



RECORD THIS INFORMATION FOR FUTURE REFERENCE
BEFORE INSTALLING THE UNIT:

Model Number _____
Serial Number _____
Date Purchased _____
Place of Purchase _____

**MODEL
CAH136.531
CARAVAN HEAT PUMP
used with
Air Distribution Box Kit
Part No. 3107209.029
Mechanical**

**THIS UNIT IS DESIGNED FOR OEM OR AFTER MARKET INSTALLATION
ALL INITIAL INSTALLATIONS MUST BE APPROVED BY THE SALES DEPT.**

! WARNING

This manual must be read and understood before installation, adjustment, service, or maintenance is performed. This unit must be installed by a qualified service technician. Modification of this product can be extremely hazardous and could result in personal injury or property damage.

**INSTALLATION & OPERATING
INSTRUCTIONS**

**MODEL
CAH136.531**

Product No. 991760368

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: means if the safety information is not followed someone could be injured or killed.

CAUTION: means if the safety information is not followed someone might be injured.

Read and follow all safety information and instructions.

Learn how to operate the heat pump properly.

Keep your heat pump in proper operating condition. See Maintenance Section. Do not modify the heat pump which may impair the function.

1. GENERAL INFORMATION

A. The roof top heat pump was designed to operate in a MILD GEOGRAPHICAL AREA for heating where the heat loss is minimum. The Heat Pump will operate down to an outside ambient temperature of 4 degrees Centigrade. At 4 degrees Centigrade, the outdoor thermostat will turn off the heat pump circuit. As long as the temperature remains below 4 degrees Centigrade, the main furnace will heat your home. As the outside temperature increases to 7 degrees Centigrade, the outdoor thermostat switches back to the heat pump circuit.

The advantages of the Heat Pump Air Conditioner are:

- 1) User friendly- only one unit for both heating and cooling.
- 2) When used in mild climates where the outdoor temperature range is 4 degrees Centigrade or higher, an L.P. furnace is not needed.
- 3) Heat pump heating uses the campsite electrical hookup; therefore, you save on trips to refill L.P. tanks.

Note: Geographical location usage should be determined before omitting a central furnace.

B. Reducing Heat Gain

The ability of the heat pump to maintain the desired inside temperature depends on the heat gain of the Caravan. Some preventative measures taken by the occupants of the Caravan can reduce the heat gain and improve the performance of the heat pump. During extremely high outdoor temperatures, the heat gain of the Caravan may be reduced by:

1. Parking the Caravan in a shaded area.
2. Using window shades (blinds and/or curtains).
3. Keeping windows and doors shut or minimizing usage.
4. Avoiding the use of heat producing appliances.

Operation on High Fan/Cooling mode will give optimum or maximum efficiency in high humidity or high outside temperature.

Starting the heat pump early in the morning and giving it a "head start" on the expected high outdoor ambient will greatly improve its ability to maintain the desired indoor temperature.

Note: The manufacturer of this heat pump will not be responsible for damage caused by condensed moisture on ceilings or other surfaces. Air contains moisture and this moisture tends to condense on cold surfaces. When air enters the Caravan, condensed moisture may appear on the ceiling, windows, metal parts, etc. The heat pump removes this moisture from the air during normal operation. Keeping doors and windows closed when this heat pump is in operation will minimize condensed moisture on cold surfaces.

SPECIFICATIONS

MODEL NO.	CAH136.531
Nominal Capacity (KW/HR)	3.0
Electrical Rating	220-240VAC, 50 Hz., 1 PH.
Compressor Rated Load Amps	5.0
Fan Motor Rated Load Amps	0.9
Compressor Locked Rotor Amps	19.0
Fan Motor Locked Rotor Amps	5.0
Power, Cooling (KW)	3.0
M ³ /hour-High Speed Max./Min.	764/590
Refrigerant (R22) grams/oz.	921/32.5
Minimum Wire Size	Up to 8meters, use 1.5mm ² Copper
Circuit Protection	10 Amp Time Delay Fuse or 10 Circuit Breaker
Installed Weight (Kg.)	50
Minimum Generator	1 Unit
Size **	2 Units
	3.5 KW
	5.0 KW

** The Dometic Corporation gives **GENERAL** guidelines for generator requirements. These guidelines come from experiences people have had in actual applications. When sizing the generator, the total power usage must be considered. Also keep in mind generators lose power at high altitudes and from lack of maintenance.

