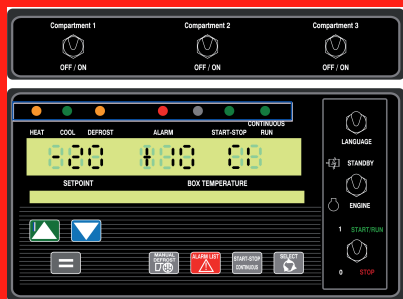




Trailer & Rail Refrigeration



VectorTM 1550 Trailer Refrigeration Units Operator Manual



VectorTM 1550

Trailer Refrigeration Units

Operator Manual

Table of Contents

1. Introduction	1
2. Unit Identification	2
3. Safety	3
3.1 Auto-Start	3
3.2 Cooling System	3
3.3 Refrigerant.....	4
3.4 Battery	4
3.5 Standby Electric Power.....	4
4. Display	5
4.1 Display Screens	6
5. Pretrip Inspection	21
6. Maintenance	23
6.1 Maintenance Schedule	23
6.2 Checking Oil Level.....	25
6.3 Priming Fuel System	26
7. Product Loading	27
7.1 Product Loading.....	27
7.2 During Loading	27
8. Recommended Transport Temperatures.....	29
9. General Troubleshooting	30
10. Fuses.....	32
11. Emergency Road Service	33

1. Introduction

This guide has been prepared for the operator of a Carrier Transicold Vector™ 1550 Trailer refrigeration unit. 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 and 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.

2. 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.

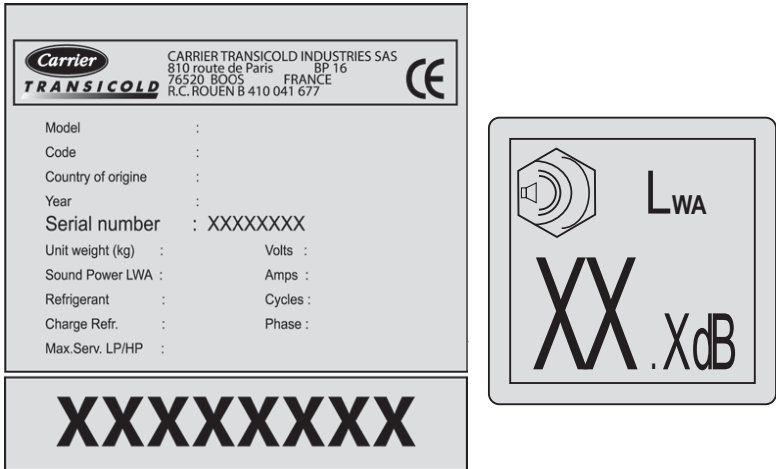


Figure 1 - Name Plate

3. Safety



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.



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.

3.1 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 five 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.

3.2 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.

3.3 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.

3.4 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.

3.5 Standby Electric Power

Be aware of HIGH VOLTAGE supplied at the power plug. Even with the unit off, power is present from the plug to the inside of the control box. Disconnect the high voltage source when performing service or maintenance procedures and lockout/tagout the receptacle in accordance with your company procedures. The recommended lockout device (Carrier P/N 07-60129-00) is shown in the following illustration.



