Operator's Manual

Supra™ Series
TruckRefrigeration Units

SUPRA
SERIES

Carrier
TRANSICOLD

Carrier

TRANSICOLD

Operator Manual

for

Supra Series

Truck Refrigeration Units

TABLE OF CONTENTS

1. Introduction

This guide has been prepared for the operator of Carrier Transicold diesel truck refrigeration units. 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 your Carrier Transicold Supra Series unit.

Your 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 ensure 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 to be an introduction to your unit and to provide general assistance when needed. More comprehensive information can be found in the Supra Series Operation and Service manual (62-11868), which is available from your local Carrier Transicold dealer.

When having your 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, unit specifications may change without notice.
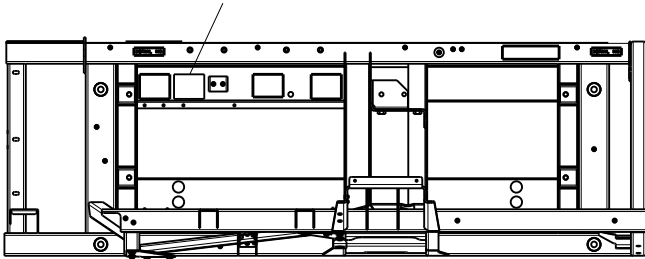
2. Unit Identification

2.1 Nameplate

Each Supra Series unit is identified by a nameplate attached to the frame. This nameplate identifies the complete model number of the unit, the serial number, the refrigerant charge and quantity, and the date the unit was placed in service.

If a problem occurs, please refer to the information on this plate, and make a note of the model and serial number before calling for assistance. This information will be needed when you contact a technician for assistance.

Nameplate Location
(Rear View of Unit)

3. Safety

Your Carrier Transicold refrigeration unit has been designed with the safety of the operator in mind. During normal operation, all moving parts are fully guarded to help prevent injury. During all pre-trip inspections, daily inspections, and problem troubleshooting you may be exposed to moving parts. Please stay clear of all moving parts when the unit is in operation and when the unit main power switch is in the RUN position.

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

3.1 Auto-Start/Stop

Your refrigeration unit is equipped with Auto-Start/Stop, a valuable fuel saving feature. When the unit is set for Auto-Start/Stop operation, it may start at any time and without warning. When performing any check of the refrigeration unit (e.g., checking the belts, checking the oil), make certain that the main power switch is in the OFF position.

3.2 Engine Coolant

The engine is equipped with a pressurized cooling system. 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 radiator. If the cap must be removed, do so very slowly in order to release the pressure without spray.

3.3 Refrigerants

The refrigerant contained in the refrigeration system 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 during system service, we recommend that whenever this unit requires service of the refrigeration system, you contact your nearest Carrier Transicold authorized repair facility for service.

3.4 Battery

This unit utilizes a lead-acid type battery. A lead-acid 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.

4. Pre-Trip Inspection

Perform a pre-trip inspection before picking up any load. This inspection is essential to anticipate and help minimize the possibility of over-the-road problems. These checks take only a few minutes.

> ### ⚠ WARNING
>
> **Inspect battery cables for signs of wear, abrasion or damage at every pre trip inspection and replace if necessary. Also check battery cable routing to ensure that clamps are secure and that cables are not pinched or chafing against any components.**

1. Place the unit's main switch in the STOP (0) position.

2. **Fuel:** Drain any water and impurities from the sump of the refrigeration unit fuel tank by opening the drain-cock located on the bottom of the tank (if so equipped). Close the valve when only pure fuel emerges. Check the fuel level in the tank, ensuring that the fuel supply is adequate for unit operation. Refuel if necessary.

3. **Belts:** Check the belt tension by using an electronic belt tensioner. Properly adjusted belts give long lasting and efficient service. Too much tension shortens belt and bearing life, and too little tension causes slippage and excessive belt wear. It is also important to keep belts and sheaves free of any foreign material which may cause the belts to slip.

4. **Battery:** On units equipped with serviceable batteries, check the level of the electrolyte in each of the cells. If the level is low, add distilled water to the correct level. Most units, however, are equipped with low- or no-maintenance batteries, which must be inspected to ensure that the connections are clean and tight. The battery hold-down must also be checked to ensure it is tight enough to keep the battery in place.

5. **Engine Oil:** The engine oil must be checked last as it is necessary for oil to drain from the block and into the oil pan to obtain a correct reading. Remove the dipstick, wipe it off and re-insert it fully into the engine block. Once again, remove the dipstick and observe the oil level, which normally falls between the full and add marks. If it falls below the add mark, add oil until the level is correct.

4. Pre-Trip Inspection (continued)

6. **General Unit:** Visually inspect the entire unit for leaks, loose bolts, frayed, loose, or broken wires, etc. The radiator and condenser coils of the unit must be free of dirt, bugs, cardboard, or any other debris that may obstruct airflow across the coils. The evaporator (located inside the body) must also be free of debris, especially stretch-wrap, which is often used during transport to prevent cargo shifting.

7. **Truck Body:** Inspect the truck body prior to loading. Check the door and vent seals for damage and wear. Inspect the entire interior and exterior of the body for damage, and check for damage to the inner and outer skins of the body. Damage to the insulation may compromise the unit's ability to maintain the product temperature by increasing the amount of heat gain across the truck body.

5. Starting the Unit

5.1 Starting the Unit - Road Operation

⚠ **WARNING**

Under no circumstances should ether or any other starting aids be used to start the engine.
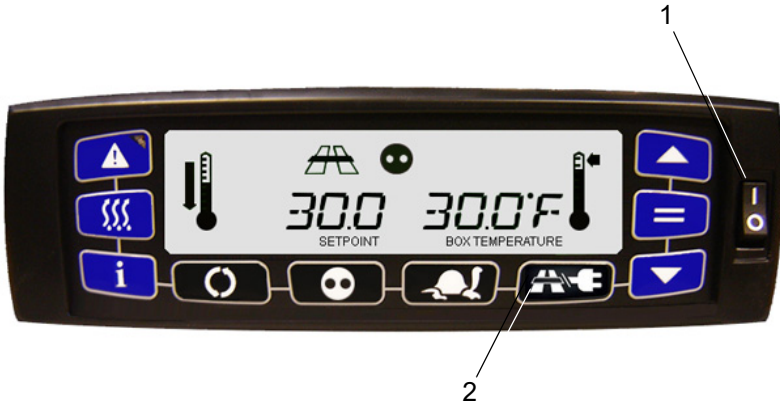
1. Place the I/O switch in the I position.
2. If the unit has been used previously in the Electric mode, press the Road/Electric key to enable Road mode.

