

**FOX VALLEY ELECTRIC AUTO ASSOCIATION NEWSLETTER FOR
SEPTEMBER 2002**

NEXT MEETING: Friday, at 7:30 PM in Ed Meyer's hangar in Bolingbrook

MEETING AGENDA: 1. ANNUAL PICNIC 2. Discussion of the October Seminar

MEMBERSHIP INFORMATION

Any person interested in electric cars is welcome to join the FVEAA. The cost for a full year's dues is \$ 20 which will entitle members to receive our monthly Newsletter that contains useful information about electric car conversions, construction, news, policies, and events. Membership is not required to attend our meetings. Dues for **NEW members joining in September will be \$4.**

To obtain info about the FVEAA you may contact either Past-President Ken Woods or President Shafer

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PRESEZ

The meeting night for September has been changed to Friday, the 13th at 7:30 PM. Member Ed Meyer, who hosts these annual events is unable to have the meeting on our usual 3d Friday of the month. It will be a chance to get together and chat about our hobby. There will be the usual \$ 5/person charge for the food & soda.

Four FVEAA vehicles were on exhibit at the Wednesday evening, August 21st *Cool Cars Under the Stars* in Elmhurst. First to arrive was Fred Kitch's Ranger, substituting for the Triton Ranger. George Krajnovich brought his Horizon, Steve Grushas had his Escort, complete with a temporary "pot box" to substitute for one that failed, and I was there with my Mazda.

There were more person around our exhibit than were examining other vehicles. I believe our sign helped to draw attention. I estimate there were 500-800 persons at the event. We passed out a lot of literature. Thanks to Woodie Bessler for suggesting we attend.

Ben Schmid's Escort conversion has a new home. Member Rob Glowacki bought the vehicle. Rob's expertise with electrical engineering will come in handy to solve the battery charger problem. He reports the conversion had weird wiring that contributed to the difficulty Ben was having with the K&W charger tripping the ground fault detector. I hope that Rob will enlighten us at a future meeting.

I received a positive response from ComEd to my request that they become the sponsor for an EV Seminar. It will require postponing the event until next spring to coordinate with the release schedule for their publication, **SOURCE**. This is enclosed as a bill insert for each Edison customer. It is expected to be an effective means of advertising the FVEAA and our seminar.

In September we will be working on the EV seminar to be presented at the annual meeting of Community College and High Instructors in Auto Technology. It will be held October 11-12 in Joliet. The event is to be hosted by Joliet Junior College. Ray Oviyach has been chosen to put the program together. He is also arranging for us to have a booth at the gathering, which will be held at the Empress Casino in Joliet.

Bill Shafer

MINUTES OF THE AUGUST 16th MEETING

The meeting at Triton was called to order by President Shafer at 7:35 PM. Sixteen members attended.

The minutes were approved as published. Treasurer Corel was absent – so no report.

The “Cool Cars under the Stars” in Elmhurst on Wednesday, August 21st was discussed. The event will last from 6-9 PM. Featured cars for Wednesday will be parked in the Bank Parking lot, 105 South York Road, east of the Bank and south of the Metra railroad. There will be four FVEAA electric vehicles on display; Geroge Krajanovich’s Horizon, Steve Grushas’ Escort, Bill Shafer’s Mazda and the Triton Ranger. Ray Oviyach stated he had an appointment for a cataract operation that day and would be unable to tow the pickup from Triton to Elmhurst. Ted Lowe has his Chevy S-10 pickup out of service for revisions. Fred Kitch volunteered to bring his Factory-converted Ranger as a substitute.

President Shafer asked anyone who could help pass out literature to be there.

Ray Oviyach discussed the FVEAA participation in the annual meeting of the State Community and High School Auto Technology Shop instructors. Joliet Community College will host the gathering on October 10-11 At the Empress Casino in Joliet. It was moved and seconded that the FVEAA participate in the event by presenting a Seminar on Electric car conversion and to have an information booth at the event. An expenditure of up to \$100 was authorized and Ray Oviyach was selected to put together the event. The motion was unanimously adopted. The matter will be discussed at our September meeting.

John Emde announced he would be moving his shop from the present location in Lyons to Lemont. This will change his present activities.

Fred Kitch said that Ford Motor Company is terminating the For *Ranger Electric* program. The are buying back his pickup. Fred is going back to working on his Bradley that he acquired five years ago. Fred isn’t going to be without an electric car.

