

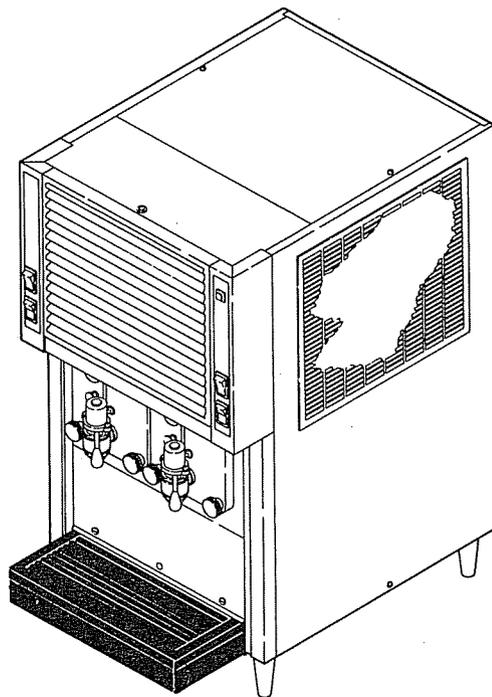


THE CORNELIUS COMPANY

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FCB OVERCOUNTER PRE-MIX DISPENSER

SERVICE MANUAL



28-6032

Manual Part No. 324101-000
September 16, 1985
Revised: June 27, 1989

THIS DOCUMENT CONTAINS IMPORTANT INFORMATION

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

TABLE OF CONTENTS

	Page		Page
SECTION I GENERAL DESCRIPTION	1-1	TROUBLESHOOTING COMPRESSOR	4-9
UNIT DESCRIPTION	1-1	COMPRESSOR COOLS BUT IS VERY	4-9
THEORY OF OPERATION	1-1	NOISY, ESPECIALLY WHEN STOPPING	
SECTION II INSTALLATION	2-1	AND STARTING	
UNPACKING AND INSPECTION	2-1	Probable Cause.....	4-9
IDENTIFICATION OF LOOSE-SHIPED	2-1	Remedy.....	4-9
PARTS		COMPRESSOR COOLS, BUT IS MOD-	4-9
SELECTING LOCATION	2-1	ERATELY NOISY; LOUD ENOUGH TO	
INSTALLING UNIT	2-2	BE NOTICED, BUT NO SHARP BANGS	
INSTALLING BEATERS AND SCRAPER	2-2	OR CLATTERING	
BLADES IN FREEZE CYLINDERS		Probable Cause.....	4-9
INSTALLING DRIP TRAY	2-2	Remedy.....	4-9
INSTALLING PRODUCT TANKS PRIMARY	2-2	COMPRESSOR OPERATES BUT REFRIG-	4-9
CO₂ REGULATOR ON CO₂ CYLINDER		ERATION SYSTEM DOES NOT COOL	
CONNECTING PRODUCT TANKS TO	2-2	Probable Cause.....	4-9
UNIT PRODUCT INLET LINES		Remedy.....	4-9
PREPARATION FOR OPERATION	2-4	COMPRESSOR STARTS AND OPERATES	4-9
OPERATION	2-3	FOR A FEW SECONDS, THEN STOPS	
SECTION III OPERATORS INSTRUCTIONS	3-1	Probable Cause.....	4-9
SECTION IV SERVICE AND MAINTENANCE	4-1	Remedy.....	4-9
PREPARING UNIT FOR SHIPPING,	4-1	COMPRESSOR WILL NOT START	4-9
STORING, OR RELOCATING		ELECTRICAL CHECK	4-10
PERIODIC INSPECTION	4-1	Inoperable Start Relay.....	4-10
REMOVAL OF SIDES AND BACK	4-1	Remedy.....	4-10
PANELS, UPPER FRONT LOUVERED		Replace Start Relay.....	4-10
PANEL, LOWER FRONT ACCESS PANEL,		Low Voltage.....	4-10
AND DRIP TRAY		Remedy.....	4-10
SIDES AND BACK PANELS	4-1	Inoperative Run Capacitor.....	4-10
UPPER FRONT LOUVERED PANEL	4-1	Remedy.....	4-10
LOWER FRONT ACCESS PANEL	4-1	Grounded or Shorted Motor Windings.....	4-10
DRIP TRAY	4-1	Remedy.....	4-10
LUBRICATION	4-1	EQUIPMENT AND SUPPLIES NEEDED	4-10
BEATERS DRIVE MOTOR	4-1	CLEANING CO₂ GAS CHECK VALVES	4-10
VISCOSITY SENSOR, DISPENSING	4-1	SECTION V TROUBLESHOOTING	5-1
VALVE CAGED O-RING, AND BEATER		FREEZE CYLINDER SLOW TO REFILL	5-1
SHAFT SEAL ASSEMBLIES		WITH PRODUCT WHEN DISPENSING	
CLEANING CONDENSER COIL	4-6	FREEZE CYLINDER DOES NOT REFILL	5-1
ADJUSTMENTS	4-6	WITH PRODUCT WHEN DISPENSING	
PRODUCT TANKS PRIMARY CO₂	4-6	PRODUCT WILL NOT DISPENSE OUT	5-1
REGULATOR		OF DISPENSING VALVE (IN ONLY	
VISCOSITY (PRODUCT CONSISTENCY)	4-6	SMALL AMOUNT, OR ONLY LIQUID)	
ADJUSTMENT		CYLINDER FREEZE-UP	5-1
CLEANING AND SANITIZING	4-6	FROZEN PRODUCT, VISCOSITY (CON-	5-1
DAILY CLEANING	4-6	SISTENCY) VARIES EXCESSIVELY	
SANITIZING	4-6	BEATERS MOTOR INOPERATIVE	5-2
REPLENISHING CO₂ SUPPLY	4-8	COMPRESSOR AND BEATERS MOTOR	5-2
REPLENISHING PRODUCT SUPPLY	4-8	OPERATING BUT NO REFRIGERATION	
PRODUCT FLAVOR CHANGE	4-8	ON ONE FREEZE CYLINDER	
RECOMMENDED PROCEDURE FOR	4-8	INSUFFICIENT FREEZE CYLINDER	5-2
INSTALLING REFRIGERATION COM-		REFRIGERATION EVEN AFTER	
PRESSOR KIT		ADJUSTING VISCOSITY CONTROL	
USE CAUTION	4-8	THUMBWHEEL TO MAXIMUM	
		NO FREEZE CYLINDER REFRIGERATION	5-2
		BUT BEATERS MOTOR OPERATING	

TABLE OF CONTENTS (cont'd)

	Page	Figure	Title	Page
SECTION V TROUBLESHOOTING (cont'd)				
UNIT INOPERATIVE WITH BOTH.....	5-2	4-5	GAS CO ₂ CHECK VALVE.....	4-10
POWER SWITCHES IN "AUTO" POSITION		4-6	WIRING DIAGRAM.....	4-11
ACCESSORIES AND TOOLS.....	5-3	6-1	TWO-FLAVOR OVERCOUNTER.....	6-2
SERVICE TOOLS.....	5-3		FROZEN CARBONATED BEVERAGE DISPENSER	
SECTION VI ILLUSTRATED PARTS.....	6-1	6-2	CONTROL PANEL ASSEMBLY.....	6-5
BREAKDOWN		6-3	FREEZE CYLINDER FACEPLATE....	6-6
WARRANTY.....	6-13		ASSEMBLY	
		6-4	DISPENSING VALVE ASSEMBLY....	6-7
		6-5	BEATER DRIVE SHAFT ASSEMBLY..	6-8
		6-6	BEARING, BRACKET AND.....	6-9
			ACTUATOR ASSEMBLY	
		6-7	SHROUD, CONDENSER AND.....	6-10
			MOTOR ASSEMBLY	
		6-8	REFRIGERATION BASE ASSEMBLY..	6-11
		6-9	CONTROL BOX ASSEMBLY.....	6-12

LIST OF FIGURES

Figure	Title	Page
1-1	FCB OVERCOUNTER PRE-MIX.....	1-1
	DISPENSER	
1-2	FLOW DIAGRAM.....	1-2
2-1	FREEZE CYLINDER-CUTAWAY.....	2-3
	VIEW	
4-1	OPERATING CONTROLS.....	4-2
4-2	UNIT INTERNAL COMPONENTS.....	4-3
4-3	SELF-CLOSING DISPENSING.....	4-4
	VALVE	
4-4	INSTALLING SHAFT SEAL.....	4-5
	ASSEMBLY IN FREEZE CYLINDER	

LIST OF TABLES

Table	Title	Page
1-1	DESIGN DATA.....	1-1
2-1	LOOSE-SHIPED PARTS.....	2-1

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 Two-Flavor FCB (Frozen Carbonated Beverage) Overcounter Pre-Mix Dispenser With Hot Gas Defrost, (hereafter referred to as a "Unit").

UNIT DESCRIPTION

The Unit (figure 1-1) consists basically of two freeze cylinders containing two beaters belt driven by one electric motor, one refrigeration system for both freeze cylinders, a thermostatically controlled hot-gas-defrost system to defrost freeze cylinders, and product inlet lines tubing coiled up inside Unit to transfer product from product tanks to Unit. The components are attached to a steel frame and are enclosed in a painted steel cabinet. The sides and back panels are easily removed (one screw on each panel) to facilitate installation and 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 removable drip tray, with cup rest, is located directly below the dispensing valves.

CAUTION: Before shipping, storing, or relocating unit, product systems *must* be sanitized and all sanitizing solution *must* be purged from 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:	286032
Overall Dimensions:	
Height	34-3/4 inches
Width	18-1/2 inches
Depth Without Drip Tray	24-1/2 inches
Depth With Drip Tray	26 inches
Shipping Weight (approx.)	250 pounds
Compressor Horsepower	3/4 H.P.
Refrigeration System:	
Refrigerant Type	R502
Refrigerant Charge	See Nameplate
Ambient Operating Temperature	40°F to 100°F

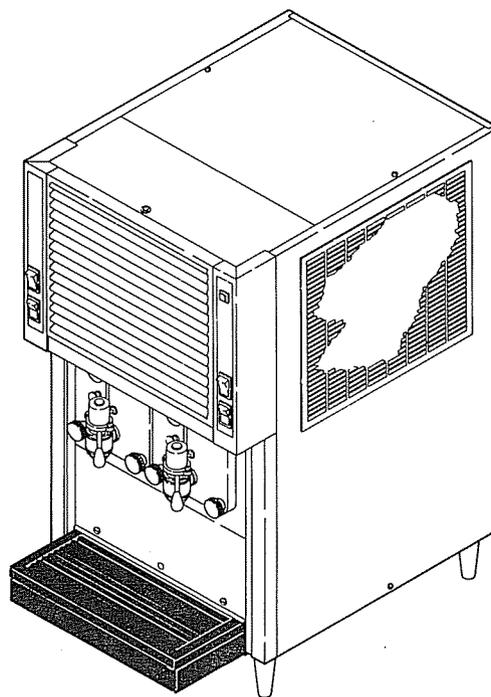


FIGURE 1-1. FCB OVERCOUNTER PRE-MIX DISPENSER

Electrical Requirements:	
Operating Voltage	115 VAC 60 Hz Single Phase
Current Draw	14 Amps

THEORY OF OPERATION (see Figure 1-2)

A CO₂ cylinder delivers carbon dioxide (CO₂) gas through an adjustable primary CO₂ regulator to the two product tanks connected to the Unit. CO₂ gas pressure pushes product out of tanks, through Unit product inlet lines, and on into the freeze cylinders. The Unit refrigeration system maintains product in freeze cylinders at a selected viscosity (product consistency) for dispensing. A transparent faceplate (see Figure 4-1), attached to front of each freeze cylinder, mounts a dispensing valve and spring-loaded relief valve that protects cylinder from accidental over-pressure. The relief valve is also used to bleed CO₂ from freeze cylinder to atmosphere when filling cylinder with product and if gas pockets form in cylinder. A viscosity (product consistency) sensing mechanism for each freeze cylinder provides a means of adjusting viscosity (product consistency) of dispensed product to suit customers preferences.

Freeze Cylinders may be defrosted at any time by momentarily pressing either DEFROST switch on front of Unit.

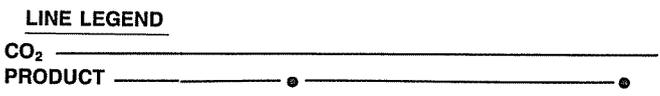
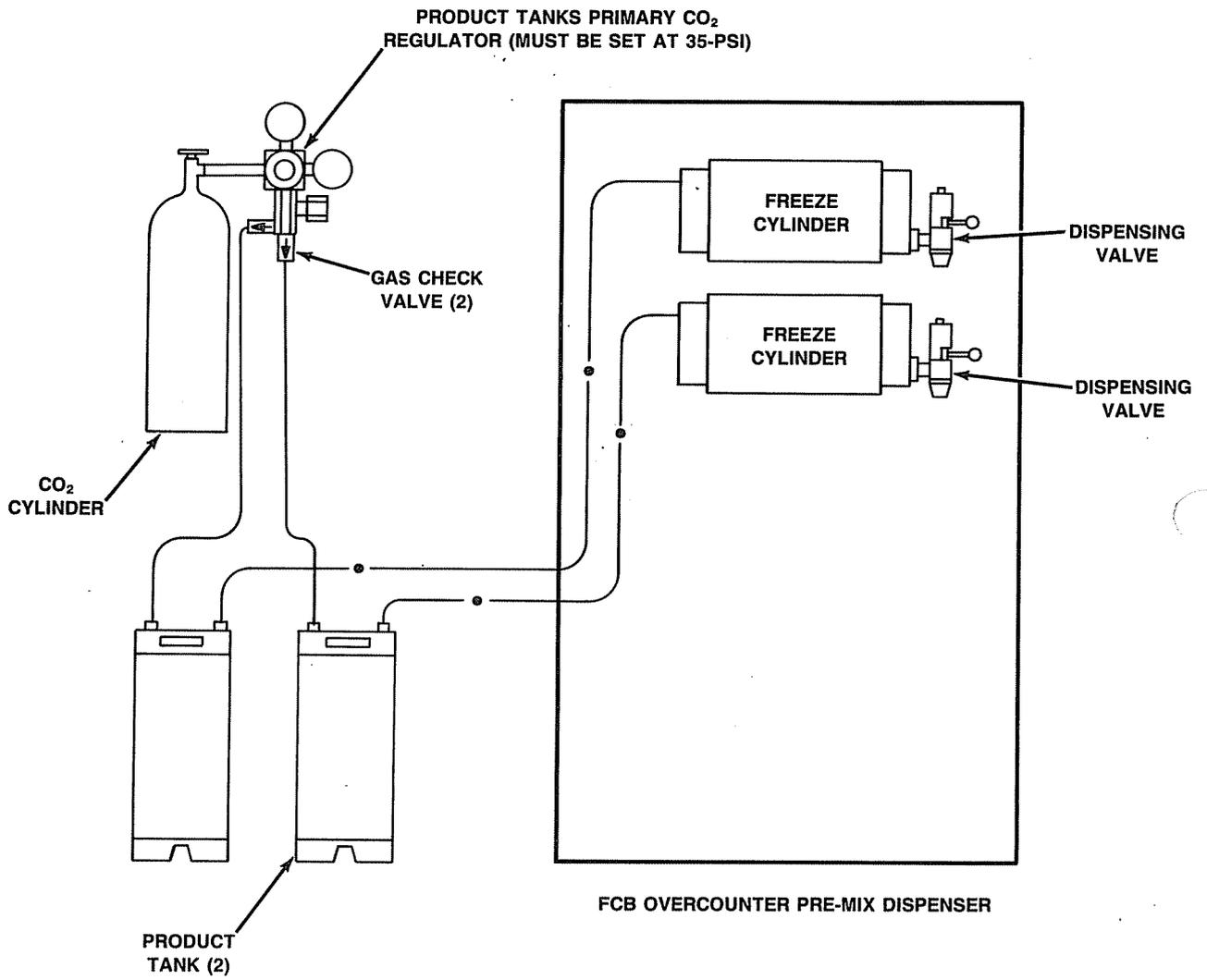


FIGURE 1-2. FLOW DIAGRAM

SECTION II

INSTALLATION

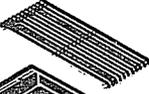
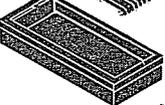
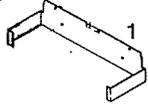
This section covers unpacking and inspection, installing LOOSE-SHIPPED PARTS, selecting location, installation, preparing for operation, and operation.

