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REFRIGERATED TRANSPORT
INSTALLATION, OPERATION, AND SERVICE
MANUAL

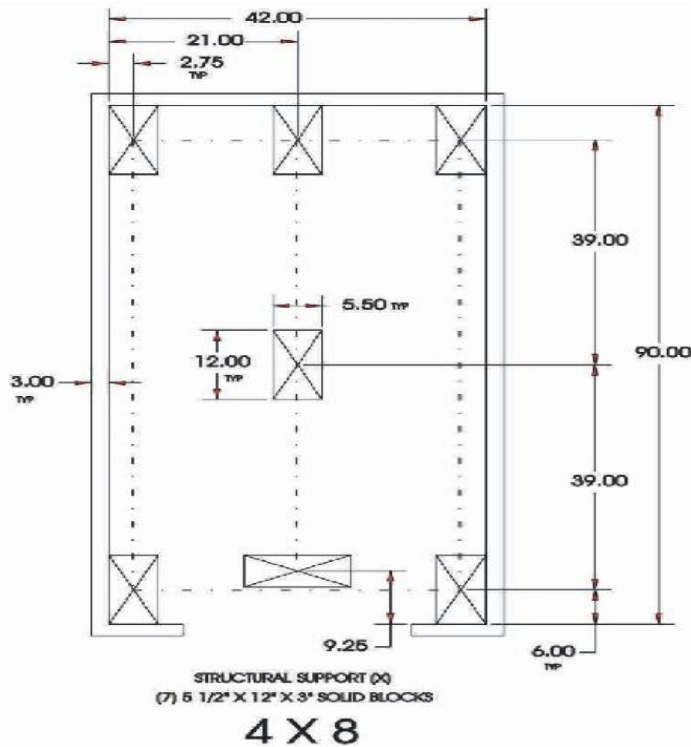
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Material and product improvement is a continuous commitment at Leer. This manual is subject to modification or change without notice and without incurring responsibility for previously sold transports and components.

WARNING! Never store flammable, combustible or reactive chemicals in transports.

Installation



The transport floor should be securely bolted to the truck or trailer bed at a minimum of four structural support locations with the carriage bolts recommended below. Install one bolt at each corner of the door wall and one bolt at each corner of the compressor wall. Due to truck structure and variations on make and model, mounting locations may vary. Extra structural support has been added to the 5 X 9 and 4 X 8 that will allow bolt attachments at multiple locations. Additional structural securing is recommended on all transports. Caulk holes with sealant to prevent leakage.

Recommended bolt sizes:

4 X 8: at least .5" x 5.5"

5 X 9: at least .5" X 6.5"

CAUTION: Due to different placement of truck and fuel tanks, extreme care must be taken when drilling bolt holes to prevent perforating the fuel tank(s) or brake line(s). Leer is not responsible for any modification of equipment.

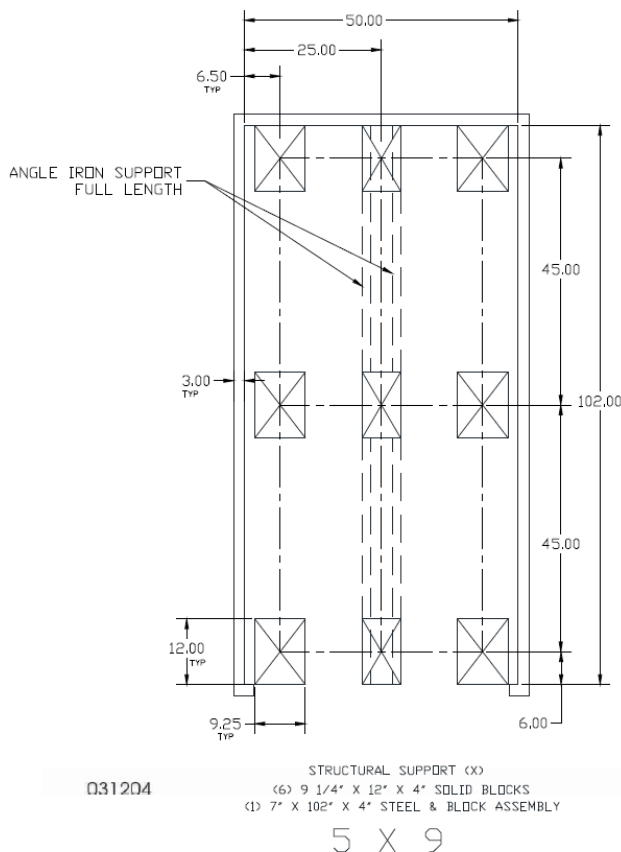
NOTE: Buyer is responsible to select the correct size and weight of truck or trailer and to securely bolt the transport to their truck or trailer.

Operation

Electrical:

Warning! Component parts shall only be replaced with like components. Electrical work and servicing should be done by licensed professionals. Disconnect power before performing service. Certain models may contain multiple voltages. Leer does not assume responsibility for any damage to people or things deriving from violation, improper use or in any case not in compliance with Leer's instructions.

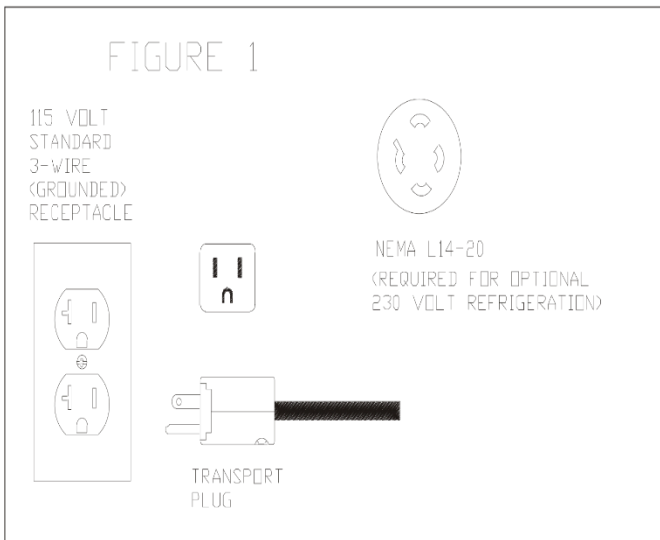
The electrical voltage and frequency cycle at electrical connection must coincide with the transport decal serial label. Electrical service connections must be in accordance with the National Electrical Code, state code, and any local code that may apply. All transports are wired to a 20-foot polarized cord with 3-prong plug.



NOTE: All reference dimensions are from interior of transport.

CAUTION: Improper use or removal of the grounding plug can result in a risk of electrical shock.

The transport refrigeration must be connected to a dedicated 115-volt, 60 Hz grounded receptacle electrical outlet with a circuit breaker or fuse. A 20-amp circuit is recommended (See Figure 1). The condensing unit data plate will indicate the maximum fuse/breaker size. **DO NOT** use extension cords. Extension cords will decrease the voltage to the unit and ultimately cause the compressor to fail.



NOTE: Buyer must provide electrical box locking device for safety and secure closure.

Plug power cord into electrical outlet. Open electrical box and slide switch to on position. The condensing unit will start and unit cooler evaporator fans will start on Auto-Defrost models. The condensing unit will continue to run until reaching preset air temperature for ice storage at approximately +18°F.

