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TECHNICAL MANUAL

DGSC APPROVAL DATE: 16MAR1994

INSTALLATION, OPERATION, MAINTENANCE INSTRUCTIONS

SHIPBOARD REFRIGERATOR/FREEZER

TYPE I, STYLE 1, SIZE 40, CLASS B, MODEL I

MODEL R17F13-2M-SN-MLR

NSN: 4110-01-384-5258

CONTRACT: SP0441-94-M-K643

COSPOLICH REFRIGERATOR CO.

949 INDUSTRY RD

KENNER, LA. 70062

FSCM 66682



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<u>PAGE NO.</u>	<u># CHANGE NO.</u>
TITLE	0
TITLE (INSIDE)	0
A	0
B	0
C	0
D	0
E	0
i THRU iv	0
1-1 THRU 1-4	0
2-1 THRU 2-3	0
3-1 THRU 3-2	0
4-1 THRU 4-5	0
5-1 THRU 5-2	0
6-1 THRU 6-16	0
7-1 THRU 7-2	0
8-1	0
9-1 THRU 9-5	0

ZERO IN THIS COLUMN INDICATES AN ORIGINAL PAGE.

A

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PRESIDENT
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SAFETY SUMMARY

THE FOLLOWING ARE GENERAL SAFETY PRECAUTIONS THAT ARE NOT RELATED TO ANY SPECIFIC PROCEDURES AND THEREFORE DO NOT APPEAR ELSEWHERE IN THIS PUBLICATION. THESE ARE RECOMMENDED PRECAUTIONS THAT PERSONNEL MUST UNDERSTAND AND APPLY DURING MANY PHASES OF OPERATION AND MAINTENANCE.

KEEP AWAY FROM LIVE CIRCUITS

OPERATING PERSONNEL MUST AT ALL TIMES OBSERVE ALL SAFETY REGULATIONS. DO NOT REPLACE COMPONENTS OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH THE HIGH VOLTAGE SUPPLY TURNED ON. UNDER CERTAIN CONDITIONS, DANGEROUS POTENTIALS MAY EXIST WHEN THE POWER CONTROL IS IN THE OFF POSITION, DUE TO CHARGE RETAINED IN CAPACITORS. TO AVOID CASUALTIES, ALWAYS REMOVE POWER AND DISCHARGE AND GROUND A CIRCUIT BEFORE TOUCHING IT.

DO NOT SERVICE OR ADJUST ALONE

UNDER NO CIRCUMSTANCE SHOULD ANY PERSON REACH INTO OR ENTER THE ENCLOSURE FOR THE PURPOSE OF SERVICING THE EQUIPMENT EXCEPT IN THE PRESENCE OF SOMEONE WHO IS CAPABLE OF RENDERING AID.

RESUSCITATION

PERSONNEL WORKING WITH OR NEAR HIGH VOLTAGE SHOULD BE FAMILIAR WITH MODERN METHODS OF RESUSCITATION.

THE FOLLOWING WARNING AND CAUTION APPEARS IN THE TEXT IN THIS VOLUME, AND IS REPEATED HERE FOR EMPHASIS.

WARNING

DUAL POWER SUPPLY WHICH REQUIRES BOTH SOURCES
OF VOLTAGE MUST BE DE-ENERGIZED PRIOR TO
WORKING ON EQUIPMENT

CAUTION

IF THE MOTOR DRIVE RUNS AT MAXIMUM SPEED WHEN
THE SPEED CONTROL IS SET TO THE LOW END
IMMEDIATELY REMOVE THE POWER FROM THE UNIT
AND HAVE AN ELECTRICIAN CHECK THE WIRING

TABLE OF CONTENTS

<u>CHAPTER - TITLE</u>	<u>PAGE</u>
LIST OF ILLUSTRATIONS	
LIST OF TABLES	
1. GENERAL INFORMATION	
1.1 Introduction	1-1
1.2 Scope	1-1
1.3 Equipment Description	1-1
1.4 Equipment Supplied	1-1
2. OPERATION	
2.1 Introduction	2-1
2.2 Controls and Indicators	2-1
2.3 Start-Up Procedures	2-2
2.4 Shut-Down Procedures	2-2
2.5 Preparation for Extended Period of Inactivity	2-3
3. FUNCTIONAL DESCRIPTION	
3.1 System Description	3-1
3.2 System Operation	3-1,2
4. SCHEDULED MAINTENANCE	
4.1 Introduction	4-1
4.2 Preventive Maintenance Action Index	4-1
4.3 Preparation for Maintenance	4-1
4.4 Maintenance Procedures	4-1
4.4.1 Weekly Maintenance Requirements	4-1
4.4.2 Monthly Maintenance Requirements	4-2,3
4.4.3 Annual Maintenance Requirements	4-3
4.4.4 Maintenance Requirement to be Performed at Ships Overhaul	4-4
5. TROUBLESHOOTING	
	5-1,2

TABLE OF CONTENTS

<u>CHAPTER - TITLE</u>	<u>PAGE</u>
6. CORRECTIVE MAINTENANCE	
6.1 Introduction	6-1
6.2 Repair Procedures	6-1
Replacement of:	
6.2.1 Motor compressor	6-1-5
6.2.2 Low Pressure Control	6-7
6.2.3 Expansion Valve	6-7
6.2.4 Filter Dryer	6-10
6.2.5 Condenser Fan Motor	6-10
6.2.6 Condenser Fan	6-10
6.2.7 Anti-Condensate Heater	6-11
6.2.8 Door Handle	6-11
6.2.9 Door Gasket	6-11
6.2.10 Door Hinge	6-11
6.2.11 Power Switch	6-12
6.2.12 Drain Line (forced air evaporator)	6-12
6.2.13 Shelf Standards	6-12
6.2.14 Lamp Socket (refrigerators only)	6-13
6.2.15 Lamp Shield (refrigerators only)	6-13
6.2.16 Light Switch (refrigerators only)	6-13
Other Maintenance:	
6.2.17 Charging Refrigeration System	6-14
6.2.18 Recalibrating Thermometer	6-14
7. PARTS LIST	
7.1 Introduction	7-1
7.2 Source Codes	7-1
8. INSTALLATION	
8.1 Unpacking	8-1
8.2 Installation	8-1
9. ELECTRICAL AND MECHANICAL	
9.1 Wiring Schematic (refrigerator)	9-1
9.2 Wiring Schematic (freezer)	9-2
9.3 Electrical Assembly Drawing (refrigerator)	9-3
9.4 Electrical Assembly Drawing (freezer)	9-4
9.5 Electrical Terminology	9-5
9.6 Mechanical Piping	9-6
10. WARRANTY	10-1

LIST OF ILLUSTRATIONS

<u>FIGURE</u>	<u>TITLE</u>	<u>PAGE</u>
1.1	Refrigerator/Freezer (assembly drawing)	1-3
6.1	Compressor	6-2
6.2	Low Pressure Control	6-6
6.3	Expansion Valve	6-8
6.4	Condensing Unit Detail	6-9
6.5	Condensing Unit (freezer)	6-15
6.6	Condensing Unit (refrigerator)	6-16
6.7	Evaporator Coil Assembly	6-17
6.8	Evaporator Coil Assembly Schedule	6-18
9.1	Electrical Schematic (refrigerator)	9-1
9.2	Electrical Schematic (freezer)	9-2
9.3	Electrical Assembly Drawing (refrigerator)	9-3
9.4	Electrical Assembly Drawing (freezer)	9-4
9.5	Piping Drawing	9-6

LIST OF TABLES

<u>TABLE</u>	<u>TITLE</u>	<u>PAGE</u>
1.1	Leading Particulars	1-2
2.1	Controls and Indicators	2-1
2.2	Start-Up Procedures	2-2
2.3	Shut-Down Procedures	2-3
2.4	Shut-Down Procedures for Extended Period	2-3
4.1	Preventive Maintenance	4-5
5.1	Mechanical and Electrical Troubleshooting Guide	5-1,2
5.2	Operators Troubleshooting Guide	5-2
7.1	Vendor Source Codes	7-1
7.2	Parts List - Refrigeration	7-2
7.3	Parts List - Cabinet	7-3
7.4	Parts List - Special Tools	7-3
7.5	Parts List	7-4
9.6	Operating Pressures Readings	9-7

CHAPTER 1

GENERAL INFORMATION

1.1 INTRODUCTION

This technical manual provides information on the installation, operation, maintenance, and inspection of this model refrigerator/freezer manufactured by Cospolich Refrigerator Co. Inc., Kenner, La. A complete parts breakdown is provided.

1.2 SCOPE OF THE MANUAL

This technical manual provides sufficient information for maintenance of the equipment.

1.3 EQUIPMENT DESCRIPTION

The refrigerator/freezer consists of the following parts:

- a. "Storage Compartment"-(chilled)-The insulated food storage compartment is clear storage area. Included in this area are the adjustable shelves, an interior light, and cooling coil.
- b. "Storage Compartment"-(frozen)-The insulated food storage compartment is clear storage area. Included in this area is adjustable shelves.
- c. "Doors"-Access to the storage compartment is through hinge mounted insulated door(s). The doors are fully "gasketed" to provide a tight seal.
- d. "Condensing Unit Compartment"-This area is located below the storage compartment and contains the condensing unit(s) along with the necessary controls.
- e. "Evaporator Coil"-The evaporator coil is located in the storage compartment and is responsible for distributing the cold air associated with the refrigeration system.
- f. "Cabinet"-The cabinet is the enclosure in which all of the above items are housed.

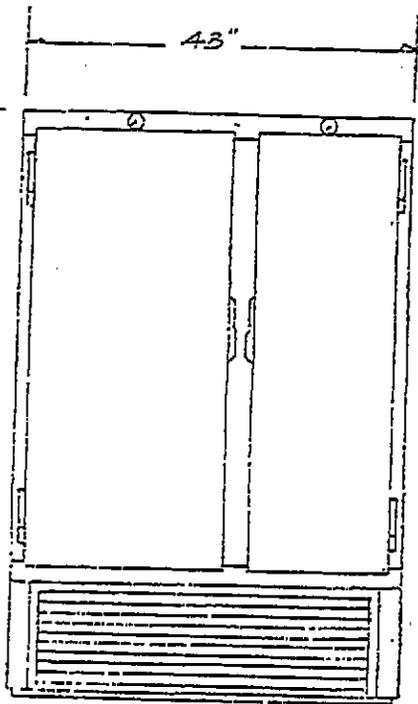
1.4 EQUIPMENT SUPPLIED

The refrigerator/freezer is shipped from the factory fully assembled except for the adjustable shelving which will require positioning on the pilaster standards as needed. The complete assembly is palletized and crated to minimize the possibility of damage in shipping and storage.