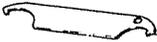
UNPACKING AND INSPECTION (see Figure 4-1)

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 (or not later than 15 days from date of delivery) and immediately reported to the delivering carrier. Request a written inspection report from Claims Inspector to substantiate any necessary claim. File 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 unit sides and back panels as instructed.
- 3) Remove shipping bolts that secure unit to skid, then remove skid.
- 4) 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	178025-100	Tapered Gasket, White 	2
2	325216	Cleaning Brush 	1
3	322165	Electrical Outlet, 20-Amp 	1
4	317660	Cup Rest 	1
5	317659-039	Drip Tray 	1
6	324119	Drip Tray Support 	1
7	323003	Machine Screw, Sl Truss Hd, No. 10-24 by 1/2-in. 	4
8	325357	Front Access Panel 	1
*9	320935	Beater (item 23) 	2
*10	320568	Scraper Blade (item 2) 	4

Item No.	Part No.	Name	Qty
12	322859	Spanner Wrench, Dispensing Valve 	1
13	325684	Operating Instructions 	1
14	314744	Leveling Legs 	4

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

IDENTIFICATION OF LOOSE-SHIPPED PARTS

- 1) TAPERED GASKETS, WHITE (item 1) used if connections are metal-to-metal when connecting Unit product inlet lines to product tanks lines.
- 2) CLEANING BRUSH (item 2) is used to clean faceplates relief valves passages.
- 3) ELECTRICAL OUTLET, 20-AMP (item 3) is provided to enable Unit power cord to be plugged into electrical outlet box.
- 4) DRIP TRAY SUPPORT (item 6) to be installed on front of Unit and secured with two MACHINE SCREWS (item 7).
- 5) FRONT ACCESS PANEL (item 8) to be installed on front of Unit and secured with two MACHINE SCREWS (item 7).
- 6) DRIP TRAY (item 5) to be installed in drip tray support.
- 7) CUP REST (item 5) to be installed in drip tray.
- 8) BEATERS (item 9) and SCRAPER BLADES (item 10) to be installed in freeze cylinders.
- 9) SPANNER WRENCH (item 12) used to remove shank nuts securing dispensing valves to faceplates.
- 10) LEVELING LEGS (item 14) to be installed on bottom of Unit.

SELECTING LOCATION

IMPORTANT: Unit operating ambient temperature MUST NOT EXCEED 100°F. 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 Unit so the following requirements are satisfied:

- 1) Near a properly grounded 115VAC, 60Hz single-phase electrical outlet fused at 20-amperes (Slo-Blow) or circuit connected through an equivalent HACR circuit breaker must be available to the Unit. ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES. MAKE SURE ELECTRICAL OUTLET IS PROPERLY GROUNDED.

NOTE: Circulating air, required to cool the refrigeration system's condenser coil is drawn in through louvered panel on front and is exhausted out through grilles on sides and back panels of Unit. Restricting air circulation through the Unit will decrease its cooling efficiency.

- 2) When installing Unit, *do not* allow obstruction to block louvered panel on front which will block off air intake to inside of Unit. If installation dictates only one side or back being unobstructed, allow 18-inches clearance between Unit and obstruction. If both sides or one side and back are unobstructed, allow 12-inches clearance.

INSTALLING UNIT

INSTALLING LEVELING LEGS (ITEM 14, TABLE 2-1)

IMPORTANT: Care *must* be taken not to tip Unit more than 45° from upright to prevent tearing refrigeration compressor loose from its mounting when installing leveling legs.

Very carefully tilt unit up and install LEVELING LEGS (item 14, Table 2-1) in four corners of unit base.

INSTALLING BEATERS (ITEM 9, TABLE 2-1) AND SCRAPER BLADES (ITEM 10, TABLE 2-1) IN FREEZE CYLINDERS (see Figure 2-1)

- 1) Remove shipping tape that holds VISCOSITY RODS (item 9) to FACEPLATES (item 12).
- 2) Remove four KNURLED NUTS (item 11) and FLAT-WASHERS (item 10) that secure each faceplate to freeze cylinders. Pull faceplates off freeze cylinders.
- 3) Position SCRAPER BLADES (item 2) on nipples at ends of BEATER (item 23) 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 (item 24) on DRIVE SHAFT (item 25).
- 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 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 (item 8) with Dow-Corning (DC111) light grade silicone to facilitate installing faceplates on freeze cylinders. Position each FACEPLATE (item 12) on freeze cylinders so (a) DISPENSING VALVES (item 17) faucets face down, (b) free ends of VISCOSITY RODS (item 9) are in slots of SWITCH ACTUATORS (item 7), and SPINNERS (item 5) clear ends of SCRAPER BLADES (item 2). Secure each faceplate to Unit with four KNURLED NUTS (item 11) and FLAT-

WASHERS (item 10) removed in step 2) preceding. Tighten KNURLED NUTS until faceplates touch all the way around on freeze cylinder flanges. **CAUTION - DO NOT OVERTIGHTEN KNURLED NUTS.**

INSTALLING DRIP TRAY (see Figure 4-1)

- 1) Install DRIP TRAY SUPPORT (item 6), on front of Unit and secure with two MACHINE SCREWS (item 7).
- 2) Connect freeze cylinders drain tube to drain elbow on drip tray support.
- 3) Install FRONT ACCESS PANEL (item 8) on front of Unit and secure with two MACHINE METAL SCREWS (item 7).
- 4) Install DRIP TRAY (item 5) in drip tray support.
- 5) Install CUP REST (item 4) in drip tray.

INSTALLING PRODUCT TANKS PRIMARY CO₂ REGULATOR ON CO₂ CYLINDER (see Figure 1-2)

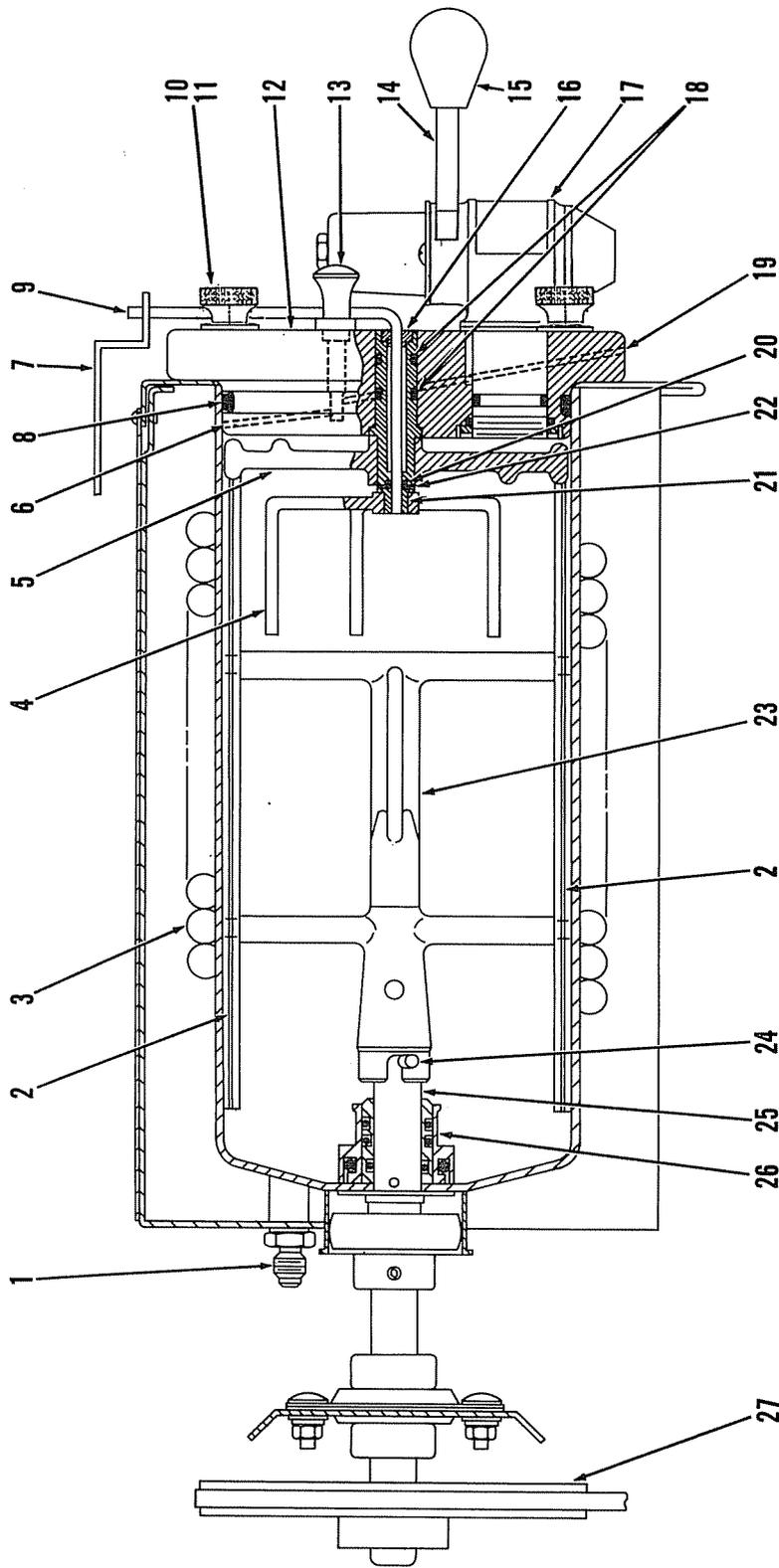


WARNING: To avoid personal injury and/or property damage, always secure CO₂ cylinder in upright position with a safety chain to prevent it from falling over. Should the valve become accidentally damaged or broken off, CO₂ cylinder can cause serious personal injury.

- 1) Place CO₂ cylinder in upright position, then fasten cylinder with safety chain.
- 2) Unscrew protector cap (with chain attached) from CO₂ cylinder valve. Open CO₂ cylinder valve *slightly* counterclockwise to blow any dirt or dust from outlet fitting before installing primary CO₂ regulator, then close valve.
- 3) Remove shipping plug from primary CO₂ regulator coupling nut and make sure gasket is in place inside nut. Install regulator on CO₂ cylinder so gages can be easily read, then tighten coupling nut. **DO NOT OPEN CO₂ CYLINDER VALVE AT THIS TIME.**
- 4) Connect product tanks CO₂ lines to primary CO₂ regulator check valve outlets.
- 5) Install gas quick disconnects on ends of product tanks CO₂ lines. **DO NOT CONNECT CO₂ LINES TO PRODUCT TANKS AT THIS TIME.**

CONNECTING PRODUCT TANKS TO UNIT PRODUCT INLET LINES (see Figure 1-2)

NOTE: Unit product inlet lines may either be connected directly to product tanks by installing liquid disconnects on ends of lines or if tanks are remote, tank product lines may be connected to Unit product inlet lines using adapter fittings provided.



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

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

FIGURE 2-1. FREEZE CYLINDER-CUTAWAY VIEW

- 1) Remove left (facing front of Unit) side panel as instructed.
- 2) Route Unit product inlet lines labeled No. 1 and No. 2 out through hole provided in Unit base. **MAKE SURE LINES DO NOT INTERFERE WITH ANY MOVING PARTS.**
- 3) Connect Unit product inlet lines to product tanks by one of two methods described in preceding note. If connections will be metal-to-metal, seal connections with **TAPERED GASKET, WHITE** (item 1).
- 4) Install liquid disconnects on ends of product inlet lines. **DO NOT CONNECT PRODUCT LINES TO PRODUCT TANKS AT THIS TIME.**
- 5) Install Unit side panel by reversing removal procedure.
- 6) Move Unit into operating position.

PREPARATION FOR OPERATION

- 1) Make sure both "POWER" switches, located on front of Unit, are pressed to "OFF" positions.
- 2) Plug Unit power cord into electrical outlet with proper electrical requirements.
- 3) Open CO₂ cylinder valve slightly to allow regulator to slowly fill with gas, then open valve fully to backseat valve. (Back seating valve prevents gas leakage around valve shaft).
- 4) Adjust product tank primary CO₂ regulator as instructed.
- 5) Unit must be sanitized prior to operation. Sanitize Unit as instructed.

OPERATION

- 1) Make sure both "POWER" switches are pressed to "OFF" positions.
- 2) Connect CO₂ and product lines to product tanks.
- 3) Repeatedly pull and release faceplate relief valves on front of freeze cylinders faceplates (see Figure 1-3) to slowly bleed CO₂ gas from cylinders and to allow product to enter and fill cylinders.
- 4) Press both "POWER" switches to "AUTO" positions. Beaters motor and refrigeration system will start. Refrigeration system will cycle off but beaters motor will continue to operate after product in freeze cylinders has reached proper viscosity (product consistency) as described in SECTION III OPERATORS INSTRUCTIONS.
- 5) If necessary, adjust product viscosity (product consistency) as instructed.