Mechanical Controls Thermostat:

The compressor is controlled by the classic thermostat where the engagement and disengagement of the thermostat is controlled by the expansion and contraction of gas within a sensing tube. Transports have mechanical thermostats and are factory set to operate at a cut-out temperature of 18° F +/-2°. The thermostat has an adjustment knob that allows adjustment. The thermostat has a pre-set differential of 8° F, which is adjustable.

On cold plate (CP) cabinet models, the thermostat is located on the right back wall of the transport interior.

On automatic defrost (AD) cabinet models, the thermostat is located on the left back wall of the transport interior.

Mechanical Defrost Timer:

The defrost timer is located under the condensing unit housing. The timer will engage the transport defrost cycle once every 4 hours for a duration of 15 minutes. The timer may be manually advanced into defrost by rotating the advancement knob in a clockwise direction. Manual advancement into the defrost mode will re-set the next controlled defrost cycle to take place in 4 hours.

The automatic defrost function is available on cabinet models designated as “auto-defrost” (AD).

The cold plate (CP) cabinet models do not have an electronically controlled defrost and require manual de-icing of the cabinet’s side interior walls.

Loading Ice: The transport should be pre-chilled prior to loading with ice. Pre-chilling will aid the transport in reaching storage temperature at a faster rate once loaded and reduce the risk of melting product. Do not over fill the transport with product!

Cold Plate Models: If the product blocks off air flow from the front of the cabinet to the control’s air probe, the control may not respond quickly enough to maintain proper cabinet temperature. Allow a minimum of 6 inches clearance between the top of the product stack and the thermostat probe. This distance will allow a pathway for warmer air entering the cabinet during door openings to migrate to the sensing bulb on the probe.

Auto-Defrost Models: Avoid stacking product above the bottom of the drain pan. Blocking off the fans may restrict the even distribution of cold air throughout the cabinet which may result in warm spots developing within the cabinet. The evaporator fans are intended to pull warm air from the back cabinet into the unit cooler and then push that warm air across the surface of the evaporator coil. This process removes the heat prior to distributing the air into the cabinet.

Maintenance

NOTE: Scheduled maintenance of transport and optional trailer is the responsibility of the buyer.

NOTE: Component parts shall only be replaced with like components. Maintenance and repair of the electrical and refrigeration systems should only be done by trained and qualified personnel. Disconnect power before performing service, certain models may contain multiple voltages. Leer does not assume responsibility for any damage to people or things deriving from violation, improper use, or in any case not in compliance with Leer's instructions.

Cleaning the Transport: The transport should be cleaned annually. In corrosive environments such as coastal regions and areas where deicing chemicals and road salts are used, more frequent cleaning is recommended.

The exterior of the transport can typically be cleaned with the use of detergents diluted in warm water followed with a tap water rinse. The exterior paint is capable of withstanding the use of polishing compounds and most solvents. If using stronger cleaning agents, they should be tested on a small, inconspicuous areas prior to application onto visible surfaces of the transport. If cleaning the interior of the transport, the use of detergents with strong odors (i.e. citrus based cleaners, abrasive cleaners containing chlorine bleach, and any form of solvent based cleaners) are not recommended. They may leave objectionable odors inside the cabinet which may be absorbed by the ice being stored in the transport.

Cleaning Door Gaskets: Door gaskets may mildew and stiffen over time. The gasket is made of a soft, flexible rubber-like material that can be cleaned using most kitchen and bath cleaners designed for mildew removal. Review manufacturer information and instructions on any cleaning agent prior to use to determine the cleaner's compatibility with the surface being cleaned.

Cleaning Condenser Coils:

It is recommended to inspect and clean the condenser coil and fan blades every 3 months. There are a variety of methods available for cleaning the condenser coils. Keep in mind that the

debris is being drawn into the coil by the condenser fan and the debris should be removed in the opposite direction.

- The simplest and preferred method would involve the use of a vacuum cleaner to suck the debris out of the coil from the outside surface.
- Another method is using compressed air to blow dust from the coil. The debris should be blown out from the inside surface of the coil.

WARNING: When using compressed air, there may be a cloud of dust released into the air surrounding the machine.

It is recommended that the service person wear proper protective equipment (i.e. safety glasses and a dust mask) when performing coil cleanings.

Note: DO NOT use any type of filter media in front of the condenser coil to trap dust. Filter testing has proven to create enough restriction of air flow to reduce the efficiency of the coil's heat exchange.

Defrosting the Transport:

The Auto Defrost Transport is designed to be self-defrosting. The heat generated by the defrost heater element will melt the ice build-up on the evaporator coil and the resulting water will drain through a tube out of the back wall of the machine.

It is recommended to check the operation and condition of the evaporator coil and for signs of excessive ice buildup every 3 months

The means and methods of the ice removal are dependent upon whether the transport is a Cold Plate model or an Auto-Defrost model.

Cold Plate Defrost Methods: The evaporator tubing for the cold plate cabinet models are located within the walls of the cabinet. After the cold plate transport is energized, a visual inspection of the cabinet's interior will reveal a serpentine frost pattern developing on the side walls. This frost pattern represents the configuration of the evaporator tubing as it's attached to the inside surface of the cabinet. As humidity enters the cabinet, it will collect and accumulate along this frost-line pattern. As the frost-line expands and builds in thickness, it will slow the heat transfer between the cabinet walls and the evaporator tubing. The cold plate cabinet models do not have the design capability to self-defrost. In order to

defrost the cold plate models, product will need to be emptied from the cabinet and the power to the cabinet disconnected. Defrosting requires the entire interior surface of the cabinet to be warmed above freezing in order to melt and remove the build-up of ice from the interior surfaces.

Power to the transport can be removed by turning off the switch at the front of the transport in the Motor Start Box. After the defrost operation is complete, return the switch to its on position to re-energize the condensing unit.

With the transport de-energized, the defrost process can be expedited with the addition of hot air being forced through the cabinet's door opening(s). As the ice build-up softens, a plastic ice scraper may be utilized to aid in the removal of ice from interior of the cabinet. If possible, avoid the use of metal ice scrapers, ice picks, or hammers as these tools may inadvertently penetrate through the wall of the cabinet, puncture the evaporator tube, and cause irreparable damage.

It is suggested that some of the time allocated to defrost the cold plate cabinet may be utilized for the cleaning of the condenser coil as well as inspecting the condition of wiring insulation, door gaskets, and hinges.

Auto-Defrost Methods: Auto-Defrost models are equipped to be self-defrosting and enter defrost mode once every four hours automatically. During the defrost cycle, the power to the refrigeration system will be automatically re-directed to the defrost circuit. This will shut down power to the condensing unit, evaporator fan motors and send power to a heat element that is attached to the surface of the evaporator coil. The heat generated by the element will melt the ice build-up on the evaporator coil and the resulting melt water will drain through a tube out of the back wall of the transport.

On outdoor cabinet models, the melt water will exit the drain tube directly to the ground.

