THERMO KING

Installation Manual

Vehicle Powered Truck Edition
V-220/V-320 Series

Single Temperature Systems

Revision A

May 2018

TK 56321-18-IM-EN

TRANE TECHNOLOGIES

THERMO KING

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.
- Follow all safety precautions outlined in the Thermo King Installation Standards and Procedures Guide (TK 56430).

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	(05/18) New manual format.

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.

NOTICE

Compressor Damage!

SEVERE COMPRESSOR DAMAGE will result from operating the unit before completing the installation which includes: installing the components, releasing the holding charge, connecting refrigeration lines, leak testing, evacuation, clean-up, and charging of the system with the proper amount and type of refrigerant.

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.

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

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

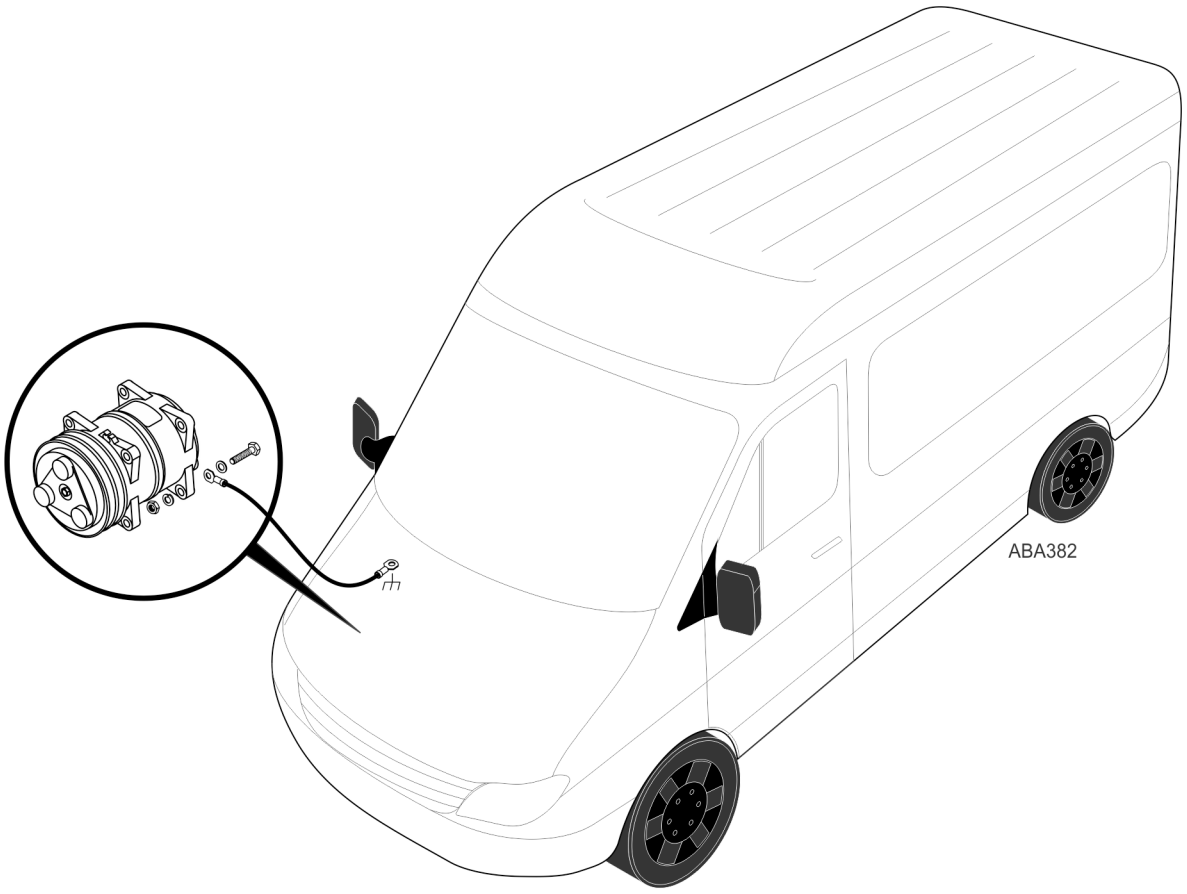
Components unable to be isolated for service must be repaired only after refrigerant is properly recovered.

Engine Driven Compressor Installation

Important: *See Section 5 - Compressor Selection and Installation Standards in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). THESE PROCEDURES MUST BE FOLLOWED!*

Important: *Failure to add the correct amount and type of oil will damage the compressor! Refer to "".*

Important: *It is critical that a P–trap is installed in the suction line **before** the roadside compressor. 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!*

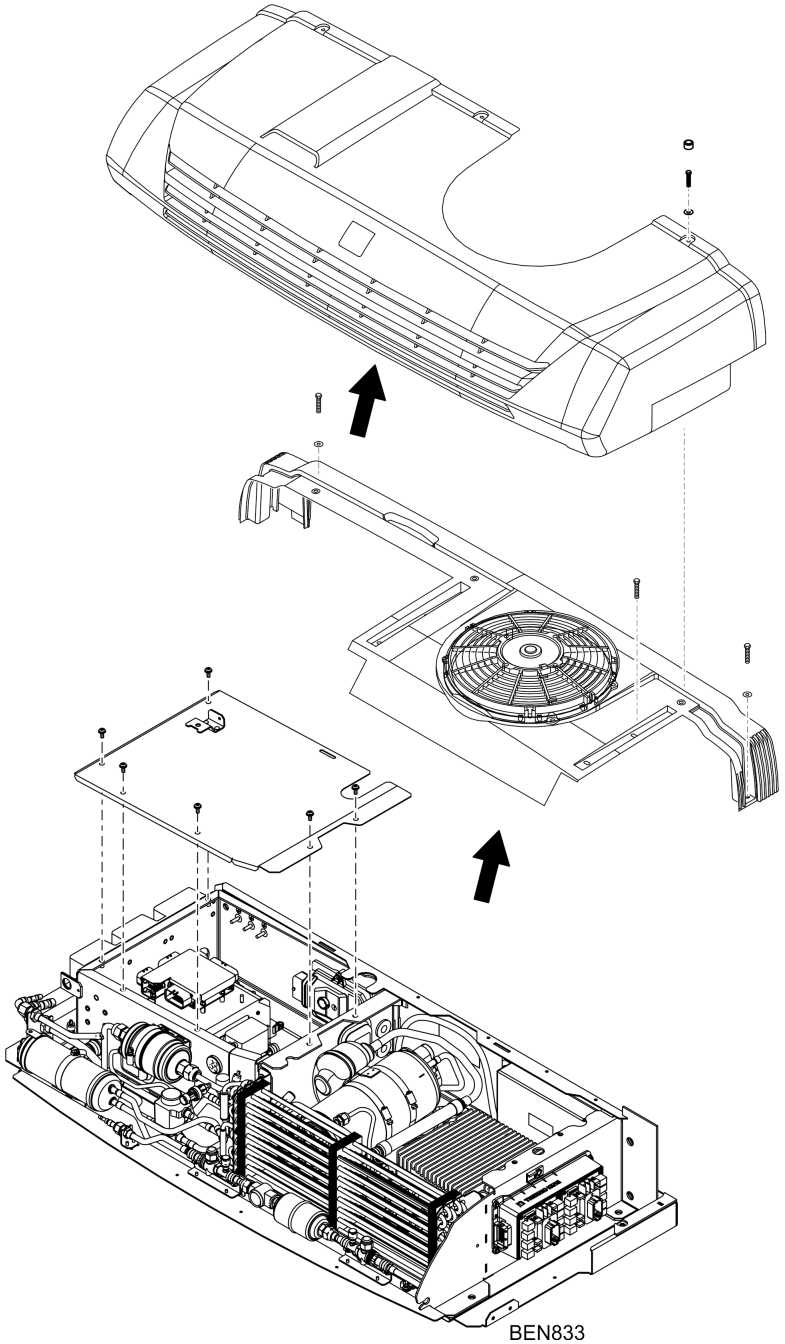


Preparing Condenser for Installation

Cover and Fan Housing Removal (All Models)

To access the unit mounting holes:

1. Remove plastic condenser cover.
2. Remove the fan housing assembly. (Remove the fan connector).
3. Remove “Power Off Device” Connector and Electric Box Cover.
4. Mounting holes are now accessible.



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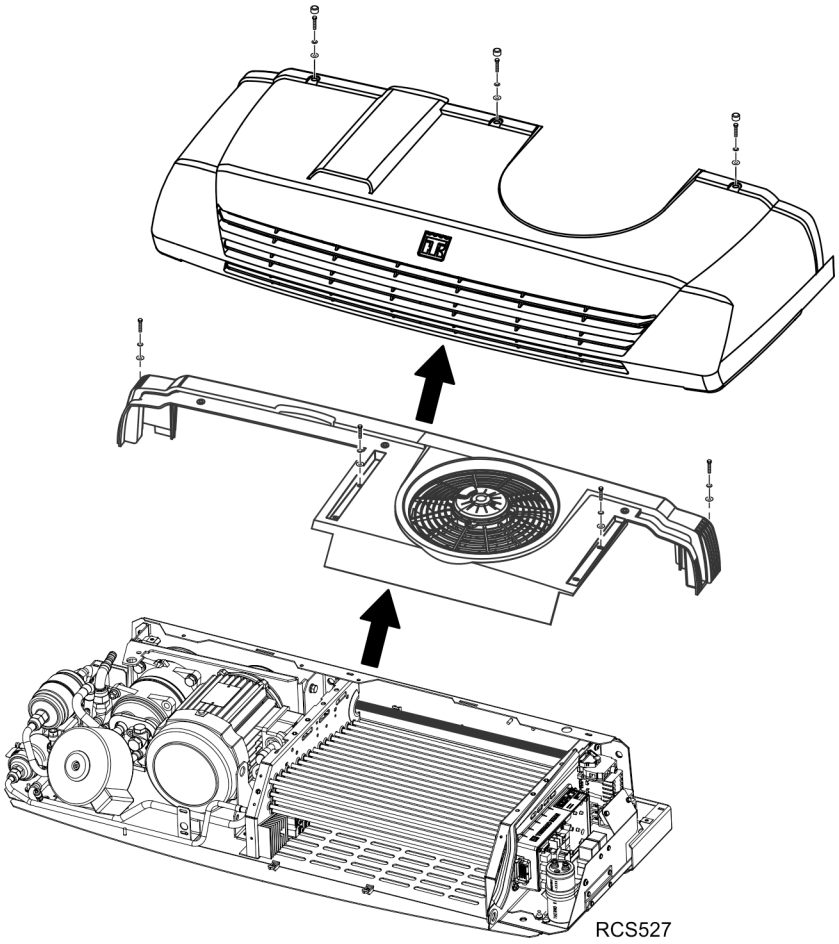
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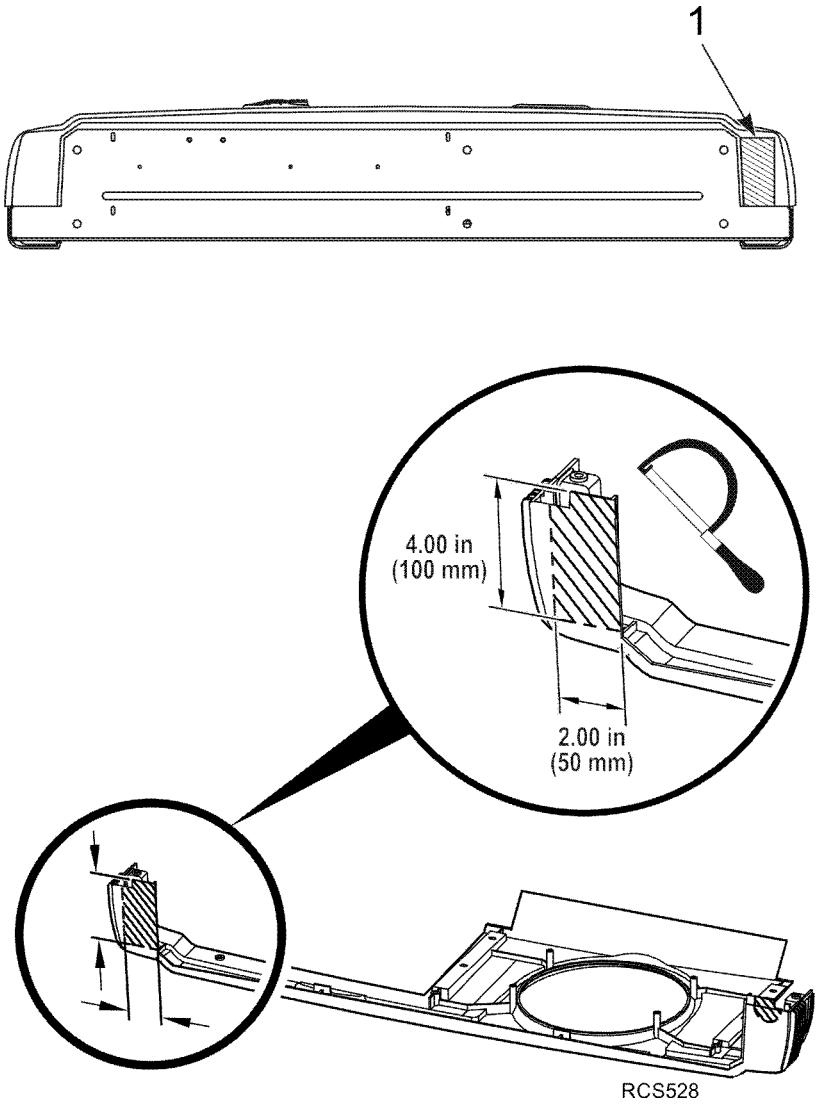
Fan Housing Modifications (Nosemount Installations Only)

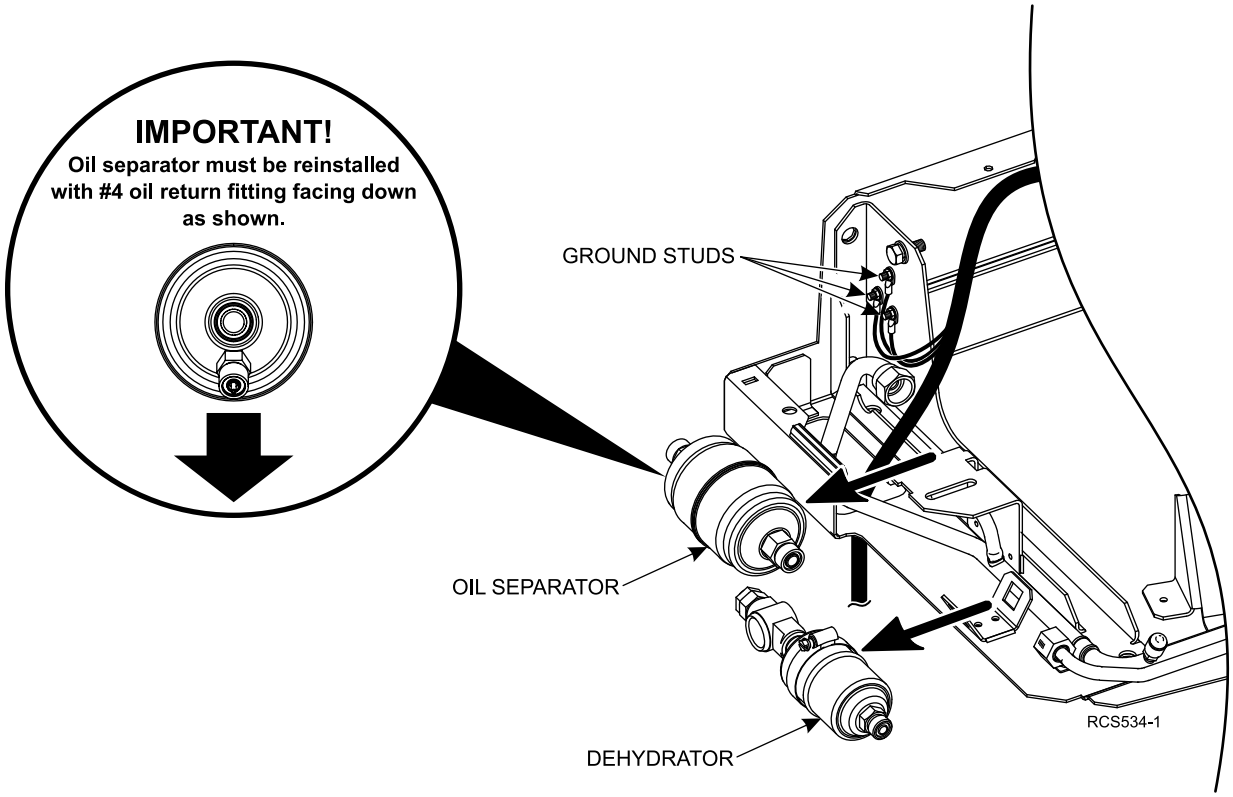
Turn fan housing over and use a hand saw to trim the area shown for refrigeration hose clearance.

