



# DIAGNOSTIC SERVICE MANUAL

## NDA1402 & NDE1402

### WITH AUTO DEFROST

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## Foreword

This service manual is the result of the dedication of Dometic, LLC technical staff and its engineers in giving service people the necessary instruction for making accurate analyses of certain conditions. Provided is a diagnostic chart leading a qualified mechanic into the service manual pages to locate and solve symptoms which may occur. Dometic, LLC has continued its commitment in providing service people with this, the most up-to-date information about servicing Dometic RV accessories.

## SAFETY INSTRUCTIONS

This manual 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** When 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.

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This service manual will address the most common system problems associated with the NDA 1402 and NDE 1402 refrigerators supplied by Dometic, LLC. Our intent is to provide you with a guideline of checks to make, should you encounter one of the following symptoms.

SYMPTOM	CAUSE	SECTION & PAGE
1. No operation - no panel lights	Operation DC Volts Fuses Wiring Front Display Panel Lower Circuit Board	1, page 09 4, page 14 5, page 21 14, page 48 5, page 18 5, page 21
2. No operation - has panel lights	Operation DC Volts Temperature Sensors Wiring Lower Circuit Board	1, page 09 4, page 14 5, page 15 14, page 48 5, page 21
3. No AC operation - operates on gas mode	Operation AC Volts Fuses Heating Elements Wiring Lower Circuit Board	1, page 09 2, page 12 5, page 21 3, page 12 14, page 48 5, page 21
4. No Gas operation - operates on AC mode	Operation LP Gas Manual Gas Valve Ignition Control Module High Voltage Cable Electrode Solenoid (Gas) Wiring Lower Circuit Board	1, page 09 6, page 22 7, page 22 5, page 17 5, page 17 5, page 17 5, page 18 14, page 48 5, page 21
5. Insufficient cooling on all modes.	Ventilation Ventilator Fans Leveling Ambient Temperature Drain Tube Wall Entrances Temperature Sensors Cooling Unit	8, page 25 8, page 27 8, page 27 8, page 27 9, page 29 9, page 29 5, page 15 8, page 23
6. Insufficient cooling on AC - cools properly on gas mode.	AC Volts Heating Elements Lower Circuit Board	2, page 12 3, page 12 5, page 21

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SYMPTOM	CAUSE	SECTION & PAGE
7. Insufficient cooling on Gas - cools properly on AC mode.	LP Gas Orifice Flue Baffle Flue Tube Burner Lower Circuit Board	6, page 22 7, page 22 7, page 23 7, page 23 7, page 23 5, page 21
8. Water on frame	Interior Liner Seal to Frame Wall Entrances High Humidity Frame Heater	9, page 28 9, page 29 9, page 29 5, page 15
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12. General Frost (freezer)	Door Seals Interior Liner Seal to Frame Wall Entrances Drain Hose Freezer Defrost Heating Element Drain Tube/Tray Heating Element	9, page 27 9, page 28 9, page 29 9, page 29 10, page 31 10, page 32
13. General Frost (fresh food)	Door Seals Interior Liner Seal to Frame Wall Entrances Drain Hose Fresh Food Heating Element Drain Tube/Tray Heating Element	9, page 27 9, page 28 9, page 29 9, page 29 10, page 32 10, page 32

This service manual will address the most common system problems associated with the NDA 1402 and NDE 1402 refrigerators supplied by Dometic, LLC. Our intent is to provide you with a guideline of checks to make, should you encounter one of the following symptoms.

SYMPTOM	CAUSE	SECTION & PAGE
14. Ice maker fails to start	Operation Mold Thermostat Shutoff Arm Water Valve Interface Module	12, page 38 12, page 39 12, page 39 12, page 39 3, page 13
15. Not making enough ice	Operation Mold thermostat	12, page 38 12, page 39
16. Ejector blades frozen into ice	Water Fill Adjustment Water Supply Water Valve	12, page 40 12, page 41 12, page 39
17. Ice around ice maker	Water Fill Adjustment Water Supply Fill Tube	12, page 40 12, page 41 12, page 40
18. No ice or water at the dispenser	Operation Lock Out Feature Freezer Door is Open Door Mechanism and Display Panel Interface Module	13, page 46 13, page 46 13, page 46 13, page 48 3, page 13
19. No ice at the dispenser	Operation Lock Out Feature Freezer Door is Open Door Mechanism and Display Panel Auger Interface Module	13, page 46 13, page 46 13, page 46 13, page 48 13, page 46 3, page 13
20. No "cubed" ice at the dispenser	Operation Door Mechanism and Display Panel Solenoid Interface Module	13, page 46 13, page 48 13, page 47 3, page 13
21. Water/Condensation at the dispenser	Water Fill Adjustment Ice Shutter High Humidity	12, page 40 13, page 47 9, page 29

# SECTION 1

## REFRIGERATOR OVERVIEW

### ABSORPTION COOLING SYSTEM

In an absorption refrigerator system, ammonia is liquefied in the finned condenser coil at the top rear of the refrigerator. The liquid ammonia then flows into the evaporator (inside the freezer section) and is exposed to a circulating flow of hydrogen gas, which causes the ammonia to evaporate, creating a cold condition in the freezer. When starting this refrigerator for the very first time, the cooling cycle may require up to four hours of running time before the cooling unit is fully operational. The tubing in the evaporator section is specifically sloped to provide a continuous movement of liquid ammonia, flowing downward by gravity through this section.

### IMPORTANCE OF LEVELING

Leveling is one of the requirements for proper operation with absorption refrigerators. To ensure proper leveling the vehicle needs to be leveled so it is comfortable to live in (no noticeable sloping of floor or walls). Any time the vehicle is parked for several hours with the refrigerator operating, the vehicle should be leveled to prevent this loss of cooling. If the refrigerator is operated when it is not level and the vehicle is not moving, liquid ammonia will accumulate in sections of the evaporator tubing. This will slow the circulation of hydrogen and ammonia gas, or in severe cases, completely block it, resulting in a loss of cooling. When the vehicle is moving, the leveling is not critical, as the rolling and pitching movement of the vehicle will pass to either side of level, keeping the liquid ammonia from accumulating in the evaporator tubing.

### AUTOMATIC DEFROSTING CONTROL SYSTEM

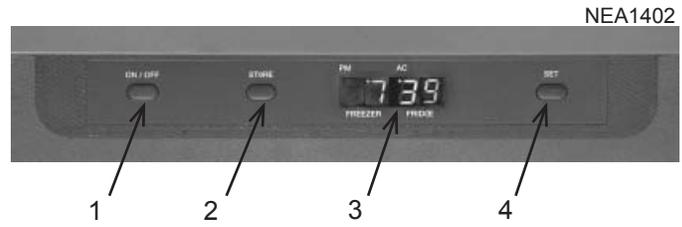
This refrigerator is equipped with an automatic defrosting control system. The defrost system will automatically carry out a defrost of the frozen food and fresh food compartments once every 24 hours. To be able to control the performance of the defrost intervals the system is equipped with a built in real time clock. The clock has to be set to local time at the very first start up of the refrigerator or when the 12 volt DC supply has been disconnected for a long period of time. A message on the LED display panel will alert when the clock needs to be set. It is also recommended to reset the clock when entering different time zones.

### MODES OF COOLING

**NDA1402:** This refrigerator is equipped with an automatic energy selector system which automatically selects the most suitable energy source that is available, either 120 volt AC or LP gas operation. The system can be set by the user to be fully automatic, or to operate on LP gas only.

**NEA1402:** All-electric operation.

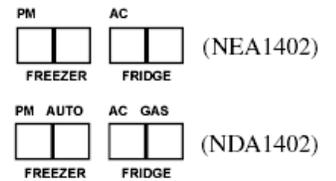
## USING THE CONTROL FEATURES



1. ON/OFF button.  
Press this button to turn the refrigerator on and off.
2. STORE button. (NEA1402)  
AUTO/STORE button. (NDA1402)  
Combined energy mode selection and store button.
3. LED display panel.
4. SET button.  
Combined temperature range and real time clock adjustment.

### LED DISPLAY PANEL

The LED panel displays temperatures in the refrigerator, current modes of operation and other useful status messages.



The displayed temperature values reflect the most probable temperature of the food in the two compartments. A delay function prevents rapid changes due to door openings etc.

#### Panel Indications:

- The most probable temperature of food in the frozen food compartment.
- The most probable temperature of food in the fresh food compartment.
- AUTO mode indication (NDA1402)
- AC operation indication.
- GAS operation indication (NDA1402)
- Thermostat setting indication (temporary during setting).
- Real time clock/ PM indication (temporary during setting).
- Various status and error messages.

### STORE FUNCTION

When setting the real time clock as well as the thermostat, the desired setting is stored automatically after 5 sec. of inactivity or by pressing the STORE button.

## OPERATION

Before starting the refrigerator, check that all the manual gas valves are in the “ON” position. DO NOT forget the manual shutoff valve on the rear of the refrigerator. The NDA1402 model refrigerator is equipped with a control system which can be set to automatically select either 120 volt AC or LP gas operation (AUTO mode), or if desired LP gas only (GAS mode). The NDE1402 model refrigerator is an all electric 120 volt AC operation.

### **⚠ WARNING**

**Most LP gas appliances used in recreational vehicles are vented to the outside of the vehicle. When parked close to a gasoline pump or traveling through tunnels, it is possible that the gasoline fumes could enter this type of appliance and ignite from the burner flame, CAUSING A FIRE OR AN EXPLOSION.**

**FOR YOUR SAFETY, when refueling or traveling through tunnels, shut off all LP gas appliances which are vented to the outside.**

## AUTOMATIC ENERGY SELECTOR CONTROL SYSTEM

The NDA1402 model is equipped with an automatic energy selector control system. The user turns the refrigerator on and selects the desired temperature and then, the control system selects the most suitable energy source available (either 120 volt AC or LP gas operation). The system can be set by the user to be fully automatic (AUTO mode ON) or to operate on LP gas only (AUTO mode OFF).

The NDE1402 model is an all electric operation.



Press AUTO/STORE button to select AUTO mode operation or to chose LP-gas mode of operation only.

## MODES OF OPERATION (AUTO) & (GAS)

When the refrigerator is in the AUTO mode, it automatically uses the most efficient energy source that is available for operation. Should a more efficient energy source become available during operation, the refrigerator will change from the current energy source to the more efficient energy source as follows:

- AC operation (if 120 volt AC is available). AC operation is only possible in AUTO mode.
- GAS operation (if 120 volt AC is not available).

### GAS mode (manual LP gas operation)

When the AUTO mode is turned off, the refrigerator uses gas as an energy source - even if AC is available.

## DESCRIPTION OF OPERATING MODES

### Auto Mode

When operating in the AUTO mode, the AUTO mode indicator dot is lit. The control system will automatically select between AC and GAS operation with AC having priority over GAS. (An indicator dot will be lit to inform of the energy source selected). If the control system is operating with AC energy and it then becomes unavailable, the system will automatically switch to GAS. As soon as AC becomes available again the control will switch back to AC operation.

**Gas operation** (120 volts AC is not available). The control system will activate the ignition system and will make three attempts to light the burner for a period of approximately 45 seconds with two minutes rest (purge) interval. If unsuccessful, “ch LP” will be displayed. To restart an ignition attempt with “ch LP” in the display turn the unit off, wait a few seconds and turn back on. The control system will attempt a new ignition sequence. If 120 volts AC becomes available while “ch LP” is displayed, the refrigerator will operate on AC but the “ch LP” will not turn off until the main power ON/OFF button is pressed to the “OFF” then “ON” position.

### GAS MODE

When operating in the GAS mode, the AUTO indication dot will be off and the GAS indication dot is lit. This mode provides LP gas operation only. The control system will activate the ignition system and will make three attempts to light the burner for a period of approximately 45 seconds with two minutes rest (purge) interval after each trial. If unsuccessful, “ch LP” will be displayed. To restart GAS Operation, press the main power ON/OFF button to the “OFF” and then “ON” position. The control system will attempt a new ignition sequence. If the refrigerator has not been used for a long time or the LP tanks have just been refilled, air may be trapped in the supply lines. To purge the air from the lines may require resetting the main power ON/OFF button three or four times. If repeated attempts fail to start the LP gas operation, check to make sure that the LP gas supply tanks are not empty and all manual shutoff valves in the lines are turned on.

### To Shut Off The Refrigerator

The refrigerator may be shut off while in any mode of operation by pressing the main power ON/OFF button to the “OFF” position. This shuts off all DC power to the control system including the interior light.

## START UP

NDE1402:

Turn on the refrigerator by pressing the ON/OFF button.

NDA1402:

### **⚠ WARNING**

**FIRE HAZARD.** If the refrigerator has not been used for some time, and before lighting the gas burner. Check that the gas path between the burner jet and the burner tube has not been obstructed. Failure to heed this warning could cause a fire resulting in death, severe personal injury and property damage.

- Before turning on the refrigerator, verify that all the manual gas valves, including the manual shut off valve, are in the “ON” position.
- Turn on the refrigerator by pressing the ON/OFF button.

## REAL TIME CLOCK



If the real time clock has to be set, the LED panel will show flashing horizontal bars “-- --”.

- To enter “TIME MODE”, keep the SET button pressed until figures flash on the LED panel.
- (Hours are to the left and minutes to the right.)
- Press the SET button to adjust to local time. AM/PM should also be set here.
- Store each setting by pressing the AUTO button (NEA 1402) - AUTO/STORE button (NDA 1402) or use the automatic store function (wait 5 sec.).

**NOTE:** It is important to check the clock setting every month and to reset when entering different time zones. This is to allow proper defrosting daily at 1:00 am.

## THERMOSTAT SETTING

The freezer and the fresh food compartment temperatures are controlled separately and independently of each other, based on the actual air temperature in each compartment.

- The freezer setting is pre-set (can not be changed) to be approx. 0°F (-18°C) when running on AC. If running on GAS the pre-set temperature is approx. 7°F (-14°C).
- The fresh food compartment can be set in 5 different positions (1-5) where 5 is the coldest setting which gives a fresh food temperature of approx. 33°F (0°C). Setting 3 gives a temperature of approx. 37°F (3°C).



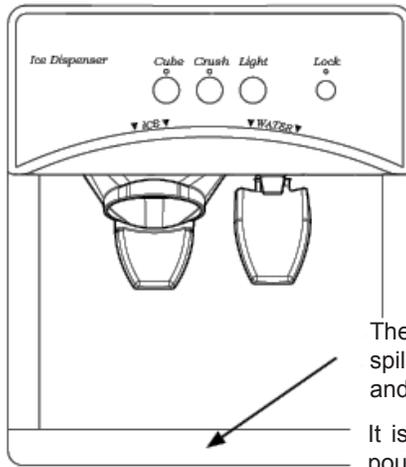
- Press the SET button to set the thermostat. Thermostat range is 1 to 5, where 5 represent's the coldest compartment temperature.
- Press the STORE button to store or use the automatic store function (wait 5 sec.).

## MANUAL DEFROST



The refrigerator can be set to defrost at any time. Usually a defrost cycle takes about 1 hour but will depend on the amount of frost and could therefore vary from time to time.

- Switch off the refrigerator with the ON/OFF button.
- Press and hold the AUTO button (NEA 1402) - AUTO/STORE button (NDA 1402). Then, press the ON/OFF button. “dE Fr” is displayed.



The drip tray catches small spills. The tray is removable and dishwasher safe.

It is not a drain; **DO NOT** pour water directly into this area.

### ICE DISPENSER (OPTIONAL)

For a refrigerator to provide ice through the door, the ice maker first dumps the ice it produces into a large bin. To request ice at the door, select Cube or Crush and then press the lever. This will activate a switch which turns on a motor that rotates the auger. When the auger rotates, it pushes ice out of the bin, through a chute right into the glass. To stop dispensing, pull the glass away from dispensing arm before the glass is full. Allow the ice chute to clear before removing the glass.

### WATER DISPENSER (OPTIONAL)

The water dispenser works much like the ice dispenser. To request water at the door, simply press the lever. This will activate a switch which turns on an electric water valve at the back of the refrigerator. Water will flow through a separate tube right into the glass.

**NOTE:** The NDA/NDE1402 models use “Non-chilled” water at the door dispenser.

### LOCK OUT FEATURE

The ice dispensing system can be locked out to prevent unwanted use.

- **Lock out**  
To lock out, press the “Lock” pad for (3-5) seconds until the RED light above the Padlock comes on.
- **Unlock**  
To unlock, press the “Lock” pad for (3-5) seconds until the RED light above the Padlock goes out.

### DISPENSER LIGHT

The light can be turned on and off by pressing the “Light” touch pad. The light will illuminate the dispenser area. The light will also turn on automatically when ice or water is dispensed.

### AUTOMATIC POWER SUPPLY SWITCH OFF

For safety reasons, when opening the freezer door, the ice/water dispenser and ice maker system will automatically shut off. Closing the freezer door automatically resumes operation of ice/water dispensing and ice maker operation.

## SECTION 2

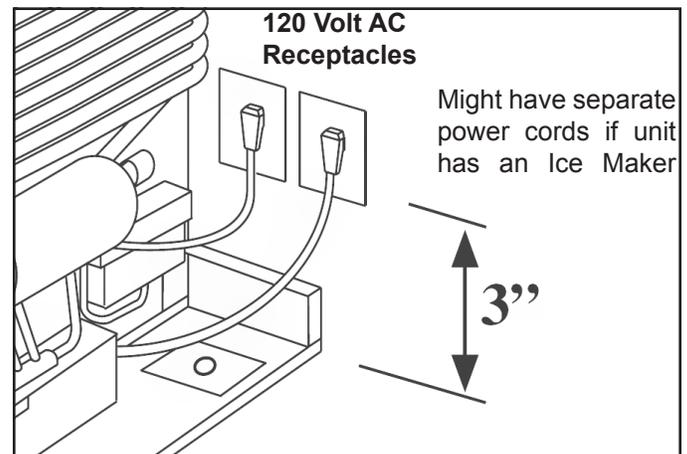
### AC VOLTAGE

#### AC VOLTAGE REQUIREMENTS

#### **⚠ WARNING**

**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**

The refrigerator is a 120 volt AC, 60 Hz appliance. The proper operating range is 108 to 132 volts. If the voltage drops below 108 volts, cooling efficiency will decrease as the voltages decreases. Check the AC volts at the receptacle where the refrigerator is attached. If the voltage is outside of the proper operating range, correct the power source problem.



The refrigerator is equipped with a three-prong (grounding) plug for your protection against shock hazards and should be plugged directly into a properly grounded three prong receptacle. **Do not cut or remove the grounding prong from this plug!** The free length of the cord is 3 feet. It is recommended that the receptacle is located to the right side of the refrigerator (viewed from the rear). The receptacle should be 3” (from the bottom of the plastic receptacle) above the refrigerator mounting floor. This allows easy access through the vent door. The cord should be routed to avoid direct contact with components that could damage the cord insulation. The refrigerator will not switch to another mode of operation until all AC power is lost.

## SECTION 3

### AC COMPONENTS

#### 3.1 Heating Element

The heating elements are designed to deliver a predetermined amount of heat to the cooling unit. To check a heating element, remove the heater leads from the printed circuit board and measure for proper resistance across the two leads with a properly calibrated Ohm meter. This check is to be done with the heating element at room temperature. You should obtain the following readings  $\pm 10\%$ .

Model	Watts	Ohms	Amps
NDA 1402	420	34.3	3.5
NDE 1402	420	34.3	3.5

The NDA/NDE1402 models use two AC heaters wired in series. The resistance should be 34.3 Ohms +/- 10%.



**Note: Never over or under size the AC heater.**

### 3.2 Interface Module

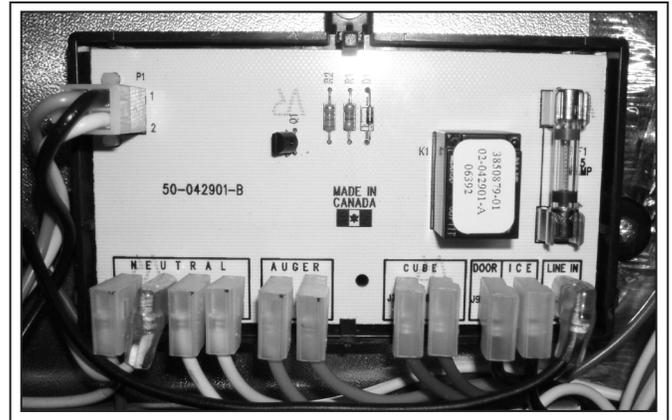
The interface module is used for two reasons:

- To shut off the 120 volt AC supply to the door dispenser and ice maker when the freezer door is opened (for safety Reasons).
- To shut off the 120 volt AC supply to the door dispenser and ice maker when the refrigerator is switched "OFF" by means of the ON/OFF button on the upper display panel.

The function of this additional module is very simple. It has a (5 amp) fuse for incoming 120 volt AC line voltage and a relay that switches the line voltage ON/OFF. The relay is driven by a circuit that senses the voltage at the node between the door switch and the interior lamp. This relay is controlled by the wires in the P1 connector on the interface module. These wires are hooked on the wires coming from the power module to the lamp and door switch. The black wire is ground (-), the white wire is 12 volt DC (+) and the yellow wire is going to the connection point between the lamp and door switch. If the door is opened, the yellow wire should be 12 volt DC (+) and if the door is closed, the reading should be 0 volts DC. If the lamp is lit or if 12 volt DC is absent, the relay will drop out and 120 volt AC will not be supplied to the ice maker or the door dispenser.

