41-6027-000

IMI Cornelius

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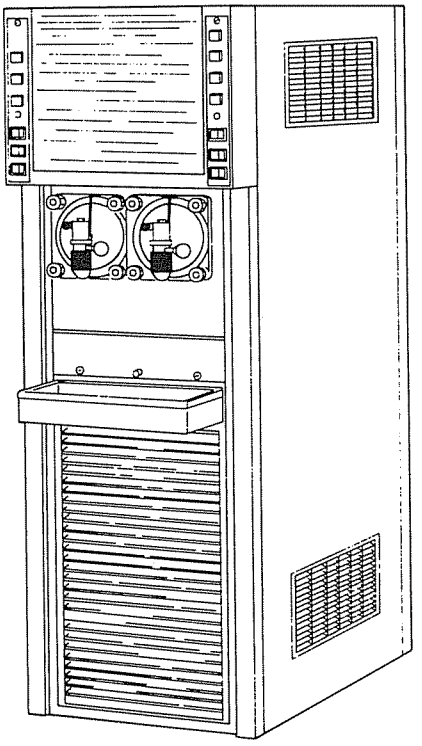
FCB HIGH-CAPACITY POST-MIX DISPENSER

SERVICE MANUAL



Manual Part No. 324100-000
January 11, 1984
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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 user of this manual* - This manual is a guide for installing, operating, and maintaining this equipment. Refer to Table of Contents for page location of information pertaining to questions that arise during installation, operation, service and maintenance, or troubleshooting this equipment.

SECTION I

GENERAL DESCRIPTION

This section gives the description, theory of operation, and design data for the FCB (Frozen Carbonated Beverage) High-Capacity Two-Flavor Post-Mix Dispenser With Automatic Hot Gas Defrost (see Figure 1-1) hereafter referred to as a unit.

UNIT DESCRIPTION

The unit consists basically 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 automatic hot-gas-defrost system controls, tubing, and fittings necessary to regulate, transfer, and dispense 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 self-closing dispensing valve, is mounted on front of each freeze cylinder. A drip tray, with cup rest, is located directly below the dispensing valves. A Step-Up/Step-Down Transformer Kit (P/N 511027-000) is available for locations where electrical power circuit low or high voltage condition exist. A more detailed explanation of the transformer may be found in SECTION II INSTALLATION under CONNECTING ELECTRICAL POWER CIRCUIT TO UNIT.

CAUTION: Before shipping, relocating, or storing 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.

TABLE 1-1. DESIGN DATA

Model Number:	416027
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 (approx.)	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
Belt Tension	20-30 pounds/inch
Ambient Operating Temperature	40°F to 100°F
Electrical Requirements:	
Operating Voltage:	
50Hz Operation	200VAC, 50Hz
60Hz Operation	230VAC, 60Hz
Current Draw	35.4 Amps

THEORY OF OPERATION (see Figure 1-2)

A carbon dioxide gas (CO_2) cylinder delivers gas 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 pre-cool plate. 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 product. 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 self-closing dispensing valve and a spring-loaded relief valve that protects freeze cylinder from accidental overpressure. 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.

The unit has an automatic freeze cylinders defrost capability that is factory adjusted to defrost approximately every eight hours but may be readjusted to defrost from approximately every one to ten hours. A manual defrost mode is also available by depressing DEFROST switches on front of unit at any time.

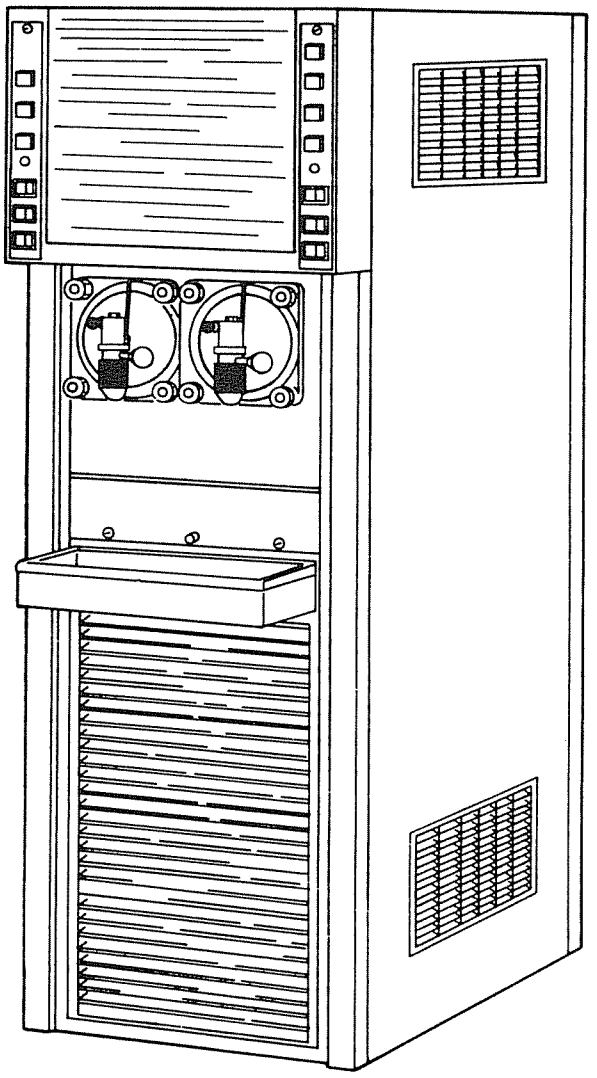


FIGURE 1-1. FCB HIGH-CAPACITY POST-MIX DISPENSER

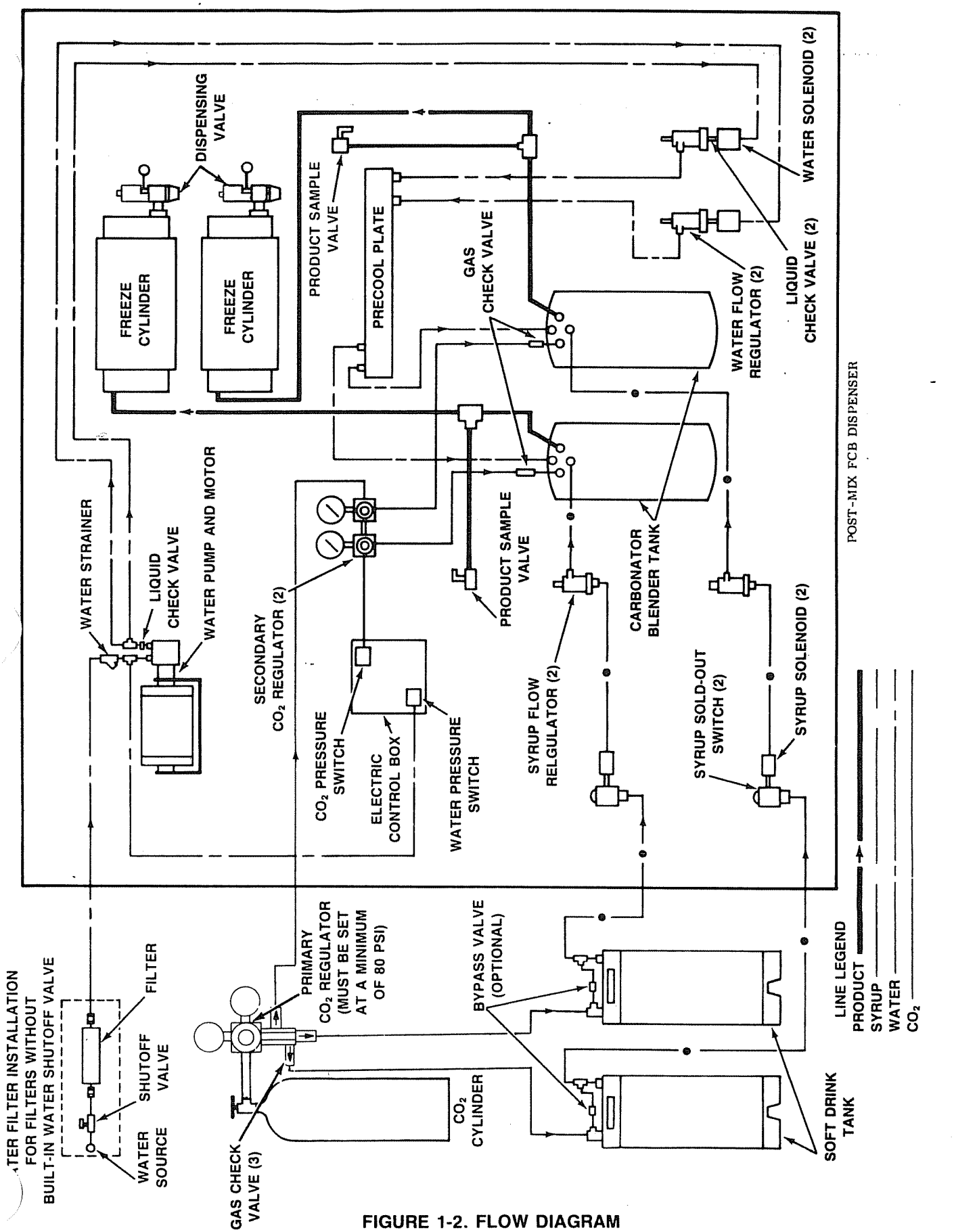


FIGURE 1-2. FLOW DIAGRAM

SECTION II

INSTALLATION

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

UNPACKING AND INSPECTION (see Figure 4-1)

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 time of delivery and immediately reported to the delivering carrier. Request a written inspection report from the Claims Inspector to substantiate 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	Qty
1	322235	Drip Tray	1
2	314097	Cup Rest	1
*3	320935	Beater (item 23)	2
*4	320568	Scraper Blade (item 2)	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	511044	Operators Instructions	1
12	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 VISCOSITY RODS to FACEPLATES (see Figure 2-1).

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

3) Position SCRAPER 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 SCRAPER BLADES. Secure each faceplate to unit with four HEX NUTS and FLAT WASHERS removed in step 2) preceding. Tighten HEX nuts until faceplates touch all the way around on freeze cylinder flanges. CAUTION - *DO NOT* OVERTIGHTEN HEX 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 faceplates.

9) CLEANING BRUSH (item 12) is used to clean faceplates relief valves passages.

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 200 VAC, 50 Hz or a 230 VAC, 60 Hz single-phase electrical circuit with a 40 amp minimum-rated disconnect switch (not furnished) fused at 40 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 louvered panels on front of the unit and exhausted out through grilles 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 louvered panels 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 installed 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 in upright position with safety chain to prevent it from falling over. Should valve become accidentally damaged or broken off, CO_2 cylinder can cause serious personal injury.

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 inside 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 (see Figure 1-2)

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

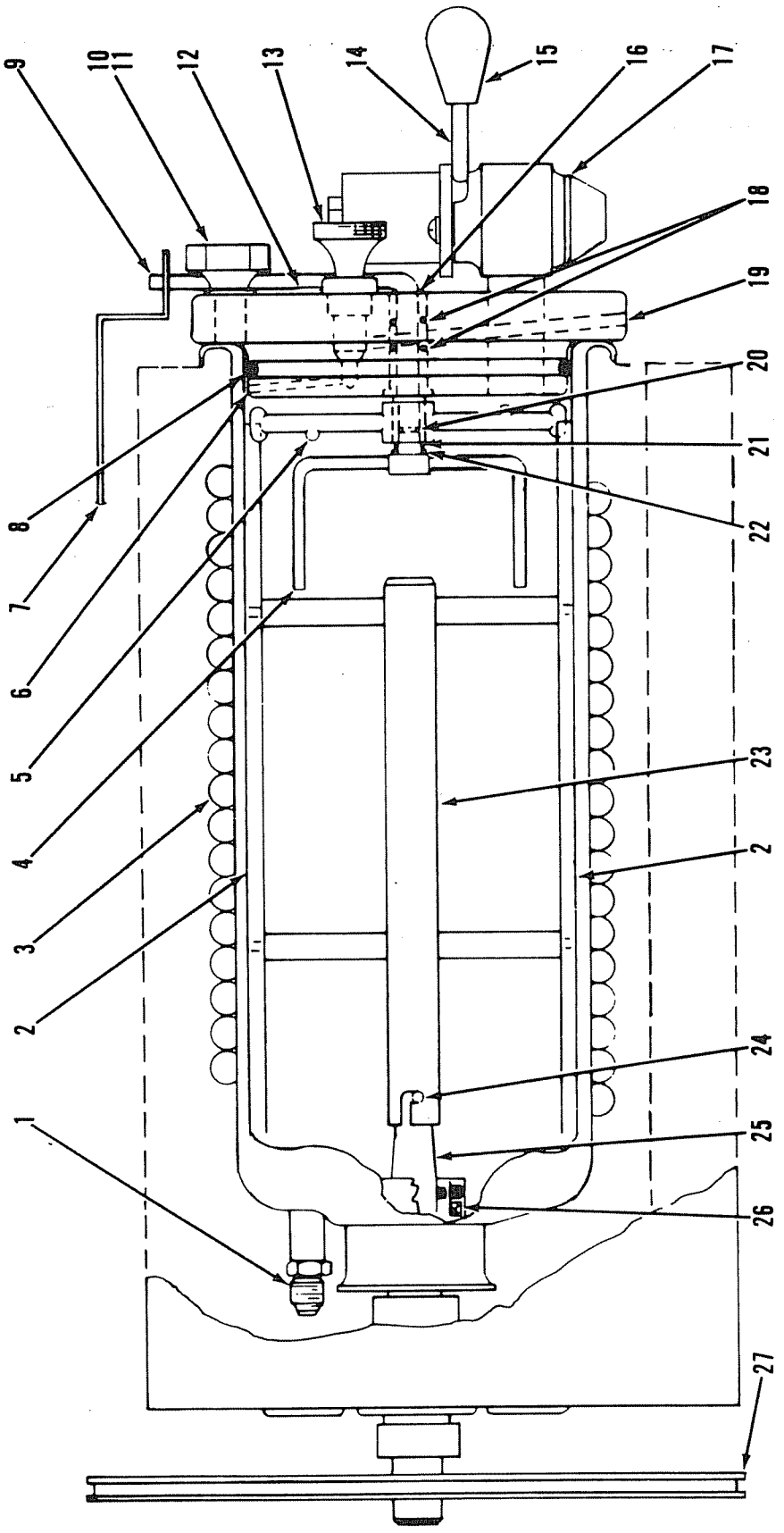
2) Install liquid disconnects on ends of unit inlet syrup lines. DO NOT CONNECT SYRUP LINES TO TANKS AT THIS TIME.

CONNECTING WATER INLET SUPPLY LINE TO UNIT (see Figure 1-2)

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.



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. Hex nut (4) (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

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 40 amp minimum-rated disconnect switch (not furnished) are in the "OFF" position.

IMPORTANT: *50-HZ OPERATION* - Voltage across L_1 and L_2 terminals inside unit control box, with all three compressors operating, *must* be in operating range of between 180 and 220 VAC, 50 Hz. If voltage is below or above this range, a Step-Up/Step-Down Transformer (P/N 511027-000) is available to correct below or above voltage condition.

***60-HZ OPERATION* - Voltage across L_1 and L_2 terminals inside unit control box, with all three compressors operating, must be in operating range of between 207 and 253 VAC, 60 Hz. If voltage is below or above this range, a Step-Up/Step-Down Transformer (P/N 511027-000) is available to correct below or above voltage condition.**

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) Connect 200 VAC, 50 Hz or 230 VAC, 60 Hz, single phase electrical power from 40 amp minimum-rated disconnect switch (not furnished) fused at 40 amps (slow-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.

NOTE: Freeze cylinder defrost timers (one for each freeze cylinder), located on outside of hot gas control box assembly as shown in Figure 4-5, are factory adjusted to No. 8 setting but may be readjusted to increase or decrease hours between defrost cycles. If necessary to change defrost cycles hours, adjust as instructed.

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 products. 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.

