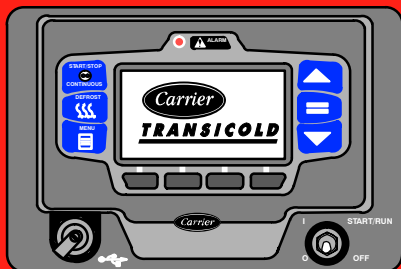




Trailer & Rail Refrigeration



OPERATOR'S MANUAL

for the

VECTOR™ 8500

Single-Temp Trailer and Rail Refrigeration Units



**OPERATOR'S
MANUAL**
for the
VECTOR™ 8500
**Single-Temp Trailer and Rail
Refrigeration Units**

TABLE OF CONTENTS

	Page
Introduction	1
Unit Identification	2
Safety	3
Auto-Start	4
Display	6
Display Screens	7
Starting Unit	8
Inspect Mode	10
Switching Operating State	12
IntelliSet™	14
Operator Messages	16
Pretrip	18
Changing Setpoint	20
Start-Stop or Continuous Operation	22
Data Recorder / Trip Start	24
Manual Defrost	26
Language Selection	28
Unit Data	29
Alarm List	32
View Hour Meters	33
Stopping Unit	34
Emergency Bypass Mode	35
Pretrip Inspection	36
Product Loading	38
Recommended Transport Temperatures	39
General Troubleshooting	40
Fuses	42
Maintenance	44
Maintenance Schedule	44
Priming Fuel System	47
Emergency Road Service	48

INTRODUCTION

This guide has been prepared for the operator of a Carrier Transicold Vector™ 8500 Trailer or Rail refrigeration unit with APX™ Control System. It contains basic instructions for the daily operation of the refrigeration unit as well as safety information, troubleshooting tips, and other information that will help you to deliver the load in the best possible condition. Please take the time to read the information contained in this booklet and refer to it whenever you have a question about the operation of this Carrier Transicold unit.

This refrigeration unit has been engineered to provide long, trouble-free performance when it is properly operated and maintained. The checks outlined in this guide will help to minimize over-the-road problems. In addition, a comprehensive maintenance program will help to insure that the unit continues to operate reliably. Such a maintenance program will also help to control operating costs, increase the unit's working life, and improve performance.

This guide is intended as an introduction to this unit and to provide general assistance when needed. More comprehensive information can be found in the Operation & Service Manual for this unit. This manual can be obtained from your Carrier Transicold dealer.

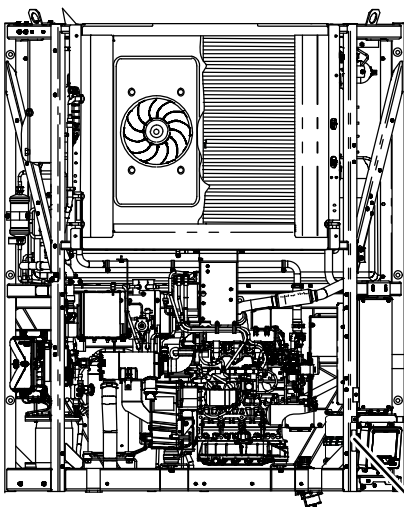
When having this unit serviced, be sure to specify genuine Carrier Transicold replacement parts for the highest quality and best reliability.

At Carrier Transicold, we are continually working to improve the products that we build for our customers. As a result, specifications may change without notice.

UNIT IDENTIFICATION

Each unit is identified by a decal attached to the frame of the unit inside the roadside side door. This decal is on the bottom vertical frame next to the display. The decal identifies the model number of the unit, the warranty ID number, the serial number, the type of refrigerant and refrigerant charge.

If a concern arises, please refer to the information on this decal, and make a note of the model and serial number before calling for assistance. This information will be needed when you contact an authorized Carrier Transicold Dealer so that they may properly assist you.



Nameplate

Carrier

Athens Ga.

Model Name:

VECTOR 8500

Serial No:

PAJH#####

Model No:

NDK537###-##

Warranty ID:

#####

Refrigerant:

R404A 14 Lbs.

Standby:

Max. Op. Press. LP:

100psig/HP: 465psig

Manufacturer's Warranty Statement:

See dealer for warranty coverage details.

