

# RV TECHNICIAN



PUBLISHED BY THE RVDA EDUCATION FOUNDATION'S

March/April 2014

## Multimeter Generator Troubleshooting Page 5



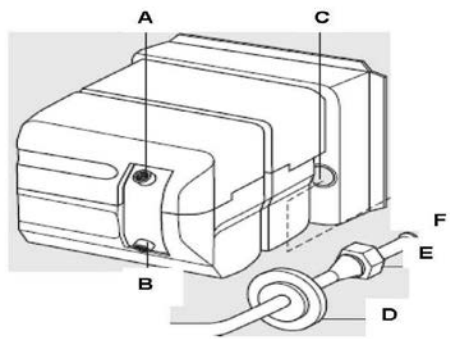
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Figure 1 6-Gal. Shown



## General Installation of Water Heaters Page 9

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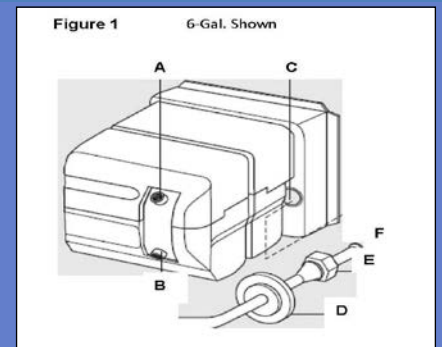


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## Spring to It!

Welcome to *RV Technician*.

This spring edition of *RV Technician* starts with an article on generator troubleshooting with a multimeter. Submitted by Greg Wischmeyer, standards inspector/certified technician for RVIA, it provides a detailed explanation of how to quickly and efficiently diagnose faulty generator systems. Using the multimeter to pinpoint problems, says Wischmeyer, is faster and easier than swapping out parts until things run properly again.

Next up is an article from Atwood on a common method for installing water heaters. It includes diagrams and a chart for determining the proper dimensions for the cutout opening.

Finally, there are two companion articles about today's battery technology and maintenance. These stories, by Vicki Hall of Trojan Battery Co., will tell you all you need to know about the different kinds of batteries used in RVs and how they vary by use and maintenance.

Don't forget to check out the information on technician certification and cert preparation on pages 24-25 — make this the year you commit to taking your skills and knowledge another rung higher.

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## Multimeter Generator Troubleshooting

*By Greg Wischmeyer*

A full diagnostic checkup for a RV generator requires the service technician to use multiple tools and a shop load bank. Many of the generator checks as outlined in the Generator Sign-Off sheet only require a multimeter. These meter checks are outlined in this article to assist the service technician in understanding how to quickly and efficiently diagnose certain potentially faulty generator systems.

The beginning of the 12 volt current path in the generator begins with verifying proper voltage to the starter solenoid and starter. While using the DC setting, check the voltage at the large hot lug on the starter solenoid. If voltage is low, check the battery, battery cables, and ground strap to the generator. *(See photo below.)*



Next, check the primary ignition coil windings. With the generator not running and the leads disconnected, the coil can be checked while still installed on the

generator. Using the ohm setting, make sure the primary windings fall within the manufacturer's specified ohms. *(See photo below.)*



After the primary windings have been checked, it's time to verify the ignition coils secondary winding. When disconnecting leads, be sure to mark them for proper re-installation. Make sure the wire sockets are clean and corrosion-free. Again, using the ohm scale, make sure the ohm readings fall within the manufacturer's specified ohms. If the spark plug wires are old, deteriorated, cracked, or in any way suspect, then they should be checked at this time,

using the ohm setting to verify that they do not have excess resistance. (See photo below.)



## The Fuel System

Use the meter on a DC setting to verify voltage to the fuel pump. The voltage to the fuel pump may pulse during the ignition cycle if the generator is not running. The test lead will need to contact the fuel pump hot terminal with the other lead to a good ground. (See photo below.)



Check that the spark plugs are in good condition. The preceding series of meter checks will verify the starting and running ignition components of the generator.

Along with the ignition source, a proper supply of fuel is required. Make sure there is at least  $\frac{1}{4}$  of a tank of fuel in the tank and that the generator is not installed too high above the fuel tank to be able to draw fuel before it can pump it. This is the case with some horse trailers having the generator mounted on top of the trailer while the fuel tank is mounted below. Some toy haulers may also have a homemade system with a generator above and fuel below.

Verify voltage to the fuel solenoid, using the DC setting on the meter. Also, a fuel pressure check using a pressure gauge or flow check to the carburetor may be done at this time. (See photo below.)





The preceding suggestions cover some basic multimeter tests that can be quickly performed to check the starting, ignition, and fuel delivery components. The following meter steps are used to check the 120 volt producing side of the generator.

Use the DC scale to verify the field flash voltage required to get the generator side working. This test can be done with the field flash leads installed. Make sure the voltage falls within manufacturer specifications. (See photo below.)



Lastly, as with most modern small engine driven generators, water pumps, and hydraulic pumps, check the low oil pressure shut-down switch. These are usually a normally closed switch until proper oil pressure causes them to open. Low oil pressure causes the switch to close, (completing a ground), shutting down the engine and saving the engine from damage due to low oil pressure. These oil pressure safety switches can go bad, and the generator will not start. Larger liquid-cooled generators will also most likely have a high coolant temperature switch that also should be checked. This picture shows the use of a meter to check the open condition of the oil shutdown switch. (See photo below.)



Now the rotor ohm check can be performed with the generator still assembled. This check is done on the ohm scale with the DC leads disconnected from the brush terminals. The generator is not running for this test. (See photo below.)

(continued on next page)



This picture shows testing the oil shut-down switch leads:



I hope this article will help service technicians learn to utilize the powerful tool known as your multimeter. It sure can be a lot faster and easier than changing parts until things run again. I think most of us went through that stage earlier in our mechanical lives.

Thank you to Cummins Onan in Elkhart, IN, for the use of its shop facilities.

*Greg Wischmeyer is the standards inspector/certified technician for the Recreation Vehicle Industry Association (RVIA).*



## General Installation of Water Heaters

*Courtesy of Atwood*

Below is the most common type of installation for the water heater. However, there are other approved methods, such as baggage compartment and flush mounting installations. Consult your field auditor, account manager, or the Atwood Service Department if you have additional questions.

1. Locate water heater on floor of coach before erecting side walls.

The water heater tank must be permanently supported at the same level as the bottom of sidewall cutout (by the floor or a raised floor).

2. To install water heater on carpeting, you must install appliance on a metal or wood panel that extends at least three inches beyond the full width and depth of the appliance.

3. If water heater is installed where potential leakage of connections or tank will damage adjacent area, install under the water heater a drain pan that can be drained to the outside of the coach.

4. Connect both 1/2" NPT water lines -- hot water outlet female (Fig 1-A) and cold water inlet female (Fig 1-B) and 3/8- flared LP gas lines (Fig 1-C).

