

# NORCOLD®



THE NEW AGE OF COLD

## TEK II

### DUAL VOLTAGE ICE BOX CONVERSION SYSTEM

120 VOLTS A.C. & 12/24 VOLTS D.C.

MODELS  
SCQT-4407 (40W)

## OWNER'S GUIDE

### SERVICE INFORMATION

IF SERVICE OR PARTS ARE REQUIRED, CONTACT THE NEAREST NORCOLD SERVICE CENTER. A NORCOLD SERVICE CENTER BOOKLET HAS BEEN INCLUDED WITH THE REFRIGERATOR INFORMATION PACKET

Printed in Japan  
1/99  
#5490 219 0100

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#### General :

This appliance is designed to convert a sailboat ice box to a mechanically refrigerated box. The conversion unit is available in a 40 watt system and can operate from either A.C. or D.C. power supplies. Unlike a standard self contained refrigerator, the cooling plate is separated from the compressor/condenser unit by flexible refrigerant lines. The conversion requires installing the cooling plate in the ice box and installing the compressor/condenser unit in a well ventilated location within the 12 feet of available refrigerant tubing.

#### CAUTION

1. Never store gasoling or other flammable vapors and liquids as these sometimes cause explosion.
2. Do not touch evaporator and metal parts of cabinet inside by wet hand. Sometimes, it may cause frostbite to your hand.
3. Do not remove modify all the electrical live parts to avoid electric shock and trouble of your refrigerator.

#### A.

Identification of parts — unpack the conversion unit and check for damaged or missing parts.

Compressor/Condenser :	SCQT-4407 (40W) 12.3(H) × 9.1(W) × 6.0(D)
Exterior Dimensions (In.)	16.0(L1) × 8.5(L2) × 10.6(H)
Dimensions of Evaporator (In.)	
Length of Suction Tube (Ft.)	12
Length of A.C. Cord (Ft.)	5
Length of D.C. Cord (In.)	3Min.
Length of Thermostat Cord (Ft.)	10.5
Thermostat Box :	
Exterior Dimensions (In.)	3.3(H) × 2.0(W) × 1.6(D)

#### Accessories :

Evaporator Standoff 6 Pieces

#### B.

##### Required Tools :

1/4" Drill and Assorted Bits  
1 1/4" Hole Saw  
7/8" and 5/16" Wrenches or 2 Adjustable Wrenches  
Phillips and Straight Screwdrivers  
Wire Cutters and/or Wire Strippers  
Electrician Tape and Wire Connectors  
Tube of Silicone

#### C.

##### Location of Components :

Before the installation work is begun, the layout of the entire system should be considered, with particular attention to the following points :

- a. Location and position of the cooling plate.
- b. Point of tubing exit from ice box.
- c. Thermostat mounting position.
- d. Route of refrigerant tubing.
- e. Location of compressor/condenser unit.

There are two basic positions which are acceptable for the cooling plate as in Fig. 3(a) or 3(b). Positions shown in Figs. 3(c), 3(d), 3(e) or 3(f) will result in eptable cooling performance. For top opening boxes, the position as shown 3(a) is the most common. It is preferable to install the cooling plate(s) as high box as possible to obtain good circulation of cold air and more uniform temper. Placement of the compressor/condenser is very important, since ventilation is a consideration. The unit depends upon the convection air around it to remo heat.

#### DO NOT PLACE THE COMPRESSOR/CONDENSER IN A CONFINED SPACE WHICH REC

#### NO VENTILATION.

Availability of space for the compressor/condenser is usually found beneath or l the companion way, lazarette, quarter berth or settee.

At times, the engine compartment may be considered but many times not recomm because of the heat produced from the engine. The important point is that the must be well ventilated. If the location is closed to air movement, it may be poss

cut openings in panels and, if necessary, provide louvered panels (available at r supply).

The best venting arrangement in a confined space is to provide an opening bel low on the side, and an opening at the top, or high on the side.

The size of the lower and upper openings should be an equivalent of 100 square minimum free opening for each.

See Fig 4. Allow several inches on each side and top of the unit for accessibili ventilation.

Before the compressor/condenser location is selected, measure the exact route refrigerant tubing to insure the unit is within reach.

Also, the top of the compressor/condenser unit must not be installed higher th inches above the cooling plate to insure sufficient circulation of refrigerant oil.

Before deciding on the compressor/condenser location, there should be assuranc the electrical wiring will be accessible to the unit, both A.C. and D.C. supplies.

