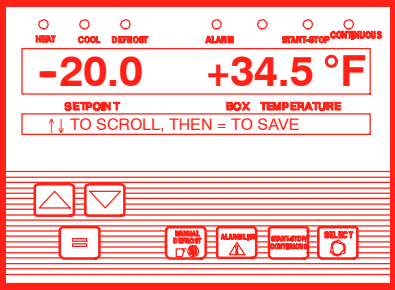
Carrier TRANSICOLD
United Technologies

Trailer & Rail Refrigeration



OPERATOR'S MANUAL

for

Belt Drive

Trailer And Rail Refrigeration Units

With

Advance™ Microprocessor

62-10646 Rev M

OPERATOR'S MANUAL

for

Belt Drive TRAILER AND RAIL REFRIGERATION UNITS With Advance Microprocessor

CONTENTS

OPERATOR'S MANUAL

This guide has been prepared for the operator of units supplied with the Advance Microprocessor: **Ultima 53, Phoenix Ultra and Extra, Ultra XTC and Ultima XTC** and **X2 2100A and X2 2500A** Carrier Transicold diesel trailer and rail 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 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.

SOFTWARE

This book is based on Software version 05.07.00. All Advance microprocessors can be upgraded to the latest software revision in order to provide users with the latest available features and options.

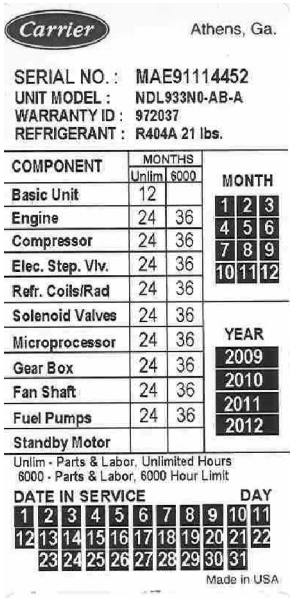
NOTE

Once any "05" version is installed into an Advance Controller, it will no longer be possible to load any earlier software versions into that microprocessor. Future version releases may be loaded as they are released.

UNIT IDENTIFICATION

Each unit is identified by a decal attached to the frame of the unit. This decal is on the roadside vertical frame post behind the roadside side door. The decal identifies the complete model number of the unit, the serial number, the type of refrigerant and quantity, and the date the unit was placed in service.

If a problem occurs, 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 a technician or Carrier Transicold Service Engineer so that they may properly assist you.



X2 2500A With Tier 4i Engine Shown
Nameplate Location Similar For All Units

SAFETY

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 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 Start/Run–Off Switch is in the START/RUN position.

NOTE TO TECHNICIANS

Refer to the Operation and Service Manual for a complete list of Safety Precautions.

AUTO-START

This refrigeration unit is equipped with Auto-Start in both Start–Stop and Continuous Run modes. 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., checking the belts, checking the oil), make certain that the Start/Run–Off Switch is in the OFF position.

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.

REFRIGERANTS

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 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.

SAFETY (CONTINUED)

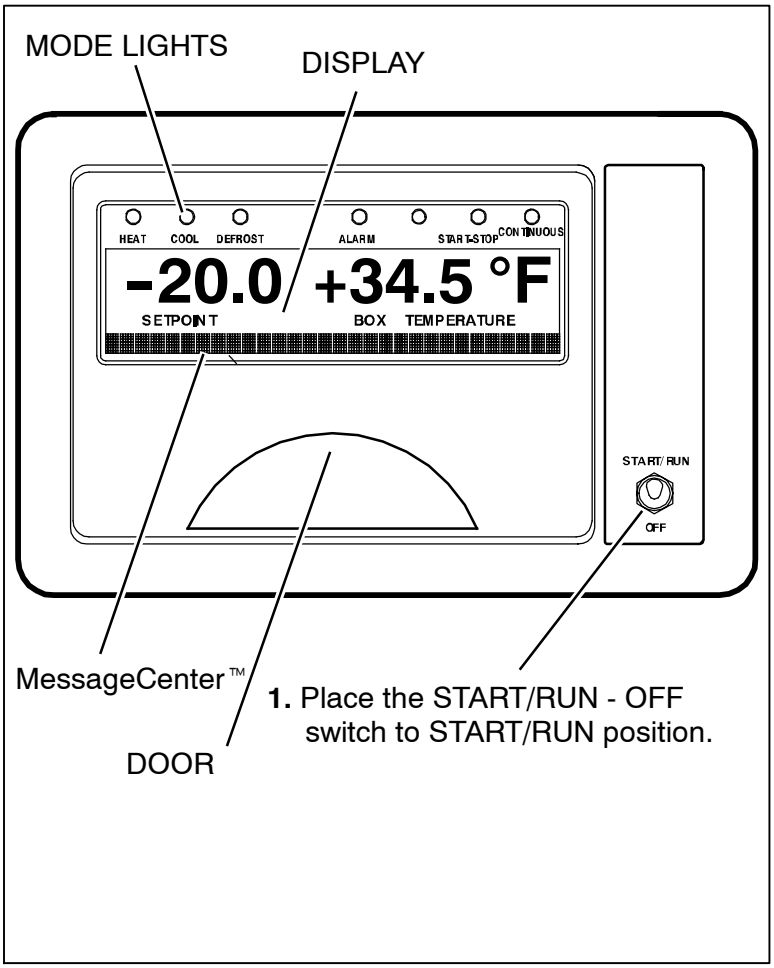
BATTERY

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- AUTO

WARNING

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



The microprocessor controller will run a self test. All of the mode lights will illuminate, all of the segments on the display will be turned on, and all of the Liquid Crystal Displays (LCDs) in the message center will be turned on.

The display will then show the set point temperature on the left and the refrigerated compartment temperature on the right. The last character (after the degree symbol) shows the temperature units as F (Fahrenheit) or C (Celsius).

The MessageCenter will display the default message, unless there is an alarm(s) stored in the controller. If there is an alarm(s) stored in the controller,
"INACTIVE ALARMS IN MEMORY" will be displayed on the MessageCenter and the Alarm LED will flash for 5 seconds, then turn off.
"CHECK AT NEXT SERVICE INTERVAL" will then be displayed if there are any active non-shutdown alarms present. Total engine hours, total switch on hours and the Active IntelliSet will also be shown when configured.

The suction modulation valve (CSMV) will go through a procedure to close itself. The microprocessor starts out giving the CSMV the command to close completely. The display will show
"SMV CLOSING: WAIT XX SECONDS" where xx is the number of seconds until the valve is fully closed. The CSMV will then open to a predetermined position according to the ambient and compartment temperatures. The display will show "SETTING SMV XX%." The start sequence will start at 30%.

After the CSMV reaches 30% the glow plugs or air intake heater will be energized, the buzzer will sound, and the diesel engine will start.

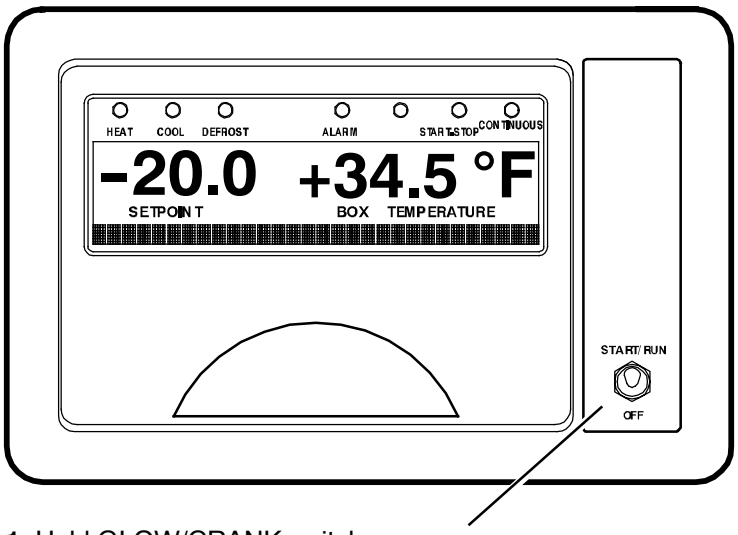
NOTE

Placing the unit in Start-Stop will automatically put the unit into Auto Start operation.

MANUAL START (GLOW / CRANK)- IF EQUIPPED*

WARNING

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

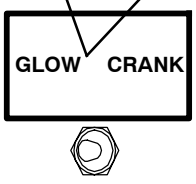


1. Hold GLOW/CRANK switch in the GLOW position.

2. Place START/RUN-OFF switch to the START/RUN position.

3. Continue to hold GLOW/CRANK switch in the GLOW position for up to 15 seconds, based on the following temperature table.

4. Then crank the engine by holding the GLOW/CRANK switch in the CRANK position until the engine starts or for a maximum of 10 seconds.



Side of Control Box
Ultima only

Back of Control Box
All Other Units

***NOTE**

The GLOW/CRANK switch was removed from units built after April 2007.

Heat Times for Tier 4i Engines		
Engine Coolant Temperature	**Heat Time in Seconds**	
	Pre Heat	**Post Heat**
Less than 33°F (1.0°C)	30	180
33°F to 51°F (1.0°C to 11°C)	20	120
51°F to 78°F (11°C to 26°C)	10	60
Greater than 78°F (26°C)	0	0

Glow Time		
Engine Coolant Temperature	**Glow Time in Seconds**	
	TV/Short (Default)	**DI/ Long**
Less than 32°F (0°C)	15	55
33°F to 50°F (1°C to 10°C)	10	40
51°F to 77°F (11°C to 25°C)	5	25
Greater than 78°F (26°C)	0	10

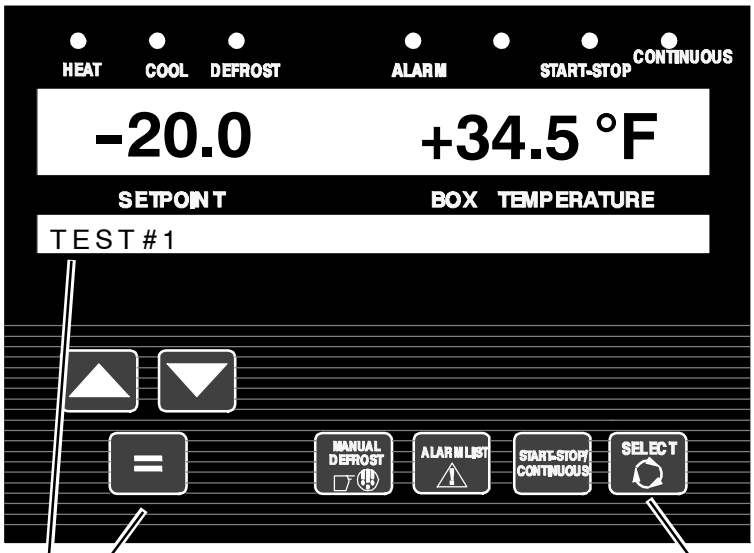
The diesel engine may be manually started using the GLOW/CRANK switch (if equipped) and/or the START/RUN- OFF switch.

