



THERMO KING

Installation Manual

B-100 Model 50 MAX

(Revision A)

August 2020

TK-56876-18-IM-EN

TRANE
TECHNOLOGIES

Introduction

This manual was written to assist with the general installation of Thermo King® components onto trucks designed and built for refrigerated applications. The **Thermo King Installation Standards and Procedures Guide** (TK 56430) provides more detailed information that must be followed to safely and properly complete the entire installation.

Due to its complexity, you should not attempt this installation unless you:

- Are an experienced mechanic.
- Can safely lift 34 kg (75 lbs.).
- In the U.S., EPA 608 certified and trained in the repair and maintenance of transport refrigeration systems.
- Have a basic understanding of electricity and electrical wiring.
- Have the necessary tools and equipment to complete the installation.
- Have a truck body designed and built to meet the requirements of this installation.

This manual is published for informational purposes only. Thermo King makes no representations warranties express or implied, with respect to the information recommendations and descriptions contained herein. Information provided should not be regarded as all-inclusive or covering all contingencies. If further information is required, Thermo King Corporation Service Department should be consulted.

Thermo King's warranty shall not apply to any equipment which has been "so installed, maintained, repaired or altered as, in the manufacturer's judgment, to affect its integrity."

Manufacturer shall have no liability to any person or entity for any personal injury, property damage or any other direct, indirect, special, or consequential damages whatsoever, arising out of the use of this manual or any information, recommendations or descriptions contained herein. The procedures described herein should only be undertaken by suitably qualified personnel. Failure to implement these procedures correctly may cause damage to the Thermo King unit or other property or personal injury.

Revision History

Revision A (08/20) Released new manual

Customer Satisfaction Survey

Let your voice be heard!

Your feedback will help improve our manuals. The survey is accessible through any internet-connected device with a web browser.

Scan the Quick Response (QR) code or click [Technical Publications TK Americas Feedback](#) to complete the survey.



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Safety Precautions

Danger, Warning, Caution, and Notice

Thermo King® recommends that all service be performed by a Thermo King dealer and to be aware of several general safety practices.

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this unit depend upon the strict observance of these precautions. The four types of advisories are defined as follows:

⚠ DANGER

Hazard!

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Hazard!

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Hazard!

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury and unsafe practices.

NOTICE

Hazard!

Indicates a situation that could result in equipment or property-damage only accidents.

Safety Precautions

Important: Additional Safety Precautions must be followed when installing this unit. See "Section 2 - Safety Precautions" in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430).

⚠ CAUTION

Risk of Injury!

Thermo King condenser units and remote evaporators are shipped with a 35 kPa (5 psi) holding charge of Helium. Be careful when removing cap. This holding charge may be safely vented into the atmosphere.

Recover Refrigerant

At Thermo King®, we recognize the need to preserve the environment and limit the potential harm to the ozone layer that can result from allowing refrigerant to escape into the atmosphere.

We strictly adhere to a policy that promotes the recovery and limits the loss of refrigerant into the atmosphere.

When working on transport temperature control systems, a recovery process that prevents or minimizes refrigerant loss to the atmosphere is required by law. In addition, service personnel must be aware of the appropriate European Union, National, Federal, State, and/or Local regulations governing the use of refrigerants and certification of technicians. For additional information on regulations and technician programs, contact your local THERMO KING dealer.

Service Tools - Use the proper service tools. Gauge manifold sets should include appropriate shutoff valves or disconnects near the end of each service line.

Recovery Equipment - Recovery equipment must be used. Proper recovering, storing and recycling of refrigerants is an important part of all service work.



THERMO KING

Safety Precautions

Service Procedures - Recommended procedures must be used to minimize refrigerant loss.

Components may be isolated by closing service valves and performing system pump-downs.

Components unable to be isolated for service must be repaired only after refrigerant is properly recovered.

Required Tools

Overview

While basic mechanics tools and refrigeration service equipment are a necessity, there are also special tools that are required when installing Thermo King Vehicle Powered Truck Units. Using these tools will assure the installation is done correctly. Many of these are available from Thermo King.



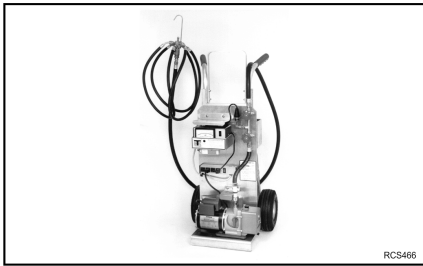
Hose Cutting Tool
(204-677)



#4 - #12 Hose Fitting Tool
(204-1045)



#16 Hose Fitting Tool
(2041128)



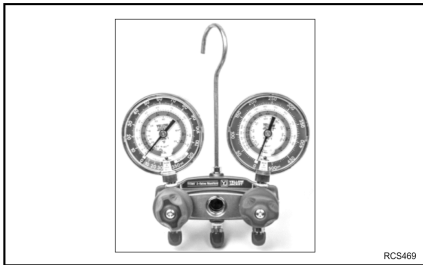
Evacuation Station
(204-725)



Leak Detection Probe
(2040888)



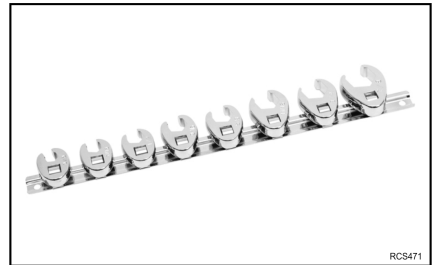
Solenoid Valve Magnet
(204-1074)



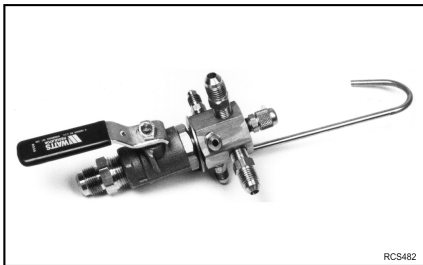
Gauge Manifold Set
(204-1925)



Torque Wrench



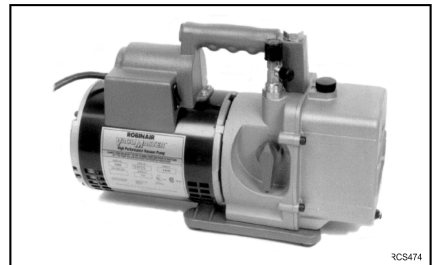
Crows Foot Wrenches



Manifold Assembly*
(2040732)



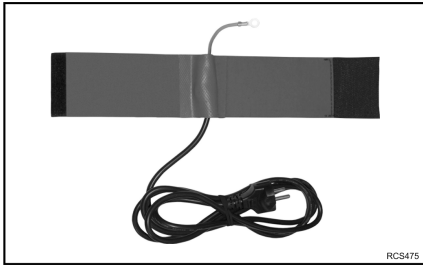
Micron Gauge*



Vacuum Pump*
(204713)

*These are included with the Evacuation Station 204-725.

Required Tools



**Heating Blanket
for 30/50 lb. Tanks
(204077)**

RCS475



**TK 2000 Assembly Kit
(2041044)**

RCS476



**Digital Voltage Meter
(2041079)**

RCS477



**Controller DSR
Communication Tool
(2041126)**

RCS478



**Serial Adapter
(2041151)**

RCS479



**USB Serial Adapter
(420575)**

RCS480



**WinTrac Software
(latest version must always be used)**

RCS481-1



**Scale
(204760)**

RCS472

Unpacking and Inspecting the Unit

Unpacking the Unit

1. Open the packaging.
2. Find the unit documentation.
3. Verify that the packaging contains all the accessories indicated on the list attached with the documentation.
4. Check that the hose length is correct before starting the installation. Checking can be carried out by consulting the "Packing List" included with the unit documentation.

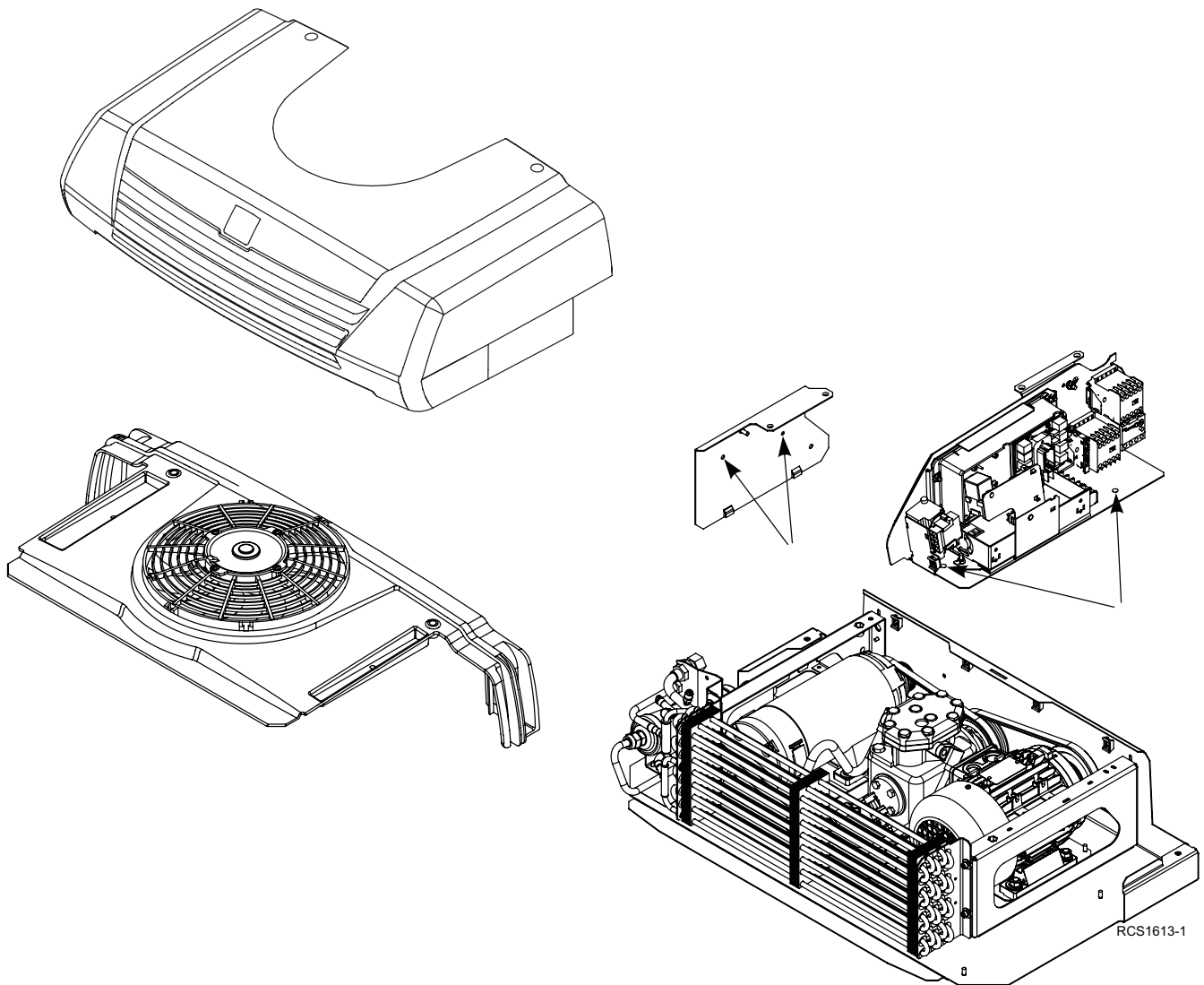
Inspecting the Unit

1. Open the condenser unit cover and ensure the following:
 - Neither the cover nor the unit should show any shock damage or imperfections.
 - The condenser unit should be charged with helium gas.
 - The voltage of all the electrical components is correct (12/24V).
2. Open the evaporator unit cover and make the following checks:
 - Neither the cover nor the unit should show any shock damage or imperfections.
 - The evaporator unit should be charged with helium gas.
 - The voltage of all the electrical components is correct (12/24V).

