H. C. DUKE & SON, INC.
2116 - 8th Avenue • East Moline, Illinois 61244

Replacement Parts Manual with Illustrations

QUALITY PARTS
PROTECT
YOUR
EQUIPMENT

Soft Serve Freezer Model 917N-CMT

184628-01 2/04

P/N 184628-01 February 2004 Printed in U.S.A.

ILLUSTRATIONS

Parts are listed on each page using terminology that best fits the function of the part. It is very important to know the serial number of the machine when ordering parts because many parts are not interchangeable from one serial number to another of the same model. The illustrations in this manual can be used as a reference for obtaining the correct part description and part number. All returned items must have a Return Authorization Number prior to returning.

All parts listed in the manual should be ordered through:

H. C. Duke & Son, Inc.
2116 - 8th Avenue
East Moline, Illinois 61244
Telephone: (309) 755-4553
Fax: (309) 755-9858

Table of Contents

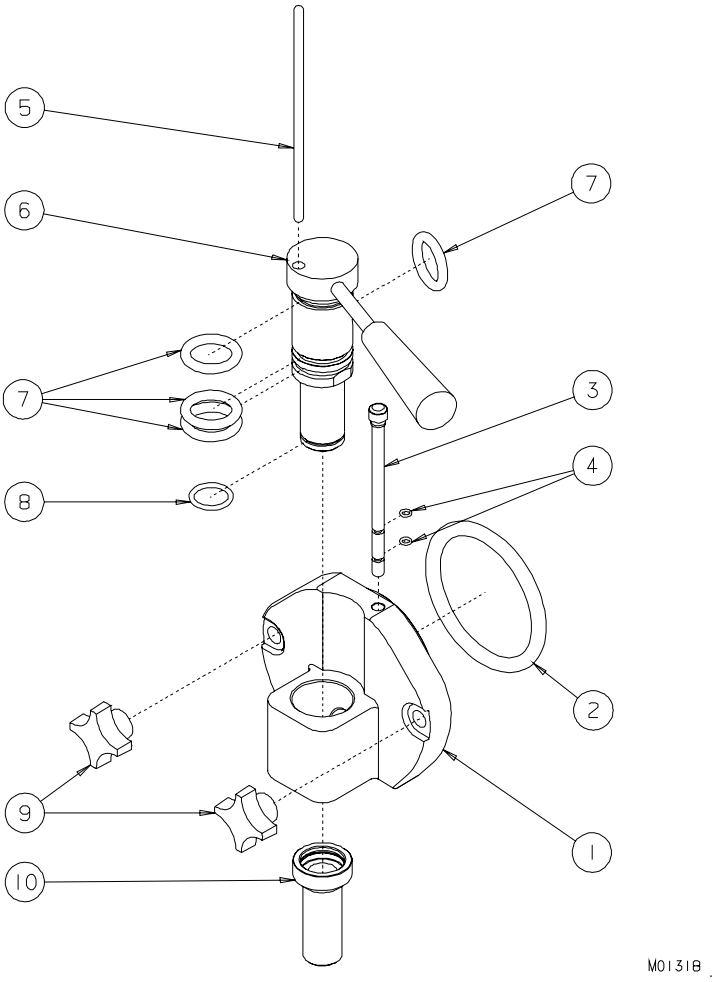


Figure 1 Dispense Head Assembly

Item	Part No.	Description
*	115130	Head-Assy. Dispense (Complete)
1	116321	Head (only)
2	160583	O-ring (Head)
3	115129	Bleeder-Assy. (Air Bleed Plug)
4	160562	O-ring (Bleeder Assembly)
5	136126	Rod-Spigot Switch
6	134921	Spigot-Long Single (less extension)
6A	162624	Handle-Black Tapered
6B	134922	Handle-Spigot
7	159295	O-ring (Spigot)
8	160584	O-ring (Extension)
9	162625	Knob-Hand
9A	114341	Stud-Assy. 1-15/16 inch (not shown)
10	136713	Extension-Spigot (Cake)

* Includes items 1 through 4, and 6 through 8.

Not Shown:

	116410	Kit-Dispense Head Switch

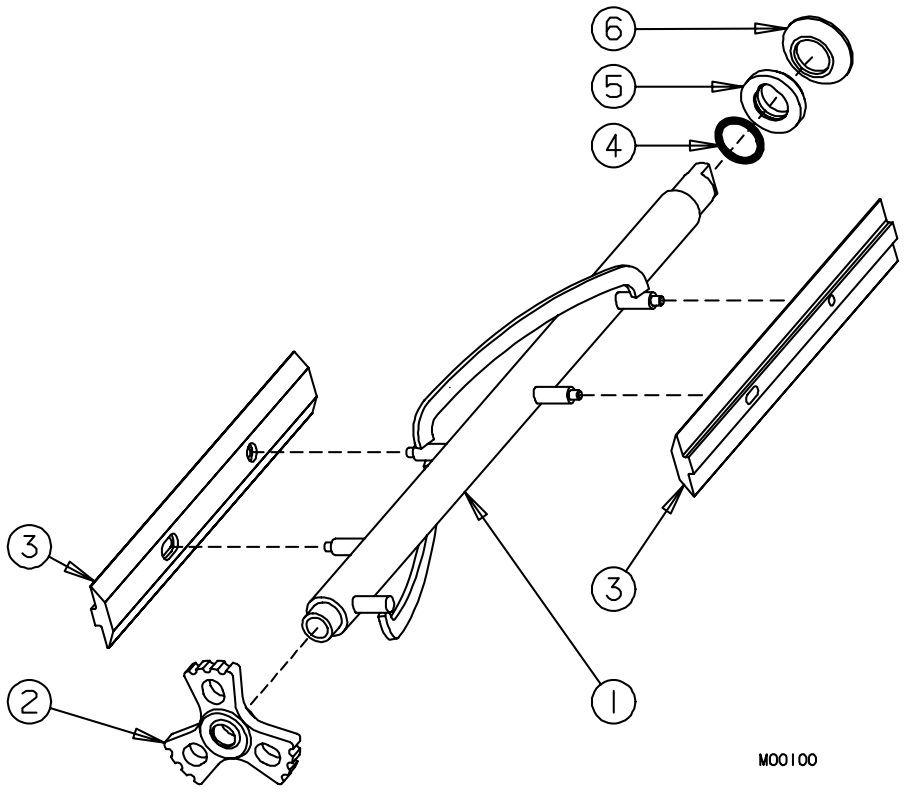


Figure 2 Beater Shaft Assembly

Item	Part No.	Description
1	113438	Shaft-Assy. Beater
2	196079	Bushing-Cylinder
3	137334	Blade-Scraper Soft Serve
4*	160500	O-ring (Seal)
5*	133098	Washer-Shaft Seal
6*	160557	Seal-Beater Shaft

* Items 4,5,6 can be ordered together as:
111875 Seal-Assy. Shaft

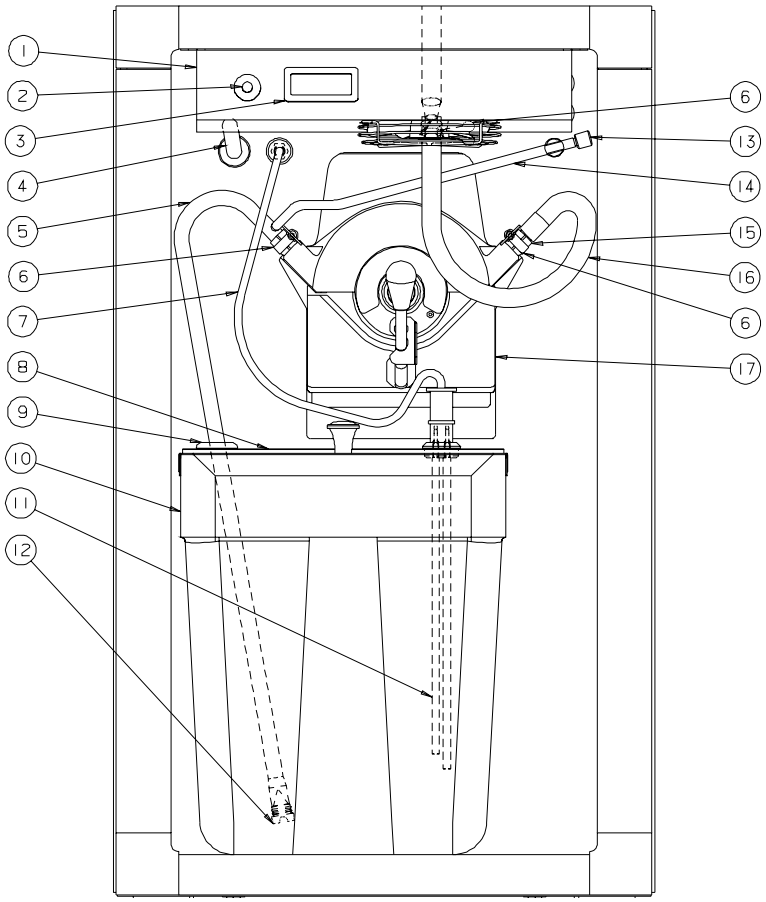


Figure 3 Cabinet Parts

REF.	PART No.	DESCRIPTION
1	116516-01	Shroud-Assy. Evaporator includes
	150532	Cord-Assy. Male Plug
	151105	Fan-Intake 230v
	151076	Guard-Fan Open
	150509	Switch-Door Push Button
	161004	Thermometer
1A	155111	Coil-Evaporator
1B	150533	Cord-Assy. Female Plug
2	150509	Switch-Door Push Button
3	161004	Thermometer (Cabinet)
4	196068	Tubing-.375 ID x .500OD PVC
4A	160738	Clamp-Hose 1/2 ID Delrin
5	116069	Tube-Assy. Pickup
6	116065	Clamp-Assy. Soft Hose 5/8
7	150537	Cordset-Mix Level Probe
7A	150536	Receptacle-Mix Level Sensor
8	113997	Cover-Assy. Mix Tank Front
8A	138165	Cover-Rear Mix Tank
9	199033	Boot-Mix Tube (Seal)
10	196222	Tank-Mix 7 Gal. Height 13-1/4"
11	115397	Probe-Assy. Mix Level 10-3/4" (7 Gallon Tank)
	137120	Base-Probe Mtg.
12	199032	Duckbill-Inlet (Valve)
13	---	Meter-Air (Order by Meter Number)
14	138170	Tube-Air (Hose)
15	138184	Hose-Transfer Black Line
16	116094	Hose-Assy. Mix Braided
17	116012	MTS-Assy. Housing (See Figure 5)
Not Shown:		
	164027	Decal - CMT Connection

Use only original or authorized replacement parts with this freezer.

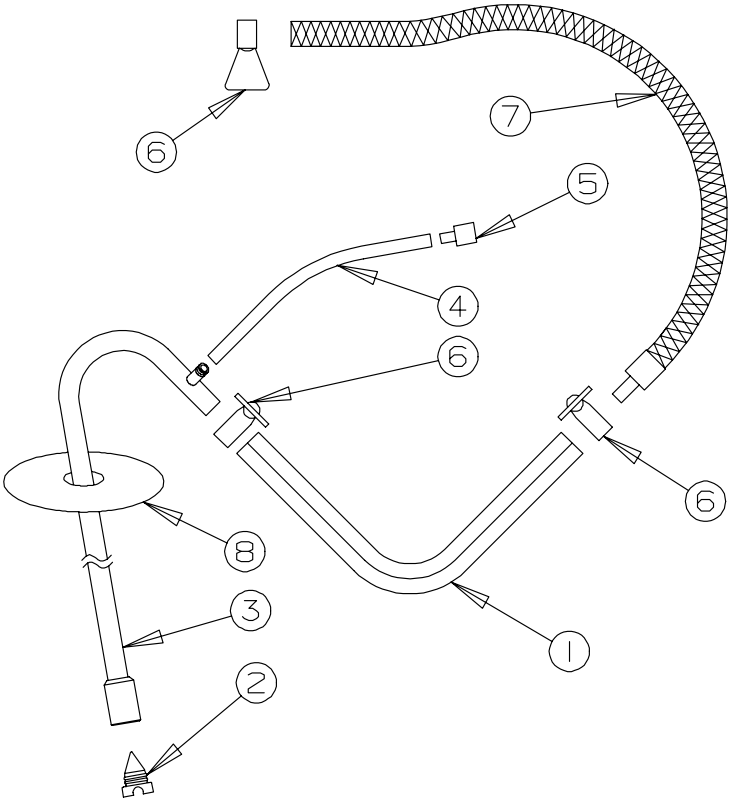


Figure 4 MTS Hose Assembly

REF.	PART No.	DESCRIPTION
1	138184	Hose-Transfer Black Line
2	199032	Duckbill-Inlet (Valve)
3	116069	Tube-Assy. Pickup
4	138170	Tube-Air
5	---	Meter-Air (Order by meter number)
6	116065	Clamp-Assy. Soft Hose 5/8
7	116094	Hose-Assy. Braided
8	199033	Boot-Mix Tube

Use only original or authorized replacement parts with this freezer.

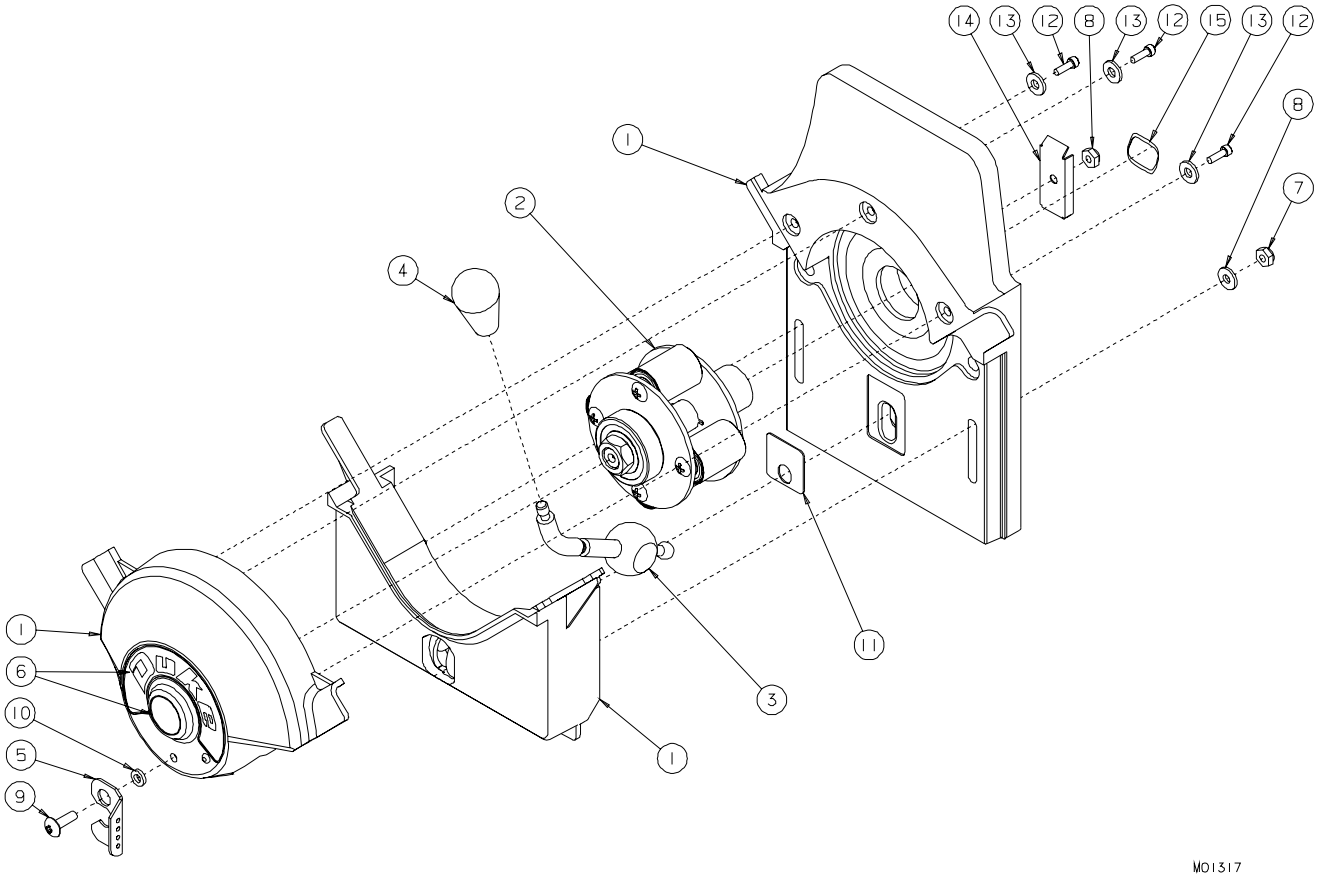


Figure 5 Mix Transfer System (MTS)

Item	Part No.	Description
*	116012	MTS-Assy. Housing (Complete)
1	117054	MTS-Assy. Housing w/o roller
2	116009-01	Kit-Roller Complete
3	116164	Handle-Assy. Round (MTS)
4	162627	Knob-Oval Taper (Handle-MTS)
5	**	Hook-Swing (Lock-MTS)
6	165021	Decal-Duke Mix Transfer
7	159421	Nut-EL Stop #10-32
8	160157	Washer-1/2 x .196 x 1/16
9	160026	Screw-TRPM #10-32 x 5/8 SST (Swing Hook)
10	160158	Washer-Flat .190 x .365 x .075 SST
11	138142	Plate-Pivot Cover
12	160307	Screw-SKHM #10 SST
13	159962	Washer-Flat #10 SST
14	117125	Actuator-Assy. Slide
15	160173	Washer-Spring Wave SST

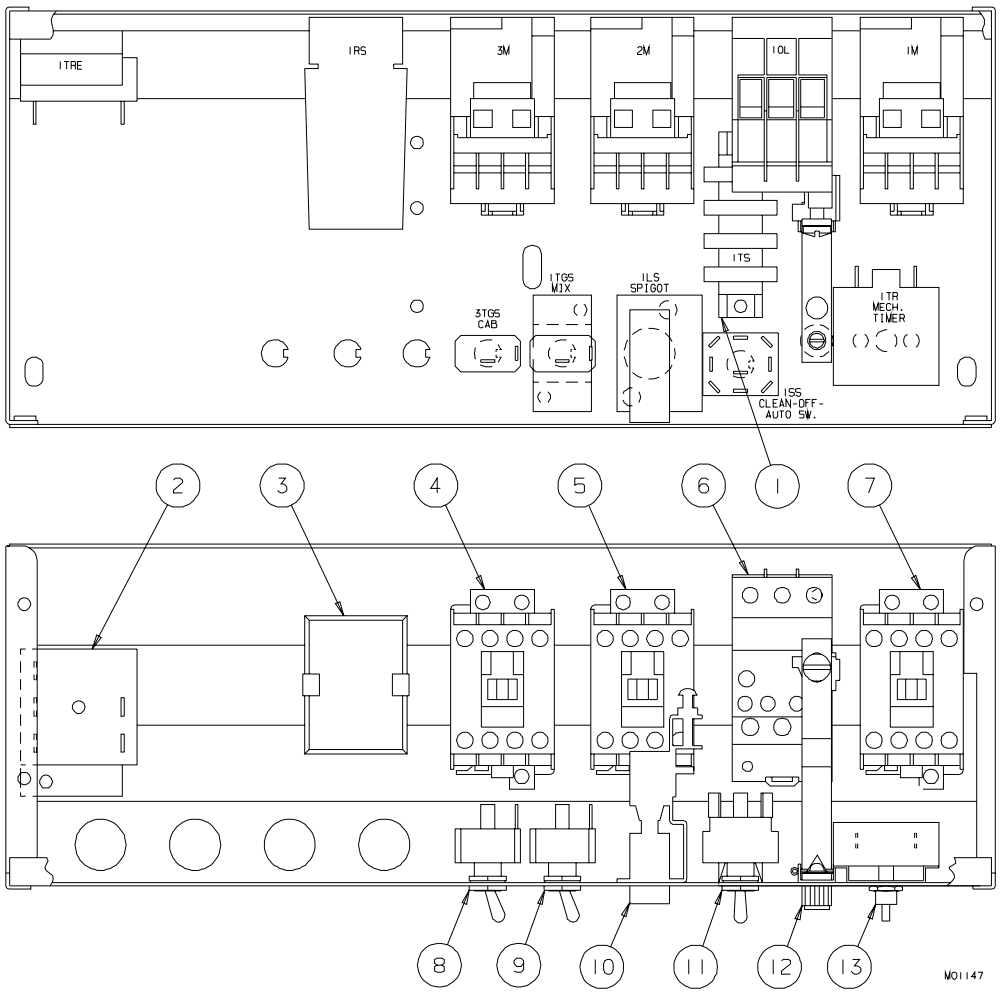
* Includes all above items except item 15.

** Order by freezer serial number

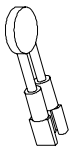
Not Shown:

159219	Screw-TRPM 1/4 -20 x 1 SST (MTS Mounting)
151129	Gearmotor-MTS
138369	Bushing-Alignment
116312	Gauge-Assy. Pressure Test
116411	Kit-MTS Slide Switch

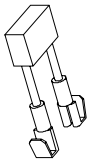
Figure 6 Switch Box (Sheet 1 of 2)



Detailed Drawings of
Filter and MOV Assemblies



Item #1A
MOV-Assy.
116188



Item #11A
Filter-Assy.
116125

Use only original or authorized replacement parts with this freezer.

Figure 6 Switch Box (Sheet 2 of 2)

REF.	PART No.	DESCRIPTION
1	150795	Strip-Terminal
1A	116188	MOV-Assy. (See Detailed Drawings)
2	150208	Timer-12 Sec. Delay on Break
3	150202	Indicator-Mix Level
3A	150119	Socket-Octal Terminal
3B	150120	Clip-Retainer (Set of 2)
4	150135	Contactor-Cabinet
4A	150156	Coil-Replacement Only
5	150135	Contactor-Compressor
5A	150156	Coil-Replacement Only
6	118359	Relay-Assy. Overload 1 Phase 5-15A
	150145	Adaptor-Overload Din Rail
	150150	Button-Overload Reset Adaptor
	150140	Relay-SS Overload 1 Phase 5-15A
	118361	Relay-Assy. Overload 3 Phase 3.7-12A
	150145	Adaptor-Overload Din Rail
	150150	Button-Overload Reset Adaptor
	150142	Relay-SS Overload 3 Phase 3.7-12
7	150135	Contactor-Beater Motor
7A	150156	Coil-Replacement Only
8	159235	Switch-Toggle SPST (Cabinet)
9	159235	Switch-Toggle SPST (Mix Transfer System)
10	113903	Switch-Assy. Spigot (See Figure 7)
	150456	Switch-Snap Button
11	150465	Switch-Toggle 3PDT Center Off (Selector)
11A	116125	Filter-Assy. (See Detailed Drawings)
12	118390	Lever-Reset & Button C23
	159036	Button-Reset
13	150218	Timer-5 Minute Mechanical
13A	162604	Knob-Timer (not shown)

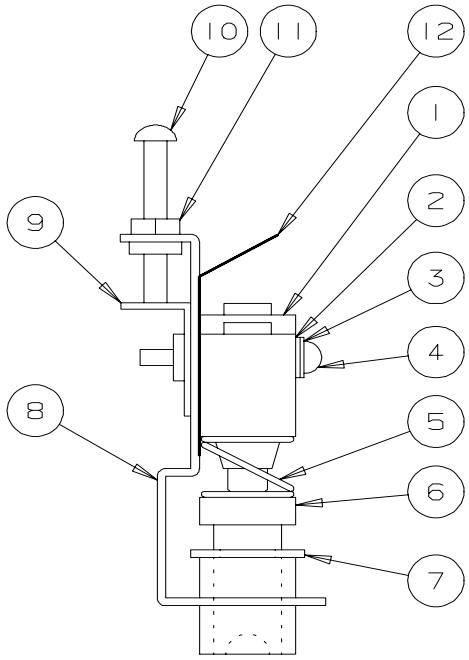


Figure 7 Spigot Switch Assembly

REF.	PART No.	DESCRIPTION
*	113903	Switch-Assy. Spigot
1	150456	Switch-Snap Button
2	160393	Washer-Flat #6 Brass
3	160392	Washer-Ext. Tooth #6 ZN
4	160296	Screw-RDHM #6–32 x 1-1/4 SST
5	162321	Spring-Spigot Switch
6	136124	Button-Spigot Switch
7	160303	Ring-Retaining 1/2 External
8	113902	Bracket-Assy. Spigot Switch Mounting
9	113901	Bracket-Assy. Adjusting
10	160267	Screw-RDHM #8–32 x 7/8 Brass
11	160102	Nut-HEX #8–32 ZN
12	135744	Insulator-Switch

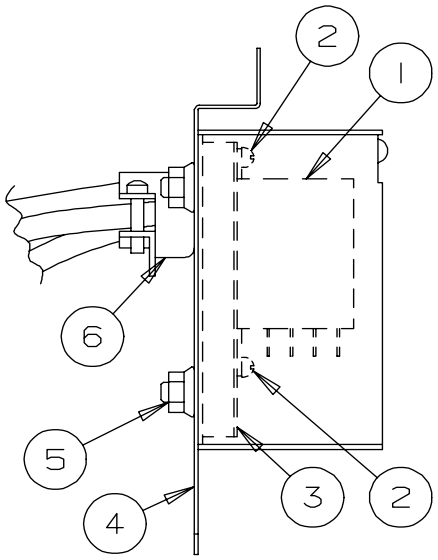
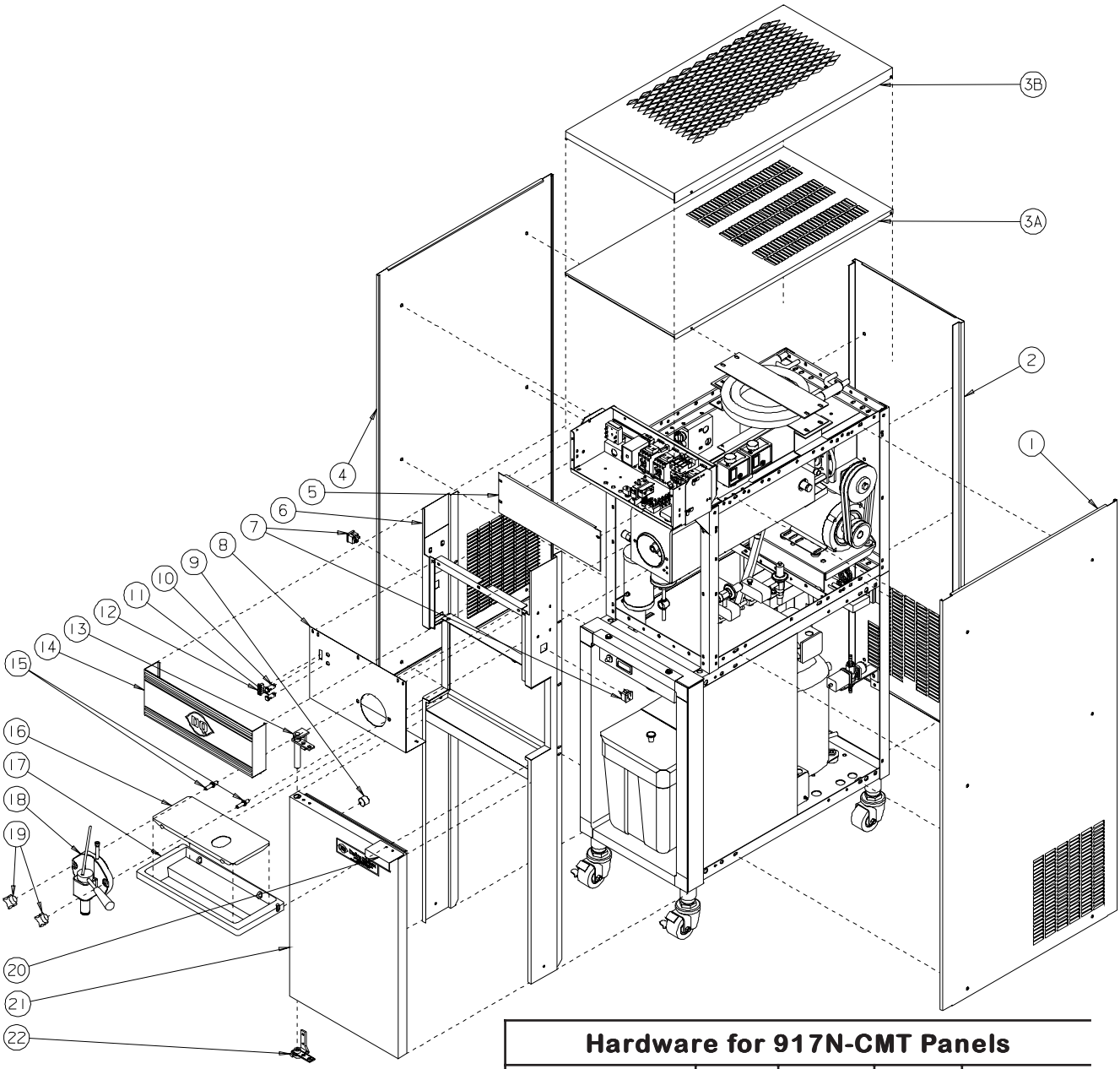


Figure 8 Relay Box - MTS

REF.	PART No.	DESCRIPTION
*	119216	Box-Assy. Relay
1	150381	Relay-Flange Base w/Cover
2	160308	Screw-RDHM #6-32 x 5/16 ZN
2A	160116	Nut-Speed #6-32 BKOX
3	138159	Bracket-Flange Relay Mtg.
4	138248	Support-MTS
5	159950	Screw-HXSF 1/4-20 x 1/2 ZN
5A	159951	Nut-HXSF 1/4-20 ZN
6	150828	Connector-1/2

*Includes all items above.