When the micro powers up, “MANUAL START MODE SELECTED” will appear in the MessageCenter and the Alarm LED will blink for 5 seconds.

NOTE: Manual Start will automatically put the unit in Continuous Run mode. Placing the unit in Start–Stop will automatically put it back into Auto Start operation.

NOTE: Manual Start Mode will automatically be cancelled when the Start/Run–Off Switch is toggled to Off and then back to Start/Run.

PRETRIP



1. Place SROS in “START/RUN” position.

2. Press the SELECT key until the MessageCenter displays “PRESS = TO START PRETRIP”.

3. Press the = key to start PRETRIP.

4. Verify that during TEST#1 the complete display is turned on, that the buzzer comes on, that all lights on the Light Bar come on and that the AutoFresh air port opens and closes (option for XTC and X2 units only).

5. The remainder of Pretrip will take 7 to 15 minutes, and will run itself automatically.

6. Pretrip cannot be started and “CANNOT START PRETRIP” will be displayed when:
- There is an active Shutdown Alarm
- The unit is in PC Mode

The PRETRIP mode is for checking unit operation and evaluating operation of all modes prior to loading the trailer.

TIP: A Pretrip can be started at any box temperature and will cause the unit to start if it is in an off cycle.

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

The MessageCenter displays the current test and the % complete of the test. When the Pretrip tests are complete the MessageCenter will display “PRETRIP PASS”. If “PRETRIP FAIL IN TEST “X” or PRETRIP FAILED & COMPLETE” is displayed the ALARM light will flash. Press the ALARM LIST key to review the alarms set by the Pretrip tests.

TIP: The Pretrip test “PASS” results message will stay displayed until a key is pressed, or until the SROS switch is in the “OFF” position.

TIP: The Pretrip test “FAIL” results message will stay displayed until the alarms are cleared.

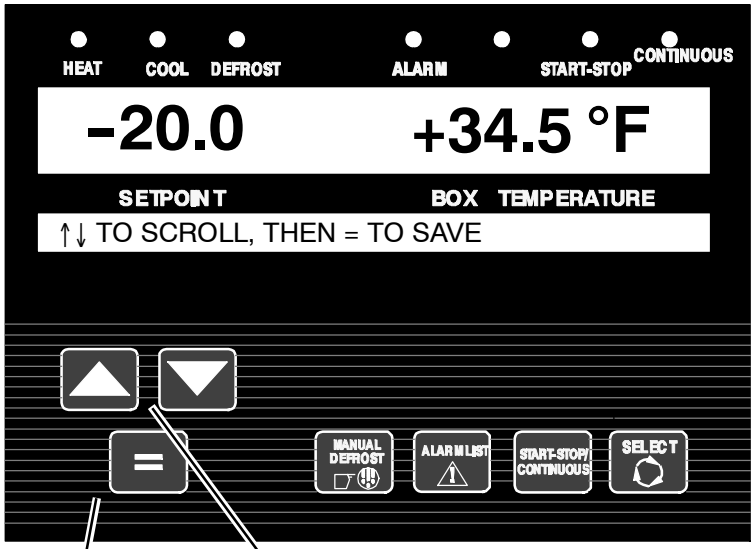
TIP: Pretrip may be stopped by the user by either turning the unit off then back on again, or by pressing and holding the = Key for 5 seconds. “PRETRIP STOPPED BY USER” will appear in the MessageCenter.

TIP: It is always a good idea to clear all alarms from both Alarm Lists before starting Pretrip.

NOTE

The operator MUST be present and validate this test by watching the micro display during Test 1- Display Test. The micro will turn on all segments of the LCD and LED display.

CHANGING SETPOINT



1. With the set point displayed, press the UP or DOWN ARROW key to change the set point to the desired value. The MessageCenter will show "↑↓ TO SCROLL, THEN = TO SAVE". The set point display will flash for 5 seconds or until the = key is pressed

2. Press the = key to save the new set point.

Set points of-22°F to +95°F (–30°C to +35°C) may be entered via the keypad. The controller always retains the last entered set point in memory. Depending on Microprocessor set–up, the set point may be changed up or down in either 0.1° (one–tenth of a degree) or 1° (one full degree) increments by pressing and releasing either the UP ARROW or DOWN ARROW key.

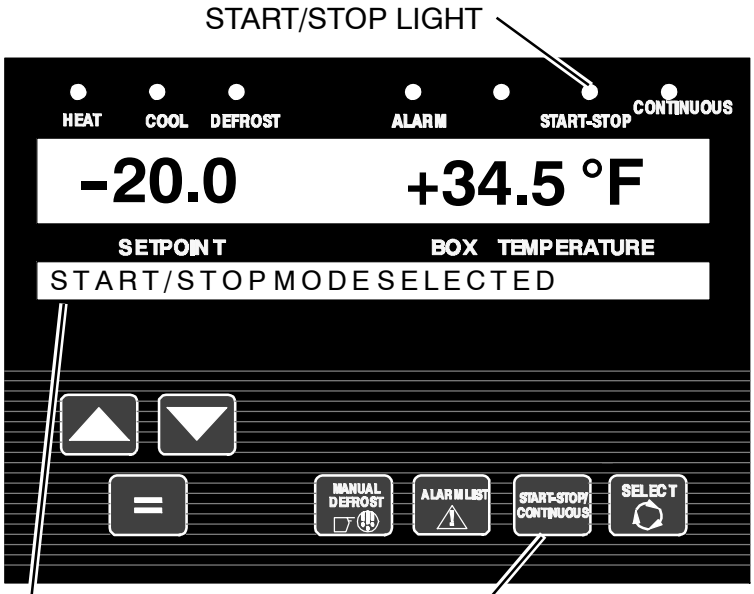
TIP: If the message “MAX SETPOINT HAS BEEN REACHED” or “MIN SETPOINT HAS BEEN REACHED” is displayed, the set point range has been locked within set minimum and maximum limits, and cannot be changed beyond those settings.

You can not change the set point when viewing the Alarm List, Data List or Functional Parameters, or when unit is in Pretrip or is in Sleep Mode. Set point may be changed any other time the SROS is in the Start/Run position, or with the unit in PC Mode.

Pressing the = key will cause the new displayed set point value to become active and “SET POINT CHANGED” is displayed. If the new value is not entered, after 5 seconds of no keypad activity, the entire display and Light Bar will flash for 15 seconds with “SETPOINT NOT CHANGED” displayed and then revert back to the last entered set point for that compartment. All other keys are active at this time and if pressed while the display is flashing, will stop the flashing, and perform the requested function.

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

START-STOP OPERATION



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

Automatic Start–Stop is provided to permit starting/stopping/restarting of the unit as required. This feature allows full automatic control of the engine or compressor starting and stopping by monitoring box temperature, battery charging amps and engine coolant temperature. The main function of automatic cycling is to turn off the refrigeration system near set point to provide an energy efficient temperature control system and to initiate a restart sequence when certain conditions are met. The Start–Stop/Continuous key is pressed to select between Continuous Run and Start–Stop operating modes. Refer to RECOMMENDED TRANSPORT TEMPERATURES (page 47) for Start–Stop operation.

The START-STOP/CONTINUOUS key is locked out if "START-STOP LOCKED" appears in the MessageCenter when the unit is in Start-Stop Mode or "CONTINUOUS LOCKED" appears in the MessageCenter when the unit is in Continuous Run Mode.

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

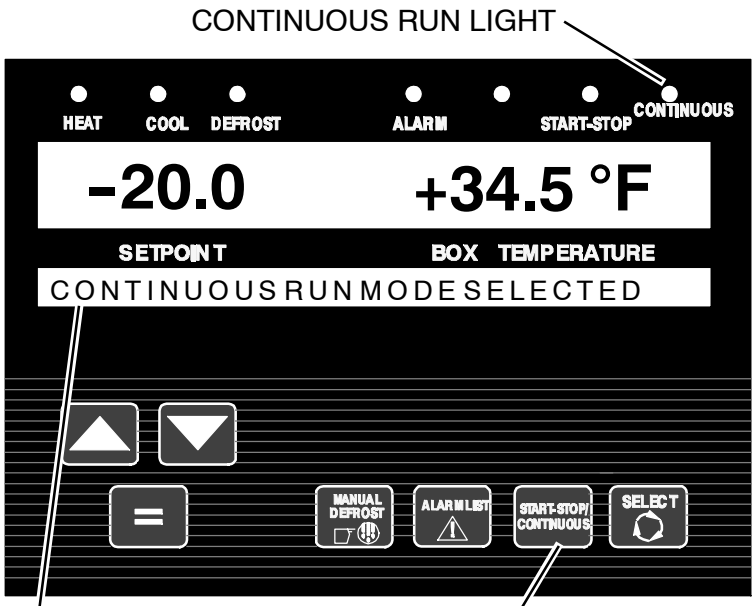
- It has run for the selected minimum run time
- The engine coolant temperature is above 122°F (50°C)
- The battery is fully charged as indicated in the MessageCenter by "OK" after the voltage value AND the charging amps must be less than the value selected in the configuration list (Factory setting is 6.5 amps.)
- The box temperature is within ±0.5°F (±0.3°C) of set point for set points in the Perishable range or is less than +0.5°F (+0.3°C) above set point for set points in the Frozen range.

A restart will be initiated when one of the following conditions occurs:

- Engine coolant temperature drops below 34°F (1°C)
- The battery voltage falls below voltage selected in the configuration list.
- During the Minimum Off Time box temperature has moved away from set point by 4° to 18°F (2° to 10°C) depending on the Functional Parameter settings.
- The Minimum Off Time has expired and the box temperature has moved away from set point by more than 4°F (2°C).
- Maximum Off Time has expired. The Maximum off time setting ensures that the entire load stays within safe temperature range. The unit will start after a pre-selected maximum off time-regardless of any change in box temperature.

