

AN EXCHANGE OF TECHNICAL INFORMATION
VOLUME 20 NUMBER 2 ABOUT CARRIER TRANSICOLD CONTAINER PRODUCTS **November 2014**

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TechFact – “Mobile Friendly” Manuals

In alignment with the success of the alarm app announced in the June TechLINE, Carrier Transicold is launching a Web Portal, allowing service technicians access to technical manuals that are mobile device friendly.



Traditionally, the container community has used hard copy and PDF manuals to reference operations and service information. PDF manuals serve their purpose for sure, and will still be available, but with more service technicians having access to smart phones and tablets to connect them to the internet, along with the positive response regarding the alarm app, we have

decided to include the mobile friendly format for manuals.

Mobile friendly manuals provide some advantages. Information is loaded on demand and is accessed more quickly than PDF versions.

Videos are embedded within the manual to support technical instructions and maintenance procedures taking on a more vital role in the technician’s learning process.

These features will be especially advantageous and prove to be beneficial as new products come online, allowing the technician to become proficient and more knowledgeable faster.

In addition to mobile friendly manuals, we are including a “Technician’s Toolbox” on the Web Portal. This feature will include digital tools, such as conversion applications and other reference tools such as the alarm app, which helps service technicians make accurate and timely decisions when servicing the unit.

The Web Portal is available 24/7 for any technician with internet access. You do not need to purchase, download or install an app onto a smartphone. To access, click on the Mobile Manuals link at <http://www.carrier.com/container> under Service Support; PC’s require Internet Explorer 9 or higher.



TechFact – XtendFRESH™ Box Check

When using the XtendFRESH system, the box must conform to air leak rates in order to maintain control of the O₂ and CO₂ set points. To ensure that the box conforms to the air leak requirements, a pressure decay check is required prior to the voyage.

To perform this check, some units or boxes may be equipped with two pressure connection ports on the front of the unit. If the ports are not available, then a Manual Fresh Air panel (Part # 79-04098-00) with two schrader ports should be installed.

Connect one of the ports to a pressurized air supply. Connect the other port to a Magnehelic pressure gauge with a scale of 0.0 to 4.0 or 6.0 inches of water gauge. The pressure gauge monitors the container leakage rate.

Prior to performing the leak test, seal the floor drains with plugs; ensure the unit condensate drain line is filled with water; ensure the air makeup panel is tightly closed; insert plug in drain hose; install container curtain at the rear door and seal the door shut.

When installing the door curtain, place the curtain around the door and seal the curtain along the top and sides of box and close the door. The curtain should be visible throughout the perimeter of the doors. Tape can be used to hold the curtain in position. The use of curtain tracks is not recommended with the XtendFRESH option. Always use a new curtain, as a small rip in the curtain can result in a failure of the box leakage test.

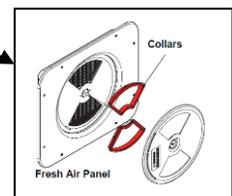
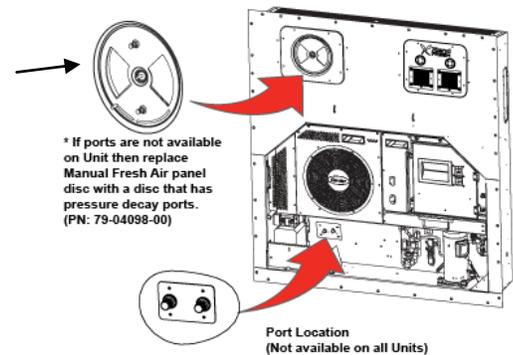
After connecting the gauges, turn on the air supply and regulate the air pressure to 40-60 psi. When the Magnehelic gauge reads 2.5 inches of water gauge (63mm), shut off the air supply. Do not allow it to exceed 3.0 inches of WG (75mm). Monitor the Magnehelic pressure gauge for the drop in air pressure in the container. When the Magnehelic pressure gauge reads 2 inches water (50mm), start a timer. When the Magnehelic pressure gauge reads 1 inch of WG (25mm), stop the timer. The amount of time expired should be eight minutes or more for a 40 foot container, and four minutes or more for a 20 foot container. If it is less than the required time (i.e. 6 min for 40 foot container), then the container needs to be checked for leaks. To check for leaks, the following actions are recommended:

External checks: Re-pressurize the container to 2 inches water gauge and look for leaks at the following areas using soapy water (mixture of dish detergent and water) looking for bubbles.

