TECHLINE

Inside This Issue

Tech*Fact*: TripWise™ Option for PrimeLINE® and PrimeLINE® with Edge Technology

Carrier Transicold has introduced a new premium option to its reefers called TripWise™. TripWise is software logic that runs in the background during every voyage and will let you know whenever a standard pre-trip inspection (PTI) is needed.

The tests run in the background and are similar to those completed as part of the standard PTI selection, which includes the following:

- Alarm presence
- Evaporator motor current
- Heater current
- Condenser motor current
- Compressor current
- Humidity sensor
- Supply / return sensors
- Evaporator temperature / pressure sensors
- Defrost temperature sensor
- Electronic expansion valve
- RMU presence
- Compressor test
- Digital loader / unloader valves
- Economizer valve
- Temperature control
- Suction / discharge temperature & pressure

To check the status of the container, the user selects the PRE/TRIP key on the unit. One of the following messages will be displayed alternating with Select Pretrip.

Message	Display
TripWise Off	"triPW" / "OFF"
TripWise Expired	"triPW" / "EX"
TripWise Pass	"triPW" / "PASS"
TripWise Check	"triPW" / "CHECK"
Select Pretrip	" SELCt" / " PrtrP"

TripWise Results

Pressing the ENTER key while "SELCt PrtrP" is displayed will place the operator into the pretrip test menu. Pressing the arrow key will navigate through the standard PTI test selections menu.

If "triPW" "PASS" is displayed, the container should be ready for use after the operator has conducted visual inspection.

If "triPW" "CHECK" or "triPW" "EX" (if the allowable interval of days between tests has

expired) is displayed, a standard PTI that follows customer-specific guidelines is recommended prior to the unit's next trip.

If "triPW" "OFF" is displayed, then the TripWise option is turned off. To activate, scroll to code select 65 (Cd65).

By pressing code select 65 "-----"," OFF" or "ON" will be displayed, in which case the user can switch from one to the other by pressing ENTER followed by the arrow and ENTER to select the desired option. If "ON" is selected, the user then sets the expiration interval in days (2 through 365 in 1 day increments) by pressing the arrow key to the desired interval followed by the ENTER key. The expiration interval is the maximum days allowed between running each test, i.e. if days are set to 30 and the low speed evaporator fan test has not run within those 30 days, the TripWise™ expired message will be displayed. If the TripWise™ expired message is displayed, it is recommended that a PTI be conducted following customer specific guidelines prior to the next trip.

If "-----" is displayed, the TripWISE™ function option is not active on the unit. To add this option to your unit, the equipment owner would need to contact their Regional Carrier Sales Manager.

A TripWise™ status event will be recorded in the DataCorder recorder when the PTI is selected. In the current DataLINE® software release, the event will show the status of the unit.

Status: Check

```
Time   Event Data
12:48 Operating Mode Changed to Cool Max
12:54 Operating Mode Changed to Low Speed Evaps Only
13:49 Operating Mode Changed to Cool Max
13:50 TripWise Status Logged by User
       Status: Check
13:55 Operating Mode Changed to Low Speed Evaps Only
```

In DataLINE version 3.2, the status/ results can be viewed by performing an all data download, and selecting from the drop down menu, "TripWise™ Summary", followed by "user logged events".

TripWise Summary Report

Drop Down Menu

TripWise Summary

User Logged Events

Select Date

Destination: Discharge Date:

Comment:

Probe Calibration Readings:USDA1 0.0 USDA2 0.0 USDA3

TripWise Status: Pass

Temperature Units:Centigrade

TripWise Status Reviewed by User on: Mar 16,2016 07:40
TripWise Status:Pass
Expiration Interval: 30 days

Test Summary:

PTIRef.	TripWise Test	Test Performed	Results	Details
P0	Remote Monitoring Unit	Mar 15,2016 15:54	Pass	Present
P1	Heaters	Mar 15,2016 15:40	Pass	5.7A
P2	Low Speed Cond Fan	Mar 15,2016 15:40	Pass	0.4A
	High Speed Cond Fan	Mar 15,2016 23:50	Pass	0.8A
P3	Low Speed Evap Fans	Mar 16,2016 02:59	Pass	0.8A
P4	High Speed Evap Fans	Mar 15,2016 15:52	Pass	1.8A
P5	Sup/Rtn/Defrost Temp	Mar 16,2016 02:59	Pass	STS: -6.0C
				SRS: -5.9C
				RTS: -7.6C
				RRS: -7.6C
				DTS: -6.8C
	Supply Temp Probes	Mar 15,2016 08:24	Pass	STS: -25.0C
				SRS: -25.0C
	Return Temp Probes	Mar 15,2016 08:24	Pass	RTS: -21.0C
				RRS: -21.0C
	Evap Temp Sensors	Mar 15,2016 15:52	Pass	Pri: -14.8C
				Sec: -14.7C
	Evap/Suct Press Sensors	Mar 15,2016 15:52	Pass	SPT: 9.5psig
				EPT: 9.8psig
	Humidity Sensor	Mar 15,2016 15:52	Pass	Present
P6	Discharge Thermistor	Mar 15,2016 15:52	Pass	
	Suction Thermistor	Mar 15,2016 15:52	Pass	
	Discharge Press Sensor	Mar 15,2016 15:52	Pass	
	Suction Press Sensor	Mar 15,2016 15:52	Pass	
	Compressor Current	Mar 15,2016 23:55	Pass	4.8A
	Compressor Leak	Mar 16,2016 02:42	Pass	0.5Δpsi
	Economizer Valve	Mar 14,2016 09:29	Pass	9.6Δ
	Unloader/Loader Valves	Mar 16,2016 02:43	Pass	Ld: -10.2Δpsi
				ULd: 12.7Δpsi
	Evap Expansion Valve	Mar 16,2016 02:46	Pass	11.5ΔRatio
P8/P10	Temperature In-Range	Mar 15,2016 15:57	Pass	
TW	Alarm Activity Test	Mar 15,2016 15:02	Pass	

Results

Tech*Fact*: Humidity Sensor Location

Starting in July 2016 production, PID number NT2750 and greater, the humidity sensor (12-00745-00) was moved from the return air grill (Figure 1) to the evaporator side wall under the evaporator motor (Figure 2), making it more serviceable.

Figure 1

Figure 2

Tech*Fact*: Humidity Sensor Troubleshooting

The following procedure has been released as a follow-up to the June 2014 TechLINE article in an effort to ease the troubleshooting of the humidity sensor. When using this procedure and working on a unit, you should always follow the local lockout/tag out procedures in your area.

Tools Required:

7/16" socket wrench or nut driver	1
¼" socket wrench or nut driver	1
Clean clear water bottle with a minimum 6 cm (2.5 in.) opening (Figure 1)	~ 500 ml (16.9 oz.)
Fresh water (distilled if available)	~ 100 ml (3.4 oz.)
Salt (NaCl)	50 gm

Procedure:
1. Remove the left upper fresh air makeup vent panel.
2. Remove humidity sensor from the mounting hardware and bring to the front of the access panel for testing.
3. Disconnect the humidity sensor from the harness.
4. Drill a 3 cm (1.25 in.) hole in cap of bottle.
5. Pour ~100ml (3.4 oz.) of water into the empty clean bottle.
6. Add salt to the water until it is present at the bottom of the bottle.
7. Cap the bottle and tape over the drilled hole.
8. Shake until salt dissolves and water is saturated.

   - To ensure saturation, add additional salt until it settles at bottom without dissolving while shaking.

9. Remove cap and insert the humidity sensor into the bottle through the bottle opening and the connector back through the drilled hole in the cap (Figure 1).