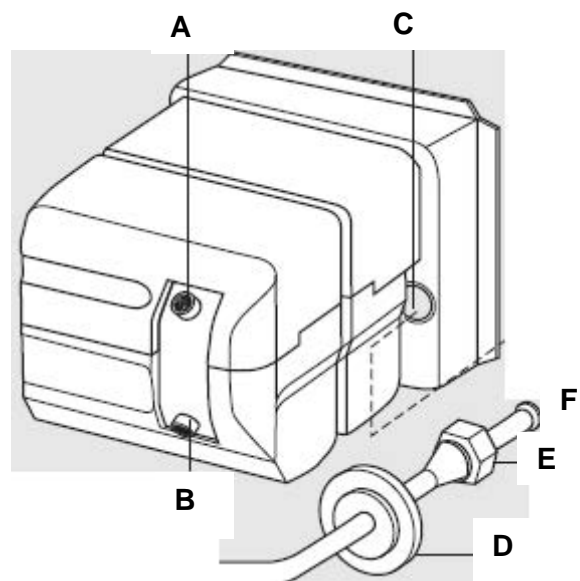
a. Allow flexibility in water and gas lines

so you can pull unit forward through wall one inch past skin (Fig 2).

b. Seal gas line entrance opening by sliding grommet (Fig 1-D) onto 3/8- tubing (Fig 1-F) before flaring tubing (Fig 1-F). Pull gas line and grommet through opening in housing (Fig 1-C). Connect flare fitting (Fig 1-E) and press grommet into opening. If gas line tubing is already flared, cut grommet on one side. Place split grommet over gas line and press it into opening.

c. Always use pipe lubricant on threads when connecting hot and cold water couplings. A suitable plastic fitting is recommended.

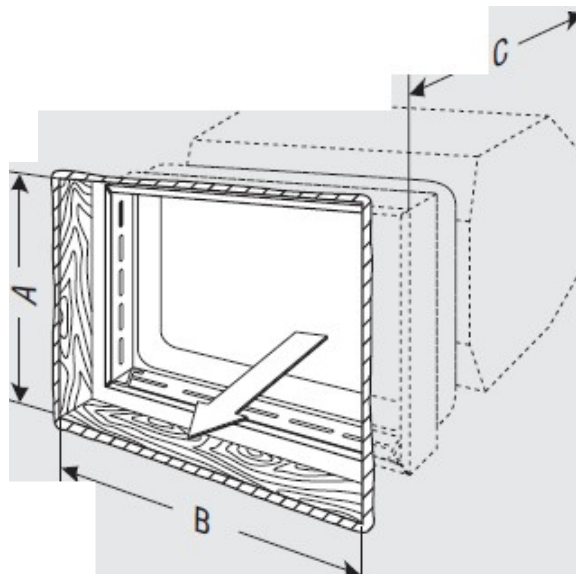
**Figure 1** 6-Gal. Shown



5. Erect side walls and cut out opening.  
 See chart and Fig 2- A & B, below. Frame  
 with 2x2 lumber or equivalent.

<b>CUTOUT</b>			
<b>Capacity</b>	<b>Cutout dimension</b>		<b>Depth</b>
<b>Gallon</b>	<b>A</b>	<b>B</b>	<b>C</b>
<b>4 - 6</b>	<b>12-5/8"</b>	<b>16-1/4"</b>	<b>17-5/8"</b>
<b>10</b>	<b>15-3/4"</b>	<b>16-1/4"</b>	<b>20-5/8"</b>
<b>Minimum Clearance From Combustible Construction</b>			
	<b>Sides: 0"</b>		<b>Top: 0"</b>
	<b>Back: 0"</b>		<b>Bottom: 0"</b>

Figure 2



6. Bend all flanges along scored lines (Fig 3).

7. To prevent water leaks, caulk thoroughly around opening, including bend slots (Fig 3 A). Butyl tape (rx1/8') may be substituted for caulking material.

8. Push unit against caulking, secure 4-corner brackets (Fig 4-A) to coach with #8-314 round head screws (not furnished) or equivalent. Complete the installation by inserting the same type of #8 screws in the holes provided around the flange of the water heater housing.

Check all gaskets--they must adhere to the pan, creating an air-tight seal.

9. Attach access door (Fig 5).

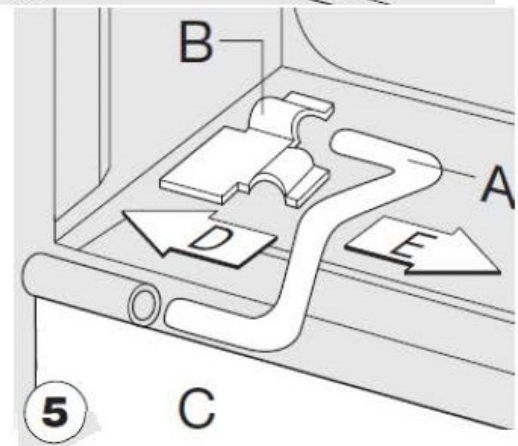
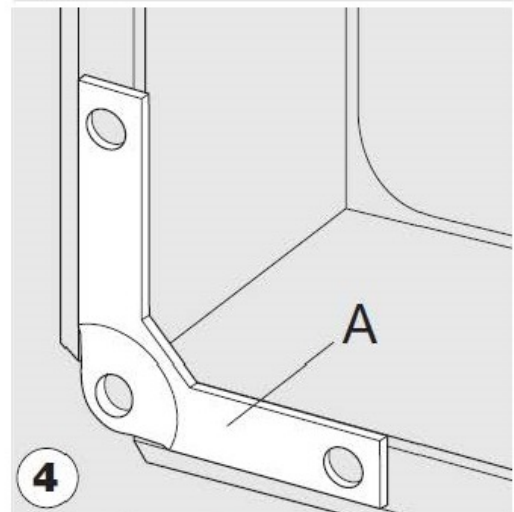
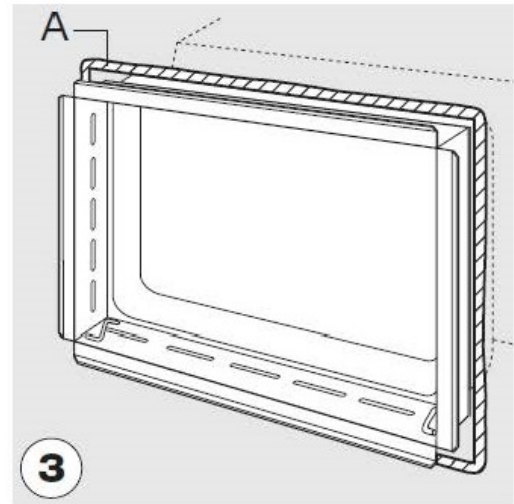
a. Snap hinge pin (Fig 5-A) into clip (Fig 5-B).

b. Slide cover (Fig 5-C) onto hinge pin.

c. Slide hinge pin into cover, snapping into clip at same time (Fig 5-D).

NOTE: To remove hinge pin, support access cover and apply force to corner of hinge pin as shown Fig 5-E.

10. Disconnect unit and its individual shut-off valve from gas supply line during any pressure testing of system in excess of 1/2 PSIG (3.4 kPa, 14 water column [W.C.]). DO NOT set inlet pressure higher than maximum indicated on rating plate of gas valve (13- W.C.). Isolate unit from gas supply line by closing its individual manual shutoff valve during any pressure testing 1/2 PSIG.





**WARNING**

**FIRE AND/OR EXPLOSION**

**DO NOT use matches, candles or other sources of ignition when checking for gas leaks.**

11. Turn on gas and check water heater and all connections for gas leaks with leak detecting solution.

12. Fill water heater tank, check all connections for water leaks (Fig 1-A & B).

## Today's Battery Basics

*By Vicki Hall, director of quality assurance and technical services  
Trojan Battery Company*

In this article, I'll discuss the various battery technologies and what to consider when determining which battery will best fit a particular application.

There are two types of deep-cycle battery technologies available on the market today - flooded lead acid (FLA) and valve regulated lead acid (VRLA). Deep-cycle flooded batteries are the most appealing due to their low initial cost and long life; however they require periodic "watering" to ensure the health and longevity of the battery. If you'd rather not worry about watering batteries and are willing to spend more money for maintenance-free convenience, AGM and gel batteries are other options.

