

Quick Reference Guide

Class A Motor Homes

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FOREWARD

I have been in the RV business for almost 20 years, and this is a more concise guide (perhaps) than your owner's manual. I will attempt to put things more into layman's terms in the interest of being more understandable. The experience I have had in the RV business has given me a wealth of knowledge, some of which I am willing to share with you. There are certain areas where I feel the normal RV owner should NOT make any attempt at performing their own repairs. Suffice it to say, that if it is not addressed in this guide, I believe that these items are best addressed by professionals who deal with these areas on a daily basis. In my years as an RV Technician, I have seen many makes and models of RVs and appliances.

I have seen some of the manuals provided by the RV manufacturers, and most of them are written by engineers with more experience with a particular product, and they seem to assume that the reader knows exactly what area they are talking about. And even for myself, when I first started doing the customer orientation on their new (or new to them) RV, it took me a while to realize that what might be second nature to me was not something the customer would understand right off the bat. Throughout the course of this guide, I will attempt to share a bit of my knowledge without overloading the reader. My main interest in writing this guide is to give you, our most valuable customer, enough knowledge to avoid major problems, and, hopefully, to give you enough information to know when it is time to contact a professional to service your unit, so that you may enjoy the benefits of RVing for many years to come.

Keep in mind that this is a general guide, and RVs differ by model and manufacturer. However, having been in the business for this many years, I have seen many more units, and many more situations than the "resident RV expert" you will find at most campgrounds and around the neighborhood. I am not saying that they are wrong, they have a wealth of knowledge. Of course, one of the great things about going RVing is that most other RVers are more than willing to help their fellow man. While they may laugh at the first-timer trying to get his unit parked just right and get it leveled, if they see you are having problems, most will be willing to lend a hand to get you set up properly.

There is a camaraderie among RVers that is much more prevalent in RV parks than in almost any other neighborhood.

This guide is being written mostly for the first-timer, but there is information here that can benefit the full-timer as well. Most full-timers, or what we sometimes refer to as long-timers will tell you that one of the most important things to have is a check-list. You will definitely want a check-list, and be sure to go through every step, every time. Yes, I consider myself an RV expert, and yes, I have started to drive away from the campsite with the TV antenna in the raised position. Following is a quick reference check-list, you may want to modify it to your particular needs, but, whether you use mine, or make up your own, make sure to go through your pre-launch check EVERY time you move your RV. (Those antennas do NOT hold up against an overpass.)

- 1) Awning, you would be surprised at the number of times I have heard of an awning being damaged from moving the coach. Most awnings on the market now take less than two minutes to extend or retract.
- 2) Power cord. (Yes, I have actually forgotten to disconnect the power cord.) Best case scenario, you see the power cord dragging behind you. Worst case scenario, you damage the receptacle at the campground and they bill you for repairs and/or you cause damage to your power cord and the junction where it enters the coach.
- 3) Water hose. First and foremost, assure that you are using a water hose made for potable water. And ensure that the hose is safely stowed before moving the coach.
- 4) Park Cable. Most newer units are coming equipped with cable TV hookups. You can imagine the damage that may occur if a screw-on cable connection is left hooked up. And you will want to make sure to check your cable every time you hook it up or unhook it. It is always best to buy the better cable. RG6 is recommended. I prefer to buy the bulk cable and the better connectors and make my own cables. I have seen cables with bad connectors right out of the package.
- 5) TV Antenna. Whether you buy the antenna warning tag, or use a simple clothespin, in a motorized unit, when you crank up the antenna, put the clip on the gear shifter. This way, if you get into the driver's seat, and the clip is still in place, you forgot something.