Note: *The fan housing assembly will be reinstalled later.*



1.	Access for Hoses and Harnesses

ALL MODELS - The oil separator and the dehydrator must be removed to access refrigeration fittings that hoses will be attached to later.



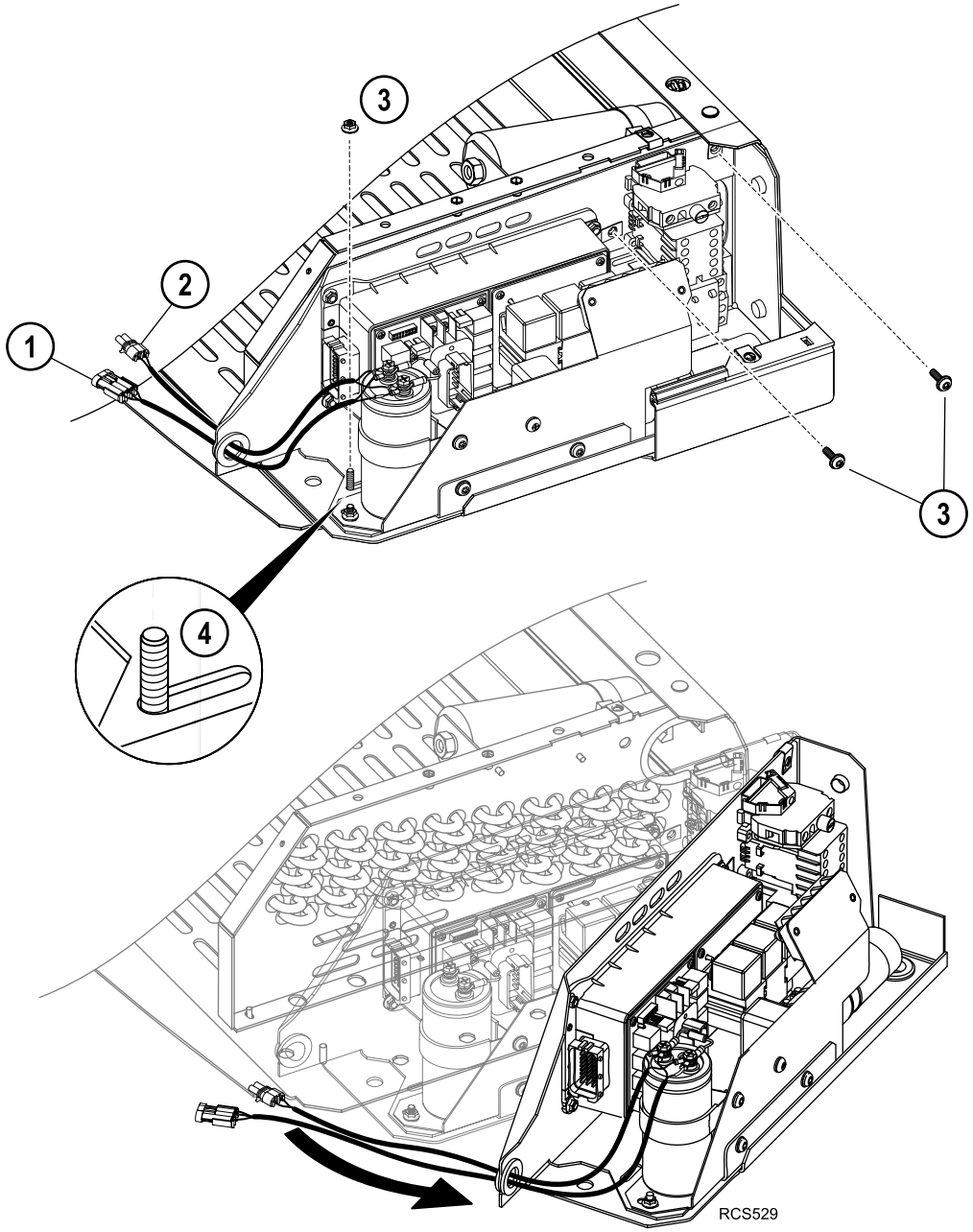
Note: *For nosemount or rooftop installations that may require the harness be re-routed from exiting the bottom of the condenser, first remove the wires with ring terminals from the three (3) ground studs to avoid damaging them. Apply dielectric grease to ground studs and re-connect ground wires after relocating harness.*

Preparing Condenser for Installation

MODELS 20 and 50 ONLY - The power tray must be moved to access unit mounting holes. Refer to the illustration below.

1. Disconnect the 3-pin plug.
2. Disconnect the 2-pin plug.
3. Remove two screws and one nut securing the tray.
4. Lift tray up off the mounting stud and swing out of the way.

Note: *All components removed will be reinstalled later.*


3
2
1
3
4
RCS529

Condenser Installation

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!*

MODELS 20 and 50 ONLY - After installing condenser, reinstall power tray and reconnect electrical wires removed earlier.

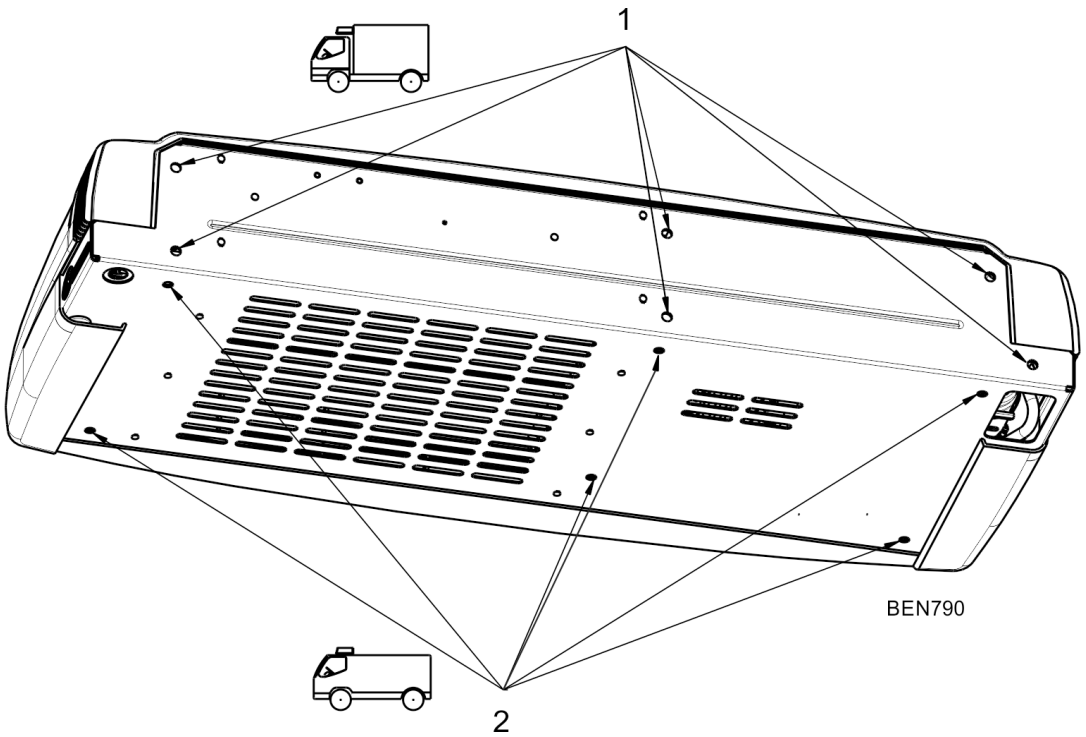
Note: *Nose mount and roof top condenser mounting and access hole dimensions can be found at the back of this manual.*

⚠ WARNING

Equipment Damage!

Seal all the holes inside the electric box which are not used for installation (depending nose mount/roof top). Otherwise water will get into the electric box and damage the components.

Figure 1. Condenser Mounting Bolts



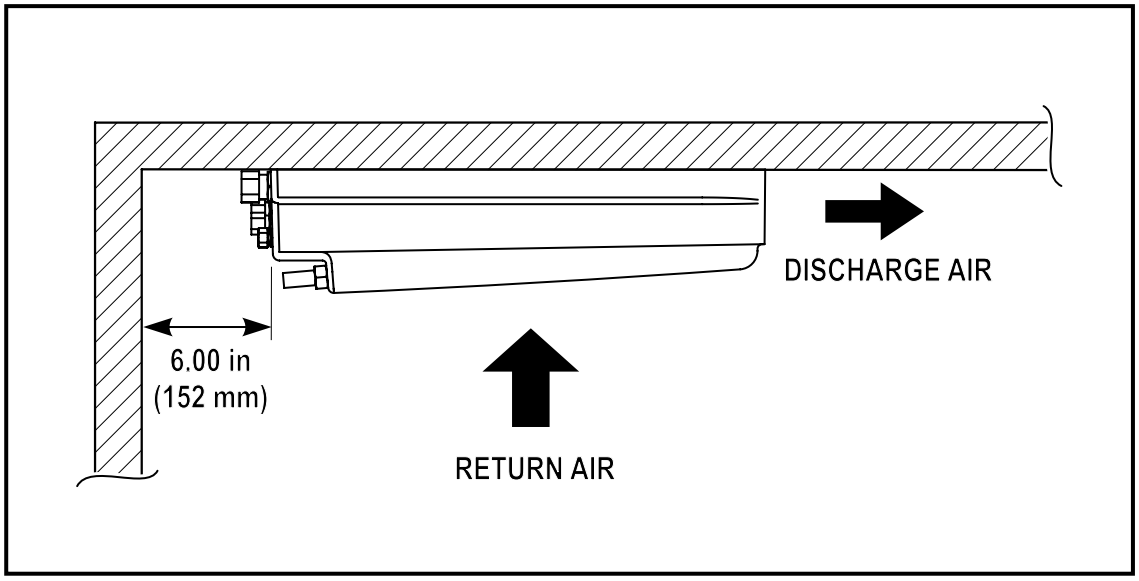
1.	Mounting holes when unit is mounted on the Front of the Truck (6)
2.	Mounting holes when unit is mounted on the Roof of the Truck (6)

Evaporator Installation

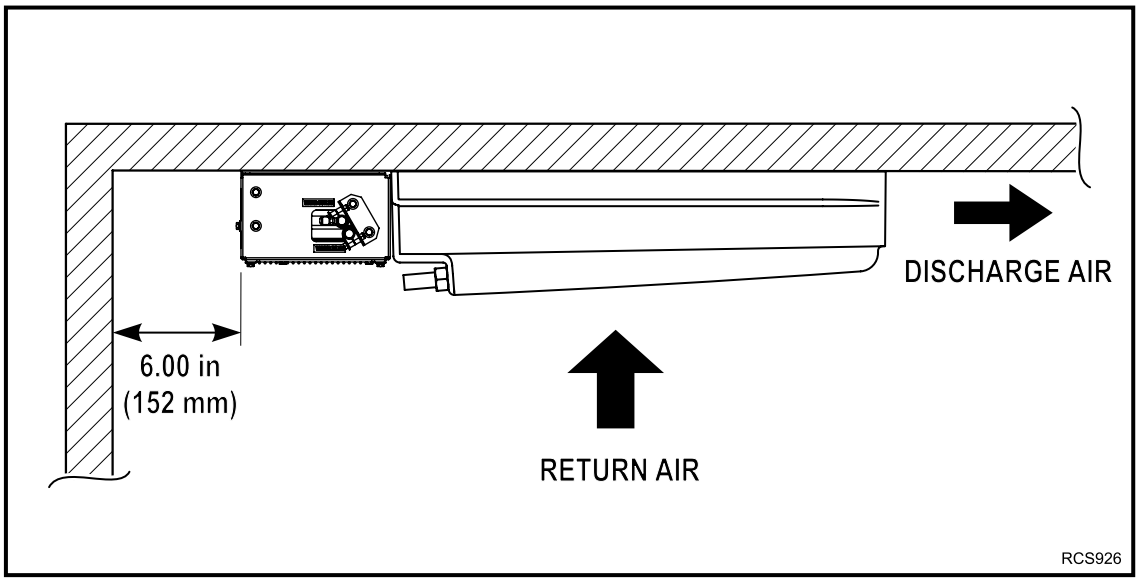
Important: *See Section 4 - Unit Installation Standards and Procedures in the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430). THESE PROCEDURES MUST BE FOLLOWED!*

Note: *Evaporator mounting hole locations can be found at the back of this manual.*

1.	Return Air
2.	Discharge Air



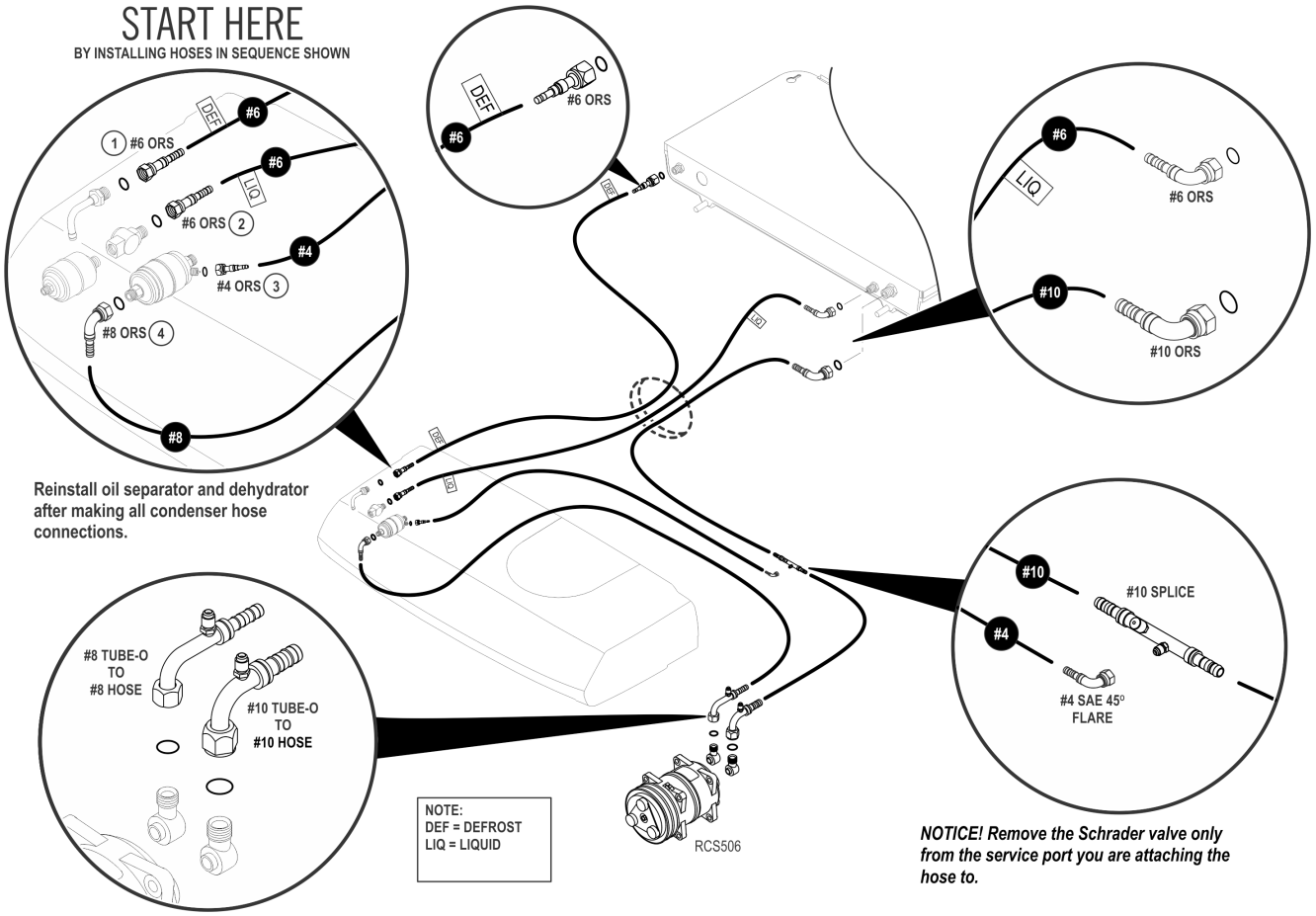
Standard Evaporator (10 and 20 Models)
Minimum distance from cargo wall to rear of evaporator shown.