Understanding the various battery technologies available on the market today enables you to select the best battery type that will provide greater performance, reliability and longevity to power your RV applications. Because there are several factors to consider when choosing a battery such as maintenance requirements, charging processes and lifespan, it's important that you do your homework on the various battery manufacturers and their products. An initial investment in high-quality, deep-cycle batteries will go a long way in keeping your total cost of ownership to a minimum and ensuring maximum performance of your vehicle.

### **Overview of FLA (Flooded)**

FLA batteries provide the best cycling performance of all deep-cycle battery technologies and are the most ideal option for a majority of RV applications where lowest cost is a key deciding factor.

To achieve maximum potential cycle life, flooded batteries require regular maintenance. As FLA batteries charge, hydrogen gas is produced and vented in the process. This off gassing of hydrogen reduces the electrolyte level in the flooded battery, so periodic "watering" of the batteries is required to ensure maximum life. The frequency will need to be determined by the owner, based on his or her individual use. However, Trojan Battery recommends that electrolyte levels be checked at least every two weeks to ensure optimum performance.

Distilled water is recommended because it contains no impurities which can reduce battery life or impact its performance. You should never add acid to cells, since batteries come with all of the acid they need. Once electrolyte is lost, it can never be replaced, and the battery will not have the proper amount of sulfate needed for good performance and long life. That's why regular watering is very important.

The proper maximum water level is 1/8" below the bottom of the fill well. It's

important not to overfill the cell, since during charging the electrolyte levels will rise and if they are overfilled the electrolyte may come out of the batteries. This will reduce the life of the battery and affect its operation.

You should also never let the electrolyte level go below the battery plates, which will damage the plates and significantly impact the overall performance of the battery.

It's important to note that water should only be added to batteries that are fully charged. Never add water to discharged batteries. The only exception is if the plates are exposed. In this case, add just enough water to cover the plates. Then, after charging, add enough water to bring the electrolyte to the proper level.

Watering batteries can sometimes be messy and difficult, so single-point watering systems have been designed to make the job easier. Trojan's HydroLink™ is one of the products available on the market today to simplify the job of watering flooded batteries. The HydroLink manifold replaces the current vents on selected Trojan batteries and features tubing which is used to connect the group of batteries in your RV. The tubing is then easily connected to a water source and will deliver the proper amount of water to the batteries, filling a set of batteries in less than 30 seconds. Please note that HydroLink is not available for use with Trojan's Plus Series batteries.

### **Overview of VRLA (AGM & gel)**

If maintenance cannot be guaranteed on a regular basis, FLA batteries are not a good choice. For those requiring maintenance-free battery technology, consider a sealed VRLA battery such as AGM or gel technology. However, while maintenance-free batteries provide more convenience,

that convenience comes with a price. Sealed VRLA batteries are going to be more expensive and will have lower cycle life when compared to FLA batteries.

Because VRLA batteries don't require regular maintenance, they're known as sealed or maintenance free. VRLA batteries do not have openings to add water to the cells, but they do "off gas" so you should have good ventilation in your RV.

AGM batteries have the electrolyte in Absorbed Glass Mat separators, so there is no free electrolyte. Gel batteries have the electrolyte immobilized in a gel-like substance, so they, too, have no free electrolyte. Both batteries use recombination to reduce the loss of H<sub>2</sub> and O<sub>2</sub> gases, which eliminates the need for watering.

Since VRLA batteries are sealed, they require a special charging algorithm that limits voltage to prevent overcharging, which causes dry-out. So if you currently have flooded batteries in your vehicle and want to move to a VRLA battery type, you'll need to purchase a new charger.

Regardless of what battery technology you choose for your particular application, always read the battery manufacturer's user manual, which should provide important information on installation, maintenance, trouble shooting, and storage.

### **Maintaining a deep-cycle battery**

In this section, I'll discuss the importance of:

\* Measuring the state-of-charge of deep-cycle flooded batteries using voltage, specific gravity, and ampere hours



\* Regularly determining batteries' state-of-charge to maintain their performance and lifecycle

Evaluating the state-of-charge of your batteries is an important part of a regular battery maintenance program. Determining the state-of-charge of flooded or VRLA batteries can be done either by taking the open-circuit voltage reading with a voltmeter or, for flooded batteries, determining the specific gravity readings of individual flooded battery cells with a hydrometer. Specific gravity is believed to be the more accurate indicator of state-of-charge, but both voltage and specific gravity readings will be more accurate if taken under a no-load condition.

You should keep a battery maintenance log to record both voltage and specific gravity readings over time. This will help when trouble shooting problems and will force commitment to a regular maintenance plan.

When using voltage or specific gravity readings to determine the battery state-of-charge, it's important to always consult the manufacturer's technical specifications, since not all flooded batteries operate with the same specific gravity electrolyte.

Measuring voltage to determine state-of-charge is the most economical method but tends to be the least accurate. It involves using an inexpensive digital voltmeter with a basic accuracy of at least 0.5 percent or better. Using a battery voltmeter is easy. Just connect it to the battery's main positive and negative terminals. Also, remember to:

- ✓ Ensure the polarity is correct, because analog meters can

be damaged by reverse polarity.

- ✓ Wait two hours after any charging to take your measurement (use your disconnect switches to stop all charging or discharging if necessary).
- ✓ Measure DC voltage across the main positive and negative terminals.

As batteries age, their voltage reading will gradually get lower. This will happen faster if the batteries haven't been properly maintained.



**Examples of voltmeters**

Measuring by specific gravity is the most accurate method. You'll need a good battery hydrometer, which measures the ratio of the density of the electrolyte (acid) to the density of water within a flooded battery cell.



**Examples of hydrometers**

Here is the procedure:

- Wear goggles and rubber gloves. Keep baking soda and water handy in case of spills, which should be cleaned up immediately.
- Open the cells on each battery and use a hydrometer to remove enough electrolyte to make the float rise in the tube.
- Record the reading.
- Calculate the average of each of the readings and using the following formula to compare the result with the chart below to determine the battery's state-of-charge.

*Specific Gravity (SG): The density (mass/volume) of the liquid (electrolyte) relative to water, at the same temperature. The density of water is 1.*

Example:  $\frac{1.277 \text{ kg/l}}{1.000 \text{ kg/l}} = 1.277$

- 1.277 is referred to as “twelve-seventy-seven” acid
- The difference between 1.277 and 1.270 is referred to as “7 points”

Percentage Charge	Specific Gravity	O P E N C I R C U I T V O L T A G E							
		Cell	6V	8V	12V	24V	36V	48V	72V
100	1.277	2.122	6.37	8.49	12.73	25.46	38.20	50.93	76.4
90	1.258	2.103	6.31	8.41	12.62	25.24	37.85	50.47	75.7
80	1.238	2.083	6.25	8.33	12.50	25.00	37.49	49.99	75.0
70	1.217	2.062	6.19	8.25	12.37	24.74	37.12	49.49	74.2
60	1.195	2.04	6.12	8.16	12.24	24.48	36.72	48.96	73.4
50	1.172	2.017	6.05	8.07	12.10	24.20	36.31	48.41	72.6
40	1.148	1.993	5.98	7.97	11.96	23.92	35.87	47.83	71.7
30	1.124	1.969	5.91	7.88	11.81	23.63	35.44	47.26	70.9
20	1.098	1.943	5.83	7.77	11.66	23.32	34.97	46.63	69.9
10	1.073	1.918	5.75	7.67	11.51	23.02	34.52	46.03	69.0

Specific gravity measurements should be temperature compensated to determine the true value. Specific gravity measurements should be used as a guide, since the actual value measured during use can be affected by temperature, battery age, and other

operating parameters. If specific gravity values seem to be consistently low across the cells (<1.250), it could be caused by not fully charging the batteries, or by the recent addition of water, which dilutes the electrolyte at the top of the cell. In both of these conditions, the

battery should be given a sufficient equalization charge that results in specific gravity readings close to the specified value range.