FREEZE CYLINDERS AUTOMATIC OR MANUAL DEFROST

The unit has a built-in freeze cylinders automatic defrost cycle or freeze cylinders defrost cycle may be manually operated by using manual DEFROST switches on front of unit.

Freeze Cylinders Automatic Defrost.

Freeze cylinders automatic defrost timers (one for each freeze cylinder), located on outside of hot gas control box assembly as shown in Figure 4-5, determine hours between freeze cylinders defrost cycles and are adjustable to increase or decrease hours between cycles. The timers actuate the defrost solenoids to permit hot gas to enter freeze cylinders refrigerant coils to defrost product in cylinders. A light, included in each manual DEFROST switch on front of unit, remains on until thermostatically controlled defrost cycles are complete. Defrost cycles may be cancelled at any time by momentarily depressing CANCEL DEFROST switches on front of unit.

Manual Defrost.

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. The defrost cycles may be cancelled at any time by momentarily depressing CANCEL DEFROST switches on front of unit.

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, are spring-loaded valves that protect freeze cylinders 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 90^0 angle with line to close valve.

PRE-COOL THERMOSTAT CONTROL

The pre-cool thermostat control (see Figure 4-2), located at the left behind front access panel, is used to control pre-cool cold plate temperature. The thermostat is factory adjusted to maintain cold plate temperature between 38^0F and 40^0F (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 ± 0.05 oz/sec and should not normally require adjustment. If adjustment is necessary, adjust as instructed.

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

Self-closing 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 overuun, 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".

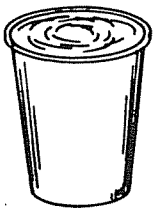
OPERATING CHARACTERISTICS

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.

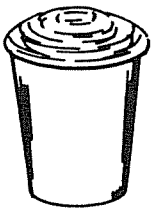
NOTE: If an attempt is made to eliminate the drink described above by turning the viscosity control thumbwheel in, a cylinder freeze-up may be expected under casual draw conditions.

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.

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. It not, adjust as instructed.

REPLENISHING SYRUP SUPPLY

Syrup supply should be checked daily and if necessary, replenished as instructed.

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 1800-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 as instructed.

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 as instructed every 90 days and before and after storage periods following parent company requirements and sanitizer manufacturers recommendations.

CLEANING CONDENSER COILS (see Figure 4-2)

NOTE: Circulating air, required to cool the refrigeration systems condenser coils inside the unit, is drawn in through louvered panels on front of unit and exhausted out through grilles 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 (see Figure 4-2) must be lubricated once a year 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 "Ratio" (mixture) of the dispensed product. If necessary to adjust BRIX, 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.

FREEZE CYLINDERS AUTOMATIC DEFROST TIMERS

The freeze cylinders automatic defrost timers, see Figure 4-5, determine hours between freeze cylinders defrost cycles and are factory adjusted to approximately eight hours between cycles. The timers may be readjusted for more or less hours between defrost cycles. If necessary to adjust timers, adjust as instructed.

WATER STRAINER SCREEN AND LIQUID CHECK VALVES MAINTENANCE

WARNING: The water pump water strainer screen and liquid check valve and the water flow regulator assemblies liquid check valves must be inspected and serviced after any disruptions (plumbing work, earth quake, 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 liquid check valves as instructed.

CLEANING GAS CHECK VALVES (see Figure 1-2)

The gas check valves, located on primary CO_2 regulator, must be inspected and serviced at least once a year under normal conditions and after any CO_2 system servicing or disruption 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 components or electrical wiring.

PREPARING UNIT FOR SHIPPING OR RELOCATING

CAUTION: Before shipping, storing, 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 1800-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 louvered grilles on front of unit and exhausted out through grilles 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 LOUVERED PANELS, 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 louvered panel by removing screw and flat washer securing top of panel, then lift panel up and out.
3) Remove lower front louvered panel by pulling top of panel out, then pull panel up and out of unit.
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. DO NOT OVER OIL.

VISCOSITY SENSOR, DISPENSING VALVE CAGED O-RING, 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 (see Figure 2-1) and dispensing valve caged O-ring (see Figure 4-3) and beater shaft seal assemblies (see Figure 4-4) each time the unit is sanitized as follows:

NOTE: Item numbers in parentheses in this paragraph are in reference to Figure 2-1.

1) Remove HEX 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) Disassemble dispensing valve (see Figure 4-3) as follows:
   a. Remove two screws and hold-down plates securing spring housing to dispensing valve body, then remove housing.
   b. Remove torsion spring from dispensing valve.
   c. Remove knob and lever assembly from dispensing valve.
   d. Remove spring fitting from dispensing valve.
   e. Press valve, with caged O-ring, down and out of dispensing valve body.
   f. Carefuly remove caged O-ring from valve.

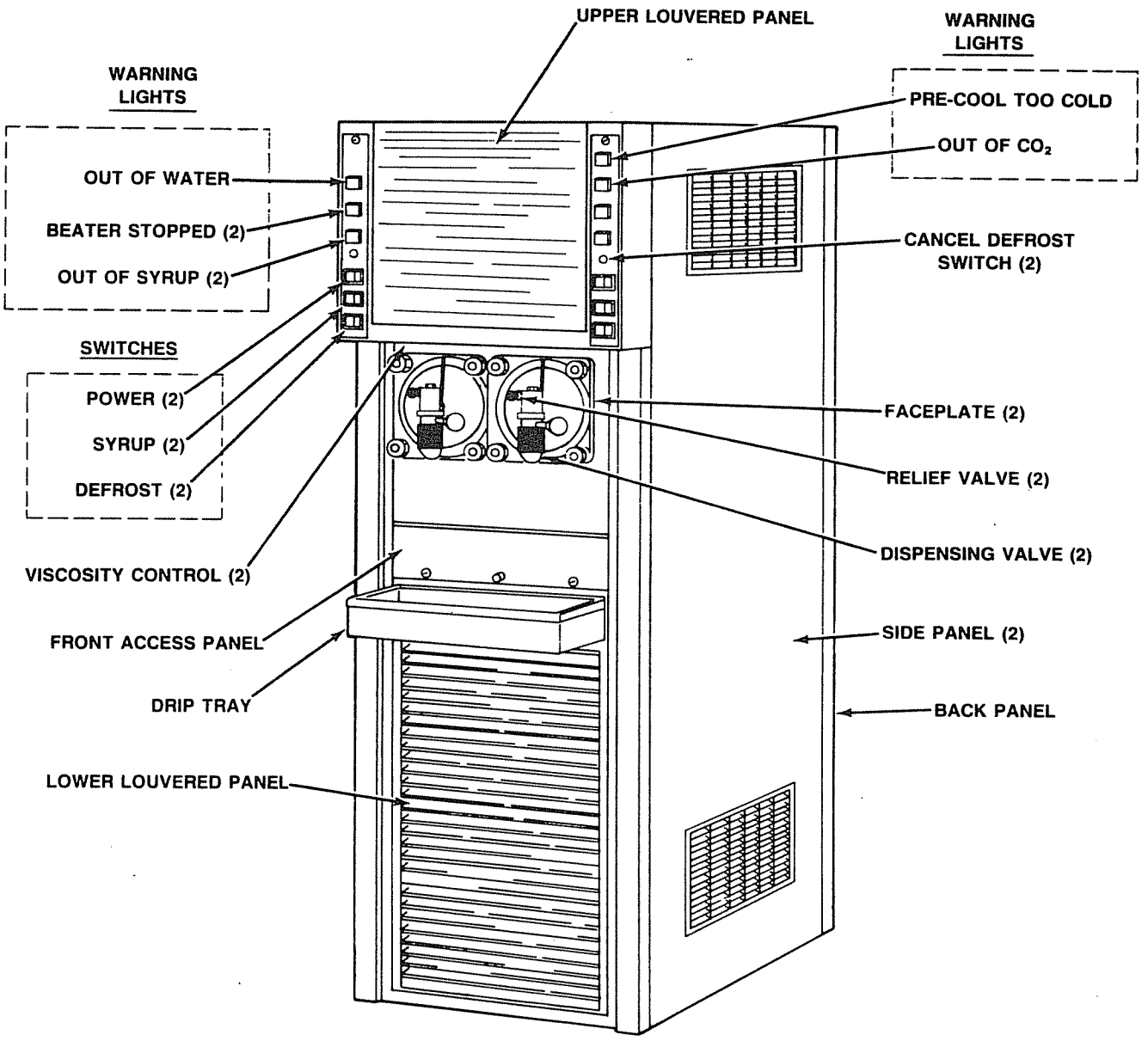


FIGURE 4-1. OPERATING CONTROLS

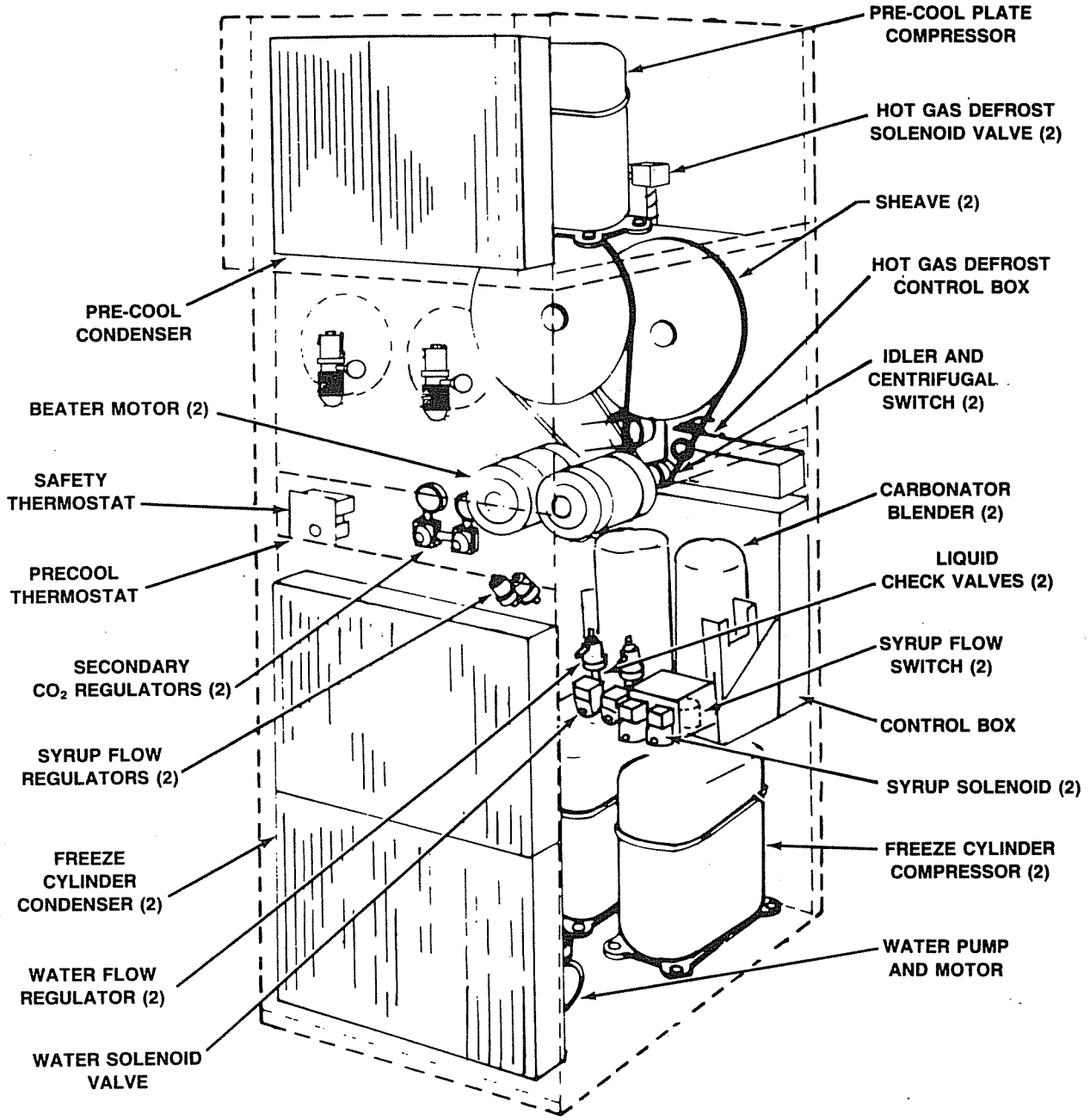


FIGURE 4-2. UNIT INTERNAL COMPONENTS

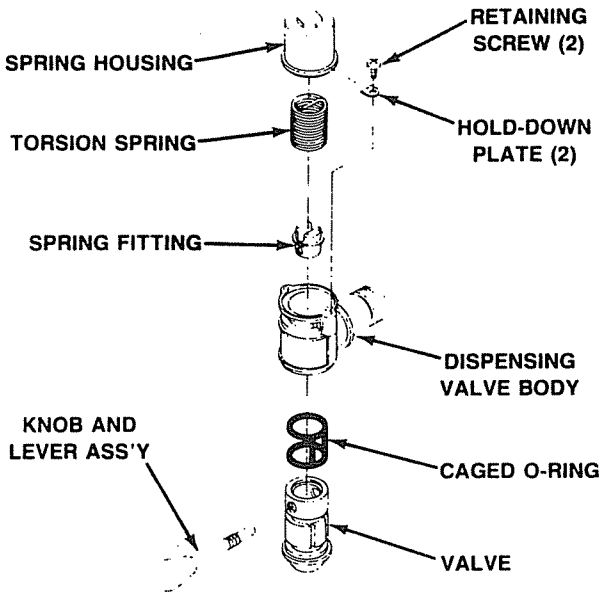


FIGURE 4-3. SELF-CLOSING DISPENSING VALVE

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, especially from caged O-ring and dispensing valve. Use BRUSH (item 12, 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) Assemble dispensing valve as follows:

a. 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.

b. Carefully install valve with caged O-ring in dispensing valve body.

c. Install spring fitting, knob and lever assembly, torsion spring, and spring housing assembly by reversing removal procedure. Do not tighten down hold-down plates securing spring housing at this time.

d. Turn spring housing to the left (counterclockwise) to put tension on torsion spring, then tighten hold-down plates to secure spring housing.

e. Test dispensing valve making sure it closes by itself when lever is released. If not, readjust torsion spring tension.

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 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 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 old lubricant cannot be removed from plastic sleeve by washing, use a nylon "pot and pan" scrubber (3M Company "Scotchbrite", or equivalent) to remove residue. *Do not scrape sleeve.* Replace any sleeve that has rough edges in 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 outer grooves 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 4-4.

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 SCRAPER 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 hex nuts until faceplate touches freeze cylinder all around flange. CAUTION - *DO NOT*OVERTIGHTEN HEX NUTS.

CLEANING CONDENSER COILS (see Figure 4-2)

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

Periodically clean condenser coils as follows:

1) Turn POWER switches to OFF position.
2) Remove upper and lower front louvered panels 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 louvered panels 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 to the left (counterclockwise) to reduce water flow rate or turn screw to the right (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 Figures 4-1 and 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 best textured product. If adjustment is necessary, adjust as instructed.