Figure 9 917N-CMT Panel Assembly (sheet 1 of 2)



Hardware for 917N-CMT Panels				
Panel	**Screw**	**Nut-Speed**	**Spacer**	**Nut-Speed on Frame**
Channel-Rear(ACR)	160048	160117	n/a	n/a
Dispense	160076	159132	n/a	n/a
Front	160076	n/a	n/a	159067
Rear	160048	160117	n/a	n/a
Side	159219	160114	138456	n/a
Top	160305	n/a	n/a	n/a
Trimstrip	160076	159067	n/a	n/a
n/a - Not Applicable				

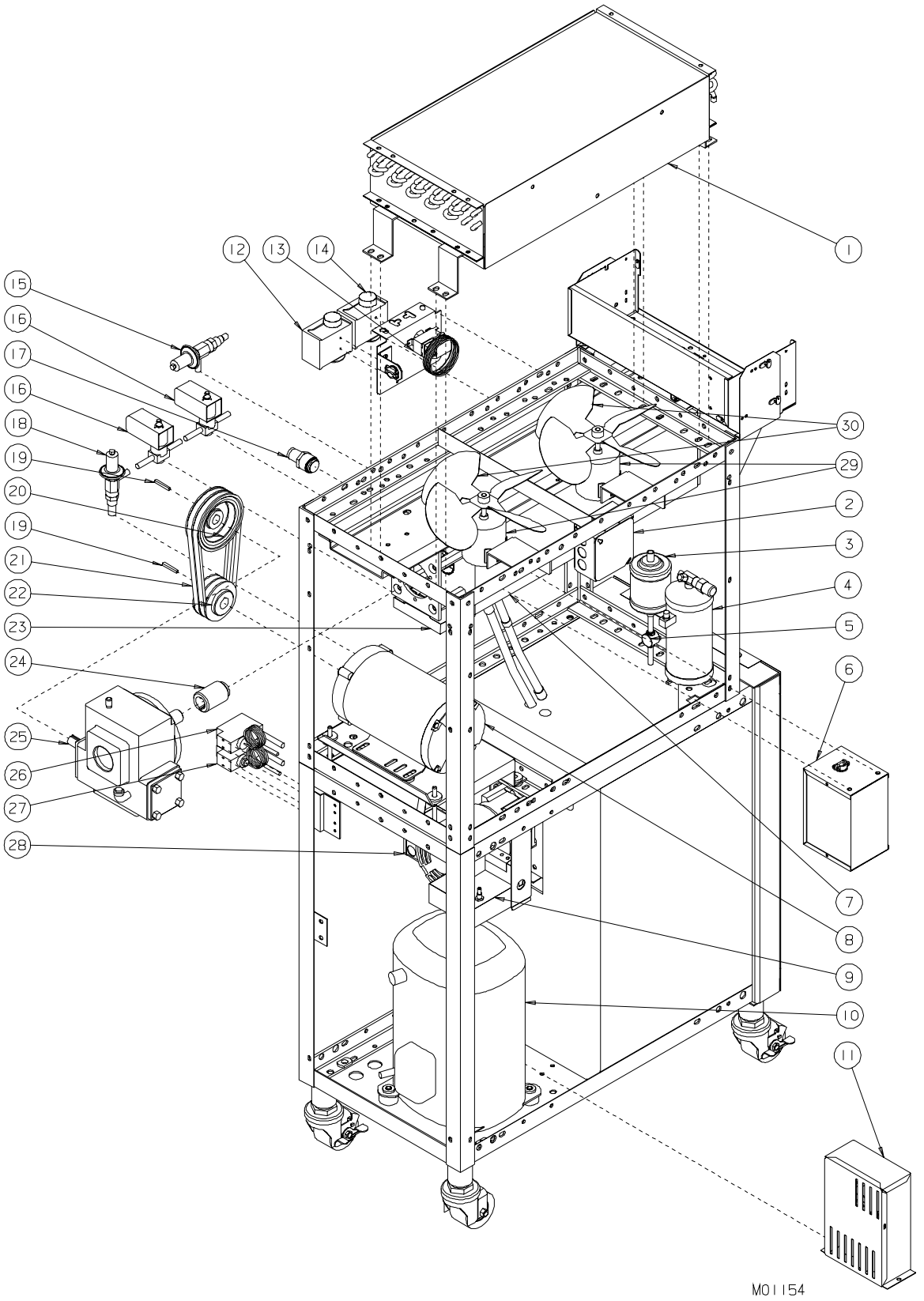
Figure 9 917N-CMT Panel Assembly (sheet 2 of 2)

REF.	PART No.	DESCRIPTION
1	137028-C	Panel-Side RH
2	140024-C	Panel-Rear (WC and AC)
	139134	Panel-Upper Rear (ACR)
	139135	Panel-Lower Rear (ACR)
2A	139137	Strip-Rear Panel (ACR)
3A	116509-C	Panel-Assy. Top (AC)
3B	116514-C	Panel-Assy. Top (WC and ACR)
4	137027-C	Panel-Side LH
5	116508	Cover-Assy. Electric Box
6	116810-C	Panel-Assy. Front
	159175	Catch-Bullet (Drip Tray Button)
	160289	Nut-Push Round (Clip for Button)
7	159050	Receptacle-Snap In
8	140126	Panel-Dispense
9	118597	Actuator-Assy. Door Switch
10	150561	Light-Pilot Red
11	150562	Light-Pilot Amber
12	150540	Light-Indicator (“LOW MIX”)
13	162045	Hinge-Pivot 1-3/8" Top LH includes
	162052	Spring LH
14	119336-01	Trimstrip-Assy. 18" IDQ
15	114341	Stud-Assy. Cylinder 1-15/16”
16	116540	Insert-Assy. Drip Tray
17	196107-03	Tray-Drip 18" White
18	115130	Head-Assy. Dispense (See Figure 1)
19	162625	Knob-Hand
20	136199	Pull-Door (Handle)
21	114260-07-C	Door-Assy. Complete
	160563-02	Gasket-Door 18"
	136199	Pull-Door (Handle)
22	162046	Hinge-Pivot 1-3/8" Bottom LH

AC = Air Cooled
WC = Water Cooled
ACR = Air Cooled Remote
LH = Left hand side of freezer when facing front.
RH = Right hand side of freezer when facing front.

Decals	
Part No.	**Description**
165119	6" Air Flow
165025	Beater Warning
165249	Cleaning Instructions
165093	Clear Overlay
164027	CMT Connection
165013	CMT Patent
165061	Duke Logo
165002	General Purpose Recpt.
165166	IDQ Logo (Door)
164129	MTS Trimstrip RH
164127	Operating Instructions
165126	Panel Removal
165124	Top Air Discharge
165440-01	Trimstrip 18 Inch IDQ
165246	Warning Pressurized

Figure 10 917N-CMT Air Cooled Assembly
(Sheet 1 of 2)



Use only original or authorized replacement parts with this freezer.

Figure 10 917N-CMT Air Cooled Assembly
(Sheet 2 of 2)

REF.	PART No.	DESCRIPTION
1	155120-C	Condenser-Air
1A	116494	Bracket-Assy. Front Air Condenser
1B	138465	Shroud-Fan
2*	119216	Box-Assy. Relay (See Figure 7)
3	155054	Drier-Filter 16 cu. in.
4	155057	Receiver-3 lb. 3/8 ID Sweat
5	155059	Glass-Sight
6	113442	Box-Assy Capacitors & Components (1 Phase) (Beater Motor) includes hardware and
	150318	Capacitor-Run
	150872	Capacitor-Motor Start
7		*Order by freezer serial number*
8	151052	Motor-2HP (3 Phase) (Beater Motor)
	118140	Kit-Motor & Capacitor 2HP 230V (1 phase) includes motor and
	150318	Capacitor-Run
	150872	Capacitor-Motor Start
8A	150877	Switch-Centrifugal (1 Phase)
9	116560	Pan-Assy. Condensate
10	118686	Compressor-Assy. (3 Phase) includes Maneurop compressor and
	151397	Adaptor-3/8 ODF x 1" for Rotalock
	155054	Drier-Filter
or	118685	Compressor-Assy (1 Phase) includes Maneurop compressor and
	151397	Adaptor-3/8 ODF x 1" for Rotalock
	151447	Capacitor-Run
	151448	Kit-Compr Start Cap & Relay
	155054	Drier-Filter
10A	151446	Kit-Maneurop Compr. Mtg.
10B	119326	Valve-Assy Rotalock MTZ includes valve and
	165532	Insulator-Rotalock Valve MTZ
	151399	Kit-Washer Rotalock MTZ
11	118647	Box-Assy. Capacitor & Relay (1 Phase) includes hardware and
	151447	Capacitor-Run
	151448	Kit-Compr Start Cap & Relay
11A	137498	Cover-Assy. Capacitor & Relay Box
12	155442	Thermostat-Low
13	155483	Thermostat-Evap. 41° Fixed w/Off (Cabinet)
14	155442	Thermostat-Low
15	155490	Valve-Automatic Expansion (Cylinder)
15A	165531	Insulator-Expansion Valve
16	155421	Valve-Solenoid 208-240v
16A	155434	Kit-Solenoid Valve
17	117014	Kit-Pressure Switch Field Replacement includes
	116105	Nut-Assy. Pressure Switch
18	155449	Valve-Automatic Expansion (Cabinet)
18A	165531	Insulator-Expansion Valve
19	153322	Key-Drive 3/16 Sq x 1-1/2
20	153625	Sheave-3/4 Bore 4.75 OD (Driven Pulley)
20A	160495	Screw-SK Set 1/4-20x1/4
21	153169	Belt-V
22	153626	Sheave-7/8 Bore 3.25 OD (Driver Pulley)
22A	160495	Screw-SK Set 1/4-20x1/4
23	114374	Tube-Assy. Drain
24	111964	Coupling-Assy. 1 in. Drive
25	153356	Reducer-Gear RH 10/1 (See Figure 12)
26	155425	Cut Out-High Pressure
27	155403	Cut Out-Low Pressure
28	151129	Gearmotor-1/8 HP (Pump)
29	151077-01	Motor-Fan 50w 230v
30	159023	Blade-Fan 11” 36°

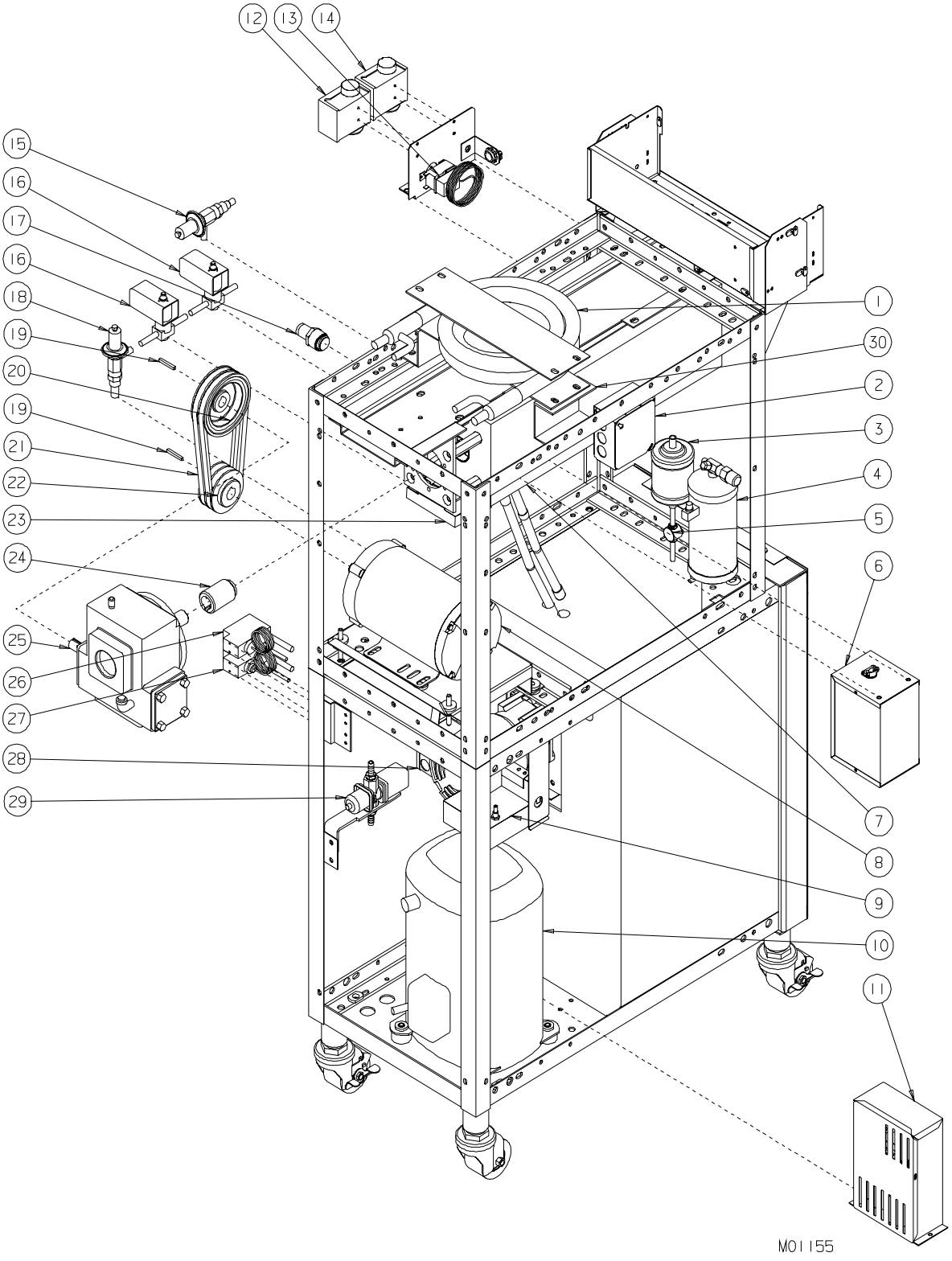
* Location may vary.

Not Shown:

161216	Sensor-10K Thermistor
116410	Kit-Dispense Head Switch

Use only original or authorized replacement parts with this freezer.

Figure 11 917N-CMT Water Cooled Assembly
(Sheet 1 of 2)



Use only original or authorized replacement parts with this freezer.

Figure 11 917N-CMT Water Cooled Assembly
(Sheet 2 of 2)

REF.	PART No.	DESCRIPTION
1	155029	Condenser-Water
2*	119216	Box-Assy. Relay (See Figure 7)
3	155054	Drier-Filter 16 cu. in.
4	155057	Receiver-3 lb. 3/8 ID Sweat
5	155059	Glass-Sight
6	113442	Box-Assy Capacitors & Components (1 Phase) (Beater Motor) includes hardware and
		150318 Capacitor-Run
		150872 Capacitor-Motor Start
7		*Order by freezer serial number*
8	151052	Motor-2HP (3 Phase) (Beater Motor)
	118140	Kit-Motor & Capacitor 2HP 230V (1 phase) includes motor and
		150318 Capacitor-Run
		150872 Capacitor-Motor Start
8A	150877	Switch-Centrifugal (1 Phase)
9	116560	Pan-Assy. Condensate
10	118686	Compressor-Assy. (3 Phase) includes Maneurop compressor and
		151397 Adaptor-3/8 ODF x 1" for Rotalock
		155054 Drier-Filter
or	118685	Compressor-Assy (1 Phase) includes Maneurop compressor and
		151397 Adaptor-3/8 ODF x 1" for Rotalock
		151447 Capacitor-Run
		151448 Kit-Compr Start Cap & Relay
		155054 Drier-Filter
10A	151446	Kit-Maneurop Compr. Mtg.
10B	119326	Valve-Assy Rotalock MTZ includes valve and
		165532 Insulator-Rotalock Valve MTZ
		151399 Kit-Washer Rotalock MTZ
11	118647	Box-Assy. Capacitor & Relay includes hardware and
		151447 Capacitor-Run
		151448 Kit-Compr Start Cap & Relay
11A	137498	Cover-Assy. Capacitor & Relay Box
12	155442	Thermostat-Low
13	155483	Thermostat-Evap. 41° Fixed w/Off (Cabinet)
14	155442	Thermostat-Low
15	155490	Valve-Automatic Expansion (Cylinder)
15A	165531	Insulator-Expansion Valve

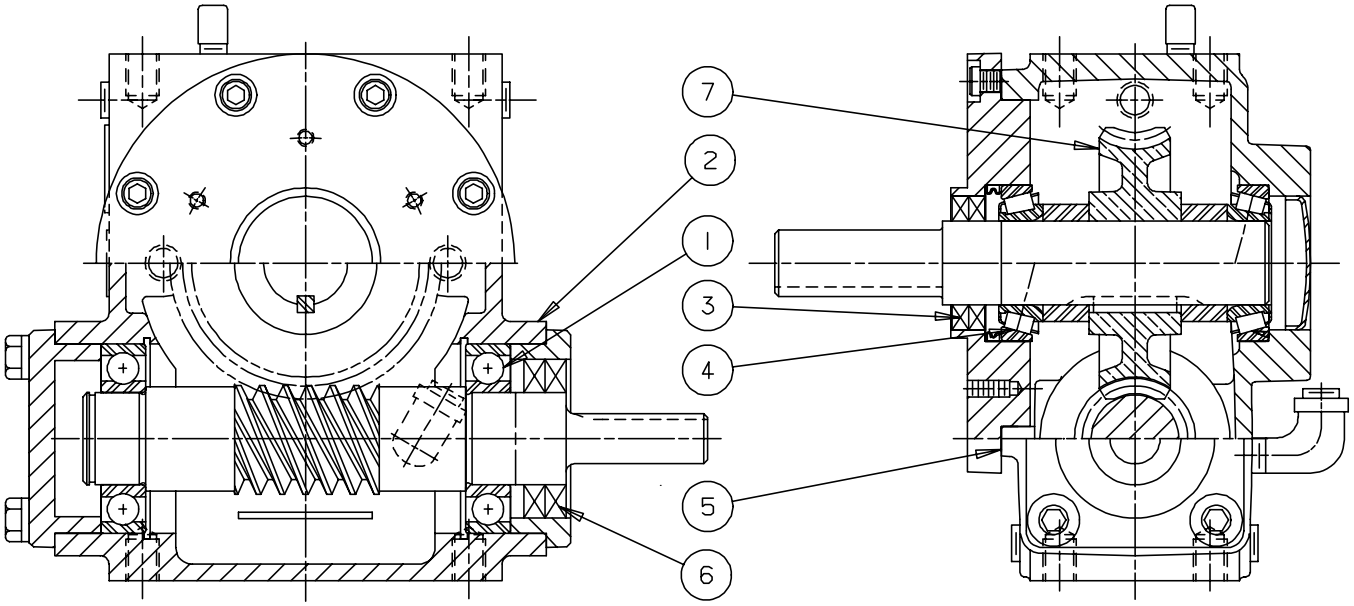
REF.	PART No.	DESCRIPTION
16	155421	Valve-Solenoid 208-240v
16A	155434	Kit-Solenoid Valve
17	117014	Kit-Pressure Switch Field Replacement includes
		116105 Nut-Assy. Pressure Switch
18	155449	Valve-Automatic Expansion (Cabinet)
18A	165531	Insulator-Expansion Valve
19	153322	Key-Drive 3/16 Sq x 1-1/2
20	153625	Sheave-3/4 Bore 4.75 OD (Driven Pulley)
20A	160033	Screw-SK Set 5/16-18x3/8
21	153169	Belt-V
22	153626	Sheave-7/8 Bore 3.25 OD (Driver Pulley)
22A	160495	Screw-SK Set 1/4-20x1/4
23	114374	Tube-Assy. Drain
24	111964	Coupling-Assy. 1 in. Drive
25	153356	Reducer-Gear RH 10/1 (See Figure 12)
26	155425	Cut Out-High Pressure
27	155403	Cut Out-Low Pressure
28	151129	Gearmotor-1/8 HP (Pump)
29	113769	Valve-Assy. Water includes
		155410 Valve-Water 3/8
29A	155444	Kit-Water Valve Repair
30	139939	Bracket-Condenser Mtg.

* Location may vary.

Not Shown:

161216	Sensor-10K Thermistor
116410	Kit-Dispense Head Switch

Figure 12 Gear Reducer

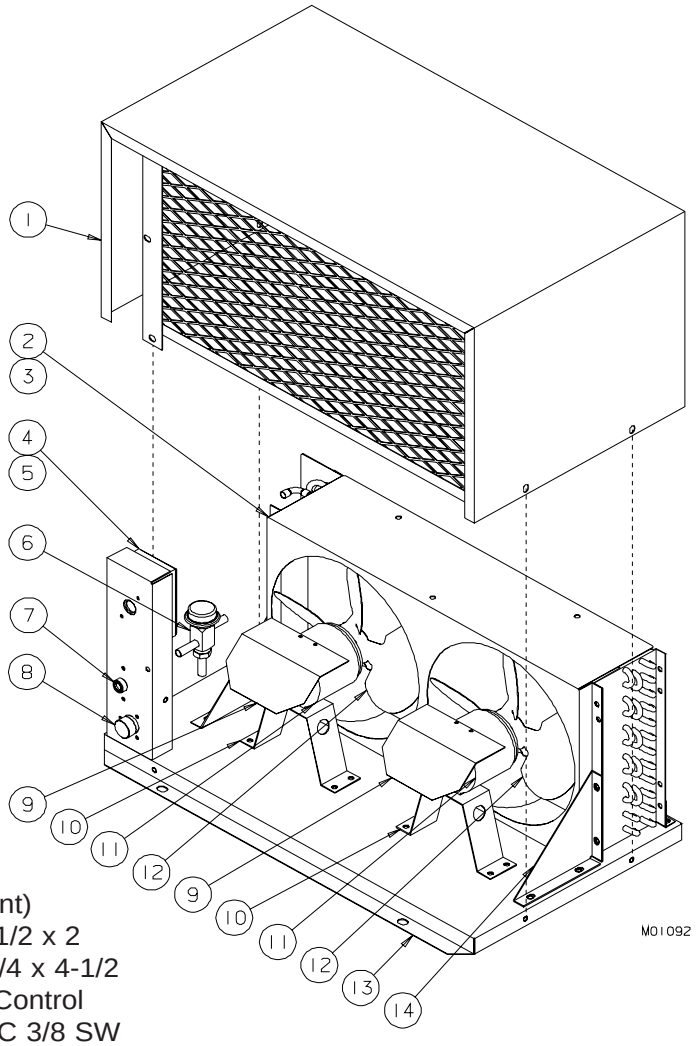


Model HCD926

153356 10:1 Ratio

Item	Part No.	Description	Quantity Required
1	153065	Bearing-Ball 1.378 ID x 2.835 OD	2 ea.
2	153066	Gasket-High Speed	1 ea.
3	153071	Seal-Slow Speed	2 ea.
4	153068	Bearing-Slow Speed Cone 1.25"	2 ea.
4A	153069	Bearing-Slow Speed Cup 2.328"	2 ea.
5	153070	Gasket-Slow Speed	1 ea.
6	153067	Seal-High Speed	2 ea.
7	153301	Gear-Slow Speed	1 ea.
	118742	Kit-Reducer Gasket Model HCD926	
	158055	Oil-Special Gear Lube	

Figure 13 Air Cooled Remote



REF.	PART No.	DESCRIPTION
*	116781-01	Condenser-Assy. 2 Hp Remote (Complete)
1	117207	Cover-Assy. Condenser
2	155120-C	Condenser-Air
3	138465	Shroud-Fan
3A	137628	Brace-Condenser (Front)
4	150732	Box-Electric 2-3/4 x 4-1/2 x 2
5	150737	Cover-Electric Box 2-3/4 x 4-1/2
6	155454	Valve-Head Pressure Control
7	153420	Coupling-Refr. 3/8 MQC 3/8 SW
7A	140039	Plate-Coupling Mtg.
8	153418	Coupling-Refr. 1/2MQC 1/2 SW
8A	153502	Flange-Refr. Coupling Mount 1/2
8B	153503	Cap-Dust Refr. Coupling
9	139017	Shield-Motor Rain
10	137632	Bracket-Fan Condenser
11	151072	Motor-Fan 50W 230V 60Hz
12	159029	Blade-Fan 11" Dia 36°
13	117206	Base-Assy. Condenser
14	137629	Support-Condenser

* Includes all items above.