If the engine fails to start after three start attempts, the "FAILED TO START-AUTO MODE" alarm will be activated. While running, if the unit shuts down on a safety, or fails to run for the minimum run time, three consecutive times, the "FAILED TO RUN MINIMUM TIME" Alarm will be activated. The shutdown counter is cleared when the engine has run for 15 minutes, or when the unit cycles off normally.

CONTINUOUS RUN OPERATION



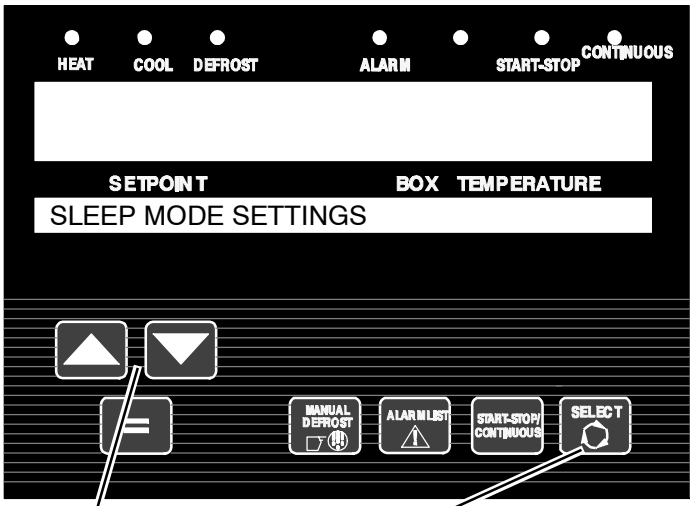
1. Press the START-STOP/CONTINUOUS key until the CONTINUOUS RUN Light on the controller illuminates.

2. Verify that “CONTINUOUS RUN MODE SELECTED” is displayed on the MessageCenter and that the CONTINUOUS RUN light is illuminated. The unit is now in Continuous Run operation.

In the Continuous Run mode, the diesel engine will run continuously- providing constant air flow and temperature control to the product. Refer to RECOMMENDED TRANSPORT TEMPERATURES (page 47).

The START-STOP/CONTINUOUS key is locked out if “START-STOP LOCKED” appears in the MessageCenter when the unit is in Start–Stop Mode or “CONTINUOUS LOCKED” appears in the MessageCenter when the unit is in Continuous Run Mode.

SLEEP MODE ON



1. Press the SELECT key until the MessageCenter displays “PRESS ↑↓ TO VIEW SETTINGS”.

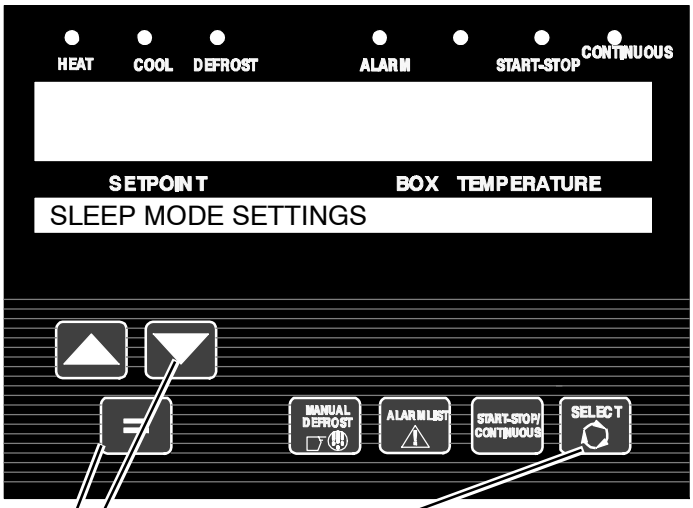
2. By pressing the UP or DOWN ARROW key, you will move through the Function List until “SLEEP MODE SETTINGS” appears in the MessageCenter.

3. Press the = key “↑ ↓ TO SCROLL, THEN = TO SAVE” will appear in the MessageCenter.

4. Press the = key to select Sleep Mode Settings.

5. “SLEEP MODE: YES OR NO” will show in the MessageCenter. Press either UP or DOWN ARROW key to change the Sleep Mode to “YES”.

SLEEP MODE OFF



1. Press the SELECT key until the MessageCenter displays “PRESS ↑↓ TO VIEW SETTINGS”.

2. By pressing the UP or DOWN ARROW key, you will move through the Function List until “SLEEP MODE SETTINGS” appears in the MessageCenter.

3. Press the = key “↑ ↓ TO SCROLL, THEN = TO SAVE” will appear in the MessageCenter.

4. Press the = key to select Sleep Mode Settings.

5. “SLEEP MODE: YES OR NO” will show in the MessageCenter. Press either the UP or DOWN ARROW key to change the Sleep Mode to “NO”.

OR

SLEEP MODE OFF

1. To take the unit out of Sleep Mode, place the START/RUN - OFF switch to OFF position, then back to Start/Run.

No further menu selections are available when NO is selected from the “SLEEP MODE: YES or NO” menu. The following sub menus are available when YES is selected:

1. “WAKE UP TIME”
2. “RUN PRETRIP TEST AT WAKE”

Refer to “SLEEP MODE SETTINGS” (page 39) for information on these settings.

Sleep Mode is used generally in cold ambients when the unit may be OFF for an extended period of time. In Sleep Mode the unit will “Wake Up” periodically and run to keep the battery charged and the engine warm. There is **NO temperature control** in Sleep Mode and it should never be used for hauling perishable or frozen products.

While the unit is running in Sleep Mode, “WARNING: NO TEMP CONTROL” will be displayed in the MessageCenter. No set point or box temperature will be shown, as the unit is not running to control the box temperature.

While the unit is cycled off in Sleep Mode, “SLEEP MODE, OFF/ON TO WAKE” will be shown in the MessageCenter.

NOTE

In the event that the Engine Coolant Temperature sensor fails, Sleep Mode will operate as follows:

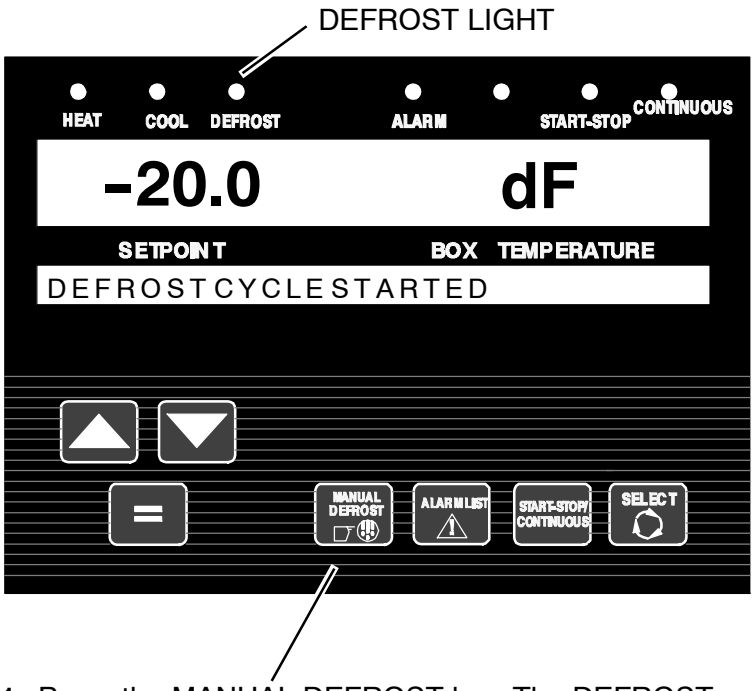
In ambients above +32°F (0°C), the unit will run as above, and will monitor battery voltage and charging amps only (according to the configuration setting).

In ambients below +32°F (0°C), the unit will run for 20 minutes minimum run time, then restart every 60 minutes (maximum off time). Battery voltage and amperage will be monitored normally.

NOTE

Units equipped with IntelliSet option can select sleep mode by choosing IntelliSleep.

DEFROST



1. Press the MANUAL DEFROST key. The DEFROST light will come on and the MessageCenter will display “DEFROST CYCLE STARTED” for 5 seconds, or flash “CANNOT START DEFROST CYCLE” for 5 seconds.

Check DTT1 and DTT2 temperatures in Data List (DTT2 only for XTC and X2 units). The defrost mode may be initiated in three different ways if the evaporator coil (defrost termination thermostat[s] or the supply air sensor) is below 40°F (4.4°C) OR the SAT is below 45°F (7.2°C) for XTC and X2 units:

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.

If “CANNOT START DEFROST CYCLE” is displayed:

• The coil temperature (defrost termination thermostat[s] or the supply air sensor) is above 40°F (4.4°C). Run the unit to lower temperature below 40°F (4.4°C) and then restart defrost.

•The unit has not run 15 seconds after starting

•The unit is in PC Mode

•The unit is in Pretrip.

•There is an active shutdown Alarm

The defrost mode terminates when:

•The evaporator temperature (defrost termination thermostat[s] or the supply air sensor) is higher than 55°F (12.8°C).

•When a shutdown alarm occurs. The unit will remain off for 15 minutes and then restart.

•The CDT rises to 310°F (154.4°C) for more than a minute when the unit has been in the defrost cycle for more than four minutes.

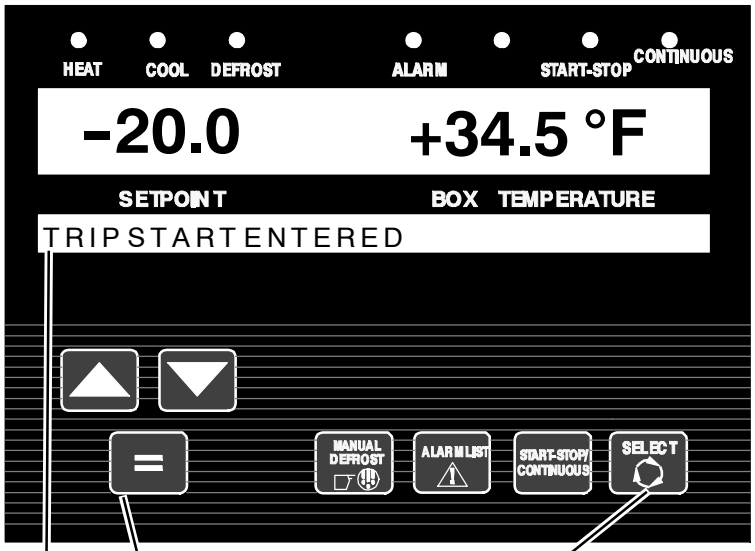
•If both the DTT2 and SAT sensor alarms are active, the unit will stop defrost after 10 minutes.

