ELECTRO FREEZE®

MANUAL

INSTALLATION-OPERATION-AND
MAINTENANCE

MODELS
33 - 33S - 66TF
AND 66TF "SUPER"

5/87 184683

Model No. _____

Serial No. _____

INDEX

Mfg. by H. C. DUKE & SON, INC. • 2116 Eighth Avenue • East Moline, Illinois 61244

SUPERIOR QUALITY FREEZERS • SOFT SERVE • SHAKE • SLUSH

NOTE: BE SURE TO COMPLETELY READ AND UNDERSTAND THIS MANUAL BEFORE OPERATING THIS FREEZER.

SAFETY

THIS SAFETY ALERT SYMBOL IDENTIFIES IMPORTANT PERSONAL SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY. DO NOT ATTEMPT TO CONTINUE UNTIL THE SAFETY PRECAUTIONS ARE READ AND THOROUGHLY UNDERSTOOD.

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UNCRATING AND INSPECTION

1. When the unit is received and while the carrier is still present, inspect the shipping crate for any damage, which may have occurred in transit. If the crate is broken, torn or punctured, note the damage on the carrier's freight bill and notify the carrier's local agent immediately.

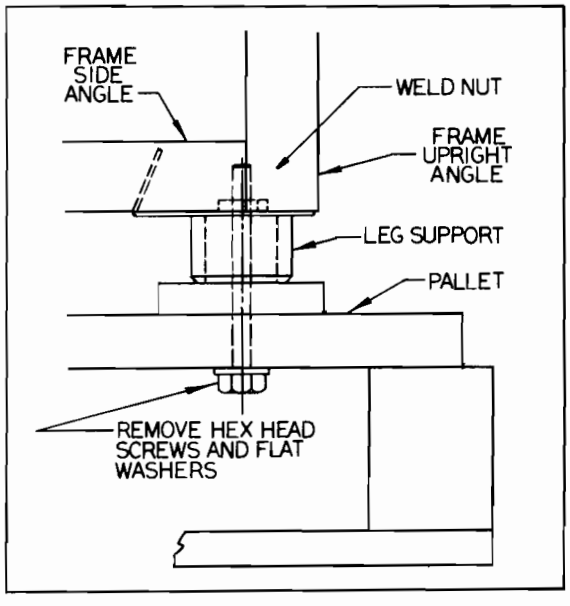
2. Remove tape and paper wrapping from all parts. Remove parts and materials packed with machine.

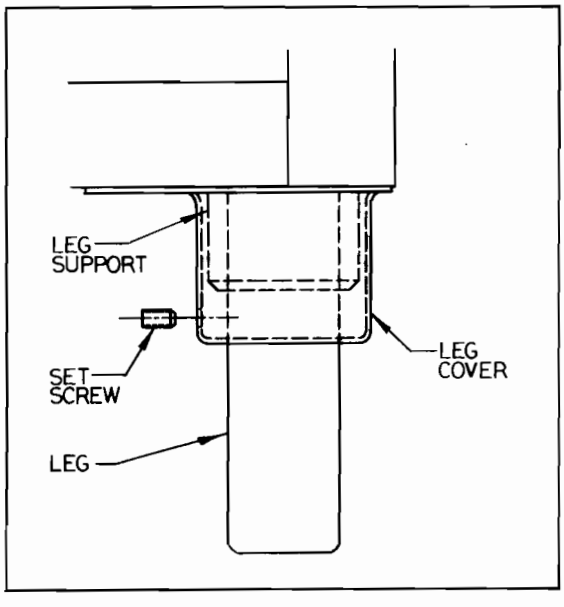
3. On the Model 33, install legs in threaded holes, where skid bolts were removed. Be sure to leave unit 4" of leg (minimum) extended from bottom of unit. (Vertical clearance).

NOTE: Be sure to properly support the machine when removing bolts and installing legs or casters.

On the Model 33S, 66TF, and 66TF Super, Note below that the unit is bolted directly to the pallet or shipping base. Remove these bolts.

Screw each leg or caster into place at the four corners of the base. (See below) When the unit is in position at its intended location, the legs must be adjusted until the unit is level, side to side, and the front is approximately 1/4" lower than the rear, to allow proper drainage of the freezing cylinder.





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INSTALLATION

Your machine must be installed and serviced by an "Electro Freeze" distributor or authorized service technician.

NOTE: All materials and connections must conform to local codes and/or the National Electric Code.

The Model 33 weight of approximately 300 lbs. will necessitate a counter or table of sufficient strength to hold this weight and prevent excessive vibration.

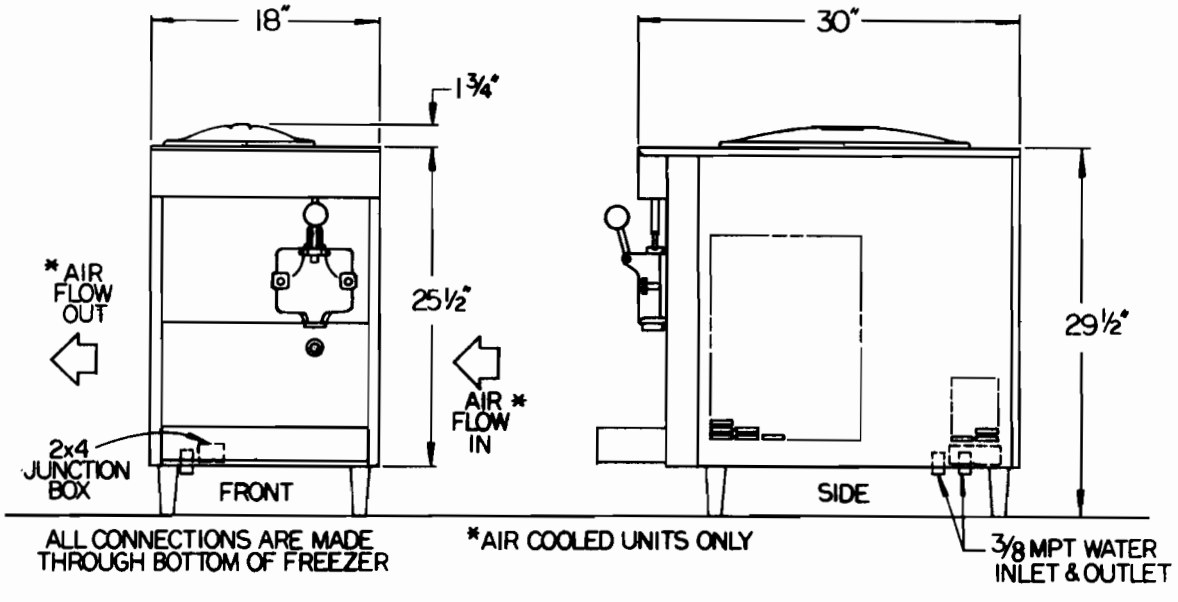
1. AIR COOLED MODELS: The Model 33 requires a 6" air space on each side of the unit. The Model 33S, 66TF, and 66TF Super require 6" at the rear of the machine. See page 4-5 for Air Flow Direction.

2. WATER COOLED MODELS: The Model 33S will require 3/8" MPT water intake and waste connections. The Model 66TF and 66TF Super will require 1/2" MPT water intake and water waste connections. There are tags attached to the lines indicating where the connections are to be made. The installation of a manual shutoff valve is suggested on the water supply line before connections are made to the machine.

WARNING: DISCONNECT POWER SUPPLY AND WATER SUPPLY BEFORE BLOWING WATER OUT OF THE CONDENSER.

CAUTION: ALL WATER COOLED MODELS MUST HAVE CONDENSERS BLOWN OUT IF EXPOSED TO BELOW FREEZING TEMPERATURES. AIR PRESSURE OF AT LEAST 20 LBS. SHOULD BE PUT THROUGH THE WATER LINES STARTING INSIDE THE WATER VALVE. IT IS RECOMMENDED THAT A QUALIFIED REFRIGERATION MAN DO THIS.

MODEL 33



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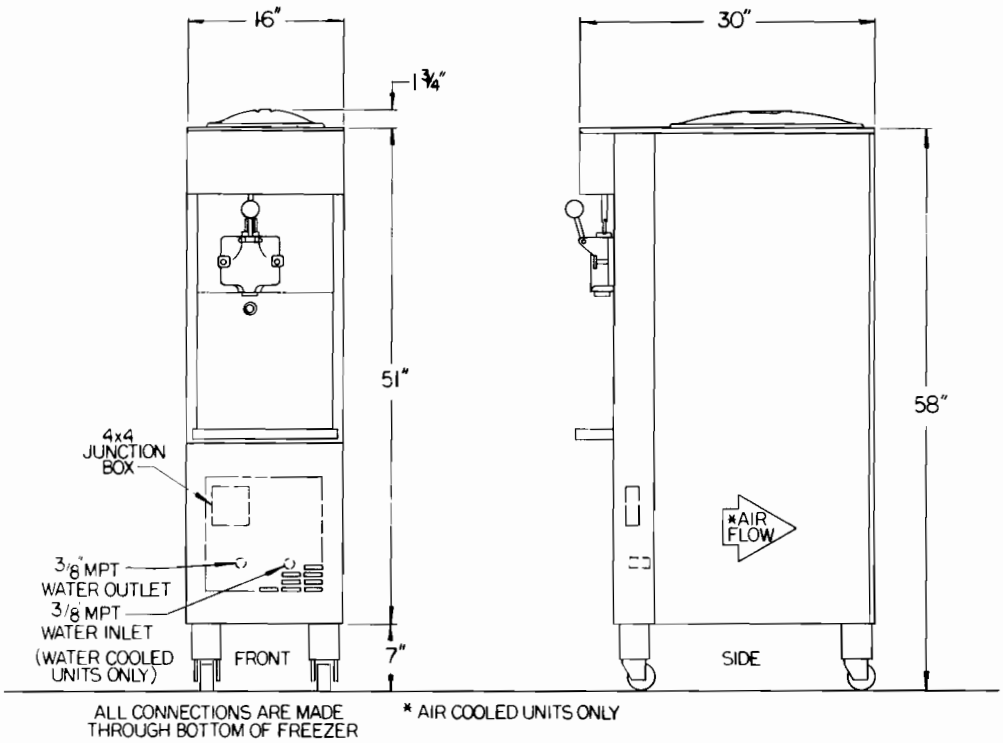
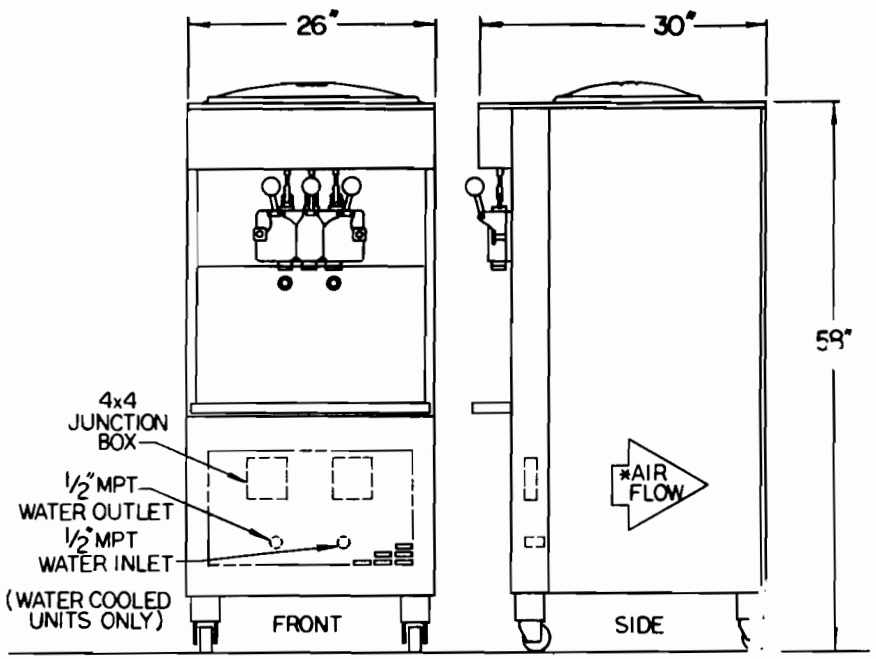
MODEL 33S



MODEL 66TF



ELECTRICAL REQUIREMENTS

WARNING: IN ORDER TO PREVENT ACCIDENTAL ELECTRICAL SHOCKS, CONNECT A POSITIVE EARTH GROUND TO THE SCREW PROVIDED IN THE CONNECTING BOX.