DATE IN SERVICE

MONTH

YEAR

1234567891011

2011

1234567891011

2012

1234567891011

2013

1234567891011

2014

DAY

1234567891011

1213141516171819202122

232425262728293031

Made in the United States of America

(Sample)

SAFETY



WARNING

Unit may start automatically at any time even if the switch is in the OFF position. Use proper lockout/tagout procedures before inspection/servicing. All unit inspection/servicing by properly trained personnel only.



WARNING

Be aware of HIGH VOLTAGE supplied at the power plug or from the generator. When performing service or maintenance procedures: ensure the START/RUN-OFF switch is in the OFF position, lockout/tagout the high voltage receptacle, and lockout/tagout the negative battery connection.

This Carrier Transicold refrigeration unit has been designed with the safety of the operator in mind. During normal operation, all moving parts are fully enclosed to help prevent injury. During any inspection or servicing with the doors open you may be exposed to moving parts; please stay clear of all moving parts when the unit is in operation.

NOTE TO TECHNICIANS

Refer to the Operation and Service Manual for a complete list of safety precautions.

SAFETY - CONTINUED

AUTO-START

This unit is equipped with Auto-Start in Start-Stop and Continuous Operation. The unit may start at any time. A buzzer will sound for 5 seconds before the unit is started. When performing any check of the refrigeration unit (e.g., visually checking the belt, oil, or coolant), place unit in Inspect Mode, unplug the high voltage connector, and disconnect the starter solenoid connector.

COOLING SYSTEM

The engine is equipped with a pressurized cooling system including a pressurized coolant bottle. Under normal operating conditions, the coolant in the engine and radiator is under high pressure and is very hot. Contact with hot coolant can cause severe burns. Do not remove the cap from a hot coolant system; if cap must be removed, cover it with a rag and remove very slowly in order to release the pressure without spray.

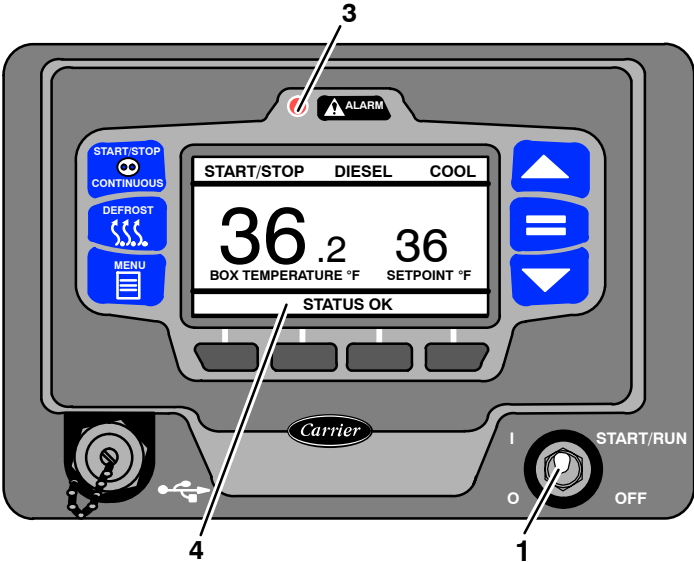
REFRIGERANT

The refrigerant contained in the refrigeration system of this unit can cause frostbite, severe burns, or blindness when in direct contact with the skin or eyes. For this reason (and because of legislation regarding the handling of refrigerants) we recommend that you contact your nearest Carrier Transicold authorized repair facility whenever service of the refrigerant system is required.

BATTERY

This unit may be equipped with a lead-acid type battery. The battery normally vents small amounts of flammable hydrogen gas. Do not smoke when checking the battery. A battery explosion can cause serious physical harm and/or blindness.

STARTING UNIT



WARNING

Under no circumstances should ether or any other starting aids be used to start the engine.



WARNING

Be aware of HIGH VOLTAGE supplied at the power plug or from the generator. When performing service or maintenance procedures: ensure the START/RUN-OFF switch is in the OFF position, lockout/tagout the high voltage receptacle, and lockout/tagout the negative battery connection.



WARNING

Unit may start automatically at any time even if the switch is in the OFF position. Use proper lockout/tagout procedures before inspection/servicing. All unit inspection/servicing by properly trained personnel only.