Determining these measurements is important to know when conducting tests to assess the health of a deep-cycle battery and how quickly the battery is aging.

### **Equalizing flooded batteries**

Another important maintenance practice to keep flooded batteries operating at optimum levels is performing equalization. Equalization is an overcharge of flooded batteries after they've been fully charged to address imbalanced cells and prevent stratification from undercharging, which will harm the batteries. Stratification occurs when the electrolyte concentration is greater at the bottom of the battery than the top, which will corrode the battery plates and eventually destroy the batteries.

Trojan recommends equalizing only when batteries have low specific gravity (below 1.250) or wide ranging specific gravity (> 0.030 points between cells) after fully charging a battery.

Also, it's very important to note that deep-

cycle AGM or gel batteries should **NEVER** be equalized.

### **Conclusion**

By gaining a clear understanding of the various battery technologies available on the market today and committing to a regular maintenance schedule ensures that whichever battery type you choose, it will continue to operate at peak levels of performance and reliability. With proper care and maintenance, an initial battery investment can be extended as well as keep the total cost of ownership to a minimum resulting in more time on the road.

*Vicki Hall is director of quality and technical services for Trojan Battery Company, a leading manufacturer of deep-cycle batteries. She has been with the company since 2006 and is responsible for Trojan's overall product quality programs, initiatives, and strategies. She also oversees Trojan Battery's application engineering support and manages its global technical support team, which addresses customer technical questions via Trojan's toll-free technical support hotline and the company's website. She can be reached at [vhall@trojanbattery.com](mailto:vhall@trojanbattery.com).*



## Deep-Cycle Battery Maintenance

*By Vicki Hall, director of quality assurance and technical services*

*Trojan Battery Company*

Proper maintenance of deep-cycle flooded, AGM, and gel batteries will extend their performance and protect your investment. Follow these simple steps to ensure your batteries operate at optimum levels day in and day out.

### **Tips for proper maintenance:**

#### **Safety**

The safety precautions and procedures outlined below should be followed whether handling flooded or valve regulated (AGM or gel) batteries.

- Always wear protective clothing, safety glasses, and gloves when handling and/or performing battery maintenance.
- Never add acid to a battery.
- Keep batteries clean and dry.
- Keep sparks, flames, and cigarettes away from batteries.
- Charge only in well-ventilated areas.
- Avoid skin contact with electrolyte.
- Always use insulated tools.

#### **Watering (*flooded batteries only*)**

- Add water only after fully charging the battery (unless plates are exposed).
- Check with the manufacturer regarding proper electrolyte fill levels.

- Never allow the electrolyte level to fall below the plates.
- Use distilled water.

#### **Charging**

- Charge batteries after each use, following the manufacturer's instructions.
- Add water to flooded batteries after they are charged, not before.
- Do not interrupt a charge cycle unless opportunity charging.
- Never charge a frozen battery.
- Avoid charging at temperatures above 120°F (49°C).

#### **Cleaning**

- Clean the battery terminals and cable lugs regularly with a solution of one cup of baking soda and one gallon of water, using a wire brush. It's imperative to maintain the entire connection in a flooded battery, because corrosion at either end of the connection can cause high resistance and potential battery failure.
- Rinse with water and dry.
- Thinly coat all connections with anti-corrosion spray or silicone gel to resist corrosion.

## Torque

- Tighten all wiring connections per the manufacturer's specifications.
- Do not over-tighten—this could break the post.
- Do not under-tighten—this could cause post meltdown.
- Make sure there is good contact with the terminals.

## Equalizing (flooded batteries only)

- Connect battery to charger, set to equalize mode, and start the charge cycle.
- Take voltage readings every hour.
- Equalization is complete when voltage no longer rises.
- If charger doesn't have an equalization setting, call the battery manufacturer's technical support staff to determine the setting.

## Storing

There are very important steps that should be followed when storing batteries for an extended period of time:

- Completely charge batteries before storing and monitor every six weeks while in storage.
- Batteries gradually self-discharge during storage. AGM batteries self-discharge at a much slower rate than flooded batteries. Be sure to monitor voltage every four to

- six weeks. Stored batteries should be given a boost charge when they are at 70 percent state-of-charge or less.
- Store batteries in a cool, dry location and avoid areas where freezing temperatures are expected.
- Keep batteries fully charged to prevent freezing.
- When batteries are taken out of storage, recharge them before use.
- Avoid direct exposure to heat sources such as radiators and heaters.

You can also check out Trojan Battery's latest "Trojan Tips" educational video tutorial for additional information on proper battery maintenance at <http://www.trojanbattery.com/ProductLiterature/GeneralProducts.aspx?tab=1#TabbedPanels1#top>.

*Vicki Hall is director of quality and technical services for Trojan Battery Company, a leading manufacturer of deep-cycle batteries. She has been with the company since 2006 and is responsible for Trojan's overall product quality programs, initiatives, and strategies. She oversees Trojan's application engineering support and manages its global technical support team, which addresses customer technical questions via Trojan's toll-free technical support hotline and website. She can be reached at [vhall@trojanbattery.com](mailto:vhall@trojanbattery.com).*

## Bug Off!



ThermaCELL's outdoor bug repellent lantern provides a 15 X 15-foot zone of protection that repels mosquitoes, black flies, no-see-ums and other flying insects. This new model offers twice as

much light as earlier models and comes with updates such as an easy-grip handle that makes it easy to carry and hang. The lantern weighs less than a pound, is registered with the EPA, and doesn't involve open flames or smelly oils. Each lantern comes with one butane cartridge and three repellent mats.

## *KPA Offers Lift, AC Training*

Training specialist KPA has two new online courses available for lifts and air conditioner repair. Automotive lifts are a huge safety liability, and there are few other scenarios where OSHA permits an employee to walk under a live load. Ensure your employees know how to properly secure and lift vehicles by having them complete the Automotive Lift Institute's new online Lifting-It-Right course through myKPAonline.

And with summer approaching, you're about to see an uptick in air conditioning service requests. Are your technicians certified to the newest EPA requirements? With

myKPAonline.com and motor vehicle air conditioner section 609 training, it's simple to make sure everyone who needs training gets it. You no longer need multiple providers for environmental and safety training -- KPA offers it all. RVLearningCenter.com provides information on upcoming and recent webinars.

## Get a **Handle** on RV Cleaning

Shurhold Industries' One Handle Does It All System uses an exclusive quick-release system that lets users easily snap different accessories to the same fixed-length or telescoping handle. The



One Handle Does It All System saves space-- one handle can snap to more than 20 brushes, mops and RV scrubbers

RV owners can use many of the same products to clean and maintain both the inside and outside of their rigs. Other attachments include an angled floor broom, squeegees, non-scratch scrubbers for attacking black streaks, and even a paint roller attachment.

## Recalls

Note: For more information on these and all federal recalls, contact the National Highway Traffic Safety Administration's Vehicle Safety Hotline at 1-888-327-4236 (TTY 1-800-424-9153), or go to [www.safercar.gov](http://www.safercar.gov).

### **Microwave Recalls for Newmar, Crossroads, Keystone**

Newmar Corporation, Crossroads RV and Keystone RV Co. are recalling certain units that are equipped with Frigidaire KG-series microwaves.

The microwaves in the affected vehicles may start on their own, and if there are contents inside, a fire could result.

Newmar's recall involves MY 2013-2014 Bay Star Sport, Bay Star, Canyon Star, Ventana LE, Ventana, Dutch Star, Mountain Aire, and Essex RVs manufactured from February 18, 2013, through November 15, 2013.

Newmar will notify owners and dealers. Owners may contact Newmar at 1-800-731-8300.

