



Truck Refrigeration Unit



OPERATOR'S MANUAL

for

Supra 550, 650, 750, 850 & 950

Truck Refrigeration Units



TRANSICOLD

OPERATOR'S MANUAL

**Supra 550, 650,
750, 850 & 950
TRUCK
REFRIGERATION
UNITS**

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SUPRA OPERATOR'S MANUAL

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 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 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 your unit and to provide general assistance when needed. More comprehensive information can be found in the Operation and Service Manual for your unit. This manual can be obtained 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.

UNIT IDENTIFICATION

Each Supra 50 Series unit is identified by a nameplate attached to the frame near the accumulator. 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 or Carrier Transicold Service Engineer so that he or she may properly assist you.



Carrier
TRANSICOLD Athens, Ga.

SERIAL NO. :
UNIT MODEL :
WARRANTY ID :
REFRIGERANT :

COMPONENT	MONTHS		MONTH
	P.L	P	
Basic Unit	989	989	1 2 3
Engine	60		4 5 6
Compressor	60		7 8 9
Refr. Coils/Rad	60		10 11 12
Solenoid Valve	60		
Microprocessor	60		
Gear Box	60		YEAR
Fan Shafts	60		1 2 3
Fuel Pumps	60		4 5 6
Generator	60		7 8 9
Standby Motor	60		10 11 12

DATE IN SERVICE DAY

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31		

MADE IN USA P/N. 62-04062-00

NAMEPLATE

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.

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.

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 your 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 your unit requires service of the refrigeration system, you contact your nearest Carrier Transicold authorized repair facility for service.

BATTERY

This unit utilizes 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.

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 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 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 6 mm to 13mm (1/4 inch to 1/2 inch). 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.
3. Battery – on units 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 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 dip-stick and observe the oil level; it should be somewhere between the full and add marks. If it is below the add mark, add oil until the level is correct.



6. Over-all Unit – visually inspect the entire unit for leaks, loose bolts, frayed, loose, or broken wires, etc. The radiator and condenser coils of the unit should be free of dirt, bugs, cardboard, or any other debris that may obstruct airflow across the coils. The evaporator (located inside the body) should be free of debris also, especially stretch-wrap, which is often used during transport to prevent cargo shifting.
7. Truck body – The body should be inspected prior to loading. Check the door and vent seals for damage and wear. Inspect the entire interior and exterior of the body for damage; 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.

UNIT OPERATION

STARTING THE UNIT - ROAD OPERATION



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

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

2. If unit was previously used in Standby Mode, press the ROAD key.

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

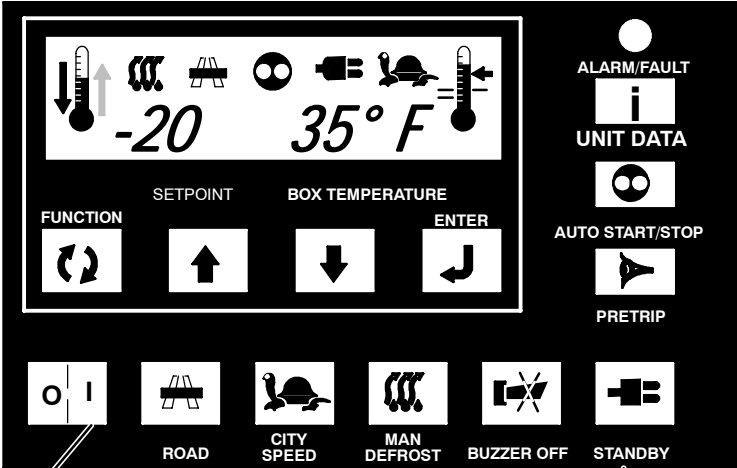
Complete the Pre-Trip Inspection described in the previous section.

STARTING THE UNIT - STANDBY OPERATION

WARNING

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

Do not attempt to connect or remove power plug or perform service and/or maintenance before ensuring the unit RUN/STOP Switch is in the STOP position and the I/O switch is in the “O” position.



The control panel features a central digital display showing a setpoint of -20 and a box temperature of 35°F. Below the display are four function buttons: FUNCTION (circular arrows), SETPOINT (up arrow), BOX TEMPERATURE (down arrow), and ENTER (L-shaped arrow). To the right of the display are three indicator lights: ALARM/FAULT (top), UNIT DATA (middle), and AUTO START/STOP (bottom). Below the indicator lights is a PRETRIP button (megaphone icon). At the bottom of the panel are six physical buttons: I/O (labeled 'O' and 'I'), ROAD (road sign icon), CITY SPEED (tortoise icon), MAN DEFROST (snowflake icon), BUZZER OFF (megaphone with slash icon), and STANDBY (power plug icon). Lines connect the I/O and STANDBY buttons to the numbered instructions below.

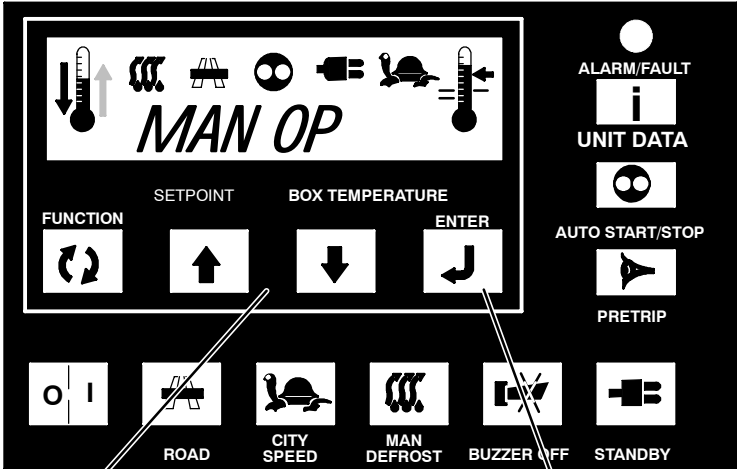
1. Place the unit RUN/STOP switch in the “STOP” position and the I/O switch in the “O” position.
2. Connect unit to appropriate power source. (See table on page 39)
3. Place the unit RUN/STOP switch in the “RUN” position and the I/O switch in the “I” position.
4. Press Standby key.

