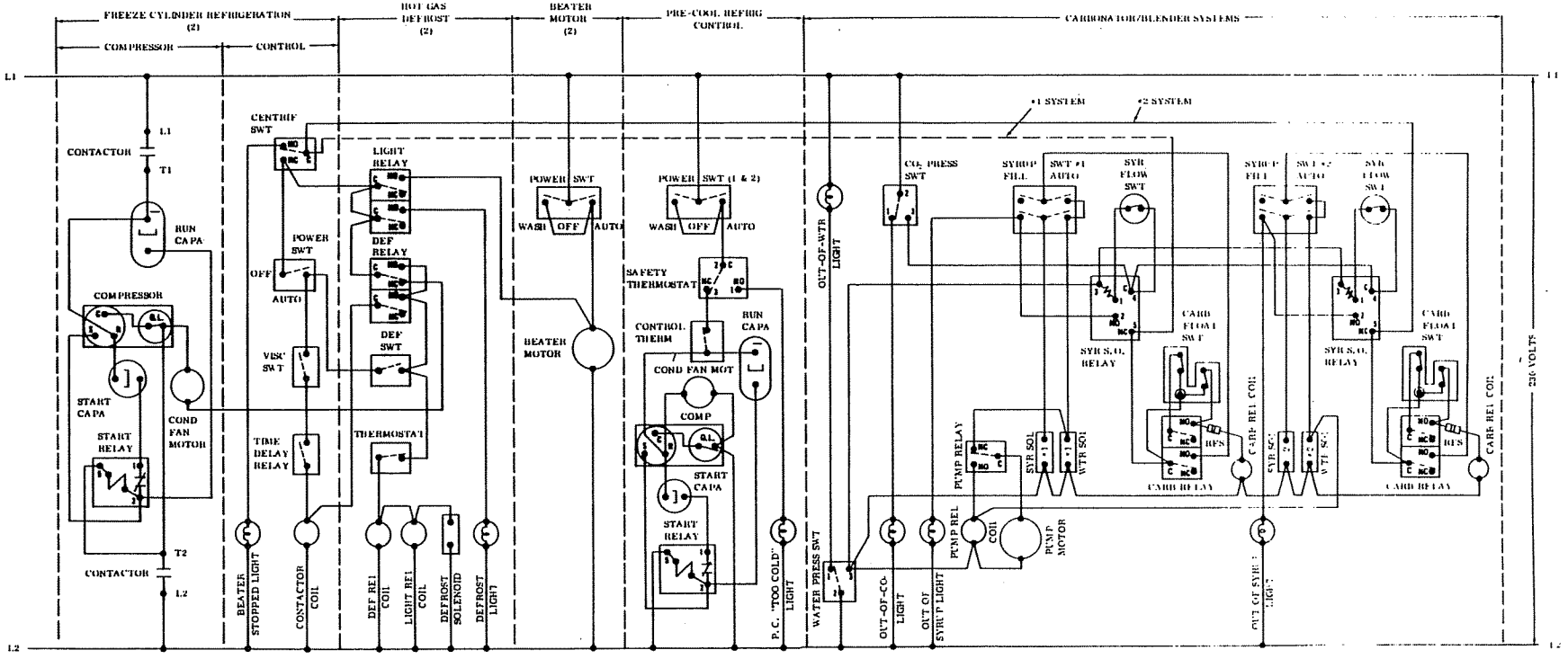
23) Use clean dry refrigerant, in amount and type specified on unit serial plate, to charge unit through suction process line. It should not be necessary to run system to install correct charge in liquid form.

24) Pinch off. Use crimp tool and pinch tube twice, leaving crimp tool applied to second (inner) pinch until weld is cold. Cut tube approximately 1/2-inch from outer pinch. Open end of tube and fill with copper brazing alloy. Repeat for other process line. Do not use line-tapping valves or poppet-type valves for system processing. They cause too much restriction for evacuation and have great potential for refrigerant leaks, causing malfunction and additional service calls, and voids warranty.

25) Press cap tube back to suction line as close as possible, then wrap cap tube and suction line with insulation.

26) If your kit contains a loose-shipped start capacitor, install capacitor on unit. Transfer applicable parts from old to new compressor, then connect electrical wiring to compressor. Make sure electrical wiring is properly connected by referring to wiring diagram on inside of control box.

27) Connect electrical power to unit, then test run and check unit for peoper operation.

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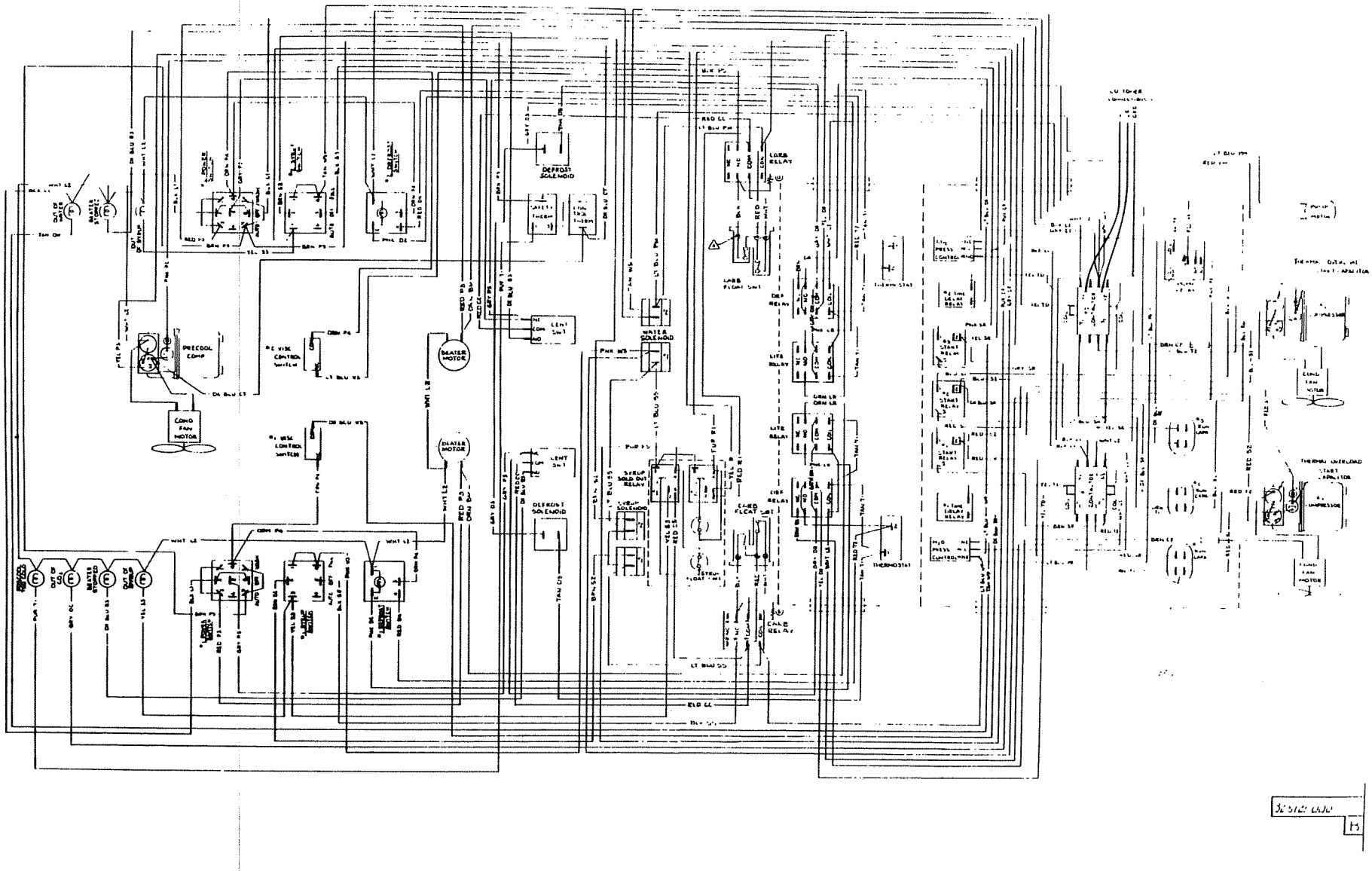
For Reference Only

Figure 4-7. Schematic Wiring Diagram (Common to both Models 416025 and 416026)




**Duplicate Wiring Diagram Decal Located on Inside of Control Box Cover.**

**Figure 4-8. Wiring Diagram (Model 416025)**

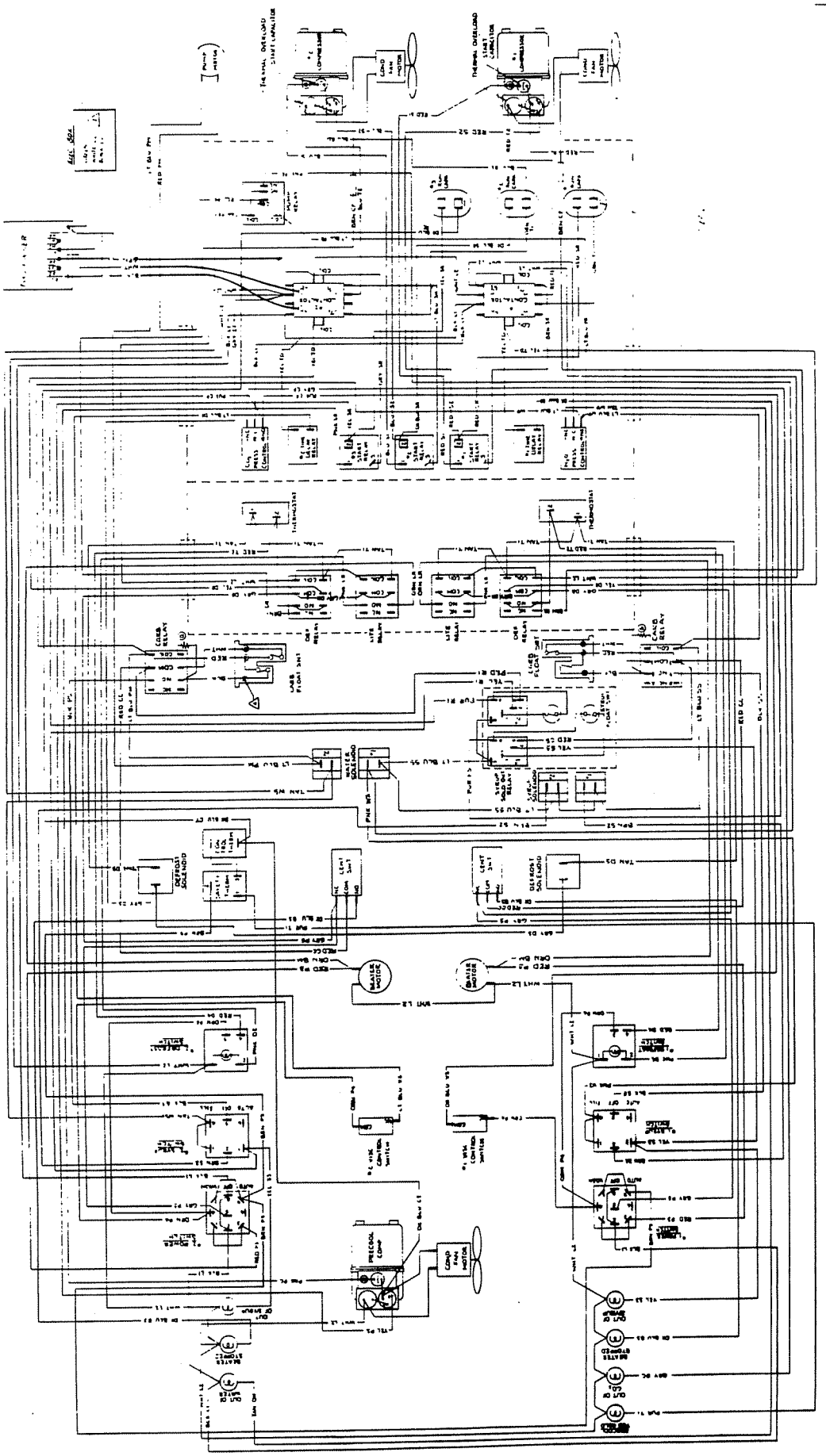


Figure 4-9. Wiring Diagram (Model 416026)

## IMPORTANT

ONLY QUALIFIED PERSONNEL SHOULD SERVICE INTERNAL COMPONENTS OR ELECTRICAL WIRING.

### WARNING !

DISCONNECT ELECTRICAL POWER TO UNIT BEFORE ATTEMPTING ANY ELECTRICAL REPAIRS TO INTERNAL COMPONENTS. IF SERVICE AND MAINTENANCE TO DISPENSING SYSTEM MUST BE PERFORMED, DISCONNECT ALL ELECTRICAL POWER TO UNIT, SHUT OFF $CO_2$ SUPPLY, THEN BLEED SYSTEM PRESSURE BEFORE PROCEEDING.