Auto-Defrost Mechanical Timer: The AD transport may come equipped with a mechanical timer. The timer is factory set for a 15 minute defrost cycle to occur at 4-hour intervals. During its' run-cycle, the timer supplies power to the thermostat, condensing unit, and evaporator fan

motors. During the defrost cycle, the timer switches power from the run-circuit to the defrost-circuit and energizes the defrost heater. The AD mechanical timer may be manually advanced to a defrost mode by rotating the advancement knob in a clockwise direction until the defrost switch engages. The advancement knob rotates in a clockwise direction only.

The mechanical defrost circuit is equipped with a defrost termination switch and is attached to one of the evaporator coil tubes (located inside the Unit Cooler Assembly). This switch senses temperature and will cut power to the defrost heat element should the temperature at the surface of the switch reach 70° F. This switch terminates power to the heat element and will not end the timed defrost cycle. Once the unit has returned to

Warning! The defrost termination / safety switch functions as a possible fire protection device. Do not remove or by-pass the switch from the defrost circuit.

Solid Door Models and Maintenance:

Transports have a metal door that has been insulated with the same urethane foam insulation as the cabinet.

The exterior metal is painted. This paint system was designed to withstand years of outdoor exposure. For routine cleaning of the door's exterior surface, a mild detergent diluted in warm water should be adequate.

Decaling Recommendations Solid Door:

- a) Use a decal with a 2-mil cast vinyl substrate. Cast vinyl contains less memory than a calendared vinyl or a polyester substrate and will conform to the embossed surface with the least amount of stress on the decal's adhesive.
- b) The decal's adhesive should have a minimum peel-strength rating of 80 oz. /inch.
- c) Clean the surface of the door with isopropyl alcohol and either air dry or dry with a clean cloth.
- d) Heating the surface of the door immediately before applying the decal will aid the adhesive bond of the decal. Never apply a decal to a surface that is colder than 50° F.
- e) Use a soft roller or plastic squeegee to apply the decal and press it into the embossed surface of

the metal. Applying a small amount of heat to the surface of the decal will aid in this process.

Door Gaskets and Hardware: Routine inspection of the door gasket seal and the action of the door's hinges are recommended. If damage has occurred to the gasket, it may allow outside air to penetrate the cabinet and the gasket should be replaced. The upright solid door (measuring 27" x 46") utilizes the same hinge as the glass door. The slant door (measuring 27" x 27") utilizes a hinge which is not spring-loaded. Both doors have the same gasket profile, which has a barbed dart that inserts into a slot opening in the surface of the door frame. See Figure 4 for instructions on solid door gasket replacement.

Optional Trailer:

WARNING: Failure to perform these maintenance items may result in product failure causing serious injury and property damage.

- Tires: Maintain air pressure per tire sidewall stamping. Replace worn tires with same type, size, and load capacity.
- Wheels: Be sure all wheel lug nuts are tight. Keep wheel bearings lubricated.
- Lights: Inspect wires for cracks and chafing every six (6) months. Replace burned out light bulbs or broken lenses.
- Brakes: Test brake system and adjust if necessary. Clean and inspect brakes at one-year intervals.
- Coupler: Lubricate ball socket with wheel bearing grease and all moving parts each month. Replace worn parts.
- Chains: Inspect for breaks or worn links every six (6) months. Replace defective chains.

Thermometer Calibration:

NOTE: Thermometers are factory tested for accuracy. However, they may become inaccurate during shipment. The following calibration procedure is required to reset the thermometer accuracy.

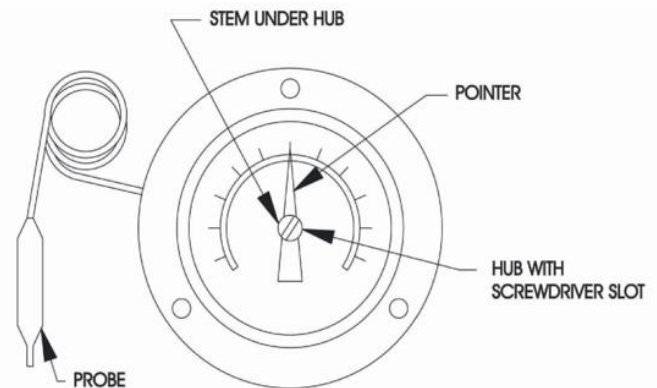
TO TEST: Fill a 24 or 32 oz. cup with ice and fill with water. Submerge probe in ice water for 30 seconds. Thermometers should read 32 degrees with a high and low tolerance of two degrees. Calibration is not required if test results are within this range.

TO RECALIBRATE: Remove lens cover with a flat head screwdriver. Slots are provided to pry cover off. The following adjustments should be made sensitive to condition of the thermometer. When adjustments are complete, replace the lens cover by pressing it back into place.

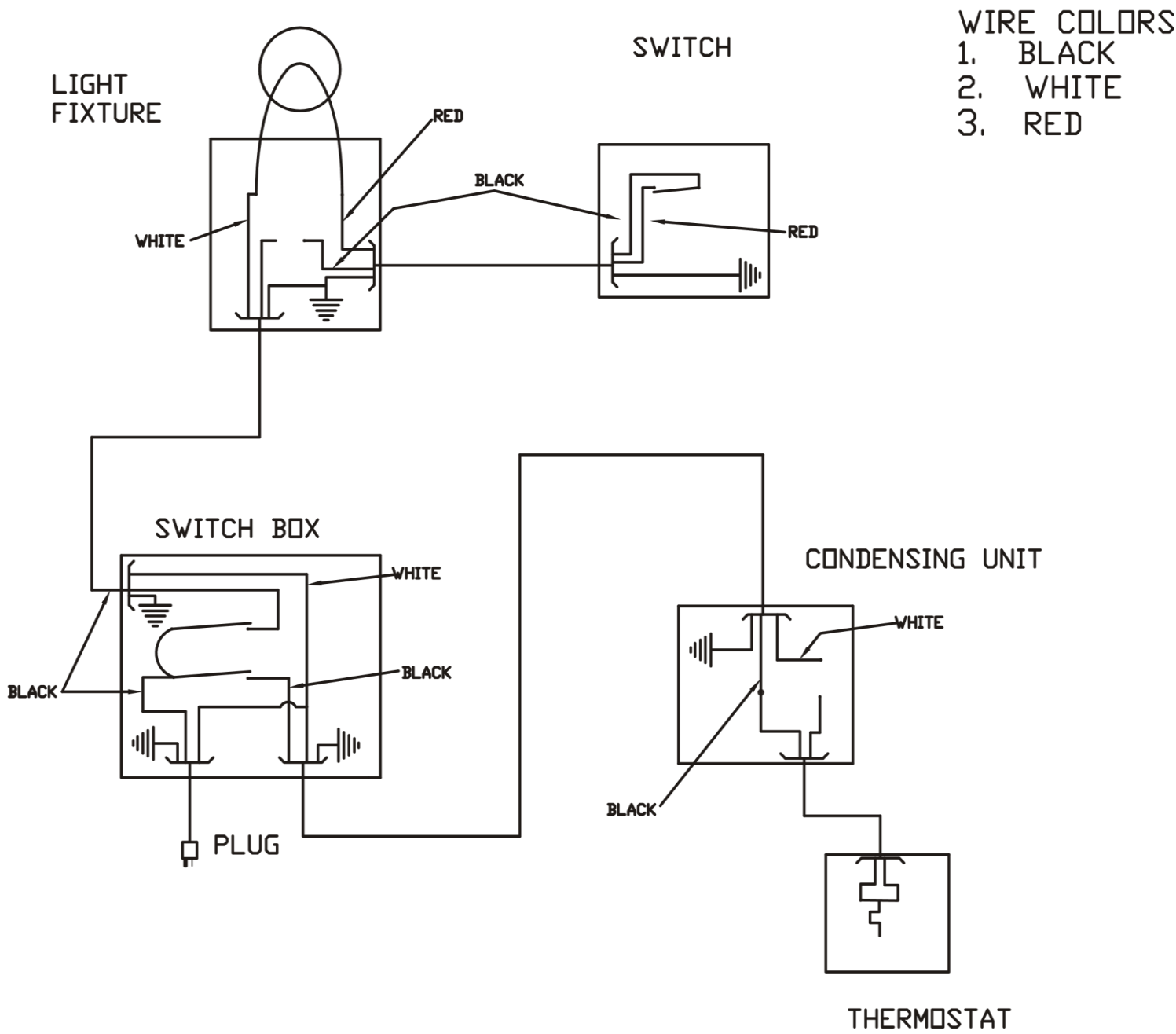
FOR LOWER TEMPERATURE: Place index finger at left side of wide end of pointer, close to the hub. Insert screwdriver in pointer slot and turn slowly clockwise. Adjust to proper setting.