#### **⚠ WARNING**

**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**



The tabs on the module are from left to right:

- (4) Interconnected tabs that serve as interconnection points of four neutral wires (white).
- (2) Interconnected tabs that serve as interconnection points of the "auger wire" from the door and the wire to the auger motor (yellow).
- (2) Interconnected tabs that serve as interconnection points for the "cube wire" from the door and the wire to the solenoid (red).
- (2) Interconnected tabs that supply switched 120 volt AC to the door and to the ice maker (black).
- (1) Tab for incoming 120 volt AC to the interface module (black).

To troubleshoot the module:

- Check that the wires are correctly connected to the tabs.
- When the door is shut, check that 120 volt AC is present on the tabs (J9) and (J10).
- When the door is open, check that the voltage on these tabs (J9) and (J10) is 0 volts AC.
- If 120 volts AC is not present on (J9) and (J10) when door is closed, check the fuse.
- If the fuse is OK, check that the interior light in the freezer is working, (switched on/off when pressing/releasing the door button).
- If the interior light is OK, check if the relay is "clicking" when the door is opened/closed (you will need an assistant to operate the door while you are touching the relay with a finger to sense if it is "clicking").
- If the relay is not clicking though the interior light is correctly switched ON/OFF, measure the voltages on the pins in the P1 connector. The voltages should be as described previous, in this section.
- If the voltages in the P1 connector are OK and still the relay is not clicking when opening/closing the door, the module is faulty; the transistor that drives the relay is probably damaged.

### 3.3 AC Sensing

The incoming 120 volt AC supply is constantly checked for availability by means of an opto-coupler. There is a delay of approximately 15 seconds before a change is recognized to avoid spurious switching. When AC is not available in AC only refrigerators, the message “no AC” is shown on the front display panel.

## SECTION 4

### DC VOLTAGE

#### 4.1 DC VOLTAGE REQUIREMENTS

Clean Direct Current (DC) power is mandatory for high-tech circuits to operate as designed. A battery will provide straight line DC power. The converter and alternator produce DC power by a series of diodes that rectify alternating current to DC. The Dometic control system will only tolerate up to 6 volts AC on the DC line (Also known as AC ripple). AC ripple can be measured by a digital volt-meter set on the AC scale and measured at the main DC terminal block connections at the back of the refrigerator. 6 volts AC or less is acceptable. If AC volts exceed 6 on the incoming DC line, the power source should be cleaned. AC voltage in excess of 6 volts will affect the processor and create erratic operation. When testing for AC ripple on the DC line put a load on the converter. The operational range of the unit is a minimum of 8.5 volts DC to a maximum of 18 volts DC (However 10.5 volts DC minimum is required to activate the defrost system). The unit will automatically shut down at 18 volts DC or greater, and come back on when voltage has decreased to the proper operating range. The refrigerator requires at least 8.5 volts DC for proper cooling operation. The refrigerator must be connected to the battery circuit with two wires of adequate capacity to avoid voltage drop. Proper polarity is crucial for refrigerator operation. No other electrical equipment or lighting should be connected to the refrigerator circuit. Just because you can read volts, does not mean you have the amps to operate the control system. If relays buzz, lights go dim or out during operation, this could indicate there is a loose connection somewhere. As a last test, use a battery and run wires directly to the DC terminal block. If the unit works OK on direct DC voltage the problem is in the coach, not the refrigerator control system.

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

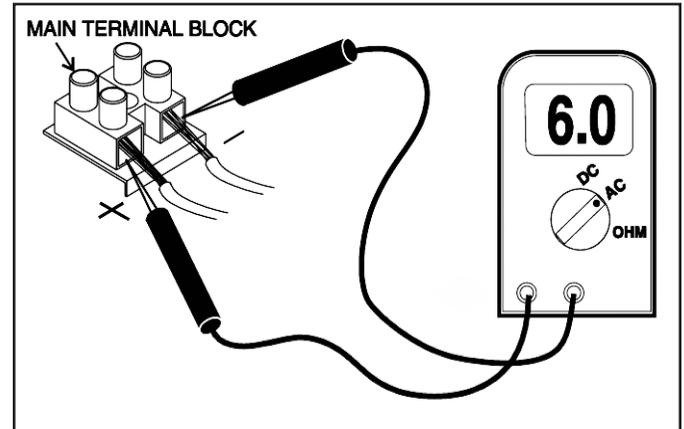
- Check the wire gauge to ensure that it is in accordance with recommended dimensions.

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

### 4.2 GROUNDS

The operation of the Dometic refrigerator is also dependent on good, clean ground connections. Loose or corroded ground terminals create an unknown resistance factor that can affect the voltage detected by the Power Module. A loose negative DC wire will create a negative millivolt signal that the control board will pick up and create erratic operation. Check the integrity of the grounds from the refrigerator all the way to the power source/battery. Clean or tighten any suspicious looking connections.

#### Main Terminal Block



**Note:** The DC terminal block located on the back of the refrigerator should be cleaned and tightened at all four wires.

## SECTION 5

### DC COMPONENTS

#### 5.1 Door Switches and Lamps

Both compartments have interior lights controlled by door switches. Both lamps are of a halogen type. The lamp in the freezer compartment is rated at 5 watts, while the lamp in the fresh food compartment is a 10 watt lamp. Lamps and switches are directly connected to the power module. The wires are foamed in and end up in the 10 pin Molex MiniFit P4 connector on the main circuit board. The lamps are directly controlled from the switches and the interconnections are on the main board. The processor on the power module cannot control the lamps but senses if the switches are closed or not, to decide if doors are open or closed (Used in the diagnostic mode). The door switches are open when the switch arm is depressed (interior light should be off). When the door is open the switch is closed (interior light should be on). Check that the switch assembly is properly aligned and that it is not broken. Check the switch assembly for continuity. To do a continuity check, first be sure all power is disconnected or “OFF” to the refrigerator. Second, remove all wires from the switch assembly, then check the switch. When the switch is depressed, there should be no continuity. When the switch is NOT depressed, there should be continuity. If any of these checks are incorrect, replace the switch. After the check, be sure the switch assembly is wired properly per the wiring diagram.

## 5.2 Temperature Sensors

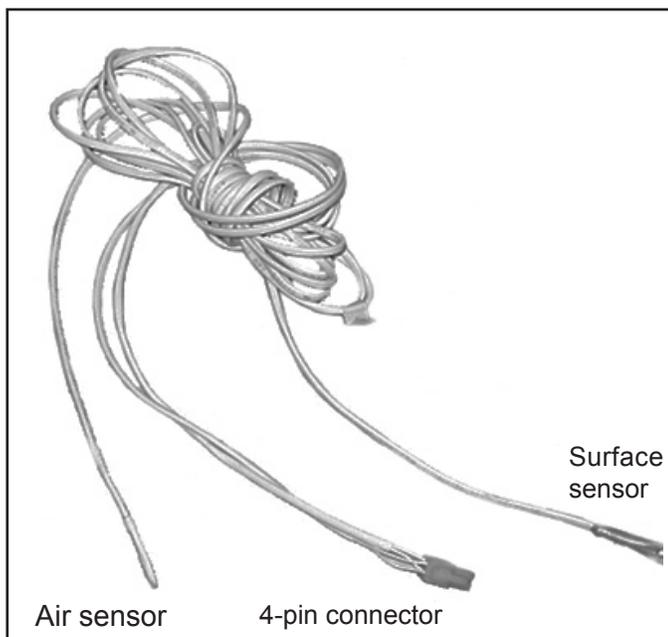
The NDA/NDE 1402 has two sets of thermistors. One for the freezer and the other for fresh food compartment. The display range is from - 9° F to 41° F in the freezer and from - 9° F to 59° F in the fresh food side. For temperatures below and above these ranges, the display will show “Lo” and “hi” respectively.

During normal operation, the temperatures in degrees Fahrenheit in the compartments are shown on the display, freezer to the left and fresh food to the right. However, the shown temperatures are not the ones actually measured. Instead they are calculated as the most probable temperatures of the food that is stored in the respective compartment. Therefore these temperatures should not be compared with temperatures measured with ordinary thermometers placed inside the compartments. When the power is switched “OFF” and then “ON” again, the temperature filters will forget historical values and the calculation restarts from the beginning. In this case the shown values will be about 2° F above the real air temperatures at the sensors.

Each thermistor harness consists of two thermistor sensors. One each for “air” and the other for “surface” for the defrosting process.

Disconnect the thermistor harness from the P2, 4-pin terminal (freezer) or P3, 4-pin terminal (fresh food) on the lower circuit board. Place the sensing tip in a glass of ice water (more ice than water), approximately 33° F to 35° F. Wait 8 to 10 minutes. You should get a reading of approximately 5,500 Ohms. Always test from the wire side of the 4-pin connector with the meter leads as not to create a connection problem at either the P2 or P3 connector.

**Note:** A disconnected or faulty thermistor will result in an error code displayed on the front display panel. See section 11 for trouble shooting error codes.



Fresh food air thermistor:

Remove the P3 connector from the lower control board. Check the resistance between pins 1 and 2 on the P3 connector.

Fresh food surface thermistor:

Remove the P3 connector from the lower control board. Check the resistance between pins 3 and 4 on the P3 connector.

Freezer air thermistor:

Remove the P2 connector from the lower control board. Check the resistance between pins 1 and 2 on the P2 connector.

Freezer surface thermistor:

Remove the P2 connector from the lower control board. Check the resistance between pins 3 and 4 on the P2 connector.

**Note:** See page 49 for thermistor values at varying temperatures.

## 5.3 Low Ambient Control

The automatic Low Ambient Control ensures trouble free operation in low ambient temperatures (e.g. Below 50° F). In colder weather, the temperature inside the fresh food compartment tends to hold the temperature inside for a very much longer period of time, with very long periods in between ON/OFF cycling of the heat source; this is OK for any food product inside the fresh food compartment, but is not OK for the freezer compartment. The NDA/NDE1402 have active thermostatic control of both compartments (however, you can only set the temperature level for the fresh food thermostat). If the temperature in the freezer is not low enough, the cooling is switched on. If the fresh food compartment then becomes too cold, the defrosting element will be switched on to keep it at the correct temperature.

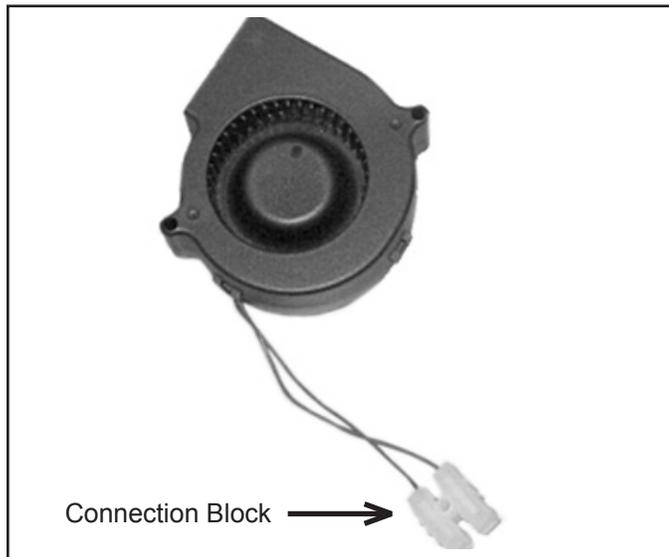
## 5.4 Frame Heater

The frame heater is located behind the metal frame between the doors. The heater helps to reduce sweating on the metal frame during periods of high humidity. The heater is on all the time except during the defrosting phases to reduce maximum current draw from the DC supply. To test the heater, remove the white wire from terminal (J4) and measure the resistance between the wire removed and chassis ground. You should have a resistance reading of 24 Ohms +/- 10%.

**Note:** Some units may have a Light blue wire on J4.

## 5.5 Interior Fans

Both compartments have fans to help distribute the temperature evenly throughout the unit. These fans are DC operated and are connected directly to the lower power module. Both fans run continuous when the ON/OFF switch is in the "ON" position and the doors are closed. The fan in the fresh food side will run when the door is open, however the freezer side is stopped during opening of the door. The fans can be tested by applying DC power directly to the power leads.



### Fresh food fan:

Remove the P4 connector from the lower control board. Apply 12 volts DC directly to pin 10 red wire (+) and pin 5 black wire (-). The fan should run. This test can also be performed at the terminal connection block just below the fan assembly. If the fan fails to run, it will need to be replaced.

### Freezer fan:

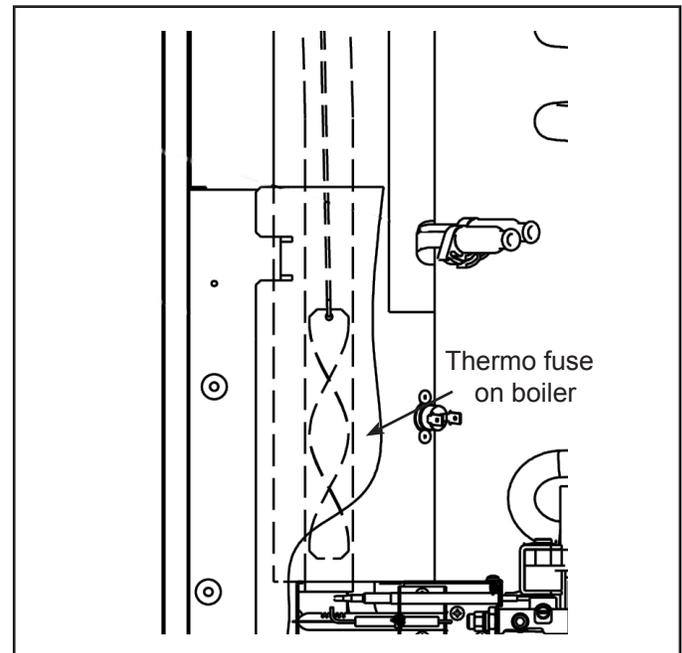
Remove the P5 connector from the lower control board. Apply 12 Volts DC directly to pin 4 red wire (+) and pin 1 black wire (-). The fan should run. This test can also be performed at the inter-connection box along the back wall behind the ice maker assembly. If the fan fails to run, it will need to be replaced.

In order to prevent the circulation of warm air throughout the compartments and to reduce the current draw on the DC supply, both fans will be stopped after approximately 10 seconds if a source to heat the cooling unit is not available (e.g. No AC detection and failure to lite on gas "ch LP") in the front display panel.

**Note:** A disconnected or faulty fan assembly will result in an error code displayed on the front display panel. See section 11 for trouble shooting error codes.

## 5.6 Thermo Fuse

The NDA/NDE 1402 cooling unit has a thermo fuse located on the boiler. The function of the thermo fuse is to shut down the control system in the event of a cooling unit problem. On certain units the fuse can be reset by pushing the button in the center. The thermo fuse is a non replaceable component of the cooling unit. When the fuse pops, it is normally an indication the cooling unit has a problem and the cooling unit will have to be replaced. To test the thermo fuse, check for continuity. Lack of continuity would indicate a faulty thermo fuse.



## 5.7 Flame Sensing

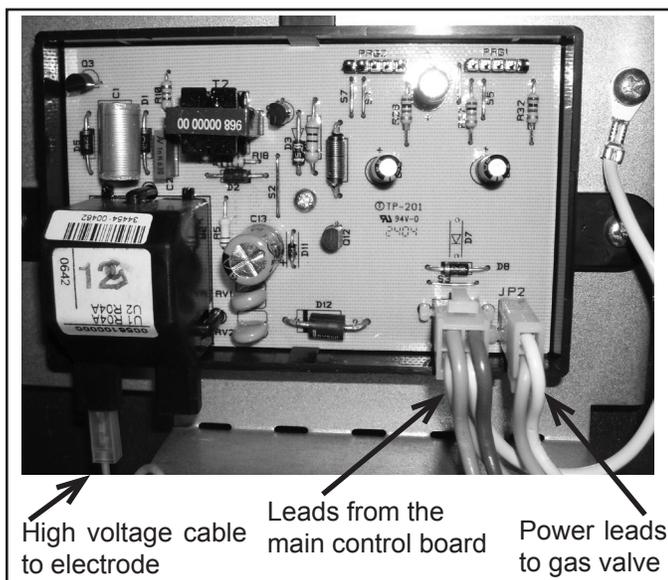
The flame is detected by a method often called "flame rectification sensing". A gas flame is slightly conductive and by applying a voltage to the spark electrode, a small current will flow through the flame to chassis ground. However, the flame conductivity depends on the polarity of the applied voltage. A positive voltage on the electrode will result in a higher current than a negative voltage. This "rectification property" of the flame is used to distinguish it from leakage currents that could be caused by dirt or moisture. To detect if a flame is present, a high frequency AC voltage is applied between the burner and the electrode. This results in a net current in the forward direction if the flame is present, but no current if the flame is not present. The rectification property then causes that the electrode will have a slightly negative DC voltage that is detected by the ignition control module. The AC voltage and the resulting negative voltage are not possible to measure with normal methods, as the impedance is too high.

## **⚠ WARNING**

**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**

### 5.8 Ignition Control Module

The ignition control module supplies continuous DC voltage to the gas valve during gas operation. On gas operation the ignition control module senses the resistance through the flame between the electrode and burner. When there is no flame at the burner, the resistance is high and the ignition control module begins sparking to light the burner. As soon as the flame is lit, the resistance between the electrode and burner drops and the ignition control module stops sparking. The resistance is monitored by the ignition control module and, if for any reason the flame goes out, the ignition control module begins sparking until the burner is lit. The resistance between the electrode and burner drops and the ignition module stops sparking. This insures that the flame will always be lit when desired. First verify proper voltage at the Yellow (+) and White (-) terminals on the 4-pin connector of the ignition control module. This reading should be 8.5 volts DC or greater. Next, remove the high voltage cable from the ignition control module. The ignition control module should produce a sparking sound, during trial-for-ignition. If not, replace the ignition control module. While operation in the gas mode, the ignition control module is constantly monitoring the presence of flame. If the flame is blown out, the ignition control module will immediately start sparking. When the ignition control module senses the loss of flame (High resistance thru the electrode) the 45 seconds trial for ignition period is started.

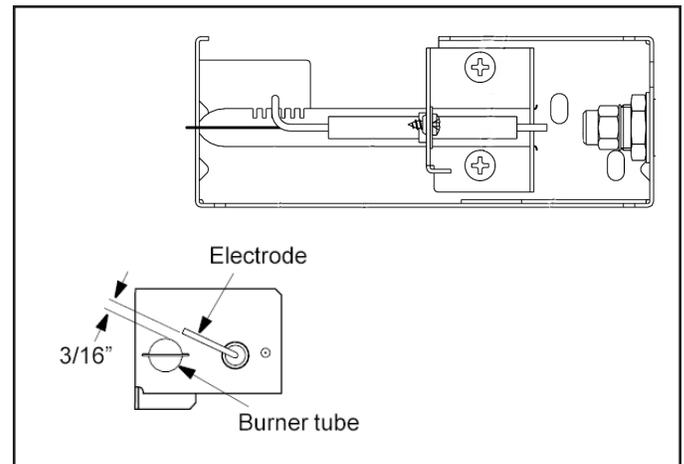


The ignition control module has an additional ground strip wire underneath the left mounting tag. This wire must be in good contact with the metal frame of the burner assembly before the system is energized. Otherwise both the ignition control module and the power module may be damaged. At every gas operation request from the power module, the ignition control module performs an integrity test of the gas burning system. This test will detect if the system is operable or not. A message code will result in a lock out mode. "ch LP" will be displayed on the front display panel.

**Note:** The message "ch LP", for safety reasons will remain until the power is switched "OFF" and then "ON".

### 5.9 Electrode

Do a visual check for cracks, breaks or moisture on the ceramic insulator. A hair line crack can be hard to see at the electrode. The spark gap must be set at three sixteenths (3/16") of an inch between the tip of the electrode and the slots in the burner. When adjusting, always loosen the screw and move into place. Never try to move without loosening the screw. On certain units the electrode and high voltage cable are integrated in to one component. To acquire the proper part always provide the product number of the model refrigerator you are working on.

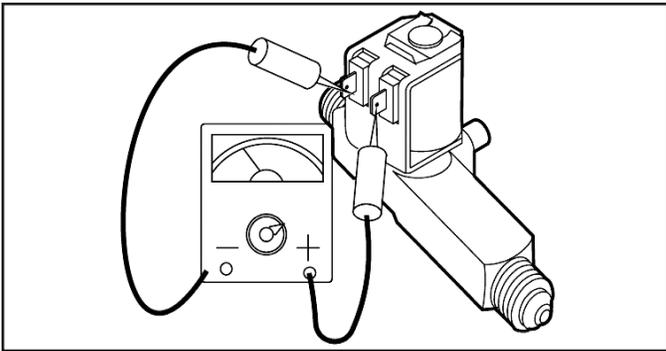


### 5.10 High Voltage Cable

If sparking starts during trial-for-ignition, the cable is good. If there is no sparking during trial-for-ignition, disconnect DC power at the refrigerator terminal block or switch the unit off. Disconnect the high voltage cable from the electrode. Reconnect DC power. If there is a sparking sound from the ignition control module during trial-for-ignition, then replace high voltage cable or electrode. On certain units the electrode and high voltage cable are integrated into one component. To acquire the proper part always provide the product number of the model refrigerator you are working on.