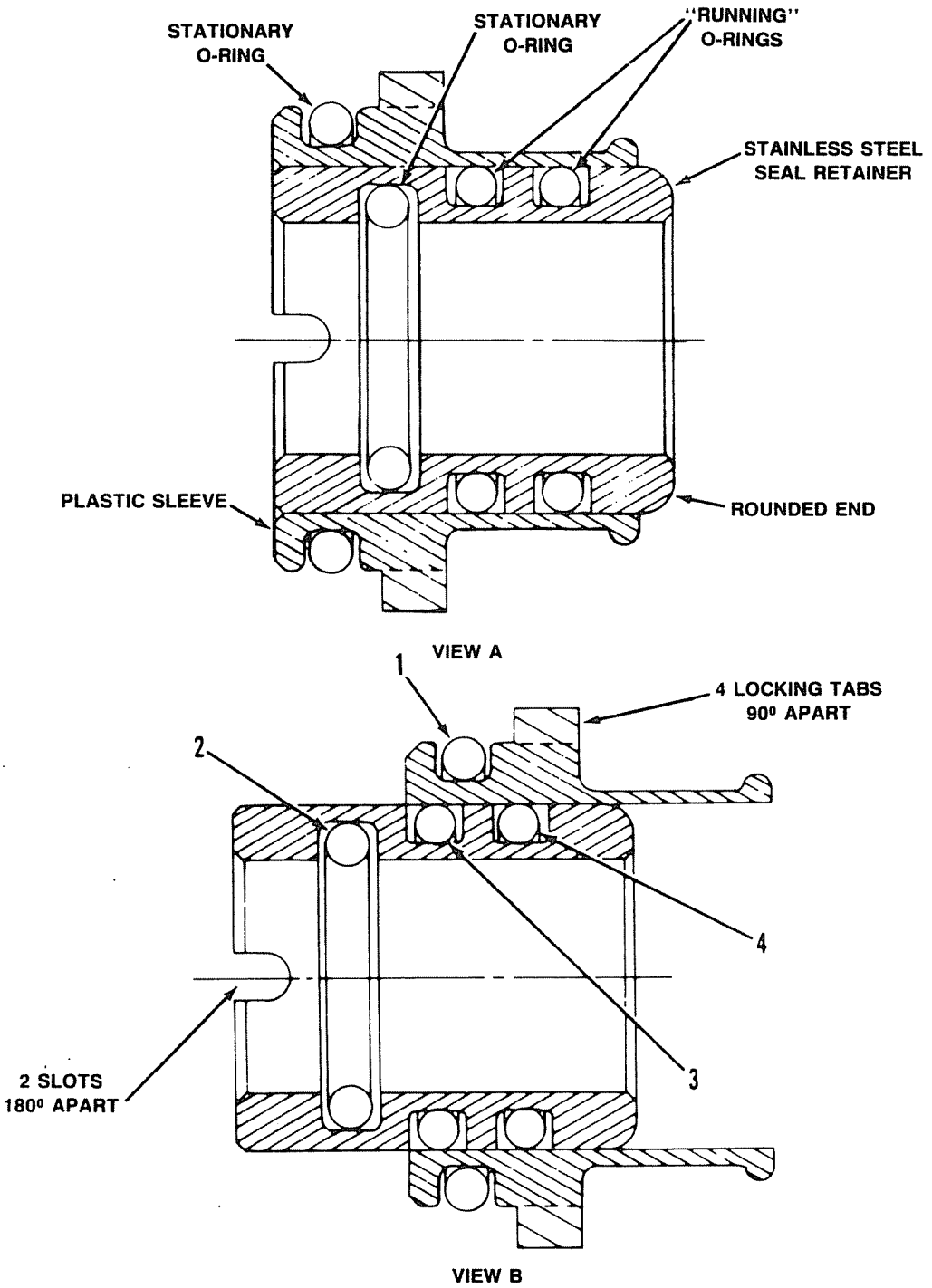


FIGURE 4-4. INSTALLING SHAFT SEAL ASSEMBLY IN FREEZE CYLINDER

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 ± 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 (counterclockwise) 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. (see Figure 4-1)

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-up 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. (see Figures 4-1 and 4-2)

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.

FREEZE CYLINDERS AUTOMATIC DEFROST TIMERS (see Figure 4-5)

Freeze cylinders automatic defrost timers, located on outside of hot gas control box assembly, determine hours between freeze cylinders defrost cycles and are adjustable to increase or decrease hours between cycles. Adjust defrost timers as follows:

1) Disconnect electrical power from unit.

2) Remove unit back panel as instructed for access to defrost timers (one for each freeze cylinder).

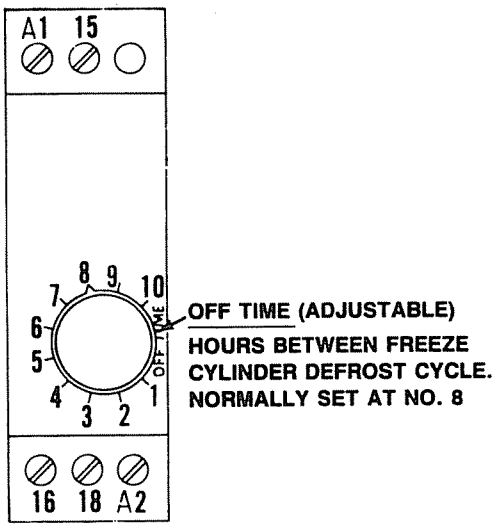


FIGURE 4-5. AUTOMATIC DEFROST TIMER

3) "OFF TIME" adjustment knobs are factory adjusted to No. 8 setting at factory to activate freeze cylinders defrost cycles approximately every eight hours but may be readjusted to more or less hours. Turn adjustment knobs to the right (clockwise) for more hours or to the left (counterclockwise) for less hours.

4) Install unit back panel by reversing removal procedure.

5) Connect electrical power to unit.

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: To avoid possible personal injury or property damage, do not attempt to remove product tank cover until CO_2 pressure has been released from tank.

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.

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.

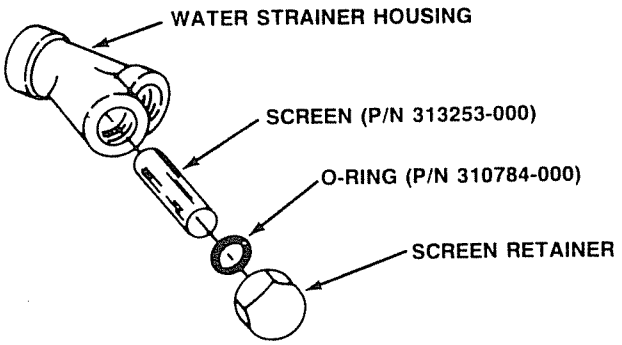


FIGURE 4-6. WATER STRAINER

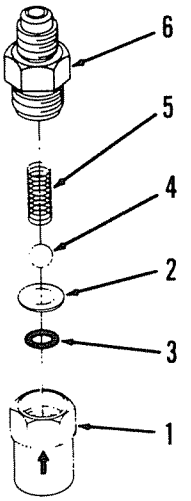
16) Press POWER switch to OFF position. Completely fill freeze cylinder with water by repeatedly pulling and releasing relief valve knob on faceplate of freeze cylinder and until water comes out of relief valve port, then release knob. Press POWER switch to WASH position.

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.



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 4-7. LIQUID CHECK VALVE

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 lose 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 liquid check valve and the water flow regulator assemblies liquid 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 4-6 and 6-19)

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.

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 LIQUID CHECK VALVE. (see Figure 4-7 and 6-19)

1) Service water pump water strainer screen before servicing water pump liquid 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 4-7.

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 4-7. 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 LIQUID CHECK VALVES (see Figures 1-2, 4-2, and 6-13)

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

2) Disconnect line from water flow regulator assembly.

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 4-7.

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 4-7. ALWAYS INSTALL NEW BALL SEAT (QUAD RING) P/N 312481-000.

8) Install check valve on water solenoid valve elbow fitting.

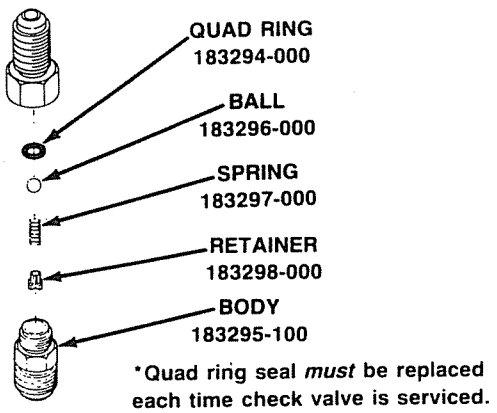


FIGURE 4-8. GAS CHECK VALVE

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.

CLEANING GAS CHECK VALVES (see Figures 1-2 and 4-8)

The gas check valves, located on primary CO_2 regulator, must be inspected and serviced at least once a year under normal conditions and after any servicing or plumbing disruption of the CO_2 system. ALWAYS REPLACE QUAD RING SEALS EACH TIME CO_2 CHECK VALVES ARE SERVICED.

REPLENISHING SYRUP SUPPLY

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

Although syrup replenishing can be done anytime, syrup supply *must* be replenished when the OUT OF SYRUP light goes on.

NOTE: The following instructions are applicable only when replenishing syrup supply. 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 1800-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 in upright position with safety chain to prevent it from falling over. Should valve become accidentally damaged or broken off, CO_2 cylinder can cause serious personal injury.

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. Changing one flavor at a time 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

The following is the refrigeration compressors replacement kits part numbers to replace the pre-cool compressor or either freeze cylinder compressor.

PRE-COOL COMPRESSOR REPLACEMENT KIT (P/N 322718-000)

Pre-cool compressor, located in top of dispenser, is to be replaced by installing Compressor Replacement Kit (P/N 322718-000). Compressor in dispenser and kit replacement compressor are both identified by MODEL RSN4 stamped on nameplates on top of compressors.

FREEZE CYLINDER COMPRESSOR REPLACEMENT KIT (P/N 325509-000)

Freeze cylinders compressors (2) located in bottom of dispenser, are each to be replaced with Compressor Replacement Kit (P/N 325509-000). Compressors in dispenser and kit replacement compressor are identified by MODEL RSL2 on nameplates on tops of compressors.

IMPORTANT: Only qualified personnel should install refrigeration compressor kit.

Read and understand these instructions thoroughly before proceeding to 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, Anoka, Minnesota 55303-1592 Phone (612)421-6120 for compressor return shipment instructions.

2) *DO NOT* change compressor until you now it is inoperative. Refer to troubleshooting 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 COMPRESSOR

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,* ESPECIALLY WHEN STOPPING AND STARTING

Probable Cause - Compressor cools, but is very noisy, especially 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.

COMPRESOR STARTS AND OPERATES FOR A FEW SECONDS, THEN STOPS

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

Remedy - Clean condenser coil 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. Voltage 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 operate, label compressor "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 180 VAC (50 Hz Compressor) or 207 VAC (60 Hz Compressor) must be present to operate compressor.

Remedy - If less than 180 VAC (50 Hz Compressor) or 207 VAC (60 Hz Compressor) 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 and replace. If none of the above conditions are evident, disconnect wires from capacitor. Connect test cord to capacitor terminals. Connect ammeter to one wire of test cord. Plug test cord into electrical outlet and record amp reading in formula $\frac{3180 \text{ X amps}}{\text{volts/50 Hz}}$ = MFD or use amp reading in formula $\frac{2650 \text{ X amps}}{\text{volts/60 Hz}}$ = MFD to determine actual value of capacitor. If calculated actual value is 10% more or less than rated value, replace capacitor.

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 4-9)

Clean condenser coil 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 drier 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 drier 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.

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-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.

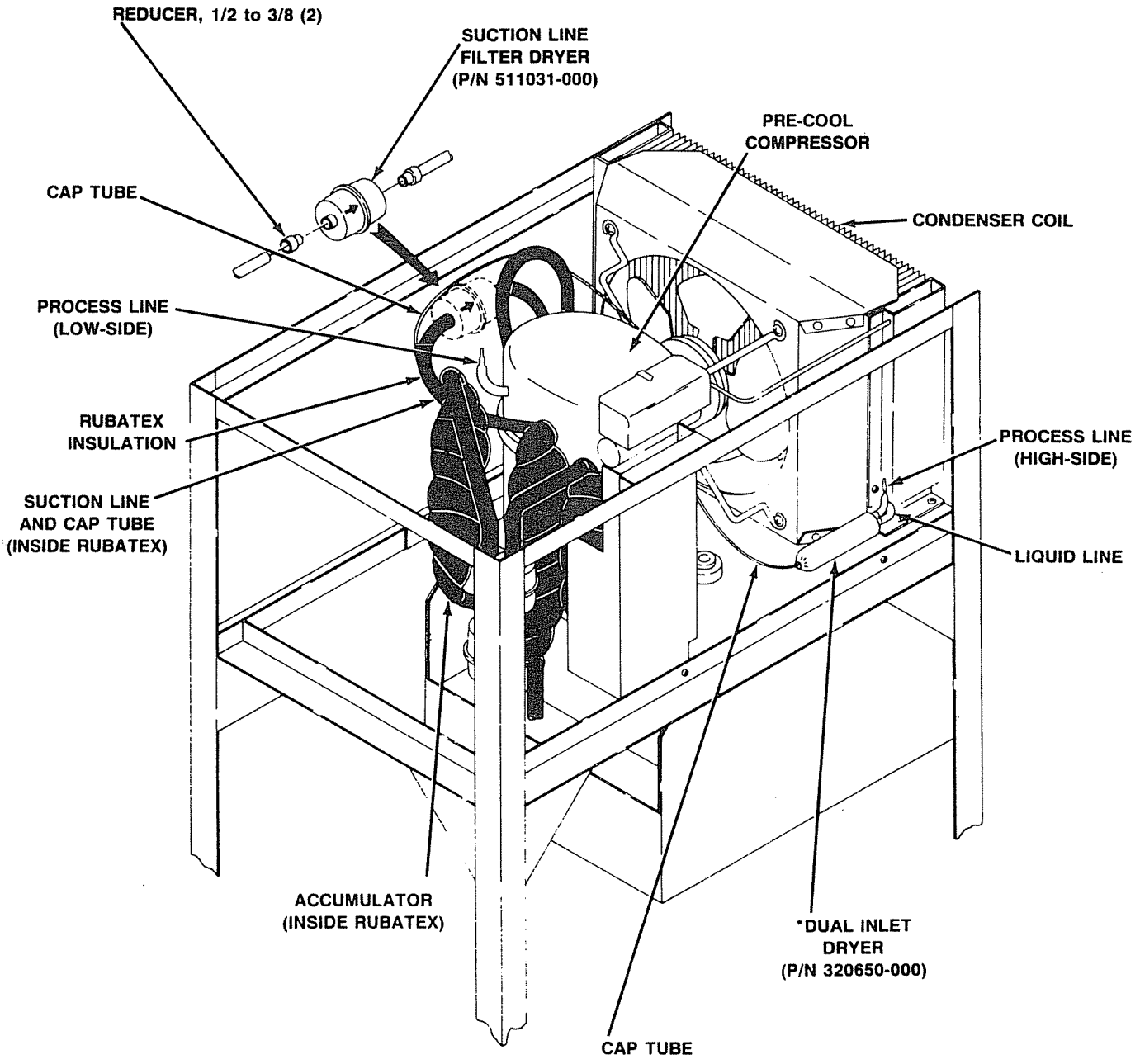
23) Use clean dry refrigerant, in amount and type specified on unit serial plate, to charge unit through suction process line. It should *not be* necessary to run system to install correct charge in liquid form.

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 malfunciton 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 proper operation.