Under normal circumstances this is all that is required to start the unit.

- The Road mode icon will be displayed and the message "ROAD" is displayed.

- The unit will perform a complete diagnostic check on the microprocessor controller, pre-heat for the required amount of time based on the engine temperature and start automatically.

5.2 Starting the Unit - Standby Operation

<table>
<tr><td>⚠️ WARNING</td></tr>
</table>

Make sure the power plug is clean and dry before connecting to any power source.

<table>
<tr><td>⚠️ WARNING</td></tr>
</table>

Do not attempt to connect or remove power plug or perform service and/or maintenance before ensuring the unit I/O switch is in the "O" position.
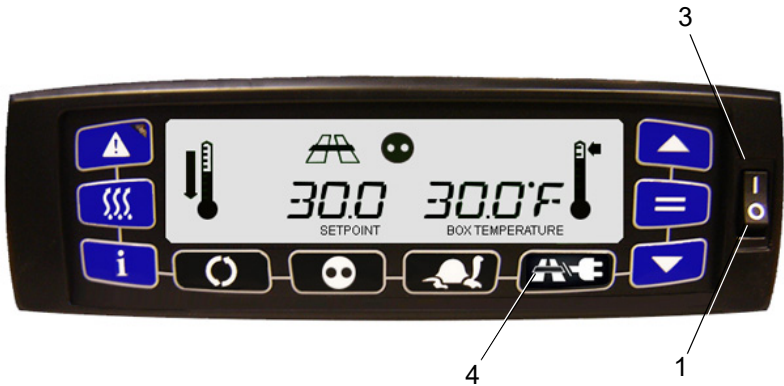
1. Place the I/O switch in the O position.

2. Connect the unit to the appropriate power source. (See table in **Standby Operation Guidelines** Section)

3. Place the I/O switch in the I position.

4. Press the Road/Electric key to enable Electric mode.

## 5.3 Starting the Unit - Standby Operation (Electric mode)

1. The Electric mode icon is illuminated and the message "ELEC" is displayed.

2. If Electric mode is initiated but no power is available, "NO POWER" is displayed.

3. The microprocessor will perform a self-test, and then setpoint and box temperature will be displayed.

6. Pre-Trip

Pre-Trip is a test sequence that the operator may initiate to check unit operation. When Pre-Trip is enabled, the unit will enter a test sequence to operate the unit in various operating modes.
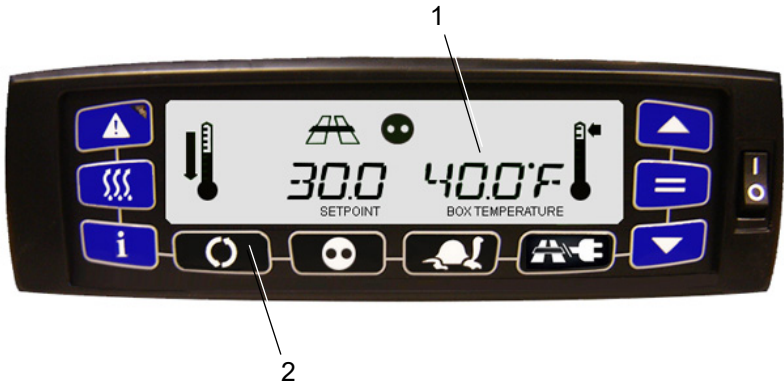
1. Start and run the unit.

2. Press the Function key. "Pre-Trip N" will be enabled. Press the = (Enter) key.

3. Press the up or down arrow until "Pre-Trip Y" is displayed. Press the = (Enter) key to start the Pre-Trip.
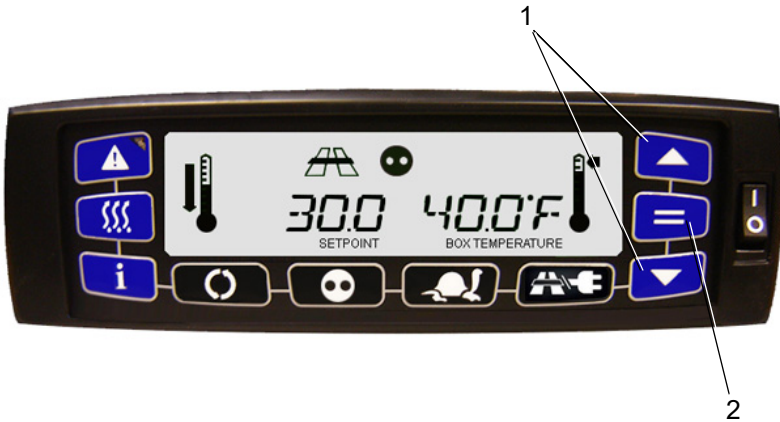

The screen will display the status of the Pre-Trip test ("Test 1," Test 2," etc.).

NOTE

If the conditions for Pre-Trip are not met, the unit will not enter Pre-Trip and the display will return to its default display

7. Changing Setpoint

Setpoints of -22°F to +95°F (-30°C to +30°C) may be entered via the keypad.

1. With the default screen showing on the display, press the up or down arrow keys to bring the setpoint to the desired reading. The display will flash to indicate that the reading being displayed is a non-entered value.

2. Press the = (Enter) key to activate the new setting. If the = (Enter) key is not pressed after five seconds, the message "NO SP CHG" is displayed for 10 seconds and all LEDs and icons flash. The display will revert to the previous active setting.

NOTE

The microprocessor retains the last entered setpoint in memory even if the unit is shut down or a power failure occurs.