FOR HIGHER TEMPERATURE: Place index finger at right side of wide end of pointer, close to the hub. Insert screwdriver in pointer slot and turn slowly counterclockwise. Adjust to proper setting.

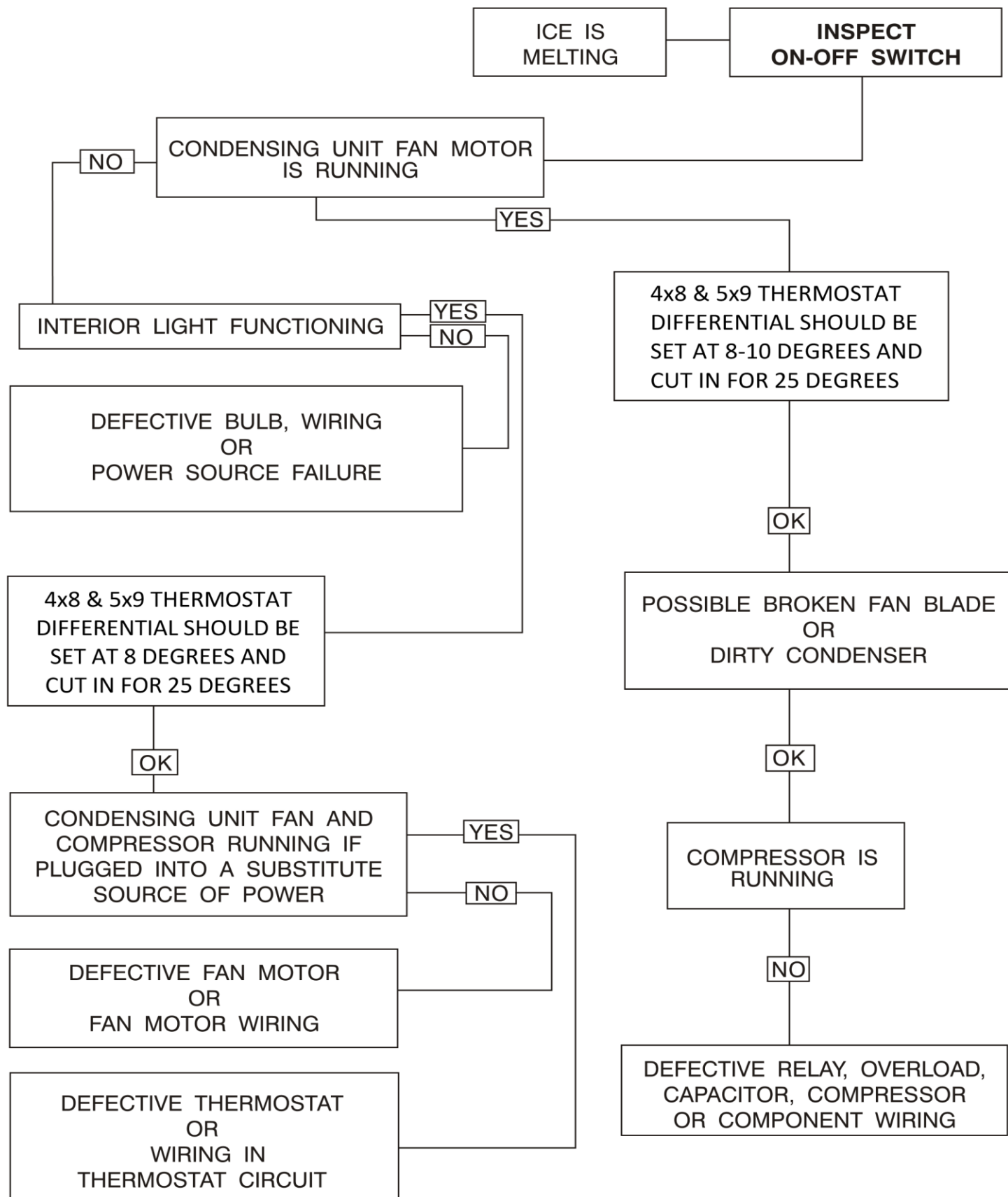
IF POINTER IS OFF STEM: Remove lens cover, place pointer on stem with tip down (6 o'clock position). Gently press pointer onto stem. Test and calibrate per above instructions. Replace lens cover.