#### D. Installation

For the purpose of keeping a sufficient circuration of refrigeration oil;

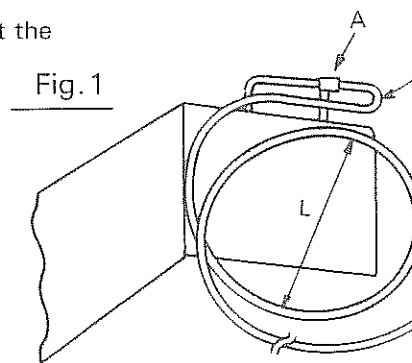
\* Altitude of compressor to evaporator

Set the evaporator within 50cm in altitude to the compressor head if the evapc is installed at higher position than the compressor.

#### IMPORTANT DIRECTIONS FOR TUBE BENDING

##### ① ORIGINAL STATE (AS RECEIVED)

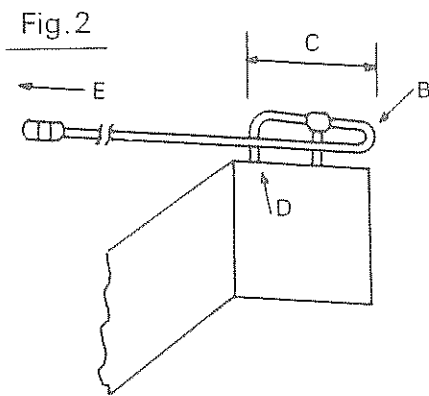
- a. The copper suction tube is clamped at the nearest point to the Evaporator. (Refer to Figure 1, Point A.)
- b. The tube is bent in a tight U-shape at Point "B". (Refer to Figure 1, Point B.)
- c. The remaining part of the tube to the connecting coupler is rolled in a large diameter "L". (Refer to Figure 1, "L".)



##### ② DIRECTIONS FOR UNCOILING SUCTION TUBE

- a. Carefully straighten the coiled tube indicated by "L" so that the tube pos is similar to the position shown in Figure 2.

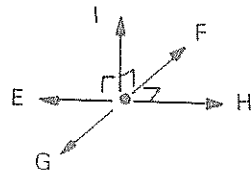
b. When the Evaporator is installed into the cabinet, retain the tight U-shape bend indicated at point "B". The tube section at "C" must not be moved or altered so as to protect the connector to the Evaporator as indicated by point "D".



c. In case the installation requires the tube to be run in Direction "E", then use Figure 2 as a guide.

On the other hand, if the tube is to be run in another direction (G,F,H,I), carefully bend the tube at point "K".

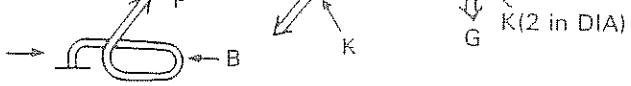
For reference, the type of bend for various directions (G,F,H,I) is shown where "K" is the point of bending.



In case of "G" direction.



In case of "F" direction.



In case of "H" direction.

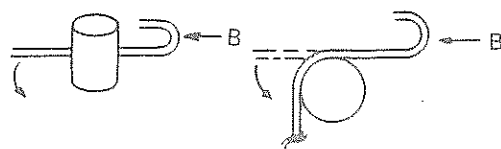


In case of "I" direction.



**Important:** In making the tube bend at point "K", a tube bending tool should be used. If not available, the tube can be hand bent using a wooden or metal cylindrical shape of approximately 2"~2-1/2" (50-65mm) diameter.

IN CASE OF "G" DIRECTION



**Caution:** Use extreme care in hand bending so as not to kind, flatten or damage the copper tube.

1. Insert the evaporator in storage compartment and secure it (with screws provided) on the vertical side wall of the compartment using the evaporator standoff. (Fig. 2).

Do not kink or excessively bend tubing since this can not only cause damage but can restrict free flow of refrigerant.

Cover the suction tube with insulation material, such as neoprene sponge, tube or fiberglass tape, outside of the refrigerating box.

**Caution:** The refrigerant quick connect couplings must be kept clean and dry. Do not remove dust caps and plugs until ready to make the connections.

2. The compressor/condenser case can be easily mounted to the floor mounting brackets and by use of supplied screws or bolts, cushions, collars, plane washers and spring lock washers. (Fig. 6) Place unit to insure accessibility and good circulation (see paragraph on location).

3. Set the thermostat box on side wall of the refrigerating box, within reach, referring to (Fig. 7) Turn the thermostat control knob to the "off" position.

**E.** With the power supplies off, make the electrical connections, referring to (Fig. 9). Refer to **WIRE SIZE** table for recommended D.C. wire sizes.