NOTE

Should the defrost cycle not complete within 45 minutes, the defrost cycle is terminated. “DEFROST NOT COMPLETE” will be in the MessageCenter.

After the 45 minute termination, the controller will wait 1.5 hours of engine running time before attempting an automatic defrost cycle. Pressing the manual defrost key will override this mode and start a defrost cycle.

TRIP START



1. Press the SELECT key until the MessageCenter displays "PRESS = TO MARK TRIP START".

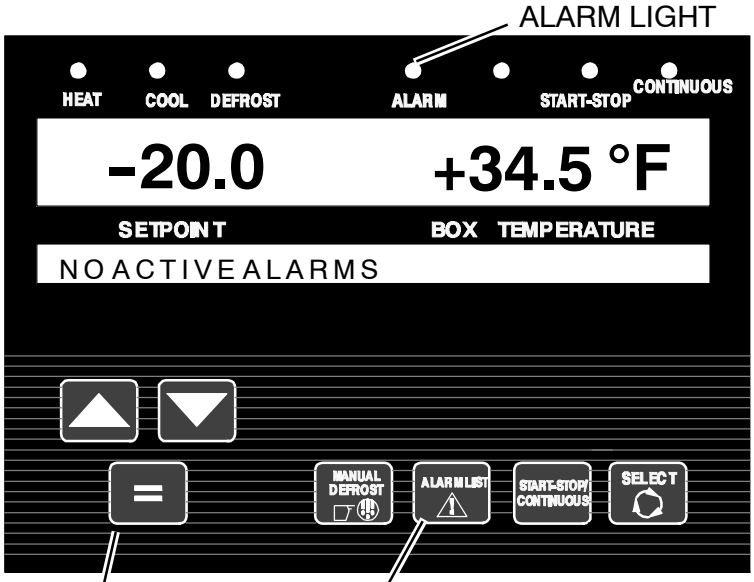
2. Press the = key.

3. If trip start is acknowledged by the data recorder, "TRIP START ENTERED" will be displayed for 5 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.

Trip start places a time stamp in the data recorder memory to allow easy review of the data from the last trip, and to allow downloading data from a specific trip.

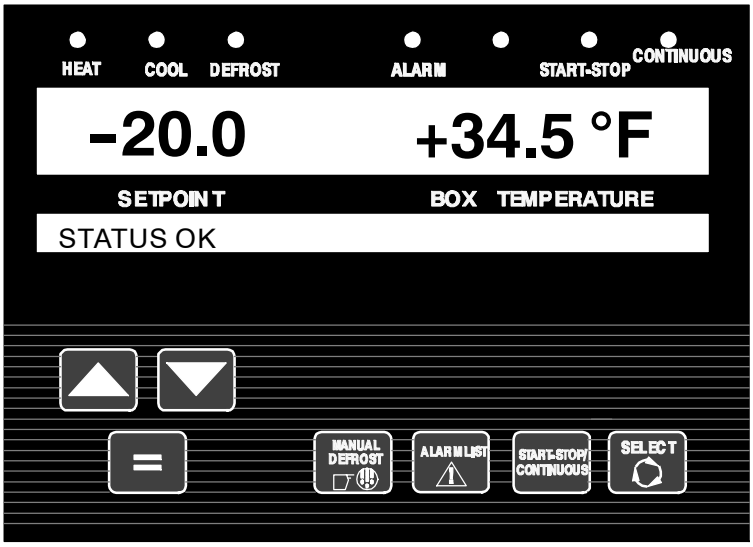
Trip start tells the recorder that the present date and time is the beginning of a new trip.

ALARM LIST - VIEW ALARMS



1. Press the ALARM LIST key. If there are no active alarms, the MessageCenter will display “NO ACTIVE ALARMS” for 5 sec.
2. If there are active alarms, the display will be ‘A’ and the alarm number and message. The last Alarm that occurred will be the first Alarm displayed.
3. Press the ALARM LIST or UP ARROW key to scroll through the list of alarms.
4. When you reach the end of the alarm list, “LIST END, = TO CLEAR ALARMS” is displayed.
5. To clear the alarm list, press the = key while “LIST END, = TO CLEAR ALARMS” is being displayed. “ACTIVE ALARMS LIST CLEAR” is displayed. This will move all Alarms to the Inactive Alarm list.

OPERATOR MESSAGES



STATUS OK- This message or other user-defined message will be shown in the MessageCenter at most times.

If a problem begins to develop one of the following messages may be shown:

SLEEP MODE, OFF / **ON TO WAKE** will appear when the unit is in Sleep Mode, and the engine has cycled off. Refer to SLEEP MODE SETTINGS (page 39) for more information on Sleep Mode.

SLEEP WARNING NO TEMP CONTROL WILL DISPLAY WHEN will display when the unit is running while in Sleep Mode. Refer to SLEEP MODE SETTINGS (page 39) for more information on Sleep Mode.

TECHNICIAN RESET REQUIRED is displayed if the Low Engine Oil Pressure or High Coolant Temperature alarm has been activated three times in the last two hours and the unit has been locked out. The unit must be brought toa Carrier Transicold Dealer for service.

WARNING: NO TEMP CONTROL will be displayed:

- when the system is not performing up to capacity and there is an active temperature control alarm
- when both compartment temperature sensors have failed, the compartment has a frozen setpoint and the compartment is only operating in cool mode.

UNIT BATTERY TOO LOW will display when the unit battery voltage is too low to allow the unit to start and run.

CHECK AT NEXT SERVICE INTERVAL is shown when there is an active non-shutdown alarm present (the alarm condition is present but is not serious enough to stop the unit). These alarms may be viewed by pressing the Alarm List Key. The message will clear itself when the condition is corrected.

UNIT SHUTDOWN- SEE ALARM LIST is shown when there is a safety shutdown. Pressing the Alarm List Key will bring any Active Alarms into the MessageCenter.

CHECK WIRES FROM MICRO TO KEYPAD- is shown when there is a wiring problem between the microprocessor and the display module.

OPTIONAL MESSAGES: These messages require an optional device and may not appear even if condition exists.

CHECK FUEL LEVEL means that the fuel level in the fuel tank needs to be checked and fuel added.

DOOR OPEN will be displayed if the trailer door is opened, and the trailer has an optional door switch to notify you when the door is opened or not closed tightly.

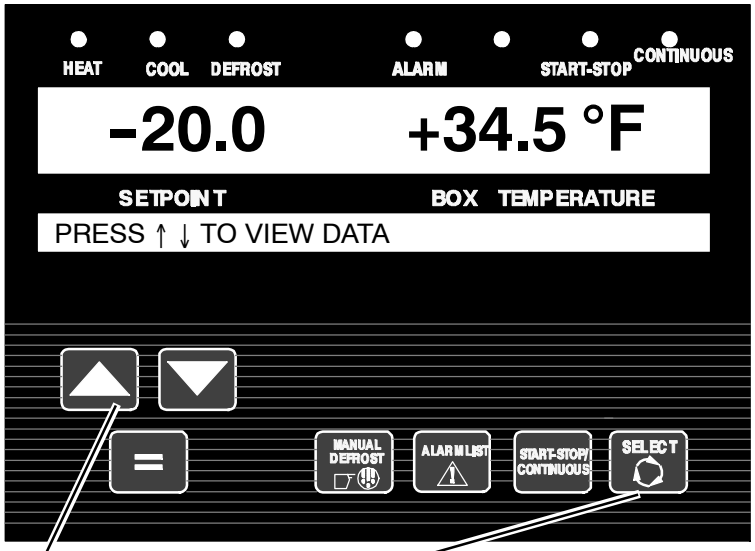
OPERATOR MESSAGES (Continued)

DOOR OPEN- LOW SPEED or REMOTE SWITCH # OPEN-LOW SPEED is displayed if an optional door or remote switch in installed and configured to operate the engine in low speed when the refrigerated compartment door is opened or remote switch is activated.

UNIT SHUTDOWN- DOOR OPEN or **REMOTE SWITCH #** is displayed if an optional door or remote switch is installed and configured to shut the unit down when the refrigerated compartment door is opened or remote switch in activated.

If there is a problem with the data recorder, **DATA RECORDER FAILURE** will be shown.

UNIT DATA



1. Press the SELECT key until the MessageCenter displays “PRESS ↑↓ TO VIEW DATA”.

2. By pressing the UP ARROW key, you will move through the Data List beginning at the top and moving toward the bottom, or by pressing the DOWN ARROW key, you will move through the Data List beginning at the bottom, and moving toward the top.

3. The selected Data Item will remain in the MessageCenter for 10 seconds, then the default message (STATUS OK or other customer specified message) will appear.

4. To lock a Data List item in the MessageCenter, press the = key. The Data item will flash continuously to indicate it is locked.

5. Pressing UP or DOWN key will move to the next data item. Pressing the = key will unlock the item, and after 10 seconds the default message will be displayed.