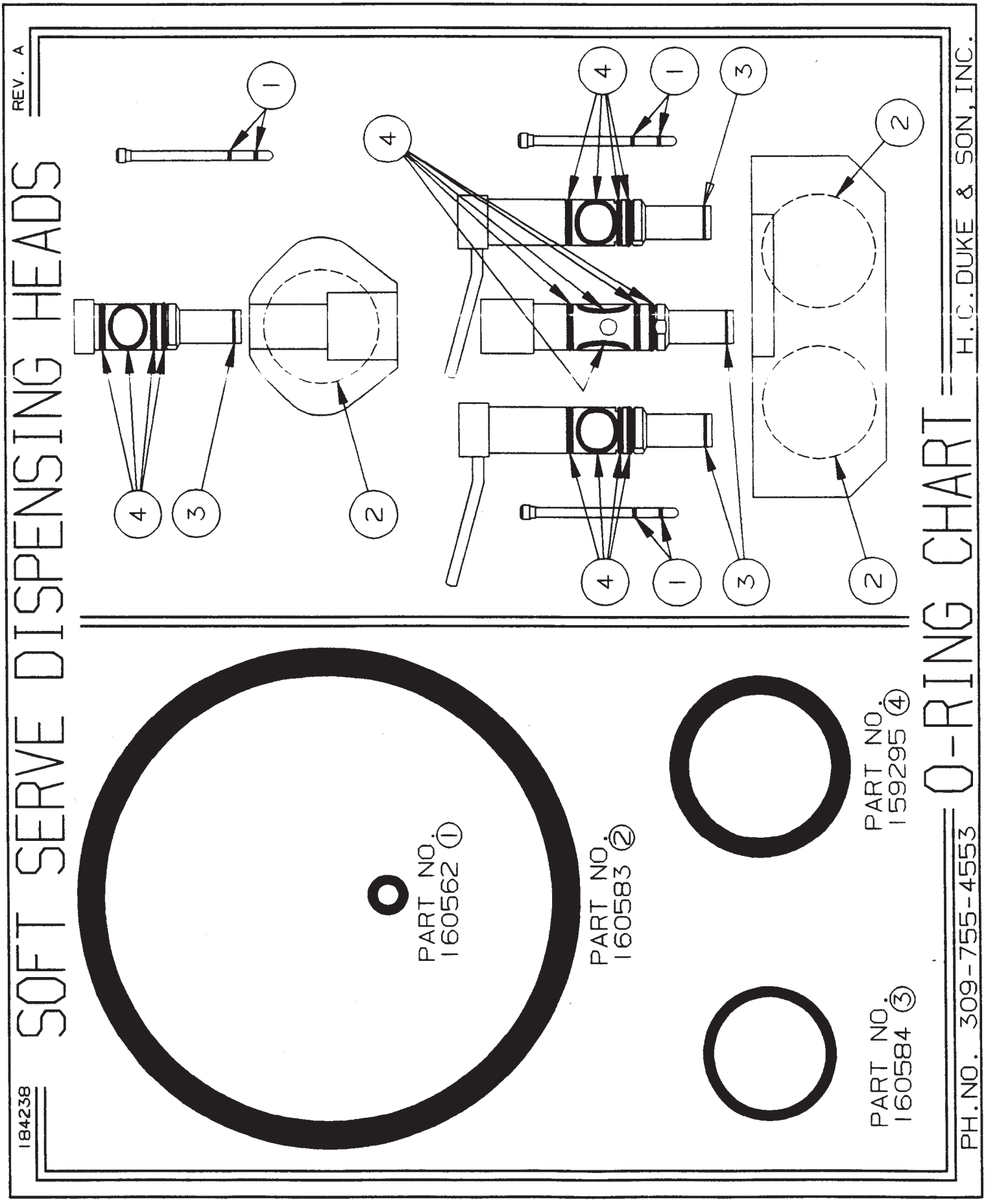
Not Shown:

155064	Receiver-10-1/2 lb. 3/8 ID Sweat
155465	Cut Out-Low Pressure
155466	Control-Pressure Fan
155487	Check-Valve 5/8 ODF Sweat
166026	Heater-Crankcase
119124	Kit-25 Foot Line Sets 404a
119125	Kit-50 Foot Line Sets 404a

Accessories

Part No.	Description
196103	Bottle-Wash
158004	Brush-4” with 36” Handle (Cylinder)
158009	Brush-4” w/o Handle
158018	Brush-7/16” dia. 12” Overall Length
158019	Brush-9/16” dia. 30” Overall Length
158026	Brush-1” dia. 12’ Long
158037	Brush-1/4” dia. 18-1/2” Long
162133	Caster-Low Profile w/Brake
162134	Caster-Low Profile Non-Swivel
184238	Chart-O-ring (Laminated-Ivory)
158051	Cup-Overrun Measuring One Pint
136567	Hose-Spigot Drain
115537	Kit-O-ring
112978	Leg-6-inch
158054A	Lubricant-Lubri-Film (4 oz. tube)
158014	Sanitizer-Stera-Sheen (per case of 4)
158014A	Sanitizer-Stera-Sheen (per 4 lb. jar)
158049	Scale-Overrun
117246	Sensor-Assy. Bag-in-Box (Adapter Kit)
169374	Tool-O-ring Removal
184818	Video-Operational
196006	Tee-5/8 x 5/8 x 5/8 White (Plastic Hose Connection)
196061	Tubing- .600 ID x .850 OD PVC (Mix Line-Std)

Use only original or authorized replacement parts with this freezer.


SOFT SERVE DISPENSING HEADS
REV. A
184238
O-RING CHART
H.C. DUKE & SON, INC.
PH. NO. 309-755-4553
PART NO. 160562 ①
PART NO. 160583 ②
PART NO. 159295 ④
PART NO. 160584 ③

Notes:

Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)
Actuator-Assy. Door Switch	114630	1	A2B-162 - E2F-1366
Actuator-Assy. Door Switch	118597	1	E2F-1367 -
Actuator-Assy. Slide (MTS)	117125	1	A2B-162 -
Adapter-Star/Spigot (Yogurt Nozzle)	137870	1	A2B-162 -
Adaptor-3/8 ODF x 1" Rotalock (Maneurop Compressors)	151397	1	A2B-162 -
Adaptor-Overload Din Rail	*See Relay-Assy. Overload*		
Base-Probe Mtg.	137120	1	A2B-162 -
Bearing-Ball 1.378 ID x 2.835 OD (Gear Reducer)	153065	2	*See Reducer-Gear 153356*
Bearing-High Speed Cone (Gear Reducer)	153015	2	*See Reducer-Gear 153343*
Bearing-High Speed Cup (Gear Reducer)	153014	2	*See Reducer-Gear 153343*
Bearing-Slow Speed Cone (Gear Reducer)	153012	2	*See Reducer-Gear 153343*
Bearing-Slow Speed Cone 1.25" (Gear Reducer)	153068	2	*See Reducer-Gear 153356*
Bearing-Slow Speed Cup (Gear Reducer)	153011	2	*See Reducer-Gear 153343*
Bearing-Slow Speed Cup 2.328" (Gear Reducer)	153069	2	*See Reducer-Gear 153356*
Belt-V	153169	2	A2B-162 -
Blade-Fan 11" Dia 36° (ACR)	159029	2	A2B-162 -
Blade-Fan 11" 36° (AC)	159023	2	A2B-162 -
Blade-Scraper Soft Serve	137334	2	A2B-162 -
Bleeder-Assy. (Air Relief Plug)	115129	1	A2B-162 -
Boot-Mix Tube (Seal)	199033	1	A2B-162 -
Bottle-Wash	196103	1	A2B-162 -

* As Required
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Use only original or authorized replacement parts with this freezer.

Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)	
Box-Electric 2-3/4 x 4-1/2 x 2 (ACR)	150732	1	A2B-162	-
Brace-Condenser (ACR)	137628	2	A2B-162	-
Bracket-Assy. Adjusting (Spigot Switch Assy.)	113901	1	A2B-162	-
Bracket-Assy Electric Box (ACR)	117197	1	A2B-162	- C2I
Bracket-Assy Electric Box (ACR)	119192	1	C2I	-
Bracket-Assy. Front Air Condenser (AC)	116494	4	A2B-162	-
Bracket-Assy. Spigot Switch Mtg. (Spigot Switch Assy.)	113902	1	A2B-162	-
Bracket-Condenser Mtg. (WC)	139939	2	A2B-162	-
Bracket-Fan Condenser (ACR)	137632	2	A2B-162	-
Bracket-Flange Relay Mtg. (MTS Relay Box)	138159	1	A2B-162	-
Brush-1/4" dia 18-1/2" Long	158037	1	A2B-162	-
Brush-1/4" dia. 2LG 6-1/2" Overall Length	158022	1	A2B-162	- C2G-548
Brush-1" dia. 12' Long	158026	1	C2G-549	-
Brush-4" w/o Handle	158009	1	A2B-162	-
Brush-4" with 36" Handle (Cylinder)	158004	1	A2B-162	-
Brush-7/16" dia. 12" Overall Length	158018	1	A2B-162	-
Brush-9/16" dia. 30" Overall Length	158019	1	A2B-162	-
Bushing-Alignment (Loaner)	138369	1	A2B-162	-
Bushing-Alignment (Purchase)	138369-01	1	A2B-162	-
Bushing-Cylinder	196079	1	A2B-162	-
Button-Overload Reset Adaptor	*See Relay-Assy. Overload*			
Button-Reset (Reset Lever)	159036	1	A2B-162	-
Button-Spigot Switch (Spigot Switch Assy.)	136124	1	A2B-162	-
Capacitor-Beater Motors	*See Motor-Beater*			
Capacitor-Compressor	*See Compressor-Assy.*			
Cap-Dust Refr. Coupling (ACR)	153503	1	A2B-162	-
Caster-Low Profile Non-Swivel	162134	2	A2B-162	-

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)	
Caster-Low Profile w/Brake	162133	2	A2B-162	-
Catch-Bullet (Drip Tray Button)	159175	2	A2B-162	-
Chart-O-ring (Laminated)	184238	1	A2B-162	-
Clamp-Assy. Soft Hose 5/8	116065	3	A2B-162	-
Clip-Retainer (Set of 2) (Switch Box)	150120	1	A2B-162	-
Coil-Evaporator (Cabinet)	155111	1	A2B-162	-
Coil-Replacement Only (Beater Motor, Cabinet, Compressor) (Switch Box) (NLA use contactor #150135)	150108	3	A2B-162	-
Coil-Replacement Only(Beater Motor, Cabinet, Compressor) (Switch Box) (for #150135)	150156	3	A2B-162	-
Compressor-Assy (1 Phase) (NLA use #118234)				
includes Tecumseh AH compressor and	116973	1	A2B-162	- H2F-2455
Box-Assy. Capacitor & Relay	151356	1	A2B-162	- H2F-2455
Capacitor-Run	150362	1	A2B-162	- H2F-2455
Capacitor-Start	150361	1	A2B-162	- H2F-2455
Relay-Start	150363	1	A2B-162	- H2F-2455
Drier-Filter	155054	1	A2B-162	- H2F-2455
Compressor-Assy (1 Phase) includes				
Tecumseh AV compressor and	118234	1	H2F-2456	- H2H-1874
Box-Assy. Capacitor & Relay	151362	1	H2F-2456	- H2H-1874
Capacitor-Run	150399	1	H2F-2456	- H2H-1874
Capacitor-Start	150398	1	H2F-2456	- H2H-1874
Relay	150401	1	H2F-2456	- H2H-1874
Drier-Filter	155054	1	H2F-2456	- H2H-1874
Valve-Access	155419	1	H2F-2456	- H2H-1874
Compressor-Assy. (1 Phase)	*Order by freezer Serial No.*			
		1	H2H-1875	- A2I-152
Compressor-Assy (1 Phase) includes				
Maneurop compressor and	118685	1	A2I-153	-
Adaptor-3./8 ODF x 1 (Rotalock Valve)	151397	2	A2I-153	-
Capacitor-Run	151447	1	A2I-153	-
Kit-Compr. Start Capacitor & Relay	151448	1	A2I-153	-
Drier-Filter	155054	1	A2I-153	-

* As Required
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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)
Compressor-Assy (3 Phase) (NLA use #118235)			
includes Tecumseh AH compressor and	117018	1	A2B-162 - K2E-3245
Drier-Filter	155054	1	A2B-162 - K2E-3245
Compressor-Assy (3 Phase) includes			
Tecumseh AV compressor and	118235	1	K2E-3246 - H2H-1874
Drier-Filter	155054	1	K2E-3246 - H2H-1874
Valve-Access	155419	1	K2E-3246 - H2H-1874
Compressor-Assy. (3 Phase)	*Order by freezer Serial No.*		
		1	H2H-1875 - A2I-152
Compressor-Assy (3 Phase) includes			
Maneurop compressor and	118686	1	A2I-153 -
Adaptor-3./8 ODF x 1 (Rotalock Valve)	151397	2	A2I-153 -
Drier-Filter	155054	1	A2I-153 -
Condenser-Assy. – Complete (ACR) (NLA)	116781	1	A2B-162 - C2I
Condenser-Assy. 2HP Remote			
Complete (ACR)	116781-01	1	C2I -
Condenser-Air	155120-C	1	A2B-162 -
Condenser-Water (NLA use kit 119004)	155039	1	A2B-162 - D2H-899
Condenser-Water	155029	1	D2H-900 -
Connector-1/2 (MTS Relay Box)	150828	1	A2B-162 - C2G-548
Contactor (Beater Motor, Cabinet,			
Compressor) (Switch Box) (NLA use 150135)	150106	3	A2B-162 - C2G-548
Contactor-IEC (Beater Motor, Cabinet,			
Compressor) (Switch Box)	150135	3	C2G-549 -
Control-Pressure Fan (ACR)	155466	1	A2B-162 -
Cord-Assy. Female Plug (Evaporator)	150533	1	A2B-162 -
Cord-Assy. Male Plug (Evaporator)	150532	1	A2B-162 -
Cordset-Mix Level Probe	150537	1	A2B-162 -

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)	
Coupling - Refr 1/2 M w/ Stub (ACR)	153410	1	A2B-162	- C2I
Coupling - Refr 3/8 M w/ Stub (ACR)	153413	1	A2B-162	- C2I
Coupling-Assy. 1 in. Drive	111964	1	A2B-162	-
Coupling-Refr. 1/2MQC 1/2 SW (ACR)	153418	1	C2I	-
Coupling-Refr. 3/8 MQC 3/8 SW (ACR)	153420	1	C2I	-
Cover-Assy. Capacitor & Relay Box	137498	1	A2B-162	-
Cover-Assy. Condenser (ACR)	117207	1	A2B-162	-
Cover-Assy. Mix Tank Front	113997	1	A2B-162	-
Cover-Assy. Electric Box	116508	1	A2B-162	-
Cover-Electric Box 2-3/4 x 4-1/2 (ACR)	150737	1	A2B-162	-
Cover-Rear Mix Tank	138165	3	A2B-162	-
Cup-Overrun Measuring One Pint	158051	1	A2B-162	-
Cut Out-High Pressure	155425	1	A2B-162	-
Cut Out-Low Pressure	155403	1	A2B-162	-
Cut Out-Low Pressure (ACR)	155465	1	A2B-162	-
Cylinder-Assy. Complete	116113	1	A2B-162	- L2F-3593
Cylinder-Assy. Complete	118600	1	L2F-3594	- I2K
Cylinder-Assy. Complete	118822	1	I2K	-
Decal-6” Air Flow	165119	1	A2B-162	-
Decal-Beater Warning	165025	1	A2B-162	-
Decal-Cleaning Instructions	165249	1	A2B-162	-
Decal-Clear Overlay	165093	1	A2B-162	-
Decal-CMT Connection	164027	1	A2B-162	-
Decal-CMT Patent	165013	1	A2B-162	-
Decal-Duke Logo	165061	1	A2B-162	-
Decal-Duke Mix Transfer (MTS)	165021	1	A2B-162	-
Decal-General Purpose Receptacle	165002	1	A2B-162	-

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)
Decal (Label)-MTS Trimstrip RH	164061	1	A2B-162 - C2I-596
Decal (Label)-MTS Trimstrip RH	164129	1	C2I-597 -
Decal-MTS Operating Instructions	164127	1	C2I-597 -
Decal-Operating Instructions	164060	1	A2B-162 - C2I-596
Decal-Panel Removal	156126	3	A2B-162 -
Decal-Top Air Discharge	156124	1	A2B-162 -
Decal-Trimstrip IDQ Logo 18”	165187	1	A2B-162 - K2I-2799
Decal-Trimstrip 18" IDQ	165440-01	1	K2I-2800
Decal-Warning Pressurized	165246	1	A2B-162 -
Door-Assy. Complete	114260-07-C	1	A2B-162 -
Drier-Filter 16 cu. in. (Sweat)	155054	1	A2B-162 - K2B-2739
Drier-Filter 8 cu. in. (Flare)	155050	1	K2B-2740 -
Duckbill-Inlet (Valve)	199032	1	A2B-162 -
Extension-Spigot (Cake)	136713	1	A2B-162 -
Fan-(Evaporator)	151102	1	A2B-162 - D2H-899
Fan-Intake 230v (Evaporator)	151105	1	D2H-900 -
Filter-Assy. (Switch Box)	116125	1	A2B-162 -
Flange-Refr Coupling Mount 1/2 (ACR)	153415	1	A2B-162 - C2I
Flange-Refr Coupling Mount 3/8 (ACR)	153414	1	A2B-162 - C2I
Flange-Refr. Coupling Mount 1/2 (ACR)	153502	1	C2I -
Gasket-Door 18"	160563-02		A2B-162 -
Gasket-High Speed (Gear Reducer)	153066	1	*See Reducer-Gear 153356*
Gasket-Slow Speed (Gear Reducer)	153070	1	*See Reducer-Gear 153356*
Gauge-Assy. Pressure Test	116312	1	A2B-162 -
Gear-Assy. Output (Gear Reducer)	153003*	1	*See Reducer-Gear 153343*

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)
Gear-Bronze (Gear Reducer)	153349	1	*See Reducer-Gear 153343*
GearMotor-1/8 HP (MTS)	151129	1	A2B-162 -
Gear-Slow Speed (Gear Reducer)	153301	1	*See Reducer-Gear 153356*
Glass-Sight (Flare)	155050	1	A2B-162 - K2B-2739
Glass-Sight (Sweat)	155059	1	K2B-2740 -
Guard-Fan Open (Evaporator)	151076	1	A2B-162 -
Handle-Assy. Round (MTS)	116164	1	A2B-162 -
Handle-Black Tapered	162624	1	A2B-162 -
Handle-Spigot	134922	1	A2B-162 -
Head-Assy. Dispense (Complete)	115130	1	A2B-162 -
Bleeder-Assy.	115129	1	A2B-162 -
Handle-Black Tapered	162624	1	A2B-162 -
Handle-Spigot	134922	1	A2B-162 -
Head (Only)	116321	1	A2B-162 -
O-Ring (Bleeder)	160562	2	A2B-162 -
O-Ring (Extension)	160584	1	A2B-162 -
O-Ring (Head)	160583	1	A2B-162 -
O-Ring (Spigot)	159295	4	A2B-162 -
Spigot-Long Single	134921	1	A2B-162 -
Hinge-Pivot 1-3/8" Bottom LH	162046	1	A2B-162 -
Hinge-Pivot 1-3/8" Top LH	162045	1	A2B-162 -
Hook-Swing (Lock-MTS)	*Order by freezer Serial Number*		
Hose-Assy. Mix Braided	116094	1	A2B-162 -
Hose-Spigot Drain	136567	1	A2B-162 -
Hose-Transfer Black Line	138184	1	A2B-162 -
Indicator-Mix Level (Switch Box)	150202	1	A2B-162 -
Insert-Assy. Drip Tray	116540	1	A2B-162 -
Insulation-Compressor Wrap MTZ (Maneurop)	165522	1	A2I-153 -

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)
Insulator-Expansion Valve	165531	2	C2I-597 -
Insulator-Rotalock Valve	165532	1	G2I -
Insulator-Switch (Spigot Switch Assy.)	135744	1	A2B-162 -
Key-Drive 3/16 Sq x 1-1/2	153322	2	A2B-162 -
Kit-25 Foot Line Sets 404a (ACR)	117292	1	A2B-162 - C2I
Kit-25 Foot Line Sets 404a (ACR)	119124	1	C2I -
Kit-50 Foot Line Sets 404a (ACR)	117293	1	A2B-162 - C2I
Kit-50 Foot Line Sets 404a (ACR)	119125	1	C2I -
Kit-CMT	117671	1	A2B-162 -
Kit-Compr Start Cap & Relay	151448	1	A2B-162 -
Kit-Dispense Head Switch	116410	1	A2B-162 -
Kit-Maneurop Compr. Mtg.	151446	1	A2B-162 -
Kit-Motor & Capacitor 2HP 230V (1 phase) includes motor and capacitor	118140	1	A2B-162 -
Kit-MTS Slide Switch	116411	1	A2B-162 -
Kit-O-ring	115537	1	A2B-162 -
Kit-Pressure Switch Field Replacement includes	117014	2	A2B-162 -
Kit-Reducer Gasket (Model HCD926) (Gear Reducer)	118742	1	*See Reducer-Gear 153356*
Kit-Reducer Gasket (Gear Reducer)	114874	1	*See Reducer-Gear 153343*
Kit-Roller Complete (MTS)	116009-01	1	A2B-162 -
Kit-Solenoid Valve	155434		A2B-162 -
Kit-Washer Rotalock MTZ (Maneurop Compressor-Rotalock Valve)	151399	1	A2I-153 -
Kit-Water Valve Repair	155444	1	A2B-162 -
Knob-Hand (Head Assembly)	162625	1	A2B-162 -
Knob-Oval Taper (Handle-MTS)	162627	1	A2B-162 -

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)	
Knob-Timer (Switch Box)	162604	1	A2B-162	-
Label-MTS Trimstrip RH	164061	1	A2B-162	- C2I-596
Label-MTS Trimstrip RH	164129	1	C2I-597	-
Leg-6-inch	112978	1	A2B-162	-
Lever-Reset & Button C23 (Switch Box)	118390	1	A2B-162	-
Light-Pilot Amber (Beater Motor)	150553	1	A2B-162	- K2I-2799
Light-Pilot Amber (Beater Motor)	150562	1	K2I-2800	-
Light-Pilot Red (Compressor)	150552	1	A2B-162	- K2I-2799
Light-Pilot Red (Compressor)	150561	1	K2I-2800	-
Lubricant-Lubri-Film (4 oz. tube)	158054A	1	A2B-162	-
Meter-Air	*Order by Meter Number*			
Motor, Kit & Capacitor 2HP 230V (1 phase)				
includes motor and	118140	1	A2B-162	-
Capacitor-Run	150318	1	A2B-162	-
Capacitor-Motor Start	150872	2	A2B-162	-
Motor-2HP (3 Phase) (Beater Motor)	151052	1	A2B-162	-
Motor-Fan 50w 230v	151077-01	2	A2B-162	-
Motor-Fan 50W 230V 60Hz (ACR)	151072	2	A2B-162	-
MOV-Assy. (Switch Box)	116188	1	A2B-162	-
MTS-Assy. Housing-Complete (MTS)	116012	1	A2B-162	-
MTS-Assy. Housing-w/o roller (MTS)	117054	1	A2B-162	-
MTS-Mounting Screws	159219	2	A2B-162	-
Nozzle-Serrated (8 point Star Adapter-Yogurt)	196185	1	A2B-162	-
Nut-Assy. Pressure Switch	116105	1	A2B-162	-
Nut-EL Stop #10-32 (MTS)	159421	2	A2B-162	-
Nut-HEX #8–32 ZN (Spigot Switch Assy.)	160102	2	A2B-162	-

* As Required
** Items Included In O-Ring Kit No. 115537
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AC = Air Cooled WC = Water Cooled ACR = Air Cooled Remote
NLA = No Longer Available

Use only original or authorized replacement parts with this freezer.

Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)	
Nut-HXSF 1/4-20 ZN (MTS Relay Box)	159951	2	A2B-162	-
Nut-Push Round (Clip for Button)	160289	2	A2B-162	-
Nut-Speed #6-32 BKOX (MTS Relay Box)	160116	2	A2B-162	-
Nut-Speed #10-24 .025-.064 SST (Dispense Panel)	159132	*	A2B-162	-
Nut-Speed #10-24 .100-.125 (Trimstrip & Front Panel)	159067	*	A2B-162	-
Nut-Speed 1/4-20 .064-.125 (Rear Panel and Channel)	160117	*	A2B-162	-
Nut-Speed 1/4-20 BPO (Side Panel)	160114	*	A2B-162	-
Oil-Special Gear Lube	158055	*	A2B-162	-
O-ring (Bleeder Assembly)	160562	2	A2B-162	-
O-ring (Extension)	160584	1	A2B-162	-
O-ring (Head)	160583	1	A2B-162	-
O-ring (Seal)	160500	1	A2B-162	-
O-ring (Spigot)	159295	3	A2B-162	-
Pan-Assy. Condensate	116560	1	A2B-162	-
Panel-Assy. Front	116810	1	A2B-162	-
Panel-Assy. Top (AC)	116509-C	1	A2B-162	-
Panel-Assy. Top (WC and ACR)	116514-C	1	A2B-162	-
Panel-Dispense	138454	1	A2B-162	- K2I-2799
Panel-Dispense	140126	1	K2I-2800	-
Panel-Lower Rear (ACR)	139135	1	A2B-162	-
Panel-Rear (AC)	138452-C	1	A2B-162	- G2I-1692
Panel-Rear (WC and AC)	140024-C	1	G2I-1693	-
Panel-Rear (WC)	138541-C	1	A2B-162	- G2I-1692

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)	
Panel-Side LH	137027-C	1	A2B-162	-
Panel-Side RH	137028-C	1	A2B-162	-
Panel-Upper Rear (ACR)	139134	1	A2B-162	-
Plate-Coupling Mtg. (ACR)	140039	1	A2B-162	-
Plate-Pivot Cover (MTS)	138142	1	A2B-162	-
Probe-Assy. Mix Level 8“ (6 Gallon Tank)	116439	1	A2B-162	- J2F-2926
Probe-Assy. Mix Level 10-3/4" (7 Gallon Tank)	115397	1	J2F-2927	-
Pull-Door (Handle)	136199	1	A2B-162	-
Pully	*See "Sheave"*			
Receiver-10-1/2 lb. 3/8 Sweat (ACR)	155058	1	A2B-162	- C2I
Receiver-10-1/2 lb. 3/8 Sweat (ACR)	155064	1	C2I	-
Receiver-3 lb. (Flare)(NLA use 155057)	155040	1	A2B-162	- K2B-2739
Receiver-3 lb. 3/8 ID Sweat	155057	1	K2B-2740	-
Receptacle-Mix Level Sensor	150536	1	A2B-162	-
Reducer-Gear RH	153343	1	A2B-162	- C2I-596
Reducer-Gear RH 10/1	153356	1	C2I-597	-
Relay-Assy. Overload 5-15A 1 Phase ONLY (Switch Box)	114760	1	A2B-162	- D2H-899
Adapter-Reset	150101	1	A2B-162	- D2H-899
Kit-Line Side Terminal	150102	1	A2B-162	- D2H-899
Relay-Overload 6.0-10.0A	150115	1	A2B-162	- D2H-899
Relay-Assy. Overload 5-15A 1 Phase ONLY (Switch Box)	118359	1	D2H-900	-
Adapter-Overload Din Rail	150145	1	D2H-900	-
Button-OL Reset Adapter	150150	1	D2H-900	-
Relay-SS Overload 1 Phase 5-15	150140	1	D2H-900	-

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)
Relay-Assy. Overload 3.7-12A 3 Phase ONLY (Switch Box)	114759	1	A2B-162 - C2G-548
Adapter-Reset	150101	1	A2B-162 - C2G-548
Kit-Line Side Terminal	150102	1	A2B-162 - C2G-548
Relay-Overload 5.5-8.0A	150115	1	A2B-162 - C2G-548
Relay-Assy. Overload 3.7-12A 3 Phase ONLY (Switch Box)	118361	1	C2G-549 -
Adapter-Overload Din Rail	150145	1	C2G-549 -
Button-OL Reset Adapter	150150	1	C2G-549 -
Relay-SS Overload 3 Phase 3.7-12A	150142	1	C2G-549 -
Relay-Flange Base w/Cover (MTS Relay Box)	150381	1	A2B-162 -
Relay-Flange Base w/Cover (Switch Box)	150381	1	A2B-162 - C2I-596
Relay-Start	*See Compressor Assembly*		
Resistor-Assy.	116154	1	A2B-162 - C2I-596
Ring-Retaining 1/2 External (Spigot Switch Assy.)	160303	1	A2B-162 -
Rod-Spigot Switch	136126	1	A2B-162 -
Sanitizer-Stera-Sheen (per 4 lb. jar)	158014A	1	A2B-162 -
Sanitizer-Stera-Sheen (per case of 4)	158014	1	A2B-162 -
Scale-Overrun	158049	1	A2B-162 -
Screw-HXSF 1/4-20 x 1/2 ZN (MTS Relay Box)	159950	2	A2B-162 -
Screw-RDHM #6–32 x 1-1/4 SST (Spigot Switch Assy.)	160296	2	A2B-162 -
Screw-RDHM #6-32x5/16 ZN(MTS Relay Box	160308	2	A2B-162 -
Screw-RDHM #8–32 x 7/8 Brass (Spigot Switch Assy.)	160267	2	A2B-162 -
Screw-SK Set 1/4-20x1/4 (Sheave)	160495	4	A2B-162 -
Screw-SKHC #10-32 x 7/16 SST (MTS)	160307	3	A2B-162 -
Screw-TRPM #10-24 x 3/8 SST (Top Panel)	160305	*	A2B-162 -

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)
Screw-TRPM #10-24 x 1/2 SST (Trimstrip, Dispense and Front Panel)	160076	*	A2B-162 -
Screw-TRPM #10-32 x 5/8 SST (Swing Lock) (MTS)	160026	1	A2B-162 -
Screw-TRPM 1/4-20 x 1/2 SST (Rear Panel & Channel)	160048	*	A2B-162 -
Screw-TRPM 1/4-20 x 1 SST (Side Panels)	159219	*	A2B-162 -
Seal-Assy. Shaft	111875	1	A2B-162 -
Seal-Beater Shaft	160557	1	A2B-162 -
Seal-High Speed (Gear Reducer)	153067	2	*See Reducer-Gear 153356*
Seal-Oil (High Speed) (Gear Reducer)	153053	2	*See Reducer-Gear 153343*
Seal-Oil (Slow Speed) (Gear Reducer)	153051	2	*See Reducer-Gear 153343*
Seal-Slow Speed (Gear Reducer)	153071	2	*See Reducer-Gear 153356*
Sensor-10K Thermistor	161216	1	C2G-549 -
Shaft-Assy. Beater	113438	1	A2B-162 -
Shaft-Input (Worm Gear) (Gear Reducer)	153347	1	*See Reducer-Gear 153343*
Shaft-Output(Slow Speed)(Gear Reducer)	153339	1	*See Reducer-Gear 153343*
Sheave-3/4 Bore 4.75 OD (Driven Pulley)	153625	1	A2B-162 -
Sheave-7/8 Bore 3.25 OD (Driver Pulley)	153626	1	A2B-162 -
Shield-Motor Rain (ACR)	139017	2	A2B-162 -
Shroud-Assy. Evaporator	116516	1	A2B-162 - D2H-899
Shroud-Assy. Evaporator	116516-01	1	D2H-900 -
Shroud-Fan (AC)	138465	1	A2B-162 -
Shroud–Fan (ACR)	138465	1	A2B-162 -
Socket-Octal Terminal (Switch Box)	150119	1	A2B-162 -
Spacer-Panel	138456	16	A2B-162 -
Spigot-Long Single (less extension)	134921	1	A2B-162 -
Spring LH	162052	1	A2B-162 -
Spring-Spigot Switch (Spigot Switch Assy.)	162321	1	A2B-162 -

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)	
Strip-Rear Panel (ACR)	139137	2	A2B-162	-
Strip-Terminal (Switch Box)	150795	1	A2B-162	-
Stud-Assy. 1-15/16 inch	114341	1	A2B-162	-
Support – Condenser (ACR)	137629	1	A2B-162	-
Support-MTS (MTS Relay Box)	138248	1	A2B-162	- G2H-1613
Support-MTS (MTS Relay Box)	138169	1	G2H-1614	- C2I-596
Support-MTS (MTS Relay Box)	138248	1	C2I-597	-
Switch-Assy. Spigot (Switch Box)	113903	1	A2B-162	-
Bracket-Assy. Adjusting	113901	2	A2B-162	-
Bracket-Assy. Spigot Switch Mtg.	113902	2	A2B-162	-
Button-Spigot Switch	136124	2	A2B-162	-
Insulator-Switch	135744	2	A2B-162	-
Nut-HEX #8-32 ZN	160102	4	A2B-162	-
Ring-Retainig 1/2 External	160303	2	A2B-162	-
Screw-RDHM #8-32 x 7/8 Brass	160267	4	A2B-162	-
Screw-RDHM #6-32 x 1-1/4 SST	160296	4	A2B-162	
Spring-Spigot Switch	162321	2	A2B-162	-
Switch-Snap Button	150456	2	A2B-162	-
Washer-EXT Tooth #6 ZN (Lock)	160392	4	A2B-162	-
Washer-Flat #6 Brass	160393	4	A2B-162	-
Switch-Centrifugal	150877	1	A2B-162	-
Switch-Door Push Button (Evaporator) (NLA use p/n 119163)	150416	1	A2B-162	- D2H-899
Switch-Door Push Button (Evaporator)	150509	1	D2H-900	-
Switch-Snap Button (Spigot Switch Assy.)	150456	1	A2B-162	-
Switch-Toggle 3PDT Center Off (Selector) (Switch Box)	150465	1	A2B-162	-
Switch-Toggle SPST (Cabinet) (Switch Box)	159235	1	A2B-162	-
Switch-Toggle SPST (MTS) (Switch Box)	150463	1	A2B-162	- C2I-596
Switch-Toggle SPST (MTS) (Switch Box)	159235	1	C2I-597	-

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Alphabetized Parts List for Model 917N-CMT

Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)
Tank-Mix 6 Gal. Height 10-1/2“ (NLA use 196222)	196092-01	1	A2B-162 - J2F-2926
Tank-Mix 7 Gal. Height 13-1/4"	196222	1	J2F-2927 -
Tee-5/8 x 5/8 x 5/8 White (Mix bag adapter)	196006	*	A2B-162 -
Thermometer-2.5 Dial Vapor	161026	1	A2B-162 - K2I-2799
Thermometer-Barrel (Cabinet)	161004	1	A2B-162 -
Thermostat-Assy. w/Cover (Ranco) (Cabinet)	118868	1	A2B-162 - H2I-2100
Thermostat-Evap. 41° Fixed w/Off (Danfoss) (Cabinet)	155483	1	H2I-2101 -
Thermostat-Low	155442	2	A2B-162 -
Timer-12 Sec. Delay on Break (Switch Box)	150208	1	A2B-162 -
Timer-5 Minute (Switch Box)(NLA use #119256)	150215	1	A2B-162 - C2I-596
Timer-5 Minute Mechanical (Switch Box)	150218	1	C2I-597 -
Tool-O-ring Removal	169374	1	A2B-162 -
Tray-Drip 18" White	196107-03	1	A2B-162 -
Trimstrip-Assy. 18"	116809	1	A2B-162 - K2I-2799
Trimstrip-Assy. 18" IDQ	119336-01	1	K2I-2800
Tube-Air (Hose)	138170	1	A2B-162 -
Tube-Assy. Drain	114374	1	A2B-162 -
Tube-Assy. Pickup	116069	1	A2B-162 -
Tubing-.600 ID x .850 OD PVC (Mix Line-Std)	196061	*	A2B-162 -
Valve-Covers	*See "Insulator"*		
Valve-Head Pressure Control (ACR)	155454	1	A2B-162 -
Valve-Assy Rotalock MTZ includes valve and	119326	1	A2B-162 -
Insulator-Rotalock Valve	165532	1	A2B-162 -
Kit-Washer Rotalock MTZ	151399	1	A2B-162 -

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Important: All parts shown are for standard models designed for 230V/1PH/60HZ or 203–230V/3PH/60HZ.

PART DESCRIPTION	PART NUMBER	QTY	SERIAL NUMBER (FROM – TO)	
Valve-Assy. Water includes	113769	1	A2B-162	-
Valve-Water 3/8	155410	1	A2B-162	-
Valve-Automatic Expansion (Cabinet)	155416	1	A2B-162	- H2C-2056
Valve-Automatic Expansion (Cabinet)	155449	1	H2C-2057	-
Valve-Automatic Expansion (Cylinder)	155400	1	A2B-162	- H2C-2056
Valve-Automatic Expansion (Cylinder)	155448	1	H2C-2057	- H2H-1874
Valve-Automatic Expansion (Cylinder)	*Order by freezer Serial Number*			
			H2H-1875	- C2I-680
Valve-Automatic Expansion (Cylinder)	155451	1	C2I-681	- B2J-463
Valve-Automatic Expansion (Cylinder)	155490	1	B2J-464	-
Valve-Head Pressure Control (ACR)	155454	1	A2B-162	-
Valve-Solenoid 208-240v	155422	2	A2B-162	- C2I-596
Valve-Solenoid 208-240v	155421	2	C2I-597	-
Valve-Water 3/8	155410	1	A2B-162	-
Video-Operational	184818	1	A2B-162	-
Washer-1/2 x .196 x 1/16 (MTS)	160157	1	A2B-162	-
Washer-Curved Spring (MTS)(NLA use 160173)	160145	2	A2B-162	- K2I
Washer-Spring Wave (MTS)	160173	1	K2I	-
Washer-Ext. Tooth #6 ZN (Spigot Switch Assy.)	160392	2	A2B-162	-
Washer-Flat #10 SST (MTS)	159962	3	A2B-162	-
Washer-Flat #6 Brass (Spigot Switch Assy.)	160393	2	A2B-162	-
Washer-Flat .190 x .365 x .075 SST (MTS)	160158	1	A2B-162	-
Washer-Kit Rotalock MTZ	151399	1	A2B-162	
Washer-Rotalock (AH)	160177	1	A2B-162	-
Washer-Shaft Seal	133098	1	A2B-162	-

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H. C. DUKE & SON, INC.
2116 - 8th Avenue • East Moline, Illinois 61244

Installation and Service Manual

for Refrigeration Technician only

Models 957CMT, 917N-CMT, 927CMT

P/N 184616-02

February 2004

Printed in U.S.A.

Table of Contents

Table of Contents - continued

1 Introduction

This Installation and Service Manual is for use by qualified service technicians only. All service technicians using this manual must follow the Installation and service instructions when servicing the freezer. Failure to follow this manual when servicing the freezer is considered misuse and could violate the warranty.

Do not refer to this manual if you are not a qualified service technician. Do not attempt to service the freezer until the safety precautions are understood. If problems occur that are not covered in this manual, further technical assistance can be obtained by calling H.C. Duke & Son, Inc. as follows:

Phone (309) 755-4553

(800) 755-4545

Fax (309) 755-9858

2 Safety First

2.1 Recognize Safety Information

Look for this safety alert symbol throughout this manual.

When you see this symbol on the freezer or in this manual, be alert to the potential for personal injury. Follow recommended precautions and safe operating procedures.

2.2 Understand Signal Words

The signal words – DANGER, WARNING, and CAUTION – are used with the safety alert symbol (DANGER decals on the freezer may or may not have the safety alert symbol, but the message is the same). Decals with the words DANGER, WARNING, or CAUTION appear on the freezer. DANGER identifies the most serious hazard. Decals with the words DANGER or WARNING are typically near specific hazards on the freezer. General precautions are listed on CAUTION safety decals.

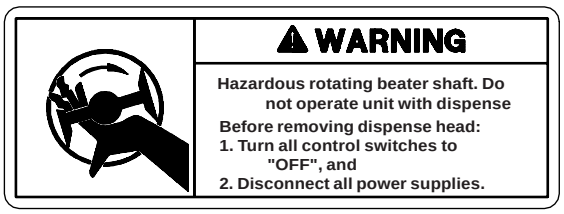
In this manual, CAUTION messages with the safety alert symbol ⚠ call attention to safety messages.

2.3 Follow Safety Instructions

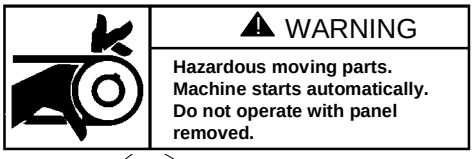
Read and understand all safety messages in this manual. Read and understand the decal safety messages on the freezer. Take notice of the location of all decals on the freezer and keep the safety decals in good condition. Check them periodically and replace missing, damaged or illegible safety decals. The safety decals must remain in place and legible for the life of the freezer. Use the information and illustrations on this page to identify the decal, and call or write to H.C. Duke & Son, Inc. for new decals.

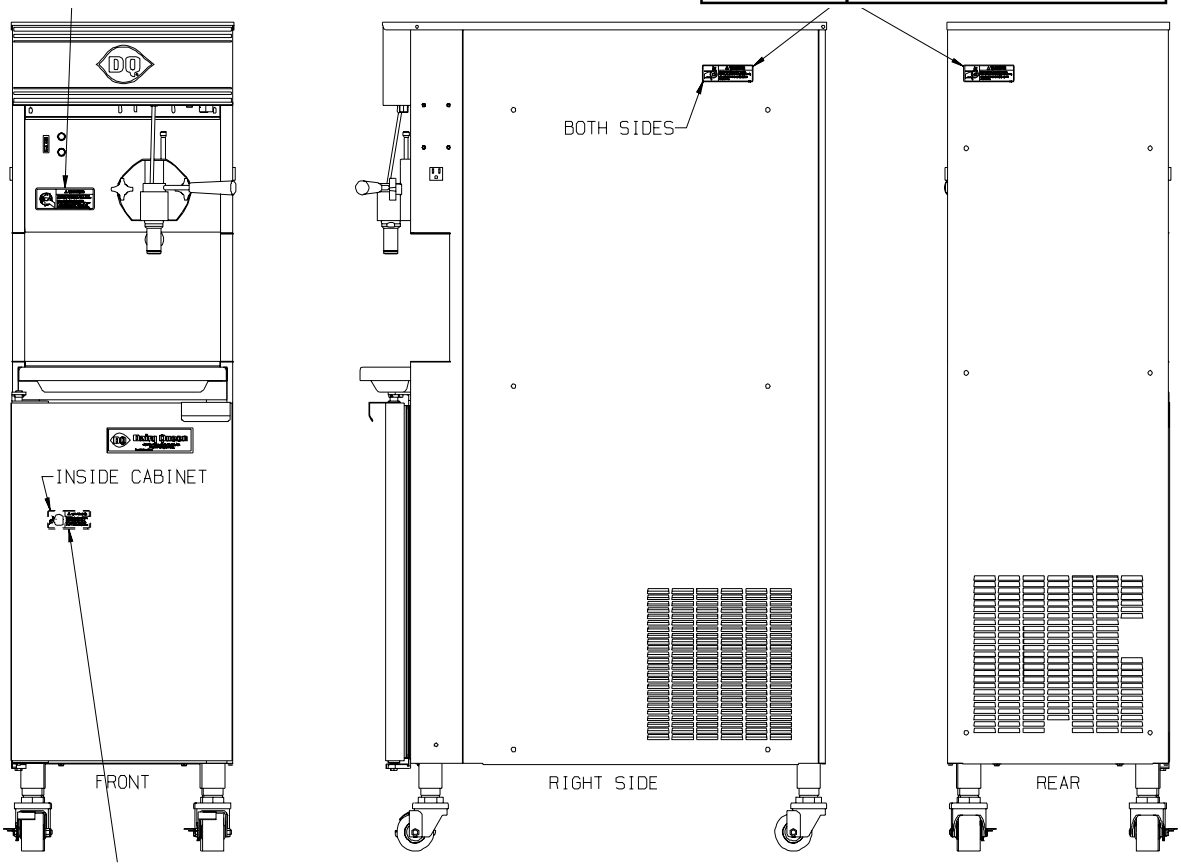
DO NOT attempt to operate the freezer until you read and understand all safety messages and the operating instructions in this manual.

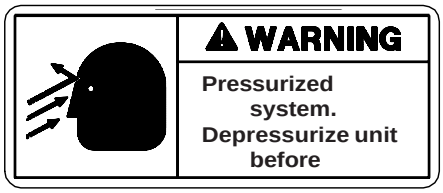
P/N 165025



P/N 165126







P/N 165246

2.4 Operate Safely

DO NOT allow untrained personnel to maintain or service this machine. Failure to follow this instruction may result in severe personal injury. **DO NOT** operate the freezer unless all service panels and access doors are secured with screws. **DO NOT** attempt to clean, maintain, or repair the freezer until the main power supply has been disconnected. Contact H.C. Duke & Son, Inc. Service Department at (309) 755-4553 or (800) 755-4545.

You may contact IDQ as follows:

International Dairy Queen, Inc.
P.O. Box 35286
Minneapolis, Minnesota 55437

(800) 679-6556

3 Service "FIRST"

When servicing Duke freezers, remember most service calls involve simple operator error or small component malfunction. Always try to approach each call in a systematic way. Use the FIRST method of diagnosing problems and servicing the freezer:

F ***Find*** the problem by listening to the operator first. Daily use of the freezer gives the operator a good "feel" for the normal operation of the freezer. Sometimes the operator will experience symptoms of more subtle problems. Listening closely will also help to establish a good working relationship with the operator.

I ***Inquire*** from the operator what they have already done to try to remedy the situation. You can avoid repetition in the work and find operational procedures that may be done incorrectly.

R ***Respond*** to the operator's concerns. Try to make the operator feel "heard." If they feel you are there to help them, they will be more patient and understanding of the work you do.

S ***Start*** by applying simple corrective measures first. For example, before removing panels, try all relevant switch combinations to trace the electrical routes and establish if a component is bad.

T ***Train*** the operator once you have determined the problem. If there is an operational problem, the operator will appreciate the information to avoid recurring problems.

3.1 Installation, Start-up, and Instruction Checklist

Remove, follow, and complete the checklist provided on the last pages of this manual to insure proper installation of the freezer.

4 Uncrating and Inspecting the Freezer

1. As soon as the freezer 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 call the carrier's local agent immediately, requesting prompt inspection by their personnel.

2. The freezer should always be stored or moved in its normal upright position and moving should be accomplished by an appropriate method of large appliance handling. Do not move the freezer by "walking" it on the corners of the skid, and do not uncrate the freezer until it has been transferred as close as possible to its location site.

4.1 Uncrating and Inspection

CAUTION

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

1. Use caution in handling uncrating tools so as not to mar or dent the cabinet. Do not pierce the crate with a pry bar or similar tool. Note, in Figure 4-1, that the unit is bolted directly to the wooden pallet, or shipping base. Remove these bolts and carefully "walk" the freezer off the wooden pallet.

2. Check all separately packed components and spare parts against the packing list. If any items appear to be missing, contact H. C. Duke & Son, Inc.

3. Screw each leg or caster into place at the four corners of the base (Figure 4- 2). When the unit is in position at its intended location, the legs or casters must be adjusted until the unit is level (Section 5.1).

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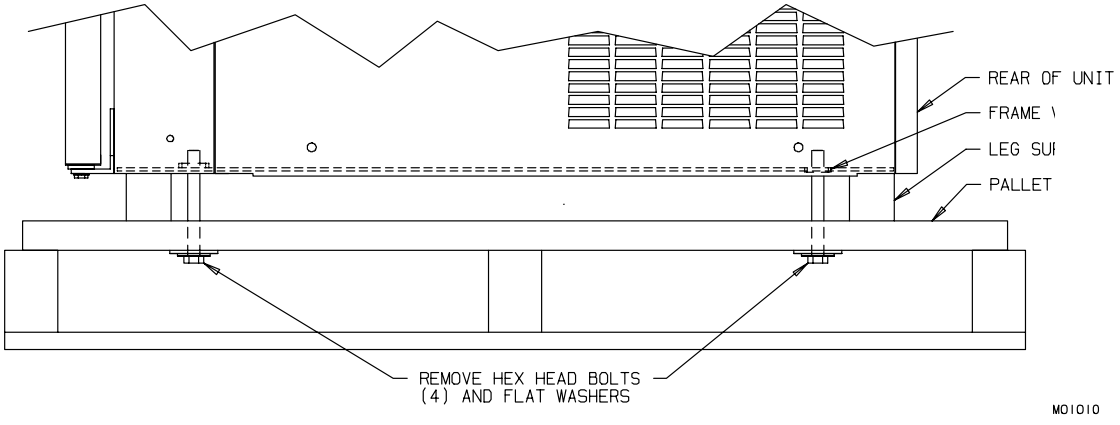


Figure 4-1 Machine bolted to Shipping Base

4.1 Uncrating and Inspection — continued

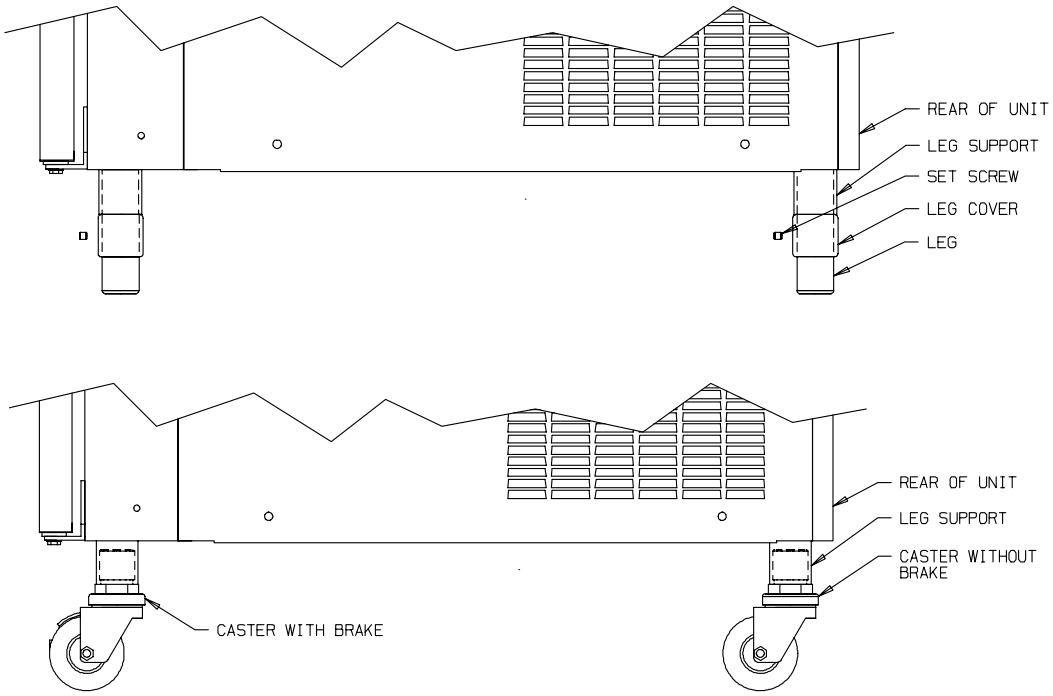


Figure 4-2 Installing Mounting Legs or Casters

4.2 Inspecting the Freezer

1. Inspect the freezer exterior for damage.
2. Remove the panels from the unit by unscrewing the attaching screws; then swing the bottom of the panel outward and pull down.
3. Check all tubing to make sure that metal-to-metal contact does not exist.
4. Check pulley alignment and belt tension (Section 11.3).
5. On air-cooled models, turn the condenser fan blade by hand to make sure that the blade turns freely and does not strike the shroud.

5 Installation Procedures

5.1 Placement of the Freezer

1. In positioning the freezer, be sure that it is accessible for periodic maintenance checks. Where codes permit, we recommend that the freezer be installed on casters and have flexible water and electrical connections for easy servicing and cleaning.
2. Air-cooled models require a minimum eighteen inches (18") clearance on the top panel for adequate ventilation. Anything (including cone dispensers) in this area will reduce the efficiency of these models.
3. Double-cylinder water-cooled models will require a 1/2" MPT water inlet and water waste connection. Single cylinder freezers require a 3/8" MPT water inlet and waste connection. The connections are found under the rear of the freezer and can be identified by removing the rear panel. A manual shut-off valve should be installed in the water inlet line at the time of installation. Also be sure that inlet water pressure is above 35 psig and below 140 psig. If the pressure drops below 35 psig, condenser pressure will increase and result in more prolonged periods of running and overall inefficiency.

   NOTE: Water-cooled freezers are not equipped with vacuum breaker valves. Be aware of local codes concerning this and all plumbing requirements.
4. The inlet water temperature should not be higher than 90°F. When inlet water temperature is higher than 90°F water usage becomes excessive and production capacity is reduced.
5. Place the freezer in its final location and level the machine by adjusting the legs or casters so that 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. If the unit is moved to a new location, be sure to check level and readjust, if necessary.

5.2 Water and Drain Connections

When making water and drain connections to water-cooled models, the following items must be taken into consideration:

1. Maintain water temperature and pressure limits as specified in Section 5.1.
2. A minimum $^{3}/_{8}$" ID water line for a single freezer or ½" ID water line for a twin freezer must be provided immediately behind or adjacent to the freezer. Make sure lines are sized properly, free of corrosion, and flushed prior to connecting to the freezer. Provide a shut-off valve in the water supply line with a male flare connection. Install a water strainer at the inlet and use flexible water line hose 5 to 6 feet long with female flare fittings to allow mobility of the freezer for servicing and cleaning. Connect the freezer to cold water only.
3. Provide a drain close to the freezer. This can be a floor drain. Do not restrict or control the flow of the drain water, as this will cause operational problems. Make the connection to the freezer with a flexible water line hose.