The meeting was recessed to the Auto Shop for coffee, Dunkin Doughnuts and individual conversations. The meeting was adjourned at 9:30 PM.

Submitted by Secretary
Tim Moore

Fifteen years ago the FVEAA Newsletter had a feature called "Ask the Fox." Members having a problem with their EVs would pose a question and a technically qualified member replied. The following e-mail from Member Rob Glowacki about replacing three defective batteries in his newly acquired Escort provides an opportunity to revive this feature.

ASK THE FOX

August 30, 2002

I got the power brake vacuum pump running last night. Wow! is it great to have an easy way to stop the car!

I tested the batteries with a hair dryer load for a few hours the other day, and found 3 that are not up to snuff.

Here's the procedure: I connected a Sunbeam 1600W hair dryer across the batteries and let it run for about 30 minutes. It drew about 10.5 amps from fully charged batteries. After that 30 minutes, I got the second dryer (\$8.96 from Wal Mart) connected, and increased the current to 20.5 A. I allowed these to run for 2.5 hours for a total of about 55 AH from the batteries. Flooded 6V batteries (about 220 AH) should be able to run such a load for over 8 hours. I was measuring the voltage every 15 minutes and watching it drop.

At the 2.5 hour time, I stopped, because one battery was at 4.2V (completely discharged - deep cycle) a second one was at 4.6V (Also deep cycled), a third one was at 5.5 V (pretty well discharged) while the rest were at 5.75 - 5.9V each. After disconnecting the load, the batteries all came back up to 6V within a half-hour.

I am planning to replace these three batteries with new ones. Is there a serious need for me to match the new ones to be the same brand as the original, or would it seem to be OK to just stop at Sam's club and get Whatever batteries they have? (I think they have Eagle now.)

I plan on using the replacement batteries for ham radio use after next year, when I plan to replace the whole set.

What break - in procedure should I use for the new batteries? I have a charger that can switch 6 or 12 V, so I can charge them 1 or 2 at a time, and I have a 10 A light bulb load to discharge them up to 12V at a time. I can also use some 1 or 2 ohm resistors at 200 - 250 W, so I could run all three batteries in series to discharge.

I figure:

Charge first till full - 7.2V for 4-5 hours

Then discharge for 1 hour at 10A

Recharge and then charge till full.

Then discharge 2 hours at 10A.

Then charge and discharge them for 3 hours.

Repeat the preceding.

Then go to a 20-25 A discharge Of course 25A would discharge the batteries very badly in 7 hours, so maybe only go 5 hours.)

Then recharge, and put the batteries in the car.

Run at higher current for several cycles - 35 - 45 MPH for 20, 30, 40 minutes with full charging between cycles.

Then the car is ready to go.

What do you think?

Rob Glowacki

THE FOX REPLIES

There is nothing wrong with your proposed procedure to deal with your three defective batteries. Your use of a 1600-watt hair dryer is certainly innovative and cost-effective.

The Battery Service Manual published by Battery Council International lists several tests that can be made on a battery. First - a visual inspection of the battery noting electrolyte levels and the battery case condition. If the battery shows signs of case swelling it is probably a goner.

You can make an open-circuit test. The average state of charge can be measured after the battery is left standing in an open-circuit condition for several hours. The open-circuit voltage of a fully charged 6-volt deep discharge battery should be 2.23 volts/cell, 7- volts for a 6-volt unit. The disadvantage of this test is that it may not reveal a single defective cell.

A load test is the most definitive choice. First remove surface charge by connecting a 1kw, 0.05-ohm resistor (The hair dryer) to a 6-volt battery. This will cause a single 6-volt short-circuited battery to deliver 150 amperes for 15 seconds. Then apply a 0.1-ohm, 300-watt resistor that will cause the battery to deliver 75 amps, the standard rating for a 6-volt deep-discharge GC-2 battery. Note the number of minutes the battery is able to deliver this current. Any unusual rate of any decline in current identifies a suspect battery.

I have used in-car load testing. For this I have a voltmeter lead with alligator terminals that can be clamped to a single battery, in my case 8-volt units. I then take the car on the road and note the voltage of that battery during a 400-amp acceleration run. I then move the clamps to each battery in succession. Any significant voltage departure from the average identifies a suspect unit.