INSTALLATION INSTRUCTIONS

1. PRECAUTIONS

⚠ WARNING

Improper installation may damage equipment, could endanger life, cause serious injury and/or property damage.

- A. Read Installation and operating instructions carefully before starting your air conditioner installation.
- B. The Manufacturer will not be liable for any damages or injury incurred due to failure in following these instructions.
- C. Installation must comply with all applicable codes and/or regulations.
- D. DO NOT add any devices or accessories to this air conditioner.
- E. This equipment must be serviced by qualified personnel and some states require these people to be licensed.

2. CHOOSING LOCATION FOR THE HEAT PUMP

A. CHOOSING LOCATION:

This heat pump is designed for:

1. Installation on a Caravan at the time the vehicle is manufactured or aftermarket installations.
2. Mounting on the roof of a Caravan.
3. Connection to an air distribution box system.
4. Roof construction with rafters/joists on minimum of 406 mm centers.
5. Minimum of 45 mm and maximum of 114 mm

inches distance between roof to ceiling of Caravan. Alternate installation methods will allow for roofs more than 114 mm thick.

B. NORMAL LOCATIONS:

The heat pump is designed to fit over an existing roof vent opening. When the vent is removed, it normally creates a 361 x 361 ± 3 mm opening.

C. OTHER LOCATIONS:

When no roof vent is available or another location is desired, the following is recommended:

For one unit installation: The heat pump should be mounted slightly forward of center (front to back) and centered from side to side.

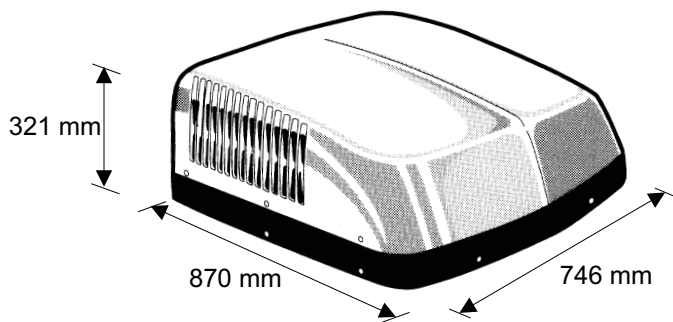
For two unit installations: Install one heat pump 1/3 and one heat pump 2/3's from front of Caravan and centered from side to side.

It is preferred that this heat pump be installed in a relatively flat and level roof section measured with the Caravan parked on a level surface; however,

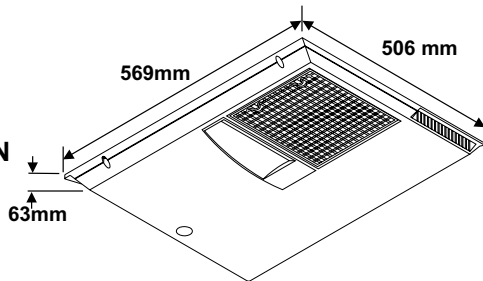
1. Up to a 15° slant to either side or front-to-back is acceptable on CAH136.531 Heat Pumps.

D. AFTER LOCATION SELECTION:

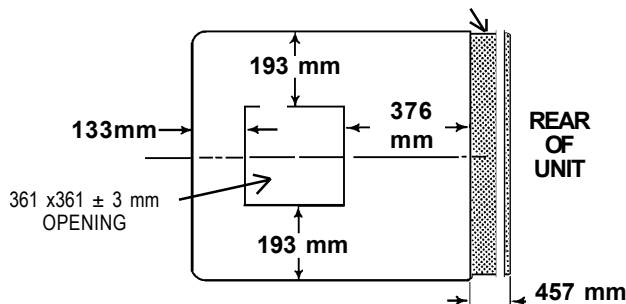
1. Check for obstructions in the area where heat pump will be installed.
2. The roof must be designed to support 59 Kg. when the Caravan is in motion. Normally a 91KG. static load design will meet this requirement.
3. Check inside the Caravan for air box obstructions. (i.e. door openings, room dividers, curtains, ceiling fixtures, etc.)