- 6) Levelers. Most newer units are coming equipped with leveling jacks. While most have some sort of warning system, it is always best to do a walk-around to ensure that all jacks are retracted all the way.
- 7) Tanks. If you don't have a sewer hookup at your site, make sure to stop by the dump station on the way out of the park. Trust me on this. Even if you only have a few miles to go, you will certainly regret not having taken a few minutes to dump. If you have a full sewer hookup, only drain when the tanks are 2/3 full, or on the way out, whichever comes first. Put another treatment in the tank after dumping.
- 8) Dishes. I tend to prefer microwavable paper plates and/or bowls. They are usually fairly sturdy, and you don't have to wash them. But if you prefer real plates, you should opt for plastic, as they are far less likely to break in transit. You will want to be sure they are safely stowed in a cupboard, and some people prefer to use non-slip material under the stack to prevent them from moving in transit.
- 9) Camp fires. When you turn in for the night, put some water on the fire-pit. You might need to use a bit more paper and/or kindling to start a fire tomorrow night, but, you won't have to worry about embers blowing onto or under your, or someone else's unit.
- 10) Always do a complete walk-around before moving the coach. Ensure that levelers are completely retracted, there are no objects under the coach which might cause damage to your coach or something or someone else, wheel chocks are stowed, antennas are in their proper position, and you will be able to make the proper turns to exit. Remember, your coach has a long overhang behind the rear wheels which will swing a lot wider than your car or truck.

Remember, these are only rough guidelines. You will probably want to modify these to fit your own particular situation. Any pilot will tell you that, even though he has flown the same aircraft hundreds of times, and has performed all the recommended maintenance, he will always complete the exact same check-list EVERY time before taking off. Five extra minutes here and there could mean the difference of several thousand dollars and weeks in the repair shop.

Starting Out

It is always difficult to determine the right starting place for a guide such as this. When I do a walk-through with a customer, I realize that the few things they will remember are likely the first thing they see and hear, and the last thing they see and hear. And the very last thing they hear will stick in their memory longer than the first thing they hear. However, I tend to stress the safety of the LP gas system as the very first thing. In my opinion, the integrity of the LP system is foremost in my mind. Due to the fact that most of your appliances operate on LP gas, the LP system is the very first thing I mention. The LP system alone makes up 25% of the RVIA certification test. This shows how important the RV Industry Assn feels a good working knowledge of these systems is. Maintained properly, the LP system on your coach is relatively safe. And, properly maintained, it will provide you with warmth, hot water, fresh food, and a convenient place to cook.

I don't want to sound like an alarmist, but, as safe as RV manufacturers make these systems, LP gas demands respect. I will not dwell on all of the particulars, such as knowing that the chemical that produces that awful odor is ethyl-mercaptin, or that LP gas boils at -44 degrees. You don't need to know that. You need to know how to keep your LP system going in the way that it was designed to operate. The following chapter will address the LP system, do's and don'ts and a few hints on keeping your system operating the way it was designed to do. After that I will address the appliances and other systems to give a basic working knowledge of your RV. My whole purpose in writing this guide is to assist you in enjoying the RV lifestyle, and hopefully to avoid unpleasant experiences. We here at Jim's RV Center have your best interests in mind. If your experiences can be enhanced by this little guide, then we all come out ahead. If any of your friends would like a copy of this guide, it is only a phone call or an e-mail away.

LP System

The LP tank on your motor home is usually a 24 gallon tank. This does not mean that it will hold 24 gallons, because 80% of water capacity is the extent of what you can safely put into an LP tank. This translates into 19.2 gallons of LP gas. Keep in mind that LP gas has a weight of 4.2 pounds per gallon. The reason you may want to keep this fact in mind is that your tank capacities are also part of your gross vehicle weight ratings. (GVWR) Depending on the coach manufacturer, your tank capacities, including fuel, water and holding tanks factor into your GVWR. I will address GVWR a bit more extensively later. Suffice it to say that everything is relative.

The LP system on your coach is essentially a closed system. If you EVER smell anything like rotten eggs, (unless you know it's from the fridge) open the windows and leave the coach. Call someone to check the coach completely for an LP leak. DO NOT turn on any lights or turn off any lights, do turn off the refer, the furnace, the water heater and any other source of spark. Leave the door open as you exit the coach. LP gas is heavier than air and will sink as it dissipates. The LP leak detector should go off before the LP reaches a dangerous level, however, I am not going to stake my life or my reputation on an electronic device. Other things will set off an LP leak detector, such as hair spray, bug spray, and some cooking sprays. A low battery situation will also set the detector off. But DO pay heed to the LP detector. It is in place for your safety, and we want you back here in a couple years for a newer unit.