Preparing Condenser for Installation

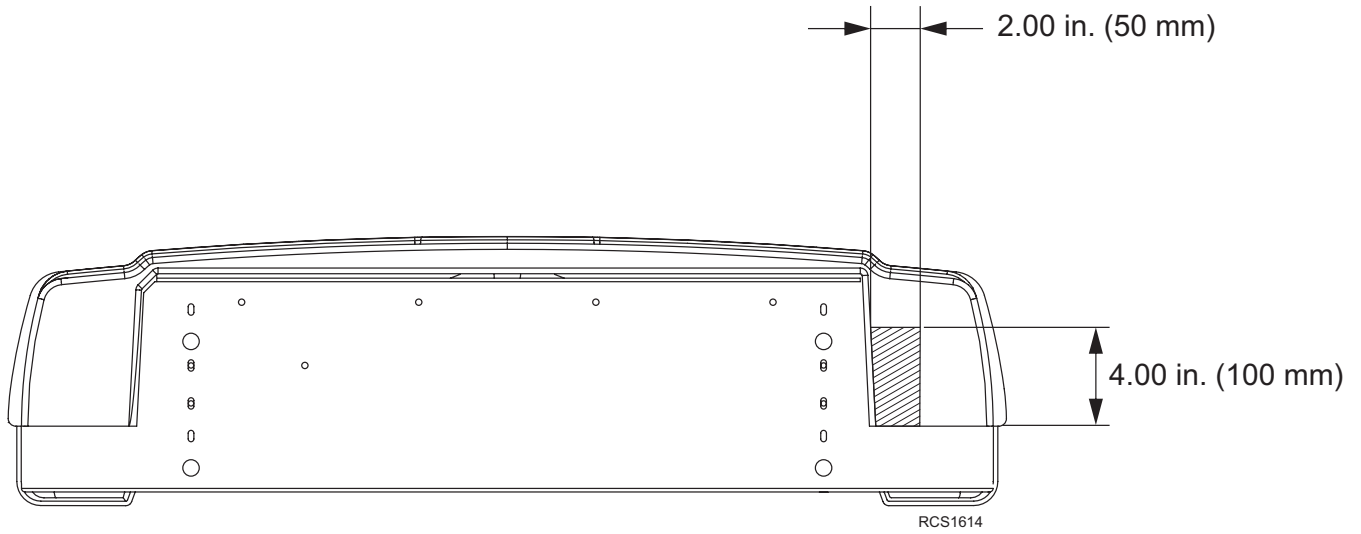
1. Remove the following components to access the condenser mounting holes:
 - a. **Condenser Cover** – Remove screws securing condenser cover to fan housing and condenser frame.
 - b. **Fan Housing** – Remove screws securing fan housing to condenser frame.
 - c. **Support Plate** – Remove two screws securing support plate to condenser frame.
 - d. **Control Box** – Remove two nuts securing control box to condenser frame.

Figure 1. Component removal shown



Note: *Nose Mount Installations Only – Trim condenser cover as shown to allow clearance for the refrigeration hoses and electrical harnesses.*

Figure 2. Trim area shown



Installing the Condenser

Roof Mounted

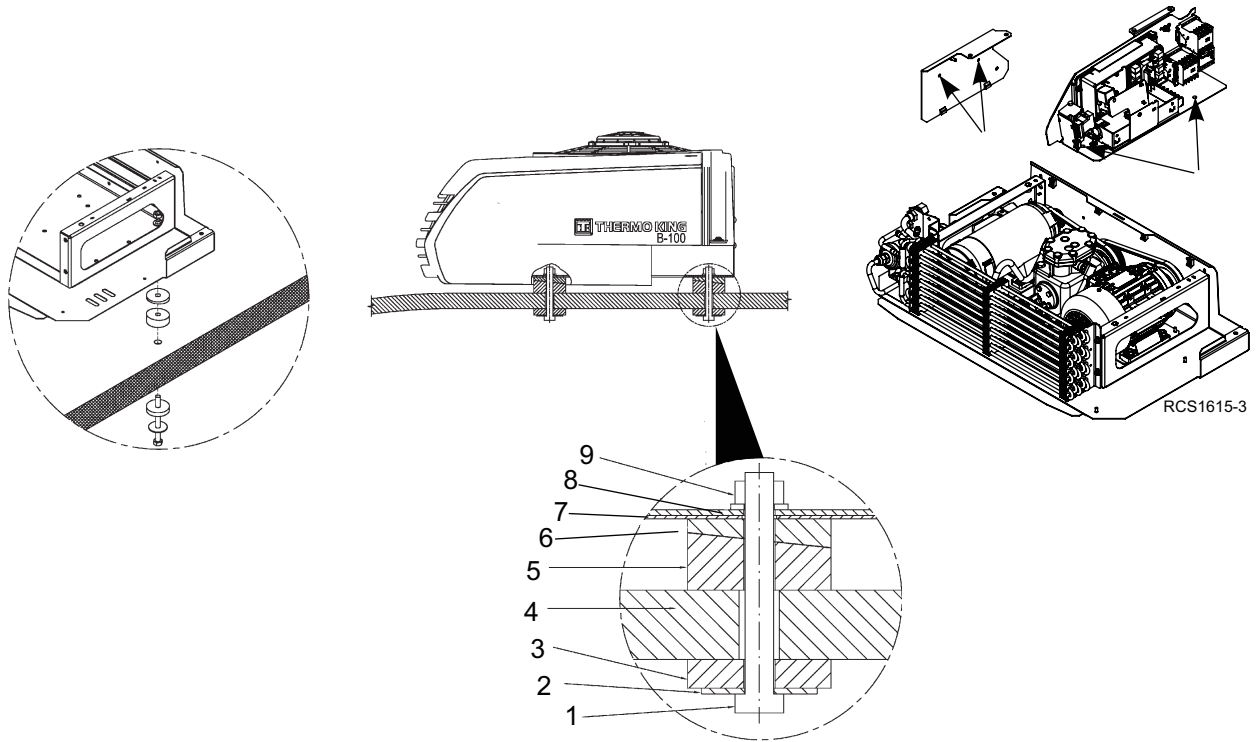
Important: See Section 4 - Unit Installation Standards and Procedures in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). THESE PROCEDURES MUST BE FOLLOWED!

1. Position condenser onto roof and install mounting hardware as shown.
 - a. Rotate rubber compensation washers until condenser is level.
 - b. Tighten hardware to 7 ft-lbs (10 N•m).
2. Reinstall control box and condenser support plate.

Note: Condenser cover and fan shown installed for illustration purposes only and will be reinstalled later.

3. Route electrical harnesses through access hole in condenser frame and into cargo area.

Figure 3. Typical roof mounted installation shown



1.	Bolt, M10
2.	Washer, large metal M10
3.	Washer, flat rubber
4.	Vehicle roof
5.	Washer, large rubber (with incline)
6.	Washer, small rubber (compensation)
7.	B-100 Condenser frame
8.	Washer, split lock M10
9.	Nut, M10

Nose Mounted

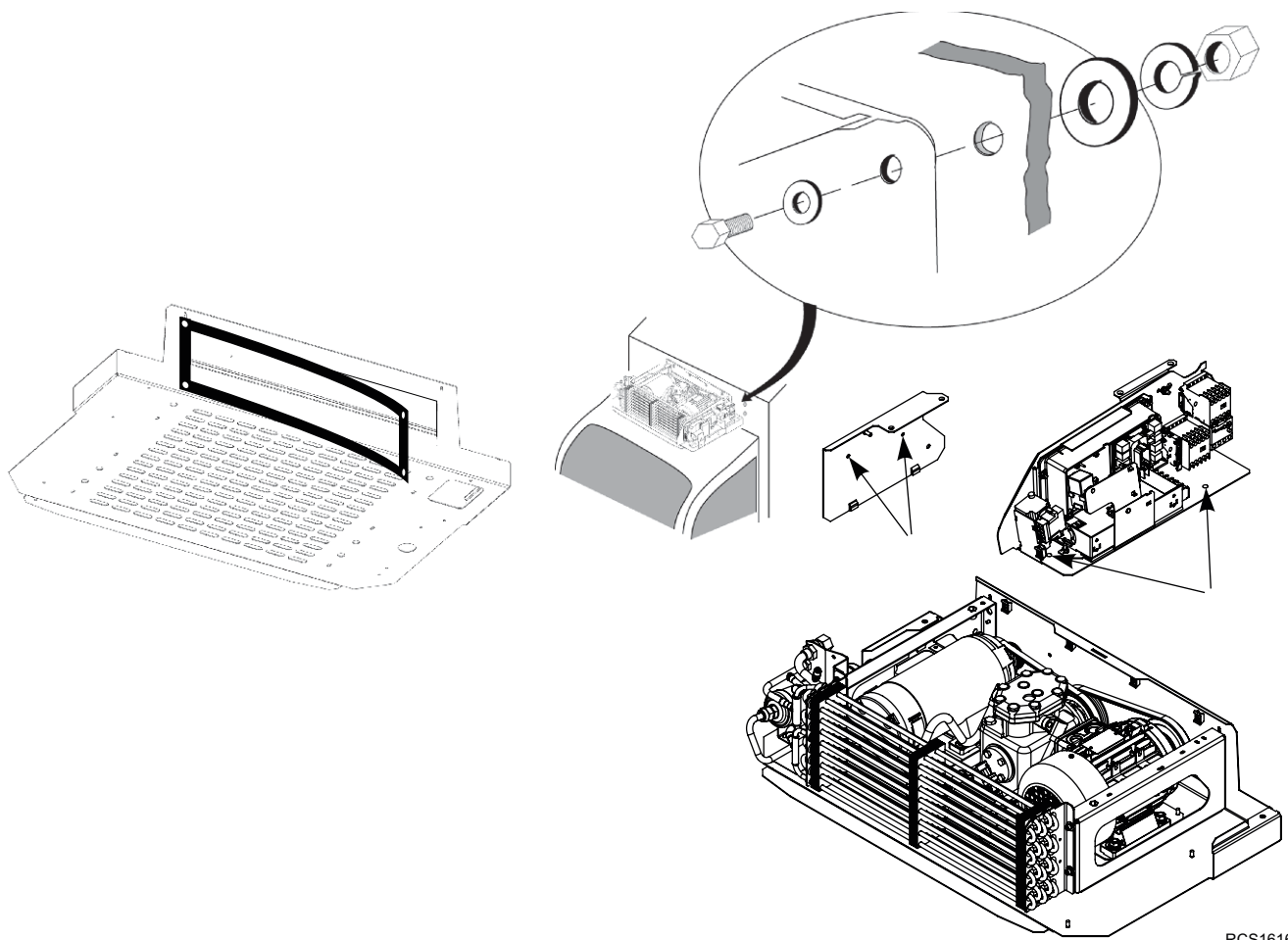
Important: See Section 4 - Unit Installation Standards and Procedures in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). THESE PROCEDURES MUST BE FOLLOWED!