| Trouble | Probable Cause | Remedy |
|---|---|---|
| **TROUBLESHOOTING WARNING LIGHTS AND SAFETY DEVICES** | | |
| WARNING LIGHT(S) DO NOT GO ON AT SPECIFIED TIMES. | 1. Burned out lamp. | 1. Replace lamp. |
| | 2. Loose or broken electrical wires. | 2. Tighten connections or replace wiring. |
| | 3. Inoperative switch. | 3. Replace switch. |
| BEATER STOPPED LIGHT(S) GO ON. | 1. POWER switch in OFF position. | 1. As applicable, press switch to WASH AUTO position. |
| | 2. Loose or broken beater motor electrical wires cause beater motor to stop. | 2. Tighten connections or replace wires. |
| | 3. Centrifugal switch spring broken. | 3. Replace switch. |
| | 4. Overheated motor cut off by overload protector. | 4. Check for proper line voltage. Reduce load by decreasing product viscosity. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| BEATER STOPPED LIGHT(S) GO ON. | 5. Inoperative centrifugal switch or beater motor. | 5. Replace switch or motor. |
| | 6. Cylinder freeze-up. | 6. Refer to CYLINDER FREEZE-UP. |
| LIGHT IN DEFROST SWITCH DOES NOT GO ON WHEN SWITCH IS PRESSED. | 1. Product temperature too high. | 1. Defrost unnecessary. |
| | 2. Loose or broken electrical wires. | 2. Tighten or replace wires. |
| | 3. Lamp burned out. | 3. Replace defrost switch. |
| | 4. Inoperative switch. | 4. Replace switch. |
| | 5. Defective light relay. | 5. Replace relay. |
| OUT OF $CO_2$ LIGHT GOES ON DURING OPERATION. | 1. $CO_2$ supply turned off or exhausted. | 1. Open $CO_2$ cylinder valve or replenish $CO_2$ supply. |
| | 2. Primary $CO_2$ regulator set too low. | 2. Adjust primary $CO_2$ regulator. |
| | 3. Inlet $CO_2$ line disconnected, loose, or broken. | 3. Connect, tighten, or replace line. |
| | 4. Inoperable $CO_2$ pressure switch. | 4. Replace switch. |
| OUT OF WATER LIGHT GOES ON DURING OPERATION. | 1. Water supply turned off or pressure inadequate. | 1. Turn on water supply or check water supply line pressure. |
| | 2. Plugged water filter or water pump strainer. | 2. Change water filter or clean pump strainer. |
| | 3. Inlet water line or water pressure switch capillary tube disconnected or broken. | 3. Connect or replace water line or replace water pressure switch. |
| | 4. Inoperatuve water pressure switch. | 4. Replace switch. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| OUT OF SYRUP LIGHT(S) GOES ON DURING OPERATION. | 1. Soft drink tank empty. | 1. Replenish syrup supply. |
| | 2. When optional gas bypass valve is used on soft drink tank, valve causes OUT OF SYRUP light to go on if either line on soft drink tank is disconnected. | 2. Reconnect line to soft drink tank. |
| PRE-COOL TOO COLD LIGHT GOES ON. | 1. Control thermostat set too cold. | 1. Decrease setting. (Should be between 2 and 1-1/2.) |
| | 2. Inoperative refrigeration solenoid. | 2. Replace solenoid. |
| | 3. Inoperative control thermostat. | 3. Replace thermostat. |
| DEFROST SWITCH IS PRESSED BUT CYLINDER DOES NOT GO ON DEFROST | 1. Product temperature too high. | 1. Defrost unnecessary. |
| | 2. Loose or broken electrical wires. | 2. Tighten or replace wires. |
| | 3. Inoperative defrost switch. | 3. Replace switch. |
| | 4. Inoperative defrost thermostat. | 4. Replace thermostat. |
| | 5. Inoperative hot gas defrost relay. | 5. Replace relay. |
| | 6. Inoperative hot gas solenoid. | 6. Replace coil and/or solenoid body and plunger. |
| UNIT DOES NOT GO OFF DEFROST CYCLE. | 1. Loose or broken electrical wires. | 1. Tighten or replace wires. |
| | 2. Inoperative defrost thermostat. | 2. Replace thermostat. |
| | 3. Inoperative hot gas defrost relay. | 3. Replace relay. |
| | 4. Stuck hot gas valve. | 4. Replace valve body and plunger. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| **TROUBLESHOOTING CARBONATOR-BLENDERS AND WATER PUMP** | | |
| WATER PUMP MOTOR WILL NOT OPERATE. | 1. No electrical power to unit. | 1. Connect unit to electrical power or check power source. |
| | 2. SYRUP switch in OFF position. | 2. Press switch to AUTO. |
| | 3. OUT OF WATER light on. | 3. Refer to OUT OF WATER LIGHT GOES ON DURING OPERATION. |
| | 4. OUT OF $CO_2$ light on. | 4. Refer to OUT OF $CO_2$ LIGHT GOES ON DURING OPERATION. |
| | 5. OUT OF SYRUP light on. | 5. Refer to OUT OF SYRUP LIGHT(S) GOES ON DURING OPERATION. |
| | 6. Water pump motor may be operative but OUT OF WATER light burned out. | 6. Replace lamp. |
| | 7. Loose or broken electrical wires. | 7. Tighten connections or replace wires. |
| | 8. Overheated water pump motor cut off by overload protector. | 8. Check for proper line voltage. Check for restricted pump discharge. |
| | 9. Inoperative water pump relay. | 9. Replace relay. |
| | 10. Inoperative carb relay. | 10. Replace carb relay. |
| | 11. Inoperative blender-level switch. | 11. Replace switch. |
| | 12. Binding water pump (new or replacement pumps only). | 12. Remove water pump from motor. Rotate pump coupling shaft 180 degrees. Reinstall pump. |
| | 13. Inoperative water pump and/or motor. | 13. Replace pump and/or motor. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| WATER PUMP MOTOR WILL NOT SHUT OFF. | 1. Inoperative carb relay. | 1. Replace relay. |
| | 2. Inoperative blender-level switches or loose electrical wires. | 2. Replace switch or repair wiring. |
| ERRATIC WATER PUMP CYCLING. | 1. Insufficient water supply pressure. OUT OF WATER light goes on and off intermittently and water pump cycles on and off during carbonator tank fill cycle. | 1. Increase water supply line pressure. Water inlet supply line must have large enough I. D.. |
| | 2. Water filter restricted. | 2. Replace water filter. |
| TROUBLESHOOTING PRODUCT DISPENSED | | |
| BRIX TOO LOW. | 1. Disconnect not secure on soft drink tank. | 1. Secure tank quick disconnect. |
| | 2. Syrup flow regulator set too low. | 2. Adjust BRIX of dispensed product. |
| | 3. Water flow regulator set too high. | 3. Water flow regulator must be set at 1.5 $\pm$ 0.05 oz/sec. |
| | 4. Syrup flow regulators stuck. | 4. Clean regulators. |
| | 5. Restriction in syrup line. | 5. Sanitize unit. |
| | 6. Baume of syrup not in proper range. | 6. Change syrup. |
| BRIX TOO HIGH. | 1. Syrup flow regulator set too high. | 1. Adjust BRIX of dispensed product. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| BRIX TOO HIGH. (cont'd) | 2. Water flow regulator set too low. | 2. Water flow regulator must be set for 1.5 ± 0.05 oz/sec. |
| | 3. Water flow regulators stuck. | 3. Clean regulators. |
| | 4. Stop guide restricted. | 4. Clean or replace stop guide. |
| | 5. Baume of syrup not in proper range. | 5. Change syrup. |
| | 6. Restricted water filter. | 6. Replace water filter. |
| IMPROPER PRODUCT DISPENSED. | 1. Secondary $CO_2$ regulators out of adjustment. | 1. Adjust secondary $CO_2$ regulators. |
| | 2. Dirty $CO_2$. $CO_2$ must be clean and free of water, oil, and dirt. Water will not absorb dirty $CO_2$ gas in the same ratio as clean gas. This can also cause off-taste problems. | 2. Replace $CO_2$ supply. |
| PRODUCT WILL NOT DISPENSE OUT OF DISPENSING VALVE, IN ONLY SMALL AMOUNTS, OR ONLY LIQUID. | 1. Dispensing valve has ice particle in it. | 1. Open and close valve repeatedly. Press DEFROST switch to defrost. Check BRIX and adjust if necessary. Adjust viscosity. |
| | 2. Cylinder freeze-up. | 2. Refer to CYLINDER FREEZE-UP. |
| FREEZE CYLINDER DOES NOT REFILL AT ALL TIMES WHEN DISPENSING. | 1. SYRUP switch in OFF position. | 1. Press SYRUP switch to AUTO. |
| | 2. Water pump not operating. | 2. Check switches or pump relay. |
| | 3. Lines restricted. | 3. Sanitize unit. |

| Trouble | Probable Cause | Remedy |
|---|---|---|
| FROZEN PRODUCT CONSISTENCY VARIES EXCESSIVELY. | 1. Torque sensing device sticking in face-plate bushing. | 1. Sanitize unit. |
| | 2. BRIX of product varying because: | 2. |
| | a. Syrup and/or water flow regulator sticking. | a. Clean regulator(s). |
| | b. Primary $CO_2$ regulator pressure insufficient. | b. Primary $CO_2$ pressure must be 80-psig. |
| | 3. Cylinder freeze-up causing ice formation in center of cylinder and liquid product channels around ice formation. | 3. Refer to CYLINDER FREEZE-UP. |
| | **NOTE**<br>Press DEFROST switch to defrost cylinder. | |
| CYLINDER FREEZE-UP. | 1. Beater stopped. | 1. Refer to BEATER STOPPED LIGHT(S) GOES ON. |
| | 2. BRIX too low. | 2. Refer to BRIX TOO LOW. |
| | 3. Viscosity control thumbwheel set clockwise too far. | 3. Adjust viscosity control as instructed. |

## ACCESSORIES AND TOOLS

| | |
|---|---|
| 294039-100 | Primary $CO_2$ Regulator |
| 323169-000 | Syphon Tube (1 hole) |
| 511005-000 | Cup Holder |
| 511006-000 | Cup Holder |
| 511027-000 | B & B Transformer Kit |
| 511031-000 | Filter-Drier Suction Line |
| 511035-000 | $CO^2$ Changeover Kit |
| 511042-000 | Cup Holder Spring Loaded |
| 511043-000 | Cup Holder Spring Loaded |

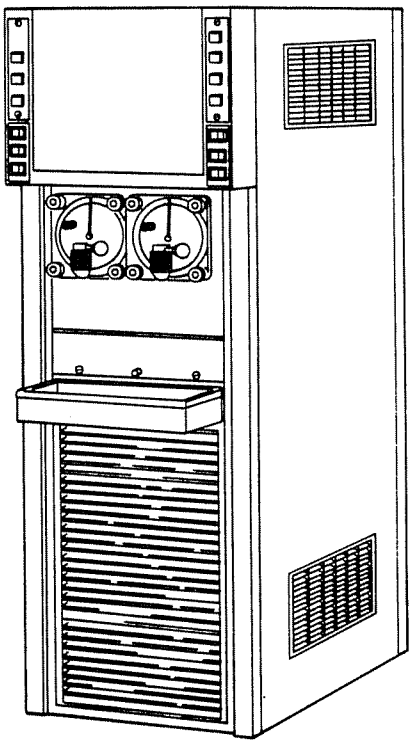
## SERVICE TOOLS

| | |
|---|---|
| 151689-000 | Spanner Wrench Flow Regulator |
| 281884-400 | 3-gallon Sanitizing Tank |
| 322063-000 | Shaft Seal Assembly Puller |
| 322859-000 | Spanner Wrench Dispensing Valve |
| 511004-000 | Refractometer 0-30 Scale |

THE CORNELIUS COMPANY
ONE CORNELIUS PLACE
HIGHWAY 10 WEST
ANOKA, MINNESOTA 55303

# FCB Dispenser Post-Mix

Model Numbers
416025
416026



## SECTION VI
ILLUSTRATED PARTS BREAKDOWN

REV: 8-8-88
11-8-77

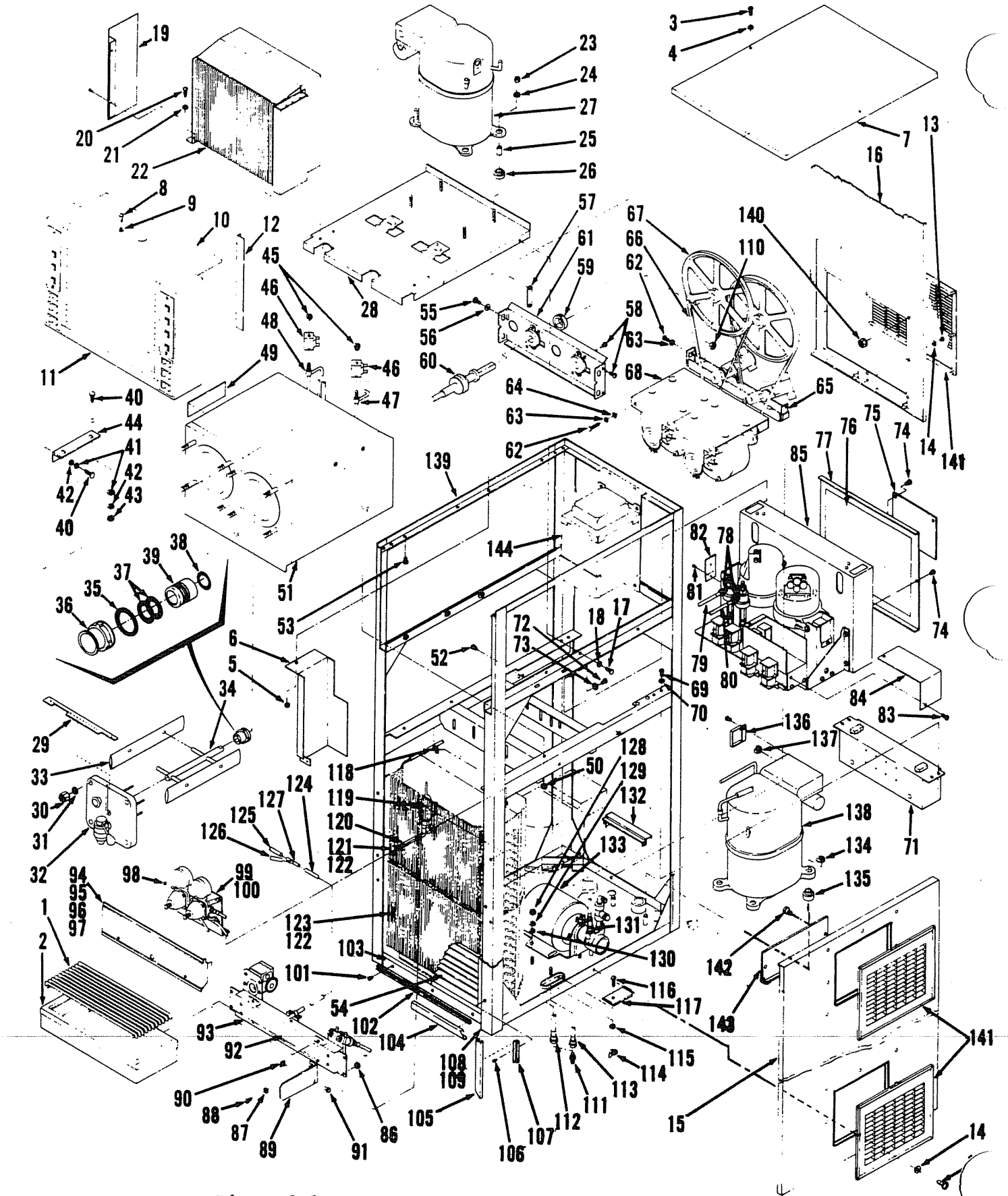



Figure 6-1. Frozen Carbonated Beverage Dispenser

Figure 6-1. Frozen Carbonated Beverage Dispenser

IMPORTANT

INCLUDE MODEL NUMBER AND SERIAL NUMBER
WHEN ORDERING REPLACEMENT PARTS.

| Index No. | Part No. | Name |
|---|---|---|
| | 416025 | Frozen Carbonated Beverage Dispenser |
| | 416026 | Frozen Carbonated Beverage Dispenser with Transformer |
| 1 | 314097 | Cup Rest |
| 2 | 322235 | Drip Tray |
| 3 | *320106 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 1-in. |
| 4 | *322967 | Lock Washer, Ext Tooth, No. 6, .146 I.D. |
| 5 | *120280 | Hex Nut, No. 6-32 |
| 6 | 325116 | Shield, Compressor |
| 7 | 325119-033 | Panel, Top |
| 8 | *189075 | Sheet Metal Screw, Sl Pan Hd, Type B, No. 6 by 3/8-in. |
| 9 | *320539 | Flat Washer, No. 8 |
| 10 | 325123 | Control Panel Ass'y (see Figure 6-3) |
| 11 | 320761-033 | Grille, Top Front |
| 12 | 322822 | Wire Insulator |
| 13 | *188206 | Thread Rolling Screw, Phil Truss Hd, No. 10-24 by 3/8-in. |
| 14 | *343304 | Lock Washer, Ext Tooth, No. 10 |
| 15 | 325285-033 | Panel, Side |
| 16 | 325286-033 | Panel, Back |
| 17 | *186394 | Cap Screw, Hex Hd, 1/4-20 by 5/8-in. |
| 18 | 341019 | Lock Washer, Ext Tooth, Stainless Steel, .261 I.D. |
| 19 | 325072 | Shield, Control Panel |
| 20 | *186309 | Machine Screw, Phil Rd Hd, No. 10-24 by 5/16-in. |
| 21 | *343304 | Lock Washer, Ext Tooth, No. 10 |
| 22 | 320643 | Condenser Fan, Motor and Shroud Ass'y (see Figure 6-4) |
| 23 | 321290 | Hex Nut, Keps, Chrome-plated Steel, 3/8-16 |
| 24 | *322330 | Washer, .390 I.D. |
| 25 | 322339 | Insert, 29/32 O.D. |
| 26 | 189723 | Grommet, Rubber |
| 27 | 322718 | Compressor Kit |
| 28 | 322324 | Refrigeration Ass'y (see Figure 6-5) |
| 29 | 325217 | Cover, Soffit Panel |
| 30 | 320553-001 | Knob |
| 31 | 320916 | Flat Washer, Special, Stainless Steel, .450 I.D. by .062 thk |
| 32 | 324091 | Freeze Cylinder Face Plate Ass'y (see Figure 6-6) |
| 33 | 320568 | Scraper Blade |
| 34 | 320935 | Beater |
| 35 | 320815 | O-Ring, 1.234 I.D. by .139 C.S. |
| 36 | 320550 | Sleeve |
| 37 | 320533 | O-Ring, .859 I.D. by .130 C.S. |