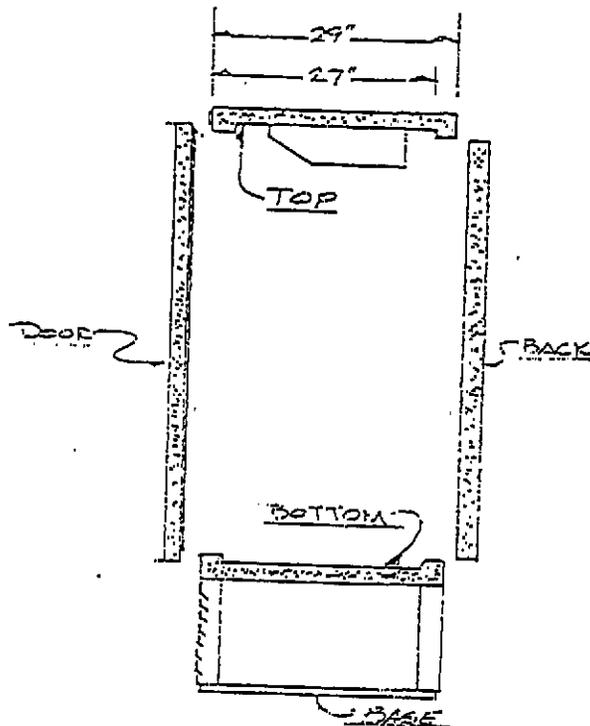
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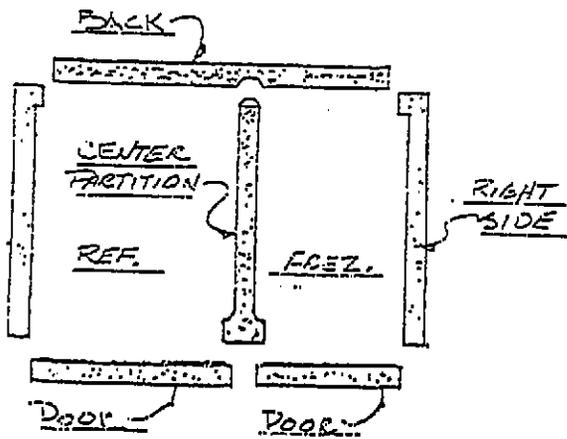
1-4



ELEVATION



EXPLODED SIDE VIEW



EXPLODED TOP VIEW

SPECIFICATIONS

MODULAR REFRIGERATOR FREEZER

Model R17F13-2M-SN-MLR

EXTERIOR DIMENSIONS:

Height 72"
Width 48"
Depth 29"

SURFACE:

20 Gauge CRES

REFRIGERATOR

FREEZER

CUBIC FOOTAGE: 17.4 Cubic Feet 12.7 Cubic Feet
INTERIOR SURFACE: 22 Gauge CRES 22 Gauge CRES

INTERIOR DIMENSIONS:

Height 51" 51"
Width 22" 18"
Depth 24" 24"

DOORS:

1 1

LATCHES:

Positive and Lockable

SHELVES:

3 3

THERMOMETER:

2" Dial 2" Dial

EVAPORATOR COIL:

1000 BTU Forced Air 900 BTU Forced Air

CONDENSING UNIT:

1/4" HP Hermetic 1/3HP Hermetic

ELECTRICAL:

115 Volt 13.5 AMPS 1 Phase

INSULATION:

Polyurethane Foamed-in-Place

ELECTRICAL CONNECTIONS:

Polarized Pin and Socket

REFRIGERATION CONNECTIONS:

Quick Connect, Self Sealing

PANEL FASTENERS:

Positive Action Cam Lock

FIG 1.1

ITEM REFRIGERATOR / FREEZER (MODULAR)		
PROJECT _____ DWG. _____		
DATE 3-30-59	SCALE N.T.S.	OWN. BY NLD
COSPOLICH REFRIGERATOR CO. INC. KENNER, LOUISIANA		

CHAPTER 2

OPERATION

2.1 INTRODUCTION

This model refrigerator/freezer is a heavy duty piece of equipment designed for continuous use in a shipboard environment. It is designed for continuous service and incorporates automatic controls to regulate the cycling of the refrigeration system.

2.2 CONTROLS AND INDICATORS

INDX NOS.	NAME	TYPE	FUNCTION
1	Low Pressure Switch	Contact Points	Cycles the refrigerator system (automatic)
2	Suction Valve	Manual Plunger Valve	Isolate suction at the compressor
3	Discharge Valve	Manual Plunger Valve	Isolate discharge line at receiver
4	Expansion Valve	Manual Stem	Regulates the flow of liquid refrigerant to the evaporator coil
5	Thermostat (ADS models)	Contact Points	Cycles the refrigeration (automatic)
6	Power Control Switch (On/Off)	Contact Points	Terminates all of the electrical into and past the supply cord
7	Defrost Timer (ADS Models)	Contact Points	Automatically controls the cycling of the evaporator fans, defrost heaters, and cycles the compressor off on defrost
8	Light Switch (Refrigerator Only)	Contact Points	Activates the interior lighting with the opening of the cabinet door

2.3 START UP PROCEDURE

The refrigeration system is completely factory assembled, precharged, and ready for operation. To energize the system it is only necessary to locate the power supply cord and connect it to a proper electrical supply source. Once the supply cord has been connected to a power source the unit can be activated by flipping the power control switch to the ON position.

TABLE 2.2 START UP PROCEDURE

Operation	Results
1. Activate system by inserting electrical service cord into electrical supply source and flip power control switch	Compressor should immediately come on line along with the condenser fan and the evaporator fan.
2. Locate liquid refrigerant indication glass mounted on the receiver	Once the system has been operating through 2 cycles, the glass should appear clear and full of liquid refrigerant.
3. Wait 15 minutes	The temperature in the storage area should begin to approach the "green zone" indicating adequate operation.
4. Wait 3 hours	Once the operating temperature has been reached stocking of the containment area can begin.

2.4 SHUT DOWN PROCEDURE

- a. To shut down disconnect the electrical supply cord and open the refrigerator and freezer door(s) allowing the cabinet interior temperature to equalize with the room temperature.
- b. A mild detergent diluted in warm water should be used to wash down the interior and exterior surfaces of the cabinet.

TABLE 2.3 SHUT-DOWN PROCEDURE

Operation	Results
1. De-energize the system by flipping the power control switch OFF and disconnecting the electrical supply cord.	Once the system is de-energized the condenser fan, and the evaporator fan will cease operation.

WARNING:

PRIOR TO ANY CLEANING OF THE SYSTEM INVOLVING PLACING OF HANDS IN AREAS WITH MOVING PARTS, THE SYSTEM SHOULD BE DEACTIVATED BY DISCONNECTING THE POWER SUPPLY CORD.

2.5 PREPARATION FOR AN EXTENDED PERIOD OF INACTIVITY

This model refrigerator/freezer is designed for continued use at automatically cycled intervals. In case of an extended shut down both the mechanical refrigeration system as well as the food storage compartment must be serviced.

TABLE 2.4 SHUT-DOWN PROCEDURES FOR EXTENDED PERIOD

Operation	Results
1. Fully close discharge valve at the receiver	Compressor will pump liquid refrigerant from the system into the receiver tank
2. Fully close suction valve at the compressor	This will isolate the refrigerant between the two valves
3. Disconnect Power Supply	De-energizes system
4. Clean and wipe dry the food storage compartment	This will reduce the odor buildup during shut down

CHAPTER 3

FUNCTIONAL DESCRIPTION

3.1 SYSTEM DESCRIPTION

This model refrigerator/freezer is a self-contained, automatically controlled, continuous duty perishable food storage system. It is designed with the intent and purpose of storing chilled and frozen food items.

The operating temperature is automatically monitored by a thermostat which is factory set to maintain a predetermined adequate condition.

The equipment is installed in three basic compartment assemblies. They are:

- a. Condensing Unit Compartment - This area is located below the storage compartment and contains the condensing unit along with the necessary controls.
- b. Storage Compartment-(chilled)-This insulated food storage area is clear storage area. Included in this compartment are the adjustable shelving.
- c. Storage Compartment-(frozen)-The insulated food storage compartment is clear storage area. Included in this area is adjustable shelves.

3.2 SYSTEM OPERATION

The design of the refrigerated cabinet focuses primarily on the safe storage of food products requiring refrigeration. In its engineering, considerable attention was placed on its functional as well as its serviceable capabilities.

The refrigeration system is a closed loop system. Barring a leak in the system, the adding of additional refrigerant is not required, however, a periodic check of its level is called for to insure that the system operates at the optimum level at which it was designed.

The condensing unit(s) is/are located just below the refrigerated storage area. Also located in this compartment is the electrical control panel which contains the power switch, temperature control, terminal box, and a defrost timer (freezer models which are automatic defrosting (ADS). On refrigerators and freezer models which feature air evaporators, a heated condensation evaporator is provided, it also is located in this compartment.

Special care in the initial loading of the storage compartment should be taken. It is suggested that the loading be scheduled in three equal portions allowing three hours between each loading.

The frozen food compartment is designed for the storage of previously frozen food and the freezing of small amounts of chilled items. It is a general rule that adequate spacing be allowed between storage items to allow proper air circulation.

The chilled food compartment is designed for the storage of perishable food items requiring a temperature range of 37 DEGREES F to 40 DEGREES F.

CHAPTER 4

SCHEDULED MAINTENANCE

4.1 INTRODUCTION

To insure the longest and trouble free operation, a thorough periodic maintenance schedule is required. The maintenance system should be aimed at maximizing the efficient utilization of maintenance personnel, minimizing down time, and providing the orderly acquisition of spare parts support.

The Cospolich Navy refrigeration cabinet will generally be operated aboard active Naval vessels, where scheduled maintenance is performed in accordance Maintenance Index Plans. This chapter of the manual is intended as an alternate to any standard Naval maintenance program which may exist. The preventive maintenance schedule is based upon similar maintenance requirements for commercial refrigeration equipment.

4.2 PREVENTIVE MAINTENANCE ACTION INDEX

In the event that there is not a ships maintenance index plan, we have formulated our schedule for periodic maintenance shown in Table 4.1.

4.3 PREPARATION FOR MAINTENANCE

Since many of the area affected in the maintenance schedule are electrically supplied it may be necessary to de-energize the system when making these inspections.

4.4 MAINTENANCE

4.4.1 WEEKLY INSPECTION

- a. The unit should first be de-energized by switching to the "OFF" position; the toggle switch is located on the control panel in the condensing unit compartment.

NOTE: It is necessary to first remove the front air grill by lifting it straight up then moving the bottom out and down.

- b. Using a vacuum or small hand broom brush the condenser coil in a vertical motion to remove any dust or debris which may have accumulated.

4.4.2 MONTHLY INSPECTION

a. Check the drain line at both the inlet and outlet ends to make certain that there are no obstructions. It is not recommended to use any chemicals in clearing a clogged drain. The preferred method of unstopping an obstructed drain is to use 60 lbs. of compressed air. (Forced air evaporator models only).

1) Simply remove the drain line at the evaporator coil and attach an air line to it.

b. With the refrigerator or the freezer in a cooling cycle, use a flashlight and locate the liquid refrigerant sight glass. If the compressor has been running for 3 minutes there should not be any bubbles visible.

1) If there should be a presence of bubbles it will be necessary to determine if there is a refrigerant leak and to locate and repair it.

2) Using a halide or electronic leak detector, check all fittings and connections for a leak.

NOTE: The system should be de-energized when it is being checked for leaks.

3) Should a leak be found on a flared fitting, many times it can be repaired by simply tightening the brass flare nut a quarter of a turn. If this does not resolve the problem it may be necessary to reflare the tubing.

4) If a leak is found on a brazed joint, it will be necessary to pump down the systems refrigerant charge to remedy the problem.

5) To pump the refrigerant into the receiver you must first connect service gauges to the system at the suction valve (on compressor) and liquid valve (on the receiver). Purge the gauges prior to opening the systems valves to avoid contamination. Run the receiver (liquid or high pressure) valve all of the way in to stop refrigerant from exiting the receiver. Start the unit up and allow it to run until the suction or low pressure gauge reads 30 inches in a vacuum. When it does de-energize the system.

NOTE: It will be necessary to jump out the pressure control switch.

- 6) At this point the necessary repairs can be made to mend the leaks.
- c. Using a mild non-abrasive detergent and soft cloth wipe the interior liner beginning with the top and working down. Also wipe the gasket as well as where it sits on the cabinet exterior.
- d. With the front air grill removed. Unbolt the condensing unit and slide it out. With the unit off, check the fan motor and make certain it is not loose. Inspect the fan for cracks and make sure it is tight on the motor.
 - 1) To inspect the evaporator motor, first turn the unit off. Then remove the drain line from the evaporator pan, loosen the four screws that hold this shroud. Lower the shroud and disconnect the polarized electrical connection. With the shroud out of the cabinet, proceed to inspect the motor mounting bolts as well as the fan for cracks or excessive play (on forced air systems).
- e. Using a mild detergent and water, wipe the vinyl gasket.
 - . Make certain to also clean under the gasket to remove any mildew or residue.
- f. Using a mild detergent (non-abrasive) and warm water, wipe the cabinet exterior. When cleaning, always follow the grain of the stainless steel so as not to scratch or mar the finish.
- g. Manual freezer defrosting is required to insure that maximum unit efficiency is realized. To accomplish this it is necessary that the frost build up on the static evaporator coil be kept to a minimum.
 - 1) To defrost the freezer you must first make arrangements to have the product stored elsewhere. With the unit turned off, open the door and remove the shelving. Using a flat non metallic scraper, scrape the ice from the side walls. Once all ice is removed use a cloth and dry the interior. Re-install the shelving and turn the unit on. Allow it to run for 1/2 hour before restocking.

4.4.3 ANNUAL MAINTENANCE

- a. Slide condensing unit from the condensing unit compartment and check all of the refrigerant lines for leaks or fatigue. Make certain that no exposed copper tubing is in contact with any other metal surface. If the case exist, install an insulating material between the two metal components.