Evaporator with Accumulator (30 and 50 Models)
Minimum distance from cargo wall to rear of accumulator shown.

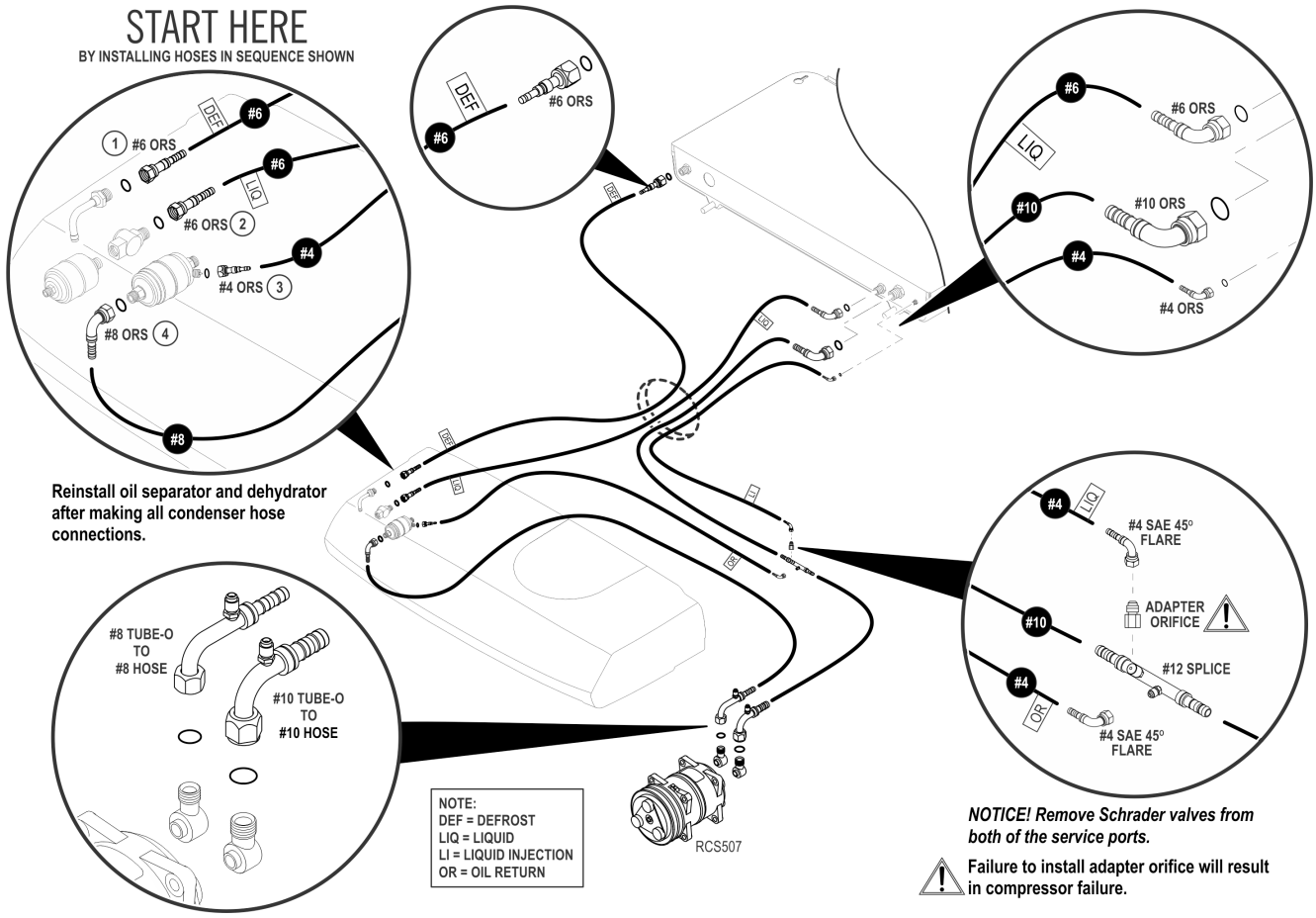
Hose Connections V-220 10

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!*



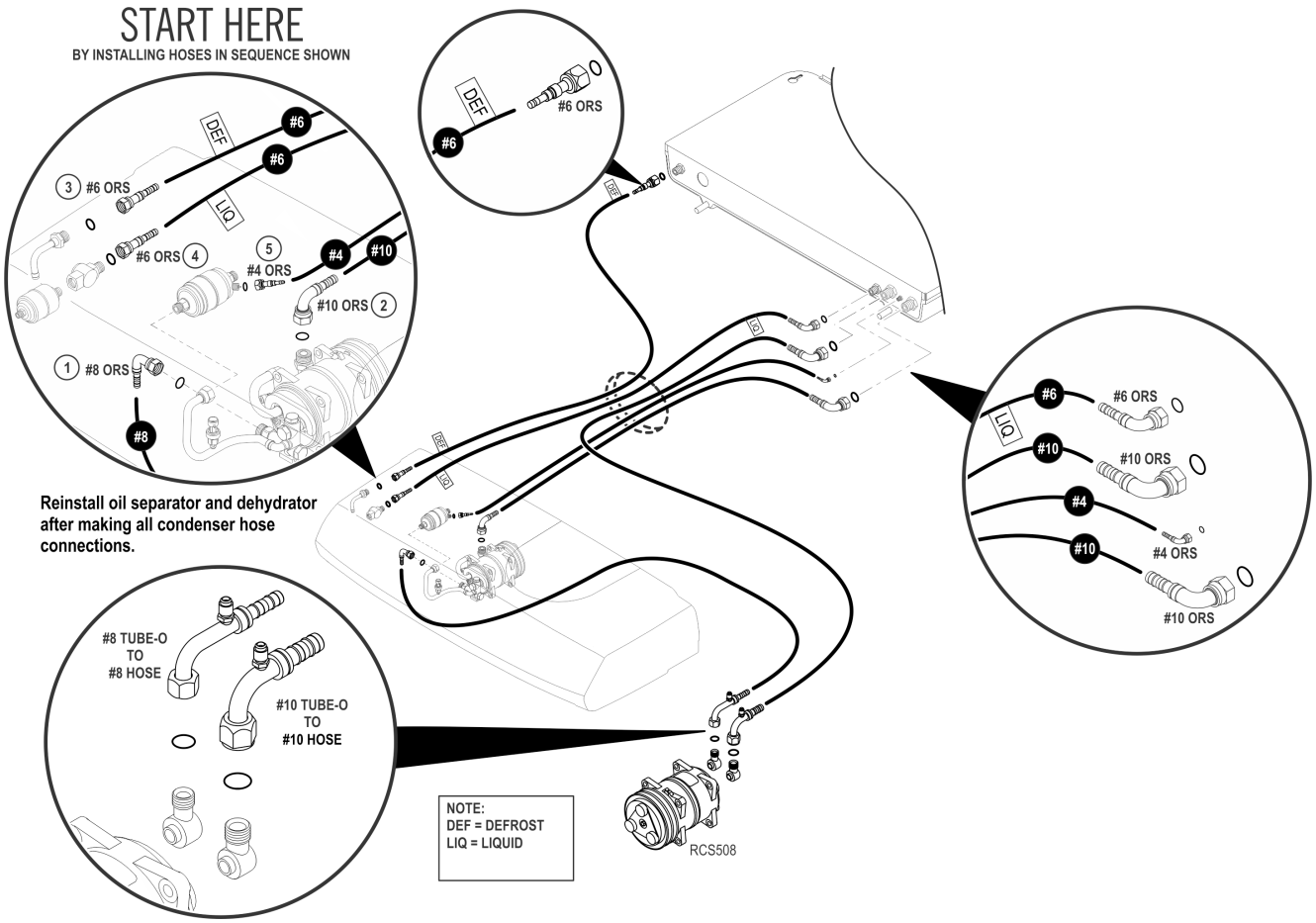
Hose Connections V-220 MAX 10

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!*



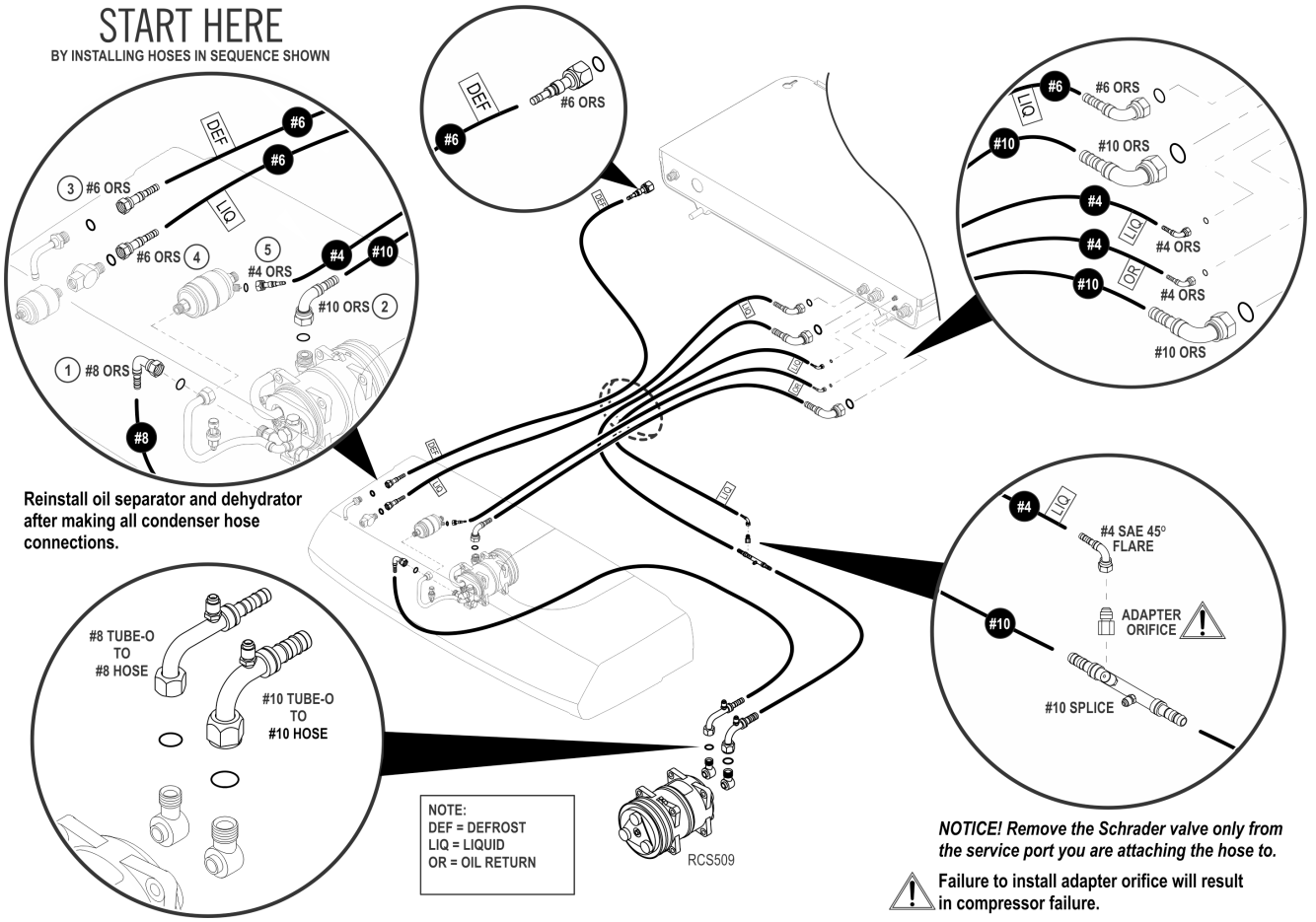
Hose Connections V-220 20

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!*



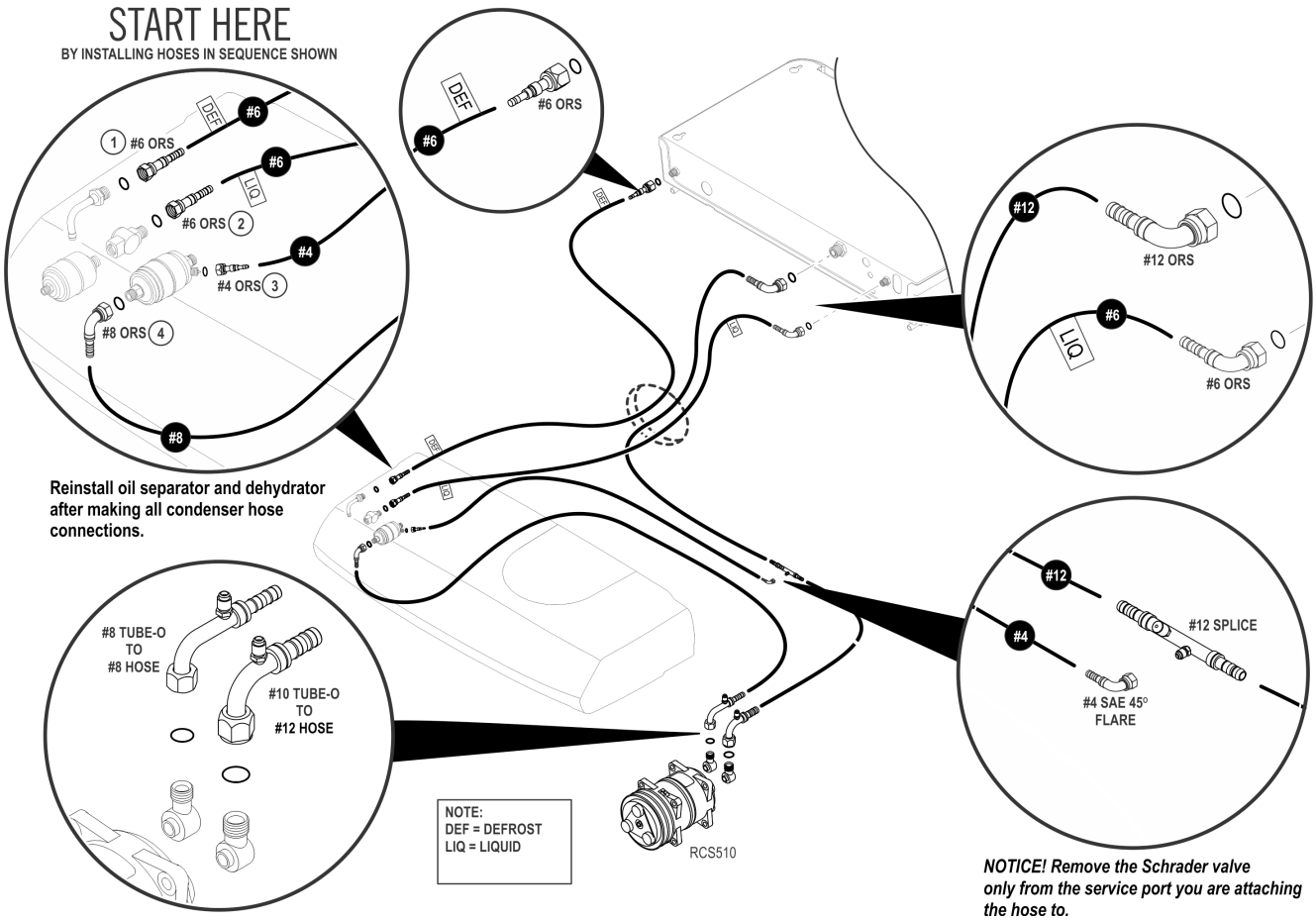
Hose Connections V-220 MAX 20

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!*



