

FVEAA NEWSLETTER FOR FEBRUARY 2004

An Independent Not-For-Profit Corporation associated with the National Electric Auto Association

NEXT MEETING: Friday, February 20 at 7:30 PM in the Triton INDUSTRIAL CAREERS BUILDING, (East Campus), and Room 108

DISCUSSION TOPICS: 1. Change in mailing policy 2. New project? 3. A 2004 Seminar? 4. Open Topics

MEMBERSHIP INFORMATION

Any person interested in electric cars is welcome to join the Fox Valley Electric Auto Association. 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 February will be \$17.

To obtain information about the FVEAA you may:

Visit the FVEAA Website at www.fveaa.org

Or contact FVEAA Vice President Steve Grushas

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PRESEZ

I'll start this month's PRESSEZ with the explanation of why I have been incommunicado for the past month and absent at the January meeting. On Jan 7th I fell down the 13 steps leading to the basement and fractured my clavicle. They put my arm in a sling in the emergency room and I have since been recovering. My doctor said if I were a teenager recovery should take about three weeks but at my age (82) it will take about twice as long. I'm in rehab now and making progress.

Thanks Steve Grushas for running the January meeting, to Rob Glowacki for taking the minutes and those who made the meeting interesting.

The January Newsletter was only partially finished and I asked my son Eric to e-mail the incomplete document. This issue will again resume the regular pattern, with one exception. Members who elected to receive only the printed copy will now receive both it and the e-mail version where an e-mail address has been provided. This will make it simpler for me in setting up the 2004 paid member database. A new database will be set up for former members who have been dropped. According to Dale Corel there were 45 paid members as of January. This Newsletter will be sent to those who did not renew along with a membership application. The new roster will be mailed in March.

Two subjects are scheduled for February; the possibility of another club conversion and the other about a 2004 Seminar. We must make sure we have the financing in place before we launch a new project. The second, a 2004 Seminar, might provide that, if we could secure a firm commitment from Com Ed to sponsor the event and provide publicity.

BILL

MINUTES OF THE JANUARY 14, 2004 MEETING

The meeting was called to order by Vice President Steve Grushas at 8PM. President Shafer was absent due to an accidental fall. Sixteen members and two guests attended. Some members arrived early to assist Ted Lowe to get his passenger compartment heating working. They found the heater was drawing outside air so the air vent was blocked.

Treasurer Corel reported no change in the Savings account and \$3528.78 in the checking account. The total was \$6296.86. His report was accepted.

The minutes of the December meeting were approved as published.

Steve opened the meeting for questions:

Q1. How do you determine how far you can go before your batteries are depleted?

A. Drive the car until the system voltage drops to as low as you want. Under load this should be about 1.75 volts/cell x the number of cells. You can go further by going easy on the accelerator pedal until the voltage drops to about 1 volt per cell. Then you must recharge.

Q2. What about battery additives for de-sulfating battery plates?

A. We don't have experience with these. It might cost about \$25 for a quart of "snake oil". There is evidence that pulse charging is capable of dislodging surface accumulation of lead sulfate that forms on the plate surface as the battery is discharged.

John Emde announced he has started his Ranger pickup conversion project. It will have a 180-volt system with 25 Optima batteries under the bed. Shocks and springs will, of course, be replaced. He has a WARP 9" motor, serial #1 that will develop 200 hp with a 600-amp controller. John is going for *speed*. He is searching for a manual steering box from a Mazda pickup that can substitute for the Ranger power steering.

John brought a DC relay for heater switching. It has magnetic arc-blowout to prevent contact burning.

John and Kevin Zak discussed Bad Amplitude adventures. The flight recorder hasn't been working. They have spent four months with the manufacturer. It seems that there was excessive common mode noise in the circuit. Filters were installed to correct this problem and it now is operational. A Rudman PFC charger is now installed along with a regulator on each Optima battery. Indicators are mounted on the front of the charger cabinet. This is an essential addition.

A dynamometer test showed the batteries sagged to 5.5 volts from the nominal 12 volts with 1200 amps current. The batteries will be replaced with five Russian-made ultracapacitors from NASA. Each 9" diameter unit is 25" long, weighs 72 pounds and has a two-farad rating.

Net Gain was represented at the EV-20 Symposium. Kevin rode in hydrogen fuel cell vehicles and some using hydrogen as a fuel for an internal-combustion engine. The range seems to be about 45 miles on one kilogram of hydrogen fuel. These require an enormous amount of additional development.