- b. With the condensing unit out and the breaker at the main electrical panel OFF, inspect the systems wiring. Look for a tight fit of all connections and make certain that the wire restraining devices are tight. Inspect all wires and cords, paying particular attention to nicks or aging cracks in the insulation.
- c. Visually inspect the outer panels and components of the cabinet. Check screws and bolts to make certain they are tight. Check the bolts which secure the base frame to the deck to make certain they are tight.

4.4.4 SHIPS FREQUENCY

- a. Replace the door gaskets. To accomplish this it is first necessary to remove all of the products from the compartment. Take the door off of the cabinet and lay it on a flat surface. Lift the gasket flange and remove the fasteners that secure the gasket. The new gasket is replaced by reversing the process.
- b. Inspect all motors and shafts for both noise and wear. If they should show of age replace them.
- c. With the main power off, remove the condensing unit from its compartment and inspect all wiring. Also remove the cover from the controls and check them to make certain they are operational and do not show signs of wear.
- d. Inspect the operation of the door latch assembly. Look into the latch to make certain that the moving parts do not show any signs of wear. Check that the screws are tight on the latch and strike. To check the hinges, open the door at a 90 degree angle to the cabinet. With a little pressure lift up the outer edge of the door. If there is an upward movement of 1/2 inch, replace the hinges.
- e. To recalibrate the thermometer remove it from the cabinet. Using a small flat screw driver remove the lens. Prepare an ice water bath and submerge the bulb continually moving it. The indicator dial should read 32 degrees F. If it does not, the thermometer can be calibrated by placing your index finger on the opposite side of the needle that it needs to move. Using a flat screw driver turn the screw at the center of the dial 1/4 turn in the direction you want to move the dial. Repeat the procedure until you reach the desired temperature.

TABLE 4.1 PREVENTIVE MAINTENANCE ACTION INDEX

ITEM	FREQUENCY	DESCRIPTION
1.	WEEKLY	a. Inspect condenser coil to make certain that air flow is not hampered and that it is clear of dust and debris.
2.	MONTHLY	a. Inspect and clear drain line. b. Check the liquid refrigerant sight glass to make certain that the system is fully charged. c. Wipe down the interior liner with a mild soap and warm water solution. Be certain to dry thoroughly. d. Check both the condenser fan motor and the evaporator fan motor to make certain that they are operational and that the fans are tight and secure. (evaporator motor on ADS models and forced air evaporator units only) e. Wipe door gaskets and breaker strips with a damp cloth. f. Clean exterior with mild soap and warm water and dry thoroughly. g. Manual freezer defrosting.
3.	ANNUALLY	a. Slide condensing unit from compartment and check all joints and fittings for any signs of leaks or fatigue. b. Inspect electrical connection to make certain that there is a good contact and that wires are neither weakened or frayed. c. Check the integrity of the cabinet.
4.	SHIPS OVERHAUL	a. Replace door gaskets. b. Inspect motor shafts for noise or wear. c. Inspect electrical controls and wiring d. Inspect door latch and hinges. e. Recalibrate thermometer.

CHAPTER 5

TROUBLESHOOTING

This chapter will assist in a systematic check of components in determining any cause of equipment failure.

It will be necessary that the individual involved in the troubleshooting operation be familiar with the function of the equipment as described in Chapter 3.

The following table lists the most common symptoms which may be experienced and the recommended corrective action. The tables are separated into electrical maintenance, mechanical maintenance, and operator's actions.

TABLE 5.1 MECHANICAL AND ELECTRICAL TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE FAILURE	REMEDY
Unit does not operate	1. control failure	adjust control or replace
	2. incorrect voltage	correct
	3. failed compressor	replace
Unit runs continuously	1. low on refrigerant	leak check system and recharge
	2. control failure	adjust control or replace
	3. bad connection at TXV	check and secure sensor bulb to suction line
	4. restricted air flow or dirty condenser	rectify air flow problem and clean condenser
	5. bad condenser fan motor	check and replace if necessary
	6. expansion valve stuck open	replace
	7. compressor failure	replace
	8. ineffective door seal	adjust door strike
	9. circulation in storage restricted	redistribute food for even air flow

**TABLE 5.1 MECHANICAL AND ELECTRICAL TROUBLESHOOTING GUIDE
(CONTINUED)**

SYMPTOM	POSSIBLE FAILURE	REMEDY
Low head pressure	1. defective compressor	replace
	2. low refrigerant	leak check system and recharge
	3. ambient temperature too low	raise room temp.
High head pressure	1. blocked or dirty condenser	clean and remove any obstructions
	2. ambient temperature too high	improve room temperature
	3. systems contains air	evacuate, change the filter dryer, and recharge
	4. refrigerant overcharge	reduce refrigerant in the system
Short cycling	maladjusted control	adjust control

TABLE 5.2 OPERATORS TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE FAILURE	REMEDY
Unit does not cool	1. blown fuse	replace fuse
	2. bad connection at supply cord	check supply cord at outlet
	3. ill fitting gasket	tighten strike on door latch

CHAPTER 6

CORRECTIVE MAINTENANCE

6.1 INTRODUCTION

This chapter focuses on the instruction needed in the removal and replacement of certain components. We will also address the repair of components not listed under the schedule maintenance index covered in Chapter 4.

Certain components are considered to be sufficiently acceptable as to be repairable by standard procedures. This repair data is limited to listing of part numbers of replaceable parts in Chapter 7.

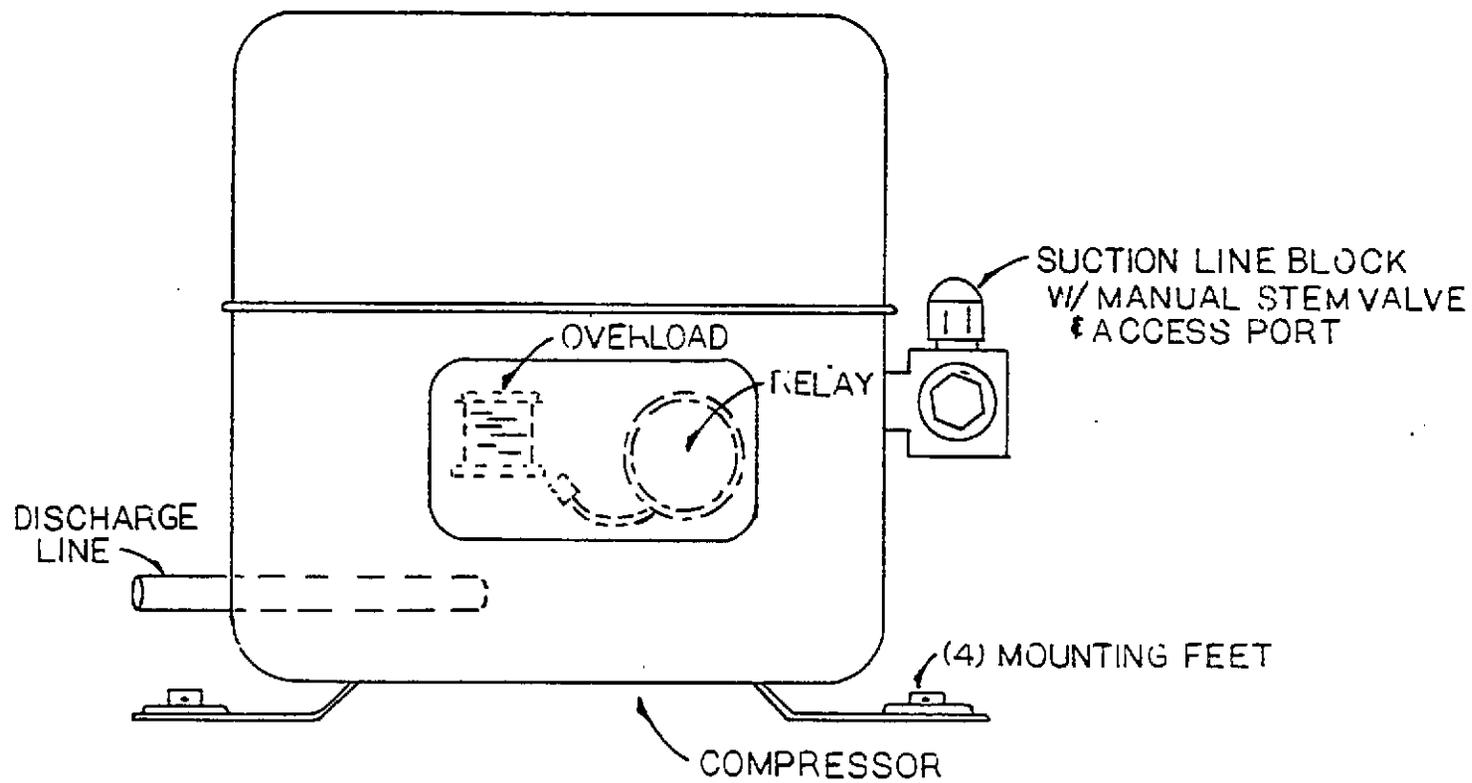
6.2 REPAIR PROCEDURES

***** WARNING *****

PRIOR TO PERFORMING ANY WORK ON THE REFRIGERATION SYSTEM IT IS REQUIRED THAT THE UNIT BE DE-ENERGIZED

6.2.1 REPLACEMENT OF MOTOR COMPRESSOR

- a. Prior to beginning the change out of the compressor, it is first necessary to disconnect electrical power to the unit. This should be done by turning off the circuit in the main supply panel. It should be noted on the panel that the refrigerator is being serviced and the breaker must remain off.
- b. To access the condensing unit, you must first remove the ventilation grill on the lower front of the cabinet. This is accomplished by lifting the grill vertically one inch, pulling out the bottom, and lowering the grill from the retainer angles.
- c. With the grill removed, use a 3/8" wrench or socket and ratchet to unscrew the mounting bolt which secures the condensing unit to the cabinet base.
- d. Once the mounting bolt is removed, carefully slide the whole condensing unit forward lifting it over the angle-mounting clip at the front of the base. The unit can be pulled completely out of the unit compartment and placed on the deck.



ITEM: COMPRESSOR		
PROJECT: U.S. NAVY	DWG#	
DATE: 3-14-90	SCALE: N.T.S.	DWN. BY: ND
COSPOLICH REFRIGERATOR CO. INC. KENNER, LA. 70062		

FIG. 6.1

- e. Locate the electrical terminal box on the side of the compressor and remove the front cover. Disconnect the wires from the compressor. Remove the screws which attach the terminal box to the compressor. At this point the compressor will be electrically detached.
- f. Using wrenches, remove the suction valve stem cover caps located on each side of the compressor. Also remove the cap nut on the suction side. With both suction caps nuts off, screw the valve stem in one revolution. This will allow the refrigerant to escape.
- g. Disconnect the hi-side line at the compressor. This is done by heating the brazed connection using an acetylene and oxygen torch set.

WARNING: IT IS UNLAWFUL TO VENT ANY REFRIGERANT INTO THE ATMOSPHERE.

- h. To remove the low pressure control capillary tube and service fitting, loosen the 1/4" brass flare nut located on the suction valve.
- i. The final step in removing the compressor will be disconnecting it from its mounting. To accomplish this, remove the wire clips located on each of the four feet. This will free the compressor.
- j. To install the new compressor, place it in position on the base and reinstall the four wire clips.
- k. Reattach the suction and discharge valve blocks to the appropriate sides of the compressor.

***** WARNING *** OVERCHARGING A REFRIGERATION SYSTEM CAN BE DANGEROUS**

If the system refrigerant overcharge is sufficient to immerse the major parts of a hermetic compressor in liquid refrigerant, a situation has been created which when followed by unusual but possible circumstances, can lead to compressor housing seam separation or rupture.

The sequence of circumstances which can lead to compressor housing seam separation or rupture occur in the following manner:

1. The system overcharge immerses the compressor motor, piston, connecting rods, cylinders, etc., in liquid refrigerant, thereby effectively forming a hydraulic block preventing the compressor from starting. This condition is known as locked rotor.
2. Electrical current continues to flow through the compressor motor windings which become, in effect, electric resistance heaters. The heat produced begins to vaporize the excessive liquid overcharge, causing a rapid increase in system pressure.
3. If the system compressor protective devices fail for any reason prior or during this locked rotor heating cycle, or cycles, liquid refrigerant may be vaporized sufficiently fast enough to raise the pressure within the system to extremes far in excess of the housing or weld seam design limits.
4. In some instances where the amount of refrigerant overcharge is critical in proportion to the system internal volume, the pressure reached can cause a compressor housing seam separation or rupture which can be hazardous.