The phase and voltage of your machine is shown on the nameplate on the rear panel. Voltage in your building should be within + or - 10 percent of voltage indicated on the nameplate. If not, transformers are available to correct voltage. The nameplate also contains the amperage of your machine along with the maximum fuse size and minimum circuit ampacity.

All double head machines must be wired with two power lines. Each side of these machines operates individually from each other and separate wiring will allow service on either side without shutting down both sides.

WARNING: FAILURE TO CONNECT OR SUPPLY PROPER VOLTAGE TO THIS FREEZER WILL VOID YOUR WARRANTY.

SPECIAL NOTE: On all Delta three phase circuits, wild or high leg must be connected to L2 (red wire).

Use dual element fuses, rated at 25% over the full load amperage (FLA) rating of the machine. Refer to the nameplate on the machine. On double head machines, fuse each side separately. Use flexible connections, if permissible. All materials and connections must conform to local code requirements and/or be in compliance with the National Electrical Code.

ELECTRICAL CONTROLS

1. SELECTOR SWITCH
   This three position switch controls the function of your machine.
   a) "CLEAN-OUT" (Left position) - This position operates the beater only (no refrigeration). This position must be used in all cleaning and sanitizing operations.
   b) "OFF" (Center position) - In this position motor and refrigeration system will not operate.
   c) "FREEZE" (Right position) - This position activates both the beater motor and refrigeration unit. This is the normal operating position.

CAUTION: DO NOT USE THE FREEZE POSITION WITH WATER OR SANITIZER IN THE CYLINDER OR HOPPER — THE MACHINE MAY BE DAMAGED.

2. PLUNGER SWITCH (Behind switch panel)
   Activated by plunger rod when product is drawn from the machine. It turns the compressor and beater motor on for product draw. When the center plunger switch is activated both compressors and beater motors will operate on double head freezers.
3. SAFETY SWITCH (Behind switch panel, 33 and 33S only)
   Located below the plunger switch, it breaks power supply to ALL controls. Plunger rod must be in place for machine to operate.

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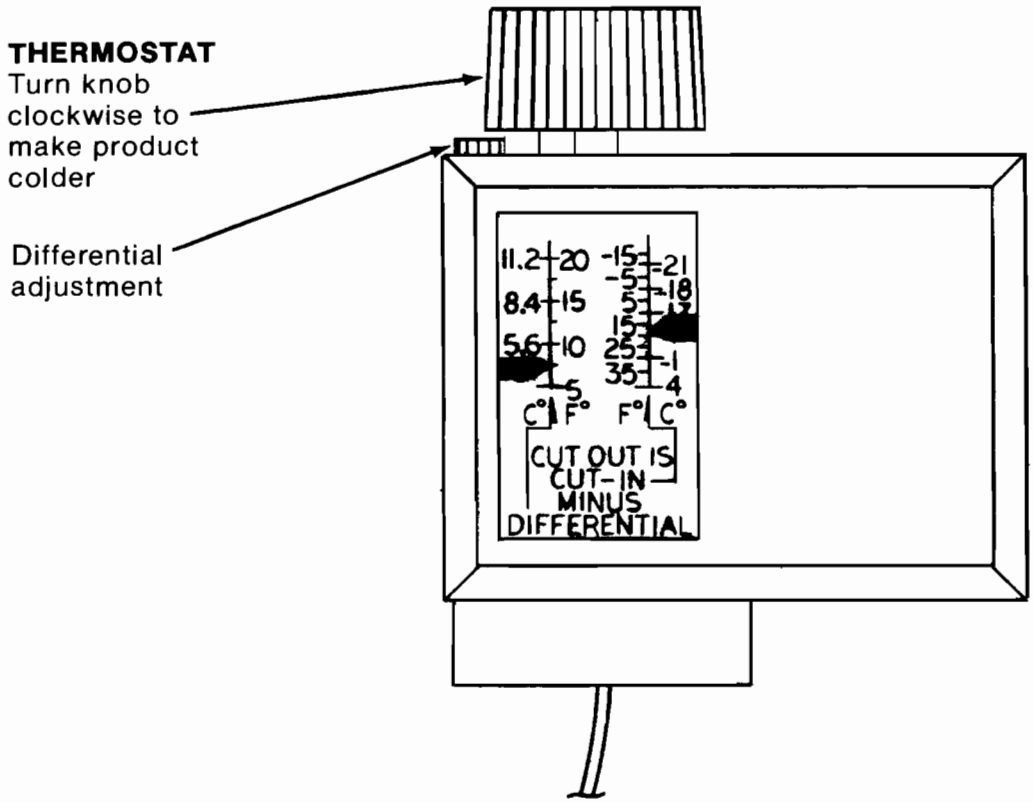
4. THERMOSTAT DAY-NIGHT SWITCH
This controls the day and night refrigeration cycles. The "Day" position, to the left, activates the low temperature refrigeration system. The "Night" position, to the right, switches the refrigeration system to a medium temperature holding cycle.

5. SERVICE SWITCH-HOPPER
The hopper service switches are located in the electrical box on model 33 and 33S. The service switch is factory set to the "ON" position to insure that the hopper is refrigerated during freezer operation. When suction pressure adjustments are made, by a qualified technician, it will be necessary to place the hopper service switch in the "OFF" position to obtain proper gauge readings.

The service switch is accessible by removing the 7/8" plug button located in the underside of the elecrical box. When refrigeration adjustments are completed return the service switch to the "ON" position and reinsert the plug button.

6. HOPPER THERMOSTAT
The thermostat, which controls the temperature in the hopper is set at the factory, but can be adjusted with the use of a screw driver. To set this thermostat colder, turn the adjustment screw clockwise. DO NOT turn the control more than 1/4 turn at any one time.

7. CYLINDER THERMOSTAT (Low Temperature)
This thermostat is located behind the lower front panel on the Model 33S. On the Model 33, it is located at the front left side of the switch box. On the Model 66TF and 66TF Super, the thermostats are located behind the lower front panel. On the Model 33, there is no adjustment knob, it is factory-set between 18° and 20° with a differential of 7 to 8 and should require no further adjustments. This control only affects the freezer when it is idling. The setting on the thermostat and the temperature of the product will not necessarily coincide. For a correct adjustment a thermometer must be used to check the actual product temperature. Each thermostat should be set in the field for the product being used. Most of the time, a setting of between 18° and 21° will maintain a satisfactory product. Once the thermostat is set for the mix used, it should require no further adjustment.



8. RESET BUTTON - Push to reset.
   On the Model 33S, 66TF, and 66TF Super, the buttons are located on the front switch box. On the Model 33, it is located on the left side panel near the front. Your machine is equipped with a heater overload system so that the beater motor is protected against damage. If your machine is stopped by the over-load heater, it will be necessary to push the reset button before it will start again. If this happens frequently, your machine should be checked for proper voltage or any unusual cause of strain on the beater motor.

9. CYLINDER THERMOSTAT - (Medium Temperature).
   On the Model 33S, the control is located behind the right side panel. On the Model 33, it is located behind left side panel. On the Model 66TF and 66TF Super a control is located behind each side panel. It is used to control temperature of the product to maintain a 35-44° F. temperature in the night position.

TEST OF INSTALLATION

(Refer to Page 19). Remove the head and beater shaft from front of unit. To check compressor operation, first place plunger rod into guide under switch box. Place selector switch to "AUTO" position. This will turn on the compressor and beater motor. Looking into the freezer barrel, the beater coupling *should be turning clockwise* only, and there should be a frost pattern from the front to the rear of the cylinder. Watch for frost pattern in hopper. Once it is obvious the machine is cooling, place the selector switch in the "OFF" position.

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OPERATION OF MACHINE

DISASSEMBLY AND WASHING INSTRUCTIONS

⚠ CAUTION: ALL CONTROL SWITCHES MUST BE IN THE "OFF" POSITION AND THE MAIN POWER SUPPLY DISCONNECTED FOR DISSASSEMBLY AND REASSEMBLY.

Your Soft Serve machine has been completely tested at the factory. It is important that the machine be dismantled, washed, lubricated and sanitized before operation.

NOTE: The washing and sanitizing instructions explained in this manual are required to maintain a clean, sanitary machine. Your Soft Serve machine should be disassembled, cleaned, and sanitized to insure the best possible product and machine operation.

Refer to Page 19 for identifying parts. Remove plunger switch rod from guide post. remove the two hand knobs and pull the dispensing head straight out. Remove the beater assembly. Remove the mix feed assembly from hopper. Take all parts to wash area, disassemble and remove all O-rings from components. Wash all parts thoroughly in a warm, detergent solution and rinse. Allow parts to air dry or reassemble wet. Wash the hopper, cylinder and drain tube on machine with brushes supplied.

REASSEMBLY

To assemble the beater, install the shaft seal. Apply a moderate amount of approved sanitary lubricant, such as Petro-Gel, or equivalent, to the internal surface and the face opposite the bell portion of the seal. Do not allow any lubricant to come in contact with the bell-shaped rubber portion of the seal. Install the shaft seal over the rear of the beater shaft, with the bell-shaped portion facing the rear. Install scraper blade on beater shaft by rotating scraper blade into pocket on shaft upright.

Insert the assembled beater into cylinder, with rear scraper toward the bottom, until the shank makes contact with the drive shaft. Rotate the beater assembly, pushing until the shank has engaged the drive coupling. Slide the beater flight onto the shaft.

Install the O-rings on plunger and dispensing head, and lubricate. Assemble the plunger, handle, dispensing head, and serrated nozzle. Install the white plastic bushing in the dispensing head and lightly lubricate the inside portion. Install the dispensing head assembly onto the machine and tighten down *evenly* with hand knobs, and install plunger rod assembly.

Assemble the mix feed and install O-rings. Reference O-Ring Chart. Lubricate mix tube O-ring only.

Insert plastic reglator into the mix tube. The regulator O-ring will rest on the top surface of the mix tube.

NOTE: Do not attempt to force the O-ring inside the mix tube. Lay the mix feed assembly in the hopper. (Do not install it into the mix port.)

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SANITIZING INSTRUCTIONS

Pour 2 gallons of sanitizing solution into the hopper. Solution should be 220 PPM chlorine, using Diversol or equivalent. Set selector switch to "CLEAN-OUT" to provide beater only operation. Wash down all hopper walls, mix feed assembly, and interior of hopper cover with sanitizer and the nylon brushes provided. After 1 or 2 minutes drain sanitizer from machine.

NOTE: When draining sanitizer from the machine, the selector switch must be in the "CLEAN-OUT" position.

START-UP INSTRUCTIONS

NOTE: Start freezer 20 to 30 minutes before desired use.

When all the sanitizer has been removed from the clinder, with the spigot still open, turn the selector switch to the "OFF" position. Pour 3 pints of product directly into the hopper/cylinder port. Leave the dispensing plunger open until you receive pure mix at the nozzle. The mix will push the remaining sanitizer out of the machine if the plunger is left open. Close the plunger after removing all remaining sanitizer.

Align the mix feed regulator to mid range on the four indent pattern. (See page 12 for mix feed adjustment.)

Install the mix feed assembly in the hopper/cylinder port, turn freezer to automatic position, and immediately fill the hopper with mix.
(Mix temperature must not exceed 44° F.)

Allow the freezer to cycle for 20 minutes before checking product temperature and overrun.

NOTE: See page 12 - Mix Properties.

CLEANING MACHINE AFTER USE

Place the selector switch in the "CLEAN-OUT" position and allow it to run for about 5 minutes to soften the product. Remove mix feed assembly from the hopper. Draw off the remaining product into a sanitized container. When all of the mix is drained from the machine, flush with 2 gallons of cold water, then warm. Disassemble, wash, and clean and sanitize according to cleaning instructions and reassemble according to instructions on page 9.

CAUTION: SELECTOR MUST BE IN THE "OFF" POSITION AND THE POWER SUPPLY DISCONNECTED FOR DISASSEMBLY AND REASSEMBLY.

REFRIGERATION CONTROLS

⚠ CAUTION: ALL CONTROL SWITCHES MUST BE IN THE "OFF" POSITION AND THE MAIN POWER SUPPLY DISCONNECTED.

