

**FVEAA NEWSLETTER - MARCH 1996**

**NEXT MEETING - Friday, March 21 at 7:30 PM will be in Room 161, Building K  
at the College of DuPage, Southwest corner of 22nd Street & Lambert Road**

**DISCUSSION TOPICS - 1. Project Update 2. Bylaw Revisions 3. EV Policy For FVEAA**

**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 the member to receive our monthly Newsletter that contains useful information about electric car components, construction, policies, and events. Dues for new members joining in March will be \$ 15.

**President - Ken Woods**  
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**Secretary - Dave Aarvold**  
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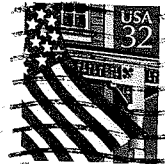
**Treasurer - Dale Corel**  
595 Gateshead North  
Elk Grove Village, IL 60007-3433  
(708) 223-5952

**Director - John Stockberger**  
2 S 643 Nelson Lake Road  
Batavia, IL 60510-9762

**Librarian - Ed Meyer**  
216 Sunshine Drive  
Bolingbrook, IL 60440-  
(708) 739-3326

**FOX VALLEY ELECTRIC AUTO ASSOCIATION**

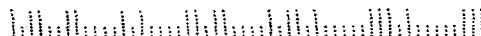
1522 Clinton Place  
River Forest, IL 60305-1208



**First Class**

John Emde  
6542 Fairmount Avenue  
Downers Grove IL 60516-2919

**ADDRESS CORRECTION REQUESTED**



## MINUTES OF FEB 15 MEETING

The meeting at the College of DuPage was called to order at 7:30 PM by VP Shafer. 17 members and 2 guests attended. The minutes were approved after discussion of proofreading by a third party and a suggestion that the newsletter be distributed by e-mail and faxed.

Treasurer Corel reported \$ 2186.70 in the savings account, \$ 3126.09 in checking, for a total of \$ 5312.79. His report was accepted without comment.

Member Bob Barrett reported on his attendance at EnV/96. GM announced the EV-1 (Impact) would soon be equipped with a NiMH battery that will extend the range. Stempel reported on the partnership for the next Generation Vehicle (PNGV). Bob brought handout material for examination.

Bob Munroe, the Coop Project Manager, updated construction status. Work at Emde's shop is complete, Battery boxes are complete, tow light circuit finished, door hinge and seat repair done, and new locks installed. Member Oviyach will arrange to tow the car to Ed Meyer's shop.

The next task is the charger. A new K&W charger can be purchased for \$ 575. A used charger is offered for sale for \$350. Member Ken Meyers estimated a charger that includes a torodial isolating transformer could be built for about \$100. The third alternative was selected. Ken will lead the design and construction team.

The controller was discussed. A new Curtis 1231 unit will cost \$ 1100. There was no response from former President Marsh on a request to use the drawings for the Marsh controller. Member Meyers estimated a new controller could be built for about \$300. It

was decided that Corel's controller would be adapted for the test using gel cells. Ken will also lead a design and construction team for a new controller. A Curtis controller will be installed after tests are finished.

There was a brief discussion of instrumentation. Ken Meyers observed that the existing dashboard fuel gage and temperature indicator, each using a bimetal element, can be driven with a simple op-amp circuit that will allow these can be used as a fuel gage and a temperature indicator.

The accelerator potentiometer was considered. A commercial model will cost about \$95. It was decided to build our own.

The meeting was adjourned at 10:09.

Submitted by Secretary Dave Aarvold

## PRESSEZ

Bob Monroe, Coop Project Manager, will report on the progress of our conversion..

Director Steve Clark will report on his study of the FVEAA By-Laws.

We will have a discussion of FVEAA policy for promoting growth of the EV market.

We need volunteers for the following Earth Day EVents:

1. Beecher Saturday April 20- 12 to 6pm
2. Spring Brook Nature Center in Itasca Saturday April 20.
3. NU Campus- Evanston, Sunday April 21, 11AM to 4:PM. (I volunteer for this)
4. Heller Nature Center- Highland Park, Sunday April 21 1-5PM

KEN

## RECENT ARTICLES ABOUT EV'S

Section 625-15 requires supply equipment to be marked "For Use with Electric Vehicles".

Cable used for connections shall be EV, EJV, EVE, EVJE, EVT, or EVJT. Maximum length of the connecting cable is 25 feet. Use of cable retractors are encouraged.