1. Attach supplied foam insulation to rear of condenser as shown.
2. Position condenser onto nose of cargo box and install mounting hardware as shown.
 - a. Tighten hardware to 26.5 ft-lb. (36 N•m).
3. Reinstall control box and condenser support plate.

Note: Condenser cover and fan shown installed for illustration purposes only. These components will be reinstalled later.

4. Route electrical harnesses through access hole in condenser frame and into cargo area.

Figure 4. Typical nose mounted installation shown



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Installing the Evaporator

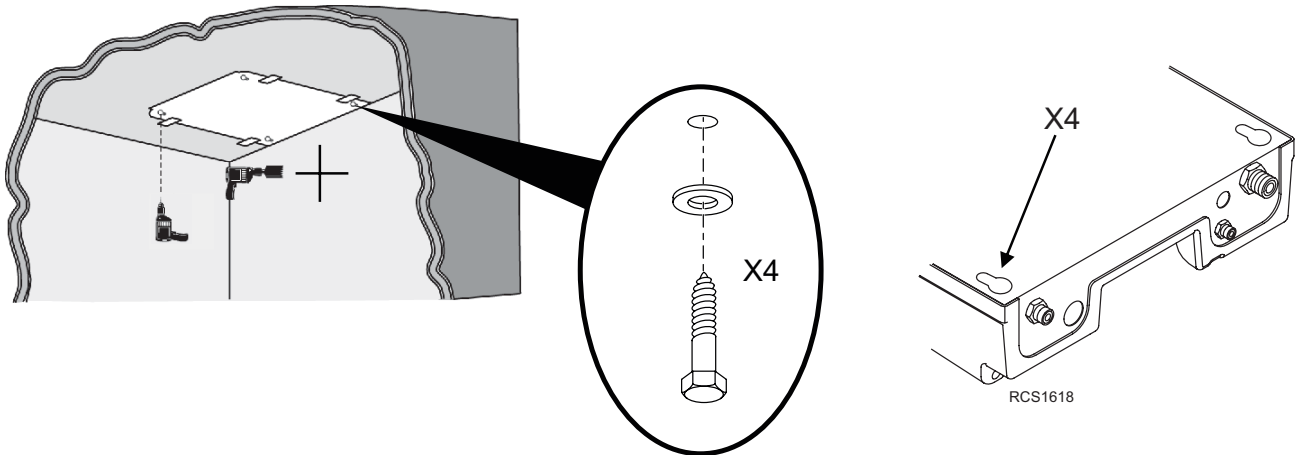
Important: See Section 4 - Unit Installation Standards and Procedures in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). **THESE PROCEDURES MUST BE FOLLOWED!**

1. Remove screws securing evaporator cover to evaporator frame and remove cover.

Note: Follow instruction on template to install evaporator on vehicle's ceiling and to drill access hole for refrigerant hoses and electrical wiring. Check for interference with vehicle electrical wires, etc. before drilling holes.

2. Drill access hole for refrigerant hoses and electrical wiring.
3. Mark mounting locations and drill pilot holes in ceiling.
 - a. Loosely install supplied lag bolts and washers into ceiling pilot holes.
 - b. Tighten bolts until approximately 0.50 in. (6 mm) protrudes from ceiling.
4. Position the evaporator's keyhole mounting holes onto the lag bolts in the ceiling.
 - a. Slide evaporator so bolts fit into keyhole slots and tighten screws securely.

Figure 5. Typical ceiling mounted evaporator shown

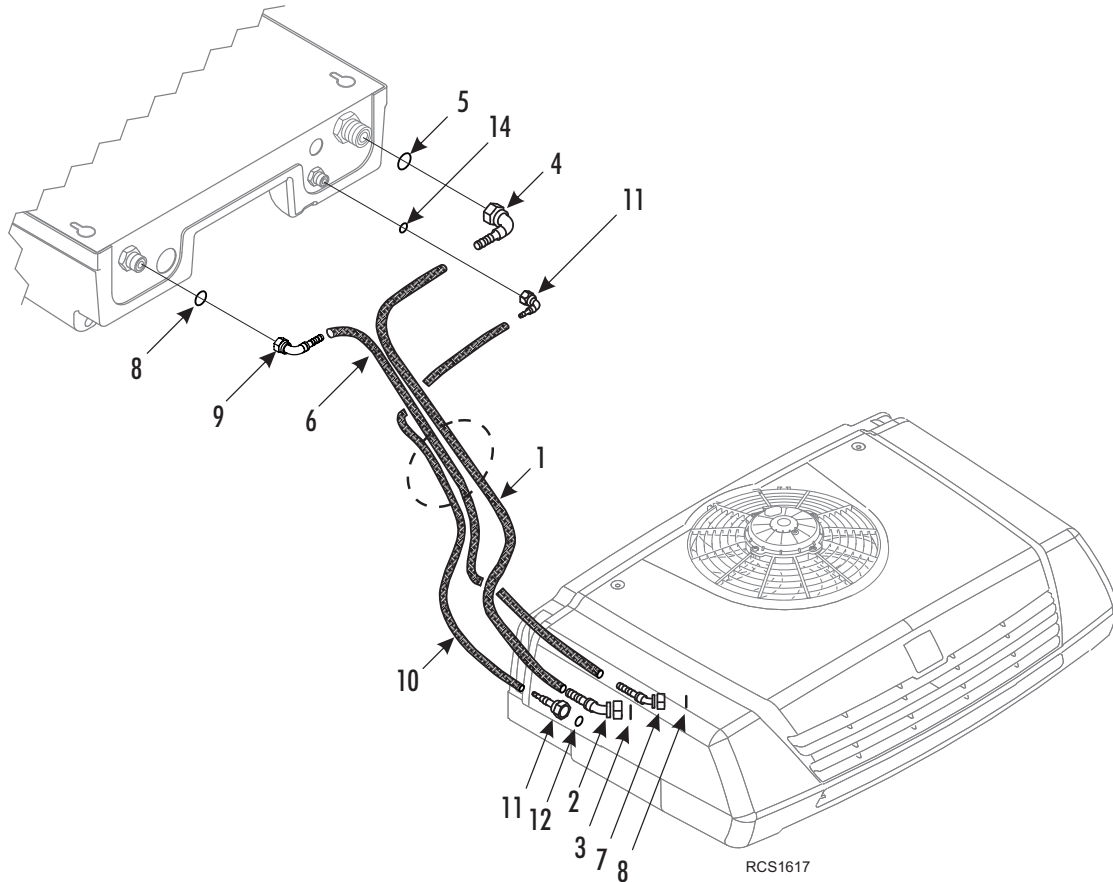


Installing the Refrigeration Hoses

Important: See Section 6 - Refrigerant Hose and Fittings Standards in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). **THESE PROCEDURES MUST BE FOLLOWED!**

1. Fabricate refrigeration hoses and make the connections as shown.

Figure 6. Typical refrigeration hose installation shown



1.	Suction Hose (#8)	7.	45° Fitting (#6 hose to #6 ORS)
2.	90° Fitting (#8 hose to #8 ORS))	8.	O-ring (#6)
3.	O-ring (#8)	9.	90° Fitting (#6 hose to #6 ORS)
4.	90° Fitting (#8 hose to #10 ORS)	10.	Hot Gas Hose (#4)
5.	O-ring (#10)	11.	Straight Fitting (#4 hose to #6 ORS)
6.	Hot Gas Hose (#6)	12.	O-ring (#4)

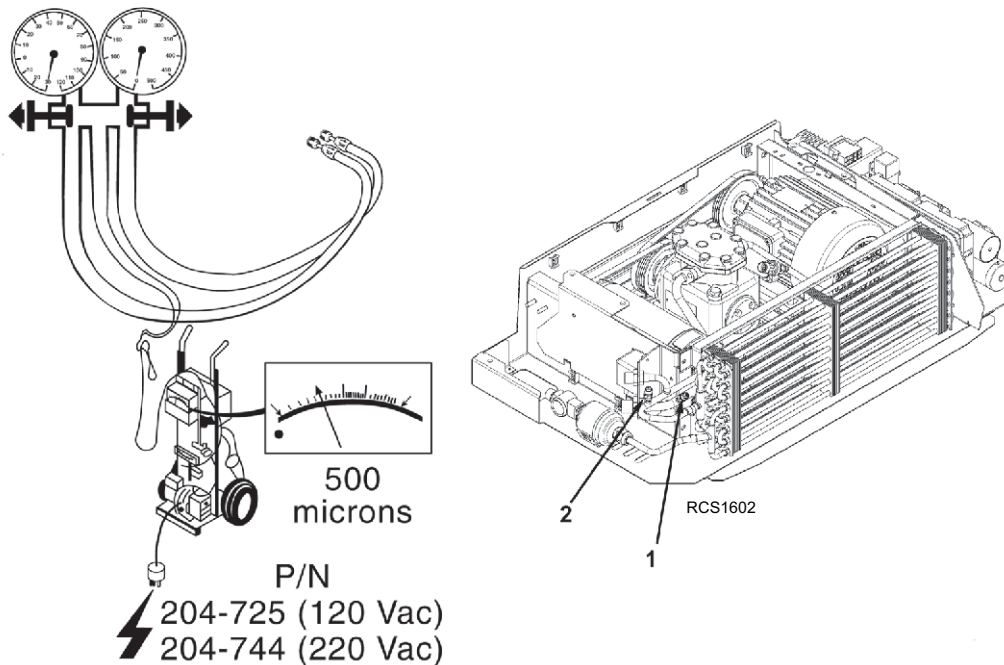
Leak Checking the System

Circuit Seal Test

Important: See Section 4 - Unit Installation Standards and Procedures in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). **THESE PROCEDURES MUST BE FOLLOWED!**

1. Heat the box up to +20°C (+70°F) using a ventilated radiator.
2. Connect the gauge manifold to the suction 1 and discharge 2 intakes of the condenser unit.
3. Connect the central line of the gauge manifold to the vacuum pump. Use recommended vacuum equipment. Before each use, check that there are no leaks in the vacuum equipment, either in the pump itself or in the hoses.
4. Open the gauge manifold and vacuum pump valves. Open all the solenoid valves on the circuit.
5. Start the vacuum pump and maintain suction until it reaches 500 microns.
6. Once it reaches 500 microns, leave suction running for one hour.
7. Close the vacuum pump valve, switch off the pump, checking that the gauge reading for the vacuum pump does not exceed 2000 microns in the following 5 minutes. If it does exceed 2000 microns, follow the procedure in the section: "In Case of Leaks".
8. Start the vacuum pump again and open the vacuum valve. Leave the pump running until it reaches 500 microns of pressure again.
9. Once it reaches 500 microns, close the vacuum pump valve and switch off the pump. The unit is ready to be filled with refrigerant.