Figure 2 - Lockout/Tagout Device

4. Display

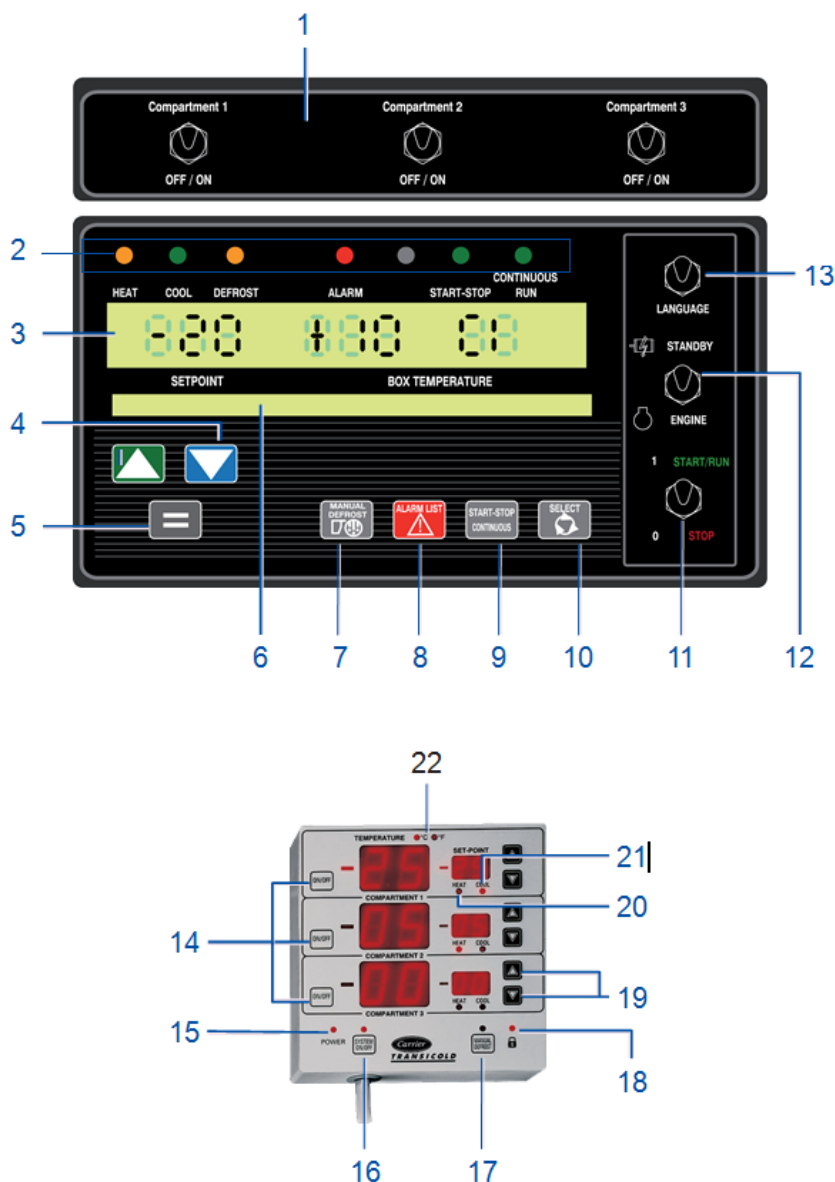


Figure 3 - Display Screens

4.1 Display Screens

4.1.1 Display

1. Not used on 1550 units

2. Mode lights

3. Display



NOTE: Box temperature is displayed in °C or °F (depending on configuration).

4. Up and down arrow keys



5. Equal key



6. Message Center



7. Manual defrost key



8. Alarm key



9. Start/stop-continuous key



10. Select key



11. Run/Stop switch



12. Standby/Engine switch



13. Language switch



4.1.2 Auxiliary Control Panel

User-friendly indicator and operator control panels clearly show individual compartment temperatures with easy-to-read displays.

From this optional control panel, you can : switch on the unit, check compartment 1, 2 or 3 temperatures, change set points, energize a manual defrost.

These compact panels can be mounted to suit the individual operator's preferences.

14. Compartment on/OFF key



15. Control panel power on



16. Unit ON/OFF key



17. Manual defrost key



18. Control panel locking



19. Up and down arrow keys

20. Heating operating mode light of a compartment



21. Cooling operating mode light of a compartment



22. Temperature indicated in °C or °F



4.1.3 Starting the Unit - Road Operation

1. To power up the unit, place the ENGINE / STANDBY switch (12) to ENGINE.
2. Place the Run/Stop switch (11) on the microprocessor controller to RUN
3. Toggle the LANGUAGE switch (13) to select one of the available languages.

4.1.4 Starting the Unit - Standby Operation



Ensure that the unit is connected to a suitable electricity supply

1. To power up the unit, place the ENGINE / STANDBY switch (12) to STANDBY.
2. Place the Run/Stop switch (11) on the microprocessor controller to RUN
3. Toggle the LANGUAGE switch (13) to select one of the available languages.

NOTE: The unit is fitted with an automatic phase reverser. In all cases, the electric motor will run in the correct direction.

Standby operation guideline

For safe, reliable operation in Standby mode, it is important to consider the following guideline:

- **ALWAYS check** that the unit is OFF (Cab command) before disconnecting from the power source.
- The extension cable and fuse used for network connection must comply with local code and the unit specifications as described in Table 1.1

For safe, reliable operation in Electric operation, it is important to consider the following guidelines:

- **NEVER** connect the unit to a high voltage power source unless the START/RUN - OFF switch is in the OFF position.
- The power supply cable and circuit breaker must comply with local electrical code and unit specifications.
- The power supply cable must be equipped with a ground connection.
- Repairs or maintenance to the supply voltage circuit should only be performed by licensed/authorized personnel.

4.1.5 Stopping the Unit

To stop the unit, place the RUN / STOP switch (11.) on the microprocessor controller keypad to STOP.

4.1.6 Changing Operating Mode

Three different sets of configurations are available to optimize the operating mode:

- **OptiCOLD**: recommended for sensitive products associated with continuous run mode
- **EcoFUEL**: recommended for any other kind of products
- **customized**: the six parameters below can be adjusted according to customer needs.