Section 625-18 requires an interlock that de-energizes the EV connector and its cable whenever the connector is uncoupled from the vehicle.

Section 625-19 requires the automatic de-energization of the cable connector, except for portable cord-connected units rated at 125-volts, 15 and 20 amps

Sections 625-21 & 22 require branch circuit overcurrent protection and ground-fault protection for personnel

Section 625-23 specifies that equipment rated at more than 60 amps must have a readily-accessible disconnecting means with locking provisions.

Section 625-24 requires all supply equipment be grounded and bonded.

Section 625-25 prohibits backfeed into the supply system upon loss of the primary source.

Topic E (Sections 625-28 & 29) applies to ventilation requirements for vented storage batteries charged at indoor locations.

## EVents

**Mega Alternative Fuel Event in Los Angeles April 10-12.** Sponsored by CALSTART and others for fleet operators. Contact Jim Warren (612) 545-1515, FAX (612) 545-1818.

**FESC Sun Day Challenge in Daytona,FL April 13-14.** Sponsored by Florida Solar Energy Center 1679 Clearlake Road, Cocoa FL 32922-5703. Contact them at (407) 683-1458.

**Solar '96 in Ashville, NC April 23-15.** Sponsored by American Solar Energy Society. Contact ASES, 2400 Central Ave., Suite G-1, Boulder CO 80301, (303) 443-3130. FAX (303) 443-3212.

**Earth Day Observances April 21.** Local programs on the 26th anniversary of the original event.

**Michigan Electrathon(s) April 27 at Coopersville and May 27 at Michigan Speedway in Eaton Rapids.** For info contact Jim Nichols, 198 East St, Coopersville High School, MI 49404.

**1996 Tour de Sol will start May 10 in NYC and end May 17 in Washington DC.** Contact NESEA, 50 Miles Street, Greenfield, MA 01301, (413) 774-6051 or -6053.

## RECENT ARTICLES ABOUT EV'S

**The Small EV - Has its Time Finally Come? Solar Mind, Nov-Dec 1991, Page 18.** The author of this article is Bob Beaumont, the man who sold more than 2200 CitiCars in the 1970's, speaks from his experience with small cars. He states that Murphy's Law, "If anything can go wrong - it will" should never be ignored. The CitiCar was given the coup-de-gras via a "consumer" publication in 1975 and a government bureaucrat a year later that forced the company into bankruptcy. The venture lost \$3-million.

He doesn't think much of the DOE EV program that spent \$150-million several years later when the reliability of petroleum supplies was doubtful and gasoline pump prices skyrocketed. He argues that the federal government and academic types don't know much about building automobiles - nor should they. He believes a marketable electric car could be produced and sold today for under \$ 8-thousand. These cars must be reasonable priced, able to maintain a 40 mph speed, travel 40 miles on a single charge, carry two persons, and have sufficient acceleration to mix with urban traffic.

He indulges in a little "Chinese Marketing" when he points out that if only 2-million small cars selling for \$ 7500 were sold for second car applications (5% of annual total sales) it would be a \$15-billion business. His analysis of car costs include \$ 4100 for materials, 25 hours of assembly time @ \$15/hour for direct labor and benefits, another \$ 1125 for overhead costs for a total factory cost of \$ 5225 per car. Dealer cost/car would be \$ 6225, leaving a dealer profit of \$ 2275.

(Editor's note) Bob gave it another try with the Tropica. It bombed. He is now cured of the EV bug.

**The EV-1 (From GM)** If you want a slick brochure from GM describing the EV-1 that is about to be sold by Saturn Dealers in Arizona and California, write to Bob Purcell, Executive Director/General Motors Electric Vehicles, PO Box 3900, Peoria, IL 61612 and ask for booklet # S795002A. (Editor's note) Are they trying to find out if it will "Play in Peoria?"

**What Do Electric Cars Offer to the Consumer. Chicago Sun-Times (Auto Section) February 12, 1996, Page 2A.** This is an article written by feature writer Nina Padgett, a Phoenix-based certified mechanic. It she notes that EVs have very few moving parts and can be refueled at home. She lists many of the technical features of GM's EV-1.