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

FIGURE 4-9. INSTALLING DRYERS

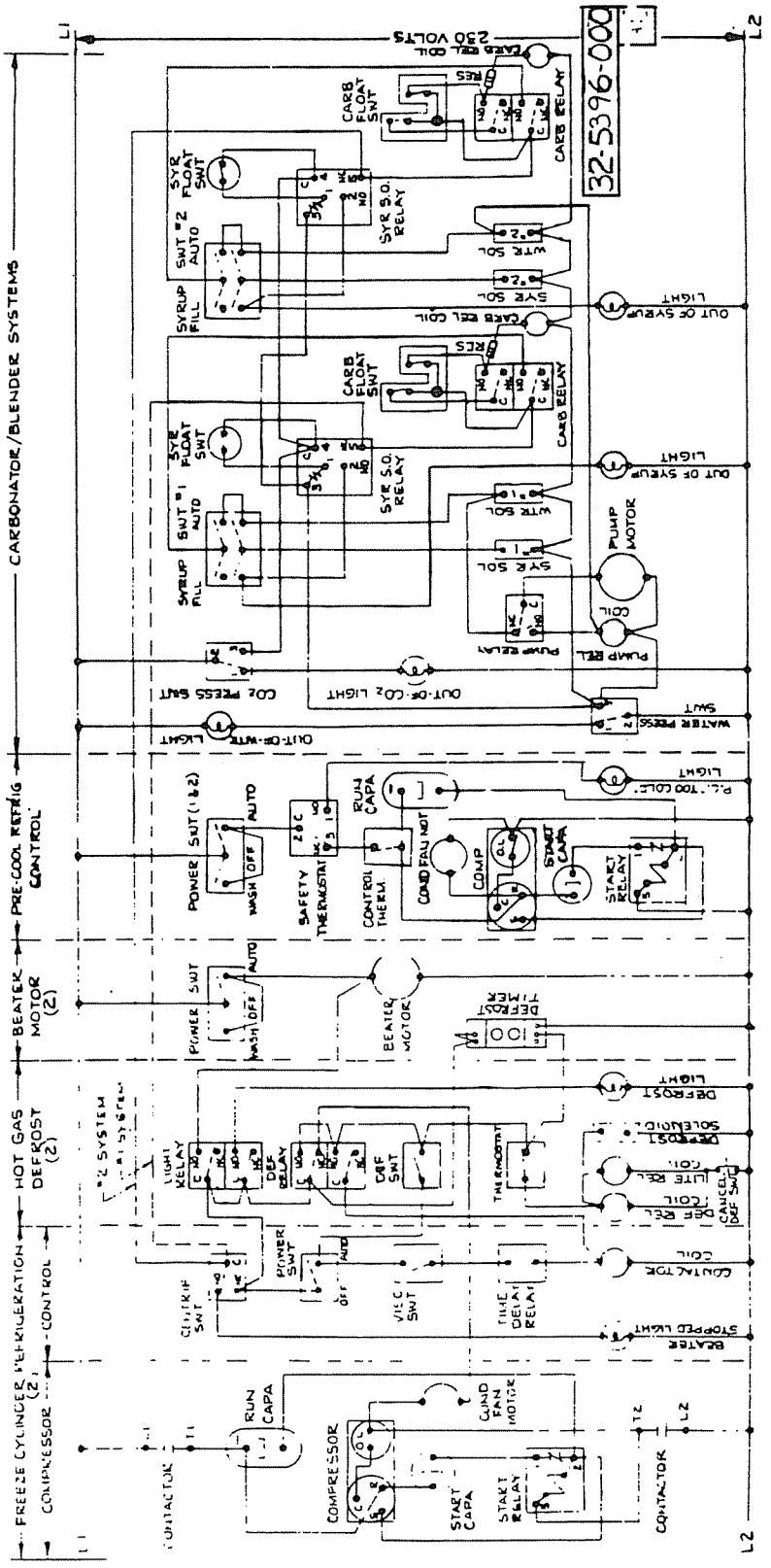


FIGURE 4-10. SCHEMATIC WIRING DIAGRAM

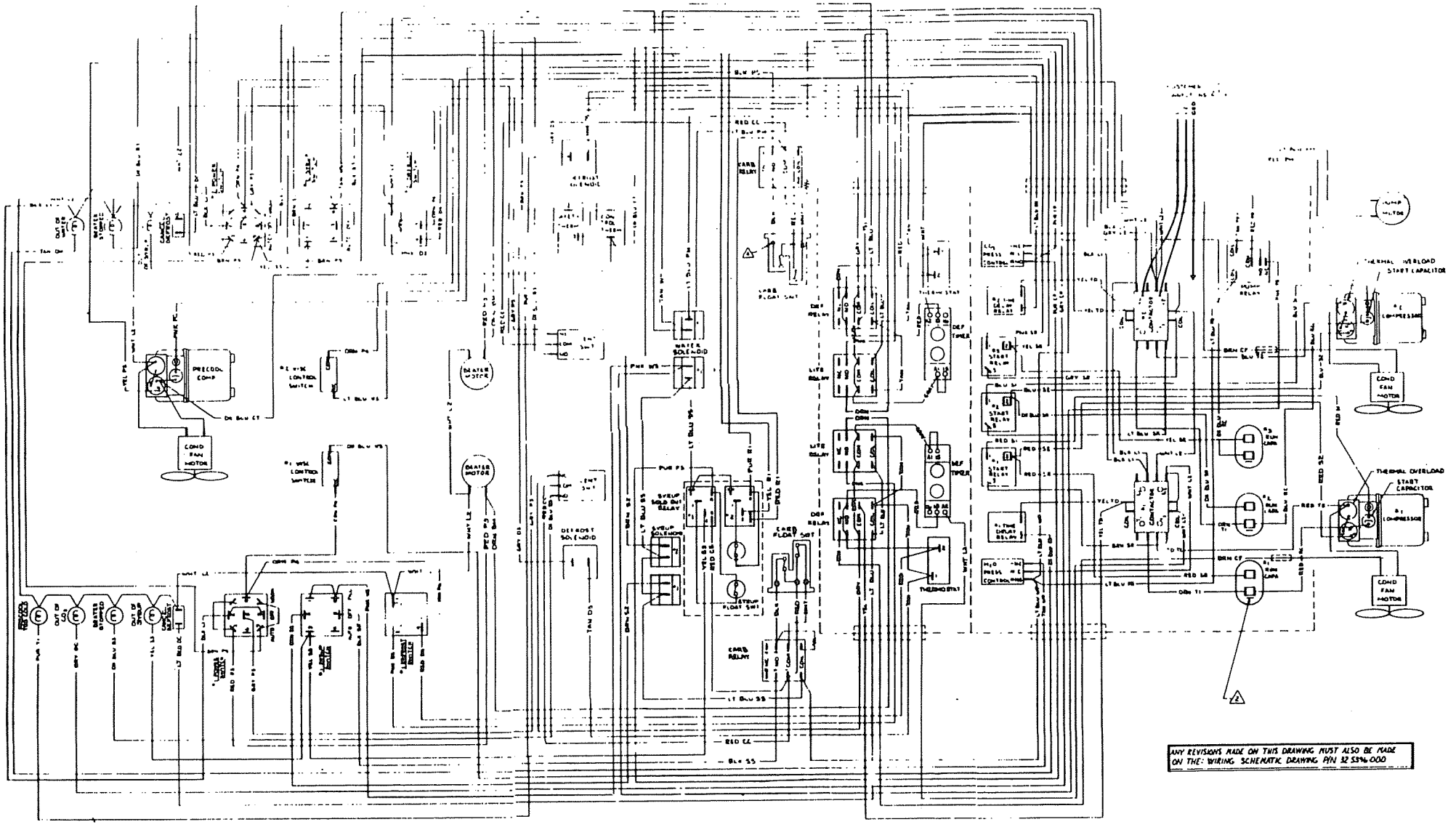


FIGURE 4-11. WIRING DIAGRAM

SECTION V

ROUBLESHOOTING

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 systems must be performed, disconnect all electrical power to unit, shut off CO_2 and syrup supplies, then bleed systems pressures 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.
EATER STOPPED GHT(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.
	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. Inoperative 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.

Trouble	Probable Cause	Remedy
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. Inoperative water pressure switch.	4. Replace switch.
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.
MANUAL 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.
FREEZE CYLINDER AUTOMATIC DEFROST DOES NOT OPERATE.	1. Loose or broken electrical wires.	1. Repair electrical wires.
	2. Inoperable automatic defrost timer.	2. Replace timer.
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.
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.

Trouble	Probable Cause	Remedy
BRIX TOO HIGH.	1. Syrup flow regulator set too high.	1. Adjust BRIX of dispensed product.
	2. Water flow regulator set too low.	2. Water flow regulator must be set for 1.5 $\pm$ 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.
FROZEN PRODUCT CONSISTENCY VARIES EXCESSIVELY.	1. Torque sensing device sticking in faceplate 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: 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

283125-113	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

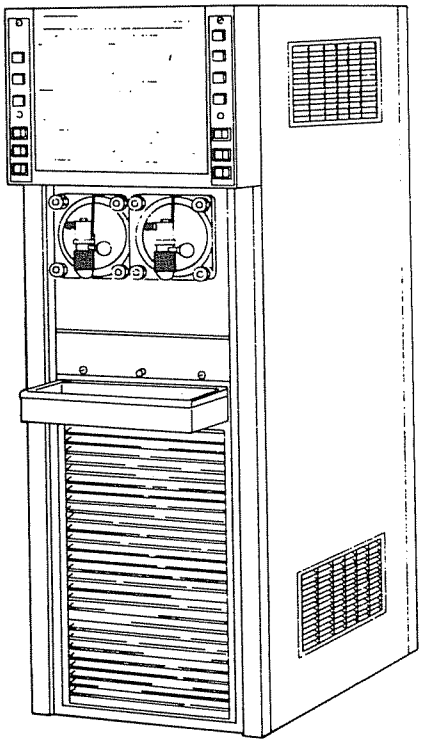
SERVICE TOOLS

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 HIGH-CAPACITY POST-MIX DISPENSER

Model Number
416027



SECTION VI
ILLUSTRATED PARTS BREAKDOWN

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1-11-84

324100-000

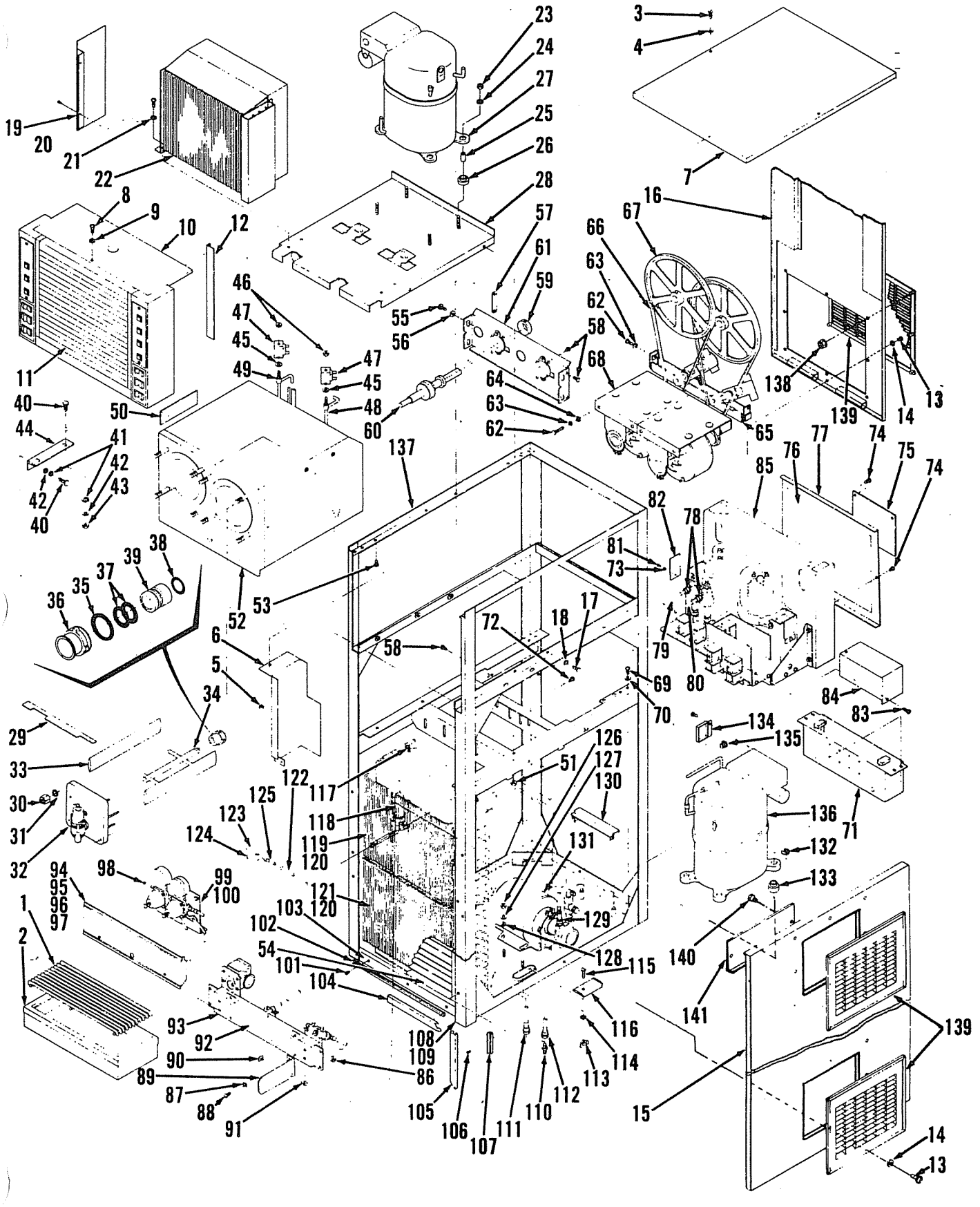

FIGURE 6-1. FROZEN CARBONATED BEVERAGE DISPENSER

IMPORTANT: Include model number and serial number when ordering replacement parts.

Index No.	Part No.	Name
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	325119-068	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	325381	Control Panel Ass'y (see Figure 6-2)
11	320761-068	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	325285-068	Panel, Side
16	325286-068	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 6-3)
23	321290	Hex Nut, Keps, Chrome-pltd Steel, 3/8-16
24	*322330	Washer, .390 I.D.
25	322329	Insert, 29/32 O.D.
26	189723	Grommet, Rubber
27	322718	Compressor Kit, Pre-Cool (see NOTE 1)
28	322324	Refrigeration Ass'y (see Figure 6-4)
29	325217	Cover, Soffit Panel
30	320553-001	Hex Nut
31	320916	Flat Washer, Special, Stainless Steel, .450 I.D. by .062 thk
32	325320-088	Freeze Cylinder Faceplate Ass'y (see Figure 6-5)
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.
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	312415	Flat Washer, Stainless Steel, .300 I.D. by .024 thk
46	325297-001	Hex Nut
47	325260	Coil, Hot Gas Solenoid (230 VAC, 60Hz)
48	325298	Solenoid Body and Plunger, No. 1 Compressor
49	325299	Solenoid Body and Plunger, No. 2 Compressor
50	313456	Decal
51	*189429	Hex Nut, Keps, 1/4-20
52	325318	Freeze Cylinder and Cold Plate Ass'y
53	*186130	Sheet Metal Screw, Phil Truss Hd, Type A, No. 6 by 1/2-in.
54	321785-068	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 6-7)
61	320736-088	Bearing and Support Bracket Ass'y (see Figure 6-8)
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 6-9)
66	325030	Drive Belt
67	325027	Sheave, includes Setscrews
68	325143	Beater Drive Motor and Mounting Plate Ass'y (see Figure 6-10)
69	*312251	Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in.
70	*343304	Lock Washer, Ext Tooth, No. 10
71	325377	Hot Gas Box Ass'y (see Figure 6-11)
72	*189129	Rivet
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	325395	Wiring Diagram
	325223	Wiring Diagram
77	320544	Cover, Control Box
78	178025-200	Tapered Gasket, Red
79	325173	Tube Ass'y, .250 I.D. by 39-in. lg
80	322727	Tube Ass'y, .250 I.D. by 27-in. lg
81	*312251	Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in.

*Zinc-plated steel unless indicated otherwise.

NOTE 1 - This compressor kit replaces pre-cool refrigeration compressor. Compressor in unit and in kit are identified by MODEL RSN4 stamped on nameplates on tops of compressors.