AUTOMATIC EXPANSION VALVE

The Models 33 and 33S are equipped with two automatic expansion valves. One for the cylinder and one for the hopper. The Model 66TF and 66TF Super are equipped with four expansion valves, one for each cylinder and one for each hopper. Settings are shown on the charts which follow:

MODELS 33, 33S and 66TF

Refrigerant	R12
Cylinder Suction Pressure	1-3 PSIG
Hopper Suction Pressure	8"-10" HG
Discharge Pressure - Water cooled	120-130 PSIG
Air cooled	135-185 PSIG

MODEL 66TF SUPER

Refrigerant	R502
Cylinder Suction Pressure	15-17 PSIG
Hopper Suction Pressure	4-6 PSIG
Discharge Pressure - Water cooled	240-250 PSIG
Air cooled	230-315 PSIG

The expansion valves must be adjusted by a refrigeration technician with refrigeration test gauges connected to the compressor. For cylinder suction pressure adjustment, the hopper service switch MUST BE IN THE *OFF* POSITION. For hopper suction pressure adjustment, the cylinder thermostat must be satisfied (Open).

To reduce the suction pressure, turn the screw on the expansion valve counterclockwise. Do not turn more than 1/4 turn at a time. Allow the unit to operate a sufficient length of time - at least two minutes - to properly read the adjustment made on the gauge. Generally, the suction pressure is correct when you see frost on the compressor service valve (facing machine). If frost reaches the body of the compressor, the suction pressure is too high. The hopper expansion valve is located on the left side and the cylinder expansion valve is located on the right side. The expansion valves are tagged accordingly.

HIGH PRESSURE CUT-OUT

This device will shut down the compressor should a failure occur in the condensing system. On air cooled models, the cause may be a dirty air condenser or a faulty fan motor. On water cooled, lack of water pressure could be the cause. This control is preset and non-adjustable.

SOLENOID VALVE

This device controls refrigerant to the freezing cylinder or the hopper. The solenoid valve coil, when energized, opens the valve for refrigerant flow.

MIX FEED ASSEMBLY ADJUSTMENT

Locate the round indent near the top of the mix tube cylinder. Align this indent to approximately the center range of the three indent pattern on the mix feed regulator.

The plastic mix feed regulator may be adjusted within the three indent range to obtain an optimum product overrun and dispense speed.

The largest indent setting will allow more mix in the cylinder and the smallest indent setting will allow the least amount of mix in the cylinder. (Higher overrun).

During periods of idle or night operation align the single indent, (located to the far right of the three indent pattern), with the mix tube cylinder indent. At this setting, mix and air flow are shut off to the product cylinder. Note: *Do not* draw product during periods of shut-off. Reset mix regulator to original position before resuming product draw.

MIX PROPERTIES

The Models 33, 33S, 66TF, and 66TF Super control settings outlined in this manual pertain to standard soft-serve dairy mixes.

Because of the properties of other mixes (such as powdered, canned, 10% butterfat, yogurt, etc.), different control settings may be necessary to obtain optimum freezer performance and a quality product dispensed.

For further information, contact your local distributor or the service department at H. C. Duke & Son, Inc.

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MAINTENANCE AND ADJUSTMENT

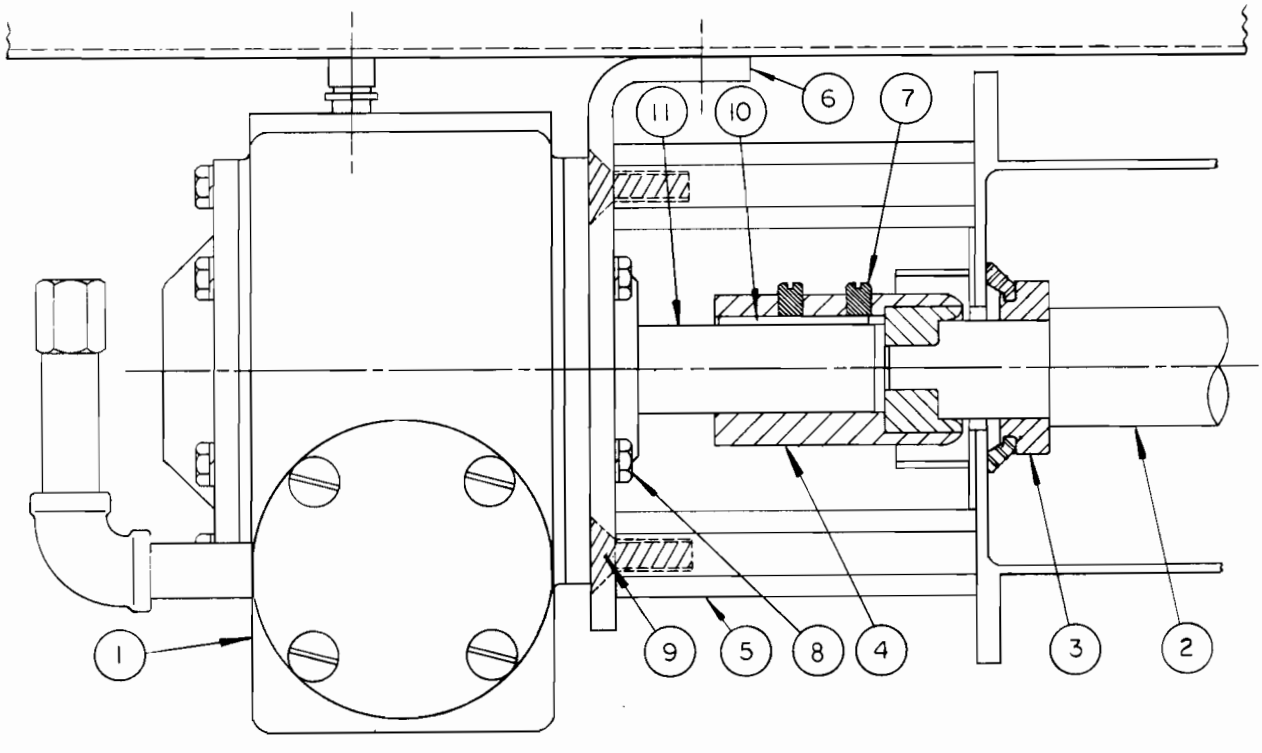
WARNING: ALL MAINTENANCE AND ADJUSTMENTS MUST BE DONE BY AN "ELECTRO FREEZE" DISTRIBUTOR, OR AUTHORIZED SERVICE TECHNICIAN.

WARNING: MAKE SURE MAIN POWER SUPPLY TO MACHINE IS DISCONNECTED BEFORE ANY MAINTENANCE OR ADJUSTMENTS ARE MADE.

END PLAY SETTING FOR BEATER DRIVE COUPLING.

It is very important that the drive coupling located on the gear reducer be set properly. Referring to the "Drive Coupling Illustration" the following procedure should be followed in setting the end play.

DRIVE COUPLING ILLUSTRATION



1. Gear Reducer
2. Beater Shaft
3. Shaft Seal
4. Drive Coupling
5. Spacer Cyl. - Reducer
6. Plate - Reducer Mount
7. Set Screw
8. Bolt - Gear Reducer
9. Screw Spacer - Mount Plate

Improper drive coupling spacing can and will damage both the beater shaft and drive coupling. When checking end play settings or replacing a coupling, proceed as follows.

REMOVING COUPLING

MAKE SURE THAT THE MAIN POER SUPPLY IS DISCONNECTED SO THAT THE UNIT WILL NOT OPERATE.

1. Remove Beater shaft, Reference # 2.
2. Remove drive belts (not shown).
3. Remove gear reducer bolts, Reference # 8. Six (6) bolts are located around the face of the reducer. NOTE: Remove the top bolt last, holding the bottom of the reducer as you do so.
4. Now remove the gear reducer, Reference # 1, and place on table or bench.
5. Replace two (2) bolts, Reference # 8, one (1) at the top and one (1) at the bottom, so that the reducer cover will not come off while the coupling is changed.
6. Loosen the four (4) set screws, Reference # 7 and remove the drive coupling, Reference # 4. Should the coupling be stuck tight to the output shaft, lightly tap the coupling from the back with a hammer and bar. Sometimes, this coupling will have to be pulled off with a pulley removing tool or a "wheel puller".
7. Remove the key, Reference # 10.

INSTALLING THE NEW COUPLING:

MAKE SURE THAT THE MAIN POWER SUPPLY IS DISCONNECTED SO THAT THE UNIT WILL NOT OPERATE.

1. Clean gear reducer output shaft, Reference # 11 with fine emery cloth and slide the new drive coupling on the reducer shaft. The coupling should slide on the shaft all the way without the key. If the coupling doesn't slide completely on, check both coupling and reducer shaft for burrs. When a smooth sliding fit is achieved, remove coupling and proceed with final assembly.
2. Place key, Reference # 10 in key way slot on the reducer output shaft. Keep the key flush with the front end of the output shaft, Reference # 11.
3. Slide the coupling, Reference # 4 on the output shaft until it bottoms out on the shaft. Leave the four (4) set screws loose as the coupling will have to be adjusted.
4. Remove the two (2) bolts added in preceding Step # 6.
5. Place one gear reducer bolt, Reference # 8 in the top hole of the gear reducer mounting plate.
6. Insert gear reducer onto gear reducer mounting plate and start top bolt # 8. Do not tighten completely. Insert the other bolts one at a time. When all bolts are in, tighten each bolt.

NOTE: Due to a very close tolerance between the Gear Reducer and Cylinder Mounting Plate, no alignment is required when installing the reducer. When the reducer bolts are tightened, the reducer will self-align with the cylinder.

7. Insert the beater shaft, Reference # 2 with the shaft seal, Reference # 3 into the cylinder and engage beater shaft in the drive coupling.
8. Place a dime (10 cents) on the back of the dispensing head bushing in the very center at the point where the beater shaft touches the dispensing head. The dime is used to acquire the proper end play setting on the drive coupling which is approximately 3/32".

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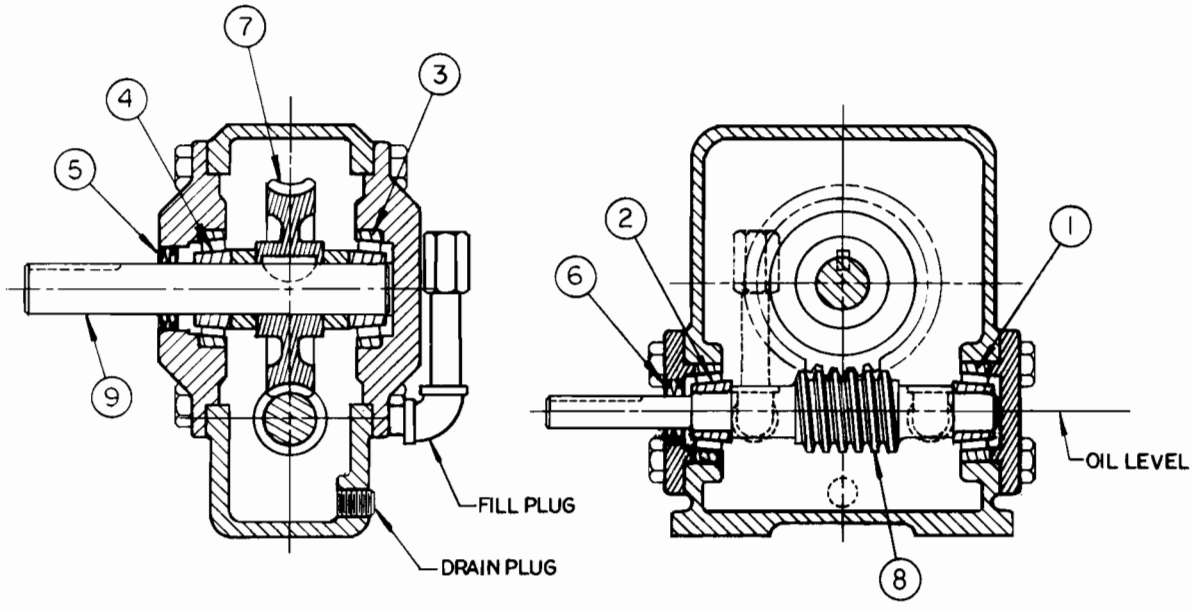
9. Place the dispensing head into the cylinder and tighten with the hand knobs. Important: Make sure hand knobs are tight and head is against the end of the cylinder tube.
10. Slide the drive coupling, Reference # 4 forward until it is tight against the beater shaft and lock into place the four (4) set screws, Reference # 7.
11. Remove the dime from the back of the dispensing head bushing.
12. Replace the drive belts and panels.