STARTING UNIT - CONTINUED

1. Place the START/RUN-OFF switch in the START/RUN position.

NOTE: The unit will automatically start in the same operating state (Engine Operation or Electric Operation) it was in when last stopped.

NOTE: If required the system will initiate a "Soft Start" / "Bump Start" procedure to clear any liquid refrigerant or oil. During this procedure, the compressor will be started for one second and then shut down for 9 seconds, up to five times.

2. The system will display the Carrier Transicold logo, display the default screen, present language selection and the hour meter readings (if configured to do so) along with a test flash of the alarm light. The system will then perform a start sequence, energize the buzzer, and then start the unit automatically.

NOTE: If the unit attempts to start in Electric Operation, and power is not available, the A00073 - "NO POWER - CHECK POWER CORD" alarm will be activated. This alarm will clear if power is restored. If the alarm condition exists for five minutes and the Functions and Configurations are set to allow a switch, the unit will switch to Engine Operation.

3. If there is an alarm present, the alarm message will be displayed in the MessageCenter and the alarm LED will flash for 5 seconds. If one or more shutdown alarms are present, the alarm(s) must be cleared before the unit will start.
4. If the unit is to be switched from Engine Operation to Electric Operation or from Electric Operation to Engine refer to the following page.

Once the unit is operating in the desired state, observe the MessageCenter. If the word "ACTIVE" or "MODIFIED" is displayed at the right, the unit is equipped with IntelliSet™ settings; for more information refer to the Intellisets section of this book.

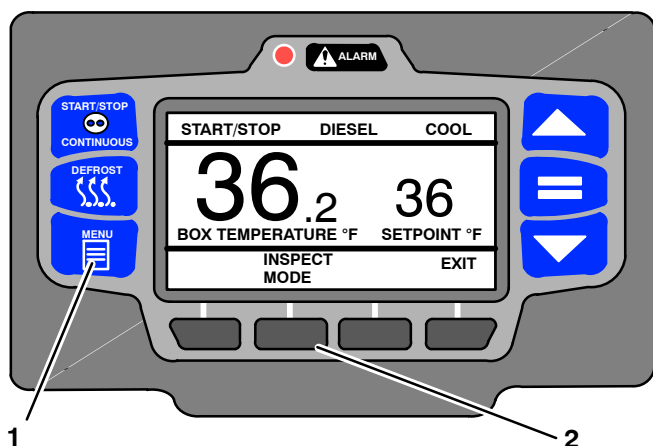
INSPECT MODE

Inspect Mode provides an additional layer of safety for operators and technicians. Inspect Mode should be used during all pretrip inspections of the unit.

Inspect Mode is a user activated feature that forces the unit to shutdown and remain in shutdown regardless of operating state.

After unit inspection, Inspect Mode must be manually disabled, at which point the unit will resume standard operation.

Inspect Mode is not a substitute for proper Lockout/Tagout procedures, which are always required when servicing the unit.



Enter Inspect Mode:

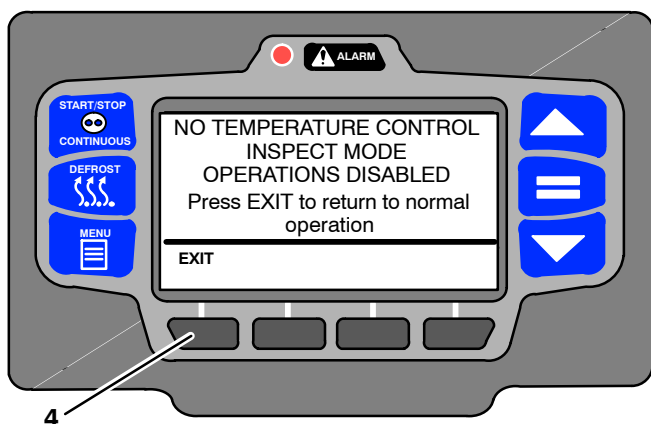
1. With the system powered up (START/RUN-OFF switch in the START/RUN position) press the MENU key until INSPECT MODE is displayed.
2. Press the INSPECT MODE soft key, the unit will shut down.