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	325399	Cover
85	325384	Carbonator Blenders and Control Box Ass'y (see Figure 6-12)
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 6-17)
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 6-18)
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)
	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	320692-068	Corner Post, Front, Left-hand/ Right-hand
110	176193	Fitting, Straight, 7/16-20
111	325144	Tube Ass'y, .250 I.D. by 95-in. long, CO_2 Inlet
112	322606	Tube Ass'y, .265 I.D. by 95-in. long, Syrup Inlet
113	*187243	Wing Nut, No. 10-24
114	325075	Flat Washer, 7/32 I.D.
115	*186770	Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in.
116	325074	Cover, Inlet Lines
117	320972	Clip
118	320650	Strainer, Drier
119	325378	Condenser Fan, Shroud and Motor Ass'y (see Figure 6-3)
120	*398024-603	Hex Nut, Keps, No. 10-24
121	325379	Condenser Fan, Shroud and Motor Ass'y (see Figure 6-3)
122	**140594	Drain Tube, 5/16 I.D. by 26-in. lg
123	**140594	Drain Tube, 5/16 I.D. by 8-in. lg
124	**140594	Drain Tube, 5/16 I.D. by 2-1/8 in. lg
125	186152	Drain Tee
126	186146	Hex Nut, Stainless Steel, 5/16-18
127	*343313	Lock Washer, Ext Tooth, 5/16-in.
128	*186147	Flat Washer, 5/16-in.
129	178025-100	Tapered Gasket, White
130	325117	Shield, Motor
131	322624-088	Motor and Pump Ass'y (see Figure 6-19)
132	187888	Clip, Compressor
133	189723	Grommet, Rubber
134	325118	Cover, Compressor
135	331304	Snap Bushing
136	325509	Compressor Kit, Freeze Cylinder (see NOTE 1)
137	322628-003	Frame
138	317658	Self-Threading Nut, .188 stud
139	317656-039	Grille
140	325282	Self-Tapping Screw, Hex Washer Hd, No. 2 point, No. 8-18 by 1/2-in.
141	325284-069	Panel

*Zinc-plated steel unless indicated otherwise.

**Sold in bulk quantity only.

NOTE 1 - This compressor kit replaces either of two freeze cylinders compressors. Compressors in unit and compressor in kit are identified by MODEL RSL2 stamped on nameplates on tops of compressors.

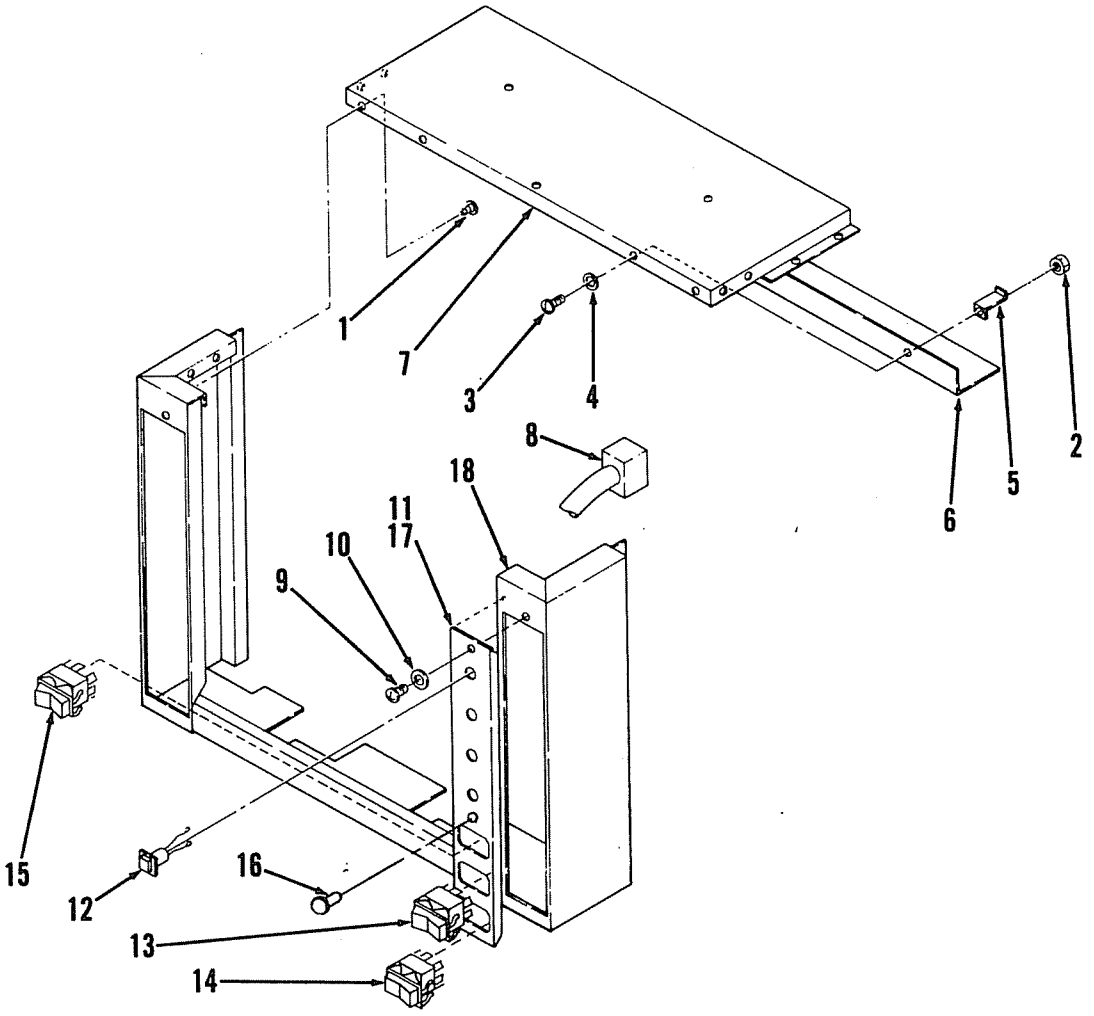

FIGURE 6-2. CONTROL PANEL ASSEMBLY

Index No.	Part No.	Name	Index No.	Part No.	Name
	325381	Control Panel Ass'y	9	*188074	Sheet Metal Screw, Sl Truss Hd, Type A, No. 4 by 1/2-in.
1	*187254	Sheet Metal Screw, Phil Truss Hd, Type A, No. 6 by 3/8-in.	10	200717-005	Lock Washer, Ext Tooth, No. 4
2	*340955	Hex Nut, No. 10-24	11	325312	Panel
3	*186770	Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in.	12	322489	Lamp
			13	320708	Switch, Rocker-Type, SYRUP
4	325070	Washer	14	322632	Switch, Rocker-Type, DEFROST
5	320959	Clip, Wire	15	320530	Switch, Rocker-Type, POWER
6	325073	Insulator	16	325313	Switch, Normally Closed
7	322650-068	Panel, Top	17	325310	Decal, Light Panel, Right
8	325387	Wiring Harness, Right-Side (shown)		325311	Decal, Light Panel, Left
	325388	Wiring Harness, Left-Side	18	325319	Housing, Control Panel

*Zinc-plated steel.

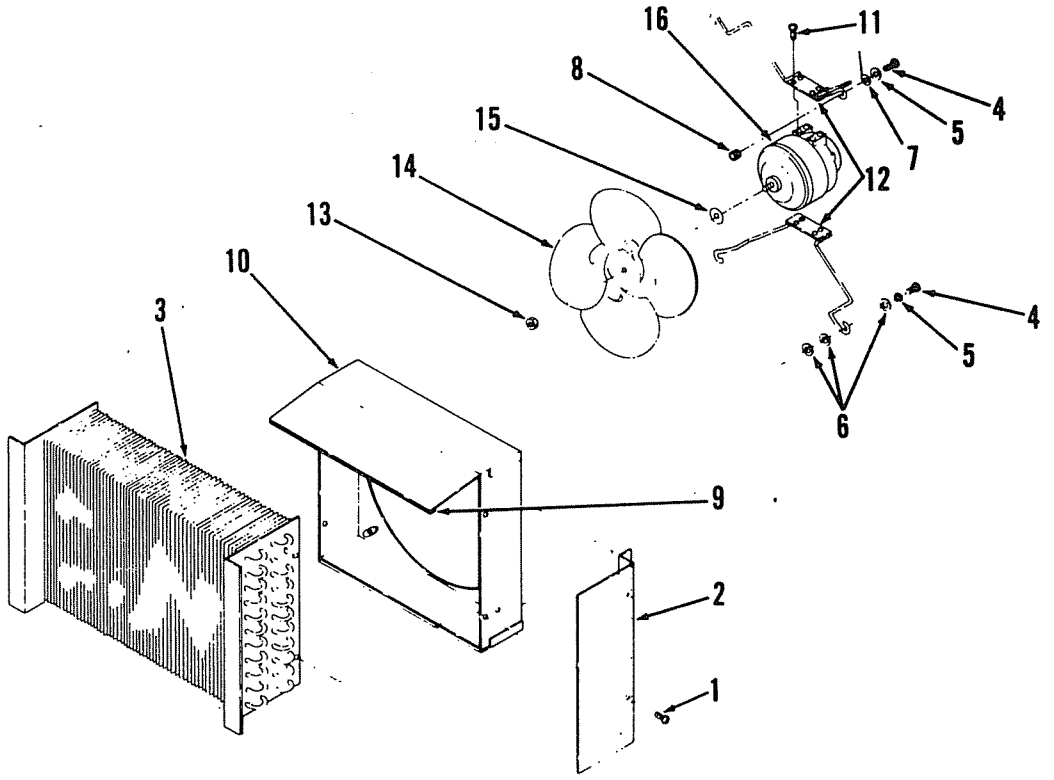

FIGURE 6-3. CONDENSER FAN AND SHROUD ASSEMBLY

Index No.	Part No.	Name
	320643	Condenser, Fan, and Shroud Ass'y, 3/4 H.P. Pre-Cool
	325379	Condenser, Fan, and Shroud Ass'y, 1-1/2 H.P. Pre-Cool, No. 1 Compressor, Lower Shroud
	325378	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
	325300	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
	322651	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.

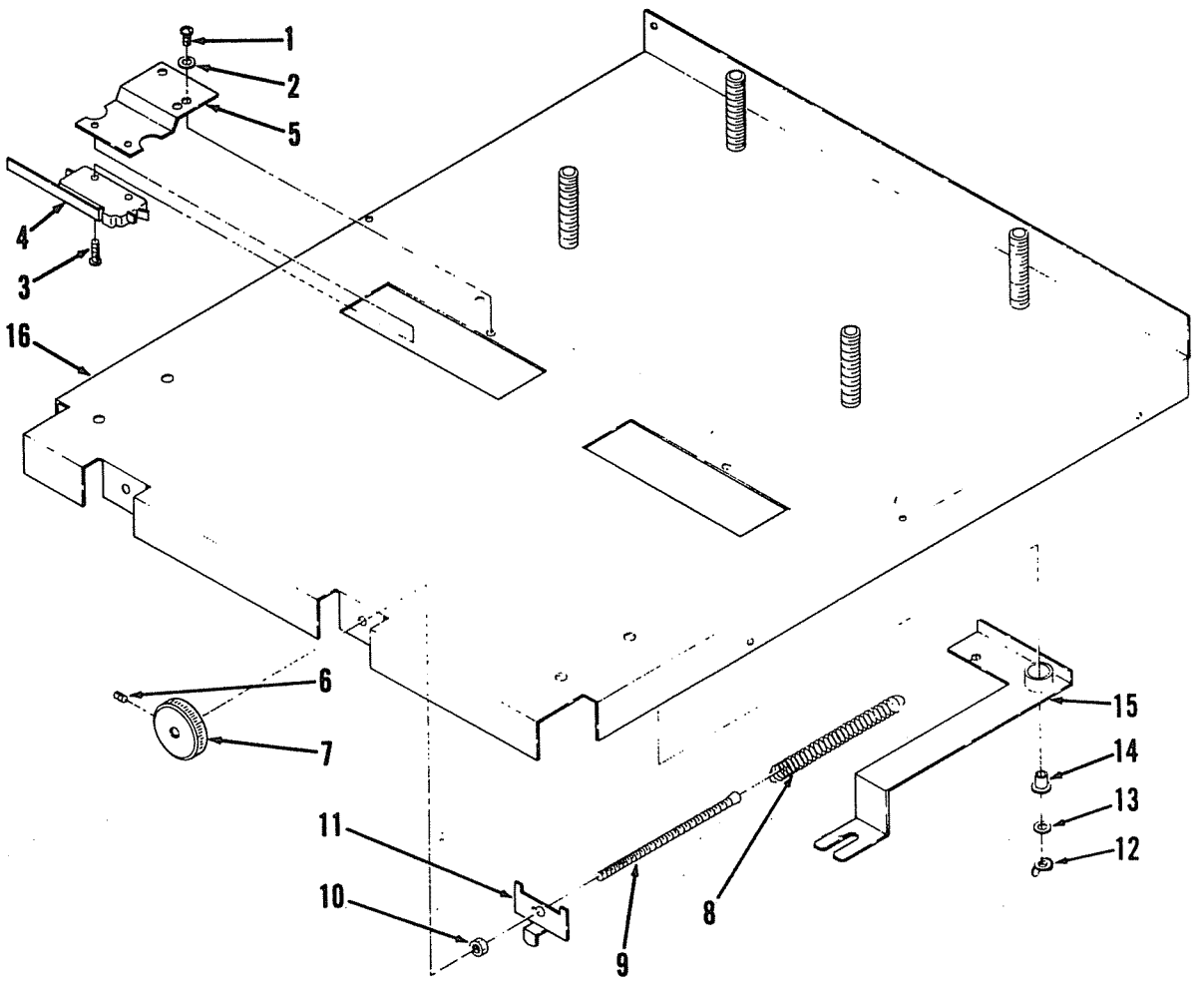

FIGURE 6-4. PRE-COOL REFRIGERATION ASSEMBLY

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	Setscrew, 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.

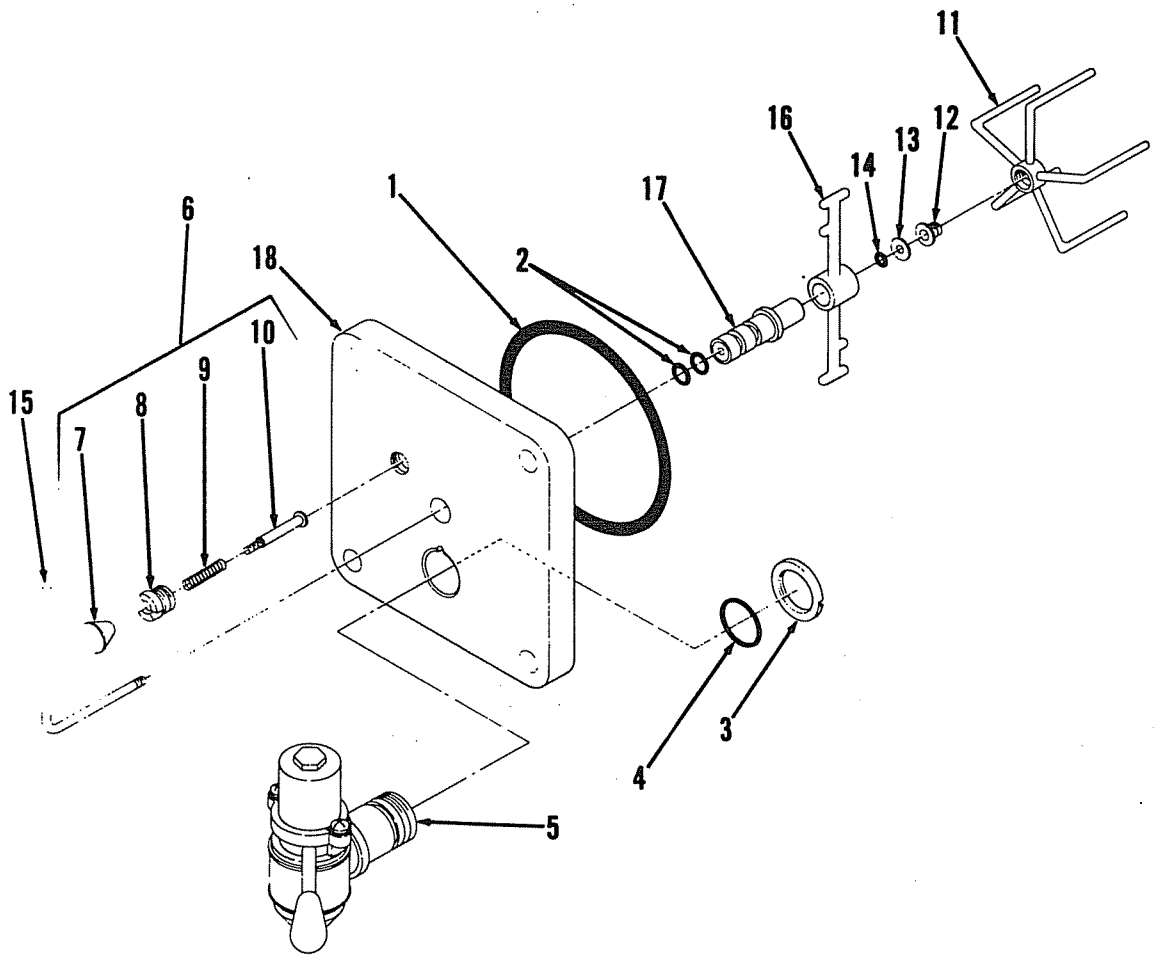

FIGURE 6-5. FREEZE CYLINDER FACEPLATE ASSEMBLY

Index No.	Part No.	Name	Index No.	Part No.	Name
	325320-088	Faceplate Ass'y	9	320614	Spring
1	320678	O-Ring	10	322275	Stem Ass'y
2	172265	O-Ring	11	322441	Sensor, Viscosity
3	321652	Nut, Shank	12	322442	Reducer
4	311086	O-Ring	13	321545	Washer, Teflon
5	325308	Dispensing Valve Ass'y, (Plastic) Motorman (see Figure 6-6)	14	321544	O-Ring
			15	321542	Arm, Viscosity Sensor
6	324089	Relief Valve Ass'y (includes 7-10)	16	321269	Spinner
7	391245	Knob	17	322069	Bushing
8	187629	Bushing, Retainer	18	324090	Faceplate

