

WATER LEAKAGE ON BRISK AIR TYPE HEAT PUMPS AND AIR CONDITIONERS



**DOMETIC & DUO-THERM
AIR CONDITIONING
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Things to look for when you find water entering the R.V. through the air conditioner:

We have done extensive testing in our Engineering Lab and on field installed units to determine the causes for this condition to occur. The purpose of this Bulletin is to furnish the serviceman with a complete list of items which could contribute to a water leak. We are confident that if all items are checked and corrections are made, the problem will be solved.

Some of the items listed are for correction of problems caused by improper installation or handling damage and are not covered by The Dometic Corporation's warranty; for example, damaged gaskets, over-tightened mounting bolts, improper roof drainage, etc.

SOLVING WATER LEAKAGE ON BRISK AIR TYPE HEAT PUMPS AND AIR CONDITIONERS

When troubleshooting a water leakage condition on heat pumps/air conditioners, it is important to know what conditions exist when the leakage occurs. Does the leakage occur only when the unit is running, or only when it rains, or only during very high humidity conditions? Once these conditions are known, the actual problem can be determined by using the following **QUICK CHECK PROCEDURES**. After the problem is located, refer to the noted section in "**Corrections**" for repairs.

QUICK CHECK PROCEDURES

1. Leakage occurs only when the unit is running.

This is the most common type of complaint for a leakage problem. All of these complaints are due to condensate water not draining properly from the roof after it has left the unit, or condensate water not draining properly from the unit.

1.1 Improper drainage from roof/water pooling around the unit:

- A. Framing
- B. Damaged Gasket
- C. Roof Opening/Seam

1.2 Over-tightening of mounting bolts:

- A. Bent Base Pan
 - 1) Foam Block Position
 - 2) Broken Seal

1.3 Drain Pan

2. Leakage occurs only from wind-driven water.

(Examples: Rain storm with wind or R.V. moving during rain.) This symptom indicates a problem in some area that is not exposed to water during normal operation of the unit. Check for the following:

2.1 Water forced under mounting gasket.

2.2 Other roof areas:

- A. Vents and Seams
- B. Roof Opening

3. Leakage occurs only when the unit is running during high-humidity conditions (80% relative humidity or higher).

3.1 Unit installed on greater than 15° slope.

3.2 Frost Formation on Cooling Coil.

- A. Restricted air flow
 - 1) Fan speed/Thermostat setting
- B. Low temperature device (ducted only - air conditioner)

3.3 Check evaporator housing assembly for air leaks.

CORRECTIONS

1. Leakage occurs only when the unit is running:

1.1 Improper drainage from roof/water pooling around the unit.

The unit must be installed on a roof which allows water to drain **away**. Check the roof around the unit to make sure water will drain away properly. If in doubt, stretch a string across the top of the R.V. See Figure 1. If the string shows a low spot in the area of the unit, this must be corrected.

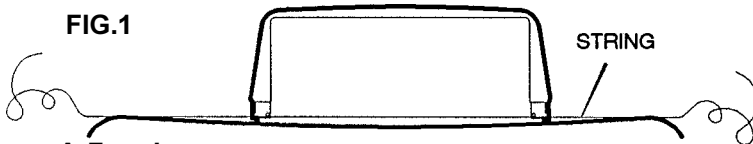


FIG. 1

A. Framing

For a roof with standard rafter-type construction, a drainage problem can usually be corrected by placing additional framing between the metal roofing and the rafters, as shown in Figure 2, thus raising the unit and creating a slope away from the unit. Roofs constructed from laminated material, etc... consult coach manufacturer for their recommendations.

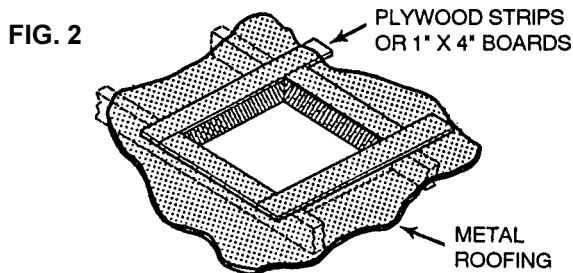


FIG. 2

B. Damaged Mounting Gasket

Check mounting gasket for any damage such as torn, compressed or trapped material under the gasket (i.e. screws, wood chips, metal shavings) which could allow water to seep inside. If any of the above conditions are found, install a new 14" x 14" gasket (Part No. 3100247.000).