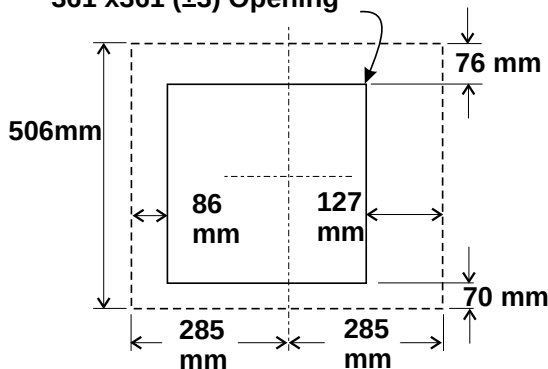
3107209 AIR DISTRIBUTION BOX



KEEP THIS AREA FREE OF OBSTRUCTIONS



3107209 AIR DISTRIBUTION BOX
361 x 361 (±3) Opening



3. ROOF PREPARATION

⚠ CAUTION

It is the responsibility of the installer of this air conditioner system to ensure structural integrity of the Caravan roof. Never create a low spot on the roof where water will collect. Water standing around the air conditioner may leak into the interior causing damage to the product and the Caravan.

A. ROOF VENT REMOVAL:

1. Unscrew and remove the roof vent.
2. Remove all caulking compound around opening.
3. Seal all screw holes and seams where the roof gasket will be located. Use a good grade of all weather sealer.

B. NEW OPENING:

(Installations Other Than Vent Openings)

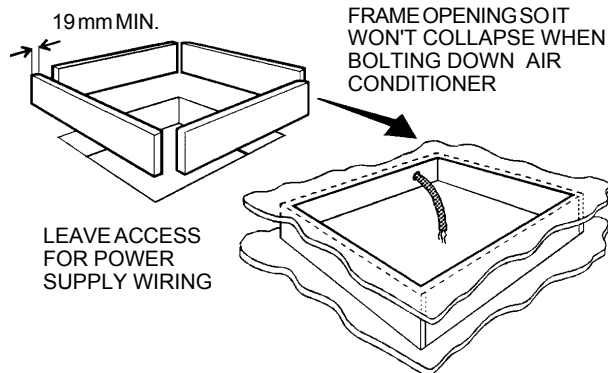
⚠ WARNING

There may be electrical wiring between the roof and the ceiling. Disconnect 220volt AC power cord and the positive (+) 12 volt DC terminal at the supply battery. Failure to follow this instruction may create a shock hazard causing death or severe personal injury.

1. A 361 x 361 ± 3 mm opening must be cut through the roof and ceiling of the RV. It is recommended this opening be located between roof reinforcing members.
2. Mark a 361 x 361 ± 3 mm square on the roof and carefully cut the opening.
3. Using the roof opening as a guide, cut the matching hole in the ceiling.

C. OPENING PREPARATION:

1. If the opening exceeds 364 x 364 mm, it will be necessary to install spacers.
2. If the opening is less than 361 x 361 mm, it must be enlarged.
3. Route a copper 1.5mm² wire, with ground, supply line from the fuse or circuit breaker box to the roof opening.
 - a. The power supply must be on a separate 10 amp Time Delay Fuse or Circuit Breaker.
 - b. Wiring must comply with all applicable codes and/or regulations.
 - c. Make sure at least 506 mm of wire extend into the roof opening. This insures easy air conditioner attachment.
 - d. If vent fan was removed, the existing wire may be used provided it is of proper size and correctly fused.



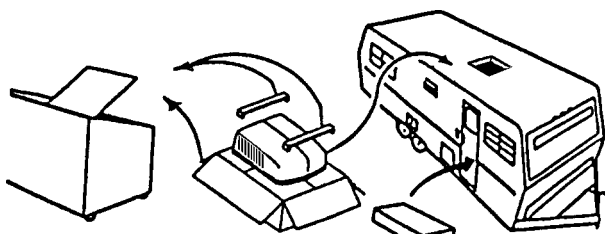
4. The opening must be framed to provide adequate support and prevent air from being drawn from the roof cavity. Lumber 19 mm thick or more and long enough to bridge the opening must be used. Remember to provide an entrance hole for the power supply wire.