Filling The LP Tank

When having the LP tank filled, if the service man looks as though he does not know where to start, he probably doesn't, and you should try to find someone who is familiar with RVs. An ASME (permanently mounted, under-floor) tank fills differently from an LP cylinder. (DOT tank) If you own a diesel coach, the tank is likely mounted between the frame rails near the center of the coach. The fill valve in

these situations is not on the tank but is in a remote location. While it is not as likely, with the newer systems, to overfill a tank, it is not unheard of. I always tell people that when the $\frac{3}{4}$ mark on the monitor panel lights, stop filling. 80% is close enough to $\frac{3}{4}$ as far as I am concerned. LP gas will expand at a rate of $1\frac{1}{2}\%$ for every 10 degrees of ambient temp. In other words, if you filled your LP tank first thing in the morning, and the outside temp was somewhere around 50 degrees, and in the afternoon, the temp gets to 85-90 degrees, now your tank is overfilled, and it will vent off. The vent system is supposed to release LP vapor at a less than dangerous level, however, it will make your neighbors nervous hearing a hissing sound and smelling the LP. If your tank should vent in this way, it is best to have it checked by a qualified technician. It may be more serious than simply being overfilled. In hot weather, it is best to have the tank filled in mid afternoon whenever possible.

NEVER, EVER, EVER disconnect an LP line on your coach. If you are not trained in LP gas systems, PLEASE defer repairs to those who are. LP gas is just volatile enough to cause major problems if treated improperly. All of your appliances must operate on the proper gas-air mixture and if you don't know what that is, (and I am not going to tell you) don't put your fingers where they don't belong. Trust me, it is cheaper to have it done right the first time than to have it repaired after it has been messed up. Also, keep in mind that LP gas and Natural gas are two entirely different products, they react differently, and operate at different pressures, so just because your neighbor works for the gas company, he is not necessarily the best one to call if you believe you have a problem with an LP appliance. I have seen numerous cases where someone has attempted to clean a burner orifice or something like that and caused more harm than good. I am not just trying to sell services here, I am trying to sell peace of mind. You will get more pleasure out of your coach if you have your appliances serviced professionally. It is usually a good idea to have a spring check up performed at the beginning of the camping season. Have the LP system checked for leaks, and an appliance check, and cleaning if necessary. A little money spent on preventive maintenance may avoid much greater costs later.

Water System

The “potable water system” in your coach, at least in theory, is adequate to provide water fit for human consumption. However, if the system is not sanitized on a fairly frequent basis, it will get stagnant and it takes a lot more work to get the system clean enough to use for even cooking. The easiest way to sanitize your water system is to put about a cup of bleach into the fresh water tank, and fill the tank to about $\frac{1}{2}$. Drain the water heater, then without putting the drain plug back in yet, turn the water pump on and let it run for a couple of minutes. Turn the pump off, and replace the drain plug. Turn the pump back on, and open the faucets one at a time, with both hot and cold. Once you are relatively satisfied that all of your water lines are sanitized, open the hot valve at the bath tub or shower and let it run the rest of tank right into the shower drain. Drain the water heater again, and fill the water tank with clear water. And repeat the above process. If there is still a heavy chlorine smell in the water, a little baking soda should take care of that. We also have available in our parts and accessories store, a portable water softener that operates on regular table salt. There are connections that accept a standard hose fitting. I would recommend the water softener, and a “whole house” filter between the softener and the city water connection. Keep in mind however, that when water, even filtered water, has a chance to sit dormant, it will get stagnant.

The waste water tanks need maintenance as well. After a period of time, they will read incorrectly on the monitor panel. The black water tank will get paper and, uh, stuff, on the probes. The grey water tank will get soap scum and calcium build up on the probes. What this means is that after you dump the tanks the panel might read $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, or whatever, after the tanks are emptied. At least twice a year, get a gallon of white vinegar, and pour $\frac{1}{2}$ down the toilet, and $\frac{1}{2}$ down the shower drain. Fill the tanks to about $\frac{2}{3}$ full and walk away for a few hours. After you drain the tanks, you might want to put some tank treatment in both tanks. I prefer to use the orange drop-

ins. You can dissolve one in a pail, and pour it into the shower drain to keep down on the smell in the grey tank. I have seen times where the grey water tank smells as bad as the black tank. If you have gotten water with large amounts of calcium or iron, or sulfur, it will take more than just a vinegar treatment. We carry probe cleaner in our parts and accessories store to help resolve this problem. However, if you are having problems with the fresh water tank I would ONLY use the vinegar tactic. Of course then you have to use the sanitizing method listed above afterwards.