## 5.11 Solenoid

Check the solenoid coil with a properly calibrated Ohm meter. Remove the connectors from the solenoid and measure the resistance across the terminals. The proper reading would be 49 Ohms  $\pm$  10%. Failure of the solenoid is very unlikely. Next, hook up a manometer at the test port. Then check for DC volts at the gas valve terminals (Yellow +, White -) while the unit is in trial-for-ignition. If DC volts are present and the pressure is low, replace the valve. If DC volts are not present at the valve while the unit is in trial-for-ignition verify that terminal 2 (yellow wire) on the 2-pin connector from the ignition control module has DC volts (8.5 volts or more).

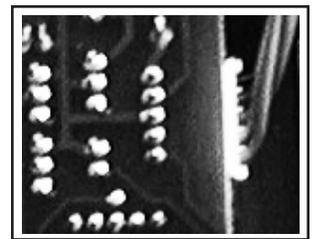
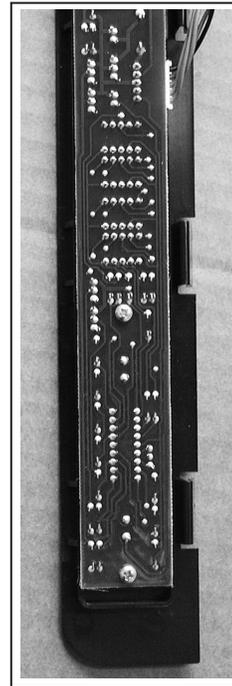


## 5.12 Front Display Panel

The display module is the user interface and acts just as a slave to the power module. It has three buttons and four, seven-segment LED displays. The left most button is the ON/OFF button and is directly controlling the power module. It has no direct influence on the processor on board. The button is not actually switching any current, but is just giving a signal on a separate wire down to the power module to switch the system "ON" or "OFF". The button in the middle is the AUTO/STORE button. At normal operation this button is used to toggle energy selection modes between AUTO and MANUAL. This button is also used to store thermostat and clock settings during setting procedures. If this button is held down during power-up, a manually initiated defrost will start. The right most button is the SET button. It is used for thermostat and clock settings. If this button is held down during power-up, the service mode will be initiated.



Depressions of the AUTO/STORE and SET buttons are interpreted by means of the display board processor, which then sends commands via a serial data bus down to the power module. The power module processor then executes the commands. The seven-segment displays are normally used to show the temperatures in the compartments. However, the temperature display may be interleaved by means of flashing with a number of status or error messages. During setting procedures (thermostat and clock settings) the displays are used to show setting information. The "decimal points" are positioned at the top of the display and these "points" are from left to right used to indicate PM at clock setting, AUTO mode, AC operation and GAS operation. The information displayed is controlled from the power module processor. When the fresh food door is closed, the display is dark. See section 11 for trouble shooting error codes.



Wire colors from top to bottom:

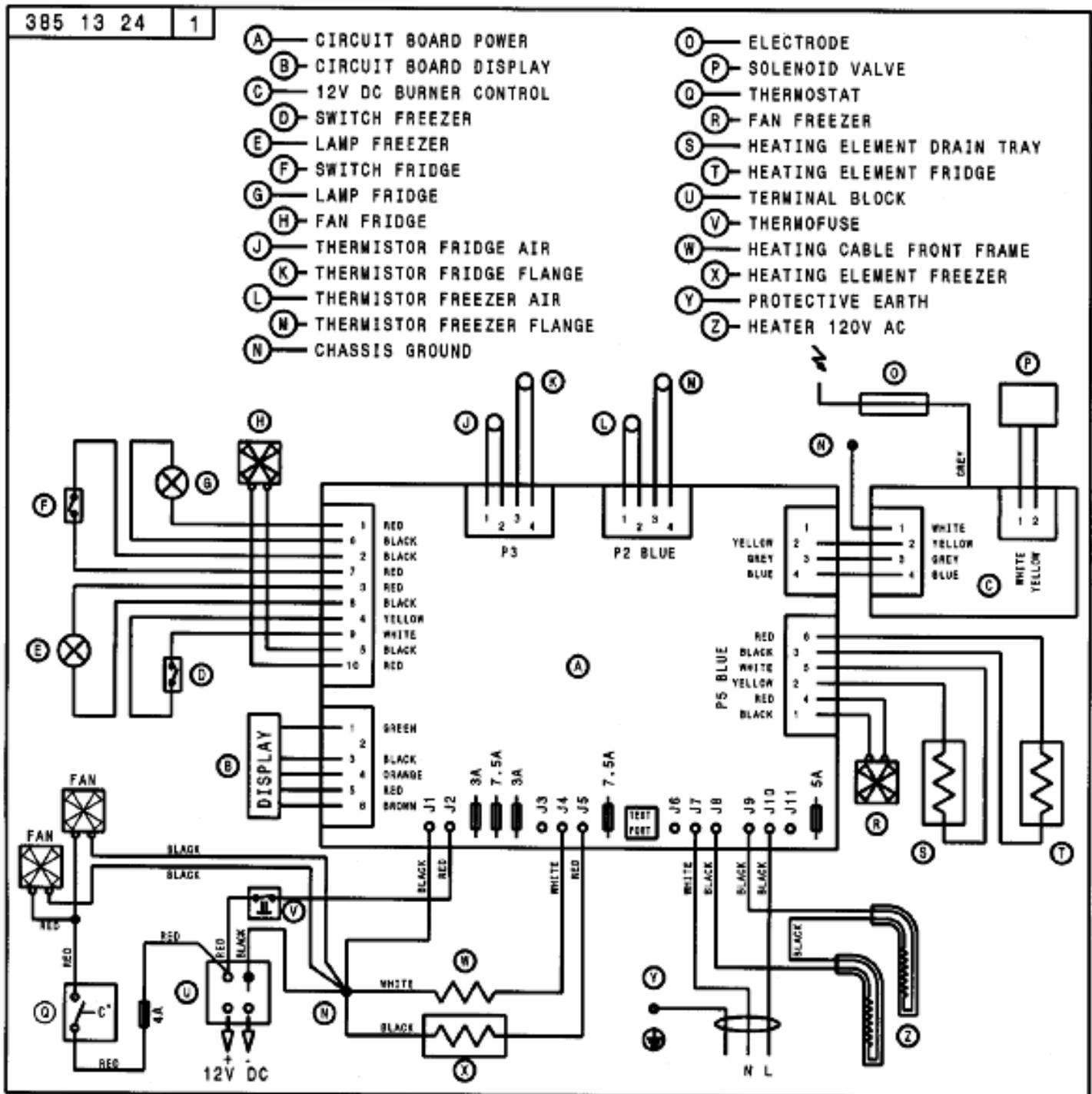
- Black
- Brown
- Red
- Orange
- Green

The NDA/NDE 1402 series display cable is identical to other cables, however the use of the wires are different. The display panel has no constant 12 volt DC supply and there is no voltage returning down to the lower control board. The ON/OFF feature is controlled by a momentary closing of a separate wire to ground when pressing the ON/OFF button. The upper display panel is always on, even if the refrigerator is off and is therefore capable of sensing the closing to ground.

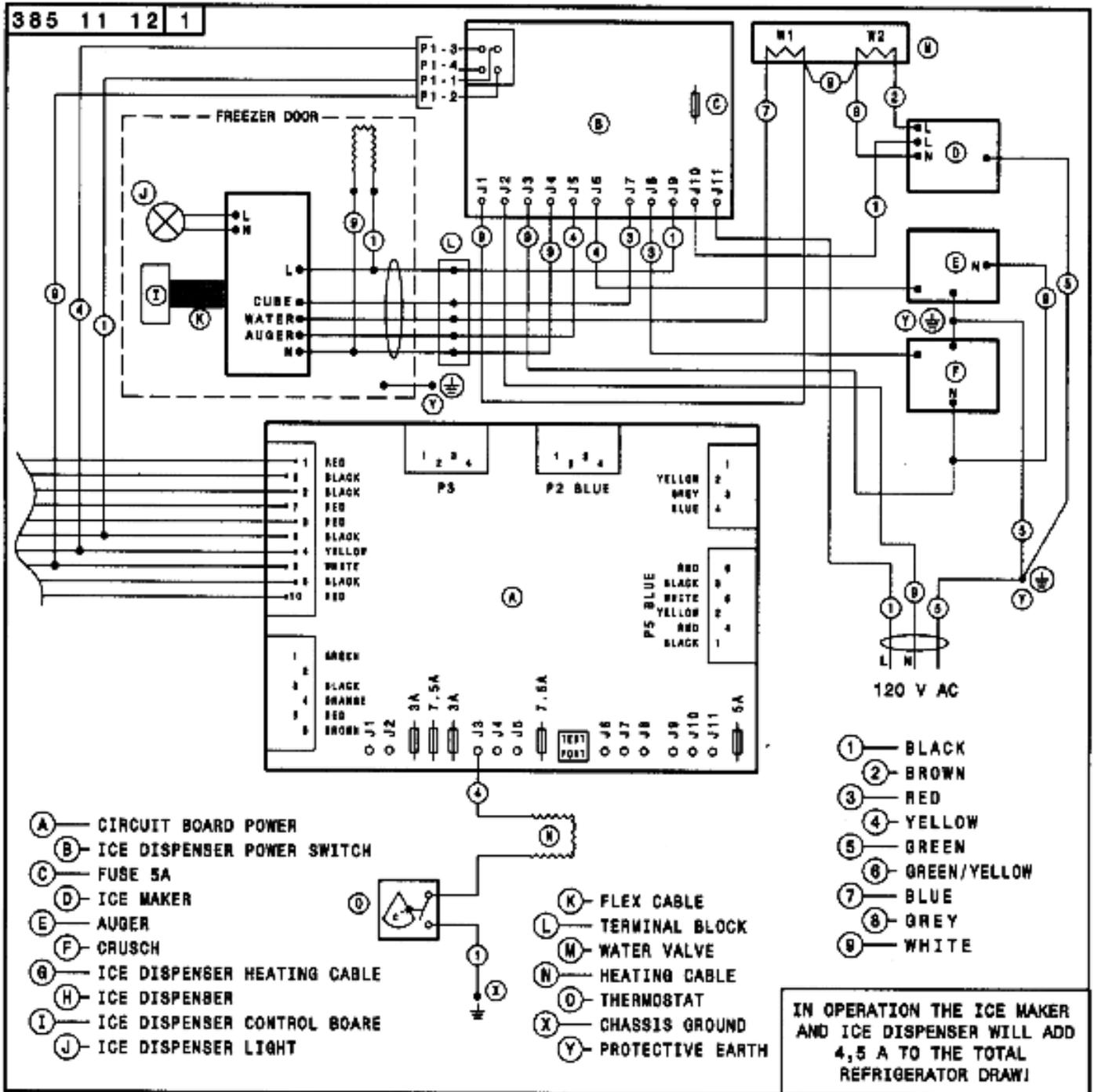
Pin connections as seen at the lower board.

- Pin 1, Green- ON/OFF Control (momentary closes to ground when pressing the ON/OFF button).
- Pin 2, Not Connected.
- Pin 3, Black- (+12) volt DC supply to the display board when the refrigerator is on.
- Pin 4, Orange- Not Connected.
- Pin 5, Red- Ground.
- Pin 6, Brown- Communication Line.

# TYPICAL WIRING DIAGRAM NDA 1402



# TYPICAL WIRING DIAGRAM NDA 1402



## 5.13 Lower Board

The power module is the main control unit that acts as the heart of the electronic control system. It performs power ON/OFF control, energy selection, thermostatic operation control and defrosting control. All other electrical parts are connected to the power module. See section 11 for trouble shooting any error codes.

**ALL TESTS ARE TO BE DONE WITH THE REFRIGERATOR IN THE COOLING MODE.**

**Unplug both thermistors from the control board during lower board testing to assure the unit is calling for cooling.**

### DC Volts

Measure the DC voltage between terminal (J2) positive (+) and (J1) ground (-) on the main control board. The voltage should be the same as at the positive (+) and negative (-) terminals on the DC input terminal block. 8.5 volts minimum to 18 volts maximum would be the operating range. If the voltage is outside the 8.5 volts minimum to 18 volts maximum, check the power supply, terminal block and correct the power source before going on with the test.

### AC Mode

#### **WARNING**

**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**

Test the upper control board and the 5-wire harness before testing for proper AC operation. Check that the incoming AC voltage is present between terminals J10 (black) and J7 (white) on the lower circuit board. If no voltage is present, check wiring and the coach power supply. If voltage is present, and with the unit on AC operation, check for voltage at the heating element connection terminals (J8) and (J9) on the circuit board. If no voltage is present, disconnect 120 volt AC and 12 volt DC and check the 5 amp AC (F5) and 3 amp DC (F2) fuses, wiring harness and upper control. If AC volts are present between (J7) and (J10), and no voltage on (J8) and (J9) the AC voltage detection circuit is damaged and the control board will need to be changed.

### Gas Mode

**Note:** All current Dometic control boards are 3 try systems in the gas mode. There is a 2 minute purge cycle between each trial for ignition. Flame failure could take 6 to 7 minutes.

Verify that the following components are good: upper circuit board, thermistor, wire harness and 3-amp fuse (F2). First, check for voltage during trial-for-ignition at Plug P6, Terminal 2 (yellow wire +) to the ignition control module. If no voltage is present change the main circuit board. If voltage is present and there is no spark, test the ignition control module. See section 5.8 for diagnosis.

**NOTE:** A loose ground will create erratic or no gas operation on all systems.

Tab connectors from left to right (at the bottom edge of the main control board)

- J1- is the ground (-) connection.
- J2 is the 12 volt DC (+) battery voltage input into the power module.
- J3 and J4 are connected in parallel and are supplying 12 volt DC (+) to the door frame heater and the anti-freezing system for the ice maker water supply line.
- J5- is the DC voltage output to the defrosting element in the freezer.
- J6- is the 120 volt AC neutral connection for the ice maker.
- J7- is the 120 volt AC main supply neutral connection.
- J8- is the 120 volt AC neutral connection for the AC heaters in the cooling unit.
- J9- is the 120 volt AC main line connection for the AC heaters in the cooling unit.
- J10- is the 120 volt AC main supply line connection.
- J11- is the 120 volt AC line voltage to the interface module if using a single power cord.

If the unit has a separate power cord for the ice-maker, (J6) and (J11) will not be used.

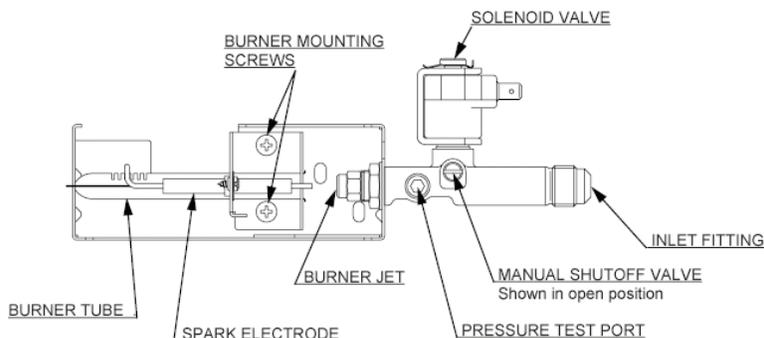
## 5.14 Fuses

The NDA/NDE 1402 use (4) DC fuses to protect the circuit board from internal/external DC shorts. The 5 amp AC (glass) fuse is designed to protect the integrity of the AC detection and heater circuit from shorts. All fuses should be checked for continuity with the fuse removed from the board. If a fuse blows don't replace it, until the problem has been found. If a fuse blows there is a short or component that has created the problem.

Fuses (From left to right, on the lower board)

Fuse	Type of component
(F2) 3 amp	A, B, C, E, G, H, P, R
(F6) 7.5 amp	S, T
(F3) 3 amp	W (optional icemaker kit)
(F4) 7.5 amp	X
(F5) 5 amp	Z

Always refer to the wiring diagram for the model/product number to determine the "Type of component" designation.



## SECTION 6

### LP GAS

#### LP GAS REQUIREMENTS



**WARNING**

DO NOT use a flame to check for gas leaks.

The LP gas pressure to the refrigerator should be 11 inches water column with half of all BTU's of the RV turned on. With all other appliances off, the pressure to the refrigerator should not exceed 12 inches water column. To check the gas pressure when the refrigerator is operating, there is a pressure test port below the solenoid valve assembly. Use a calibrated manometer to check for proper gas pressure.

## SECTION 7

### LP GAS COMPONENTS

#### 7.1 Manual Gas Shutoff Valve

The manual shutoff valve is a non-serviceable part. The valve is part of the solenoid valve assembly. It is very rare to have problems with the manual shutoff or the solenoid assemblies. If you have checked gas pressure and it's low, check the pressure at the input line to the refer. If the pressure is 11 inches at the input and low at the pressure test port, change the solenoid valve assembly. The valve is not opening all the way.

#### TESTING LP GAS SAFETY SHUTOFF

The gas safety shutoff must be tested after the refrigerator is connected to the LP gas supply.

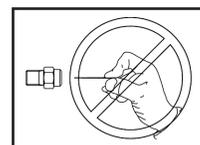
To test the gas safety shutoff, proceed as follows:

- Start the refrigerator according to the instructions, and switch to the GAS mode.
- Check that the gas flame is lit and the GAS mode indicator lamp is on.
- Close the manual gas shutoff valve at the back of the refrigerator.
- Wait for six to seven minutes. The "chLP" indicator should be on and the GAS mode indicator lamp should be off.
- Remove the protection cover from burner and open the manual gas shutoff valve. Do not change any button positions on the control panel. Apply a non-corrosive commercial bubble solution to the burner jet orifice.

- No bubbles should appear at the opening of the burner jet orifice. The presence of bubbles indicates a defective gas safety shutoff, and service is required.
- If no bubbles were present at the burner jet orifice, it should be rinsed with fresh water. Be careful not to damage the burner jet orifice. Replace the cover and press the main power ON/OFF button "OFF" and back "ON". Normal operation of the burner should return. Allow the burner to operate for a minimum of five minutes.

#### 7.2 Orifice

The Dometic orifice is a brass alloy with a man-made ruby pressed in the center that has been laser-beam drilled in a spiral pattern. The orifice is cleaned by using an alcohol based solvent. Soak the orifice for approximately 1 hour and allow to air dry. **DO NOT** insert anything into the center of the orifice as it can damage the man-made ruby. **DO NOT** use an air nozzle to blow thru the orifice as the ruby could be moved or damaged. Never over or under size the orifice on a Dometic refrigerator. The cooling unit is designed to work with a predetermined amount of heat and modifying the orifice size will decrease cooling. If there is a lack of cooling on gas operation, verify the orifice is the proper size per the chart.



**WARNING**

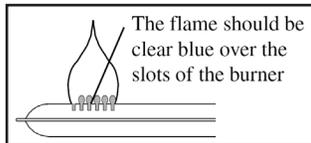
DO NOT use a wire or pin when cleaning the burner jet as damage can occur to the precision opening. This can cause damage to the refrigerator or create a fire hazard.

Model	Jet Size
NDA 1402	#76
NDE 1402	Not Used (All Electric)

Always check the parts list with the model and product number to assure the right jet size.

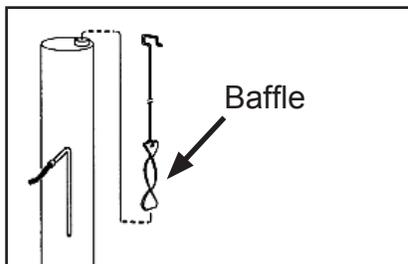
### 7.3 Burner

The burner is a slotted metal tube located below the flue tube on the cooling unit. It should be level and the slots in the burner should be directly below the flue tube. The burner should be cleaned periodically, at least once a year. To clean the burner, remove from the refrigerator and check for any foreign residue that could cause a deflection of the gas flow or the flame. Next, soak the burner in an alcohol based solution and allow it to air dry. If the burner does not have a good ground it can cause erratic gas operation. The electrode sparks to the burner tube and an erratic ground will cause erratic gas operation.



### 7.4 Flue Baffle

The flue baffle (spiral baffle) is a twisted piece of metal that hangs in the flue tube to slow the heat from the flame to the proper location on the cooling unit. If the flue baffle is too high or low the heat will not be transferred to the cooling unit properly. It should be cleaned periodically, at least once a year. To clean, remove from the flue tube and check for any damage, then clean thoroughly.



Model	Above the Burner	Size
NDA 1402	1-1/4"	6" x 15/16"
NDE 1402	Not Applicable	Not Applicable

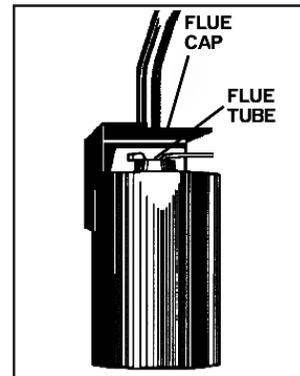
Lack of heat transfer to the cooling unit will cause low cooling performance in the gas mode. It should be cleaned periodically, at least once a year. The proper position of the baffle above the burner should be as shown in the chart: **Always refer to parts list on the model/product number unit you are currently working on.**

### 7.5 Flue Cap

The flue cap is located at the top of the flue tube and is attached with a screw or pushed down over tube. Not all units will come with a flue cap. The design of the baffle wire in the flue tube will slow down a down draft.

