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

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

List of Procedures

**Procedure A:** Checking Power Board 628661 Diagnostics Inputs and Outputs on N41X/N41X.3/N51X/N51X.3/N62X/N82X Models.

**Procedure B:** Checking Power Board 628661 Diagnostics Inputs and Outputs on N64X/N64X.3/N84X/N84X.3/12XX Models.

**Procedure C:** Checking Power Board 621267/621268 Diagnostics Inputs and Outputs on N41X/N41X.3/N51X/N51X.3/N62X/N82X Models.

**Procedure D:** Checking Power Board 621269/621270/621271/621272 Diagnostics Inputs and Outputs on N64X/N64X.3/N84X/N84X.3/12XX Models.

**Procedure E:** Checking DC Power Input to the Power Board and Power Board DC power output to the Control Panel.

**Procedure F:** Checking DC Power Input at the Control Panel (applies to Power Boards 621267/621268/621270/621271/621272/621991).

**Procedure G:** Checking DC Power Input at the Control Panel (applies to Power Board 628661).

**Procedure H:** Checking Electronic Controls AUTO Operation (Except N61X/N8X Refrigerators).

**Procedure I:** Checking Electronic Controls Operation N61X/N8X Refrigerators.
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.**

**Accessing Diagnostics**
1. At the same time, press and hold the TEMP SET and MODE switch buttons.
2. Release both buttons when \( \mathbf{1} \) shows on the screen.

**Screen [1] Action**
The \( \mathbf{1} \) turns off. If no LEDs show on the screen after the \( \mathbf{1} \) 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 \( \mathbf{2} \) 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**
The \( \mathbf{3} \) turns off. After a short pause, the screen displays \( \mathbf{3} \) temperature.

**Screen [4] Action**
Screen \( \mathbf{4} \) 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 \( \mathbf{5} \) 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 \( \mathbf{6} \) is used to clear stored fault history. After the screen number turns off, the letters \( \mathbf{6} \) and \( \mathbf{4} \) show on the screen.

To erase fault history:
1. After the letters \( \mathbf{6} \) and \( \mathbf{4} \) display, press and hold the TEMP SET switch button until the letters \( \mathbf{6} \) and \( \mathbf{4} \) show on the screen.
2. Allow the letters \( \mathbf{6} \) and \( \mathbf{4} \) to display for five seconds, then press and hold the TEMP SET switch button until the letters \( \mathbf{6} \) and \( \mathbf{4} \) show on the screen.

**Screen [7] Action**
Screen \( \mathbf{7} \) 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 \( \mathbf{8} \) 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 \( \mathbf{9} \) 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 [0] Action**
Screen \( \mathbf{0} \) 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.
Procedure B: Checking Power Board 628661 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 in the screen.

Screen [1] Action
The 1 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 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 3 turns off. After a short pause, the screen displays fit temperature.

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 is used to clear stored fault history. After the screen number turns off, the letters [Er] show on the screen.
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 in 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 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 [10] Action
Screen 10 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 11 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 C: Checking Power Board 621267 / 621268 Diagnostics Inputs and Outputs – N41X / N41X.3 / N51X / N51X.3 / N62X / N82X Refrigerators**

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

**Screen [1] Action**
- The [1] 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 [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 identifies recent fault items.
- Fresh food compartment door open for more than two minutes.
- Burner failed to light or lit incorrectly.
- DC voltage was lower than 10.5 volts.
- Relay stuck slow.
- AC relay stuck open.
- AC relay stuck closed (3-way refrigerators only).
- *Requires replacing the power board.

**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 identifies recent fault items.
- Thermistor open or shorted.
- DC heater relay stuck closed (3-way refrigerators only).
- DC heater relay stuck open (3-way refrigerators only).
- AC voltage was less than 104 volts.
- AC voltage was over 152 volts.

**Screen [6] Action**
- Screen [6] is used to clear stored fault history. After the screen number turns off, the letters [E] and [F] show on the screen.
- To erase fault history:
  1. After the letters [E] and [F] display, press and hold the TEMP SET switch button until the letters [E] and [F] show on the screen.
  2. Allow the letters [E] and [F] to display for five seconds, then press and hold the TEMP SET switch button until the letters [E] and [F] 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 indicates active inputs to the power board.
- Fresh food compartment door is closed and light is off.
- Thermistor sensing temperature.

