# TROUBLE SHOOTING INFORMATION

Here is a brief list of some **"How to check out a cooling unit"** information. You will be able to confirm if you have a bad cooling unit or not. Be sure that during any test to confirm a good or bad cooling unit **you never use LP Gas to confirm. ONLY the AC mode** should be used to confirm. Once the AC is confirmed working correctly with a cold refrigerator the LP gas can be confirmed at that time. There is no way for you to confirm the LP gas BTUs of heat needed for operation. AC can be confirmed by amp draw, element resistance, and input voltage during test at any time.

## Testing the Cooling Unit Testing by "Feel"

For this method of testing the only tools required are your hands! **CAUTION:** some of the components may be **HOT!** **Be Careful!**

If a Cooling Unit is operating properly, there should be approximately the same amount of heat in the middle sections of the boiler and absorber. A bad cooling unit will always be HOT somewhere on the back. No heat at any location on the back after several hours could mean something other than a bad cooling unit.

## Cooling Unit Blockages

When a cooling unit malfunctions due to a blockage, the boiler section may be to hot to touch, and the absorber will be relatively cool. Any blockage reduces the free flow of the solutions and will inhibit or completely prevent proper cooling operation. A blockage is caused when the fridge has been operated in an off-level condition. The heat that is generated by the propane flame or the electric heating element is the force that initiates the boiling cycle of the ammonia solutions inside the cooling unit. This action is like the familiar coffee percolator where the water is lifted by the heat and flows by gravity down over the coffee grounds.

The refrigerator depends on gravity to move the solutions through the system once the heat source has lifted the solutions to the top of the cooling unit. The passages that the solution must travel through have only a slight slope to them

and any off-level condition will hinder this gravity flow. Parking on a hill, with your refrigerator running while you go off to lunch, starts the degradation of the system and every time you do this, it adds up. There is no way to reverse this problem.

What happens in this situation is that the solution in the cooling unit gets overheated and a component of this solution crystallizes and becomes solid particles that float around and lodge where they are not supposed to. Tipping the refrigerator upside down, may or may not dislodge the particles, but they are still in there and will (sooner or later) plug things up again.

You have two choices… replace the cooling unit (Brand-New or Remanufactured) or replace the entire refrigerator. We have both Brand-New and Remanufactured cooling units in stock. The best saving is the cooling unit as this is a very easy "Do it Yourself" type of job.

A Remanufactured or a Brand-New cooling unit comes with a three-year replacement warranty for any cooling problems and the option to extend.

## Leaking Cooling Unit

If the boiler is warm and the absorber is hot, this indicates that a leak has developed, and the hydrogen gas has escaped. The liquid ammonia does not change to a vapor without the hydrogen gas atmosphere and circulates as a liquid. A strong ammonia smell is a definite sign of a leak. The cooling unit must be replaced. Never use a cooling unit that has been patched. Only install a cooling unit from a supplier that uses new boiler and evaporator tubing. The best way to tell if the cooling unit you plan on purchasing is a good built unit is that it has the option to have an extended warranty plan. If you find one and they only warranty the cooling unit for 2 years, with no extended option, this should tell you they know the cooling unit they remanufactured will not last longer than three years.

There is a chemical called sodium chromate in the solutions that circulates inside the cooling unit. It is there to prevent the ammonia/hydrogen/water solution from corroding the steel tubing. If a leak develops, this chemical changes from a

liquid state to a powder in the presence of air. A yellow residue on the outside of the cooling unit indicates a leak. The cooling coils must be replaced.

## Advanced Testing Methods

***Dometic recommends the following method for testing the cooling unit which will confirm… this can also be used to test Norcold.***

1. Make sure the unit is level, do not assume.
2. Hook up the two wires of the heating element directly to a know good 110-volt source, in effect bypassing the thermostat and control systems. To do this, locate the two wires coming from the 110-volt AC heating element. The heating element is located in the cylindrical tin casing surrounding the burner flue and is accessible through the removable panel on the side of the casing. If you have a three way refer there should be two elements side by side. The 12-volt element can be identified by noting the way the wires are connected. The 12-volt element has one wire connected directly to the element and the other wire connects with a spade type of terminal for the Dometic units. The 110-volt element has both wires connected directly to the element. Also, if you fully remove the elements, the voltage will be stamped on the casing. Disconnect the two wires at the terminal block and connect these wires directly to a 110-volt source. If you are not comfortable or sure about what you are doing, then this test is best left to your RV Technician.
3. Place a thermometer in a glass of water and place it in the food compartment. It is important to use the glass of water for this test as it equalizes the temperature reading.
4. After 12 hours the temperature should be in the 30's degree F or less.
5. After 24 hours the temperature should be between the low 20's to low 30's maximum. If these temperatures are not reached and maintained during the hottest part of the day, then the cooling unit is faulty and should be replaced.
6. Only confirm a good cold lower food zone temperature, because sometimes a bad cooling unit can freeze and make ice. The food zone (lower level) is the tail end of the cooling cycle so a good cooling unit will be able to cool and maintain all the way through the unit, top to bottom.

7. If the refrigerator is located in a slide out room, having fans on the back side, the fans **MUST BE RUNNING** during this wired direct test to DC power.

## The Electric Heating Element

The electric heating element supplies the necessary heat source for refrigerator operation on shore power. The element can be checked with an ohmmeter. Be sure to disconnect the 110-volt power cord and the 12-volt supply before working on the unit. On three-way refrigerators there will be two heating elements – on a two-way mode, there will be only one. NOTE: Some older models had a combination 110-volt and 12-volt element in one casing. All the side b side units of both Dometic or Norcold have two AC elements, both must be good and tested at the same time. Locate and disconnect the wires leading to the element. With the multi-meter set on ohms reading, check the resistance of the element. Do not be misled if the heating of the AC heats but does not cool. It should work on LP gas. The cooling unit works from a heat source, which you have two sources, so if the AC heats without cooling, and the unit is bad, the LP gas is not going to work either.

If you need more info for a test, be sure to email me at rvrepair1029@comcast.net or call 901-337-9948.

**On various models that have been designed for slide-out rooms, they will have a fan installed on the back side and these fans must be confirmed working during any of your testing.**