Under normal circumstances this is all that is required to run the unit in standby power. The unit will then perform a complete diagnostic check on the microprocessor controller and start automatically.

Complete the Pre-Trip Inspection described in the previous section.

STARTING THE UNIT - MANUAL OPERATION

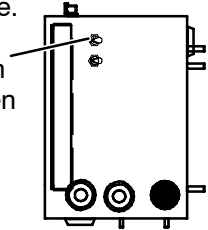
1. Place unit RUN/STOP switch in RUN and I/O switch in "I" position. (Manual Operation will only function if unit is in Continuous Mode. If AUTO START/STOP indicator is illuminated, press AUTO START/STOP toggle key to place unit in Continuous Mode.)
2. Press FUNCTION key until AUTO OP or MAN OP is displayed. If MAN OP appears, unit is already in Manual Start Mode.



3. If AUTO OP appears, first press ENTER key, then UP or DOWN arrow key until MAN OP appears. Press ENTER key to lock in Manual Mode.

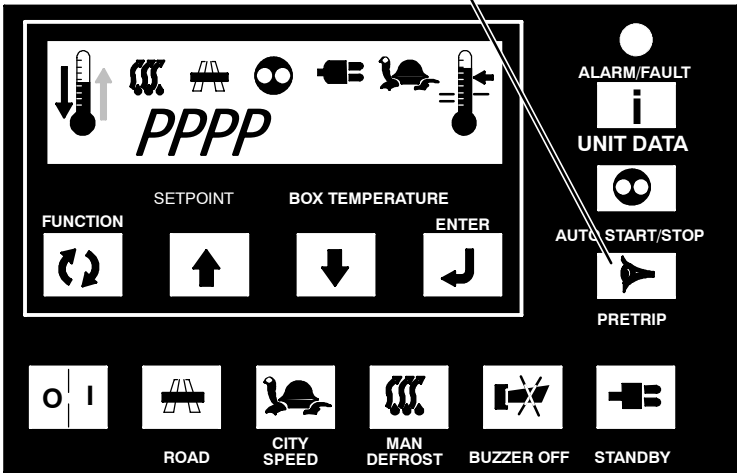
4. Place manual GLOW/CRANK switch in GLOW and hold for 5 to 15 seconds. Then place switch in CRANK position to crank and start.

Control Box



PRETRIP CHECK

1. Start and run unit until box temperature is $40^{\circ} \pm 5^{\circ}F$ ($4.4^{\circ} \pm 2.8^{\circ}C$).
2. Press PRETRIP CHECK key.

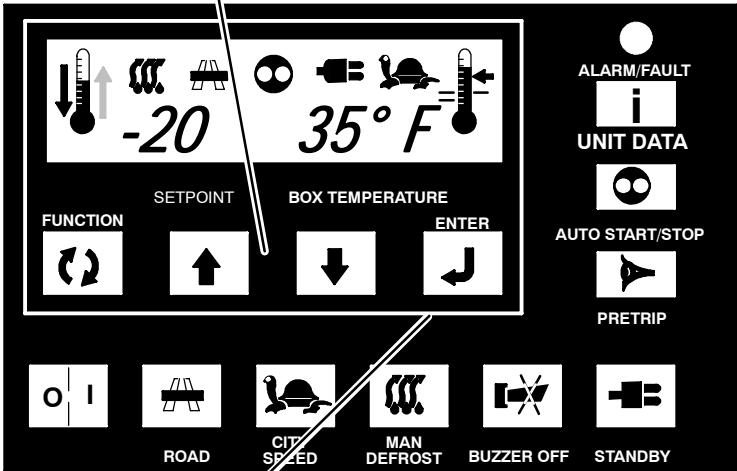


The PRETRIP key initiates a check of all normal operating modes. Upon initiation, the unit will cycle through all operating modes at 30 second intervals. The display will show “PPPP” at the beginning and will show various unit data during the pre-trip cycle. The final PRETRIP mode is Defrost. When Defrost ends, PRETRIP will be complete.

This is not a self-diagnosing pretrip test. No specific pretrip alarms will be generated. Pretrip must be monitored by the user to verify that the unit operates through all cycles.

CHANGING SETPOINT

Press UP or DOWN arrow key to increase or decrease displayed setpoint.



Press ENTER key when desired setpoint is displayed to lock in new setpoint.

New setpoint will flash and then return to original setpoint if ENTER key is not pressed within 5 seconds.

Setpoints of -22°F to +89°F (-30°C to +32°C) may be entered via the keypad. The controller always retains the last entered setpoint in memory. If no setpoint is in memory (i.e. on initial startup), the controller will lock out the run relay and flash “SP” on the left hand display until a valid setpoint is entered. The setpoint may be changed up or down in 1° increments by pressing and releasing either the UP ARROW or DOWN ARROW key.

You cannot change setpoint when unit is in Pretrip or when viewing Unit Data or Functional Parameters.

START/STOP OPERATION

The diagram shows a control panel with a digital display at the top showing a setpoint of -20 and a box temperature of 35° F. Below the display are buttons for FUNCTION, SETPOINT (up arrow), BOX TEMPERATURE (down arrow), and ENTER. To the right of the display is an illuminated indicator for AUTO START/STOP. Below the display are buttons for ROAD, CITY SPEED, MAN DEFROST, BUZZER OFF, and STANDBY. On the far right, there are buttons for ALARM/FAULT, UNIT DATA, and PRT TRIP.