4. PLACING THE AIR CONDITIONER ON THE ROOF

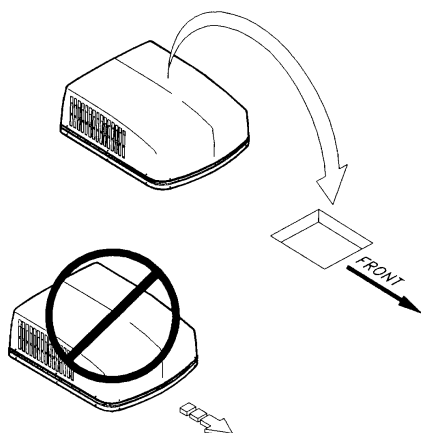
- A. Remove the Air Conditioner from the carton and discard the carton.
- B. Place the heat pump on the roof.

CAUTION

This unit weighs approximately 50 Kg. To prevent back injury, use a mechanical hoist to place Heat Pump on roof.



- C. Lift and place the unit over the prepared opening using the gasket as a guide. The condenser coil goes toward the rear of the Caravan.



CAUTION

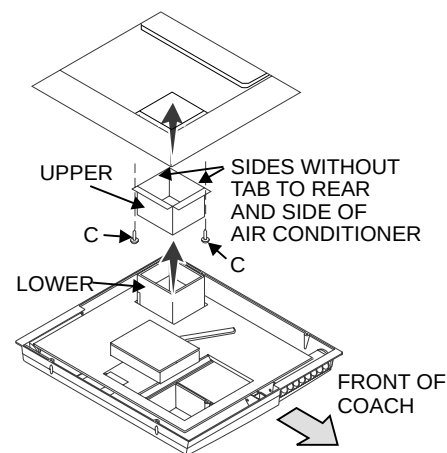
Do not slide the unit. This may damage the neoprene gasket attached to the bottom and create a leaky installation.

- D. Place the Air Box Kit inside the Caravan. This box contains mounting hardware for the air conditioner and will be used inside the Caravan.

This completes the outside work. Minor adjustments can be done from the inside if required.

5. DISCHARGE DUCT AND CEILING TEMPLATE INSTALLATION

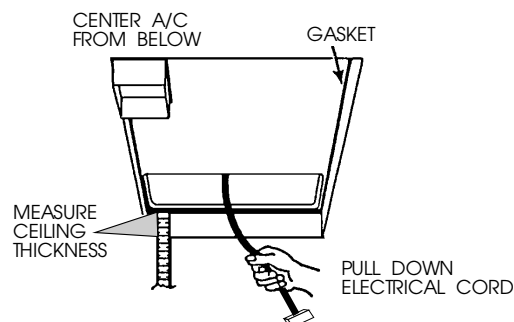
- A. Remove air box and mounting hardware from carton. The upper duct is shipped inside the lower duct which is part of the ceiling template.



1. Remove upper duct from ceiling template and locate it over blower discharge.

Note: Edges without flanges install toward REAR and SIDE of opening.

2. Use two (2) sharp pointed #10 x 1/2" sheet metal screws (C) to hold duct to base pan. Holes provided in bottom of basepan for these screws to go into.
- B. Check for correct alignment and adjust the unit as necessary (Roof Gasket centers over 354 mm opening).
- C. Reach up into return air opening of the air conditioner and pull the unit electrical cord down for later connection.



- D.** Measure the ceiling to roof thickness:
1. If distance is 25 - 51 mm, remove perforated tabs from both upper and lower ducts.
 2. If distance is 51 - 76 mm, remove perforated tabs from bottom duct only.
 3. If distance is 76 - 101 mm, install ducts as received.
 4. If distance is 101 - 152 mm, use optional duct adaptor, Part No. 313606.000 and Bolt Kit, Part No. 3100895.006.
- E.** Install ceiling template by sliding lower duct over upper duct.
- F.** Start each mounting bolt by hand before tightening any of them. The four (4) threaded inserts in the base pan can be seen to aid in starting the bolts. **EVENLY TIGHTEN MOUNTING BOLTS TO A TORQUE OF 4.5N*M TO N*M.** This will compress the roof gasket to approximately 13 mm. The bolts are self locking so over tightening is not necessary.