SECTION III

OPERATORS INSTRUCTIONS

This section describes operating controls and indicators, dispensed product conditions, operating characteristics, Unit operation, replenishing product supply, product flavor change, checking CO₂ supply, operators daily cleaning of Unit, and sanitizing requirements.

OPERATING CONTROLS AND INDICATORS

"POWER" SWITCHES

The two "POWER" switches (see Figure 1-3), located on front of the Unit, are three-position electrical switches labeled "WASH", "OFF", and "AUTO". The "WASH" position of the switches are used to operate freeze cylinders beaters without refrigeration during flushing or sanitizing. The "AUTO" position is used during normal operation. Both freeze cylinders "POWER" switches must be placed in "OFF" positions to shut down refrigeration and beaters motor for freeze cylinder(s) internal maintenance.

DISPENSING VALVES

Self-closing dispensing valves (see Figure 1-3), located on faceplates on front of Unit, are operated one or both at a time to deliver product to the customer.

"BEATER STOPPED" INDICATOR LIGHT

The "BEATER STOPPED" indicator light, located on Unit front panel (see Figure 1-3) comes on if beaters motor is not operating.

"DEFROST" SWITCHES

The two "DEFROST" switches (see Figure 1-3), 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 cylinders refrigerant coils to defrost product in cylinders. A light included in each switch remains on until thermostatically controlled defrost cycle is complete.

If it should be desired to cancel thermostatically controlled defrost cycle before cycle is complete, merely place applicable "POWER" switch in "OFF" position, then place switch back in "AUTO" position.

PRODUCT VISCOSITY (PRODUCT CONSISTENCY) CONTROLS

The two viscosity controls (see Figure 1-3), located above the faceplates, control viscosity (product consistency) of the product dispensed. If viscosity adjustment is necessary, adjust as instructed.

FACEPLATE RELIEF VALVES

The faceplate relief valves (see Figure 1-3), 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 CO₂ gas from freeze cylinder to atmosphere during filling and if gas pockets form in cylinder during operation.

PRODUCT TANKS PRIMARY CO₂ REGULATOR

The product tanks primary CO₂ regulator (see Figure 1-2) controls CO₂ pressure to the product tanks. If necessary to adjust primary CO₂ regulator, adjust as instructed.

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 CO₂ gas breakout and secondary by freezing.*

Overrun is a Variable.

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

Specific Product Ingredients Affect Overrun.

Each product 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 amount of sugar in a drink has a direct bearing on product's freezing characteristics.*



DRAWING 1

Low Dispensing Volume Affects Overrun.

When Unit sets idle for a period of time and no drinks are dispensed, CO₂ gas in system takes a "set". When first few drinks are drawn off after an idle period, CO₂ gas has less tendency to break out as 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 break out in frozen carbonated form of that drink. For example, *drinks with 3.0 volume of carbonation will have more gas breakout in frozen carbonated form, and more overrun, than will drinks that contain 2.0 volumes of CO₂ gas.*

Freezing Affects Overrun.

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

OPERATING CHARACTERISTICS

The viscosity (product consistency) can be varied by viscosity control setting from a high overrun light drink to a wet heavy drink. The length of freezing cycle and amount of CO₂ present in 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 last drink was drawn from the particular freeze cylinder and 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 drink described by turning viscosity control thumbwheel in, a cylinder freeze-up may be expected under casual draw conditions.



DRAWING 2

- 2) If product is drawn from freeze cylinder quite regularly, its consistency will be maintained at whatever setting was made within normal variance of compressor off and on cycle. See Drawing 2.
- 3) If product is drawn continuously from freeze cylinder and rate is approaching capacity of Unit, overrun of drink will increase just prior to point capacity is exceeded, and drink dispensed will turn slightly wetter.
- 4) If a mounding-type drink is desired and Unit is set for this type drink, but a large number of drinks are drawn very rapidly or in extremely large quantities exceeding capacity of Unit, drink dispensed will turn wet and will not mound up in cup. See Drawing 3.

NOTE: Do not attempt to make drinks drier or stiffer by adjusting viscosity control thumbwheel when wet drinks are caused by exceeding capacity of Unit. Adjustments made under these conditions cause cylinder freeze-ups under casual draw.

VISCOSITY (PRODUCT CONSISTENCY)

ADJUSTMENT

The viscosity (product consistency) of the product to be dispensed is set at factory but can be varied to customer's preference. If necessary to adjust viscosity of dispensed product, adjust as instructed.

UNIT OPERATION

- 1) Make sure product tanks primary CO₂ regulator is adjusted as instructed.
- 2) Make sure CO₂ and product inlet lines are connected to product tanks.
- 3) Make sure Unit power cord is plugged into electrical outlet, then press both "POWER" switches to "AUTO" positions. Beaters motor and refrigeration system will start. Refrigeration system will cycle off but beaters motor will continue to operate after product in freeze cylinders has reached proper viscosity (product consistency). Unit is now ready for dispensing.



DRAWING 3

REPLENISHING PRODUCT SUPPLY

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

PRODUCT FLAVOR CHANGE

Change product flavor as instructed.

CHECKING CO₂ SUPPLY

Make sure CO₂ cylinder shutoff valve is fully opened and primary regulator assembly 1800-psi gage indicator is not in shaded ("change CO₂ cylinder") portion of dial. If so, CO₂ cylinder is almost empty and must be replaced as instructed.

CLEANING AND SANITIZING

DAILY

The Unit should be cleaned daily or more often if necessary as instructed.

SANITIZING

The Unit should be sanitized as instructed every 90 days and before and after storage periods following parent company requirements and sanitizer manufacturer's recommendations.

CLEANING CONDENSER COIL

NOTE: Circulating air, required to cool the refrigeration system condenser coil, is drawn in through louvered panel on front and is exhausted out through grilles on sides and back of Unit. Restricting air circulation through the Unit will decrease its cooling efficiency.

Condenser coil must be cleaned periodically as instructed.

LUBRICATION

Beaters drive motor bearings must be lubricated periodically as instructed.

ADJUSTMENTS

PRODUCT TANKS PRIMARY CO₂ REGULATOR

The primary CO₂ regulator regulates CO₂ pressure to the product tanks. If necessary to adjust primary CO₂ regulator, adjust as instructed.

VISCOSITY

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

CLEANING CO₂ GAS CHECK VALVES

The CO₂ gas check valves *must* be inspected and serviced at least once a year under normal conditions and after any CO₂ system servicing or disruption as instructed.

SECTION IV

SERVICE AND MAINTENANCE

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



WARNING: Disconnect electrical power to Unit to prevent personnel injury before attempting any internal maintenance. Only qualified personnel should service internal components or electrical wiring.

PREPARING UNIT FOR SHIPPING, STORING, OR RELOCATING

CAUTION: Before shipping, storing, or relocating Unit, product systems *must* be sanitized and all sanitizing solution *must* be purged from 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 CO₂ cylinder valve is fully open and primary CO₂ cylinder regulator assembly 1800-psi gage indicator is not in shaded ("change CO₂ cylinder") portion of dial. If so, CO₂ cylinder is almost empty and must be replaced.
- 2) Make sure product tanks contain sufficient amount of product for Unit operation.
- 3) Circulating air, required to cool the refrigeration system condenser coil inside the Unit, is drawn in through louvered panel on front and is exhausted out through grilles on sides and back of Unit. Make sure louvered panel and grilles are not obstructed. Refer to *CLEANING CONDENSER COIL* in this section.

REMOVAL OF SIDES AND BACK PANELS, UPPER

FRONT LOUVERED PANEL, LOWER FRONT

ACCESS PANEL, AND DRIP TRAY (see Figure 4-1)

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

SIDES AND BACK PANELS

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.

UPPER FRONT LOUVERED PANEL

Remove upper front louvered panel by removing screw and flatwasher securing top of panel, then lift panel up and out.

LOWER FRONT ACCESS PANEL

Remove lower front access panel by removing two screws securing panel, then remove panel.

DRIP TRAY

Remove drip tray by lifting tray up and out of drip tray support.

LUBRICATION

BEATERS DRIVE MOTOR (see Figure 4-2)

Beaters drive motor must be lubricated once a year as instructed on motor. **DO NOT OVER OIL.**

VISCOSITY SENSOR, DISPENSING VALVE CAGED O-RING, AND BEATER SHAFT SEAL ASSEMBLIES (see Figures 2-1, 4-3 and 4-4)

Lubricate 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 unit is sanitized as follows:

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

- 1) Remove KNURLED NUTS (item 11), and FLAT-WASHERS (item 10) to remove faceplate assembly.
- 2) Unscrew RELIEF VALVE (item 13) from FACEPLATE (item 12).
- 3) Hold VISCOSITY ROD (item 9) and unscrew VISCOSITY SENSOR (item 4) from FACEPLATE (item 12). Pull SPINNER (item 5), O-RING (item 20), and TEFLON WASHER (item 22) from viscosity rod. Remove viscosity rod from faceplate. Remove REDUCER (item 21) from viscosity sensor.
- 4) Remove BUSHING (item 16) and O-RINGS (item 8) from FACEPLATE (item 12). Carefully remove O-RINGS from bushing.
- 5) Carefully remove large O-RING (item 8) from FACEPLATE (item 12).
- 6) 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.