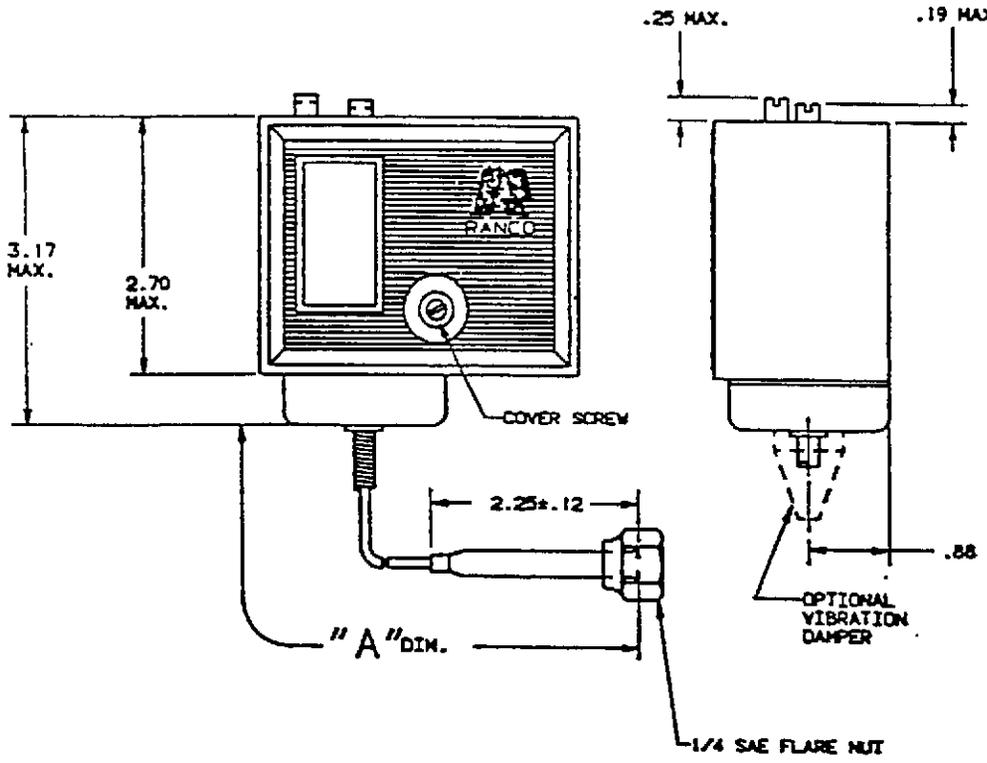
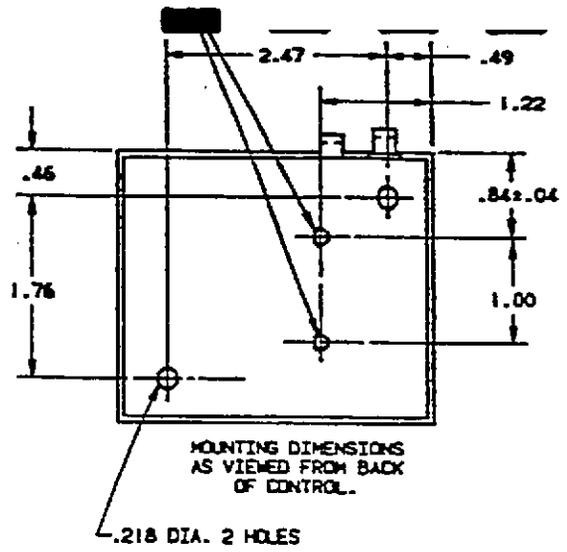
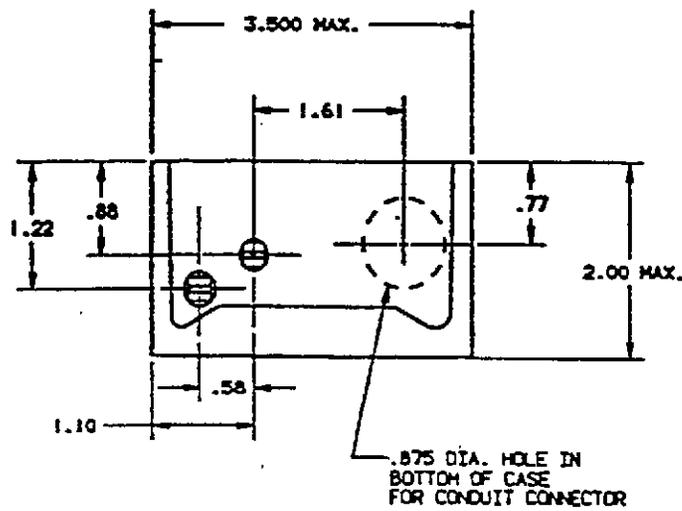
The remedy to eliminate this exceedingly rare but potential possible hazard is to use correct refrigerant charging amounts and techniques.

Cospolich Refrigerator Company urges that all individuals responsible for training, teaching, or advising installation mechanics and service personnel, emphasize proper charging techniques and strict adherence to limiting refrigerant charge amounts to those specifically recommended by the manufacturer of the refrigeration, air conditioning, or heat pump system.

- l. Reattach the low pressure control capillary tube and service fitting to the suction valve.
- m. Reattach the suction line to the compressor.
- n. In reconnecting the hi-pressure line, it will be necessary to first prepare the line end. Using a fine sand paper or emery cloth, clean the residue on the end. Also clean the connection on the compressor. Apply flux to both ends and braze.
- o. Remove the valve stem cap from the suction valve block on the side of the compressor. Run the valve stem all of the way out, and then in, one turn clockwise.

NOTE: It is recommended that whenever the system is open for a prolonged period, the filter dryer be changed (see section 6.2.4 Replacement of Filter Dryer).

- p. Place the refrigeration service manifold gauge hoses on the suction and hi-side valves. Attach a bottle of refrigerant 22 to the charging hose and charge the system with 150 psi of vapor. Using an electronic leak detector, check the new connects for leaks. Should a leak appear, release the charge and repair the leak. Repeat the leak check process again.
- q. If the system checks out with no leaks, release the charge by disconnecting the charging hose from the refrigerant cylinder and opening the two valves on the manifold.
- r. With the system pressure at zero, connect the vacuum pump and evacuate the system. The pump should run for 1 hour. The vacuum pump should pull the system down to 30 inches of vacuum.
- s. Reattach the electrical terminal box and secure all wiring.
- t. Place 20 ounces of refrigerant 22 into the system and start it up. Monitor the pressures on both the suction and discharge side of the manifold gauges. Check the temperature as it begins to fall through the sight glass located on the receiver. Once the unit has been running for 5 minutes and bubbles continue in the sight glass, it may be necessary to add additional refrigerant (add refrigerant in small amounts to keep from overcharging).



REVISED RANGE & DIFF SETPOINTS TO SQUARE HEADS. DELETED NOTE 1				
WT	WT	MAX	15 LBS	D
RANGE: 12" VAC TO 50 PSIG				
DIFFERENTIAL: 5 TO 35 PSIG				
AUTOMATIC RESET REFRIGERATOR SETTING:				
CUT IN 68 LBS				
CUT OUT 38				

NOTES:

FREEZER SETTING:
CUT IN 15 LBS
CUT OUT 1

U.L. & C.S.A. LISTED RATINGS MAX. RATED MOTOR AMPS.				
VAC	FLA	LRA	PILOT DUTY	
120	24	144	720	

UL FILE SA512

RANCO CONTROLS DIVISION				
REV. NO.	010	REV. NO.	015	
REV. NO.	000	REV. NO.	000	
OUTLINE DIMENSION DRAWING				
TYPE 010 CONTROL AUTO RESET-LOW PRESSURE				
C	010-001			

FOR D.C. APPLICATIONS ASSEMBLE MAGNET PACKAGE 48265-2 TO THE SWITCH.

FIG. 6.2

6.2.2 REPLACEMENT OF LOW PRESSURE CONTROL

- a. Disconnect refrigerator from electrical service.
- b. Remove control cover and disconnect electrical terminals
- c. Disconnect capillary tube.
- d. Remove mounting fasteners on control base and install new control by reversing the procedure.
NOTE: The cabinet temperature (37 - 40 degrees for the refrigerator and -5 - 0 degrees for the freezer) is regulated by system pressure rather than actual cabinet compartment temperature.
- e. To adjust the control, hook up the service manifold to the suction and discharge valves and crack the service valves on the condensing unit to allow the gauges to read.
- f. Coarse adjust the control by using a standard screw-driver by turning the adjustment screws located on the top of the control. Preset the cut in and cut out at 68 lbs. and 38 lbs. respectively for the refrigerator and 25 lbs. and 10 lbs. respectively for the freezer.
- g. Start the system up. Allow it to run for 5 minutes. Monitor the low side pressure. Fine adjustments will be needed to achieve the required cycling pressures.

NOTE: The control adjustment process can be speeded up by running the suction valve in or out as required to affectively change the pressures.

6.2.3 REPLACEMENT OF EXPANSION VALVE

- a. Shut liquid valve and run compressor until it pumps refrigerant into receiver (low side service gauge will read 0 pounds). Close the suction line valve.
- b. Disconnect the sensor bulb on the suction line.
- c. Disconnect liquid line (1/4") and suction line (3/8"). Remove valve.
- d. Install new valve, reconnect lines and refasten sensor bulb.

NOTE: It is not recommended to adjust the valve super heat as this comes pre-set from the factory.

TYPE F

for Refrigerants 12-22-502 — SAE Flare Connections



The Type-F Valve is a small, externally adjustable valve designed for use on refrigerated fixtures where space is limited.

The use of Sporlan Selective Charges C, Z, and ZP make the Type-F valve ideal for ap-

plication to refrigerated display cases, wall in coolers, reach-in coolers and all other small refrigeration systems both high and low temperature.

for complete details of construction, see page 39.

SPECIFICATIONS								
ELEMENT - NON-REPLACABLE								
REFRIGERANT	TYPE	NOMINAL CAPACITY Tons of Refrigeration	Thermostatic Charges Available	Standard Tubing Length - Inches	CONNECTIONS — Inches SAE Flare		Net Wt. - lbs.	Shipping Weight - lbs.
					① INLET	OUTLET		
12	FF-1/4	1/4	C Z	30	1/4	1/2	1	1 1/2

- ① Has long taper. 1/4" OD tubing can be connected by using 1/2" x 1/4" reducing flare nut.
- ② Conical insert strainer provided with 1/4" inlet. Removable strainer provided with 1/2" inlet.

BULB SIZE — Inches

CHARGE	REFRIGERANT		
	12	22	502
C	0.50 OD x 3.00		
Z			
ZP			

DIMENSIONS — Inches Connections — SAE Flare

Inlet	A	B	C
1/4 Elbow	1.06	1.50	—
3/8 Elbow	1.25	1.38	—
Outlet			
1/4	—	—	1.62
1/2	—	—	1.75