Figure 7. Gauge manifold and connection locations shown



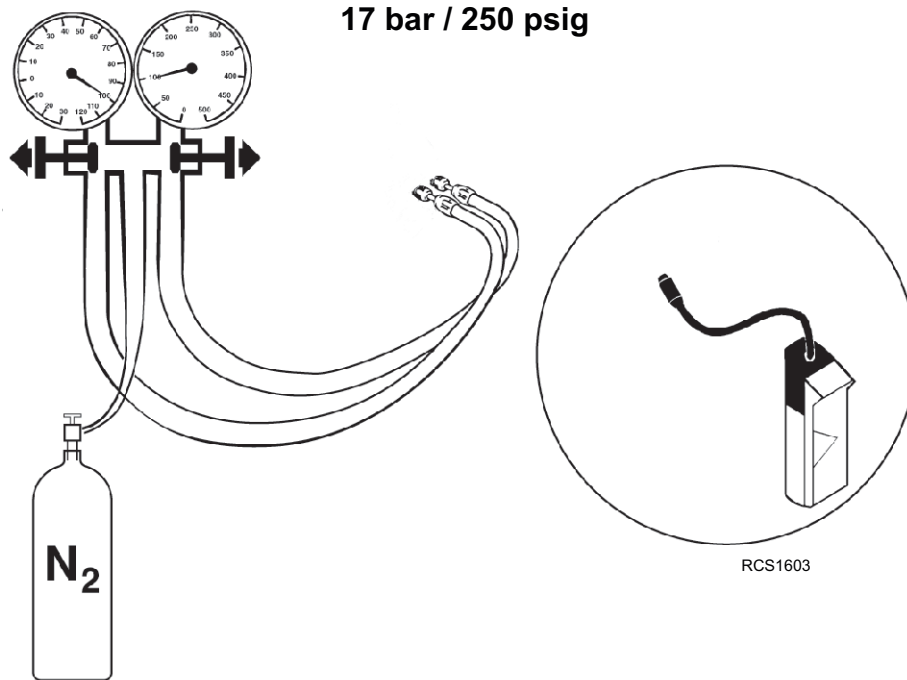
In Case of Leaks

1. Pressurize the circuit to 17 bar (250 psig) with nitrogen.
2. Identify the defective part (fitting, sleeve, line, hose, O-ring, etc.) and replace it with a new part (if in doubt replace the entire joint).

Note: Use the recommended leak detector.

3. Repeat the seal test from the beginning.

Figure 8. Typical leak check equipment shown



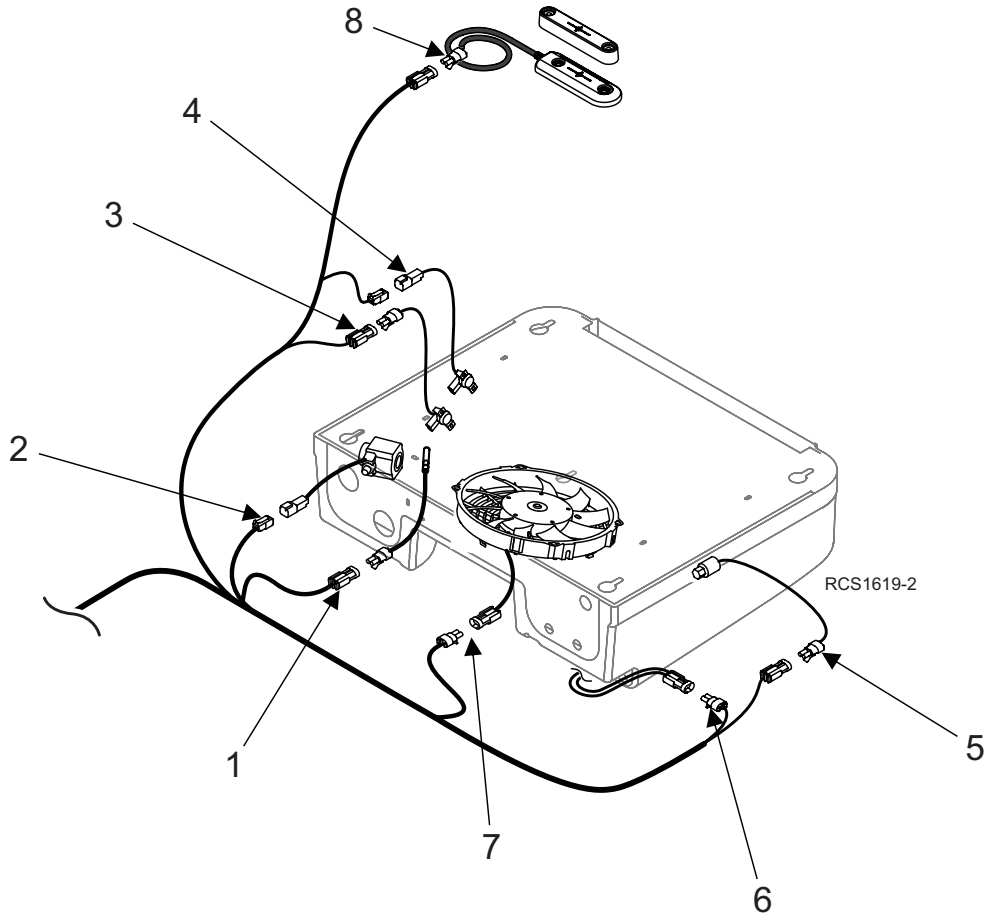
Electrical Connections

Evaporator Connections

Important: See Section 7 - Electrical Standards in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). THESE PROCEDURES MUST BE FOLLOWED!

1. Make the DC electrical connections as shown.

Figure 9. DC electrical connections shown

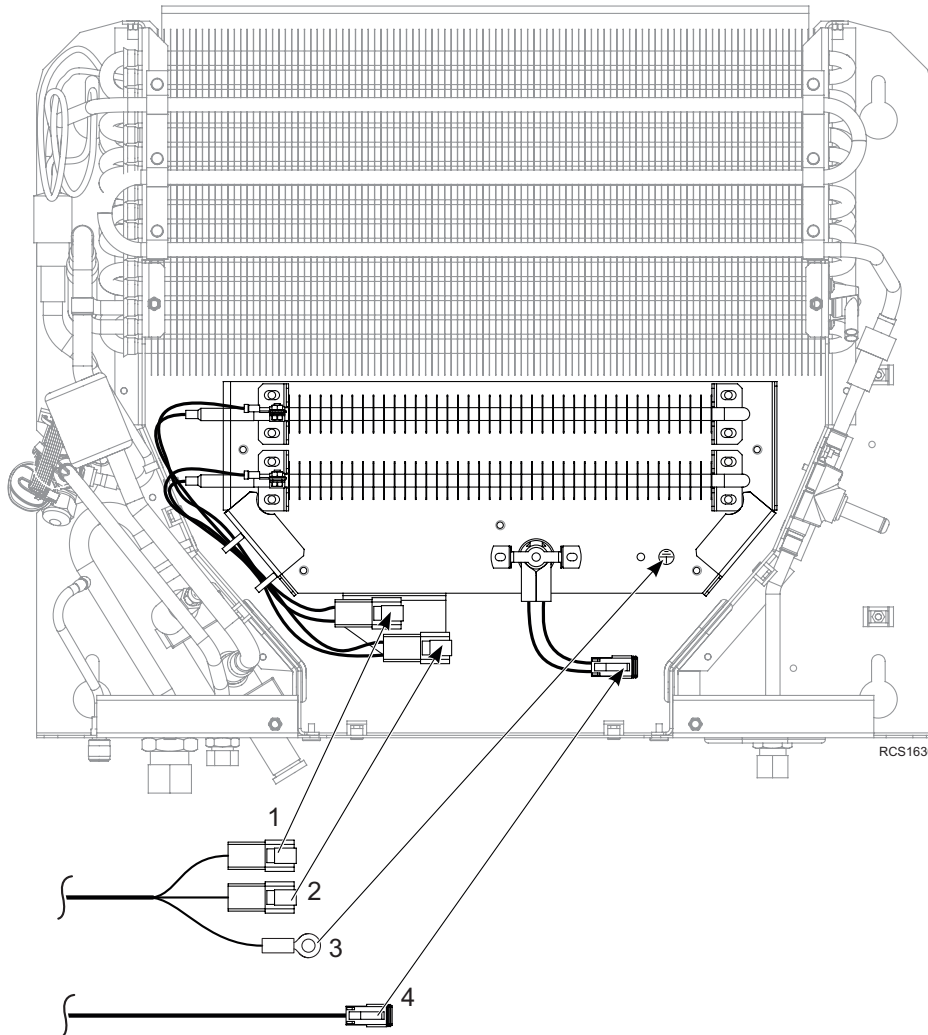


1.	Temperature Sensor Connector
2.	Hot Gas Solenoid Valve Connector
3.	Defrost Switch Connector
4.	Thermostat Switch Connector
5.	Low Pressure Cut Out Switch Connector
6.	Drain Heater Connector
7.	Evaporator Fan Motor Connector
8.	Optional Door Switch Connector

2. Make the AC electrical heater connections as shown.

Important: Ground terminal ring connection must be secured properly to the heater panel at location shown.

