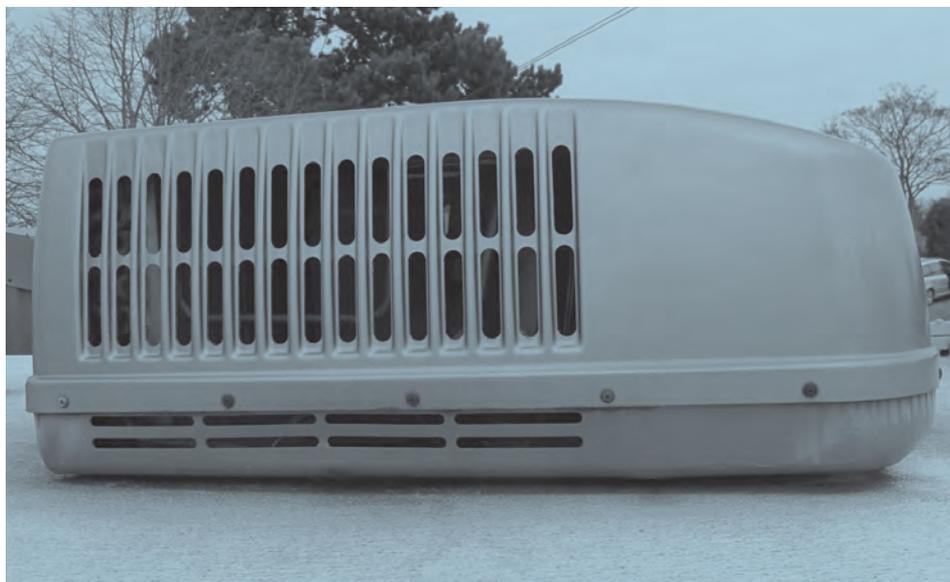


Many RV owners find the workings and maintenance required of roof mounted air conditioning units on RVs a complete mystery and possibly beyond their capabilities to keep them in top working order.

Basic maintenance of these units is fairly straight forward and will avoid expensive repair bills.

DO THE MAINTENANCE BEFORE YOU NEED THE UNIT TO WORK HARD IN WARM CLIMATES.

HOW TO USE AND MAINTAIN ROOF AIR CONDITIONERS



PART 1

HOW THEY WORK AND HOW TO USE THEM

Now that the Summer is fast approaching some thought should be given to the care and maintenance of the roof air conditioning unit fitted on your RV.

The ability to travel and live in a controlled inside environment during hot weather has been made possible by RV air-conditioning. Until more recently air conditioning was reserved for larger, luxury RVs; today the majority of RVs, including small fifth-wheelers and campers - have air conditioning. Roof-mounted units are the most common, although Winnebago Vectra, for one, have the unit in a basement locker and some high-end RVs are being equipped with central systems. RV air conditioners are compressor-type units and work on the same operating principle as those found in offices, factories and some homes.