**Important:** The D.C. wire connection should be made to a dedicated 12/24 volts supply with a circuit breaker. This 12/24 volts must be a battery -not a converter or battery charger. See (Fig. 10).

#### F. Connection of Refrigerant Couplings

1. Remove dust caps and plugs if used, making sure that components synthetic seals are intact. It is best to complete connection to the lower coupling before making the next connection.
2. Wipe off coupling seals and threaded surfaces with a clean cloth to prevent the inclusion of dirt or any foreign material in the system.
3. Lubricate rubber seal in male half with a thin coat of oil. Thread coupling halves together by hand to insure proper mating of threads.

**Note:** one set of couplings connects to the mating set on the compressor/condenser unit. The threads are such that the two lines cannot be reversed.

At this point make sure two proper sized wrenches are available, since the tightening should be done rapidly to minimize any refrigerant loss (you may hear a brief "hiss" as the joint is tightened).

**CAUTION:** Always turn the female coupling and hold the male coupling with second wrench.

Use proper size wrenches (on coupling body hex and union nut) and tighten coupling bodies "bottom" or definite resistance is felt.

Using a marker or ink pen, mark a line lengthwise from the coupling hex bulkhead. Then tighten an additional 1/6 to 1/4 turn.

The misalignment of the line will show the degree of tightening.

The final turn is necessary to insure that the knife edge metal seal bites in brass seat of the coupling halves, forming the leakproof joint. If torque wrench is used, the following torque values are recommended.

Coupling Size : No. 6; Torque : 18ft. lbs.

After all couplings are tight, leak check the joint with a soap solution.

#### G. Connecting to Power Source :

Your refrigerator can be operated on A.C. (120 volts 60 hertz) from the wall socket or D.C. (12/24 volts) from a battery. 12/24 volts D.C. Operation in Your Boat, T. Camper, Etc.

The car battery voltage varies with the type of car you own. Most cars and trucks use a 12 volts system. Your refrigerator needs a 12/24 volts battery. See (Fig. 10) If the battery voltage is too high (for example 32 volt) your refrigerator cannot cool. On the other hand, its cooling power will decrease if the voltage is lower than 12 volts.

Set the thermostat control knob to "OFF". Connect two (2) wires from the battery, REFERRING TO PLUS/MINUS (+/-) INDICATIONS.

#### CAUTION

CONNECT REFRIGERATOR DIRECT TO BATTERY

The battery must have a charging means available, such as a generator, converter or the alternator. If not, the battery will discharge in a short period of time. Any switches, lead wires or other electrical equipment should not be connected with wiring between your refrigerator and battery, because this equipment can generate high voltage pulses and causes transistor trouble in the power-supply. See (Fig. 10).

On D.C. operation, connecting the D.C. supply properly to the refrigerator is important. You will note that one lead wire is marked (+) positive and the other (-) negative.

If the polarity be reversed, The unit does not operate and does not light the lamp, check the fuse located in D.C. lead and the polarity of the D.C. power supply.

If it still does not operate, this is an indication that other problem exist in the inverter, and the unit should be checked by an authorized Norcold Service Center. To reduce the radio interference and induction of a high surge voltage from outside, twisting of the lead wire is important. See (Fig. 11).

#### H. Operational Check:

After completing the final installation details, an operational check can be made by watching the thermostat control knob to "ON" and turning the temperature control dial from 1 to 5 until the compressor starts. After a few minutes, the cooling plates should feel cold indicating circulation of refrigerant. Check on both A.C. and D.C. operation.

**NOTE:** Built in relay switches automatically to correct power supply.

- a. Suppose the refrigerator is operating on 120 volts A.C. (shore-power connection on boat dock, etc.) and then the power source is disconnected by a switch or by pulling the plug, the relay automatically switches the refrigerator over to the 12 volts D.C. power source and continues to operate the compressor, providing, of course, the leads are connected to the battery.
- b. If the refrigerator is operating normally on a 12 volts battery, then, when 120 volts A.C. power is switched on or by just plugging in the A.C. power cord, the relay switches the compressor over to A.C. operation. This will save power consumption and keep your battery in good condition. Refrigerator temperature can be controlled by means of the temperature control dial. The interior temperature drops as the dial position is changed from "1" to "5". In this way, interior temperatures can be regulated freely within the range of 45° to 32°F. To switch off your refrigerator, move the thermostat control knob to "OFF". The dial does not turn clockwise beyond "1" and "5". For efficient operation, regulate the temperature according to the types of foods stored.