**The National Electrical Code 1996 Handbook contains Section 625 ( Pages 718-723) that applies to Electric Vehicle Requirements.** System voltages are 120, 120/240, 208Y/120, 277, 480, 600Y/347, and 600 volts. The Standard establishes 3 levels of application: Level 1 applies to a 15 or 20 amp, 120-volt supply circuit with a maximum load of 12 amps (1.4 kva); Level 2 applies to the primary and preferred method of EV charging at private and public facilities with a 40-amp maximum, 208 or 240 volt supply circuit. Load maximum is 32 amps providing 7.7 kva @ 240 volts and 6.7 kva @ 208 volts. EV's are treated as continuous loads. Level 3 is the functional equivalent of a gasoline station where voltages and currents are not defined.

## STEPS REQUIRED TO CONVERT A 1990 NISSAN TO ELECTRIC DRIVE

The preliminary list of tasks involved with converting a car to electric power was approved by FVEAA members. Revised & Updated 12/95, 1/96, 2/96, 3/96.

Task Description	%	\$	Time Hrs.
Selection of car for conversion	100	---	200
Car procurement	100	550	8
Preliminary design	100	---	50
Measurements of the as-is car, weight on	100	---	4
right front		661 Lbs	
left front		689	
right rear		421	
left rear		414	
total front		1350	
" rear		835	
TOTAL		2185	
Remove, advertise & sell used engine	100	97cr	38
Clean engine compartment	100	---	1
Install tow bar attachment	100	80	15
Repair body components: Steering wheel, RH door hinge, seat, ignition & door lock.	100	176	30
Select major electrical components, motor controller	100	1654	3
battery charger	100	100	
9" Advanced DC 12-volt Gel (For Test)			
Fabricate motor adapter plate, keep clutch	100	740	
Adapt engine mounts and install new motor. Reconnect drivetrain.	100	25	
Determine battery placement.	100	---	3
Fabricate & install battery racks	100	75	45
Determine power cable routing & install	20	48	2
Procure & install power circuit breaker	10		
Design, adapt & install instrumentation in dashboard	30		15
Ammeter			
Voltmeter			
Motor & control temperature meter			
State-of-charge meter			
(2/3/96 - Work not started on page 2 items) Subtotals	---	3351	414

Page 2/2	Item Description	%	\$	Time
	<b>FVEAA Conversion of 1990 Nissan (Totals From Page 1)</b>		3351	414
	Controller selection, procurement & installation	50		15
	Install potbox & connect to accelerator pedal			
	Install auxiliary battery			
	Install auxiliary wiring - connect to existing cabling. Test auxiliary systems.			
	Power brake design and associated components	20		5
	Select & install battery charger	25		10
	Install AC charging plug & connect to charger			
	Select or design DC-DC converter and install			
	Defroster & heater modifications			
	Install splash pan & rain deflectors	10	20	2
	Replace tires			
	Prepare electrical schematic			
	Prepare owner's manual			
	Obtain electrical title & license			
	Test drive car			
	Evaluate procedures taken in building car *			
	Evaluate project success *			
	Sell vehicle *			

\* Added 9/95

March, 1996

## EV Partial Conversion For Sale

FVEAA long-time member Andy Wohlert began an EV conversion project four years ago but never finished the job. He wants to sell his Audi Fox partial conversion that is about 90% complete. The motor is an aircraft starter-generator used with a lead-acid battery system that can be 12-16 GC-2 units. The controller is an SCR type. Andy equipped the car with standard alternators attached to two wheels to provide regenerative braking. Asking sale price - \$1000 (Batteries not included). Call him at (708) 584-8364 or write to him at 219 Sixth Street, St Charles 60174 if you are interested.