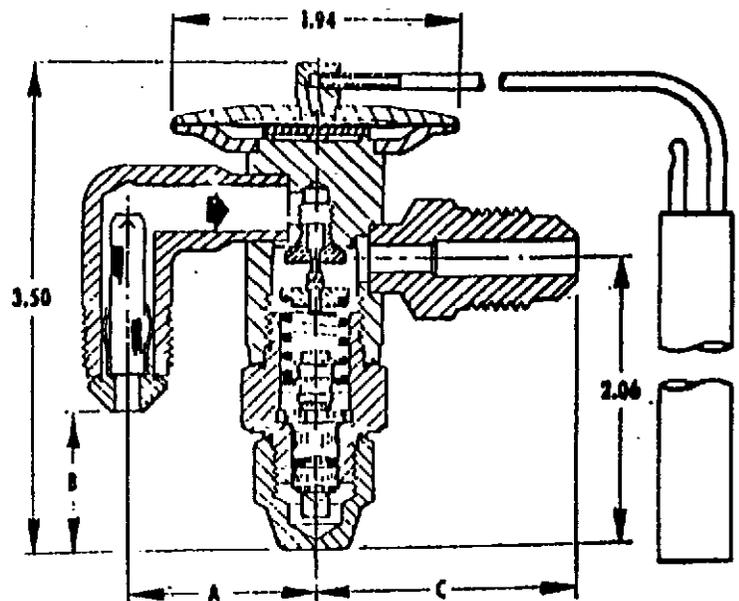
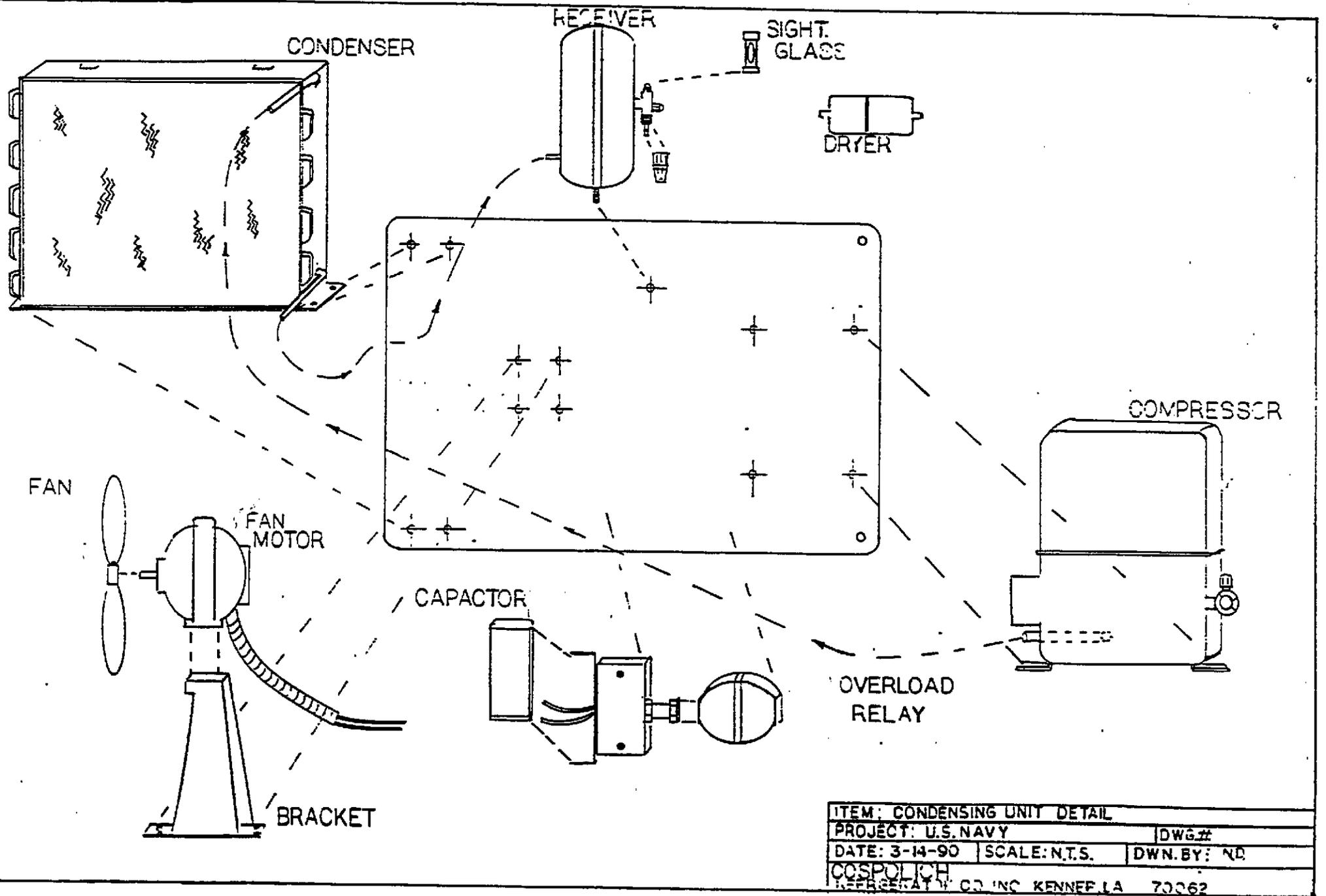


FIG. 6.3



ITEM: CONDENSING UNIT DETAIL		
PROJECT: U.S. NAVY		DWG#
DATE: 3-14-90	SCALE: N.T.S.	DWN. BY: ND
COSPOLICH		
KENNEBICUTI CO. INC KENNEBICUTI 70062		

FIG. 6.4

6.2.4 REPLACEMENT OF FILTER DRYER

- a. Close liquid line valve and run compressor until the low side refrigeration gauge indicates 0 pounds, then close suction valve.
- b. Remove filter dryer from system and replace with new dryer.
- c. Purge system and add refrigerant if needed.

6.2.5 REPLACEMENT OF CONDENSER FAN MOTOR

- a. Disconnect all electrical power to the unit
- b. Remove the condensing unit from the condensing unit compartment.
- c. Remove the protective wire shroud.
- d. Disconnect the fan motor leads from the terminal box on the compressor.
- e. Remove the mounting screws at the motor base.
- f. Using an allen wrench, remove the aluminum fan.
- g. To install the new motor reverse the process.

6.2.6 REPLACEMENT OF CONDENSER FAN

- a. Disconnect all electrical power to the unit
- b. Remove the front grill by lifting vertically pulling the bottom out slightly & dropping down.
- c. Remove the mounting bolts on the condensing unit base & slide the refrigeration assembly out.
- d. Remove the protective shroud from around motor.
- e. Using an allen wrench, loosen the set screw on the blade hub & slide blade from the shaft.
- f. Reverse procedure to reassemble.

6.2.7 REPLACEMENT OF ANTI-CONDENSATE HEATER

NOTE: The anti-condensate heater is located behind the front edge of the vinyl door opening breakers.

- a. Disconnect all electrical power supply to cabinet.
- b. Remove breakers by exerting pressure at the front edge toward the center of the door. Disconnect anti-condensate wiring connection under rail.
- c. Remove anti-condensate heater from recess in rail.
- d. Replace heater in rail and reconnect electrical.

6.2.8 REPLACEMENT OF DOOR HANDLE

NOTE: It may be necessary to remove the handle assembly in order to get the cabinet through a door opening.

- a. Remove the three side mounting screws in latch.
- b. Remove two screws in strike.
- c. Replace in reverse order.

6.2.9 REPLACEMENT OF DOOR GASKET

NOTE: It is suggested that the door be removed from the cabinet and placed face down on a work table.

- a. Remove the fasteners and pull old gasket off retainer.
- b. Clean gasket retainer and immediate area.
- c. Start new gasket into retainer. After gasket is positioned replace fasteners.

NOTE: Avoid cutting the gasket if possible.

6.2.10 REPLACEMENT OF DOOR HINGE

NOTE: This procedure will require two people. One to hold the door while the other person removes the attachments screws.

- a. Using a screw-driver, remove the three screws which attach the butt section of the hinges to the cabinet.
- b. With the door detached from the cabinet remove the screws which attach the second part of the hinge to the door.
- c. To install the replacement hinge, reverse the process.

6.2.11 REPLACEMENT OF POWER SWITCH

- a. First shut off all electrical power going to the refrigerator and tag the switch so that it can't be accidentally turned on.
- b. Remove the front air grill.
- c. Using a flat blade screw-driver, remove the cover plate with switch attached.
- d. Remove the wires connected to the switch.
- e. Unscrew the lock washer and remove the switch.
- f. Reverse the processing in installing the new switch.

6.2.12 REPLACEMENT OF DRAIN LINE (FORCED AIR EVAPORATOR ONLY)

NOTE: To replace the vinyl drain line, it is necessary that there be access to the rear of the cabinet.

- a. First remove the rear tubing cover using a 1/4" nut driver.
- b. From the inside, pull the drain from the evaporator shroud fitting.
- c. From the rear, pull the drain line through the penetration in the cabinet.
- d. At the bottom of the condensing unit compartment cut the drain line retaining strap.
- e. The drain line should now be free.
- f. To install the new line reverse the process.

6.2.13 REPLACEMENT OF SHELF STANDARDS

- a. To replace a shelf standard you must first remove all products from the shelves and then remove the shelves.

- b. With the shelves removed, move the standard vertically 1/2" to allow it to slip out to the retainer stud.

6.2.14 REPLACEMENT OF LAMP SOCKET (REFRIGERATORS ONLY)

- a. Should the interior lamp socket be found to be defective, the replacement of it is necessary.

WARNING: IT IS NECESSARY TO SHUT OFF THE CABINET TO PERFORM THIS REPAIR.

- b. With the power off, remove the lamp shield by unscrewing the two #8 screws (1/4" hex head).
- c. Unscrew the light bulb and remove.
- d. To remove the porcelain fixture will require depressing the two metal retainer clips located on the outer edge of the base of the fixture.
- e. Once the fixture is out, use a screw-driver to remove the terminal wires.
- f. Re-installation can be accomplished by reversing the process.

6.2.15 REPLACEMENT OF LAMP SHIELD (REFRIGERATOR ONLY)

- a. This change can be undertaken by loosening the two #8 screws with a 1/4" driver.
- b. Once loosened, rotate the shield to the large openings on the shield flange.
- c. Re-installation is a reversal of the process.

6.2.16 REPLACEMENT OF LIGHT SWITCH (REFRIGERATOR ONLY)

WARNING: ALL ELECTRICAL POWER TO THE CABINET MUST BE TURNED OFF AND THE BREAKER MARKED TO READ THAT SERVICE IS IN PROGRESS ON THAT CIRCUIT

- a. Using a thin blade screwdriver, apply twisting pressure between the chrome cap on the switch and the refrigerator. With this, the switch will pop out.
- b. Pull the switch away from the cabinet about 2 inches, exposing the wires.

- c. Remove the connectors from the switch.
- d. Fasten the spare connectors to the new switch.
- e. Place the new switch into the opening and apply inward pressure with you thumbs to the chrome flange.
- f. Test the switch to make certain it is operational.

6.2.17 CHARGING REFRIGERATION SYSTEM

- a. Connect service gauges to the suction and discharge service valves and open valves one full turn.
- b. If the system is pressurized slightly, open both manifold gauge valves and purge the service gauge lines.
- c. With manifold gauge valves closed, start up refrigeration system.
- d. Attach a drum of refrigerant 22 to the suction service side of the manifold gauges and add refrigerant until the liquid sight glass is clear of bubbles.

6.2.18 RECALIBRATING THERMOMETER

- a. Prepare an ice bath in a small container.
- b. Remove the plastic lens cover on the thermometer.
- c. Remove the sensor element from its location on the interior of the cabinet.
- d. Place the sensor into the ice bath and stir. The thermometer should read 32 degrees F.
- e. To lower temperature - place left index finger at the left side of the wide end of pointer, but close to bulb. Insert screw driver in pointer slot and turn slowly clockwise. Adjust to proper setting.
- f. To raise temperature - place left index finger at the wide end of pointer, but close to bulb. Insert screw driver in pointer slot and turn slowly counter clockwise. Adjust to proper setting.