- Inspect the evaporator motor access panels. Check whether gasket is properly in place. Tighten access panel bolts to 60 inch/lbs. Caulk, if necessary.
- Inspect the condensate drain outlet line. If leaking, complete other checks and re-inspect internally.
- Inspect the unit/container box joints. Caulk, if necessary.
- Inspect the through-wire bulkhead connections. Secure and caulk, if required.
- Inspect the container floor drains under container (if accessible). If leaking, complete external checks and re-inspect internally.
- Inspect the rear door seals. Ensure curtain is properly installed (curtain should be visible throughout the perimeter of the doors). If not, remove and install a new curtain. De-pressurize the container prior to opening the container. Ensure manual fresh air panel is equipped with collars (Part #:79-04064-00).

Internal checks: Remove pressure within container and inspect the following locations:

- Inspect curtain for any rips. Replace curtain, if necessary.
- Inspect the container floor drains. Ensure plug is secure and in place.
- Inspect condensate drains outlet line. Confirm drain line is filled with water.
- Inspect for any internal wall damage. Repair and caulk, as required.
- Inspect the floor to side wall joint and floor to front bulkhead joint for damage. Repair and caulk, as required.



Upon completion of the checks, and any associated repairs, it is recommended that the unit be tested again to confirm that it now meets the required level of leak rate.

TechFact – ML3 Green Label Controller

The new ML3 green label controller (part number 12-55012 / Scroll, 12-55011 / Recip) is compatible across all ML2i and ML3 based platforms. The NaturaLINE™ platform must use the green label controller.



Due to internal enhancements with the microcontroller, a minimum level of software revision 5x55 (loaded with menu file 0116 or greater) is required. The latest software can be downloaded from the Carrier Transicold Transcentral website.

TechFact – “Old Controller” Message

We have received a report of an “Old” “Cntrl” (old controller) message being displayed on a controller in the field. This occurrence is the result of a field installation of an ML3 controller, prior to Date Code 1213 (week 13, 2012), Serial Number 04163550 being installed in a new PrimeLINE with the EDGE option unit (561-300 series and newer).

Controllers manufactured post serial number 04163550 use a solid state relay in place of an electro-mechanical relay, which energizes the various electrical components in the refrigeration unit (i.e. condenser fan motor, valves, etc.). This was a “state of the art” change within the controller.

This change has become important with the introduction of the DLV (digital loader valve) / DUV (digital unloader valve) circuits included with the PrimeLINE EDGE model. Refer to Q2 / 2014 issue of TechLINE. These valves will cycle often depending on the units’ operational conditions. It was determined that with the high level of duty cycles expected with the DUV/DLV circuit, that the controllers with the solid state relay would better withstand the operational life of the units.

To ensure that newer controllers are installed, an “old controller” message was implemented if a controller with an electro-mechanical relay is installed into a PrimeLINE Edge unit. With the message displayed, the controller will continue to maintain unit temperature as designed, but it will also act as a reminder to the operator that it should be changed to a newer controller at the earliest opportunity.



The controller serial number and date code is found on the yellow sticker on the edge of the controller. All green sticker controllers contain the solid state relay.

TechFact – XtendFRESH Alarms (#62 and #07)

The XtendFRESH option has a new alarm (Alarm 62, O₂ Out Of Range) used as an indication that the O₂ level is rising after reaching its setpoint. If O₂ level exceeds 4% above setpoint, the alarm will activate. The alarm will not activate if the unit was pre-tripped or if a trip started since last reaching its O₂ setpoint and exceeding the plus 4%, or if power has been turned off for eight hours. The alarm is deactivated if O₂ drops below setpoint + 1% or if a pre-trip or trip start is performed. This alarm should be considered to be a notification, as high O₂ levels do not pose a risk to fresh produce.

The current AL07 alarm was upgraded to include Vent positioning sensor (“VPS”) units with the XtendFRESH option. The alarm is now triggered when the VPS is greater than 0 CMH while unit is operating in the frozen or the XtendFRESH mode.