	OptiCOLD mode (factory set by default)	EcoFUEL mode
Ecomode	No	Yes
Perish minimum Off Time	20 min	30 min
Perish override T°	3°C	4°C
Frozen minimum Off Time	30 min	45 min
Frozen Override T°	4°C	5°C
High Speed Pulldown	Yes	No

1. Press the SELECT key  until the operating mode appears in the Message center.
2. Press UP  or DOWN  arrow to select COLD, EcoFUEL or customized.
3. Press the EQUAL key  to validate selected configuration.

4.1.7 Initiating Defrost Mode

The defrost mode may be initiated in three different ways if the evaporator coil is below 4.5°C (40°F):

1. Defrost is initiated automatically at preset intervals by defrost timer in the microprocessor.
2. Defrost is initiated by the defrost air switch.
3. The defrost mode may be manually initiated by pressing the Manual Defrost key (). The DEFROST Light will come on and k "DEFROST CYCLE STARTED" will be displayed for five seconds.

If "CANNOT START DEFROST CYCLE" is displayed, the coil temperature is above 4.5°C (40°F). Run the unit to lower temperature below 4.5°C (40°F) and then restart defrost.

- All defrost modes with heater bars terminate when the evaporator temperature is higher than 12.5°C (55°F).
- Natural defrost mode terminates when Return Air Temperature is equal to Supply Air Temperature.
- Should the defrost cycle not complete within 45 minutes, the defrost cycle is terminated. "A54-DEFROST NOT COMPLETE" will be in the Message center.
- After the 45 minute termination, the controller will wait 1.5 hours before attempting another defrost cycle. Pressing the manual defrost key will override this mode and start a new 45 minute defrost cycle. Overriding this 1.5 hour waiting period will generate an alarm.
- If a shutdown alarm occurs, defrost will be terminated.

4.1.8 Changing Setpoint Temperature

1. With the set point displayed, press the UP () or DOWN () ARROW key to change setpoint to the desired value.

The display will flash to indicate that the set point reading being displayed is a non-entered value.

The message center will show "↑↓TO SCROLL, THEN = TO SAVE". The setpoint display will flash for five seconds or until the EQUAL key is pressed.

2. Press the EQUAL/ENTER () key to save the new setpoint.
3. Verify that the message "SETPOINT CHANGED" is displayed on the Message center for 15 seconds.

Remarks :

- Setpoints of -30°C to +32°C (-22°F to +89°F) may be entered via the keypad. The controller always retains the last entered set point in memory.

- Setpoint can not be changed when unit is in Pretrip or when viewing Alarm List, Data List or Functional Parameters.

- Depressing the EQUAL key () will cause the new displayed setpoint value to become active. If the display is flashing and the new value is not entered, after five seconds or no keyboard activity, the display will flash for 15 seconds with "SET POINT NOT CHANGED" displayed and then revert back to the last set point. All other keys are active at this time and may be pushed while the display is flashing.

TIP



You may press and hold the UP or DOWN arrow key to change the set point. The longer the key is held, the faster the setting will change.

4.1.10 Start-Stop Operation

1. Press the START/STOP CONTINUOUS key () until the START/STOP Light (2.) on the controller illuminates.
2. Verify that "START/STOP MODE SELECTED" is displayed on the message center for five seconds and that the START/STOP Light is illuminated. The unit is now in Start-Stop operation.

4.1.10.1 Start-Stop operation – Road / Standby modes

The system works as follows:

- Engine preheat and start-up are automatic.
- When the temperature(s) selected with the thermostat(s) has been reached, the system shuts the unit down.
- Unit shut-downs can be programmed. Shut-down times will be modified depending on the isothermal insulation of the box, the ambient temperature and the cargo. The shut-down time is pre-programmed in the plant.

The user should determine whether this setting is appropriate for his type of cargo and the insulation of the bodywork (**all adjustments are to be made by a Carrier Transicold technician**).



CAUTION

During unit shut-downs, the evaporator fans also stop. Only use this operating mode for products which tolerate shut-downs of this kind.

- Devices which ensure it operates correctly. These check:
 - the battery status
 - the temperature of the engine water
 - the minimum run time
- Automatic start/stop is provided to permit starting/restarting of the compressor as required. This gives the microprocessor automatic control of starting and stopping the unit. The main function of automatic start-stop is to turn off the refrigeration system near the set point to provide an energy efficient temperature control system and then restart the unit when needed. Start-stop operation is normally used for frozen loads only.
- If pressing the START/STOP CONTINUOUS key seems to have no effect, this key may be locked out. START-STOP and CONTINUOUS operation may be tied to the set point ranges for frozen and perishable loads.
- If the unit fails to start, shuts down on a safety, or fails to run for the minimum run time, three consecutive times, the "Auto-Start/Failure" is activated.
- The microprocessor controller monitors box temperatures, battery voltage and current, and engine coolant temperature. Once set points are reached the controller will shut off the diesel engine to conserve fuel. The controller will not shut off the engine if the battery voltage is not sufficient to restart it.
- Safety conditions to restart the unit if the box temperature is:
 - more than +6°C (+11°F) (programmable) over set point,
 - the battery voltage drops below 12.2 VDC, or if
 - the engine coolant temperature drops below +0°C.