WINTERIZING YOUR WATER SYSTEM

Proper winterization is essential to the continuous operation of your fresh water system. Most newer coaches are equipped with a water heater bypass kit of some sort. There are single lever bypass kits, two valve, and three valve bypass kits. Most of the time the bypass kit will be installed at the rear of the water heater. The very first thing you want to do when winterizing is to drain the water heater. Leave the drain plug out for the most part, especially if your unit is equipped with a Suburban water heater. Suburban uses a different material for the water heater tank and they do not recommend ever putting antifreeze in the water heater tank. Once the water heater is bypassed, it is usually a good idea to install a "blow-out plug" (a hose type connector with a tire valve attached) to the city water inlet and blow the water out of the water lines. Then with an air compressor or bicycle tire pump, apply air pressure and open all the spigots one at a time until there is just a fine mist. NEVER use more than 50-60 PSI. (30-40 PSI is usually sufficient.) If your unit has a winterize kit installed at the water pump, the rest will be quite simple. If your coach does not have a winterize kit, they are available in our parts store. I wouldn't have a coach without a pump kit. Always use the non-toxic antifreeze available at most RV accessories outlets.

If the coach has a winterize kit at the pump, make sure all faucets are shut, put the hose from the winterize kit into your first jug of antifreeze. Turn on the water pump. Once the pump gets to pressure and shuts off, I usually suggest changing to a new jug at this point. Start at the farthest point from the pump and open the cold and hot taps one at a time until you get a solid stream of pink antifreeze. Make sure to get the

toilet, (and outside shower, if equipped.) and the city water inlet. This is usually fairly simple to accomplish. For the city water inlet, turn off the pump first, then bleed the pressure off using one of the faucets. At the city water inlet, remove the screen (if there is one) and depress the check valve. This is usually a small plastic piece on a spring. (If there was a screen on the city water inlet, and you are working alone, install the screen backwards so that it depresses the check valve.) Turn on the pump again for just a few seconds, this should pump antifreeze through the check valve.

It is not much more difficult to winterize your coach with a hand pump. I will usually pour the antifreeze into the kitchen sink (with the drain plug in place, of course) and hook the hand pump to the kitchen faucet. Open the cold spigot at the kitchen faucet, and the cold spigot at the farthest point from the kitchen sink. (This is usually much easier if there are two people involved.) Draw some antifreeze into the pump, and keep pumping until you see pink at the far end. Continue with rest of the cold spigots. If your coach does not have a water heater bypass, install the drain plug into the water heater again. At this point you will open the hot spigot at the kitchen sink and pump air into the water heater. (Operate the hand pump without any antifreeze.) Then simply repeat the above process with the hot water spigots. We usually use three gallons per unit in our shop. This ensures there is adequate antifreeze in the water lines, and enough to put into the drain traps.

Appliances

In this section I will address the different appliances found in most coaches. Let me start off by saying, NEVER, EVER, UNDER ANY CIRCUMSTANCE, MAKE ANY ATTEMPT TO CLEAN A BURNER ORIFICE ON ANY APPLIANCE!!!!!!! The orifice on all of your appliances is a precise size and anything that can alter that size could cause a fire where fire is not supposed to be. If you suspect there is a problem with the orifice on any of your appliances, consult a qualified professional to repair the problem. I cannot stress enough the importance of PROPER maintenance. I will address some areas where you can perform preventive maintenance yourself. But, I will not give you enough information to get you into trouble.