1. Check if AUTO START/STOP indicator is illuminated. If not, press AUTO START/STOP toggle key to place unit in Start/Stop mode. AUTO START/STOP will then be illuminated.

The AUTO START/STOP key is used to change the operating mode from “Continuous Run” to “Auto Start/Stop.” Each push of the key will alternate the operating modes. The Auto Start/Stop indicator on the display will illuminate when Auto Stop/Start is enabled. If the indicator is not illuminated, the unit is in the Continuous Run Mode.

Automatic start/stop is provided to permit starting/restarting of the diesel-driven compressor as required. This gives the microprocessor automatic control of starting and stopping the diesel engine. The main function of automatic 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. Refer to RECOMMENDED TRANSPORT TEMPERATURES (See Page 26).

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.

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. Look at battery voltage in data list to find out whether shutdown voltage has been reached. If there is a “+” in front of the number, the voltage is enough to shutdown and restart. If only the number appears, the voltage is still too low for shutdown.

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

- Box temperature has changed by $\pm 11^{\circ}\text{F}$ ($\pm 6.1^{\circ}\text{C}$) for setpoints in the perishable range and $+11^{\circ}\text{F}$ ($+6.1^{\circ}\text{C}$) for setpoints in the frozen range **DURING** minimum off time.
- Box temperature has moved away from setpoint by $\pm 3.6^{\circ}\text{F}$ (2.0°C) **AFTER** minimum off time for setpoints in the perishable range or $+0.5^{\circ}\text{F}$ (0.3°C) for setpoints in the frozen range.
- The battery voltage drops below 12.2 Vdc Refer to Page 19 for unit data).
- The engine coolant temperature drops below 34°F (1°C).

To start the unit in manual start mode, the unit must be in continuous run mode and the Auto/Manual Start Operation function parameter set to “MAN OP” (FN10 OFF)

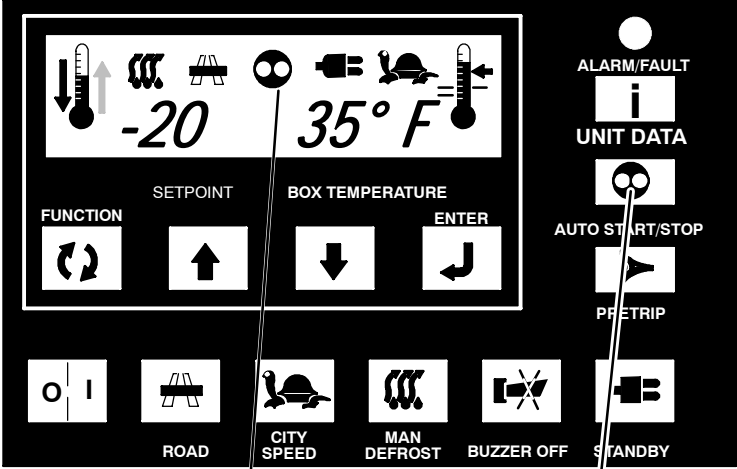
NOTE

When configuration CNF11 is “ON” and setpoint is 32 to 42° F (0 to 5.5°C) the unit is locked into continuous run. The AUTO START/STOP key is disabled.

NOTE

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

CONTINUOUS RUN OPERATION



The diagram shows a control panel with a digital display at the top showing a setpoint of -20 and a box temperature of 35° F. Below the display are several control buttons: FUNCTION (circular arrows), SETPOINT (up arrow), BOX TEMPERATURE (down arrow), and ENTER (J-shaped arrow). At the bottom are six mode buttons: O I, ROAD (road icon), CITY SPEED (tortoise icon), MAN DEFROST (snowflake icon), BUZZER OFF (bell with slash), and STANDBY (power icon). On the right side, there are three indicator lights: ALARM/FAULT (i icon), UNIT DATA (i icon), and AUTO START/STOP (tortoise icon). Below the AUTO START/STOP indicator is a PRETRIP button (right arrow).

1. Check if AUTO START/STOP indicator is illuminated. If it is, press AUTO START/STOP toggle key to place unit in Continuous Run mode. AUTO START/STOP indicator will not be illuminated.

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. Refer to RECOMMENDED TRANSPORT TEMPERATURES (See Page 26).

Continuous operation may be tied to the setpoint ranges for frozen and perishable loads and the AUTO START/STOP key may be locked out.

MANUAL DEFROST

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

2. Press MANUAL DEFROST key to initiate manual defrost.

The defrost mode may be initiated in three different ways if the evaporator coil is below 40°F (4.4°C):

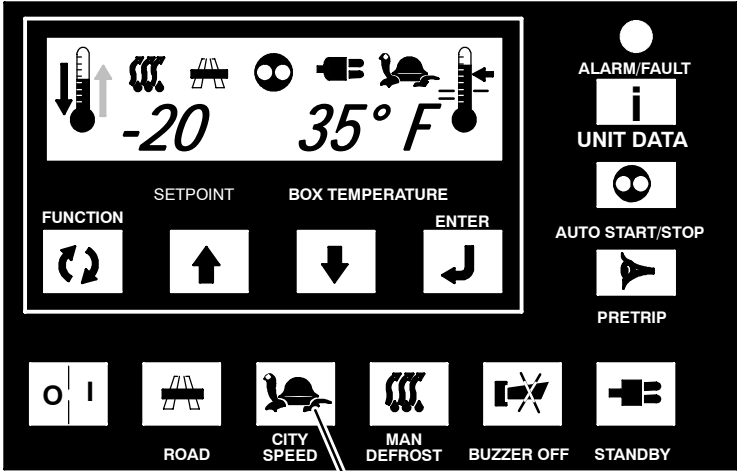
1. Defrost is initiated automatically at preset intervals by the defrost timer in the microprocessor.
2. Defrost is initiated by the defrost air switch.
3. The defrost mode may be manually initiated by pressing the Manual Defrost Key.