*Zinc-plated steel unless indicated otherwise.

| Index No. | Part No. | Name |
|---|---|---|
| 38 | 320814 | O-Ring, .734 I.D. by .139 C.S. |
| 39 | 320808 | Retainer Seal, Stainless Steel |
| 40 | *320899 | Cap Screw, Hex Hd, 5/16-18 by 3/4-in. |
| 41 | *186147 | Flat Washer, 5/16-in. |
| 42 | *343313 | Lock Washer, Ext Tooth, 5/16-in. |
| 43 | 186146 | Hex Nut, Stainless Steel, 5/16-18 |
| 44 | 320923 | Bracket, Support Angle |
| 45 | *313672 | Clamp |
| 46 | 325260 | Coil, Hot Gas Solenoid (230 VAC, 60Hz) |
| 47 | 322893 | Solenoid Body and Plunger, No. 1 Compressor |
| 48 | 322894 | Solenoid Body and Plunger, No. 2 Compressor |
| 49 | 313456 | Decal |
| 50 | *189429 | Hex Nut, Keps, 1/4-20 |
| 51 | 322249 | Freeze Cylinder and Cold Plate Ass'y |
| 52 | *320940 | Thread Rolling Screw, Hex Hd, No. 10-24 by 5/8-in. |
| 53 | *186130 | Sheet Metal Screw, Phil Truss Hd, Type A, No. 6 by 1/2-in. |
| 54 | 321785-033 | Grille, Lower Front |
| 55 | *311462 | Cap Screw, Hex Hd, 5/16-18 by 1/2-in. |
| 56 | *343313 | Lock Washer, Ext Tooth, 5/16-in. |
| 57 | 320604 | Twin Nut, 5/16-18 |
| 58 | *320940 | Thread Rolling Screw, Hex Hd, No. 10-24 by 5/8-in. |
| 59 | 321836 | Collar |
| 60 | 320723 | Drive Shaft Ass'y (see Figure 6-8) |
| 61 | 320736-088 | Bearing and Support Bracket Ass'y (see Figure 6-9) |
| 62 | *186394 | Cap Screw, Hex Hd, 1/4-20 by 5/8-in. |
| 63 | *341019 | Lock Washer, Ext Tooth, Stainless Steel, .261 I.D. |
| 64 | *150779 | Flat Washer, 1/4-in. |
| 65 | 325279 | Idler and Channel Ass'y (see Figure 6-10) |
| 66 | 325030 | Drive Belt |
| 67 | 325027 | Sheave, includes Setscrews |
| 68 | 325143 | Beater Drive Motor and Mounting Plate Ass'y (see Figure 6-11) |
| 69 | *312251 | Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in. |
| 70 | *343304 | Lock Washer, Ext Tooth, No. 10 |
| 71 | 322680 | Electrical Box Ass'y (see Figure 6-12) |
| 72 | *151576 | Machine Screw, Phil Truss Hd, No. 10-24 by 3/8-in. |
| 73 | *343304 | Lock Washer, Ext Tooth, No. 10 |
| 74 | *320271 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in. |
| 75 | 325115 | Shield, Compressor |
| 76 | 325121 | Wiring Diagram, w/o Transformer |
| | 325223 | Wiring Diagram, with Transformer |
| 77 | 320544 | Cover, Control Box |
| 78 | 178025-200 | Tapered Gasket, Red |
| 79 | 325173 | Tube Ass'y, .250 I.D. by 39-in. long |
| 80 | 322727 | Tube Ass'y, .250 I.D. by 27-in. long |
| 81 | *312251 | Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in. |

*Zinc-plated steel unless indicated otherwise.

| Index No. | Part No. | Name |
|---|---|---|
| 82 | 324096 | Cover, Relay |
| 83 | *320271 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in. |
| 84 | 325130 | Cover, Relay Box |
| 85 | 325124 | Carbonator Blenders and Control Box Ass'y (see Figure 6-13) |
| 86 | *398024-603 | Hex Nut, Keps, No. 10-24 |
| 87 | *343304 | Lock Washer, Ext Tooth, No. 10 |
| 88 | *186770 | Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in. |
| 89 | 322218 | Support, Drip Tray, Left-Hand |
| | 322219 | Support, Drip Tray, Right-Hand |
| 90 | 321504 | Speed Nut |
| 91 | 321503 | Bullet Catch |
| 92 | 323880 | Label, Cleaning and Sanitizing |
| 93 | 322277 | Drip Tray Panel Ass'y (see Figure 6-18) |
| 94 | 322267 | Door Access |
| 95 | 320771 | Screw Fastener |
| 96 | 320773 | Retaining Washer |
| 97 | 330495 | Pin |
| 98 | 178025-100 | Tapered Gasket, White |
| 99 | *398024-603 | Hex Nut, Keps, No. 10-24 |
| 100 | 325141 | Secondary $CO_2$ Regulators and Bracket Ass'y (see Figure 6-19) |
| 101 | *320293 | Thread Rolling Screw, Phil Pan Hd, No. 4-40 by 3/8-in. |
| 102 | 320718 | Track, Molding, Bottom |
| 103 | 321505 | Angle, Trim, Lower Front |
| 104 | 320716 | Trim, Molding, Bottom |
| 105 | 320714 | Trim, Molding, Right-hand w/o Transformer (shown) |
| | 320693 | Trim, Molding, Right-hand with Transformer |
| | 320715 | Trim, Molding, Left-hand |
| 106 | *320293 | Thread Rolling Screw, Phil Pan Hd, No. 4-40 by 3/8-in. |
| 107 | 320717 | Track, Molding, Side |
| 108 | *320271 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in. |
| 109 | 320692-033 | Corner Post, Front, Left-hand/Right-hand |
| 110 | 320604 | Twin Nut, 5/16-18 |
| 111 | 176193 | Fitting, Straight, 7/16-20 |
| 112 | 325144 | Tube Ass'y, .250 I.D. by 95-in. long, $CO_2$ Inlet |
| 113 | 322606 | Tube Ass'y, .265 I.D. by 95-in. long, Syrup Inlet |
| 114 | *187243 | Wing Nut, No. 10-24 |
| 115 | 325075 | Flat Washer, 7/32 I.D. |
| 116 | *186770 | Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in. |
| 117 | 325074 | Cover, Inlet Lines |
| 118 | 320972 | Clip |
| 119 | 320650 | Strainer, Drier |
| 120 | 187917 | Tube, Elbow, 1/4 O.D. |
| 121 | 322625 | Condenser Fan, Shroud and Motor Ass'y (see Figure 6-4) |
| 122 | *398034-603 | Hex Nut, Keps, No. 10-24 |

*Zinc-plated steel.

| Index No. | Part No. | Name |
|---|---|---|
| 123 | 320628 | Condenser Fan, Shroud and Motor Ass'y (see Figure 6-4) |
| 124 | **140594 | Drain Tube, 5/16 I. D. by 26-in. long |
| 125 | **140594 | Drain Tube, 5/16 I. D. by 8-in. long |
| 126 | **140594 | Drain Tube, 5/16 I. D. by 2-1/8 in. long |
| 127 | 186152 | Drain Tee |
| 128 | 186146 | Hex Nut, Stainless Steel, 5/16-18 |
| 129 | *343313 | Lock Washer, Ext Tooth, 5/16-in. |
| 130 | *186147 | Flat Washer, 5/16-in. |
| 131 | 178025-100 | Tapered Gasket, White |
| 132 | 325117 | Shield, Motor |
| 133 | 322624 | Motor and Pump Ass'y (see Figure 6-19) |
| 134 | 187888 | Clip, Compressor |
| 135 | 189723 | Grommet, Rubber |
| 136 | 325118 | Cover, Compressor |
| 137 | 331304 | Snap Bushing |
| 138 | 322718 | Compressor Kit |
| 139 | 322628-033 | Frame |
| 140 | 317658 | Self-Threading Nut, .188 stud |
| 141 | 317656-033 | Grille |
| 142 | 325282 | Self-Tapping Screw, Hex Washer Hd, No. 2 Point, No. 8-18 by 1/2-in. |
| 143 | 325284-033 | Panel |
| 144 | | Transformer, Buck and Boost (see Figure 6-2) |

*Zinc-plated steel unless indicated otherwise.
**Sold in bulk quantity only.

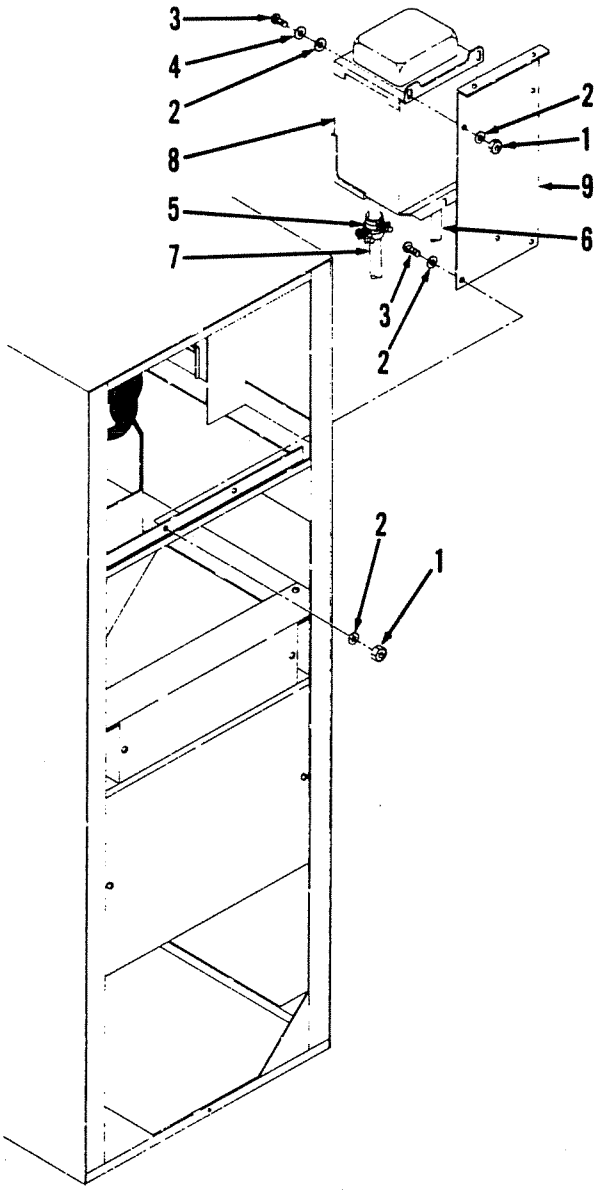



Figure 6-2. Buck and Boost Transformer

| Index No. | Part No. | Name |
|---|---|---|
| 1 | 150904 | Hex Nut, No. 10-24 |
| 2 | 343304 | Lock Washer, Ext Tooth, No. 10 |
| 3 | 186770 | Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in. |
| 4 | 186207 | Flat Washer, No. 10 |
| 5 | 322865 | Connector |
| 6 | 325182 | Power Cord (6-ft long) |
| 7 | 325181 | Power Cord (5-ft long) |
| 8 | 511017 | Transformer |
| 9 | 511013 | Mounting Bracket |

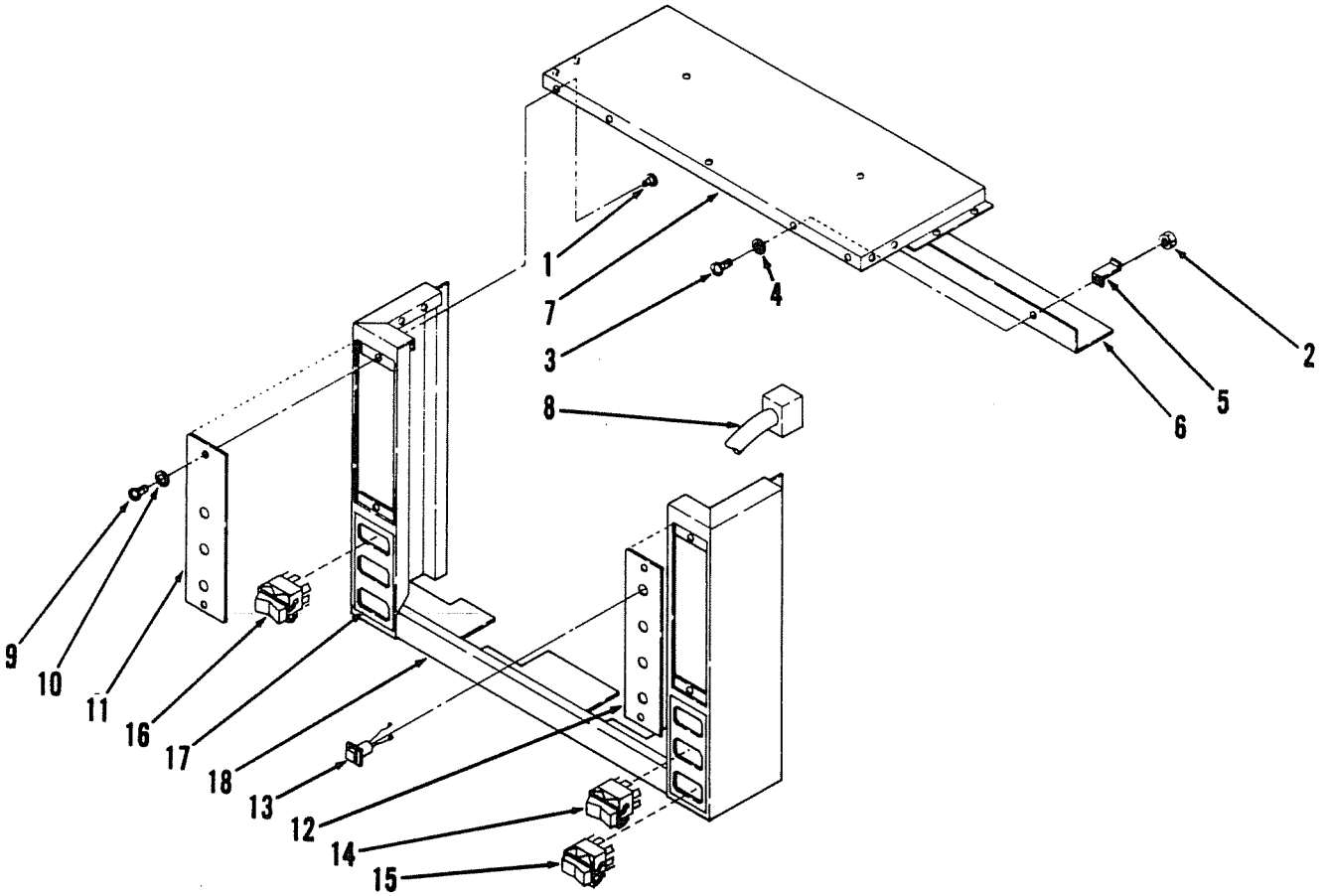



Figure 6-3. Control Panel Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 325123 | Control Panel Ass'y |
| 1 | *187254 | Sheet Metal Screw, Phil Truss Hd, Type A, No. 6 by 3/8-in. |
| 2 | *150904 | Hex Nut, No. 10-24 |
| 3 | *186770 | Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in. |
| 4 | 325070 | Washer |
| 5 | 320959 | Clip, Wire |
| 6 | 325073 | Insulator |
| 7 | 322650-033 | Panel, Top |
| 8 | 325114 | Wiring Harness, Right-Side (shown) |
| | 325113 | Wiring Harness, Left-Side |
| 9 | *188074 | Sheet Metal Screw, Sl Truss Hd, Type A, No. 4 by 1/2-in. |
| 10 | 200717-005 | Lock Washer, Ext Tooth, No. 4 |
| 11 | 324065-059 | Panel, Warning Lights, Left-Side |
| 12 | 324066-059 | Panel, Warning Lights, Right-Side |
| 13 | 322480 | Lamp |
| 14 | 320708 | Switch, Rocker-Type, SYRUP |
| 15 | 322632 | Switch, Rocker-Type, DEFROST |
| 16 | 320530 | Switch, Rocker-Type, POWER |
| 17 | 322633 | Decal, Power, Syrup, and Defrost Switches |
| 18 | 322634 | Housing, Control Panel |

*Zinc-plated steel.