Figure 10. AC electrical heater connections shown

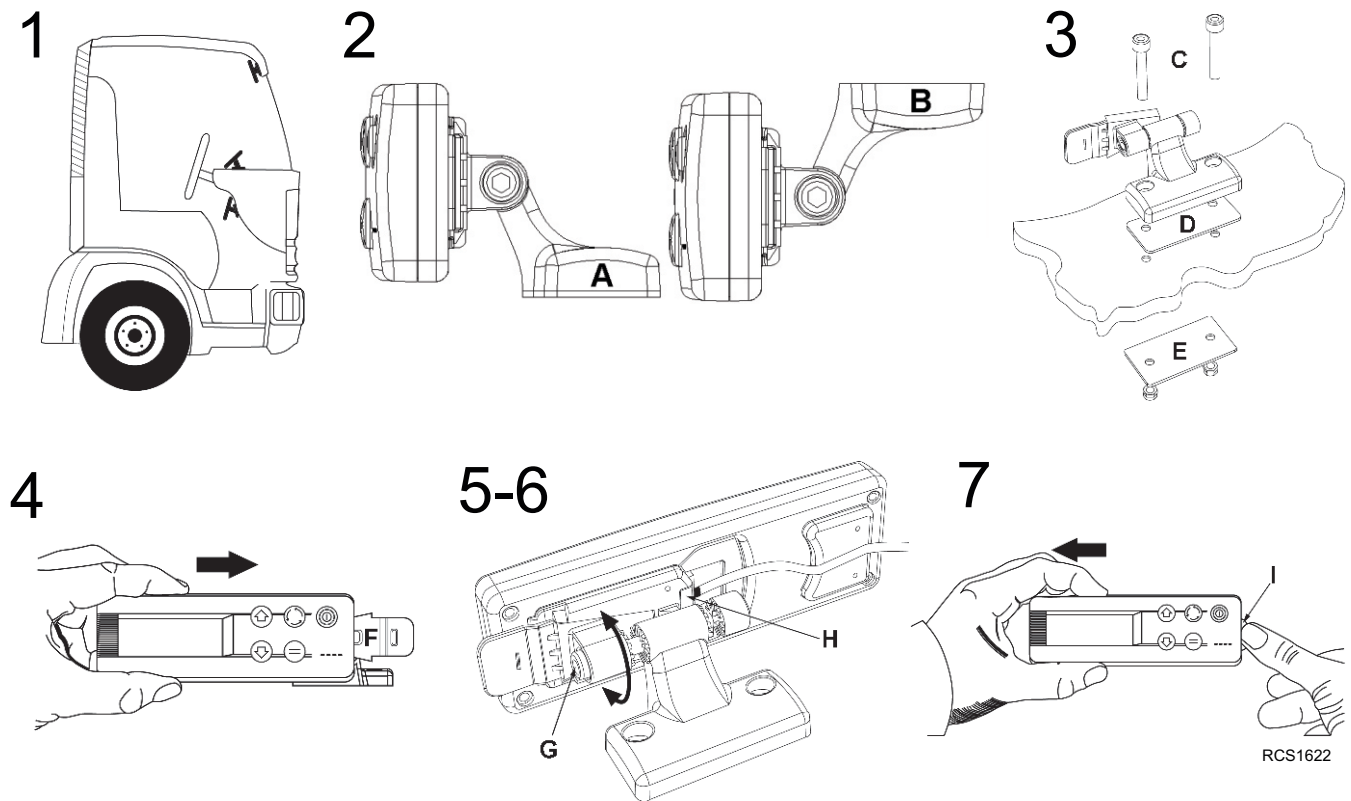


1.	Heater Connector
2.	Heater Connector
3.	Heater Ground Terminal Ring
4.	Heater Thermostat Switch Connector

Installing the In-Cab Controller

1. Install the mounting bracket for the controller. Its design allows the mounting bracket to be positioned in various places in the cab interior. Find a location which is accessible and visible from the driver's seat, and which does not restrict the mobility or visibility of either the driver or the vehicle's instruments and levers.
2. Depending on the location chosen, the base should be mounted following either Option A or Option B.
3. Mount the base of the mounting bracket in the chosen location. Use screws (C), rubber mat (D) and metal plate (E), which are supplied by Thermo King, as indicated in the drawing.
4. When placing the controller on the bracket, rest the controller on the arm (F), and slide it to the right until the arm tab is properly fitted to the controller frame.
5. The tilt of the controller's front face may be altered by loosening screw (G).
6. Connect the data cable to connector (H).
7. To remove the controller from the bracket, press the tab (I) and slide to the left.

Figure 11. In-Cab controller shown

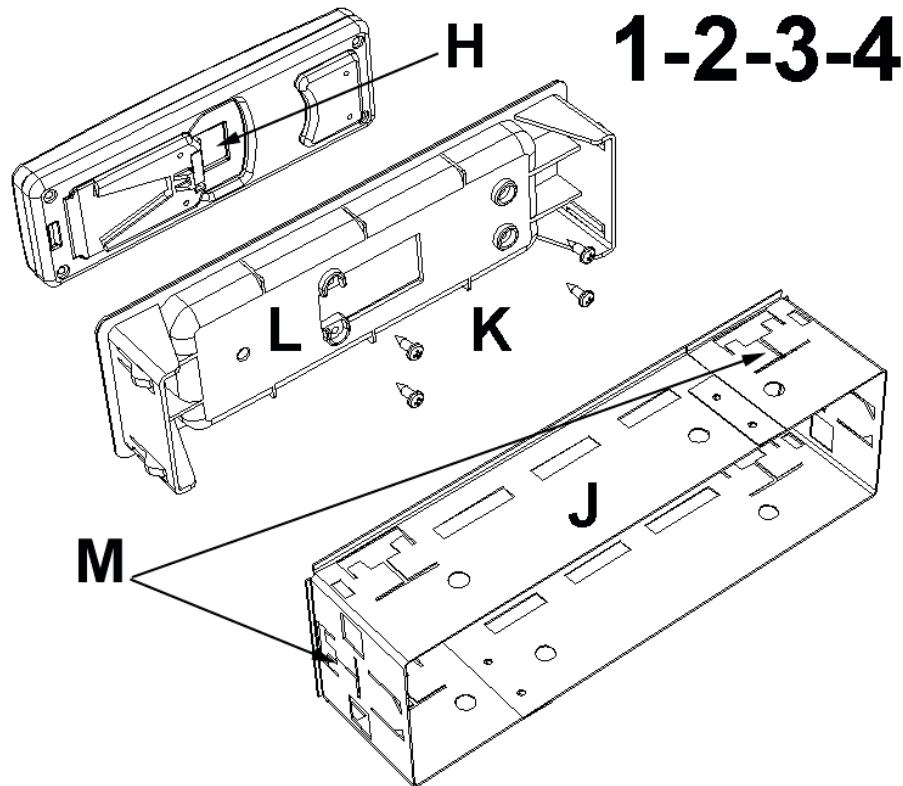


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Optional Internal DIN Adaptor

1. Place the DIN adaptor metal box (J) supplied in the housing designed for the radio. Raise the tabs (M) sufficiently to fit the box into the housing.
2. Attach the control to the plastic bracket (L) using the 4 screws (K).
3. Connect the data cable to the control connector (H).
4. Insert the assembly formed by the control box and the plastic bracket into the metal box, until the bracket tabs are properly fitted to the metal box.

Figure 12. DIN adaptor shown



RCS1623

Ignition Switch Connection

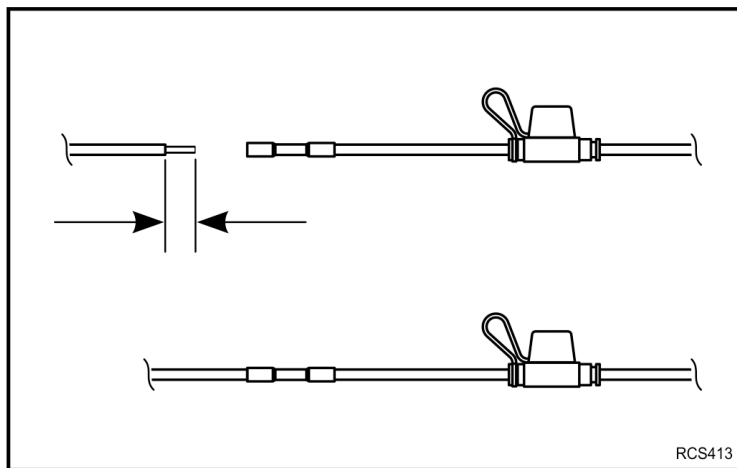
The HMI controller (01) wire must be connected to the vehicle's 12/24 Vdc positive ignition switch ON circuit. An in-line mini fuse assembly is supplied with a sealed splice connector attached and must be attached to the HMI controller power (01) wire. This power wire then must be connected to a fused circuit of the vehicle to provide power to the in-cab controller only when the ignition switch is in the ON position.

Important: No other means of fused power connection is allowed.

Always follow this procedure when connecting the 5 amp in-line fuse power connection to the vehicle's fused ignition ON circuit:

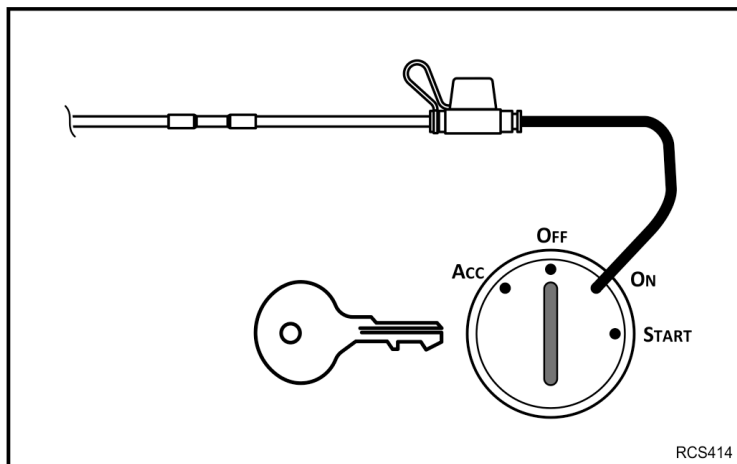
1. Cut power wire (03) to appropriate length, attach to in-line fuse splice connector and crimp.

Figure 13. Power wire with in-line fuse shown



2. Attach fused power (03) wire to ignition ON circuit. Ignition connection will vary by application.

Figure 14. Power wire shown connected to ignition ON circuit shown



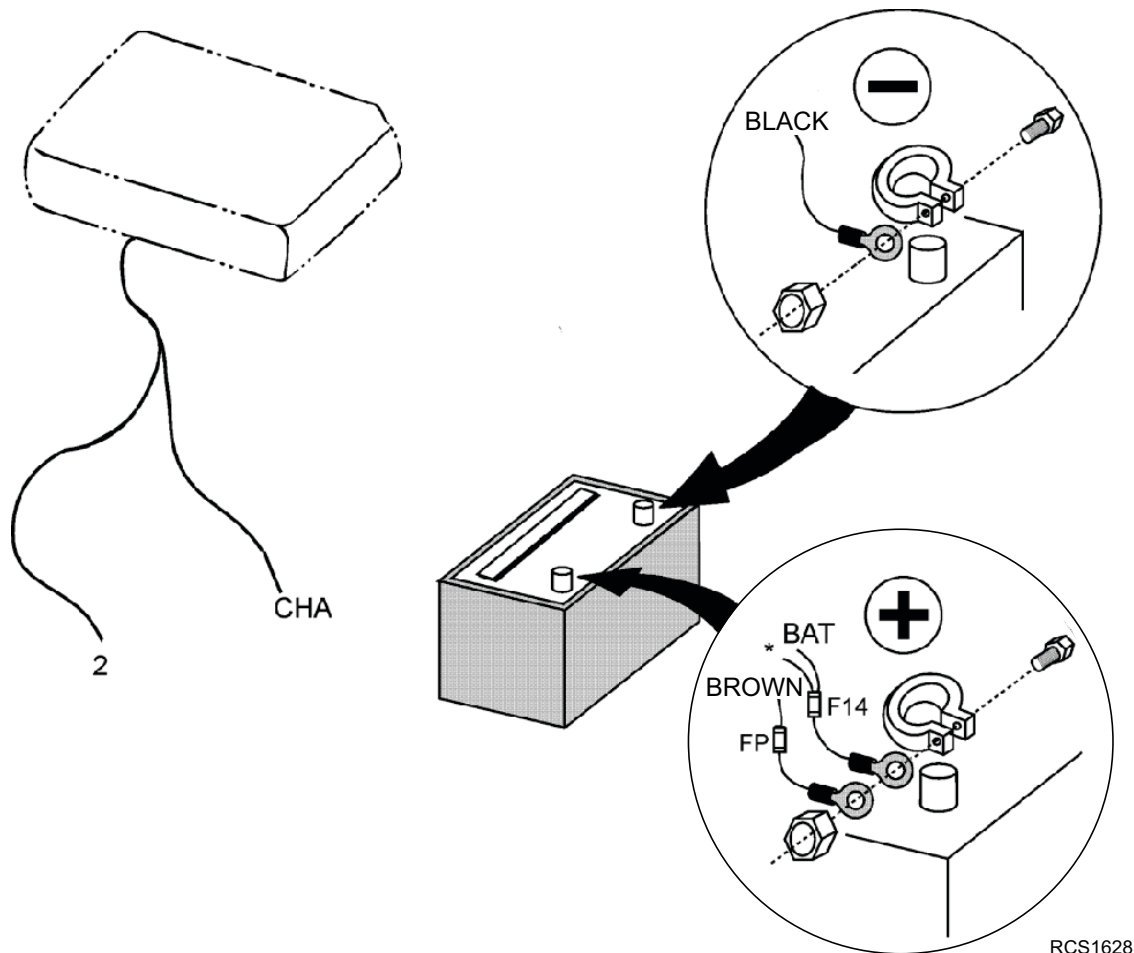
Battery Connections

Important: See Section 7 - Electrical Standards in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). THESE PROCEDURES MUST BE FOLLOWED!