The defrost mode terminates when the evaporator temperature is higher than 55°F (12.8°C). Should the defrost cycle not complete within 45 minutes, the defrost cycle is terminated automatically by the microprocessor.

After the 45 minute termination, the controller will wait 1.5 hours before attempting another defrost cycle. Pressing the manual defrost key will override this mode and start a defrost cycle.

If a shutdown alarm occurs, defrost will be terminated.

CITY SPEED



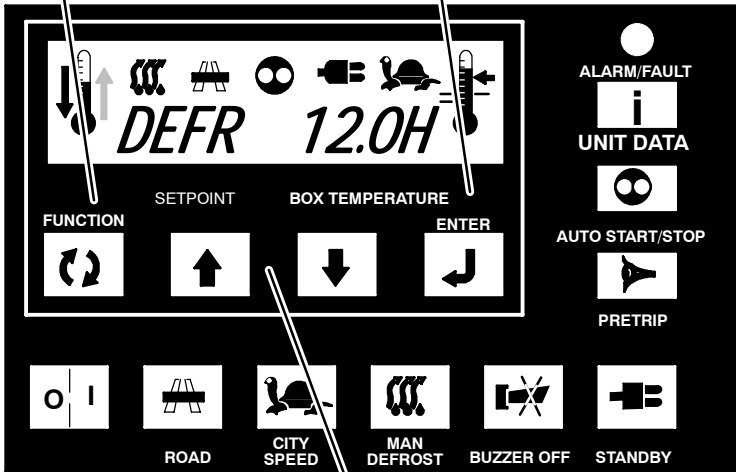
1. Press the CITY SPEED key to toggle between low speed only and normal operating mode.

The CITY SPEED key enables the city speed mode of operation. In the city speed mode, the unit will operate in low speed. Each push of the key toggles the operating mode. The city speed indicator on the display will illuminate when the city speed mode is enabled.

FUNCTION CHANGE

1. Press FUNCTION key until Function to be changed is displayed.

2. Press ENTER key.



3. Press either UP or DOWN ARROW key until desired Function setting is displayed.

NOTE: Function changes will change operation of unit.

NOTE: If configuration CNF11 is "ON" functional parameters are locked. The ability to change any functional parameters is disabled.

The Function 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.

With a function parameter displayed, the data choice can be changed by pressing ENTER then pressing either the up or down ARROW keys. The displayed choice will then flash to indicate that the choice has not been entered. Depress the ENTER key to activate the new choice. The display will stop flashing to indicate that the choice has been entered.

FUNCTION CHANGE

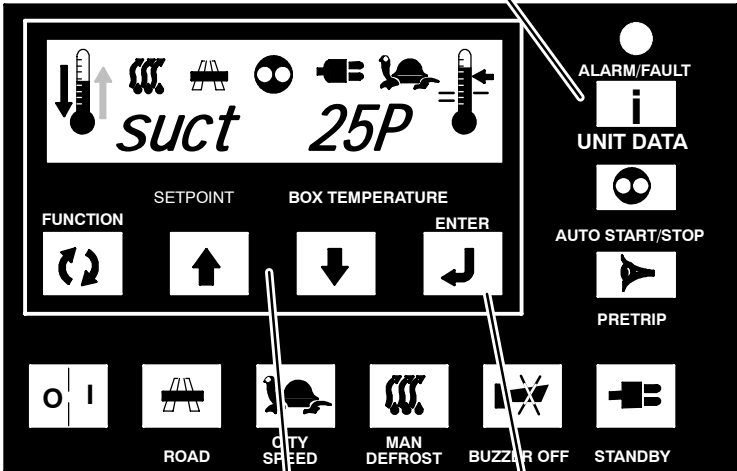
The following table has columns for Code and English displays. English is the default setting. Change Functional Parameter to Code to see Code display format.

Functional Parameters

CODE	ENGLISH	DATA
FN0	DEFR	Defrost Interval
FN1 ON	CITY SPD	Low Speed
FN1 OFF	HIGH SPD	High Speed
FN2	OFF T	Minimum Off-time
FN3	ON T	On-time
FN4 a	REM PROBE	Controlling Probe - Return Air
FN4 b	SUP PROBE	Controlling Probe - Supply Air
FN5	Degrees F or C	Temperature Unit °C or °F
FN6 ON	TIME STRT	Maximum Off-time 30 Min.
FN6 OFF	TEMP STRT	Temperature Based Restarting
FN7	MOP STD	Unloader Control
FN8	2SET	N/A
FN9	3SET	N/A
FN10 ON	AUTO OP	Auto Start Operation
FN10 OFF	MAN OP	Manual Start Operation
FN11	T RANGE	Out-of-Range Tolerance
Code vs English = Code or English display format		
Manual Glow Override = Normal or Add 30sec		
Alarm RST = Alarm Reset Required Alarm CLR = No Alarm Active		

UNIT DATA

1. Press UNIT DATA key to scroll thru data list one item at a time.



2. To scroll through the list faster, use the UP or DOWN ARROW keys.
3. Data will display for 5 seconds
4. Press the ENTER key to display data for 30 seconds.
5. The display will revert back to the default display if no keys are pressed for 5 seconds.

The UNIT DATA key can be used to display the microprocessor input data values. The display will show the description of the input on the left side with the actual data on the right side.

UNIT DATA CODES

The following table has columns for Code and English displays. English is the default setting. Change Functional Parameter to Code to see Code display format.

