Purpose
Use this bulletin to diagnose Norcold refrigerator control panels and power boards. Most problems can be linked to components controlled by the power board or voltage input to the power board. Sometimes the power board or control board will need to be replaced. Use this bulletin to determine the correct action.

Background
The electronic control system controls the refrigerator’s power board and control panel. Use the electronic control system diagnostic mode to identify problems with the power board and control panel.

The electronic controls work on 10.5 to 15.4 volts DC. The AC power cord that is attached to the power board conducts 120 volts AC power from the RV receptacle to the power board. It does not provide power to the electronic controls.

Applicability
Before trying to fix or replace the control panel and power board, make sure these areas, which can be affected by the electronic controls, are working properly:
- Proper refrigerator installation
- Adequate ventilation
- Leveled operation
- AC heater(s)
- DC heater
- Burner and orifice assembly
- Fan(s)
- Heat deflector cap (flue cap)
- Flue baffle

The power board and the control panel do not control the fans, ice maker, or the ice maker water valve.

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Procedure A: Checking Power Board 628661 Diagnostics Inputs and Outputs – N41X / N41X.3 / N51X / N51X.3 / N62X / N82X Refrigerators

Turn ON Refrigerator and select the highest temperature setting.

Indicates the thermistor circuit is open.

Indicates the thermistor circuit is shorted.

Screen displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

Screen Action

Burner failed to light or relight
DC voltage was lower than 10.5 volts
DC voltage was higher than 15.4 volts
AC relay stuck closed*
AC heater failed open
Fresh food compartment door was open for more than two minutes
AC was selected but not available
* Requires replacing the power board.

Screen Action

Flame present with gas valve power off
Thermistor open or shorted
DC heater relay stuck closed
DC heater relay stuck open
AC voltage was over 132 volts
No Cool condition has occurred
*** Flame present with gas valve power off.
* Service required error (5s or 5r)
* Requires replacing the power board.

Screen Action

To erase fault history:
1. After the letters [E] and [r] display, press and hold the TEMP SET switch button until the letters [CL] show on the screen.
2. Allow the letters [C] and [L] to display for five seconds, then press and hold the TEMP SET switch button until the letters [E] and [r] show on the screen.

Screen Action

AC voltage higher than 132 volts
AC voltage within 108 and 132 volts
No AC voltage sensed

Navigating and Exiting Diagnostics

To move to the next screen, press and release the MODE switch button.
To return to a previous screen, press and hold the MODE switch button until you reach the desired screen.
To exit Diagnostics, turn the refrigerator OFF and back ON.

The [1] turns off. After a short pause, the screen displays fin temperature.

The [2] turns off. The On LED remains lit. If any LED segments show on this screen after the screen number turns off, replace the control panel.


The [4] turns off. The On LED remains lit. If any LED segments show on this screen after the screen number turns off, replace the control panel.


The [8] turns off. After a short pause, the screen displays fin temperature.

The [9] turns off. After a short pause, the screen displays fin temperature.
Procedure B: Checking Power Board 628661 Diagnostics Inputs and Outputs N64X / N64X.3 / N84X / N84X.3 / N109X / 12XX Refrigerators

**Accessing Diagnostics**
1. At the same time, press and hold the TEMP SET and MODE switch buttons.

**Navigating and Exiting Diagnostics**
- To move to the next screen, press and release the MODE switch button.
- To return to a previous screen, press and hold the MODE switch button until you reach the desired screen.
- To exit Diagnostics, turn the refrigerator OFF and back ON.

**Screen [1] Action**
The [1] turns off, if no LEDs show on the screen after the [1] turns off, replace the control panel.

**Screen [2] Action**
The [2] turns off. The On LED remains lit. If any LED segments show on this screen after the screen number turns off, replace the control panel.

**Screen [3] Action**

**Screen [4] Action**
Screen [4] displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

**Screen [5] Action**
Screen [5] displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

**Screen [6] Action**
Screen [6] is used to clear stored fault history. After the screen number turns off, the letters [Er] show on the screen.