TechFact – Condenser Motor Limp Home

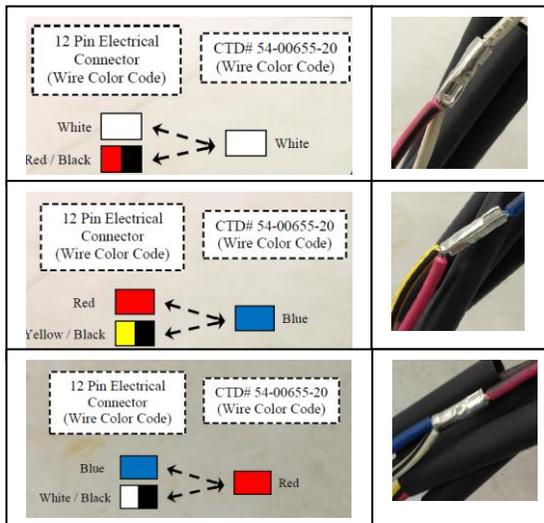
The following are installation instructions for installing a Three Phase Single Speed Condenser Motor into a 69NT40-561-3XX (PrimeLINE® EDGE) unit with a dual speed motor as an emergency when a direct replacement is not readily available.



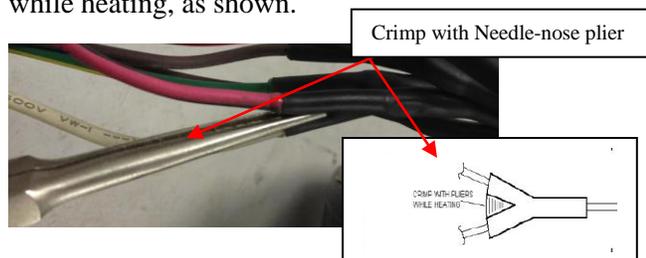
1. From a failed CM (54-00670-20), cut the wires (150mm or 6”, measured from the 12 pin connector end) using a wire cutter and strip off (5mm or 0.2”) the wire insulation using a wire insulation stripper.
2. From the Emergency Replacement Motor (54-00655-20), cut the wires (150mm or 6”, measured from the 9 pin connector) using a wire cutter, and strip off (5mm or 0.2”) of the wire insulation from the motor end using a wire insulation stripper.
3. Position the heat shrink and crimp the electrical splice connector for all 6 replacement motor wires.
4. From the 12 pin electrical connector in step #1, perform the butt splice connection as shown below.



5. Perform the following 3, two-to-one butt splice electrical connections as shown.



6. Using a Hot Air Gun, shrink the Heat Shrink Tube to insulate all of the electrical butt splice joints. While heating the Heat Shrink Tube for two-to-one butt splice electrical connection, use a Needle-nose plier to crimp the Heat Shrink Tube while heating, as shown.



7. Re-install the corrugated tube to protect the wires and secure with 4 cable ties, shown below.

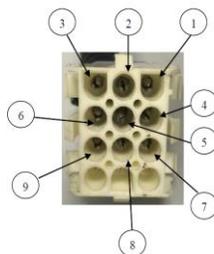
8. To verify that the procedure has been performed correctly, the following checks need to be performed using a Multi-meter (ohm meter).

9. Ensure a short circuit ($< 2 \Omega$) connection between ground Pin 5 and motor shaft; ensure open circuit (OL) between ground Pin 5 and all other Pins.

10. Ensure a short circuit ($< 2 \Omega$) connection between IP Pins 4 and Pin 6, ensure open circuit (OL) between Pin 4 and all other Pins.

11. Ensure a short circuit ($< 2 \Omega$) connection between Pin 1 and Pin 7, ensure Resistance Reading between:

- Pin 1 and Pin 2 ($> 30 \Omega$)
- Pin 1 and Pin 3 ($> 30 \Omega$)
- Pin 1 and Pin 8 ($> 30 \Omega$)
- Pin 1 and Pin 9 ($> 30 \Omega$)



12. Ensure a short circuit ($< 2 \Omega$) connection between Pin 2 and Pin 8, ensure Resistance Reading between

- Pin 2 and Pin 3 ($> 30 \Omega$)
- Pin 2 and Pin 7 ($> 30 \Omega$)
- Pin 2 and Pin 9 ($> 30 \Omega$)

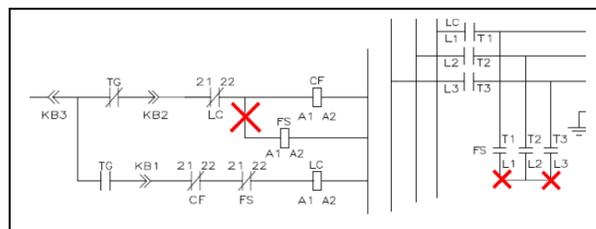
13. Ensure a short circuit ($< 2 \Omega$) connection between Pin 3 and Pin 9, ensure Resistance Reading between:

- Pin 3 and Pin 7 ($> 30 \Omega$)
- Pin 3 and Pin 8 ($> 30 \Omega$)

System re-wiring (must be completed before using this modified motor for actual application).

