Dometic

Frost Checklist and Troubleshooting Guide for NDA1402 & NEA1402

REFRIGERATOR BULLETIN R82-7A NOVEMBER 2007

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SYMPTOM	CAUSE	LOCATION
1. Ice around Ice maker	Water fill set too high Fill tube not positioned correctly Box not sealed around fill tube Box not sealed around wall entrances Freezer door gasket not sealing Needs auxiliary defrost fan Voltage Real time clock not set Failed defrost cycle	Page 4, Section 4 Page 5, Section 5 Page 5, Section 6 Page 5, Section 6 Page 4, Section 3 Page 3, Section 2 Page 7, Section 12 Page 7, Section 13 Page 7, Section 15
2. Frost around drain tube (Freezer)	Drain tube orifice too small Drain tube clogged Drain tube heater inoperative Needs auxiliary defrost fan Freezer door gasket not sealing Drain cap not in place Voltage Box not sealed around fill tube Box not sealed around wall entrances Real time clock not set Failed defrost cycle	Page 5, Section 7 Page 5, Section 7 Page 6, Section 9 Page 3, Section 2 Page 4, Section 3 Page 5, Section 6 Page 7, Section 12 Page 5, Section 6 Page 5, Section 6 Page 7, Section 13 Page 7, Section 15
3. General frost (Freezer)	Freezer door gasket not sealing Drain cap not in place Needs auxiliary defrost fan Freezer heating element inoperative Drain tube heater inoperative Voltage Box not sealed around fill tube Box not sealed around wall entrances Real time clock not set Failed defrost cycle Drain hose Split	Page 4, Section 3 Page 5, Section 6 Page 3, Section 2 Page 6, Section 10 Page 5, Section 9 Page 7, Section 12 Page 5, Section 6 Page 5, Section 6 Page 7, Section 13 Page 7, Section 15 Page 6, Section 8
4. General frost (Fresh Food)	Drain tube orifice too small Drain tube heater inoperative Fridge heating element Voltage Box not sealed around wall entrances Real time clock not set Failed defrost cycle	Page 5, Section 7 Page 6, Section 9 Page 7, Section 14 Page 7, Section 12 Page 5, Section 6 Page 7, Section 13 Page 7, Section 15
5. Water/condensation at the dispenser	Ice shutter not closing Ice shutter heater inoperative Too warm in coach Water fill set to high Fill tube not positioned correctly	Page 6, Section 11 Page 6, Section 11 Page 3, Section 1 Page 4, Section 4 Page 5, Section 5

SAFETY INSTRUCTIONS

This bulletin has safety information and instructions to help users eliminate or reduce the risk of accidents and injuries.

RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating instructions.

UNDERSTAND SIGNAL WORDS

A signal word , **WARNING** OR **CAUTION** is used with the safety-alert symbol. They give the level of risk for potential injury.

⚠ WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION indicates a potentially hazardous situation which, if not avoided may result in minor or moderate injury.

CAUTION used without the safety alert symbol indicates, a potentially hazardous situation which, if not avoided may result in property damage.

Read and follow all safety information and instructions.

INTRODUCTION

This Bulletin is applicable for the NDA1402 & NDE1402 model refrigerators. It primarily deals with Frost and Ice issues in the freezer section regarding the auto defrost system.

TOOLS REQUIRED

The refrigerator can be checked with a Phillips screwdriver and a multimeter for checking resistance.

CHECKLIST

Perform the following tasks.

- Make sure the freezer door is sealing properly.
- Check if the water supply for the ice maker needs adjusting.
- Verify that the ice maker water fill tube is in place.
- Check the cabinets wall entrances for wire harnesses and fill tube sealing.
- Make sure the drain plug at the bottom of the freezer is in place.
- Inspect the drainage tube to see if it's blocked or if the orifice needs to be increased.
- Check if the drainage heater is looped and measure the resistance.
- Verify that the ice shutter is working/sealing properly.

IMPORTANT

The Refrigerator must be completely defrosted before repairs are completed to ensure proper operation.

1. INTERIOR COACH TEMPERATURE

If the interior of the coach is not air conditioned, allowing for higher temperatures and humidity in the inside of the coach, it's possible to get condensation running out of the dispensing area of the freezer door and onto the floor.