   - Ensure that the sensor is not immersed in, or touching the salt water.
   - Secure cap and seal the wire going through the cap.

10. Allow the saturated salt mixture to settle for ~10 minutes.

Cap Opening (6 cm) Cap Hole (3 cm)
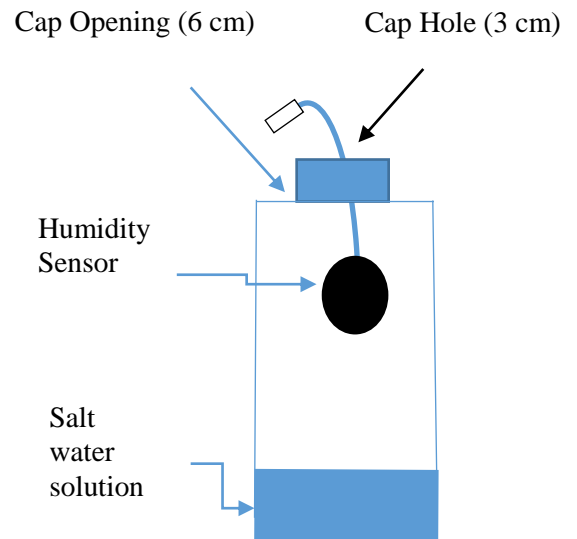
Humidity Sensor

Salt water solution

Figure 1

11. Reconnect humidity sensor to the harness and power the reefer unit on.
12. Go to Code select 17 to display the humidity sensor reading (Figure 2).

   - Reading should be between 60% and 85% Relative Humidity.

   - If humidity sensor display is outside of this range, reconfirm salt mixture and retest. If not in range, replace at the next opportunity.

Figure 2

13. Wipe clean and reinstall humidity sensor and access panel. Torque the access panel hardware to 69 kg-cm (60 in.-lbs.) using a crossing pattern similar to the numbering below.

Humidity Sensor Location
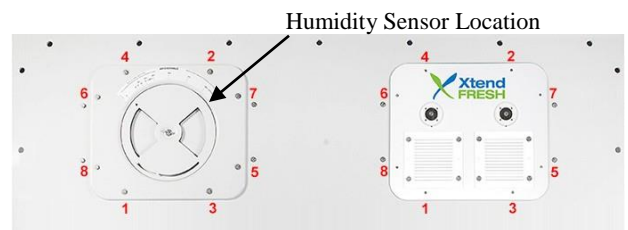
If the panel gasket is damaged and needs to be replaced, use the following part numbers.

   - Standard Panel Gasket: 42-00296-01
   - XtendFRESH Panel Gasket: 42-00823-00

Tech*Fact*: PrimeLINE® R-513A-Ready Units

Carrier Transicold recently added to its model listings a R-513A-ready PrimeLINE® unit shipped with R-134a for field conversion to R-513A at a later date as requested by the owner of the equipment. Refrigerant R-513A is an azeotrope blend containing R-1234yf and R-134a (56%wt/44%wt).

The difference between the base R-134a unit and the R-513A-ready unit is the compressor. A new part number 18-10178-20 for R-513A-ready units was added. To simplify the identification of an R-513A-ready compressor in the field, we have placed a green dot on the top of the compressor on the DUV fitting. This compressor can be used as a general replacement for any standard PrimeLINE unit.

Green Dot On DUV Fitting

As a means of identifying R-513A-ready units, container model number series 69NT40 -561-500 has been assigned to a unit with this option.

To convert a R-513A-ready unit, the technician will need to recover refrigerant, change the filter drier, and charge the unit with liquid only as R-513A is a blend. Charging or topping off as a vapor will result in an incorrect mixture of charge in the system. Refrigerant charge amount is the same in both. Upon completion, the technician will need to change the refrigerant labels (76-50235-00) on the front of the unit indicating the change in refrigerant.

