

## TRUE AIR HEAT PUMP

This month we hope to clear up any confusion concerning the operation of the optional heat pump offered with our True Air® packaged air conditioning systems. Most questions asked pertain to use of the heat pump in conjunction with the LP furnace. "Sometimes the furnace runs; sometimes it doesn't," is a statement we hear quite often. Inevitably, this is followed with the question, "Why?" There is also an expectation that you should be able to heat the entire coach with only the heat pump. This is not always the case.

The following is compiled from our current operator's manual and the RV Products installation and operating guide. It addresses the thermostat settings and general operation of the heat pump. Take special note of the example where the two hour lock-out takes place.

### Digital Thermostat Display

The digital display normally shows current room temperature, with the word "ROOM" in small letters at the left side of the display. When you press the temperature selector button up or down, the display will show the word "SET" and the new temperature set point until you release the button.

### Change Temperature

To set the temperature to a new temperature, simply press the Temperature Selector button up or down until the temperature you want appears in the display. The word "SET" will also appear at the left side of the display while you are changing the temperature set point. A few seconds after you release the temperature selector button, the display will return to showing the current room temperature.

### To Run Fan Only (No Heat)

- Set thermostat switch to OFF.
- Slide Fan Mode switch to ON.
- Place Fan Speed switch to Lo or Hi as desired.
- The fan will run continuously at the selected speed and is not controlled by thermostat setting. The display will show current room temperature.

### HEAT PUMP – Optional

Your coach may be optionally equipped with an air source heat pump built into the central air conditioning system. Because the heat pump operates on electricity, it provides economical heat inside your coach and helps reduce the use of LP gas for heating

in cooler weather.

A heat pump can be thought of as an air conditioner running in reverse. An air conditioner absorbs heat from the air inside the coach and moves it to the outside. The heat pump does exactly the opposite. Even cold air contains some heat, so a heat pump will extract heat from the outside air on a cold day and carry it to the inside of the coach to maintain a comfortable temperature.

The efficiency of a heat pump decreases as the outdoor air temperature drops, so supplementary heat is often needed when the outside temperature is freezing. This system is set to automatically start the LP gas furnace to assist the heat pump if room temperature cools to 5 degrees F or more below the thermostat set point. You may wish to manually switch to furnace heat to maintain a higher temperature when outside temperatures begin to reduce the efficiency of the heat pump. The heat pump will not operate when the outside temperature falls below 36 degrees F.

### To Operate the Heat Pump

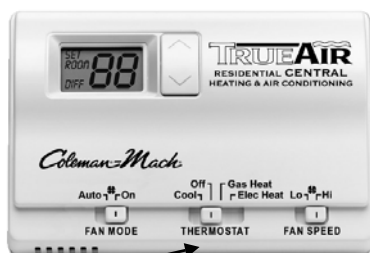
- Slide the thermostat switch to electric heat mode.
- If the inside temperature is 5 degrees or more below the thermostat set point, both the heat pump and the furnace will run initially to bring the interior temperature up to the set point as quickly as possible. (If the inside temperature is 4 degrees or less below the set point, then only the heat pump will run initially.)
- When the thermostat calls for heat again, only the heat pump will run. The heat pump will remain the sole heat source unless it cannot maintain the inside temperature. If the inside temperature falls five degrees below the set point, the furnace will assist the heat pump until the set point is reached.

If the furnace must assist the heat pump three times in a row, the thermostat will shut down the heat pump for two hours and furnace will take over as the heat source. After two hours the heat pump will become active again and try to be the primary heat source.

The furnace acts as a standby heat source if the outside temperature drops below a point that the heat pump can no longer extract heat from the outside air to maintain the desired inside temperature.

Closed or blocked vents and a dirty air filter can hinder the efficiency of a heat pump. See Air Conditioner Filter for location and instructions.

- Be sure ceiling vents are open to distribute heat pump output air. Also make sure furniture, clothing items, packages or other obstructions do not block the air return air grills beneath the rear bed.
- The filter should be checked monthly for dirt build-up and replaced as needed. The air filter is disposable woven fiberglass type, which cannot be cleaned and should be replaced when coated with dust.



Thermostat Switch  
Gas Heat = Furnace Only  
Elec Heat = Heat Pump

## Operation Chart

The chart below shows the system functions with the 6537-335\* thermostat. After the entire air conditioning system (and furnace system) is installed, check each position function.