14. Turn the unit start-stop switch (ST) and unit circuit breaker (CB-1) OFF, and disconnect power to the unit. Follow the regional lock out tag out procedure for electrical system.

15. From LC Contactor (Contact 22), remove the one white wire marked "FSA1~LC22" from the LC Contactor and isolate it with electrical tape.



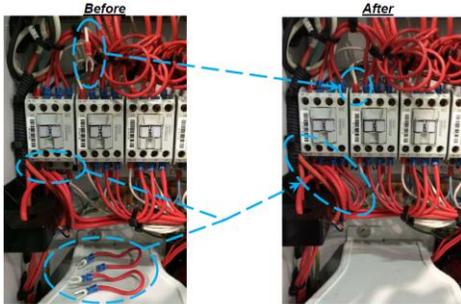
16. From FS Contactor (Contact L1, L2, L3); Remove the 2 jumper red wires from the FS Contactor (L1, L2, L3) and safe keep them into a plastic bag, required during the recovery stage.

Recovery Procedures (Print and paste this page in front of control box): **For emergency repair, this unit has been modified to use a Condenser Motor (CTD# 54-00655-20) as the actual replacement Condenser Motor (CTD# 54-00670-20) is not available. With this modification, unit is expected to fail PTI P2-0 (condenser fan low speed test). The correct replacement Condenser Motor (CTD# 54-00670-20) should be installed onto this unit at the earliest opportunity.**

Ensure correct motor is installed before following the procedures listed below.

1. Turn the unit start-stop switch (ST) and unit circuit breaker (CB-1) OFF, and disconnect power to the unit. Follow the regional lock out tag out procedure for electrical system.

2. On LC Contactor (Contact 22), re-connect the white wire marked “FSA1~LC22” to the LC Contactor.
3. On FS Contactor (Contact L1, L2, L3), replace the 2 jumper red wire from the FS Contactor (L1, L2, L3), i.e. Jumper L1 to L2, and L2 to L3, reference to electrical schematics if necessary.



TechFact – Upper VPS Setting Selection

On a system power up, the last known upper vent positioning sensor (“UVPS”) sensor reading will be compared to the input reading taken 10 seconds after power up. If the differential value is greater than 5 CMH, the position change will be updated. Otherwise the previous setting will be displayed.

To initiate a vent position change during operation, the vent will require a movement across the entire range (0 – 30% (low stop) or 30% - 100% (high stop)) to initiate a change.

After moving the entire range, the user can then set the selection using the display. The alarm processing shall be disabled for 4 minutes to allow the vent setting adjustment. On completion of the first four minutes, the vent is required to remain stable for the next four minutes. If vent position changes are detected during the second four minute period, AL50 will be activated.



TechFact – Return Material Tags (MPR tags)

A brief reminder that all returned parts should be tagged with a properly completed MPR tag. In the Americas, tags should be ordered from the literature ordering center in Transcentral. All other regions order on a regular parts order (part number 62-10805).

TechFact – Updating Boot loader Software

As a result in the growth of the operational file sizes, it is taking longer to upgrade it into the controller. The length of time for uploading the

optional software is monitored by the boot loader software in the controller.

What is a bootloader? A boot loader is the resident code that is executed before any operating system starts to run. The concept of boot loaders is virtually universal to all operating systems. Bootloaders basically package the instructions to boot the operating system kernel. The kernel is a computer program that manages input/output requests from software, and translates them into data processing instructions for the central processing unit and other electronic components of a computer. The kernel is a fundamental part of a modern computer's operating system.

If the boot loader sees that it is taking too much time during the upload process, it will evaluate this as a problem, halt the upload, and go through a restart, attempting to meet the time on the next upload.

With this needed growth, the bootloader software resident in the controller will also need upgrading to accept the increased time. To meet this need, we have chosen to include the bootloader software as part of the controller software upgrade starting with the 5X61.ml3 release. In future releases, when uploading; if that file on the card contains a newer version of the boot loader software than is currently installed on the controller, then it will be automatically loaded on to the controller. If the version on the controller is newer, then no action will be taken. As part of all future uploads, it is important not to remove the programming card until "Pro donE" is displayed and that menu file 0116 or greater is loaded on the programming card.