IMPORTANT:
All water cooled models must have condensers blown out if exposed to temperatures below freezing. Pressure of at least 20 psig should be put through the water lines starting inside the water valve.

4. If the water to the inlets is to be tee-connected, make sure that the pipe feeding the tee is one size larger.

IMPORTANT:
Do NOT install a solid connection from the drain to a sanitary service line. Allow an air break to prevent the possibility of the reverse flow of sewer water. Drain connections must comply with local code regulations.

5. If glycol/water recirculating system is used, refer to manufacturer's instructions. Adjust the freezer water valve to specifications in Section 8.2 Refrigeration Settings. Also allow for a shut off valve to return freezer to city water.

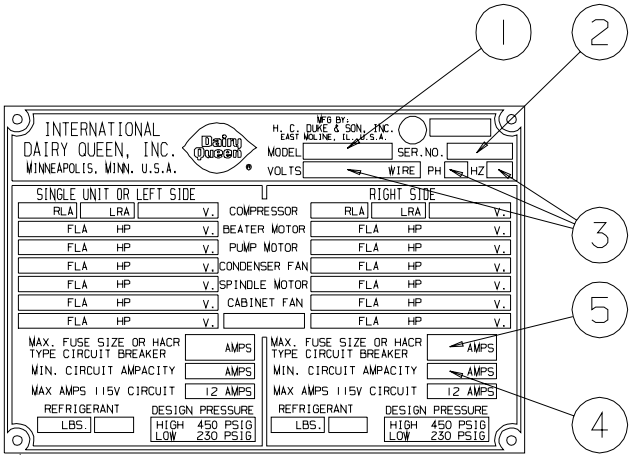
5.3 Electrical Requirements

CAUTION
To prevent accidental electrical shock, a positive earth ground is required.

1. Always verify electrical specifications on the data plate of each individual freezer. Data plate specifications will always supersede the information in this manual.
2. Supply voltage must be within ± 10% of voltage indicated on the nameplate. Also, on three-phase systems, voltage between phases must be balanced within 2%. (More than a 6 volt difference between any two voltage measurements at 208-230 volts indicates a possible imbalance.) Request the local power company to correct any voltage problem.
3. A main power disconnect must be supplied and should be:
   a. easily accessible
   b. within sight of the freezer
   c. provided for all poles of the wiring to the freezer
   d. installed in the line ahead of the unit connections.

   Use a disconnect box rated for the amperage noted on the nameplate of the freezer. For twin models, provide a separately-fused disconnect switch for each side of the unit.
4. Use flexible connections, if possible. All connections must conform to local code requirements and be in compliance with the National Electric Code.
5. Use fuses or HACR type circuit breakers not exceeding the maximum rating allowed on the nameplate on the back panel of the freezer.
6. If the 120V receptacles on the freezer are to be used, a separate 120V power supply is required to be connected to the freezer service connection box marked for 120V.

5.4 Data Plate



The date plate provides important information that the operator should record and have available for parts ordering, warranty inquiries, and service requests.

5.5 Reference Information

Fill in the following information below as soon as you receive your freezer. The item numbers, encircled, correspond with the callout numbers above.

(1) Model Number_____

(2) Serial Number_____

(3) Electrical Spec: Voltage_____

Phase_____ Hertz_____

(4) Minimum Circuit Ampacity_____

(5) Maximum Fuse Size_____

Installation Date_____

Installed by_____

Address _____

_____

Phone_____

6 Remote Air Condenser

The remote air-cooled system consists of a) the freezer, b) the condensing unit, and c) pre-charged line sets. The following procedures will insure leak-free connections are made when installing these pre-charged units.

6.1 Placement of the Remote Air Condenser

1. Select a location as close as possible to the freezer for placing the remote condensing unit. No more than 30ft. of condenser line can be installed outdoors.

   IMPORTANT:
   Thirty feet is the maximum length of condenser line which may be installed outdoors. Exceeding 30 ft. may cause operational problems during cold weather.

2. Position the condenser(s) where there is minimal restriction to air flow, giving consideration to prevailing wind direction. Allow for at least two (2) feet clearance at inlet and outlet. If there are two condenser units, position them so they will not discharge hot air from one into the other.
3. Bolt the condenser to a secure foundation, using the four slot holes on the condenser base plate.

6.2 Remote Air Condenser Installation

1. Two factory pre-charged and insulated condenser line sets are required for each condenser:
   a. Discharge-1/2 in. OD line set
   b. Liquid return-3/8 in. OD line set

   IMPORTANT:
   Before routing line sets for a freezer with two condensers, label each end or coupling of one line set with tape, marker, etc. The couplings at the rear of the freezer are labeled "A-SIDE" and "B-SIDE". (See Figure 6-1.) For example, label both ends of a ½" and ⅜" line set for the "A-SIDE". Labeling will insure that the line sets are properly connected.

2. Route the condenser line sets between the freezer and condenser. Position the lines in a safe location so they can be securely clamped to a wall or structural member of the building. Any excess tubing should be coiled and laid flat in an indoor location.
3. The 6 foot flexible lines connect at the rear of the freezer. Each flexible line can have only one bend. (See Figure 6-2 for reference).
4. Provide proper pitch and oil trap bends in the discharge line where required. Avoid sharp bends wherever possible. Do not remove the insulation on the lines due to condensation and refrigerant heat loss during cold weather conditions. Position the condenser lines to their final location.
5. Be sure to keep the discharge line separate from the liquid line by approximately 6 inches.

6.2.1 Connecting Condenser Line Couplings

The refrigerant couplings that connect at the freezer and condenser eliminate the need for initial field charging. The coupling design prevents air inclusion and refrigerant loss during connection. Follow these installation procedures to insure leakproof connections.

1. Remove protector caps and plugs and examine the couplings for dirt or foreign material. If necessary, carefully wipe coupling seats and threads with a clean, dry cloth.
2. Lubricate male half diaphragm and synthetic rubber seal with POE refrigerant oil.
3. Thread the coupling halves together by hand to insure proper mating of threads. Use proper size wrenches (on coupling body hex and on union nut) and tighten until coupling bodies “bottom” or definite resistance is felt.
4. Using a pencil or marker, mark a line lengthwise from the coupling union nut to the bulkhead panel. Then tighten an additional ¼ turn (approximately 90°); the marked line rotation on the coupling union nut will indicate the amount the coupling has been tightened. (See figure 6-3.) If a torque wrench is used, the following torque values are recommended:

   3/8 in. OD liquid return line couplings: 20 ft-lbs.

   1/2 in. OD discharge line couplings: 35 ft-lbs.
5. After connecting the condenser line couplings at both the freezer and the condenser, secure the condenser lines to their permanent location with U-type clamps.
6. Inspect all refrigerant tubing connections for leaks.

NOTE: The freezer is shipped with the service valves backseated in the normal operating position.

IMPORTANT:

Refrigerant does not need to be added or removed at installation, or as seasons change. The freezer, condenser, and line sets are factory-charged with the proper amount of refrigerant for all ambient conditions and for either 25 ft. or 50 ft. line lengths. The total system charge is 10.5 lb. of R404a. If a leak is found, recover the refrigerant, repair the leak, evacuate the system, and recharge with 10.5 lb. of R404a.

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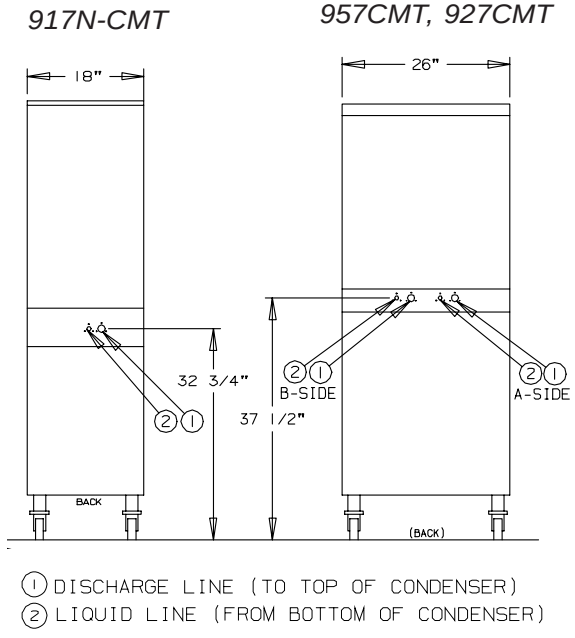


Figure 6-1 Line Connections

6.2.1 Connecting Condenser Line Couplings – continued

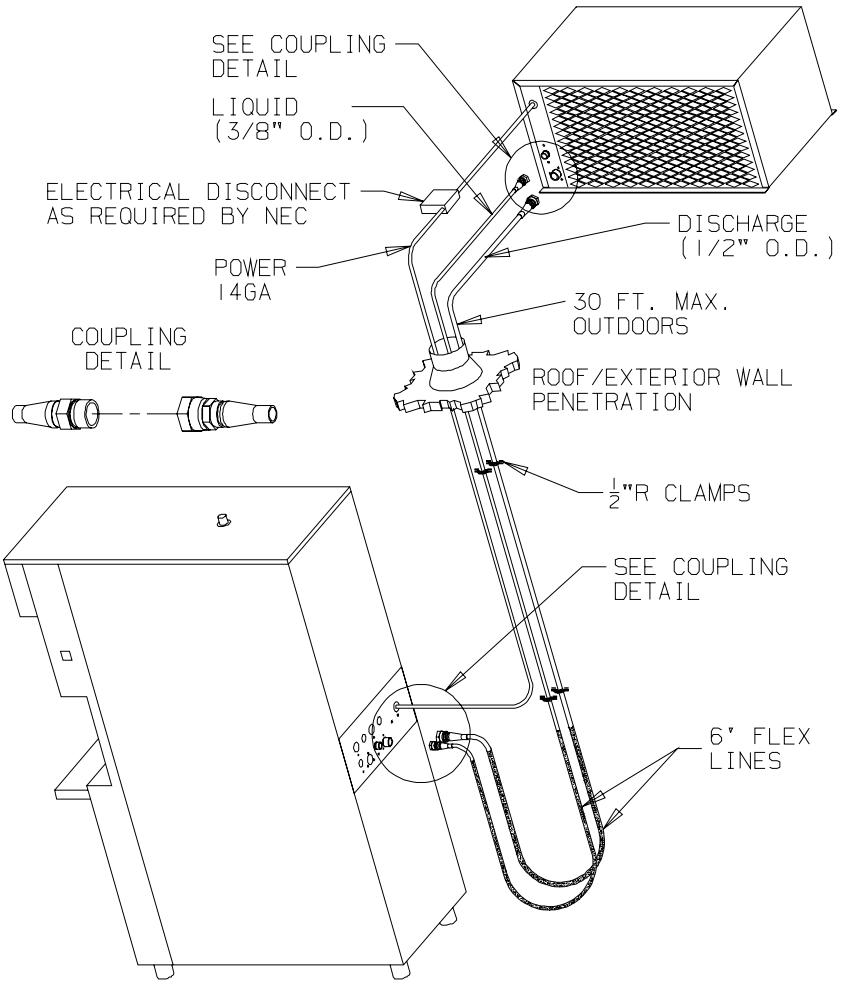
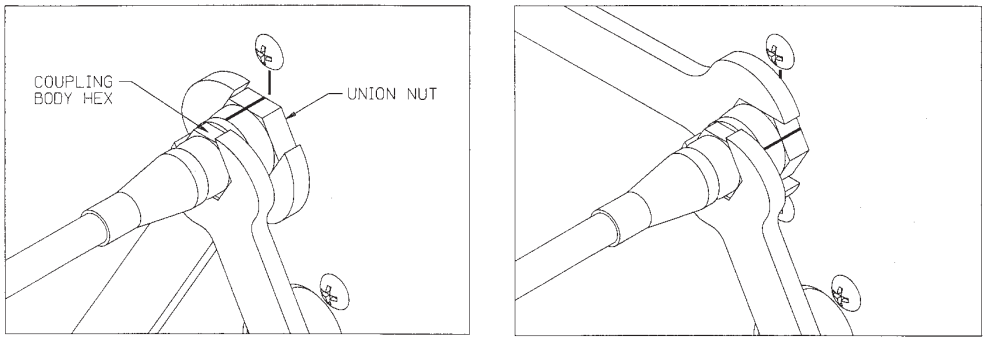


Figure 6-2 Line Connections & Coupling Detail – Remote Condenser



1/2 in. O.D. Line Set:
Union Nut = 1-3/16 in.
Body Hex = 1 in.

3/8 in. O.D. Line Set:
Union Nut = 24mm
Body Hex = 19mm

Figure 6-3 Detail – Connections

6.2.2 Condenser Electrical Wiring

CAUTION:
To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

1. Identify the condenser fan leads at the freezer service box. (See below.)

IMPORTANT:
Each condenser requires separate leads. The "B-SIDE" leads are labeled "Right Side Condenser Fan." Label the ends of the wires so they are connected to the correct condenser.

2. Run 14ga minimum wires (copper conductors that are suitable for outdoor use) to the condenser fan motor leads at the condenser service box. Install an electrical disconnect at the condenser unit. Ground the condenser frame to a solid earth ground using the ground screw provided in the service box.

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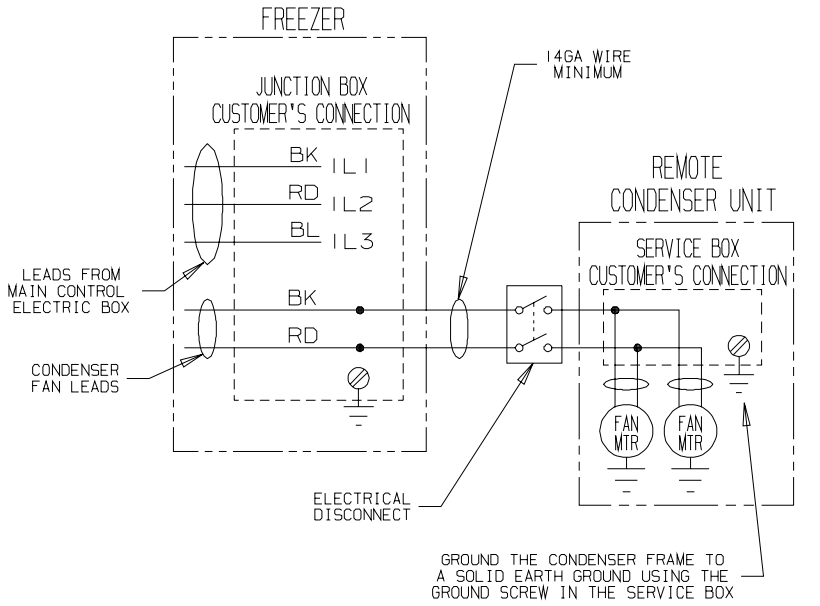
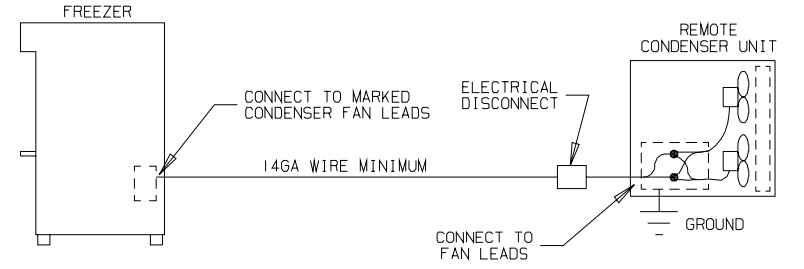




NOTE:
SINGLE COMPRESSOR FREEZER WIRING SHOWN.
DOUBLE COMPRESSOR FREEZERS REQUIRE (2)
REMOTE CONDENSER UNITS. REFERENCE
FREEZER WIRING SCHEMATIC AND DIAGRAM.

Figure 6-4 Electrical Schematic

6.2.2 Condenser Electrical Wiring – continued

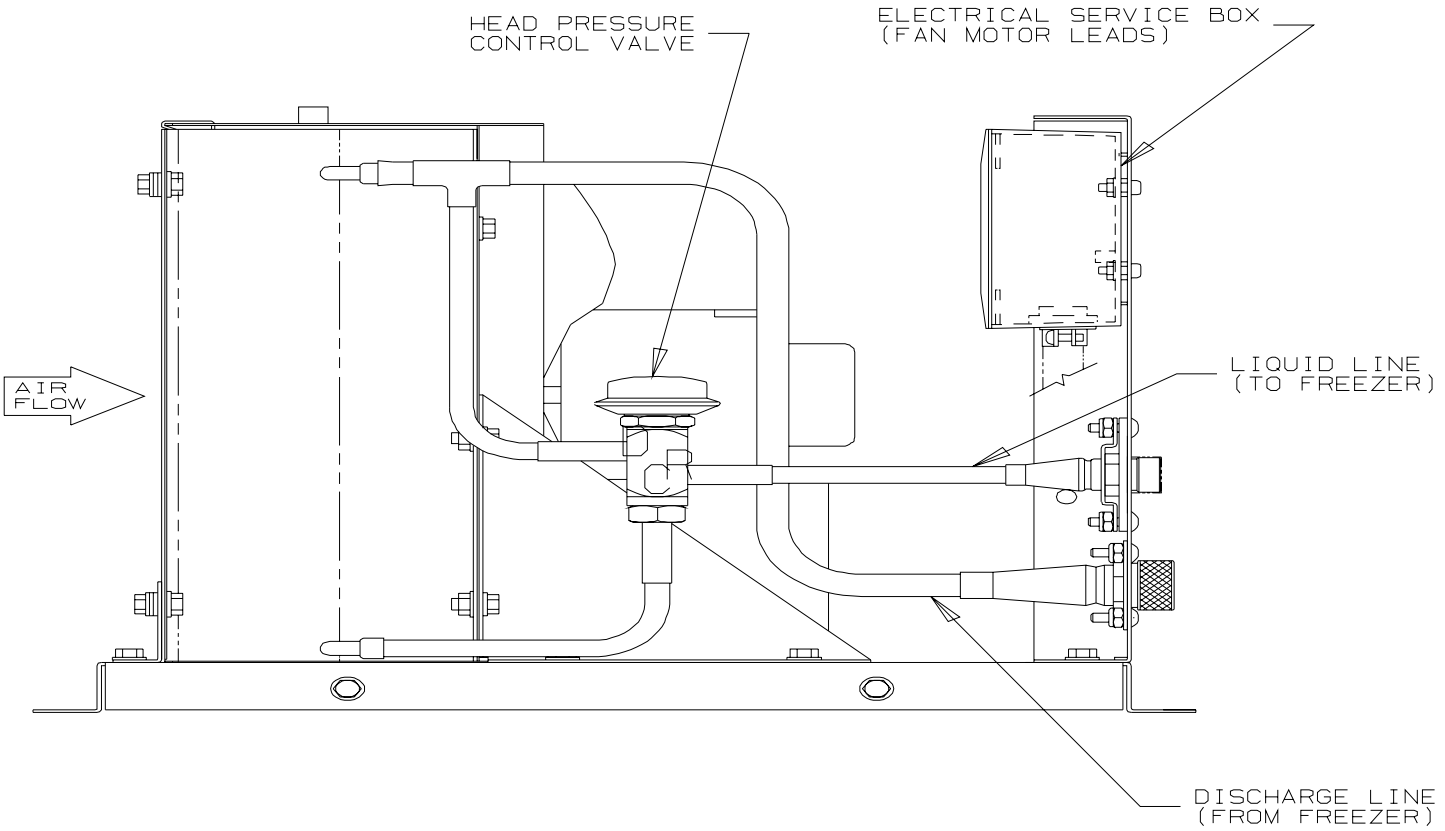


Figure 6-5 Side View

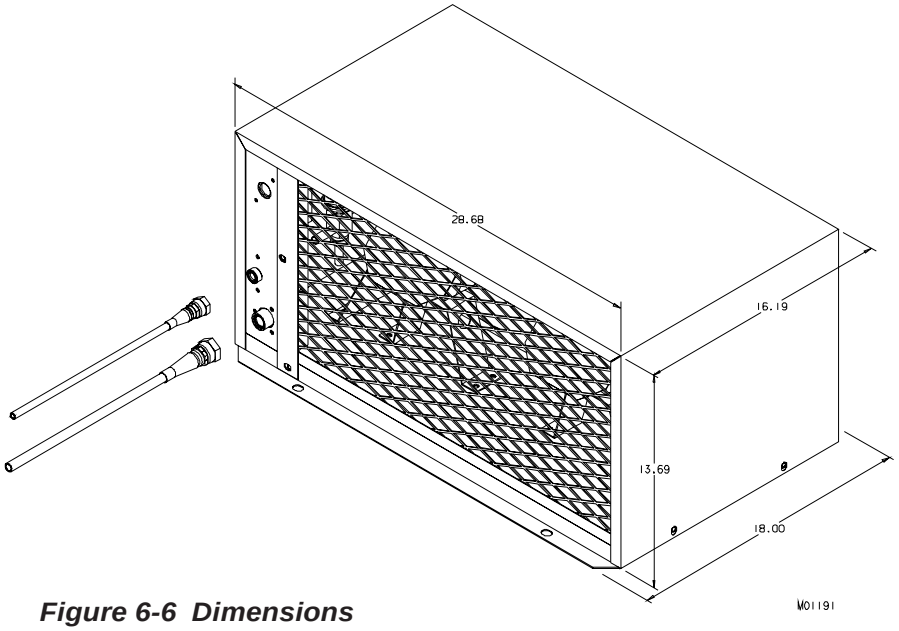


Figure 6-6 Dimensions

7 Tests of Installation

7.1 Head Switch Operation

The head switch feature is designed to prevent the beater shaft from being accidentally activated. The beater motors should not operate with the head assembly removed. It is essential that the proper operation of this switch be verified routinely. Use the following instructions to test for proper operation:

1. Make sure all switches are in the "OFF" position.

CAUTION

To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

2. Disconnect the main power supply.
3. Remove the dispense head and beater shaft assemblies.
4. Connect the main power supply.

CAUTION

Moving parts. Do not place hands in the freezing cylinder. Severe personal injury could result.

5. Turn the selector switches to "CLEAN", then the "AUTO" position. Look inside the freezing cylinder toward the rear—the drive shaft coupling should **NOT** be turning in either position. Turn the switch off and disconnect the main power supply. If a coupling is turning this condition should be corrected before the freezer is put in operation.

7.2 Cylinder Frost Pattern

The cylinder frost pattern test will show the proper refrigeration. To test the refrigeration system and certain controls, perform the following:

1. Disconnect the main power supply.
2. Remove the dispense head and beater shaft.
3. Connect the main power supply.
4. Turn the selector switch to "AUTO". Observe the frost pattern as the refrigeration system runs until the cylinder thermostat satisfies (approximately 2 minutes). There should be an even frost pattern starting 1" from the front going to the rear of the cylinder.

   During normal operation throughout the course of the day, and when not dispensing product, the unit should run for a minimum of 30-50 seconds about every 8-10 minutes.
5. Turn the manual timer knob one quarter turn. Let the refrigeration system run until it shuts off automatically (approximately 1½ minutes) to verify proper operation.

CAUTION
Hazardous moving parts. Freezer starts automatically.

6. On water-cooled models, check to make certain that water is flowing through the condenser by feeling the water inlet and outlet tubes. The inlet tube should feel cold and the outlet tube warm. Check to be sure the water flow stops when the compressor is not running. Be sure that the hand shut-off valve is fully open.
7. While the unit is operating, listen for unusual noises such as vibration (metal tubes making contact), rattles (loose mountings), or noisy belts (dry or misaligned belts.
8. All machines are carefully checked for leaks prior to shipment. Nevertheless, it is advisable to inspect all refrigerant tubing connections for leaks with an electronic leak detector. If leaks are detected, tighten the connection and check the sight glass for proper charge. If leakage persists, or if leakage is discovered at brazed joints, it will be necessary to recover the refrigerant and repair the leak.

7.3 Spigot Switch Operation

The spigot switch is designed to start the compressor and beater motor just before product begins to flow from the spigot. To test and adjust the switch:

CAUTION

To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected.

1. Remove the dispensing head and view the back of the head. With the spigot inserted in the dispense head, turn the spigot so that the edge of the spigot dispensing port is visible. This is the point at which product will begin to enter the spigot.
2. Mark this position on the dispensing head and spigot with a pencil, as shown in figure 7-1 and figure 7-2, item C.
3. Install the dispensing head and spigot rod (Item A, Figure 7-2) on the freezer.
4. Slowly open the spigot (Item B, Figure 7-2). The micro switch should click at the point the pencil marks line up on the spigot and head assembly.
5. If the switch does not click, a switch adjustment must be made. Remove the cover from the electrical box and slightly loosen the two mounting screws (#1 Figure 7-2). Loosen the locking nuts (2). Adjust screws (3) for proper actuation of the switch.
6. Tighten all screws and nuts. Recheck for proper operation.

NOTE: Excessive force on these screws may change the position of the switch assembly. Once they are in place, recheck for correct position.