4.1.11 Continuous Run Operation

1. Press the START/STOP CONTINUOUS key () until the CONTINUOUS RUN Light (2.) on the controller illuminates.
2. Verify that "CONTINUOUS RUN MODE SELECTED" is displayed on the message center and that the CONTINUOUS RUN Light is illuminated. The unit is now in Continuous Run operation.

Remarks:

- In the continuous run mode, the diesel engine will not shut down except for safeties or if the engine stalls. Continuous Run operation is normally used for perishable loads.
- If pressing the START/STOP CONTINUOUS key seems to have no effect, this key may be locked out. Start-Stop and Continuous operation may be tied to the set point ranges for frozen and perishable loads.

4.1.12 Pretrip

The PRETRIP mode is for checking unit operation and evaluating operation of all modes and indicating a failure when detected.

The message center displays the current test and the % complete of the test. When the Pretrip tests are complete the message center will display "PRETRIP PASS" or "PRETRIP FAIL IN TEST<test number>". If "PRETRIP FAIL IN TEST<test number>" is displayed the ALARM light will flash. Press the ALARM LIST key to review the alarms set by the Pretrip tests.

Once Pretrip is started, the control panel keys are disabled until the Pretrip ends.

1. Press the SELECT key () until "PRESS = TO START PRETRIP" is displayed.
2. Press the = key () to start PRETRIP.
3. Verify that the display shows "TEST#".

4.1.13 Trip Start

Trip Start marks a time stamp in memory to allow easy review of the data from the last trip. This function tells the recorder that the present date and time is beginning of a new trip.

1. To mark the start of a trip in the data recorder, press the SELECT key () until "PRESS = TO MARK TRIP START" is displayed.
2. Press the = key ().
3. If trip start is acknowledged by the data recorder, "TRIP START ENTERED" will be displayed for five seconds and then the display will revert back to the normal display. Otherwise "CANNOT ENTER TRIP START" will flash and then the display will revert back to the normal display.

4.1.14 Displaying Unit Data

Press the SELECT key () until "PRESS ↓↑ TO VIEW DATA" is displayed.

2. Press the = key () to enter unit data menu.
3. Press UP () or DOWN () arrow to display the requested data.

4.1.15 Changing a Function

1. Press the SELECT key () until "PRESS ↑↓ TO VIEW SETTINGS" appears in the Message center.
2. Press the UP () or DOWN () arrow to scroll through the Function List beginning at the top or the bottom.
3. "↑↓ TO SCROLL, THEN = TO SELECT" will appear in the Message center.
4. To read through the Function List, continue to press either the UP or DOWN ARROW key. The Functional Parameters will appear in the Message center in the order as shown below. The list is circular meaning that once the end is reached, it is repeated from the beginning. If no key presses are made for 10 seconds, the Message center will return to the default message.

4.1.15 Changing a Function (continued)

- To change one of the Functions, bring the Function you wish to change into the Message Center and press the EQUAL ()
"↓↑TO SCROLL, THEN = TO SAVE" will appear in the Message center.
- Press either UP () or DOWN () ARROW key to begin to change the Function setting. The Message center will flash, indicating that a change has been made that has not been entered into memory.
- Continue pressing UP () or DOWN () key until the desired value is showing, then press the EQUAL () key. The Message center will stop flashing. The new value is now in memory



If the  key is not pressed within 10 seconds, the Message Center will change to "FUNCTION NOT CHANGED". This will appear for five seconds, then return to the last Functional Parameter shown. If no further keys are pressed, the default display will return in another 10 seconds.