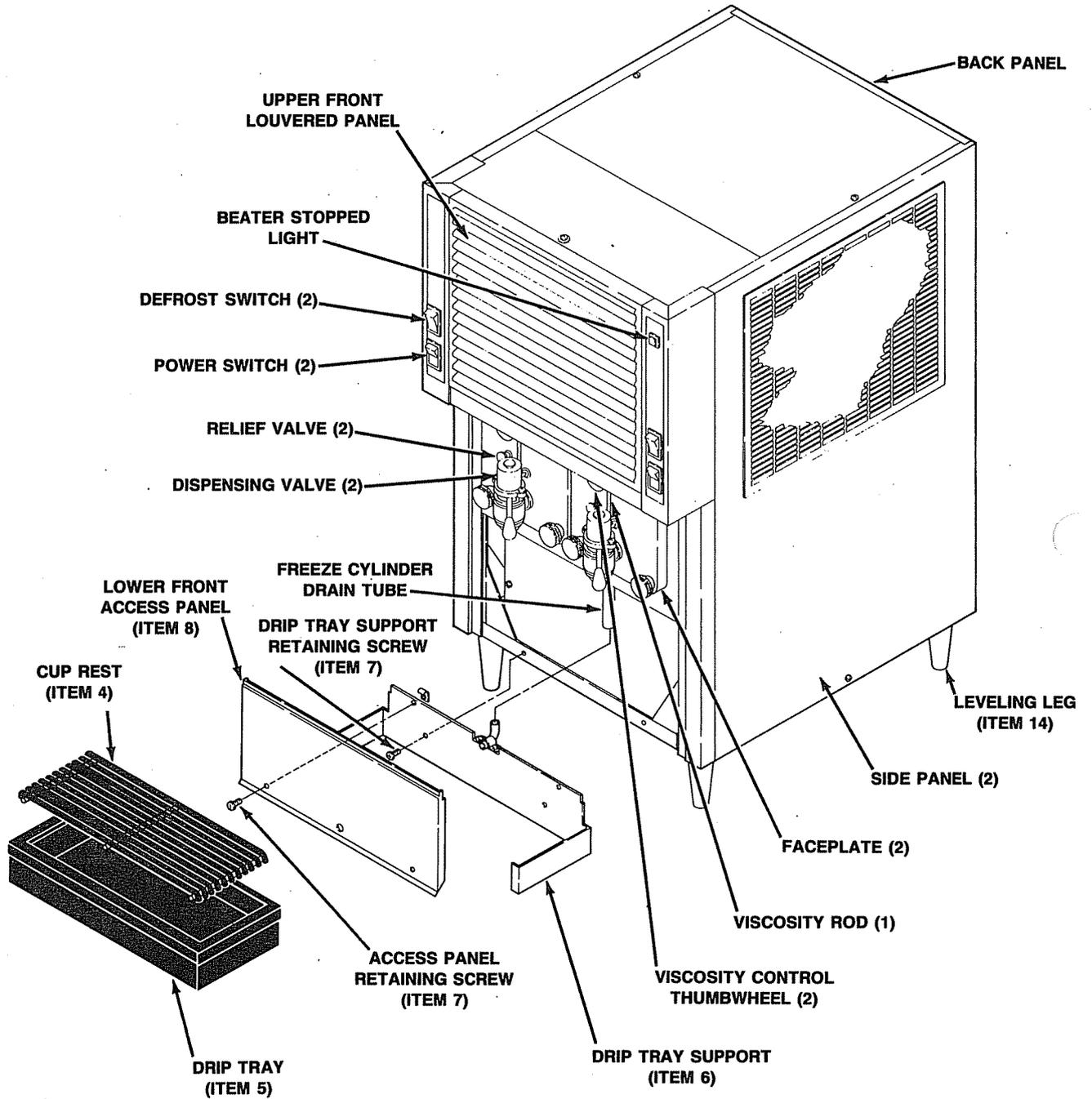


FIGURE 4-1. OPERATING CONTROLS

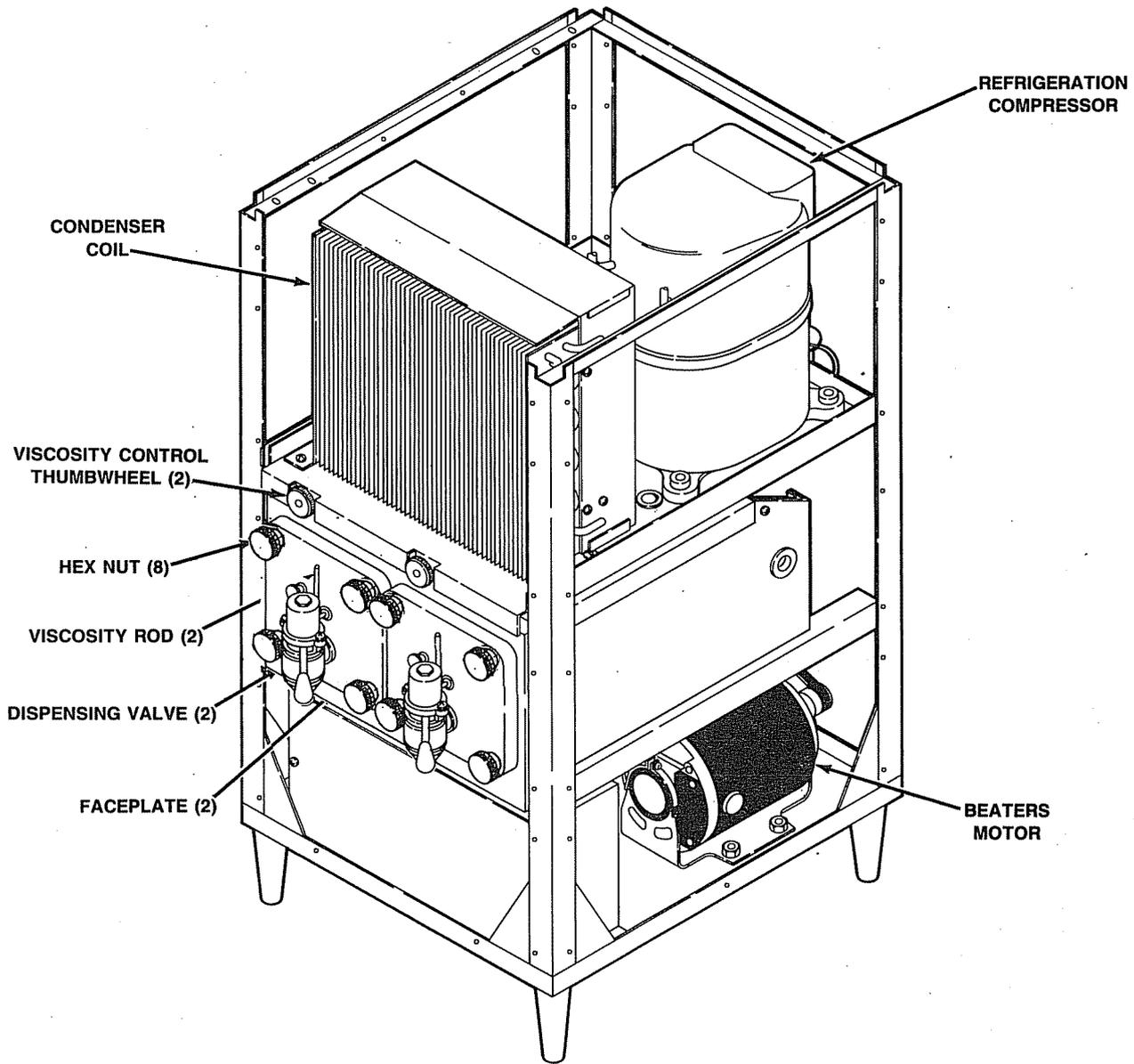


FIGURE 4-2. UNIT INTERNAL COMPONENTS

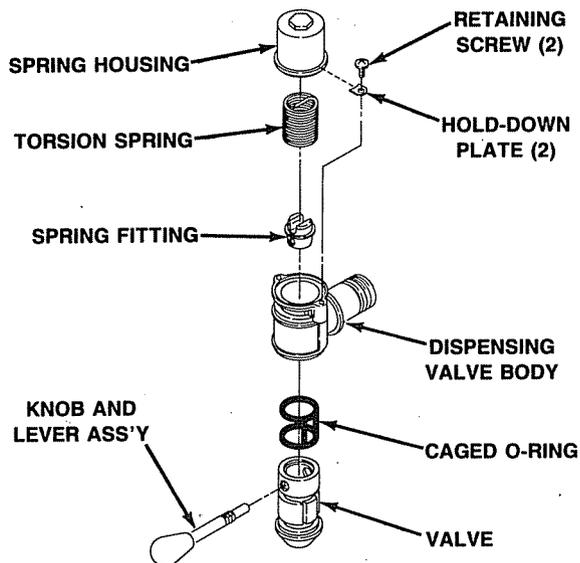


FIGURE 4-3. SELF-CLOSING DISPENSING VALVE

- e. Press valve, with caged O-ring, down and out of dispensing valve body.
- f. Carefully remove caged O-ring from valve.
- 7) Wash all parts in warm water. Remove all traces of syrup and lubricant, especially from faceplate, O-rings, and dispensing valve. If parts are excessively coated, wipe clean with paper towel to remove syrup and lubricant, especially from caged O-ring and dispensing valve. Use **CLEANING BRUSH** (item 2, 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 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.

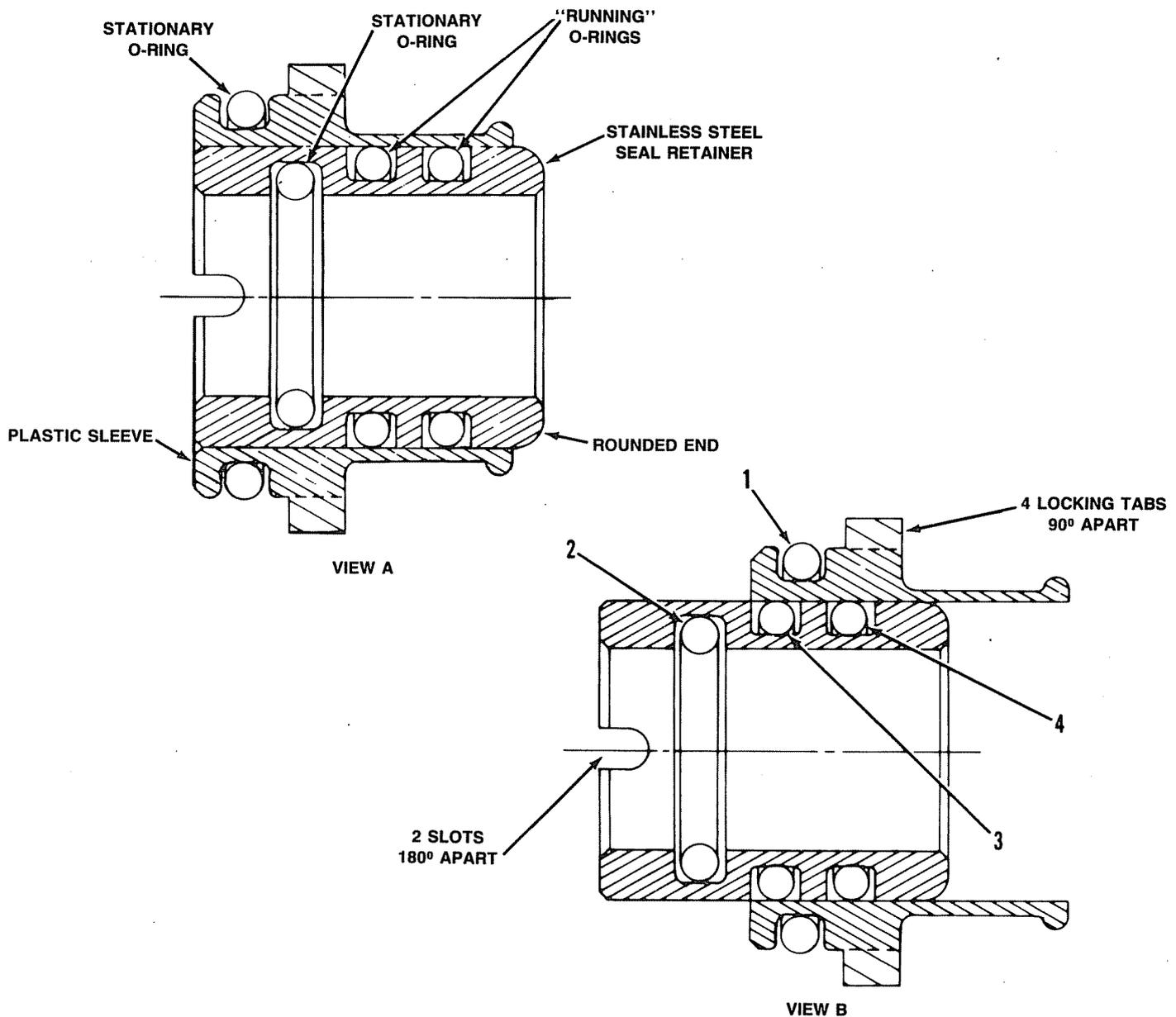


FIGURE 4-4. INSTALLING SHAFT SEAL ASSEMBLY IN FREEZE CYLINDER

- 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 7) with water to facilitate faceplate installation. Tighten knurled nuts until faceplate touches freeze cylinder all around flange. CAUTION-DO NOT OVERTIGHTEN KNURLED NUTS.

CLEANING CONDENSER COIL

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

Periodically clean condenser coil as follows:

- 1) Press POWER switches to "OFF" positions.
- 2) Remove upper front louvered panel as instructed.
- 3) Vacuum or wipe condenser coil with clean cloth or if available, use low pressure compressed air to blow dust out of coil.
- 4) Install upper front louvered panel on unit.
- 5) Press POWER switches to "AUTO" positions.

ADJUSTMENTS

PRODUCT TANKS PRIMARY CO₂ REGULATOR

NOTE: To readjust CO₂ regulator to a lower setting, loosen regulator adjusting screw lock nut, then turn screw to the left (counterclockwise) until pressure gage reads 5-psi lower than new setting will be. Turn adjusting screw to the right (clockwise) until gage registers new setting, then tighten lock nut.

Adjust product tanks primary CO₂ regulator by turning regulator adjusting screw to the right (clockwise) until regulator gage reads 35-psi.

VISCOSITY (PRODUCT CONSISTENCY) ADJUSTMENT (see Figure 4-1)

The viscosity (product consistency) of product to be dispensed was adjusted at factory but can be varied to 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 (above faceplate on front of unit) and turn wheel to the right (clockwise) to increase viscosity. When wheel is turned in this direction, spring tension in control mechanism increases and causes compressor to operate longer. Tighten lock nut after each adjustment.

NOTE: When making viscosity control adjustment, do not adjust thumbwheel more than necessary to obtain desired product. The probability of cylinder freeze-up increases when 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 operate. 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.

CLEANING AND SANITIZING

DAILY CLEANING

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

SANTIZING

NOTE: This unit should be sanitized every 90 days following sanitizer manufacturer's recommendations. Use Chlor-tergent (Oakite Products, Inc.) or equivalent sanitizer.

The Unit should be sanitized every 90 days and before and after storage periods following parent company requirements and sanitizer manufacturer's recommendations. An economic practice is to arrange any product changeover to coincide with sanitizing operation.

Either or both dispensing systems may be sanitized at the same time although the following instructions describe sanitizing both systems in one operation. Proceed as follows:

- 1) Disconnect product tanks from both systems.
- 2) Press both systems POWER switches to "OFF" positions to shut down refrigeration system and to stop beaters in both freeze cylinders.
- 3) Connect clean empty product tank to one of the systems.
- 4) Open applicable dispensing valve and dispense all product from freeze cylinder. As product level lowers in freeze cylinder, partially close dispensing valve to avoid spurting. Close dispensing valve when cylinder is empty.
- 5) Remove empty product tank from system and connect tank to other system.
- 6) Repeat step 4) preceding to dispense all product from other freeze cylinder.



WARNING: To avoid possible personal injury or property damage, do not attempt to remove product tank cover until CO₂ pressure has been released from tank.

- 7) Disconnect tank from system, then pull up on cover relief valve to release CO₂ pressure from tank.
- 8) Refer to VISCOSITY SENSOR, DISPENSING VALVE CAGED O-RING AND BEATER SHAFT SEAL ASSEMBLIES under LUBRICATION and perform procedure to lubricate viscosity sensors, dispensing valve o-rings, and beater shaft seal assemblies.
- 9) Using clean empty product tank, prepare full tank of sanitizing solution using 70°F to 100°F (max) plain water and 1 oz/gallon of sanitizer. This mixture will provide 300-ppm of chlorine.
- 10) Shake sanitizing solution tank to thoroughly mix solution, then connect tank into one of the systems.
- 11) Completely fill applicable 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.
- 12) Disconnect product tank containing sanitizing solution from system and connect to other system.
- 13) Completely fill other freeze cylinder with sanitizing solution by repeating step 11) preceding.
- 14) Disconnect tank containing sanitizing solution from system, then connect empty tank into system.
- 15) Press both POWER switches to "WASH" positions to start beaters.
- 16) Allow beaters to operate for not less than 10 and no more than 15-minutes (max) contact time, then press both POWER switches to "OFF" positions to stop beater motors.
- 17) Hold appropriate container under dispensing valve and dispense until sanitizing solution has been dispensed from freeze cylinder. As sanitizing solution level lowers in freeze cylinder, partially close valve to avoid spurting.
- 18) Disconnect empty product tank from system and connect to other system.
- 19) Repeat step 17) preceding to dispense all sanitizing solution from other freeze cylinder.
- 20) Disconnect empty product tank from system, then release CO₂ pressure from tank by pulling up on cover relief valve.
- 21) Pull both freeze cylinders faceplates relief valves to release all CO₂ pressure from cylinders.
- 22) Remove knurled nuts securing faceplate assembly to freeze cylinder.
- 23) Hold waste container below freeze cylinder, then pull faceplate off freeze cylinder and allow remaining sanitizing solution to drain from cylinder.
- 24) Repeat steps 22) and 23) to remove other faceplate assembly from freeze cylinder and drain remaining sanitizing solution from cylinder.
- 25) Being careful not to touch inside surfaces (surfaces that go inside freeze cylinders) of faceplate assemblies, install faceplates on freeze cylinders and secure with knurled nuts.
- 26) Connect tank containing product into both systems.
- 27) Completely fill both freeze cylinders with product by repeatedly pulling and releasing relief valve knobs on freeze cylinder faceplates and until product comes out of relief valve ports, then release knobs. Open dispensing valves until product flows from valves, then close valves.
- 28) Disconnect tanks containing product from both systems.
- 29) Press both POWER switches to "WASH" positions to start both beaters. Allow beaters to operate for five minutes, then press POWER switches to "OFF" positions.
- 30) Connect empty product tank into one of the systems.
- 31) Hold appropriate container under dispensing valve and dispense until all product has been dispensed from freeze cylinder. As product level lowers in freeze cylinder, partially close valve to avoid spurting.
- 32) Disconnect empty product tank from system and connect to other system.
- 33) Repeat step 31) preceding to dispense all product from other freeze cylinder.
- 34) Disconnect empty product tank from system, then release CO₂ pressure from tank by pulling up on tank cover relief valve.
- 35) Pull both freeze cylinder facepalte relief valves to release all CO₂ pressure from cylinders.
- 36) Remove knurled nuts securing faceplate assembly to freeze cylinder.
- 37) Hold waste container below freeze cylinder, then pull faceplate off freeze cylinder and allow remaining product to drain from cylinder.

- 38) Repeat steps 36) and 37) to remove other faceplate assembly from freeze cylinder and drain remaining product from cylinder.
- 39) Being careful not to touch inside surfaces (surfaces that go inside freeze cylinders) of faceplate assemblies, reinstall faceplates on freeze cylinders and secure with knurled nuts.
- 40) Connect tanks containing product into systems.