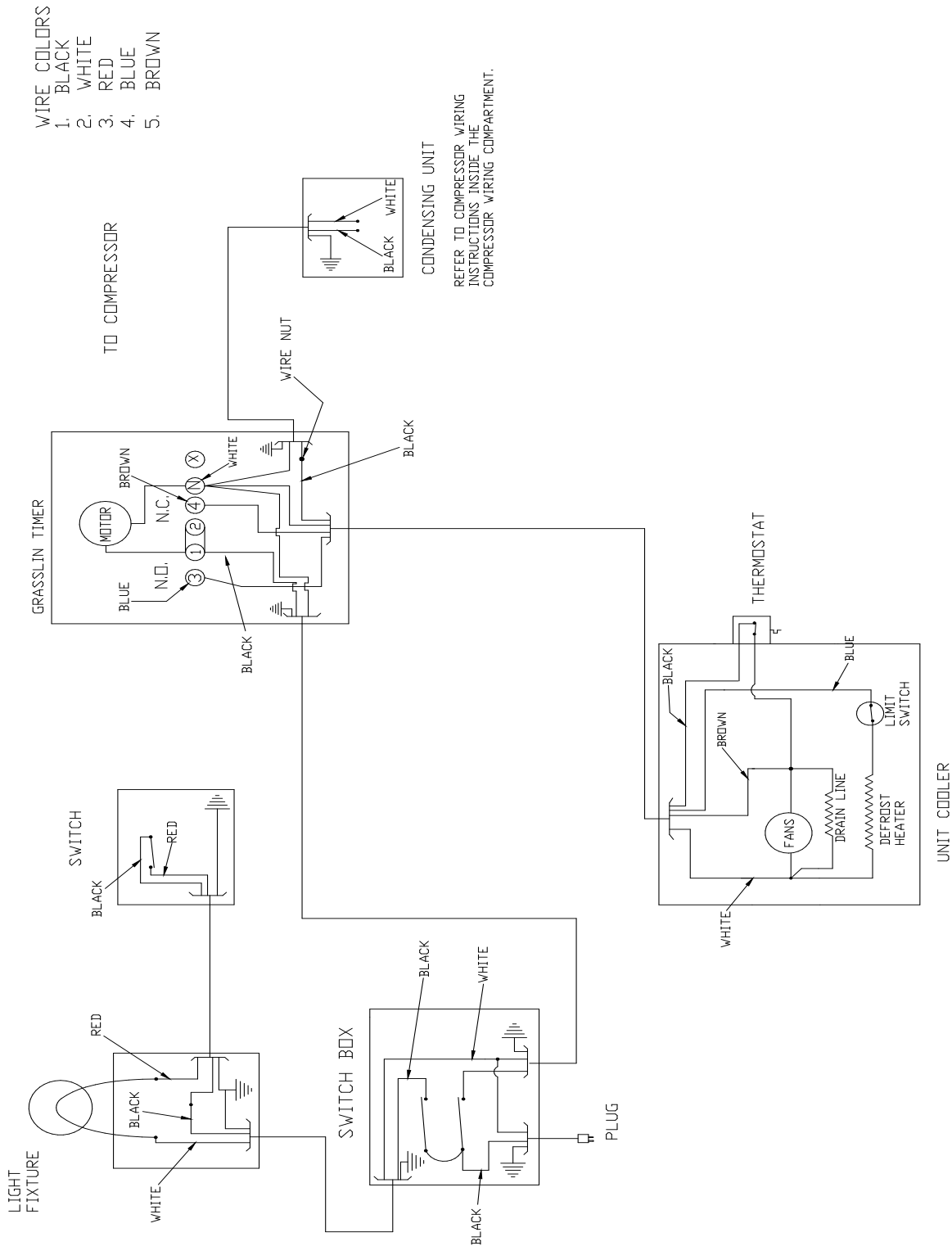
Cold Plate Wiring Diagram



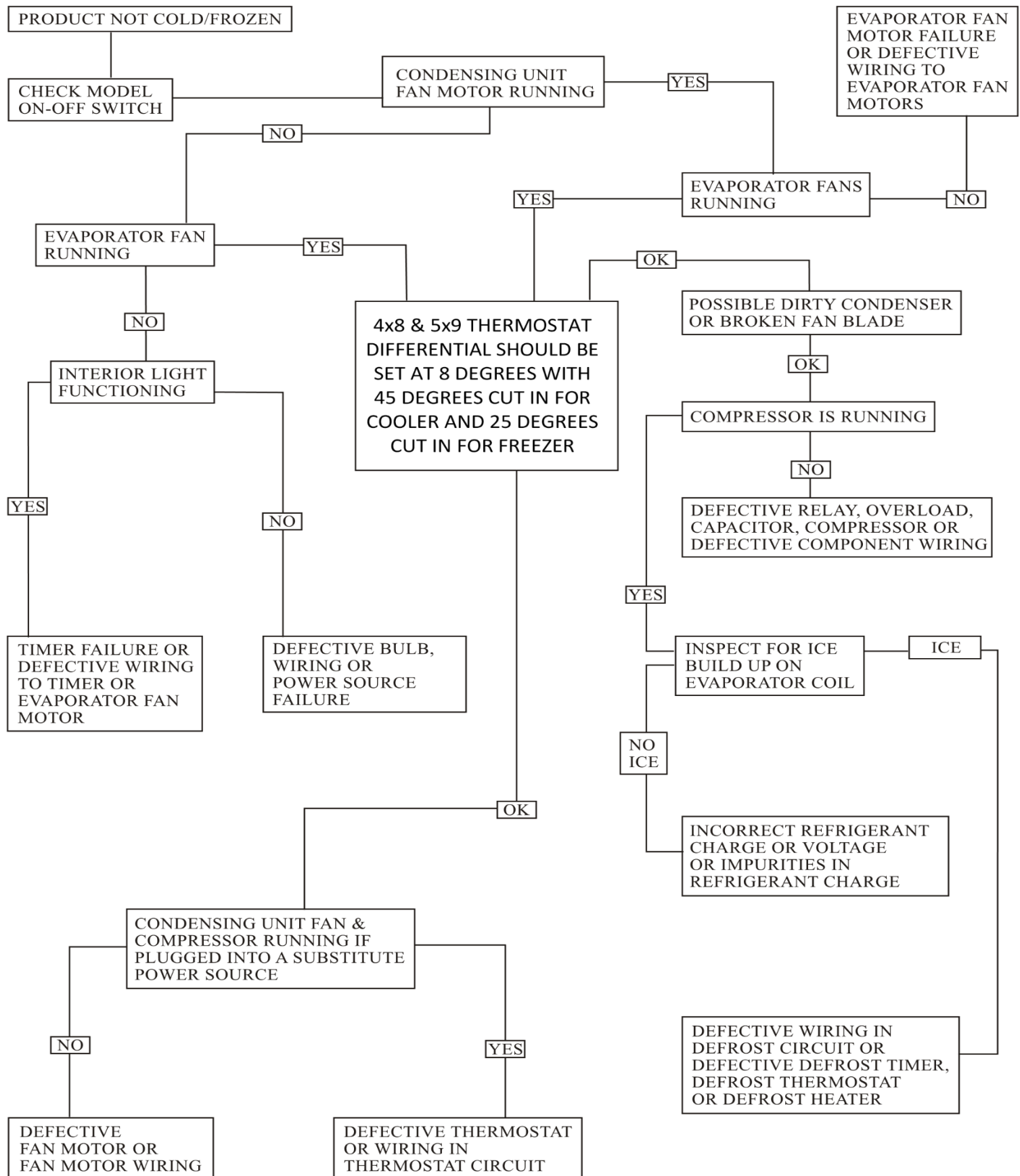
Cold Plate Troubleshooting Flowchart



Auto-Defrost Wiring Diagram



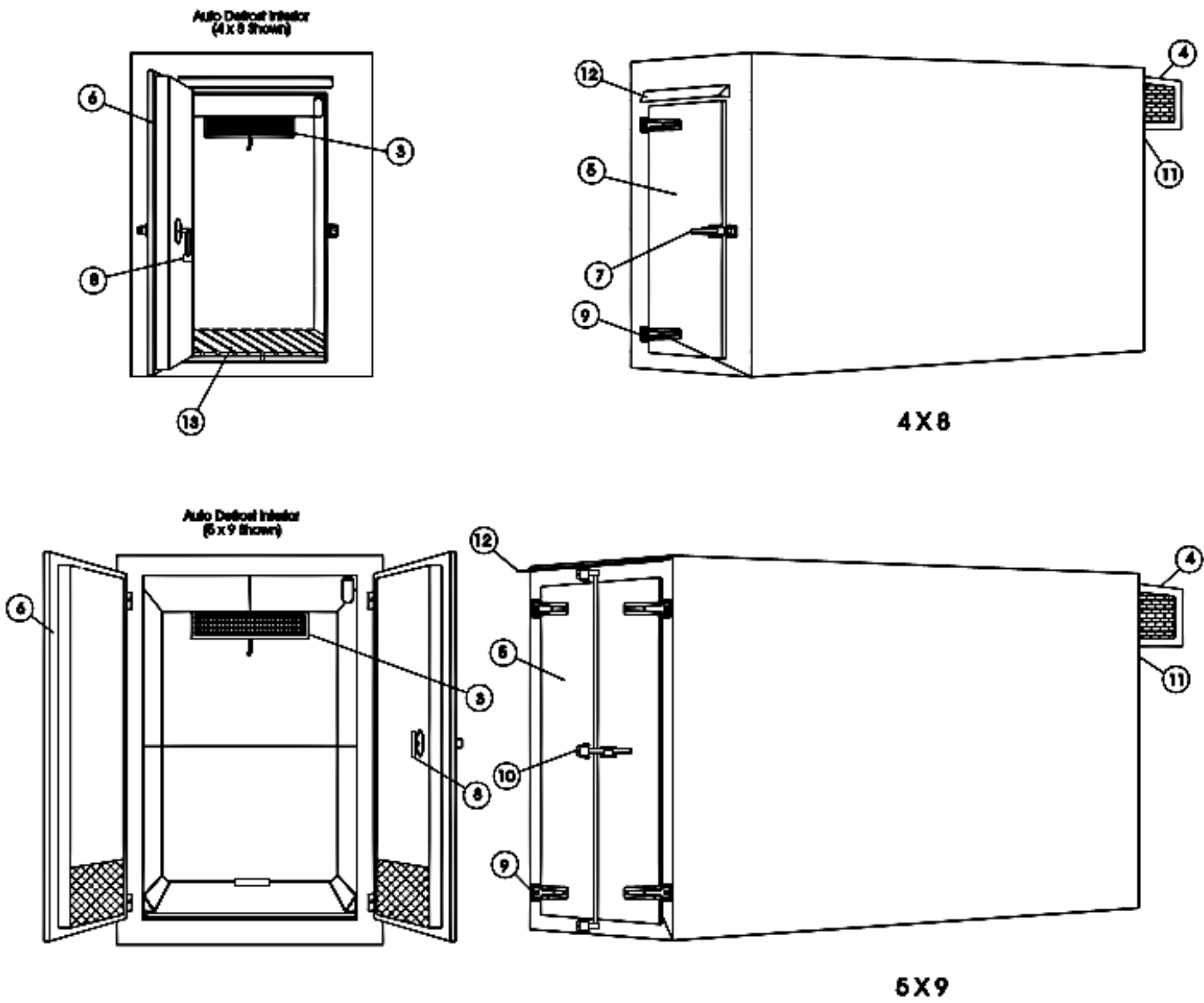
Auto-Defrost Troubleshooting Flowchart



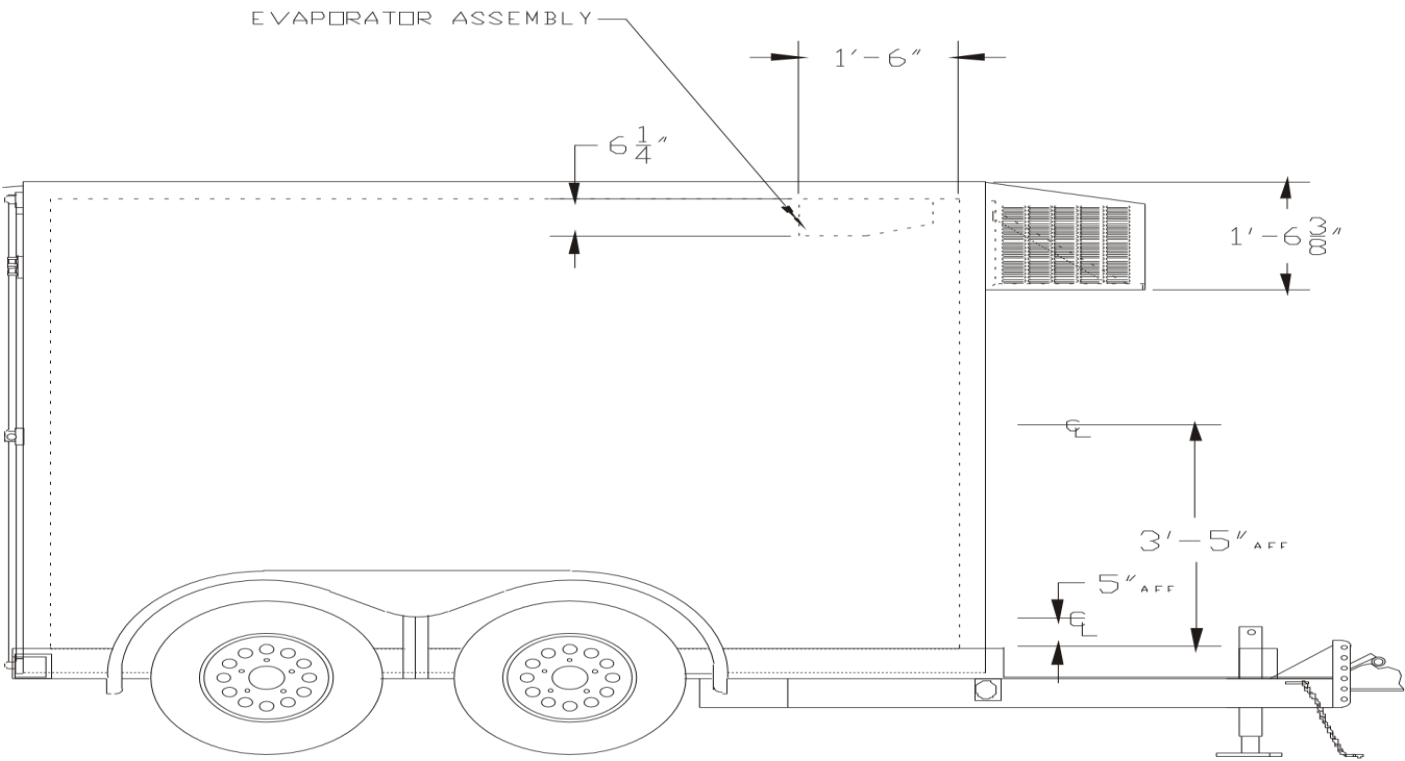
Replacement Parts

Item	Description	Part #	Item	Description	Part #
1. Refrigeration Components			6. Door Gaskets:		
Receiver Tank 5x9 AD	1390015		4x8	1030083	
Receiver Tank 4x8 AD	1390014		5x9	1030064 RH	
Drier	1323002			1030067 LH	
Crankcase Regulator 5x9 AD	1328043		7. Door Latch and Strike		
Condensing Unit (Provide condensing unit model number for parts)			4x8	1913000	
			4x8	1913002	
2. Electrical Components:			8. Safety Release		
Timer 4x8, 5x9	1328015		4x8	1916017	
Thermostat 4x8, 5x9	1328018		9. Door Hinge		
Light Fixture	1213016		4x8, 5x9	1911018 RH	
Lighted Switch	1213142			1911008 LH	
Switch Cover	1213147		10. Door Latch 5x9-3 PT with Safety Release	1913024	
Main Power Switch	1213035		11. Thermometer	1951010	
Switch Cover Lanyard	1067008		12. Rainshield:		
Lanyard Spring Snap	1067009		4x8	5120098	
Cord/Plug 20 ft.	5225008		5x9	5120078	
3. Evaporator Parts:			13. Duckboard		
Fan Guard	1396023		4x8	5629005	
Fan Blade	1392008		14. Standard "ICE" Decals (One Set):		
Fan Mounting Bracket	1101401		4x8, 5x9	1071067	
Fan Motor	1393029				
Defrost Heater 4x8 & 5x9	1261009		Note: This parts list is representative of standard ice storage models. Parts may differ for optional cooler or sub-zero temperature applications.		
Defrost Termination Switch	1328003				
Drain Line Heater	1262007				
Evaporator Coil 4x8 & 5x9	1315006				
Expansion Valve 5x9 AD-R404a	1321059		Note: Provide Leer Transport Model number and Serial Number for faster processing of parts orders.		
Expansion valve 4x8 AD-R404a	1321058				
4. Compressor Cover Assembly			Ship only unauthorized return of products or parts to this address:		
4x8, 5x9	5849025		Leer, Inc.		
5. Replacement doors (Please request assistance from Leer			206 Leer Street		
			New Lisbon, WI 53950		