INSPECT MODE - CONTINUED

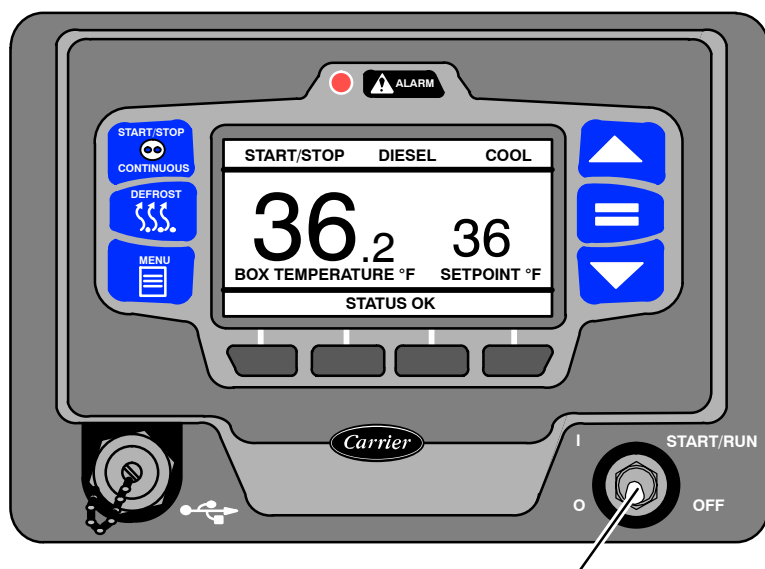
While the unit is in Inspect Mode the ALARM light will flash, and the display will indicate that unit operation, including temperature control, has been disabled.

Exit Inspect Mode:

3. While the unit is in Inspect Mode, the EXIT soft key will be available, all other keys and functions will be locked out.
4. Press the EXIT soft key to disable Inspect Mode, the unit will resume standard operation.



STOPPING UNIT



To stop the unit, place the START/RUN-OFF switch in the OFF position. The refrigeration system and engine will shut down immediately while the control system completes a shut down sequence, and then the display will go blank.

NOTES

The system will close the compressor suction modulation valve (CSMV) and evaporator expansion valve (EVXV) before turning off.

Due to internal processing, turning the START/RUN - OFF switch OFF then back to the START/RUN position will result in a 4 to 50 second delay between the display going off and coming back on again.



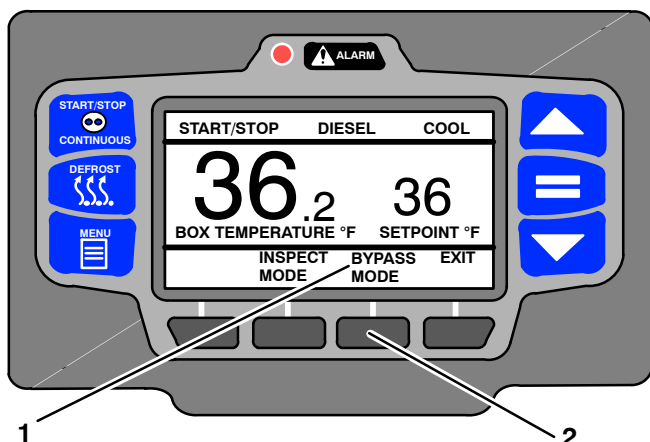
WARNING

Unit may start automatically at any time even if the switch is in the OFF position. Use proper lockout/tagout procedures before inspection/servicing. All unit inspection/servicing by properly trained personnel only.

EMERGENCY BYPASS MODE

In the event of an alarm caused by a failure of the display module, the refrigeration unit will go into shutdown. In order to temporarily bypass this shutdown state, Emergency Bypass Mode can be activated.

Once Emergency Bypass Mode has been activated, the refrigeration unit will operate normally for 24 hours, a countdown timer will be shown on the display. This 24 hour window of operation will keep the load safe, and provide enough time to contact the nearest Carrier Transicold Service Center for repair of the unit.



Enter Emergency Bypass Mode:

1. When the refrigeration unit is in a shutdown state due to the display module alarm, press the MENU key until BYPASS MODE is displayed.
2. Press the BYPASS MODE soft key, the unit will resume operation until Emergency Bypass Mode is disabled, or after 24 hours of unit operation in Emergency Bypass Mode.