#### c. MAINTENANCE OF BATTERY IS IMPORTANT

If the charge of your battery is not sufficient, a decline in the cooling performance of your refrigerator can be expected. If 120 V, 60 hertz, electrical power supply is available, A.C. operation is recommended to keep your battery in good condition. A.C. power is AUTOMATICALLY applied, if your vehicle 120 volts electric system is connected to the outside 120 V power supply.

- d. NEVER EMPLOY A "QUICK CHARGER" TO YOUR BATTERY UNLESS THERMOSTAT POWER SWITCH HAS BEEN TURNED TO "OFF".

e. NEVER USE A COMMERCIAL 12/24 VOLTS D.C. TO 120VOLTS A.C., 60 HERTZ INVERTER OR CONVERTER for operating your refrigerator on A.C., since these devices do not hold the required constant frequency.

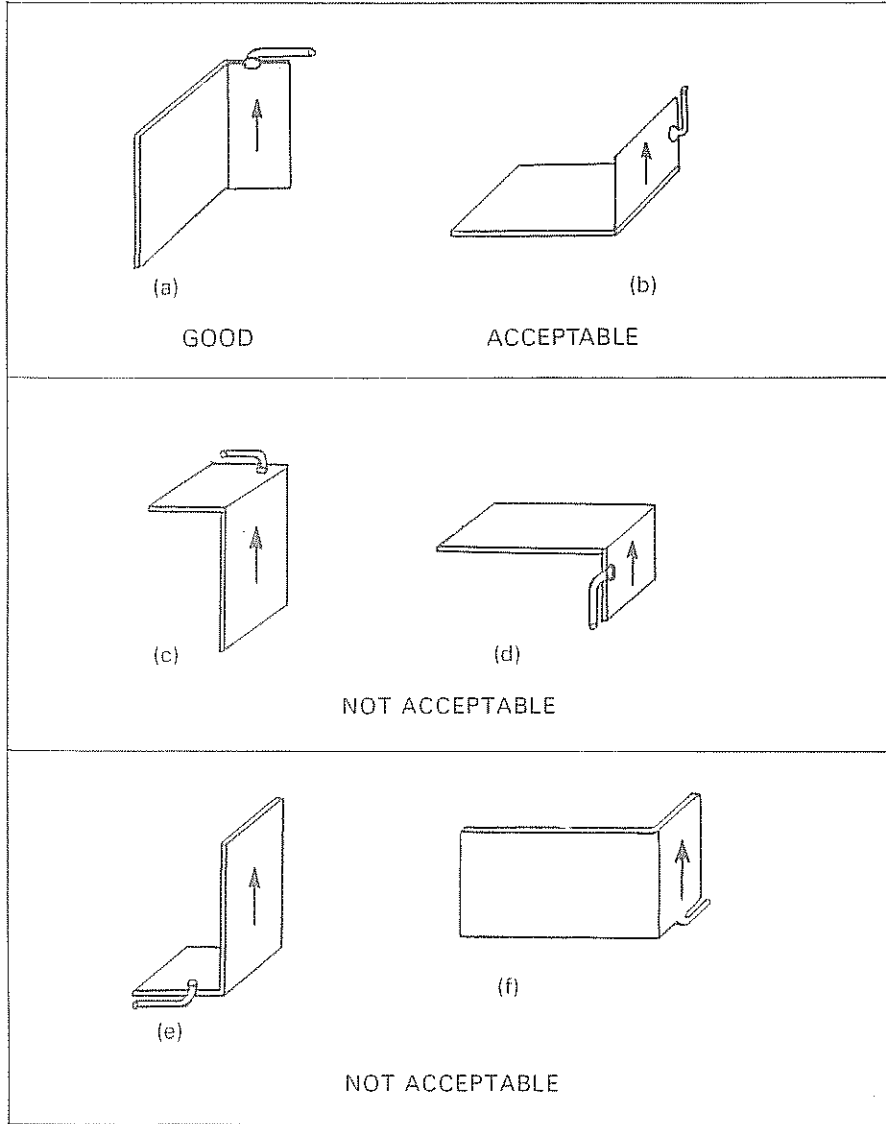


Fig. 3

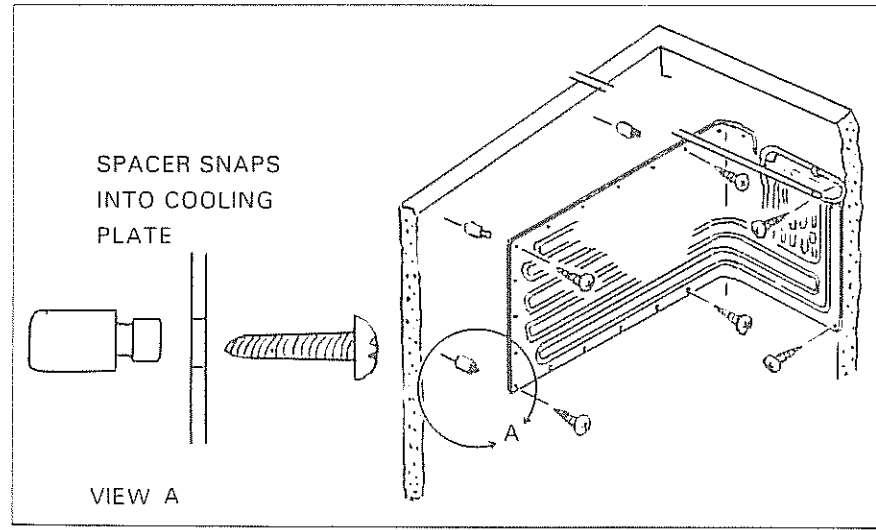


Fig. 5

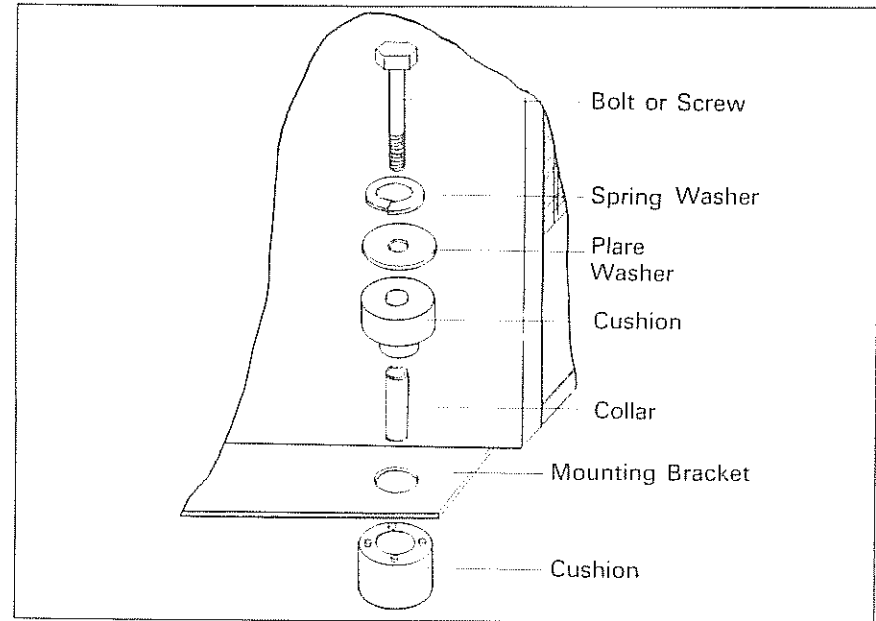


Fig. 6

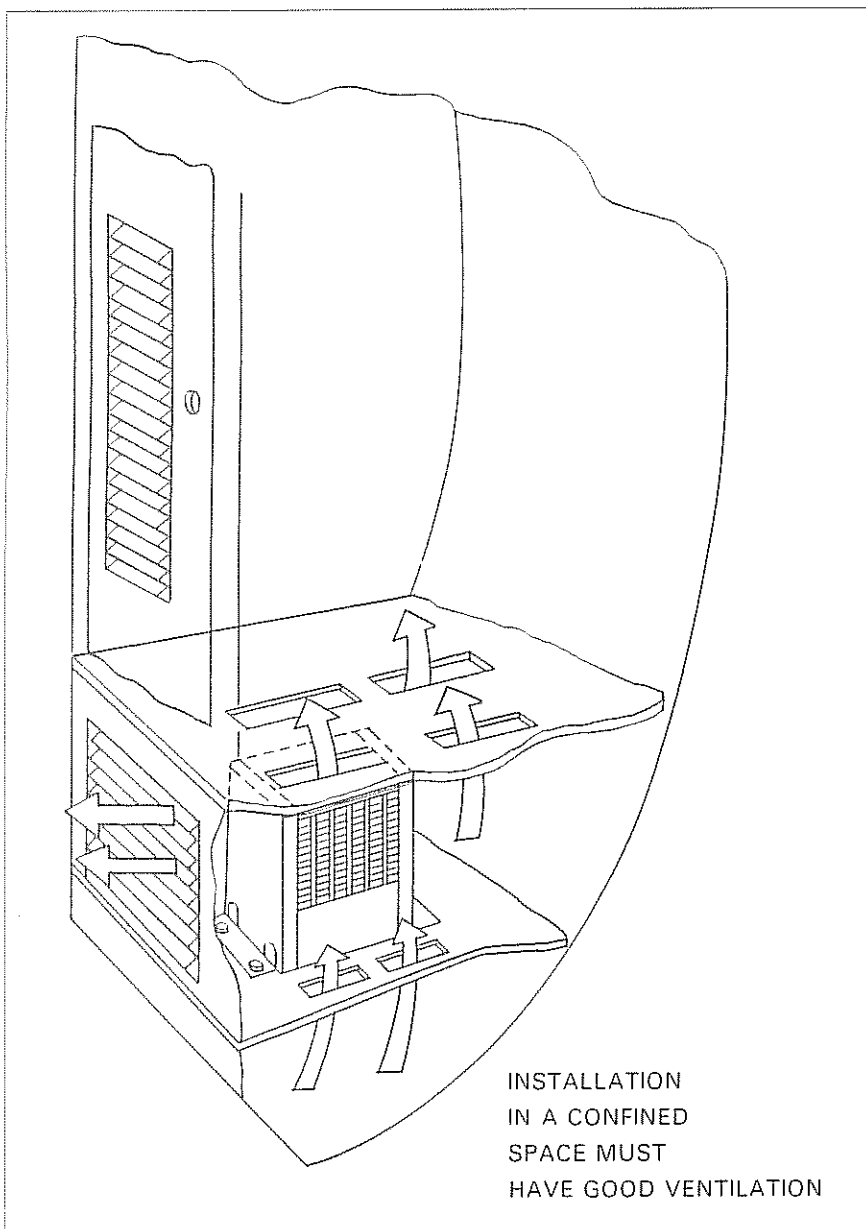


Fig. 4

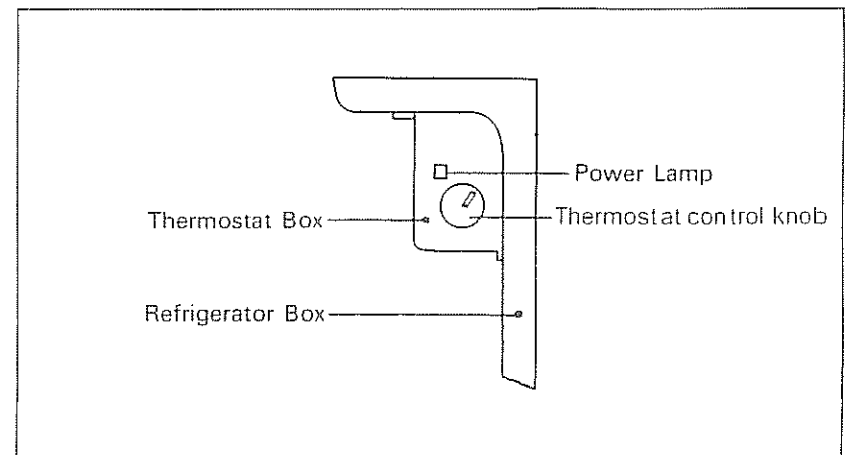


Fig. 7