Functional parameter	Available selection	Functional parameter	Available selection
Selection in BOLD are the factory settings		"ENGINE"	ON / OFF / RESUME / RESET -
"DEFROST TIMER SET FOR"	1.5 hrs / 3 hrs / 6 hrs / 12 hrs	"SWITCH ON"	PM 1 thru PM 55
"SET S/S PARAMETERS:" (These may be displayed individually (8 parameters) as PERISH and FROZEN, or combined (4 parameters) with no designation.)		"STANDBY"	ON / OFF / RESUME / RESET -
"PERISH MIN RUN TIME:"	4 mins to 60 mins (in 1 minute increments)	"SWITCH ON"	PM 1 thru PM 55
"FROZEN MIN RUN TIME:"	10 mins to 90mins 20 mins – PERISH 30 mins – FROZEN (in 1 minute increments)	"OUT OF RANGE ALARM:"	OFF / 2°C (4°F) / 3°C (5.5°F) / 4°C (7°F)
"PERISH MIN OFF TIME:"	10 mins to 90mins 20 mins – PERISH 30 mins – FROZEN (in 1 minute increments)	"C2 OUT OF RANGE ALARM:"	OFF / 2°C (4°F) / 3°C (5.5°F) / 4°C (7°F)
"FROZEN MIN OFF TIME:"	10 mins to 90mins 20 mins – PERISH 30 mins – FROZEN (in 1 minute increments)	"C3 OUT OF RANGE ALARM:"	OFF / 2°C (4°F) / 3°C (5.5°F) / 4°C (7°F)
"PERISH OVERRIDE TEMP:"	2°C to 10°C (38.5°F to 50°F) 3°C (37°F) – PERISH 4°C (40°F) – FROZEN (in 0.5°C increments)	" LOW SPEED START UP : S/S	OFF / 255 Min : 1min increment
"FROZEN OVERRIDE TEMP:"	2°C to 10°C (38.5°F to 50°F) 3°C (37°F) – PERISH 4°C (40°F) – FROZEN (in 0.5°C increments)	" LOW SPEED START UP : CONTINUOUS	OFF / 255 Min : 1min increment
"PERISH MAX OFF TIME:"	OFF / 10 mins to 255mins (in 1 minute increments)	"SILENT MODE"	NO / YES
"FROZEN MAX OFF TIME:"	OFF / 10 mins to 255mins (in 1 minute increments)	"SLEEP MODE:"	NO / YES
"FROZEN SHUTDOWN:"	0°C to 2°C (32°F to 38.5°F)	* "OVERRIDE DOOR SHUTDOWN:"	NO / YES
"OFFSET:"	0°C to 2°C (32°F to 38.5°F)		
"PERISH SENSITIVE PRODUCT	ON / OFF	* "OVERRIDE REMS1 SHUTDOWN:"	NO / YES
"TEMP CONTROL:"	"RETURN AIR" / "SUPPLY AIR"	* "OVERRIDE REMS2 SHUTDOWN:"	NO / YES
"DISPLAY PRESSURE IN"	PSIG / BARS	"NO POWER-SWITCH TO DIESEL:"	NO / YES
"DISPLAY TEMP IN"	°C / °F		
"ECO MODE"	YES / NO		
* "SET PM HOURMETERS:"		* This Functional Parameter may not appear in the list for your unit, depending on microprocessor configuration.	

4.1.15 Changing a Function (continued)

Unit problems detected by the controller are stored in the Alarm List in the controller. Stored alarms may be viewed in the Message center. The "STATUS OK" message will be displayed in the Message center.

1. Press the ALARM LIST key (). If there are no active alarms in the alarm list, the message "NO ACTIVE ALARMS" will be displayed for five seconds.

If there are active alarms in the alarm list, the display will be "A" and the alarm message for the latest active alarm in the list for five seconds.

2. Press the UP () or DOWN () arrow keys to scroll through the alarm list.
3. When you reach the end of the alarm list, "LIST END, = TO CLEAR ALARMS" is displayed.
4. If the alarm list is full, the "A" and the alarm message for the latest alarm is displayed for five seconds, then "LIST END, = TO CLEAR ALARMS" is displayed for five seconds.
6. To deactivate the active alarm list, press the EQUAL key () while "LIST END, = TO CLEAR ALARMS" is being displayed.



TIP

To deactivate active alarms, turn the controller OFF and then back ON using the RUN / STOP switch.

4.1.15.1 Alarm List

If there is a safety shutdown, "UNIT SHUTDOWN-SEE ALARM LIST" will be displayed.

Pressing the ALARM LIST key () will bring any active alarms into the Message center. The following are the Shutdown Alarms that may appear:

4.1.15.1 Alarm List (continued)

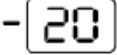
Alarm message	status
√: alarm only X or √: depends on the configuration X: Shutdown	
Driver alarms	
"2-LOW ENGINE OIL LEVEL" (option)	X or √
Shutdown alarms	
"11-LOW ENGINE OIL PRESSURE"	
"12-HIGH COOLANT TEMPERATURE"	X or √
"13-HIGH DISCHARGE PRESSURE"	X
"14-ELECTRIC CIRCUIT"	X
"15-BATTERY VOLTAGE TOO HIGH"	X
"16-BATTERY VOLTAGE TOO LOW"	X
"17-HIGH COMP DISCHARGE TEMP"	X
"18-LOW REFRIGERANT PRESSURE"	X or √
"19-LOW FUEL SHUTDOWN"	X or √
"22-LOW SUCTION SUPERHEAT"	X
"23-A/C CURRENT OVER LIMIT"	X
"27-HIGH SUCTION PRESSURE"	X or √
"28-CHECK REFRIGERATION SYSTEM"	X or √
Start up engine alarms	
"30-FAILED TO RUN MINIMUM TIME"	X
"31-FAILED TO START-AUTO MODE"	X
"32-FAILED TO START-MANUAL"	X
"39-CHECK ENGINE RPM"	X or √
"35-CHECK STARTER CIRCUIT"	X or √
"41-ENGINE STALLED"	X
Warning status alarms	
"51-ALTERNATOR NOT CHARGING"	X or √
"62-C2 BOX TEMP OUT-OF-RANGE" -V1950 Mt°	X or √
"63-C3 BOX TEMP OUT-OF-RANGE" -V1950 Mt°	X or √
Electrical alarms	
"73-NO POWER- CHECK POWER CORD"	X
"74-AC PHASE REVERSED"	X or √
"75-COMP MOTOR OVERHEATED"	X
"76-CONDENSER MOTOR OVERHEATED"	X
"77-EVAP MOTOR OVERHEATED"	X
"98-CHECK HIGH TEMP THERMOSTAT"	X both electric heater

4.1.15.1 Alarm List (continued)

Sensor alarms	
"122-CHECK RETURN AIR SENSOR"	X
"123-CHECK SUPPLY AIR SENSOR"	X
Microprocessor alarms	
"232-SETPOINT ERROR"	X
"233-MODEL # ERROR"	X
"237-FUNCTION PARAMETER ERROR"	
"238-CONFIGURATIONS ERROR"	X
"242-DIS PRESS CALIBRATE ERROR"	X
"243-SUCT/EVAP CALIBRATE ERROR"	X
"244-ECONO CALIBRATE ERROR"	X
"245-CAN NOT SAVE SETTING"	X
"246-EEPROM WRITE FAILURE"	X
"248-CONFIG MODE / HP2 ERROR"	X
"249-MICROPROCESSOR ERROR"	X

4.1.16 Operating with Auxiliary Control Panel

1. Start the unit as mentioned before.
2. Press the SYSTEM ON/OFF key (16). Power light will go ON.
3. Press the ON/OFF key (14) to energize selected compartment.
4. Display

		waiting for communication with unit
		compartment temperature display
		set point temperature display
		evaporator status (heat or cool or null)
		compartment shut-down via remote control
		defrost compartment
		temperature sensor malfunction

4.1.16.1 Changing Setpoint

Set point change can be made from control panel or cab control.

Press the UP or DOWN ARROW key (19) to increase or decrease set point. This is the same operation for each compartment.

4.1.16.2 Setting Pre-Set Setpoint

The control panel allows the user to pre-set five different temperatures on each compartment.

1. Switch main RUN/STOP switch (11) and required remote compartment switches (14) on the unit to RUN.
2. Press Carrier logo and the lock light will be displayed.
3. Press host compartment UP ARROW key for 10 seconds. P1 will be displayed in all compartments.
4. Set lowest set point temperature required.
5. Press Carrier logo and P2 will be displayed. Set next lowest temperature required up to five pre-set set points are available.
6. Pressing the second compartment up or down arrow will allow the lowest temperature required to be preset in the second compartment. Pressing Carrier logo will then move on to the next lowest (up to five).
7. Press the Carrier logo for 10 seconds and this will remove the lock light and store the pre-set set points in memory.

4.1.16.3 Removing Pre-Set Setpoint

1. Switch main RUN/STOP switch and required remote compartment switches on the unit to RUN.
2. Press Carrier logo and the lock light will be displayed.
3. Press host compartment up arrow for 10 seconds. P1 will be displayed in all compartments.
4. Set temperature to lowest possible and OFF will be displayed.
5. Press the UP ARROW key on remote compartments will display the presets, take the temperature to the lowest possible and OFF will be displayed.
6. Press the Carrier logo for 10 seconds and the new information will be stored in memory.

4.1.16.4 Locking and Unlocking Control Panel

1. Press the CARRIER logo 10 seconds to lock the control panel.
2. Then, starts to flash in the new logic.
3. Press again the CARRIER logo 10 seconds to unlock.
4. The indicator goes off.

NOTES

- When unit is turned OFF remotely from control panel, after two hours, it will automatically stop.

- A cycle power with the RUN/STOP switch (11) must be done to restart the unit..

- On Vector Mt° units, when all compartments are switched OFF from the compartment ON/OFF switches (1), after two hours, the control panel will automatically stop and at the same time, switch OFF the unit.

- A cycle power with R/S switch (11) must be done to restart the unit. It is not necessary for the compartment to be running in order to modify or see the set point value and the temperature of the compartment. The unit can be shut down both with the control panel and the general switch.

5. 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.