Note: If the vehicle is equipped with a battery disconnect switch, always wire the unit after the switch. This allows power to the unit to be turned off by the battery disconnect switch.

1. Route electrical wires BLACK, 01/ BAT, and BROWN to the vehicle battery.
2. Cut wires to the proper lengths. **Do not coil or splice the excess wire.**
 - a. Strip wires and install the terminals supplied.
3. **REMOVE THE NEGATIVE CABLE FROM THE BATTERY.**
4. Connect 2 wire to one end of the fuse FP fuse holder (both supplied by Thermo King) and connect the other end of the fuse holder to the battery's positive terminal.
 - a. Install fuse FP (100A/12V or 60A/24V) in the fuse holder. See note above.
5. Connect the 01/BAT wire to one end of the fuse F14 fuse holder (supplied by Thermo King), and connect the other end of the fuse holder to the battery's positive terminal.
 - a. Install fuse F14 (5A) in the fuse holder.
6. Connect BLACK wire to the battery's negative terminal.
7. Reconnect the battery's negative cable.

Figure 15. Typical battery connections shown

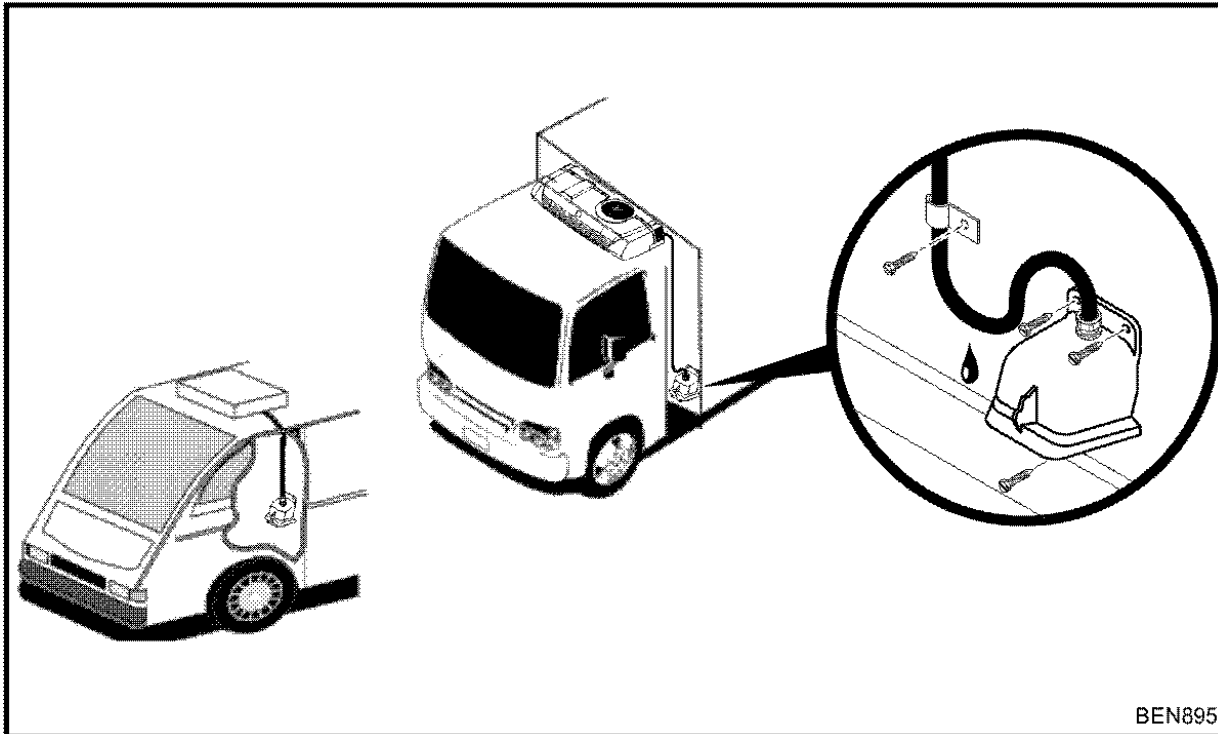


RCS1628

Standby Receptacle Box Installation (Models 20 and 50 Only)

Important: See Section 7 - Electrical Standards in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). THESE PROCEDURES MUST BE FOLLOWED!

Figure 16. Typical receptacle installation with correct drip loop shown



Evaporator Drain Hose Installation

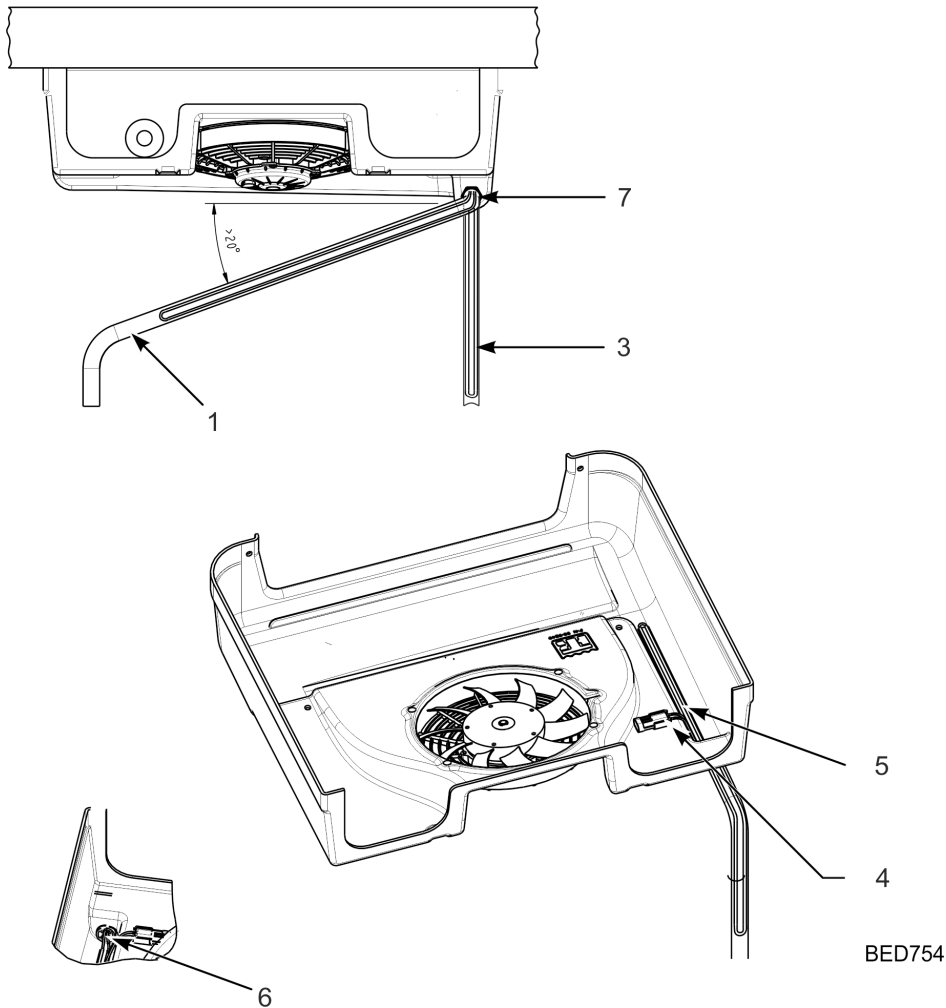
Important: See Section 8 - Evaporator Drain Hose Standards in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). THESE PROCEDURES MUST BE FOLLOWED!

1. DO NOT fit band wrap to hold the wires.
2. DO NOT cut the wires to fit.
3. DO NOT cover the Heaters.
4. DO NOT fit more than 4 wires into the tube.

ES-100

1. Cut the drain hose to the required length.
2. Connect the hose to the drain tube. Secure connections with plastic flanges.
3. Route the hose through the drain hole and seal hermetically.
4. Check that the corresponding siphon or moisture trap is installed at the end of each drain hose. If not, install it.