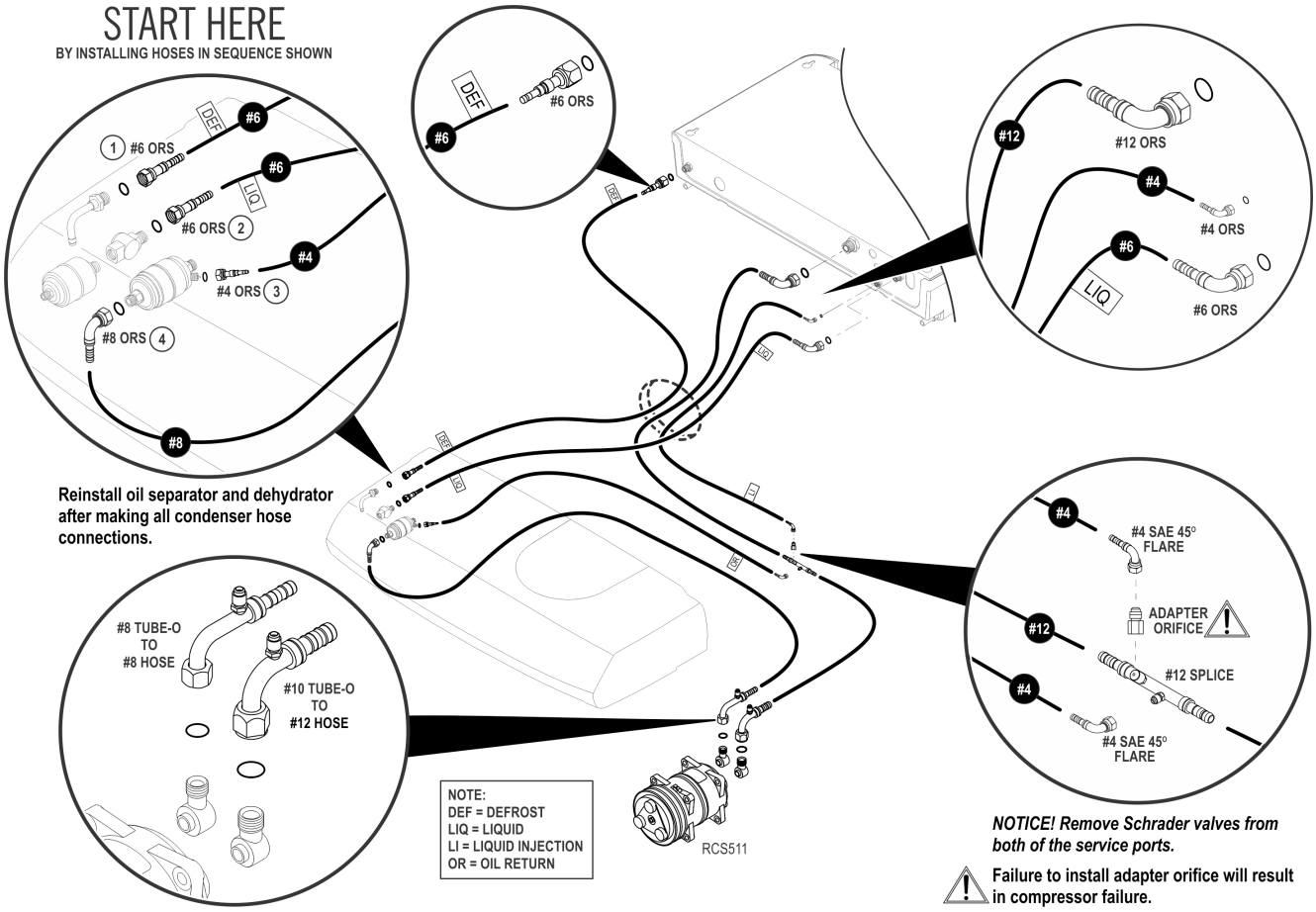
Hose Connections V-320 10

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!*



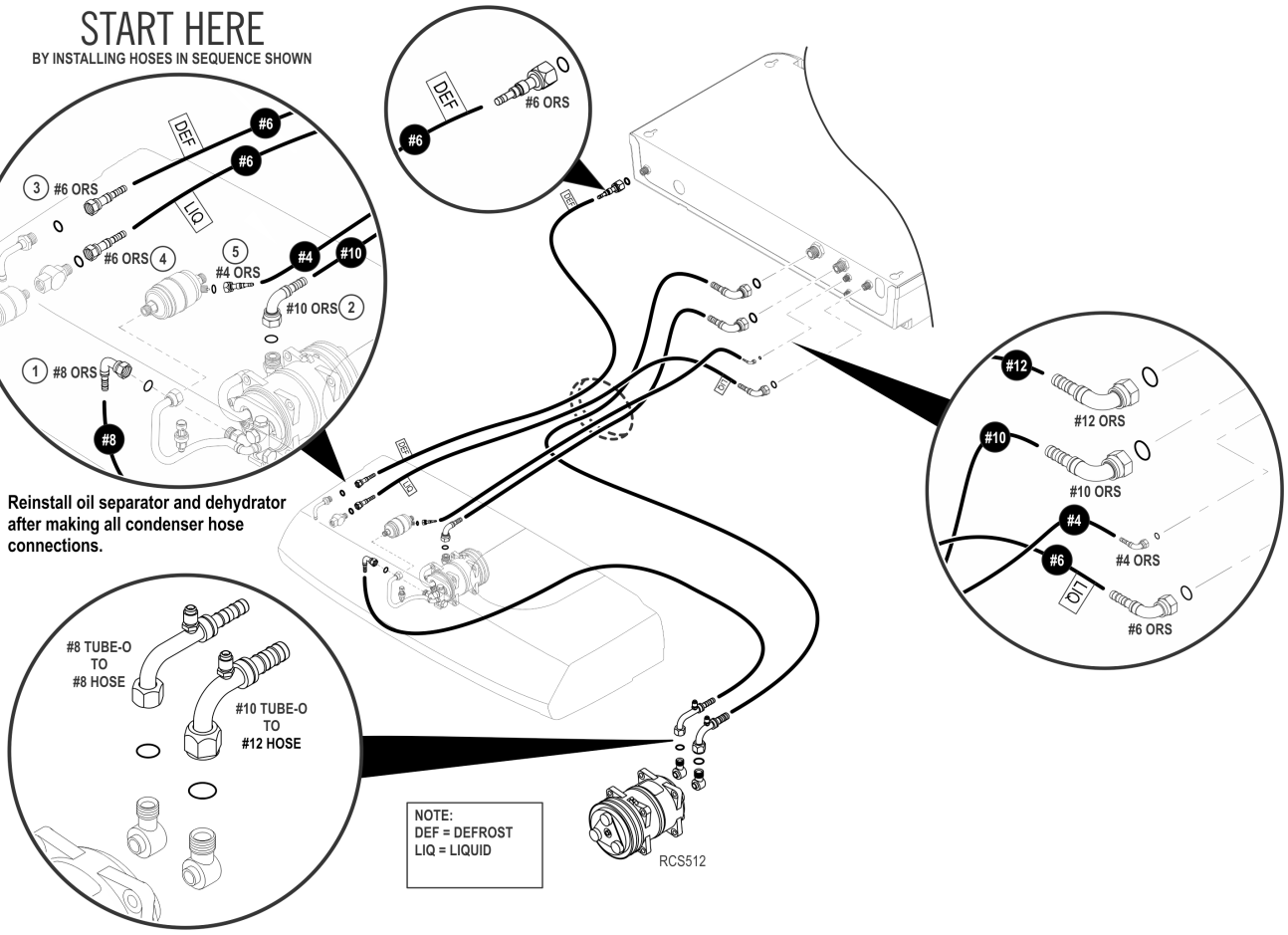
Hose Connections V-320 MAX 10

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!*



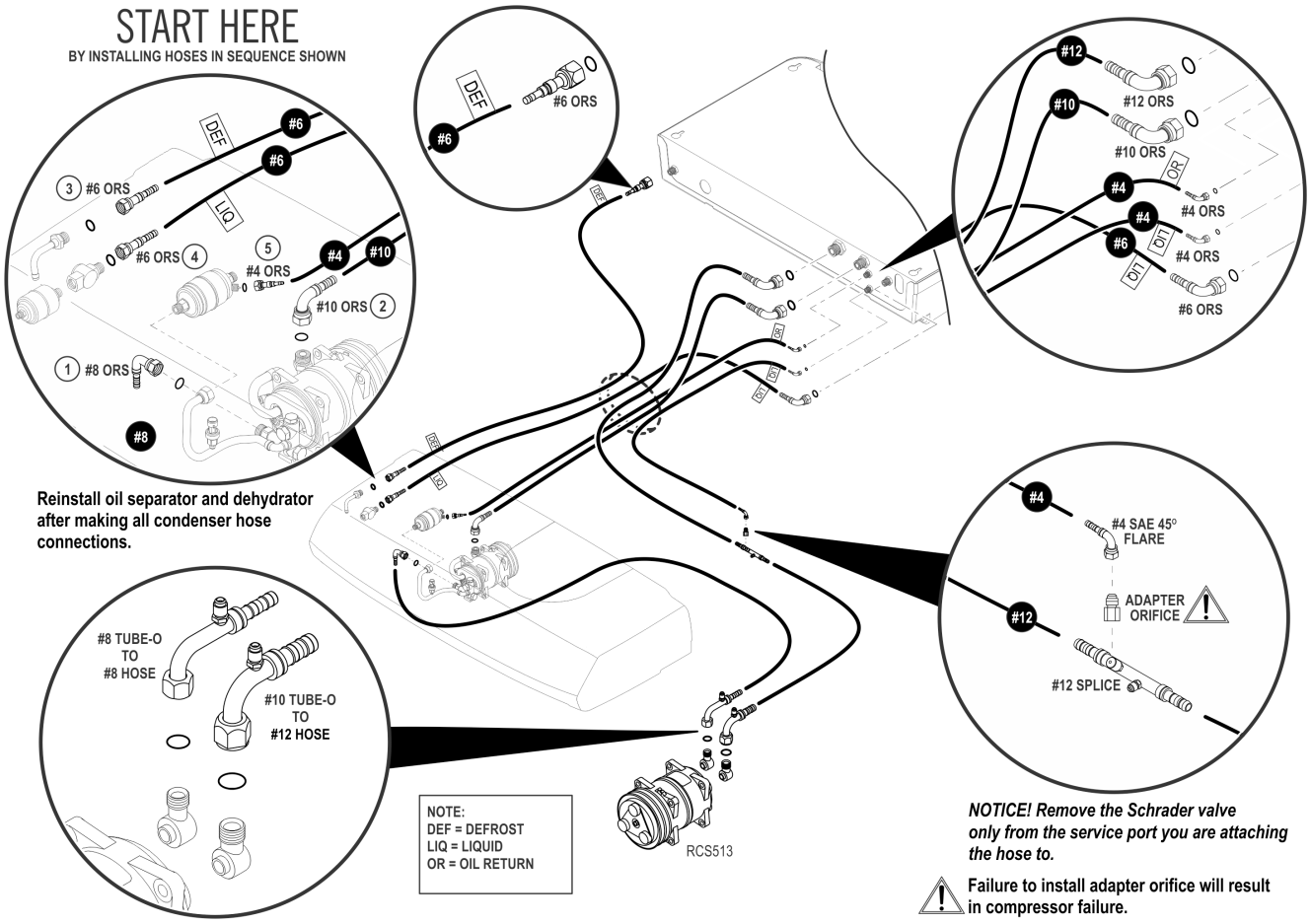
Hose Connections V-320 20

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!*



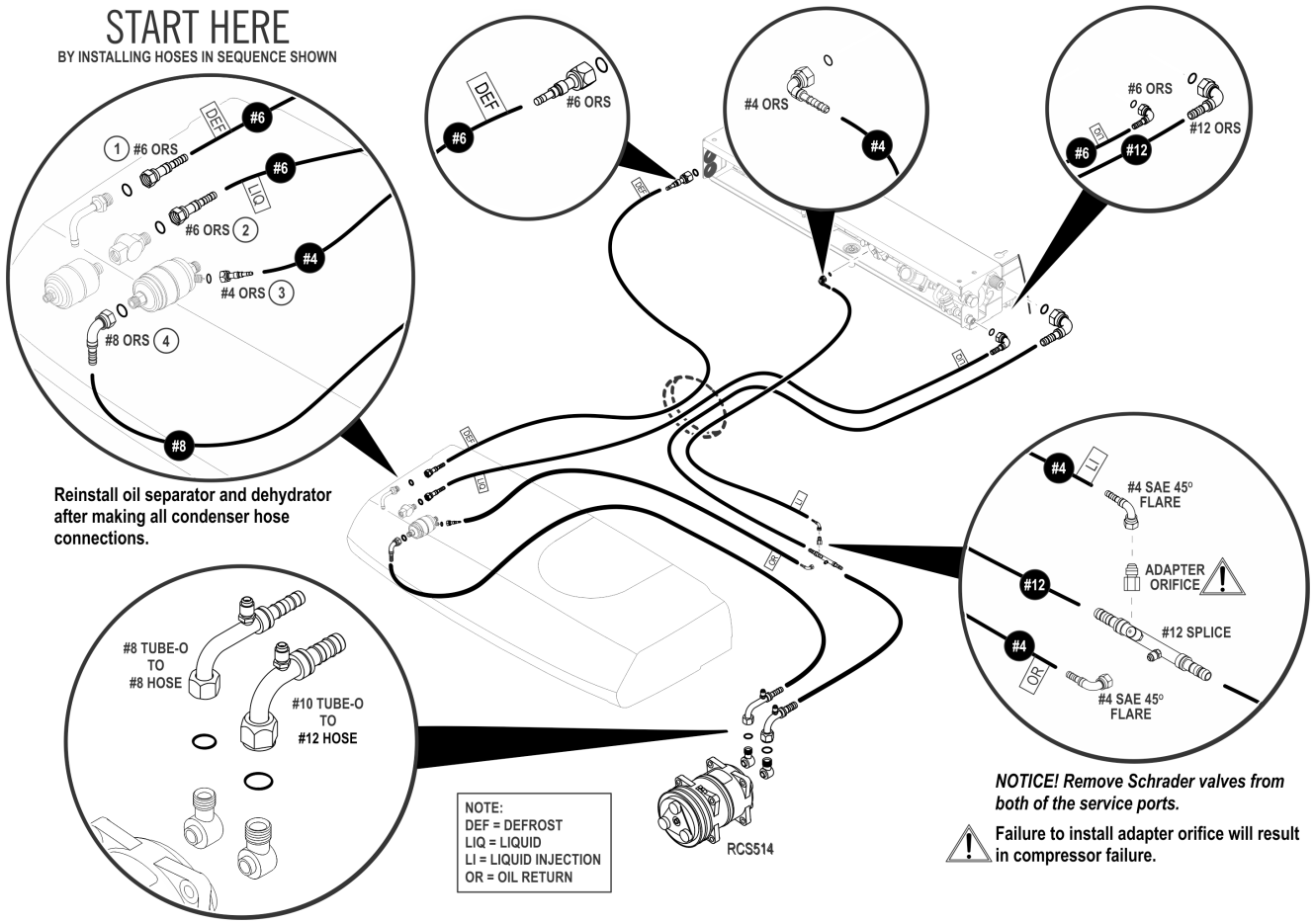
Hose Connections V-320 MAX 20

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!*



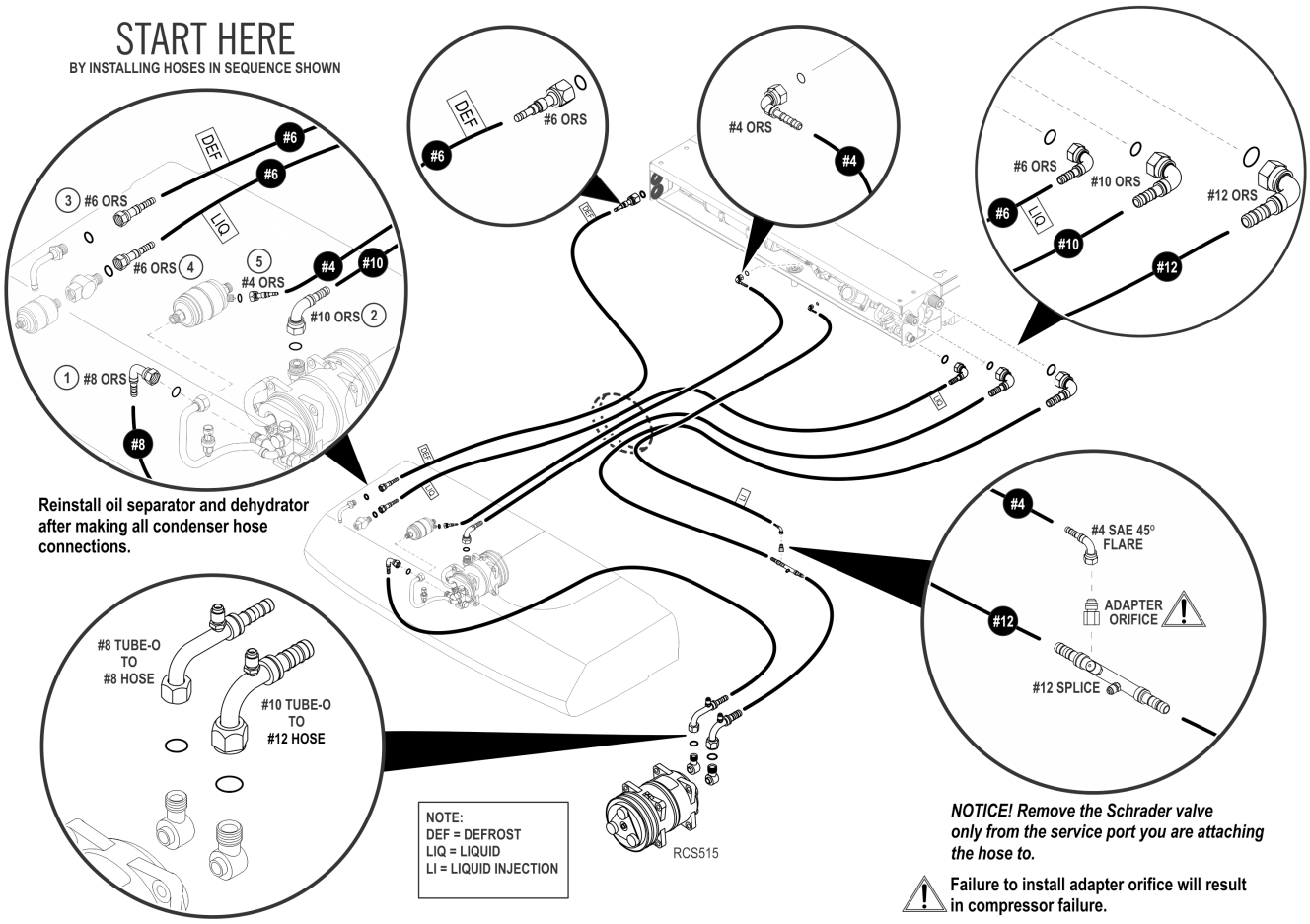
Hose Connections V-320 MAX 30