2. AUXILIARY DEFROST FAN KIT

Refrigerators with serial numbers below 707XXXXX may require an auxiliary fan kit to be installed for proper defrosting. Contact Technical Service at 800-216-5115 to order an auxiliary fan kit (Part# 385130901). The Refrigerator must be completely defrosted before repairs are completed to ensure proper operation.

3. FREEZER DOOR GASKET

Check the gasket on the doors to be sure of a positive air seal. A simple method to check gaskets is to close the door on a dollar bill, then pull the dollar bill out. If no resistance is felt, the gasket in that place is not sealing properly. This should be done on all sides of the door in several places. For freezer doors not sealing at the angled portion of the door, replace the sealing strip mounted under the gasket. For refrigerators lacking this strip, install strip under the door gasket. See Fig. 1.

If a gasket is not sealing properly, lift up inside of door gasket and insert 1/4" ball of fiberglass insulation at all corners of the door. Next warm the gasket material with a hair dryer. Then close the door and the magnetic strip should pull the gasket to the metal frame. Leave the door closed until the material has cooled. Then recheck for a positive seal. If a positive seal cannot be achieved, replace the door gasket.

Note: Air leaks will cause insufficient cooling as well as rapid formation of frost.

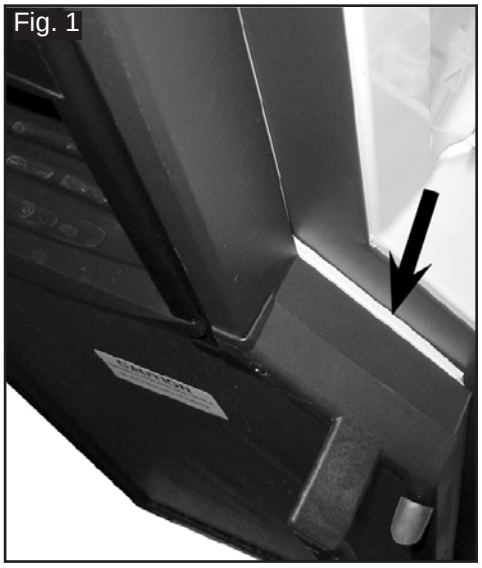


Fig. 1

Open the freezer door and gently fold back the gasket in order to check the condition of the sealing strip. Replace or install a new sealing strip if necessary. See Figs. 2 & 2A.

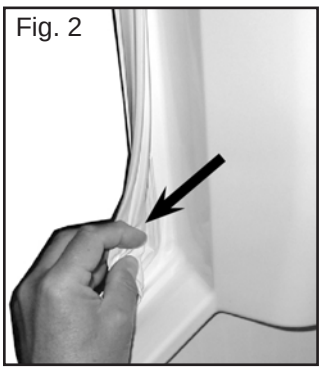


Fig. 2

Fig. 2A

4. WATER FILL/SUPPLY

Check the ice maker and make sure the mold is not overfilled and leaking water.

To prevent the mold from being overfilled with water, regulate the water supply by removing the cover and turn the adjusting screw (1 turn = 20 cc). See Fig. 3.

Note: The amount of water varies depending on water pressure.

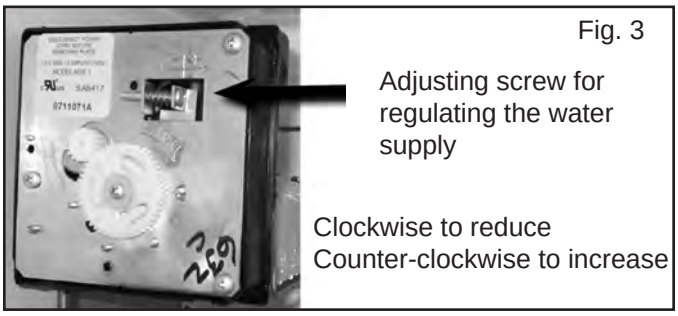


Fig. 3

In some cases a foaming/overspray will be noticed around the fill cup area. This may be noticed if the water pressure is unregulated or in excess of 40-50 psi.

To determine if foaming/overspray is happening:

- Disconnect city water supply.
- Turn water pump switch on.
- Set the ice maker water supply line shut-off valve to "full open".
- Remove ice bin.
- Remove cover from face of ice maker.
- Rotate ice maker main gear/sprocket using channel-lock pliers until bail arm begins to lift.
- Depress & hold freezer door switch (to allow AC power to pass into freezer compartment & ice maker).
- Allow ice maker to cycle.
- Just before end of cycle observe water fill at rear of ice maker (shine flashlight into compartment and observe cup).