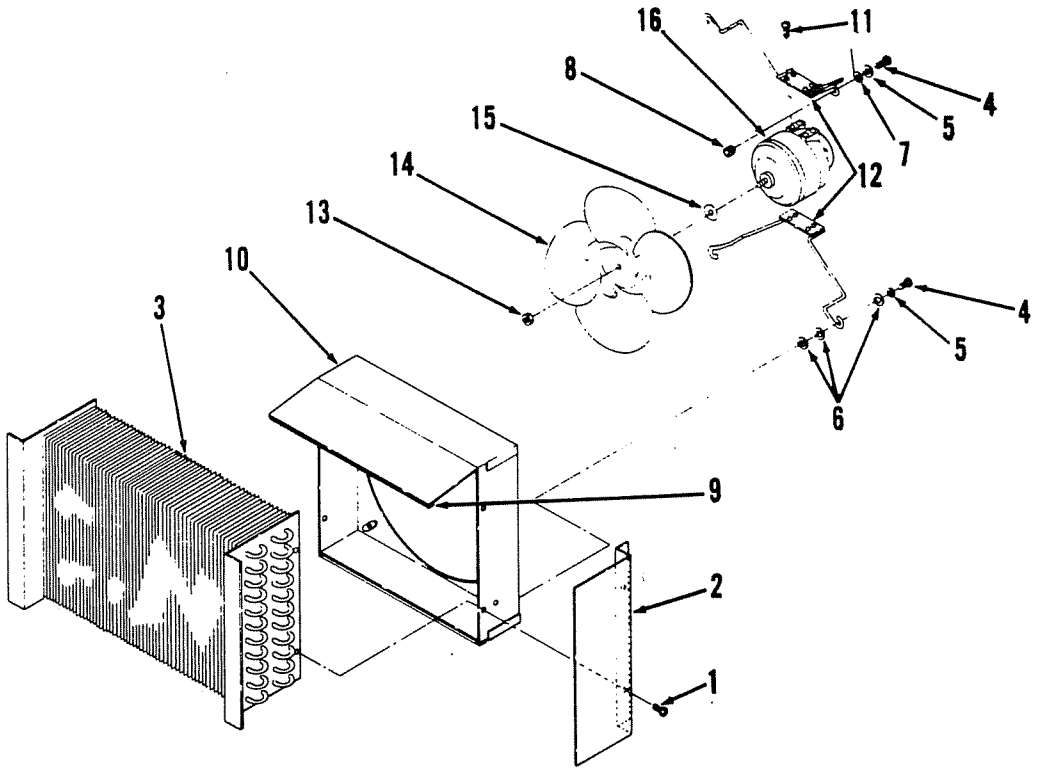



Figure 6-4. Condenser Fan and Shroud Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 320643 | Condenser, Fan, and Shroud Ass'y 3/4 H. P. Pre-Cool |
| | 320628 | Condenser, Fan, and Shroud Ass'y, 1-1/2 H. P. Pre-Cool, No. 1 Compressor, Lower Shroud |
| | 322625 | Condenser, Fan, and Shroud Ass'y, 1-1/2 H. P. Pre-Cool, No. 2 Compressor, Upper Shroud |
| 1 | *187254 | Sheet Metal Screw, Phil Truss Hd, Type A, No. 6 by 3/8-in. |
| 2 | 325071 | Shield, Insulation, for 3/4 H. P. Compressor |
| 3 | 322529 | Coil, Condenser, for 3/4 H. P. Compressor |
| | 322321 | Coil, Condenser, for 1-1/2 H. P. Compressor |
| 4 | *186770 | Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in. |
| 5 | *120227 | Lock Washer, Spring, No. 10 |
| 6 | *320539 | Flat Washer, No. 8 |
| 7 | 186202 | Eyelet |
| 8 | 321484 | Grommet |
| 9 | 186220 | Pad |
| 10 | 320639 | Shroud, Condenser, for 3/4 H. P. Compressor |
| | 320625 | Shroud, Condenser, for 1-1/2 H. P. Compressor, Lower Shroud |
| | 322601 | Shroud, Condenser, for 1-1/2 H. P. Compressor, Upper Shroud |
| 11 | *186154 | Machine Screw, Phil Pan Hd, Sems No. 8-36 by 5/16-in. |
| 12 | 320619 | Bracket, Motor |
| 13 | *189429 | Hex Nut, Keps, 1/4-20 |
| 14 | 310429 | Fan, Condenser |
| 15 | 187394 | Silencer |
| 16 | 320651 | Motor, Condenser, Fan (230 VAC, 60 Hz) |

*Zinc-plated steel.

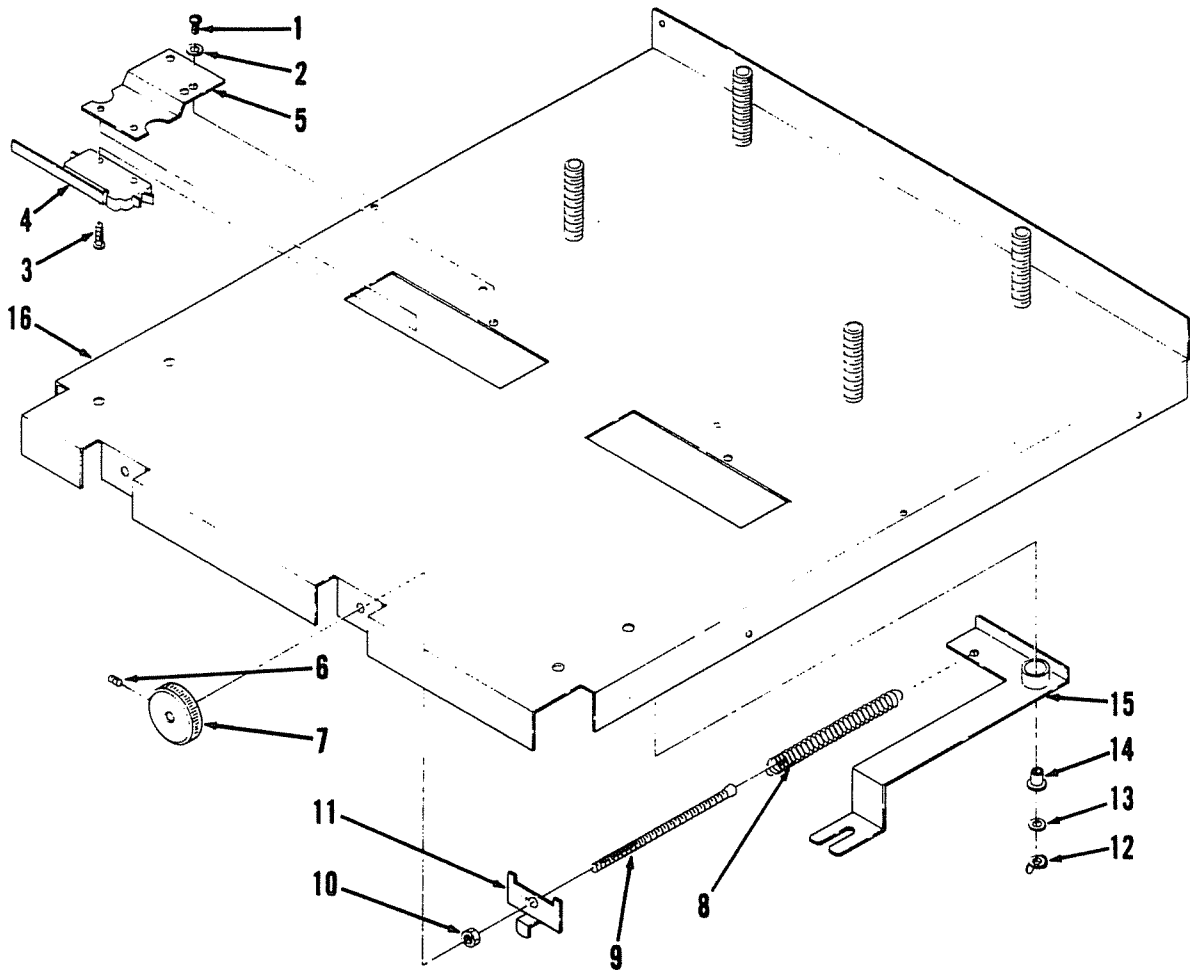



Figure 6-5. Pre-Cool Refrigeration Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 322324 | Pre-Cool Refrigeration Ass'y |
| 1 | *310461 | Thread Rolling Screw, Phil Pan Hd, No. 8-32 by 3/8-in. |
| 2 | *343311 | Lock Washer, Ext Tooth, No. 8 |
| 3 | *320106 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 1-in. |
| 4 | 340739 | Switch, Viscosity Control |
| 5 | 322216 | Bracket, Switch |
| 6 | 187875 | Set Screw, Headless Hex Soc, Stainless Steel, Cup Pt, No. 6-32 by 1/8-in. |
| 7 | 321011 | Thumb Wheel, Viscosity Control |
| 8 | 320610 | Spring, Tension |
| 9 | *321478 | Threaded Rod, No. 10-24 by 3-1/2-in. long |
| 10 | *150904 | Hex Nut, No. 10-24 |
| 11 | 321010 | Plate, Torque Sensor |
| 12 | 311777 | Clip, Reuseable |
| 13 | 343387 | Flat Washer, Brass, .250 I.D. |
| 14 | 320949 | Bearing, Flange |
| 15 | 320554 | Torque Arm |
| 16 | 322323 | Base |

*Zinc-plated steel.

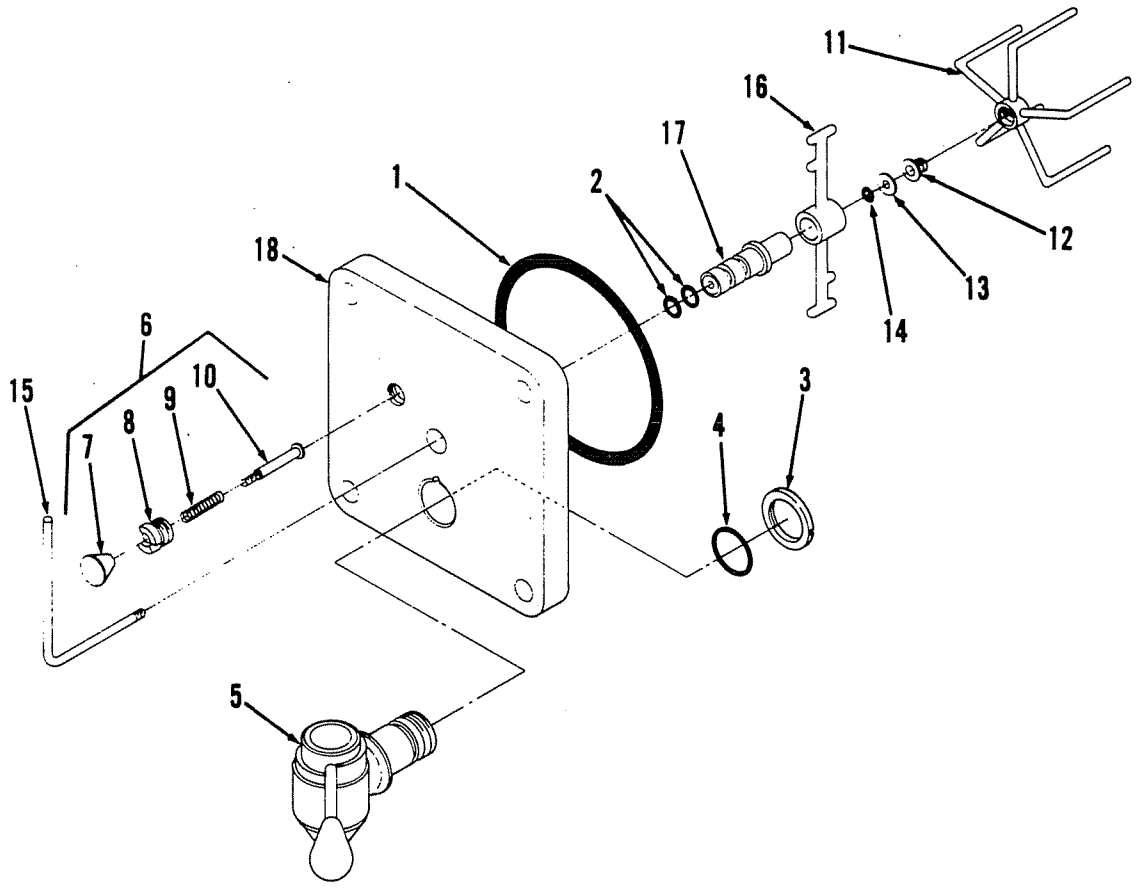



Figure 6-6. Freeze Cylinder Faceplate Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 324091 | Faceplate Ass'y |
| 1 | 320678 | O-Ring |
| 2 | 172265 | O-Ring |
| 3 | 321652 | Nut, Shank |
| 4 | 311086 | O-Ring |
| 5 | 321671-088 | Dispensing Valve Ass'y, (Plastic) Motorman (see Figure 6-7) |
| 6 | 324089 | Relief Valve Ass'y (includes 7-10) |
| 7 | 391245 | Knob |
| 8 | 187629 | Bushing, Retainer |
| 9 | 320614 | Spring |
| 10 | 322275 | Stem Ass'y |
| 11 | 322441 | Sensor, Viscosity |
| 12 | 322442 | Reducer |
| 13 | 321545 | Washer, Teflon |
| 14 | 321544 | O-Ring |
| 15 | 321542 | Arm, Viscosity Sensor |
| 16 | 321269 | Spinner |
| 17 | 322069 | Bushing |
| 18 | 324090 | Faceplate |