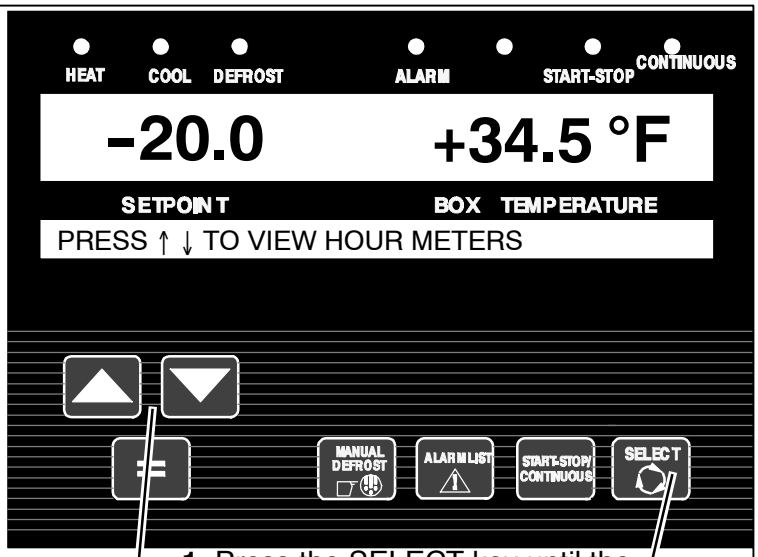
UNIT DATA

UNIT DATA	
DATA	**DEFINITION**
SUCTION PRESSURE	Compressor suction pressure
DISCHARGE PRESSURE	Compressor discharge pressure
ENGINE COOLANT TEMP	Engine coolant temperature
RETURNAIR TEMP	Return (air entering evaporator) air temperature
SUPPLYAIR TEMP	Supply (air leaving evaporator) air temperature
DELTA-T	Supply air temperature minus Return air temperature. (A positive temperature indicates the unit is in heating, a negative temperature indicates the unit is in cooling.
AMBIENTAIR TEMP	Ambient (air entering condenser) air temperature
DEFROSTTERM TEMP 1	Defrost termination temperature #1- Temperature in Blower Housing **(Non XTC and X2 units only)**
DEFROST TERM TEMP 2	Defrost termination temperature #2- Evaporator Coil Temperature
DISCHARGE TEMP	Compressor discharge temperature
BATTERY	Battery voltage
CURRENT DRAW	Current (amp) draw of the electrical circuits
ENGINE RPM	Engine revolutions per minute
FUEL LEVEL	% of fuel in tank. (This is only shown when 0 to 100% sensor is configured ON)
SUCTION MOD VALVE	% open of SMV or CLOSING **XTC and X2 units ONLY**
START MODE	AUTO if the engine will start automatically MANUAL if the engine must be started manually
INSTALLED OPTIONS •IntelliSet •DataTrak •Compressor Alarm Shutdown	This is only shown if software options have been installed in the Microprocessor.
SOFTWARE REVISION	Revision of the software that is operating the Microprocessor
DISPLAY SOFTWARE REV	Revision of the software that is operating the display

UNIT DATA	
DATA	**DEFINITION**
CONTROL SERIAL #	Serial Number of the Microprocessor
TRAILER ID #	Trailer ID (as entered by the user)
UNIT SERIAL #	Unit serial number
UNIT MODEL #	Unit model number (selected through configurations)
HOURS TO ENGINE MAINT	Number of engine hours until the next programmed engine maintenance.
HOURS TO UNIT MAINT	Number of switch–on hours until the next programmed general unit maintenance.
TIME LEFT TO PM (1–5)	Number of hours until the next programmed PM maintenance.
ProductShield SETUP:	Indicates that unit has IntelliSet installed and is configured for Product Shield
•ProductShield Econo:	Indicates if ProductShield Econo is OFF or GO TO S/S or GO TO CONTINUOUS
•Econo Min Temp	Minimum ambient temperature of range for activation of ProductShield Econo (Will only be displayed if Econo is NOT OFF)
•Econo Max Temp	Maximum ambient temperature of range for activation of ProductShield Econo (Will only be displayed if Econo is NOT OFF)
•Econo Delta–T	Delta–T value for activation of ProductShield Econo (Will only be displayed if Econo is NOT OFF)
•ProductShield High Air:	Indicates if Product Shield High Air is ON or OFF
•High Air Min Temp	Minimum ambient temperature of range for activation of Product Shield High Air (Will only be displayed if High Air is ON)
•High Air Max Temp	Maximum ambient temperature of range for activation of Product Shield High Air (Will only be displayed if High Air is ON)
•High Air Delta–T	Delta–T value for activation of Product Shield High Air (Will only be displayed if High Air is ON)
•ProductShield Winter - xx°	Indicates the ambient temperature below which ProductShield Winter will operate. (Will only be displayed if WINTER is NOT OFF)
RANGE 1 LOCK	OFF- Temperature Range 1 Lock is turned off. CONTINUOUS- When the Set Point is set between Range 1 Minimum & Maximum Temperatures, the unit is set to operate only in Continuous Run. START–STOP- When the Set Point is set between Range 1 Minimum & Maximum Temperatures, the unit is set to operate only in Start/Stop.

UNIT DATA	
DATA	**DEFINITION**
RANGE 1 MINIMUM TEMP	This is the lower setpoint limit for Range 1.
RANGE 1 MAXIMUM TEMP	This is the upper setpoint limit for Range 1.
RANGE 2 LOCK	OFF- Temperature Range 2 Lock is turned off. CONTINUOUS- When the Set Point is set between Range 2 Minimum & Maximum Temperatures, the unit is set to operate only in Continuous Run. START–STOP- When the Set Point is set between Range 2 Minimum & Maximum Temperatures, the unit is set to operate only in Start–Stop.
RANGE 2 MINIMUM TEMP	This is the lower setpoint limit for Range 2.
RANGE 2 MAXIMUM TEMP	This is the upper setpoint limit for Range 2.
REMOTE SENSOR (1–3)	This is the temperature at remote Temperature Sensor 1, 2, and 3. (These sensors are optional, and may not be applicable to the unit. Up to 3 remote sensors may be listed.)
DATALOGGER	This is the current Date and Time that the Data Recorder is using. This may be different than your actual time, depending on the Time Zone and daylight–saving time selections made by the owner of the unit.

VIEW HOUR METERS



1. Press the SELECT key until the MessageCenter displays "PRESS ↑↓ TO VIEW HOURMETERS".

2. Press the UP or DOWN ARROW key to move through the Hourmeter List.

3. Displayed hour meters will depend on unit configurations. Typical displayed meters are: "TOTAL ENGINE HOURS" and "TOTAL SWITCH ON HOURS".

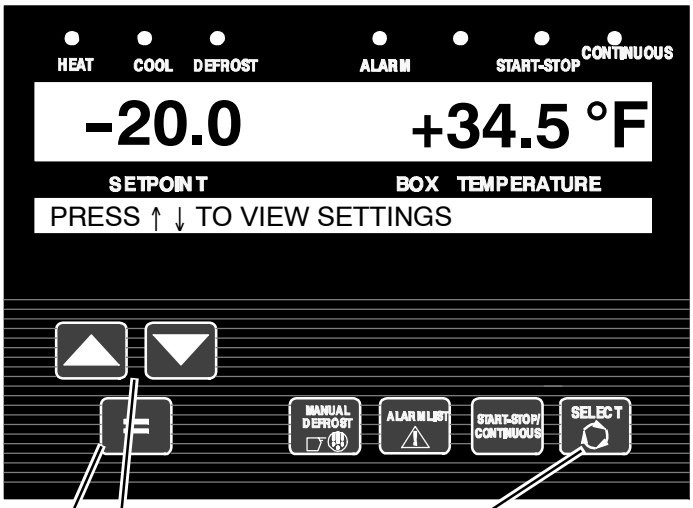
4. Pressing the = key will access all other meters and display "OTHER METERS AND COUNTERS".

5. Selected Hourmeter will remain in the MessageCenter for 10 seconds, then the default message (STATUS OK or other customer specified message) will appear.

6. To lock an hourmeter in the MessageCenter, press the = key. The Data item will flash continuously to indicate it is locked.

7. Pressing any key on the keypad will unlock the item. Pressing the UP or DOWN ARROW key will move to the next hourmeter.

FUNCTIONAL PARAMETERS



1. Press the SELECT key until the MessageCenter displays "PRESS ↑↓ TO VIEW SETTINGS".

2. Press the UP or Down keys to scroll through the functional parameters list.

3. To change one of the Functions, bring the Function you wish to change into the MessageCenter, and press = key. "↑ ↓ TO SCROLL, THEN = TO SAVE" will appear in the MessageCenter. Pressing either UP or DOWN ARROW key will begin to change the Function setting. The MessageCenter will flash, indicating that a change has been made that has not been entered into memory.

4. Continue pressing UP or DOWN ARROW key until the desired value is showing, then press the = key. The MessageCenter will stop flashing. The new value is now in memory. If the = key is not pressed within 10 seconds, the MessageCenter will change to "FUNCTION NOT CHANGED". This will appear for 5 seconds, then return to the last Functional Parameter shown. If no further keys are pressed, the default display will return in another 10 seconds.

NOTE: Any Function shown with a padlock symbol are locked and cannot be changed from the keypad.

FUNCTIONAL PARAMETER	SELECTIONS	DESCRIPTION
DEFROST TIMER SET FOR	1.5HRS 3HRS **6HRS** 12HRS	The defrost timer will automatically put the unit into the defrost cycle at the interval selected if DTT1,DTT2 or SAT is below 40°F (4.4°C). Shorter times are generally used for warm, humid products like produce. Longer times can be used for dry and frozen products.
SET S/S PARAMETERS (These may be displayed individually as 8 parameters [4 PERISH and 4 FROZEN], or 4 parameters [with no designation].		Time and Temperature values that control the Automatic Start/Stop operation are set in this section. When "TOGETHER" is selected in Configurations, only Perishable Settings are used.
• (PERISH/ FROZEN) MIN RUN TIME:	**4MINS** TO 60MINS (in 1 minute increments)	This determines the minimum run time for perishable/frozen set points in start/stop mode.
• (PERISH/ FROZEN) MIN OFF TIME:	10MINS TO 90MINS **20MINS** default (in 1 minute increments)	This determines the minimum off time for perishable/frozen set points in start/stop mode.
• (PERISH/ FROZEN) RESTART TEMP:	0.5°F (2°C) TO 18°F (10°C) **5.5°F (3°C)** default (in 0.5 degree increments)	Following the Minimum Off Time, should the compartment temperature drift this far above or below set point in the Perishable Range or above set point in the Frozen Range, the unit will restart.
• (PERISH/ FROZEN) OVERRIDE TEMP:	3.6°F (2°C) TO 18°F (10°C) **11°F (6°C)** default (in 0.5 degree increments)	This defines how far away the active temperature must be from the set point before the minimum off time can be overridden in start/stop mode for perishable/frozen set points.