### 7.6 Flue Tube

The flue tube is a component that is welded to the pump tube of the cooling unit. It must be cleaned periodically, at least once a year. To clean, remove the flue cap (if applicable) and flue baffle, then cover the burner and clean by using a flue brush, Dometic Part Number 0151404001. If the flue tube becomes coated with scale or residue from combustion of LP gas, the efficiency of gas operation decreases.



## SECTION 8

### COOLING UNIT

#### 8.1 Cooling Unit

The cooling unit is a self-contained, hermetically sealed set of coils where the refrigeration process takes place. The chemicals involved in the cooling process include hydrogen, ammonia, water and a rust inhibiting agent. There are no repairs recommended on the cooling unit. If it is defective, replace with a new cooling unit. To check the cooling unit, first verify the AC heating elements are good. Verify for proper Ohms at room temperature. Also verify for proper venting and the unit is level. Then place approximately one gallon of water inside the refrigerator and place a thermometer in the container of water. Next, unplug both thermistors from the lower control board. This will by-pass the thermostat control and operate for at least 12 hours. Then check the temperature on the thermometer. It should be at 43 degrees or lower depending on test conditions. If so, the cooling unit is good. If the temperature of the water is above 43 degrees, replace the cooling unit. The outside temperature will affect the cooling capacity of the unit. There is that rare occasion when the cooling unit will work OK for the first 12 hours and start to warm up. If the customer's complaint is "works OK for 2 to 5 days and then warms up", the unit may have an internal problem. To test this it would be necessary to operate the cooling unit for up to 24 to 48 hours in the test mode.

# The Absorption System

The continuous absorption type of cooling unit is operated by the application of a limited amount of heat furnished by gas, electricity or kerosene. No moving parts are employed.

The unit consists of four main parts—the boiler, condenser, evaporator and absorber.

The unit can be run on either electricity, kerosene or gas. When the unit operates on kerosene or gas the heat is supplied by a burner which is fitted underneath the central tube (A) and when the unit operates on electricity the heat is supplied by a heating element inserted in the pocket (B).

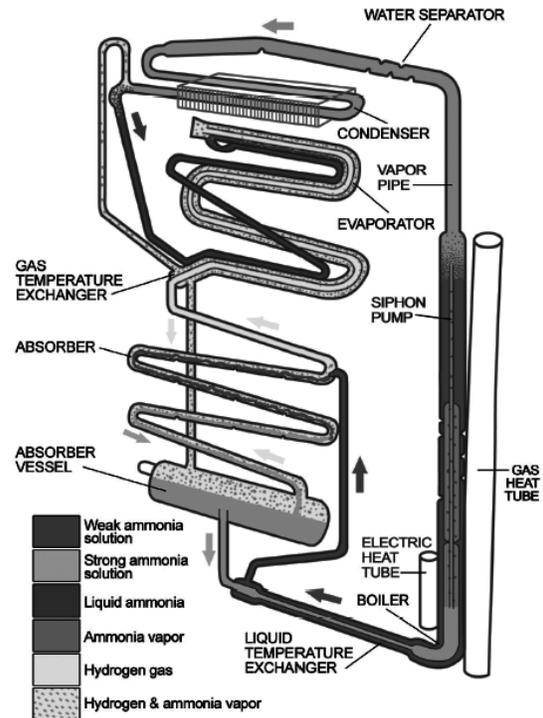
The unit charge consists of a quantity of ammonia, water and hydrogen at a sufficient pressure to condense ammonia at the room temperature for which the unit is designed.

When heat is supplied to the boiler system, bubbles of ammonia gas are produced which rise and carry with them quantities of weak ammonia solution through the siphon pump (C). This weak solution passes into the tube (D), while the ammonia vapor passes into the vapor pipe (E) and on to the water separator. Here any water vapor is condensed and runs back into the boiler system leaving the dry ammonia vapor to pass to the condenser. Air circulating over the fins of the condenser removes heat from the ammonia vapor to cause it to condense to liquid ammonia in which state it flows into the evaporator.

The evaporator is supplied with hydrogen. The hydrogen passes across the surface of the ammonia and lowers the ammonia vapor pressure sufficiently to allow the liquid ammonia to evaporate. The evaporation of the ammonia extracts heat from the evaporator which in turn extracts heat from the food storage space, as described above, thereby lowering the temperature inside the refrigerator.

The mixture of ammonia and hydrogen vapor passes from the evaporator to the absorber.

Entering the upper portion of the absorber is a continuous trickle of weak ammonia solution fed by gravity from the tub (D). This weak solution, flowing down through the absorber, comes into contact with the mixed ammonia and hydrogen gases which readily absorbs the ammonia from the mixture, leaving the hydrogen free to rise through the absorber coil and to return to the evaporator.



The hydrogen thus circulates continuously between the absorber and the evaporator.

The strong ammonia solution produced in the absorber flows down to the absorber vessel and then to the boiler system, thus completing the full cycle of operation.

The liquid circulation of the unit is purely gravitational.

Heat is generated in the absorber by the process of absorption. This heat must be dissipated into the surrounding air. Heat must also be dissipated from the condenser in order to cool the ammonia vapor sufficiently for it to liquefy. Free air circulation is therefore necessary over the absorber and condenser.

The whole unit operates by the heat applied to the boiler system and it is of paramount importance that this heat is kept within the necessary limits and is properly applied.

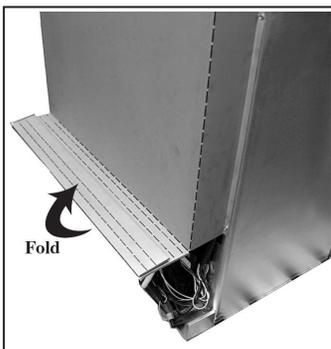
 **Dometic**

## 8.2 Ventilation

The installation shall be made in such a manner as to separate the combustion system from the living space of the mobile home or recreational vehicle. Openings for air supply or for venting of combustion products shall have a minimum dimension of not less than 1/4 inch. Ventilation is a critical requirement for proper cooling unit operation. The coach vent system must be able to provide a way to direct the hot air, produced by the action of the cooling unit, out away from the installation of the refrigerator. The refrigerator extracts heat from the interior of the refrigerator cabinet and dissipates the heat out through the vent system. In a proper installation there should be zero (0") clearance surrounding the sides and top of the refrigerator to achieve proper air flow. Clearance from the back of the refrigerator to the outside wall must be kept no greater than 1 inch. All potential dead air pockets should be blocked or baffled to ensure that heat won't be trapped in these spaces and reduce efficiency.

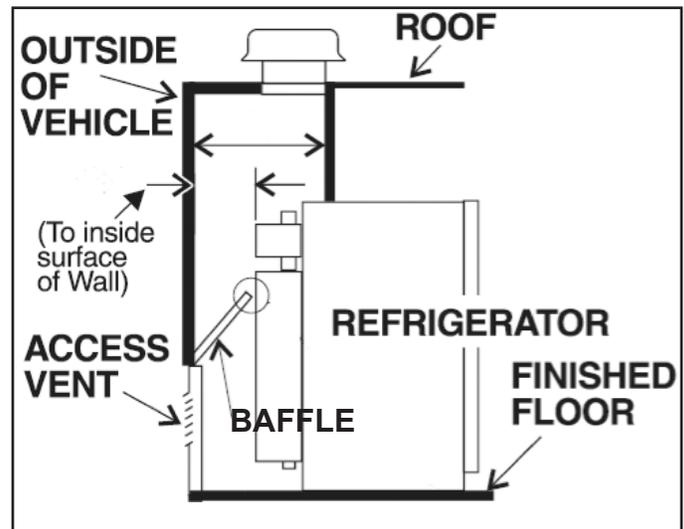
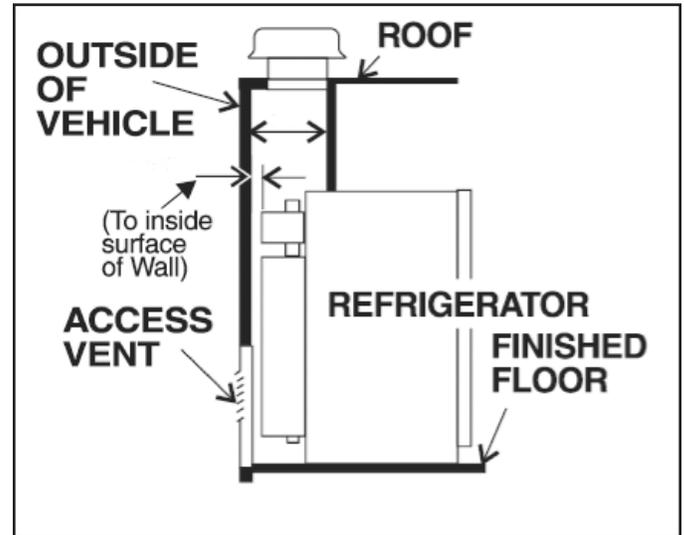
**NOTE:** Refrigerators should be installed in accordance with appropriate installation instructions received with the refrigerator.

**FOR MORE UPDATED INFORMATION ON UNIQUE VENTILATION REQUIREMENTS,** refer to Vent Installation Instructions, Form No. 3308666.XXX.

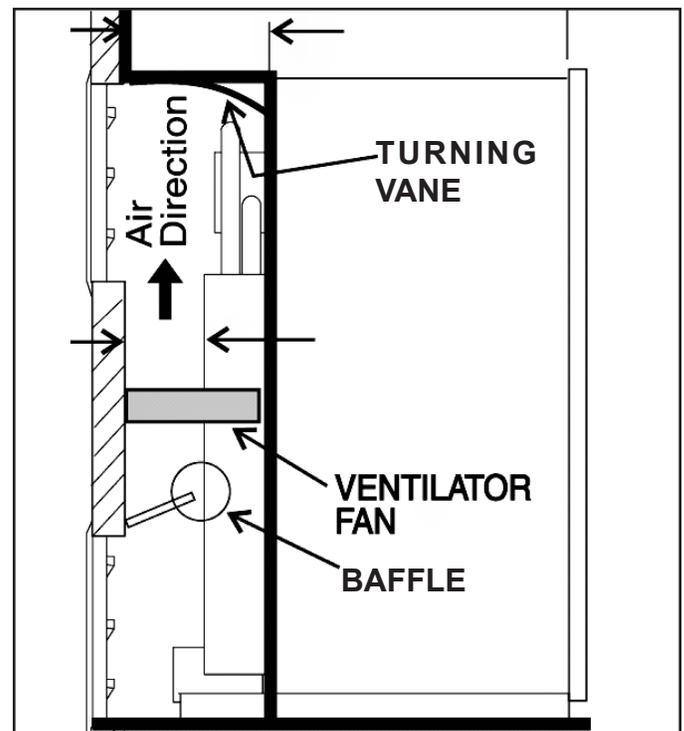


**SOME UNIQUE APPLICATIONS MAY REQUIRE THE INSTALLATION OF AN AIR CHANNEL KIT;** refer to Air Channel Kit Installation Instructions, Form No. 3312374.XXX.

### Typical Roof Vent and Side Wall Vent



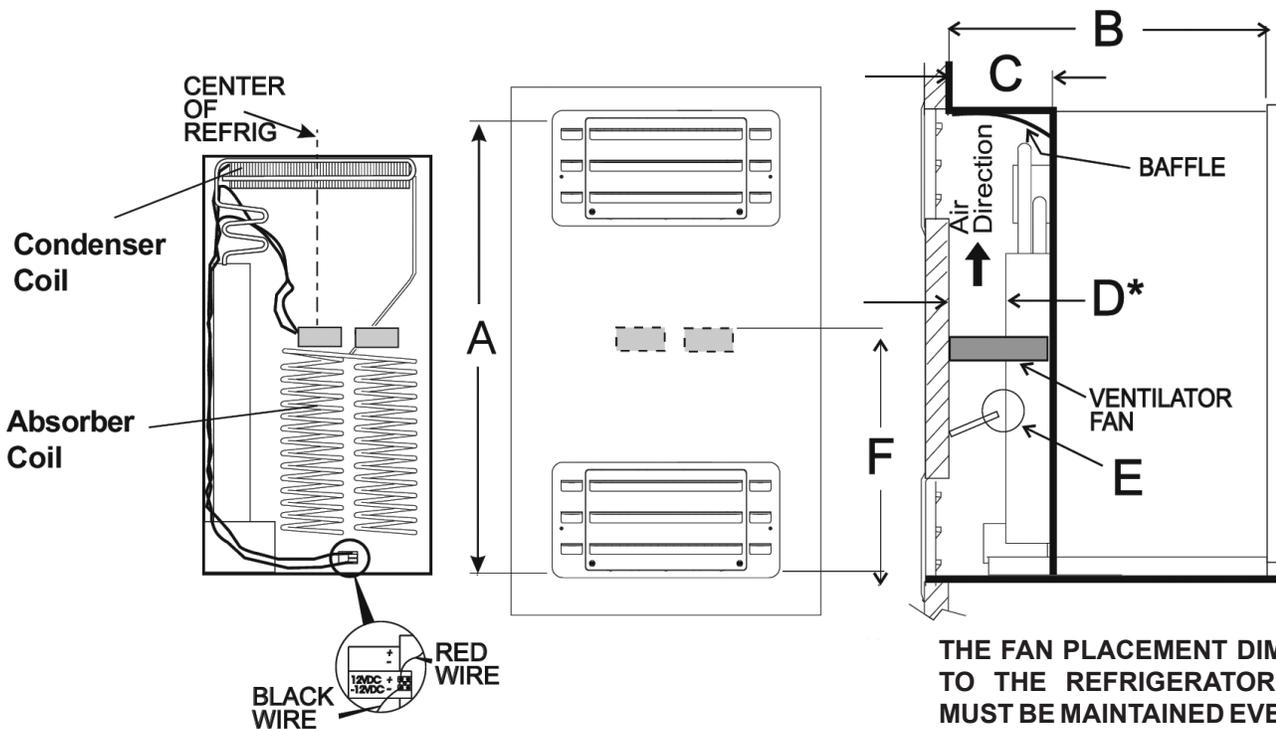
### Typical Two Side Wall Vents



## Typical Two Side Wall Vent Application. Always Refer To Vent Instructions 3308666.xxx

(Dimensions are in inches)

Model No.	Min. Vent Height	Min Dim. +1/4, -0	Min Dim.	Max Dim.	Min Dim.	Max Dim.	
	A	B	C	C	D*	E	F
NDA 1402	63	27 - 1/16	5 - 1/8	8	4 - 5/8	1	44 - 1/2
NDE 1402	63	27 - 1/16	5 - 1/8	8	4 - 5/8	1	44 - 1/2

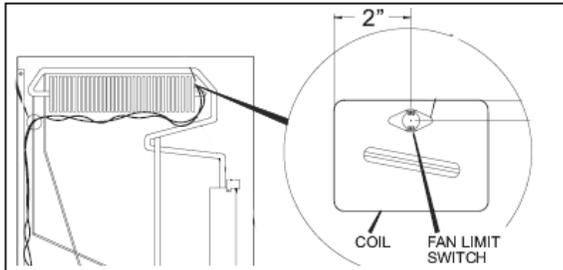


**THE FAN PLACEMENT DIMENSION TO THE REFRIGERATOR FLOOR MUST BE MAINTAINED EVEN WHEN THE UPPER VENT IS LOCATED HIGHER THAN DIMENSION "A"**

\* When dimension "D" exceeds "1", it is necessary to add baffle (E) above lower access vent as shown, for more efficient operation in warm temperatures.

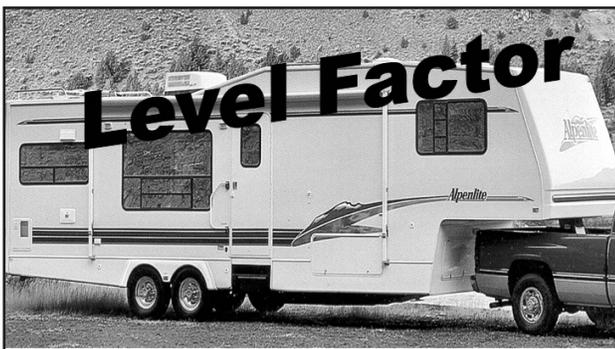
### 8.3 Ventilator Fans

The NDA/NDE 1402 models use two ventilator fans mounted to the back of the refrigerator (exterior). The purpose is to assist required air movement across the refrigerator condenser to ensure optimum performance. The fans are powered from DC current and are controlled from a limit switch, mounted on the end plate to the condenser fins just above the flue. The limit switch is normally open and will close at 149° F +/- 9° F and re-open at 122° F +/- 9° F. The switch can be checked for continuity. If the fans fail to run. Check all wiring, the inline 3 amp fuse and the limit switch. If these checks are good, replace the fan(s).



### 8.4 Leveling

Leveling is one of the requirements for proper operation of absorption refrigerators. The absorption design utilizes no mechanical pumps or compressors to circulate the refrigerant within the system, so proper leveling must be maintained to provide the correct refrigerant flow. Without proper leveling, refrigerant within the cooling unit will collect and stagnate at certain areas. Without proper refrigerant flow, the cooling process will stop. Absorption refrigerators have a type of cooling unit that utilizes an enclosed pump tube surrounded by a solution to protect the assembly. To ensure proper leveling, the vehicle needs to be leveled so it is comfortable to live in. (No noticeable sloping of floor or walls). When the vehicle is moving, leveling is not critical as the rolling and pitching movement of the vehicle will pass to either side of level, keeping the refrigerant from accumulating in the piping.



**PERFECTLY LEVEL NOT REQUIRED  
MORE LEVEL = BETTER OPERATION**

### 8.5 Food Storage

Proper refrigeration requires free air circulation within the food storage compartments. Restricted air circulation within the compartments will cause higher cabinet temperatures. To remedy this situation, simply rearrange your foodstuffs. It is also essential that the shelves are not covered with paper or large storage containers. Always remember to allow for proper air circulation. Odorous or highly flavored foods should always be stored in covered dishes, plastic bags or wrapped in foil or waxed paper to prevent food odors. Vegetables, lettuce, etc., should be covered to retain their crispness.

#### **NEVER PUT HOT FOOD INTO THE REFRIGERATOR.**

To reduce frost formation in and on the freezing compartment, cover stored liquids and moist foods and do not leave the door open longer than necessary. When the refrigerator is heavily loaded, it takes a longer time for refrigerator temperatures to lower, also increasing the ice making time.

### 8.6 Ambient Temperature

This is the temperature surrounding the recreational vehicle, as well as the temperature of air at the back of the refrigerator. As the ambient temperature increases, the air temperature in the area of the cooling unit increases. Improper venting at this point will cause the cooling unit to have reduced efficiency. A refrigerator that chases the out-side temperature is improperly vented or a weak cooling unit.

## Section 9

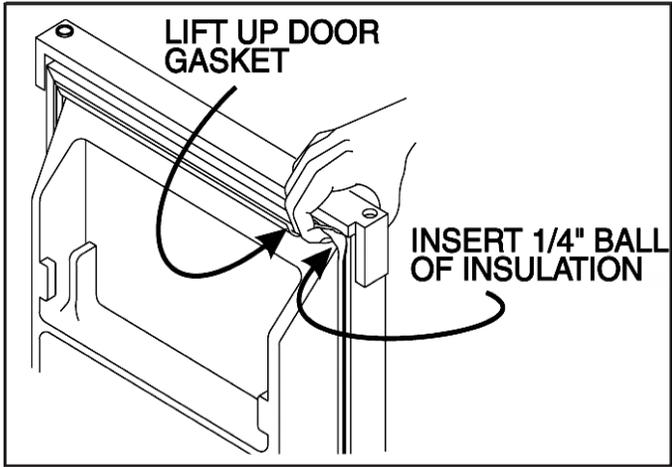
### FROST

#### 9.1 Door Seals

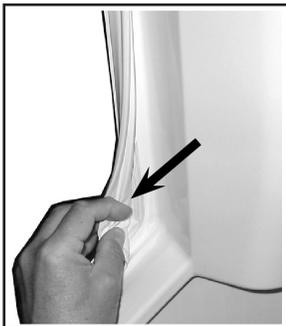
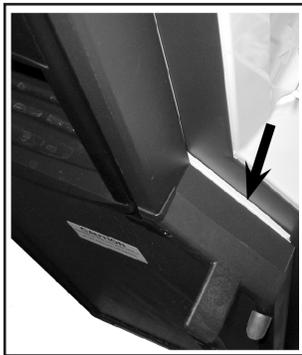
Check the gasket on the doors to be sure of a positive air seal. A simple method to check gaskets is to close the door on a dollar bill, then pull the dollar bill out. If no resistance is felt, the gasket in that location is not sealing properly. This should be done on all sides of the door in several places. If a gasket is not sealing properly, lift up the inside of door gasket and insert 1/4" ball of fiberglass insulation at all corners on both doors. This is especially important to the top corners. 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. Also check that the cooling unit is installed properly. The cooling unit's foam block, the portion that surrounds the evaporator coils, must be flush to the cabinet at the back of the refrigerator and have a positive seal. If the cooling unit is not installed properly, remove and install properly.