GEAR REDUCERS



Order By Freezer Serial Number.

Model 3CB

153344	5-1 Ratio	Model 33S (A Side Model 66TF and 66TF Super)
153345	5-1 Ratio	Model 33 (B Side Model 66TF and 66TF Super)

Ref. No.	Part No.	Description
1	153004	High Speed Cup ..... (2 ea. required)
2	153005	High Speed Bearing ..... (2 ea. required)
3	153008	Slow Speed Cup ..... (2 ea. required)
4	153009	Slow Speed Bearing ..... (2 ea. required)
5	153052	Slow Speed Seal ..... (2 ea. required)
6	153054	High Speed Seal ..... (2 ea. required)
7	153313	Brass Gear 5-1 Ratio
8	153316	Worm Gear
9	163336	Output Shaft 5-1 Ratio
	158055	Synthetic Gear Lube 51,001

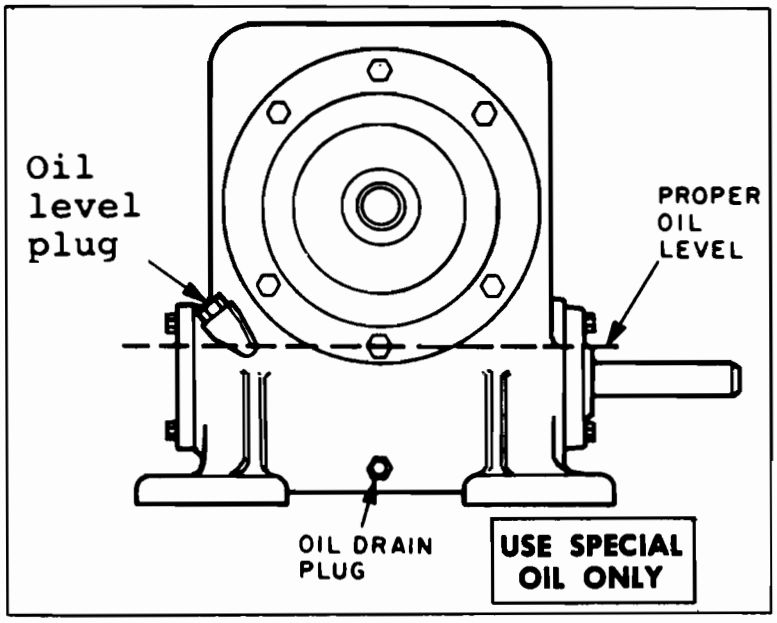
CAUTION: ALL CONTROL SWITCHES MUST BE IN THE "OFF" POSITION AND THE MAIN POWER SUPPLY DISCONNECTED.

LUBRICATION INSTRUCTIONS

A. BEATER MOTOR — Beater motors are single or three phase starting torque motors. Capacitor starting is used on single phase motors. The beater motors should be inspected and cleaned annually.

B. GEAR REDUCER — The gear reducers are heavy duty, worm-geared units manufactured to H.C. Duke specifications. If traces of oil are found in the immediate area around the gear reducer, remove the plug and check the oil level. See illustration.

NOTE: Reducer oil should be changed a minimum of once every 12 months using special oil only.



C. FAN MOTOR - Lubricate annually by adding SAE 10 motor oil in the oil cups.

WATER-COOLED SYSTEM CLEANING

To determine if cleaning is required, periodically check the amount of water passing into the drain from the condenser. The condenser can be flushed out with an acid solution to remove scaling.

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AIR COOLED CONDENSER CLEANING

At least once a month, the face area of the condenser should be inspected for accumulation of dirt and dust. Surface dust and dirt can usually be removed with a stiff brush and/or vacuum cleaner. After brushing, hold a light between the fan blades and look through the condenser from the opposite side. This procedure will locate those areas where accumulated dirt has lodged between the condenser fins. To clean these areas, obtain a small tank of nitrogen or carbon dioxide with a needle control valve or pressure regulator and proceed as follows.

a) Place a damp towel or cloth over the face area of the condenser.

b) Open the control valve or regulator on the tank, releasing pressure to the coil through the clogged areas of the condenser.

c) Check the condenser periodically with the light and continue the nitrogen or carbon dioxide treatment until the fins are clean.

PULLEY ALIGNMENT AND BELT TENSION

a) Make sure the selector switch is in the OFF position, and that the power is disconnected. Then remove the side panel to expose the pulleys and belts.

b) Check the alignment of the beater motor pulley and gear reducer pulley by placing a straight edge across the faces of the two pulleys. If the pulleys are not aligned, adjust as necessary until proper alignment is obtained.

c) Depress the belt with a finger at a point midway between the two pulleys. When properly adjusted, the belt should depress 1/2 inch from its normal position with approximately 5 pounds of pressure. If the belt is too tight or too loose, adjust as necessary until proper belt deflection is obtained.

BELTS

Periodically inspect the belts. If worn excessively, replace them.

CAUTION: USE ORIGINAL OR AUTHORIZED REPLACEMENT PARTS ONLY WITH THIS FREEZER.

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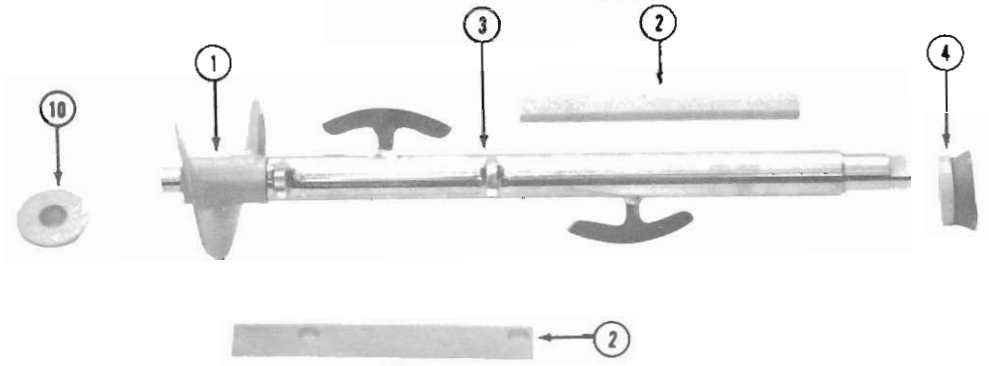
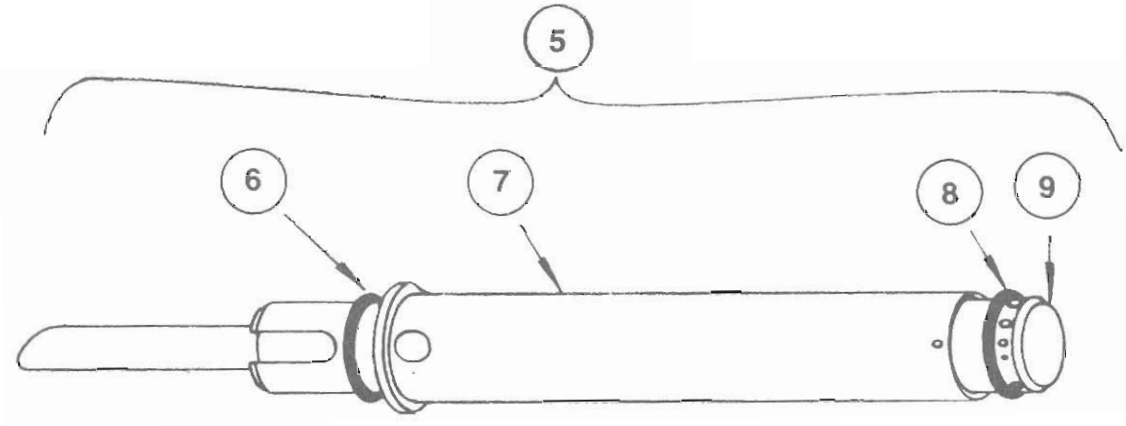
BEATER SHAFT AND MIX FEED ASSEMBLIES

BEATER SHAFT ASSY.



MIX FEED ASSY.



Ref. No.	Part No.	Description
1	196094	Flight-Beater
2	196035	Blade-Beater
3	114209	Shaft-Beater
4	113824	Seal-Beater Shaft
5	114414	Mix Feed Ass'y. Model 33
5a	114415	Mix Feed Ass'y. Model 33S
5b	114416	Mix Feed Ass'y. Model 66TF and 66TF Super
6	160503	O-Ring - Mix Tube
7	114463	Mix Tube Model 33
7a	114411	Mix Tube Model 33S
7b	114412	Mix Tube Model 66 TF and 66TF Super
8	160590	O-Ring - Regulator
9	136720	Regulator Models 33 & 33S
9a	136721	Regulator Model 66TF and 66TF Super
10	196095	Bushing

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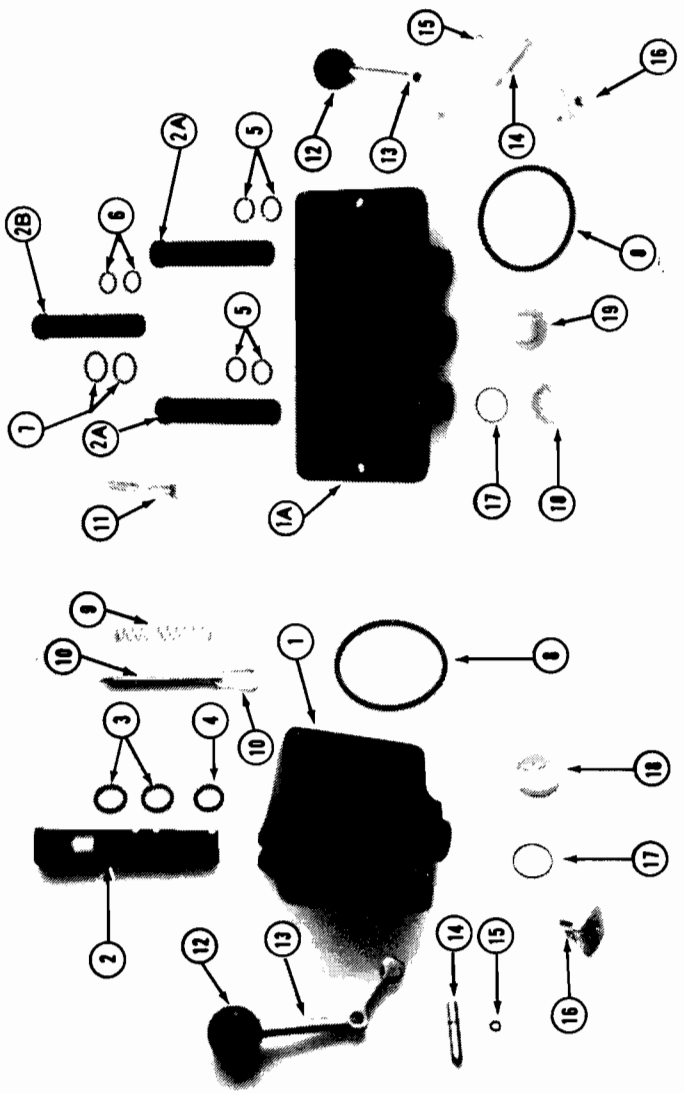
DISPENSING HEAD ASSEMBLIES



Item	Part No.	Description
1	196084	Dispensing Head
1a	136770	Dispensing Head, TF
2	134773	Dispensing Plunger
2a	136662	Dispensing Plunger, TF
2b	135605	Dispensing Plunger Center, TF
3	160501	O-Ring Plunger (top)
4	160582	O-Ring Plunger (bottom)
5	160501	O-Ring Plunger
6	160582	O-Ring Plunger
7	159295	O-Ring Plunger
8	159309	O-ring 4"
9	162318	Spring
10	113947	Push Rod
11	113426	Push Rod, TF
12	162629	Dispensing Knob
13	110022	Dispensing Handle
14	133878	Pin-Lever
15	160554	O-Ring
16	136798	Hand Knob
17	160620	O-Ring
18	196076	Serrated Nozzle
19	196095	Head Bushing