C. Roof Opening/Seams

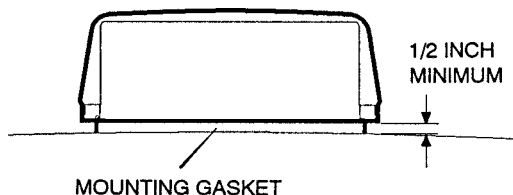
See Section 2.2.

1.2 Over-tightened mounting bolts

When attaching the unit to the roof, tighten the mounting bolts only enough to compress the mounting gasket to **1/2 inch** (40 inch pounds of torque).

DO NOT OVER-TIGHTEN the mounting bolts as you may damage the unit base.

FIG. 3



Once the unit has been installed, the mounting gasket will retain its installed thickness. If the unit is removed for inspection or service, avoid a future problem by installing a new 14" x 14" gasket (Part No. 3100247.000) when you reinstall the unit.

A. Bent Base Pan

- 1) Seven styrofoam blocks have been placed on the underside of the base pan. The styrofoam blocks provide an even support for the base pan which prevents it from bending and warping during installation. Over-tightening of the mounting bolts described in **Corrections Step 1.2**, can cause the styrofoam blocks to act as a wedge and force the edges of the base upward. (See Figure 4).
- 2) The rolling and bending of the base pan caused by over tightening of the mounting bolts will let the plastic drain pan pull away from the sealant. Water can flow through the gap between the plastic drain pan and sealant. The water becomes trapped under the plastic drain pan and can enter the interior of the RV through screw holes, etc.. It may be possible to remove the unit and straighten the base pan; however, if the plastic drain pan has pulled away from the sealant it may not reseal. In those cases the entire base pan will require replacement.

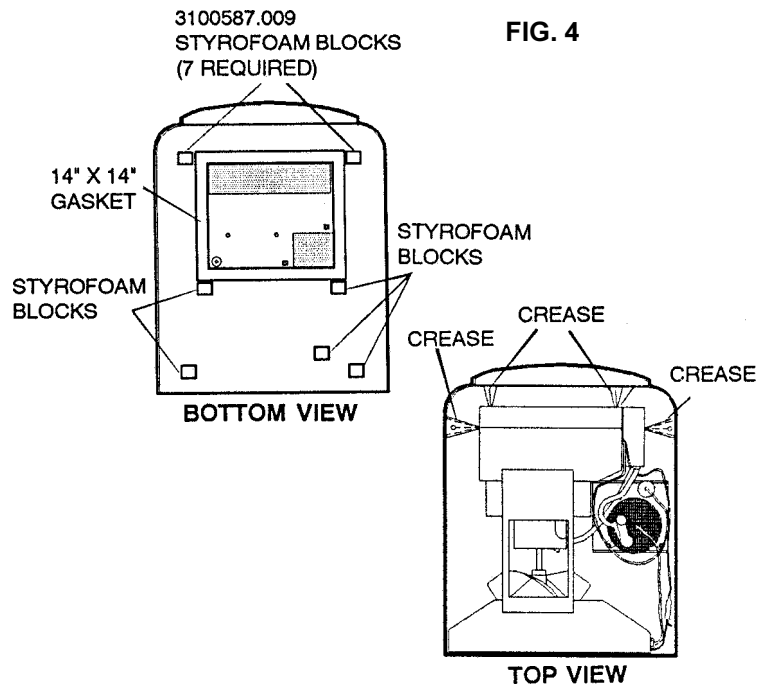
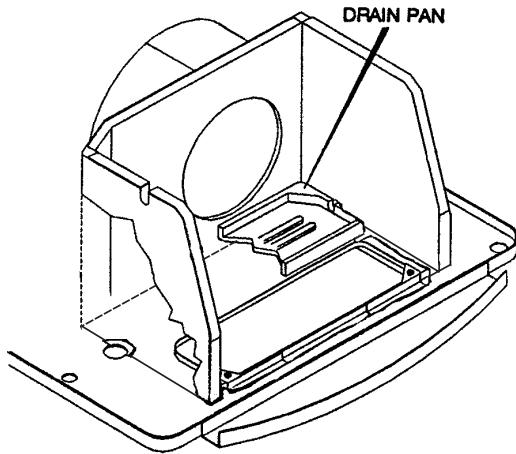