Also, you can test the overspray scenario with city water supply as well by reversing steps 1 & 2 to shut off the water pump and connect to city water supply.

If foaming/spraying occurs:

1. Inspect/Replace water line insert.
   - The larger insert (.140 ID) allows for greater flow and greater possibility of overspray. The recommended size should be (.125 ID). See Fig. 4.

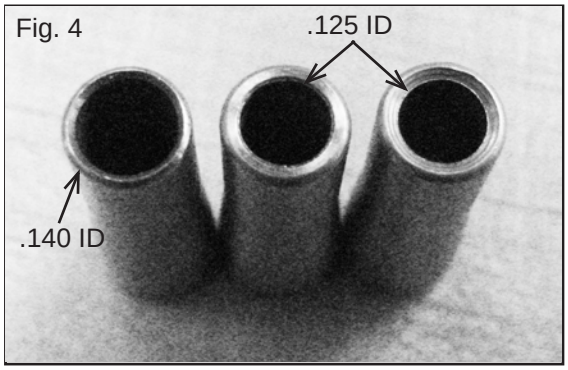
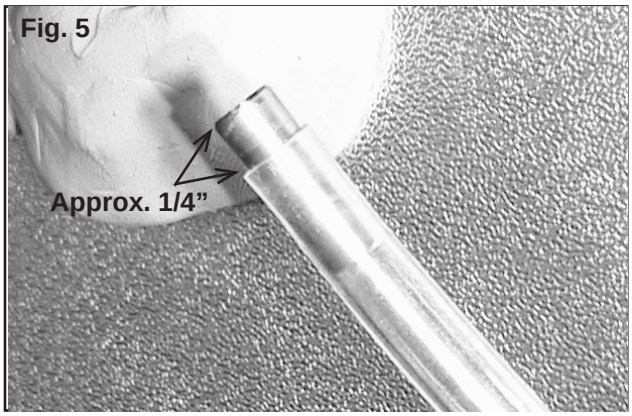
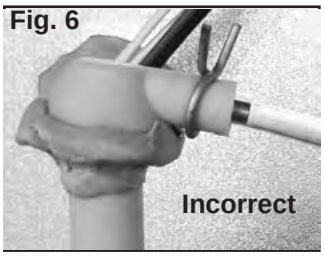
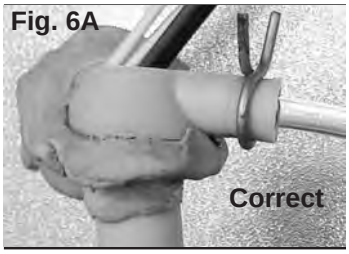


Fig. 4

- The insert needs to be partially (not fully) inserted into the clear tubing. See Fig. 5.
- Clear tube and insert need to be inserted into the angled fill tube so that the insert is flush with the edge of the fill tube. See Figs. 6 & 6A.
- Spring clip needs be positioned so that it is firmly pinching down onto metal insert. See Figs. 6 & 6A.





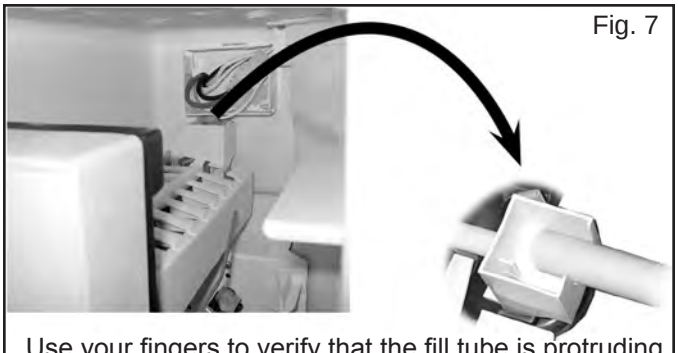


In most applications, removing the upper side wall vent will provide access to the ice maker fill tube. For applications using a roof vent, removal of the refrigerator may be necessary.