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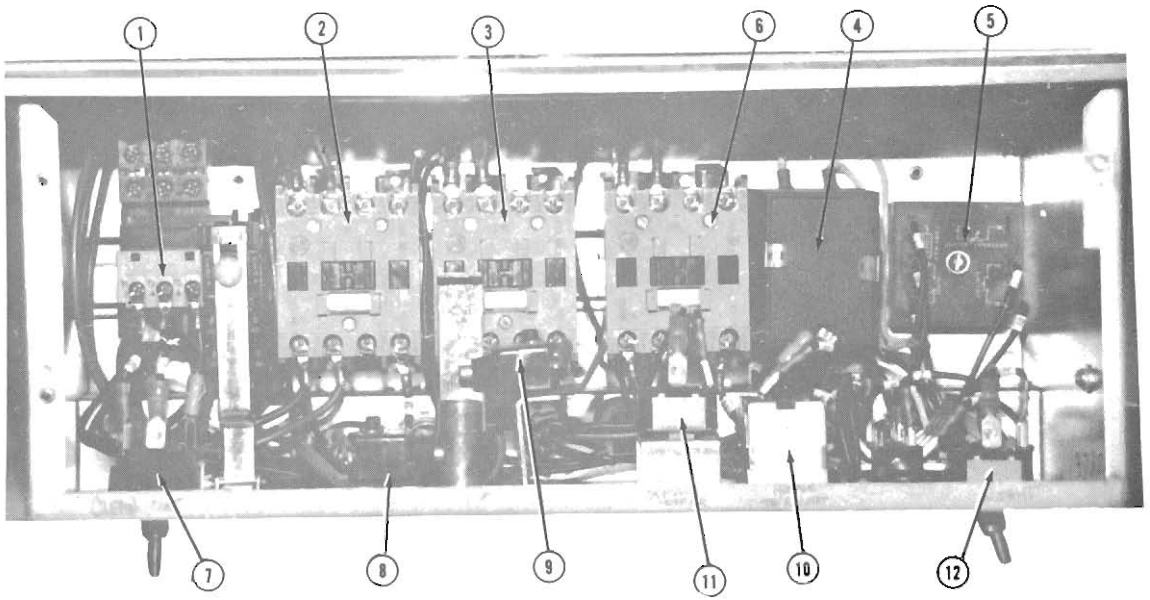
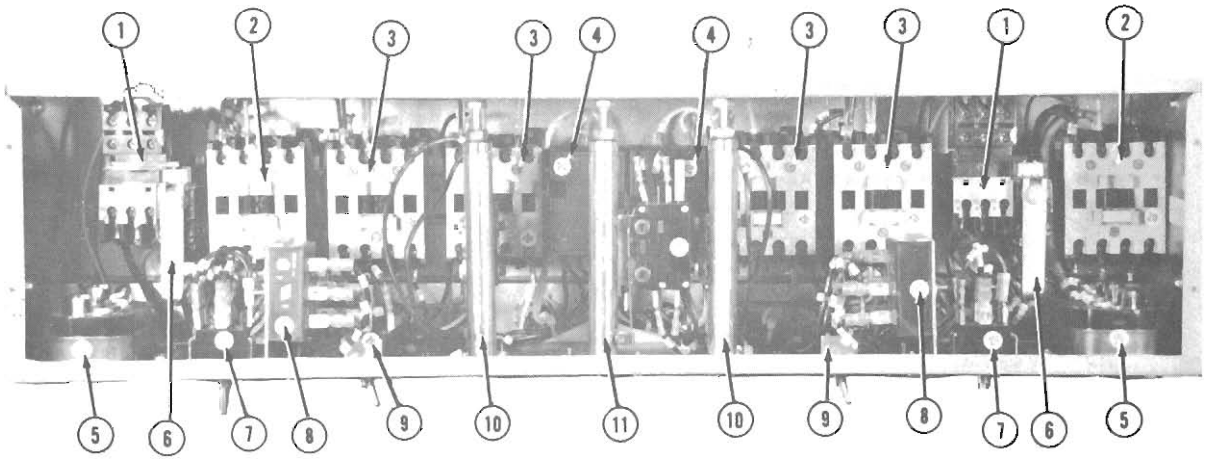
ELECTRICAL BOX - 33S



ELECTRICAL BOX - 66FT AND 66TF SUPER



ELECTRICAL BOX MODEL 33S

Item	Part No.	Description
1		Overload Block
2	150106	Starter (order by freezer serial number)
3	150106	Contactor (order by freezer serial number)
4	150202	Mix Level Indicator
5	150208	Time Delay
6	150106	Contactor (order by freezer serial number
7	150463	Switch - Selector
8	150456	Switch - Safety
9	150456	Switch - Dispensing
10	155441	Thermostat - Hopper
11	159235	Switch - Service (hopper)
12	159235	Switch - Medium Temp.

ELECTRICAL BOX MODEL 66TF AND 66TF SUPER

Item	Part No.	Description
1		Overload Block (order by freezer serial number)
2	150106	Starter (order by freezer serial number)
3	150106	Contactor (order by freezer serial number)
	150108	Coil - Contactor/Starter
4	150202	Mix Level Indicator
5	150215	Timer
6	114751	Reset Lever
7	150463	Switch-Selector
8	150208	Time Delay
9	159235	Switch-Day/Nite
10	114176	Dispensing Switch Ass'y. (side)
10a	150447	Dispensing Switch (Side)
11	114178	Dispensing Switch Ass'y. (Center)
11a	150478	Dispensing Switch (Center)
	159374	Spring Plunger Switch

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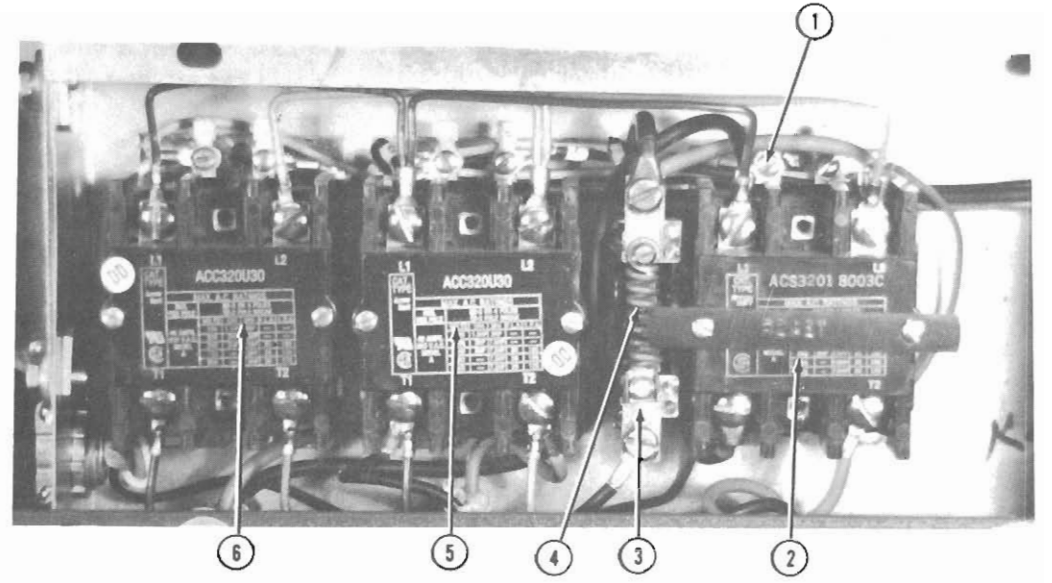
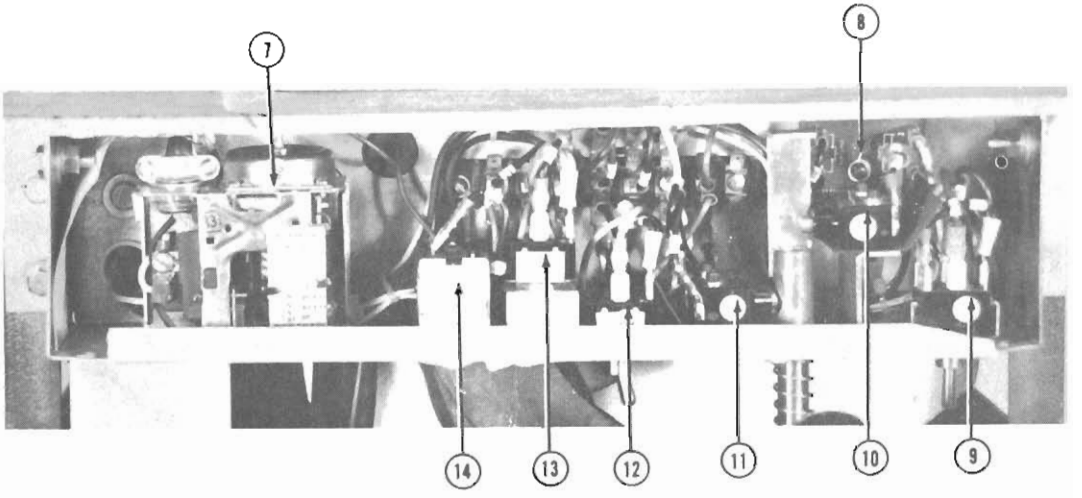
ELECTRICAL BOX - 33



CONTROL PANEL - 33



ELECTRICAL BOX - 33

Item	Part No.	Description
1	150306	Coil
2		Starter (order by freezer serial number)
3	150319	Overload (less heater)
4		Heater (order by freezer serial number)
5		Contactor (order by freezer serial number)
6		Contactor (order by freezer serial number)

CONTROL PANEL 33

Item	Part No.	Description
7	155442	Thermostat - Cylinder Low Temp.
8	150208	Solid State Timer
9	150463	Switch - Selector
10	150456	Switch - Dispensing
11	150456	Switch - Safety
12	159235	Switch - Day & Night
13	159235	Switch - Service (hopper)
14	155441	Thermostat - Hopper

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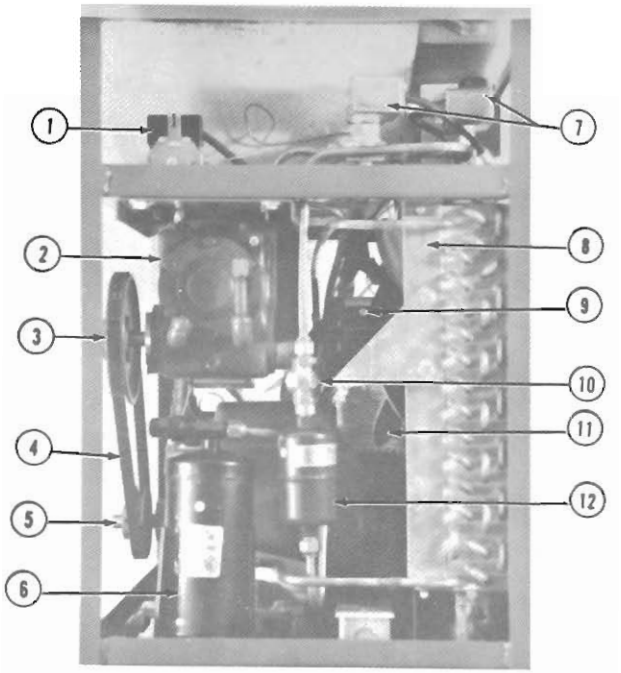
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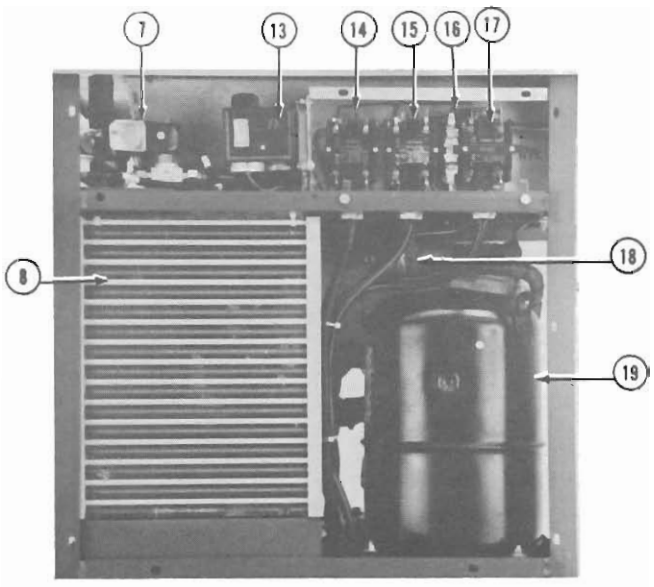
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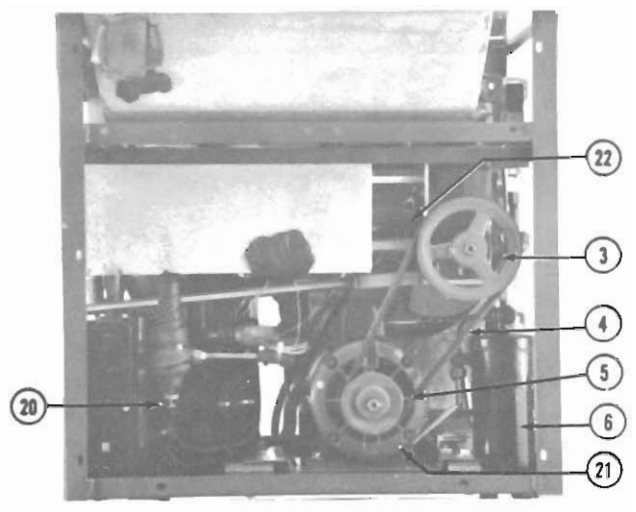
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MODEL 33