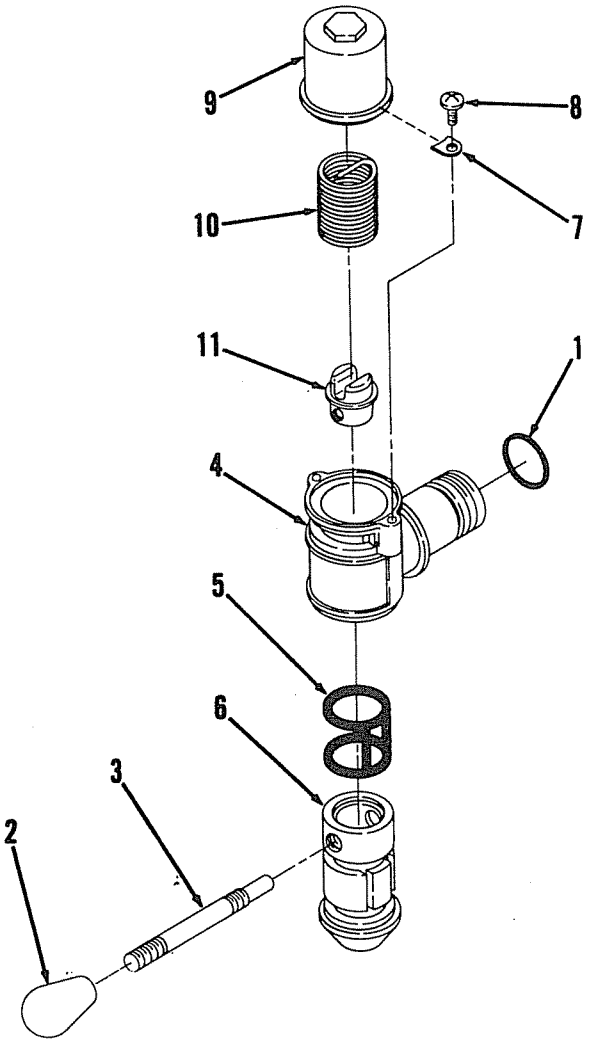

FIGURE 6-6. DISPENSING VALVE ASSEMBLY

Index No.	Part No.	Name
	325308	Dispensing Valve Ass'y
1	321653	O-Ring
2	321540	Knob
3	321651	Lever, Valve
4	325307	Valve Body and Shank
5	321514	O-Ring, Caged
6	321733	Valve
7	317714	Plate
8	317784	Thread Cutting Screw, Phil Truss Hd, Stainless Steel, No. 8-32 by 3/8-in.
9	325306	Housing
10	325305	Spring
11	325304	Fitting

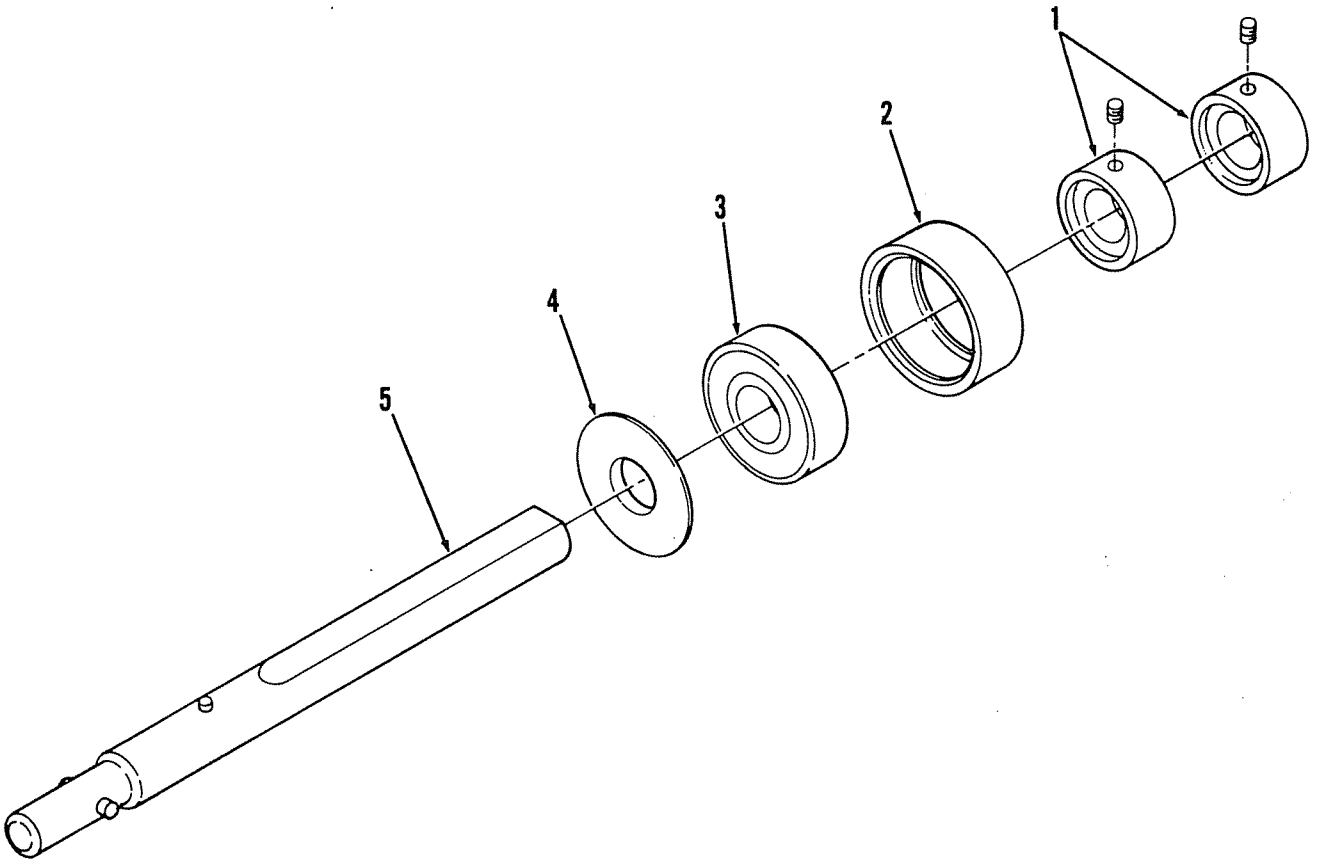

FIGURE 6-7. BEATER DRIVE SHAFT ASSEMBLY

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

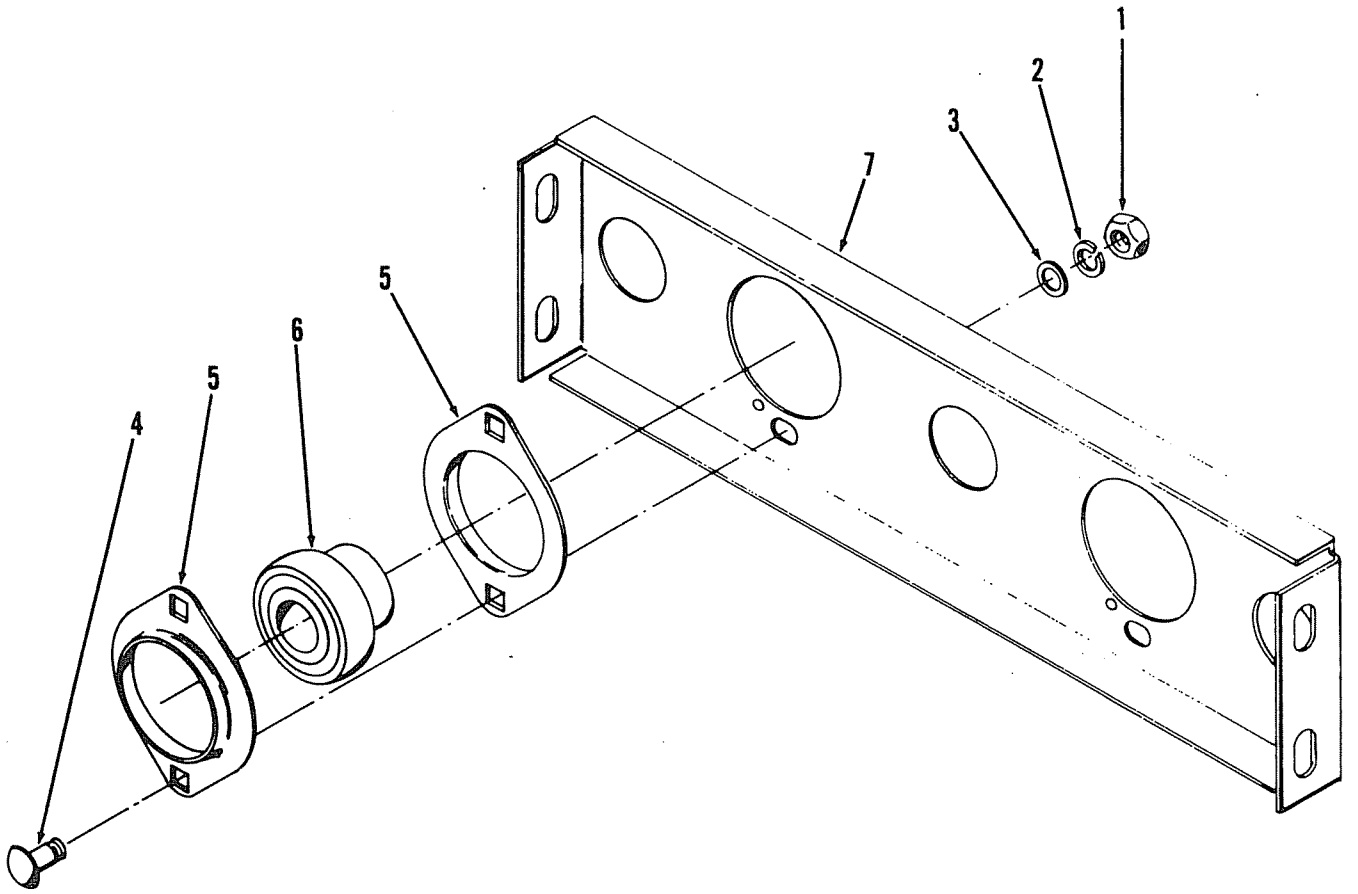

FIGURE 6-8. BEARINGS AND SUPPORT BRACKET ASSEMBLY

Index No.	Part No.	Name
	320736-088	Bearing 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.

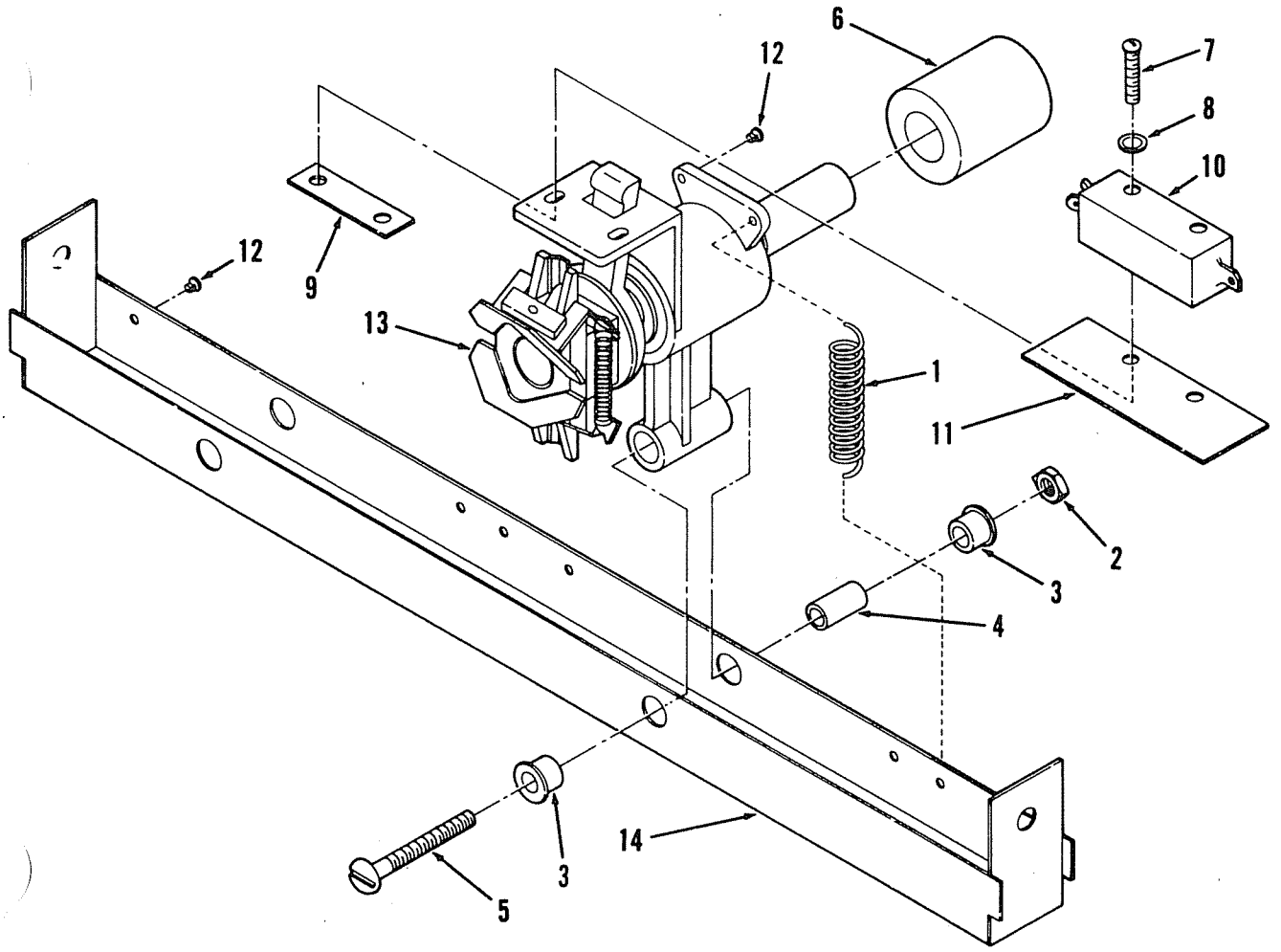

FIGURE 6-9. IDLER AND CHANNEL ASSEMBLY

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.