**Screen [7] Action**
Screen [7] shows active inputs to the power board. After the screen number turns off, the power board input LEDs display. The position of the LED's indicate active inputs to the power board.

**Screen [8] Action**
Screen [8] shows active power board outputs. After the screen number turns off, the power board output LEDs display. The position of the LEDs indicate active outputs to the power board.

**Screen [9] Action**
Screen [9] shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.

**Screen [10] Action**
Screen [10] shows AC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the AC voltage input to the power board.

**Screen [11] Action**
Procedure C: Checking Power Board 621267 / 621268 Diagnostics Inputs and Outputs – N41X / N41X.3 / N51X / N51X.3 / N62X / N82X Refrigerators

**Accessing Diagnostics**

1. Turn ON Refrigerator and select the highest temperature setting.
2. At the same time, press and hold the TEMP SET and MODE switch buttons.
3. Release both buttons when Screen 1 shows on the screen.

**Navigating and Exiting Diagnostics**

- To move to the next screen, press and release the MODE switch button.
- To return to a previous screen, press and hold the MODE switch button until you reach the desired screen.
- To exit Diagnostics, turn the refrigerator OFF and back ON.

**Screen 1 Action**
The [1] turns off. After a short pause, the screen displays fin temperature. If no LEDs show on the screen after the [1] turns off, replace the control panel.

**Screen 2 Action**
The [2] turns off. If any LED segments show on this screen after the screen number turns off, replace the control panel.

**Screen 3 Action**
The [3] turns off. After a short pause, the screen displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

**Screen 4 Action**
Screen 4 displays the fault history stored in non-volatile memory. The screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

**Screen 5 Action**
Screen 5 displays the fault history stored in non-volatile memory. The screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

**Screen 6 Action**
Screen 6 is used to clear stored fault history. After the screen number turns off, the letters [E] and [R] show on the screen.

1. After the letters [E] and [R] display, press and hold the TEMP SET switch button until the letters [CL] show on the screen.
2. Allow the letters [C] and [L] to display for five seconds, then press and hold the TEMP SET switch button until the letters [E] and [R] show on the screen.

**Screen 7 Action**
Screen 7 shows active inputs to the power board. After the screen number turns off, the power board input LEDs display. The position of the LEDs indicate active inputs to the power board.

**Screen 8 Action**
Screen 8 shows active power board outputs. After the screen number turns off, the power board output LEDs display. The position of the LEDs indicate active outputs to the power board.

**Screen 9 Action**
Screen 9 shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.

**Screen 10 Action**
Screen 10 shows DC voltage higher than 15.4 volts. DC voltage between 10.5 and 15.4 volts. DC voltage less than 10.5.
Procedure D: Checking Power Board 621269 / 621270 / 621271 / 621272 Diagnostics Inputs and Outputs
N64X / N64X.3 / N84X / N84X.3 / N109X / 12XX Refrigerators

Turn ON Refrigerator and select the highest temperature setting.

Accessing Diagnostics
1. At the same time, press and hold the TEMP SET and MODE switch buttons.
2. Release both buttons when shows on the screen.

Screen 1 Action
The turns off. If no LEDs show on the screen after the [1] turns off, replace the control panel.

Navigating and Exiting Diagnostics
- To move to the next screen, press and release the MODE switch button.
- To return to a previous screen, press and hold the MODE switch button until you reach the desired screen.
- To exit Diagnostics, turn the refrigerator OFF and back ON.

Screen 2 Action
The turns off. The On LED remains lit. If any LED segments show on this screen after the screen number turns off, replace the control panel.

Screen [1] Action
The turns off. After a short pause the screen displays fin temperature.

Screen [2] Action
The turns off. The Fresh food compartment door open for more than two minutes

Indicates the thermistor circuit is open.
Indicates the thermistor circuit is shorted.