Crossroads' recall involves certain MY 2014 Redwood trailers manufactured from March 12, 2013, through July 22, 2013, equipped with certain KG-series microwaves.

Keystone's recall involves certain MY 2013-2014 Montanas; 2014 Alpines, Big Skys and Fuzions; and 2014 Dutchmen Infinity and Voltage fifth wheel trailers equipped with certain KG-series microwaves. Keystone will notify owners, and dealers will repair the membrane/keypad component.

Owners may contact Keystone Customer Service at 1-866-425-4369.

### **Forest River Slide Room Actuator Bracket Recall**

Forest River Inc. is recalling certain MY 2014 Crusader fifth wheel trailers manufactured from September 26, 2013, through March 3, 2014. In the affected trailers, the slide room actuator bracket may come into contact with the tire under certain road conditions, possibly resulting in sudden tire failure.

Forest River will notify owners, and dealers will install a replacement bracket that will adequately clear the tire. Owners may contact Forest River at 1-574-862-3001.

### **KZ RV Recalls Undersized Axles**

KZ RV is recalling certain 2014 Sportsmen towable travel trailers manufactured from November 4, 2013 through February 24, 2014. The affected trailers were built with axles not designed to accommodate the weight-carrying capacity of the trailer. Overloaded axles may result in failure of the suspension or the axle, and/or tire blowouts, resulting in an increased risk of a crash or injury.

KZ RV will notify owners, and dealers will replace the axles with ones that have the

correct load capacity. Owners may contact KZ RV at 1-800-768-4016.

### **Heartland GVWR Label Recall**

Heartland Recreational Trailers LLC is recalling certain MY 2014 Sundance 2880RLT travel trailers manufactured from November 20, 2013, through January 31, 2014 because of incorrect Federal Certification labels.

The labels state that the gross vehicle weight rating (GVWR) is 16,500 lbs. instead of the correct GVWR of 13,500 lbs. As a result, the trailer may be loaded beyond the specified weight rating, which could cause a tire or suspension failure, leading to poor vehicle handling and an increased risk of a crash.

Heartland will notify owners and dealers will replace the incorrect Federal Certification label with a corrected version. Owners may contact Heartland at 1-888-262-5992.

### **Forest River GVWR Label Recall**

Forest River Inc. is recalling certain MY 2014 Wildcat recreational vehicles manufactured October 25, 2013, through January 24, 2014.

The Federal Certification tag incorrectly states that the gross vehicle weight rating (GVWR) is 15,500 lbs. instead of the correct GVWR of 12,330 lbs.

As a result, the trailer could be loaded beyond the specified weight rating, which could cause a tire or suspension failure, leading to poor vehicle handling and an increased risk of a crash.

Forest River will notify owners, and dealers will install a new certification label with the correct information. Customers may contact Forest River Wildcat Customer Service and Warranty Department at 1-574-206-7600.



# CONTRIBUTORS

\*Active donors are those who have contributed to the RV Learning Center since 07/01/12.



Received From	Contributed 07/01/12 - 04/18/14*	Total Lifetime Pledge	Last Contribution	Received From	Contributed 07/01/12 - 04/18/14*	Total Lifetime Pledge	Last Contribution
<b>MAJOR GIFTS active donors* with cumulative donation or pledge of \$25,000 or more</b>							
Newmar Corporation	\$50,000	\$260,000	10/31/13	Pan Pacific RV Centers, Inc.	\$1,000	\$41,500	10/15/13
RVDA of Canada	\$25,000	\$175,000	12/18/13	McClain's RV Superstore	\$6,000	\$41,000	08/05/13
Bank of America Merrill Lynch Protective	\$5,000	\$173,000	04/29/13	RVAC	\$12,000	\$38,000	12/11/13
Tom Stinnett Derby City RV	\$50,199	\$161,162	11/22/13	Bill Thomas Camper Sales, Inc.	\$5,000	\$31,000	03/12/14
PleasureLand RV Center, Inc.	\$1,000	\$102,000	11/25/13	Pikes Peak Traveland	\$1,000	\$31,000	06/03/13
Horsey Family Memorial Fund	\$4,000	\$86,350	11/15/13	Paul Evert's RV Country, Inc.	\$1,000	\$30,000	04/01/13
Bill & Kristen Fenech	\$1,000	\$69,000	07/01/13	Tiffin Motor Homes, Inc.	\$5,000	\$28,500	03/24/14
Campers Inn of Kingston	\$7,500	\$57,500	07/09/13	Reines RV Center, Inc.	\$5,000	\$27,025	12/18/13
Ron & Lisa Fenech	\$23,578	\$56,000	10/08/13	Avalon RV Center, Inc.	\$1,000	\$26,500	04/12/13
Byerly RV Center	\$5,000	\$55,000	08/27/13	Holiday World of Houston	\$500	\$25,500	06/17/13
Fogdall Family Fund	\$5,000	\$52,000	01/10/14	Bill Plemmons RV World	\$5,000	\$25,000	06/24/13
	\$6,000	\$43,100	03/05/14				
<b>CHAMPIONS active donors* with a cumulative donation or pledge between \$2,500 and \$24,999</b>							
Diversified Insurance Mgmt. Inc.	\$6,600	\$21,000	02/21/14	American RV	\$1,000	\$6,925	10/04/12
Earl Stoltzfus	\$10,000	\$20,000	08/30/13	Circle K RV's, Inc.	\$250	\$6,250	06/24/13
Dixie RV Superstore	\$5,000	\$20,000	03/21/14	Hayes RV Center	\$800	\$5,900	12/24/13
Wilkins R.V., Inc.	\$1,500	\$19,600	07/22/13	Burlington RV Superstore	\$500	\$5,500	06/19/13
Greenway, Inc. (Route 66 Dealer)	\$5,250	\$18,550	06/11/13	Hayes RV Center	\$800	\$5,900	12/23/13
Rivers RV	\$250	\$17,600	05/31/13	Webster City RV, Inc.	\$1,000	\$5,100	04/22/13
Alpin Haus	\$500	\$17,500	06/21/13	Madison RV Supercenter	\$1,000	\$5,000	08/08/13
Butch Thomas	\$1,000	\$16,000	11/30/12	Minnesota RVDA	\$5,000	\$5,000	01/11/13
Hartville RV Center, Inc.	\$1,250	\$15,750	10/18/13	Camperland of Oklahoma, LLC	\$500	\$4,850	07/02/13
MBA Insurance, Inc.	\$1,000	\$15,100	05/17/13	Topper's Camping Center.	\$500	\$3,500	04/18/13
Mike and Barb Molino	\$775	\$11,586	01/24/14	Myers RV Center, Inc.	\$1,250	\$3,250	06/11/13
Affinity RV Service Sales & Rentals	\$2,000	\$11,000	07/01/13	A World of Training	\$3,000	\$3,000	11/20/13
AIRXCEL - RV Group	\$500	\$11,000	06/06/13	J. D. Sanders, Inc.	\$500	\$3,000	08/05/13
United States Warranty Corp.	\$1,000	\$10,250	04/12/13	United RV Center	\$1,000	\$3,000	09/20/12
Little Dealer, Little Prices	\$5,000	\$10,050	01/23/13	Best Value RV Sales & Service	\$1,000	\$2,750	04/08/13
Great Lakes RVA	\$10,000	\$10,000	02/27/13	RV Outlet Mall	\$750	\$2,550	06/05/13
Hemlock Hill RV Sales, Inc.	\$639	\$10,000	09/14/12	Alliance Coach, Inc.	\$1,000	\$2,500	04/11/14
Rich & Sons Camper Sales	\$4,000	\$10,000	11/14/13	Crestview RV Center	\$500	\$2,500	12/18/13
Folsom Lake RV Center	\$2,700	\$9,700	12/16/13	Phil Ingrassia	\$2,500	\$2,500	03/26/14
Motley RV Repair	\$1,000	\$9,075	09/13/13	RCD Sales Company, Ltd.	\$750	\$2,500	06/07/13
Curtis Trailers	\$1,000	\$8,000	06/03/13				
<b>LEADERS active donors* with a cumulative donation or pledge between \$1,000 and \$2,499</b>							
The Trail Center	\$500	\$2,350	11/06/13	Skyline RV & Home Sales, Inc.	\$1,250	\$1,500	06/14/13
Hilltop Trailer Sales, Inc.	\$541	\$2,122	06/11/13	Dinosaur Electronics	\$500	\$1,250	06/06/13
Noble RV, Inc.	\$755	\$1,655	03/21/14	Out of Doors Mart, Inc.	\$500	\$1,250	09/18/13
Lindsey Reines	\$1,500	\$1,500	12/20/13	Bill Mirrielees	\$250	\$1,000	05/09/13
<b>BENEFACTORS active donors* with a cumulative donation or pledge between \$500 and \$999</b>							
Schaap's RV Traveland	\$500	\$850	11/14/13	Ronnie Hepp	\$300	\$625	08/24/12
Steinbring Motorcoach	\$500	\$750	11/21/12	Holiday Hour, Inc.	\$200	\$500	03/24/14
Camp-Site RV	\$250	\$750	01/13/14	Beckley's Camping Center	\$250	\$500	06/06/13
<b>SUPPORTERS active donors* with a cumulative donation or pledge between \$100 and \$499</b>							
Bell Camper Sales	\$200	\$450	08/26/13	Happy Camping RV	\$200	\$200	11/07/13
Foley RV Center	\$250	\$250	09/01/12	Mike Thompson's RV Super Stores	\$100	\$100	08/12/13
Kroubetz Lakeside Campers	\$250	\$250	12/02/11	John Peak	\$100	\$100	10/03/13
Mayflower RV, Inc.	\$250	\$250	07/27/12	Amy Pennington	\$100	\$100	11/30/12
Karin Van Duyse	\$250	\$250	10/25/12	Setzer's World of Camping, Inc.	\$100	\$100	02/21/14
Tennessee RV Sales & Service	\$250	\$250	02/21/14				
<b>ENDOWMENTS</b>							
Kindlund Family Scholarship		\$270,000					