To convert an operational OEM R-134a PrimeLINE unit (non R-513A-ready), Carrier recommends that the compressor be changed to a R-513A-ready compressor (18-10178-20).

Tech*Fact:* ContainerLINK™ App

The ContainerLINK™ app is available free for download through the Apple App Store and Google Play Store. The app offers interactive resources, including service manuals with instructional videos, an alarm code lookup function, conversion tools in the technician's tool box and warranty information inclusive of recently completed work for units being serviced.
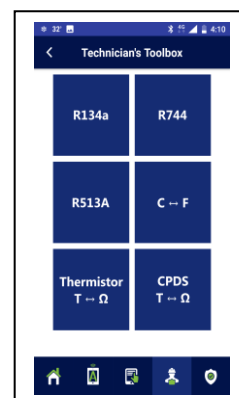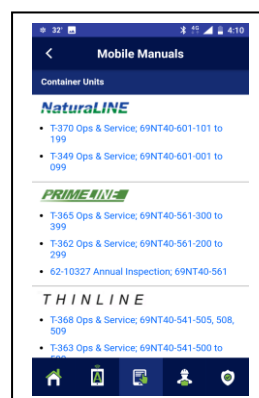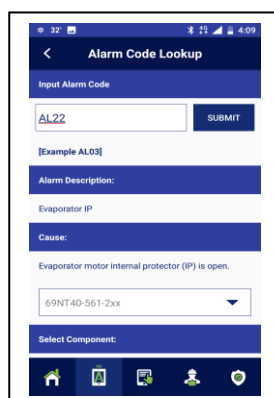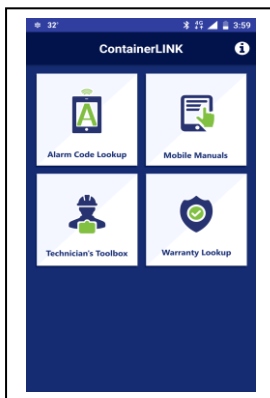
For more information about Carrier Transicold's products and services for container refrigeration, visit www.transicold.carrier.com.

Tech*Fact:* XtendFRESH™ Operators Guide (62- 12065)

A general user's guide is now available online for the operation and troubleshooting of alarms on the XtendFRESH™ unit. The guide provides recommended actions that can be taken if replacement parts are not readily available.

The operators guide can be found at the following Website:
https://www.carrier.com/container-refrigeration/en/worldwide/service-support/#3 in the Literature section under Search by Product Type: Option / XtendFRESH / all documents