TechFact – XtendFRESH PreTrip

To ensure a successful XtendFRESH trip, the following pre-trip steps should be performed prior to each trip.

The following procedure is to be used in alignment with the upcoming 5x62 release scheduled for November.

1. Remove the rear upper back panel.
2. Go to code select 18 and ensure container has software version (5X62 or higher).
3. Go to code select Cd43 and arrow select “tEst” mode. On entering test mode there are two selectable options available (tEst and CAL).
4. Select tEst. On selection, a mechanical component operational test which is a visual inspection, followed by a CO₂ and O₂ sensor test and calibration will be completed as follows:

a. Mechanical Test: the fresh air solenoids will open for eight seconds and close followed by the blower fans and scrubber motor turning on for 60 seconds. Visual inspection of each occurrence is required.

If the unit is equipped with the UVPS option, you need to manually check the operation of the UVPS switch. This switch gives priority to the XtendFRESH option. To ensure the switch is working, with Cd43 set to the off position, the panel setting value can be seen in Cd45. If Cd43 is set to FrESh, Cd45 will display dashes.

b. Sensor Test: the controller will perform a range check of the CO₂ (0% to 1.0%) and O₂ (above 19%) sensors. If both meet this requirement, a calibration test “CAL StArt” will be displayed for five seconds and a calibration of each sensor will be performed.

If both sensors pass calibration, a “CAL PASS” will display for five minutes or until the user presses and holds the Code Select key for three seconds. In either case, normal operation will be resumed.

If one or both of the sensors are outside of the range check condition above, the failed results will be displayed (i.e. “CO₂ OUt”, “O₂ In...”), alternating every five seconds. To exit, the user should press and hold the Code Select key for three seconds.

If the range check fails (indicating a drifted sensor), ensure the box is clean of cargo remnants from the last trip, open the back doors, and rerun the test. If the range check fails a second time, replace the sensor that is out of range.

Both sensors will be calibrated based on the conditions in the container. If either of the sensors fail open or are shorted, an alarm 09 for O₂ sensor or alarm 10 for CO₂ sensor will occur.

DO NOT RUN THE CAL SELECTION UNDER LOADED CONDITIONS

5. On completion of the Cd43 test, prepare box for an air leak test.
6. Check the defrost drain hose for any damage and ensure that the trap is filled with water.
7. Reinstall the upper back panel and ensure the floor drains within the container are sealed.
8. Ensure the manual fresh air panel is closed tight and that the warning label is in place on the on the unit.



9. Check air tightness of the box following the “XtendFRESH Box Checkout / Leak Test” article within this TechLINE release. **The box must meet or exceed the specified air tightness requirement in the procedure.**

10. Install new curtain, load cargo and select the desired O₂ and CO₂ levels via Code select 43 “FrESh” modes.

TechFact – XtendFRESH (prior to servicing)

Due to the potential of a low oxygen level inside the container it is important to follow proper venting procedures prior to servicing the unit or discharging the cargo from the unit. These steps should be taken:

1. Set the ST switch to the ON position and open the Manual Fresh Air vent. Avoid direct breathing of the venting gases from the air makeup vent.
2. Go to code 43(Cd43), select FrESh mode and set the operating O₂ set point parameters to 21%.
3. Allow the refrigeration unit to run. This allows the evaporator fans to exchange low-oxygen level air with ambient air.
4. Monitor the container internal environment via code 44 (Cd44).
5. When the oxygen level reaches a safe level ~ 20 ± 2%, open both of the container rear doors and pull back the curtain to facilitate the clearing of the hazardous atmosphere. Step away from the container rear doors.
6. Continue refrigeration operation for five minutes prior to entry or unloading of the container.

TechFact – Software Release Update

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

Recip (ML2i/ML3, 5159) / Scroll (ML2i, 5360 /ML3, 5361), **5X62 coming in November.**

Reciprocating Unit (ML2) – 1207

Controlled Atmosphere – 3115

DataLINE – 2.1 / DataBANK – 0513 / Menu - 0116

After completing a software upgrade, it is important for the user to check the user selectable controller selections (i.e. defrost setting, set point, etc.).



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