Screen [4] Action
Fresh food compartment door open for more than two minutes
Burner failed to light or relight
DC voltage was lower than 10.5 volts
DC voltage was higher than 15.4 volts
AC relay stuck closed*
AC heater failed open

Screen [5] Action
Thermistor open or shorted
Flame sense failure
DC heater relay stuck closed**
DC heater relay stuck open** (3-way refrigerators only)
AC voltage was less than 108 volts
AC voltage was over 132 volts

To erase fault history:
1. After the letters [Er] display, press and hold the TEMP SET switch button until the letters [CL] show on the screen.
2. Allow the letters [CL] to display for five seconds, then press and hold the TEMP SET switch button until the letters [Er] show on the screen.

Screen [7] Action
Fresh food compartment door is closed and light is off
Thermistor sensing temperature

Screen [8] Action
Screen shows active power board outputs. After the screen number turns off, the power board output LEDs display. The position of the LEDs indicate active outputs to the power board.

Screen [9] Action
Screen shows AC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the AC voltage input to the power board.

Screen [0] Action
Screen shows AC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the AC voltage input to the power board.

Screen [1] Action
Screen is used to clear stored fault history. After the screen number turns off, the letters [Er] show on the screen.

Screen [2] Action
Screen displays AC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the AC voltage input to the power board.

Screen displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

Screen [4] Action
Screen displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

Screen [5] Action
Screen displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

Screen displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs indicate recent fault items.

Screen [7] Action
Screen displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

Screen [8] Action
Screen shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.

Screen [9] Action
Screen shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.

Screen [0] Action
Screen shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.
Procedure E: Checking DC Power Input to the Power Board and Power Board DC Power Output to the Control Panel

The refrigerator controls operate on 12 volt DC power. Check and verify the availability of DC power to the refrigerator power board. Make sure that:
1. The refrigerator is supplied DC power through a dedicated circuit.
2. The circuit is wired and fused as per installation instructions.
3. RV DC circuit fuse is intact.
4. Power supplied by the circuit is between 10.5 and 15.4 volts.
5. All connections are clean and tight.

1. Disconnect DC power from the power board.
2. Check fuse continuity. Replace if open ("blown").
   Use only a 5 amp Automotive style fuse.
3. Make sure the new fuse has continuity before installing into power board terminals.
4. Install new fuse. Make sure that each fuse leg engages fully into its terminals.
5. Recheck for voltage across fuse.

Measure voltage across P1 fuse.

Is DC voltage input 10.5 to 15.4 volts?

NO

YES

1. Disconnect DC power from the power board.
2. Check fuse continuity. Replace if open ("blown").

3. Make sure the new fuse has continuity before installing into power board terminals.
4. Install new fuse. Make sure that each fuse leg engages fully into its terminals.
5. Recheck for voltage across fuse.

Measure power board voltage to control panel.

Is DC voltage input 10.5 to 15.4 volts?

NO

YES

The refrigerator controls operate on 12 volt DC power. Check and verify the availability of DC power to the refrigerator power board. Make sure that:
1. The refrigerator is supplied DC power through a dedicated circuit.
2. The circuit is wired and fused as per installation instructions.
3. RV DC circuit fuse is intact.
4. Power supplied by the circuit is between 10.5 and 15.4 volts.
5. All connections are clean and tight.

Replace power board.

Go to Procedure F.
Procedure F: Checking DC Power Input to the Control Panel

Check voltage input to control panel.

To check control operation, proceed to Procedure C.

Is DC voltage input 10.5 to 15.4 volts?

NO

No voltage input to the control panel may be due to a loose or disconnected wire connector or a connector not making full contact with its mating pin.

To identify and correct the no voltage input to the control panel:
1. Check condition of wire harness connections at the power board P1 connector.
2. Check condition of wire harness connector at the control panel P2 connector and at the wire harness connector.
3. If necessary, check the wire harness wires for continuity.
4. Recheck for voltage input to the Control Panel.
Procedure G: Power Board 628661 – Checking DC Power Input at the Control Panel

Check voltage input to control panel.