XtendFRESH Trouble Shooting Guide

AL07	MANUAL FRESH AIR VENT (FAV) OPEN
Cause	For units equipped with XtendFRESH and a Vent Position Sensor, the controller will monitor the manual fresh air opening at a pre-determined time. If during this time the fresh air vent is open and XtendFRESH is active, an alarm will be generated. If alarm is active, the controller monitors the manual fresh air once per hour. Upon clearing the alarm, the controller goes back to monitoring at the pre-determined time.
Component	**Vent Position Sensor (VPS)**
Troubleshooting	Manually reposition vent to 0% and confirm using Cd45. If Cd45 is not reading 0%, perform a calibration of the panel.
	If unable to obtain zero reading, replace defective VPS.
	If unit is loaded, ensure vent is closed. Note and replace VPS on next PTI. The alarm will not affect the XtendFRESH system from operating.
AL09	**O₂ SENSOR FAILURE**
Cause	Triggered anytime the O_2 sensor reading is outside of the normal operation range, after an initial signal was detected.
Component	**O₂ Sensor, O₂ Amplifier, Sensor Switch Module (if equipped)**
Troubleshooting	Check Cd44 and scroll down to 02V. The O_2 sensor output will be displayed in millivolts (130mV to 4100mV).
	Switch equipped: If voltage is not present at Cd44 and a sensor switch module is installed, check for O_2 voltage on black wire connected to the sensor switch module, connecting ground of meter to TP9. If the voltage is in the 130mV to 4.1V range, directly wire black wire to KD04. This may cause an AL07 depending on O_2 reading but XtendFRESH will operate normally. If no voltage on black wire, proceed to next step.
	Check wiring (refer to schematic), and correct if found mis-wired.
	If O_2 sensor is available, remove upper fresh air panel and evaporator motor and replace sensor. If after replacing sensor AL09 continues, replace amplifier.
	If parts are not available, turn XtendFRESH option off (Cd43) and open the Manual Fresh Air Vent.
AL10	**CO₂ SENSOR FAILURE**
Cause	Triggered anytime the CO_2 sensor reading is outside of the normal operation range, after an initial signal was detected.
Component	**CO₂ Sensor**
Troubleshooting	Check the voltage at MC5 to ground pin on TP9. (1 - 4.7 vdc)
	Check wiring (refer to schematic), and correct if found mis-wired.
	If part is available, remove upper fresh air panel and evaporator motor; replace sensor.
	If no part is available, take no action and service at next PTI. XtendFRESH will continuously run the scrubber. O_2 level will be controlled with the opening and closing of the fresh air vents as required.
AL29	**LOSS OF ATMOSPHERIC CONTROL**
Cause	Triggered whenever the CO_2 level is above its upper limit by 1% for 60 minutes. Or, when O_2 level is greater than 1% below its set point for longer than 5 minutes after the unit has been in range. The alarm is triggered off when the levels return to within the normal range.
Setup	Run Cd43 test mode for troubleshooting the below components. If test mode times out, you must restart the mode prior to the continuation of testing.
Troubleshooting	If components do not energize, check FX1 and FX2 for power (460 VAC). If fuse is open, check heater continuity (XHT1 to ground). Must be greater than 1 mega ohm. If less than 1, disconnect the heater at XHT1 and XHT2. Replace fuse. Unit will control on fresh air solenoids.
Component	**Solenoid Air Vents** - Visually inspect to see if the Solenoid Valves are opening air vents.
Troubleshooting	If vents open, troubleshoot the next component. If vents do not open, continue with troubleshooting below.
	Check FX4 fuse for power (~20 volts dc).
	If fuse is open, check wiring and or replace solenoid if part is available.
	If no part is available, open manual fresh air vent.
Component	**XtendFRESH Fan(s) / XtendFRESH Scrubber Motor** - Visually inspect to see if the XtendFRESH Fan(s) are running (air blowing on left, intake on right), check current draw of motor at the XST1 (~ 40 to 200 milliamps / contactor load side). Troubleshoot the non-operating component.
Troubleshooting	If both are running, proceed to next component.
	Verify XS contactor is pulling in. If not, check FX6 fuse for power (24 VAC). If not, check power at controller KB4.
	Check FX3 fuse for power (~20 vdc). If no power, replace fuse. If fuse opens a second time, take no further action. O_2 level will be controlled with the opening and closing of the fresh air vents.
	If part is available, replace either fan or scrubber motor. Fan is replaceable from the front on a loaded unit; Scrubber motor is not.
	If no part is available or accessible, take no action and service at next PTI. O_2 level will be controlled with the opening and closing of the fresh air vents.
Component	**Heater**
Troubleshooting	Verify XH contactor is pulling in. If not, Check FX6 for power (24 VAC). If open ohm contactors XHA1 and XSA1 to ground. Replace (12 Amp) contactor. If contactor is pulling, power unit off and check heater resistance from XH1 to XH2 (450 to 500 ohms). If heater is outside of the range, disconnect heater at XHT1 and XHT2 and replace at next PTI. Unit will control on fresh air solenoids.
AL62	**O₂ OUT OF RANGE**
Cause	This is a notification alarm and does not pose a risk to fresh produce. AL62 is triggered when there is an indication that the O_2 level is rising after reaching its setpoint (+ 1%). If O_2 level exceeds 4% above setpoint, the alarm is activated. The alarm does not activate if the unit was pre-tripped or trip started between last reaching its O_2 setpoint and exceeding the plus 4%, or if power has been turned off for eight hours. The alarm is deactivated if O_2 drops below setpoint (+ 1%) or if a pre-trip or trip start is performed.
Component	**Scrubber Failure**
Troubleshooting	Refer to AL29 Scrubber component above.
Component	**XtendFRESH Solenoid Valves**
Troubleshooting	Refer to AL29 Solenoid Air Vent component above.
Component	**Container Air Tightness**
Troubleshooting	Seal container where possible (access panels, rear doors, mounting hardware, etc).
AL96	**SCRUBBER ROTATION FAILURE - OPTIONAL FEATURE**
Cause	Feedback from the Scrubber Motor to the controller not detected
Component	**Scrubber Motor**
Troubleshooting	Run Test Mode and verify scrubber bed is turning. If back panel cannot be removed to check verify the scrubber amperage consumption, read at XS contactor wire XSL1. If between 40 and 200mA motor rotating properly. If NO current detected check and replace FX3. If current spiking to 350mAps for 2 seconds then dropping to 90mAmps the scrubber motor is located. If scrubber motor is locked further inspection of the scrubber bed is required. Unit will control CO_2 with the fresh air solenoid when this alarm occurs if scrubber inaccessible.
Component	**Ground Interface Module (GIM)**
Troubleshooting	Once it has been verified that the scrubber motor is rotating check the wiring connections to the GIM module. If all wires secured properly replace the GIM module if one is available. If not the unit will control CO_2 using the fresh air solenoids.