2. Reduce the flow of water into ice maker.
    - A permanent fix would be to regulate the water supply using a pressure reducing valve before the inlet side of our water solenoid valve (regulate between 40 and 50 psi).
    - A temporary solution in-the-field would be to turn the manual shut-off valve “OFF”. And then reopen the valve approx 1/4 turn (less if a “ball” type valve is used)

5. ICE MAKER FILL TUBE

To avoid the risk of water leakage outside the inlet, make sure the ice maker fill tube (located behind the ice maker) is inserted far enough in the ice maker water inlet cup. See Fig. 7.



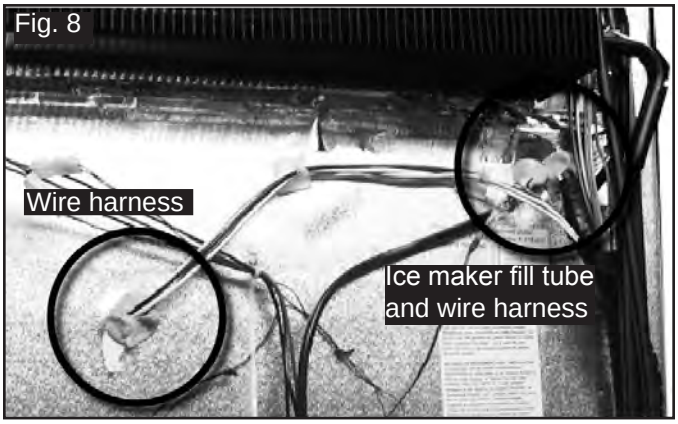
Use your fingers to verify that the fill tube is protruding approx. 1/2” into fill cup.

6. WALL ENTRANCES

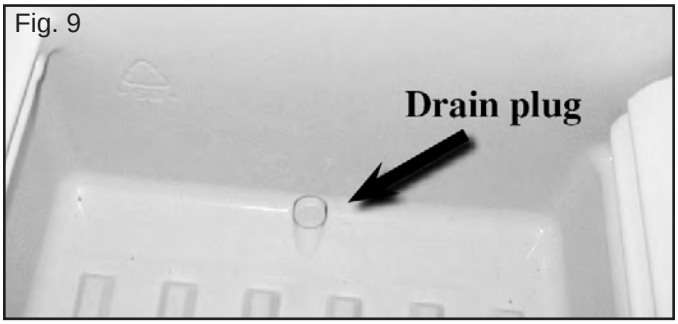
To prevent air leaks from the outside, it is vital to make sure that wall entrances have been sealed properly and that the drain plug is inserted at the bottom of the freezer compartment. See Figs. 8 & 9.

Verify that the wall entrances for the wire harnesses and for the ice maker fill tube have been sealed properly. If necessary, apply a putty type sealant around the openings from the inside as well as from the outside.

In most applications, removing the upper side wall vent will access the entrance points. For applications using a roof vent, removal of the refrigerator may be necessary.



Locate the drain plug at the bottom of the freezer compartment. Make sure the drain plug is in place. If the plug is missing, install with a new one. See Fig. 9.



7. DRAIN TUBE

The drainage tube must be free from anything blocking the passage. The required orifice dimension is 1/4”.

Check the drainage tube for blockage, ice, dirt etc. and clean if necessary. If the orifice dimension is smaller than 1/4”, use a sharp tool to increase the orifice size. See Fig. 10.

Check orifice diameter. Should be ¼”

8. DRAIN HOSE

Excessive frost or moisture can occur if the drain hose on the back of the refrigerator is split or broken allowing warm air back into the fresh food or freezer compartment. Check to make sure that the hose is sealed and the drain plug or flapper/check valve is installed in the end of the hose.

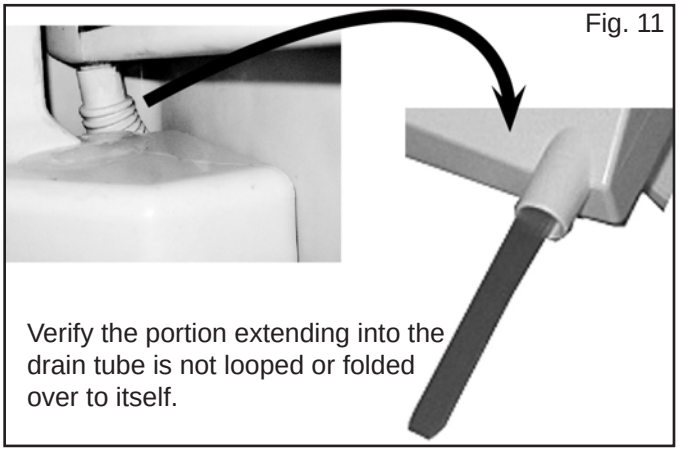
9. DRAIN TUBE HEATER

⚠ WARNING

Shock Hazard. The 120 VAC electrical power supply to the refrigerator must be turned "OFF" prior to testing the drain tube heater. Failure to heed this warning may cause death or severe personal injury.