Exit Emergency Bypass Mode:

3. Press the MENU key until the EXIT BYPASS soft key is displayed.
4. Press the EXIT BYPASS soft key, the refrigeration unit will shut down. Once Emergency Bypass Mode is turned off, it cannot be restarted and the unit will remain in shutdown until it is repaired.

After repairs have been made and the display module alarm has been cleared, the unit will operate normally and Emergency Bypass Mode will no longer be available.

PRETRIP INSPECTION

The Pretrip Inspection should be performed before picking up any load. This inspection is essential to ensure reliable operation of this unit. These checks take only a few minutes.



WARNING

Unit may start automatically at any time even if the switch is in the OFF position. Use proper lockout/tagout procedures before inspection/servicing. All unit inspection/servicing by properly trained personnel only.

BEFORE STARTING UNIT
Place unit in Inspect Mode, unplug the high voltage connector and disconnect starter solenoid connector
Drain water from bottom of fuel tank
Drain water from water separator on fuel filter (if applicable)
Check radiator coolant level
Check air cleaner indicator
Check engine oil level
Visually check condition of belt
Check door latches & hinges
Check battery cables for rubbing or chafing
Check battery terminals for cleanliness
Check channels or "T" bar floor as well as return air bulkhead for cleanliness and obstruction. Channels and return air bulkhead must be free of debris for proper air circulation.
Check air chute
Exit Inspect Mode and reconnect starter solenoid connector
Start unit and place in engine / continuous operation
IMMEDIATELY AFTER STARTING ENGINE
Visually check fuel lines and filters for leaks
Visually check oil lines and filters for leaks
Visually check coolant hoses for leaks
Visually check exhaust system for leaks
Verify correct air flow of condenser fan*
* Place a small rag in front of the condenser coil, the rag should hold. If the rag blows away it means that the fan is rotating in reverse.

PRETRIP INSPECTION - CONTINUED

[illegible]

GENERAL TROUBLESHOOTING



WARNING

Unit may start automatically at any time even if the switch is in the OFF position. Use proper lockout/tagout procedures before inspection/servicing. All unit inspection/servicing by properly trained personnel only.



WARNING

Be aware of HIGH VOLTAGE supplied at the power plug or from the generator. When performing service or maintenance procedures: ensure the START/RUN-OFF switch is in the OFF position, lockout/tagout the high voltage receptacle, and lockout/tagout the negative battery connection.

Everything possible has been done to ensure that this unit is the most reliable, trouble-free equipment available today. If, however you are having an issue, the following section may be of assistance.

If you do not find the trouble that you have experienced listed, please call your Carrier Transicold dealer for assistance.

GENERAL TROUBLESHOOTING - CONTINUED

Engine Operation	
Unit won't crank	Check alarm list Visually check battery condition Visually check battery connections Check all fuses
Unit won't start	Check alarm list Check fuel level Check all fuses
Unit won't run	Check alarm list Check fuel level Check engine oil level Check all fuses
Unit stops operating	Check alarm list Visually check belt Check engine oil level Visually check coolant level Check fuel level Check all fuses
Unit not cooling/heating properly	Check alarm list Initiate Manual Defrost of unit, refer to Manual Defrost section. Check for proper air circulation in the refrigerated compartment Check condenser for airflow restriction Check refrigerated compartment for damage or air leaks
Electric Operation	
Unit won't run	Check all fuses Check power cable connections Check power supply circuit breaker Visually check battery condition Visually check battery connections
Unit not cooling properly	Initiate Manual Defrost of unit, refer to Manual Defrost section. Check for proper air circulation in the refrigerated compartment Check condenser for airflow restriction Check refrigerated compartment for damage or air leaks

FUSES - CONTINUED



WARNING

When replacing fuses, lockout/tagout the power plug and the negative battery cable.