⚠ CAUTION

If bolts are left loose there may not be an adequate roof seal or if over tightened, damage may occur to the air conditioner base or ceiling template. Tighten to torque specifications listed in this manual.

- G.** Install wood screws (C) in each end of ceiling template and into junction box. This insures a tight fit of air box to ceiling.

6. WIRING OF SYSTEM

Note: All wiring must comply with all applicable code and or regulations.

⚠ WARNING

Disconnect 220 volt AC. Failure to follow these instructions could create a shock hazard causing death or severe personal injury.

⚠ WARNING

This product is equipped with a 3-wire (grounded) system for protection against shock hazard. Make sure this unit is wired into a properly grounded 220 volt AC circuit and the polarity is correct. Failure to do so could result in death, personal injury or damage to the equipment.

- A.** Route supply line into junction box thru provided Romex Connector. 152 mm leads are sufficient for connection to unit wires and ground screws.

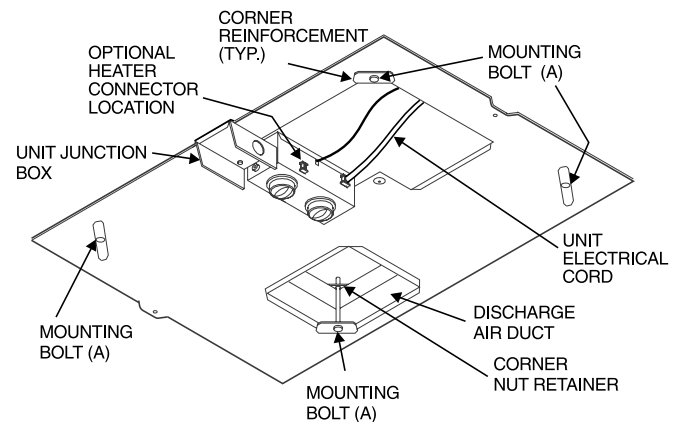
- B.** Connect white wire in junction box to white or neutral wire from supply line.
- C.** Connect black wire in junction box to black or hot wire from supply line.
- D.** Connect supply ground wire to identified ground screw in junction box.
- E.** Install junction box cover with two (2) blunt point screws.
- F.** Plug unit electrical cord into the mating connector on control box.

7. INSTALL AIR BOX

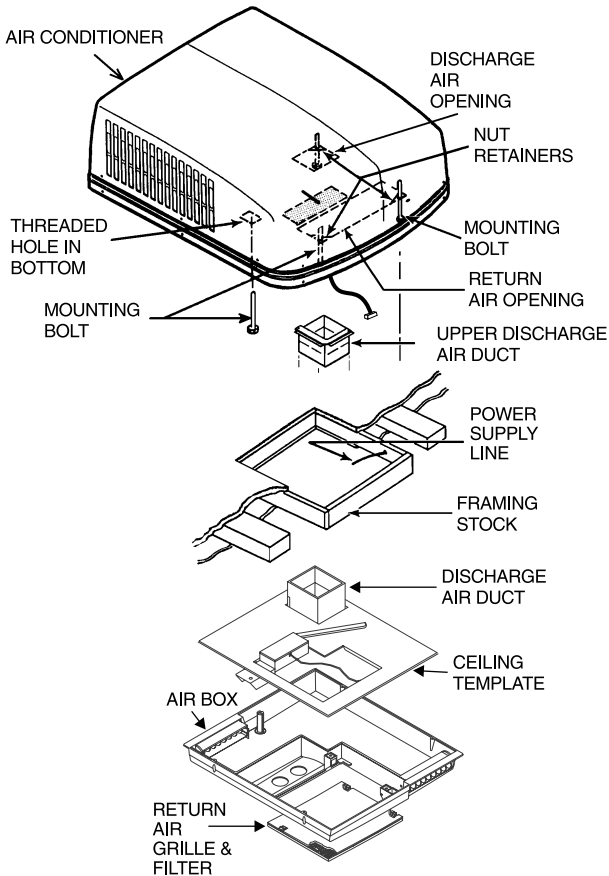
A. 3107209 AIR DISTRIBUTION BOX:

1. Remove return air grille from air box by pulling in on half-round finger catches.
2. Hold air box up to ceiling template and install three (3) #10 x 3/8" screws at air box mounting point.
3. Snap hole plug (E) into place at rear of air box.
4. Install four (4) wood screws (B) that hold air box tight to ceiling if so desired.
5. Reinstall return air grille and filter into air box.
6. The air conditioner installation is now complete. Turn on power to the unit for operational check. Please read Unit Operating Instructions before proceeding.

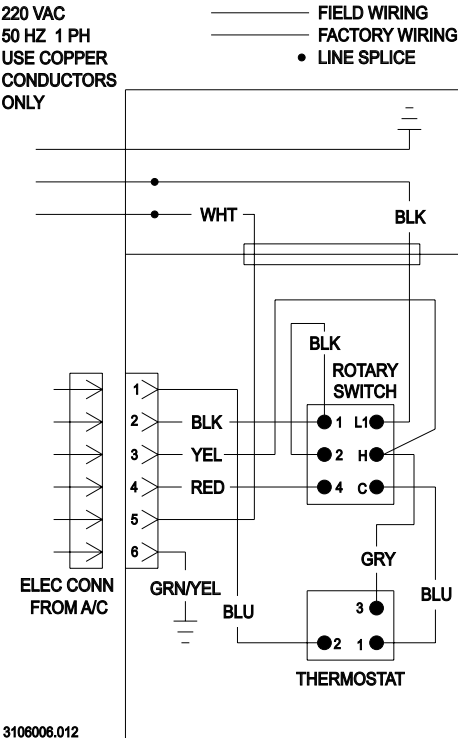
3107209 AIR DISTRIBUTION BOX



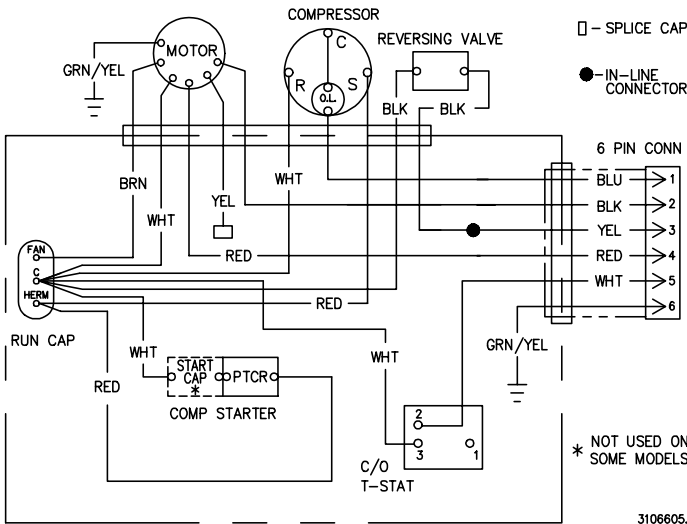
AIR CONDITIONING UNIT



AIR BOX WIRING DIAGRAM



ELECTRICAL BOX WIRING DIAGRAM



OPERATING INSTRUCTIONS

1. CONTROLS

- A. The Selector Switch controls fan speed, heating mode, and cooling modes.
- B. The thermostat controls the compressor ON/OFF operation in a temperature range of 18°C to 32°C.

2. COOLING OPERATION

- A. Set the thermostat at the desired temperature level.
- B. Select the fan speed that best satisfies your needs:
 - 1. **HIGH COOL**: Selected when maximum cooling and dehumidification required.
 - 2. **LOW COOL**: Selected when room at desired comfort level and needs to be maintained. Normally this speed used for night time operation.

Note: The blower runs continuously to circulate air and maintain an even temperature. The compressor will come on as cooling is required to maintain the selected temperature level.

CAUTION

After shutting the air conditioner down with either selector switch or thermostat, wait at least two (2) minutes before restarting. This allows the refrigerant pressure in the air conditioner to equalize and will allow the compressor to start easily. Failure to follow this instruction may cause fuses or circuit breaker to open.