Figure 17. ES-100 Rear and Bottom views





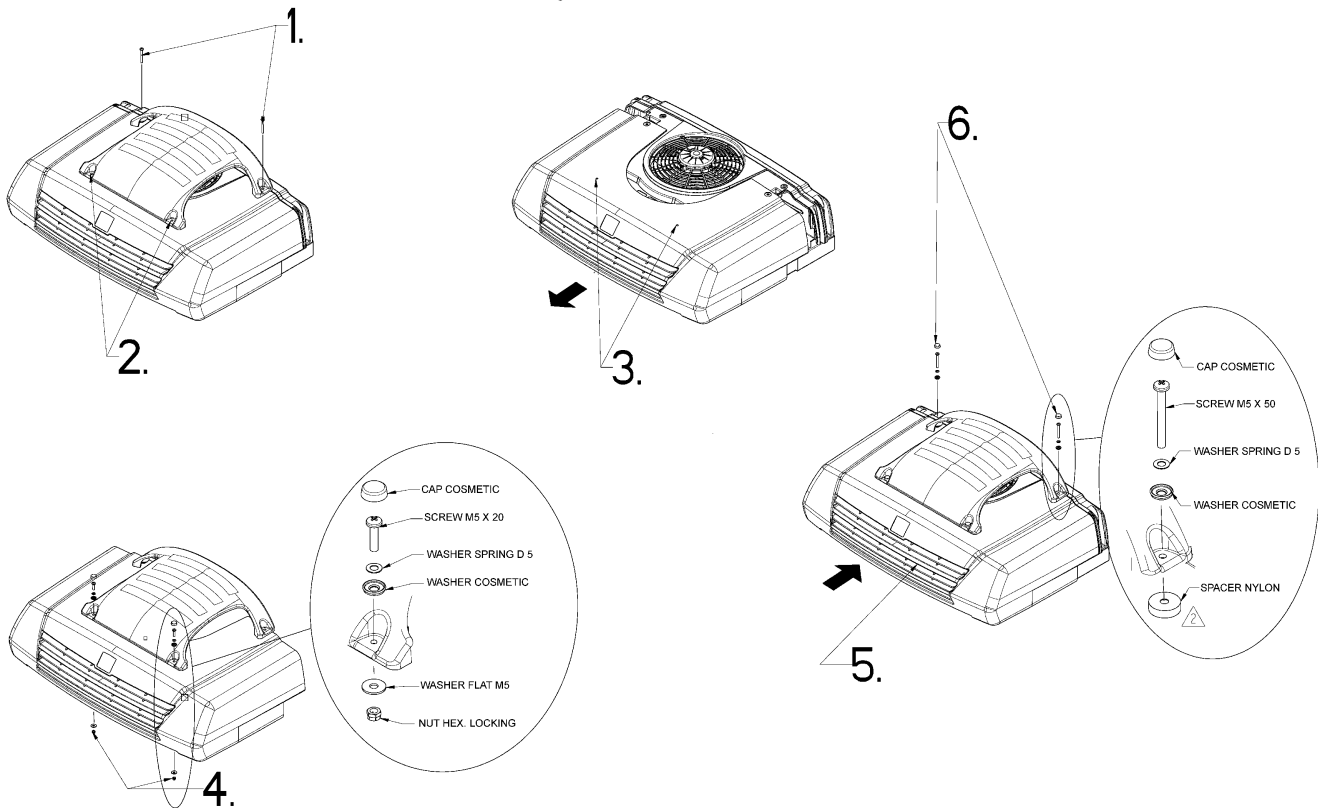
Legend

1.	Option 1 Hose
2.	Heaters
3.	Option 2 Hose
4.	Connector
5.	Aluminium Foil Tape
6.	Drain Tube
7.	Nut

Installing the Deflector

1. Place deflector onto condenser cover and align it with the two rear holes.
2. Mark the two front holes on the condenser cover and remove deflector.
3. Remove the condenser cover and drill the two front holes.
4. Attach deflector onto cover and secure to the two front holes using supplied hardware as shown.
5. Reinstall the condenser cover with deflector onto the condenser.
6. Install supplied hardware in the two rear holes of cover as shown.

Figure 18. Air Deflector Installation Shown



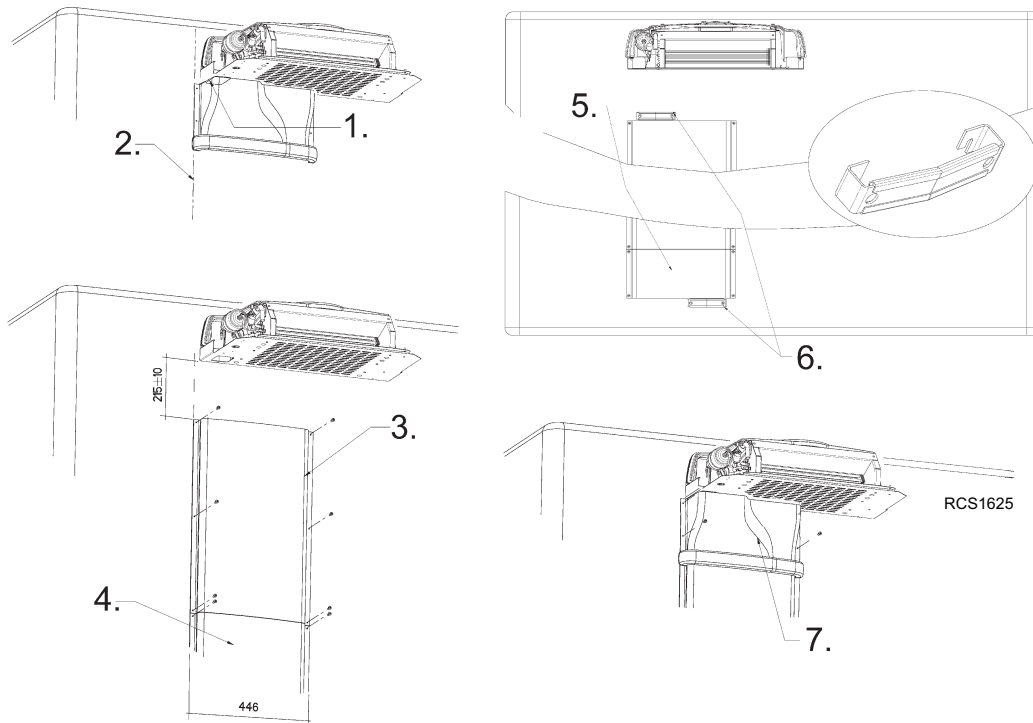
ASA408

Installing the Hose Covers

1. Place (but do not fit for the moment) the elbow-shaped curved section, aligning it so that the inside coincides with the rim of the hose outlet hole.
2. Mark the left-hand baseline.
3. Mount and fit the straight section of the cover. To ensure the correct curvature, the total width should be 446 mm (17.5 in.).
4. If necessary, fit additional straight sections.
5. Cut the last straight section to the required length.
6. Secure the hoses using the clamps, choosing the best possible location.
7. Mount and fit the elbow-shaped curved section of the cover.

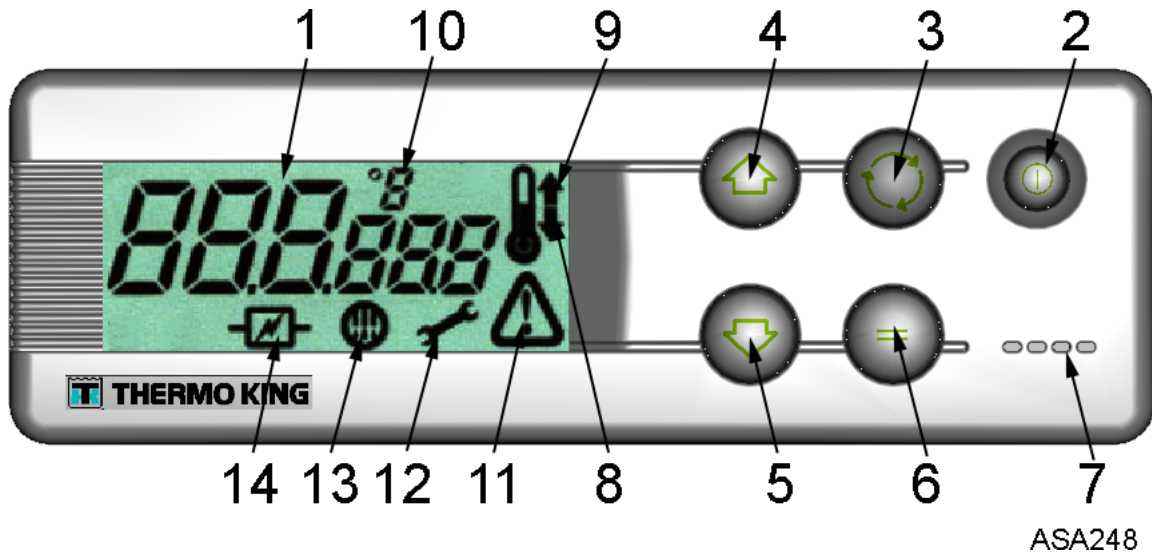
Note: The hoses may be connected before or after fitting the straight section of the cover, depending on the particular characteristics of each installation.

Figure 19. Hose Covers Shown



In-Cab Controller

DISPLAY, KEYS AND SYMBOLS



1. **Display.** It is always active and backlit except when the unit is disconnected (no power) or when the unit is connected but has been manually switched off from the In-cab Control Box. It normally displays the return air temperature (of both load compartments in bi-temperature units).
2. **ON/OFF Key.** This key is used to start/stop the unit. It is always lit except when the unit is disconnected (no power), and thus acts as an indicator of the presence of power in the unit.
3. **Select Key.** Selects prompt screens and information screens.
4. **Up Key.** Is used to increase the setpoint temperature.
5. **Down Key.** Is used to reduce the setpoint temperature.
6. **Enter Key.** Is used to enter a new command such as manual defrost, etc.
7. **Buzzer.** It is energized when the vehicle battery and the electric power supply are connected simultaneously. It is also energized if the doors are opened while the refrigeration unit is running
8. **Cool Symbol** (Thermometer with an arrow pointing downward). The unit is cooling
9. **Heat Symbol** (Thermometer with an arrow pointing upward). The unit is heating
10. **°C/°F Symbol.** Indicates whether the on-screen temperature reading is in degrees Celsius (°C) or degrees Fahrenheit (°F).
11. **Alarm Symbol.** Indicates that there is an alarm in the system.
12. **Maintenance Symbol.** Warns of the need to carry out maintenance to the unit.
13. **Defrost Symbol.** Indicates the unit is in Defrost Mode
14. **Electrical Symbol.** Indicates that the unit is in Electric Standby
15. **Triangle Symbol.** Indicates that the return air temperature of the remote load compartment is outside the setpoint temperature range of the remote compartment.

HOURMETER MENU

From the **Standard Display** press the SELECT key for 3 seconds to enter the **Hourmeter Menu**, then use the SELECT key to display:

1. **HC:** Hours remaining to maintenance notice.
2. **tH:** The total amount of time the unit has been switched on protecting the load.

3. **CC:** Battery Mode Compressor Hours.
4. **EC:** Electric Mode Compressor Hours
5. Return to Standard Display

INFORMATION MENU

From the **Standard Display** press the ENTER plus the UP key during 3 seconds to enter the **Information Menu**, which scrolls automatically through the following:

1. Display test (all symbols on).
2. Software version.
3. Refrigerant type.
4. **bat:** current battery voltage (value in volts, decimal).
5. **HP:** current pressure
6. Number of Compartments/Unit type
7. Return to Standard Display

INSTALLATION MENU

From the Standard Display press the ENTER plus the DOWN key for 3 seconds to enter the Installation Menu: the first parameter will be displayed, the value in the large digits and its name in the small digits. To modify the parameter value press the ENTER key, the value will flash, press the UP or DOWN key to modify the value and confirm by pressing the ENTER key again. To scroll through the menu press the UP or DOWN keys.

Note: Some Direct Smart Reefer versions show the setpoint temperature (SP) as the first parameter in the Installation Menu.