# Certification How-to

## It's time to take the first step toward certification!

*The RV technician certification process is just a click away. Visit [www.rvtechnician.com](http://www.rvtechnician.com) to learn more.*

### Step 1

Technician Certification Candidate: The candidate test is a basic orientation to the RV service technician career. The training and test is available at no cost and is located at: <http://www.rvst.org/Candidate/>.

### Step 2

Registered Technician: This test establishes that the technician is proficient in core knowledge areas such as propane, basic electrical, fire & life safety, weight knowledge, and other technical skills.

### Step 3

#### Select a Career Path

Traditional Certification: This test is designed to evaluate both the general and specific knowledge in 12 different areas--propane, electrical, plumbing, brakes, suspension, towing, appliances, generators, hydraulics, interior, exterior, slide out systems and other technical skills.

Specialty Certifications: There are five certified specialist areas that make up the right path on the RV Service Technician Career Ladder: body, chassis, electrical systems, appliances, and plumbing. Each test focuses on the subject related to the specialty.





# RV TECH CERT PREP COURSES



Every technician can have access to individual self-study training and certification preparation for all sections on the career ladder.

## Just getting started?

Take the **FREE** online **Candidate test** by clicking on "How to Become Certified" at [www.rvtechnician.com](http://www.rvtechnician.com)

### REGISTERED TECHNICIAN

#### Course A. \$89

The **Registered Technician Course** prepares RV Service Technician Candidates to take the **Registered RV Service Technician** test. \*

## Already a Registered Technician?

### Choose Your Path:

#### CERTIFIED TECHNICIAN PREP COURSE

##### Course B. \$249

Comprehensive Certification Preparation Course that represents the left side of the RV Service Technician Career Ladder. This course is preparation for testing as a **Certified Technician.** \*

#### CERTIFIED SPECIALIST PREP COURSE

##### Course C. \$69/specialty

Prepares a technician to be tested and certified\* in five areas of specialty:

- C1. Appliances \$69
- C2. Body \$69 *Coming Soon!*
- C3. Chassis \$69
- C4. Electrical Systems \$69
- C5. Plumbing \$69

**ALL COURSES USE AN INTERACTIVE MULTIMEDIA ONLINE FORMAT.** Combines text, graphics, and video with mentor support. All content is online. No extra materials needed. Courses align with core knowledge areas of certification tests.\*

*\*Each fee offers access to the specific online preparation course and DOES NOT cover certification testing.*

**YES, I WANT TO REGISTER MY TECHNICIANS!** (Copy this form to register more than four.)

Company \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Phone \_\_\_\_\_ FAX \_\_\_\_\_

*Developed by RVIA and available through the Mike Molino RV Learning Center.*



**Each technician MUST have a *distinct* email address that only they can access.**

Indicate which **COURSE** a technician is choosing with A, B, or C. **If choosing C, indicate chosen specialties by number.**

Name \_\_\_\_\_ Email \_\_\_\_\_ Course \_\_\_\_\_ \$ \_\_\_\_\_ \*

Name \_\_\_\_\_ Email \_\_\_\_\_ Course \_\_\_\_\_ \$ \_\_\_\_\_ \*

Name \_\_\_\_\_ Email \_\_\_\_\_ Course \_\_\_\_\_ \$ \_\_\_\_\_ \*

Name \_\_\_\_\_ Email \_\_\_\_\_ Course \_\_\_\_\_ \$ \_\_\_\_\_ \*

Send progress reports and other notifications to the following supervisor: **TOTAL \$ \_\_\_\_\_ \***

Name \_\_\_\_\_ Title \_\_\_\_\_ Email \_\_\_\_\_

**Method of Payment** All registrations must be pre-paid in U.S. funds. Fees subject to change without notice.

**Check enclosed:** Payable to the Mike Molino RV Learning Center **Credit Card**  VISA  MC  AMEX  DISCOVER

Cardholder Name \_\_\_\_\_ Billing Address \_\_\_\_\_

Acct # \_\_\_\_\_ Exp \_\_\_\_\_ Security Code \_\_\_\_\_

Cardholder Signature \_\_\_\_\_

Fax to (703) 359-0152 or mail to the Mike Molino RV Learning Center, 3930 University Dr., Fairfax, VA 22030. Call (703) 591-7130 to enroll by phone.



# RV Service Textbooks

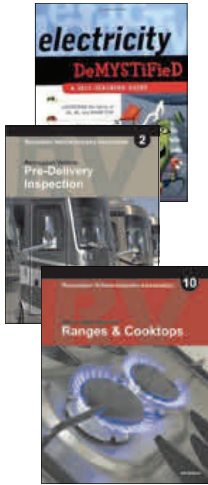
## SUMMARIES & ORDER FORM

Published by RVIA, Available through The RV Learning Center

These RV textbooks help technicians increase their knowledge and understanding of the various RV components and operating systems found in today's RVs, and also prepares them for the new testing requirements of the RV Service Technician Career Ladder. The complete set consists of 14 volumes --written by RV service experts, and the Electricity Demystified text.

**SAVE 30% WHEN YOU ORDER A COMPLETE HARD COPY OR CD-ROM SET!**

See next page for details!