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!*



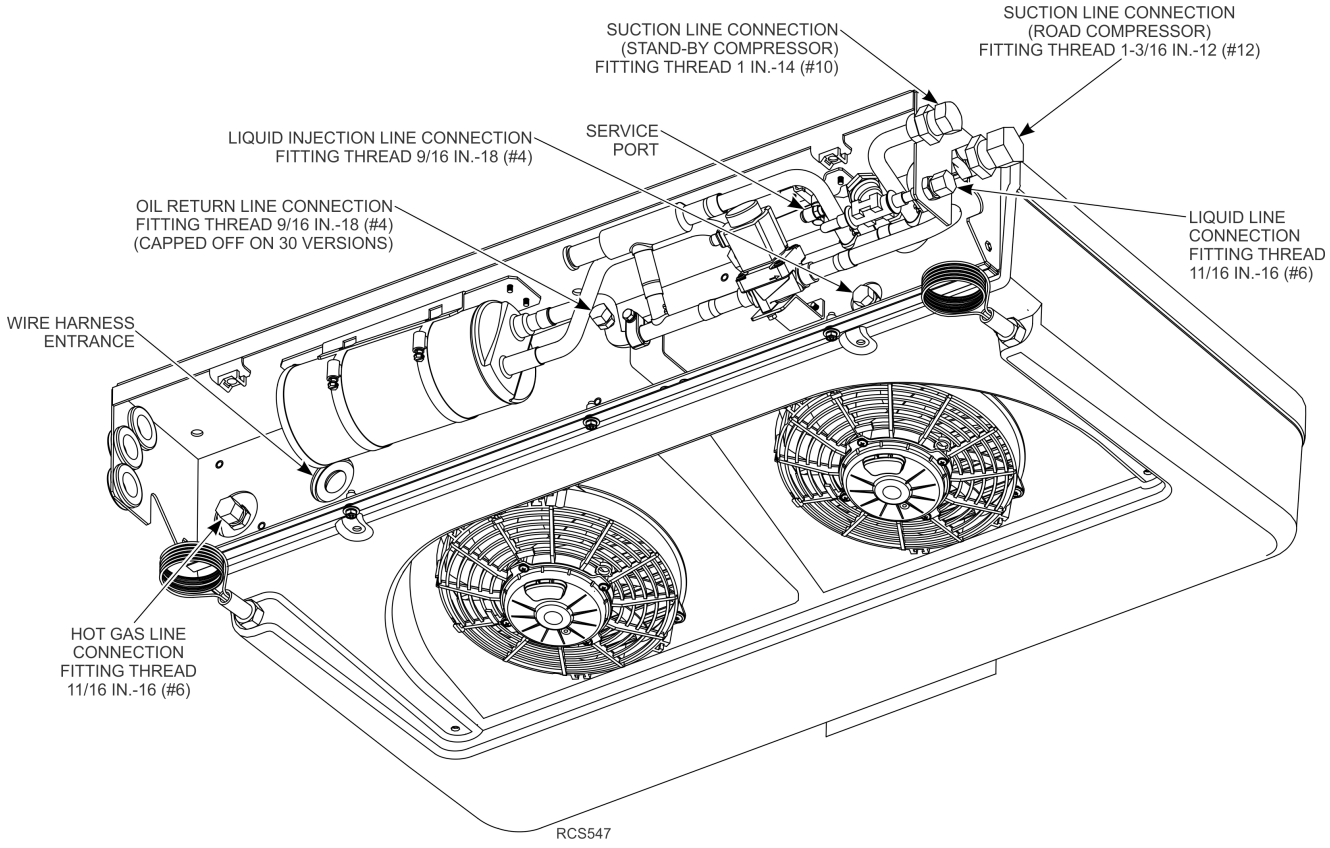
Hose Connections V-320 MAX 50

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!*



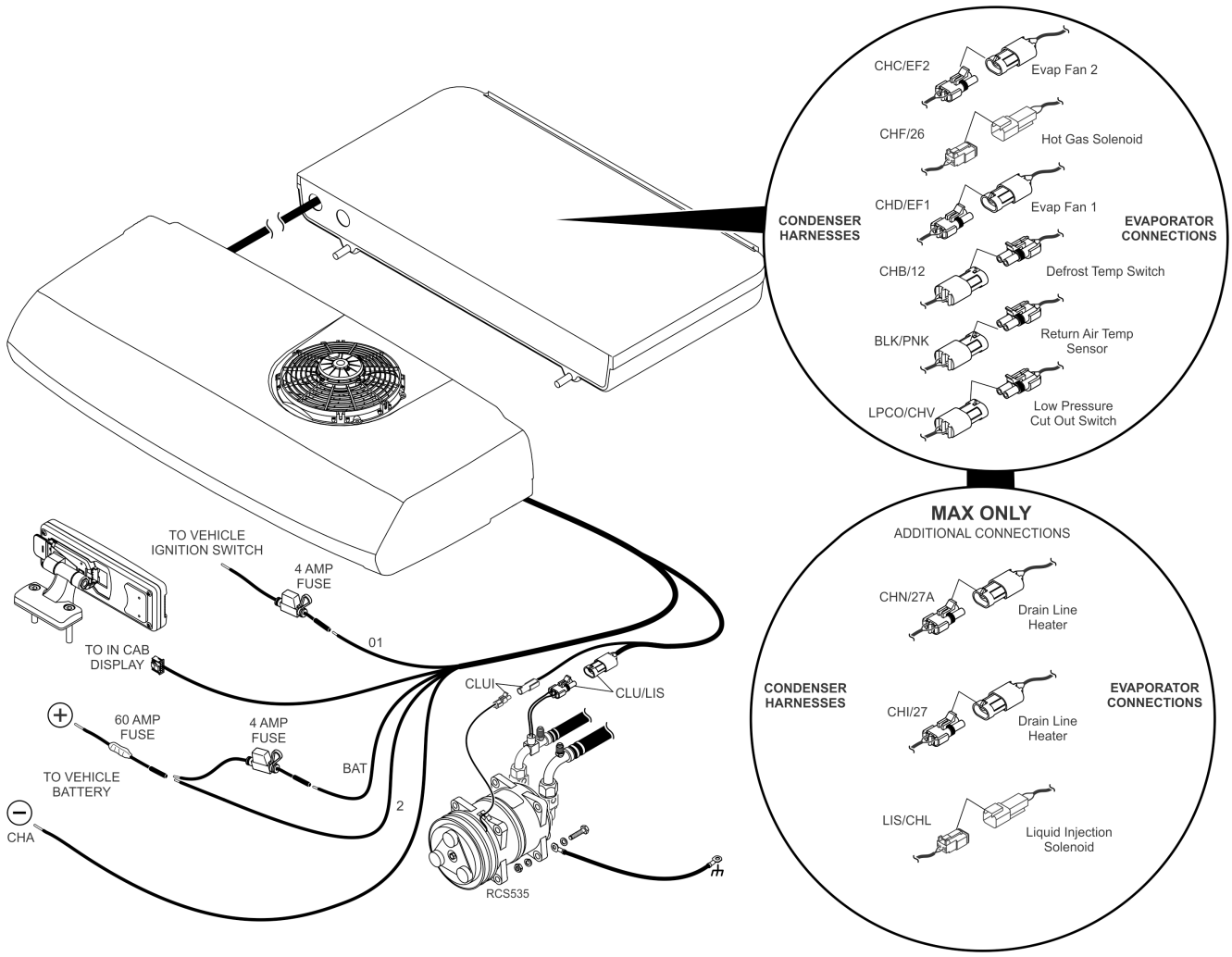
Hose Connections to Accumulator Assembly V-320 MAX 30/MAX 50

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!*



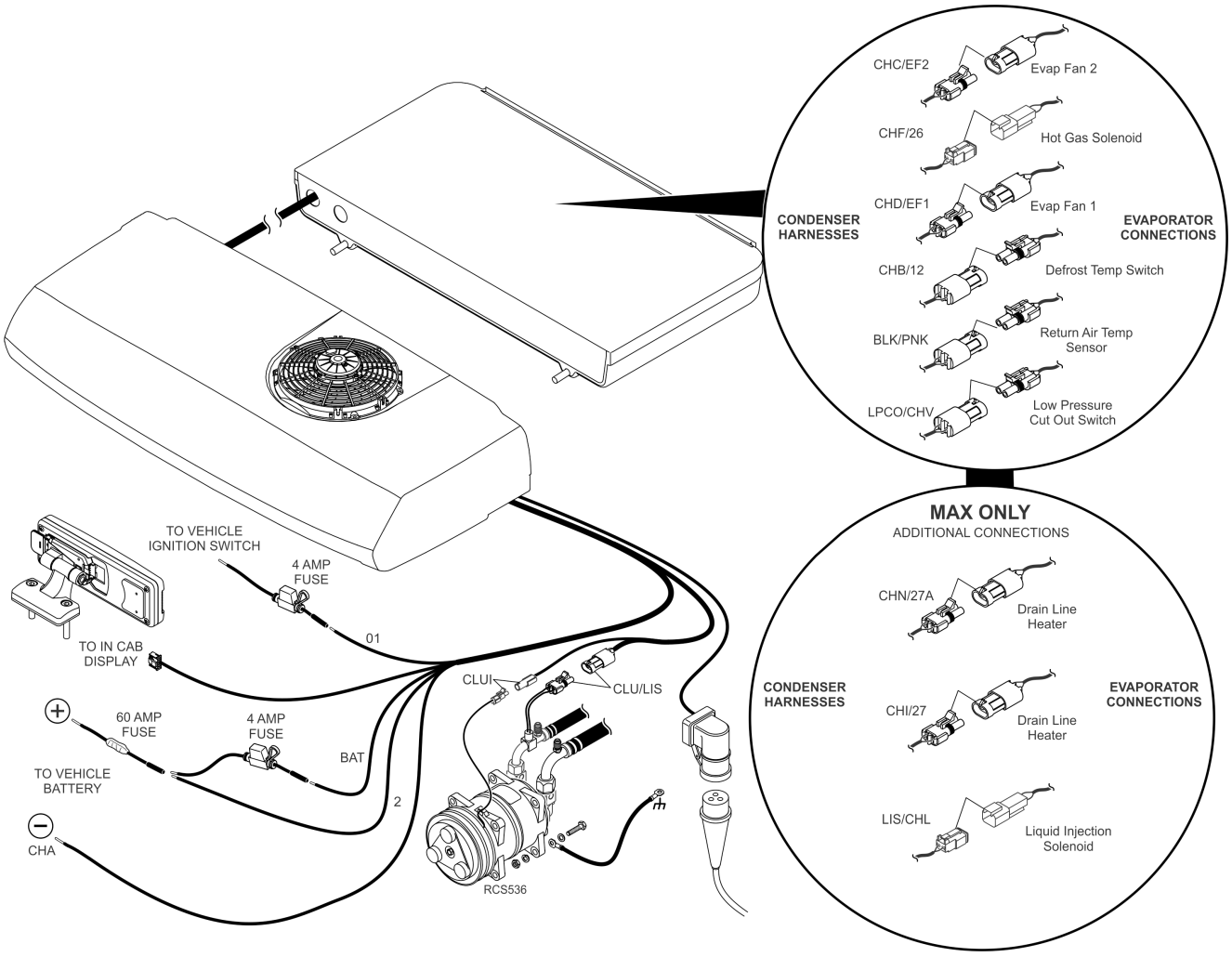
Wiring Connections V-220/V-320 10 & MAX 10

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!*



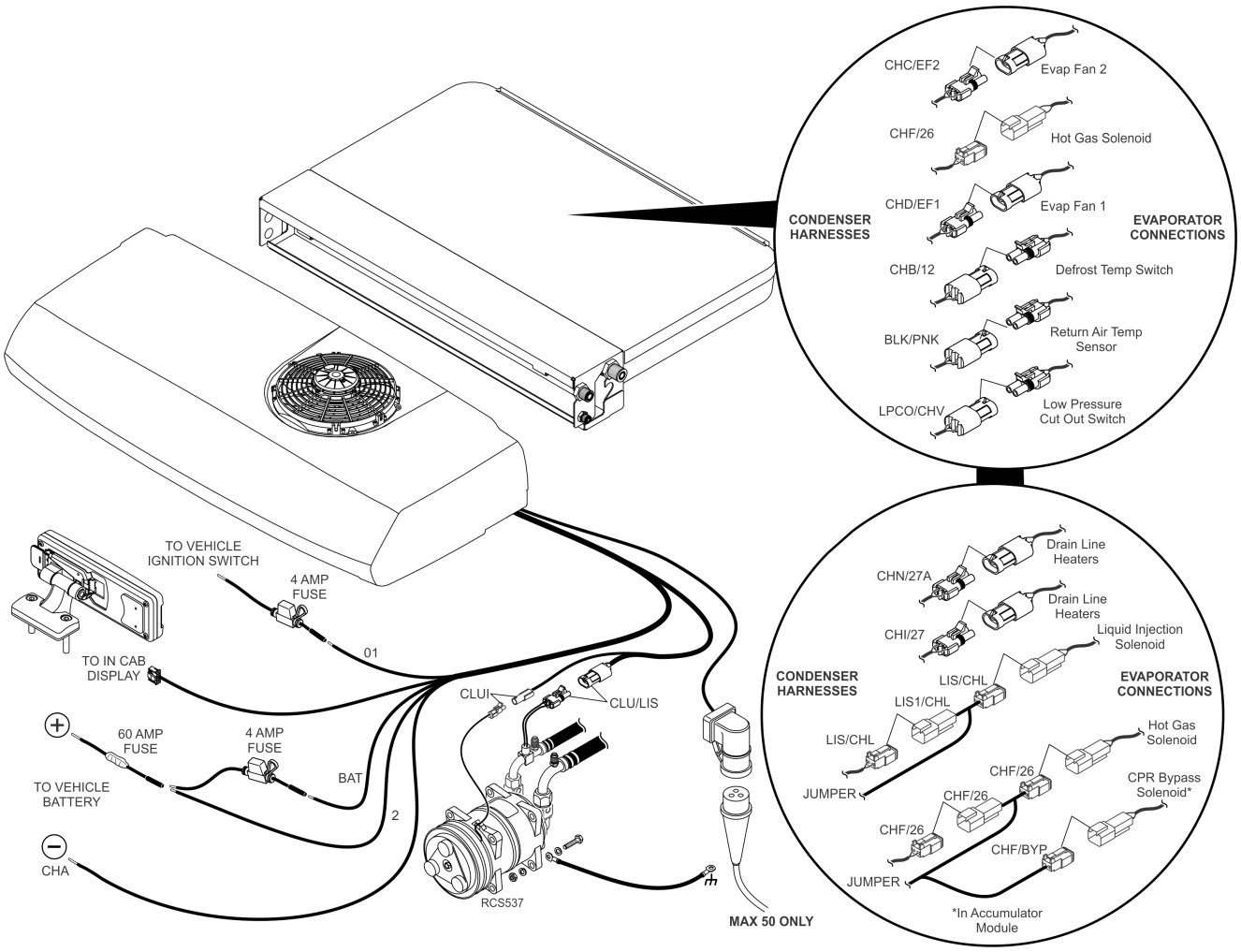
Wiring Connections Model 20 & MAX 20Wiring Connections Model 20 & 50