Unit may start automatically at any time even if 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 and hinges
Check battery cables for rubbing or chafing
Check battery terminals for cleanliness
Check channels or 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

5. Pretrip Inspection (continued)

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
After 15 Minutes of Operation
Initiate defrost and allow to terminate automatically, refer to Manual Defrost .
Check defrost drain line for blockage and proper water flow
Pretrip
Initiate Pretrip, refer to Pretrip .
List any Pretrip alarms
Final
Enter trip start in micro, refer to Data Recorder / Trip Start .

6. Maintenance

For the most reliable operation and for maximum life, this unit requires regular maintenance. This includes oil and filter changes, fuel filter and air cleaner replacement and coolant replacement. Maintenance should be performed by properly trained personnel on the following schedule:



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.

6.1 Maintenance Schedule

SYSTEM	OPERATION
Pretrip Inspections	
	1. Pretrip Inspection - See Pretrip Inspection 2. Run Microprocessor Pretrip - Before loading, see Pretrip 3. Check Engine Hours
Ever 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 and 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 and reset air cleaner indicator

6.1 Maintenance Schedule (continued)

Starting Circuit	1. Clean battery connections and cable ends 2. Check battery hold down clamps 3. Check battery condition 4. Check starter operation
*Based on EPA 40 CFR Part 89	
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 and compressor mounting bolts 3. Check door latches and hinges 4. Check condition of water pump belt
Refrigeration System	1. Check defrost air switch and calibrate as necessary 2. Remove bulkhead (if equipped); check & clean the evaporator coil and all defrost drain hoses 3. Install manifold gauge set and check refrigerant pressure 4. Check calibration of suction pressure transducer 5. Run Advance Control System Pretrip 6. Check manual defrost operation
Electrical System	1. Check unit switches and electrical connections 2. Check all ground connections for corrosion and 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
5 year or 12,000 Hour Maintenance	
Coolant System	1. Drain and flush cooling system 2. Refill with Extended Life Coolant
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.

6.2 Checking Oil Level

Engine oil - the petroleum oils recommended for use in this refrigeration unit must comply with the American Petroleum Institute's (API) Class CG or better rating. The only recommended synthetic oil is Mobil Delvac 1. The use of any oil that does not meet this rating may affect the warranty on the engine. The use of oil of the proper weight (viscosity) is also essential. The following chart indicates the SAE weight rating of the oil to be used in various climates:

SAE Weights		
Outdoor Temperature		SAE
Fahrenheit	Centigrade	
Below 32°	Below 0°	10W 30 or Mobil Delvac 1 (5W 40)
Above 32°	Above 0°	10W 30 or Mobil Delvac 1 (5W 40) or 15W 40

To check the engine oil level: Run the unit to bring the engine up to operating temperature, shut the unit off, and remove the cap/dipstick. Wipe the dipstick clean and insert it into the oil fill tube without threading it all the way back into the tube. Remove the dipstick again and check oil level. **DO NOT** add oil if the level is in the “safe” range. If needed, add oil as indicated by markings on dipstick until level is in the “safe” range.

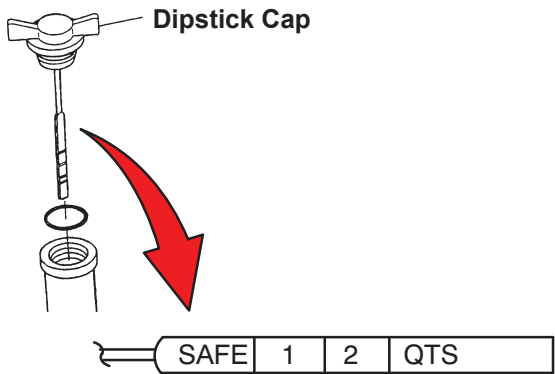


Figure 4 - Checking Oil Level

6.3 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.



Keep clear of rotating belts and pulleys.

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 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 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.

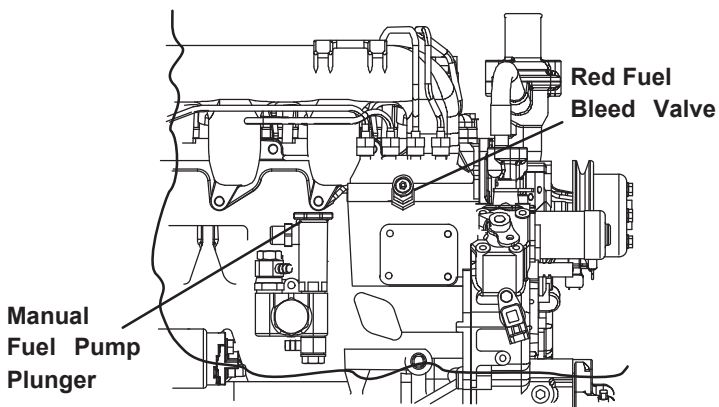


Figure 5 - Priming Fuel Systems

7. Product Loading

7.1 Before Loading

- Pre-cool the compartment. This will remove much of the heat from the inside of the compartment (including the walls and insulation) and give the product better protection when it is loaded.
- If possible, place unit in a defrost cycle immediately before loading. This will remove moisture accumulated on the evaporator coil.