Fuse	Purpose	Amps	Volts
F1	Module Logic Circuit & Buzzer Power	5A	12VDC
F3	Stepper Valve Module Component Actuation and Engine Control Unit Power	5A	12VDC
F5	Power Enable Relay Contact Power	30A	12VDC
F6	AutoFresh Air Exchange Solenoid Power	10A	12VDC
F7	Main Power	80A	12VDC
F8*	Fuel Level Sensor Power	5A	12VDC
F9	Contactor Control Board Component Actuation Power	5A	12VDC
F10	Main Microprocessor Module Component Actuation Power	20A	12VDC
F11	Light Bar Power	5A	12VDC
F12	Satellite Communications Power	5A	12VDC
F14	Fuel Heater Power	15A	12VDC
F33,34,35	Battery Charger	5A (timed)	600VAC
F36,37,38	Condenser & Evaporator Fan Motors	12A	600VAC
F39,40,41	Coil/Drain Pan Heaters	12A (timed)	600VAC

*With EES installed F8 = 10 amp for FLS & EES



WARNING

Unit may start automatically at any time even if the switch is in the OFF position. Use proper lockout/tagout procedures before inspection/servicing. All unit inspection/servicing by properly trained personnel only.

SYSTEM	OPERATION
a. Pretrip Inspections	
	1 Pretrip Inspection - See Pretrip section 2 Run Microprocessor Pretrip - Before loading 3 Check Engine Hours
b. Every Service Interval or Yearly	
Engine	1 Check engine oil and filter change interval 2 Check low oil pressure switch 3 Clean crankcase breather 4 Check fuel injectors every 1,500 hours* 5 Check injection pump every 3,000 hours* 6. Check & adjust engine valves every 4,000 hours
Fuel System	1 Clean mechanical and electric (if equipped) fuel pump screens 2 Change fuel filter 3 Check fuel heater (if equipped)
Cooling System	1 Check coolant change interval. If replacement is not required, check antifreeze concentration using a refractometer (Carrier Transicold P/N 07-00435-00) 2 Clean condenser/radiator surfaces 3 Check water pump 4 Check water temperature sensor
Exhaust System	1 Check mounting hardware 2 Check muffler and exhaust pipes
Air Intake System	1 Change air cleaner element 2 Check & reset air cleaner indicator
Starting Circuit	1 Clean battery connections & cable ends 2 Check battery hold down clamps 3 Check battery condition 4 Check starter operation
*Based on EPA 40 CFR Part 89	

MAINTENANCE SCHEDULE - CONTINUED

b. Every Service Interval or Yearly (Continued)	
Charging Circuit	1 Check battery charger output voltage 2 Check battery charger amperage
Unit	1 Check unit mounting bolts 2 Check engine & compressor mounting bolts 3 Check door latches & hinges 4 Check condition of water pump belt
Refrigeration System	1 Check defrost air switch & calibrate as necessary 2 Remove bulkhead (if equipped); check & clean the evaporator coil and all defrost drain hoses 3 Install manifold gauge set & check refrigerant pressure 4 Check calibration of suction pressure transducer 5 Run APX Control System Pretrip 6 Check manual defrost operation
Electrical System	1 Check unit switches and electrical connections 2 Check all ground connections for corrosion & tightness 3 Check stand-by plug for signs of wear or damage 4 Check condenser fan amperage 5 Check evaporator fan amperage 6 Check compressor amperage 7 Check heater amperage
c. 5 year or 12,000 Hour Maintenance	
Coolant System	1 Drain and flush cooling system. 2 Refill with Extended Life Coolant
d. Oil Change Intervals	
Oil Type	Oil Change / ESI Filter Change
Petroleum	3000 hours or 2 years (Maximum oil drain interval is 2 years)
Mobile Delvac 1*	4000 hours or 2 years (Maximum oil drain interval is 2 years)
*Mobil Delvac 1 is the only approved synthetic oil	

These maintenance schedules are based on the use of approved oils and regular pretrip inspections of the unit. Failure to follow the recommended maintenance schedule may affect the life and reliability of the refrigeration unit.

PRIMING FUEL SYSTEM

The mechanical fuel lift pump is mounted on the engine next to the injection pump. This pump has a manual plunger for priming the fuel system when the fuel tank has been run dry.



WARNING

Keep clear of rotating belt and pulleys.