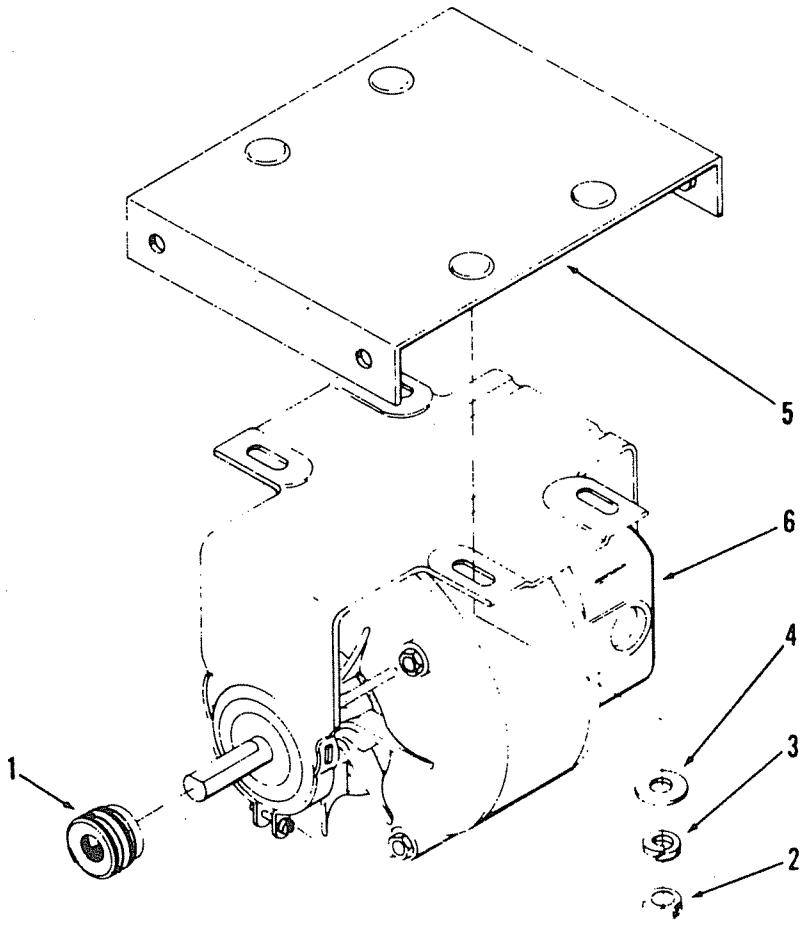

FIGURE 6-10. BEATER DRIVE MOTOR AND MOUNTING PLATE ASSEMBLY

Index No.	Part No.	Name
	325143	Beater Drive Motor and Mounting Plate Ass'y
1	325028	P[illegible] Motor (includes setscrew)
2	186146	H[illegible]ut, Stainless Steel, 5/16-18
3	343313	Lo[illegible]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 H.P. (230 VAC, 60 Hz)

*Zinc-plated steel.

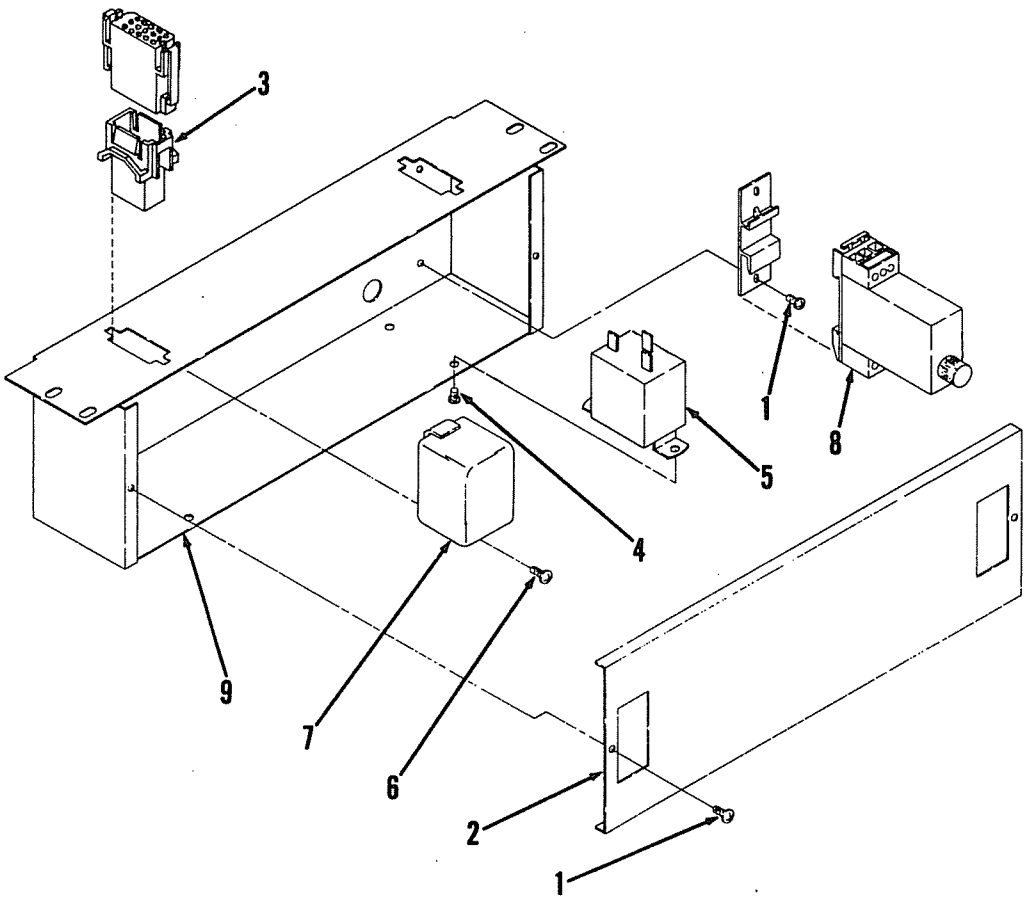

FIGURE 6-11. HOT GAS CONTROL BOX ASSEMBLY

Index No.	Part No.	Name
	325377	Hot Gas Control Box Ass'y
1	*320289	Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 1/4-in.
2	325376	Cover, Control Box
3	325389	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	325386	Timer
9	325380	Control Box

*Zinc-plated steel.

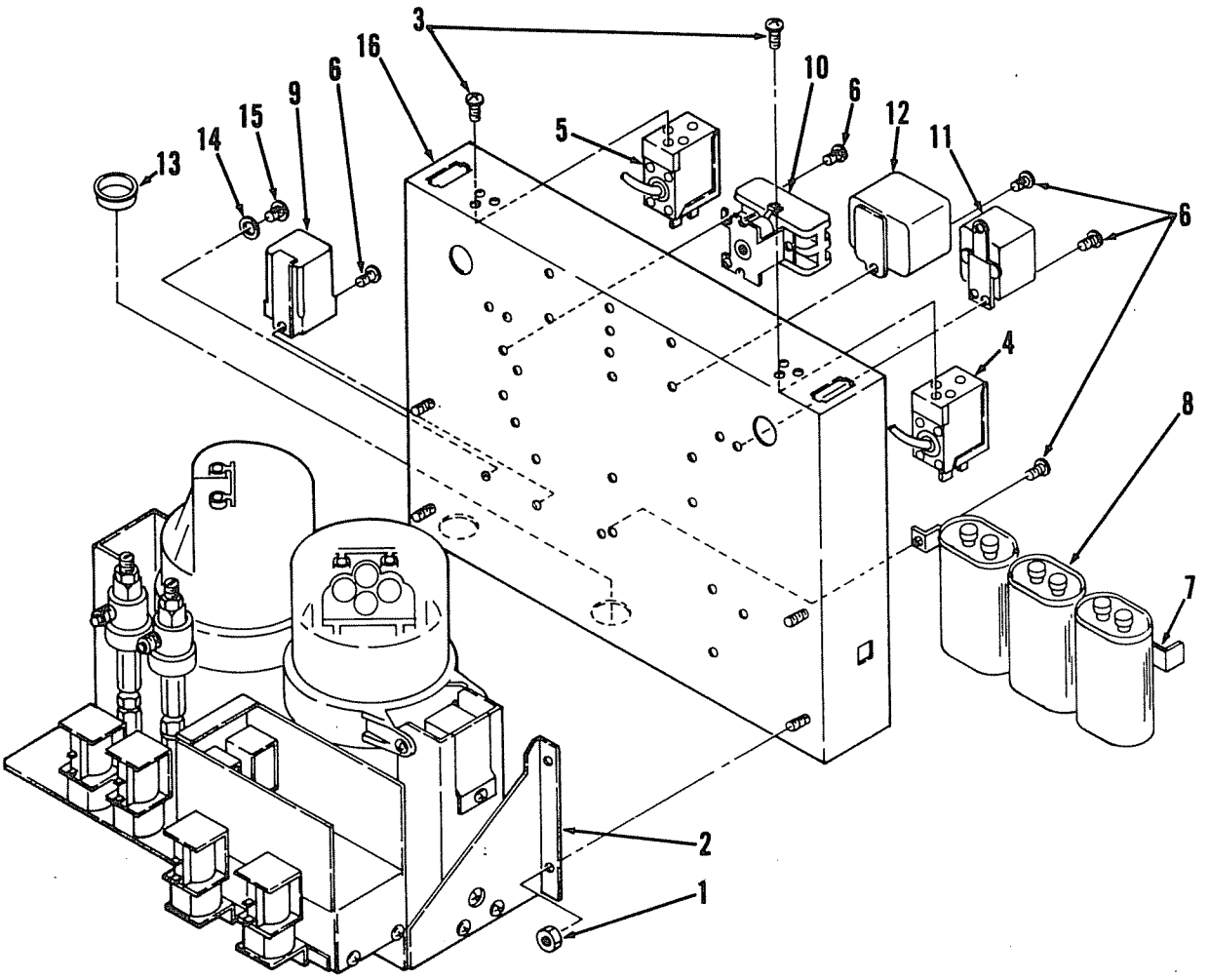

FIGURE 6-12. CARBONATOR-BLENDERS AND CONTROL BOX ASSEMBLY

Index No.	Part No.	Name
.	325384	Carbonator-Blenders and Control Box Ass'y
1	321497	Flanged Nut, No. 10-24
2	325400	Carbonator-Blenders Platform Ass'y (see Figure 6-13)
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	325301	Strap, Capacitor
8	325309	Capacitor, Run
	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)
	325303	Relay, Start
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.

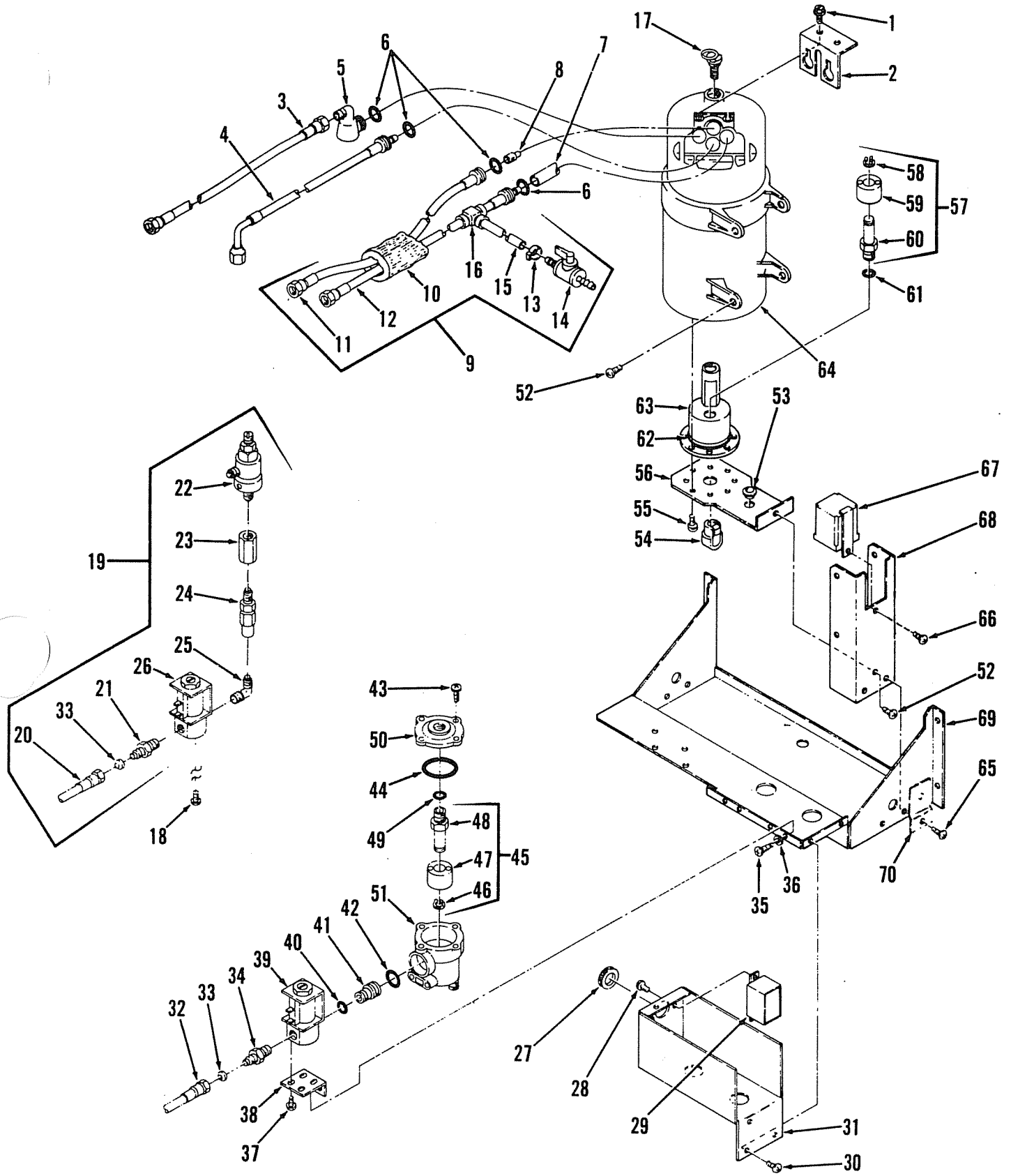

FIGURE 6-13. CARBONATOR-BLENDERS PLATFORM ASSEMBLY

Index No.	Part No.	Name
	325400	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	310536	Tube Ass'y, CO_2, No. 1 Side, 20-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 6-14)
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 20-26)
20	312948-003	Tube Ass'y, Water, 10-in. long
21	176107	Adapter, 1/4 NPTF male by 7/16-20 male
22	312002	Flow Regulator Ass'y, Water (see Figure 6-15)
23	325019	Connector, 1/4 by 1/4 female flare
24	311764-001	Liquid Check Valve Ass'y, Stainless Steel (see Figure 6-16)
25	187485	Elbow, 1/4 NPTF male by 7/16-20 male
26	320667	Solenoid Valve, Water
27	331304	Snap Bushing
28	310461	Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in.
29	315930	Relay, Sold-Out
30	*320271	Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in.
31	325129	Relay Box, Syrup Sold-Out
32	312519	Tube Ass'y, Syrup, 17-in. long
33	178025-100	Tapered Gasket, White
34	176107	Adapter, 1/4 NPTF male by 7/16-20 male
35	*343487	Machine Screw, Phil Pan Hd, No. 8-32 by 1/2-in.
36	*343845	Flat Washer, No. 8
37	320734	Machine Screw, Phil Truss Hd, Sems, No. 6-32 by 1/4-in.
38	315927	Bracket, Solenoid
39	320663	Solenoid Valve, Syrup
40	150058	O-Ring
41	315929	Fitting, Solenoid Adapter
42	183008	O-Ring
43	*343487	Machine Screw, Phil Pan Hd, No. 8-32 by 1/2-in.
44	315925	O-Ring
45	325170	Float Switch Ass'y (includes 46-48)
46	325289	Retaining Clip
47	325148	Float
48	325147	Stem and Switch
49	315931	O-Ring
50	315916	Cover, Float Switch
51	315915	Body, Float Switch
52	*343417	Thread Cutting Screw, Phil Pan Hd, No. 10-32 by 3/8-in.
53	331303	Snap Bushing
54	186570	Strain Relief
55	*343487	Machine Screw, Phil Pan Hd, No. 8-32 by 1/2-in.
56	325131	Support, Switch Holder
57	325288	Float Switch Ass'y (includes 58-60)
58	325289	Retaining Clip
59	325148	Float
60	325290	Stem and Switch
61	315931	O-Ring
62	315925	O-Ring
63	325001	Holder, Float Switch
64	324099-888	Carbonator Tank, No. 1 Side
	324098-888	Carbonator Tank, No. 2 Side
65	*320767	Machine Screw, Phil Pan Hd, Sems, No. 10-24 by 3/8-in.
66	*312251	Thread Rolling Screw, Phil Pan Hd, No. 10-24 by 3/8-in.
67	322678	Relay
68	325127	Support, Carbonator Tank
69	325126	Platform
70	324096	Relay Cover