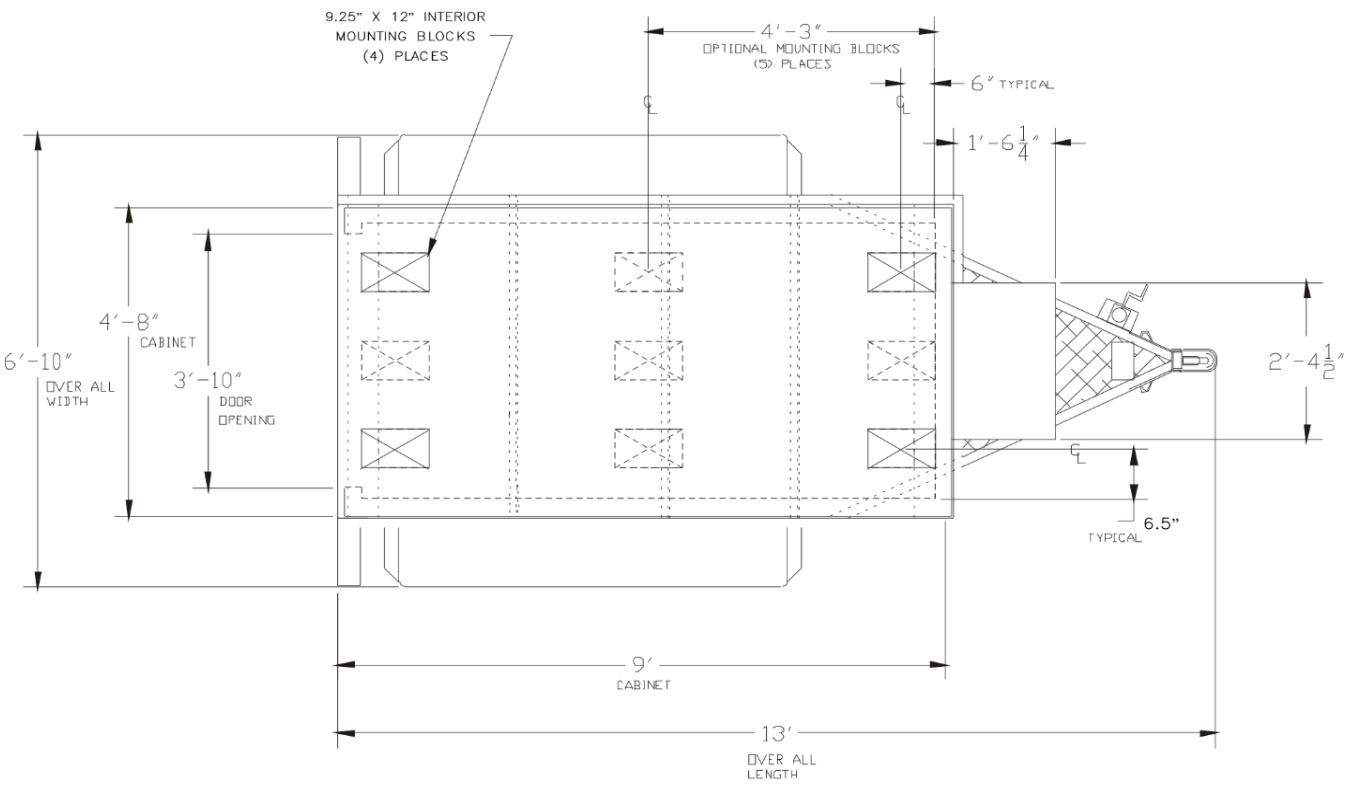
Available Models



Optional Trailer Illustrations

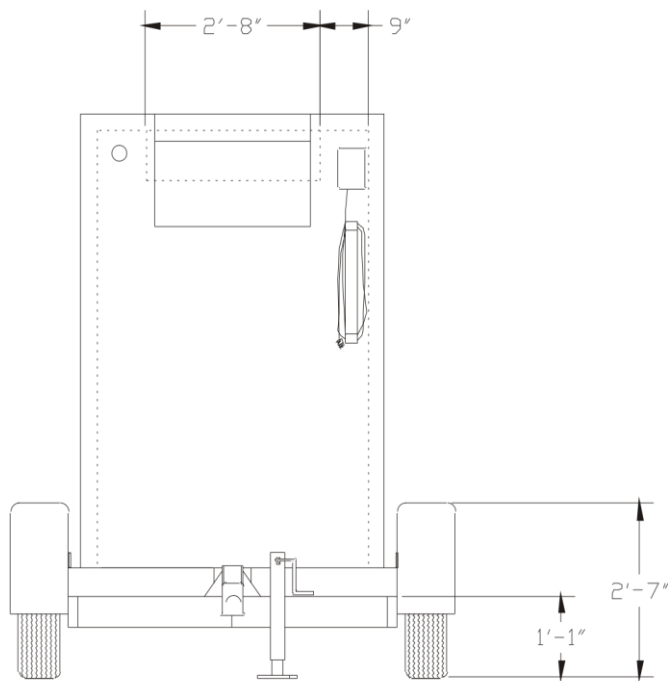


SIDE VIEW

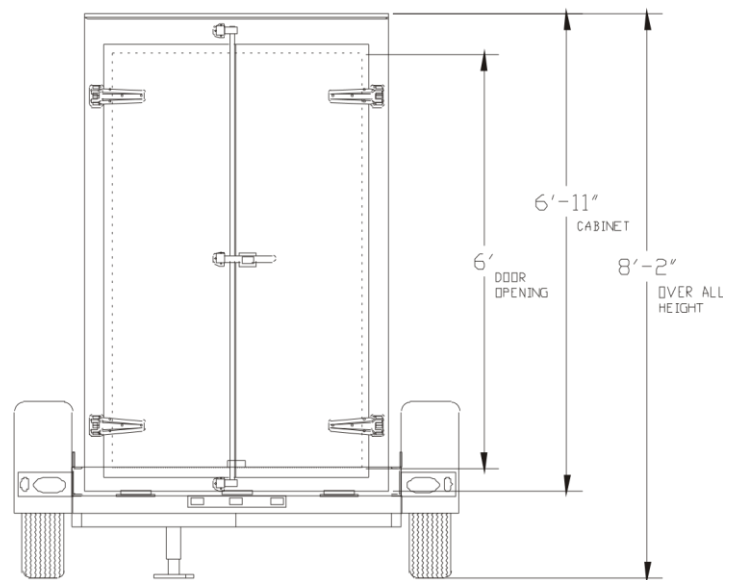


TOP VIEW

Optional Trailer Illustrations (Cont.) and Information



FRONT VIEW



REAR VIEW

WARNING: Buyer is responsible for the following items before driving tow vehicle and trailer with transport. Failure to verify these items may result in product failure causing serious injury and property damage.

- Inspect all transport floor bolts for tightness.
- Inspect all trailer wheel lug nuts for tightness.
- Inspect trailer tires for proper inflation per stamped tire pressure.
- Test trailer electric brakes and lights for designed operation.
- Be sure coupler and hitch ball are level and coupling secured.
- Be sure trailer jack is raised and locked in place.
- Be sure safety chains are crossed under trailer tongue, do not touch road, and are attached to tow vehicle hitch.
- Be sure trailer load distribution is properly balanced, secured, and will not exceed the Gross Vehicle Weight Rating (GVWR).

WARNING: Do not add accessories or components that are not safe and approved for transport or trailer. Buyer is responsible for modification that may result in product failure causing serious injury and property damage.

Modifications may affect weight specifications and/or distribution and can adversely affect handling and stability of trailer. Seller does not provide warranty coverage for equipment installed by buyer for such modifications or additions.

Tow Vehicle, Hitching, and Towing Information

Tow Vehicle:

WARNING: The buyer is responsible for the safety and maintenance of the tow vehicle and compatibility to trailer. Failure to follow this information may result in tow vehicle and trailer causing serious injury and property damage.

Be sure tow vehicle is mechanically sound for the intended usage and pay particular attention to suspension components, brakes, tires, and tire pressure. Know loaded hitch weight and select a hitch that is adequate for that weight. Hitch ball must be the same size as trailer coupler. Hitch ball and trailer coupler must be same size as trailer coupler. Hitch ball and trailer coupler must be same distance to the ground so completed coupling is level. Consult hitch and tow vehicle manufacturer with any questions before towing trailer. Do not exceed the tow or cargo capacity of tow vehicle and remember that the gross combined vehicle weight rating (GCVWR) relates to towing capacity and does not necessarily indicate braking capacity. The owner must clearly understand how their particular tow vehicle capacities are calculated.

Hitching:

1. Block trailer wheels.
2. Turn crank on stabilizer jack to raise coupler above the hitch ball.
3. Open coupler latch.
4. Back tow vehicle hitch below coupler.
5. Turn crank on jack to lower coupler onto hitch ball.
6. Close coupler latch.
7. Raise stabilizer jack to its retracted position.
8. Criss-cross safety chains below coupler and attach ends to hitch.
9. Plug 12-volt electrical connector from tow vehicle to trailer.
10. Remove trailer wheel blocks.

Towing:

1. **WARNING: Never allow anyone to ride on trailer. Failure to comply may result in serious injury.**
2. Decrease speed for safety. Most states require vehicles to maintain slower speeds, usually the same as truck traffic.
3. When being passed by a large truck or bus, be prepared for displaced air as it may cause the trailer to sway slightly. Steer straight and use trailer brakes if necessary, to slow or control the trailer sway.