NOTE

You cannot change a setpoint when in Pre-Trip or when viewing Unit Data or Functional Parameters

8. Start/Stop Operation

- Auto-Start/Stop is provided to permit stopping / restarting the diesel-driven compressor as required. This gives the microprocessor automatic control of starting and stopping the diesel engine.

- The main function of Auto-Start/Stop is to turn off the refrigeration system near the setpoint to provide a fuel efficient temperature control system and then restart the engine when needed.

- Start/Stop operation is normally used for frozen loads.

1 (Icon illuminated when Auto Start/Stop mode active)

2
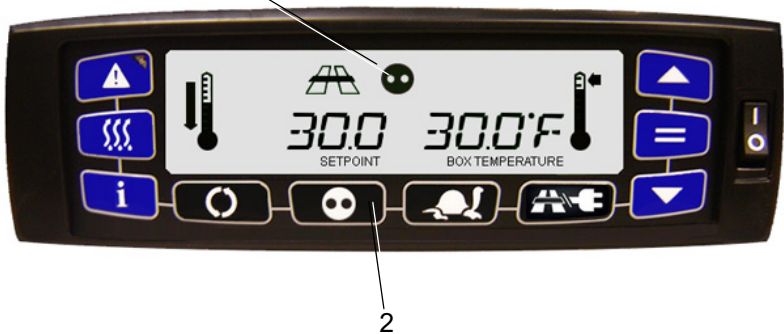
1. After start-up, check that the Auto Start/Stop mode Icon is illuminated. If it is illuminated, the unit is already in the Auto Start/Stop mode.

2. If it is not illuminated, press the Auto Start/Stop - Continuous key to toggle the unit into Auto Start/Stop mode. The message "S/S ON" is displayed.

Whenever the unit starts in Auto Start/Stop, it will run until:

- It has run for the predetermined minimum run time

- The engine coolant temperature is above 122°F (50°C)

- The box temperature is at setpoint

8. Start/Stop Operation (continued)

The controller will not shut off the engine if the battery voltage is not sufficient to restart it. Battery voltage above approximately 13.4 volts is required for shutdown. This varies depending on ambient. The control system will calculate the equivalent voltage based on ambient.

The controller will restart the engine if any of the following criteria have been met:

- Box temperature has changed by the selected override temperature **DURING** minimum off time
- Box temperature has moved away from setpoint by selected restart temperature **AFTER** minimum off time
- The battery voltage drops below 12.2 VDC (Refer to **Unit Data** section) or the selected voltage in configurations
- The engine coolant temperature drops below 34°F (1°C)
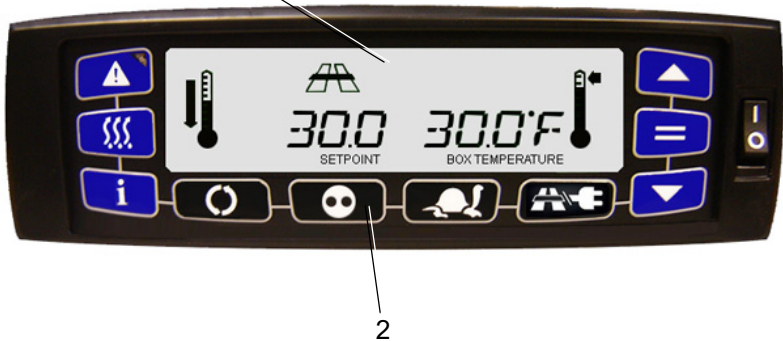
NOTE

Auto Start-Stop operation may be tied to the setpoint ranges for frozen and perishable loads and the Auto Start/Stop - Continuous key may be locked out.

9. Continuous Run Operation

In the Continuous Run mode, the diesel engine will run continuously providing constant air flow and temperature control to the product. Continuous Run operation is normally used for perishable loads.

1 (Icon turned off when Continuous Run mode active)

2

- After start up, check to see that the Auto Start/Stop mode icon is not illuminated. If it is not illuminated, the unit is already in Continuous Run mode.

- If it is illuminated, press the Auto Start/Stop - Continuous key to toggle the unit into Continuous Run mode (unit will operate continuously after starting). The message "CONT ON" is displayed.

NOTE

Continuous Operation may be tied to the setpoint ranges for frozen and perishable loads and the Auto Start/Stop - Continuous key may be locked out.

NOTE

The unit will remain in low speed for 10 minutes after engine start-up when the Continuous Run setpoint is below 10°F (-12°C).

10. Manual Defrost

Defrost is an independent cycle overriding cooling and heating function to de-ice the evaporator as required.

1

2
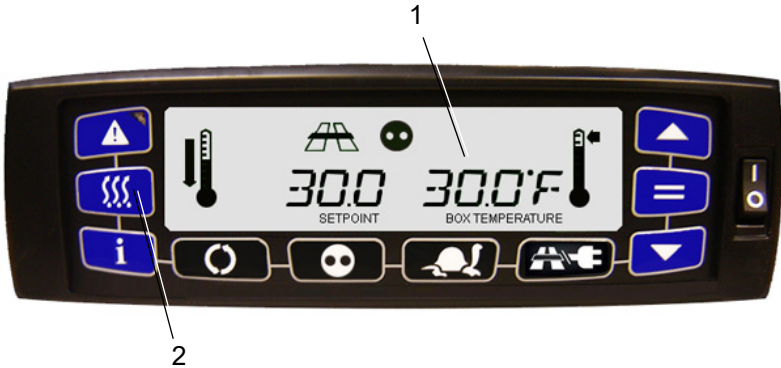
1. Check that box temperature on the display is 40°F (4.4°C) or lower.

2. Press the Defrost key to initiate Manual Defrost.

Defrost Icon

Defrost Indicator

If defrost is initiated successfully, the Defrost icon remains and "dF" is displayed in the Box Temperature area for 10 seconds without box temp and other icons. Then, the default display returns while the Defrost icon and "dF" display remains for the duration of the defrost.

