



FVEAA NEWSLETTER - DECEMBER, 1995

**NEXT MEETING - December 21 at 7:30 PM will be in Room 157, Building K
at the College of DuPage, southwest corner of 22nd Street & Lambert Road**

DISCUSSION TOPICS - 1) Project Financing 2) Open Agenda & 1996 Objectives

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 December will be \$ 19

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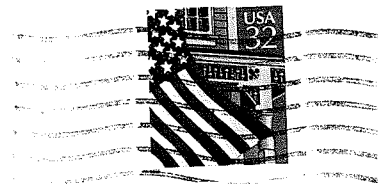
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FOX VALLEY ELECTRIC AUTO ASSOCIATION

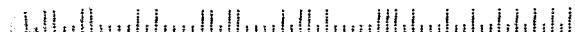
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First Class

John Emde
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ADDRESS CORRECTION REQUESTED



Minutes of November 11, 1995 Meeting

The meeting at the COD was called to order by President Woods at 7:30 PM. Seventeen members and four guests attended.

Treasurer Corel reported \$ 2557.02 in the checking and \$ 2186.70 in the savings account. The Coop account income was \$ 4000, expenditures \$ 2300. Approved.

President Woods noted 1996 dues are payable now. The December Newsletter will be mailed to the present list but only to paid-up members beginning in January.

Project Manager Munroe reported on the Nissan status. The car will be moved to Member Emde's shop on 11/18 for motor installation and further work. Any member interested in participating should call Bob Munroe (708) 858-7066 for a schedule.

Guest speaker Howard Penrose, Field Services and R&D Director for Dreisilker Electric Motors in Glen Ellen, presented information on motor drives for electric cars. Included was a review of AC motor fundamentals, various types of AC motors, control theory - including pulse width modulation basics. He provided a handout that covered the material presented.

There was a discussion of the Nissan conversion project status. New door locks are available. Member Barrett has located a car with a vacuum pump at a salvage yard. The rear brakes need to be checked. The test voltage was discussed. Additional funding will be required to complete the project..

Meeting adjourned at 11PM.

Submitted by Secretary Aarvold

PRESEZ

An update report on the COOP Project (Nissan Conversion) will be given at the December meeting. We will discuss the additional financing needed to complete the project. The rest of the time will be utilized for open topics and suggestion for our 1996 objectives.

I wish to remind members paid for 1995 that this newsletter ends our publication year. The new paid membership list will be used for distributing the January, 1996 issue. If you haven't yet renewed, send your \$ 20 check to Dale Corel to continue to receive FVEAA information. His address is on the cover of this issue.

Season's Greeting and Happy Holidays.

Ken

FROM THE EDITOR

My thanks to Prez Ken for taking care of the last newsletter while I was moving. Please note my new address shown on the cover. You now also have an e-mail option.

Ken mailed the last issue from Naperville. It was processed by a different section of the postal system that shredded everything but the front page, which is all that most of you received. Contributing was the failure of the sealing button on the bottom, leaving the mail machinery to try deal with loose edges, something it is unable to. I would like to hear from you on the delivery condition of this issue.

Bill

RECENT ARTICLES ABOUT EV'S

Zoom without a vroom. Autoweek, 10/23/95, page 46. Italian designer Bertone's ZEV, the Blitz, achieved a record 188.923 mph, eclipsing the former record held by GM's Impact by 5.2 mph. The EV also covered 124.205 miles in one hour, also a record. The Blitz is 165 inches long with a wheelbase of 86.5 inches. It is powered by a brushless motor good for 204 HP @ 12000 rpm. Car weight is 2257 lbs with a chassis weight of just 462 lbs. The motor, transmission, and control unit weigh 409 lbs. Thirty four lead-acid batteries weigh 1320 lbs.

Shocking news. Autoweek 10/23/95, page 4. The Battery Technical Advisory Panel of the California Air Resources Board (Those folks who conceived the Zero-Emission Mandate) has concluded that any electric car in the showrooms in 1998 will use lead-acid batteries. This bolsters automaker arguments that limited range will restrict consumer acceptance of EVs.

Electric Bikes Hitting the Roads Chicago Sun-Times 10/9/95, page 49 & Tribune 11/12/95, Section 12, page 3. Malcom Bricklin, the man who brought the Yugo to the US is hoping for more success with his electric bicycle, the EV Warrior. The vehicle doesn't use advanced technology. It uses a 12-volt electric motor activated by a thumb switch and a battery good for about 30 miles of travel. It will sell for \$900-1500. Portland (OR) and San Diego have been chosen as the trial market for the bike.

Expo turns up juice on electric cars Tribune 9/24/95. Virginia Electric Power's Insbrook Technical Center was the site of an electric car expo. At the event, Retired GM Chairman and EV advocate, Robert Stemple, radiated enthusiasm for the cars. It was noted that GM spent a half-billion dollars on EV development since 1990. The GM Impact has been tested and found that its 70-mile single-charge range would be adequate for 85% of commuter trips. The biggest problem seems to be consumer expectations.

Charging up hope for electrics. Tribune 10/22/95. Automakers and oil companies have urged Gov. Wilson to repeal the 2% ZEV mandate for 1998 because battery technology has not advanced to a point where a 150-mile single-charge range in urban driving is possible. It will be sometime after the year 2002 before advanced batteries will begin to appear commercially according to an advisory panel.