TECUMSEH HERMETIC CONDENSING UNITS

MODEL AK9433EB

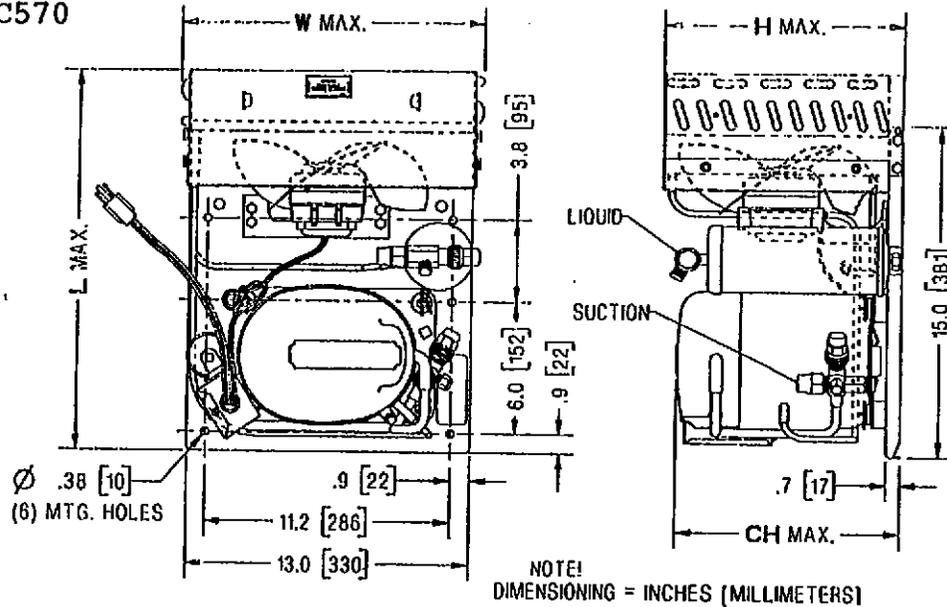
R-22

1/3 HP

AIR COOLED

COSPOLICH # RWC570

FREEZER



Model	Dimensions				*Line Connections		Pumpdown 90°F 90% Full	Air CFM	Oil Chg oz.	Gross Wt. Lbs.
	L	W	H	CH	Suction	Liquid				
AK9433EB	17.4	14.0	10.9	10.2	1/2 F	1/4 F	3.4#	350	17	71

*F=Flare, S=Solder, RF or RS = Rotolock Valve with Flare or Solder Connections

Factory Charge: 20 psig nitrogen - MUST BE EVACUATED

Approved Evap. Range		Ambient								
		90°F			100°F			110°F		
°F	PSIG	BTUH	Watts	Head	BTUH	Watts	Head	BTUH	Watts	Head
-10	16.5	1220	435	190	940	420	215	630	400	245
- 5	20.0	1560	465	195	1250	450	225	930	435	250
0	24.0	1890	495	205	1560	485	230	1240	470	260
5	28.2	2220	530	210	1880	520	240	1560	510	270
10	32.8	2580	570	220	2200	560	250	1880	555	280
15	37.7	2940	505	230	2530	505	260	2210	600	290
20	43.0	3320	550	240	2880	550	270	2560	550	300
25	48.8	3710	590	250	3250	595	280	2900	600	315
30	54.8	4030	630	265	3640	640	295	3280	650	330
35	61.5	4600	675	275	4070	690	305	3690	700	345
40	68.5	5100	720	290	4530	735	320	4120	755	355
45	76.0	5710	765	300	5090	785	335	4620	810	370

Return gas temp. 20°F max superheat above 20°F evap,
40°F max below 20°F evap, 5°F subcooling
FIG 6.5



TECUMSEH HERMETIC CONDENSING UNITS

Page: C2.249
Date: 9-1-92

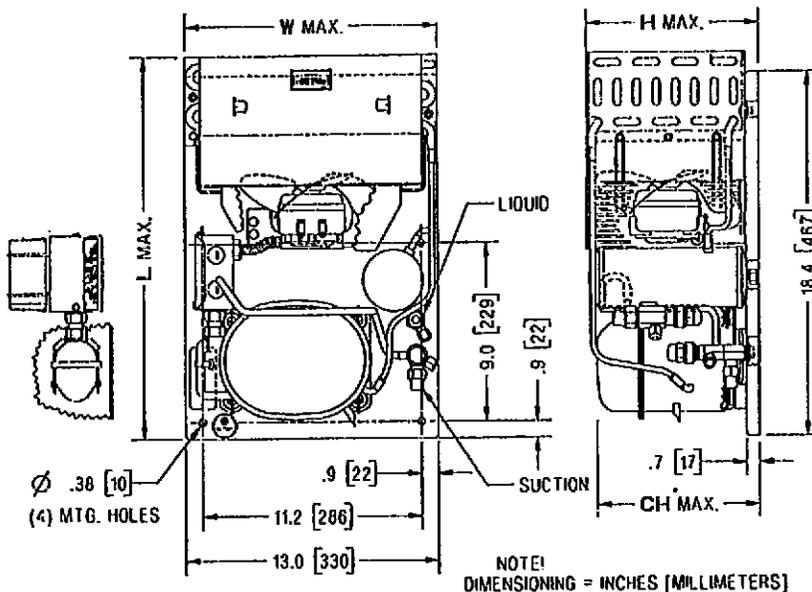
MODEL AE9423EC

R-22

1/4 HP

AIR COOLED

COSPOLICH # RWC490
REFRIGERATOR



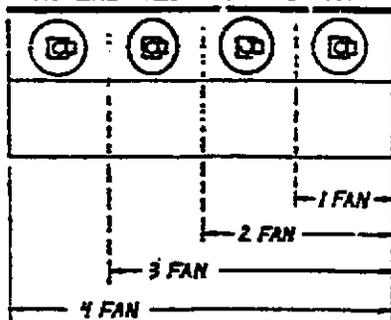
Model	Dimensions				*Line Connections		Pumpdown 90°F 90% Full	Air CFM	Oil Chg oz.	Gross Wt. Lbs.
	L	W	H	CH	Suction	Liquid				
AE9423EC	19.4	13.0	9.0	8.5	3/8 F	1/4 F	3.4#	210	10	55

*F=Flare, S=Solder, RF or RS = Rotolock Valve with Flare or Solder Connections
Factory Charge: 20 psig nitrogen - **MUST BE EVACUATED**

Approved Evap. Range		Ambient								
		90°F			100°F			110°F		
°F	PSIG	BTUH	Watts	Head	BTUH	Watts	Head	BTUH	Watts	Head
-10	16.5	-----	---	---	-----	---	---	-----	---	---
- 5	20.0	1240	345	210	-----	---	---	-----	---	---
0	24.0	1430	365	215	-----	---	---	-----	---	---
5	28.2	1630	385	220	-----	---	---	-----	---	---
10	32.8	1840	405	225	-----	---	---	-----	---	---
15	37.7	2060	430	235	1860	445	260	-----	---	---
20	43.0	2300	455	240	2070	470	270	-----	---	---
25	48.8	2580	485	250	2320	500	280	-----	---	---
30	54.8	2860	510	260	2580	530	290	-----	---	---
35	61.5	3190	540	270	2880	560	300	2570	585	325
40	68.5	3560	570	275	3220	595	310	2880	620	345
45	76.0	4010	600	285	3530	625	320	3250	655	360

Return gas temp. 20°F max superheat above 20°F evap,
40°F max below 20°F evap, 5°F subcooling

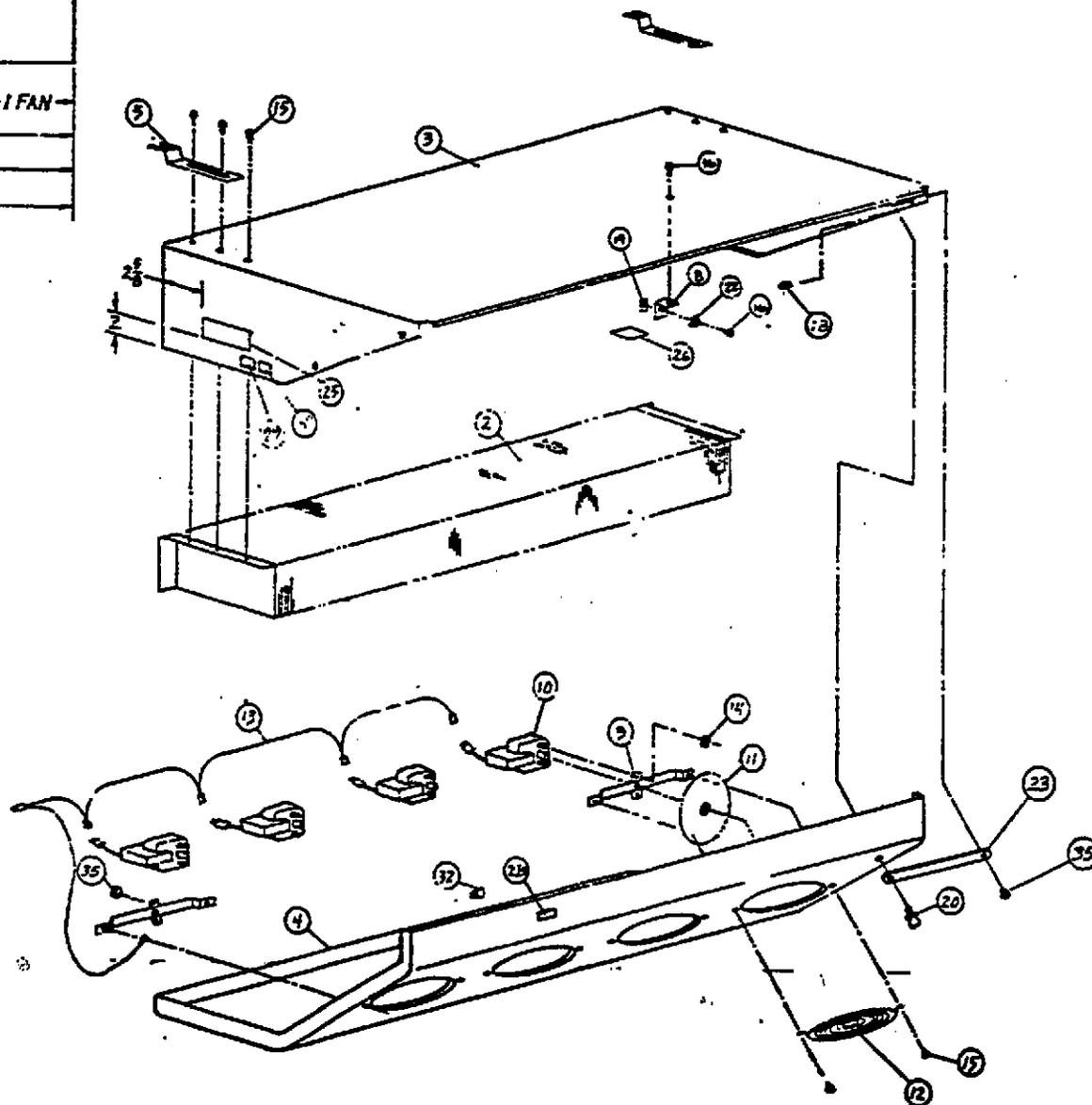
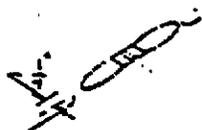
NOTE: ATTACH MOTOR HARNESS TO FAN PANEL WITH WIRE CLIP (ITEM #32) AT EACH PLUG CONNECTION



NOTE: FAN PANEL TO FIT INSIDE HOUSING ON FRONT EDGE.



FAN SETTING



FINAL ASSEMBLY

TA & TAK

DRAWN BY R. CERRONE DATE 3-18-59
APPROVED BY H. W. B. DATE 4-1-59

C23714

1 2 32 33

TOLERANCES UNLESS OTHERWISE SPECIFIED BY DRAWING OR MANUFACTURING STANDARDS

SHEET METAL

- 1 CUTTING SIZE $\pm 1/64$
- 2 HOLE DIA. $\pm .002$
- 3 CTR TO CTR. DISTANCE OF HOLES $\pm 1/64$
- 4 ANGLES $\pm 2^\circ$
- 5 HOLE LOCAT. $\pm 1/64$
- 6 PUNCHED DIA. $\pm 1/32$

TUBING

- 1 BECDIAL DIA. $\pm .006$
- 2 PRACT DIA. $\pm 1/32$
- TURN $45^\circ \pm 1/16$

C23714

CHAPTER 7

PARTS LIST

7.1 INTRODUCTION

This section of the manual contains lists of replaceable parts. Each of the tables contains a list of removable parts associated with an assembly of the cabinet or refrigeration system. No parts identification has been provided for details of permanently assembled items or those items which are not suitable for field repair.