It was reported that Evercell has nickel-zinc (NiZn) batteries. They might provide up to 100 miles per charge. Cost is about \$3000 for a pack (Voltage not stated).

Submitted by acting Secretary, Rob Glowacki.

FROM OTHER EV NEWSLETTERS

The Sept-Oct EV Circuit Newsletter lead article was about how to electrify a boat. Might be suitable for sneaking up on fish but otherwise useless. It also had an article by Dave Holden on “How to PROPERLY Promote Eve’s. The issue also has a report of NEDRA Event at the Mason-Dixon Dragway. *Bad Amplitude* didn’t make it to the race because of fuel problems with the tow vehicle. The winning dragster covered the ¼ mile in 10.8 seconds (110 mph). Three persons drove their EV 30-50 miles to the event.

The issue had Part 18 of Michael Brown’s conversion manual. It discussed final hookup and testing. It also had lots of pictures taken at the Woodburn (OR) meeting. The most unusual vehicle was a “milk float” that clocked 75 mph. Why the hurry to deliver milk?

The Nov-Dec EV Circuit issue featured the impressive record of T-Zero at the 2003 Bidenbaum Challenge. The issue had two pages of EV pictures of those attending the annual September Silicon Valley Rally. It was held at the Palo Alto High School. There were several impressive distances attained on the track; A Karman Giha conversion with 15 6-volt batteries was the winner at 67.7 miles, a Honda EV Plus 61.3, and a Toyota RAV-4 56.4. The last two were commercially produced EVs. The article included energy consumption calculations indicating energy use of 245 Watt-hours/mile.

Part 19 of Mike Brown’s conversion handbook was in the issue. It discussed suspension modifications.

Dr. John H. Wilson, a Canadian, authored an article entitled “Why (Not) Hydrogen”. His conclusion was, “Hydrogen has been greatly oversold by ‘evangelists’ in the US Department of Energy and by the environmental lobby.” His paper is available at www.tmgtech.com

The issue also has an article about the Renault plug-in hybrid, the “Kangoo”. It uses 320 kg of NiCad batteries and a 500-cc cylinder air-cooled engine-generator. A technical description is available at http://www.emobil-infor.de/kangoo/kangoo_hybrid.pdf.

Lack of sales has caused Daimler-Chrysler to layoff 100 employees at it Fargo, ND plant that makes the GEM vehicle. Eighty five remain.

GM is backing development of a wheel hub motor. The unit is rated at 25 kW. It will be tested on Chevy S-10.

Darryl has a 2-page article discussing “Why are there so few electric cars. His conclusion: cheap and readily available gasoline.

The EAA has received from the Postal Service chargers used during an experiment with electric vehicle use for mail delivery in California. The EAA will deploy these chargers in various locations to provide opportunity charging.

DEVC, the Denver Group, in their January issue had a brief report on the 20th Electric Vehicle Symposium held recently in Long Beach. It notes that NiCad battery cost is \$600/kW, Nickel Metal Hydride (NiMH) is \$1200/kW.

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FROM EV NEWSLETTERS-CONCLUDED

Bill Dube had a report entitled “Wabbit Weapon” about the replacement of 16 Optima Yellow-Top batteries with 24, 100 amp hr SAFT NiCads in his 1985 VW Cabriolet conversion. This entailed installation of a CVPC pipe cooling system. This involved a lot of plumbing and connections. He is working on a fan and pump control system that will shut off when a charge is complete. He expects the installation will extend his range to 70 miles/charge.

EEVC – The eastern group in their January newsletter had an article about their “Club member of the year”. Mike DeLiso has been a member since 1984. He has helped Cinnamonsen high school students with conversion projects and collects GE *Eletrak* tractors. He is an expert at repairing electric vehicles, including at one time getting *Citicars* running after failures.

The issue also has an article entitled, “GM Just Doesn’t Get It.” It notes. “Despite the popularity of the GM EV-1 and waiting lists for the vehicle, GM terminated the customer’s leases early and sent the vehicles to a crusher at GM’s Desert proving Ground in Mesa, AZ.” The article contained a photo of the 3-deep piles of the vehicles. (What a waste! EV hobbyists would have paid good money for these) Some have concluded this was a repeat of the infamous episode in the 1940’s when GM acquired a streetcar system in California and replaced it with GM buses.