7.2 During Loading

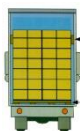
- Stop the unit (place START/RUN-OFF switch in the OFF position)
- Check product temperature during loading
- Ensure the air returns and supply openings remain unobstructed
- Leave approximately 4 to 5 inches (100 to 125 mm) between the load and compartment front wall for air return to the unit
- Leave at least 10 to 12 inches (250 to 300 mm) between the top of load and the ceiling to ensure there is nothing to prevent airflow
- Load product on pallets to provide free air return to unit and improve product protection

Proper air circulation in the compartment, air that can move around and through the load, is a critical element in maintaining product quality during transport. If air cannot circulate completely around the load, hot spots or top-freeze can occur.

The use of pallets is highly recommended. Pallets, when loaded so air can flow freely through the pallets to return to the evaporator, help protect the product from heat passing through the floor of the trailer. When using pallets, it is important to refrain from stacking extra boxes on the floor at the rear of the compartment as this will cut off the airflow.

7.2 During Loading (continued)

Product stacking is another important factor in protecting the product. Products that generate heat - fruits and vegetables, for example - should be stacked so the air can flow through the product to remove the heat; this is called “air stacking” the product. Products that do not create heat - meats and frozen products - should be stacked tightly in the center of the trailer. All products should be kept away from the side-walls of the body, to allow air flow between the body and the load; this prevents heat filtering through the walls from affecting the product.



Load spacers

Load on pallets

It is important to check the temperature of the product being loaded to ensure that it is at the correct temperature for transport. The refrigeration unit is designed to maintain the temperature of the product at the temperature at which it was loaded; it was not designed to cool or warm product.

8. Recommended Transport Temperatures

Below are some general recommendations on product transport temperatures and operating modes for the unit. These are included for reference only and should not be considered pre-emptive of the setpoint required by the shipper or receiver.

Contact your Carrier Transicold dealer for more detailed information.

Product	Setpoint Range		Operation ¹
	°F	°C	
Bananas	56 to 58	13 to 14	Continuous
Fresh fruits and vegetables	33 to 38	0.5 to 3	Continuous
Fresh meats and seafood	28 to 32	-2 to 0	Start/Stop or Continuous
Dairy products	33 to 38	0.5 to 3	Start/Stop or Continuous
Ice	15 to 20	-10 to -7	Start/Stop ²
Frozen fruits and vegetables	-10 to 0	-23 to -18	Start/Stop ²
Frozen meats and seafood	-10 to 0	-23 to -18	Start/Stop ²
Ice cream	-20 to -15	-29 to -26	Start/Stop ²

* During delivery cycles that include frequent stops and door openings, it is recommended that the unit always be operated in the continuous run mode to help ensure product quality. It is essential to shut down the compartment during the periods when the doors are open in order to maintain the temperature of the cargo in the other compartments and keep the unit operating correctly.

9. 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.

9. 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, refer to Manual Defrost . 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, refer to Manual Defrost . Check for proper air circulation in refrigerated compartment Check condenser for airflow restriction Check refrigerated compartment for damage or air leaks

10. Fuses

Fuses are located in the in the Control Box (roadside of the unit).



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.

Fuse	Purpose	Amps	Volts
F1	Microprocessor Fuse	7.5A	12VDC
F2	Speed Relay	10A	12VDC
F2	Run Relay	7.5A	12VDC
F5	Battery	80A	12VDC
F6	Control Circuit	15A	12VDC
F4/F7/F8	Battery Charger - 40 amp	5A (Timed)	460VAC
F9	Contactors	10A	12VDC
F10/F11/F11	Heaters	12A	460VAC
F19	Fuel Heater Circuit	20A	12VDC
FLS	Fuel Level Sensor Circuit	3A	12VDC

11. 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.



WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information, go to
www.P65warnings.ca.gov/diesel

North America

Carrier Transicold
700 Olympic Drive
Athens, GA 30601 USA
Tel: 1-706-357-7223
Fax: 1-706-355-5435

Central America and Mexico

Carrier Transicold
Ejercito Nacional 253-A Piso 5
Colonia Anahuac
11320 Mexico, D.F.
Tel: (5255) 55315010
Fax: (5255) 55315010 ext. 1005



Carrier Transicold
P.O. Box 4805
Syracuse, NY 13221 USA

A part of UTC Building & Industrial Systems, a business unit of
United Technologies Corporation. Stock symbol UTX.

www.carrier.transicold.com