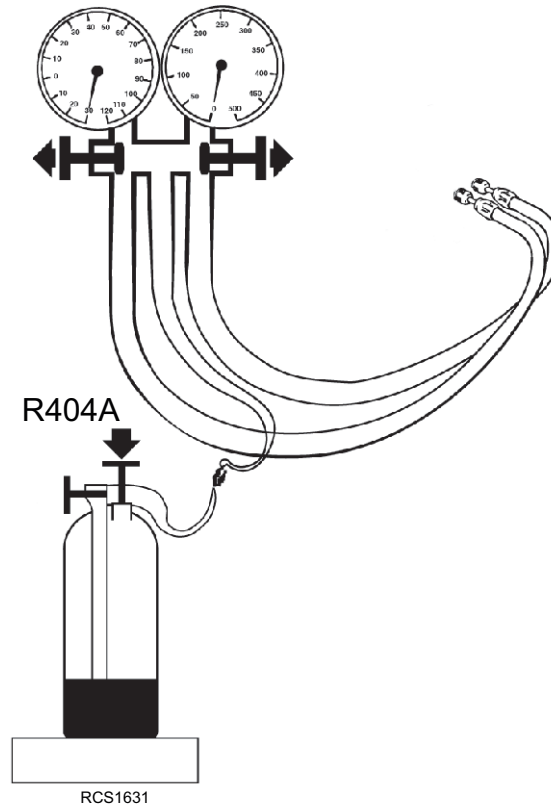
NAME	DESCRIPTION	DEFAULT	MIN	MAX
diF	Set Points Differential Once the setpoint temperature has been reached, and while the temperature remains between diF °C/°F above or below the setpoint, there is no demand for transfer of heat or cold, and the unit remains in null mode. Increments of 1°.	3	1	5
SSC	Soft Start Cycles (ON/OFF) Programmable soft start for the road compressor clutch.	OFF	OFF	ON
dit	Defrost Initiation Timer (Minutes) Increments of 30 minutes. On time out the unit will switch from cool to the appropriate defrost mode. The timer will count all the time the system is in any cool mode. The timer will be reset when a defrost starts. When the value is set at 0, is the test position: the defrost will begin in 15 seconds.	240	30	480
dtT	Defrost Termination Timer (Minutes) Increments of 5 minutes. Timer will count from defrost mode initiation. Timer will reset after a temperature defrost termination or timer time out. On time out the unit will switch from defrost to null mode. When the value is set at 0, is the test position: the defrost will stop in 15 seconds.	30	5	50
EFc	Evaporator Fans Constant Blow on: evaporator fans stays on also during null mode. off: evaporator fans cycles on and off with the regulators	OFF	OFF	ON
dAL	Out Of Range Alarm Programmable from 1° up to 10° or off (0). When the difference between the return air temperature and the set point exceeds the on-screen return air temperature reading flashes.	0	0	10
HC	Hour Counter Initial Value For Maintenance Purposes (Tens of hours, e.g. 150=1500 hours), programmable from 1000 up to 5000, 500 steps.	150	0	10
dSP	Doors Switches Presence/polarity 0: normally closed, 1: normally open, 2: not present.	1	0	2
bE	Buzzer Enable 0: not enabled, 1: enabled, 2: enabled also when keys are pressed, 3: enabled only when keys are pressed.	2	0	3

tu	Thermostat Units C: temperature visualization in °C, F: temperature visualization in °F.	C	C	F
Pu	Pressure Units b: pressure visualization in bar, P: pressure visualization in psig	P	b	P

Charging the Unit

1. Connect gauge manifold to the suction and discharge service ports on the condenser unit.
2. Connect refrigerant bottle to the gauge manifold and place it on a scale.
3. Open refrigerant bottle valve and **drain the gauge fitting line**.
4. Keep the low pressure side valve of the gauge manifold closed. Open the high pressure side valve.
5. Add refrigerant until reaching approximately **2.1 lbs (0.95 kg) of R-404a**.
6. Close refrigerant bottle valve and the high side valve of the gauge manifold.
7. Start the vehicle engine running at around 1000 rpm and switch on the unit.
8. Set the unit thermostat to 32°F (0°C) (see operating manual).
9. Run unit until it reaches a temperature close to that indicated, and a **high circuit pressure of 180 psig (12.5 bar) for R-404a**. Partially block the air intake to the condenser if necessary.
10. Open the low side valve of the gauge manifold and the refrigerant bottle valve, and add refrigerant slowly until no bubbles can be seen through the liquid sight glass.
11. Close the refrigerant bottle and gauge manifold valves.
12. Leave the unit running for 15 minutes.
13. Only if you are installing a unit without electrical standby, turn off the unit, stop the vehicle and remove the gauge manifold.

Figure 20. Typical charging equipment shown



Suction Pressure Regulator (SPR) Adjustment Procedures - MAX 50

Important: All new unit installations require these adjustment procedures. Failure to do so may not allow the unit to operate at its maximum capacity.

Note: The following procedures are for initial settings. Sometimes conditions such as high or low ambient temperatures may require that the settings be fine-tuned for optimum performance.

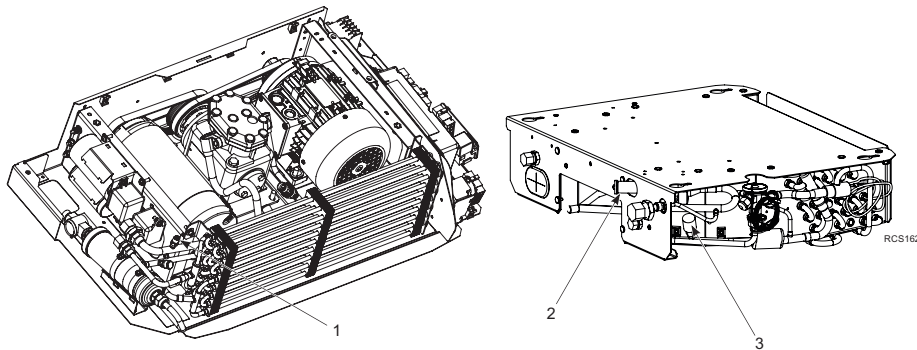
MAX 50 units are equipped with a SPR valve located in the evaporator (see illustration below). The valve is used to limit the load on the standby compressor. This also affects the current draw of the electric motor. Monitor the current drawn of the electric motor when making this adjustment to ensure it is below the motor overload relay setting.

1. Install gauge manifold set onto the suction service port at the standby compressor (see illustration below).
2. Attach an additional compound gauge on suction service port located on copper suction tube in evaporator to monitor suction pressure going to the SPR valve (see illustration below).
3. Connect clamp on amp meter to T1 (Black) motor wire on a 115V/230V 1 PH unit.
4. Connect standby power receptacle to an appropriate electric power source.
5. Place jumper wire between the 12 and CHB wires at the defrost termination switch to verify the unit will run in defrost.
6. Start unit and run in defrost on the electric standby compressor until the pressure on the additional compound gauge attached to the suction service port stabilizes at a pressure above 45 psig (310 kPa).
7. Check the suction pressure on the gauge attached to the suction service port at the standby compressor. It should be 24 ± 2 psig (165 ± 14 kPa) without exceeding the following electric motor current draws:

VOLTAGE	OVERLOAD RELAY SETTING
115/1/60	10.5 Amps
230/1/50	6.5 Amps
230/1/60	5.5 Amps

8. If the pressure is not within range, or the current is above the specific values, remove the protective cap and adjust the SPR valve to the correct setting. Reinstall protective cap when done.
9. Remove gauge manifold set, the additional compound gauge, and the jumper wire when finished with the procedure.

Figure 21. Service ports and SPR locations shown



1.	Standby Compressor Service Port
2.	Evaporator SPR Valve
3.	Evaporator Service Port

Compressor Oil Amounts and Type

Important: Using the absence of bubbles in the sight glass as an indicator of correct refrigerant charge can be misleading, **YOU MUST** refrigerate the box to 0-5°C (32-41°F) to get a more precise indication from the sight glass.

NOTICE

Compressor Damage!

Failure to add the correct amount and type of oil will damage the compressor.

Table 1. Oil Capacity for Units Utilizing Hermetic Compressors

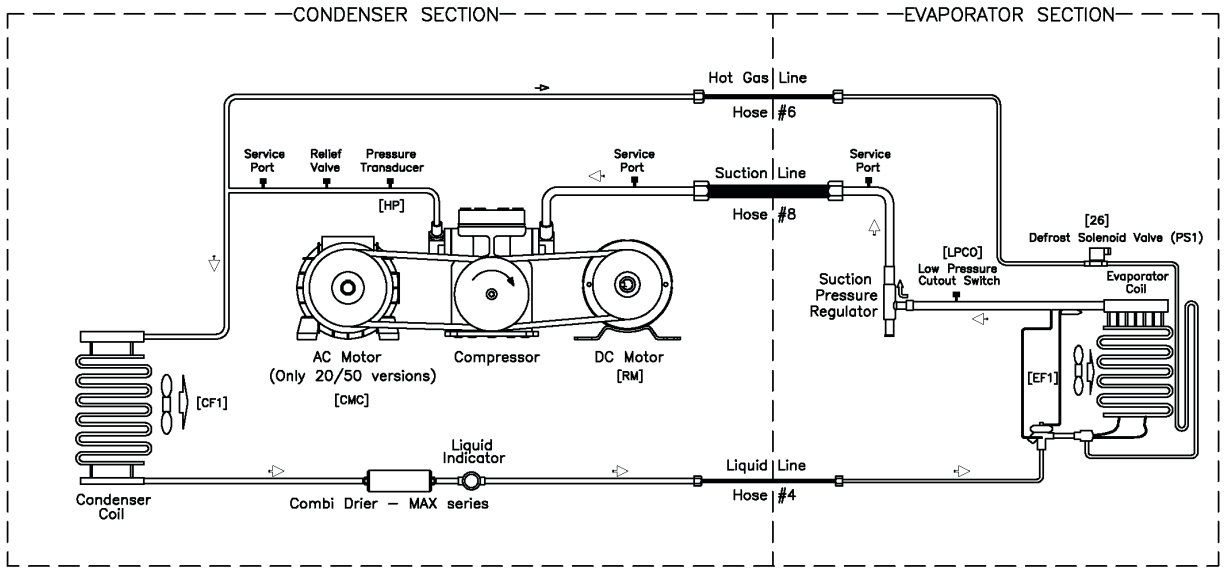
Model	Compressor Type	Oil Supplied in Unit		Oil Added at Installation			Total System Capacity (oz.)	Oil Type
		System Oil (oz.)	Standby Compressor	Add to Roadside Compressor (oz.)	Add to Suction Line (oz.)	Total Oil Added at Installation (oz.)		
B-100			10 oz (0.29 liter)	N/A				
B-100 20/50 MAX			10 oz (0.29 liter)	N/A	2 oz	2 oz	10.2 oz (0.30 liter)	POE-Solest 35

Note: If utilizing a discharge muffler, add an additional 3 oz. of oil during installation or repair.

Checking the Installation

- All holes should be sealed with silicone or foam.
- Check with a sheet of paper that the fans blow in the right direction.
- The drain circuit should be slanted on all evaporators and the moisture trap should be installed.
- The hole should be located at the expansion valve on all evaporators.
- The temperature sensor should be connected on all evaporators.
- The in-cab control box should be located in a location that it is accessible and visible from the driver's position.
- The contact draw should be made.
- Hoses should not be taut (they should be able to absorb vibrations).
- Hoses should not rub against moving parts, sharp parts, or parts that can reach high temperatures.
- The unit should be connected to the battery.
- The seal test should have been carried out.

Refrigeration Diagram



RCS1621

LEGEND

↔	ROAD & STANDBY COOL MODE
→	DEFROST MODE
—	COPPER TUBING
- - -	FLEXIBLE HOSE
[]	WIRE NAMES



THERMO KING

Notes

Thermo King – by Trane Technologies (NYSE: TT), a global climate innovator – is a worldwide leader in sustainable transport temperature control solutions. Thermo King has been providing transport temperature control solutions for a variety of applications, including trailers, truck bodies, buses, air, shipboard containers and railway cars since 1938. For more information, visit www.thermoking.com or www.tranetechnologies.com.

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