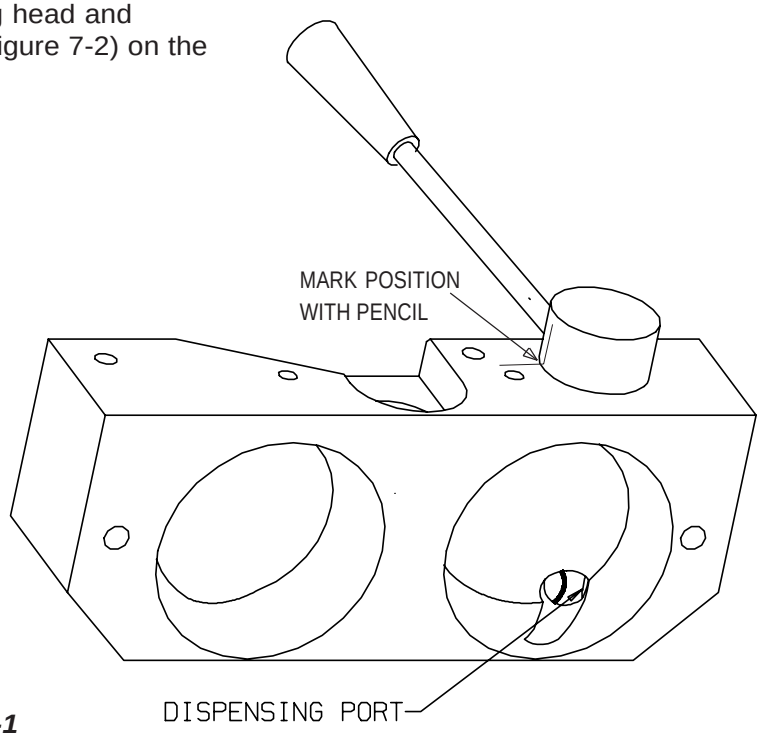


Figure 7-1

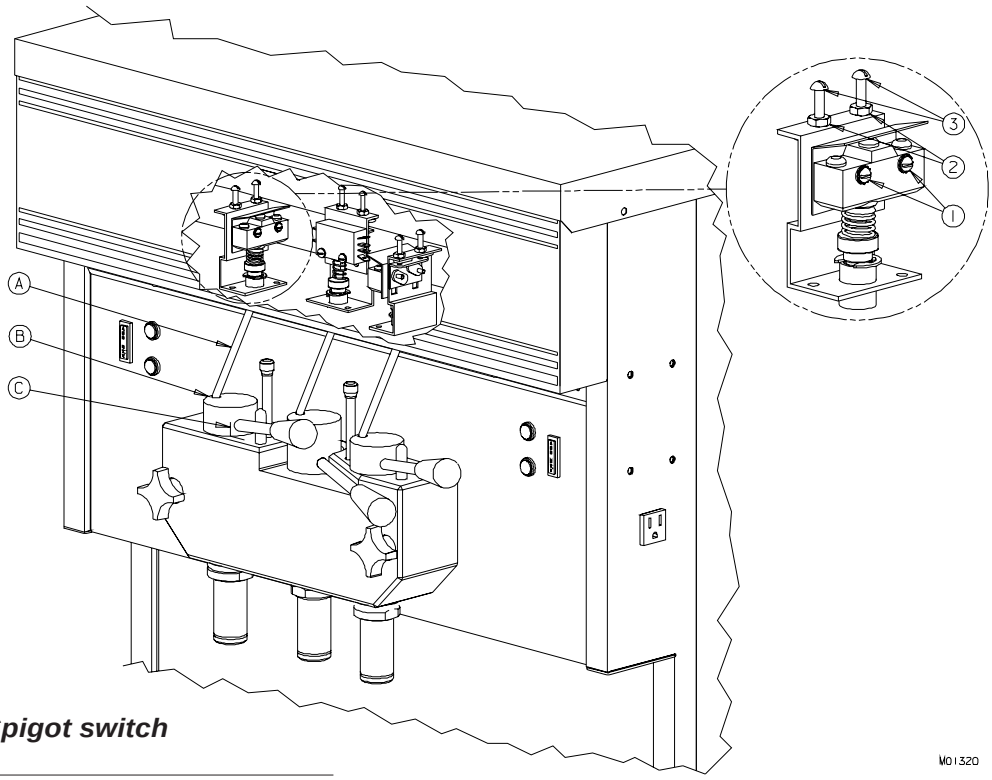


Figure 7-2 Spigot switch

7.4 Beater Rotation

The beater shaft is designed for clockwise rotation as viewed from the front of the freezer. Single phase freezers are pre-wired for proper rotation, but the direction must be checked on three-phase freezers.

CAUTION
Hazardous moving parts. Freezer starts automatically.

CAUTION
To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

1. Remove one side panel.
2. Install the beater shaft assembly(ies), head assembly, and spigot rods. Connect the main power supply. Turn the selector switch(es) to the “CLEAN” position.
3. View the drive coupling from the side. Couplings should be turning in a clockwise direction (as viewed from the front of the freezer). If the couplings do not rotate as specified, turn the selector switch(es) to the "OFF" position and disconnect power. Reverse position of any two of the three-phase service leads. Do not disturb any factory wiring.
4. Reconnect the main power supply and turn selector switch to the "CLEAN" position. Verify proper rotation. Turn selector switch to the "OFF" position.
5. Reinstall side panel.

8 Operating Adjustments

The freezer will need to be tested with mix for verification of proper control settings. Follow the disassembly, cleaning and assembly instructions in the Operator's Manual. Once the freezer has been assembled and sanitized, prime the freezer with mix in accordance with the Operator's Manual instructions.

The following adjustments are mandatory on installation. All adjustments must be within specifications to obtain proper operation of the freezer.

8.1 Thermostat

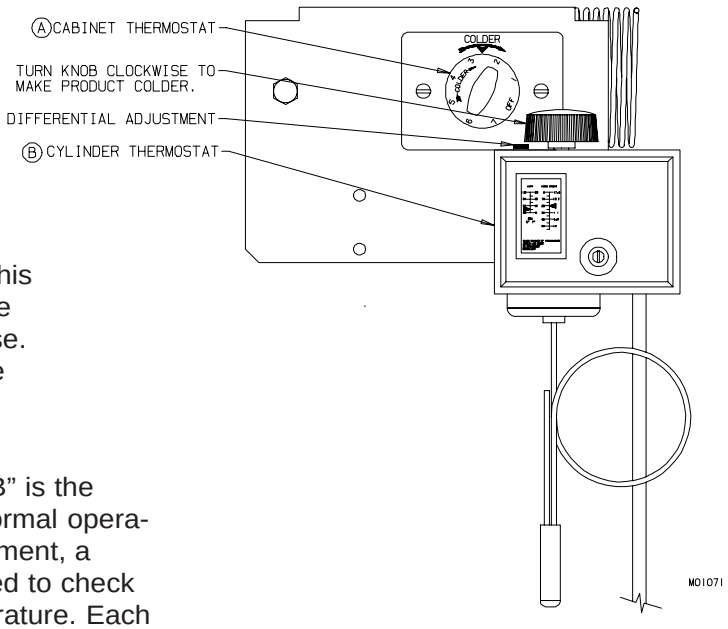
IMPORTANT:
To correctly set the cylinder expansion valve, the cabinet thermostat switch must be in the "OFF" position (Full counterclockwise) with the compressor running.

IMPORTANT:
To correctly set the cabinet expansion valve, the selector switch must be in the "OFF" position, and the cabinet switch in the "ON" position (with the compressor running.

NOTE: Do NOT adjust the product temperature below 17°F. A freeze-up may result. The setting son the thermostat are ONLY to be used as a guide; actual setting must be determined by measuring the frozen product temperature with an accurate thermometer.

1. Thermostat "A" is the cabinet refrigeration thermostat. The cabinet thermostat maintains a mix temperature of 35°-41°F in the mix storage cabinet. This thermostat can be adjusted by rotating the adjustment knob. To set this thermostat colder, turn the adjustment knob clockwise. The normal setting for the cabinet thermostat is between #2 and #4.

3. The thermostat marked "B" is the cylinder thermostat for normal operation. For a correct adjustment, a thermometer must be used to check the actual product temperature. Each thermostat should be set for the product being used. In most cases, a temperature setting of between 18° and 19°F will result in a satisfactory product.



8.2 Refrigeration Settings - Tecumseh Compressors

A refrigeration test gauge must be used when adjusting the suction pressure. To reduce the suction pressure, turn the adjustment screw on the expansion valve counterclockwise. Do not turn more than ¼ turn at a time. Let the unit operate a sufficient length of time — at least two minutes — to properly read the adjustment.

1. On self-contained air or water-cooled freezers:

a. Check the refrigeration pressure settings with the gauges attached to the service valves on the compressor and receiver tank. Adjust to the proper settings (See Figure 8-2.)

SELF-CONTAINED FREEZERS

Refrigerant	Model	Cabinet Suction	Cylinder Suction	Head Pressure Air Cooled	Head Pressure Water Cooled
R-404a	917N-CMT	10-11	16-18	250-350 psig	255-260 psig
R-404a	957CMT	10-11	16-18	250-350 psig	255-260 psig
R-404a	927CMT	10-11	16-18	250-350 psig	255-260 psig

Figure 8-2 Self-contained freezer settings

2. On air-cooled remote freezers:

a. Refrigerant does not need to be added or removed at installation, or as the seasons change. The freezer, condenser, and line sets are factory charged with the proper amount of refrigerant for all ambient conditions and for either 25 ft. or 50 ft. line lengths. The total system charge is 10.5 lb. of R404a. If a leak is found, recover the refrigerant, repair the leak, evacuate the system, and recharge with 10.5 lb. of R404a.

b. Operate the freezer until the system stabilizes before adjusting pressures. Adjust to proper settings (See Figure 8-3.)

AIR-COOLED REMOTE FREEZER SETTINGS

Refrigerant	Model	Cabinet Suction	Cylinder Suction	Head Pressure	Head Pressure Control Valve Setting	Fan Control Cut-in	Fan Control Diff.
R-404a	917N-CMT	10-12	16-18	250-350psig	250 psig	245	20
R-404a	957CMT	10-12	16-18	250-350psig	250 psig	245	20
R-404a	927CMT	10-12	16-18	250-350psig	250 psig	245	20

Figure 8-3 Air-cooled remote freezer settings

8.3 Operational Checks

It is important to observe the general performance of the freezer and make corrections as necessary.

1. If set correctly, the freezer will have a cycle time of 8-10 minutes off and 30-50 seconds run time. Keep the suction pressure setting as high as possible but not more than 18 PSIG.
2. Check for mix leaks around the dispensing head and the beater shaft seal in the rear of the freezer cylinder.
3. Check the 12-second timer by activating the dispensing switch, which should automatically start the compressor and beater motor. When the spigot is closed, the compressor and beater motor will continue to run approximately 12 seconds before shutting off.

NOTE: If the cylinder thermostat calls for additional refrigeration, these components may continue to run and will shut off when the thermostat has been satisfied.

4. Slowly dispense some product from the freezer. The product should flow smoothly and dispense at 18°F (-8°C). If the product comes out in spurts, slowly, or if there are popping sounds, check to see that the mix transfer system is operating properly.

CAUTION

To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

5. There should be no squeaking, squealing or slapping of the beater drive belt. With the freezer selector switch in the "OFF" position, check the belt tension (1/2" deflection with approximately 5 pounds of pressure) and use a straight edge to check pulley alignment.

9 Mix Transfer System

The Mix Transfer System (MTS) is designed to provide a constant pressure in the cylinder and maintain a consistent overrun. The MTS operates by peristaltic action; the MTS hose is squeezed by the MTS rollers, forcing the mix up from the mix container, through the MTS and into the cylinder. The overrun is controlled by the size of the air meter.

The MTS will shut off when the cylinder pressure reaches 22 to 26 psig (152 to 180 kPa) and start when the pressure in the cylinder drops below 19 PSIG (131 kPa). The differential is 2 to 5 psig (14 to 34 kPa).

It is important that the mix transfer hose be replaced every thirty days. Because the hose is under constant pressure, it will lose elasticity and durability.

9.1 MTS Housing Replacement

CAUTION

To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position, and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

CAUTION

Pressurized system. Depressurize before disassembling.

A. REMOVING THE ROLLER ASSEMBLY

1. Unlock the MTS handle and pull down to open the housing and give access to the hose cavity.
2. Remove the mix transfer hose assembly.
3. Remove the two screws located inside the hose cavity. See Figure 9-1.
4. Remove the MTS from the cabinet wall by pulling straight out with a rocking action.

Important:
Make sure the wavy spring washer stays on the motor shaft behind the cabinet wall.

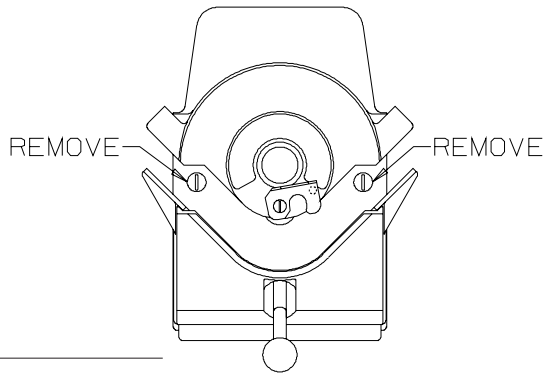


Figure 9-1

9.1 MTS Housing Replacement — continued

B. INSTALLING NEW MTS HOUSING

1. Remove all RTV from the MTS slide switch on the rear wall of the cab. Reapply a thin coat (less than 1/32" thick or .8 mm) to the left side of the switch, and 1/16" (1.5 mm) thick coat to the top, bottom, and right side of the switch. (See Figure 9-3.) Do not reapply RTV to the surface of the switch that faces the cab opening. Failure to complete this procedure could result in the slide opening and closing improperly.
2. Check to ensure the spring washer is on the motor shaft.
3. Install the MTS on the cabinet wall by aligning the coupling and the motor shaft.
4. Turn the roller assembly while pushing the MTS back until completely engaged.
5. Install the two mounting screws being sure the base is flush against the back wall before tightening screws.

C. TEST INSTALLATION

1. Reassemble the freezer according to the Operator's Manual. Reconnect power to the freezer, turn the mix switch to the "ON" position and pressurize the unit with water. Then depressurize. Repeat 5 times. With the unit depressurized, turn the mix switch to the "OFF" position.
2. Unlock the MTS handle and pull the slide down to open the hose cavity. Carefully check the position of the hose in relation to the rollers. The hose should be near the center of the roller. If the hose is too far back or forward, the hose could be cut by the edge of the roller. If this is the case, call H. C. Duke & Son, Inc. Service Department for further instructions.

NOTE: This mix transfer housing has been completely tested at the factory with a roller assembly installed.

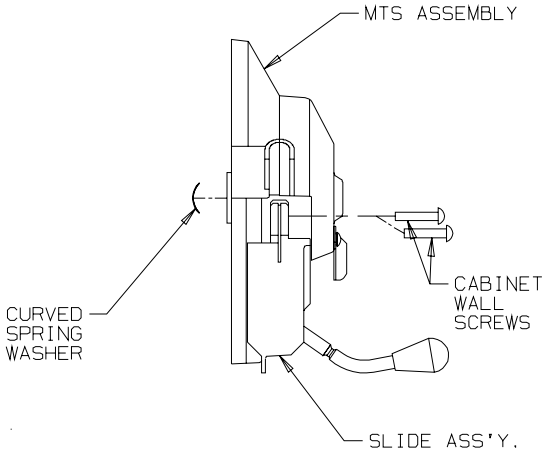


Figure 9-2

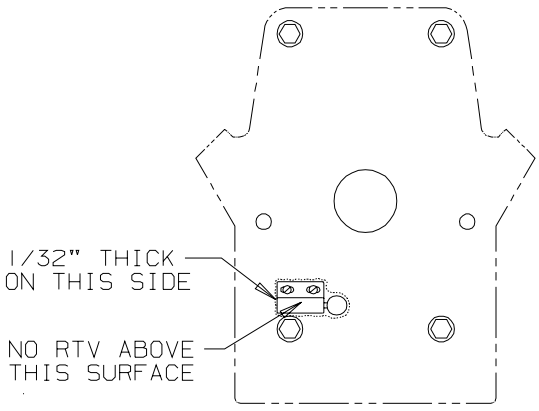


Figure 9-3

9.2 MTS Motor Replacement

CAUTION

To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position, and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

CAUTION

Pressurized system. Depressurize before disassembling.

1. Disassemble the Mix Transfer System by unlocking the MTS handle and pulling down to open the housing and gain access to the hose cavity.
2. Remove the mix transfer hose.
3. Remove the two mounting screws located inside the hose cavity.
4. Remove the MTS from the cabinet wall by pulling straight out with a rocking action.

Important

Make sure wavy washer is removed from motor shaft in cabinet wall.

5. Remove the side and rear panels. Locate the MTS gearmotor, remove the electrical connections to the motor, and disconnect the wires to the MTS slide switch.
6. Remove the bolt from the motor support bracket at the rear of the gearmotor.
7. Remove the 4 bolts holding the gearmotor and mounting plate to the outside of the cabinet. Remove the motor and plate.
8. Remove the motor from the plate and install the new motor to the plate. Tighten the bolts.
9. Install the motor and plate to the outside of the cabinet leaving the 4 mounting bolts loose.
10. Insert the alignment bushing (p/n 138369) over the motor shaft, with arrow pointing to the 12 o'clock position.

NOTE: Alignment bushing must be inserted to shoulder. See figure 9-5.

11. Move motor side to side and up and down to allow for proper alignment.
12. Tighten 4 bolts on motor plate. Tighten bolt on rear motor support bracket.

— continued

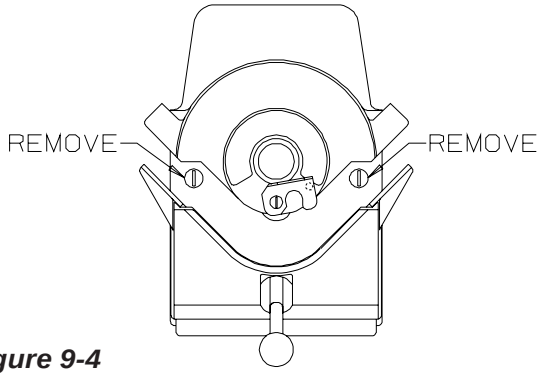
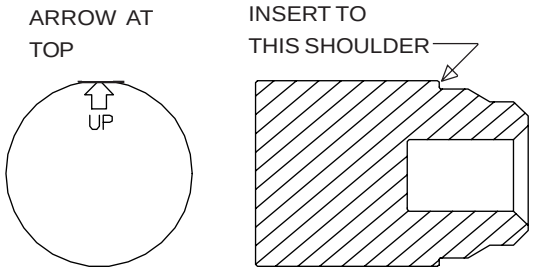


Figure 9-4



MTS ALIGNMENT BUSHING PART NO. 138369

Figure 9-5

9.2 MTS Motor Replacement – continued

NOTE: If hole in motor bracket and hole in electrical box bracket do not line up, loosen nuts on 2 bolts that secure the 4" x 4" electrical box to the frame, tighten nuts on bolts when holes align. (If holes still do not line up it may be necessary to enlarge the holes on the motor support bracket so the bolt will go through without binding.)

13. Remove the alignment bushing and install the wavy washer.
14. Install the MTS on the cabinet wall by aligning the coupling and the motor shaft.
15. Turn the roller assembly while pushing the MTS back until completely engaged.
16. Install the two mounting screws.
17. Install the MTS hose assembly according the Operator's Manual.

Important

Use original Duke hose only. The freezer will not operate properly with any other type of hose. Never twist the hose when assembling or installing.

Important

The MTS will not operate unless the handle is in the closed and locked position.

CAUTION

Mix Transfer System will be pressurized during operation. Make sure all components and fasteners are secure before start-up.

18. Place a container of water in the cabinet and insert pickup tube in bucket. Place an empty bucket under the dispense head.
19. Reconnect the main power supply. Place the MTS switch in the "ON" position and allow MTS to fill and pressurize the cylinder. Open the spigot and allow some water to drain.
20. Repeat so that the MTS runs for at least two minutes.
21. Place MTS switch in the "OFF" position and drain the water from the cylinder. Remove the duckbill valve and allow water to drain from the mix pickup tube.
22. Unlock the MTS handle and pull down to gain access to the hose/ roller cavity. Check to make sure the MTS hose has not moved to the back side of the rollers. If hose has moved to the back side of the roller cavity, contact the factory.

9.3 MTS Slide Switch Replacement

CAUTION
To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position, and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

CAUTION
Pressurized system. Depressurize before disassembling.

A. REMOVING THE MTS SLIDE SWITCH

1. If the freezer is in operation with frozen mix in the cylinder, it first must be emptied and cleaned.
2. Remove the rear panel.
3. Locate and disconnect the MTS slide switch connectors that come through the back of the cabinet to the MTS motor area.
4. Inside the cabinet, unlock the MTS handle and pull down to open housing and gain access to hose cavity.
5. Remove the mix transfer hose assembly.
6. Remove the two mounting screws located inside the hose cavity.
7. Remove the MTS from the cabinet wall by pulling straight out with a slight rocking action.

Important:
Make sure the wavy washer stays on the motor shaft behind the cabinet wall.

8. Remove the 2 screws and washers holding the MTS slide switch and pull switch wires out through the cabinet.
9. Remove the bushing from the cabinet wall and thread the wires on the new slide switch through the bushing. Install the switch with the two mounting screws and washers. Install the bushing back into the hole in the cabinet wall making sure the wires are threaded through the bushing as far as possible.
10. Check to ensure the wavy spring washer is on the motor shaft.
11. Install the MTS on the cabinet wall by aligning the coupling and motor shaft.
12. Turn the roller assembly while pushing the MTS back until completely engaged. The MTS base should seat flush to the wall of the cabinet.
13. Install the two mounting screws.
14. Reinstall the MTS hose assembly.
15. From the rear of the freezer, reconnect wires from the slide switch to the wire's "slide switch cord." (If wire terminals have been removed from cord marked "cord switch," use terminals provided.) Use electrical tape and wrap around connectors.
16. Install rear panel.

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9.3 MTS Slide Switch Replacement –- continued

B. CHECKING THE MTS SLIDE SWITCH ASSEMBLY

CAUTION
DO NOT place hands near the MTS rollers. Severe personal injury could result.

1. Reconnect power to the freezer.
2. With the MTS handle in the down position put the MTS switch in the "ON" position. If the slide switch is working properly, the MTS will not come on.
3. Place the MTS switch in the “OFF” position.
4. Close the MTS handle and lock in place with the swing hook.
5. Place the MTS switch in the "ON" position. If the slide switch is working properly, the MTS will come on.
6. With the MTS running, unlock the swing hook and slowly lower the housing using the handle. If the slide switch is working properly, the MTS will shut off within 3/8” (9.5 mm) travel.

NOTE: If the MTS slide switch will not turn on, readjust switch to left or right and test again. If the MTS slide switch does not operate properly, call the factory.

7. After the slide switch has been checked for proper operation, disconnect power.

CAUTION
To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position, and the main power supply is disconnected. Some freezers have more than one disconnect switch.

8. Open the slide, and remove screws holding the MTS in place.
9. Pull off MTS to expose switch. Apply silicone sealant around switch and lead wires. See figure 9-10.
10. Reapply a thin coat (less than 1/32" thick or .8 mm) to the left side of the switch, and 1/16" (1.5 mm) thick coat to the top, bottom, and right side of the switch. (See Figure 9-3.) Do not reapply RTV to the surface of the switch that faces the cab opening. Failure to complete this procedure could result in the slide opening and closing improperly.

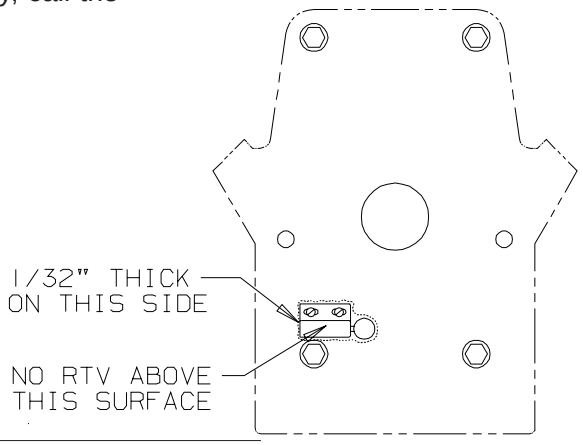


Figure 9-8

10 Equipment Operation

10.1 The Refrigeration System

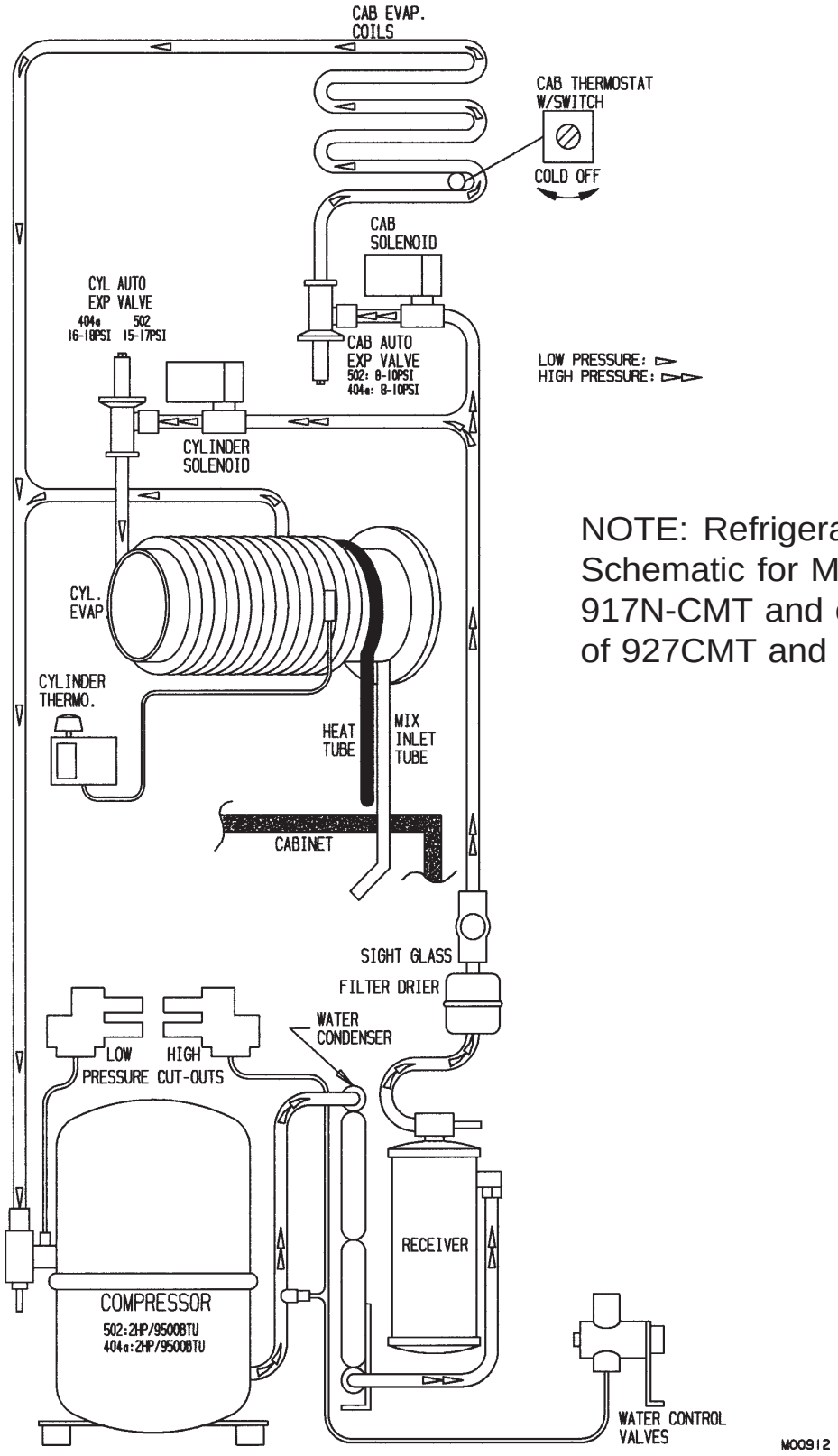
(See Figures 10-1 and 10-2) The compressor discharges the refrigerant to the condenser as a high-temperature, high-pressure gas. Either by water-cooling or air-cooling, the refrigerant gas condenses to liquid. This high pressure liquid flows into the receiver which serves as the refrigerant reservoir. Upon leaving the receiver, the refrigerant flows through the filter drier, sight glass, and cylinder solenoid valve (which is controlled by the cylinder thermostat).