7.2 SOURCE CODES

The sources for some items listed is indicated in the part tabulation. Where no individual source code is listed, the part is available through COSPOLICH REFRIGERATOR CO. INC., KENNER, LA 70062. (FED. MFG. CODE # 66682)

CODE NO.	NAME AND ADDRESS
63291	Bohn Heat Transfer Danville, ILL. 61932
17479	Honeywell Minneapolis, MN. 55440
32761	Kason Industries Shenandoah, GA. 30265
42605	Paragon Electric Two Rivers, WI. 54241
50992	Ranco Control 5 St. Louis, MO. 63143
78462	Sporlan Valve St. Louis, MO. 63143
59431	Tecumseh Corp. Tecumseh, MI. 49286

TABLE 7.1 PART LIST - REFRIGERATION

PART#	DESCRIPTION	QTY
<u>REFRIGERATOR</u>		
RWE010	EVAPORATOR COIL	1
RWE011	EVAPORATOR MOTOR	1
RWE012	EVAPORATOR FAN	1
RWEV14	EXPANSION VALVE	1
RWC490	CONDENSING UNIT	1
RWC491	COMPRESSOR	1
RWC493	CONDENSER FAN	1
RWC492	CONDENSER MOTOR	1
RWC494	CONDENSER	1
RWC496	RECEIVER	1
RW4991	OVERLOAD	1
RW4993	RELAY	1
RW4992	CAPACITOR	1
RWFD01	FILTER DRYER	1
RWSG01	SIGHT GLASS	2
RWPC01	LOW PRESSURE CTRL	1
LFTS01	POWER CTRL SWITCH	1
LFTB01	TERMINAL BOX	1
LFAP01	ELECTRICAL PANAL	1
<u>FREEZER</u>		
RWEV20	EXPANSION VALVE	1
RWC570	CONDENSING UNIT	1
RWC571	COMPRESSOR	1
RWC573	CONDENSER FAN	1
RWC572	CONDENSER MOTOR	1
RWC574	CONDENSER	1
RWC576	RECEIVER	1
RW5791	OVERLOAD	1
RW5793	RELAY	1
RW5792	CAPACITOR	1
RWFD01	FILTER DRYER	1
RWSG01	SIGHT GLASS	1
RWPC01	LOW PRESSURE CONTROL	1
LFTS01	POWER CONTROL SWITCH	1

TABLE 7.2 PARTS LIST - CABINET

PART#	DESCRIPTION	QTY
HXLH01	LATCH	2
HXHE02	HINGE	4
HXTR01	THERMOMETER	2
HXSD01	PILASTER	8
HXCS01	PILASTER CLIP	24
SEW210X190	SHELVES REFRIGERATOR	3
SEN18CX21B	SHELVES FREEZER	3
GE61S	GASKET REFRIGERATOR	1
GE62S	GASKET FREEZER	1
LHR135	MULLION HEATER REF	1
L1HR126	MULLION HEATER FRE	1
HCBS01	BREAKER STRIP	2SETS
DC61S	DOOR COMPLETE REF	1
DE62S	DOOR COMPLETE FRE	1
EE71S	LOUVERED GRILL	1
LRLS01	LIGHT SWITCH	1
LRLG01	LIGHT GUARD	1
LRSK01	LIGHT SOCKET	1

TABLE 7.3 SPECIAL TOOLS LIST

PART #	DESCRIPTION	QUANTITY
CTRG01	Refrigerant service gauges with hoses	1
CTVW01	valve service wrench	1
CTLD01	halide leak detector	1
CTAM01	amp meter	1

CHAPTER 8

INSTALLATION

8.1 UNPACKING

NOTE: Before unpacking unit, note any crating markings and check for damage to crating and notify the carrier if there should appear to be damage to the equipment.

The unit is shipped from the factory securely fastened to a single shipping pallet protected by an external wrapping.

- a. Carefully remove all external wrappings and other protective coverings.
- b. Review the installation section of the manual completely prior to installation.
- c. Discard crating materials.

8.2 INSTALLATION

- a. Prior to moving the unit to the installation sight, double check passageways to make certain that it will move through without modifications.

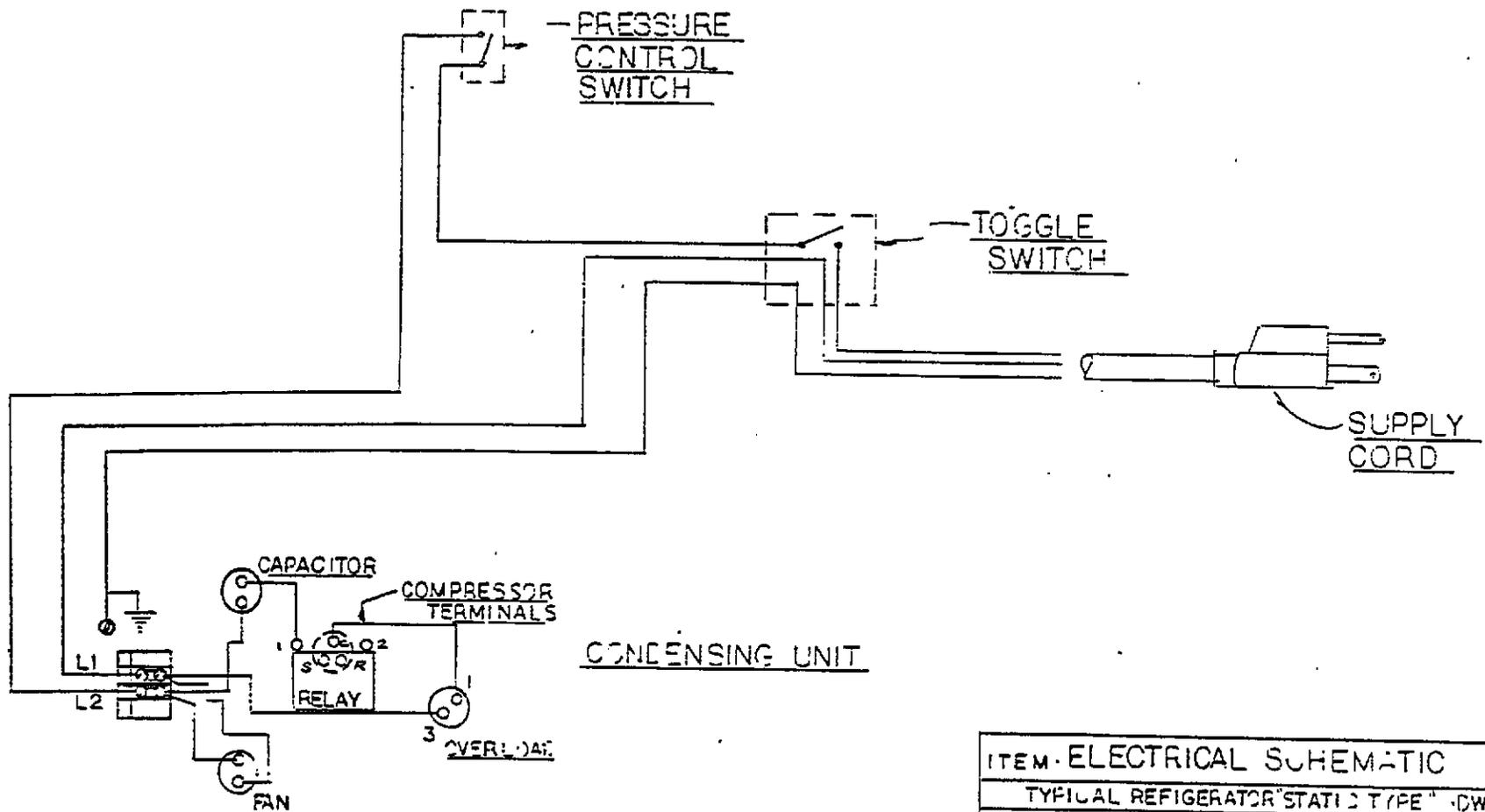
NOTE: In certain instances, it may be necessary to remove the doors and hardware to negotiate tight spaces.

- b. On most shipboard applications, a permanent base is fabricated by the ship builder to accommodate the base frame of the unit. Once the cabinet has been attached to the ships foundation it is necessary to apply a silicone sealant around the complete perimeter at the point which the cabinet base contacts the foundation.
- c. Position the unit to allow sufficient ventilation, usually leave a 3" clearance from adjacent bulkheads and other equipment. Try not to place the unit near heat producing items such as ovens, ranges, and furnaces.
- d. Level the cabinet from front to back and from side to side. This is important so that when securing to the deck base the cabinet will not be pulled out of square.
- e. Evaporator coil drain lines are factory installed and are tied into a condensate evaporator which eliminates the need for exterior plumbing. Check to make certain that the drain line is located inside the condensate evaporator pan.
- f. Check the door gasket to make certain that they are sealing properly to the cabinet. It may be necessary to adjust the latch strike inward to compensate for the compression of the gasket with age.

- g. Prior to applying electrical power to the unit, you should first check the electrical characteristics of the condensing unit and make certain that they agree with those of the electrical supply source.

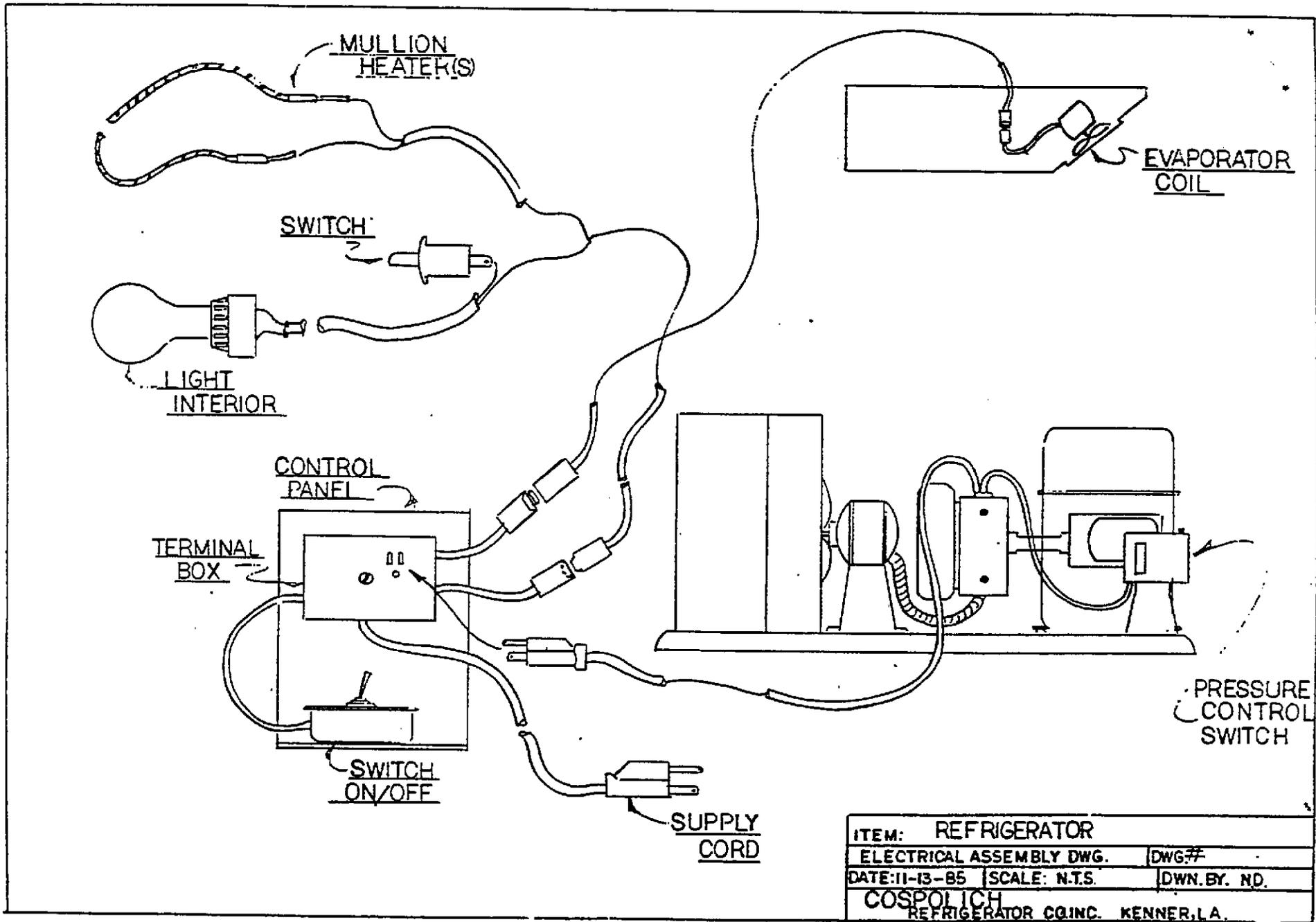
CAUTION: LOW OR EXCESSIVE VOLTAGE CAN SEVERELY DAMAGE THE ELECTRICAL SYSTEM.

NOTE: It is not necessary to adjust any valves or controls on the system as this has been done at the factory.



ITEM - ELECTRICAL SCHEMATIC		
TYPICAL REFRIGERATOR "STATIC TYPE" - DWG #		
DATE 3-17-88	SCALE NTS	DWN. BY NC.
DUBPOLICH		
REFRIGERATION CO. KENNER LA.		