Control Panel Circuit Board
Models N41X / N51X / N62X / N82X / N64X / N84X / N19X

Pt 2: White/Red: -12 V DC
Pt 1: Green: +12 V DC

P/N 628662 (N61X / N81X)

Is DC voltage input 10.5 to 15.4 volts?

NO
To check control operation, go to Procedure I.

YES

Control Panel Circuit Board
Models N61X / N81X p/n 628662

P/N 628663 (N41X / N51X / N62X / N82X)

P/N 628664 (N64X / N84X / N109X)

Pt 2: White/Red: -12 V DC
Pt 1: Green: +12 V DC

Connector

Green
White/Red
Blue
White/Violet
White
Purple
Yellow

Control Panel Circuit Board
Models 121X

P/N 628665 121X

Pt 2: White/Red: -12 V DC
Pt 1: Green: +12 V DC

Connector

Green
White/Red
Blue
White/Violet
White
Purple
Yellow

No voltage input to the control panel may be due to a loose or disconnected wire connector or a connector not making full contact with its mating pin. To identify and correct the no voltage input to the control panel:

1. Check condition of wire harness connections at the power board P1 connector.
2. Check condition of wire harness connector at the control panel P2 connector and at the wire harness connector.
3. If necessary, check the wire harness wires for continuity.
4. Recheck for voltage input to the Control Panel.
Procedure H: Checking Electronic Controls AUTO Operation (Except N61X and N81X Refrigerators)

1. Turn ON refrigerator.
2. Select AUTO mode operation.
4. Controls select AUTO AC operation?
   - YES: Unplug the AC cord to verify that the controls shift from AUTO AC to AUTO LP.
   - NO: AUTO mode controls working as designed. Plug AC power cord into the RV receptacle.
5. Controls shift and select AUTO LP operation?
   - YES: AUTO mode controls okay. Plug the AC power cord back into the RV receptacle.
   - NO: 2-way Refrigerators
     - “A” / “no” “AC” fault
     - No AC and No Flame faults display?
       - YES: Burner failed to ignite or re-ignite
       - NO: Burner failed to ignite or re-ignite
         - “F” / “no” “FL” fault
         - AUTO mode controls okay. Plug the AC power cord back into the RV receptacle.
     - 3-way Refrigerators
       - AU dc
       - Controls shift and select AUTO DC operation?
         - NO: The “dc” “HE” fault code displays. This fault indicates the following should be checked:
           - DC heater fuse may be open (blown).
           - Faulty or loose DC heater connections at power board.
           - DC heater is open (OL).

To correct a no flame fault:
1. Make sure LP gas is available to the refrigerator.
2. Make sure the refrigerator “Manual shut off” valve is open.
3. Check the condition of the orifice and burner. These components should be cleaned yearly.
4. Make sure the electrode air gap is 1/8 to 3/16 in.
5. Check the electrode spark sense wire assembly for continuity.
6. Make sure the power board is properly grounded to the refrigerator back plate.
7. Check the power board T1 coil for damage.
   - Replace the power board if the coil or connector is loose.

Perform the following checks in the order listed below with AC power available in the RV.

1. Check incoming AC power at the RV outlet.
   - Voltage 108 to 132 volts AC: go to Step 2.
   - No voltage: check RV AC power distribution to the refrigerator circuit.
2. Check for 108 to 132 volts AC presence at AC power cord power board plug.
   - Voltage 108 to 132 volts AC: go to Step 3.
   - No voltage: replace AC power cord.
3. Check the condition of the F2 fuse (F3 in previous power boards).
   - Fuse good: go to Step 4.
   - Fuse open: check for a grounded AC heater.
4. Check the condition of the F2 fuse terminal clips.
   - Clips tight and in good condition: go to Step 5.
   - Fuse clips loose: adjust clips as required.
5. Connect AC power cord to the power board, then measure voltage across fuse terminals.
   - Fault corrected: voltage present and the controls select AUTO AC operation.
   - Fault NOT corrected: voltage present and the controls select AUTO LP operation.
   - Replace power board.
Procedure I: Checking Electronic Controls AUTO Operation N61X and N81X Refrigerators

1. **Turn ON refrigerator.**
   - Green light on? (YES)
   - Green light and Yellow light flashing constantly? (YES)
   - Green light on and Yellow light illuminated? (YES)

   **Controls in AUTO AC operation.**
   - Unplug the AC cord to verify the controls shift from AUTO AC to AUTO LP operation.