If defrost does not initiate, the Defrost icon turns off and "no dF" is displayed in the Box Temperature area for 10 seconds without box temp and other icons. Then, the default display returns along with a display of box temperature.

Defrost may be terminated in any of three ways:
- Timer initiation
- Air switch initiation
- Manually

11. City Speed

The City Speed key enables the City Speed mode of operation, in which the unit will operate in medium speed.

1
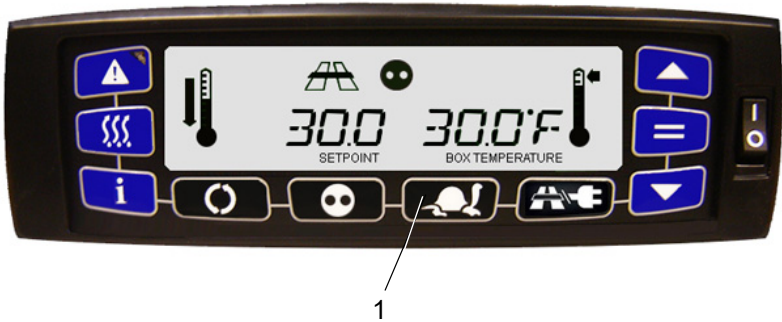
1. Press the City Speed key to toggle between low speed only and normal operating mode.

    • The City Speed mode (Turtle) Icon is illuminated and the message "CITY ON" is displayed (or if City Speed disabled, the icon turns off and "CITY OFF" is displayed) in the setpoint area without setpoint or box temperature displayed for 10 seconds.

    • If the City Speed Functional Parameter is locked OR all functional parameters are locked, "FN LOCKED" is displayed for 10 seconds and display the appropriate value that is locked in. Then, the display will return to its default state.

City Speed Mode Icon

CITY ON Indicator
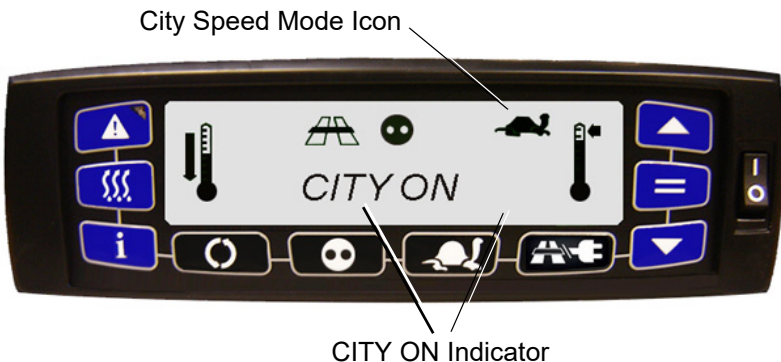
When City Speed is enabled, the City Speed mode (Turtle) Icon is illuminated and the message "CITY" is displayed in setpoint while "ON" is displayed in box temperature.

When City Speed is disabled, the City Speed mode (Turtle) Icon turns off and the message "CITY" is displayed in setpoint while "OFF" is displayed in box temperature

12. Function Change

The Functional Parameters control selected operating features of the unit. When multiple choices are available, the display will show the function description on the left side with the corresponding function choice on the right side.

Refer to the **Functional Parameters** table for a list of all parameters.

NOTE
Function changes will change the operation of the unit.

NOTE
Functions may be locked to prevent unintended changes.

1. With the system powered up, place the I/O switch in the I position.
2. Press the Function key.

12. Function Change (continued)

Arrow Keys
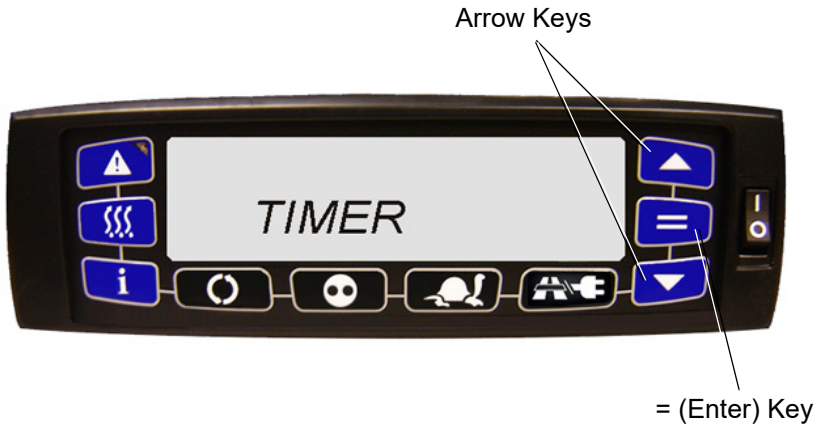
= (Enter) Key

3. Press the up or down arrow keys to scroll through the function sub-menus list.

4. Press the = (Enter) key when the submenu requested is displayed. The submenus are TIMER, TEMP, SETTING, SS PARAM, MODE, OTHER.

5. Press the up or down arrow keys to scroll through the functions in a sub-menu.

6. Press the = (Enter) key while the function is being displayed to change the value.

7. Press the up or down arrow keys to change the value. Then, press the = (Enter) key to lock in the change.

12. Function Change (continued)

Functional Parameters

Parameter	Description	Range
Timer		
SLEEP	Enable or disable Sleep mode	0 - Off 1 - On **Default:** Off
SLEEPWAKE	Set a wake-up time - when Sleep mode will wake up, ranging from one hour to eight days from current time. (Only if Wake Up is ON)	0 - Off 1 - On **Default:** Off
Temp		
RSTR	Restart temperature for perishable setpoints in S/S	32.5° to 50°F in 0.5° increments (0.3° to 10°C) in 0.1° increments **Default:** is 39°F (4°C)
PROBE RAT or SAT	Indicates the primary sensor that is used for performing temperature control in the system	0 - Return Air 1 - Supply Air **Default:** Return Air
Setting		
TEMP	Determines temperature units on display	0 - Fahrenheit °F 1 - Celsius °C **Default:** Fahrenheit This parameter is also defaulted to "locked" for NAO Region models.
PRESS	Determines pressure units on display	0 - Psig 1 - Bars **Default:** Psig This parameter is also defaulted to "locked" for all NAO Region models.
DATE	Determines date format on display	0 - MM/DD/YYYY 1 - DD/MM/YYYY **Default:** MM/DD/YYYY