1	155402	High Pressure Cut-Out A/C
1a	155406	High Pressure Cut-Out W/C
2	153345	Gear Reducer
3	153608	Driven Pulley
4		Belt (order by freezer serial number)
5	153606	Driver Pulley
6	155040	Receiver Tank
7	155422	Solenoid Valve
8	155121	Condenser - Air cooled
9	151080	Condenser Fan Motor
10	159203	Sight Glass
11	159020	Condenser Fan Blade
12	155051	Drier
13	155442	Thermostat Cyl. Med. Temp.
14		Contactor (order by freezer serial number)
15		Contactor (order by freezer serial number)
16		Overload Block (less heater) (order by freezer serial number)
16a		Heater (order by freezer serial number)
17		Starter (order by freezer serial number)
18	155407	Expansion Valve - Hopper
19	154970	Compresor 230 - 1 - 60Hz
19a	151349	Cap Relay Assy. Compressor
19b	154969	Compressor 230 - 3 - 60Hz
20	155400	Expansion Valve - Cylinder
21	151063	Motor 208/230 - 1 - 60Hz
21a	151060	Motor 208/230 - 3 - 60Hz
	155025	Water Condenser
	155410	Water Valve
22	111780	Drive Coupling
	136489	Drip Pan (Not shown)
	136490	Drip Pan Insert (Not shown)
	196121	Hopper Cover - Solid (Not shown)
	162102	Legs (Not shown)

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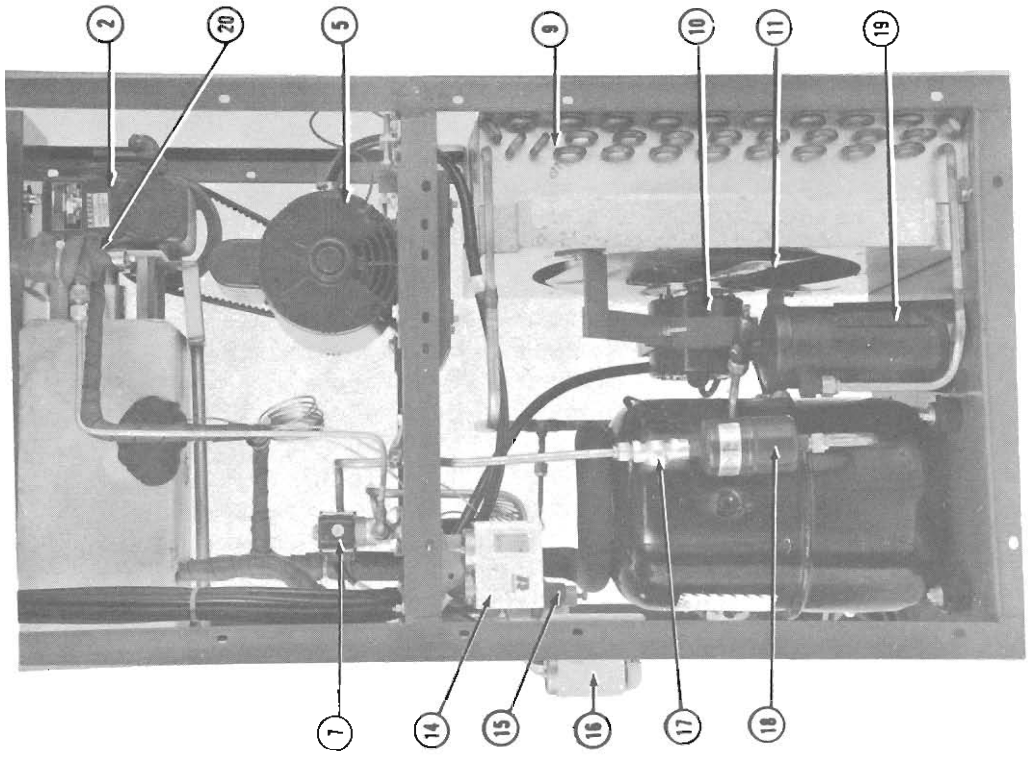
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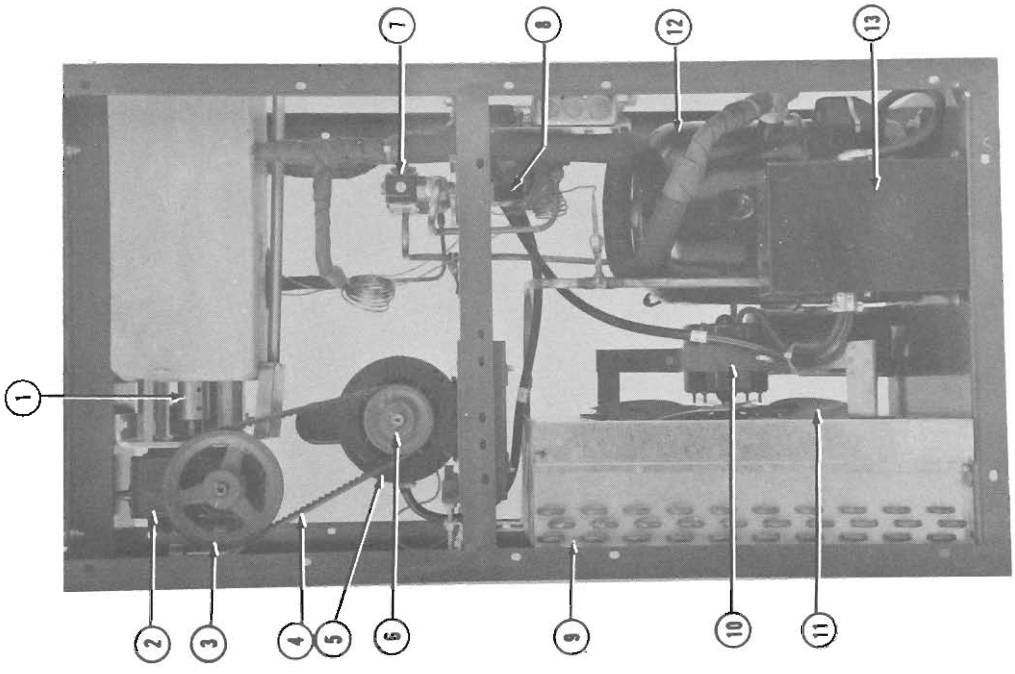
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MODEL 33S

Item	Part No.	Description
1	111780	Drive Coupling
2	153344	Gear Reducer
3	153608	Driven Pulley
4		Belt (order by freezer serial number)
5	151060	Motor 208/230 - 3 - 60Hz
6	153606	Driver Pulley
7	155422	Solenoid Valve
8	155406	High Pressure Cut-Out W/C
8a	155402	High Pressure Cut-Out A/C
9	155122	Air Condenser
9a	155025	Water Condenser
10	151080	Fan Motor - Condenser
11	159020	Fan Blade - Condenser
12	154970	Compressor 230 - 1 - 60
12a	154969	Compressor 208/230 - 3 - 60Hz
13	151349	Capacitor Assembly - Compressor
14	155442	Thermostat - Cylinder Med. Temp.
15	155400	Expansion Valve - Cylinder
16	155442	Thermostat - Cylinder Low Temp.
17	159203	Sight Glass
18	155051	Drier
19	155040	Receiver Tank Assembly
20	155407	Expansion Valve - Hopper
	155410	Water Valve Assembly (not shown)
	196119	Drip Tray (not shown)
	114609	Drip Tray Insert (not shown)
	196121	Hopper Cover (not shown)
	112798	Legs (not shown)
	162105	Caster w/Brake (not shown)
	162106	Caster w/o Brake (not shown)

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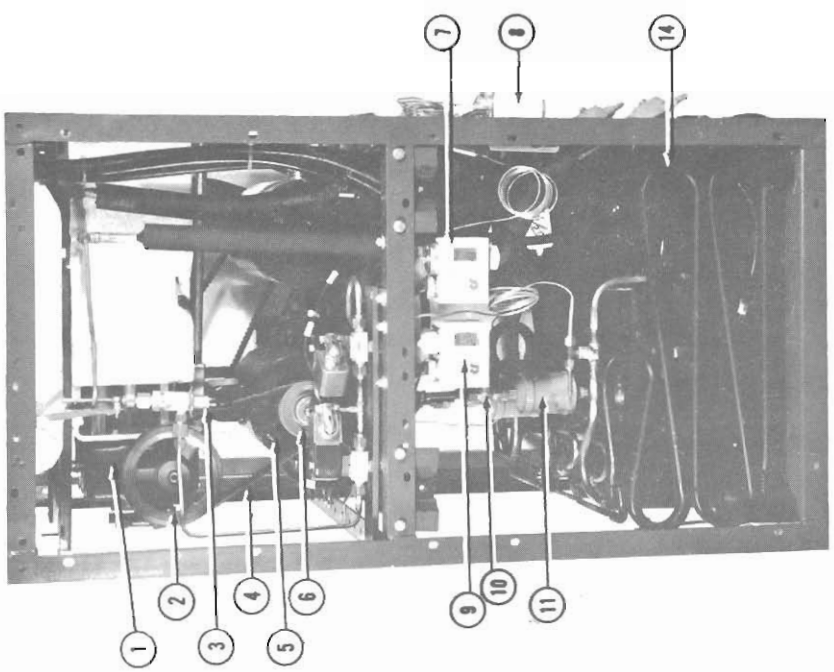
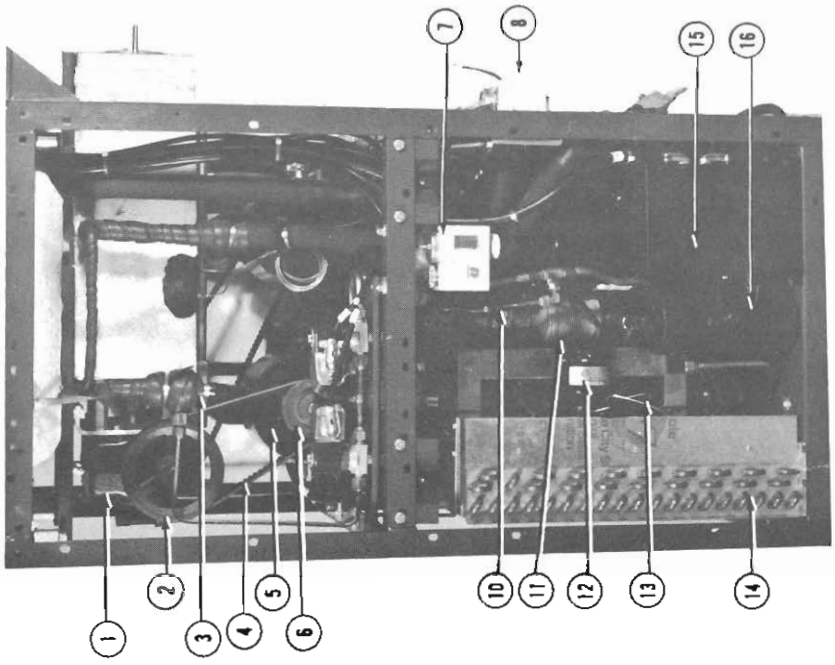
Water Cooled 66TF



Air Cooled 66TF



MODEL 66TF

Item	Part No.	Description
1	153344	Gear Reducer A-Side
1a	153345	Gear Reducer B-Side
2		Driven Pulley (order by freezer serial number)
3	155407	Expansion Valve-Hopper
4		Belt (order by freezer serial numbr)
5		Motor (order by freezer serial number)
6		Driver Pulley (order by freezer serial number)
7	155442	Med. Temp. Thermostat
8	155442	Low Temp. Thermostat
9	155406	High Pressure Cut-Out W/C
	155402	High Pressure Cut-Out A/C (not shown)
9a	155406	High Pressure Cut-Out W/C (66TF Super)
	155401	High Pressure Cut-Out A/C (66TF Super)
	155403	Low Pressure Cut-Out (66TF Super)
10	159203	Sight Glass
11	155051	Drier
12	151080	Fan Motor (air condenser)
13	159020	Fan Blade (air condenser)
14	155122	Condenser, Air Cooled
	155038	Condenser, Water Cooled - A-Side
	155025	Condenser, Water Cooled - B-Side
14a	155026	Condenser, Water Cooled - A-Side (66TF Super)
	155039	Condenser, Water Cooled - B-Side (66TF Super)
15	151349	Capacitor Assembly (1 phase)
15a	151351	Capacitor Relay Assembly (1 Phase) - 66 TF Super
	151094	Fan - Rear Panel (WC 66TF Super only)
16	155040	Receiver Tank Ass'y.