When the cylinder thermostat calls for cooling, the cylinder solenoid coil is energized and the valve opens to permit the flow of refrigerant to the automatic expansion valve. This expansion valve controls the flow of refrigerant in the evaporator in such a way as to keep practically the entire coil filled with evaporating refrigerant.

As the refrigerant in the cylinder evaporator absorbs the heat, it changes to a low pressure vapor. This vapor is returned to the low pressure side of the compressor through the suction line leading from the freezing cylinder, thus completing the refrigeration cycle.

In water-cooled systems the flow of cooling water to the condenser is metered by a pressure-controlled regulating valve. Here, two forces control the size of the valve opening through which condenser water may flow. An adjustable tension spring tends to keep the valve closed while a bellows, connected by tubing to the high-pressure side of the system, tends to open the valve. When the refrigeration system begins operation, the increased pressure caused by the compressor opens the water regulating valve and permits water to flow through the condenser. When the unit cycles off, the water continues to flow through the valve until the condensing pressure has decreased below the valve setting. (See Section 8.2, for settings.)

10.1 The Refrigeration System – continued



NOTE: Refrigeration Schematic for Model 917N-CMT and one side of 927CMT and 957CMT.

Figure 10-1 Refrigeration Schematic

10.1 The Refrigeration System – continued

Refrigeration Schematic for Remote Condenser

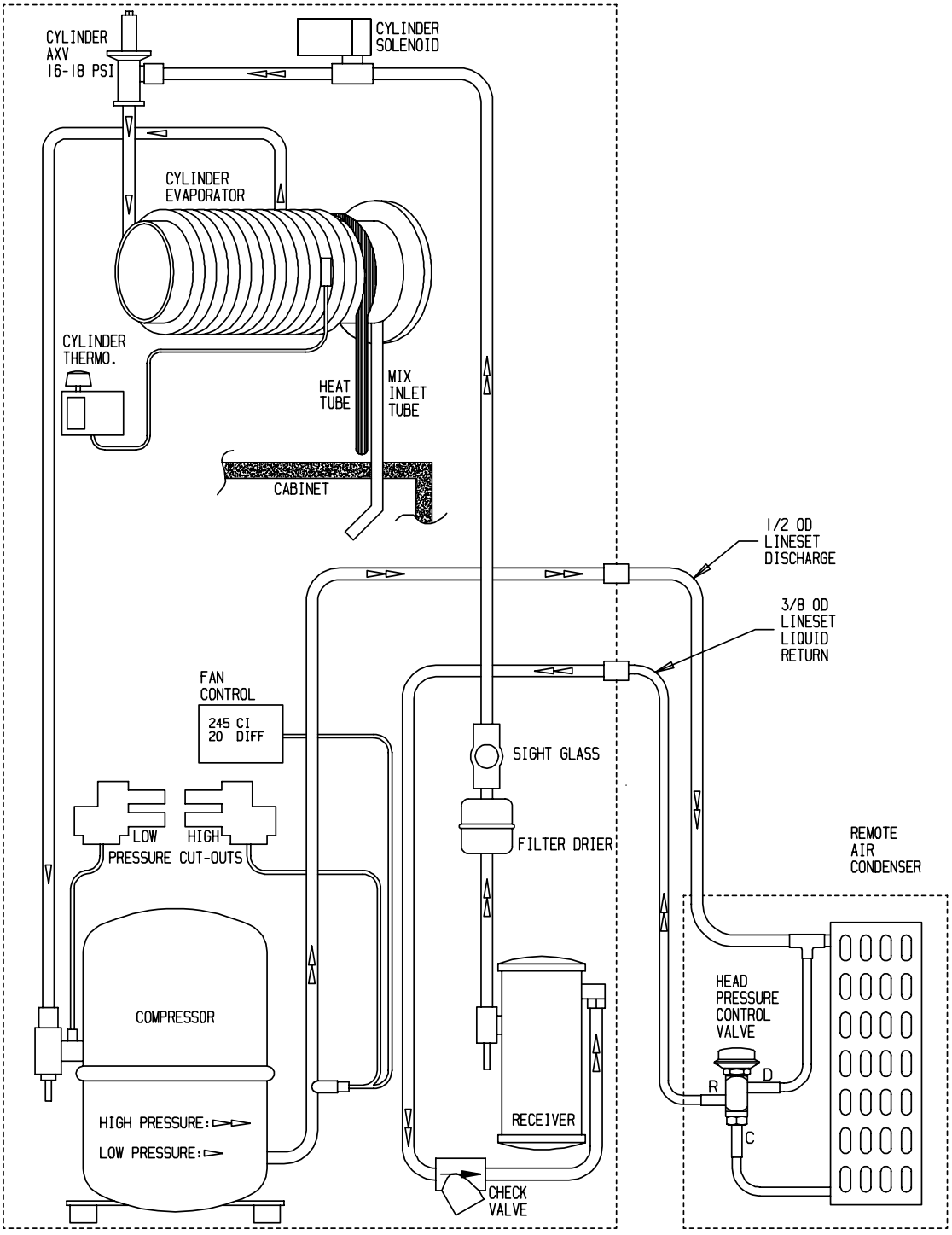


Figure 10-2 Refrigeration Schematic

10.2 The Electrical Circuit

The electrical operation of the system depends on the position of the MTS switch, selector switch and mode of operation. In the following discussion, five examples are considered.

1) operation when the selector switch is in the "AUTO" position but product is not being dispensed
2) operation during the time that the product is being dispensed
3) operation immediately after dispensing the product
4) operation when the selector switch is in the "CLEAN" position
5) operation of the pump when the MTS switch (mix) is in the “ON” position.

Note the differences between the single-phase circuit and the three-phase circuit.

NOTE: The following schematic shown (Figure 10-3) is for a standard 917N-CMT. Always refer to the schematic and wiring diagram supplied with the freezer.

NOTE: If the head is removed, the magnetic head switch will be open, cutting power to the beater motor contactor coil.

When the selector switch is in the "AUTO" position but product is not being dispensed, the refrigeration circuit is controlled by the cylinder thermostat. Note that current cannot flow through the mechanical timer or the spigot switch circuit, when both are open. When the temperature in the cylinder exceeds the setting of its controlling thermostat, the thermostat contacts close, thus energizing the solenoid valve and releasing the flow of refrigerant to the cylinder coils. This action also energizes the compressor contactor and beater motor starter coils, closing the points on the contactors.

When the operator is dispensing product, the spigot switch closes the contacts 1-2 on the solid state timer. This in turn energizes the coils on the contactors for the beater motor, compressor, and cylinder solenoid.

When the operator closes the spigot to shut off the flow of product, the spigot switch opens which starts the time delay period. The time delay contacts will remain closed for a period of 12 seconds after dispensing. The purpose of this delay is to refrigerate the new mix that entered the freezing cylinder when the frozen product was dispensed. Control of the refrigeration circuit is returned to the thermostat at the end of the 12 second period.

When the selector switch is in the "CLEAN" position, the refrigeration circuit is de-energized and only the beater motor starter and beater motor are energized.

The mechanical timer bypasses the thermostat, forcing the compressor and beater motor to run up to 3 minutes. This timer is used for quick start-ups or fast recovery when dispensing large portions.

Important:
Excessive use of the mechanical timer can causes freeze-up and damage to the freezer.

When the mix switch is in the “ON” position the mix motor relay coil is energized through the mix pressure switch and magnetic slide switch. The mix motor is then energized through the mix motor relay points. When the mix pressure switch opens the mix motor relay coil is de-energized and the mix motor stops.

10.2 The Electrical Circuit – continued

917N-CMT Electrical Schematic

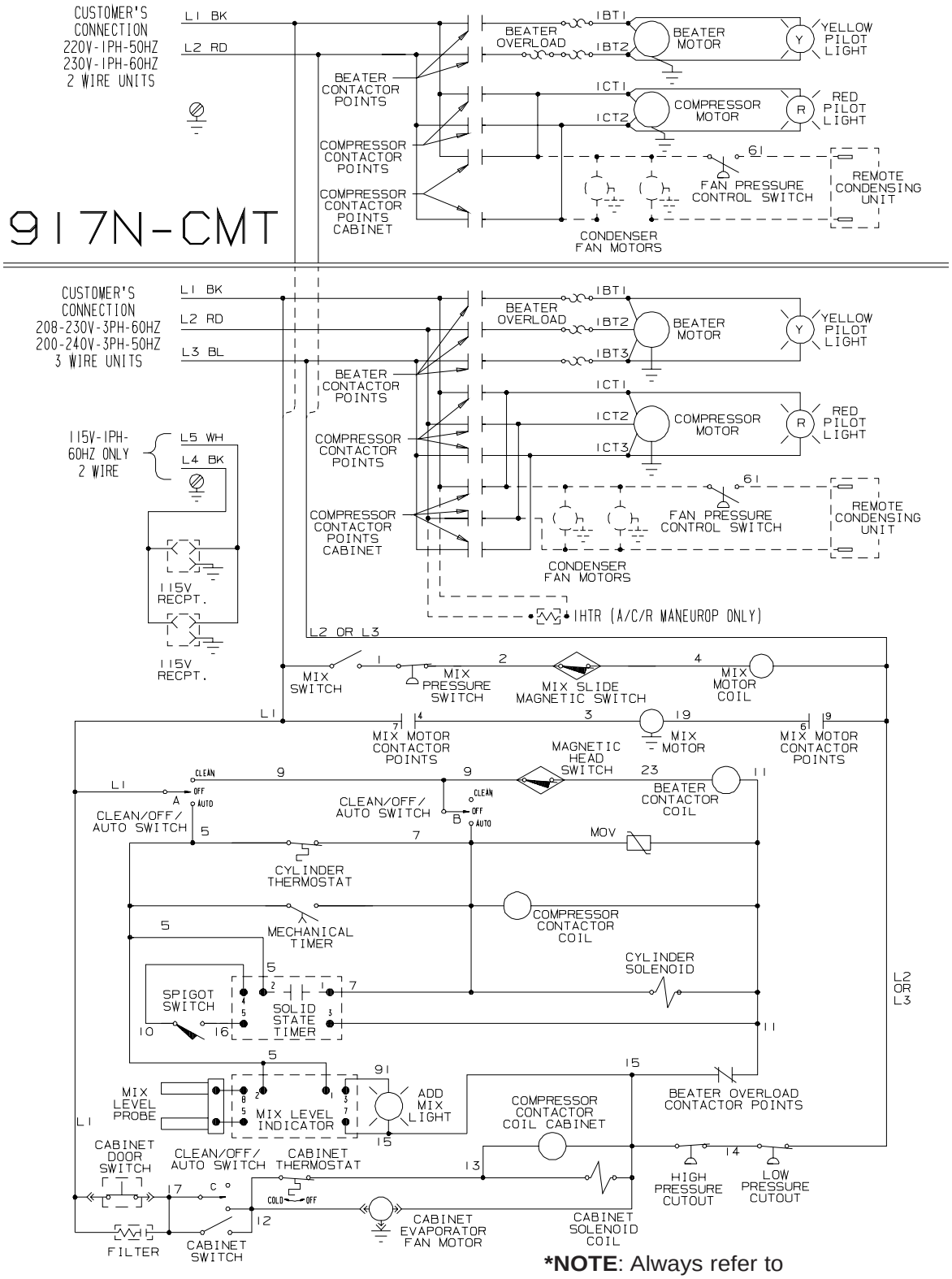
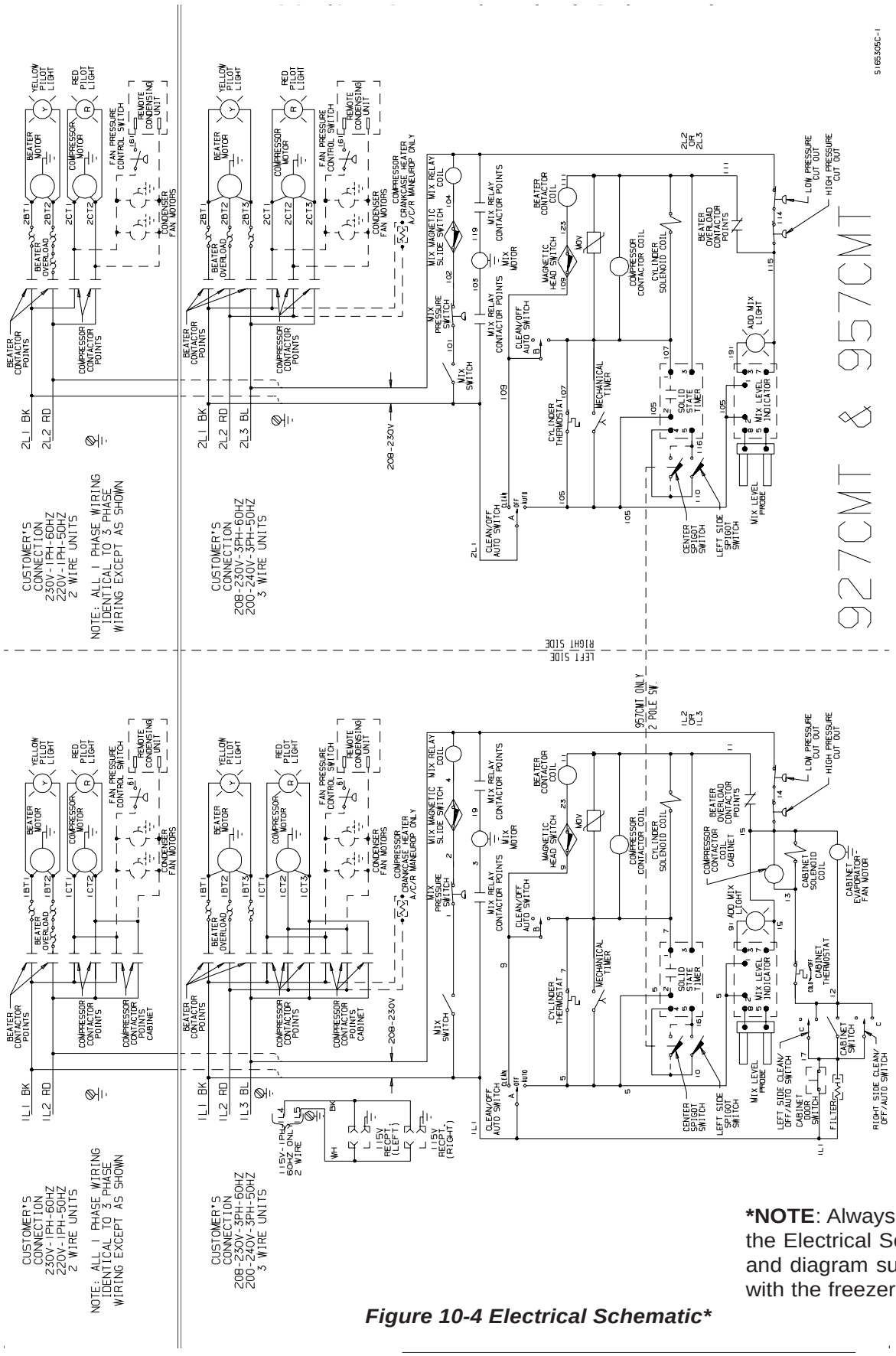


Figure 10-3 Electrical Schematic*

***NOTE**: Always refer to the Electrical Schematic and diagram supplied with the freezer.

10.2 The Electrical Circuit – continued



***NOTE**: Always refer to the Electrical Schematic and diagram supplied with the freezer.

Figure 10-4 Electrical Schematic*

11 Maintenance and Adjustments

CAUTION
All maintenance and adjustments must be done by an authorized service technician.

CAUTION
To avoid electrical shock and contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

11.1 Gear Reducer Lubrication Instructions

The gear reducers are heavy duty, worm-geared units manufactured to H. C. Duke & Son, Inc. specifications. The following lubrication procedures should be followed.

CAUTION
To avoid electrical shock and contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

IMPORTANT:
DO NOT overfill. Overfilling can damage the gear reducer.

1. OIL – This is a special oil and will not mix with petroleum base oil. When adding or changing oil use only part number 158055 oil.
2. INITIAL OIL CHANGE – The oil in a new gear reducer should be drained at the end of 250 hours of operation. (30 days for 8 hour per day service, 15 days for 16 hour service, 10 days for 24 hour service).
3. OIL CHANGING – Under normal conditions, after the initial change, the oil should be changed after every 2500 hours of operation, or every six months, whichever occurs first.
4. OVERFILLING OR UNDERFILLING – If a gear reducer is overfilled with oil, the energy used in churning the excessive oil can result in overheating. If the gear reducer is underfilled, the resultant friction can cause overheating. If underfilling occurs, fill the gear reducer to the oil level plug hole. See Figure 11-1.

NOTE: Normal operation can generate temperatures up to 200°F (93°C). If overheating occurs due to overfilling, shut down the drive, remove the oil level plug and allow excess oil to drain. Reinstall the oil level plug, and restart the drive.

– continued

11.1 Gear Reducer Lubrication Instructions – continued

5. DRAINING OIL – Open oil drain plug(s). Drain oil with speed reducer at normal operating temperature.
6. PROPER OIL LEVEL – Fill until oil is at the bottom of the threads in the oil level plug hole.
7. INSPECTION – When changing oil, always inspect all areas around the reducer for traces of oil. If oil is found in the immediate area, repair the leak (usually an oil seal) and check for proper oil level.

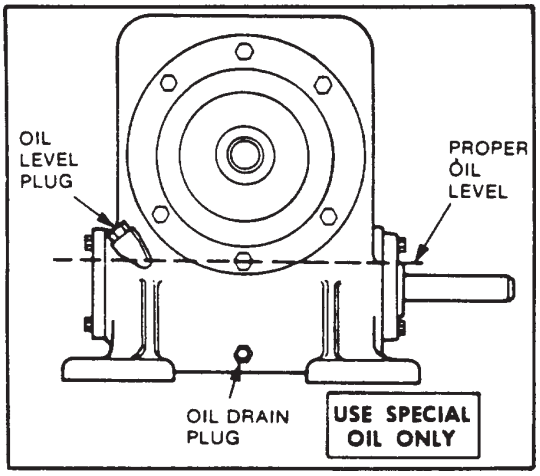


Figure 11-1 Gear Reducer

11.2 Condenser Cleaning

CAUTION

To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and the main power supply is disconnected. Some freezers have more than one disconnect switch.

A. Air Cooled Condensers

At least once a month, the face area of the condensers should be inspected for accumulation of dirt and dust. Surface dirt and dust can usually be removed with a stiff brush and/or vacuum cleaner or compressed air. 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.

When using compressed air:

1. Place a damp towel or cloth over the face area of the condensers.
2. Blow dirt through the clogged areas of the condenser into the damp towel.

B. Water Cooled Condensers

Depending on water conditions, the condenser may require cleaning. Usually a restricted flow of water resulting in a high head pressure indicates a dirty condenser. Flush the condenser with a commercially available condenser cleaner suitable for use on copper and rubber components.

C. Beater and Condenser Fan Motor Inspection

CAUTION

To avoid electrical shock and contact with moving parts, make sure all selector switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

The beater and fan motors do not require lubrication but should be inspected and cleaned annually.

11.3 Pulley Alignment and Belt Tension

CAUTION
To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

1. Remove the side panels to expose the pulleys and the belts.
2. Check the alignment of the beater motor pulley and the 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.

NOTE: Most pulleys are mounted with Loctite®. It may be necessary to heat for removal.

3. Depress the belt at a point midway between the two pulleys. When properly adjusted, the belt should depress ½ inch from its normal position with approximately five pounds of pressure.
4. If the belt is too tight or too loose, adjust as necessary until proper belt deflection is obtained by loosening the four (4) bolts which hold the motor mounting plate to the frame. With these loose, adjust the tension bolt in or out as required to obtain proper belt tension. Retighten bolts.
5. Periodically inspect the belts. If they are worn, replace both belts, as they are manufactured in matched sets.

11.4 Beater Drive Coupling Replacement and End Play Setting

11.4.1 Beater Drive Coupling Removal

IMPORTANT:
Improper drive coupling spacing will damage the beater shaft, dispensing head, and drive coupling. When checking end play settings or replacing a coupling, proceed as follows.

CAUTION
Make sure freezer is depressurized before proceeding.

1. Remove product from the cylinder.

CAUTION
To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

2. Remove dispensing head and beater shaft. (See figure 11-2 Ref.#2.)
3. Remove both drive belts (not shown).

11.4.1 Beater Drive Coupling Removal – continued

4. Remove gear reducer bolts (Ref. #8). Six (6) bolts are located around the face of the reducer.

NOTE: Remove the top bolt last while holding the bottom of the reducer.

5. Remove the gear reducer (Ref. #1).

6. Replace two (2) bolts (Ref. #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.

7. Loosen the four (4) set screws (Ref. #7), and remove the drive coupling (Ref. #4). If the coupling is stuck tight to the output shaft, lightly tap the coupling from the back with a brass or plastic hammer and bar, as a hard hammer can damage the bearings. Sometimes, due to age, this coupling will stick so tight it will have to be removed with a pulley-removing tool or a "wheel puller."

8. Remove the key (Ref. #10).

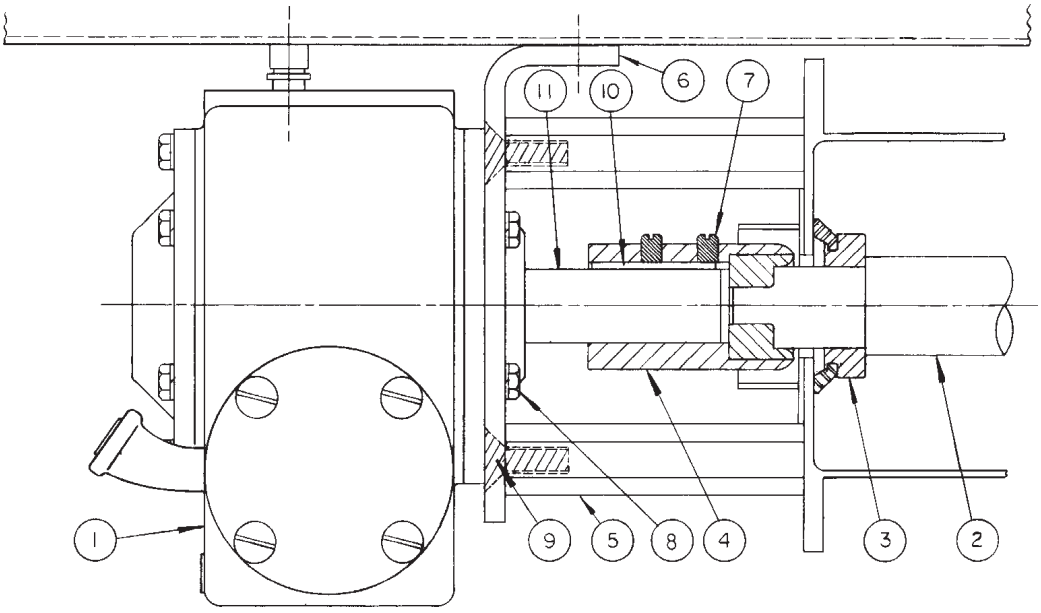


Figure 11-2

No.	DESCRIPTION	No.	DESCRIPTION
1.	Gear Reducer	7.	Set Screws
2.	Beater Shaft	8.	Bolt-Gear Reducer
3.	Shaft Seal	9.	Bolt-Reducer Mounting Plate
4.	Drive Coupling	10.	Key
5.	Spacer	11.	Output Shaft
6.	Reducer-Mounting Plate		

11.4.2 Installing the New Coupling

1. Clean gear reducer output shaft (Ref.#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 the coupling and reducer shaft for burrs.
2. When a smooth sliding fit is achieved, remove coupling and proceed with final assembly.

   Place key (Ref. #10) in key slot on the reducer output shaft. Keep the key flush with the front end of the output shaft (Ref. #11).

NOTE: Coat output shaft with Loctite Anti-Seize to make future removal easier.

3. Slide the coupling (Ref. #4 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 of Beater Drive Coupling Removal (previous page).
5. Place one (1) gear reducer bolt (Ref.#8) in the top hole of the cylinder mounting plate.
6. Insert gear reducer onto cylinder mounting plate and start top bolt (Ref. #8). Do not tighten completely. Now insert the other bolts one at a time. When all bolts are in, tighten each bolt.

   IMPORTANT:
   Make sure the drain pan lip is on the front of the reducer mounting plate, not in between it and the reducer.

NOTE: Due to 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.

11.4.3 End Play Adjustment for Beater Drive Coupling

1. Insert the beater shaft (Ref.#2) with the shaft seal and blades into the cylinder and engage beater shaft in the drive coupling.

NOTE: The four (4) set screws on the coupling must be loose, as the coupling will have to be adjusted.

2. Place the head bushing on the beater shaft.
3. 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.

4. Slide the drive coupling (Ref.#4) forward until it is tight against the beater shaft. Move the coupling back 1/16 of one inch (about the thickness of a dime)
5. Tighten all four set screws.
6. Replace the drive belts.
7. Reconnect electrical power.