A) Refrigerator. There are only two manufacturers of RV refrigerators, commonly referred to in the trade as refers. Both Dometic and Norcold are used as original equipment by most RV manufacturers. RV refers are heat absorption units. This means essentially that they use heat to produce cold. While both refer manufacturers would tell me I am wrong, I would still argue the point that a refer, as a general rule, will cool quicker, and run more efficiently on LP gas than on electric. Particularly if you are on less than a 30 Amp supply. Most newer refers have an auto setting which means that if there is 120VAC available it will operate on electric, but if the electric supply is interrupted, it will automatically switch to LP gas operation. However, if the input power is inadequate, it will not cool efficiently. The only maintenance I would ever recommend that a customer perform is to check and clear the burner assembly. This can usually be accomplished by removing the burner cover and using an air nozzle or a can of compressed air to blow rust and/or dust from the burner assembly. If the burner assembly needs to be taken apart to be cleaned, take it to a trained professional for repairs.

If your refer is equipped with an ice maker, the ice maker will only operate on 120VAC. There is a temp control that will not allow the ice maker water valve to operate until the refer is at normal operating temp. It is important when you sanitize the water system to sanitize the feed line to the ice maker valve. This should be fairly simple to accomplish. Most coaches will have a shut-off valve in the water line leading to the ice maker. If you close the shut-off valve, (with the water pump turned on) disconnect the feed line to the water valve, hold the feed line away from the coach and open the shut-off valve to allow some of the bleach solution to run through the feed line. Close the shut-off valve again, and after you put clear water in the tank, repeat the process. Remove the output line from the bottom of the valve, and blow air through the line so that whatever water is left in the line ends up in the ice maker. When you use the ice maker after sanitizing the lines, discard the first tray full of ice cubes. I don't mean just the first cycle of ice,

the entire first bucket. This should ensure that your ice cubes will not affect the taste of your drink.

B) Water Heater. Again, there are only two manufacturers of water heaters for RVs. They are Atwood and Suburban. Both of them operate essentially the same way. However, there are a few differences in the two makes. There are also several different models between the two makes. Most newer units will use what is called DSI, or Direct Spark Ignition. This means that for LP gas operation, all you have to do is turn on a switch and if everything works properly, the water heater will light all by itself, and will recycle as the water temp changes. DSI water heaters are preset at between 140 and 160 degrees. The water temp is not adjustable on DSI water heaters. One thing you can do if you feel the water is too hot, is to open the water heater bypass valve a little bit. This will mix a little cold water with the hot water output. The biggest drawback of this is the water temp may fluctuate a little more, depending on your usage. There are also what are referred to as pilot models, which means that the water heater has a pilot flame that needs to be lit in order to ignite the main burner. Two advantages of having a pilot ignition water heater are that you can control the temperature of the water, and, you will see how the burner is operating, every time you light the water heater. Most people do not check the burner with a DSI water heater. On a DSI water heater, the spark probe is also the sense probe. (At least on newer models.) The flame creates a resistance between the probe and ground. The ground is established at the point where the spark probe is mounted to the burner assembly. If there is any corrosion between these points, the likely reaction is that the water heater will ignite, but will only burn for a few seconds. One thing you should do is take a long look at the area where the probe is mounted. If you notice any corrosion, remove the probe mount, clean the area with sandpaper and reinstall. Make sure the mounting screws are tight enough to make a solid connection when you put it back together. There are also combination gas and electric water heaters. If your water heater is a combination unit, I usually suggest putting a piece of tape across the switch for electric operation until you are positive that the water heater tank is full. (I usually open the lever on the pressure relief valve to ensure that there is water at that point.) With an empty tank, the electric heating element has a life expectancy of

about 30 seconds. The burner assembly can be removed for inspection and cleaning without disturbing the gas line or orifice. It is a good idea to use an inspection mirror to check the burner assembly if the unit has not been used for some time. Bees and spiders tend to be drawn to LP for some reason.

