

# Evaluating Air Conditioner Performance

An informative bulletin from RV Products, the exclusive manufacturer of Coleman® - Mach® roof and basement packaged air conditioners and heat pumps.



**Q:** "I think my air conditioner needs refrigerant. What do you think?"

**A:** This question has been asked countless times. The truth is; most cooling problems are related to poor customer maintenance, improper usage, or the original air conditioner installation.

Evaluating the performance of a Coleman - Mach Series Air Conditioner is relatively simple and requires only a thermometer, and some basic hand tools.

*NOTE: Cooling performance tests can only be effectively done at ambient temperatures above 75° Fahrenheit.*

The first thing to do when you are evaluating any air conditioners performance is a visual inspection of the unit. Check the installation of all connecting duct collars or divider plates which separate the return and discharge/supply air. Any leakage from the supply air to the return is a loss in capacity to the recreational vehicle and must be sealed. Continuing with the visual inspection, you must make sure the return air filter(s) and the evaporator and condenser coils are clean and undamaged. Clean and straighten the fins on

both coils and clean the filter(s) as necessary before starting a cooling performance test. More than likely by the time you get this far, you have already fixed any problem that may exist.

After cleaning the unit and inspecting the air conditioner installation, conduct a Cooling Performance Test as follows:

## 1. Measure Line Voltage To The A/C

Line voltage should be checked at the unit where the coach wiring connects to the air conditioner while the air conditioner is running. The correct operating range is between 103.5 and 126.5 VAC.

## 2. Measure the evaporator temperature difference as follows:

- a. Open all discharge/supply registers fully.
- b. Turn the selector switch or wall thermostat to the HIGH COOL position.
- c. Allow the air conditioner to run for at least fifteen minutes, longer if possible. This is necessary to fully cool the evaporator coil and saturate the unit with condensate water before beginning a temperature test.



d. Use a standard dial type or digital thermometer to measure the temperature of the air immediately entering the return air filter/grille of the air conditioner.

e. Measure and subtract the temperature of the air leaving the discharge/supply air louvers from the return air temperature. When you are testing a ducted air conditioner application be sure to measure the supply temperature at the closest register to the unit. Make sure the temperature sensing device is measuring supply air temperature only.

f. A properly running A/C unit should have a temperature difference of approximately 16 to 22°. Slightly lower temperature differences are possible under extremely humid conditions. (The unit may have to run longer to remove moisture.) Greater temperature differences than 22° are possible in hot dry weather

*NOTE: Restricted air flow over the evaporator may also cause greater than 22° temperature differences. In this case, even though the temperature difference is greater, the capacity would be less.*

### 3. Compressor Amperage

When checking the amperage of the compressor, keep these tips in mind:

a. If your compressor is pulling amperage, it **IS** running.

b. The amp draw of the compressor will fluctuate with the outdoor temperature. The higher the outdoor temperature = higher pressure in the system. The higher the pressure in the system = higher amp draw by the compressor.

c. The amperage of the compressor will also fluctuate with the voltage to the unit. The lower the voltage = higher amp draw by the compressor.