CAUTION: Do not relieve freeze cylinder pressures too fast while filling cylinders with product as product will foam excessively and lose its carbonation.

- 41) Intermittently pull and release relief valve knob on faceplate of freeze cylinder. This bleeds CO₂ from cylinder and allows product to enter and fill cylinder.
- 42) Fill other freeze cylinder with product by repeating step 41) preceding.
- 43) Press both POWER switches to "AUTO" positions. Product will be ready to dispense in approximately 10-minutes.
- 44) Thoroughly rinse inside and outside of product tank that was used for sanitizing solution to remove all solution residue.

REPLENISHING CO₂ SUPPLY

When indicator on product tanks primary CO₂ regulator assembly 1800-psi gage is in shaded ("change CO₂ cylinder") portion of dial, CO₂ cylinder is almost empty and should be changed.

- 1) Fully close (clockwise) CO₂ cylinder valve.
- 2) Slowly loose primary CO₂ regulator assembly coupling nut allowing CO₂ pressure to escape, then remove regulator assembly from empty CO₂ cylinder.
- 3) Unfasten safety chain and remove empty CO₂ cylinder.



WARNING: To avoid personal injury and/or property damage, always secure CO₂ cylinder in upright position with safety chain to prevent it from falling over. Should valve become accidentally damaged or broken off, CO₂ cylinder can cause serious personal injury.

- 4) Open (counterclockwise) CO₂ 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 CO₂ connections for leaks. Tighten loose connections.

REPLENISHING PRODUCT SUPPLY

NOTE: The following instructions are applicable only when replenishing same flavor product. Refer to *PRODUCT FLAVOR CHANGE* when changing product flavor.

- 1) Press applicable POWER switch to "OFF" position.
- 2) Disconnect CO₂ and unit inlet product lines from product tank.
- 3) Check product tank quick disconnects for sticky or restricted operation. Clean disconnects in warm water.
- 4) Connect CO₂ and unit product inlet lines to full product tank.
- 5) If freeze cylinder is not full of product, leave POWER switch in "OFF" position. Repeatedly pull and release faceplate relief valve knob to bleed CO₂ from freeze cylinder and allow product to fill cylinder. When freeze cylinder is full, press POWER switch to "AUTO" position.

PRODUCT FLAVOR CHANGE

NOTE: Either one or both product flavors can be changed at the same time. Proceed as follows:

- 1) Refer to SANITIZING in this section and perform sanitizing procedure to system(s) where product flavor change will be made.
- 2) Connect CO₂ and unit inlet product lines to product tank(s) containing new flavor product.
- 3) Leave POWER switch in "OFF" position. Repeatedly pull and release faceplate relief valve knob to bleed CO₂ from freeze cylinder and allow product to fill cylinder.
- 4) Press POWER switch(s) to "AUTO" position. Product will be ready to dispense in approximately 10-minutes.

RECOMMENDED PROCEDURE FOR INSTALLING REFRIGERATION COMPRESSOR KIT

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

IMPORTANT: Only qualified personnel should install refrigeration compressor kit.

USE CAUTION

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

- 1) If the compressor is within warranty period, contact The Cornelius Company Service Department, One Cornelius Place, Anoka, Minnesota 55303-1592, Phone (612) 521-6120 for compressor return shipment instructions.
- 2) *DO NOT* change compressor until you know it is inoperative. Refer to troubleshooting guide included in these instructions.
- 3) *DO NOT* "frost line" charge refrigeration system. 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.

COMPRESSOR 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 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 capacitor that has 15% of the MFD rating in parallel with the existing capacitor.
- c. Try to start compressor.

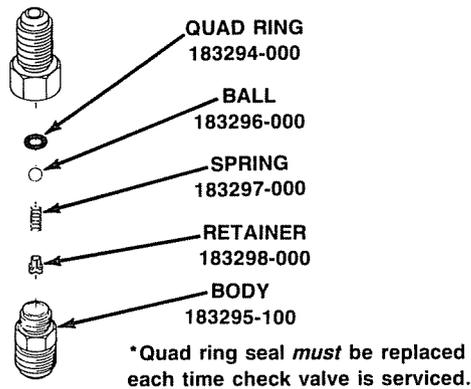


FIGURE 4-5. CO₂ GAS CHECK VALVE

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

ELECTRICAL CHECK

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 103 VAC must be present to operate compressor.

Remedy

If less than 103 VAC is present, upgrade unit power source.



WARNING: To avoid electrical shock even after electrical power has been disconnected from unit, run capacitor *must* be discharged by momentarily touching both capacitor terminals at the same time using an insulated screwdriver.

Inoperative Run Capacitor. Inspect capacitor for bulges, cracks, or any external deformation. If found, assume the capacitor is inoperable. If none of the mentioned conditions are found, disconnect electrical wires from capacitor. Connect test cord to capacitor terminals. Connect ammeter to one wire of test cord. Plug test cord into electrical outlet and observe amp reading.

Use amp reading in formula $\frac{2650 \times \text{Amps}}{\text{Volts}/60 \text{ Hz}} = \text{MFD}$ to determine actual value of capacitor. If calculated 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, then 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 ohms 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.

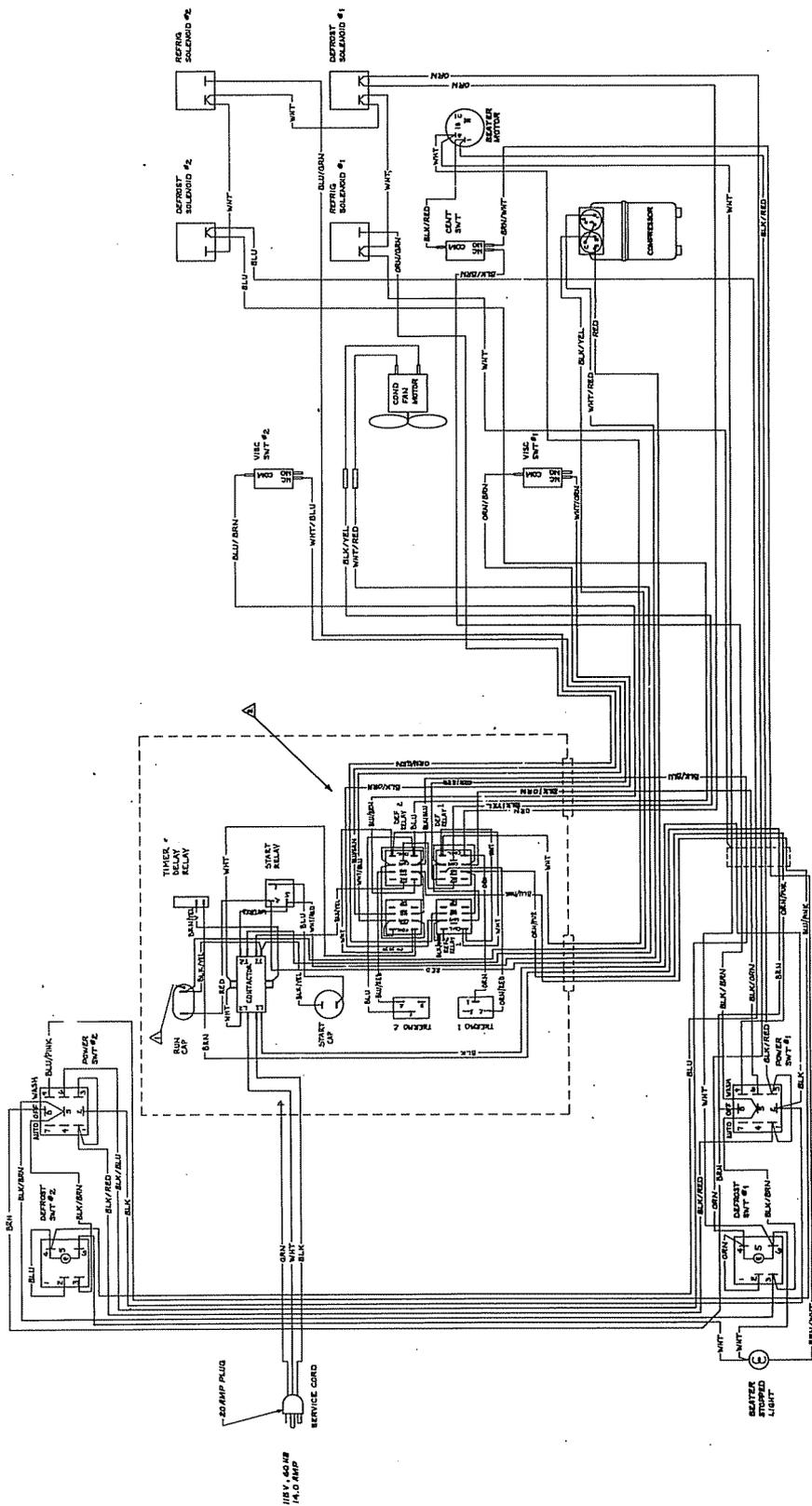
EQUIPMENT AND SUPPLIES NEEDED

- 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 R502 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.

CLEANING CO₂ GAS CHECK VALVES (see

Figures 1-2 and 4-5)

The CO₂ gas check valves must be inspected and serviced at least once a year under normal conditions and after any servicing or disruption of the CO₂ system. ALWAYS REPLACE QUAD RING SEAL EACH TIME CO₂ GAS CHECK VALVES ARE SERVICED.



32-5430-000

FIGURE 4-6. WIRING DIAGRAM

SECTION V

TROUBLESHOOTING



WARNING: Disconnect electrical power to Unit before to prevent personnel injury attempting any electrical repairs to internal components. If service and maintenance to dispensing system must be performed, disconnect all electrical power to Unit, shut off CO₂ supply, disconnect product tanks, then bleed systems pressures before proceeding.

Trouble	Probable Cause	Remedy
FREEZE CYLINDER SLOW TO REFILL WITH PRODUCT WHEN DISPENSING.	<ol style="list-style-type: none"> 1. Product line restricted. 2. CO₂ tank nearly empty (pressure down). 3. Unit inlet product line kinked. 4. CO₂ inlet line quick disconnect not securely connected to product tank. 	<ol style="list-style-type: none"> 1. Sanitize Unit as instructed. 2. Replenish CO₂ supply as instructed. 3. Remove line kink. 4. Secure CO₂ inlet line quick disconnect on product tank.
FREEZE CYLINDER DOES NOT REFILL WITH PRODUCT WHEN DISPENSING.	<ol style="list-style-type: none"> 1. Product tank empty. 2. CO₂ tank empty. 3. Unit inlet product line kinked. 4. CO₂ and/or Unit product inlet line(s) not connected to product tank. 	<ol style="list-style-type: none"> 1. Replenish product supply as instructed. 2. Replenish CO₂ supply as instructed. 3. Remove line kink. 4. Connect CO₂ and/or Unit product inlet line(s) to product tank.
PRODUCT WILL NOT DISPENSE OUT OF DISPENSING VALVE. (IN ONLY SMALL AMOUNTS, OR ONLY LIQUID).	<ol style="list-style-type: none"> 1. Dispensing valve has ice particles in it. 2. Cylinder freeze-up. 	<ol style="list-style-type: none"> 1. Open and close dispensing valve repeatedly. 2. Refer to <i>CYLINDER FREEZE-UP</i>.
CYLINDER FREEZE-UP.	<ol style="list-style-type: none"> 1. Viscosity control thumbwheel set too far clockwise. 	<ol style="list-style-type: none"> 1. Adjust viscosity as instructed.
FROZEN PRODUCT, VISCOSITY (CONSISTENCY) VARIES EXCESSIVELY.	<ol style="list-style-type: none"> 1. Torque sensing device sticking in faceplate bushing. 2. Cylinder freeze-up causing ice formation in center of cylinder and liquid product channels around ice formation. 	<ol style="list-style-type: none"> 1. Sanitize Unit as instructed. 2. Refer to <i>CYLINDER FREEZE-UP</i>.

Trouble	Probable Cause	Remedy
BEATERS MOTOR INOPERATIVE.	<ol style="list-style-type: none"> 1. "POWER" switches in "OFF" position. 2. Loose or broken beaters motor wire. 3. Centrifugal switch spring broken. 4. Overheated beaters motor, turned off by overload protector. 5. Inoperative centrifugal switch or beaters motor. 6. Cylinder freeze-up. 7. One of the beaters drive belts broken. 	<ol style="list-style-type: none"> 1. Press "POWER" switches to "ON" position. 2. Tighten connection, splice, or replace wire. 3. Replace switch. 4. Check for sufficient line voltage or motor condition. 5. Replace switch or motor. 6. Refer to <i>CYLINDER FREEZE-UP</i>. 7. Replace drive belt.
COMPRESSOR AND BEATERS MOTOR OPERATING BUT NO REFRIGERATION ON ONE FREEZE CYLINDER.	<ol style="list-style-type: none"> 1. Inoperative refrigeration solenoid. 2. "POWER" switch pressed to "WASH" position. 	<ol style="list-style-type: none"> 1. Replace solenoid. 2. Press "POWER" switch to "AUTO" position to restore refrigeration to cylinder.
INSUFFICIENT FREEZE CYLINDER REFRIGERATION EVEN AFTER ADJUSTING VISCOSITY CONTROL THUMBWHEEL TO MAXIMUM.	<ol style="list-style-type: none"> 1. Dirty condenser coil. 2. Inoperative condenser fan motor. 3. Loss of refrigerant charge. 	<ol style="list-style-type: none"> 1. Clean condenser coil as instructed. 2. Replace condenser fan motor. 3. Call serviceman.
NO FREEZE CYLINDER REFRIGERATION BUT BEATERS MOTOR OPERATING.	<ol style="list-style-type: none"> 1. "POWER" switches in "WASH" position. 2. Refrigeration compressor inoperative. 	<ol style="list-style-type: none"> 1. Place "POWER" switches in "AUTO" position. 2. Call refrigeration serviceman.
UNIT INOPERATIVE WITH BOTH POWER SWITCHES IN "AUTO" POSITION.	<ol style="list-style-type: none"> 1. Unit power cord unplugged from electrical outlet. 2. Blown electrical power circuit fuse or tripped circuit breaker. 	<ol style="list-style-type: none"> 1. Plug Unit power cord into electrical outlet. 2. Replace electrical power circuit fuse (use only 20-amp "slo-blow" fuse) or reset circuit breaker.