**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 indicates active outputs to the power board.
- DC power to AC heater (3-way refrigerators).
- DC power to divider heater.
- DC power to gas valve circuit.
- DC power to light circuit.
- On AC or standby for AC power.
- DC power to ignition circuit.
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 the numbers on the screen.

The screen displays the temperature. After a short pause, the screen displays the temperature.

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 indicates the 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 indicates the recent fault items.

Screen 6 is used to clear the stored fault history. After the screen number turns off, the letters [E] 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 inputs LEDs display. The position of the LEDs indicates active inputs to the power board.

Navigating and Exiting Diagnostics
- To move to the next screen, press and release the MODE switch button.
- To return to the 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 screen shows if any LEDs are on the screen after the first screen turns off, replace the control panel.

Screen [2] Action
The screen displays the power board 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 3 shows active inputs to the power board. After the screen number turns off, the power board inputs LEDs display. The position of the LEDs indicates active inputs to the power board.
Procedure E: Checking DC Power Input to the Power Board and Power Board DC Power Output to the Control Panel

1. Disconnect DC power from the power board. Check for continuity. Replace if open ("blown").
2. 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 F1 fuse.

- YES
  - Is DC voltage input 10.5 to 15.4 volts?
    - YES
      - Measure power board voltage to control panel.
    - NO
      - Is DC voltage input 10.5 to 15.4 volts?
        - YES
          - Measure power board voltage to control panel.
        - NO
          - Replace power board.

Replace power board.

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

Check voltage input to control panel. → Control Panels for Power Board 621991001 → Control Panel Circuit Board Models N61X / N81X

Pt 2: Green: -12 V DC
Pt 3: White/Red: +12 V DC
Pt 5: White/Violet: -12 V DC

Control Panels for Power Boards 621267001 / 621269001 / 621270001 → Control Panel Circuit Board Models N41X / N61X / N82X / N85X / N64X / N64X

Pt 2: White/Red: +12 V DC
Pt 5: White/Violet: -12 V DC

Control Panel Circuit Board Models 120XLR / 121X

To check control operation, proceed to Procedure C. → YES: 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 N61X / N81X p/n 628662

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

Control Panel Circuit Board Models 121X

Connector

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

P/N 628662 (N61X / N81X)

Connector

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

P/N 628663 (N41X / N51X / N62X / N82X)
P/N 628664 (N84X / N19X)

Connector

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

P/N 628665 121X

Is DC voltage input 10.5 to 15.4 volts? YES

To check control operation, go to Procedure I.

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 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: Controls shift and select AUTO LP operation?
      - Yes: AUTO mode controls working as designed. Plug AC power cord into the RV receptacle.
      - No: 2-way Refrigerators
4.1. "A" / "no" "AC" fault
4.2. No AC and No Flame faults display?
   - No: Burner failed to ignite or re-ignite.
   - Yes: "F" / "no" "FL" fault
4.3. AUTO mode controls okay. Plug the AC power cord back into the RV receptacle.

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 NOT corrected: voltage present and the controls select AUTO AC operation.
   - Fault corrected: voltage present and the controls select AUTO LP operation.
   - Replace power board.

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 checked 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.

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).
Procedure I: Checking Electronic Controls AUTO Operation N61X and N81X Refrigerators

Turn ON refrigerator. -> Select AUTO mode operation. -> Set Temperature to 5

Green light on?

YES

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

NO

Green light and Yellow light flashing constantly?

YES

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

NO

Green light on and Yellow light illuminated?

YES

Burner failed to ignite or re-ignite.

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.
   * 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.

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.

Fault Codes displayed by N61X and N81X Control Panel LEDs

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.

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

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.

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

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.

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 cartridg has tripped. It may be due to poor ventilation, exceeding off-level operation limits, or a dirty burner.
2) 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.
This manual has been provided courtesy of
My RV Works, Inc.
www.myrvworks.com

You can find more RV service manuals here:
www.myrvworks.com/manuals

Over the years of running a mobile RV repair service, having a dedicated place
to access service manuals for all the different appliances and components
found on RVs was something that I always had a desire to create.

I hope this resource makes your RV repairs easier, as it has mine, but please
be careful and follow proper safety practices when attempting to repair
your own RV.

If in doubt, please consult with a professional RV technician!

DARREN KOEPP - OWNER, MY RV WORKS, INC.

All service manuals provided on www.myrvworks.com are believed to be
released for distribution and/or in the public domain.