FUNCTIONAL PARAMETER	SELECTIONS	DESCRIPTION
• (PERISH/ FROZEN) MAX OFF TIME:	**OFF** 10MINS TO 255MINS (in 1 minute increments)	OFF- There is no maximum off time. When a minute value is selected, this is the longest amount of time the unit will remain off during a (Perishable or Frozen or both) Auto Start/Stop Off Cycle. When this time expires, the unit will restart and run for the Minimum Run Time, regardless of any temperature change inside the box.
FROZEN SHUTDOWN OFFSET:	**0°F (0°C)** TO 1°F (0.6°C) (in 0.1 degree increments)	This only applies to Frozen set points in Start–Stop operation. This offset is the number of degrees below set point that the unit will run before cycling off. This will allow for a lower average box temperature when considering temperature rises during off cycles.
TEMP CONTROL	**RETURN AIR** SUPPLY AIR	Indicates which probe will be used to determine when set point is reached for set point selections above 10.4°F (-12°C). The unit will ALWAYS be controlled by the Return Air Sensor when set point is below 10.4°F (-12°C).
DISPLAY TEMPS IN	**FAHRENHEIT** CELCIUS	The display will show temperatures in either Fahrenheit (°F) or Celsius (°C)
DISPLAY PRESSURES IN	**PSIG** BAR	The display will show pressures in either pounds per square inch gauge (PSIG) or barometers (bar)

FUNCTIONAL PARAMETER	SELECTIONS	DESCRIPTION
* RESET PM HOURMETERS		Maintenance Hour Meters that are enabled will appear in this list.
• ENGINE • SWITCH ON • PM 1 THRU 5	RESET	If there are no active maintenance hourmeters, this menu item will not appear in the Functional Parameters. If there are active maintenance hourmeters and none have expired and turned the alarm on, the MessageCenter will display "NO HOURMETERS TO RESET." When any maintenance hourmeter has timed out, and preventative maintenance has been performed, selecting RESET and pressing the = key will de-activate the alarm, and reset the hourmeter for the next service interval.
OUT OF RANGE ALARM	English / Metric OFF / OFF 4°F / 2°C 5°F / 3°C **7°F / 4°C**	Once the unit is at set point, then drifted away for more than 30 minutes, an Out-Of-Range Alarm will come on. (Or, if configured for Out Of Range Shutdown, the unit will shut down after 45 minutes.) This setting determines how far away from set point the temperature must move before the timer is started. 4°F may be used for very critical temperature products, 7°F may be used for less critical products. The alarm may be turned off by selecting the OFF setting.

FUNCTIONAL PARAMETER	SELECTIONS	DESCRIPTION
AIR FLOW	**NORMAL** HIGH	The Normal selection allows the unit to cycle from High Speed to Low Speed, depending on how close the box temperature is to set point. Some products generate a considerable amount of heat (heat of respiration) during transportation. This frequently occurs with produce. The High selection can be used for these loads, since continuous high air flow may be required to keep the entire load at a constant temperature. The engine will remain in High Speed when High is selected. NOTE: HIGH AIR FLOW does not work with set points below +10.4°F (-12°C).
FRESH PROTECT	OFF A = 2 TO 5°F (1.1 TO 2.8°C) B = 4 TO 7°F (2.2 TO 3.9°C) **C = 6 to 9°F (3.3 TO 5.0° C)** D = 8 to 11°F (4.4 TO 6.1 ° C) E = 10 to 13°F (5.6 TO 7.2° C)	OFF- Fresh Protect is turned off A thru E determines the allowable temperature SAT can go below set point when the unit is operating in Continuous Run Cool. FreshProtect does not operate in Start-Stop.

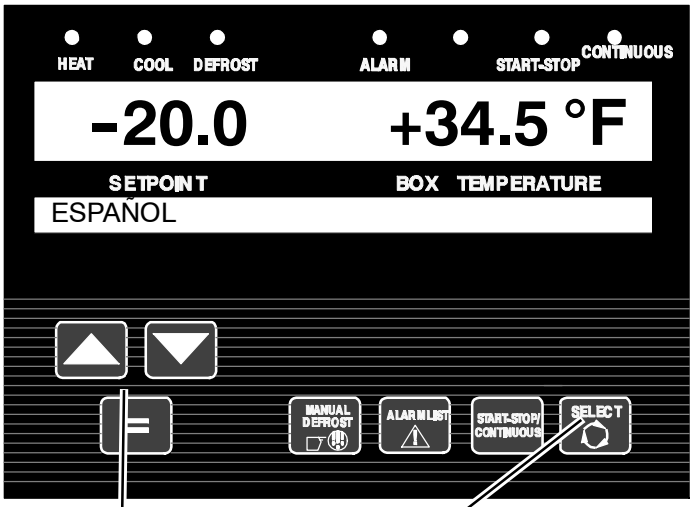
FUNCTIONAL PARAMETER	SELECTIONS	DESCRIPTION
AutoFresh Air **XTC AND X2 ONLY** Factory Installed Option	**CLOSED** OPEN CFM CONTROL Uses values shown below	Closed- AutoFresh Air Exchange assembly will be closed except for pretrip and component test mode. Open- Assembly will be open if the engine is running and the set point is greater than 28°F (-2.2°C) and the unit is not defrosting. CFM Control- Assembly will be cycled open and closed over a 20 minute time period. The length of time the assembly is opened or closed is based on the Auto Fresh Air Control Functional Parameter. The CFM CONTROL will only be active for set points greater than 28°F (-2.2°C) and in Continuous Run mode or Auto Start-Stop mode when the engine is running. The assembly will be closed when the set point is less than 28°F (-2.2°C) or during defrost or during the off cycle of Start-Stop mode.
AutoFresh Air Control **XTC AND X2 ONLY** Factory Installed Option	5 To 50 CFM **25 CFM** in 5 CFM increments	When CFM Control (Above) is selected, this setting is used to open and close air exchange.

FUNCTIONAL PARAMETER	SELECTIONS	DESCRIPTION
LOW SPEED START-UP MINUTES		Allows user to set the number of minutes the unit will run in low speed every time the engine starts.
•CONTIN-UOUS:	**Off** or 1 to 255 minutes	
•START/ STOP	OFF or 1 to 255 minutes (**10 min**)	
UNLOADER PRESSURE CONTROL	**STD** -5 +5	The recommended setting for this is Std. This setting should not be changed unless discussed with a Carrier Transicold Factory Service Engineer or Field Service Engineer.
SLEEP MODE SETTINGS The following sub menus determine whether sleep mode is to be used and what the settings will be.		NO- is the normal operating selection. YES- selects Sleep Mode. In this mode the unit will operate only as needed to keep the engine warm, and the battery charged. There is NO TEMPERATURE CONTROL in Sleep Mode.
• SLEEP MODE The following two sub menu selections will be available if YES is selected.	**NO** YES	NO- is the normal operating selection and no further selections will be available. YES- selects Sleep Mode. In this mode the unit will operate only as needed to keep the engine warm, and the battery charged. There is NO TEMPERATURE CONTROL in Sleep Mode.

FUNCTIONAL PARAMETER	SELECTIONS	DESCRIPTION
• WAKE UP TIME	**NO** YES	NO- the unit will remain in Sleep Mode until it is taken out manually. This can be accomplished either through the Functional Parameter list or by turning the Run/Stop switch to STOP and then back to RUN. YES– the SET WAKE UP TIME sub menu will be available
SET WAKE UP TIME		This setting is used to set Sleep Mode wake up time. The clock is a 24 hour clock. Hours 1 thru 12 are AM and 13 thru 24 are PM. The wake up time must be at least 1 hour and no more than 8 days from the time the clock is set
•MONTH	1–12	Allows user to set time.
•DAY	1–31	
•YEAR	1998–2037	
•HOURS	0–23	
•MINS	0–59	
RUN PRE-TRIP AT WAKE	**NO** YES	NO- The unit will wake up at the designated time and control to set point. YES- The unit will wake up at the designated time, automatically run Pretrip and then control to set point. The Pretrip Pass/Fail message will remain in the MessageCenter until the message is manually cleared.
* OVERRIDE DOOR SHUT-DOWN	**NO** YES	This will only appear when a compartment door switch is configured “ON” . NO- Allows the door switch to shut the unit down whenever the compartment door is opened and the door switch is configured for shut-down. YES- Allows operator to over-ride the compartment door shutdown switch, and allow the unit to continue to run, even with the compartment door open. TIP: This function can be used if there is a failure in the switch circuit to keep the unit running until repairs can be made.

FUNCTIONAL PARAMETER	SELECTIONS	DESCRIPTION
* OVERRIDE REMS (1-2) SHUTDOWN	**NO** YES	NOTE: This will only appear when a remote switch (REMS1 or REMS2) is configured “ON” in the Configuration List. NO- Allows the door switch to shut the unit down whenever the compartment door is opened and the door switch is configured for shutdown. YES- Allows operator to over-ride the compartment door shutdown switch, and allow the unit to continue to run, even with the compartment door open.
LANGUAGE/ IDIOMAS: LANGUE: LINGUAGEM:	**ENGLISH** ESPAÑOL FRANÇAIS PORTUGUÊS	**ENGLISH**- All information displayed in the MessageCenter will be shown in English. ESPANOL- All information displayed in the Message Center will be shown in Spanish. FRENCH- All information displayed in the Message Center will be shown in French. PORTUGUÊS- All information displayed in the MessageCenter will be shown in Portuguese. **NOTE:** This parameter can be quickly accessed by pressing and holding the Select key for six seconds
TIME SELECTION		Allows user to set time.
Selections in **BOLD** are the factory settings.		
* This Functional Parameter may not appear in the list for the unit, depending on how the Microprocessor has been configured.		

LANGUAGE SELECTION



1. Press the SELECT key for 6 seconds until MessageCenter displays current language (ENGLISH, ESPAÑOL, FRANÇAIS or PORTUGUÊS).

2. Press the UP or Down ARROW key until the MessageCenter indicates desired language. Press the = key. The new language will now be active. If the = key is not pressed within 10 seconds, the MessageCenter will change to “FUNCTION NOT CHANGED”. This will flash for 5 seconds, then return to the current language selection. If no further keys are pressed, the default display will return in another 10 seconds.

TIP

If the language is set to one that the user does not understand, press and hold the “SELECT” key for 6 seconds to bring up the Language Parameter so that it can be changed.

INTELLISET

The Advance™ Microprocessor offers over 48 parameters that may be set depending on the product being carried.