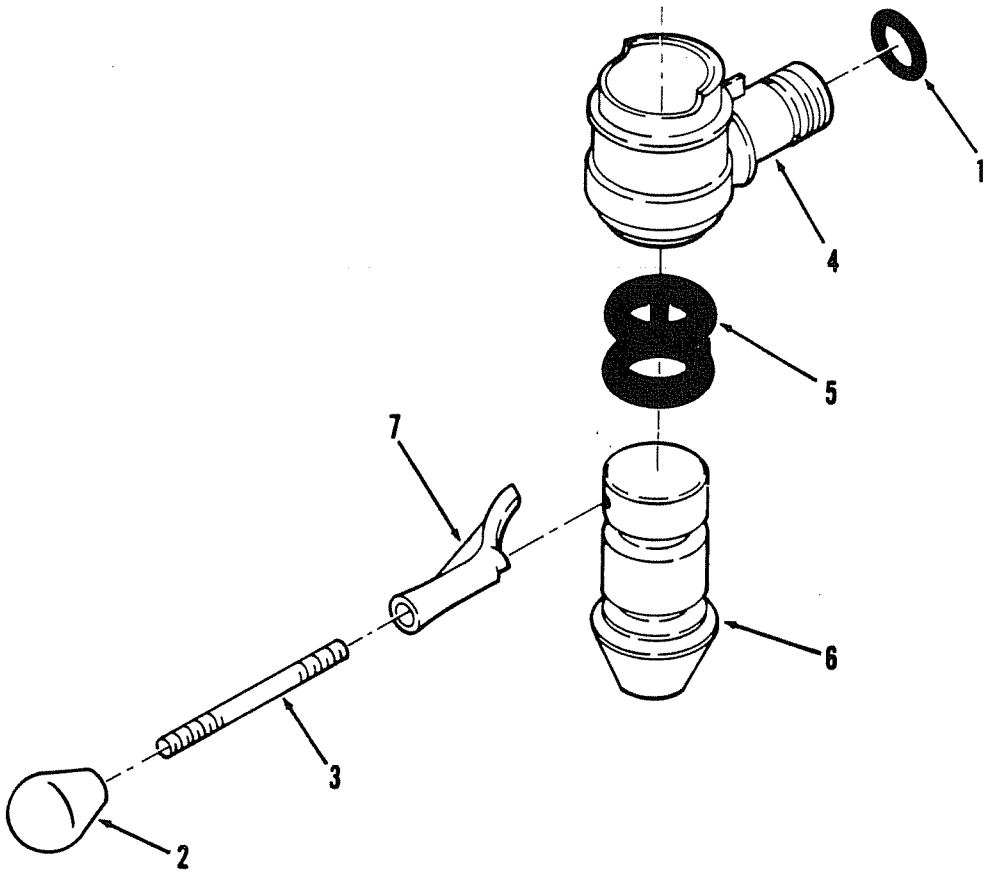



Figure 6-7. Dispensing Valve Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 321671-088 | Dispensing Valve Ass'y |
| 1 | 321653 | O-Ring |
| 2 | 321540 | Knob |
| 3 | 321651 | Lever, Valve |
| 4 | 321646 | Valve Body and Shank |
| 5 | 321514 | O-Ring, Caged |
| 6 | 322828 | Valve |
| 7 | 321534 | Sleeve, Lever Stop |

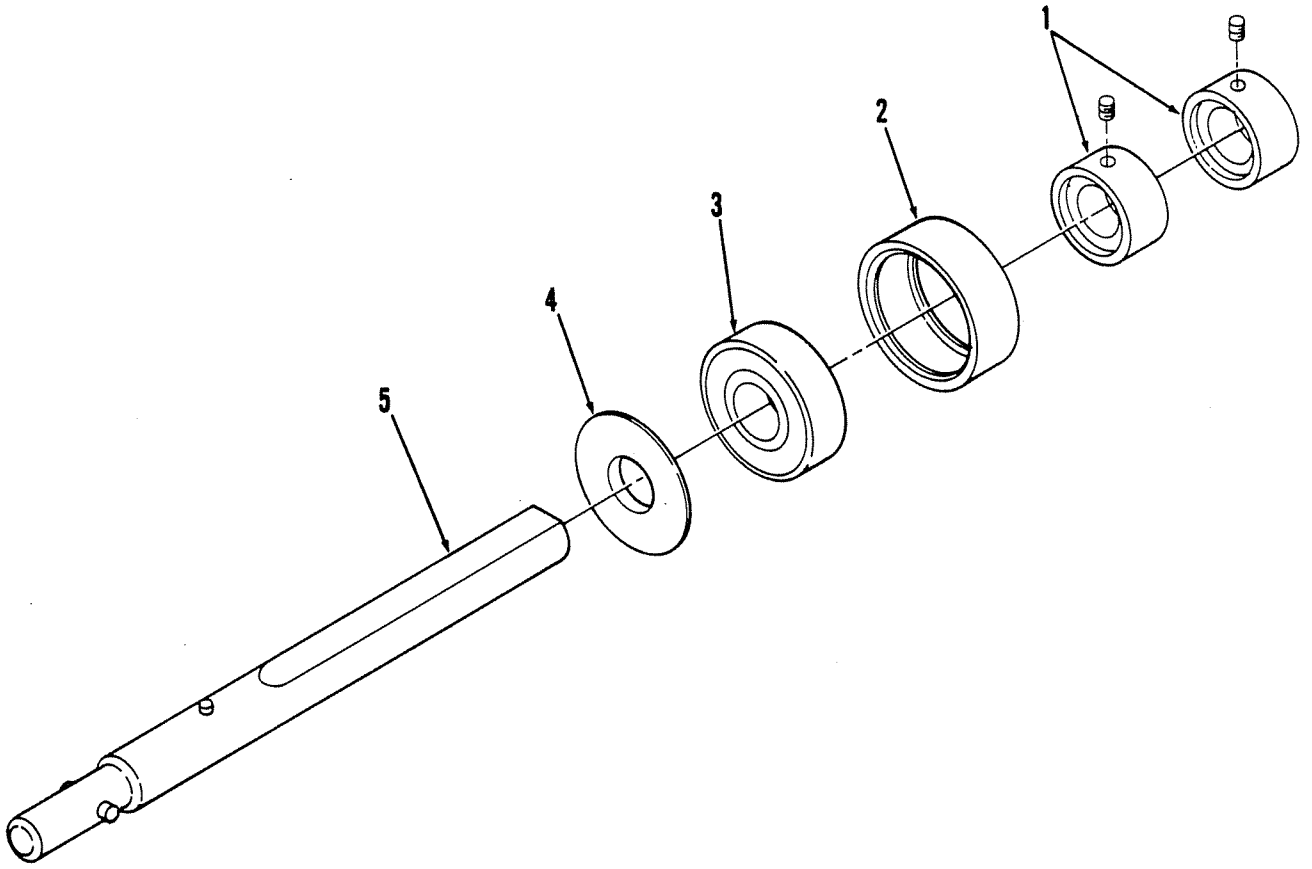



Figure 6-8. Beater Drive Shaft Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 320723 | Beater Drive Shaft Ass'y |
| 1 | 321836 | Collar |
| 2 | 325291 | Boot, Rubber |
| 3 | 320557 | Bearing |
| 4 | 320812 | Slinger |
| 5 | 322953 | Shaft Ass'y |

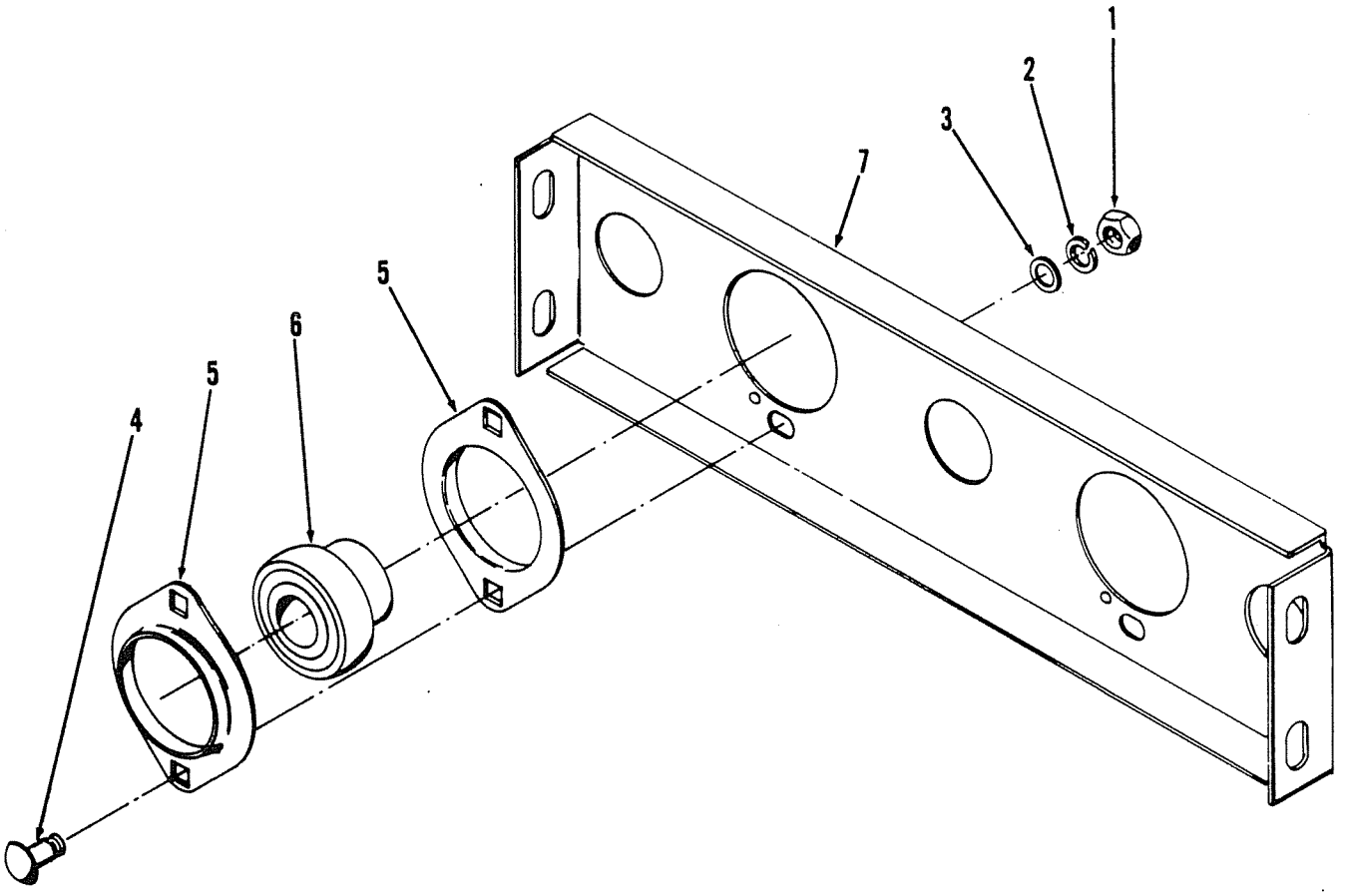



Figure 6-9. Bearings and Support Bracket Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 320736-088 | Bearings and Support Bracket Ass'y |
| 1 | 186146 | Hex Nut, Stainless Steel, 5/16-18 |
| 2 | *186148 | Lock Washer, Spring, 5/16 |
| 3 | *320737 | Flat Washer, 5/16 |
| 4 | 320622 | Carriage Bolt, 5/16-18 by 3/4-in. |
| 5 | 320558 | Flange, Bearing |
| 6 | 320557 | Bearing |
| 7 | 320578 | Bracket, Bearing Support |

*Zinc-plated steel.

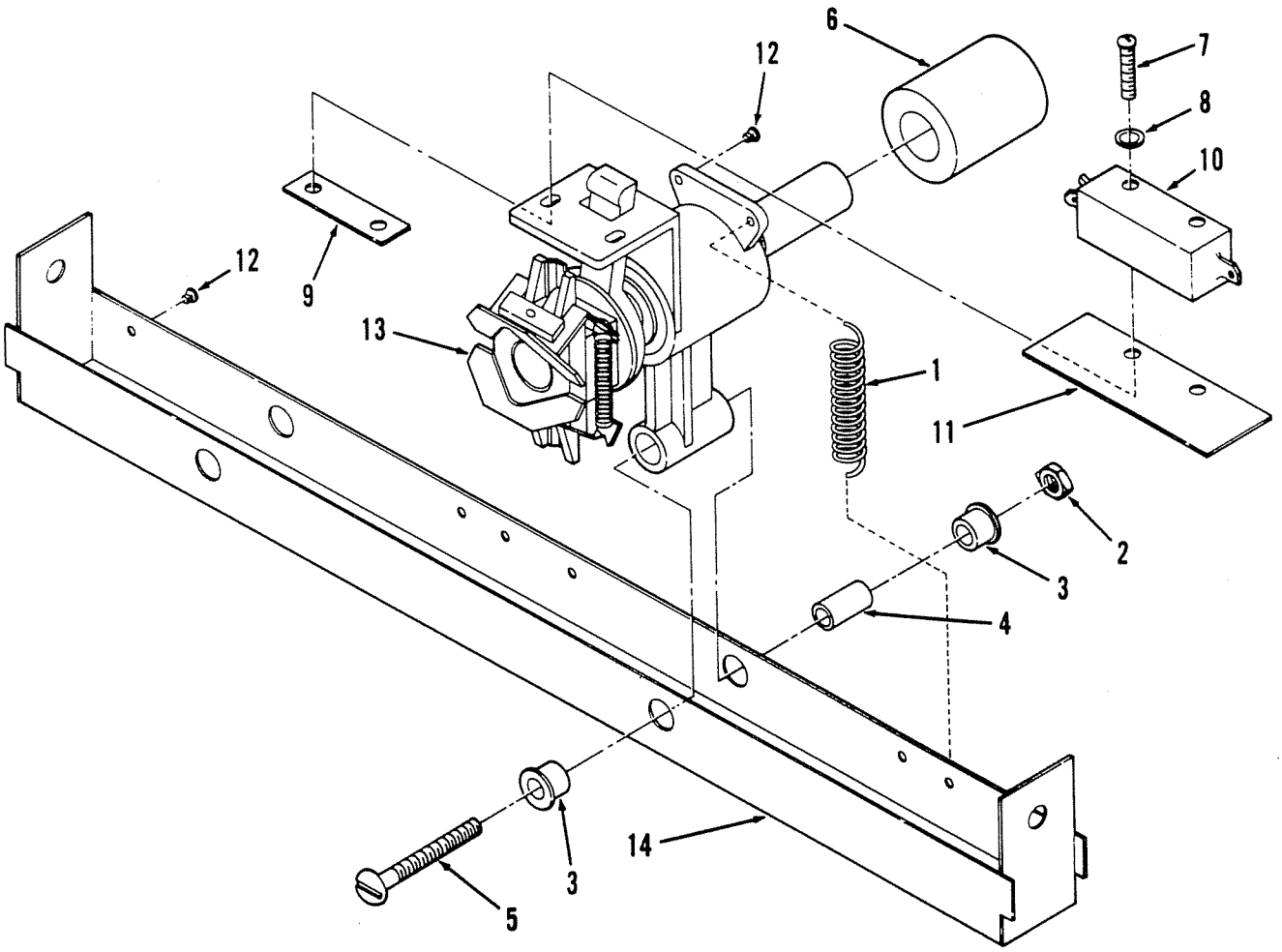



Figure 6-10. Idler and Channel Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 325279 | Idler and Channel Ass'y |
| 1 | 322663 | Spring, Extension |
| 2 | *189429 | Hex Nut, Keps, 1/4-20 |
| 3 | 325293 | Bearing, Flange |
| 4 | 325294 | Spacer |
| 5 | *325292 | Machine Screw, Sl Rd Hd, No. 1/4-20 by 1-3/4 in. |
| 6 | 325029-003 | Pulley, Idler (includes Setscrew) |
| 7 | *199732 | Machine Screw, Sl Rd Hd, No. 6-32 by 1-in. |
| 8 | *188490 | Lock Washer, No. 6 |
| 9 | 311802 | Speed Nut, Twin, (for 6-32 Screw) |
| 10 | 320777 | Switch, Centrifugal, SPDT |
| 11 | 320719 | Insulation, Switch |
| 12 | *320271 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in. |
| 13 | 325278-003 | Bearing Bracket and Activator Ass'y |
| 14 | 323365-005 | Channel, Idler |

*Zinc-plated steel.