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!*



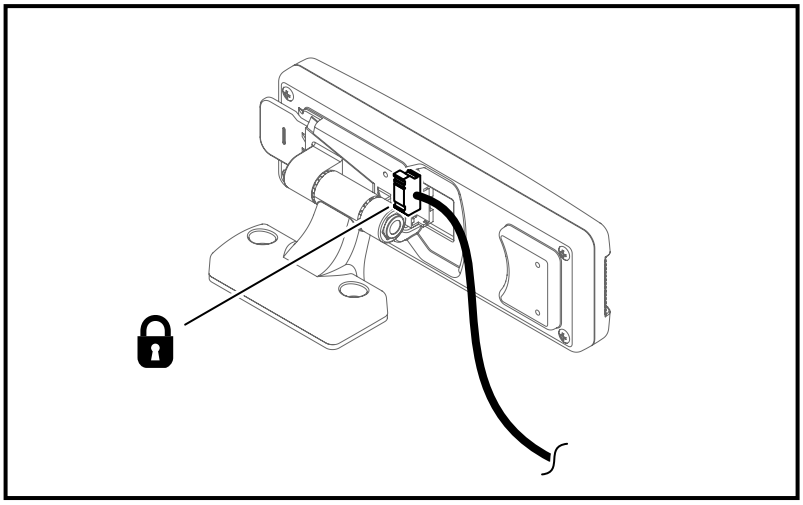
Wiring Connections V-320 MAX 30 & MAX 50

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!*

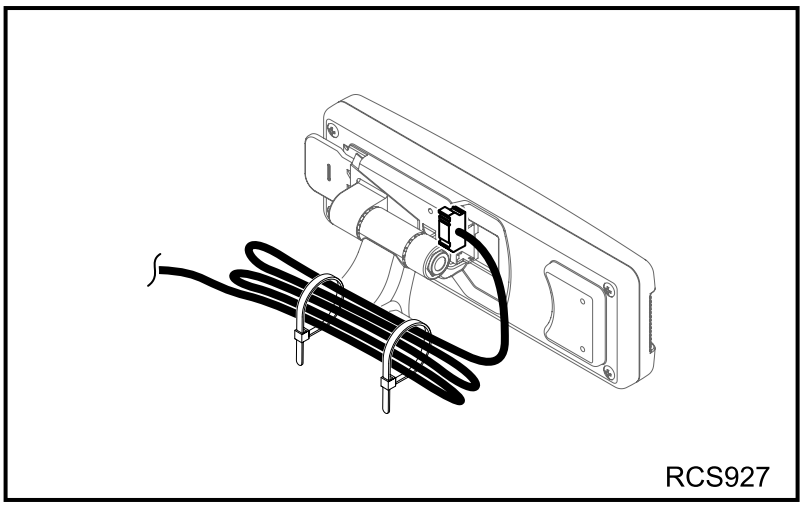


In-Cab Controller Installation

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!*



Attach connector to controller verifying it locks securely in place.



Secure any excess harness adequately with band wraps.

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 2. Typical receptacle installation with correct drip loop shown

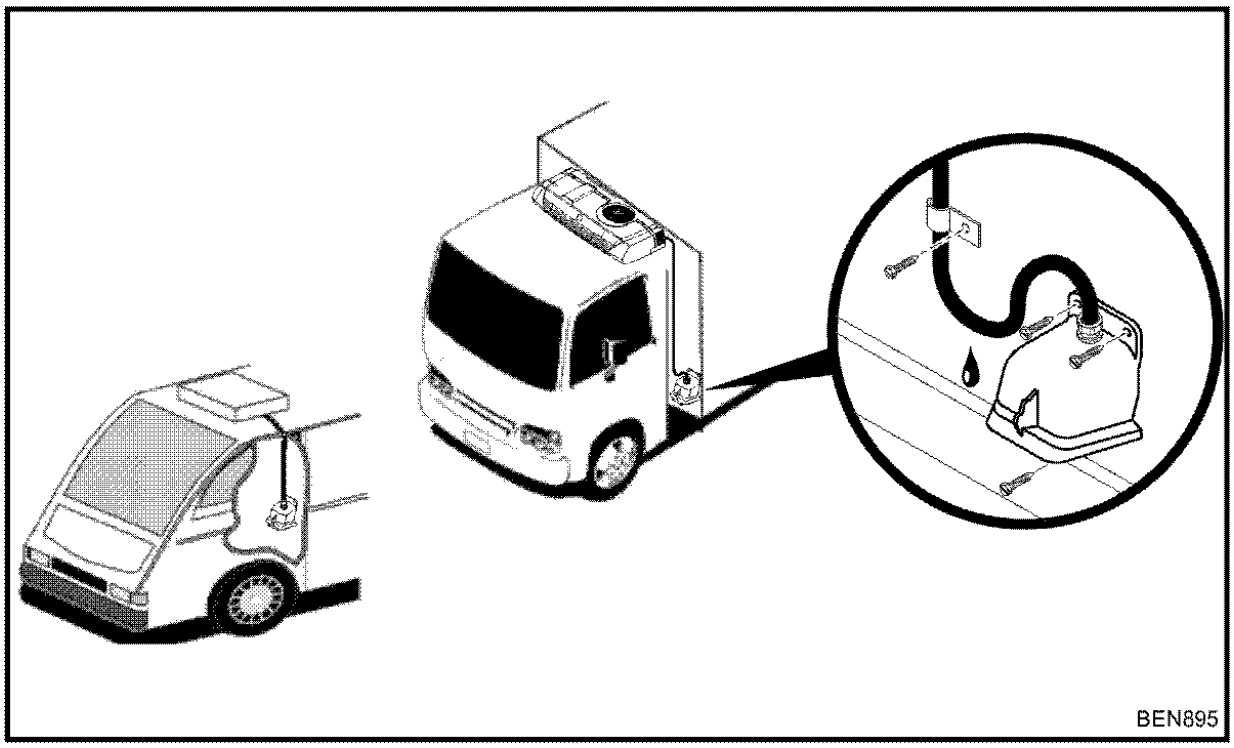
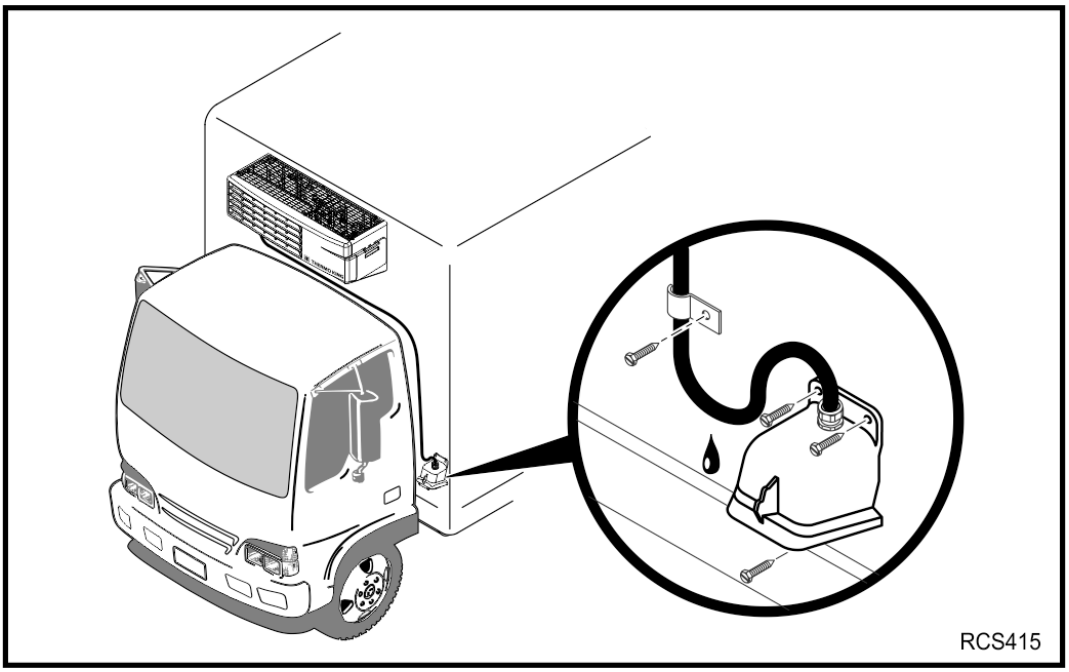


Figure 3. Typical receptacle installation with correct drip loop shown



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-100N/ES150

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 4. ES-100 Rear and Bottom views

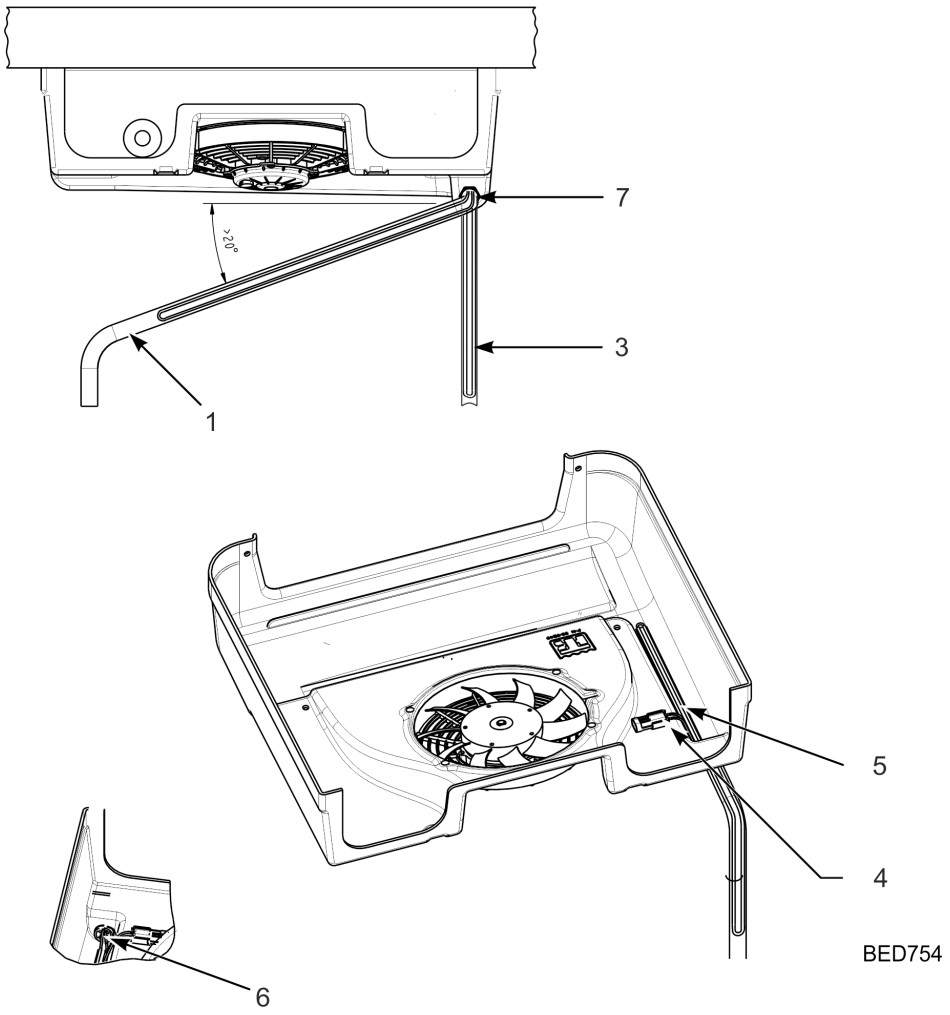
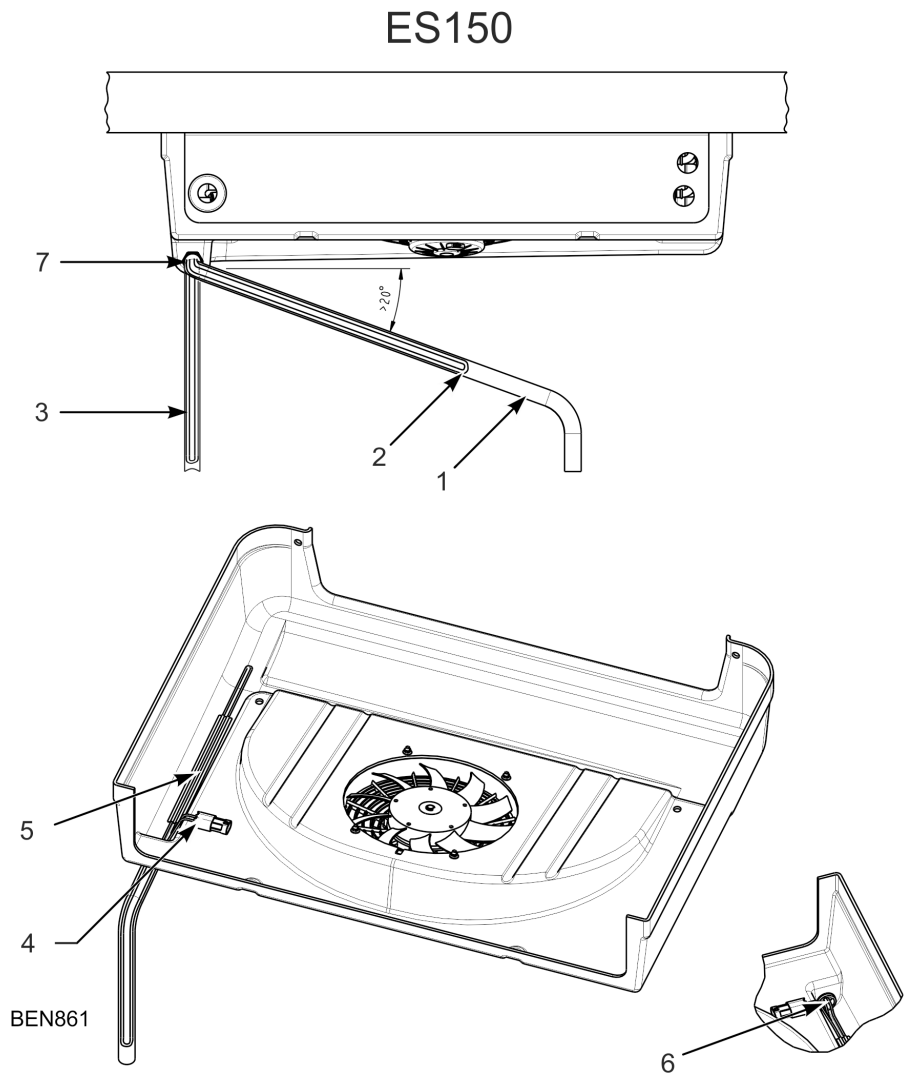


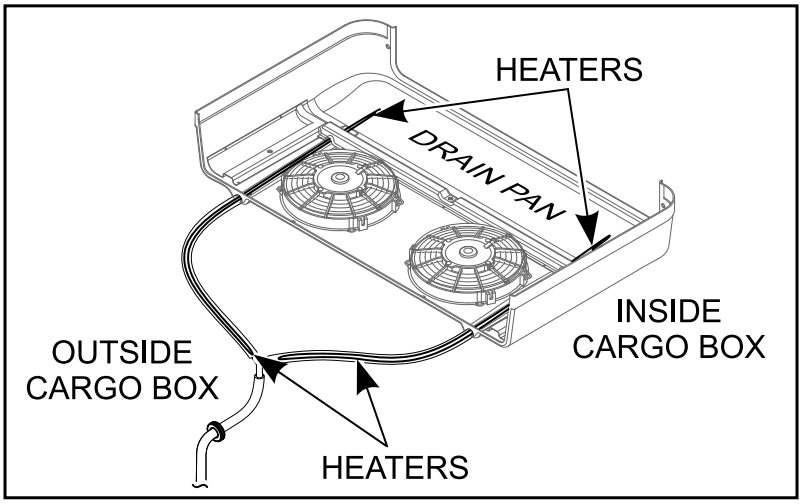
Figure 5. ES-150 Rear and Bottom views



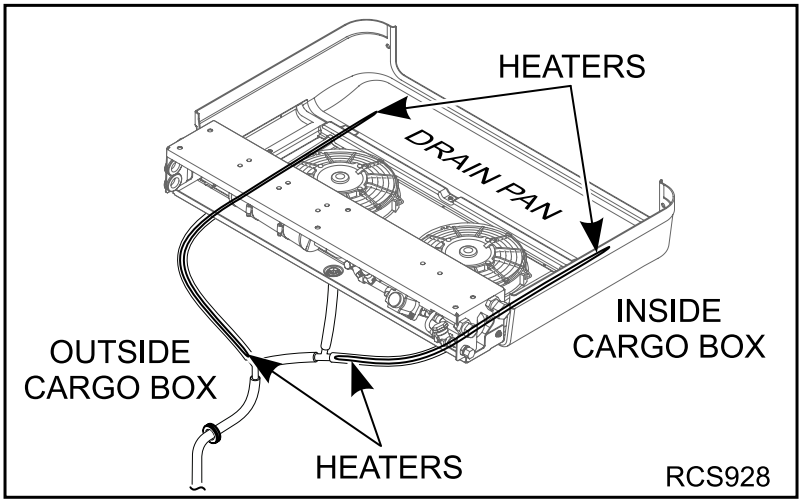
Legend

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

ES-220/ES-320



Attach drain hoses onto both evaporator drain tubes and combine into a single hose using supplied Y-connector. **MAX Units Only** - Install heaters into each drain hose as far as they will go.