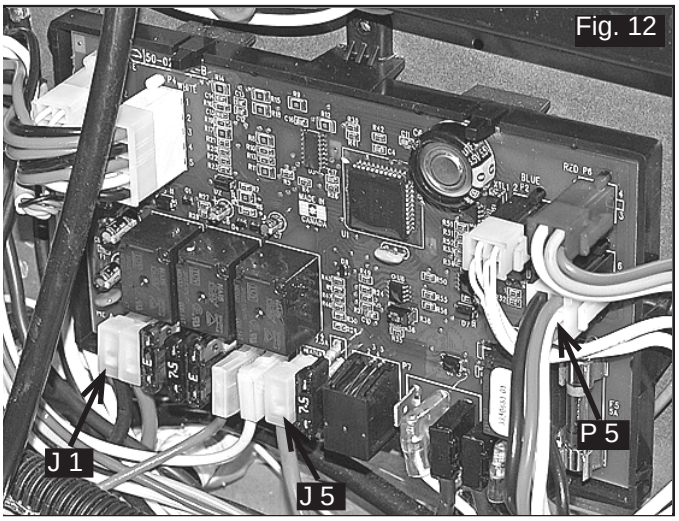
- Ensure the drainage heater is not looped or folded over. See Fig. 11.
- Check the resistance of the heater. To measure the resistance of the heater, remove the cover of the main control board on the back of the refrigerator. Remove P5 cable from lower pc board. Measure resistance between pin 5 white wire and pin 2 yellow wire. You should have a resistance reading of approximately 12.5 ohm's +/- 10%. The refrigerator should be defrosted prior to this test to avoid erroneous readings. Frost/Ice could conduct current hiding an open circuit in the heater. See Fig. 12.

Fig. 11



Verify the portion extending into the drain tube is not looped or folded over to itself.

Fig. 12



10. FREEZER HEATING ELEMENT

⚠ WARNING

Shock Hazard. The 120 VAC electrical power supply to the refrigerator must be turned "OFF" prior to testing the freezer heating element. Failure to heed this warning may cause death or severe personal injury.

Check the resistance of the freezer surface heater. To measure the resistance of the heater, remove the cover of the main control board on the back of the refrigerator. Remove red wire from J5 terminal and black wire from J1 terminal from lower pc board. Measure the resistance between these two wires. The resistance reading should be 2 ohm's +/- 10%. The refrigerator should be defrosted prior to this test to avoid erroneous readings. Frost/Ice could conduct current hiding an open circuit in the heater. See Fig. 12.

11. ICE SHUTTER

Ensure the ice shutter closes properly. Give the shutter a little push and watch it close completely. Verify for debris on the shutter that does not allow for a tight seal. If it is not working as intended, the dispenser mechanism should be disassembled for troubleshooting. See Fig. 13.

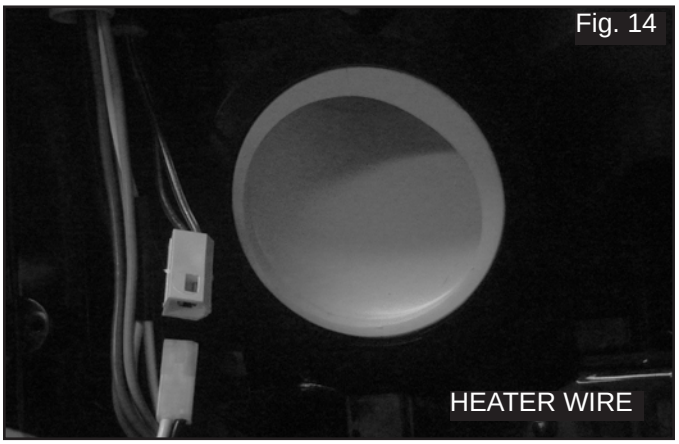
Fig. 13

⚠ WARNING

Shock Hazard. The 120 VAC electrical power supply to the refrigerator must be turned "OFF" prior to testing the heating element. Failure to heed this warning may cause death or severe personal injury.