Your second question was about how to treat each of the three new batteries you require. There are individual cell difference caused by the battery manufacturing process. When cells are series-connected to get a 96 or 120 volt power system these variations can cause problems for series connected recharging that put the same current thru each cell. Cells do not all charge equally. The solution is a periodic *overcharge*. The charger voltage is set above the 2.33 volt gassing level of each cell. All cells are recharged when all cells are gassing.

The gas is a mixture of hydrogen and oxygen liberated by the electrochemical process. No harm. A cell reaching the gassing point early in the recharge requires additional water. The gassing will cause a sulfuric acid mist to be deposited on the battery surface. This is conductive. It can cause electrical system difficulties. The accumulation can be neutralized with a baking soda solution brushed over the battery surface with a used toothbrush.

Your proposed conditioning protocol fine, but elaborate. Most of the time new batteries are just installed and used. They eventually find their own level. It usually takes about five discharge-charge cycles before they settle down. It can be high as 100 cycles.

Your third question is purchase of deep-discharge batteries from Sam's Club. Although they offer a significant price break there is a factor you must consider. New batteries should receive a maintenance charge during storage. Batteries not maintenance charged will self-discharge in as little as 30 days. They become sulfated and useless. Be sure to ask about their return policy.

Bill Shafer
August 31, 2002

FROM OTHER EV NEWSLETTERS AND ARTICLES AFFECTING ELECTRIC VEHICLES

The Jul/Aug issue of Current Events, the publication of the National Association, contained an account of the recent EAA Chapters Conference in Washington. Dave Goldstein, President of the Washington Chapter was the host. Charlie Garlow noted “ The EV movement has accomplished a number of things, the most important of what was to keep alive the hope that EVs will someday be the most frequent way to transport people.” Scott Cornell observed “We are now at an environmental crossroads – beginning to see just how we are affecting our environment.”

Ron Freund had an article, “Tuning your EV for maximum range”. He recommends checking battery terminals for tightness, be sure your interconnects are at least 2/0 cable, check your wheel bearings and lubricant. Make sure you don’t have a dragging brake, Be sure your differential has the lightest-possible lubricant (In cold weather the differential can become a real drag), check your battery tops for sulfuric-acid mist accumulation, check your wheel alignment, and make sure you have a proper-functioning charger.

John Wayland had an article listing the advantages of a plug-in hybrid vehicle.

Mike Brown had Step 11 in his EV conversion series that discusses component location and installation.

Lee Hart had an article about battery maintenance. He notes that batteries seem to work best when they are not discharged below the 50% level. Don’t “Work them till they drop”. Recharge as soon as possible after use. Don’t overfeed the batteries. Also, don’t underfeed them. Be sure to provide a maintenance charge when your batteries are hibernating. Be sure to use distilled water when fluid addition is needed. Keep batteries at reasonable temperatures. Recognize there are different “breeds” of batteries, similar to horses. Slow, plodding workhorses are long-lived. Racehorse batteries are fast, powerful, and short-lived. He concludes that batteries are similar to people. Even with identical batteries initially, some will die early and some last for a long time.

DEVC, the Denver Group, August newsletter was loaded about articles concerning fuel-cell vehicles and hybrids. They also note that auto weight reduction will be an important element in future vehicles. *GE Plastics* has a product they call Noryl that can resist the high temperatures in the baking process and do not require painting. European manufacturers are now using about 7,000 tons of thermoplastics, chiefly for front fender that pop off in a collision. These vehicles get an insurance break.

EEVC, the Eastern Group, in their August newsletter thinks a plug-in Toyota Prius hybrid can become the ultimate electric vehicle. The issue also has a comment about the soon-to-expire federal tax subsidy for hybrid cars. Their July meeting was highlighted by the presence of John Murphy’s EV Sport vehicle. This is a 3-wheeler kit car based on the British Lomax. John fitted it with a 45 horsepower Solectria electric motor that occupies the hood area. The performance is fantastic with 45 HP in a 1800-pound car, great acceleration, 70- mph top speed, and a 140-mile range.

Mitsubishi has developed a new motor intended for hybrid applications. It weighs 47 kilograms, about half the size and weight of other units, and has a peak output of 100 kW.

The March 25th issue of Design News, on page 52, has an article about the Segway HT. They point out the unique control system probably will find many other applications. The HT has *Dynamic Stabilization* in which the wheel speed is rapidly changed to maintain the set-point vertical orientation. Tip forward and the wheels speed up, tip backward and they slow down.

On the back of this page is a map showing the location of our September picnic