Functional Parameters (Continued)

BRIGHT	Determines brightness on display	Setting is 0 to 100.
SS Parameter		
MIN RT	Minimum run time for perishable setpoints in Start/Stop mode	4 to 60 minutes, with 1 minute intervals **Default:** 4 minutes
MIN OFF	Minimum off time for perishable setpoints in Start/Stop mode	10 to 90 minutes, with 1 minute intervals **Default:** 10 minutes
OVER	Defines how far away the active temperature must be away from the setpoint before the minimum off time can be overridden in Start/Stop mode for perishable setpoints	36° to 50°F in 0.5° increments 2° to 10°C in 0.1° increments. **Default:** 39°F (4°C)
MAX OFF	Maximum off time for perishable setpoints during Start/Stop mode	0 - Off 1 - 10 to 255 minutes, with 1 minute intervals **Default:** Off
Mode		
LS CON	Determines the low speed delay adjustment for Continuous	0 - Off 1 - 0 to 255 minutes, with 1 minute intervals **Default:** 1 minute
LS SS	Determines the low speed delay adjustment for Start/Stop mode	0 - Off 1 - 0 to 255 minutes, with 1 minute intervals **Default:** 1 minute
CITY	Disable high speed in the speed control overrides	0 - Off 1 - On **Default:** Off Only applies to EMEAR Region

Functional Parameters (Continued)

| Other		
DEFR	The time interval between defrost cycles	0 - 1.5 hours 1 - 3 hours 2 - 6 hours 3 - 12 hours **Default:** 6 Hours
SWT DSL	Switch to Diesel: When this functional parameter indicates No, the No Power configuration parameter is overridden and the system can be shut down.	0 - No 1 - Yes **Default:** No
FRESHNO	Fresh Protect: Used for supply air control.	0 - OFF 1 - A 2 - B 3 - C (**Default**) 4 - D 5 - E
TRANGE	Out-of-range temperature tolerance selection.	0 - Off 1 - 2°C (NDTP Display A) 2 - 3°C (NDTP Display B) 3 - 4°C (NDTP Display C) **Default:** 4°C
OVR DOOR	Indicates if the door switch alarm should override the shutdown of the unit. If the Override Door switch Shutdown functional parameter = Yes, the door switch alarm controller response is alarm only regardless of the configuration parameter. Low speed Alarm only could still be applicable.	0 - No 1 - Yes **Default:** No

OVR SWITCH	Indicates if the remote switch 1 alarm should override the shutdown of the unit. If the Override Remote Switch 1 Shutdown functional parameter = Yes, the remote switch 1 alarm controller response is alarm only regardless of the configuration parameter. Low speed Alarm only could still be applicable.	0 - No 1 - Yes **Default:** No
	Airflow function. Normal Air = no effect High Air = SPEED = HIGH in Perishable Range.	0 - Normal Air 1 - High Air **Default:** Normal Air
	Start/stop shut down offset for frozen	0°F to 1.1°F 0°C to 0.6°C **Default:** 0
	Display alarm description in alarm list	0 - No 1 - Yes **Default:** Yes
	Top Freeze Protection: If Yes, use supply air temperature as active probe If No, use selected probe in Temp Control setting This can only be turned on when 0 <= setpoint <= 18.4 °C. It will be automatically turned to NO if system is set outside of these conditions or if the SAT probe is bad.	0 - No 1 - Yes **Default:** No

13. Unit Data

The Unit Data key is used to display the unit operating data. This key, in conjunction with the Arrow keys and = (Enter) key, will allow the user to display the unit's operating data values (hour meters, battery voltage, etc.). Once inside the Unit Data submenus, if no keys are pressed for five seconds the display will return to the default display.

NOTE

For all temperature unit data, the values are in °C or °F depending on the configuration and the °C or °F indicator will be displayed appropriately. Pressures are displayed with a P or B to signify psig or bars.
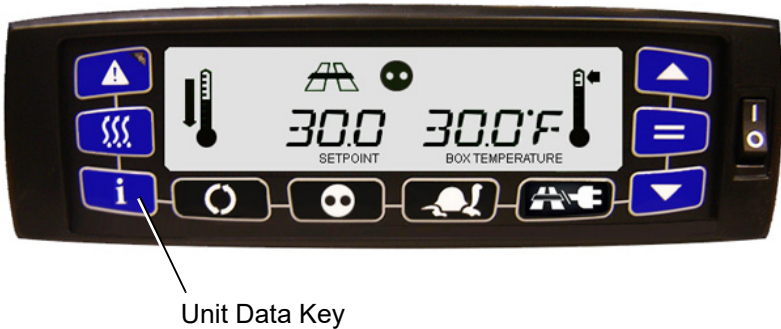
Unit Data Key

1. Pressing the Unit Data key will bring up the Unit Data submenu. Use the up and down arrow keys to cycle through the submenu items.

   The submenus are: SENSORS, METERS, SYSTEM, ENGINE, INFO.
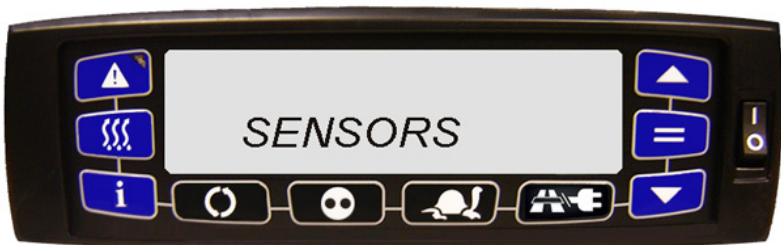
2. When a submenu item is displayed, press the = (Enter) key to enter that submenu and then use the Arrow keys to cycle through the items.

13. Unit Data (continued)

1. The display will show the description of the input on the left side with the actual data on the right side. If the Arrow key is held for one second, the list will scroll at a rate of one item every 0.5 seconds. Once the end of the list is reached, the list will scroll back to the first entry.