CODE	ENGLISH	DATA
CD1	SUCT	Suction Pressure
CD2	ENG	Engine Hours
CD3	WT	Engine Temperature
CD4	RAS	Return Air Temperature
*CD5	SAS	Supply Air Temperature
*CD6	REM	Remote Air Temperature
CD7	ATS	Ambient Temperature
CD8	EVP	Future Expansion
CD9	CDT	Discharge Temperature
CD10	BATT	Battery Voltage
CD11	SBY	Standby Hours
CD12	MOD V	Future Expansion
CD13	REV	Software Revision
CD14	SERL	Serial Number Low
CD15	SERU	Serial Number Upper
CD16	2RA	N/A
CD17	3RA	N/A
CD18	MHR1	Maintenance Hour Meter 1
CD19	MHR2	Maintenance Hour Meter 2
CD20	SON	Switch On Hour Meter
* Codes 5 & 6 are variable. SAS is displayed when the SUP Probe Function is selected. REM is displayed when the REM Probe Function is selected.		

ALARM DISPLAY & RESET

ALARM DISPLAY

When fault light is on, normal display of Setpoint /Box temperature alternates with alarm display. Check display for alarm message.

ALARM RESET

The diagram shows a control panel with a central display and several rows of buttons. The display shows 'ENG OIL' with various icons. The control panel includes buttons for FUNCTION, SETPOINT, BOX TEMPERATURE, ENTER, and various system functions like ROAD, CITY SPEED, MAN DEFROST, BUZZER OFF, and STANDBY. A FAULT LIGHT is also indicated.

2. Press UP/DOWN arrow key until ALARM RST is displayed.
3. Press ENTER to clear alarm. ALARM CLR will be displayed. (Unit will restart if alarm condition has been corrected and unit is in Start/Stop or Auto OP).

ALTERNATE ALARM RESET

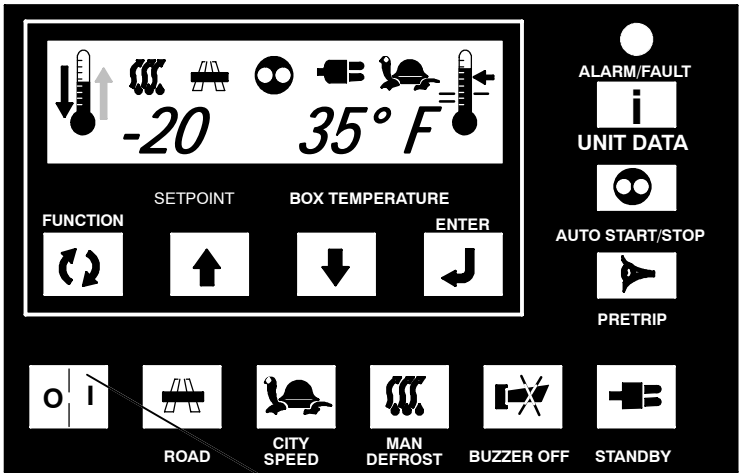
Place I/O switch in "O" position. (Unit can now be restarted after alarm condition has been corrected).

Table 2-1. Alarm Display

The following table has columns for Code and English displays. English is the default setting. Change Functional Parameter to Code to see Code display format.

ALARM DISPLAY ✓ = FAULT LIGHT ON		
CODE	ENGLISH	DESCRIPTION
AL0	ENG OIL	✓ Low Oil Pressure
AL1	ENG HOT	✓ High Coolant Temperature
AL2	HI PRESS	✓ High Discharge Pressure
AL3	STARTFAIL	✓ Auto Start Failure
AL4	LOW BATT	✓ Low Battery Voltage
AL5	HI BATT	✓ High Battery Voltage
AL6	DEFR FAIL	Defrost Override
AL7	ALT AUX	✓ No Alternator Auxiliary Output
AL8	STARTER	✓ Starter Motor Fault
AL9	RA SENSOR	✓ Return Air Sensor Fault
AL10	SA SENSOR	Supply Air Sensor Fault
AL11	WT SENSOR	Coolant Temperature Sensor
AL12	HIGH CDT	✓ High Discharge Temperature
AL13	CD SENSOR	Discharge Temperature Sensor Fault
AL14	SBY MOTOR	✓ Standby Motor Fault
AL15	FUSE BAD	✓ Fuse Open
AL16	SYSTEM CK	✓ Check Refrigeration System
AL17	DISPLAY	Display
AL18	SERVICE 1	Maintenance Hour Meter 1
AL19	SERVICE 2	Maintenance Hour Meter 2
AL20	RAS OUT	✓ Main Compartment Out-of-Range
AL21	2RA OUT	✓ N/A
AL22	3RA OUT	✓ N/A
AL23	NO POWER	No AC Power When Unit Is In Standby

STOPPING UNIT



1. To stop the unit, place the I/O switch in the “O” position.

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

PRODUCT LOADING

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.

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 between the load and the front wall for air return to the unit.
- Leave at least 10 to 12 inches 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.

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 that passes 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. 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.

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 set point required by the shipper or receiver.

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

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, it is recommended that the unit always be operated in the continuous run mode to help ensure product quality. If it is possible, the unit should be turned off 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.

PROBLEMS

Everything possible has been done to ensure that your 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 running.	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.
Fault Display on Cab Command	
Service 1 Service 2	Unit is calling attention to a normal service requirement (oil change, etc.). Normally this does not require immediate attention.