ES320 MAX 30 and 50 ONLY – These evaporators are equipped with accumulator assembly which includes a separate drain hose. This drain hose must be connected along with the other two drain hoses using T and Y connectors. Install heaters into each drain hose as far as they will go.

ES-200/ES-300

Completing the Installation

Important: *BEFORE COMPLETING THE INSTALLATION, YOU MUST PERFORM THE FOLLOWING PROCEDURES IN ACCORDANCE WITH THE THERMO KING INSTALLATION STANDARDS AND PROCEDURES GUIDE (TK 56430):*

- *SYSTEM EVACUATION PROCEDURES*
- *SYSTEM LEAK CHECK PROCEDURES*
- *SYSTEM CHARGING PROCEDURES*
- *CONFIGURATION SOFTWARE PROCEDURES*
- *CONTROLLER PARAMETER SETUP*

Suction Pressure Regulator (SPR) Adjustment Procedures - MAX 20

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.*

⚠ WARNING

Equipment Damage!

Lower settings can be selected based on local preferences to optimize heating operation. HIGHER valve settings than specified will lead to system malfunction including operation interruption when box is warm (motor overcurrent conflict with inverter limits).

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 20 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.

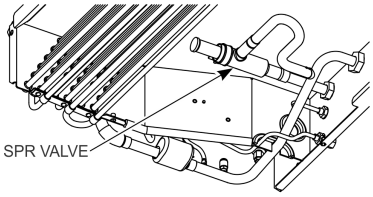
MAX units are equipped with a SPR valve located in the evaporator (See illustration below). The valve is used to limit the load on the compressor. This also affects the current draw of the electric motor.

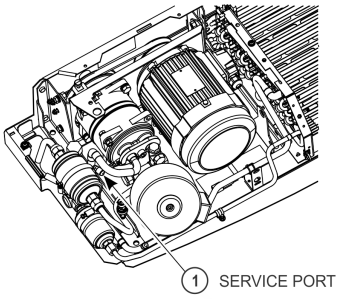
1. Install gauge manifold set onto the suction service port at the standby compressor (See illustration below).
2. Install gauge manifold set onto the suction service port at the compressor (See illustration below).
3. Attach an additional compound gauge on suction service port located on copper suction tube in evaporator to monitor suction pressure going to the SPR valve (See illustration below).
4. Connect clamp on amp meter to T1 (Black) motor wire on a 115V/230V 1 PH unit, or to the leg of the highest voltage motor wire of a 230V 3 PH unit.
5. Connect standby power receptacle to an appropriate electric power source.
6. Place jumper wire between the 12 and CHB wires at the defrost termination switch to verify the unit will run in defrost.
7. 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).
8. Start unit and run in defrost on the electric compressor until the pressure on the additional compound gauge attached to the suction service port stabilizes at a pressure above 45 psig (310 kPa).
9. 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:

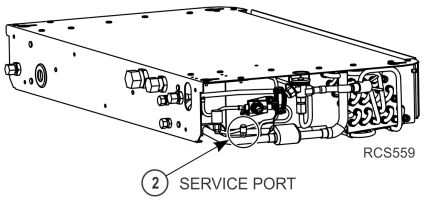
VOLTAGE	OVERLOAD RELAY SETTING
115/1/60	14 Amps
208/1/60	9.5 Amps
230/1/60	9 Amps
208/3/60	7.2 Amps
230/3/60	7 Amps

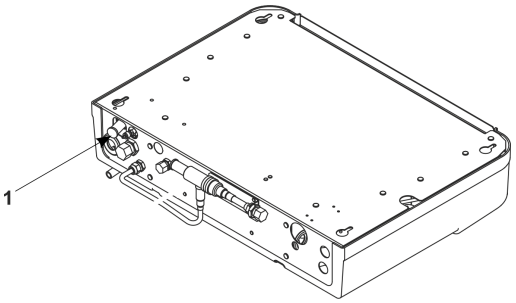
10. Check the suction pressure on the gauge attached to the service port at the electric compressor. It should be not higher than 40 +-2psig (275kPa +-14kPa).
11. If the pressure is not within range, or the current is above the specific values, remove the protective cap and adjust the SPR valve to the correct setting.

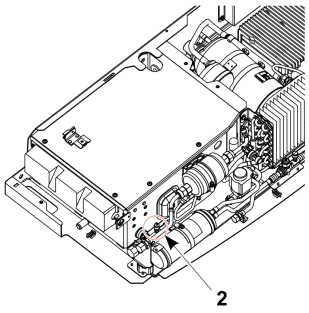
12. If the pressure is not within range, remove the protective cap and adjust the SPR valve to the correct setting.
13. Remove gauge manifold set, the additional compound gauge, and the jumper wire when finished with the procedure.

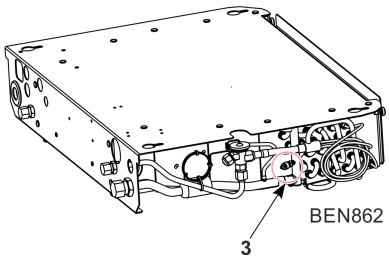












1.	SPR Valve
2.	Service Port E-200
3.	Service Port Evaporator

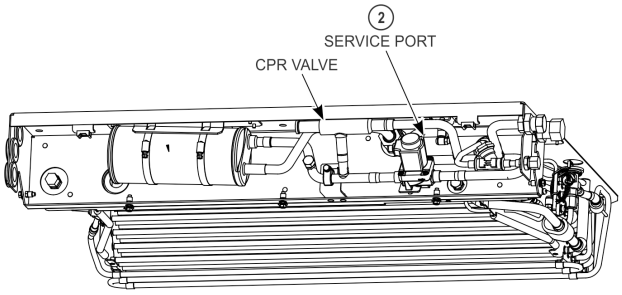
Compressor Pressure Regulator (CPR) Adjustment Procedures - MAX 30

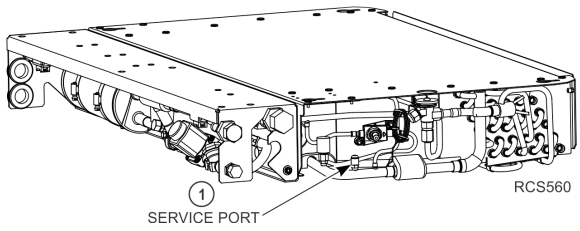
Important: *All new unit installations require these adjustment procedures. Failure to do so may not allow the unit to operate at its maximum capacity.*

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 30 units are equipped with a compressor pressure regulator (CPR) valve located in the accumulator module mounted on the back of the evaporator (See illustration below). It is used to limit the suction pressure during heat.

1. Install a gauge manifold set on the suction service port located on the upper suction tube in the evaporator to monitor suction pressure going to the CPR valve (See illustration below).
2. Attach an additional compound gauge to the accumulator suction service port to monitor suction pressure after the CPR valve (See illustration below).
3. Place a jumper wire between the 12 and CHB wires at the defrost termination switch to verify the unit will run in defrost.
4. Start the unit and run it in defrost on the roadside compressor until the pressure on the gauge manifold set attached to the suction service port in the evaporator stabilizes at a pressure above 45 psig (310 kPa).
5. Check the suction pressure on the compound gauge at the accumulator suction service port. It should be 24 ± 2 psig (165 ± 14 kPa). If the setting is incorrect, remove the protective cap and adjust the compressor pressure regulator valve to the correct setting.
6. Remove the gauge manifold set and the additional compound gauge when finished with the test.





Compressor Pressure Regulator (CPR) 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.*

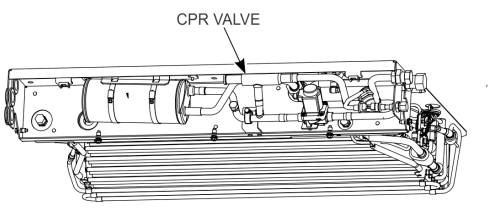
Note: *The following procedures are for initial settings. Sometimes conditions such as high or low ambient temperatures may require that the settings be fine-tuned for optimum performance.*

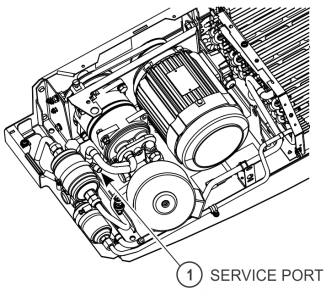
MAX 50 units are equipped with a compressor pressure regulator (CPR) valve located in the accumulator module mounted on the back of the evaporator (See illustration below). The valve is used to limit the load on the standby compressor and limit suction pressure during heat mode. This also affects the current draw of the electric motor. Monitor the current drawn of the electric motor when making this adjustment to verify it is below the overload relay setting.

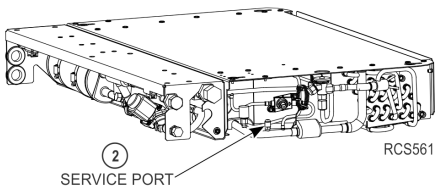
1. Install gauge manifold set to the suction service port at the electric standby compressor (See illustration below).
2. Attach additional compound gauge on suction service port located on copper suction tube in evaporator to monitor suction pressure going to the CPR valve (See illustration below).
3. Connect clamp on amp meter to T1 motor wire on a 115V/230V 1 PH unit, or to the leg of the highest voltage motor wire of a 230V 3 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	14 Amps
208/1/60	9.5 Amps
230/1/60	9 Amps
208/3/60	7.2 Amps
230/3/60	7 Amps

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







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 Swash Plate Compressors

		Oil Supplied in Unit		Oil Added at Installation				
Model	Compressor Type	System Oil (oz.)	Standby Compressor (oz.)	Add to Roadside Compressor (oz.)	Add to Suction Line (oz.)	Total Oil Added at Installation (oz.)	Total System Capacity (oz.)	Oil Type
V-220/V-320 10	TK 13/TK 15	5	–	4	4	8	13	POE 120
V-220/V-320 20	TK 13/TK 15	5	4	4	4	8	17	POE 120
V-320 30	TK 15	5	–	4	8	12	17	POE 120
V-320 50	TK 15	5	4	4	8	12	21	POE 120
Note: *If utilizing a discharge muffler, add an additional 3 oz. of oil during installation or repair.*								

Table 2. Oil Capacity for Units Utilizing Reciprocating Compressors

		Oil Supplied in Unit		Oil Added at Installation				
Model	Compressor Type	System Oil (oz.)	Standby Compressor (oz.)	Add to Roadside Compressor (oz.)	Add to Suction Line (oz.)	Total Oil Added at Installation (oz.)	Total System Capacity (oz.)	Oil Type
V-220/V-320 10	TK 208	5	–	17	4	21	26	POE 120
V-220/V-320 20	TK 208	5	4	17	4	21	30	POE 120
V-320 30	TK 208	5	–	17	8	25	30	POE 120
V-320 50	TK 208	5	4	17	8	25	34	POE 120
Note: *If utilizing a discharge muffler, add an additional 3 oz. of oil during installation or repair.*								

Table 3. Oil Capacity for Units Utilizing Hermetic Compressors

		Oil Supplied in Unit	Oil Added at Installation		
Model	Compressor Type	Compressor (oz.)	Total Oil Added at Installation (oz.)	Total System Capacity (oz.)	Oil Type
E-200	Rotary hermetic (variable speed)	10 oz. (0.29 liter)	4 oz. (0.12 liter)	14 oz. (0.41 liter)	PVE
Note: *The remaining oil supplied (8oz) to be used for greasing the o-rings at the fittings*					

Table 4. Oil Capacity for Units Utilizing Hermetic Compressors

		Oil Supplied in Unit		Oil Added at Installation				
Model	Compressor Type	System Oil (oz.)	Standby Compressor	Add to Roadside Compressor (oz.)	Add to Suction Line (oz.)	Total Oil Added at Installation (oz.)	Total System Capacity (oz.)	Oil Type

Table 4. Oil Capacity for Units Utilizing Hermetic Compressors (continued)

V-100			10 oz (0.29 liter)					
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.*								

Recommended Refrigerant Charge by Model

Important: *Failure to add the proper amount of refrigerant will result in decreased system performance. Refer to the Thermo King Vehicle Powered Truck Installation Standards and Procedures Guide (TK 56430) for information on proper system charging procedures.*

Model	Recommended Refrigerant Charge (lb.)
V-220 10	2.8
V-220 10 MAX	2.5
V-220 20	2.8
V-220 20 MAX	2.6
V-320 10	3.3
V-320 10 MAX	3.0
V-320 20	3.4
V-320 20 MAX	3.1
V-320 30 MAX	3.1
V-320 50 MAX	3.2
Note: *Final refrigerant charge will vary slightly based on each unique installation.*	

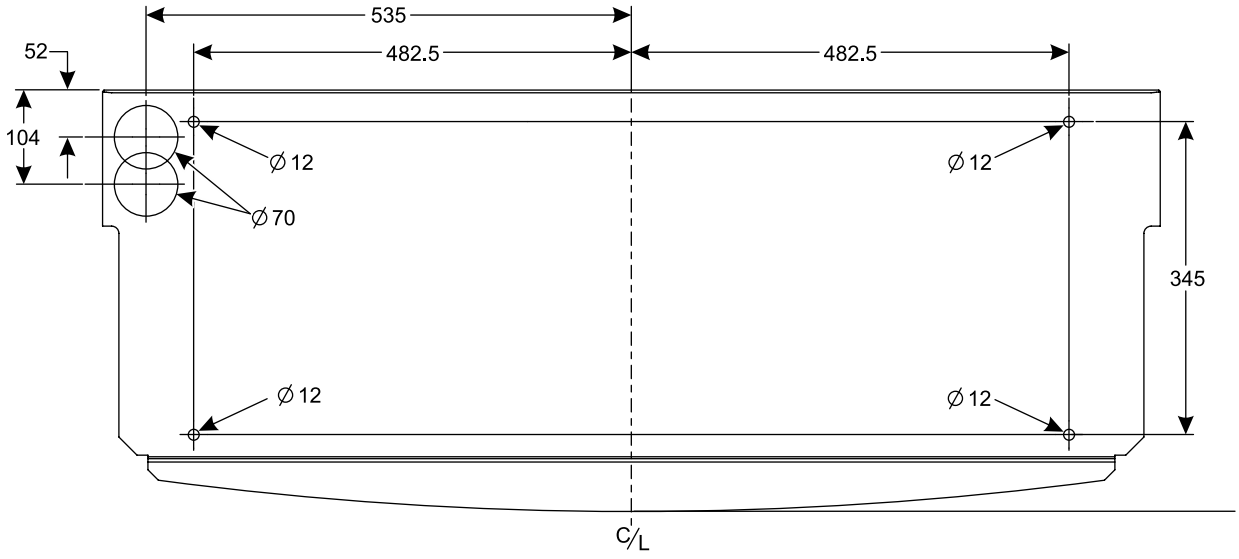
Model	Recommended Refrigerant Charge (lb.)
B-100 B-100 ECO	1.87 lb (0.85 kg) R-134a 1.87 lb (0.85 kg) R-134a ***Important:*** *For each additional meter (39") of hose extension, 80g (0.17lb) of refrigerant **MUST** be added*
E-200 20 E-200 MAX 50 E-200 MAX 50 Spectrum	1.3kg (2.8lb) (including 1.5m (60") hoses supplied as standard) R134a 1.3kg (2.8lb) (including 1.5(60") hoses supplied as standard) R452A/ R404A 1.6kg (3.5lb) (including 6m(237") hoses supplied as standard) R452A/ R404A ***Important:*** 1. *For each additional meter (39") of hose extension, 80g (0.17lb) of refrigerant **MUST** be added* 2. *It is a good idea to utilise the WINTRAC tool to set compressor speed at an intermediate level (for example - 60Hz) during refrigeration charge. If the unit is charged with the compressor at full speed, overcurrent protection may trip.*