FIG. 4

1.3 Drain Pan

Inspect the drain pan for broken lip, cracks, and plugged outlets. Be sure the drain pan is sealed to the base and look for water trapped under the plastic drain pan. Pressing on the center and edges of the plastic drain pan will move air bubbles that can be seen under it. Breaks, cracks or loss of seal between the plastic drain pan and the base will require replacement of the entire base pan on the unit. Cleaning of the drain outlets will correct problems with water that is trapped on top of the drain pan.



2. Leakage occurs only from wind-driven water.

2.1 Water forced under the mounting gasket. (See "Corrections 1.1 B. Damaged Mounting Gasket").

2.2 Other roof areas.

A) Examine other areas on the roof, such as roof seams and around vent pipes, which could be allowing leakage into the roof at some other point, then flowing across the top of the ceiling until it reaches the air conditioner opening.

NOTE: Contact the R.V. manufacturer for their recommendations for correcting these types of leaks.

B) The size of the roof opening is also important, and should not be overlooked. If the opening is larger than the recommended size of 14-1/4" x 14-1/4" the gasket can roll into the roof cavity and leak. A new gasket, relocation of the unit, or resizing the opening should correct this.

3. Leakage occurs only when the unit is running during high humidity conditions (80% relative humidity or higher).

During high humidity conditions the evaporator coil will remove large quantities of water at a fast rate. The unit is designed to handle the increased water production; however, Steps 3.1 through 3.3 cover variables that affect the performance of the unit.

3.1 Unit is installed on greater than 15° slope.

Units are designed to be installed on flat surfaces or on a slope of up to 15°.

NOTE: The closer to 15 degrees of front-to-back slant, the more likely water will overflow the drain pan. (Example: Sudden stops or turns while traveling could cause water to splash over the drain pan and into the R.V.'s interior).

3.2 Frost formation on cooling coil:

A. Under certain conditions frost may form and block the air flow through the evaporator coil. As the frost buildup grows, air velocity increases and allows moisture to be pulled off the coil. The frost may extend over the edges of the drain pan and drip into the return air opening of the base pan. If this occurs, inspect the air filter and clean if dirty. Make sure the air louvers are open and not obstructed. To defrost the evaporator coil, turn the controls to high fan and do not operate compressor until the ice is gone. If the temperature is below 75 degrees outside, further operation of the unit should be at high fan speed only with the thermostat turned to a warmer setting.

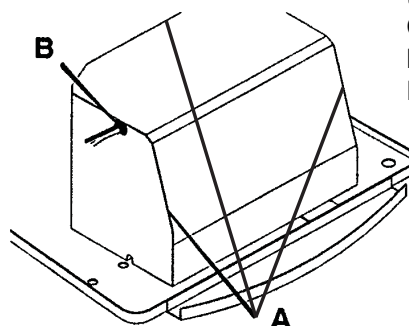
B. Ducted models (air conditioners only) are protected by a low temperature device to prevent frost buildup. If frosting occurs, check for a defective low temperature device.

3.3 Check evaporator housing for air leaks

During high humidity conditions (80% or higher), the blower can suck outside air into the evaporator bulkhead. This air contains large amounts of moisture that will condense on colder surfaces.

Check completely around the evaporator coil cover to be sure it has an airtight seal to the evaporator bulkhead. Look for loose screws that secure cover to the evaporator bulkhead. (See "A" of Figure 6). Check putty sealant around area that refrigerator lines enter the evaporator bulkhead. (See "B" of Figure 6).

FIG. 6



Double-check to be sure all items listed in this Bulletin are correct on the unit. If water leaks are still present contact the Dometic Technical Service Department.

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