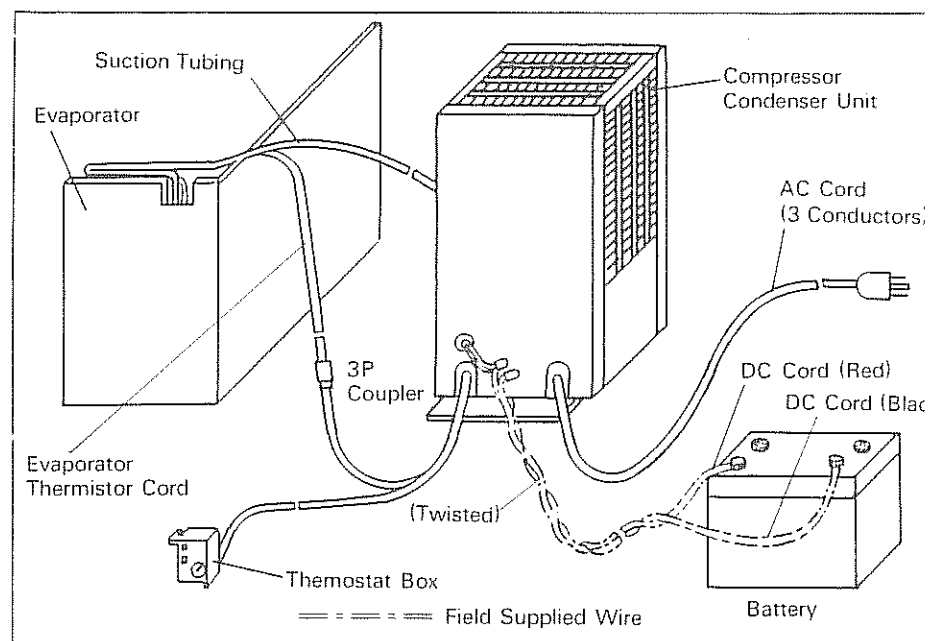
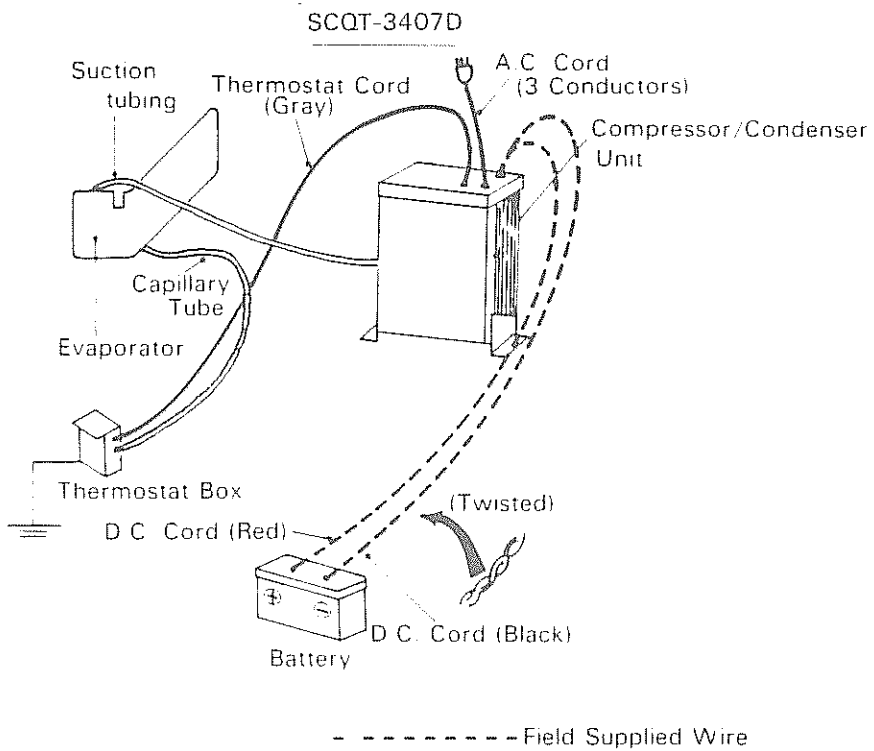


Fig. 8

LIMITED WARRANTY

NORCOLD®

P.O.Box 4248  
Sidney, Ohio 45365-4248



WIRE SIZE tables for field supplied D.C. cord (to battery)

Length of Field Supplied Wire	WIRE SIZE SCQT-3407D(40W)
Less than 6 FT.	AWG #14
6 FT. to 12 FT.	AWG #14
12FT to 20FT	AWG #12