2. Press the = (Enter) key at any time to exit and return to the default display.

13.1 Lock or Unlock the Unit Data Screen:

To lock or unlock the display, hold the = (Enter) key for five seconds.

13. Unit Data (continued)

The following is a list of definitions for the acronyms used in the display.

Unit Data Codes

Data	Definition
Sensors	
AMB	Ambient Air Temperature (entering condenser)
RAT	Return Air Temperature (entering evaporator)
RRAT	Redundant Return Air Temperature (entering evaporator)
SAT	Supply Air Temperature (leaving evaporator)
DL-T	Delta-T. Supply air temperature minus return air temperature (negative value indicates cooling and a positive value indicates heating).
DTS	Defrost Termination Temperature
RS1*	Remote Sensor 1
RS2*	Remote Sensor 2
RS3*	Remote Sensor 3
Meters	
SBY	Electric Hour Meter
SON	Switch On Hour Meter
HS	High Speed Cycle Counter
STRT	Start Cycle Counter
ENG	Engine Hour Meter
MENG**	Maintenance Engine Hour Meter
MSBY**	Maintenance Standby Hour Meter
MSON**	Maintenance Switch On Hour Meter

Unit Data Codes (Continued)

Data	Definition
System	
CDT	Compressor Discharge Temperature (leaving the compressor)
CDP	Compressor Discharge Pressure (leaving the compressor)
CSP	Compressor Suction Pressure (entering the compressor)
CST	Compressor Suction Temperature (entering the compressor)
%SMV	Percentage of SMV Valve Opening***
Engine	
ENCT	Engine Coolant Temperature
RPM	Diesel Engine Speed
BATT	Battery Volts
DCS	DC Current Sensor displayed in amps
FLS	Fuel Level Percentage. Displayed only if the fuel level sensor is installed.
Info	
MM/DD/YY	Current Date and Time that the system is using
HH:MM	Hours and Minutes using a 24 hour clock
SER1****	Characters 1-4 of Serial Number
SER2****	Characters 5-8 of Serial Number
SER3****	Characters 9-11 of Serial Number
MOD1	Characters 1-4 of Model Number
MOD2	Characters 5-8 of Model Number
MOD3	Characters 9-12 of Model Number
SWXXXXXX	Software Revision of the Unit

* Only visible if turned on in the configuration.

** Only if activated.

*** Sensor not active. Value is always 32°F (0°C).

**** For unit with serial number: SER1 = ABC9, SER2 = 8765, SER3 = 432.

14. Alarm Buzzer and Reset

Alarm Key

14.1 Alarm Buzzer Silence

When an alarm occurs, the warning buzzer will sound alerting the operator that an alarm has occurred.

Press and hold the Alarm key for five to seven seconds to silence the warning buzzer. The fault light remains illuminated until the alarm is cleared.

14.2 Alarm Reset

1. Press and hold the Alarm key to show the alarms codes from latest alarm to first alarm.

2. Press the Up and Down Arrow keys to scroll through the alarm code list until "ALARM RST" is displayed.

3. While "ALARM RST" is displayed, press the = (Enter) key to clear the alarm list. "ALARM CLR" will be displayed for 10 seconds. The unit will restart if the alarm condition has been corrected and the unit is in Auto Start/Stop.

14.3 Alternate Alarm Reset

1. Place the I/O switch in "O" position.

2. The unit can be restarted after the alarm condition is corrected.

14.4 Inactive Alarms

1. Press the Alarm key and Up Arrow key at the same time and hold together for five seconds. This will display the inactive alarm list.

2. If there are no inactive alarms, "NO ALARMS" is displayed. If there are active alarms, scrolling is the same as with active alarms. When the end of the list is reached, display will show "ALARM RST" and "ALARM CLR" as with active alarms.

14.5 Verifying No Active Alarms

Press the Alarm key. If the message displayed is "STATEOK", there are no active alarms.

15. Stopping the Unit

1

1. To stop the unit, from any operating mode, place the I/O switch in the O position.

2. The diesel engine/electric motor will stop and the microprocessor controller will turn off.

16. Product Loading

16.1 Before Loading

- Pre-cool the body. This will remove much of the heat from the inside of the body and give the product better protection when it is loaded.

- Place the unit in a defrost cycle immediately before loading. This will remove moisture accumulated on the evaporator coil.

16.2 During Loading

- Turn the unit off!

- Check product temperature during loading.

- Ensure that the air return and supply opening remain unobstructed.

- Leave approximately 4 to 5 inches (10.2 to 12.7 cm) between the load and the front wall for air return to the unit.

- Leave at least 10 to 12 inches (25.4 to 30.5 cm) between the top of the load and the ceiling to ensure that there is nothing to prevent airflow to the rear of the body.

- Load product on pallets to provide free air return to unit and improve product protection.

Proper air circulation in the truck body - 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.

Pallets

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

Product Stacking

Product stacking is another important factor in protecting the product. Stack products that generate heat - fruits and vegetables, for example - so the air can flow through the product to remove the heat. This is called "air stacking" the product. Stack products that do not create heat - meats and frozen products - tightly in the center of the trailer. Keep all products 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.

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 warm product.

17. 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 preemptive of the setpoint required by the shipper or receiver.

More detailed information can be obtained from your Carrier Transicold dealer.

Product Transport Temperatures

Product	Setpoint Range		Operating Mode*
	°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	Auto-Start/Stop or Continuous
Dairy Products	33 to 38	0.5 to 3	Auto-Start/Stop or Continuous
Ice	15 to 20	-10 to -7	Auto-Start/Stop**
Frozen fruits and vegetables	-10 to 0	-23 to -18	Auto-Start/Stop**
Frozen meats and seafood	-10 to 0	-23 to -18	Auto-Start/Stop**
Ice Cream	-20 to -15	-29 to -26	Auto-Start/Stop**

* During delivery cycles that include frequent stops and door openings, we recommend that the unit always be operated in the continuous run mode to help ensure product quality. If it is possible, turn off the unit during the time the body doors are open to help preserve the product temperature.