There is a heater on the door that the shutter rests against. If the heater is inoperative this could allow for condensation in the door that could run out onto the floor. The shutter heater wires are located behind the dispenser controls. To access the heater wires remove the water drip tray at the bottom of the dispenser located on the outside of the freezer door. This will expose three screws holding the trim strip to the freezer door. Once the screws have been removed lift the trim up and pull outward at the bottom to remove the trim. Then locate and remove the three screws attaching the dispenser controls to the freezer door. This will expose the heater wires.

An ohms test should be performed on the two clear wires going into the freezer door separate from the larger wire harness by measuring across the two pins in the connector. The resistance should be approximately 7220 ohms +/- 10%. See Fig. 14.



12. VOLTAGE AND WIRE GAUGE

All the defrosting elements operate on 12 VDC. Necessary voltage is >10.5 VDC during active defrost.

Note: The defrosting cycle will not start if the voltage is below 10.5 VDC. It is important that the wires to the 12 VDC terminal are of proper wire size.

- Check the DC supply.
- Check wire gauge to ensure that it is in accordance with recommended dimensions.

Length (ft)	Min. size (AWG)
< 33	12
33-66	10
> 66	8

13. REAL TIME CLOCK

To get the best performance from the refrigerator, defrosting is performed when the least amount of demand is on the refrigerator. Therefore the refrigerator has a real time clock that controls the defrosting process. The clock runs even if the refrigerator is switched “OFF”. However, if the +12 VDC supply (battery voltage) is disconnected, the clock will continue to run only about three weeks. So if battery voltage has been disconnected for more than three weeks, the clock must be set again. This will be indicated by horizontal bars (- - - -) in all four, seven-segment displays. Even if this “clock not set” warning is not shown, the clock should be checked at regular intervals (at least once per year) to ascertain that the time setting is correct. It is also recommended to set the clock when entering a different time zone.

14. FRIDGE HEATING ELEMENT

⚠ WARNING

Shock Hazard. The 120 VAC electrical power supply to the refrigerator must be turned “OFF” prior to testing the fridge heating element. Failure to heed this warning may cause death or severe personal injury.

Check the resistance of the heater. To measure the resistance of the heater, remove the cover of the main control board on the back of the refrigerator. Remove P5 cable from lower pc board. Measure resistance between pin 6 red wire and pin 3 black wire. You should have a resistance reading of approximately 3.6 ohm’s +/- 10%. See Fig. 12.

15. AUTOMATIC DEFROSTING

Defrosting is initiated automatically every 24 hours, at 1:00 AM. However, a defrosting is only initiated if the temperature in the freezer is lower than 18° F at 1:00 AM. If the battery voltage is lower than 10.5 VDC the defrosting start is delayed until the battery voltage is restored. If it is not restored within 3 hours, the defrosting will be skipped.

Note: There is a blocking function that inhibits automatic defrosting during the first 24 hours after the refrigerator is switched “ON”. This 24 hour blocking function is re initialized every time the refrigerator is switched “OFF” for more than one hour.

Temperature “pull down”

When a defrosting is initiated, the first thing that happens is that the refrigerator pulls down the compartment temperatures to thermostat “cut out” levels. If these levels are not reached within one hour, the defrosting sequence starts anyway.

Cooling unit relax time

After the temperature pull down period, the real defrosting sequence is started. The cooling unit is now switched “OFF”, but nothing more happens for 10 minutes to let the cooling unit relax.

Heating in the freezer

After the relaxing period, the heating elements in the freezer and in the water drain are switched “ON”. The fan in the freezer is at the same time stopped to prevent the food from being heated by hot air.

The heating stops when the temperature on the cooling surfaces has reached 41° F or when 75 minutes has elapsed. If the heating is stopped by the time criteria, the defrosting is treated as incomplete. An incomplete defrosting could depend on either extreme ice on the cooling surface, or that the battery voltage has became so low that the heating effect was insufficient.

The heating is also stopped before the defrosting is completed if the battery voltage drops below the battery protection level.

If 2 incomplete defrostings occur in a row, the warning message “Er 01” is displayed.