C) Furnace. One again, there are only two manufacturers of furnaces for RVs. They are, once again, Atwood and Suburban. (Dometic used to make a Duo-Therm furnace, but, they haven't been built since 1986.) As far as the furnace goes, I will never suggest that a customer undertake ANY repair aside from replacing the ignition module board. However, if the furnace casing must be disassembled to gain access to the board, I would recommend having repairs completed by a professional. You didn't hear this from me, but, there are screens available to keep bees, spiders, and mice from gaining access to your furnace. The furnace manufacturers say it will void the warranty on the furnace if a screen is installed. The main thing they are worried about is that the screens will reduce the air flow by as much as 30%! Worst case scenario is that carbon monoxide can be introduced inside the coach. If you decide to install one of these screens, DO NOT operate the furnace with the screen in place. These screens are installed with a simple spring hooked to one or two places on the exhaust grate. Every time I sell a screen to a customer, I always suggest putting some kind of label on or near the thermostat. Even if the label is simply "SCREEN", at least it will remind you to remove the screen prior to operating the furnace.

D) Range. There are three manufacturers of RV stoves. They are Atwood, Magic Chef, and Suburban. They all operate pretty much the same. All of the newer stoves will have either a piezo ignition system, or manual light system. The stove top pilot was eliminated several years ago, in the interest of safety. It seems that people would leave the pilot valve open and when the LP gas was turned off, the pilot flame would, of course, go out. Then when the LP gas is turned on again, there is an LP leak. Suburban and Atwood, on the models with piezo ignition, put an igniter on each burner, above the stove top. Magic Chef uses a single igniter in the center, under the stove top. The big drawback here is that it is possible for gas to build up under the stove top and for a flash fire under the stove top. With a Magic Chef stove I would suggest always using a grill lighter to light the top burners.

E) Generator. Most newer models motor homes will come equipped with a generator of some sort. Smaller units with one air conditioner will generally use a 4 KW gas powered generator. (Usually referred to in the trade as a “genny”) The larger diesel coaches will usually be equipped with a 7 KW diesel or LP powered genny. If you purchased, or are thinking of purchasing a used motor home, do not be alarmed if the genny hour meter seems kind of high. In my experience, a genny that has been used a lot is better than one that has very low hours on the meter. The genny is installed to be used, and it should be exercised at least once a month, whether you need it or not. In this way, when you really do need it, it will operate as it was intended to do. I usually suggest if your coach is parked near your home, once a month, start the engine on the motor home, start the genny, let it run for a while, and work the genny. In the summer months, run the air conditioner(s), in the winter months, put a TV dinner or two in the microwave. Contrary to popular belief, the more a generator is operated, the better it is for the genny. Most newer units have what is called an automatic transfer switch, or change-over relay. What this means is that, once the genny starts, there is a slight delay, and the relay box switches to genny power and away from the “shore line”. (Power cord) However, I have seen cases where the genny has been started with the shore line plugged in, and the resulting arc from either the genny or shore line will actually weld the contacts on the relay together. When this happens, you will only get power in the coach from either the shore line or genny, but not from both. I will address more on these issues when I get to the rest of the electrical system. Some coaches do not use a changeover relay. On these units, there is usually a 30A receptacle in the same compartment as the shore line. In these cases, the genny will only power that receptacle. In order to get power to the coach from the genny, you must plug the shore line into that receptacle. While it is a bit more inconvenient, to a certain point it is more sure. And you won't have to worry about having to choose one over the other. If you are dry camping for several days and using the genny frequently, it is always best to check the oil level on a daily basis. In addition to checking the oil level on the dipstick, it is a good idea to smell the oil. If you detect an odor of fuel (either gasoline or diesel) you will need to change the plugs

and oil at the same time. A diesel genny will not usually foul the glow plugs as quickly as a gasoline genny will foul spark plugs. It is always a good idea to use fuel treatment frequently. Unless you are using your coach very frequently, as in at least once a week, it is a good idea to put a fuel stabilizer into the fuel tank and run the genny for at least fifteen minutes after every fill up. This will help to keep varnish from accumulating in the genny fuel system. And on a diesel coach, an anti-gel additive will keep your engine starting much more easily.