**Variations may be necessary for very high or very low ambient temperatures.

18. Troubleshooting

Everything possible has been done to ensure that your unit is the most reliable, trouble-free equipment available today. If, however, problems occur, the following section may be of assistance.

If the problem you are experiencing is not listed, please contact your Carrier Transicold dealer for assistance.

General Problems

Starter Motor will not crank or low cranking speed	Battery insufficiently charged
	Battery terminal post dirty or defective
	Bad electrical connections at starter
	Starter motor malfunctions
	Starter motor solenoid defective
	Open starting circuit
	Incorrect grade of lubricating oil
Starter Motor cranks but engine fails to start	No fuel in tank
	Air in fuel system
	Water in fuel system
	Plugged fuel filters
	Plugged fuel lines to injector(s)
	Fuel control operation erratic
	Glow plug(s) defective
	Fuel pump (FP) malfunction
Starter cranks, engages, but dies after a few seconds	Engine lube oil too heavy
	Voltage drop in starter cable(s)

Engine stops after several rotations	Fuel supply restricted
	No fuel in tank
	Leak in fuel system
	Faulty fuel control operation
	Fuel filter restricted
	Injector nozzle(s) defective
	Injection pump defective
	Air cleaner or hose restricted
	Safety device open
	Fuel pump (FP) malfunction
Starter motor turns but pinion does not engage.	Pinion or ring gear obstructed or worn
Starter motor does not disengage after switch was depressed.	Starter motor solenoid defective
Pinion does not disengage after engine is running.	Defective starter
No power to starter motor solenoid (SS)	Battery defective
	Loose electrical connections

19. Fuse and Relay Locations

The fuses and relays that protect the unit are located on the TPC board in the control box on the roadside of the unit. They are accessible by loosening the screws that hold the control panel closed.
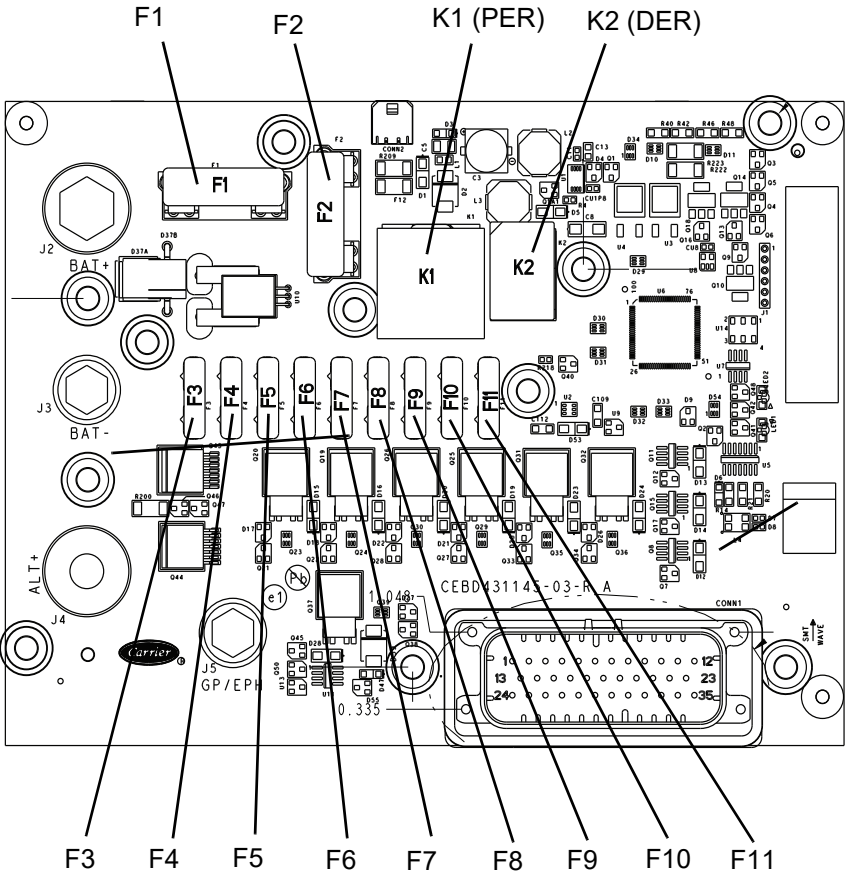
19. Fuse and Relay Locations (continued)

Fuse Identification

Fuse		Designation
Fuses on TPC Board		
F1	80 Amps	Main Fuse
F2	30 Amps	PER Relay
F3	5 Amps	12V Options
F4	5 Amps	Stepper Motor
F5	5 Amps	ENCU (12-00702)
F6	4 Amps	MCA Logic Power
F7	20 Amps	Fuel Heater
F8	5 Amps	Option (not used)
F9	5 Amps	Automatic Phase Reversal
F10	7.5 Amps	Evap Fan Relays
F11	20 Amps	Fuel Pump Fuse
Fuses Outside TPC Board		
F20	50 Amps	Condenser Fans
F21	40 Amps	Condenser Fans
F22	30 Amps	Evaporator Fans
F23	30 Amps	Evaporator Fans
F24	30 Amps	Evaporator Fans

Relay Identification

Relay	Designation
K1 (PER)	Power Enable Relay (on TPC)
K2 (DER)	Diesel / Electric Relay (on TPC)

20. Unit Maintenance

For the most reliable operation and for maximum life, your unit requires regular maintenance. This includes oil and filter changes, fuel and air filter replacement, and coolant system maintenance. Perform maintenance according to the following schedule (in hours):

Maintenance Intervals

Service	Hours
Initial Service	1000
Service A	2000
Service B	4000

20.1 Engine Oils

The oils recommended for use in your refrigeration unit must comply with the American Petroleum Institute's (API) SG/CD rating. The use of any oil that does not meet this rating may affect the warranty on the engine in the unit. The use of oil of the proper weight (viscosity) is also essential.