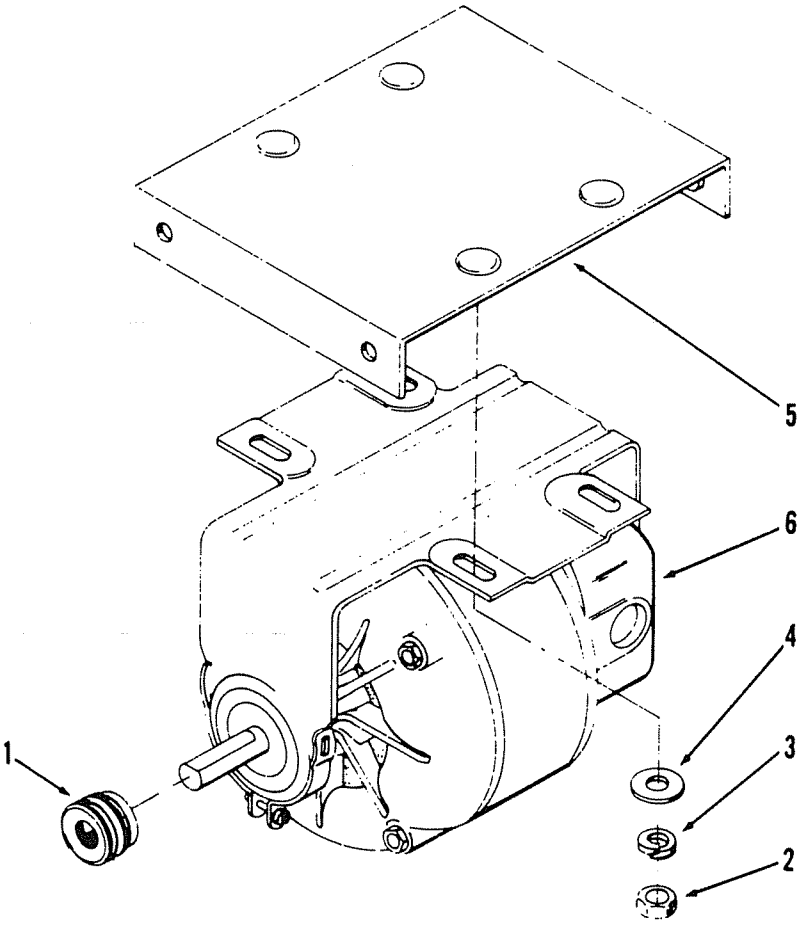



Figure 6-11. Beater Drive Motor and Mounting Plate Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 325143 | Beater Drive Motor and Mounting Plate Ass'y |
| 1 | 325028 | Pulley, Motor (includes set-screw) |
| 2 | 186146 | Hex Nut, Stainless Steel, 5/16-18 |
| 3 | 343313 | Lock Washer, Ext Tooth, 5/16-in. |
| 4 | *186147 | Flat Washer, 5/16-in. |
| 5 | 321344 | Plate, Motor Mounting |
| 6 | 322821 | Motor, Beater Drive, 1/8 HP (230 VAC, 60 Hz) |

*Zinc-plated steel.

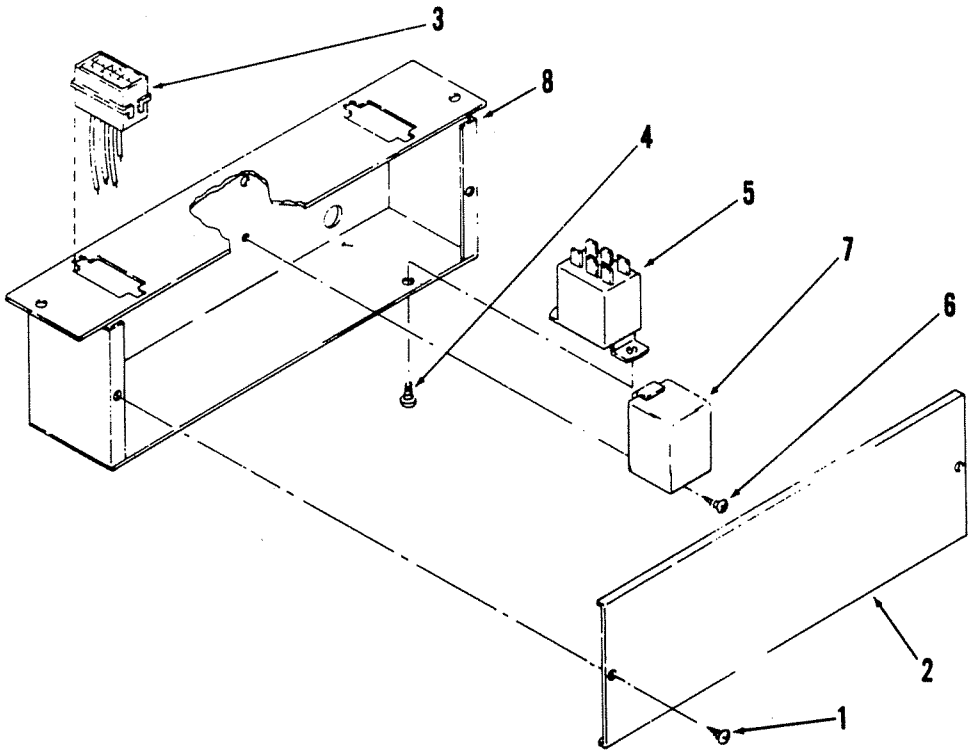



Figure 6-12. Hot Gas Control Box Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 322680 | Hot Gas Control Box Ass'y |
| 1 | *320289 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 1/4-in. |
| 2 | 322652 | Cover, Control Box |
| 3 | 322671 | Wiring Harness |
| 4 | 187188 | Machine Screw, Phil Rd Hd, Sems, No. 8-32 by 1/4-in. |
| 5 | 320710 | Thermostat, Safety |
| 6 | *320289 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 1/4-in. |
| 7 | 322678 | Relay |
| 8 | 322648 | Control Box |

*Zinc-plated steel.

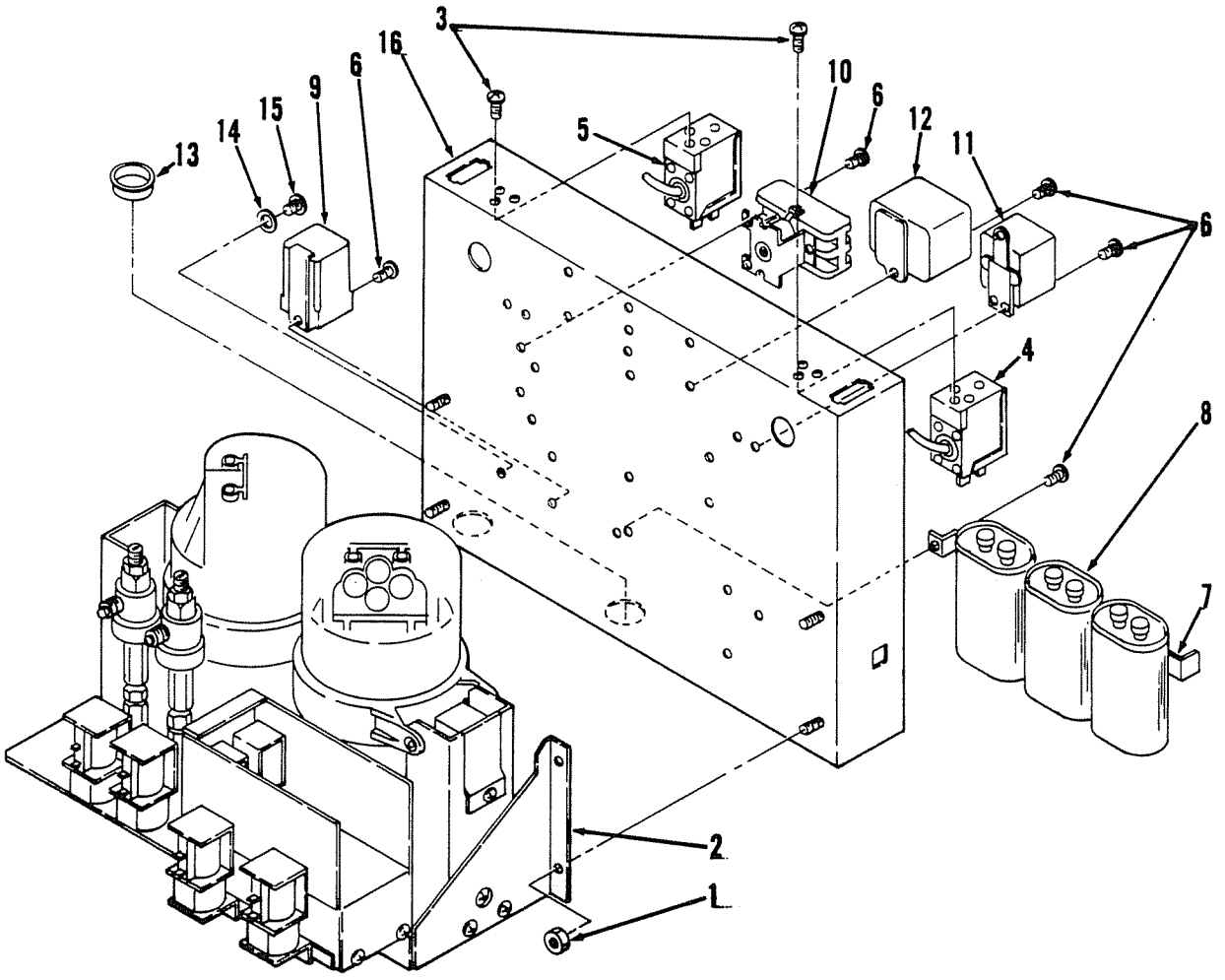



Figure 6-13. Carbonator-Blenders and Control Box Ass'y

| Index No. | Part No. | Name |
|---|---|---|
| | 325124 | Carbonator-Blenders and Control Box Ass'y |
| 1 | 321497 | Flanged Nut, No. 10-24 |
| 2 | 325125 | Carbonator-Blenders Flat Form Ass'y (see Figure 6-14) |
| 3 | *320734 | Machine Screw, Phil Pan Hd, Sems, No. 6-32 by 3/8-in. |
| 4 | 320669 | Cut Out Switch, Low Pressure Water |
| 5 | 320670 | Cut Out Switch, Low Pressure $CO_2$ |
| 6 | *320271 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in. |
| 7 | 322012 | Strap, Capacitor |
| 8 | 320677 | Capacitor, Run |
| 9 | 320623 | Relay Pump |
| 10 | 320620 | Contactor (Relay) |
| 11 | 324092-001 | Relay, Time Delay |
| 12 | 320648 | Relay, Start (230 VAC, 60 Hz) |
| 13 | 325192 | Snap Bushing |
| 14 | *325145 | Washer, Int Tooth, No. 10 |
| 15 | *325069 | Machine Screw, Sl Hex Hd, No. 10-24 by 1/2-in. |
| 16 | 325197 | Control Box |

*Zinc-plated steel.