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

**CAUTION**  
**DO NOT OVERHEAT GASKET**  
**AS YOU CAN MELT THE MATERIAL**

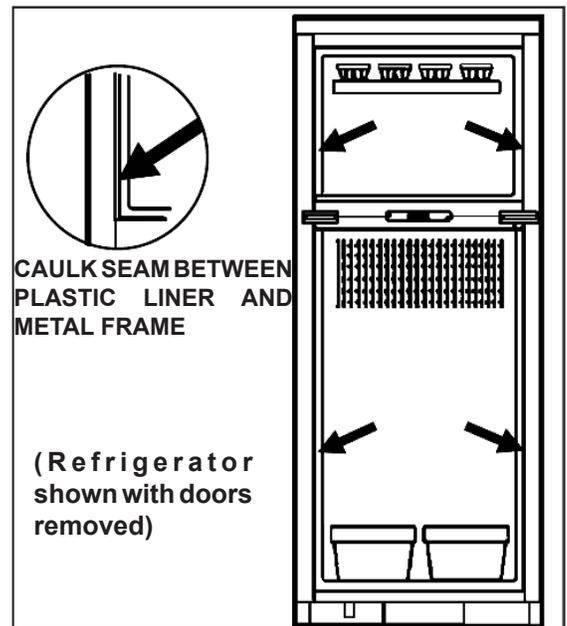


For freezer doors not sealing at the angled portion of the door, replace the sealing strip mounted under the gasket. For refrigerators lacking this strip, contact Dometic Technical Services and ask for part# 385133501.

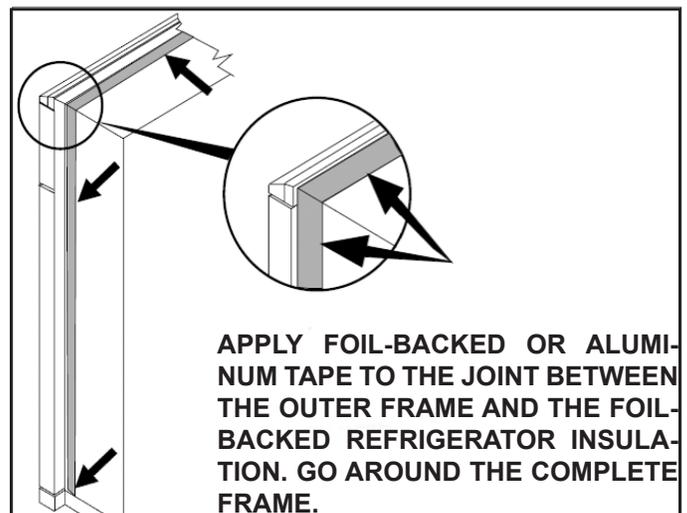


## 9.2 Interior Liner Seal To Frame

There is a seal that is applied to the liner in the area where the metal frame makes contact with the interior liner. If this seal is incomplete, cold air can migrate out to the metal frame. If this happens, condensation could form on the frame and could promote rapid formation of frost. If you suspect an improper seal, apply a small bead of silicone all the way around the perimeter where the frame meets the interior liner. Next remove all screws securing the refrigerator into the cabinet and slide the refrigerator out approximately 2-4 inches. Clean the metal frame and foil-backed insulation around the refrigerator. Apply a foil-backed adhesive tape to the joint between the outer frame and the foil-backed refrigerator insulation. Make sure the refrigerator is dry and that the surface temperatures are above 50° F. Use a white silicon caulking compound and seal the seam between the refrigerator's plastic liner and the metal frame. Apply the silicon in a continuous bead around both the freezer and fresh food compartments.



**Note: To form a proper seal, it is important not to leave any gaps**



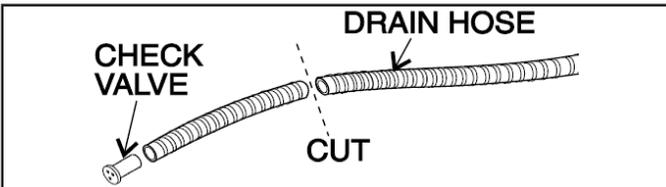
### 9.3 Drain Tube

The drain tube is used during the defrost cycle to allow water from the defrosting of the freezer section to migrate to the fresh food side and be drained through the rear of the refrigerator and out through the floor or the lower side-wall vent. 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.



Check orifice diameter. Should be 1/4"

Another source for air leaks could be the drain hose. At the end of the drain hose is a check valve. During installation of the refrigerator the hose might be shortened and the check valve must be moved to the end of drain hose. Any time lack of performance or excessive frost is experienced, look for the check valve at the end of hose.

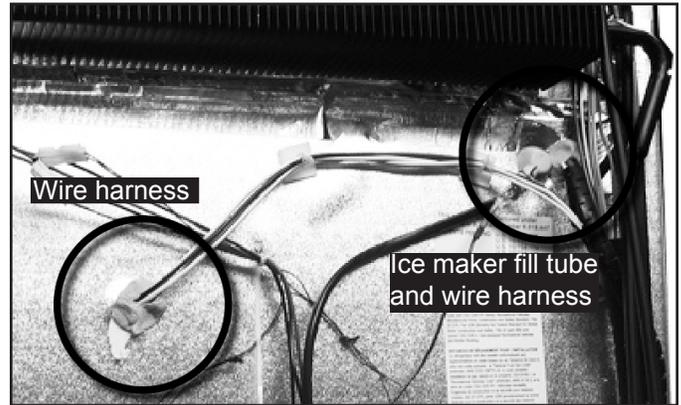


### 9.4 Wall Entrances

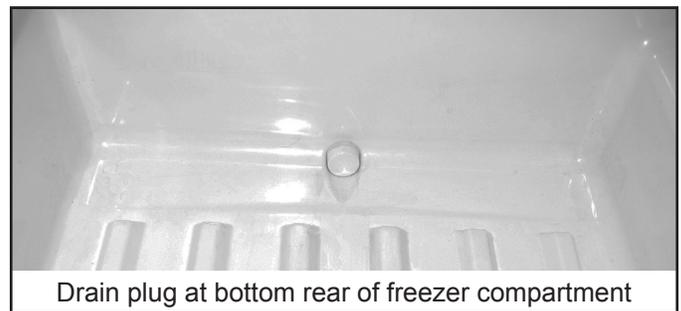
To prevent air leaks from the outside, it is vital to make sure that wall entrances have been sealed properly and that the drain plug is inserted at the bottom rear of the freezer compartment.

Verify that the wall entrances for the wire harnesses and for the ice maker fill tube have been sealed properly. If necessary, apply a butyl tape 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 rear of the freezer compartment. Make sure the drain plug is in place. If the plug is missing, install with a new one.



Drain plug at bottom rear of freezer compartment

### 9.5 Auxiliary Defrost Fan

In some cases refrigerators with serial numbers below 707XXXXX may require an auxiliary defrost fan kit to be installed to reduce the formation of frost in the freezer section. Contact Dometic Technical Service at 800-216-5115 to order an auxiliary defrost fan kit (Part# 385130901). The Refrigerator must be completely defrosted before repairs are completed to ensure proper operation.

### 9.6 High Humidity

If the interior of the coach is not air conditioned, higher temperatures and humidity can occur. A small amount of condensation may form on the frame of the refrigerator or around the ice dispenser area. In some cases it can develop to such a degree that it will run off the frame or down the freezer door. As the humidity is reduced, the sweating will decrease. High humidity can also be a factor in rapid formation of frost.

### 9.7 Door Position

If either door is closing too high or low against the frame, cold air leakage can occur. Adding or deleting a flat thin washer at the top or lower hinge pin can raise or lower the door position. To correct the door alignment, loosen the hinge screws slightly and reorient the door in the proper position. Hold the door in its new position and carefully retighten the hinge screws.

## SECTION 10

### DEFROSTING

#### 10.1 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 volt DC supply (battery voltage) is disconnected, the clock will continue to run only about three weeks. So if the 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 reset the clock when entering different time zones. (Refer to section 1, page 11 for setting of the clock).

#### 10.2 Automatic Defrosting

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 reinitialized every time the refrigerator is switched "OFF" for more than one hour.

Defrosting is initiated automatically every 24 hours, at 1:00 AM (based on clock setting). However, a defrosting may be skipped if the air temperature in the freezer is greater than 18° F, or the DC voltage is less than 10.5 volts.

**NOTE:** An automatic defrost may also be skipped if the control module detects a fault with either the heater or the thermistor for the cooling surface in the freezer section. These conditions will be indicated by an error code displayed on the front display panel. See section 11 for trouble shooting error codes.

The start of an automatic defrosting may be delayed for up to 3 hours based on two criteria. If the battery voltage is lower than 10.5 volts DC, or no cooling source (Gas or Electric) is available. If these two conditions are met, the defrost will be started and will complete as normal. If these two conditions are not met within 3 Hours, the defrost for this 24 Hour period will be skipped, and recorded as incomplete.

#### 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 become 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 (less than 8.5 volts DC).

### 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 heating stops when the temperature on the cooling surfaces has reached 41° F or when 20 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 become 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 (less than 8.5 volts DC).

After the defrosting of the fresh food side, normal thermostatic operation is restarted again. However, the heating element in the water drain line is still "ON" for some time. It is switched "OFF" 30 minutes after the start of the fresh food defrosting period.

If 2 incomplete defrostings occur in a row, the warning message "Er 01" is displayed on the front display panel.

**Note:** The WARNING "Er 01" on the front display panel 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 the power is switched "OFF" and then "ON".

## Freezer fan operation during and after a defrosting

The fan in the freezer is stopped during defrosting of the freezer cooling plate, but it is started for short periods of time for testing and to prevent it from being blocked (Test and Rinse). A permanently blocked fan will display a message “Er 02” on the front display panel. This 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” on the front display panel 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 volt DC supply is removed for short periods of time or if the refrigerator is switched “OFF” and then “ON” again during an 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 at 1:00 AM. Wait at least three minutes before trying to cancel the defrosting.

## 10.3 Manual Defrosting

A manually initiated defrosting will start if the AUTO/STORE button is held down during “power up”. However, on some models, if the freezer door is open during this initiation, a drying up period is instead started. 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 volt DC power break will not cancel the defrosting.

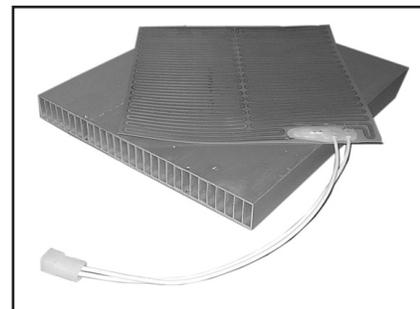
## 10.4 Drying Function

When the NDA/NDE 1402 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 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.

**NOTE:** Not all NDA/NDE 1402 models will have this feature.

## 10.5 Freezer Defrost Heating Element

The freezer heating element is a coated heat film, taped to the back side of the cooling flange. This flange is not visible when opening the freezer door. It is enclosed behind a cover mounted to the upper right hand side of the freezer. During the cooling cycle, as the plate gets cold the chilled air is directed into an air channel and pulled to the lower section of the freezer by the fan assembly. During defrosting, the heater will provide 70 watts of heat to melt the ice or frost that has accumulated on the cooling flange. To check the resistance of the freezer heating element, remove the cover of the main control board on the back of the refrigerator. Remove the red wire from terminal (J5). Measure the resistance between this wire and ground (-). The resistance reading should be 2 Ohm’s +/- 10%. The resistance can also be checked at the interconnection box along the back wall behind the icemaker assembly. 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. A faulty heater may display an error code on the front display panel. See section 11 for trouble shooting error codes.



Another test would be to check the amp draw. A simple method is to remove the wires from the thermo fuse and place a meter inline. Enter the service mode, and proceed to test #8. The amp draw should be 5.8 +/- 10%.

**NOTE:** The interior light must be off when performing this test as to avoid a false value of the actual amp draw of the heater.

## 10.6 Fresh Food Defrost Heating Element

The fresh food heater is located behind the cooling fins along the back wall of the refrigerator section. When activated, it will provide 40 watts of heat to melt any ice or frost that may have accumulated during normal operation. To check the resistance of the heater, remove the cover from the main control board on the back of the refrigerator. Remove the P5 harness cable from the lower pc board. Measure the resistance between pin 6 (red wire) and pin 3 (black wire). The resistance reading should be 3.6 Ohm's +/- 10%. The resistance can also be checked at the inter-connection box just above the cooling fins. 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. A faulty heater may display an error code on the front display panel. See section 11 for trouble shooting error codes.



Another test would be to check the amp draw. A simple method is to remove the wires from the thermo fuse and place a meter inline. Enter the service mode, and proceed to test #7. The amp draw should be 3.3 +/- 10%.

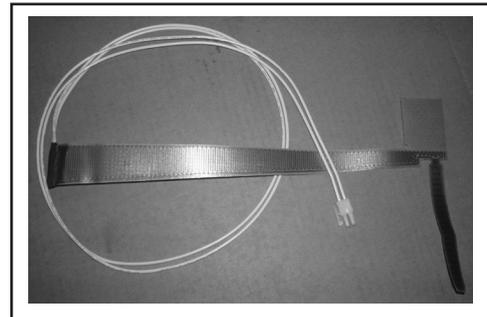
**NOTE:** The interior light must be off when performing this test as to avoid a false value of the actual amp draw of the heater.

## 10.7 Drain Tube/Tray Defrost Heating Element

The drain tube/tray heater is placed at the bottom of the plastic cover, housing the freezer cooling plate. This heater is on at all times during the defrosting of the freezer and fresh food compartments and will remain on for short periods of time at the end of defrosting to help assure water does not refreeze in the drain line. To check the resistance of the heater, remove the cover from the main control board on the back of the refrigerator. Remove the P5 harness cable from lower pc board. Measure the resistance between pin 5 (white wire) and pin 2 (yellow wire). The resistance should be 13.3 Ohm's +/- 10%. The resistance can also be checked at the inter-connection box along the back wall behind the ice maker assembly. 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. A faulty heater may display an error code on the front display panel. See section 11 for trouble shooting error codes

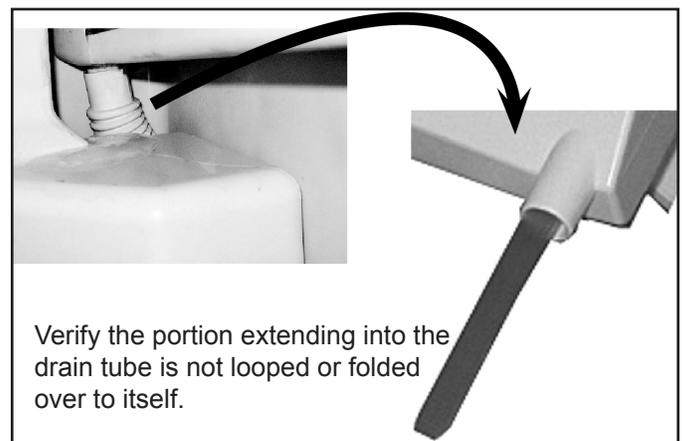


Drain tube/tray heater installed.



Drain tube/tray heater removed

In some cases during the install or replacement of the drain tube/tray heater, the portion that extends into the drain tube may become folded over or bunched up. When the heater is activated, this may cause a short and cause the heater to become open. A faulty heater may display an error code on the front display panel. See section 11 for trouble shooting codes.



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

Another test would be to check the amp draw. A simple method is to remove the wires from the thermo fuse and place a meter inline. Enter the service mode, and proceed to test #9. The amp draw should be .9 +/- 10%.

**NOTE:** The interior light must be off when performing this test as to avoid a false value of the actual amp draw of the heater.

## SECTION 11

### TROUBLE SHOOTING

#### 11.1 Status Messages

- Only one error code is displayed at a time. If more than one error exists, the error with the lowest error number is shown.
- Some errors are only detected at the power ON self-test; others are detected all the time and will be shown as soon as they occur. Therefore some error messages may not be reset until the refrigerator is turned “OFF and then back “ON”.

LED Display Panel	Status Message	Steady Display	Flashing- (Alternates between temp. & Message)
“dE Fr”	Defrost has been initiated.	X	
“drY”	Drying phase has been initiated.	X	
“x” (1-5)	Thermostat range set point. (1-5)	X	
“ch LP”	Gas operation fault. [1] (NDA 1402 only)		X
“ch AC”	A/C operation fault. [2] (NDE 1402 only)		X
“Lo dc”	Voltage is too low to start defrosting. [3]		X
“-- --”	Real time clock needs to be set. [4]		X
“Er 01”	Defrosting problem; (Two incomplete defrost attempts failed consecutively). [5]		X
“Er 02”	The fan in the frozen food compartment is blocked. [6]		X
“Er 03”	Freezer plate is above 95° F. [7]		X
“hi”	Temperature is above measurement range. [8]	X	
“Lo”	Temperature is below measurement range. [9]	X	
“CA LL” and a error code	Component failure. [10]		X

[1] Check to make sure that the LP-gas supply tanks are not empty and all manual shutoff valves in the lines are open. If the refrigerator has not been in used for a long time or if the LP tanks have been recently refilled, air may be trapped in the supply lines. To purge the air from the lines may require resetting the ON/OFF button several times.

[2] Check the AC supply, fuses etc.

[3] Check battery charge level (min 10.5 volts DC).

[4] Refer to section 1, page 11 for setting of the clock.

[5] Defrosting has been insufficient twice in a row (48 hours) either because of the DC voltage being too low, no cooling source available or because of too much frost buildup. Check the battery charge level to overcome low DC voltage situations. Check for the proper wire size as described in the table on page 14. Use the manual defrost function (see page 11) to overcome excess of frost buildup.

[6] The fan in the freezer has been blocked and is not circulating the air in the freezer compartment. Check the fan by unscrewing the bottom part of the fan housing. Try to rotate and look for ice buildup or other parts that can interfere with the rotation of the fan.

[7] The temperature of the cooling plate in the freezer is above 95° F when you start a “drying” phase. It is shown for one minute and then the refrigerator is turned off. This is a protection function against overheating if you try to start a “drying” phase just after a “drying” phase has been performed.

[8] The compartment temperatures are warmer than 41° F in freezer and warmer than 59° F in fresh food compartment.

[9] The compartment temperatures are less than -9° F in freezer and less than -9° F in the fresh food compartment.

[10] Refer to section 11.2, page 34 for troubleshooting the error codes.

## 11.2 Error Codes

NEA1402



NDA1402



Error codes are shown flashing, alternated with the message “CALL”.

Fault Detected	Message Displayed
Defrost heater for the freezer plate is faulty.	“Er 11”
Defrost heater for the fresh food cooling flange is faulty.	“Er 12”
Defrost heater for the drain tube/tray heater is faulty.	“Er 13”
Fan in the freezer compartment is faulty.	“Er 14”
Fan in the fresh food compartment is faulty.	“Er 15”
Air temperature sensor in the freezer compartment is faulty.	“Er 16”
Air temperature sensor in the fresh food compartment is faulty.	“Er 17”
Surface temperature sensor in the freezer compartment is faulty	“Er 18”
Surface temperature sensor in the fresh food compartment is faulty.	“Er 19”

### “Er 11”:

The fault is detected as an “open circuit” to the heating element for defrosting of the freezer plate.

#### Possible faults:

- Blown Fuse F4 (7.5 amp).
- Cable on terminal (J5) on the lower control board is disconnected.
- Ground cable to the heating element, terminal (J1) on the lower control board is loose.
- Wrong or loose connections in the inter-connection box inside the freezer compartment.
- Blown overheating protection fuse in the heating element (heating element has to be replaced).
- Broken element (heating element has to be replaced).
- See section 10.5 for testing of the heater.

### “Er 12”:

The fault is detected as an “open circuit” to the heating element for defrosting of the fresh food cooling flange.

#### Possible faults:

- Blown fuse F6 (7.5 amp).
- Connector (P5) on the lower control board is disconnected.
- Loose wires in the harness connected to (P5).
- Wrong or loose connections in the inter-connection box inside the fresh food compartment.
- Blown overheating protection fuse in the heating element (heating element has to be replaced).
- Broken element (heating element has to be replaced)
- See section 10.6 for testing of the heater.

### “Er 13”:

The fault is detected as an “open circuit” to the heating element in the drain tube/tray heater.

#### Possible faults:

- Loose wires in the harness connected to (P5) on the lower control board.
- Wrong or loose connections in the inter-connection box inside the freezer compartment.
- Blown overheating protection fuse in the heating element (heating element has to be replaced).
- Broken element (heating element has to be replaced)
- See section 10.7 for testing of the heater.

The fuse F6 also serves this heating element, but if the fuse is blown “Er 12” will be shown, as it has priority over “Er 13”.

### “Er 14”:

The fault is detected as an “open circuit” to the fan in the freezer compartment.

#### Possible faults:

- Loose wires in the harness connected to (P5) on the lower control board.
- Wrong or loose connections in the inter-connection box inside the freezer compartment.
- Wrong polarization at the fan terminal block.
- Fan motor faulty.
- See section 5.5 for testing of the fan.

#### “Er 15”:

The fault is detected as an “open circuit” to the fan in the fresh food compartment.