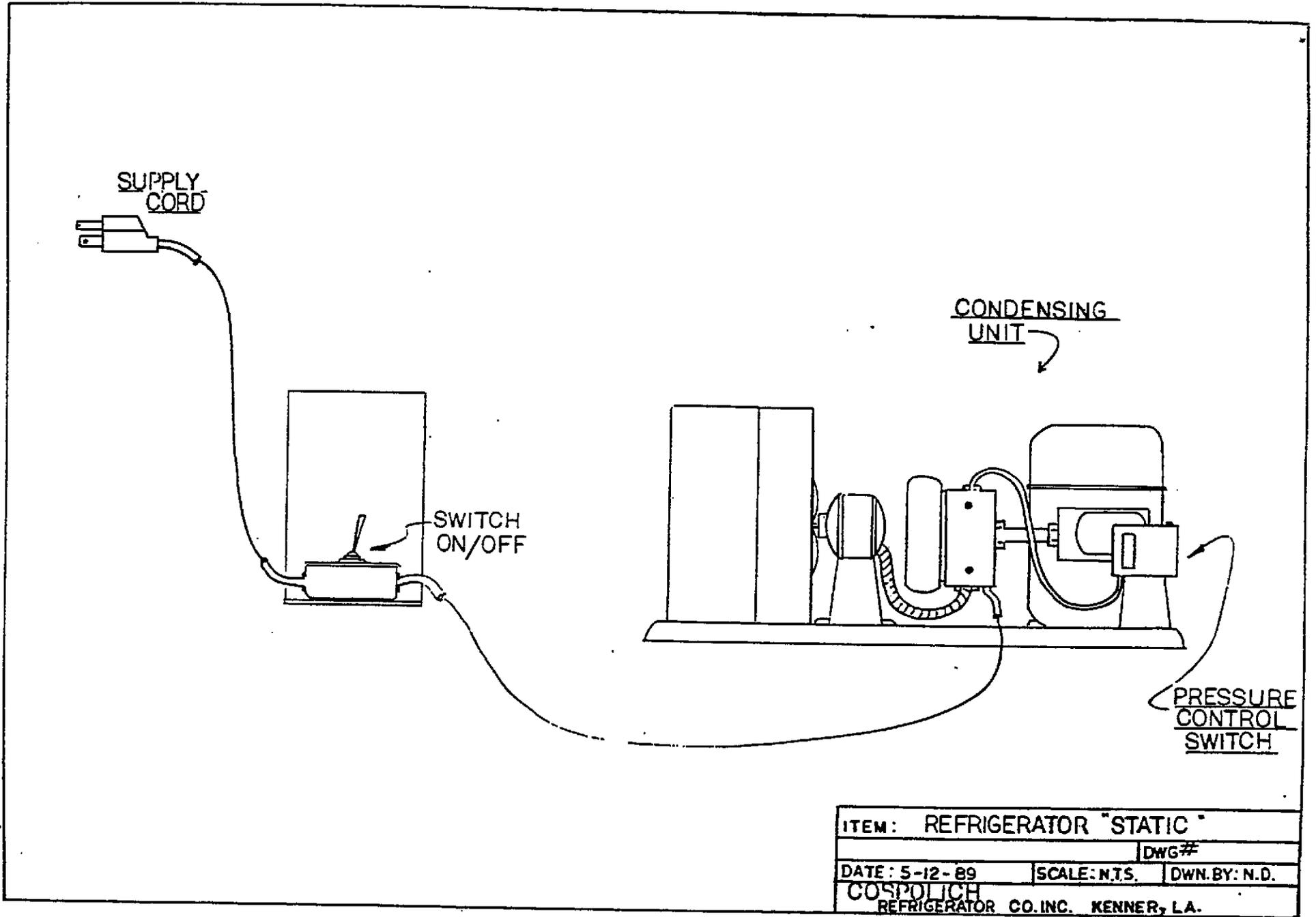
FIG. 9.2



ITEM: REFRIGERATOR		
ELECTRICAL ASSEMBLY DWG.	DWG.#	
DATE: 11-13-85	SCALE: N.T.S.	DWN. BY. NO.
COSPOLICH REFRIGERATOR CO. INC. KENNER, LA.		

9-3

FIG. 9.3



ITEM: REFRIGERATOR "STATIC"		
		DWG#
DATE: 5-12-89	SCALE: N.T.S.	DWN. BY: N.D.
COSPOLICH REFRIGERATOR CO. INC. KENNER, LA.		

FIG. 9.4

ELECTRICAL TERMINOLOGY AND ABBREVIATIONS

DEFINITIONS

RLA - Rated load amps

Rated load amps is a measure of the current drawn by a compressor when operated at Tecumseh rating conditions at nominal voltage. This value is listed at U.L. and C.S.A. as "RLA". It is in agreement with the N.E.C. definition that the RLA be the current draw when the compressor is delivering rated output.

LRA - Locked rotor amps

Locked rotor amps of a compressor is the current value recorded three seconds after rated voltage is applied under locked rotor conditions from a 75 degree F motor soakout temperature. (Voltage drop to be pre-determined and adjusted accordingly prior to test.) This value appears on the compressor serial plate and on all compressor statistics sheets.

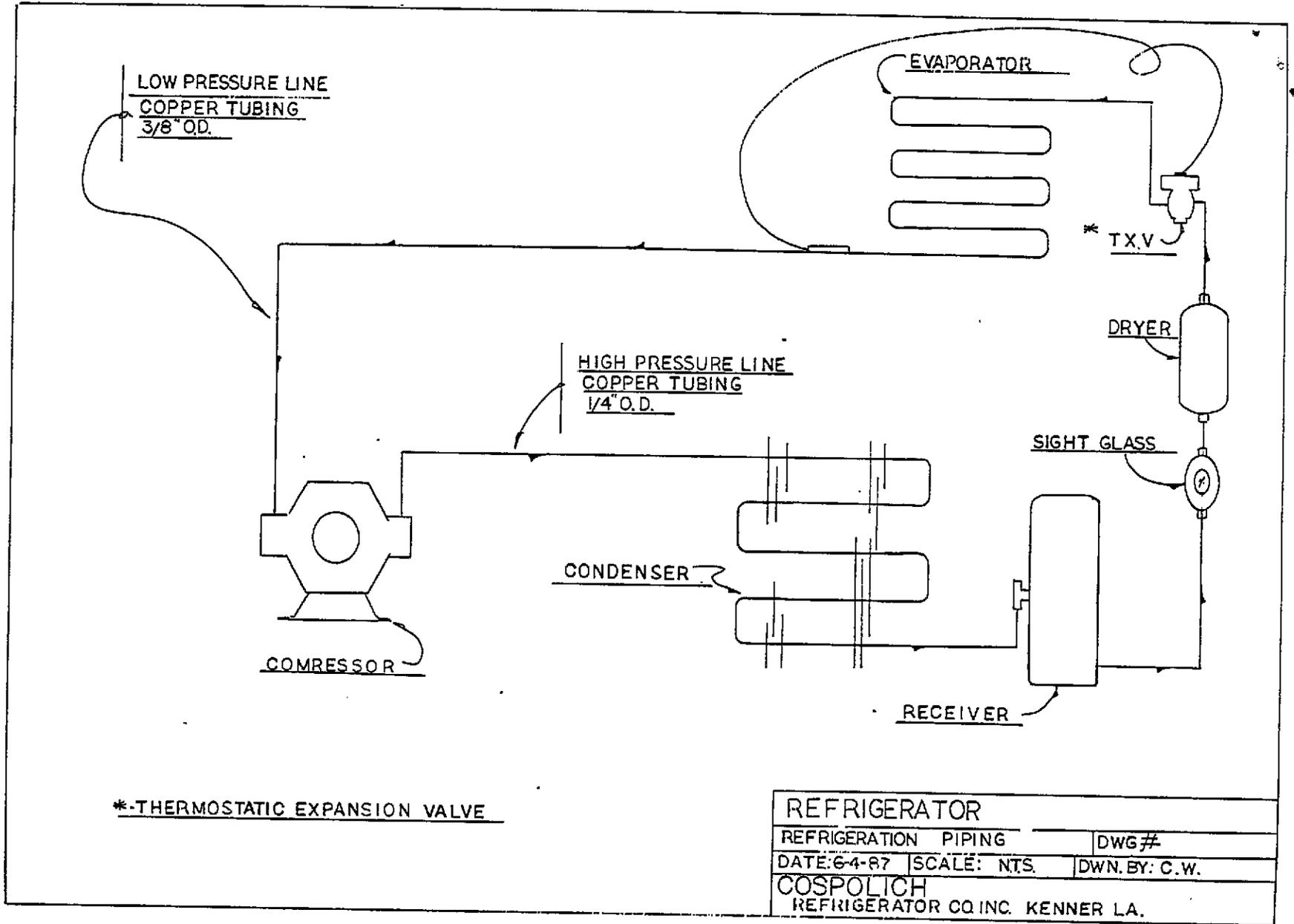
It may be well to note that the practice in the past was to show an additional column marked, LRA "U.L. Test Report". This is no longer needed, since the U.L. investigation work, as regards component rating, will be guided by the compressor manufacturer's published value.

MCG - Maximum continuous current

Maximum continuous current is a limiting ampere value which must not be greater than 156% of the rated load amps (RLA) of the compressor as marked on the nameplate of the particular unit into which that compressor is applied.

The 156% rule applies to all equipment except that which is rated 115v or 230v and can be protected (per N.E.C.) with a 20 amp or 15 amp fuse respectively. Further, the rule applies to all equipment rated 265v - single phase, 460v - three phase, and 575v - three phase, with no exceptions

FIG 9.5



**THIS PAGE NOT AVAILABLE
FOR RASTER SCAN**

LIMITED WARRANTY

Cospolich warrants their cabinets to consumers only against defects in material or workmanship under normal use and service for a period of one year from the date of shipment. We will repair or replace at our option, any part, assembly or portion there of which Cospolich's examination discloses to be defective. Cospolich will pay the labor costs for the repair up to twelve (12) months from date of purchase.

TERMS

EXCLUSIONS

Cospolich's obligations under this warranty shall not extend to any malfunction or other problem caused by unreasonable use, such as but not limited to improper setting of controls, improper installation, improper voltage supply, loose electrical connections or blown fuses, and damage not attributable to a defect in workmanship. This warranty shall not apply to any cabinet or component part which has been subject to any accident, alteration, abuse, misuse to any damage caused in fire, flood, or other acts of God and to any product which has been serviced by an unauthorized service person or company.

TO SECURE WARRANTY SERVICE

If you claim a defect under this warranty, direct your claim to whom you purchased the product giving model, serial and code numbers a description of the problem.

If the above procedure fails to satisfy your claim you may write directly to the DIRECTOR OF CUSTOMER RELATIONS, COSPOLICH REFRIGERATOR CO. INC. 949 Industry Rd. Kenner, Louisiana 70062. LISTING THE ABOVE.

There is no other express warranty on the Cospolich units except as stated herein. Any and all implied warrants of fitness and merchantability are limited in duration to the duration of this Warranty. The liabilities of Cospolich are limited solely and exclusively to replacement as stated herein and do not include any liability for any incidental, consequential, or other damages of any kind whatsoever, whether any claim is based upon theories of contract negligence or tort. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion of limitations of incidental or consequential damages. So the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

(Insert Classification of TMDER Here) CLASSIFICATION:

NAVSEA/SPAWAR TECHNICAL MANUAL DEFICIENCY/EVALUATION REPORT (TMDER)

INSTRUCTION: Continue on 8 1/2" x 11" paper if additional space is needed.

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- 2. FOR CLASSIFIED TMDERS, SEE OPNAVINST 5510H FOR MAILING CLASSIFIED TMDERS.

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5. TITLE			6. REPORT CONTROL NUMBER

7. RECOMMENDED CHANGES TO PUBLICATION

PAGE NO. A.	PARA- GRAPH B.	C. RECOMMENDED CHANGES AND REASONS

8. ORIGINATOR'S NAME AND WORK CENTER (Please Print)	9. DATE	10. DSN/COMM NO.	11. TRANSMITTED TO
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3. For TMDERs that affect more than one publication, submit a separate TMDER for each.
4. Submit TMDERs at web site <http://nsdsa.phdnswc.navy.mil> or mail to: **COMMANDER, CODE 310 TMDER BLDG 1388, NAVSURFWARCENDIV NSDSA, 4363 MISSILE WAY, PORT HUENEME CA 93043-4307**

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5. TITLE OF PUBLICATION			6. REPORT CONTROL NUMBER (6 digit UIC-YY-any four: xxxxxx-03-xxxx)

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7a. Page #	7b. Para #	7c. RECOMMENDED CHANGES AND REASONS

8. ORIGINATOR'S NAME AND WORK CENTER	9. DATE	10. ORIGINATOR'S E-MAIL ADDRESS	11. TMAA of Manual (NSDSA will complete)
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12. SHIP OR ACTIVITY Name and Address (include UIC/CAGE/HULL)	13. Phone Numbers: Commercial () ___ - ___ DSN ___ - ___ FAX () ___ - ___
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