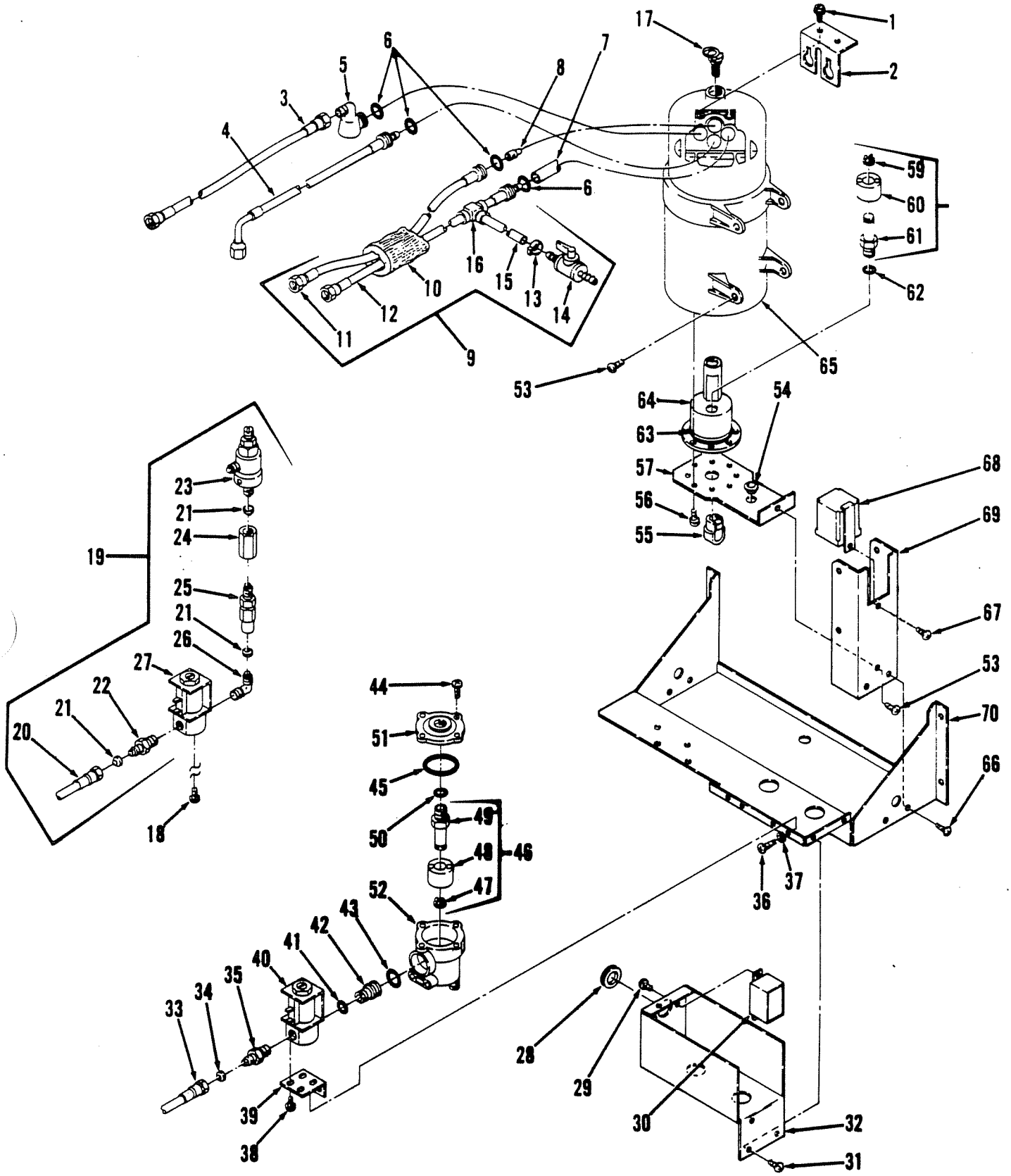



Figure 6-14. Carbonator-Blenders Platform Assembly

Figure 6-14. Carbonator-Blenders Platform Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 325125 | Carbonator-Blenders Platform Ass'y |
| 1 | *311751 | Machine Screw, Sl Hex Washer Hd, No. 4-40 by 1/4-in. |
| 2 | 311743 | Nipple Retainer |
| 3 | 312519 | Tube Ass'y, $CO_2$, No. 1 Side, 17-in. long |
| | 321748 | Tube Ass'y, $CO_2$, No. 2 Side, 33-in. long |
| 4 | 325138 | Tube Ass'y, Syrup, No. 1 Side, 21-in. long |
| | 325139 | Tube Ass'y, Syrup, No. 2 Side, 33-in. long |
| 5 | 325077 | Check Valve Ass'y, Plastic (see Figure 6-15) |
| 6 | 183008 | O-Ring |
| 7 | 322743 | Syphon Tube (2 hole) |
| 8 | 310380 | Stop Guide, Red |
| 9 | 325132 | Water and Product Line Ass'y, No. 1 Side (includes 10-16) |
| | 325133 | Water and Product Line Ass'y, No. 2 Side (includes 10-16) |
| 10 | **940068 | Rubatex Insulation, 5/8-in. I.D. by 26-in. long |
| 11 | 325137 | Tube Ass'y, Water, No. 1 Side |
| | 325135 | Tube Ass'y, Water, No. 2 Side |
| 12 | 325136 | Tube Ass'y, Product, No. 1 Side (includes 13-16) |
| | 325134 | Tube Ass'y, Product, No. 2 Side (includes 13-16) |
| 13 | 311908 | Tube Clamp (crimp; for 7/16 O.D. tube) |
| 14 | 325012 | Product Sample Valve |
| 15 | **174103 | Tube, No. 1 Side, 1/4-in. I.D. by 33-in. long |
| | **174103 | Tube, No. 2 Side, 1/4-in. I.D. by 42-in. long |
| 16 | 311791 | Tee, Barbed, 1/4-in. |
| 17 | 187627-888 | Relief Valve (75-psi) |
| 18 | *320770 | Machine Screw, Phil Pan Hd, Sems, No. 8-32 by 3/8-in. |
| 19 | 325128 | Solenoid Valve and Water Flow Regulator Ass'y (includes 20-27) |
| 20 | 344142 | Tube Ass'y, Water, 10-in. long |
| 22 | 176107-001 | Adapter, 1/4 NPTF male by 7/16-20 male |
| 23 | 312002 | Flow Regulator Ass'y, Water (see Figure 6-16) |
| 24 | 325019 | Connector, 1/4 by 1/4 female flare |
| 25 | 311764-001 | Check Valve Ass'y, Stainless Steel (see Figure 6-17) |
| 26 | 187485-001 | Elbow, 1/4 NPTF male by 7/16-20 male |
| 27 | 320667 | Solenoid Valve, Water |
| 28 | 331304 | Snap Bushing |
| 29 | 310461 | Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in. |
| 30 | 315930 | Relay, Sold-Out |
| 31 | *320271 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in. |
| 32 | 325129 | Relay Box, Syrup Sold-Out |
| 33 | 312519 | Tube Ass'y, Syrup, 17-in. long |
| 34 | 178025-100 | Tapered Gasket, White |
| 35 | 176107-001 | Adapter, 1/4 NPTF male by 7/16-20 male |
| 36 | *343487 | Machine Screw, Phil Pan Hd, No. 8-32 by 1/2-in. |

*Zinc-plated steel.
**Sold in bulk quantity only.

| Index No. | Part No. | Name |
|---|---|---|
| 37 | *343845 | Flat Washer, No. 8 |
| 38 | 320734 | Machine Screw, Phil Truss Hd, Sems, No. 6-32 by 1/4-in. |
| 39 | 315927 | Bracket, Solenoid |
| 40 | 320663 | Solenoid Valve, Syrup |
| 41 | 150058 | O-Ring |
| 42 | 315929 | Fitting, Solenoid Adapter |
| 43 | 183008 | O-Ring |
| 44 | *343487 | Machine Screw, Phil Pan Hd, No. 8-32 by 1/2-in. |
| 45 | 315925 | O-Ring |
| 46 | 325170 | Float Switch Ass'y (includes 47-49) |
| 47 | 325149 | Retaining Clip |
| 48 | 325148 | Float |
| 49 | 325147 | Stem and Swt |
| 50 | 315931 | O-Ring |
| 51 | 315916 | Cover, Float Switch |
| 52 | 315915 | Body, Float Switch |
| 53 | *312251 | Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in. |
| 54 | 331303 | Snap Bushing |
| 55 | 186570 | Strain Relief |
| 56 | *343487 | Machine Screw, Phil Pan Hd, No. 8-32 by 1/2-in. |
| 57 | 325131 | Support, Switch Holder |
| 58 | 325288 | Float Switch Ass'y (includes 59-61) |
| 59 | 325149 | Retaining Clip |
| 60 | 325148 | Float |
| 61 | 325147 | Stem and Swt |
| 62 | 315931 | O-Ring |
| 63 | 315925 | O-Ring |
| 64 | 325001 | Holder, Float Switch |
| 65 | 324099-888 | Carbonator Tank, No. 1 Side |
| | 324098-888 | Carbonator Tank, No. 2 Side |
| 66 | *320767 | Machine Screw, Phil Pan Hd, Sems, No. 10-24 by 3/8-in. |
| 67 | *312251 | Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in. |
| 68 | 322678 | Relay |
| 69 | 325127 | Support, Carbonator Tank |
| 70 | 325126 | Platform |

*Zinc-plated steel.

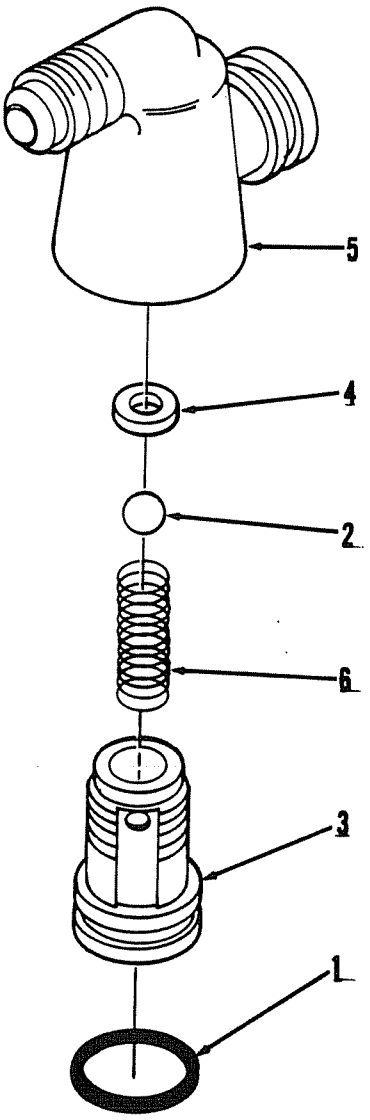



Figure 6-15. Check Valve Assembly, Plastic

| Index No. | Part No. | Name |
|---|---|---|
| | 325077 | Check Valve Ass'y, Plastic |
| 1 | 183008 | O-Ring |
| 2 | 311662 | Ball |
| 3 | 311740 | Retainer, Ball |
| 4 | *311197 | Flat Washer |
| 5 | 311739 | Body |
| 6 | 312196 | Spring |

*Zinc-plated steel.

CAUTION
ITEMS 6 AND 7 ARE
A MATCHED SET
DO NOT REPLACE SEPARATELY

FOR SYRUP FLOW REGULATOR
USE SLEEVE AND PISTON ASS'Y
P/N 315553-000
FOR
WATER FLOW REGULATOR
USE SLEEVE AND PISTON ASS'Y
P/N 313437-000

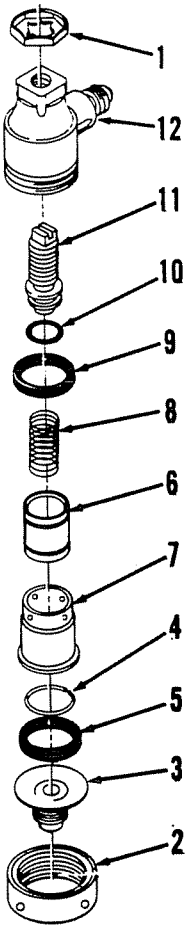



Figure 6-16. Flow Regulator Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 310198-133 | Flow Regulator Ass'y, Syrup |
| | 312002 | Flow Regulator Ass'y, Water |
| 1 | 310477 | Lock Nut, 7/16 |
| 2 | 310488 | Coupling Nut |
| 3 | 310483 | Fitting, Inlet |
| 4 | 311509 | Ring, Expansion |
| 5 | 311236 | Quad Ring |
| 6 | 310755 | Sleeve |
| 7 | 310480 | Piston (used on Syrup Flow Regulator) |
| | 310754 | Piston (used on Water Flow Regulator) |
| 8 | 310482 | Spring |
| 9 | 313657 | Quad Ring, .612 I.D. by .103 C.S. |
| 10 | 180025 | O-Ring |
| 11 | 310632 | Adjusting Screw |
| 12 | 310484-833 | Body, Syrup Regulator |
| | 310484-839 | Body, Water Regulator |

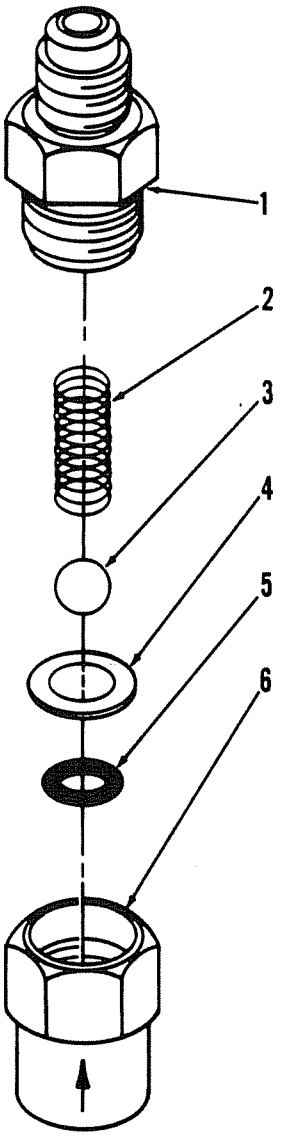



Figure 6-17. Single Check Valve Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 311764-001 | Single Check Valve Ass'y |
| 1 | 317965 | Retainer |
| 2 | 312196 | Spring |
| 3 | 312419 | Ball |
| 4 | 312415 | Washer, .300 I. D. |
| 5 | 312418 | Quad Ring |
| 6 | 317963 | Body |

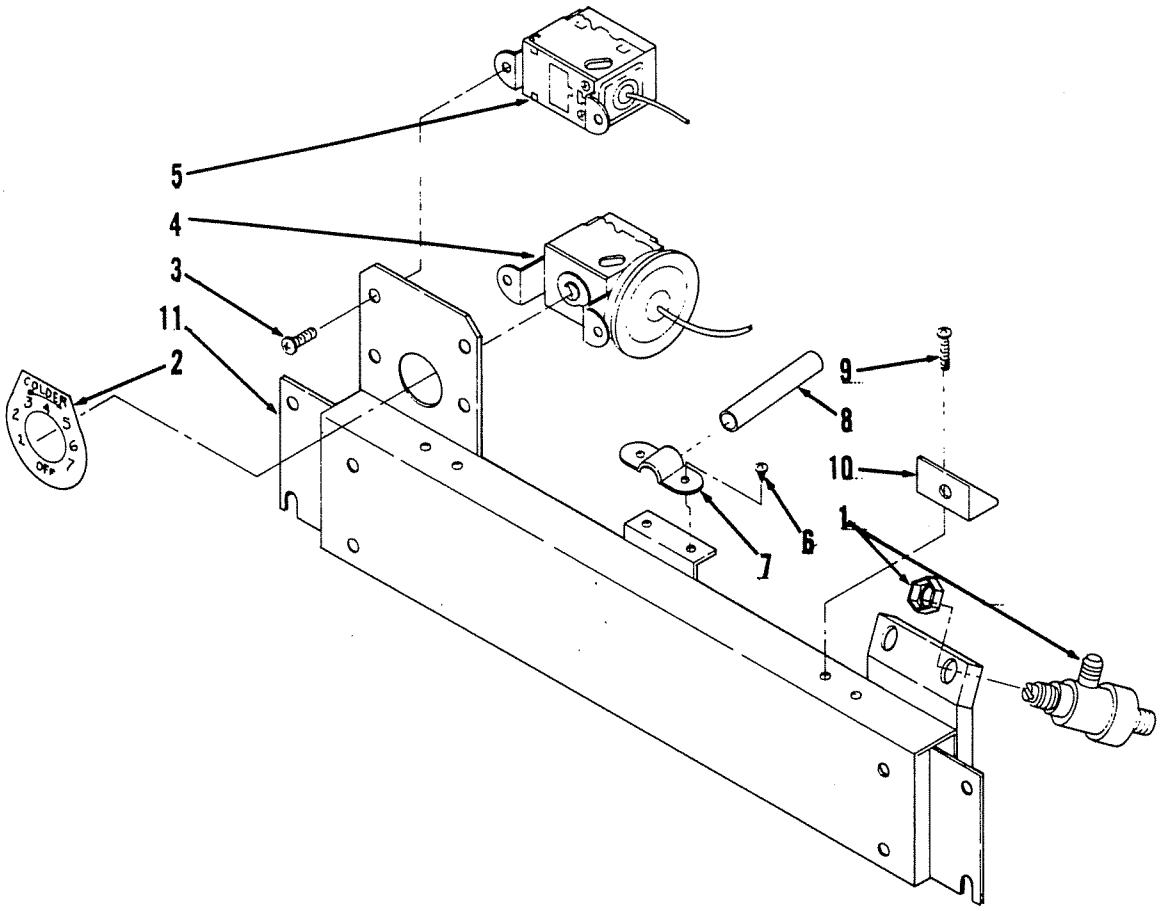



Figure 6-18. Drip Tray Panel Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 322277 | Drip Tray Panel Ass'y |
| 1 | 310198-133 | Flow Regulator Ass'y, Syrup (see Figure 6-16) |
| 2 | 189267 | Decal, Thermostat Indicator |
| 3 | 187188 | Machine Screw, Phil Rd Hd, Sems, No. 8-32 by 1/4-in. |
| 4 | 320709 | Thermostat, Precool, Control |
| 5 | 320710 | Thermostat, Precool, Safety |
| 6 | *320289 | Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 1/4-in. |
| 7 | 320776 | Strap, Tube |
| 8 | 320754 | Drain Tube (brass) |
| 9 | *320293 | Thread Rolling Screw, Phil Pan Hd, No. 4-40 by 3/8-in. |
| 10 | 320772 | Strike, Door |
| 11 | 322274-059 | Panel, Drip Tray |

*Zinc-plated steel.