TROUBLESHOOTING

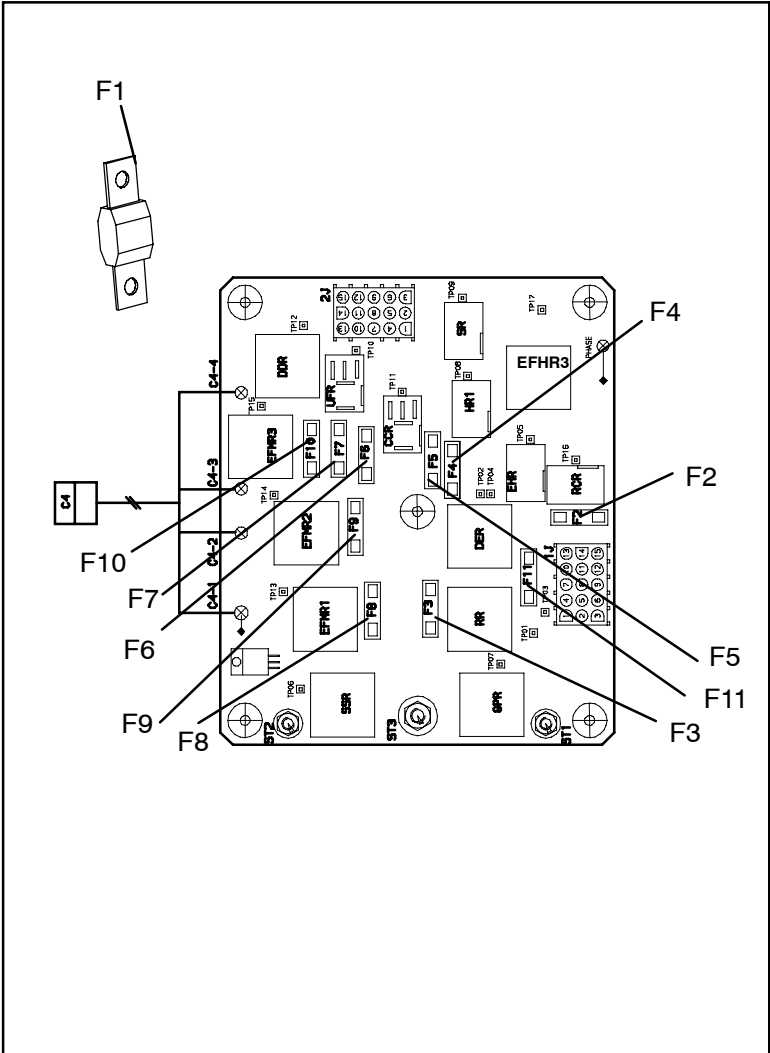
Fault Display on Cab Command		
AL0	ENG OIL	Low engine oil pressure condition. Check engine oil level.
AL1	ENG HOT	The engine has overheated. Check the coolant level, belts, and radiator coil for air restriction.
AL2	HI PRESS	High compressor discharge pressure. Check all belts, check condenser coil for airflow obstruction and cleanliness
AL3	START-FAIL	The engine has failed to start. Check battery, fuses and fuel level.
AL4	LOW BATT	The battery voltage has fallen below 10 VDC. Check battery.
AL5	HI BATT	The battery voltage is above 10 VDC. Check battery.
AL6	DEFRR FAIL	The unit is in a defrost override mode.
AL7	ALT AUX	The alternator signal is not present with the engine running or with the standby electric mode active. Check alternator.
AL8	STARTER	The starter motor input signal is not present with the starter solenoid output on. Check starter solenoid.
AL9	RA SENSOR	The return air sensor is not working and the unit has shut down. Check probe.
AL10	SA SENSOR	The supply air sensor has been chosen in the functional parameters and is not working.
AL11	WT SENSOR	The coolant temperature sensor is not working.
AL12	HIGH CDT	The discharge temperature is above 310°F or 340°F if ambient temperature is above 120°F.
AL13	CD SENSOR	The discharge sensor is not working.
AL14	SBY MOTOR	The standby motor is overloaded.
AL15	FUSE BAD	One of the fuses has low input. Check fuses.

Fault Display on Cab Command

AL16	SYS CK	Low refrigerant pressure detected. Have system checked for leaks.
AL17	DISPLAY	Communication between main board and the display board has been interrupted.
AL18	SERVICE 1	Hour meter is greater than maintenance hour meter 1.
AL19	SERVICE 2	Hour meter is greater than maintenance hour meter 2.
AL20	RAS OUT	Box temperature is Out-of-Range.
AL21	2RA OUT	Not Applicable
AL22	3RA OUT	Not Applicable
AL23	NO POWER	No AC power when unit is in Standby.

RELAY BOARD

The fuses and relays that protect the unit are located on the relay board 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 Identification

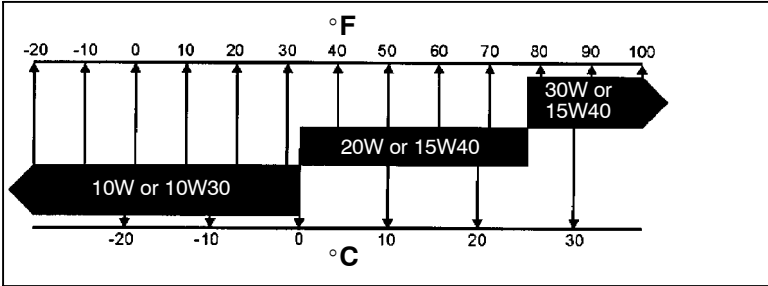
Fuse	Purpose	Capacity (Amps)
F1	Main Fuse	80A
F2	RCR Fuse	5A
F3	Run Relay Fuse	15A
F4	Heat Relay Fuse	3A
F5	Speed Relay Fuse	10A
F6	Unloader Fuse (850 & 950)	5A
F7	Defrost Damper Relay Fuse	15A
F8	Evaporator Fan Motor 1 Fuse	20A
F9	Evaporator Fan Motor 2 Fuse	20A
F10	Evaporator Fan Motor 3 Fuse	20A
F11	Fuel Pump Fuse	5A
F12	Fuel Heater Fuse (on fuel adding harness)	25A