Note: The WARNING “Er 01” indicates that 2 or more consecutive defrosting attempts failed. This message will disappear when a defrosting has completed successfully. But it will also be cleared if power is switched “OFF” and then “ON”.

Heating in the fridge

After the defrosting of the freezer, the cooling unit is restarted again. It takes some time before cold is produced and during that period, the defrosting in the fridge now takes place. After a one minute delay, the heating element in the fridge is switched “ON”. The fan in the fridge is stopped during this defrosting cycle. The heating element in the water drain line remains “ON”.

The defrosting in the fridge is terminated when the temperature on the cooling surfaces has reached 41° F or when 20 minutes has elapsed.

After the defrosting, normal thermostatic operation is restarted again. However, the heating element in the water drain is still “ON” for some time. It is switched “OFF” 30 minutes after the start of the fridge defrosting period.

Freezer fan operation during and after a defrosting

The fan in the freezer is stopped during defrosting in the freezer, but it is started for short periods at certain intervals for testing and to prevent it from being blocked. A permanently blocked fan will result in the error code “Er 02”.This error message is also shown if the fan is permanently blocked during normal thermostatic operation.

After a defrosting, the fan in the freezer is not started until the temperature on the cooling surfaces becomes colder than the air temperature in the freezer.

Note: The warning “Er 02” indicates that the fan in the freezer is blocked (by ice probably). As soon as the fan can move again, this message disappears. The fan has to be blocked for at least one hour before this message is shown. When the fan is “OK” it will only be a delay of about one minute before the message is cleared.

Power breaks during a defrosting

If the +12 VDC is removed for short periods of time or if the refrigerator is switched “OFF” and then “ON” again during a automatic defrost, the defrosting will continue from the point where it was interrupted. However, if power has been “OFF” for more than one hour, the remaining part of the defrost is skipped.

Cancelling of an automatically initiated defrosting

If, for some reason an automatically initiated defrosting needs to be cancelled. Enter the “Service mode”. Then switch the refrigerator “OFF” and then “ON” again. This cancelling will not work immediately after the defrosting is initiated a 1:00 AM. Wait at least three minutes before trying to cancel the defrosting.

16. ENTERING THE SERVICE MODE

Before entering the “Service mode”, switch “OFF” the refrigerator with the “ON/OFF” button. To enter the service mode, press and hold the “SET” button then press “ON/OFF” button to the “ON” position. In this mode the refrigerator is not operating normally. Instead a number of tests can be performed and the “SET” button is used to step through the tests. The test number and the result of the test are displayed alternating (flashed). Stepping beyond the last test will result in a restart from test number 1 again. The refrigerator will automatically exit the “Service mode” if no action is detected for 3 minutes. To manually exit, switch the refrigerator “OFF” and then back “ON” again.

17. MANUAL DEFROSTING

A manually initiated defrosting will start if the “AUTO/STORE” button is held down during “power up”. However, if the freezer door is open during this initiation, a drying up period is instead started. (See below). A manually initiated defrosting is identical to an automatically initiated defrosting with the exception that the defrosting sequence starts immediately with the “relaxing period”, that is without any initial temperature “pull down” period. A manually initiated defrosting may be cancelled at any time just by switching the refrigerator “OFF” and then “ON” by means of the “ON/OFF” button. However, a short 12 VDC power break will not cancel the defrosting.

18. DRYING FUNCTION

When the refrigerator is to be off for some time, the compartments must have a chance to dry up to prevent mold from forming. The doors should then be left open. However, the cooling surfaces in the freezer will dry very slowly as they are well encapsulated and the air convection is small. Therefore the refrigerator has a feature that can speed up the drying up of the freezer. To initiate this drying function, start the refrigerator with the “AUTO/STORE” button held down and the freezer door open. If required, the drying function starts with a defrosting. The drying period will take about 3 hours (longer if a defrosting is first performed). Afterwards the refrigerator is automatically switched off. The drying function may be terminated by switching off the refrigerator or by closing the freezer door.

TROUBLESHOOTING RECORD FORM FOR NDA/NDE1402

Product # .....

Serial # .....

Notified Error Codes .....

Checklist results:

Task	Checked	Comments
1. Freezer door gasket		
2. Water supply		
3. Ice maker fill tube		
4. Wall entrances		
5. Drainage tube		
6. Drainage heater		
7. Ice shutter		
8. DC voltage and wire gauge		

Comments .....

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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.

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