F) Air Conditioner. Heretofore referred to as A/C. Most newer coaches will come equipped with at least one roof-mounted A/C. There are now three manufacturers of A/C units. They are, Dometic, (Duo-Therm) Coleman, and the new kid on the block, Carrier. Of course, Carrier has been manufacturing air conditioners for homes and businesses for a very long time. So a few years ago, they moved into the RV market. Without getting into how the A/C works, I'll just say that in order for the A/C to operate properly, it needs a good power source. Two things you should have on hand are a plug-in voltage meter, and a polarity tester. I recommend leaving the volt meter plugged into a receptacle pretty much constantly. This way you can tell if the voltage drops off for any reason. In very hot weather, when every other camper in the campground is running the A/C's, it is very possible to get a voltage drop. Low power, or reverse polarity will cause damage to your A/C. Also, most people do not realize that ice can form when it is well over 90 degrees outside. In extremely hot weather, you will often be tempted to run your A/C at the maximum setting. However, it will eventually ice up, and this creates more draw on the compressor, and the rest of your electrical system. I usually suggest running the A/C to keep the coach at about 75 degrees for the most part, and gradually cooling it down further.

G) Microwave. There are two types of microwaves used in RV's. Standard microwave, and combination microwave/convection oven. Always keep in mind that a micro/convection even will use considerably more power than a standard microwave. This is one reason why some manufacturers will install a selector switch between the microwave and another appliance or other appliances. For instance, if your coach is equipped with a washer/dryer, and/or a combination gas/electric water heater, you will only be able to use one of these appliances at a time. This is not usually that big of a problem, as the microwave is generally not in use for more than a few minutes at a time. Of course, some people use the clock on the microwave to keep time. However, if you would rather operate your water heater on electric, you can get a nice battery operated wall clock for about \$10.00. I will get into microwaves and other appliances when I get into the electrical system.

H) Washer/Dryer. If your coach is equipped with a washer/dryer, there are a few things to keep in mind. First and foremost, a washer/dryer unit will use a fair amount of electricity. Depending on your incoming power, you may or not be able to use the A/C at the same time. In other words, if you don't have a 50A power supply, the washer/dryer will likely take the biggest part of your incoming power. And of course, the dry cycle takes considerably more power than the wash cycle. Also, keep in mind that these units, by nature, will not dry clothes like your dryer at home. They are mostly designed so that you can wash a few towels, washcloths, swimsuits, etc. after a trip to the beach. If you are washing heavy fabrics, such as jeans, flannels, etc. expect it to take at least two cycles. Also, if you don't have a full sewer hookup where you can leave the grey water gate valve open, chances are that you will get soapy water coming into the tub/shower.

Electrical System

The electrical system on your coach is made up of several different components. The first thing most people recognize, and think about, is the power cord, or shore line. Of course, this is just the start of the electrical system. Most coaches are equipped with a 30 Amp shore line, and of course, a 30A distribution panel. Part of this distribution panel will supply power to the Power Converter. The power converter supplies 12VDC to power the interior lights, and most appliances (With the exception of the A/C, microwave, washer/dryer, etc.) , as well as charging the coach batteries. One important fact to keep in mind, is that the power converter draws 5-8 Amps of your available input power right off the top. Let's say you are plugged into a standard household outlet. (Most of these are 15A, 20A at the most.) The refer requires 6-8 amps on electric operation, a microwave requires anywhere from 6-15 amps depending on model, a TV will draw anywhere from 3-8 amps depending on size and configuration. So, as you can see, amps are just as important as voltage, if not more so.

Without a good source of power, things will not operate properly. And in some cases the appliances could be damaged due to low power. Even if you are plugged into a 30A supply, or even a 50A supply, if you are in a campground with many occupied sites on a very hot day where everyone is running at least one A/C, chances are that your incoming power is not adequate to operate all of your appliances properly. If you think your incoming power may not be adequate, the first thing you should do is switch the refer to gas operation, try to avoid using the microwave, and if you need the A/C, run your generator. As long as your generator is well maintained, and has been checked for proper output, your own power source will almost always be superior to camp power. Unless you are plugging another coach into your RV, your generator will supply more than enough power to operate everything in your coach.