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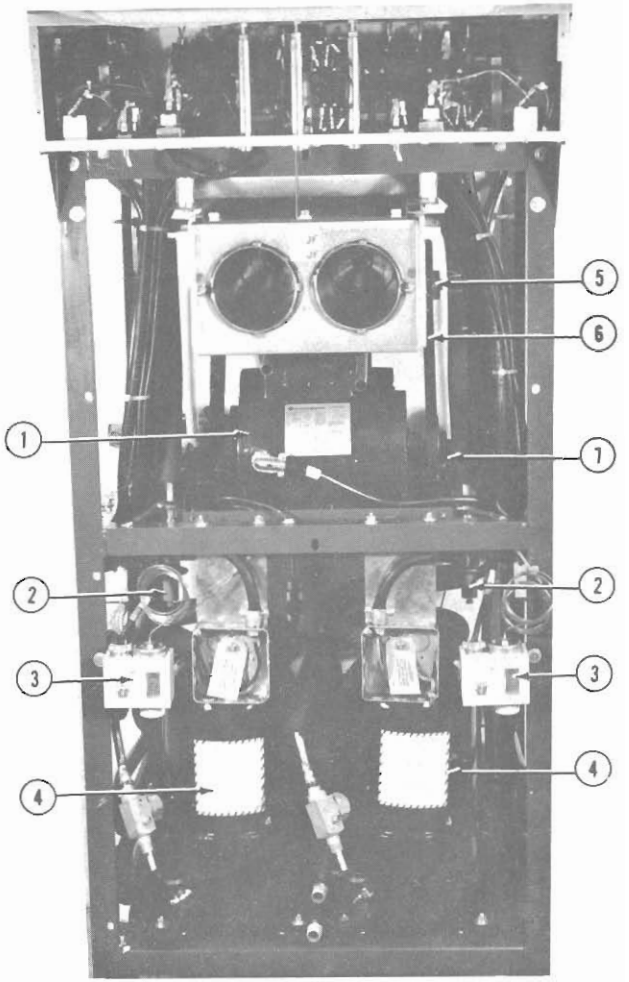
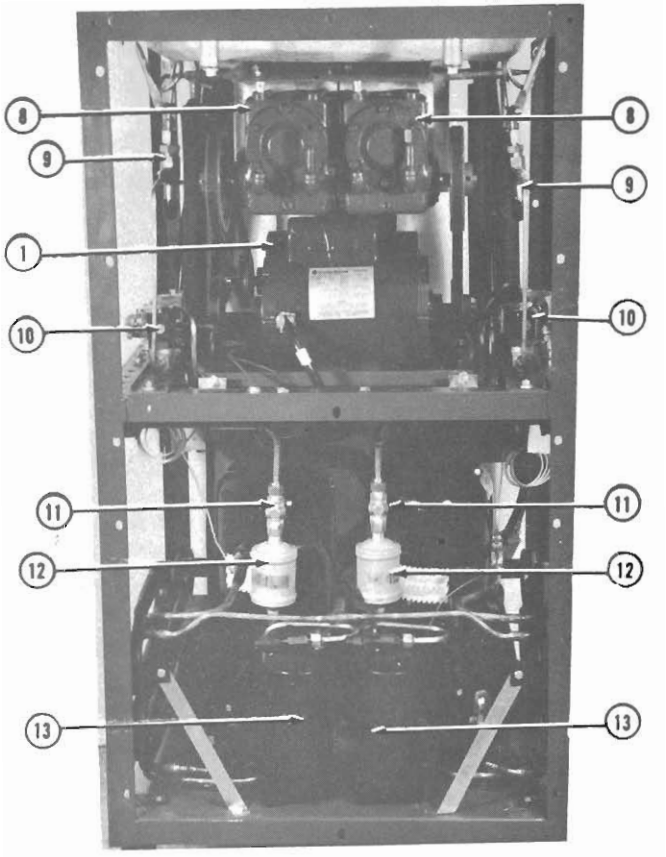
MODEL 66TF

Front View



Rear View



MODEL 66TF

Item	Part No.	Description
1		Motor (order by freezer serial number)
2	155400	Expansion Valve, Cylinder
3	155442	Thermostat, Low Temp.
4		Compressor (order by freezer serial number)
5		Driven Pulley (order by freezer serial number)
6		Belt (order by freezer serial number)
7		Driver Pulley (order by freezer serial number)
8	153344	Gear Reducer, A-Side
	153345	Gear Reducer, B-Side
9	155407	Expansion Valve, Hopper
9a	155416	Expansion Valve, Hopper (66TF Super)
10	155422	Solenoid Valve
11	159203	Sight Glass
12	155051	Drier
13	155040	Receiver Tank Ass'y.
	155441	Hopper Thermostat (not shown)
	159235	Hopper Switch (not shown)
	196108	Drip Tray (not shown)
	114607	Drip Tray Insert (not shown)
	196111	Hopper Cover (not shown)
	112978	Leg (not shown)
	162105	Caster w/Brake (not shown)
	162106	Caster w/o Brake (not shown)

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TROUBLE-SHOOTING CHART

TROUBLE	PROBABLE CAUSE	REMEDY
Unit does not operate.	1. Fuse blown at main disconnect.	1. Check fuse size; Check for low voltage; if not within 10% of name-plate rating install transformer or call power company.
	2. Beater motor out on overload.	2. Press starter reset button and check for low voltage. Check product temper-ature & overrun.
	3. Disconnect or broken wire in electrical circuit.	3. Check wiring and wire connections; repair or replace lead wires, as necessary.
	4. Faulty selector switch.	4. Replace selector switch.
	5. Out on high pressure.	5. Check for low water supply or dirty air condenser.
	6. Safety switch faulty.	6. Check safety switch, adjust or replace as necessary.
Compressor does not oper-ate or operates improperly.	1. Trouble in compressor condensing circuit.	1. Refer to Trouble-Shooting Compressor/Condensing Circuit.
	2. Faulty capacitor assembly.	2. Replace capacitor assembly.
	3. Faulty contactor.	3. Replace contactor or points.
Compressor operates but beater motor does not.	1. Loose connection at motor starter coil (electrical box).	1. Tighten connection.
	2. Open starter coil.	2. Replace beater motor starter coil.
	3. Faulty capacitor assembly.	3. Replace capacitor assembly.
Dispensed product too hard.	1. Cylinder thermostat eratic or set too low.	1. Adjust thermostat or replace.
	2. Faulty time delay relay.	2. Replace time delay relay.
	3. Low suction pressure.	3. See chart on page # 11 for adjustments.
	4. Incorrect mix Feed adjustment	4. Adjust mix feed ass'y.
Leakage of mix from rear housing discharge tube to drip tray.	1. Damaged beater shaft seal.	1. Replace shaft seal.

TROUBLE-SHOOTING CHART

TROUBLE	PROBABLE CAUSE	REMEDY
Mix leaking at dispensing head.	1. Faulty head gasket. 2. Head not properly installed.	1. Replace head gasket. 2. Install head properly.
Mix sours in hopper.	1. Hopper thermostat setting too high. 2. Hopper solenoid defective (does not open). 3. Hopper switch defective. 4. Hopper expansion valve defective or out of adjustment.	1. Adjust thermostat or replace. 2. Replace solenoid. 3. Replace switch. 4. Adjust or replace expansion valve as necessary.
Hopper freezes.	1. Hopper thermostat setting too low. 2. Hopper solenoid defective (stuck in open position). 3. Hopper expansion valve defective or out of adjustment.	1. Adjust thermostat or replace. 2. Replace solenoid. 3. Adjust or replace expansion valve as necessary.
Machine runs continually & product continues to get colder.	1. Suction pressure too low. 2. Defective plunger switch. 3. Plunger switch rod engaged. 4. Faulty time delay relay. 5. Starter or relay contacts stuck. 6. Faulty thermostat or bulb not deep enough in well.	1. Adjust expansion valve. 2. Replace plunger switch. 3. Close plunger completely. 4. Replace time delay relay. 5. Check contacts. 6. Check bulb location or replace thermostat.
Compressor operates only when dispensing.	1. Cylinder thermostat setting too high or thermostat defective.	1. Adjust thermostat or replace.
Unit runs continuously. Product does not reach 18° temperature.	1. Trouble in compressor/ condensing system. 2. Expansion valve setting is too high.	1. See Trouble-Shooting — Compressor/Condensing circuit. 2. Adjust expansion valve.

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TROUBLE-SHOOTING CHART

TROUBLE	PROBABLE CAUSE	REMEDY
Dispensed product too soft (product temperature above 21° F).	1. Automatic expansion valve incorrectly set or eratic in operation.	1. Adjust or replace expansion valve.
	2. Leak in refrigeration system resulting in little or no refrigeration.	2. Pump down system or remove refrigerant charge; repair leak, evacuate and recharge.
	3. Thermostat set too high or faulty.	3. Adjust thermostat or replace.
Product dispenses slowly out of dispensing head.	1. Temp. control set too low.	1. Adjust temp. control. See mix properties, pg. 12.
	2. Product being drawn too fast (starving cylinder).	2. Adjust mix feed ass'y. to larger indent setting. See page 12.
	3. Reverse rotation. (3 phase)	3. Change rotation to clockwise from front of freezer.

TROUBLE-SHOOTING CHART COMPRESSOR/CONDENSING CIRCUIT

TROUBLE	PROBABLE CAUSE	REMEDY
Compressor will not start — hums intermittently (cycling on overload).	1. Improperly wired.	1. Check wiring against diagram.
	2. Low line voltage.	2. Ask power company to increase voltage to not less than 10% below nameplate rating or install transformer. Check for inadequate wire size.
	3. Open starting capacitor.	3. Replace starting capacitor.
	4. High discharge pressure.	4. Check water regulating valve setting. Check water or air condenser and clean, if necesary. Make sure discharge shut-off valve is open.

TROUBLE-SHOOTING CHART
COMPRESSOR/CONDENSING CIRCUIT

TROUBLE	PROBABLE CAUSE	REMEDY
Compressor starts, but remains in start windings.	1. Low line voltage.	1. Ask power company to increase voltage to not less than 10% below nameplate rating or install transformer.
	2. Improperly wired.	2. Check wiring against drawing. Check wire size.
	3. Running capacitor shorted.	3. Check by disconnecting running capacitor.
	4. Starting capacitor weak.	4. Check capacitor, replace.
	5. High discharge pressure.	5. Check water regulating valve; check water or air condenser and clean, if necessary. Check discharge shut-off valve.
Starter burned out.	1. Low line voltage.	1. Ask power company to increase voltage to not less than 10% below nameplate rating or install transformer.
	2. Excessive line voltage.	2. Ask power company to reduce voltage to maximum of 10% over nameplate rating.
Starting capacitors burn out.	1. Low line voltage.	1. Ask power company to increase voltage to not less than 10% below nameplate rating or install transformer.
	2. Improper capacitor.	2. Replace capacitor with properly rated capacitor as listed in manual.
Running capacitors burn out.	1. Excessive line voltage.	1. Ask power company to reduce line voltage to not more than 10% above rating of motor.