Textbook Title	Price	# books	Total \$
<b>Introduction to RV Service</b> – Provides an introduction to the RV industry, the various types of RVs and their structural characteristics and systems, the basic tools utilized by RV technicians, and safety in the RV workplace. Summaries of industry codes and standards and RV technician job classifications are also included as well as basic information on using RV service manuals. Developing and demonstrating solid customer relations and record keeping skills are also addressed.	\$19.95		
<b>Electricity Demystified</b> – Written in a step-by-step format, this practical guide begins by covering direct current (DC), voltage, resistance, circuits, cells, and batteries. The book goes on to discuss alternating current (AC), power supplies, wire, and cable. Magnetism and electromagnetic effects are also addressed. Detailed examples and concise explanations make it easy to understand the material.	\$14.95		
<b>RV Electrical Systems</b> – Provides instruction on performing AC and DC voltage systems inspections and tests; servicing AC and DC power sources; servicing wiring/distribution systems; and maintaining, repairing and inspecting AC and DC devices.	\$49.95		
<b>RV Propane Systems</b> – Provides instruction on inspecting and maintaining propane containers and fittings; inspecting and maintaining the piping system; performing propane system tests; purging and filling containers; transferring propane from container to container; and burning off propane in a container.	\$49.95		
<b>RV Generators</b> – Covers the installation, maintenance and repair of RV generators, the generator section and control system. This includes inspecting, maintaining and repairing generator components and verifying battery voltage, fuel source and pressures, engine operation, output voltage and frequency, and governor operation.	\$39.95		
<b>RV Ranges &amp; Cooktops</b> – Provides instruction on the installation, repair and replacement of ranges and ovens. This includes verifying gas pressure; verifying grate clips installation; checking lines and fittings; repairing and replacing components; verifying range burners are not affected by operation of force air furnace or other appliances; and performing function test.	\$39.95		
<b>RV Water Heaters</b> – Covers the installation, repair and replacement of RV water heaters — Pilot, DSI (direct spark ignition) and Electric. Topics addressed include inspecting ignition systems, verifying gas pressure; troubleshooting the sequence of operation, repair and replacement of various components; draining and flushing the water heater and inspecting fittings for calcium deposits; checking fittings on the tank; inspecting and replacing the water tank; and checking lines and valves for motor aide.	\$39.95		
<b>RV Plumbing Systems</b> – Provides instruction on performing fresh water systems tests; inspecting and repairing fresh water storage tanks, distribution systems, and fixtures and devices; performing waste water systems tests; and inspecting, repairing and replacing waste holding tanks and drainage piping systems.	\$39.95		
<b>RV Heating Appliances</b> – Covers installation, repair and replacement of RV heating systems, including gravity, pilot and DSI (direct spark ignition furnaces). Topics examined include verifying pressure and electrical voltage; inspecting and cleaning burner, pilot, exhaust tube and air intake; troubleshooting the sequence of operation; repairing and replacing various furnace components; inspecting and correcting ducting and return air.	\$39.95		



# RV Service Textbooks

<b>RV Refrigerators</b> – Provides instruction on the installation, repair and replacement of absorption refrigerators (manual and automatic selection). This includes verifying proper venting, AC and DC power sources, propane gas pressure, and leveling; diagnosing and replacing electric and gas components; diagnosing and replacing the cooling unit; diagnosing, repairing and replacing the internal ice maker components; and performing function tests.	\$39.95		
<b>RV Air Conditioning</b> – Covers the installation, repair and replacement of air conditioning and heat pump units, including verifying air flow, assessing the integrity of the electrical system, and evaluating the integrity of refrigerant systems.	\$39.95		
<b>RV Pre-Delivery Inspection</b> – Introduces and explains the many important steps in inspecting the RV before delivering to the customer, including checking propane systems, pre-testing all appliances and accessories, testing and inspecting the AC and DC electrical system; checking safety items, lighting, window roof molding seals, and wiper blades; checking and lubing doors; visually inspecting chassis; checking lug nuts and tire pressure; testing water supply and drainage systems; and conducting a test drive.	\$39.95		
<b>RV Preventive Maintenance</b> – Examines what services to perform for preventative maintenance, including checking propane systems; servicing and adjusting appliances; testing G.F.C.s; winterizing and de-winterizing coach; checking safety items; checking and lubricating doors; checking exterior lights; checking window roof molding seals; changing oil and filter on power plants; checking wiper blades; visually inspecting fluid levels; servicing batteries; inspecting belts and hoses; changing chassis oil and filter and lubricating chassis; changing transmission oil, filter and gasket; visually inspecting chassis; checking lug nuts and tire pressure; flushing and refilling cooling system; and performing a test drive.	\$39.95		
<b>RV Brakes, Suspension &amp; Towing</b> – Covers the basics of brakes and brake controllers used in RV towable systems. References RV suspension systems as well as wheels and tires. Fully describes types of RV towing systems, hitches, wiring, and accessories. Includes information on troubleshooting, repair and replacement of stabilizer jacks and mechanical landing gear jacks. Textbook also covers vehicle weights, weight safety, weight labels, legal regulations, codes and standards.	\$39.95		
<b>RV Hydraulics</b> – Covers the basic principles and laws of hydraulics, hydraulic terminology, special tools and equipment and basic hydraulic circuits. The book introduces the technician to hydraulic system components and their functions. Includes information on performing hydraulic system maintenance, safety, and troubleshooting procedures.	\$39.95		
<b>Save almost \$200 – Complete Book Set</b>	<b>\$382.00</b>		
<b>TOTAL COST OF TEXTBOOKS IF PURCHASED INDIVIDUALLY</b>	<b>\$574.25</b>		
<b>ALSO AVAILABLE ON CD-ROM</b> (NOTE: Electricity Demystified is NOT on the CD-ROM, but will be included in hard copy format with your order.)	<b>\$382.00</b>		

Price includes shipping and handling. **Total Amount Enclosed: \$**

Name: \_\_\_\_\_ Company: \_\_\_\_\_

Shipping Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Method of Payment (Please Check One):

- Check (Made Payable to the Mike Molino RV Learning Center)
- Send an Invoice (RVDA Members Only)
- Credit Card:  Visa  MasterCard  Amex  Discover

**Mail this form to Mike Molino RV Learning Center  
or fax to (703) 359-0152.**

For more information call (703) 591-7130 or visit  
our website at [www.rvlearningcenter.com](http://www.rvlearningcenter.com)

Card No.: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

Name on Card \_\_\_\_\_

Signature: \_\_\_\_\_

Billing Address (if different from above): \_\_\_\_\_





# Need Money for College?

**College Scholarships Available from the RV Learning Center**

More information and an application available at [www.rvlearningcenter.com](http://www.rvlearningcenter.com)

*The RV Learning Center is a tax exempt organization as described in section 501(c)(3) of the Internal Revenue Code. Contributions may be tax deductible as charitable donations. The scholarship program is made possible through the generosity of the Newt and Joanne Kindlund Family.*



## FACT SHEET AND APPLICATION: 2014-2015 ACADEMIC YEAR

### About This Scholarship

The RV Learning Center's Scholarship Program awards \$2,500 scholarships to deserving college undergraduate students majoring in business, finance, economics, accounting, or other RV industry-related subjects. A factor for awarding the scholarship may be an applicant's background of RV industry employment or a desire to work in the RV business after completing post-secondary education. The scholarship program is made possible through the generosity of the Newt and Joanne Kindlund Family.

### Eligibility Requirements

We will award a scholarship to an RV-related company employee or their dependent based on a combination of factors.

### Requirements\*

- Must be a rising sophomore, junior, or senior college undergraduate student.
- Must complete an essay on their goals and objectives for attending college.
- Must submit a completed Free Application for Federal Student Aid (FAFSA) form. The form is available at: [www.fafsa.ed.gov](http://www.fafsa.ed.gov).
- Must demonstrate the ability and willingness to fund a portion of their educational expenses on their own.
- Must be accepted into an accredited four-year college or university as a condition of receiving the scholarship.
- Must have a 2.8 or better cumulative grade point average, and a 1050 minimum SAT score (1575 minimum on the 2400 point scale). A minimum ACT Composite Score of 22 is also acceptable.