##### Possible faults:

- Loose wires in the harness connected to (P4) on the lower control board.
- Wrong or loose connections at the screw terminal block inside the fan housing in the fresh food compartment.
- Wrong polarization at the fan motor terminal block.
- Fan motor faulty.
- See section 5.5 for testing of the fan.

#### “Er 16”:

The fault is detected as an “open circuit” to the air temperature sensor in the freezer compartment.

##### Possible faults:

- Connector (P2) on the lower control board is disconnected.
- Loose wires in the harness connected to (P2) on the lower control board.
- Broken air temperature sensor in the freezer compartment.
- See section 5.2 for testing of the temperature sensor.

#### “Er 17”:

The fault is detected as an “open circuit” to the air temperature sensor in the fresh food compartment.

##### Possible faults:

- Connector (P3) on the lower control board is disconnected.
- Loose wires in the harness connected to (P3) on the lower control board.
- Broken air temperature sensor in the fresh food compartment.
- See section 5.2 for testing of the temperature sensor.

#### “Er 18”:

The fault is detected as an “open circuit” to the surface temperature sensor in the freezer compartment.

##### Possible faults:

- Loose wires in the harness connected to (P2) on the lower control board.
- Broken surface temperature sensor in the freezer compartment.
- See section 5.2 for testing of the temperature sensor.

**NOTE:** A disconnected (P2) connector will result in an error code 16 as this has priority.

#### “Er 19”:

The fault is detected as an “open circuit” to the surface temperature sensor in the fresh food compartment.

##### Possible faults:

- Loose wires in the harness connected to (P3) on the lower control board.
- Broken surface temperature sensor in the fresh food compartment.
- See section 5.2 for testing of the temperature sensor.

**NOTE:** A disconnected (P3) connector will result in an error code 17 as this has priority.

## 11.3 Service Mode

NEA1402



NDA1402



The service mode is intended as a tool to perform diagnostic troubleshooting.

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 the 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.

No.	Test Function	Test Results
00	-----	-----
01	LED Display panel.	All LED Segments on.
02	DC Voltage check.	“12” = within the proper operational range, 8.5 to 18 volts DC. “Lo” or “hi” = outside of operational range.
03	Air temperature sensors, freezer & fresh food.	Degrees °F = in range, “hi” or “Lo’ = out of range, “-- --” = fault detected.
04	Surface temperature sensors, freezer & fresh food.	Degrees °F = in range, “hi” or “Lo’ = out of range, “-- --” = fault detected.
05	Door switches.	“OP” = door is opened, “CL” = door is closed.
06	AC Detection.	“On” = circuit is turned on, “no AC” = fault detected.
07	Turn on fresh food defrost heater.	“On” = turned on, “-- --” = fault detected.
08	Turn on freezer plate defrost heater.	“On” = turned on, “-- --” = fault detected.
09	Turn on drain tube/tray defrost heater.	“On” = turned on, “-- --” = fault detected.
10	Turn on door frame heater.	“On” = turned on.
11	Turn on fan in fresh food section.	“On” = turned on, “-- --” = fault detected.
12	Turn on fan in freezer section.	“On” = turned on, “-- --” = fault detected or “bl” = fan is blocked.
13	Turn on gas ignition system (NDA1402) only.	“i9” = sparking, “FL” = flame is present, “-- --” = fault detected.

### Test 01:

#### Display Test

All segments and dots in the displays shall now be lit.

### Test 02:

#### DC Voltage Test

The display shows either “Lo”, “12” or “hi” depending on the actual battery supply voltage. If the display does not show “12”, there is a severe problem with the 12 volt DC battery supply.

**Note:** The “Lo dc” message will remain for approx 10 minutes after correct DC voltage is restored. Switching the refrigerator “OFF” and then back “ON” will clear the message immediately if DC voltage is normal.

### Test 03:

#### Air Temperature Sensor Test

The display shows the actual air temperatures in degrees Fahrenheit of the two compartments, freezer to the left and fresh food to the right. The display range is from -9° F to 41° F in the freezer and from -9° F to 59° F in the fresh food side. For temperatures below and above these ranges, the display will show “Lo” and “hi” respectively. An open circuit to a sensor will be displayed as “--”.

The out of range indications in the temperature display (“hi” and “Lo”) indicates that temperature is out of measurement circuit range. However, these indications may remain for some time after temperature is within range again. This depends on that the temperature display is filtered with long time constants. To reset the temperature filter memory, switch “OFF” and “ON” again. Now the temperature indications will start from the actual value.

**Note:** There is an offset between measured temperature and shown temperature, as the indications are intended to show food temperature rather than the temperature at the sensor.

## Test 04:

### Surface Temperature Sensor Test

The display shows the actual temperatures in degrees Fahrenheit on the cooling surfaces, freezer to the left and fresh food to the right. The displayable range is from -9° F to 59° F. Temperatures below or above this range will be displayed as “Lo” and “hi” respectively. An open circuit to a sensor will be displayed as “--”.

The out of range indications in the temperature display (“hi” and “Lo”) indicates that temperature is out of measurement circuit range. However, these indications may remain for some time after temperature is within range again. This depends on that the temperature display is filtered with long time constants. To reset the temperature filter memory, switch “OFF” and “ON” again. Now the temperature indications will start from the actual value.

## Test 05:

### Door Switch Sensor Test

The display shows the actual status for the doors. “CL” stands for door closed and “OP” stands for door open. The freezer door is to the left and the fresh food door is to the right. A depressed fresh food door sensor will not darken the display in the “Service mode”.

## Test 06:

### 120 Volt AC Test

If AC voltage is available, the display will show “On” and the AC relay will be activated so that the heater in the cooling unit is energized. If AC is not available, the display will show “no AC” and the relay will not be activated. A blown fuse (F5) will result in a “no AC” display. However, a faulty heater will not be detected at this test. A manual check of the heaters will be necessary to verify they are hot.

**Note:** Replacing a blown fuse while in this test will not clear the “no AC” display. Restart the “Service mode” to refresh the display message. Repeatedly press the SET button until this test is reached again.

## Test 07:

### Test of the Defrost Heating Element in the Fresh Food Side

A disconnected or broken defrosting element in the fresh food side results in the display “--”. A blown fuse (F6) or blown overheating protection in the element will also result in this display. Otherwise the display shows “On” and the element is energized. A fault here is also indicated with “Er 12” during normal operation.

**Note:** Replacing a blown fuse while in this test will not clear the “--” display. Restart the “Service mode” to refresh the display message. Repeatedly press the SET button until this test is reached again.

## Test 08:

### Test of the Defrost Heating Element in the Freezer

A disconnected or broken defrosting element in the freezer results in the display “--”. A blown fuse (F4) or blown overheating protection in the element will also result in this display. Otherwise the display shows “On” and the element is energized. A fault here is also indicated with “Er 11” during normal operation.

**Note:** Replacing a blown fuse while in this test will not clear the “--” display. Restart the “Service mode” to refresh the display message. Repeatedly press the SET button until this test is reached again.

## Test 09:

### Test of the Defrost Heating Element in the Drain Tube/Tray

A disconnected or broken defrosting element in the drain tube/tray results in the display “--”. A broken fuse (F6) also results in this display. Otherwise the display shows “On” and the element is energized. A fault here is also indicated with “Er 13” (or “Er 12” in case of a blown fuse) during normal operation.

**Note:** Replacing a blown fuse while in this test will not clear the “--” display. Restart the “Service mode” to refresh the display message. Repeatedly press the SET button until this test is reached again.

## Test 10:

### Test of the Heating Element in the Door Frame and Ice-Maker Waters Supply Line

This test only switches on the loads. A disconnected or faulty load will not be detected. The display therefore always shows “On” here. A faulty heater will not be detected at this test. A manual check of the heaters will be necessary to verify they are hot.

## Test 11:

### Test of the Fan in the Fresh Food Side

An open circuit to the fan in the fresh food side will result in the display “--”. Otherwise the display will show “On” and the fan is started. A fault here is also indicated with “Er 15” during normal operation.

**Note:** Correcting this problem while in this test will not clear the “--” display. Restart the “Service mode” to refresh the display message. Repeatedly press the SET button until this test is reached again.

## Test 12:

### Test of the Fan in the Freezer

An open circuit to the fan in the freezer will result in the display "--". A blocked fan will result in the display "bL". Otherwise the display will show "On" and the fan is started. A fault here is also indicated with "Er 14" during normal operation.

**Note:** Correcting this problem while in this test will not clear the "--" display. Restart the "Service mode" to refresh the display message. Repeatedly press the SET button until this test is reached again.

## Test 13:

### Gas Operation Test

In this test, gas operation may be checked. If the gas burner and the gas ignition control module are working OK, the gas flame shall be lit and the display shall show "FL" (Flame). Before the flame is lit and sparking is on, the display will show "i9" (stands for "ig" and shall be read as "ignition"). If a fault is detected "--" is shown.

**Note:** Correcting a gas operation fault while in this test will not clear the "--" display. Restart the "Service mode" to refresh the display message. Repeatedly press the SET button until this test is reached again.

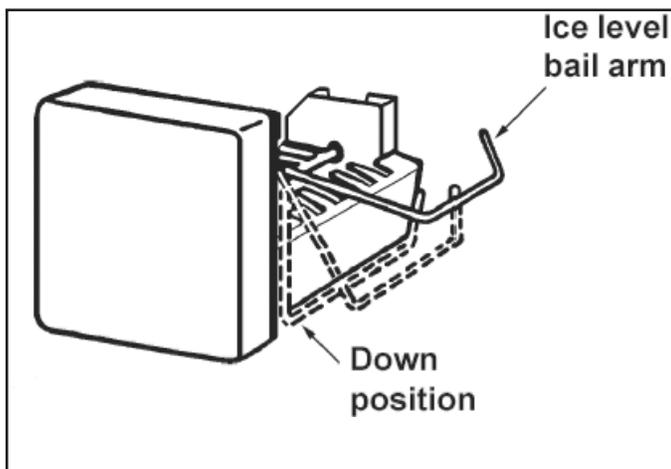
**Note:** For model NDE1402 (AC only) this test has no meaning. "--" will always be displayed during this test.

## SECTION 12

### ICE MAKER

#### 12.1 Operation

The refrigerator must be allowed to pre-cool properly before starting the ice maker. The refrigerator has to be connected to 120 volts AC before the ice maker can operate. The water line manual shutoff valve (not part of Dometic unit) must be open. To start making ice, move the ice level bail arm to the DOWN position.

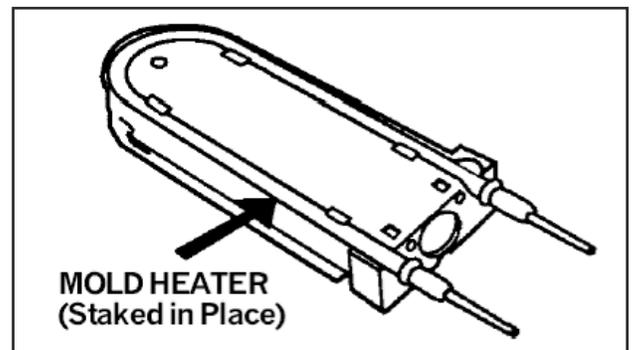


When the ice maker thermostat senses the preset temperature for ejection of the ice cubes, the fingers will start to rotate dumping any ice cubes and filling the mold with water. When the storage container is full of ice, the ice level bail arm cannot return to the DOWN position. This will stop further production of ice until the container is emptied and the bail arm is returned to the down position. The absorption system will keep the compartment at the proper temperature for storage of ice. Ice making is accelerated if the thermostat is set to the coldest position. It is a good idea to do this a few hours before you anticipate a need for ice. The first few cycles may have small cubes due to air trapped in the water lines. The first container of ice cubes should be dumped if the water system has been winterized or not used for several weeks.

**NOTE: IF THE ICE MAKER WAS CLEANED AND DRAINED, NO ICE CUBES WILL BE DUMPED INTO THE STORAGE CONTAINER DURING THE FIRST FEW CYCLES.**

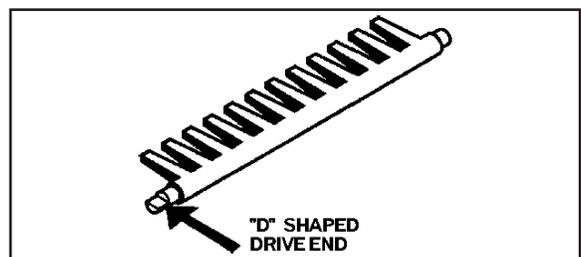
#### 12.2 Mold Heater

The mold heater uses 165 watts to thaw the ice free from the mold. It is wired in series with the thermostat which also acts as a safety device. With power to the appliance off, check for resistance between the two leads to the heater element. You should obtain a reading of approximately 80 Ohms +/- 10%. If the heater is found to be defective, replacement of the entire ice making unit is recommended for proper operation.



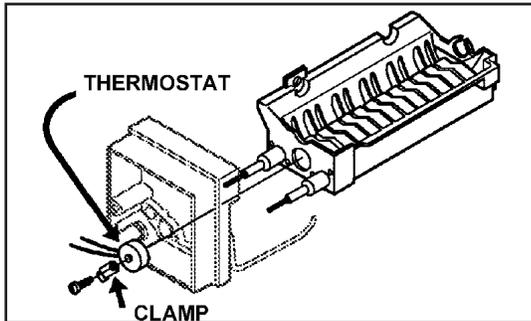
#### 12.3 Ice Ejector

The ice ejector blades sweep the ice from the mold cavities during the ejection cycle. The drive end of the ejector is "D" shaped for positive coupling. The bearings at both ends are lubricated with silicone grease. If the ejector blades are frozen into the ice, defrost the ice maker and manually cycle the ice making unit, making sure the ejector stops at the right location.



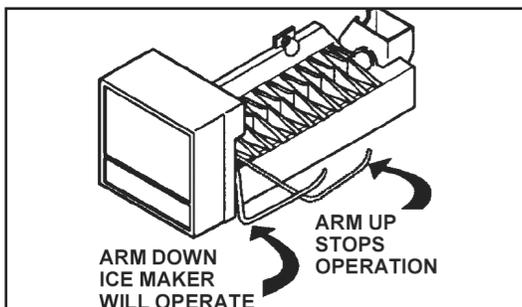
## 12.4 Mold Thermostat

This is a single-pole, single-throw, bimetal switch. It starts an ejection cycle by closing at  $15^{\circ}\text{F} \pm 5^{\circ}\text{F}$ . The reset temperature is  $50^{\circ}\text{F} \pm 5^{\circ}\text{F}$ . The thermostat is in series with the mold heater and acts as a safety against overheating in case of a mechanical failure. If the thermostat is defective, replace it. The mold thermostat starts the ice ejection cycle. The freezer must be down to proper temperature for the mold thermostat to start the cycle.



## 12.5 Shut Off Arm

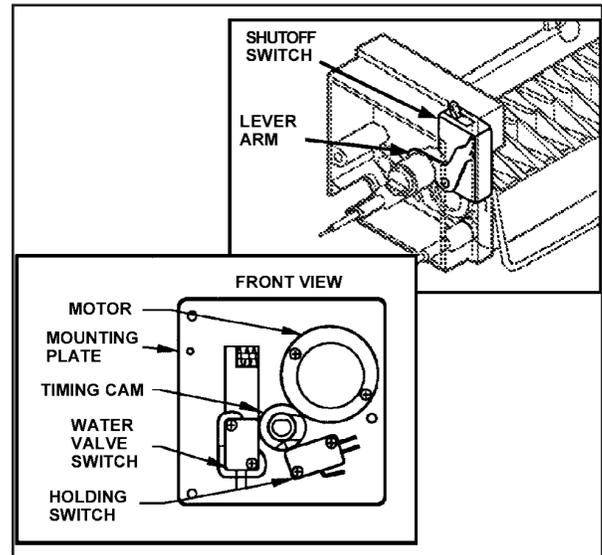
The shutoff arm is cam driven. It operates a switch to control the quantity of ice produced. During the ejection cycle the arm is raised and lowered during each of the two revolutions of the timing cam. If the shutoff arm comes to rest on top of the ice in the storage bin during either revolution, the switch will remain open and stop the ice maker at the end of that revolution. The arm has a manual shutoff built into the linkage; by raising the arm as high as possible, it will lock in that position until forced down. If the arm and switch do not operate properly, check for damage and repair or replace parts as necessary.



## 12.6 Mold Switches

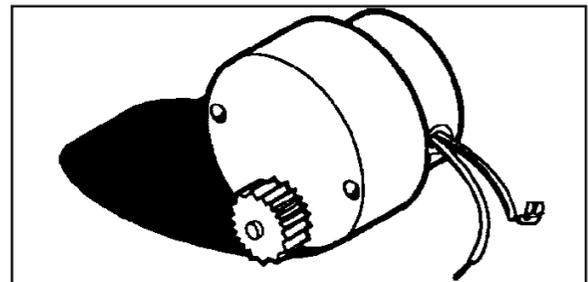
The three switches are single-pole, double-throw style. They are identical and interchangeable. The holding switch assures completion of a revolution once a cycle has started. The water valve switch opens the water valve during the fill stage of the cycle.

**NOTE:** This is the only adjustable component of the ice maker. If you use a double throw switch, **DO NOT** use the N.O. terminal. The shutoff switch stops the ice maker's operation when the storage bin is full.



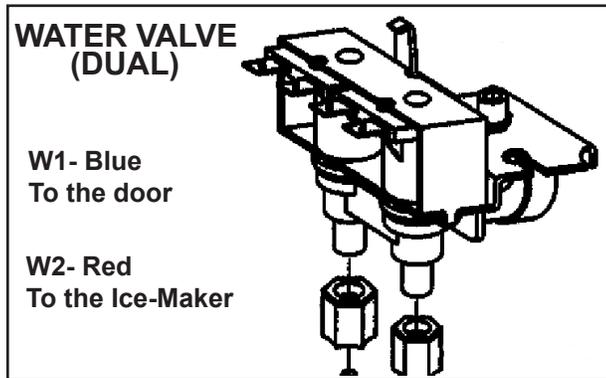
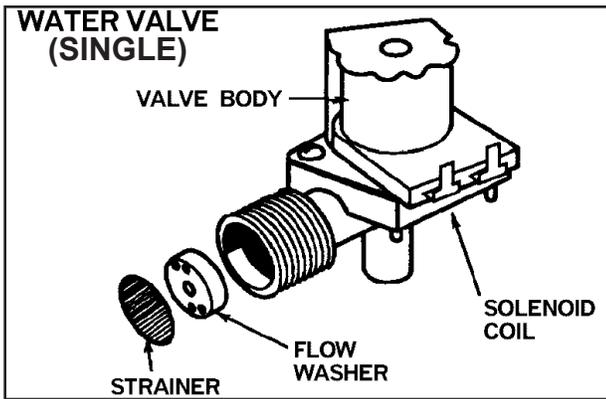
## 12.7 Timing Motor

This is a low-wattage, stall-type motor which is geared to the timing cam and ice ejector. It is a one RPM motor. To check the motor, disconnect power to the appliance and test for continuity between the two leads. If you have no continuity, replace the motor. If you have continuity and the motor runs, **DO NOT** replace.



## 12.8 Water Valve

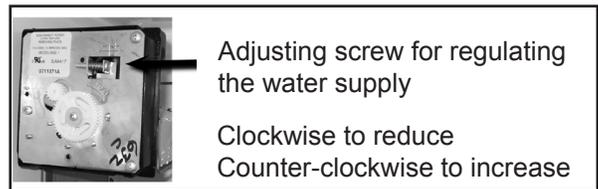
This valve is solenoid operated. When it is open, it releases water from the source to the mold. The amount of water is proportional to the length of time the water valve switch is held closed by its timing cam. Disconnect power to the appliance, remove the wires to the water valve solenoid coil, and check for continuity between the two terminals. The Ohms value should be between 200 to 500. If you have continuity, the solenoid is good. It takes 10-15 watts to energize the solenoid coil. The mold heater and coil are in series. When the mold heater is activated, this causes the voltage to drop to about 105 VAC at the coil. The valve has a flow washer inside which acts as a pressure regulator. A strainer is installed to prevent dirt, rust, etc, from entering the valve. Check for any debris which might obstruct the flow of water, or prevent the valve from closing completely when the circuit is not energized. Remove any obstructions. If the valve still fails to operate properly, replace it. If the valve has been cracked from freezing this would not be a warranty item.



## 12.10 Water Fill Adjustment

The correct water level in the mold is important for the proper production of ice. The size of the ice cubes depends on the amount of water which enters the mold. The cubes should be approximately 1/2" wide, 3/4" high and 2-1/2" long. If the water overflows in the mold, first check to see if the ice maker unit is level in the appliance. Next ensure that the appliance is installed level in the RV. If there is still water overflow, adjustment of the water fill screw is necessary. Locate the screw on the ice maker assembly. Turn the screw as necessary toward the "+" or "-" side. One full turn of the screw will make a 20 cc change in the amount of water. DO NOT turn the screw more than one full turn at a time. If the water level is too high, it can also cause the ejector blades to become frozen in the ice. Follow the procedures above to correct the problem.