The owner's manuals on all of your appliances should list the power usage in the product spec sheets. Make a list of these specs and keep it handy. This way you won't have to look for each manual every time if you have a question of whether you have

adequate power. It is a good idea to occasionally add up the power usage of the appliances you use the most. Two things you should always have available are a plug-in volt meter, and a polarity tester, as I mentioned previously. It will also help if you have what most techs call a reverse adapter. This will be an adapter that will accept a standard household plug, and the male end will plug into a standard 30A receptacle. DO NOT USE ONE OF THESE ADAPTERS TO PLUG YOUR COACH INTO A 30A SUPPLY USING A HOUSEHOLD EXTENSION CORD!!! The best case scenario of this setup is that the extension will overheat and fail to function. The worst case scenario is that the cord will overheat and catch fire. Always use a 30A or 50A extension cord if you need extra length. But also keep in mind that the more cable you are using, the greater the voltage and amperage drop. (I usually recommend using only one extension cord if you need extra length.) And again, here is where appliances can be damaged. And always check for proper polarity and/or open ground every time you plug your coach into a power source. Particularly if you are using an extension cord. If a cord even gets overheated, it is possible for one or more of the terminals to lose contact.

Moving on to the DC side of your electrical system, this consists of the battery(ies), and the power converter as far as power supply. As a general rule, your lights will almost always be 12V. Of course, there are some coaches that will utilize a few 110VAC lights where more light is preferred. Always make sure to use the correct replacement bulbs in your lamps. Don't try buying bulbs at the local auto parts store. First and foremost, they are not familiar with RV's, and chances are that they do not have the proper bulbs. While the bulb may look like the same bulb, different bulbs have different outputs. For instance, a standard backup light bulb might give you a little more light, but it will also produce more heat than your lamp is designed for. Again, best case scenario is that the lens melts from the heat, worst case scenario, the lamp overheats and catches fire. I am not trying to be an alarmist. I am only trying to give you enough information so that you can avoid some of the mistakes I have seen other people make.

As far as your batteries are concerned, make a habit of checking the fluid level at least once a month. More often if you leave your coach plugged into 110V power

most of the time. Every time a battery is being charged it will lose a certain amount of fluid. If the fluid level drops below the plates, and a charge current is applied to the battery, it will short the plates. At that point, the battery is useless. It will no longer accept a charge, or if it does, it would only take a static charge. This means that once the unit was unplugged, the battery charge will fade almost instantly. And, if the battery is shorted, there is a high degree of probability that it will burn out your power converter. Deep cycle batteries, (which are what your coach batteries should be) are designed to go from full charge to almost no charge and still be able to accept a charge. They have different qualities than a starting battery, and you should not attempt to use an engine starting battery for a coach battery or a deep cycle battery for a starting battery. Deep cycle batteries, as a general rule, have an average life expectancy of three years, if they are properly maintained.

Most newer Class A motor homes have two 6V wired in a series circuit. In this type of installation, the positive terminal of one battery is hooked to the power supply of the coach, the negative terminal of this battery is wired to the positive terminal of the second battery, and the negative terminal of the second battery is hooked to the coach, or chassis, ground. This produces 12VDC power with more amp/hours than a single 12V battery. If one of these batteries should fail, it is always best to replace them as a pair. An older battery against a newer battery will actually draw the newer battery down quicker. Whenever you remove batteries, or disconnect cables for any reason, always mark the cables so that you can ensure they are hooked up properly. If you remove the cables from the batteries for any reason, it is always best to tape the terminal of the positive cable so that it cannot short out against anything if the coach gets plugged in. Keep in mind that just because the lights in your coach work, it does not necessarily mean that the batteries are hooked up properly. Light bulbs don't care which way the electricity is flowing. However, the rest of the coach does.

Glossary Of Terms

AC: Alternating Current, usually relating to 120VAC

A/C: Air Conditioner. You will usually find this listed on a repair order.

Coach: RV. This term is used mostly by technicians.

DC: Direct Current. Usually refers to the 12V system, or house battery system.

M.H. or MH: Motor Home.

Fiver or Fifth or 5th: Fifth Wheel trailer.

Genny or Gen: Generator. That neat little power source for the races.

Micro: Microwave. Usually as an abbr. for micro/conv.

Refer: Refrigerator. Sometimes will be abbr. as simply ref.

Items You Will Need

- 1) Water pressure regulator
- 2) Polarity tester
- 3) Voltage meter