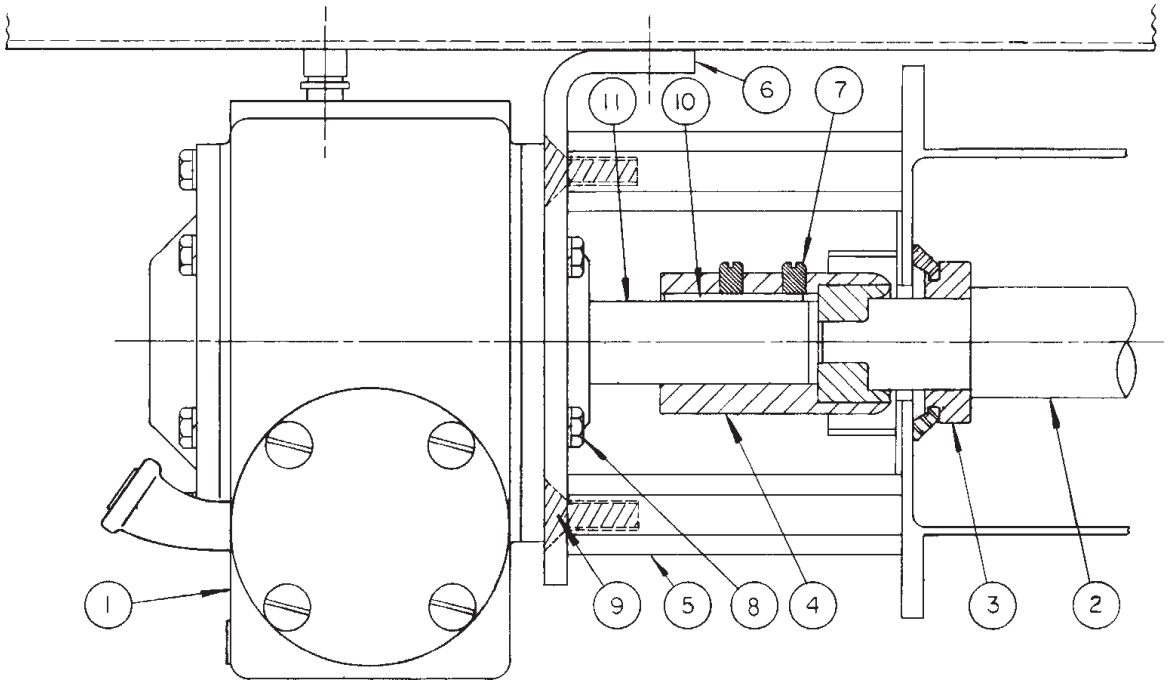


Figure 11-2

No.	DESCRIPTION
1.	Gear Reducer
2.	Beater Shaft
3.	Shaft Seal
4.	Drive Coupling
5.	Spacer
6.	Reducer-Mounting Plate
7.	Set Screws
8.	Bolt-Gear Reducer
9.	Bolt-Reducer Mounting Plate
10.	Key
11.	Output Shaft

11.5 Defective Cylinder Pressure Switch

11.5.1 Removing Defective Cylinder Pressure Switch

CAUTION

To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

1. Remove Permagum Sealant putty around pressure switch and scrape off silicone sealant (if any).
2. Disconnect red and white wire 12 inches from switch.
3. Using 1/16” hex key, loosen the three set screws on the hex nut holding the pressure switch. Unscrew the nut from the switch and remove. Remove the spacer. Lightly tap the switch to break the silicone seal and push it through into the cylinder.
4. Carefully clean both surfaces of the cylinder wall with rubbing alcohol and remove all old silicone. The cylinder may be lightly sanded to remove old silicone. Clean the outer cylinder surface (nut & spacer side) of silicone and Permagum Sealant. SURFACES MUST BE PERFECTLY CLEAN FOR THE NEW SWITCH TO WORK PROPERLY. Use rubbing alcohol to remove any surface films.

11.5.2 Installing New Cylinder Pressure Switch

IMPORTANT:

Do not press diaphragm of new pressure switch, drop, or distort this surface in any way. This is very delicate and if abused will void all warranties. Retain protective cover on switch assembly until installation of switch.

1. Trial-fit new switch in cylinder, using the new spacer and nut. Hint: Tape the wires together at the ends. This will help when threading the wires through the pressure switch mounting hole.

IMPORTANT:

Do not drag threads on pressure switch through the hole in the cylinder. Lift and gently push the switch through.

2. Check to be sure the curvature of the cylinder matches the lip of the switch. Slide the switch holding tool into the cylinder and on to the head of the pressure switch, taking care not to depress the switch diaphragm. Wiggle the switch and the curved spacer to get the exact match to the curvature of the cylinder.

IMPORTANT:

Any misalignment of pressure switch and wall of cylinder will change pressure set point and damage the switch!

3. Scribe a locator line on label of new switch with a pen to mark the horizontal position of the switch. Scribe a horizontal line on the curved spacer to match the line on the switch.
4. Remove the pressure switch from the cylinder. With rubbing alcohol, thoroughly clean the area to be sealed. Clean cylinder wall, inside and out, and clean mating surface of pressure switch. Allow to dry. It is important that surfaces receiving the sealant are clean to ensure a good bond.

— continued

11.5.2 Installing New Cylinder Pressure Switch – continued

5. Apply a thin film of grey RTV silastic sealant around O-ring on switch and a 1/8 in. bead around the head of pressure switch. (See figure 11-3.)

6. Install the switch into the cylinder hole, taking care not to smear the bead of RTV. Align the horizontal line into position noted in the trial installation. Place the holding tool in cylinder straight over the switch to hold the switch in place.

7. With the O-ring in the spacer, apply a thin film of gray RTV sealant on the o-ring, slide it over the switch body and thread it on the nut. Align the locating lines and tighten the nut finger-tight. Tighten 3 set screws uniformly to finger-tight. (2 in-lb torque)

8. Remove the holding tool from the cylinder.

9. Wipe off excess RTV inside the cylinder with a tissue or a soft paper towel. Allow RTV sealant to cure for 30 minutes.

10. Reconnect switch leads to wires and secure in place with tie-wraps.

Important
Excessive pressure on nut or set screws will change pressure setting and may damage pressure switch.

11. While waiting, seal the wires where they exit the switch. Squeeze out a liberal amount of the clear silicone sealant and allow it to flow over the rear of the switch (See Fig 11-3.) The sealant should cover the entire black cap, 3/4 in. of the exposed wires and 1/4 in of the metal housing. Place a paper towel under the switch to catch the excess sealer which runs off. After a skin forms on the sealant—about 15 minutes—apply a full second coat.

12. The installation can be checked for leaks using water. Also check the cut-out and cut-in pressure setting of the switch. (Use part number 116312 pressure gauge assembly.)

NOTE: Cut out pressure must not exceed 26 psig and the cut in pressure should be within 2-5 psi of the cutout pressure.

NOTE: Minimum cut out PSIG is 19 PSIG.

Important
Pressures over 26 psig will cause the hose to stretch which will shorten the life of the hose.

13. Once the 2nd coat of clear sealant is dry, repack permagum insulation around pressure switch. Then the freezer can be cleaned, assembled, sanitized and placed in service.

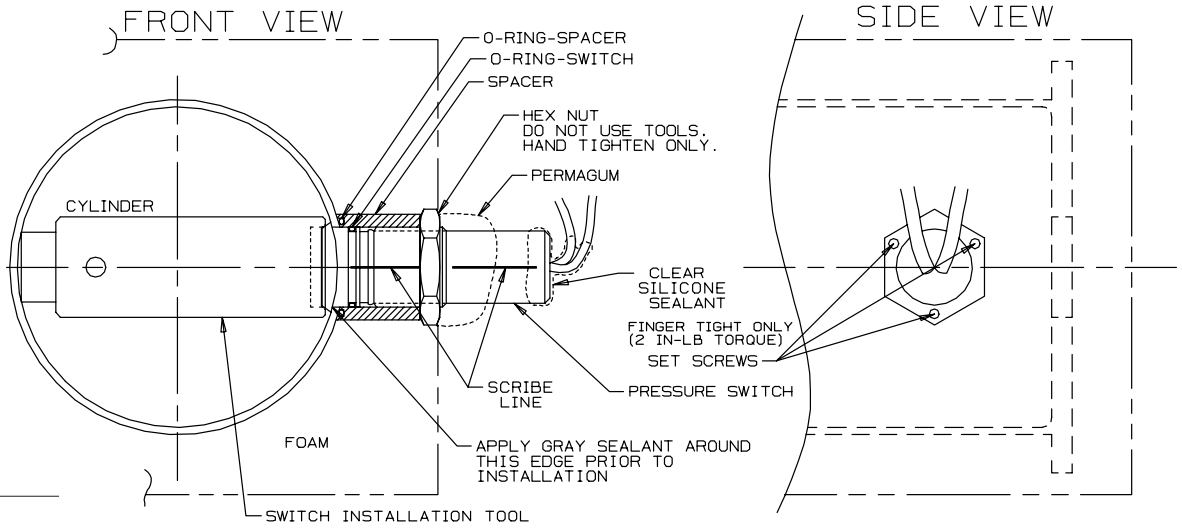


Figure 11-3

12 Service Troubleshooting Charts

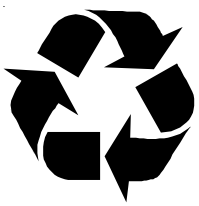
SAFETY

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 thoroughly understood.

CAUTION
ALL MAINTENANCE AND ADJUSTMENTS MUST BE MADE BY A QUALIFIED REFRIGERATION TECHNICIAN.

CAUTION
WHEN EVACUATING EITHER SIDE OF THE FREEZER, DO NOT OPERATE THE OPPOSITE SIDE. ALL CONTROL SWITCHES MUST BE IN THE "OFF" POSITION AND THE MAIN POWER SUPPLY DISCONNECTED. IF POWER IS APPLIED TO A COMPRESSOR IN A VACUUM, A SHORT MAY OCCUR.

NOTE: Some refrigerants are hazardous to the Earth's atmosphere. To protect our environment, use a refrigerant recovery/recycling unit whenever removing refrigerant from the system.



12 Service Troubleshooting Charts – continued

PROBLEM	PROBABLE CAUSE	REMEDY
Unit does not operate.	1. Freezer unplugged.	1. Plug in freezer.
	2. Fuse or breaker blown at main disconnect.	2. Make sure your freezer is connected to a separate circuit independent from any other electrical equipment. Check fuse or breaker size; check for low voltage; if not within 10% of nameplate rating call power company.
	3. Beater motor out on overload.	3. Press overload reset button. Check for low voltage. Check product temperature and overrun.
	4. Off on high pressure cut out control.	4. Check refrigerant charge, pressure settings and high pressure control. Check for restricted water or drain line. Check condenser fans. Clean air condenser coil.
	5. Off on low pressure cut out control.	5. Check refrigerant charge, pressure settings and low pressure control. Check for moisture in refrigeration system.
	6. Faulty selector switch.	6. Replace selector switch.
	7. Disconnected or broken wire in electrical circuit.	7. Check wiring and connections; repair or replace wires as necessary.
Leakage of mix or water from drain tube to drip tray.	1. Damaged beater shaft seal or installed improperly.	1. Replace cup seal or o-ring inside bushing. Install properly.
	2 Beater shaft end play not set properly.	2 Set per instructions in Maintenance and Adjustment section.
	3 Damaged beater shaft.	3 Replace beater shaft.
Mix leaking at dispensing head.	1. Faulty head o-ring.	1. Replace o-ring.
	2. Head not properly installed.	2. Install head properly. Replace o-ring if pinched.

12 Service Troubleshooting Charts – continued

PROBLEM	PROBABLE CAUSE	REMEDY
Dispensed product too soft (Product temperature above 21°F)	1. Automatic expansion valve incorrectly set or erratic in operation.	1. Adjust or replace expansion valve. (See Section 8.2 or 8.3)
	2. Leak in refrigeration system resulting in little or not refrigeration.	2. Find refrigerant leak. Remove charge into a refrigerant recovery/recycling unit. Repair leak, evacuate and recharge system.
	3. Thermostat set too high or faulty.	3. Adjust thermostat or replace. (See Sec. 8.1)
Product dispenses slowly out of dispensing head.	1. Product too cold.	1. See "Dispensed Product Too Hard" this section.
	2. Reverse rotation on beater.	2. Correct rotation to clockwise as viewed from the front of freezer.
	3. MTS pressure too low.	3. Check dispensing pressure.
Dispensed product too hard.	1. Cylinder thermostat erratic or set too cold.	1. Adjust thermostat or replace.
	2. Faulty time delay. (Unit runs all the time.)	2. Replace time delay. (See Sec. 8.1)
	3. Low suction pressure.	3. See Maintenance and Adjustments for setting. (See Sec. 8.2 or 8.3)
	4. Spigot switch electrically or mechanically stuck closed. (Unit runs all the time.)	4. Adjust or replace spigot switch
Machine runs continually and product continues to get colder.	1. Spigot switch rod engaged.	1. Close spigot completely.
	2. Spigot switch (side or center) out of adjustment or defective.	2. Adjust or replace spigot switch. (Sec.7.3)
	3. Faulty thermostat or bulb not deep enough in well.	3. Check movister, time delay and thermostat, replace as needed.
	4. Starter contact points stuck.	4. Replace starter, and test head switch operation.
	5. Faulty time delay.	5. Replace time delay.
	6. Suction pressure too low, refrigeration system.	6. See Maintenance and Adjustments for setting. (See Sec. 8.2 or 8.3)

12 Service Troubleshooting Charts – continued

PROBLEM	PROBABLE CAUSE	REMEDY
Poor or slow product recovery.	1. Dirty or blocked condenser, restricted air flow - high ambient temperature.	1. Clean condenser, lower ambient temperature.
	2. Thermostat cut in point out of adjustment or malfunctioning.	2. Adjust or replace.
	3. Defective condenser fan motor.	3. Replace fan motor.
	4. Defective compressor.	4. See Trouble Shooting Compressor/Condensing Circuit.
	5. Water flow restriction to machine or through condenser.	5. Remove restriction, clean or replace condenser.
Compressor does not operate or operates improperly.	1. Trouble in compressor condensing circuit.	1. Refer to Trouble Shooting Compressor/Condensing Circuit.
	2. Faulty start capacitor, run capacitor or relay. (single phase only)	2. Replace start capacitor. Replace run capacitor. Replace compressor relay
	3. Faulty contactor.	3. Replace contactor.
	4. Disconnected or broken wire in switch or capacitor relay box.	4. Check wiring and connections; repair or replace wire leads as necessary.
Beater motor does not operate.	1. Head assembly is not installed.	1. Install head assembly.
	2. Magnetic head switch defective.	2. Replace magnetic head switch.
	3. Loose connection in control circuit.	3. Locate and tighten connection.
	4. Open starter coil.	4. Replace coil.
	5. Worn out relay contact.	5. Replace relay.
	6. Faulty capacitor assembly, (1 phase)	6. Replace capacitor assembly.
	7. Faulty beater motor.	7. Replace beater motor.
	8. Beater overload open.	8. Reset or replace overload.
Compressor and beater motor operate only when dispensing.	1. Cylinder thermostat, setting too warm.	1. Replace or adjust thermostat. (See Sec. 8.1)
Compressor and beater motor do not operate when dispensing.	1. Spigot switch (es) defective or out of adjustment.	1. Replace or adjust. (See Sec. 7.3)
	2. Time delay defective	2. Replace time delay.

12 Service Troubleshooting Charts – continued

PROBLEM	PROBABLE CAUSE	REMEDY

Troubleshooting Charts
Compressor/Condensing Circuits

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 dataplate rating or install transformer. Check for inadequate wire size and length of wire to circuit breaker.
	3. Open start capacitor. (single phase only)	3. Replace start capacitor.
	4. High discharge pressure.	4. See "Discharge Pressure Too High" this section.
	5. Defective compressor.	5. Replace compressor.
	6. Potential relay defective.	6. Replace potential relay.
Compressor starts, but remains in start windings.	1. Low line voltage.	1. Ask power company to increase voltage to not less than 10% below dataplate rating or install transformer. Check for inadequate wire size and length of wire to circuit breaker.
	2. Improperly wired.	2. Check wiring against diagram. Check wire size.
	3. Run capacitor shorted. (single phase only)	3. Check by disconnecting run capacitor.
	4. Start capacitor weak. (single phase only)	4. Check capacitor, replace.
	5. Defective relay. (single phase only)	5. Replace relay.
Contactor failure, points burned and pitted.	1. Low line voltage.	1. Make sure your freezer is connected to a SEPARATE circuit independent from any other electrical equipment. Ask power company to increase voltage to not less than 10% below dataplate rating or install transformer.
	2. Excessive line voltage.	2. Ask power company to reduce voltage to maximum of 10% over dataplate rating.
	3. Contactor chattering.	3. Check movister, time delay and thermostat. Replace as needed.

12 Service Troubleshooting Charts – continued

Troubleshooting Charts
Compressor/Condensing Circuits

Unit operates long or continuously.	1. Dirty condenser.	1. Clean condenser.
	2. Shortage of refrigerant.	2. Remove charge into a refrigerant recovery/recycling unit, repair leak and recharge.
	3. Moisture in system.	3. Remove charge into a refrigerant recovery/recycling unit, evacuate and recharge system.
⚠	CAUTION: When evacuating either side of a double freezer DO NOT OPERATE THE OPPOSITE SIDE. All control switches must be in the "OFF" position and the main power CORD(S) disconnected. If power is applied to a compressor in a vacuum a short may occur CAUSING PERSONAL INJURY.	
	4. Compressor failing.	4. Check compressor for proper pressures. Replace if inadequate.

Discharge pressure too high..	1. Water turned off or defective water regulating valve.	1. Turn on water, replace regulating valve, or install water valve kit.
	2. Restricted water cooled condenser.	2. Check water lines to see if they are kinked. Clean or replace condenser.
	3. Dirty condenser.	3. Clean condenser.
	4. Unit location too warm (air cooled).	4. Relocate unit away from restriction. Place nothing against the back or on top of the unit.
⚠	CAUTION: When evacuating either side of a double freezer DO NOT OPERATE THE OPPOSITE SIDE. All control switches must be in the "OFF" position and the main power CORD(S) disconnected. If power is applied to a compressor in a vacuum a short may occur CAUSING PERSONAL INJURY.	
	5. Refrigerate overcharge.	5. Bleed refrigerant charge into a refrigerant recovery/recycling unit, until sight glass bubbles (flashes) then add refrigerant until sight glass clears.
	6. Air in system.	6. Purge system into a refrigerant recovery/recycling unit, evacuate and recharge.

12 Service Troubleshooting Charts – continued

Troubleshooting Charts
Compressor/Condensing Circuits

PROBLEM	PROBABLE CAUSE	REMEDY
Capacitor failures.	1. Low line voltage.	1. Ask power company to increase voltage to not less than 10% below dataplate rating or install transformer.
	2. Improper capacitor. (single phase only)	2. Replace capacitor with properly rated capacitor as listed in manual.
Discharge pressure too low.	1. Water regulating valve open too wide.	1. Adjust for proper water temperature and discharge pressure or replace or repair water valve.
	2. Shortage of refrigerant	2. Remove charge into a refrigerant recovery/recycling unit, repair leak, evacuate and recharge system.
Noisy compressor	1. Tubing rattle.	1. Bend tubes away from contact.
	2. Spring broke internally.	2. Replace compressor.

NOTE: Contact H.C. Duke & Son, Inc. for instructions prior to warranty compressor replacement.

12 Service Troubleshooting Charts – continued

Troubleshooting Charts
Mix Transfer System (MTS)

PROBLEM	PROBABLE CAUSE	REMEDY
No Air (Overrun).	1. Air meter plugged.	1. Clean or replace air meter.
	2. Air tube pinched.	2. Replace tube.
	3. Incorrect air meter size.	3. Use higher number air meter.
Too much air, overrun too high-popping problems.	1. Air meter too large.	1. Install smaller air meter.
	2. Air leak between pick up tube and hose.	2. Replace as needed.
	3. Air line hose cracked.	3. Replace air line hose.
	4. Defective or missing duckbill valve.	4. Replace valve.
Mix shoots out air meter.	1. Transfer hose worn out.	1. Replace hose.
	2. MTS handle not fully closed.	2. Close handle and lock in place.
	3. Clip for handle worn.	3. Replace clip.
	4. MTS pressure too high.	4. Check pressure with gauge kit. Replace pressure switch if not 19-26 PSIG.
Mix pick up tube losses prime.	1. Transfer hose worn.	1. Replace transfer hose.
	2. Defective duckbill check valve.	2. Replace check valve.
Mix transfer system (MTS) will not operate.	1. MTS handle not closed.	1. Close slide and lock in place.
	2. Slide switch defective	2. Replace slide switch.
	3. MTS relay defective.	3. Replace MTS relay.
	4. Start capacitor defective .	4. Replace start capacitor.
	5. Pressure switch defective.	5. Replace pressure switch assembly.
	6. Motor burned out or tripped overload.	6. Replace motor or let cool down and check for cause .
	7. Hose not installed properly.	7. Check position-reinstall
MTS will not shut off.	1. MTS hose worn out.	1. Replace hose.
	2. Mix relay defective.	2. Replace mix relay.
	3. Pressure switch stuck in closed position.	3. Replace pressure switch.

12 Service Troubleshooting Charts – continued

Troubleshooting Charts
Mix Transfer System (MTS)

PROBLEM	PROBABLE CAUSE	REMEDY
MTS cycles on and off without dispensing.	1. Leak on pressure side of system.	1. Find leak and correct, check head, drain tube, pressure relief and all hoses.
	2. Worn transfer hose.	2. Replace hose.
Mix leaks out of MTS.	1. Hose clamp too loose.	1. Tighten hose clamp.
	2. Transfer hose worn and split.	2. Remove, clean inside MTS around rollers with spray bottle provided, install new hose.

Keep your freezer in excellent condition. Always contact H.C. Duke & Son, Inc. for replacement parts and maintenance information.

QUALITY PARTS
PROTECT
YOUR
EQUIPMENT

INSTALLATION, START-UP, AND INSTRUCTION CHECKLIST
*For Freezers Equipped with Mix Transfer Systems

Machine Location:Account Name _____ Model No.: _____
Street Address: _____ Phone: _____ Serial No.: _____
City: _____ State: ____ Zip: _____ Voltage: _____
Service Agency Name: _____ Phase: _____
Street Address: _____ Phone: _____ Cooling: _____
City: _____ State: ____ Zip: _____ Installation Date: _____

IMPORTANT: This freezer must be installed by a qualified service technician in accordance with the Installation Instruction Manual.

Installation

	A Left Side	B Right Side
A. Position the Unit		
1. Inspect freezer for any transit damage.	☐	
2. Check pulley alignment, belt tension, set screws, bolt tightness.	☐	☐
3. Install casters or legs.	☐	
4. Place freezer in proper location	☐	
5. Level freezer by adjusting legs or casters. Unit should have ¼" slope to the front.	☐	
6. Allow 6" clearance for air flow.	☐	
B. Electrical Wiring		
Note: All connections must conform to local code requirements and/or be in compliance with the National Electrical Code.		
1. Check and record supply voltage at disconnect.	___ V	___ V
2. Check and record wire size and condition.	___ GA	___ GA
Record length of run from supply box.	___ ft.	___ ft.
3. Wire all 2 compressor freezers with two (2) separate lines and disconnects.	☐	☐
4. Connect green ground wire to ground screw lug in service entrance junction box.	☐	☐
5. Fuse freezers between maximum fuse size and minimum circuit ampacity listed on freezer data plate. Record fuse size or breaker rating.	___	___
6. Check beater rotation (Clockwise only)	☐	☐
7. After installation, check and record voltage at machine under load.	___	___
8. After installation, check and record actual operation amperage.	___	___
C. Water Connections (If applicable)		
1. Connect water inlet line (cold water only) (⅜" ID for single head, ½" ID for double head).	☐	
2. Connect drain line.	☐	
3. Turn water on and check for leaks.	☐	☐
D. Final Assembly for Freezers with Mix Transfer Systems		
1. Unpack all spare parts for inspection.	☐	
2. Install any accessory item purchased.	☐	☐
3. Install refrigeration test gauges.	☐	☐
4. Perform the Test of Installation outlined in the Installation Manual	☐	☐

Operator/Owner Training

CAUTION

To avoid electrical shock or contact with moving parts, make sure all switches are in the "OFF" position and that the main power supply is disconnected. Some freezers have more than one disconnect switch.

1. Review and explain operators manual and caution labels to operator/owner.	☐
2. Identify model and serial number tag. Record in manual.	☐
3. Explain and identifiy all control switches.	☐
4. Instruct the owner/operator in assembly and disassembly procedures and explain the following:	☐
a. Spigot/dispensing rod.	☐
b. Dispensing head, spigot and serrated nozzle or spigot extension.	☐
c. Beater shaft, blades, shaft seal and bushing.	☐
d. MTS hose assembly	☐
e. Transfer hose, locating line and life (30 days maximum)	☐
f. Duckbill check valve and air hose	☐
g. Air meter number identification and care	☐
h. MTS housing and hose installation	☐
5. Wash all cylinder and dispense head parts per manual instructions. Let air dry.	☐
6. Wash cylinder(s) with brushes.	☐
7. Wash mix inlet tube with brush.	☐
8. Explain lubrication points, reassemble and install cylinder parts.	☐
9. Reassemble and install mix transfer hose assembly.	☐
10. Before proceeding with demonstration, have operator/owner disassemble, lubricate and reassemble all parts.	☐
11. Explain and identify function and cleaning of drain tube.	☐
12. Explain and identify spare parts kit.	☐

Freezer Model No. _____

Serial No. _____

Machine Startup

	A Left Side	B Right Side
1. Instruct the operator on proper cleaning and sanitizing as outlined in the Operator's manual.	☐	☐
2. Drain sanitizer from the freezer.	☐	☐
3. Pour at least 2 1/2 gallons of mix into each mix container.	☐	☐
4. Open dispensing spigot and air relief/bleed plug. Turn MTS switch to "PRIME" or "ON" if there is no prime position. Leave spigot open until pure mix comes out of dispensing head then close spigot. Close air relief/bleed plug when mix is coming out of the air relief/bleed plug opening in the bottom of the head.	☐	☐
5. Allow MTS to run until it shuts off on pressure.	☐	☐
6. Turn selector switch to "AUTO" and MTS switch to "MIX ON".	☐	☐
7. Allow refrigeration to cycle, record cycle times once down to dispensing temperature. (Approximately 15-20 minutes) Length of on time and off time	____	____
8. Completely review all portions of freezer start-up.		☐
9. Explain overrun, how to check, calculate and change.		☐
10. Explain and have operator/owner sign warranty card.		☐

Installation Adjustments

		A Left Side	B Right Side
1.	Check refrigerant charge - sight glass. *First check*	☐	☐
	Second check	☐	☐
2.	Check, set and record head pressure. *First check*	_____psig	_____psig
	Second check	_____psig	_____psig
3.	Check, set and record cylinder expansion valve pressure. *First check*	_____psig	_____psig
	Second check	_____psig	_____psig
	Note: Cabinet or hopper refrigeration must be turned off while setting.		
4.	Check and record cabinet or hopper suction pressure. *First check*	_____psig	
	Second check	_____psig	
5.	Check and record. *Voltage*	_____	
	Amperage	_____	
6.	What product is being used.		
	A_____	B_____	
7.	Set cylinder thermostat to maintain desired temperature. Record settings. *First check*	___/___	___/___
	Second check	___/___	___/___
8.	Check and record actual product temperature. *First check*	_____°F	_____°F
	Second check	_____°F	_____°F
9.	Check and record air meter size. *First check*	_____	_____
	Second check	_____	_____
9.	Check and record overrun. *First check*	_____%	_____%
	after a full cylinder has been drawn off *Second check*	_____%	_____%
10.	Re-install all panels and panel screws:	☐	

NOTE: Wait approximately two (2) hours and recheck and record all installation adjustments again. Verify freezer is properly set. This check should be recorded in the second check column.

Remarks: _____

_____

Installation Checked and Inspected By:

Name: _____ Date: _____

Check one: ☐ Distributor ☐ Authorized Service Agency

Operator/Owner Training completed By:

Name: _____ Date: _____

Check one: ☐ Distributor ☐ Authorized Service Agency

I hereby certify this equipment has been inspected and is in satisfactory operating condition. It has been demonstrated for proper startup and operating procedures. The potential dangers which could occur if the freezer is not operated properly have been explained to me and I have read and understand the warranty attached to the Warranty registration card.

Signature required.

Purchaser: _____ Date: _____

Operator: _____ Date: _____

IMPORTANT: Distributor and owner or chain manager retain copy for reference.

IMPORTANT: MAIL WARRANTY REGISTRATION CARD TO VALIDATE AND START WARRANTY PERIOD.