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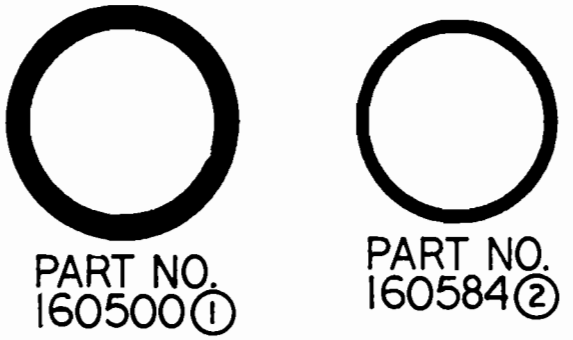
TROUBLE-SHOOTING CHART
COMPRESSOR/CONDENSING CIRCUIT

TROUBLE	PROBABLE CAUSE	REMEDY
Unit operates long or continuously.	1. Shortage of gas. 2. Dirty condenser. 3. Moisture in system. 4. Compressor failing.	1. Repair leak and recharge. 2. Clean condenser. 3. Evacuate and recharge system. 4. Check compressor.
Head pressure too high.	1. Refrigerant overcharge. 2. Air in system. 3. Dirty condenser (Air cooled). 4. Unit location too warm (air cooled). 5. Restricted water cooled condenser. 6. Water turned off or defective water regulating valve.	1. Purge system. 2. Purge system, evacuate and recharge. 3. Clean condenser. 4. Relocate unit away from restriction. Place nothing against back of unit. 5. Clean or replace condenser. 6. Turn on water, or replace regulating valve.
Head pressure too low.	1. Shortage of refrigerant. 2. Water regulating valve open too wide.	1. Repair leak and recharge. 2. Adjust regulating valve
Noisy compressor.	1. Tubing rattle.	1. Bend tubes away from contact.

Note: Refer to warranty card prior to compressor replacement.

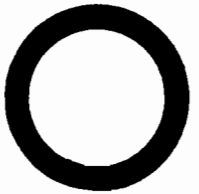
MIX FEED REGULATOR
MIX FLOAT



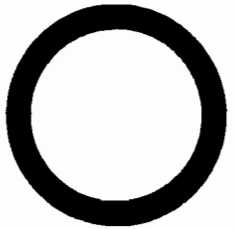
PART NO.
160500 (1)

PART NO.
160584 (2)

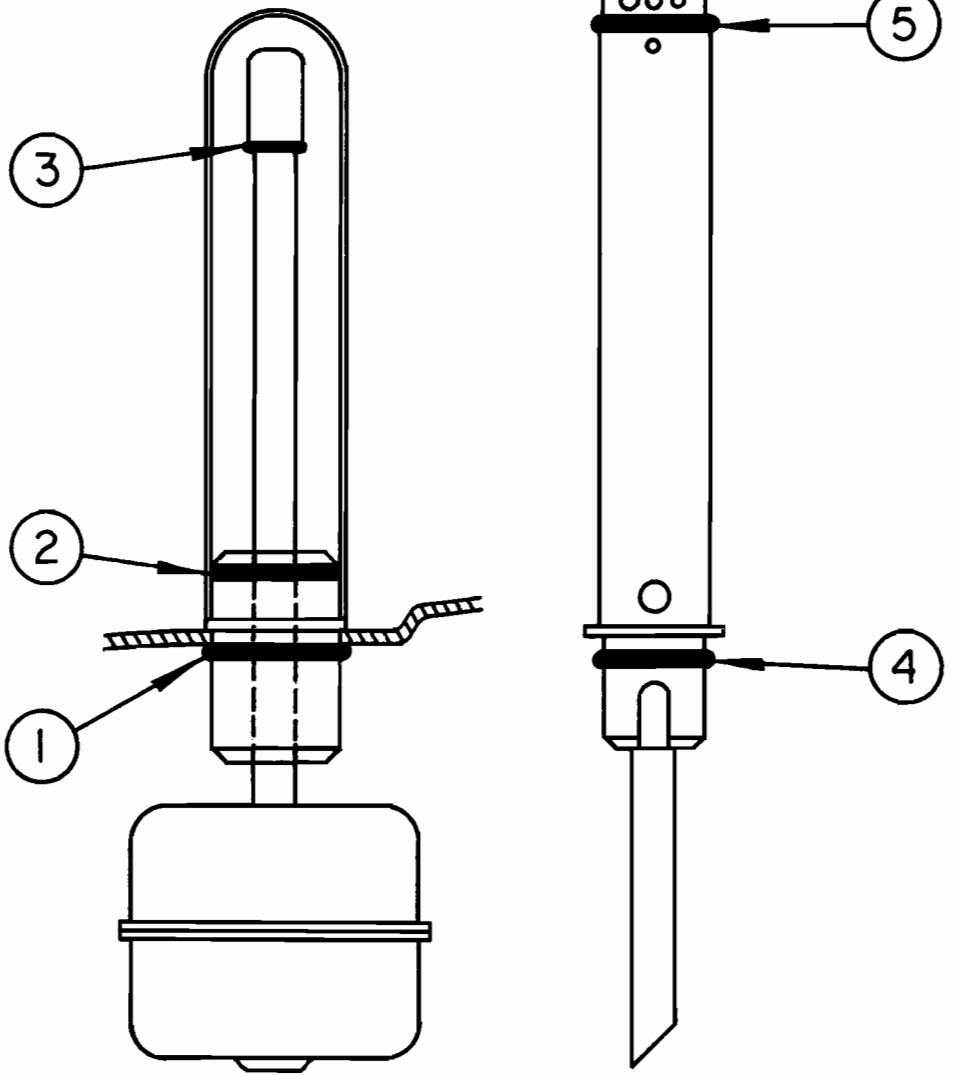
PART NO.
160610 (3)



PART NO.
160503 (4)



PART NO.
160590 (5)



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GRAVITY SOFT SERVE DISPENSING HEADS

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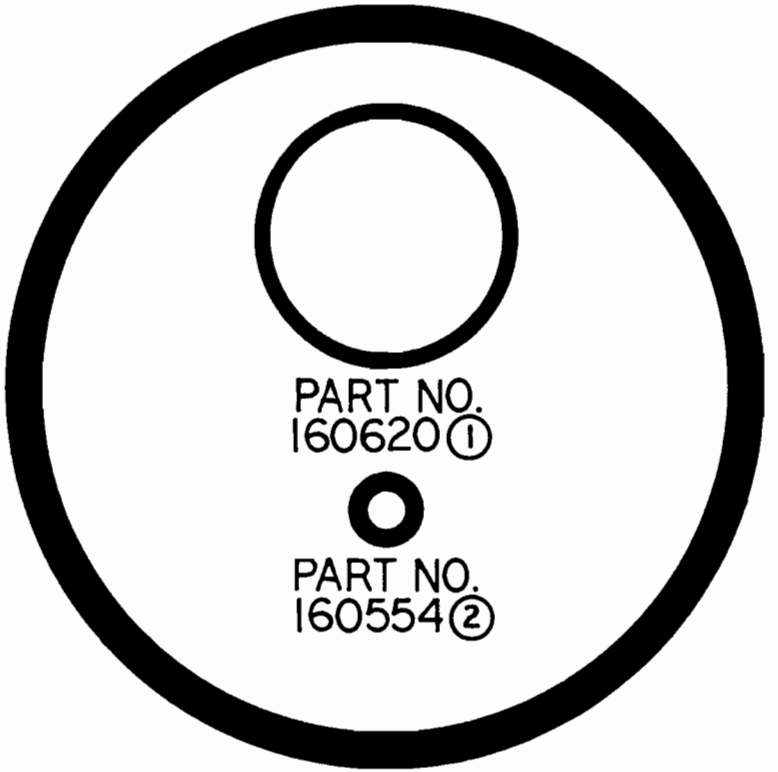

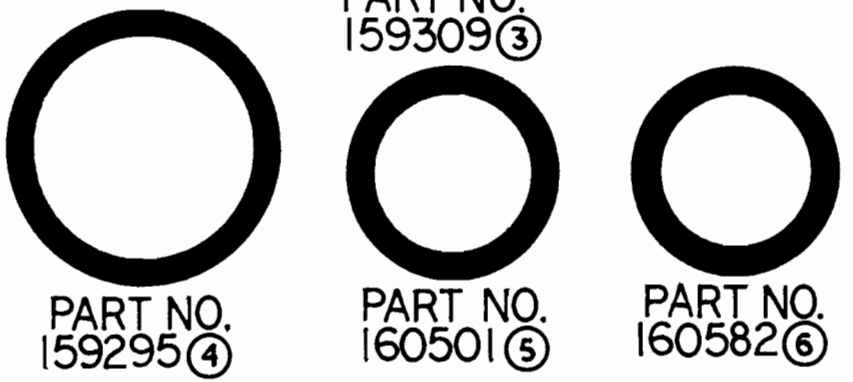

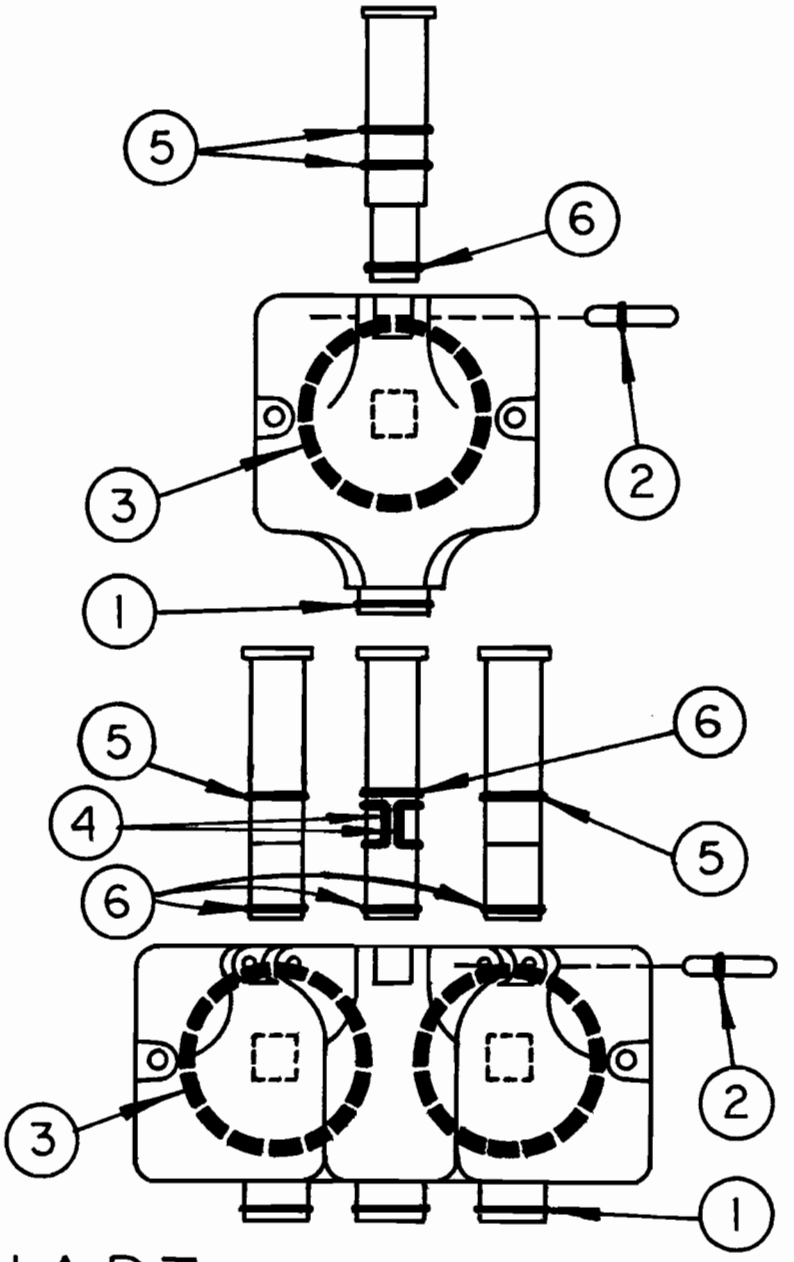

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