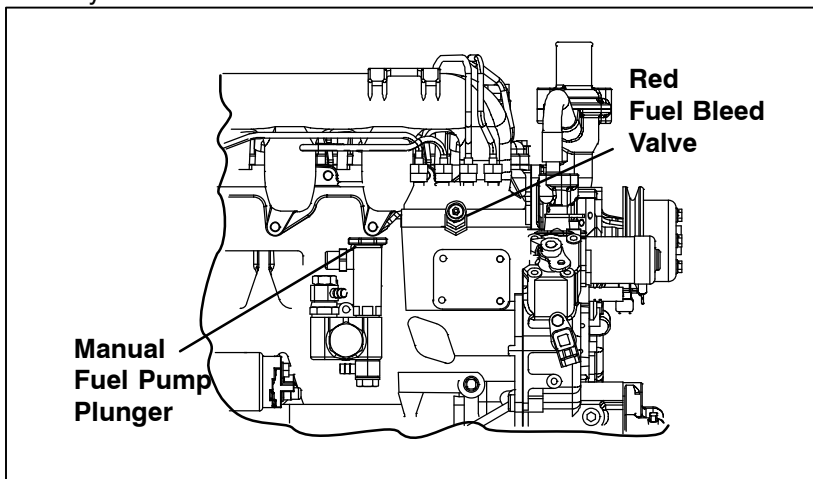
To prime the fuel system, use the following steps:

1. Turn the bleed valve (red) counter-clockwise until fully opened.
2. Turn the top of the manual fuel pump plunger counter-clockwise to unlock it. S-L-O-W-L-Y (up/down once per second) pump the manual plunger until positive pressure (resistance) is felt. This may take up to 200 strokes. Positive pressure indicates fuel flow.
3. Continue to pump S-L-O-W-L-Y (up/down once per second) approximately 100 more strokes to fill the filter and bleed the air out of the lines.
4. Start engine. It may be necessary to continue to pump until the engine starts.

NOTE

Running the engine for an extended period of time with the manual plunger up can cause a priming pump failure.

5. Depress and turn the top of the manual plunger clockwise to lock in place.
6. When engine is running smoothly, turn bleed valve clockwise until fully closed.



EMERGENCY ROAD SERVICE

At Carrier Transicold we're working hard to give you complete service when and where you need it. That means a worldwide network of dealers that offer 24-hour emergency service. These service centers are manned by factory trained service personnel and backed by extensive parts inventories that will assure you of prompt repair.

Should you experience a problem with your unit during transit, follow your company's emergency procedure or contact the nearest Carrier Transicold service center. Consult the Shortstop Service Centers directory or visit www.trucktrailer.carrier.com and click on "Dealer Locator" to locate the service center nearest you. The Shortstop directory may be obtained from your Carrier Transicold dealer.

You can also download the Carrier Transicold North America Truck/Trailer Dealer Locator App to your smart phone. The Dealer Locator app provides:

- Location information for every Carrier Transicold dealer in North America
- The nearest dealer from your present location
- Dealer look-up capability
- Dealer services (Trailer, Truck, APU, Mobile Support, etc.)
- Addresses
- Maps to easily find dealers
- Directions and navigation to the dealerships
- Phone number and 24-hour emergency hotlines, where available
- Auto dialing
- Hours of operation
- Link to dealer website
- Ability to add dealers to Contacts

To download the Carrier Transicold North America Truck/Trailer Dealer Locator App, scan this QR code, or go directly to your App store.



If you are unable to reach a service center, call our 24-hour Action Line: (800) 448-1661.

We will do everything we can to get your problem taken care of by an authorized CTD dealer and get you back on the road.

INDEX

A

Alarm List, 32

Auto-Start, 4

B

Battery, 4

C

Continuous Operation, 22

Cooling System, 4

D

Data Recorder / Trip Start, 24

Defrost, Manual, 26

Display, 6

Display Screens, 7

E

Emergency Bypass Mode, 35

Emergency Road Service, 48

F

Fuses, 42

G

General Troubleshooting, 40

H

Hour Meters, 33

I

Inspect Mode, 10

IntelliSet, 14

Introduction, 1

L

Language Selection, 28

lockout/tagout, 5

M

Maintenance, 44

Maintenance Schedule, 44

O

Operator Messages, 16

P

Pretrip, 18

Pretrip Inspection, 36

Priming Fuel System, 47

Print To Screen, 25

Product Loading, 38

R

Recommended Transport
Temperatures, 39

Refrigerant, 4

S

Safety, 3

Setpoint, Changing, 20

Standby Electric Power, 5

Start-Stop Operation, 22

Starting Unit, 8

Stopping Unit, 34

Switching Operating State, 12

T

Trip Start, 24

U

Unit Data, 29

Unit Identification, 2