**6537-335\* 2-Stage Heat Pump Thermostat Truth Table**

	Mode Switch	Fan Speed Switch #1	Fan Speed Switch #2	Calling	Operation of Unit
1	Cool	Auto	Lo	No	No functions occur in this mode
2	Cool	Auto	Lo	Stage 1 1° above set	ID fan low, compressor #1 and OD blower low cycle as needed
3	Cool	Auto	Lo	Stage 2 2° above set	ID fan low, compressor #1 and #2 and OD blower high cycle as needed
4	Cool	On	Lo	No	ID fan low continuous
5	Cool	On	Lo	Stage 1 1° above set	ID fan low continuous, compressor #1 and OD blower low cycle as needed
6	Cool	On	Lo	Stage 2 2° above set	ID fan low continuous, compressor #1 and #2 and OD blower high cycle as needed
7	Cool	Auto	Hi	No	No functions occur in this mode
8	Cool	Auto	Hi	Stage 1 1° above set	ID fan high, compressor #1 and OD blower low cycle as needed
9	Cool	Auto	Hi	Stage 2 2° above set	ID fan high, compressors #1 and #2 and OD blower high cycle as needed
10	Cool	On	Hi	No	ID fan high continuous
11	Cool	On	Hi	Stage 1 1° above set	ID fan high continuous, compressor #1 and OD blower low cycle as needed
12	Cool	On	Hi	Stage 2 2° above set	ID fan high continuous, compressors #1 and #2 and OD blower high cycle as needed
13	Off	Auto	Lo or Hi	N/A	No functions occur in this mode
14	Off	On	Lo	N/A	ID fan low continuous
15	Off	On	Hi	N/A	ID fan high continuous
16	Gas Heat	Auto or On	Lo or Hi	No	No functions occur in this mode
17	Gas Heat	Auto or On	Lo or Hi	Stage 1 1° below set	Gas heat will be energized to run
18	Gas Heat	Auto or On	Lo or Hi	Stage 2	There is no provision for second stage heat when operating in the gas heat mode
19	Elec Heat	Auto or On	Lo or Hi	No	Nothing is operating in this mode
20	Elec Heat	Auto or On	Lo or Hi	Stage 1 1° below set	Heat pump will run ID fan high, Compressor #1 and #2 with reversing valve #1 and #2 and the OD fan high
21	Elec Heat	Auto or On	Lo or Hi	Stage 2 5° below set	Heat pump will run ID fan high, Compressor #1 and #2 with reversing valve #1 and #2, OD fan high and gas heat will be energized to run
<b>Notes:</b> 1) When 2nd stage cooling is activated, it stays on until setpoint is satisfied. 2) When 2nd stage heating is activated, it stays on until setpoint is satisfied. 3) The word "DIFF" will display on the LCD when 2nd stage electric heat (gas furnace) is operating.					

### Heat Pump Algorithm To bring on gas furnace as 2nd stage heat

Setpoint	Indoor Temp.	Operation
70	70+	No functions occur
	69	Heat pump turns on (primary heat source)
	71	Heat pump turns off (thermostat satisfied)
	69	Heat pump turns on
	65	Gas furnace turns on (heat pump not able to satisfy thermostat) (first strike for second stage heat counter)
		(First strike for second stage heat counter)
	71	Heat pump and gas furnace turn off (thermostat satisfied)
	69	Heat pump turns on
	65	Gas furnace turns on (heat pump not able to satisfy thermostat) (second strike for second stage heat counter)
	71	Heat pump and gas furnace turn off (thermostat satisfied)
	69	Heat pump turns on
	65	Gas furnace turns on (heat pump is again unable to satisfy thermostat), (second stage heat counter reaches third strike and heat pump is locked out for 1 hour and 45 minutes), <b>second stage heat counter is reset if heat pump is running for more than 20 minutes and does not call for second stage heat</b>
	71	Gas furnace turns off (thermostat satisfied)
	69	Gas furnace turns on (becomes primary heat source)
	71	Gas furnace turns off (thermostat satisfied)
		<b>After 1 hour and 45 minutes lockout</b>
	69	Heat pump turns on (resumes as primary heat source)
	65	Gas furnace turns on (becomes primary heat source) (heat pump is locked out for another 1 hour and 45 minutes)
	71	Gas furnace turns off (thermostat satisfied)
		<b>After 1 hour and 45 minutes lockout</b>
69	Heat pump turns on (resumes as primary heat source)	
71	Heat pump turns off (thermostat satisfied) ( <b>second stage heat counter is reset any time heat pump satisfies thermostat setpoint and does not need gas furnace</b> )	

The word "DIFF" will display on LCD when second stage heat is operating and the heat pump is locked out. There is a 30-second delay between Stage 1 and Stage 2. There is also a 3-minute anti-short cycle delay time for cooling.