4. Be aware of the extra weight behind vehicle. Acceleration will be slower, and more distance is required for stopping.
5. Drive slowly during wet and icy conditions to ensure better control of vehicle.
6. Avoid sudden stops that can cause jack-knifing.
7. When climbing steep long grades, and when descending, use lower gears. Use brakes smoothly and evenly.
8. Ensure enough turning area at corners as wider turns are necessary.
9. When passing or changing lanes, consider the overall length of vehicle and trailer to allow ample time and distance.
10. Use rearview mirrors frequently to observe trailer and traffic conditions.

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Warranty

Ice Transports & Truck Bodies: Seller warrants the transport under normal use and service, for one (1) year for the component parts (to be shipped by seller), and ninety (90) days for repair labor from the date of original shipment. The transport compressor motor is warranted for five (5) years from the date of original shipment. SELLER MUST BE CONTACTED AND PROVIDED TRANSPORT SERIAL NUMBER FOR WARRANTY CLAIM. This applies only to goods installed in the United States, Canada or Mexico. Seller's obligation under this warranty shall be limited to repair (subject to the limitations below) or replacement of any part(s), F.O.B. Seller's factory, which prove(s) defective within the applicable warranty period. Seller reserves the right to inspect defective part(s) and may at Seller's discretion require return of part(s) to Seller's factory for inspection. The determination as to whether any defect exists shall be made in Seller's sole judgement.

GENERAL PROVISIONS APPLICABLE TO ALL WARRANTIES AND PRODUCTS: Seller shall not be liable for any breach of any express warranty set forth above unless Seller is informed immediately upon the discovery of defective part(s). The warranties described above are not assignable and shall operate only in favor of the original buyer/user. In event of any claim for breach of express warranty, Seller shall be responsible for labor charges for repair or replacement of any defective part(s) or assembly only for defects reported to Seller within ninety (90) days after the date of installation. ALL LABOR CHARGES SHALL BE AUTHORIZED OR APPROVED BY SELLER PRIOR TO THE REPAIR OR REPLACEMENT OF PART(S). In all other events, Seller shall not be responsible for any labor charges. Labor charges shall only include standard straight time labor hours at the site of product installation, and shall exclude charges for travel time, mileage, or other premium charges. These warranties shall not apply to any goods, or any part thereof, which may have been subject to any damage in transit, accident, negligence, abuse or misuse, unauthorized alteration or repair, acts of nature or failure to follow any of the Seller's manuals or instructions, if in Seller's sole judgement, such act, omission or event has detrimentally affected the physical condition, use or operating qualities of the product.

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, BY REASON OF LAW, STATUTE OR OTHERWISE, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE, AND ALL IMPLIED WARRANTIES ARE HEREBY DISCLAIMED. SELLER SHALL NOT BE LIABLE FOR LOSS OF GOODS, MERCHANDISE OR OTHER PROPERTY, OR LOSS OF PROFITS, RESULTING FROM PRODUCT DEFECTS. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CIRCUMSTANCES FOR ANY BREACH OF CONTRACT OR FOR ANY OTHER CLAIM BY BUYER AGAINST SELLER EXCEED THE CONTRACT PRICE OF THE GOODS SOLD HEREUNDER WITH RESPECT TO WHICH SUCH CLAIM ARISES.

MODEL NO. _____

SERIAL NO. _____