FVEAA PAID MEMBERS, MARCH - 1996

FAX	NAME E-MAIL	TOWN	STATE	ZIP	AREA CODE	PHONE
	David B Aarvold	DeKalb	IL	60115	815	748-3796
	Robert D. Barrett 865-0249	Westchester	IL	60154	708	865-7027
	Paul Bowerchuck	Westmont	IL	60559	708	971-2599
	Alfred Brinkmeyer	Lisle	IL	60532	708	968-7052
	Jack Cahill	Lombard	IL	60148	708	629-3989
	Tom Cartwright	Dixon	IL	61021	815	
	Sharon Chlebanowski	Joliet	IL	60435		
	Steven F Clark	Downers Grove	IL	60515	770	963-3110
	Larry Claypool	Frankfort	IL	60423	815	469-2936
	Dale Corel	Elk Grove Villag	IL	60007	708	228-5952
	Shawn Cutting	Joliet	IL	60435	815	725-7017
	Frank Delmonico	Berkley	IL	60163	708	544-6312
	John Emde	Downers Grove	IL	60516	708	968-2962
	John J Enhorning	Ludington	MI	49431	616	843-3093
	Leonard Fisher	Dublin	OH	43017	614	764-9733
	William T Forde	Everett	WA	98208	204	337-4179
	Alexander Glowiak	Westmont	IL	60559	708	968-2486
	Hendley Hall	Loves Park	IL	61111	815	877-7290
	Everett Harris	Geneva	IL	60134	708	232-0344
	Jay Johnson	Aurora	IL	60504		
	Richard Johnson	Oak Park	IL	60304	708	386-0082
	Thomas Kaminski	Chicago	IL	60641	312	282-4828
	Bob Kapheim	Elmhurst	IL	60126	708	530-1736
	James E Ketelle	Port Edwards	WI	54469	715	887-3912
	Fred Kitch	Riverside	IL	60546	708	447-6125
	George Krajnovich	Oakbrook Terrace	IL	60181	708	834-0370
	Lad Kucera	Clarendon Hills	IL	60514	708	850-7246
	Steve Leisner	Racine	WI	53405	414	634-4470
	Dr Henry Shaw, MD	Stevens Point	WI	54481	715	341-6004
	Michael Magiera	Sharpsville	IN	46068	317	963-5227
	Edward E Meyer	Bolingbrook	IL	60440	708	759-0326
	Charles Miller	Elgin	IL	60123	708	742-2052
	Dana Mock	Bolingbrook	IL	60440	708	759-8033
	Bob Munroe	Glen Ellen	IL	60137	708	858-7066
	Bill Murphy	Chicago	IL	60643		
	Kenneth Myers	St Charles	IL	60174	708	584-6057
	Richard Ness	Chicago	IL	60639	312	889-7757
	L J Obiala	Weyauwega	WI	54983	414	867-3445
	Raymond Oviyach	Oak Forest	IL	60452	708	560-0715
	Jim Paulsen	La Grange	IL	60525	708	985-2993
	Edward E Petrik	Wheaton	IL	60187	708	653-4655
	Frank Pietrolonardo	Arlington Height	IL	60004	708	255-1665
	Bob Randerson	LaGrange	IL	60525	708	352-3887
	Ben Schmid	Munster	IN	46321		
	William H Shafer WShofer@aol.com	River Forest	IL	60305	708	771-5202
	Irwin Singh	Carol Stream	IL	60188	708	372-6182
	John Stockberger	Batavia	IL	60510	708	879-0207
	Mark Tilton	McHenry	IL	60050	708	516-2456
	Carl Tipton	Ames	IA	50010	515	292-8493
	Vladimir Vana	LaGrange	IL	60525	708	246-3046
	Alan V Wilson	Beloit	WI	53511	608	362-2956
	Kenneth Woods Casa Zeus2@aol.com	Naperville	IL	60564	708	420-1118
	Richard Ziegler 584-9000 Zieglerr@caedm.et.byu.edu	Provo	UT	84602	801	579-8947

This list included with paid-up members' March Newsletter

## **CORRECTIONS AND ADDITIONS TO THE MEMBERSHIP LISTS**

The membership list on the other side of this page was taken from the computer database records maintained by Bill Shafer and used for mailing purposes. If corrections are required, please let him know. If you have a fax please call (708) 771-5202 and it will be added to your record. If you have an E-mail address, E-mail to WHShafer@aol.com and the info will be added to your record for inclusion in future lists.

Only paid-up members received this membership list. It was not included with our exchange newsletter recipients.

**BILL**

## **ARE ELECTRIC CAR CONVERSIONS A "KEEPER" ?**

Andy Wohlert's decision to offer his electric car for sale brought to mind that many converted cars owned by FVEAA members have been offered for sale. Wonder why? The early conversions were underpowered and couldn't keep up with traffic. None of the conversions have been equipped with adequate heat or insulated battery boxes for cold weather operation. Early users have had to pay attention to electrolyte levels about once a month. Are these and other limitations the reason for selling their conversions?

This subject needs to be discussed along with the EV Policy position scheduled for the March meeting. Our membership has much experience with building and using electric cars. We need them to offer candid comments about the inadequacies that must be addressed if EVs are going to become commercially acceptable.

**BILL**