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

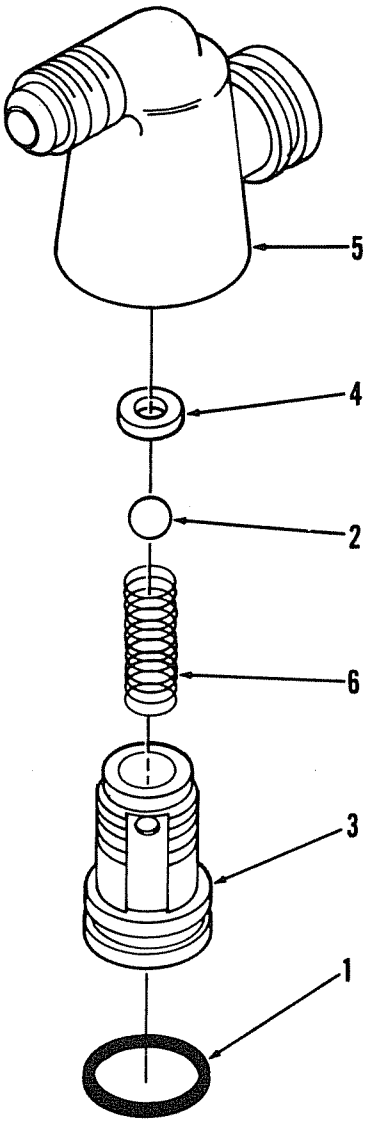

FIGURE 6-14. GAS CHECK VALVE ASSEMBLY, PLASTIC

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

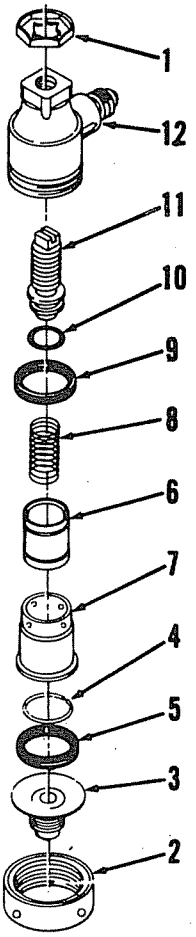

FIGURE 6-15. FLOW REGULATOR ASSEMBLY

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	313921-833	Body, Syrup Regulator
	318936-039	Body, Water Regulator

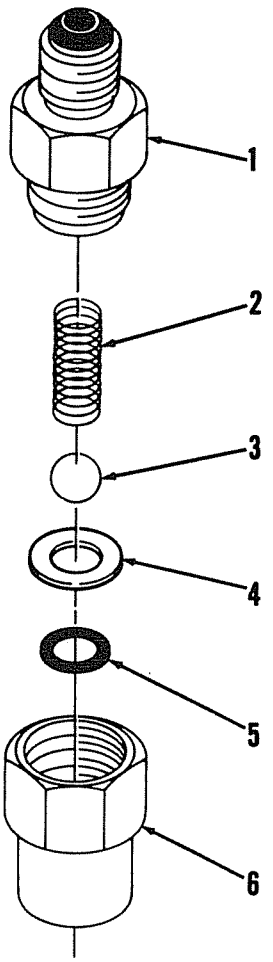

FIGURE 6-16. LIQUID CHECK VALVE ASSEMBLY

Index No.	Part No.	Name
	311764-001	Liquid 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

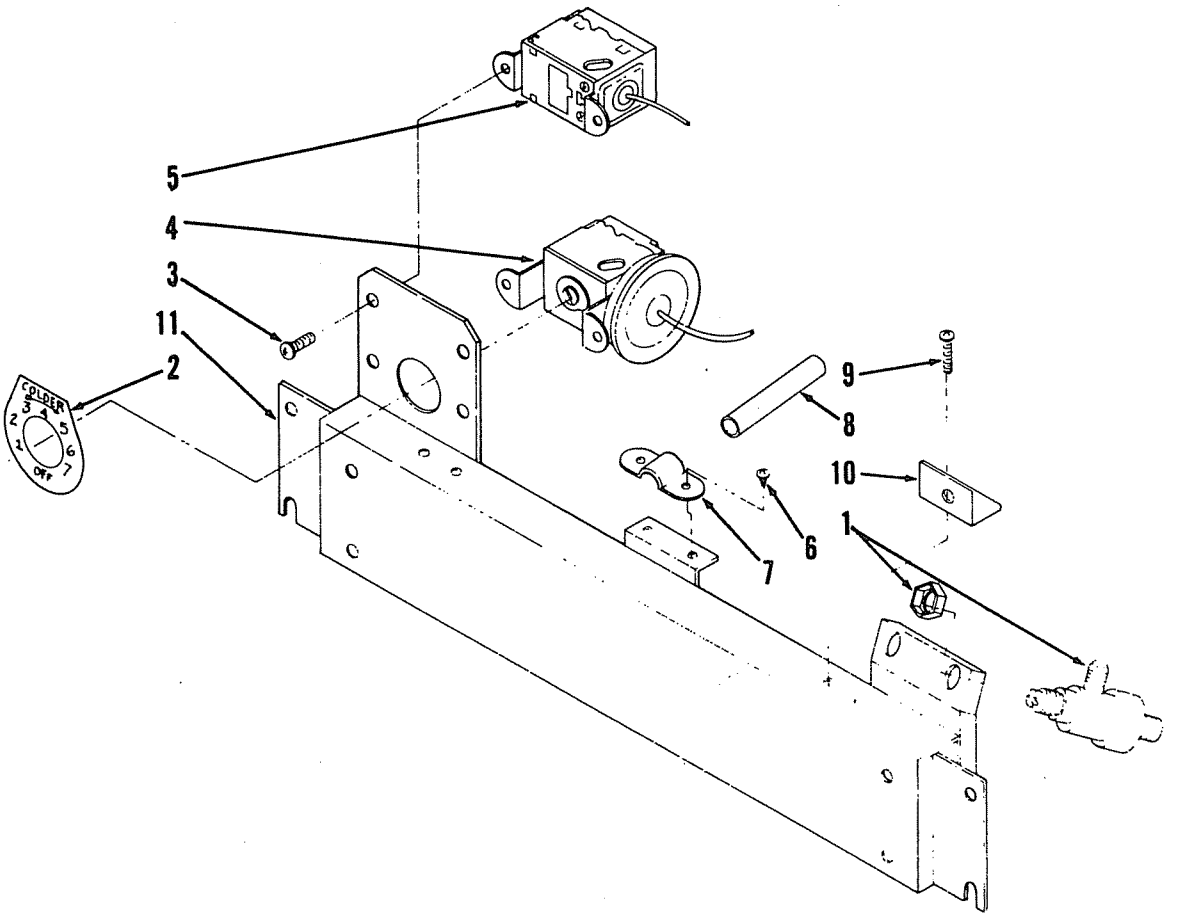

FIGURE 6-17. DRIP TRAY PANEL ASSEMBLY

Index No.	Part No.	Name
	322277	Drip Tray Panel Ass'y
1	310198-133	Flow Regulator Ass'y. Syrup (see Figure 6-15)
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.

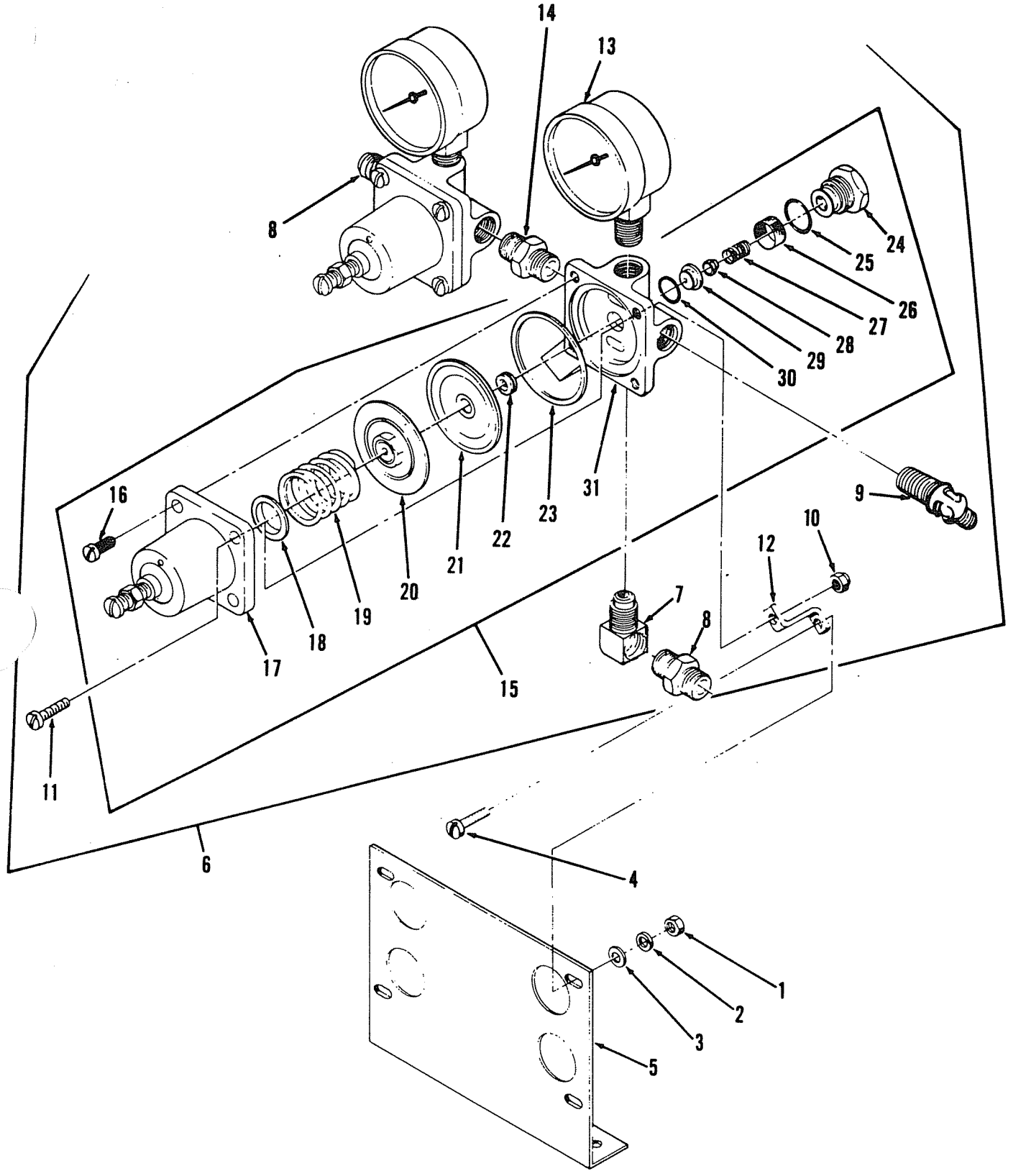

FIGURE 6-18. SECONDARY CO_2 REGULATORS AND BRACKET ASSEMBLY

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	183068	Elbow, Male, 1/4 NPT by 7/16-20
8	183061	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	Manifold Nipple, Hex, 1/4 NPT
15	183460	Pressure Regulator Ass'y (includes 16-31)

*Zinc-plated steel.

Index No.	Part No.	Name
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	183011-007	Baffle
22	130167	Guide, Grey
23	183010	Gasket, Baffle
24	183009-007	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	183001-007	Regulator Body
	183099	Secondary Regulator Repair Kit (includes 20, 22, 23, 25 and 28)

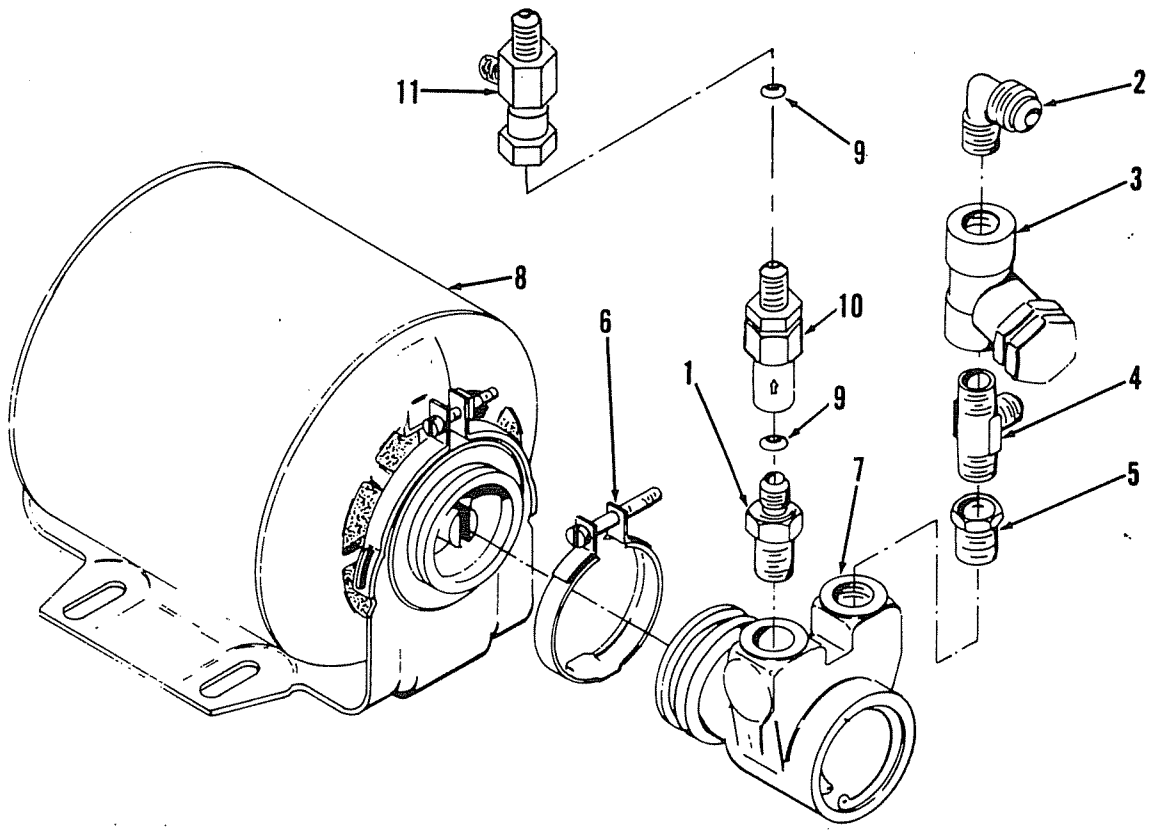

FIGURE 6-19. WATER PUMP AND MOTOR ASSEMBLY

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)
9	178025-100	Tapered Gasket, White
10	311764	Liquid Check Valve (see Figure 6-16)
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

31-7490-000

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