Oil Viscosity

Outdoor Temperature	Recommended Oils
Below 32°F or 0°C	10W30, 5W40 (synthetic)
Above 32°F or 0°C	10W30, 5W40 (synthetic), 15W40

Ambient Temperature

0°C   40°C
32°F   104°F

10W30*

5W40* (synthetic)
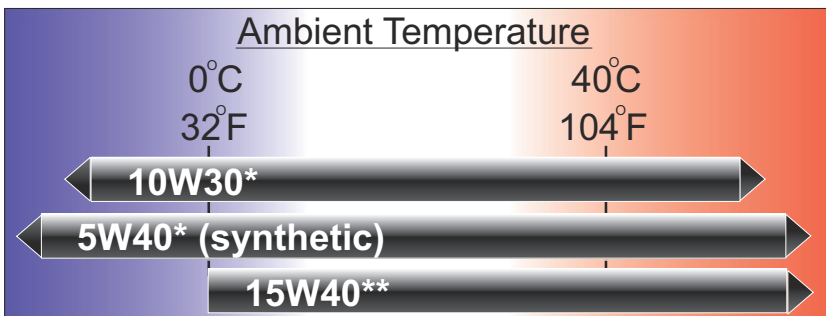
15W40**

*10W30 & 5W40 (synthetic) are recommended for ALL climates
**15W40 is NOT recommended for climates < 32°F (0°C)

20.2 Unit Maintenance Schedule

Maintenance Schedule

	Initial	Check Up	Service A	Service B
Before running				
Report any sign of damage on vehicle/ body/ refrigeration unit.	O	O	O	O
Check coolant level; report strength.	O	O	O	O
Write down hour meter diesel and standby.	O	O	O	O
Visually check the tightness of fixing bolts/screws, frame, metalworks including remote evaporators and heater bracket when applied.	O	O	O	O
Check software revision. Write it down.	O	O	O	O
Check exhaust system security and visually check for signs of corrosion, including sections where exhaust insulation is installed (silent-city units).	O	O	O	O
Visually check vibrasorber LP/HP and fixations.	O	O	O	O
Visually check - shaftseal + oil level in compressor.	O	O	O	O
Check routing of electrical wires, harnesses, fuel lines (repair or replace if needed), cab command routine, plug from standby module, check oil tubes routing and security Check battery security, lubricate terminals against corrosion, check battery cables routine.	O	O	O	O
Check fuel tank straps integrity, fixing bolts, cap. Drain water from fuel tank if applicable.		O	O	O

Maintenance Schedule (Continued)

	Initial	Check Up	Service A	Service B
Connect gauges and start the engine				
Check operator panel, display, light, switches (including evaporator door switch, undermount safety switch)	O	O	O	O
Check all sensors, transducers consistency between each others			O	O
Check glow plug operation, connections, secure the wire	O	O	O	O
Perform pull down test	O	O	O	O
Check on sight glass refrigerant flow and cleanliness	O	O	O	O
Check coolant system temperature, thermostat, leaks	O	O	O	O
Initiate manual defrost and confirm termination; check defrost drain pipes and water evacuation	O	O	O	O
Check the engine high / low speed and adjust if required			O	O
In heat mode, check hot gas functionality. Check heater bars.			O	O
Check battery state of charge		O	O	O
Check alternator charge output			O	O

Maintenance Schedule (Continued)

	Initial	Check Up	Service A	Service B
Stop the engine. Lock out tag out.				
Check fuel pump filter, clean if necessary, replace bowl gasket		O	O	
Check oil level and refill if required. Check for oil leak		O		
Drain and refill oil			O	O
Replace oil filter and bypass filters, fuel filter, air filter			O	O
Check air filter element. Replace if necessary		O		
Check all belts (wear + tension)	O	O	O	
Check clutch and connections, pulleys, standby motor, alternator, (noise test). Hand test				O
Replace all belts				O
Check operation of evaporator fan / turbine (bearing/noise)			O	O
Check evaporator fan brushes - Clean if necessary (if applicable)				O
Check high and low voltage wiring, and connections into control box, corrosion, chafing and signs of heat build up	O	O	O	O
Visually check cleanliness of condenser and clean if necessary	O	O	O	O
Visually check cleanliness of evaporator and clean if necessary	O	O	O	O
Check air switch calibration				O
Check alternator brushes			O	O
Check and lubricate all linkages, hinges and lock mechanisms				O
Grease serviceable bearings				O

Maintenance Schedule (Continued)

	Initial	Check Up	Service A	Service B
Remove lock-out/tag-out. Start the unit on standby.				
Check date and time in micro.	O	O	O	O
Check and confirm all current product upgrades have been completed	O		O	O
Replace maintenance sticker & clean unit of marks made during service	O		O	O
Every two years				
Replace coolant and coolant bottle cap				
Check valve clearance of diesel engine and adjust if necessary (Refer to engine technical manual)				

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

All units are shipped with Extended Life coolant. Replace coolant every two years.

21. Standby Operation Guidelines

For safe, reliable operation in Standby mode, it is important to follow a few guidelines:

- Never plug the unit into the power source with the main switch in the RUN (I) position. The main switch must always be in the STOP (O) position when connecting the unit to the power source.

- The circuit breaker and extension cable used for Standby operation must conform to the following specifications:

Circuit Breaker and Extension Cable Specifications

Operating Voltage	FLA Rating*	Circuit Breaker Capacity	Cable Requirement
208/230 V 60 hz 3 phase	20-35 Amp*	50 A	8/3 with ground up to 50 ft / 15.25 m
460 V 60 hz 3 phase	10-25 Amp*	30 A	10/3 with ground up to 75 ft / 23 m

- When multiple units are in use, each unit must be operated on its own electrical circuit. Never operate more than one unit on a circuit breaker.

NOTE

This information is provided as a guideline only.

Contact a licensed electrician when preparing a circuit for operation of the refrigeration unit A licensed electrician is familiar with all local ordinances and special requirements for your area and can ensure that the circuits are properly designed and installed, and that connections are correct.

22. Emergency Road Service

At Carrier Transicold, we are working hard to provide 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.

If 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 hot-lines 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

INDEX

⚠️ **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 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

Carrier

TRANSICOLD