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

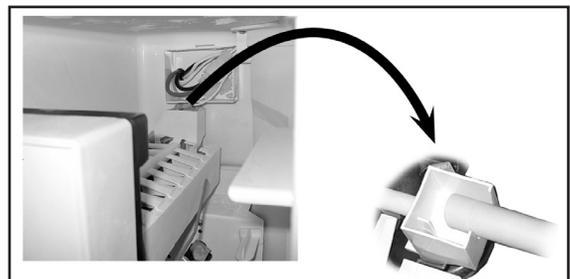


**NOTE:** Units that have water at the door dispenser will use a dual coil water valve. Both coils are 120 volt AC and can be tested by measuring the resistance.

W1 - Blue	400 Ohms +/- 10%
W2 - Red	200 Ohms +/- 10%

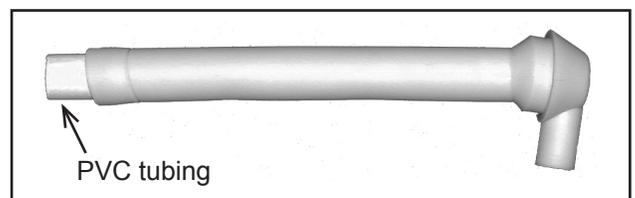
## 12.11 Fill Tube

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.



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

Should the fill tube be too short, extending the overall length may be necessary. This can be accomplished by inserting a piece of PVC tubing (1" long x 5/8" OD) into the end of the fill tube.



## 12.9 Ice Maker Replacement

### **⚠ WARNING**

**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**

It may be necessary to replace the entire ice maker assembly. Disconnect the power to the appliance. Disconnect the 4 pin connector from the ice maker unit. Check each wire for continuity to make sure the wiring is good before replacing the ice maker unit. If there is no continuity on any of these wires, replace or repair them as necessary and recheck the ice maker unit to determine whether the problem was in the wiring or the unit itself. Remove the three screws holding the unit to the plate. Before replacing the ice maker assembly check the temperature of the freezer, for the unit to cycle it should be 15° F ± 5° F or cooler as the mold thermostat starts the cycle.

## 12.12 Water Supply

To operate properly, the water pressure in the water supply line must be greater than 15 lbs. psi. Lower water pressure, water turned off, or obstructions or air in the water line can cause low or no ice production. First check to see that the water supply is fully turned on. Visually check the line for kinks, etc. which might obstruct the flow of water. To remove trapped air, loosen the connection at the water solenoid valve of the appliance. Ensure that pressurized water is reaching this point, and bleed off any air in the line. Retighten the connection, making sure there are no leaks.

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:

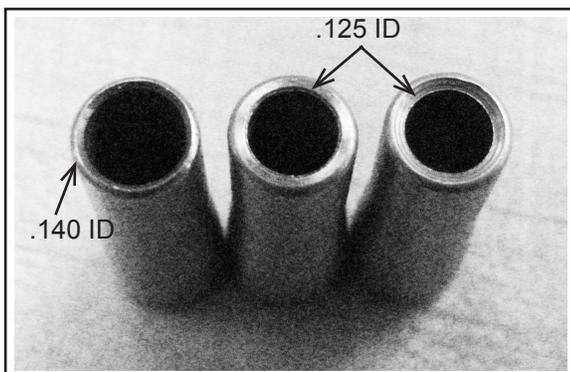
- Disconnect city water supply.
- Turn water pump switch on.
- Set the ice maker water supply line shut-off valve to "full open".
- Remove the ice bin.
- Remove the cover from face of ice maker.
- Rotate the ice maker main gear/sprocket using channel-lock pliers until bail arm begins to lift.
- Depress & hold the 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.

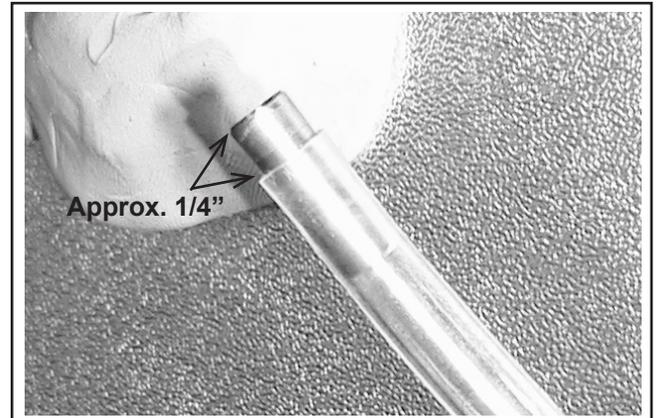
If foaming/spraying occurs:

### 1. Inspect/Replace water line insert.

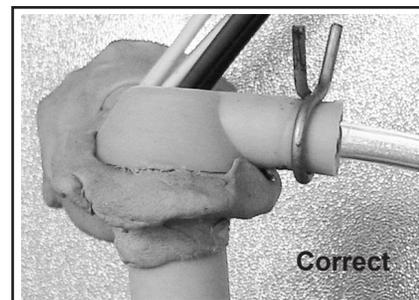
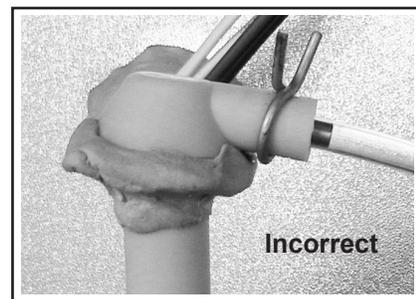
- The larger insert (.140 ID) allows for greater flow and greater possibility of overspray. The recommended size should be (.125 ID).



- The insert needs to be partially (not fully) inserted into the clear tubing.



- 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.
- Spring clip needs to be positioned so that it is firmly pinching down onto metal insert.



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).

## 12.13 Wiring

### **⚠ WARNING**

This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.

### Water Valve (Single)

Refer to the wiring diagram supplied with the unit you are working on, and make sure all wiring connections are correct and tight. There are 4 wires coming from the ice maker.

**BLACK:** Connected to incoming hot from AC power source. This could be a split wire at the AC BLACK at the circuit board or a separate power cord.

**WHITE:** Connected to either side of the water valve and will split at the valve and hook-up to the incoming WHITE from the power source.

**GREEN/YELLOW:** Connected to chassis ground.

**BROWN:** Connected to either side of water valve.

### Water Valve (Dual)

Refer to the wiring diagram supplied with the unit you are working on, and make sure all wiring connections are correct and tight. There are 4 wires coming from the ice maker.

**BLACK:** Connected to incoming hot from AC power source. This could be a split wire at the AC BLACK at the circuit board or a separate power cord.

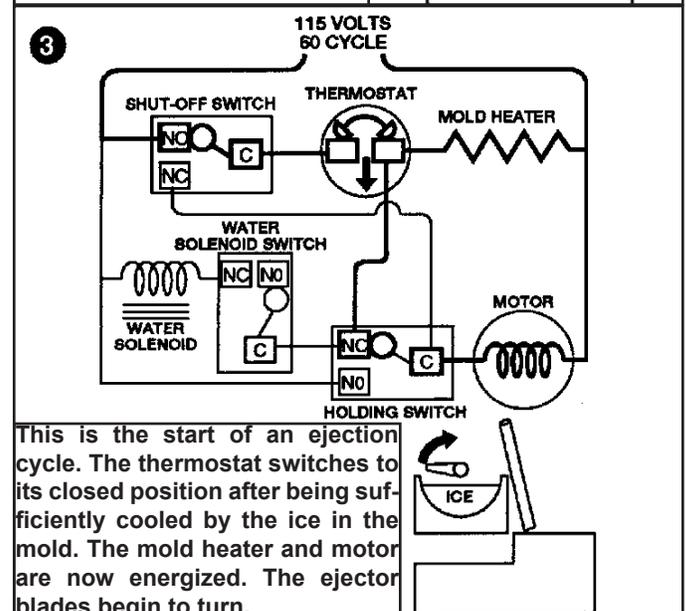
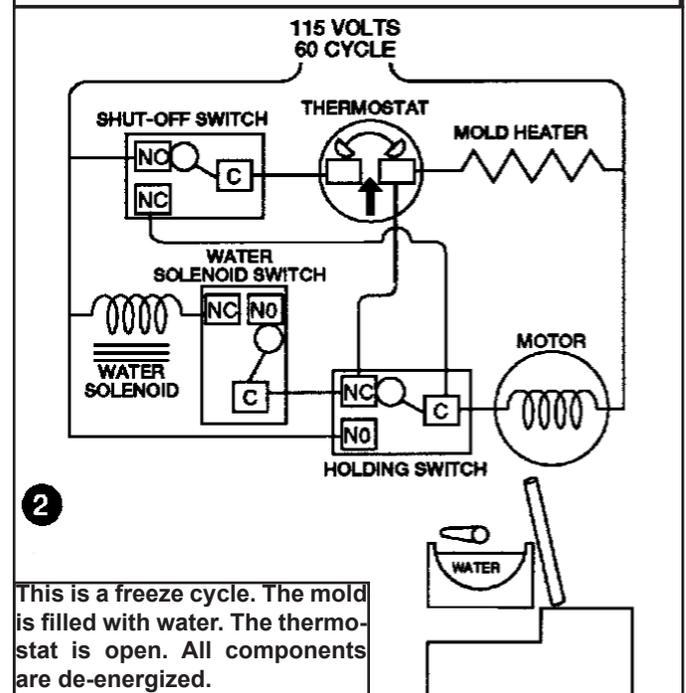
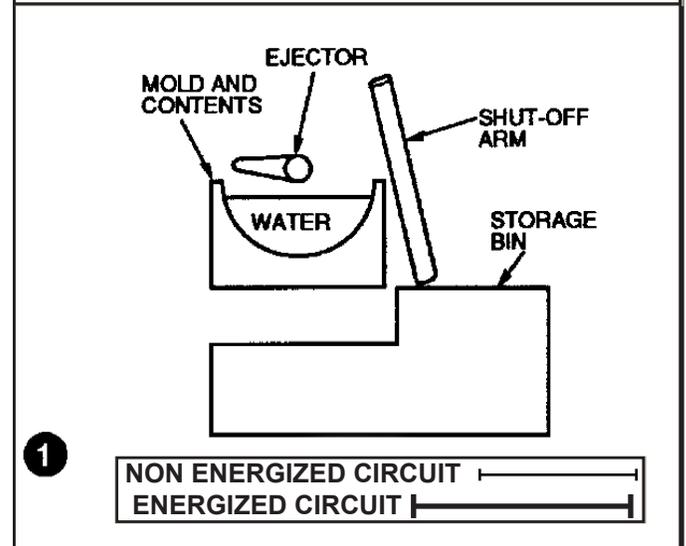
**WHITE:** Connected to either side of the water valve (W2) and will be wired in series to water valve (W1). From the water valve it will be routed to (J1) on the interface module and split to the incoming WHITE from the power source.

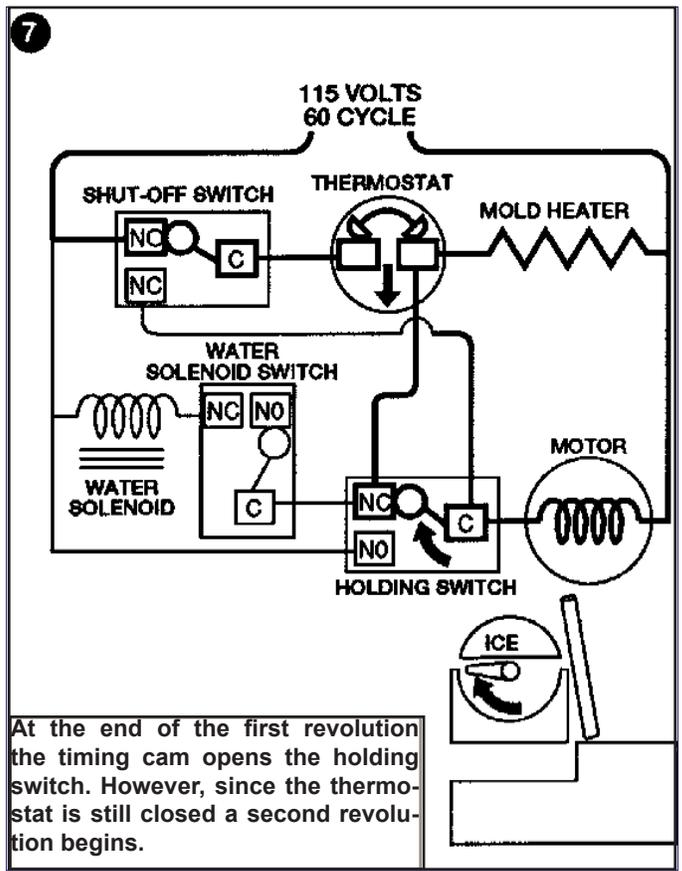
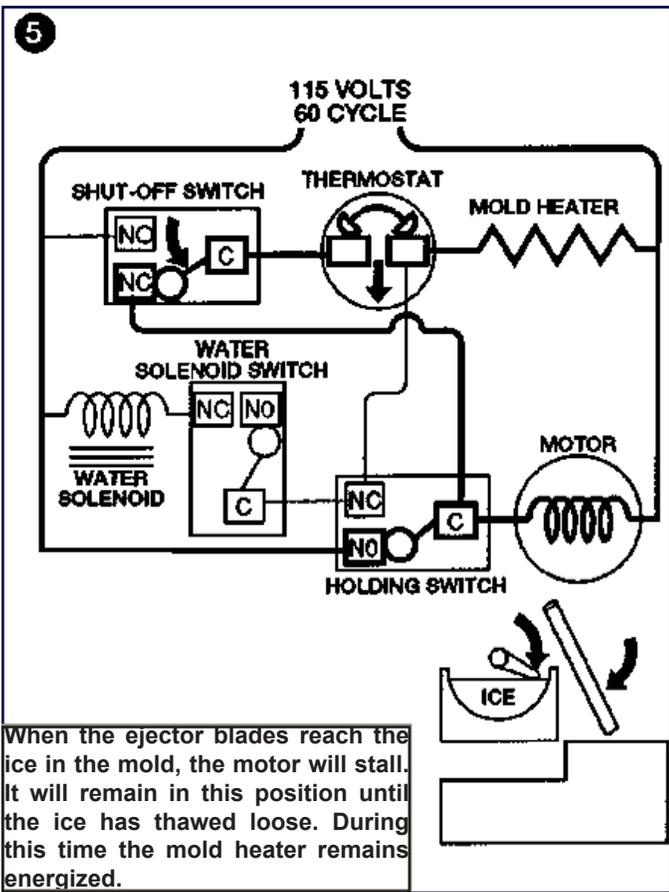
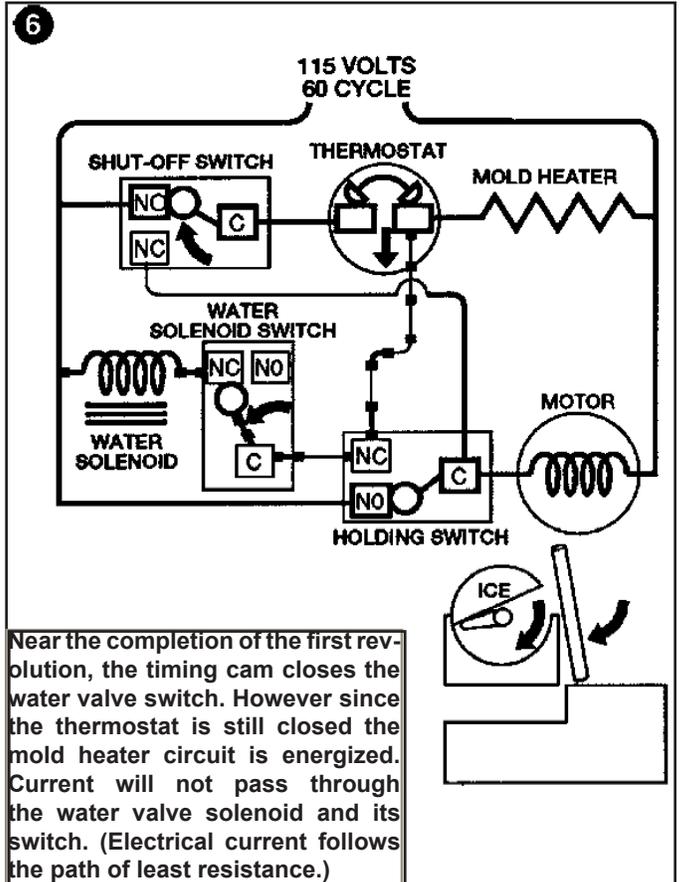
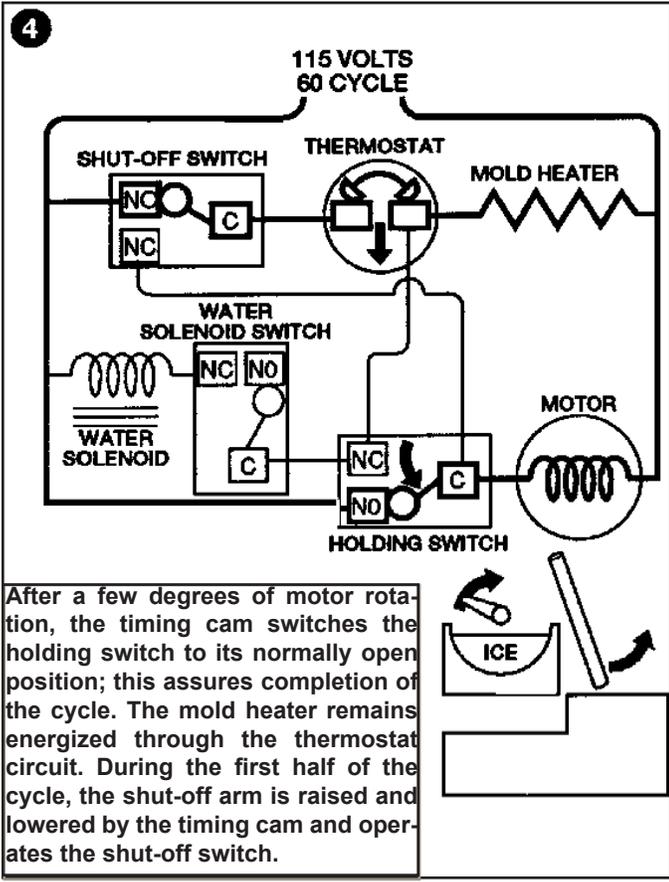
**GREEN/YELLOW:** Connected to chassis ground.