*\*All requirements must be met by the application deadline. Dealer principals and their dependents are not eligible.*

### Enclose with Application:

1. An official copy of your most recent college transcript.
2. A copy of your SAT/ACT scores.
3. An essay of not more than 500 words on "My Goals and Objectives in College."
4. A list of extracurricular activities, honors, etc.
5. A copy of your FAFSA form (available at your school or at [www.fafsa.ed.gov](http://www.fafsa.ed.gov)).
6. Digital photo for publicity (only used if candidate receives scholarship).

Submit application packet to:  
**Mike Molino RV Learning Center**  
**3930 University Drive**  
**Fairfax, VA 22030**  
**or fax to: (703) 359-0152,**  
**or by e-mail to [info@rvda.org](mailto:info@rvda.org)**

**Applicant's Name:** \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

**Sponsoring RV-related Company:** \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

**High School:** \_\_\_\_\_ Year Graduated: \_\_\_\_\_ SAT/ACT Score: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

**College Attending in 2014-2015:** \_\_\_\_\_

Address: \_\_\_\_\_ Major: \_\_\_\_\_

Have You Been Accepted?: \_\_\_\_\_ If No, When Do You Expect to Be? \_\_\_\_\_ College Credits Completed: \_\_\_\_\_

College GPA: \_\_\_\_\_ Estimated College Expenses (One Year): \$ \_\_\_\_\_ % to Be Covered by Self/Family: \_\_\_\_\_ %

**Are You Employed?** No  Yes  Employer: \_\_\_\_\_

How Long/When? \_\_\_\_\_

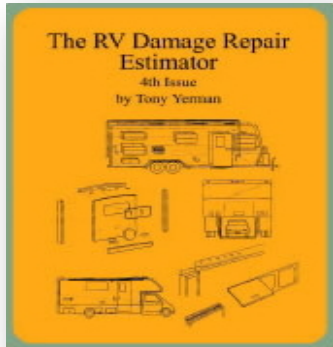
*By signing below, I indicate that I have read the fact sheet that accompanies this application and that I meet the eligibility criteria specified for scholarship applicants.*

**Signature:** \_\_\_\_\_

**Deadline: June 2, 2014. To be considered, all application materials must be received by the deadline. For more information and to download additional applications, visit [www.rvlearningcenter.org](http://www.rvlearningcenter.org) or e-mail [info@rvda.org](mailto:info@rvda.org).**



# The RV Damage Repair Estimator



Written and published by RV repair expert Tony Yerman, **The RV Damage Repair Estimator** offers dealers a centralized source for average time and cost of making RV repairs and purchasing RV parts. A growing source of service department revenue comes from insurance company reimbursements for collision, storm, and vandalism repair. Now in its fourth edition, **The RV Damage Repair Estimator** helps RV service departments prepare consistent, data-supported claim estimates for insurance companies and RV owners.

**The RV Damage Repair Estimator** is available in print as a 300+ page manual.

Service departments around the country rely on **The RV Damage Repair Estimator**. Order yours today by completing and submitting this order form, visiting [www.rvlearningcenter.com](http://www.rvlearningcenter.com), or calling the dealer services hotline. The RVDA member price for the printed manual is \$199, or \$239.95 for non-members. Note: Prices are subject to change without notice.

The RV Damage Repair Estimator				
<b>Part 1: Contact Name:</b>				
Company:				
Company Address:				
City/State/Zip:				
Phone:			Email:	
<b>Part 2: PAYMENT METHOD</b>				
<b>The RV Damage Repair Estimator, 4<sup>th</sup> Issue</b> <input type="radio"/> Send Invoice (RVDA members only)	\$199	Non-Member	Qty.	Total
	<input type="radio"/> Check Enclosed	\$239.95		\$
Name on Credit Card:	<input type="radio"/> Check Enclosed		<input type="radio"/> Visa <input type="radio"/> MasterCard <input type="radio"/> Discover <input type="radio"/> AMEX	
Card Number:	Security Code:		Expires:	
Card Billing Address:				
City/State/Zip:				
<b>Card Holder Signature:</b>				
Submit to the Mike Molino RV Learning Center				

# Online Training with FRVTA's

## DISTANCE LEARNING NETWORK

### FRVTA – The Mike Molino RV Learning Center Partnership

\$995 per year for each dealership location. Over 50 sessions available, 24 hours a day, seven days a week, with full access to training through July 31, 2014.

#### The DLN offers your dealership:

- Onsite training
- Group training
- No travel time or expenses
- Self-determined pace
- One fixed price of \$995 for the subscription term

#### The DLN offers online training for:

- **RV Technicians** – The certification prep course helps technicians get ready for the certification exam. Your subscription includes unlimited access to more than 50 training sessions, reviews, and test preparation sections. Also included are manufacturer- and supplier-specific advanced repair and troubleshooting classes designed to upgrade technicians' skills. Completion of these classes qualifies for recertification hours. Classes are available 24/7 throughout the program year, providing maximum flexibility.
- **Service Writers/Advisors** – This three-hour program is valuable for both new staff and experienced personnel preparing for the RV Learning Center's Service Writer/Advisor certification.
- **Greeters/Receptionists** – This 50-minute session is suitable for all employees who need customer service skills. It includes a final exam and certificate of completion.
- **Dealers/GMs** – This program features important topics for management, including lemon laws, LP gas licensing issues, and the federal Red Flags Rule.



### DEALERSHIP REGISTRATION

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Mentor Name: \_\_\_\_\_ Phone: \_\_\_\_\_

E-mail (at dealership): \_\_\_\_\_ Fax: \_\_\_\_\_

**\*\*High speed Internet access required. RVIA service textbooks not included\*\***

\_\_\_\_\_ location(s) at **\$995 each** = payment due: \$\_\_\_\_\_ (select payment method below)

**PAYMENT METHOD** Note: prices are subject to change without notice. Complete lower section and mail or fax to:

**Florida RV Trade Association, 10510 Gibsonton Drive, Riverview, FL 33578, (813) 741-0488, Fax: (813) 741-0688**

PAY BY CHECK OR MONEY ORDER     PAY BY VISA OR MASTERCARD

Name on Credit Card: \_\_\_\_\_

Card Number: \_\_\_\_\_ Security Code: \_\_\_\_\_ Expires: \_\_\_\_\_

Card Billing Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_

Card Holder Signature: \_\_\_\_\_

# The BEST for You and Your Customers



There are good reasons why our XtraRide® service contract program has been exclusively endorsed by the RVDA for more than 20 years.

We give your dealership the **BEST** opportunity to:

- Offer one of the most comprehensive service contracts available
- Grow profitability
- Drive customer satisfaction



Find out what Protective Asset Protection can do for your dealership and your customers – so they can protect tomorrow and embrace today. **Call us at 888 258 1901** or visit [protectiveassetprotection.com](http://protectiveassetprotection.com) to learn more.

**Protect Tomorrow. Embrace Today.™**

XtraRide Service Contracts | Post-Sale Programs  
Dealer Experience Refund & Reinsurance Programs  
F&I Training | On-Line Rating, Reporting & Contracts



\*An RVDA endorsed product or service is one that has been extensively evaluated by the RVDA to assure quality, dependability and overall value. RVDA and the RVDA Education Foundation receive compensation from a Protective company for business generated by RV dealers.

The XtraRide service contract program is backed by Lyndon Property Insurance Company, a Protective company, in all states except New York. In New York this product is backed by Old Republic Insurance Company.