Tech*Fact*: Q3/Q4, 2018 Global Training

Listed below are the instructor-led training courses scheduled through Q4 2018. Courses are subjected to a minimum requirement of 12 students. Courses marked with the asterisk are technician certification courses. The attendees of the course need to pass both the hands-on troubleshooting and written exam.

Approximately 30 days prior to the class start date, registered students will receive an email confirming the class is being conducted along with logistical information. You should not make travel arrangements to attend the class until after you have received a confirmation email. To register, go to:

https://www2.carrier.transicold.com/webtrain.nsf/BE3D1D0690374A1B85257C19007A6413?OpenView

Region	Start Date	Course Description *Certificate	Location
APO	7/17/2018	3-Day Container Technician *	Vladivostok, Russia
APO	7/30/2018	1-Week Container Technician *	Chennai, India
APO	9/11/2018	2-Day Container Technician *	Tauranga, New Zealand
APO	9/19/2018	3-Day Container Technician *	Nagoya, Japan
APO	10/9/2018	3-Day Container Technician *	Suva, Fiji
APO	10/23/2018	3-Day Container Technician *	Xiamen, China
APO	11/5/2018	1-Week Container Technician *	Karachi, Pakistan
APO	11/13/2018	3-Day Container Technician *	Kaohsiung, Taiwan
EMEA	8/6/2018	3-Day Container Technician *	Abidjan, Ivory Coast
EMEA	8/21/2018	3-Day Container Technician *	Odessa, Ukraine
EMEA	8/28/2018	3-Day Container Technician *	Tangier, Morroco
EMEA	9/4/2018	3-Day Container Technician *	Le Havre, France
EMEA	9/11/2018	2-Day Container Technician *	Cape Town, South Africa
EMEA	9/18/2018	3-Day Container Technician *	Izmir, Turkey
EMEA	9/25/2018	2-Day Container Technician *	Bremerhaven, Germany
EMEA	10/4/2018	2-Day Container Technician *	Dubai, United Arab Emirates
EMEA	10/9/2018	3-Day Container Technician *	Haifa, Israel
EMEA	10/16/2018	2-Day Container Technician *	Hamburg, Germany
LAO	7/30/2018	3-Day Container Technician *	Paita, Peru
LAO	8/14/2018	3-Day Container Technician *	Montevideo, Uruguay
LAO	8/20/2018	1-Week Container Technician *	Puerto Limon, Costa Rica
LAO	9/17/2018	1-Week Container Technician *	Progreso, Mexico
LAO	9/25/2018	3-Day Container Technician *	Guayaquil, Ecuador
LAO	10/3/2018	3-Day Container Technician *	Kingston, Jamaica
LAO	10/22/2018	3-Day Container Technician *	Buenos Aires, Argentina
LAO	10/22/2018	3-Day Container Technician *	Ensenada, Mexico
LAO	10/25/2018	2-Day Genset	Ensenada, Mexico
LAO	11/5/2018	3-Day Container Technician *	Rio Grande, Brazil
NAO	8/6/2018	2-Day Container Technician *	Long Beach, CA
NAO	8/9/2018	2-Day Container Technician *	Oakland, CA
NAO	8/13/2018	2-Day Container Technician *	Seattle, WA
NAO	10/8/2018	1-Week Container Technician *	Long Beach, CA
NAO	11/12/2018	1-Week Container Technician *	Jacksonville, Florida