   **Burner failed to ignite or re-ignite.**
   - Green light flashing
   - Yellow light flashing

   **AC not sensed by the controls.**
   - Perform the following checks in the order listed below with AC power available in the RV.
   1. Check incoming AC power at the RV outlet.
      - Voltage 108 to 132 volts AC: go to Step 2.
      - No voltage: check RV AC power distribution to the refrigerator circuit.
   2. Check for AC presence at AC power cord at AC power board plug.
      - Voltage 108 to 132 volts AC: go to Step 3.
      - No voltage: replace AC power cord.
   3. Check the condition of the F2 fuse (F3 in previous power boards).
      - Fuse good: go to Step 4.
      - Fuse open: check for a grounded AC heater.
   4. Check the condition of the F2 fuse terminal clips.
      - Clips tight and in good condition: go to Step 5.
      - Clips loose: adjust clips as required.
   5. Connect AC power cord to the power board, then measure voltage across fuse terminals.
      - Fault corrected: voltage present and the controls select AUTO AC operation.
      - Fault NOT corrected: voltage present and the controls select AUTO LP operation.
      - Replace power board.

2. **Set Temperature to 5.**
   - Green light on?
     - NO
     - Green light and Yellow light flashing constantly?
       - NO

   **Controls in AUTO LP operation.**
   - Plug AC power cord into the RV receptacle.

3. To correct a no flame fault:
   1. Make sure LP gas is available to the refrigerator.
   2. Make sure the refrigerator "Manual shut off" valve is open.
   3. Check the condition of the orifice and burner.
      - These components should be cleaned yearly.
   4. Make sure the electrode air gap is 1/8 to 3/16 in.
   5. Check the electrode spark sense wire assembly for continuity.
   6. Make sure the power board is properly grounded to the refrigerator back plate.
   7. Check the power board T1 coil for damage.
      - A loose coil or connector will require power board replacement.

4. **Green “ON” light flashes 1 time every 3 seconds.**
   - Thermistor or its circuit is open or shorted. The controls are in Backup Operating Mode.
   - (1) Check thermistor connections.
   - (2) Measure thermistor resistance. Do not replace the power board or the control panel.

5. **Green “ON” light flashes 2 times every 3 seconds.**
   - Mode switch in control panel faulty.
   - Replace the control panel.

6. **Green “ON” light flashes 3 times every 3 seconds.**
   - AC heater or its circuit is open.
   - Check AC heater connections and continuity.
   - Do not replace the power board or the control panel.

7. **Green “ON” light flashes 4 times every 3 seconds.**
   - The Yellow light (LP operation) is off. Flame sensing circuit fault.
   - Replace the power board.

8. **Green “ON” light flashes 5 times every 3 seconds.**
   - The Yellow light (LP operation) is off. The controls have detected a No cooling condition.
   - (1) First occurrence - reset and then turn the refrigerator Off and back On.
   - (2) Second occurrence - the Power Board has to be hardwire reset. Do not replace the power board or the control panel.

9. **Green “ON” light flashes 6 times every 3 seconds.**
   - The Yellow light (LP operation) is off. Probable causes:
     1. The open limit switch in the cooling unit canister has tripped.
     2. It may be due to poor ventilation, exceeding off-level operation limits, or a dirty burner.
     3. The switch connections or jumper wire is disconnected (units without the high temperature limit switch).
     - Do not replace the power board or the control panel.