Relay Identification

Desig.	Item
SSR	Starter Solenoid Relay
EFMR1	Electric Fan Motor Relay
EFMR2	Electric Fan Motor Relay
EFMR3	Electric Fan Motor Relay
DDR	Defrost Damper Solenoid Relay (Option)
UFR	Unloader Front Relay (850 & 950)
CCR	Compressor Clutch Relay
SR	Speed Relay
HR1	Heat Relay 1
DER	Diesel Electric Relay
RR	Run Relay
GPR	Glow Plug Relay
RCR	Run Control Relay
EHR	Evaporator Heater Relay

UNIT MAINTENANCE

Engine oil – 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. The following chart indicates the SAE Weight Rating of the oil to be used in various climates:



The following oils are approved for use in the Supra range of units:
In the US, Canada Mexico, Central and South America, any oil that meets the above API specification is suitable for use in the Supra range of units. Mobil Delvac1 is the only approved synthetic oil.

UNIT MAINTENANCE SCHEDULE

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, coolant replacement. Maintenance should be performed on the following schedule:

SERVICE SCHEDULE FOR SUPRA 550	
Petroleum and Synthetic Oil- With and Without Bypass At 250 Hours	<ul style="list-style-type: none">● Check engine cooling system.● Check and clean the air filter.● Check all bolts, screws and unit mounting bolts for tightness. Tighten as required.● Check all belts.
Petroleum Oil Without Bypass At 500 and every 500 hours after Petroleum Oil- With Bypass At 600 and every 600 hours after Synthetic Oil- Without Bypass At 1000 and every 1000 hours after Synthetic Oil With Bypass At 1200 and every 1200 hours after	<ul style="list-style-type: none">● Replace lube oil and filter.● Check engine cooling system.● Check and clean the air filter.● Check all belts.

SERVICE SCHEDULE FOR SUPRA 550 (CONT)

<p>Petroleum and Synthetic Oil With and Without Bypass At 1500 Hours</p>	<ul style="list-style-type: none"> ● Check fuel pump filter. ● Replace the cartridge of the dry air filter. ● Check battery terminals and fluid level. ● Check compressor oil level. Use polyol ester oil (POE) approved by CARRIER. ● Check alternator brushes. Check for diesel and standby hours. ● Check engine thermostat. ● Check defrost: <ul style="list-style-type: none"> - Check timer setting and function - Check refrigerant control valves - Fans stop or defrost damper closes - Defrost ends automatically - Water drains from evaporator ● Check fan motor brushes. ● Check and adjust rocker arms. ● Check belts as necessary.
<p>Petroleum and Synthetic Oil With and Without Bypass At 2000 Hours</p>	<ul style="list-style-type: none"> ● Replace oil filter. ● Clean radiator/condenser coil. ● Check refrigerant level.
<p>Petroleum and Synthetic Oil With and Without Bypass At 3000 Hours</p>	<ul style="list-style-type: none"> ● Change fan motor brushes. ● Check and rebuild alternator. ● Check engine speed: <ul style="list-style-type: none"> High - 2300 to 2350 Low - 1800 to 1850
<p>Petroleum and Synthetic Oil With and Without Bypass With Standard Coolant At 6000 Hours</p>	<ul style="list-style-type: none"> ● Check all belt tension pulleys ● Change anti-freeze and flush cooling system. ● Check bearings in clutch and electric motors. ● Clean and adjust fuel injectors.
<p>Petroleum and Synthetic Oil With and Without Bypass With Ext. Life At 12000 Hours</p>	<ul style="list-style-type: none"> ● Check all belt tension pulleys ● Change anti-freeze and flush cooling system. ● Check bearings in clutch and electric motors. ● Clean and adjust fuel injectors.

SERVICE SCHEDULE FOR SUPRA 650/750/850

<p>Petroleum and Synthetic Oil- With and Without Bypass At 250 Hours</p>	<ul style="list-style-type: none"> ● Check engine cooling system. ● Check and clean the air filter. ● Check all bolts, screws and unit mounting bolts for tightness. Tighten as required. ● Check all belts.
<p>Petroleum Oil Without Bypass At 750 and every 750 hours after</p> <p>Petroleum Oil- With Bypass At 1000, 1500, 3000 Hours</p> <p>Synthetic Oil- Without Bypass At 1500 and every 1500 hours after</p> <p>Synthetic Oil With Bypass At 2000 and every 2000 hours after</p>	<ul style="list-style-type: none"> ● Replace lube oil and filter. ● Check engine cooling system. ● Check and clean the air filter. ● Check all belts.
<p>Petroleum and Synthetic Oil With and Without Bypass At 1500 Hours</p>	<ul style="list-style-type: none"> ● Check fuel pump filter. ● Replace the cartridge of the dry air filter. ● Check battery terminals and fluid level. ● Check compressor oil level. Use polyol ester oil (POE) approved by CARRIER. ● Check alternator brushes. Check for diesel and standby hours. ● Check engine thermostat. ● Check defrost: <ul style="list-style-type: none"> - Check timer setting and function - Check refrigerant control valves - Fans stop or defrost damper closes - Defrost ends automatically - Water drains from evaporator ● Check fan motor brushes. ● Check and adjust rocker arms. ● Check belts as necessary.