Recommended Refrigerant Charge by Model

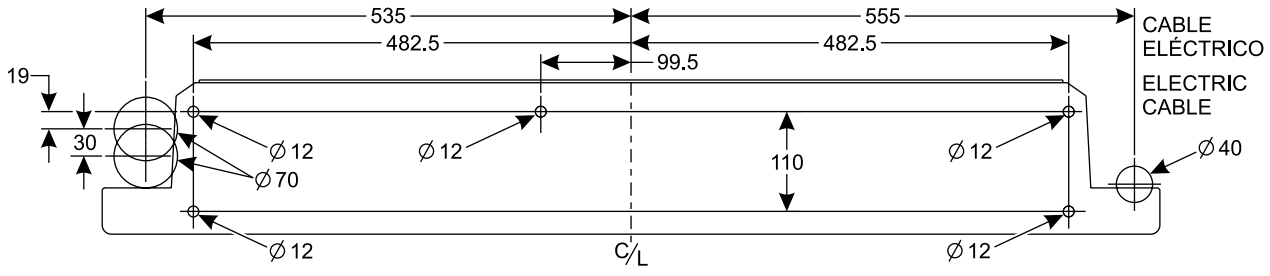
V-200 MAX 10/30	2.20 lb (1.0 kg) R-452A
V-200 MAX 20/50	2.66 lb (1.2 kg) R-452A
V-200 MAX 30 Spectrum	3.00 lb (1.35 kg) R-452A
V-200 MAX 50 Spectrum	3.00 lb (1.35 kg) R-452A
V-300 MAX 10/30	1.37 lb (0.62 kg) R-452A
V-300 MAX 20/50	2.20 lb (1.0 kg) R-452A
V-300 MAX 50 Spectrum (ES150+ES150)	4.10 lb (1.85 kg) R-452A
V-300 MAX 50 Spectrum (ES100+ES150)	4.10 lb (1.85 kg) R-452A
V-300 MAX 50 Spectrum (ES100+ES200)	4.10 lb (1.85 kg) R-452A
	Important: *For each additional meter (39") of hose extension, 80g (0.17lb) of refrigerant* ***MUST*** *be added*
V-100 MAX 10	1.37 lb (0.62 kg) R-452A
V-100 MAX 20	2.20 lb (1.0 kg) R-452A
V-100 MAX 30	1.37 lb (0.62 kg) R-452A
V-100 MAX 50	2.20 lb (1.0 kg) R-452A
V-200s MAX 20	.66 lb (1.2 kg) R-452A
V-200s MAX 50	.66 lb (1.2 kg) R-452A
V-500 MAX 10	4.63 lb (2.1 kg) R-452A
V-500 MAX 20/30	4.85 lb (2.2 kg) R-452A
V-500 MAX 50	5.07 lb (2.3 kg) R-452A
V-500 MAX Spectrum 10	5.07 lb (2.3 kg) R-452A
V-500 MAX Spectrum 20/30	5.29 lb (2.4 kg) R-452A
V-500 MAX Spectrum 50	5.51 lb (2.5 kg) R-452A
V-600 MAX 10	4.85 lb (2.2 kg) R-452A
V-600 MAX 20/30	5.07 lb (2.3 kg) R-452A
V-600 MAX 50	5.29 lb (2.4 kg) R-452A
V-800 MAX 10/30	10.36 lb (4.7 kg) R-452A
V-800 MAX 20/50	11.02 lb (5.0 kg) R-452A
V-800 MAX 30 Spectrum (ES400+ES400)	11.46 lb (5.2 kg) R-452A
V-800 MAX 50 Spectrum (ES600+ES150)	11.02 lb (5.0 kg) R-452A
V-800 MAX 50 Spectrum (ES600+2xES150)	11.35 lb (5.15 kg) R-452A

Condenser and Evaporator Dimensions

CONDENSER ROOF TOP
MOUNTING / ACCESS HOLE LOCATIONS



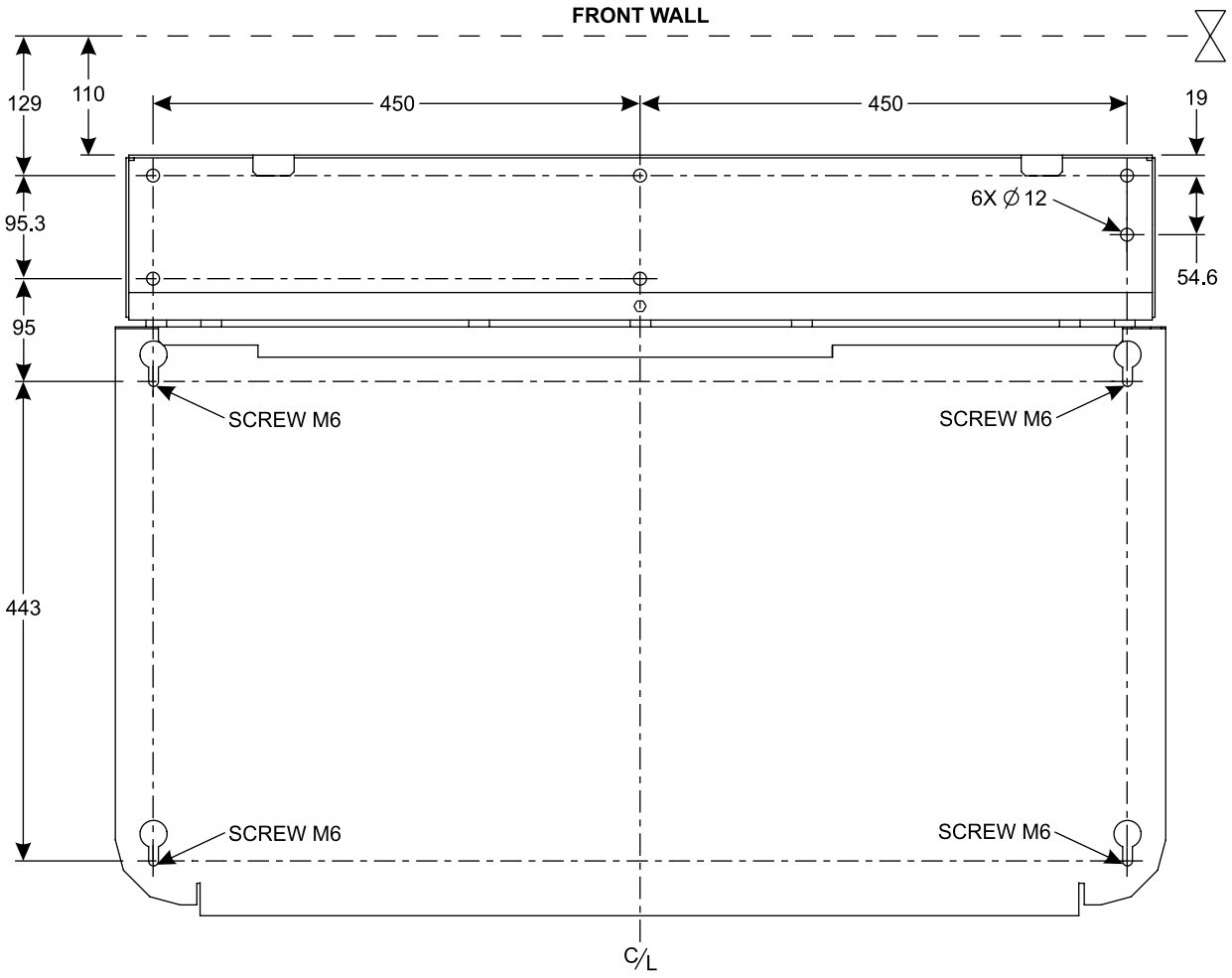
CONDENSER NOSE MOUNT
MOUNTING / ACCESS HOLE LOCATIONS



Paper templates are available to assist with the installation of the condenser and evaporator. These templates provide the installer with a “footprint” of the component and provide the correct mounting and access hole locations. Thermo King Dealers can order templates through InfoCentral and ReqDirect system.

RCS922

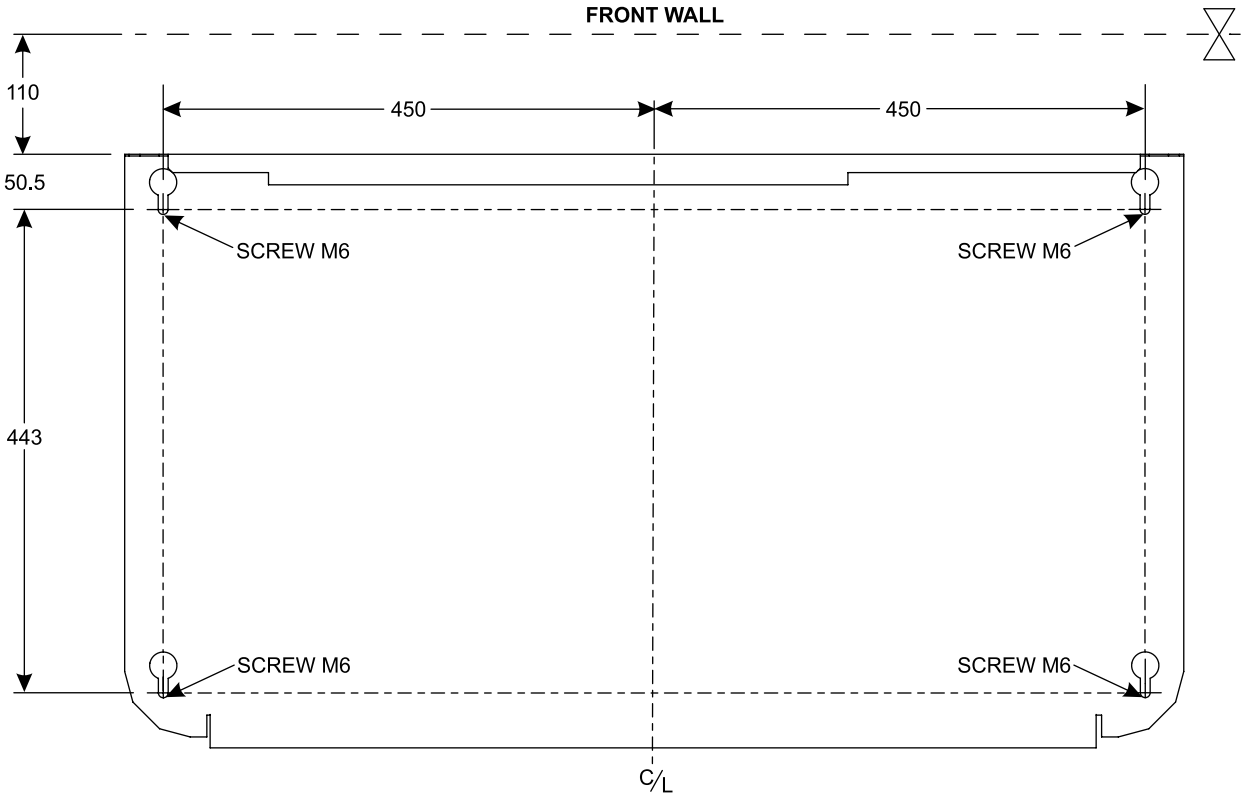
ES320 EVAPORATOR WITH ACCUMULATOR MOUNTING HOLE LOCATIONS



Paper templates are available to assist with the installation of the condenser and evaporator. These templates provide the installer with a “footprint” of the component and provide the correct mounting and access hole locations. Thermo King Dealers can order templates through InfoCentral and ReqDirect system.

RCS925

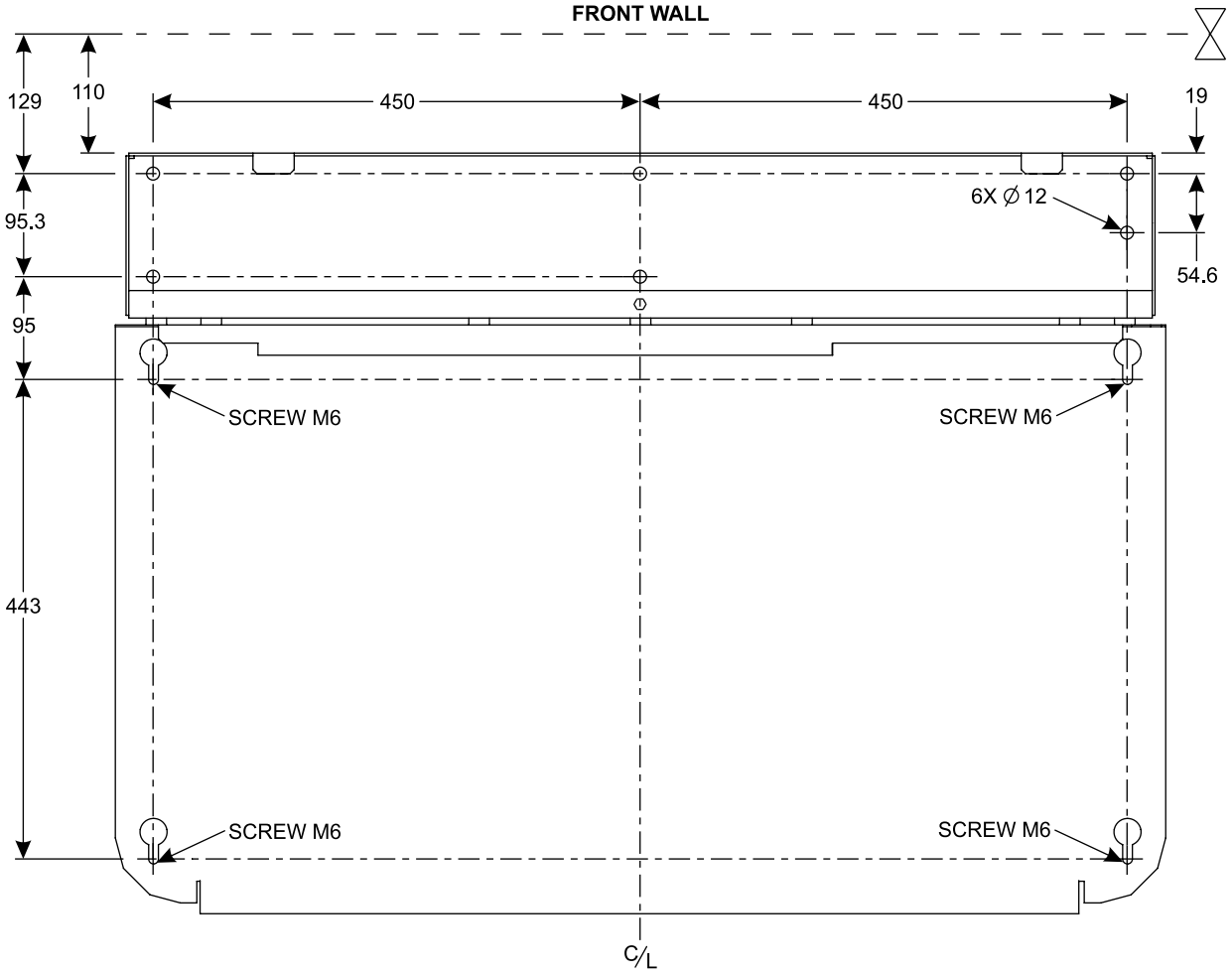
ES320 EVAPORATOR
MOUNTING HOLE LOCATIONS



Paper templates are available to assist with the installation of the condenser and evaporator. These templates provide the installer with a “footprint” of the component and provide the correct mounting and access hole locations. Thermo King Dealers can order templates through InfoCentral and ReqDirect system.

RCS924

ES320 EVAPORATOR WITH ACCUMULATOR MOUNTING HOLE LOCATIONS



Paper templates are available to assist with the installation of the condenser and evaporator. These templates provide the installer with a “footprint” of the component and provide the correct mounting and access hole locations. Thermo King Dealers can order templates through InfoCentral and ReqDirect system.

RCS925

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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Supersedes TK 56321-18-IM-EN (June 2017)