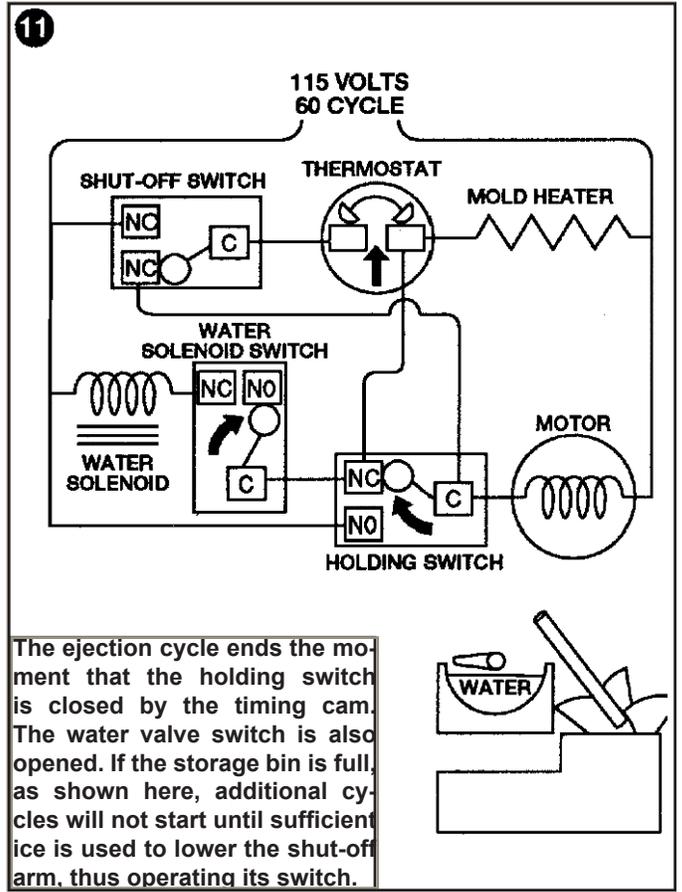
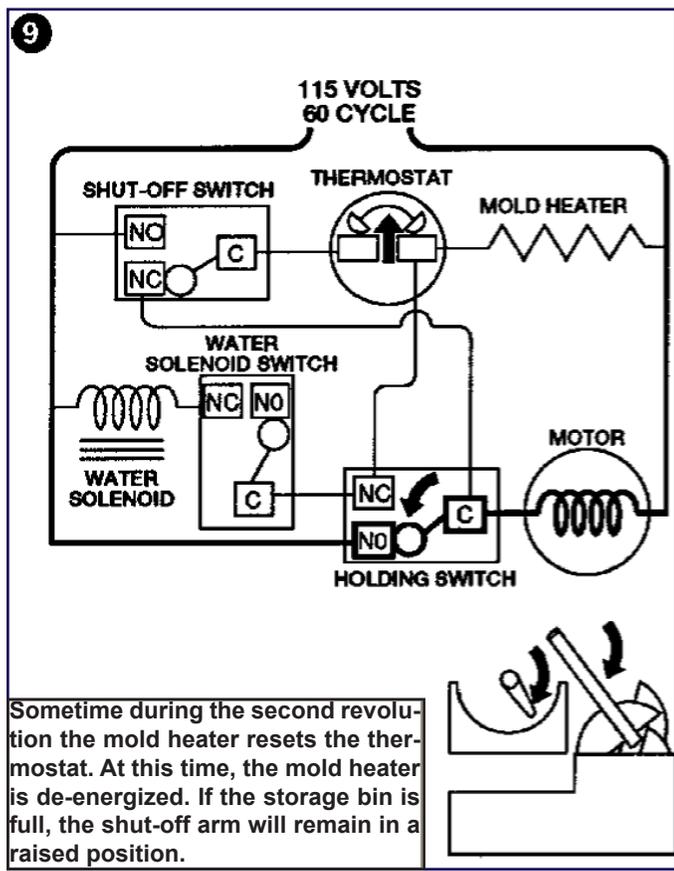
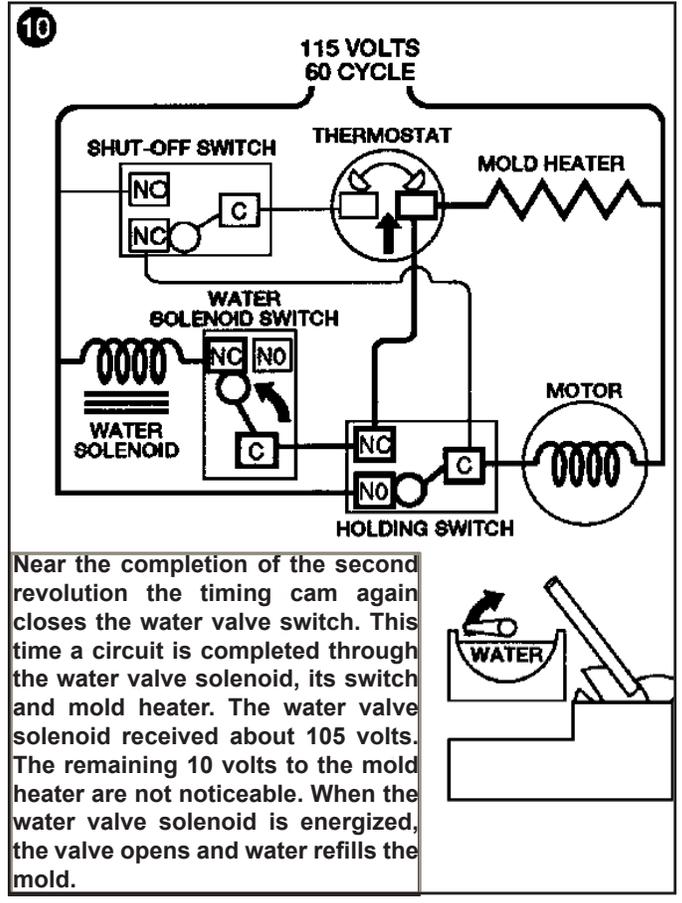
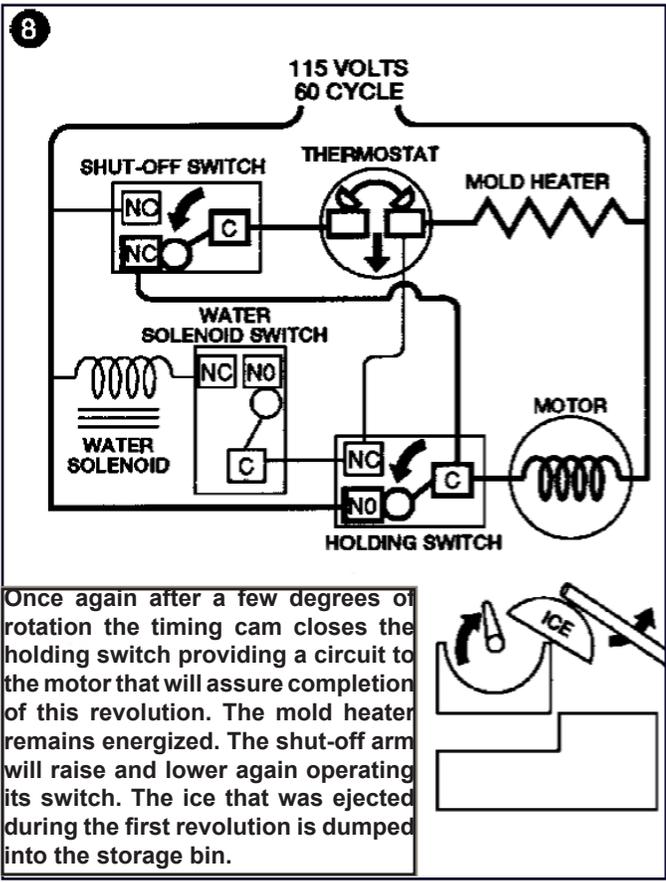
**BROWN:** Connected to either side of water valve (W2)

**BLUE:** Connected to either side of water valve (W1).

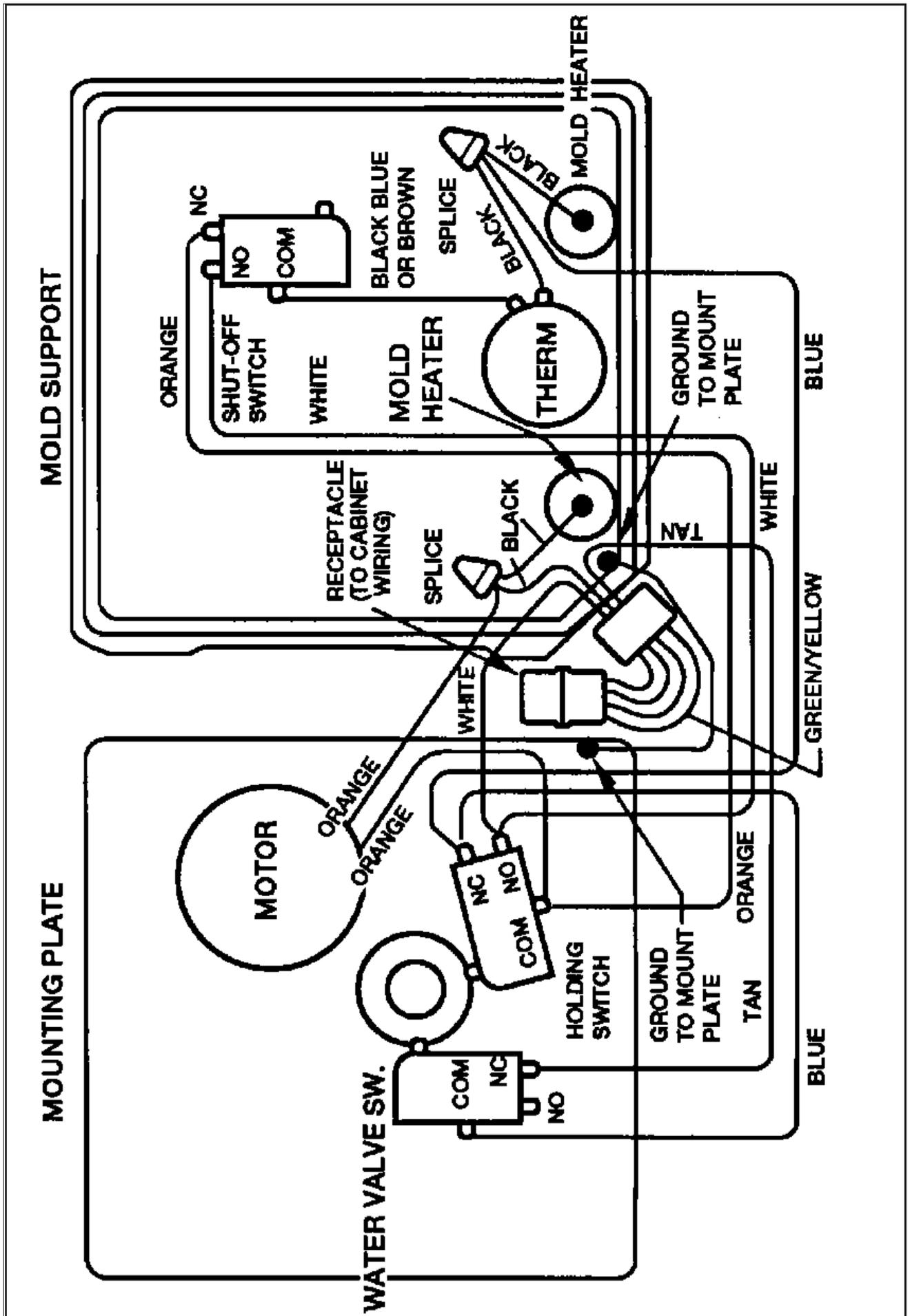
NOTE THE RELATIVE POSITION OF THESE COMPONENTS IN THE FOLLOWING SCHEMATICS







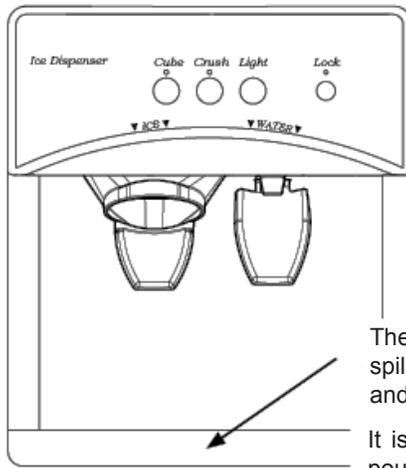
ICE MAKER TYPICAL WIRING DIAGRAM



## SECTION 13

### DOOR DISPENSER

#### 13.1 Operation



The drip tray catches small spills. The tray is removable and dishwasher safe.

It is not a drain; ***DO NOT*** pour water directly into this area.

#### ICE DISPENSER (OPTIONAL)

For a refrigerator to provide ice through the door, the ice maker first dumps the ice it produces into a large bin. To request ice at the door, select Cube or Crush and then press the lever. This will activate a switch which turns on a motor that rotates the auger. When the auger rotates, it pushes ice out of the bin, through a chute right into the glass. To stop dispensing, pull the glass away from dispensing arm before the glass is full. Allow the ice chute to clear before removing the glass.

#### WATER DISPENSER (OPTIONAL)

The water dispenser works much like the ice dispenser. To request water at the door, simply press the lever. This will activate a switch which turns on an electric water valve at the back of the refrigerator. Water will flow through a separate tube right into the glass.

#### LOCK OUT FEATURE

The ice dispensing system can be locked out to prevent unwanted use.

- **Lock out**  
To lock out, press the "Lock" pad for (3-5) seconds until the RED light above the Padlock comes on.
- **Unlock**  
To unlock, press the "Lock" pad for (3-5) seconds until the RED light above the Padlock goes out.

#### DISPENSER LIGHT

The light can be turned on and off by pressing the "Light" touch pad. The light will illuminate the dispenser area. The light will also turn on automatically when ice or water is dispensed.

#### AUTOMATIC POWER SUPPLY SWITCH OFF

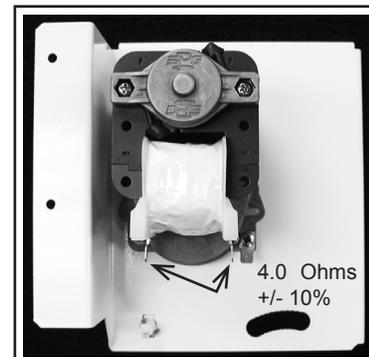
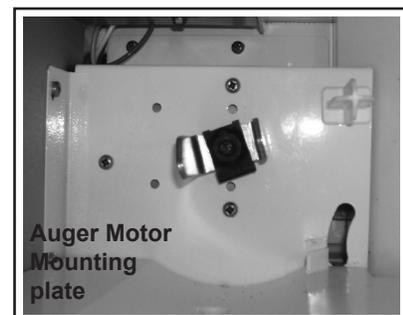
For safety reasons, when opening the freezer door, the ice/water dispenser and ice maker system will automatically shut off. Closing the freezer door automatically resumes operation of ice/water dispensing and ice maker operation.

#### **⚠ WARNING**

**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**

#### 13.2 Auger

When the paddle on the door dispenser is depressed calling for ice, a switch will be closed sending AC voltage via the yellow wire to the interface module. This contact on the interface module is a bridged set of terminals that internally send the AC voltage to the auger motor. As the auger motor rotates, this pushes the ice forward in the ice bin and down through a chute to the door dispenser. To check the motor, disconnect the 120 volt AC supply to the interface module. Measure the resistance between the wires on terminals (J6) and (J3) of the interface module. The resistance should be 4.0 Ohms +/- 10%. The resistance can also be checked directly at the motor assembly. This will require removal of the plate along the back wall of the freezer just behind the ice bin.



**⚠ WARNING**

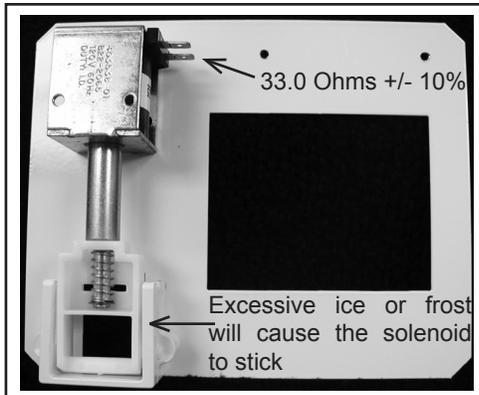
**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**

**13.3 Solenoid**

The solenoid is only activated when calling for cubed ice. When the paddle on the door dispenser is depressed calling for ice, a switch will be closed sending AC voltage via the red wire (solenoid) and yellow wire (auger) to the interface module. These contacts on the interface module are bridged separately and internally send AC voltage to the solenoid and auger motor. When the solenoid is activated, it will raise the lever in the ice bin, lifting a small door. As the auger motor rotates, this pushes the ice forward in the ice bin bypassing the crushing fingers, providing cubed ice down through a chute to the door dispenser. To check the solenoid, disconnect the 120 volt AC supply to the interface module. Measure the resistance between the wires on terminals (J8) and (J3) of the interface module. The resistance should be 33.0 Ohms +/- 10%. The resistance can also be checked directly at the solenoid assembly. This will require removal of the auger motor along the back wall of the freezer just behind the ice bin.

**NOTE:** When crushed ice is called for, the solenoid will not be activated. This forces the lever to remain down, forcing the ice through the crushing fingers in the ice bin and down through the chute to the dispenser.

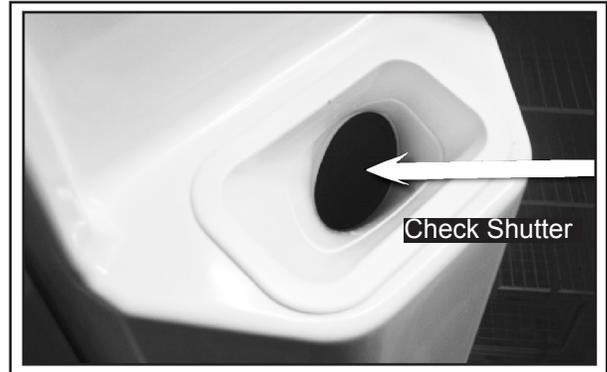
Excessive frost around the solenoid may prevent the ice bin lever from rising. This will result in crushed ice, regardless of the request from the door controls.



**13.4 Ice Shutter**

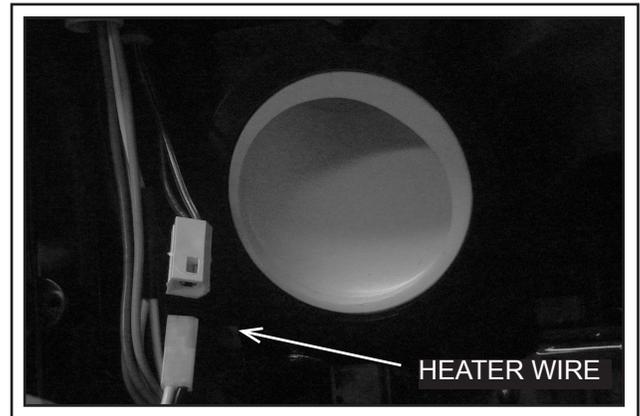
The ice shutter is a door that holds back the ice into the ice bin when the dispenser is not in use. When the paddle for ice is depressed, the shutter will open allowing ice to pass through. If the interior of the coach is not air conditioned, allowing for higher temperatures and humidity, a small amount of condensation may form on the shutter area. In some cases it can develop to such a degree that it will run down the freezer door and into the living area of the coach. As the humidity is reduced, the condensation will decrease.

Ensure the ice shutter closes properly. Give the shutter a gentle push and watch to see if it closes completely. Verify for debris on the shutter that does not allow for a tight seal. If the shutter is not sealing as intended, the dispenser mechanism should be replaced.



**⚠ WARNING**

**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**



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%.

## 13.5 Water Dispenser

When the paddle on the door dispenser is depressed calling for water, a switch will be closed sending AC voltage via the blue wire to the water valve. When activated, water will be supplied to the door dispenser. If no water is dispensed, check for AC voltage at W1 (Blue) coil of the water valve assembly. If no voltage is present check the wiring harness, or the dispenser mechanism will need to be replaced. If voltage is present when the lever is depressed and no water is dispensed, verify water supply and check for leaks at the valve, water line & 90° elbow. If the above checks are OK replace the water valve assembly.

**NOTE:** For safety reasons, when opening the freezer door, the ice/water dispenser and ice maker system will automatically shut off. Closing the freezer door automatically resumes operation of ice/water dispensing and ice maker operation.

## 13.6 Door Mechanism and Display Panel

The control system in the door is split into two units: One unit with a power supply for the electronic control and four relays for switching on the AC to the auger motor, cube/crushed ice solenoid, water valve and the lamp. The micro switches for sensing of the water and ice paddles are mounted separately and connected to this power supply board. The lamp and the cable from the back side are also connected to this board. The other unit is positioned just behind the front display panel and has switches that are actuated by the touch pads. The front panel also has a central processor that controls all commands to the dispenser assembly. The two units are interconnected by a flat flexible cable. However, all intelligence is on the processor board (front panel). If the unit fails to operate, first verify the connections of the flexible cable, and then replace the front panel.

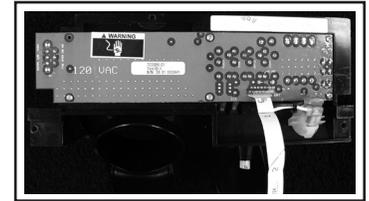
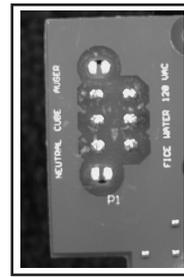
### **⚠ WARNING**

**This is an energized circuit. Shock can occur if not tested properly. Testing is to be done by a qualified service technician.**

To bypass the door controls and verify the operation of the auger, solenoid and water dispenser. Remove the drip tray and front display panel. These test can be performed at the (6) six pin connector on the left side of the dispenser assembly.

Using an insulated jumper wire, jump between 120 VAC and:

- Water- Water should be dispensed.
- Auger- Auger should rotate.
- Cube- Solenoid should be activated.
- Fice- This connection is not used.



When performing these tests, if the auger, solenoid, and water dispenser work as intended, the problem is located in the door mechanism, flat cable or display panel.

## SECTION 14

### WIRING

#### 14.1 Internal Wiring

Check all wires and the connectors to ensure a proper and tight connection. Also verify the refrigerator is wired per the wiring diagram for the model you are working on. (See applicable wiring diagrams for your model refrigerator). A loose connection can create erratic operation. Always check the wires at the DC terminal block, two wires in and two wires out.

#### 14.2 External Wiring

**120 Volts AC Connection:** The refrigerator is equipped with a three prong (grounded) plug for protection against shock hazards and should be plugged directly into a properly grounded three prong receptacle. **DO NOT** cut or remove the grounding prong from this plug.

**12 Volt Connection:** The connection is made to the terminal block marked 12 volts DC. The control system is connected to a battery/converter circuit and could draw about 3 amps (7 amps if defrosting) at 12 volts DC. The refrigerator must be connected to the battery circuit with two wires of adequate capacity to avoid a voltage drop. Proper polarity is crucial for refrigerator operation. **Don't use the chassis for the ground circuit. No other electrical equipment or lighting should be connected to refrigerator circuit.** A loose connection will create erratic operation.

#### 14.3 Wiring Schematics

To view typical wiring schematics look in the Lower Circuit board testing section 5, pages 19, 20 and 21. All units should have a specific schematic on the rear of that unit. To acquire the proper wiring schematic always have the product number when you call or e-mail.

### **⚠ WARNING**

**DO NOT** use a flame to check for gas leaks.

## SECTION 15

### MISCELLANEOUS

#### 15.1 Thermistor

Thermistor values at varying temperatures:

See section 5.2, page 15 for procedure to test thermistors.

Temperature F°	Temperature C°	Ohms
70	21	2343
65	18	2601
60	16	2917
55	13	3275
50	10	3684
45	7	4152
40	4	4687
35	2	5300
30	-1	5952
25	-4	6755
20	-7	7682
15	-9	8754
10	-12	9995
5	-15	11435
0	-18	13111
-5	-21	15064