GM limited the trial to just two locations, employed half-hearted marketing efforts, and stocked only a limited supply of parts. GM sued the California Air Resources Board and pressured them to abandon their mandate that 2% of California cars sold in the air-quality district had to be zero-emission vehicles by 2002.

GM isn’t supporting hybrid development. On January 6th CNN Senior writer Chris Isadore reported the remarks of Bob Lutz, GM vice-chairman who said, “Hybrids are an interesting curiosity and we will do some. But they do make sense with gas a \$1.50/gallon? No they do not”. (I filled my Honda up today and the pump price was \$1.799/gallon)

A FVEAA CLUB CONVERSION PROPOSED NEW PROJECT

In 1996 the FVEAA did its first club project, conversion of a 1996 Nissan. The car had a 120-volt system with twenty batteries, weighed 2746 pounds, and a good performance. An energy use record showed it used 0.35 kWh/ mile. The final conversion cost was \$6404.

Selling “Participation Shares” to members provided project financing. Each share was priced at \$100. The FVEAA redeemed all shares following the conversion and sale of the car to Ed Meyer. A few “investors” donated to the FVEAA the share they bought.

What was learned?

A place to do the work is essential.

Financing must be in place before starting the project estimated to cost about \$9,000.

Assurance of selling the vehicle after completion is necessary.

Someone has to be in charge of the design, work execution, and recruiting a volunteer workforce.

Members who have not yet renewed their membership will find an application blank included

THE PLUG-IN HYBRID

The January, 2004 issue of the Institute of Electrical and Electronic Engineers (IEEE) publication *Spectrum* included an extensive article by writer Glenn Zorpette about development of a plug-in hybrid which I thought deserved special attention in this FVEAA Newsletter.

The Smart Hybrid

If you commute about 20 miles each way to work and have plug-in privileges at the job site you can use an electric car that uses conventional lead-acid batteries. Add an engine-driven generator you can have a very efficient vehicle with a greater range. It is called a plug-in hybrid.

This is a concept being developed at a Daimler-Chrysler (DC) facility in Mannheim, Germany. Participating in the project in addition to DC are the Electric Power Research Institute (EPRI), Southern California Edison, California's South Coast Air Quality Agency, and the Metropolitan Energy Center of Kansas City.

Three vehicles will be produced for testing. Two will be light-duty utility trucks. The third vehicle is similar but will be configured as a public transit van for Kansas City. All vehicles will be based on the DC Sprinter. The Sprinter's 115 kW diesel engine will be replaced with a 14.4 kWh battery pack made up of Varta's NiMH batteries located over the vehicle rear axle. Over the front axle will be a 75 hp AC drive system furnished by AC Propulsion. A big advantage of an AC motor is its relatively flat torque curve over the entire speed range. Driver's of GM EV-1 particularly liked this feature. Up front will also be a 2.3-liter engine-generator in a series-hybrid configuration and the electrical control components.

In a series configuration the engine drive a generator that in turn drives the propulsion motor. The Toyota and Honda passenger cars now being sold have a parallel configuration in which both the engine and motor can simultaneously propel the car and/or recharge a small battery pack. This combination makes torque from both the engine and motor available simultaneously provides better acceleration than the series arrangement.

Test vehicles are expected to achieve 30 miles on a single charge and can be recharged from either a utility outlet or the engine combination while driving. The driver may set a selector switch to activate the engine. In service most of the driving is expected to be in the battery-only mode. This produces significant *environmental and cost advantages* since off-peak utility-supplied electricity can be used.

Comment

The concept is a consistent extension of the FVEAA principle that only an electric vehicle offers a **choice** of fuels. It adds limited use of gasoline to that choice and helps address the long-range problem of petroleum depletion. A typical compact sedan driven 40 miles per day uses 1500 liters of gasoline annually, a mid-sized sedan 2000, and a full-sized SUV 3200. A plug-in hybrid with a 20-mile electric-only range would reduce gasoline consumption of a compact by 400 liters, a mid-sized by 1000 and the SUV by 2000 liters. Typical reduction in gasoline can be as much as 75%. The hybrid also provides a sensible solution to the vexing problem of cabin heating.

The series connection of engine and motor to the drive train does have a disadvantage compared to a parallel configuration. With a series connection losses are higher and acceleration could be a problem. Tests will measure these losses. Both motor and engine torque is available for acceleration with the parallel connection.

Who will be the second FVEAA member to design and build a plug-in hybrid conversion? Who was first?