Available with the Advance Microprocessors is the IntelliSet Option. IntelliSet allows the owner to pre-program specific product settings into the microprocessor and give the settings a name. The driver may then call up these settings by simply selecting the IntelliSet name.

For example: Apples may require continuous operation at 35°F (1.7°C) with a defrost every 3 hours while a load of cheese may require the same operation with set points ranging from 35°F to 42°F (1.7°C to 5.6°C) and a load of ice cream requires start/stop operation at-22°F (-30°) with defrost at 12 hour intervals. The settings required for each product may be entered into the microprocessor and then locked so they cannot be changed. In the case of the cheese, the range of set points may be locked, leaving the driver the ability to change the set point within the locked range.

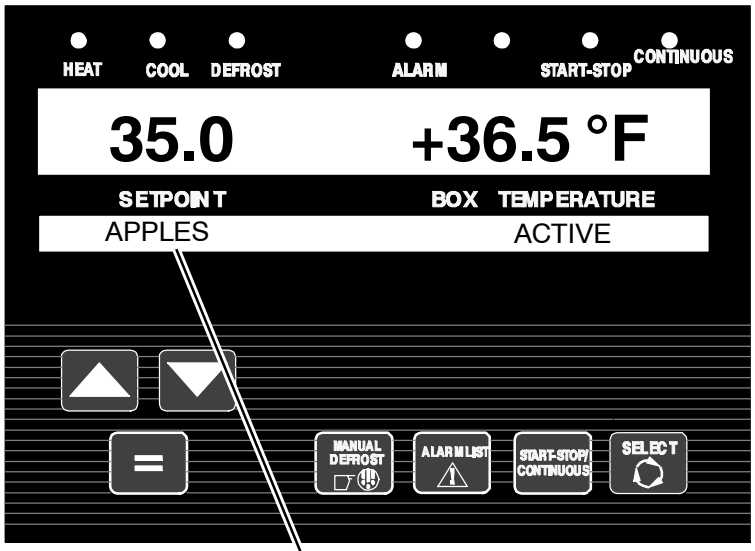
When a load of apples is going to be picked up, the driver simply selects "APPLES" from the IntelliSet menu; for cheese, "CHEESE" is selected and the set point reset as required; for ice cream, "ICE CREAM" is selected. With each selection, the microprocessor automatically re-programs the settings to provide the best temperature control, fuel economy, and performance for that particular product.

NOTE: IntelliSet #31 is pre-programmed as "IntelliSleep" which allows Sleep Mode (refer to Page 18) to be entered by simply changing to that IntelliSet.

The ONLY way to exit from IntelliSleep is to select a different IntelliSet.

NOTE: The above settings are **examples** of possible settings. Except for #31, IntelliSets are not factory set. They are developed by individual customers.

CURRENT INTELLISET SELECTION



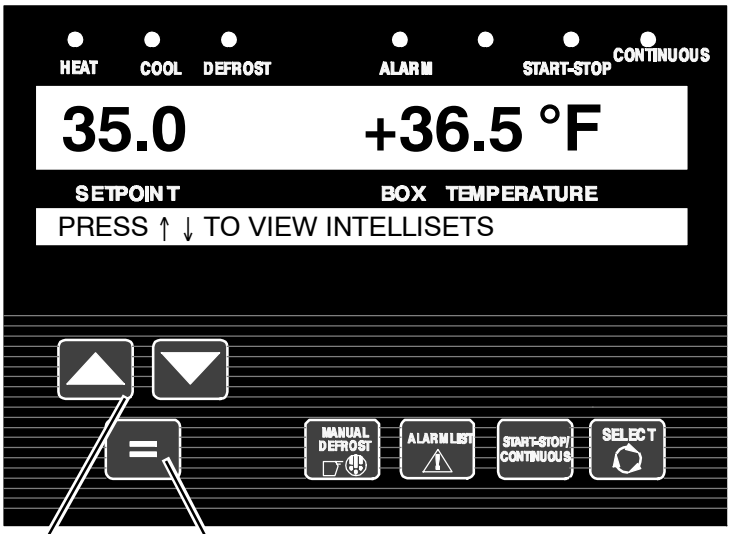
DURING START UP

Observe the MessageCenter during the Power-Up process. If the unit is equipped with IntelliSet, the name of the active or modified IntelliSet will be displayed for approximately 10 seconds before the engine starts.

DURING OPERATION

Press the = key to view current IntelliSet. (IntelliSet Hot Key must be configured.) Press either the the UP or DOWN ARROW Key to scroll through list of IntelliSets. The current IntelliSet will have either the word ACTIVE or MODIFIED after it. MODIFIED indicates that one or more of the IntelliSet settings (other than set point) have been changed. To change MODIFIED to ACTIVE, press = key while the IntelliSet is shown in the MessageCenter.

CHANGING INTELLISETS



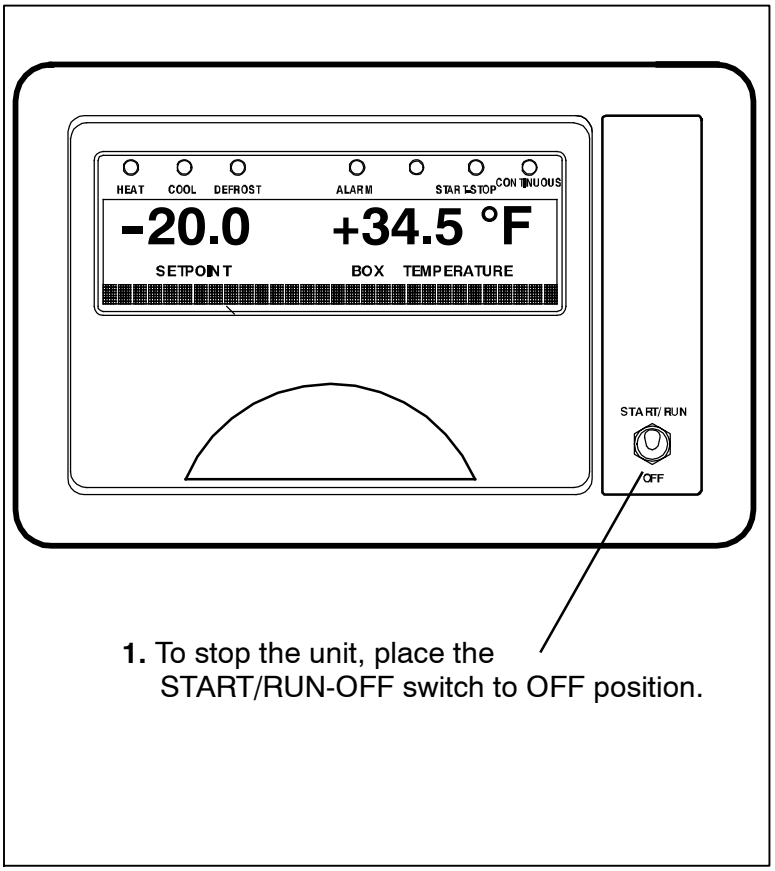
1. Press the = key to display current IntelliSet. (Enable IntelliSet at = Key must configured ON in configurations.)

2. Press the UP or DOWN ARROW key, to move through the IntelliSet List. The current IntelliSet will have either ACTIVE or MODIFIED to the right of the name.

3. To choose a different IntelliSet or to change the current IntelliSet from MODIFIED to ACTIVE, bring the IntelliSet you wish to use into the MessageCenter and press the = Key.

NOTE: If pressing the = key does not bring up this message, press the SELECT key until the message appears.

STOPPING UNIT



1. To stop the unit, place the START/RUN-OFF switch to OFF position.

The diesel engine will stop and the microprocessor controller will display “MICRO WILL STOP IN XX SECONDS”. (XX is countdown of seconds while the CSMV is closing.) The Microprocessor main display and MessageCenter will then turn off. All lights on the optional Light Bar will turn off. If the Start/Run–Off Switch is turned to ON while this message is being displayed, the MessageCenter continues to count down to zero. At that point it will blank out for a few seconds to allow the controller to reset, then power back up and proceed with the start up messages.

RECOMMENDED TRANSPORT TEMPERATURES

Below are some general recommendations on product transport temperatures and operating modes for this unit. These are included for reference only and should not be considered preemptive of the set point required by the shipper or receiver.

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

Product	Set Point Range		Operating Mode[1]
	°C	°F	
Bananas	13 to 14	56 to 58	Continuous
Fresh fruits and vegetables	0.5 to 3	33 to 38	Continuous
Fresh meats and seafood	-2 to 0	28 to 32	Auto-Start/Stop or Continuous
Dairy Products	0.5 to 3	33 to 38	Auto-Start/Stop or Continuous
Ice	-10 to-7	15 to 20	Auto-Start/Stop[2]
Frozen fruits and vegetables	-23 to-18	-10 to 0	Auto-Start/Stop[2]
Frozen meats and seafood	-23 to-18	-10 to 0	Auto-Start/Stop[2]
Ice Cream	-29 to-26	-20 to-15	Auto-Start/Stop[2]

1. During delivery cycles that include frequent stops and door openings, it is recommended that this unit always be operated in the continuous run mode to help insure product quality. If delivery conditions allow, the unit should be turned off during the time the trailer doors are open to help conserve the product temperature.

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

PRE-TRIP INSPECTION

The pre-trip inspection should be performed 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.

1. Place the Start/Run–Off Switch in the OFF 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. Dispose of fuel properly. Don't drain waste fuel onto ground.
3. Belts- Check the belt tension by depressing the belt with your thumb, near the center of the longest free run of each belt. Under moderate pressure each belt should deflect approximately 1/4 inch to 1/2 inch (6 mm to 13mm). If the belts deflect more than this they should be tightened (loose belts may slip, generating heat and reducing belt life). If the belts are too tight they should be loosened; tight belts can reduce bearing life.
4. Battery- on unit equipped with serviceable batteries, the level of the electrolyte in each of the cells should be checked. If the level is low, distilled water should be added to the correct level. Most units, however, are equipped with low or no-maintenance batteries; these should be inspected to ensure that the connections are clean and tight, and the battery hold-down should be checked for tightness.
5. Engine Oil- the engine oil should be checked last since it is necessary for oil to drain down from the block and into the oil pan to obtain a correct reading. Unscrew and remove the 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. (refer to page 54)

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.