ACCESSORIES AND TOOLS

283025-113	Primary CO ₂ Regulator
511005-000	Cup Holder
511006-000	Cup Holder
511035-000	CO ₂ Changeover Kit

SERVICE TOOLS

281884-400	3-gallon Sanitizing Tank
322063-000	Shaft Seal Assembly Puller
322859-000	Spanner Wrench Dispensing Valve

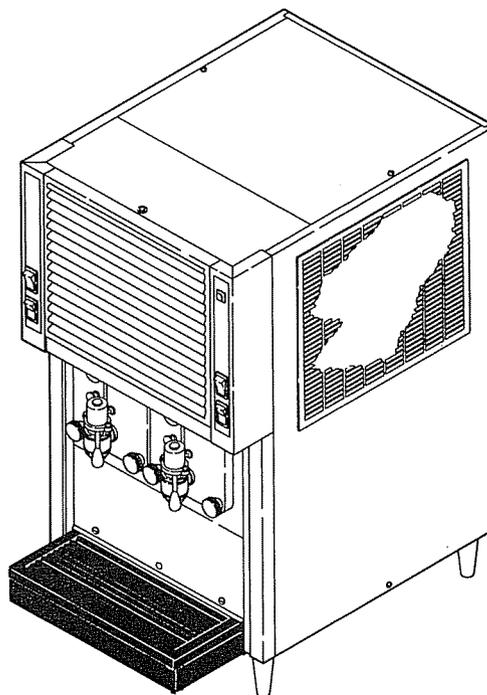


THE CORNELIUS COMPANY

ONE CORNELIUS PLACE
HIGHWAY 10 WEST
ANOKA, MINNESOTA 55303

FCB OVERCOUNTER PRE-MIX DISPENSER

Model Number
286032



SECTION VI ILLUSTRATED PARTS BREAKDOWN

REV: 6-27-89
9-16-85
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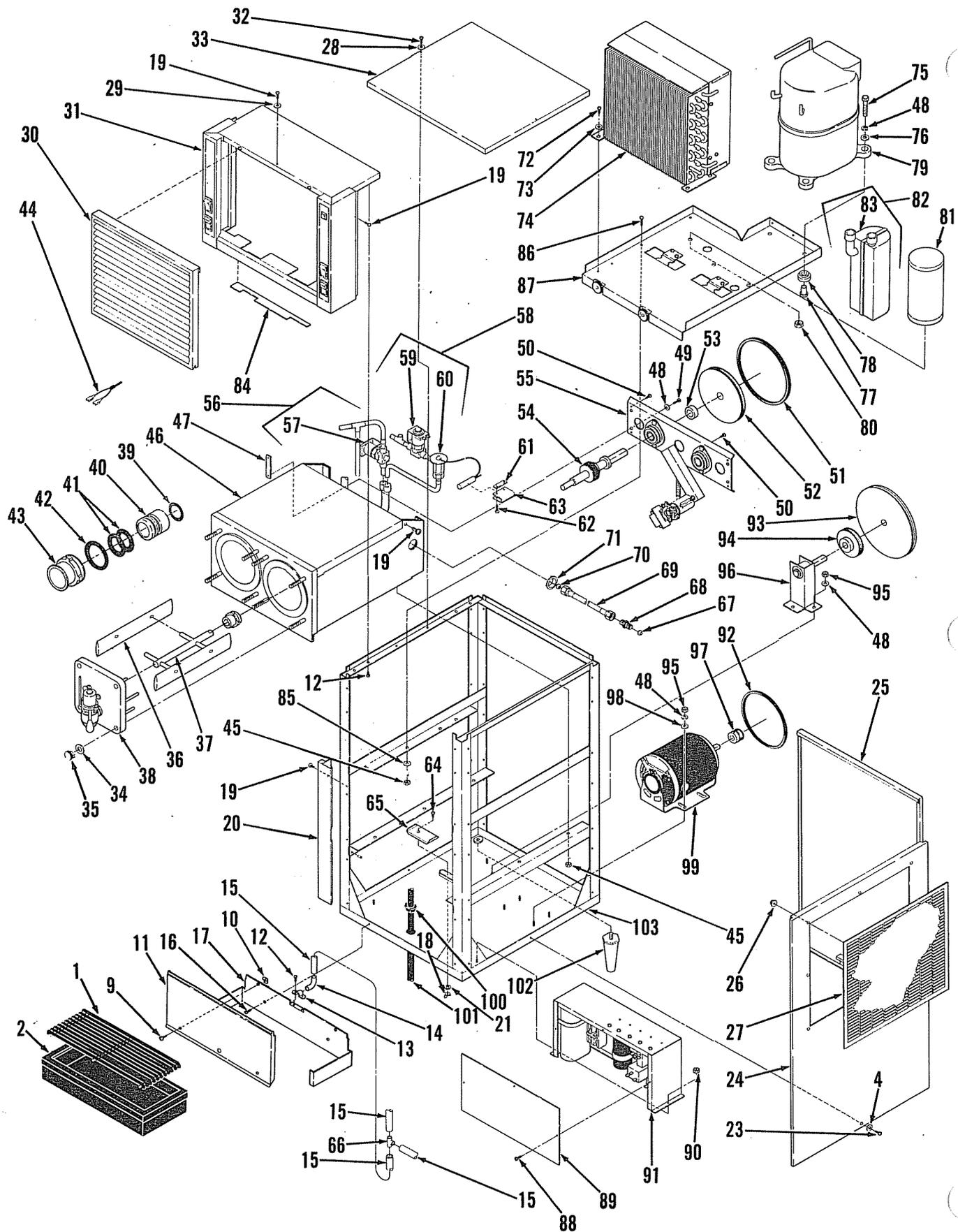


FIGURE 6-1. 2-FLAVOR OVERCOUNTER FROZEN CARBONATED BEVERAGE DISPENSER

Item No.	Part No.	Description	Item No.	Part No.	Description
	286032-168	FCB Dispenser, 2-Flavor, Over-counter	43	320550	Sleeve
1	317660	Cup Rest	44	325391	Wire Harness
2	317659-039	Drip Tray	45	*189429	Hex Nut, 1/4-20
3		Item Not Required	46	325344	Foam Pack Ass'y
4		Item Not Required	47	320604	Twin Nut, 5/16-18
5		Item Not Required	48	*343313	Lock Washer, Ext Tooth, 5/16-in.
6		Item Not Required	49	*311462	Cap Screw, Hex Hd, 5/16-18 by 1/2-in.
7		Item Not Required	50	*320940	Thread Rolling Screw, Hex Hd, No. 10-24 by 5/8-in.
8		Item Not Required	51	325030	Drive Belt, 42-in. long
9	*323003	Machine Metal Screw, SI Truss Hd, No. 10-24 by 1/2-in.	52	325413	Sheave, 6-in. Pitch Dia.
10	*186129	Speed Nut, J-Type, No. 10-24	53	321836	Collar, Bearing
11	325357	Panel, Access	54	320723	Beater Drive Shaft Ass'y (see Figure 6-5)
12	*320271	Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in.	55	325433	Bearing and Support Bracket Ass'y (see Figure 6-6)
13	320776	Strap, Tube	56	325682	Solenoid and Plumbing Ass'y (includes 57)
14	325368	Elbow, Drain	57	325683	Solenoid Valve
15	**140594-015	Tube, .312 I.D. by 12-in. long	58	325680	Solenoid and Expansion Valve Ass'y (includes 59 and 60)
16	*323003	Machine Screw, SI Truss Hd, No. 10-24 by 1/2-in.	59	325683	Solenoid Valve
17	324119	Support, Drip Tray	60	325679	Expansion Valve
18	*187243	Wing Nut, No. 10-24	61	323264	Twin Nut, No. 10-32
19	*320271	Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in.	62	343433	Machine Screw, SI Pan Hd, Stainless Steel, No. 10-32 by 5/8-in.
20	325354-068	Post, Front Corner, Right-Side	63	319428	Clamp, Sensor Bulb
21	325762-068	Post, Front Corner, Left-Side	64	*186770	Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in.
22	325075	Flat Washer, 7/32 I.D. by 1-1/2 O.D.	65	325074	Cover Inlet Lines
23	331301	Pin	66	325668	Tee
	*188206	Thread Rolling Screw, Phil Truss Hd, No. 10-24 by 3/4-in.	67	178025-100	Tapered Gasket, White
24	325350-068	Panel, Side,	68	176193	Fitting, 7/16-20
25	325351-068	Panel, Back	69	325269	Tube Ass'y, .250 I.D. by 95-in. long
26	317658	Pal Nut, .188 Stud	70	178025-200	Tapered Gasket, Red
27	319346-039	Grille	71	*940063	Grommet, Flexible
28	*322967	Lock Washer, Ext Tooth, No. 6	72	*311526	Machine Screw, Phil Truss Hd, No. 10-24 by 1/2-in.
29	*320539	Flat Washer, No. 8	73	*343304	Lock Washer, Ext Tooth, No. 10
30	320761-069	Grille, Front	74	325437	Motor and Shroud Ass'y (see Figure 6-7)
31	325434	Control Panel Ass'y (see Figure 6-2)	75	*320410	Cap Screw, Hex Hd, 5/16-18 by 1-3/4 in. long
32	*320106	Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 1-in.	76	*186147	Flat Washer, 5/16-in.
33	325353-068	Panel, Top	77	320405	Spacer
34	320916	Flat Washer, Special, Stainless Steel, .450 I.D. by .062 thk	78	320404	Grommet
35	320553	Knurled Nut, Nickel-pltd, 7/16-14	79	312859	Compressor Kit
36	320568	Blade, Scraper	80	*150777	Hex Nut, Jam, 3/8-16
37	320935	Body, Beater	81	325446	Receiver
38	325320	Freeze Cylinder Door Ass'y (see Figure 6-3)	82	325370	Accumulator Ass'y (includes 83)
39	320814	O-Ring, .734 I.D. by .139 C.S.	83	325408-010	Accumulator
40	320808	Retaining Seal, Stainless Steel	84	325217	Cover, Soffit
41	320533	O-Ring, .859 I.D. by .139 C.S.	85	*150779	Flat Washer, 1/4-in.
42	320815	O-Ring, 1.234 I.D. by .139 C.S.			

*Zinc-plated steel unless indicated otherwise.

**Sold in bulk quantity only.

Item No.	Part No.	Description	Item No.	Part No.	Description
86	*186394	Cap Screw, Hex Hd, 1/4-20 by 5/8-in.	92	325420	Drive Belt, 32.75 in. long
87		Base, Refrigeration Ass'y (see Figure 6-8)	93	325412	Sheave, 8-in. Pitch Dia.
88	*320271	Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 3/8-in.	94	325411	Sheave, 3.15 in. Pitch Dia.
89	325360	Cover, Control Box	95	186146	Hex Nut, Stainless Steel, 5/16-18
90	*321811	Hex Nut, Keps, No. 10-32	96	325415	Jack Shaft Bracket and Bearing
91		Control Box Ass'y (see Figure 6-9)	97	325028	Pulley, 1.110 Dia.
			98	*186147	Flat Washer, 5/16-in.
			99	325425	Motor, 115V, 1/4 H.P.
			100	313621	Strain Relief
			101	316099	Service Cord
			102	314744	Leg Leveler
			103	325329-068	Frame

*Zinc-plated steel unless indicated otherwise.

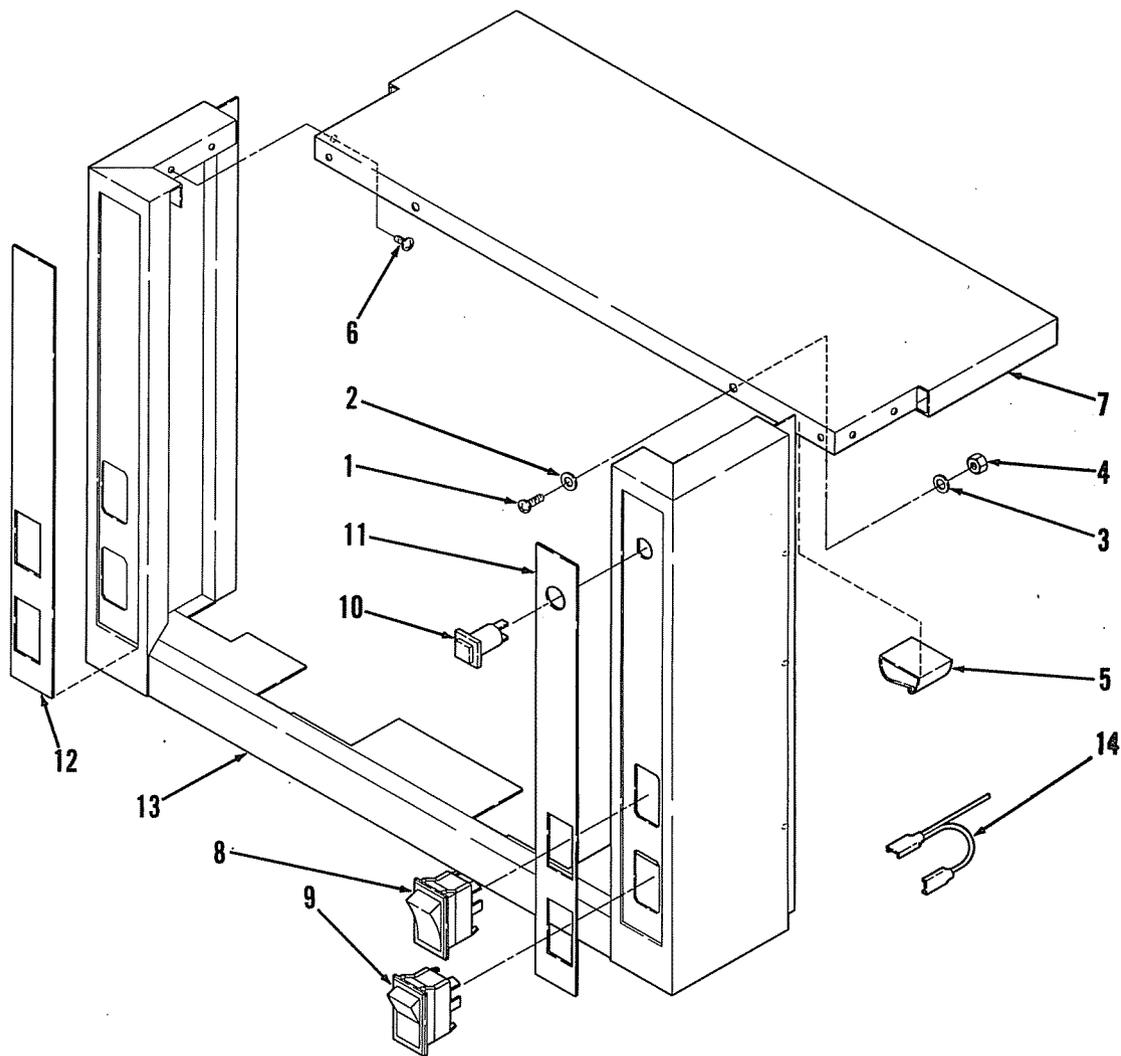


FIGURE 6-2. CONTROL PANEL ASSEMBLY

Item No.	Part No.	Description	Item No.	Part No.	Description
1	325434	Control Panel Ass'y	7	325348-068	Panel, Top
2	*151576	Machine Screw, Phil Truss Hd, No. 10-24 by 3/8-in.	8	325419	Switch, 6 Amp, Rocker with Pilot Light
3	*325070	Flat Washer, .198 I.D. by .060 C.S.	9	320530	Switch, 15 Amp 125 Vac, Three Pole-Double Throw
4	331400	Flat Washer, Stainless Steel, .265 I.D. by .028 thk	10	321022	Light, Indicator, 115 Volt
5	*150904	Hex Nut, No. 10-24	11	325431	Decal, Right-hand
6	*187254	Sheet Metal Screw, Phil Truss Hd, Type A, No. 6 by 3/8-in.	12	325432	Decal, Left-hand
			13	325347-068	Housing, Control Panel
			14	325390	Wire Harness

*Zinc-plated steel unless indicated otherwise.