New Online XtendFRESH™ training module coming in July

APO – Asia Pacific Operations, EMEA- Europe Middle East Africa, LAO – Latin America Operations, NAO – North America Operations

Class dates and or locations can change throughout the year. It is recommended that you periodically go to the website to check on any that may have been added, revised or removed.

Tech*Fact*: NaturaLINE® Parts / Tools

As the NaturaLINE™ units are becoming more globally available in the field, it is important to ensure that, both parts and tools are available. Following is a listing of the parts and tools required:

Ship Kit Parts List:

Part Number	Description	Stock QTY	69NT40-601 001 to 099	101 to 199
76-00892-06	Suction Pressure Transducer (SPT) Service Kit	1	X	X
76-00892-07	Pressure Transducer (DPT, FPT) Discharge and Flashtank Service Kit	1	X	X
76-00892-08	High Pressure Switch Service Kit	1	X	X
14-00382-00	Electronic Exp. Valve (EVXV)	1	X	X
14-00394-20	Economizer Solenoid Coil (ESV, USV)	1	X	X
14-00396-10	HPXV High pressure Expansion Valve Coil	1	X	X
14-00406-01	Filter Drier	1	X	X
10-00482-20SV	VFD Fan Replacement Kit	1	X	X
79-04023-21	Service Compressor Kit	1	X	X
22-04214-02	VFD Interface Module	1	X	X
54-00640-20	Gas Cooler Fan Motor	1	X	
54-00677-20	Gas Cooler Fan Motor	1		X

Tools List

Part Number	Description	Qty
07-00414-00	Electronic Vacuum Gauge (MICRONS)	1
07-00512-00	Magnet (Solenoid Valve Manual Opening Coil)	2
07-00527-00	CO2 Gauge Set	1
14-00396-20	Magnet (Expansion Valve Manual Opening Coil)	1
R744	AHRI 700 Standard	1

For a complete listing of parts refer to the operation and service manual (T-349 and T370) or contact your regional service engineering manager.

Tech*Fact:* Software Release Update

Listed are the software release versions for operating and working with Carrier Transicold units. Prior to upgrading software on units, you should seek agreement from the equipment owners.

> Recip (ML2i / 5159, ML3, 5167), Scroll (ML2i, 5360 /ML3, 5369)
> Reciprocating Unit (ML2) – 1207, NaturaLINE (ML3, 5706)
> Controlled Atmosphere – 3115
> DataLINE 3.2, DataBANK 0513.
> Menu – 0116, Software cards with revision greater than 5159 or 5361 must have menu 0116 or an error could occur.

After completing a software upgrade, verify the user selections (i.e. defrost interval, set point, etc.).