HOW AIR CONDITIONERS WORK

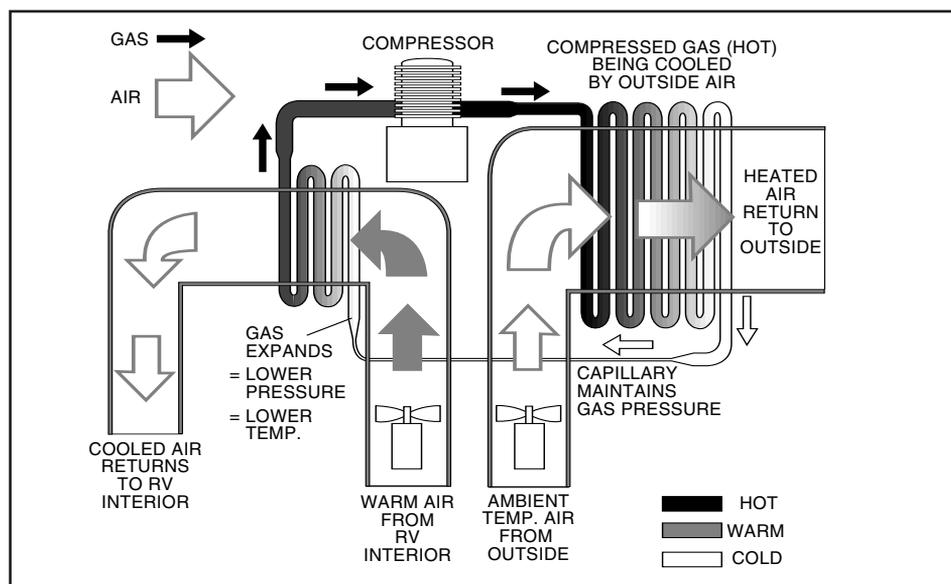
Contrary to popular belief, an air conditioning system is not really just a cooling machine; it is a heat and humidity-transfer system. Understanding how this system works will help you better manage your motorhome's airconditioning system.

Air-conditioning works by the simple process of transferring heat from one area to another. In a motorhome the inside air is circulated through the air conditioner where it loses heat which is then transferred to the outside air. The idea that a conditioner produces cold air is not entirely true, it actually removes heat from the air, and the absence of heat leaves the air cold. Cold air is denser than warm and so it gravitates to a lower level, displacing warm air towards the ceiling and the

intake grille of the conditioner. It is most important that you understand that air conditioners only recirculate air and so when they are operating it is most important to keep all doors and windows shut. If you do not then the cold air will escape to the outside and more warm air will be drawn in.

An air-conditioner transfers heat from the conditioned area to the outside by the use of a refrigerant. The refrigerant is circulated by means of an electric pump (compressor) through a closed system that includes an evaporator and a condenser. Air from inside the RV is drawn into the conditioner past the coils of the evaporator where it gives up heat to the refrigerant. The refrigerant is then circulated to the condenser where it

gives up heat to the outside air. The cooling of the condenser is assisted by means of a motor driven fan which draws outside air in from the sides of the conditioner and forces it through the condenser coils. This entire process is accomplished by a motor-driven compressor (sealed unit), two fans, two coils and some refrigerant tubing. The size of the coils, compressor and fans determine the capacity of an air-conditioning unit, which is usually rated in British Thermal Units (BTUS) in RV applications. A popular size at present is the 13,500 BTU models which will be found on most new RVs. Smaller RVs usually have one unit and the larger ones have two which quite often have their cooled air output connected together by ducting.



Above: Integral air con unit with controls built-in. Left: Remote thermostat and on-off switch. Right: Air intake vent for ducted aircon.

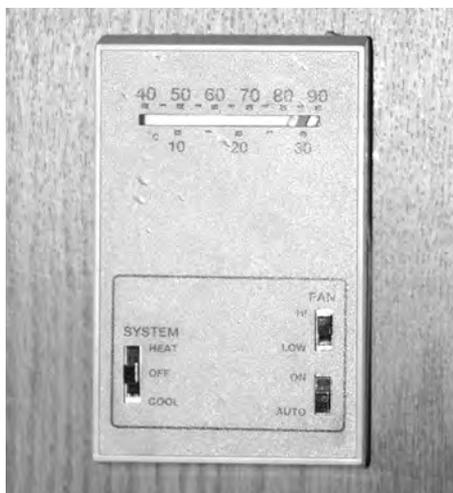
The conditioner as well as cooling warm air also filters and dries it (air humidity). The air is conditioned, hence the name. This drying occurs when moisture in the air contacts the cold evaporator and turns to water droplets (like water condensing on a glass of cold water). The excess moisture that has been removed from the interior of the RV is channelled into the condensate drain which usually just allows it to run across the roof of the RV and then down the sides onto the ground. This removal of moisture is an important part of air-conditioning. An air-conditioner, by controlling the humidity of a room, allows your body to cool itself more effectively.