SERVICE SCHEDULE FOR SUPRA 650/750/850 (CONT)

<p>Petroleum and Synthetic Oil With and Without Bypass At 2000 Hours</p>	<ul style="list-style-type: none"> ● Replace oil filter. ● Clean radiator/condenser coil. ● Check refrigerant level.
<p>Petroleum and Synthetic Oil With and Without Bypass At 3000 Hours</p>	<ul style="list-style-type: none"> ● Change fan motor brushes. ● Check and rebuild alternator. ● Check engine speed: High - 2300 to 2350 Low - 1800 to 1850
<p>Petroleum and Synthetic Oil With and Without Bypass With Standard Coolant At 6000 Hours</p>	<ul style="list-style-type: none"> ● Check all belt tension pulleys ● Change anti-freeze and flush cooling system. ● Check bearings in clutch and electric motors. ● Clean and adjust fuel injectors.
<p>Petroleum and Synthetic Oil With and Without Bypass With Ext. Life At 12000 Hours</p>	<ul style="list-style-type: none"> ● Check all belt tension pulleys ● Change anti-freeze and flush cooling system. ● Check bearings in clutch and electric motors. ● Clean and adjust fuel injectors.

SERVICE SCHEDULE FOR SUPRA 950

<p>Petroleum and Synthetic Oil-Without Bypass At 250 Hours</p>	<ul style="list-style-type: none"> ● Check engine cooling system. ● Check and clean the air filter. ● Check all bolts, screws and unit mounting bolts for tightness. Tighten as required. ● Check all belts.
<p>Petroleum Oil Without Bypass At 1000 and every 1000 hours after Synthetic Oil-Without Bypass At 1500, 3000 and 4000 hours</p>	<ul style="list-style-type: none"> ● Replace lube oil and filter. ● Check engine cooling system. ● Check and clean the air filter. ● Check all belts.
<p>Petroleum and Synthetic Oil Without Bypass At 1500 Hours</p>	<ul style="list-style-type: none"> ● Check fuel pump filter. ● Replace the cartridge of the dry air filter. ● Check battery terminals and fluid level. ● Check compressor oil level. Use polyol ester oil (POE) approved by CARRIER. ● Check alternator brushes. Check for diesel and standby hours. ● Check engine thermostat. ● Check defrost: <ul style="list-style-type: none"> - Check timer setting and function - Check refrigerant control valves - Fans stop or defrost damper closes - Defrost ends automatically - Water drains from evaporator ● Check fan motor brushes. ● Check and adjust rocker arms. ● Check belts as necessary.
<p>Petroleum and Synthetic Oil Without Bypass At 2000 Hours</p>	<ul style="list-style-type: none"> ● Replace oil filter. ● Clean radiator/condenser coil. ● Check refrigerant level.
<p>Petroleum and Synthetic Oil Without Bypass At 3000 Hours</p>	<ul style="list-style-type: none"> ● Change fan motor brushes. ● Check and rebuild alternator. ● Check engine speed: <ul style="list-style-type: none"> High - 2300 to 2350 Low - 1800 to 1850

SERVICE SCHEDULE FOR SUPRA 950 (CONT)

Petroleum and Synthetic Oil Without Bypass With Standard Coolant At 6000 Hours	<ul style="list-style-type: none"> ● Check all belt tension pulleys ● Change anti-freeze and flush cooling system. ● Check bearings in clutch and electric motors. ● Clean and adjust fuel injectors.
Petroleum and Synthetic Oil Without Bypass With Ext. Life At 12000 Hours	<ul style="list-style-type: none"> ● Check all belt tension pulleys ● Change anti-freeze and flush cooling system. ● Check bearings in clutch and electric motors. ● Clean and adjust fuel injectors.

Oil Type	Supra 550	Supra 650/750/850	Supra 950
Petroleum	500 Hours*	750 Hours*	100 Hours*
W/Bypass	600 Hours*	1000 Hours*	N/A
Synthetic**	1000 Hours**	1500 Hours**	2000 Hours**
W/Bypass	1200 Hours*	2000 Hours*	N/A

* Maximum oil drain interval is one year (12 months).
 ** Mobil Delvac1 is the only approved synthetic oil. Maximum oil drain interval is two (2) years. Oil filter change required once a year (every 12 months).

These maintenance schedules are based on the use of approved oils 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.

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

- All units are shipped with Extended Life Coolant. Replace every 5 years/12,000 hours.

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

STANDBY OPERATION GUIDELINES

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

- Never plug the unit in to the power source with the main switch in the RUN (I) position. The main switch should 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 should conform to the following:

Operating Voltage	FLA Rating	Circuit Breaker Capacity	Cable Requirement
208/230 V 60 hz 3 phase	15.8 A	50 A	8/3 with ground (up to 50 ft)
460 V 60 hz 3 phase	13.2 A	30 A	10/3 with ground (up to 75 ft)

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

Important note: This information is provided as a guideline only.

When preparing a circuit for operation of the refrigeration unit, a licensed electrician should be contracted. 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.

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 unit 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 to locate the service center nearest you. This directory may be obtained from your Carrier Transicold dealer.

If you are unable to reach a service center, call our 24-hour Action Line:

Call (800) 448-1661 from any phone in the United States or Canada. When calling, please have the following information ready for fastest service:

- Your name, the name of your company, and your location.
- A telephone number where you can be called back.
- Refrigeration unit model number and serial number.
- Box temperature, set point and product.
- Brief description of the problem you are having, and what you have already done to correct the problem.

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

**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.

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

**Central America
and Mexico**
Ejercito Nacional No. 418
Piso 9, Torre Yumal
Col. Chapultepec Morales
11570 Mexico, D.F.
Tel: (5255) 9126.0300
Fax: (5255) 9126.0373



Carrier

A United Technologies Company

Carrier Transicold Division,
Carrier Corporation
Truck/Trailer Products Group
P.O. Box 4805
Syracuse, N.Y. 13221 U.S.A

www.carrier.transicold.com



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