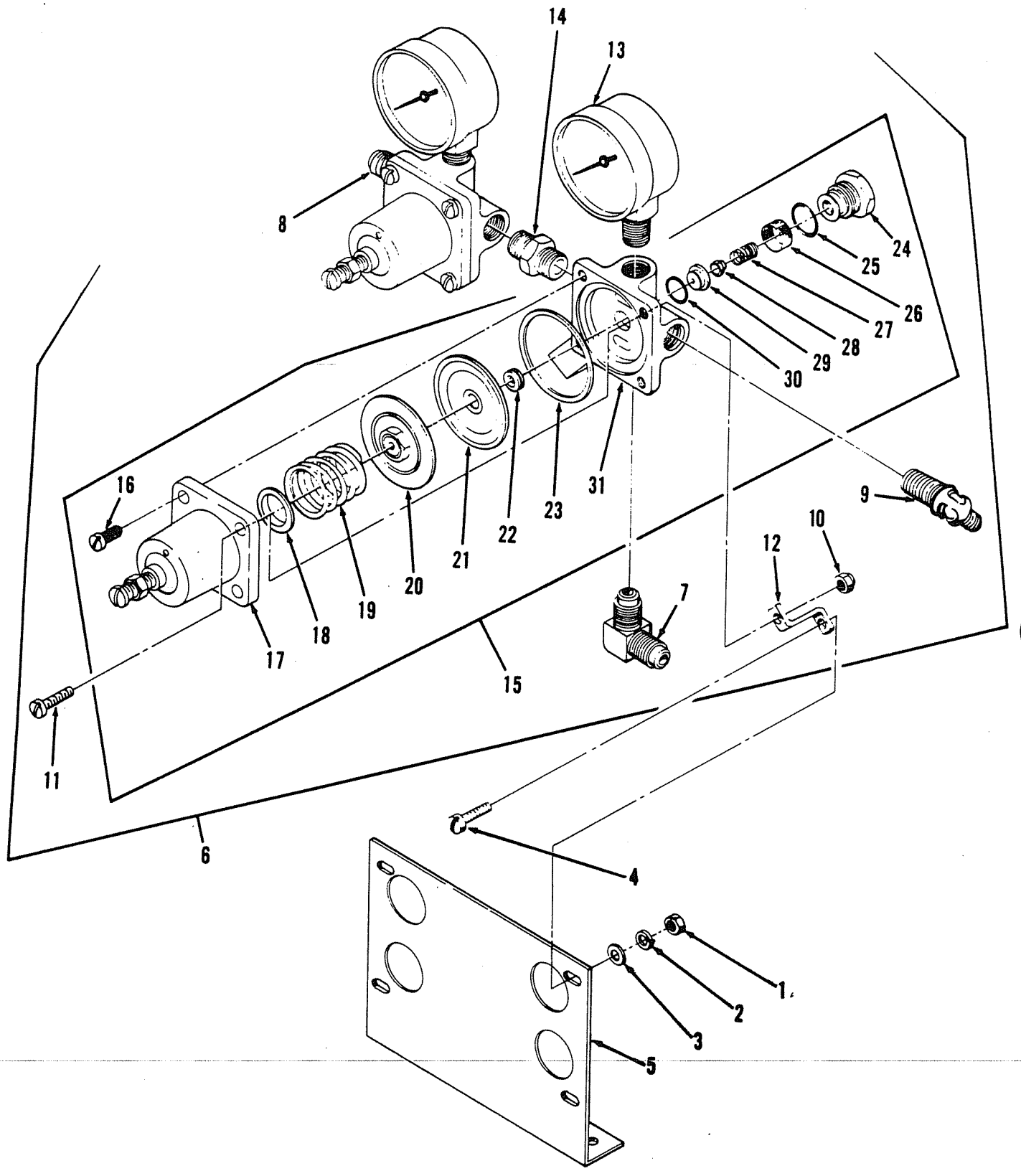



Figure 6-19. Secondary $CO_2$ Regulators and Bracket Assembly

Figure 6-19. Secondary $CO_2$ Regulators and Bracket Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 325141 | Secondary $CO_2$ Regulators and Bracket Ass'y |
| 1 | *150904 | Hex Nut, No. 10-24 |
| 2 | *120227 | Lock Washer, Spring, No. 10 |
| 3 | *186207 | Flat Washer, No. 10 |
| 4 | *186770 | Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in. |
| 5 | 322620 | Bracket, Pressure Regulator |
| 6 | 183456 | Pressure Regulators and Gages Ass'y (includes 7-15) |
| 7 | 187485-001 | Elbow, Male, 1/4 NPT by 7/16-20 |
| 8 | 183061-001 | Connector, Male, 1/4 NPT by 7/16-20 |
| 9 | 187556 | Elbow, Male, 1/4 NPTF by 7/16-20 |
| 10 | 183044 | Hex Nut, No. 10-32 |
| 11 | 183040 | Machine Screw, Phil Fil Hd, No. 10-32 by 7/8-in. |
| 12 | 322388 | Foot, Mounting |
| 13 | 130101 | Gage, Pressure, 60-pound |
| 14 | 183047-001 | Manifold Nipple, Hex, 1/4 NPT |
| 15 | 183460 | Pressure Regulator Ass'y (includes 16-31) |
| 16 | *120081 | Machine Screw, Phil Fil Hd, No. 10-32 by 1/2-in. |
| 17 | 183233 | Cover Kit (includes Non-Removeable Adjusting Screw) |
| 18 | 183021 | Spring Retainer |
| 19 | 130166 | Adjusting Spring, Black, 60-psi |
| 20 | 130174 | Diaphragm Ass'y |
| 21 | 183011 | Baffle |
| 22 | 130167 | Guide, Grey |
| 23 | 183010 | Gasket, Baffle |
| 24 | 183009 | Seat Retainer |
| 25 | 183008 | O-Ring |
| 26 | 183007 | Filter Screen |
| 27 | 183006 | Spring, Poppet |
| 28 | 130170 | Valve Poppet |
| 29 | 130168 | Reducing Valve Seat |
| 30 | 183003 | Gasket, Seat |
| 31 | 183001-006 | Regulator Body |
| | 183099 | Secondary Regulator Repair Kit (includes 20, 22, 23, 25, and 28) |

*Zinc-plated steel.

*Zinc-plated steel.

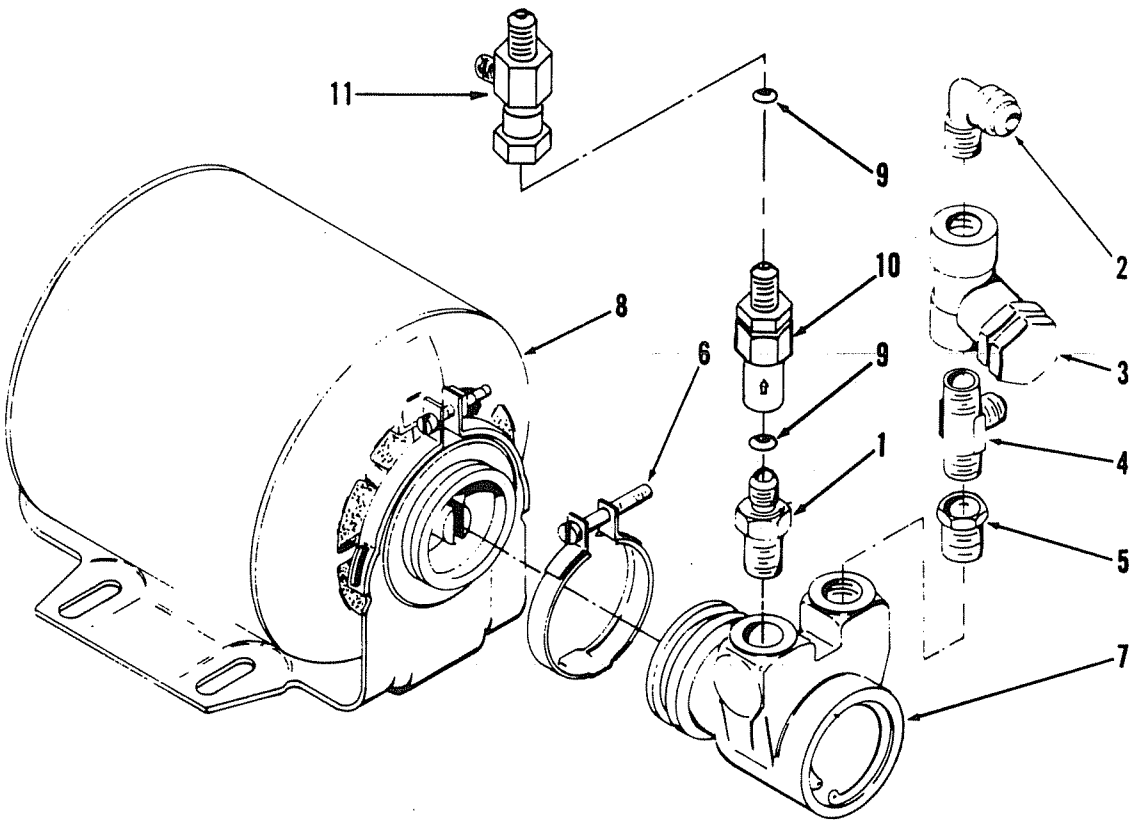



Figure 6-20. Water Pump and Motor Assembly

| Index No. | Part No. | Name |
|---|---|---|
| | 322624-088 | Water Pump and Motor Ass'y |
| 1 | 311437 | Adapter, 3/8 NPT male by 7/16-20 male |
| 2 | 311738 | Male Elbow, 1/4 NPT by 5/8-18 |
| 3 | 311035 | Strainer, Water |
| 4 | 310961 | Male Tee, 1/4 NPT run by 7/16-20 leg |
| 5 | 311284 | Bushing, 3/8 NPT male by 1/4 NPT female |
| 6 | 187483 | Coupling |
| 7 | 311400 | Pump, Water (100 gph) |
| 8 | 320626 | Motor, Pump Drive, 1/4 HP (230 VAC, 60 Hz) |
| 10 | 311764 | Single Check Valve (see Figure 6-17) |
| 11 | 176231-100 | Tee, 7/16-20 male by 7/16-20 female swivel run, by 7/16-20 male leg |

# COMMERCIAL WARRANTY

THE CORNELIUS COMPANY ("CORNELIUS") does warrant to the original purchaser from CORNELIUS who buys solely for commercial or industrial uses, or for resale in the ordinary course of business, that each of the Products covered by this Commercial Warranty shall be free from defects in material and/or workmanship, under normal and proper use and service conditions.

Any products covered by this **Commercial Warranty** (including components thereof) demonstrated to have been defective when shipped by CORNELIUS will be either repaired, replaced (with new or rebuilt replacement) or the purchase price therefor refunded, as CORNELIUS may determine solely in its discretion. A product or component thereof covered by this Commercial Warranty supplied as a Warranty Replacement will assume the balance of the Period of Warranty applicable to the original measured from the date of replacement. This Commercial Warranty does **not** include, and CORNELIUS will not assume or pay, the expense of any repair, replacement, analysis or any other services or parts furnished by any party other than CORNELIUS unless specifically authorized in writing by CORNELIUS. This Commercial Warranty does **not** include labor for diagnosis, removal or installation of any products or components.

**Products covered** by this Commercial Warranty include all beverage and food dispensing or vending equipment manufactured or sold by CORNELIUS after the date hereof (not excluded hereinafter) and this Commercial Warranty is further limited to the use of that equipment in connection with soft drinks, soft drink syrups, beer, coffee, hot chocolate, tea or food commodities for which use the particular product has been identified by CORNELIUS.

**Specific exclusions** to this Commercial Warranty are OEM Sales, water filter cartridges, coin mechanisms, light bulbs, fuses, glass, diaphragms, seals, o-rings, silicone or rubber parts, refrigeration access valves or related refrigeration leaks, parts in contact with water or the product dispensed and which become inoperative due to scale or chemical change, normal maintenance items. This Commercial Warranty shall not apply to damage resulting from improper voltage, inadequate wiring, abuse, accident, alteration, misuse, neglect, unauthorized repair, improper cleaning or failure to follow installation, operating or maintenance instructions. Remote water-cooled refrigeration systems must have properly sized and installed remote cooling towers or systems. Failure of refrigeration components (compressor-valves) due to remote condensor system failure, incorrect sizing, operation, or installation are not covered by this Commercial Warranty.

The **Period of Warranty** is (i) one (1) year from the date of installation, or, (ii) fifteen (15) months from the date of shipment by CORNELIUS of a product covered hereby, whichever time period elapses first. For products incorporating a refrigeration system the Period of Warranty, with respect to the refrigeration system only (defined as the compressor, evaporator, condensor, and interconnecting tubing [not to include any access valves]), is five (5) years from the date of installation or sixty-three (63) months from the date of shipment by CORNELIUS, whichever time period elapses first.

Any **claim** under this Commercial Warranty must be made as promptly as is reasonably possible, but in no event later than thirty (30) consecutive calendar days, after the discovery of the defect. Such claims are to be directed to the CORNELIUS SERVICE DEPARTMENT at One Cornelius Place, Anoka, MN 55303-1592 (612) 421-6120.

Under no circumstances should the entire unit be returned to CORNELIUS except for repair or replacement of the sealed refrigeration unit. Whenever a product is returned to CORNELIUS for repair or replacement of the sealed refrigeration system under the terms of the Commercial Warranty and the defect is found to exist in parts other than the sealed refrigeration system (example: ice bank control, agitator motor, condensor fan motor, start capacitor or relay), an evaluation fee of twenty-five dollars ($25.00) may be charged. If such defective part needs replacement or repair and is within its Period of Warranty, such part will be replaced or repaired at no charge, except for labor for removal and installation of such part; if not within its Period of Warranty, a charge for such part and the labor will be made.

The product covered by this Commercial Warranty, or components thereof, must not be returned to CORNELIUS without authorization from the CORNELIUS SERVICE DEPARTMENT. Instructions for return will be given with any such authorization. All returned products and/or parts must be shipped prepaid to CORNELIUS. Return shipping costs of repaired or replacement products or parts will be prepaid by CORNELIUS, except that as to original purchasers in Alaska or Hawaii, CORNELIUS will pay shipping costs only to Seattle or San Francisco respectively. CORNELIUS will not accept collect shipments. Replaced products or parts become the property of CORNELIUS. Any product or parts returned to CORNELIUS under the terms of this Commercial Warranty must be accompanied by a Returned Goods Tag, properly filled out as to unit model number and serial number and detailed explanation of failure.

Except for descriptions of size, quantity and type, which may appear on CORNELIUS' invoices and other written materials, and except for any statements of conformity of CORNELIUS' products with specifications of certain industry, government or professional organizations standards, which may appear as product information disclosures in CORNELIUS' literature and other documents from time to time, THIS COMMERCIAL WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

CORNELIUS' LIABILITIES ARE LIMITED SOLELY AND EXCLUSIVELY TO THE REPLACEMENT OR REPAIR OF THE DEFECTIVE PRODUCT OR REFUND OF THE PURCHASE PRICE OF SAID PRODUCT. CORNELIUS IS NOT LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER, WHETHER ANY CLAIM FOR RECOVERY IS BASED ON THEORIES OF CONTRACT, NEGLIGENCE OR TORT. Without limitation, these liabilities do not include shipping charges, labor, installation or any other losses or expenses incurred in operation or installation of any replaced, repaired or returned product or component. In those jurisdictions where liability for damages cannot be disclaimed, the original purchaser's recovery shall not exceed the cost of the product to which this Commercial Warranty may apply.

CORNELIUS neither assumes, nor authorizes any salesperson, distributor, employee, agent or other person to assume for it, any liability of obligation of any kind which is different from the terms of this Commercial Warranty.

CORNELIUS MAKES NO WRITTEN WARRANTY OF ANY KIND WHATSOEVER TO ANY PURCHASER WHO BUYS FOR PERSONAL, FAMILY OR HOUSEHOLD USE.

For CORNELIUS Warranties on products other than covered hereunder, see the Warranties covering each product category.

CORNELIUS may in its discretion direct an Authorized Service Center reasonably proximate to the Original Purchaser to perform its obligations under this Commercial Warranty. That Service Center may also perform such other services as the purchase may require at purchaser's expense.

Cornelius®

**THE CORNELIUS COMPANY**
ONE CORNELIUS PLACE
ANOKA, MINNESOTA 55303-1592

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