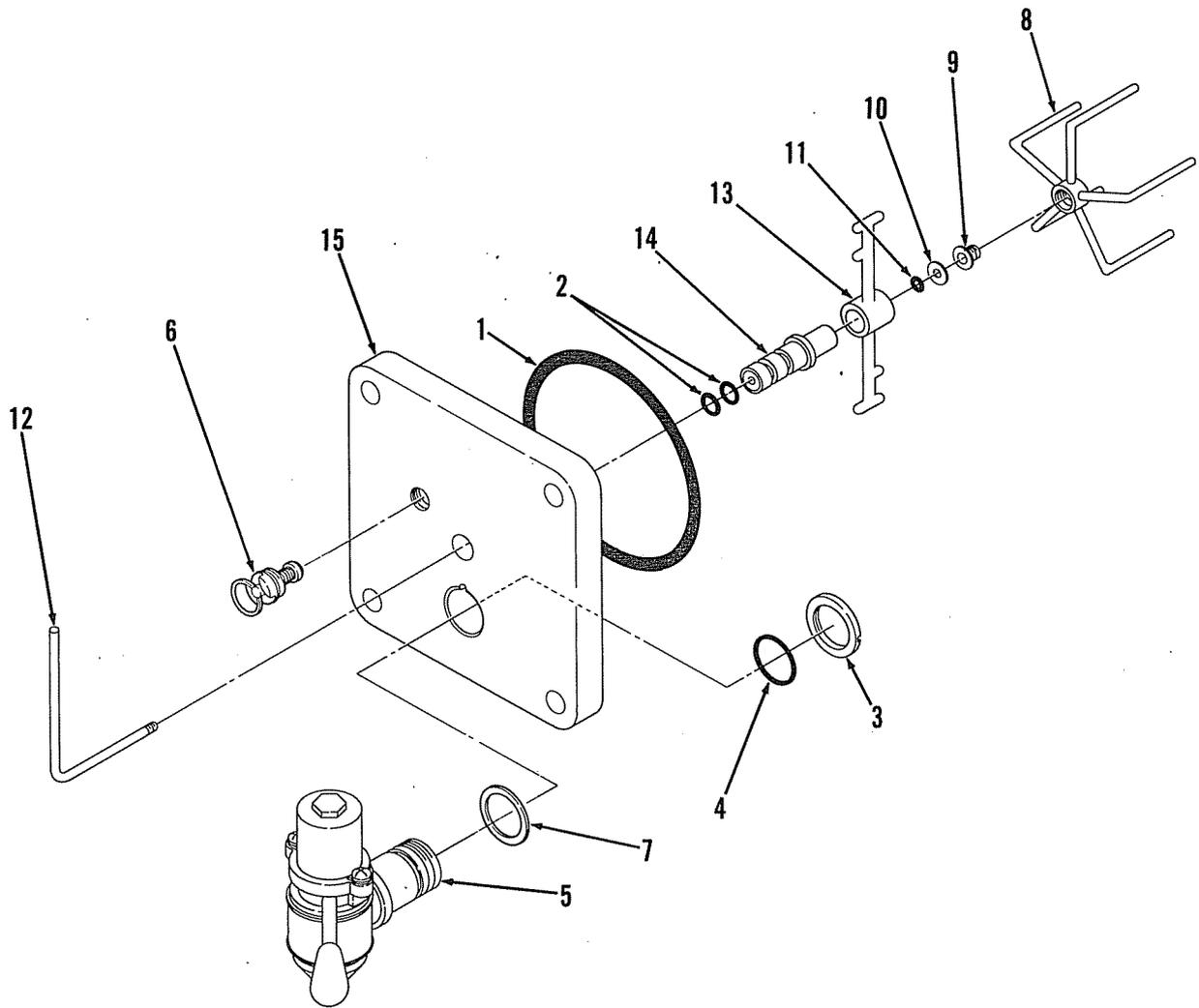


FIGURE 6-3. FREEZE CYLINDER FACEPLATE ASSEMBLY

Item No.	Part No.	Description	Item No.	Part No.	Description
	325320	Faceplate Ass'y	8	322441	Sensor, Viscosity
1	320678	O-Ring	9	322442	Reducer
2	172265	O-Ring	10	321545	Washer, Teflon
3	321652	Nut, Shank	11	321544	O-Ring
4	311086	O-Ring	12	321542	Arm, Viscosity Sensor
5	325308-088	Dispensing Valve Ass'y (see Figure 6-3)	13	321269-001	Spinner
6	325954	Relief Valve Ass'y	14	322069	Bushing
7	325936	Spacer	15	325965	Faceplate

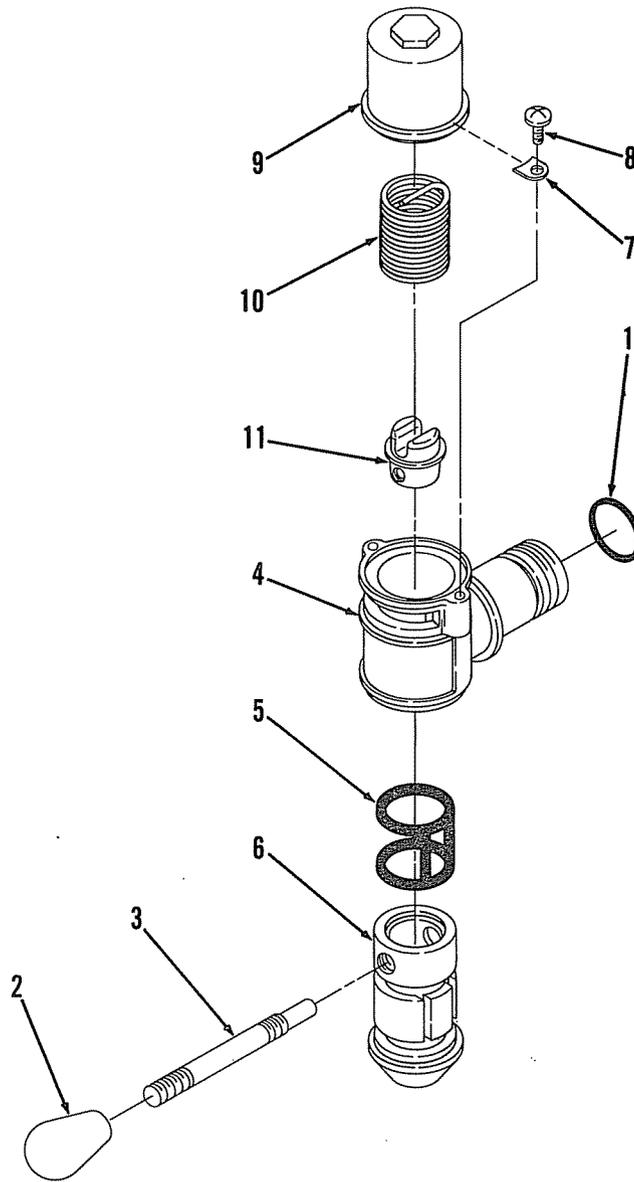


FIGURE 6-4. DISPENSING VALVE ASSEMBLY

Item No.	Part No.	Description
	325308-088	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	325647	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

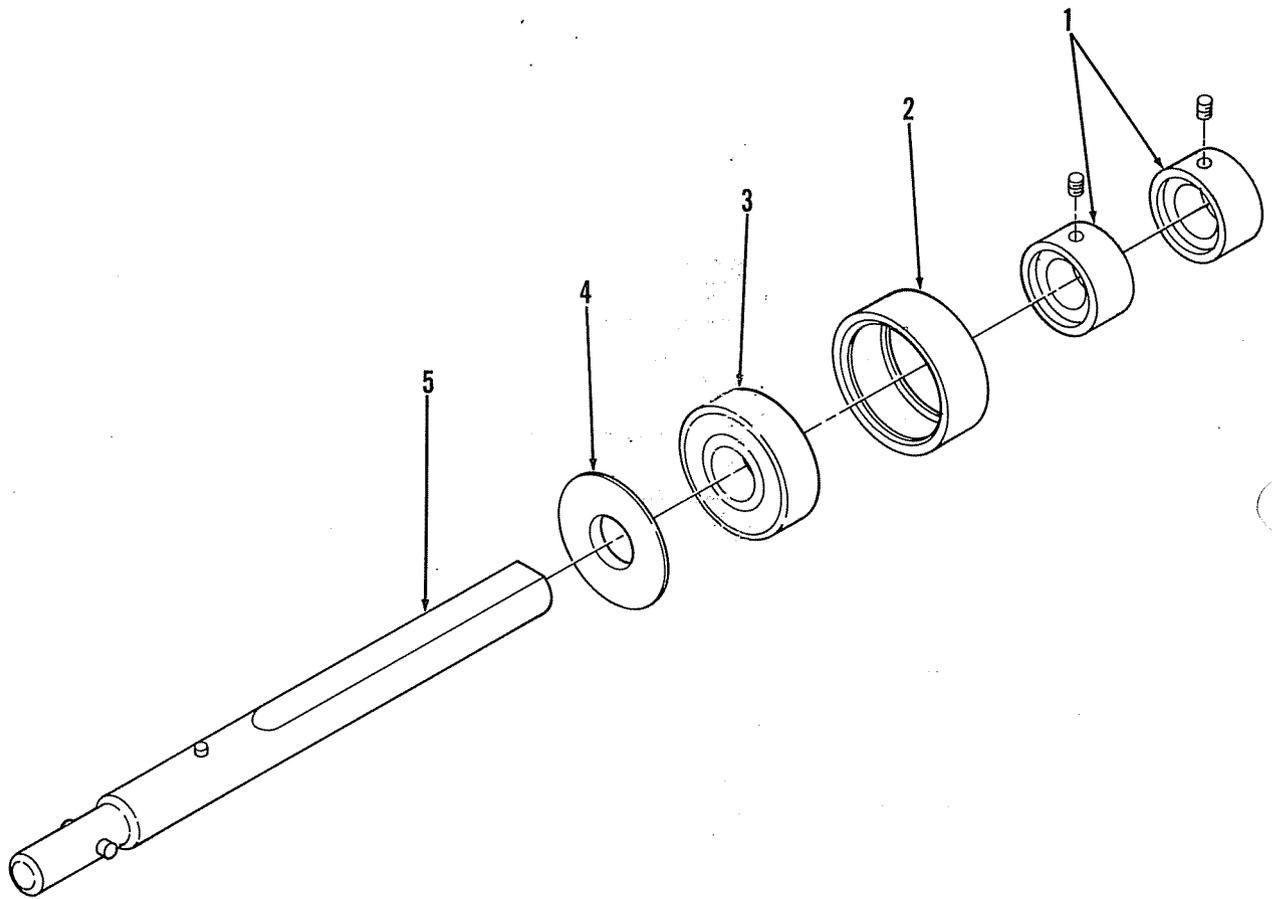


FIGURE 6-5. BEATER DRIVE SHAFT ASSEMBLY

Item No.	Part No.	Description
	<i>320723</i>	Beater Drive Shaft Ass'y
1	321836	Collar
2	325291	Boot, Rubber
3	320557	Bearing
4	320812	Slinger
5	322953	Shaft Ass'y

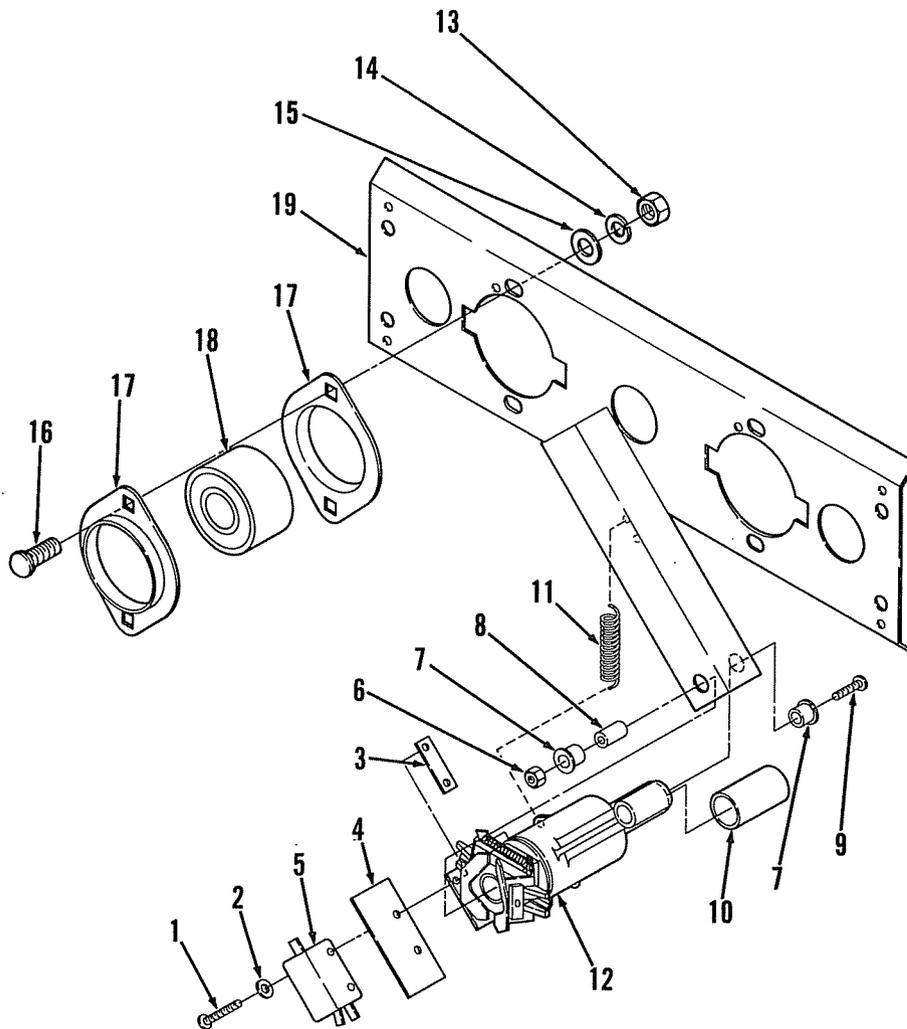


FIGURE 6-6. BEARING, BRACKET AND ACTUATOR ASSEMBLY

Item No.	Part No.	Description	Item No.	Part No.	Description
		Bearing, Bracket and Actuator Ass'y	9	*325292	Machine Screw, SI Rd Hd, No. 1/4-20 by 1-3/4-in. long
1	*199732	Machine Screw, SI Rd Hd, No. 6-32 by 1-in. long	10	325361	Pulley, Idler, .750 Dia.
2	*188490	Lock Washer, Int. Tooth, No. 6	11	322663	Spring
3	311802	Speed Nut, Twin, No. 6-32	12	325278-003	Actuator Ass'y
4	320719	Insulation, Float Switch	13	186146	Hex Nut, Stainless Steel, 5/16-18
5	320777	Switch, Micro	14	*186148	Lock Washer, Spring, 5/16-in.
6	*189429	Hex Nut, Keps, 1/4-20	15	*320737	Flat Washer, 5/16-in.
7	325293	Bearing	16	*320622	Carriage Bolt, 5/16-18 by 3/4-in.
8	325294	Spacer	17	320558	Flange, Bearing
			18	320557	Bearing <i>32-4228-000</i>
			19	325358-068	Bracket, Bearing

*Zinc-plated steel unless indicated otherwise.