Fig.9

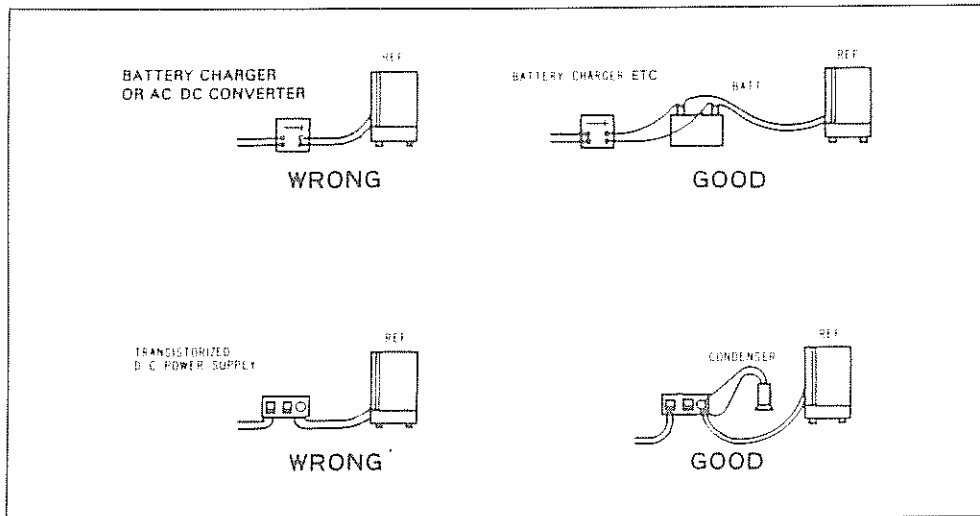


Fig.10

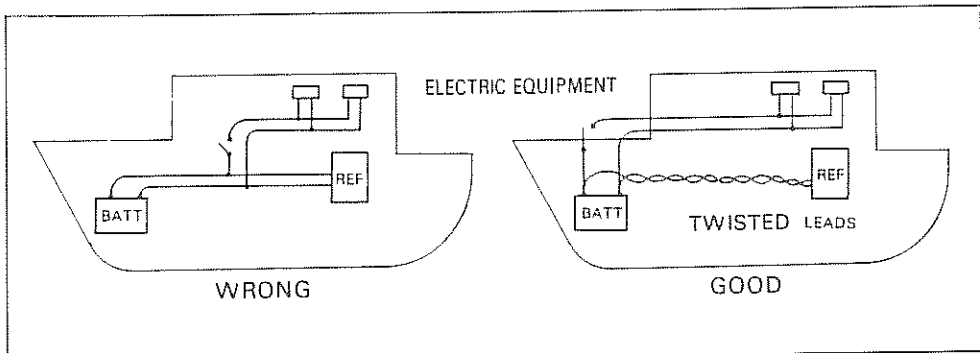


Fig.11

This Limited Warranty is given by NORCOLD, Inc. ("Company") to the original consumer-purchaser of any new refrigerating equipment ("Equipment") supplied by the Company, excluding glassware and electric light bulbs, and will be effective for a period of one year from date of original purchase. The Company warrants, provided that the Equipment shall at all times have been in possession and used by the original consumer-purchaser, that:

A. The Company will provide free service and replacement of defective parts no charge at all authorized Norcold Service Centers for a period of one year from the date of original purchase. This Limited Warranty covers labor or incurred in removing and re-installing the refrigerator only when necessary to replace a defective part. The Company will pay inbound and outbound transportation costs of any defective part, for a 1 year period commencing with date of purchase. The original consumer-purchaser must pay all expenses incurred in making the equipment available at one of the Norcold Service Centers.

B. The following procedure shall be followed by any original consumer-purchaser desiring to obtain performance under the terms of this Limited Warranty. The refrigerator must be brought to any of the Norcold Service Centers and the original consumer-purchaser must present evidence (1) to identify the original consumer-purchaser; and (2) that the item claimed to be defective is within the warranty coverage. If the original consumer-purchaser is unable to accomplish this task, written notice should be immediately directed to Norcold and advice will be promptly given concerning the manner in which warranty service may be obtained.

Inability to physically bring the refrigerator to a Norcold Service Center will not void the warranty, but any additional costs thereby incurred are so for the account of the original consumer-purchaser.

C. The Company will not be liable under this Limited Warranty for any of the following:

- (1) Defects which arise by reason of transit damage, misuse, neglect or accident.
- (2) Manufacturing defects found at the time of purchase which are not communicated to the Company within 30 days.
- (3) Defects in glassware and electric light bulbs.
- (4) Defects arising from improper installation or adjustment of Equipment.
- (5) The need for normal maintenance of this refrigerator.
- (6) Defects arising from the improper use of parts or parts not manufactured or supplied by the Company in the course of repairs or replacements to Equipment.

D. Employees and agents of the Company, and its authorized service representatives, have no authority to vary the terms of the Limited Warranty which applies only to Equipment purchased and installed in the United States of America and the Dominion of Canada. The Company reserves the right to make any improvements or changes in parts or models without notice to the original consumer-purchaser.

E. The Company shall not be liable or in any way responsible for any loss of damage to person or property, or lost profits or other similar loss or damage that may result or be claimed to have resulted from a defect in any part of the Equipment covered by this Limited Warranty. Some states do not allow the exclusion or limitations of any incidental or consequential damages, so the above limitation or exclusion may not apply to you.

F. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE:

- (1) APPLICABLE TO A PART OR PARTS OF THE REFRIGERATOR LIMITED TO A PERIOD OF ONE YEAR FROM DATE OF PURCHASE.
- (2) SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS. THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

G. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.