6. Over-all Unit- visually inspect the entire unit for leaks, loose bolts, frayed, loose, or broken wires, etc. The radiator/condenser coils of this unit should be free of dirt, insects, cardboard, or any other debris that may obstruct airflow across the coils. The evaporator (located inside the trailer) should be free of debris also, especially stretch-wrap, which is often used during transport to prevent cargo shifting.

7. Start a Pretrip Check (page 10).

PRODUCT LOADING

BEFORE LOADING:

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

DURING LOADING:

- Place the Start/Run-Off Switch in the Off position.
- Check product temperature during loading.
- Ensure that the air return and supply opening remain unobstructed.
- Leave approximately 4 to 5 inches (100 to 125 mm) between the load and the front wall for air return to the unit.
- Leave at least 10 to 12 inches (250 to 300 mm) 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.

PRODUCT LOADING (CONTINUED)

Proper air circulation in the trailer, 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 trailer as this will cut off the airflow.

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.

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.

PROBLEMS

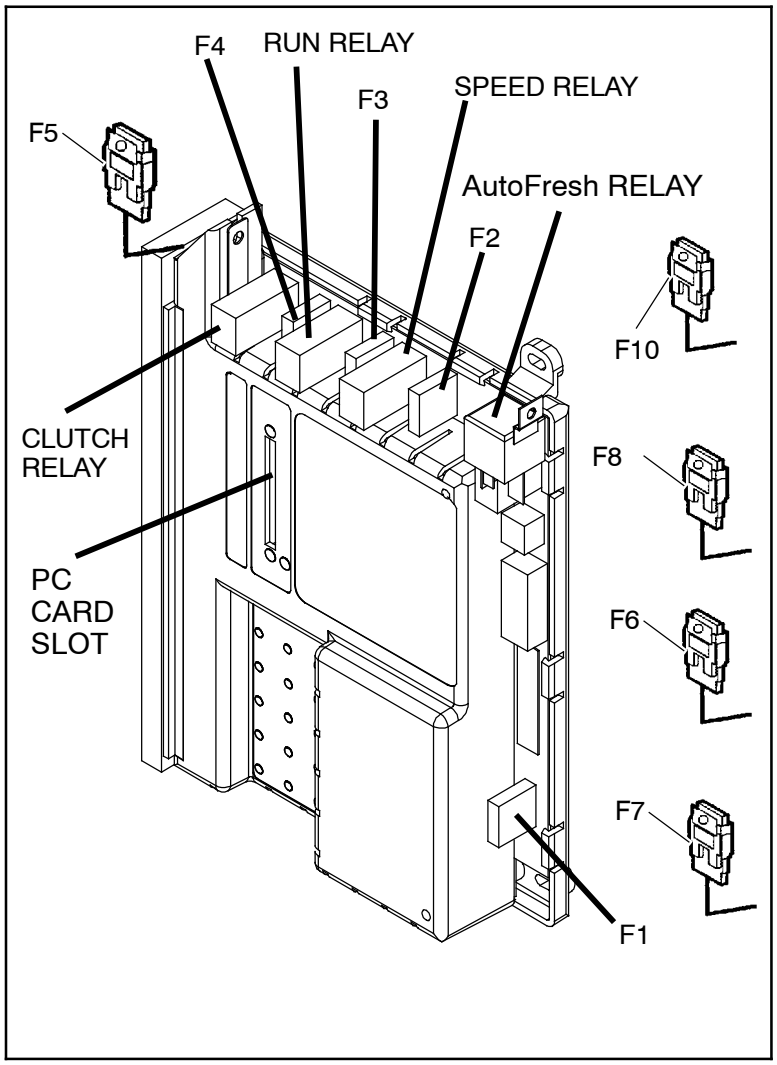
Everything possible has been done to ensure that this unit is the most reliable, trouble-free equipment available today. If, however you run into problems the following section may be of assistance.

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

General Problems	
Unit won't crank.	Check battery condition. Check battery connections. Check all fuses
Unit won't start.	Check fuel level. Check all fuses
Unit won't run.	Check fuel level. Check engine oil level. Check all fuses
Unit stops operating.	Check belts. Check engine oil level. Check coolant level. Check fuel level. Check all fuses.
Unit not cooling properly.	Defrost unit. Check evaporator for airflow restriction. Check condenser for airflow restriction. Check body for damage or air leaks.

FUSES

The fuses that protect the circuits of the Microprocessor control system are located in the control box on the roadside of the unit. They may be accessed by loosening the screws that hold the control panel closed.



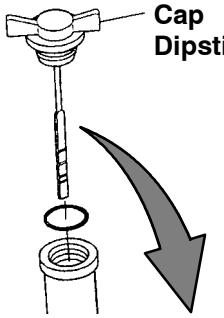
Fuse	Purpose	Amps
F1	Microprocessor Power	7.5A
F2	Speed Control Solenoid	10A
F3	Fuel Solenoid / Fuel Pump	7.5A
F4	Evap Fan Clutch	7.5A
F5	Glow Plug, Control Circuit & Starter Solenoid	80A
F6	Buzzer, SV1 to SV4 & Unloaders	15A
F7	Micro, Glow & Crank	5A
F8	Fuel Heater (Option)	20A
F9	Light Bar (Located in Engine Harness Outside of Control Box)	3A
F10	AutoFresh (Located in Engine Harness) **Option on XTC and X2**	40A

Engine oil- the oils recommended for use in this refrigeration unit must comply with the American Petroleum Institute's (API) CG or higher 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. The following chart indicates the SAE Weight Rating of the oil to be used in various climates:

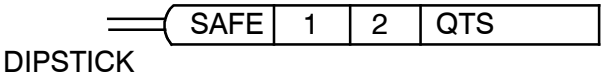
SAE Weights		
Outdoor Temperature		SAE
Fahrenheit	Centigrade	
Below 32°	0°	10W 30
32° to 77°	0° to 25°	10W 30 or 15W 40
Over 77°	Over +25°	10W 30 or 15W 40

The following oils are approved for use in this unit:

(API) class CG or higher or Mobil Delvac 1, 5W-40 (synthetic)



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.



DIPSTICK

UNIT MAINTENANCE SCHEDULE

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

SERVICE	
Every Service Interval or Annually	● For units beginning with serial number JAB90602792, check lube oil and filter change interval (refer to following table) For units prior to serial number JAB90602792 refer to the Operation & Service manual for the unit for maintenance intervals. ● Beginning with S/N JAB90602792 drain 2–3 oz. of fuel off bottom of fuel filter in order to remove water and sediment. ● Check unit mounting bolts ● Check engine hour meter. Adjust engine valves every 4,000 hours ● Check engine and compressor mounting bolts ● Check door latches & hinges ● Check switches and electrical connections ● Check all belt tensions ● Check control box ● Check gearbox and fan shaft for oil leaks ● Check fan shaft, idler and gearbox bearings ● Check clutch air gap and adjust as required ● Check for oil leaks ● Check low oil pressure safety ● Clean crankcase breather ● Check engine speeds for units without electronic speed control ● Clean fuel pump strainer ● Change fuel filter(s) ● Check fuel heater (optional) ● Clean radiator/condenser fin surface ● Check antifreeze concentration ● Check water pump

SERVICE	
Every Service Interval or Annually (Continued)	• Check water temperature sensor functions • Check exhaust system mounting hardware • Check muffler and exhaust pipes • Change air cleaner element • Check and replace air filter indicator if needed • Check battery condition • Clean battery connections and cable ends • Check battery hold down clamps • Check starter operation • Check alternator brushes and replace if necessary • Check alternator output • Check air switch & calibrate • Check & clean evaporator coil and defrost drain hoses • Check operating refrigerant pressure • Check all sensor calibrations • Check manual defrost operation • Check Compressor drive coupling • Perform Pre–Trip inspection
Every 6,000 hours (Normal Operating Conditions) with conventional coolant	• Drain and flush cooling system **(12,000 hours with extended life coolant)**
Every 10,000 hours	• Clean and test nozzles and replace if necessary.
Every 12,000 hours with extended life coolant	• Drain and flush cooling system **(6,000 hours with conventional coolant)**

Oil and Filter Change Intervals		
ESI Oil Filter	**Oil & Filter Change Interval using API Class CG engine oil**	**Oil & Filter Change Interval using Mobil Delvac 1 engine oil***
	3000 hrs/2 yrs	4000 hrs/2 year

***** Mobil Delvac1, 5W–40 or 15W–40, is the only approved synthetic oil.

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

In addition to the above service requirements please adhere to the following:

Non–synthetic engine oil should be changed at least once a year and synthetic engine oil should be changed at least once every 2 years, even if the engine has not run the necessary number of hours.

Standard coolant should be replaced every two years. Extended life coolant should be replaced every five years.

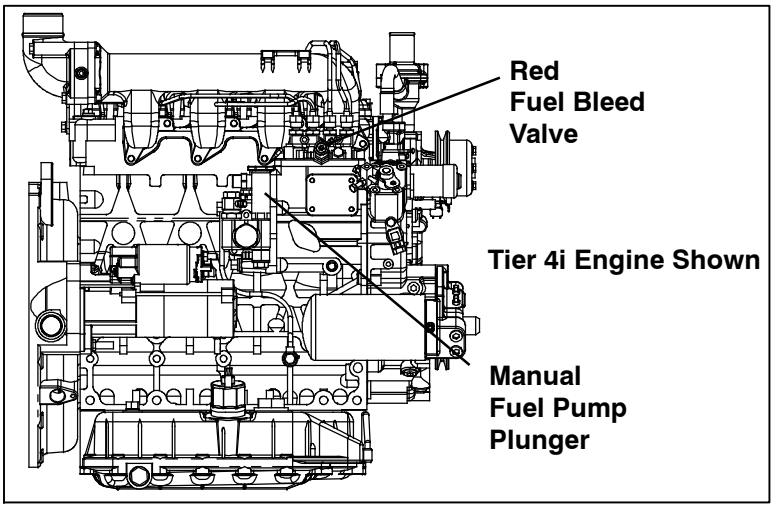
A more detailed description of service requirements and procedures can be found in the Service and Operations Manual for this unit. This manual may be obtained from any Carrier Transicold dealer.

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.

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. This will indicate 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.
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 refrigeration 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.

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.

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CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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