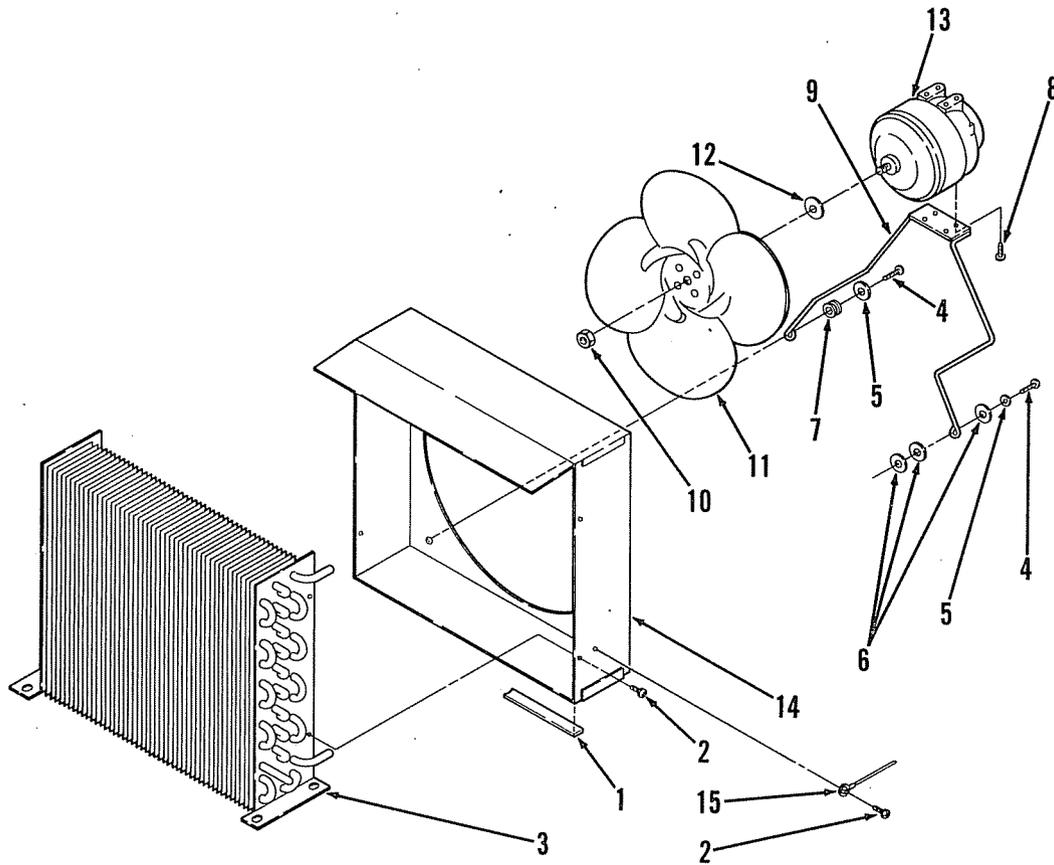


FIGURE 6-7. SHROUD, CONDENSER AND MOTOR ASSEMBLY

Item No.	Part No.	Description	Item No.	Part No.	Description
		Shroud, Condenser and Motor Ass'y	6	*320539	Flat Washer, No. 8
1	186220	Pad	7	321484	Grommet
2	*187254	Sheet Metal Screw, Phil Truss Hd, Type A, No. 6 by 3/8-in.	8	*186154	Machine Screw, Phil Pan Hd, Sems, No. 8-36 by 5/16-in.
3	325748	Condenser Coil	9	320619	Bracket, Motor
4	*186770	Machine Screw, Phil Rd Hd, No. 10-24 by 5/8-in.	10	*189429	Hex Nut, Keps, 1/4-20
5	*120227	Lock Washer, Spring, No. 10, .050 thk	11	310429	Fan, 4-Blade
			12	187394	Silencer
			13	325436	Motor, 60 Hz 115V
			14	325750	Shroud
			15	335673	Ground Wire

*Zinc-plated steel unless indicated otherwise.

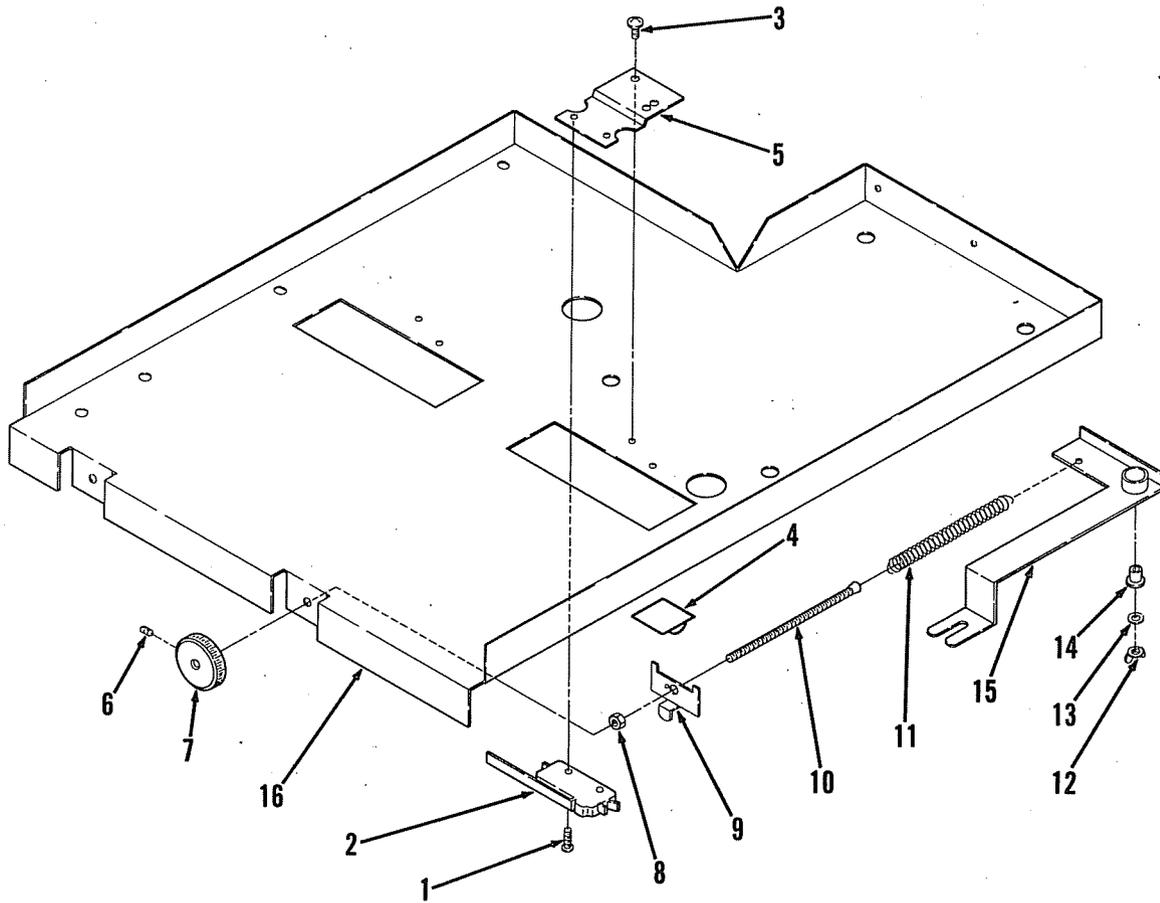


FIGURE 6-8. REFRIGERATION BASE ASSEMBLY

Item No.	Part No.	Description	Item No.	Part No.	Description
1	*320106	Refrigeration Base Ass'y Thread Rolling Screw, Phil Pan Hd, No. 6-32 by 1-in. long	7	321011	Wheel, Torque Adjustment
2	340739	Switch, Float, 15 Amp	8	*150904	Hex Nut, No. 10-24
3	*310461	Thread Rolling Screw, Phil Pan Hd, No. 8-32 by 3/8-in.	9	321010	Plate, Torque
4	313736	Wire Clip	10	*321478	Threaded Rod, No. 10-24 by 3-1/2 in. long
5	322216	Bracket, Switch	11	320610	Spring, Torque Arm
6	187875	Setscrew, Headless Hex Soc, Cup Pt., Stainless Steel, No. 6-32 by 1/8-in.	12	311777	Clip, Reuseable
			13	*343387	Flat Washer, Brass, .250 I.D. by .040 thk
			14	320949	Bearing, Flange
			15	320554	Arm, Torque
			16	325330-068	Base, Refrigeration

*Zinc-plated steel unless indicated otherwise.

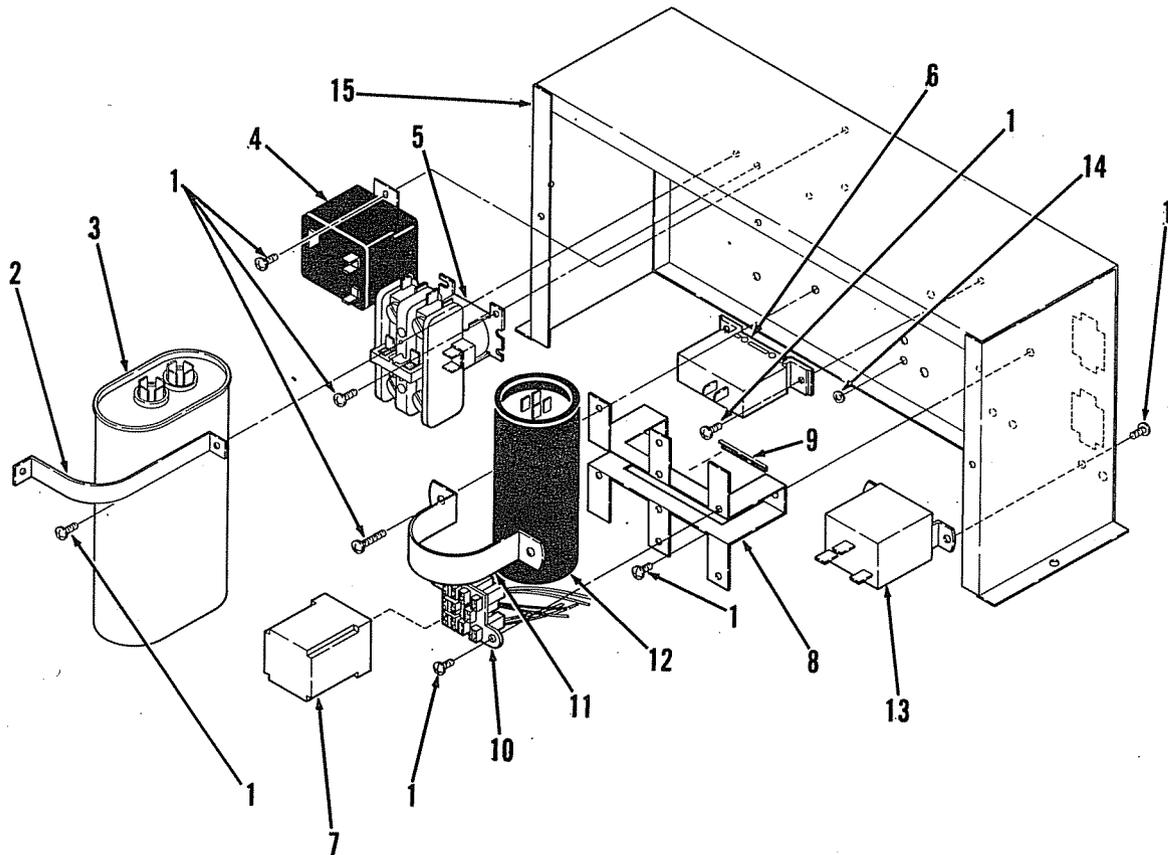


FIGURE 6-9. CONTROL BOX ASSEMBLY

Item No.	Part No.	Description	Item No.	Part No.	Description
1	325428	Control Box Ass'y	7	325764	Relay, 3 Pole Double Throw
	*319941	Thread Cutting Screw, SI Hex Washer Hd, No. 6-32 by 5/16-in.	8	325761	Bracket, Relay
2	325359	Strap, Capacitor, Run	9	319960-005	Edging, Grommet
3	320675	Capacitor, Run	10	325392	Wire Harness
4	325303	Relay, Start	11	325418	Strap, Capacitor, Start
5	325423	Contactor, 115V	12	325417	Capacitor Start
6	325416	Relay, Time Delay	13	320710	Thermostat
			14	321484	Wire Harness
			15	325334	Wrap, Control Box

*Zinc-plated steel.

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 condenser 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, condenser, 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, condenser 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.**

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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.



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