There are basically three different types of air-conditioners found in RVs: the standard self contained package unit for cooling only, the same unit with small heaters (heat strips) and the automotive (in-dash) air-conditioner. Some of the more expensive RVs are fitted with dual purpose air conditioners (heat pumps) which are capable of heating the motorhome by reversing the action of the unit. This is done by reversing the refrigerant flow and then the outside condenser becomes the evaporator and the inside evaporator becomes the condenser. The refrigerant takes heat from the outside air and this is given up to the inside air of the RV.

Most motorhome air conditioners are mounted on the roof and are factory-wired. Usually, all controls are mounted in the unit, so there are no external installations required that can cause problems. The thermostat is located in the unit itself and the temperature sensor bulb is in the return air, which helps to make these units highly efficient. Sometimes the same package unit is located underneath rather than on the roof, or in a more convenient location for the manufacturer. Ducts from this unit distribute air more efficiently throughout the RV. The return air is located close to the installed unit. This type of air-conditioner utilises a remotely operated thermostat, located somewhere in the motorhome.

Remote thermostats should be located as close to the return air as possible so that air movement is constant across the thermostat while the unit is in operation. However, locating the thermostat in an air stream that is directly affected by the supply air (cold air) will cause the unit to short cycle (the unit will cut off and on too often). A thermostat should not be mounted on an outside wall either, since it will respond to the heat coming through the wall rather than the surrounding air temperature.

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A thermostat is simply a switch that turns the air-conditioner on and off when it has reached the pre-set temperature; a thermostat is not an accelerator. Many people mistakenly believe that the lower you set the thermostat, the faster it cools. This is not the case. An air conditioner will not cool faster at a lower temperature than if it is set at the desired temperature. If the setting is low enough to make the air-conditioner run, it is cooling as fast as it can. By setting the temperature lower than the desired temperature, you run a serious risk of over working and damaging your unit. If the temperature is set too low, it can ice the coil, possibly damaging the compressor.

Another thing you must never do is to turn your unit off and immediately turn it back on. This could damage the unit because the pressure in the refrigerant system has not had time to equalise. This usually takes one to two minutes. If you turn the air-conditioning unit off, wait one to two minutes before starting it again. This eliminates extra stress to the compressor, as repeated short cycling could shorten the life of the compressor. Some systems have circuits that guard against this, but it cannot do any harm to follow this advice.

Heat loads vary throughout an RV: sleeping areas do not require the same amount of air-conditioning as kitchen and living-room areas. More heat is generated in the kitchen and living area than in the sleeping area. A simple process called air balance permits you

to direct the cooling capacity to the areas with the greatest heat load. Simply adjust the supply air grilles, delivering the air to the desired area. Always remember that slow air movement may be detrimental to your system. Do not restrict airflow to one grille without opening another. Maintain the same air volume at all times through the system. You may, of course, adjust the direction of the air with the grilles, but be careful not to restrict the airflow completely.

THE DO'S AND DONT'S OF USING AN AIRCON UNIT

Avoid showers in the middle of the day, since the hot water used will add to the heat load. Cook meals in the early morning or later in the evening, or use the microwave. Close off living areas in order to cool smaller spaces. One common mistake is running the kitchen exhaust fan in the middle of the day. The cool air removed by the vent is replaced by hot air from outside that must then be re-cooled. Avoid opening and closing outside doors as much as possible; hot air replaces the air-conditioned air. Sometimes, on very hot days, you will be tempted to run two air-conditioners at the same time (if you have them). This is not always possible, especially if you are limited by 30-amp electrical service. Even if your air conditioners pull only 15 amps each when running, the starting amps required for either one to start will cause a surge in amperage and kick the breaker. If you are limited to using only one, run the air-conditioner in the area you are occupying.

NEXT MONTH
PART 2 - MAINTENANCE

July 2016