3. FAN OPERATION

This will circulate the air in your Caravan without cooling or heating. There are two positions: HIGH FAN or LOW FAN to select from, depending upon personal choice and model.

4. HEATING OPERATION:

Note: The heat pump will not replace a furnace for heating your Caravan in cold weather. The intent is to warm the coach during mild winter weather.

- A. Turn the selector switch to:
 - 1. High heat
 - 2. Low heat
- B. Set the thermostat to your comfort level.
- C. The fan and compressor will come on and begin heating.
- D. When the desired temperature level is reached, the compressor will cycle as required to maintain selected temperature. The blower will run continuously to circulate air and maintain an even temperature.

5. "OFF" POSITION

This is to turn Unit off.

MAINTENANCE

1. AIR FILTER

Periodically remove the return air filter located above the removable panel in the air box. Wash the filter with soap and warm water, let dry and the reinstall.

NOTE: Never run the air conditioner without return air filter in place. This may plug the unit evaporator coil with dirt and may substantially affect the performance of the unit.

2. AIR BOX HOUSING

Clean air box housing and control panel with a soft cloth dampened with a mild detergent. Never use furniture polish or scouring powders.

3. FAN MOTOR

Factory lubricated and requires no service under normal use.

4. FROST FORMATION ON COOLING COIL:

Under certain conditions, frost may form on the evaporator coil. If this should occur, inspect the filter and clean if dirty. Make sure air louvers are not obstructed. Air conditioners have a greater tendency to frost when the outside temperature is relatively low. This may be prevented by adjusting the thermostat control knob to a warmer setting (counter clockwise). Should frosting continue, operate on HIGH FAN setting until the cooling coil is free of frost.

SERVICE - Unit Does Not Operate

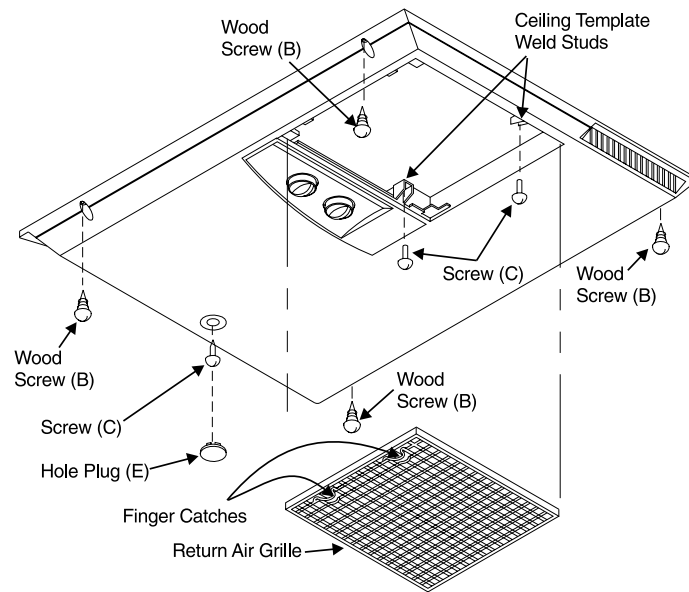
If your unit fails to operate or operated improperly, check the following before calling your service center.

1. If RV connected to motor generator, check to be sure motor generator is running and producing power.
2. If RV connected to power supply by a land line, check to be sure line is sized properly to run air conditioner load and it is plugged into power supply.
3. Check your fuse or circuit breaker to see if it is open.
4. After the above checks, call your local service center for further help. This unit must serviced by qualified service personnel only.

When calling for service, always give the following:

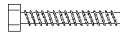
1. **Air Conditioner Model and Serial Number found on rating plate located on base pan of air conditioner bottom.**
2. **Air Distribution Box Kit Part and Serial Number found on rating plate located on ceiling template. Observe this rating plate through the air discharge louver of Air Distribution Box.**

3107209 AIR DISTRIBUTION BOX



MOUNTING PARTS

- A. (4) 1/4" - 20 x 7" Bolts



- B. (4) #8 x 5/8" long sharp point wood screws



- C. (4) #10 x 3/8" blunt point tapping screws



- D. (1) Romex connector



- E. (1) Hole Plug