All Charged Up Nucleus (Union of Concerned Scientists) Fall, 1993, page 1. Curing the ills of urban air pollution, traffic congestion, and oil dependency will require an integrated approach that includes reducing demand for auto travel and producing cleaner and more-efficient vehicles. The EV is acknowledged as the cleanest and most-efficient of the alternative vehicles. The big problem is energy storage; a kg of gasoline contains 12000 watt-hours while the same weight of lead-acid batteries has just 30-35. EVs can best help solve transportation problems by developing a niche market for limited-range trip use. Almost two-thirds of gasoline engine emissions are emitted during the first few minutes of operation.

Recent Articles about EV's - Continued

Cheap Lithium ? Popular Science, Nov 93, page 41. Two companies, Valance Technology of San Jose (CA) and Battelle Labs of Richland (WA) have made headway in the commercialization of lithium batteries. Valance has signed a \$ 20-million development contract with GM. Battelle announced a new manufacturing process that may cut manufacturing costs in half.

Electric Cars. WashBiz (From our Washington-area EV Spy and FVEAA Member, Dr Rodney Bohlmann). Potomac Electric Power Company is seeking, in various area newspaper stories, 60 customers willing to test-drive the GM Impact for two weeks. He responded and received an interesting Drive Candidate Survey from GM which he shared with us. He reports a daily round trip of 26 miles, ideal for the Impact but too far for "Sparky" - his converted Escort.

FROM OTHER EV NEWSLETTERS

EV Circuit (The Ottawa EV Group) in their Sep/Oct issue reports a low-temperature test of two Ev's built by members that have been winterized. The heating effectiveness was tested at the Environmental Test Center in Ottawa. The EPA FTP-75 LA-4 test cycle was used to first establish the 20C range. The cars were next frozen to -17C and the test repeated. Fred Green's 86 Fiero had a hot range of 57.5 Km and a cold range of 52.9. Battery heaters were energized for 18 hours between tests. Rick Lane's Jetta had a hot range of 76.8 Km and a cold range of 76.7. Additional info on winterizing is available from Richard Lane, 248 Anna Avenue in Ottawa, Canada, K1Z 7V4 (613) 722-9939.

The issue also contains an article on an electric boat by Rontan Patterson. It notes that an electric boat requires a large diameter, high-pitch propeller turning at a slow speed. A speed reducer is necessary to allow the electric drive motor to operate near its rated speed.

EEVC (The Eastern EV Group) October Newsletter featured Al Cocconi's 200 horsepower EV drive system (AC-150). It uses a 336-volt system, a 110-lb DC motor converted for AC application, a 20kW on-board charging system using a 240-volt, 80 Amp supply circuit, and a battery pack using 28 Optima lead-acid batteries. The converted Honda Civic, in which the system is used, 0-60 acceleration is under 6 seconds, top speed 80 mph, and a range over 40 miles.

EVAOSC (The Southern Cal Group) September Newsletter has a Ken Koch article on Cruising Equipment Company's new E-meter. This microprocessor-based meter provides volts, amps, amp-hours, Kwh, and time remaining on a battery charge. The Device was introduced at EVS-12 last year. The device sells for about \$200.

Their November Newsletter contained an article by Ken Koch on the Fisher Ranger, a trailer-mounted auxiliary power unit (FVEAA Aug 95 Newsletter). It contains Fisher's patented neodymium-iron-boron alternator technology rated at 13.5 kw and weighing only 28 pounds. The V-Twin engine weighs 92 pounds. Selling price is \$ c.

From Other EV Newsletters - Continued

SEVA (The Sacramento Association) in their October Newsletter featured the final chapter of Tony Cygan's "The Yellow Porsche Project". He equipped the car with Trojan's new 8-volt batteries and had some difficulty with the cable routing. He mounted the controller, contactor, and shunt on a slab of 1/4" aluminum heat sink that acts as a heat sink. The car is operative, but painting, suspension upgrading, and addition of battery box covers remain. His final observation, "I would like to encourage anyone worried about not being able to convert a car to give it a try. I had no experience before I started and made it through".

They report in their December Newsletter that California Secretary of Environmental Affairs has suggest a deal with automakers to delay the ZEV 1998 mandate if carmakers begin production of cleaner car nationwide by 1997. Another article noted the Massachusetts consumers like the \$200 monthly electric car (Solelectria) leasing program sponsored by the Division of Energy Resources.

VEVA (The Vancouver Folks) in their November Newsletter reports the organization plans to sponsor three Electrathons in 1996. They also note that after building 15 Tropica EVs, Bob Beaumont has resigned from the company. The production plant is empty. He resolves never to again be bitten by the electric car bug. US Electricar financial results for 1995 listed revenues of \$ 11.6-million, and a net loss of \$ 37.6 million (\$1.86/share). Restructuring the company has been initiated.

World Electric Transportation (Clarence Ellers Newsletter from Yachats, OR) in his September issue reports that the Edison Electric Institute survey conducted by Cambridge Reports of 1000 persons indicate that 72% would buy an EV that could go 75 miles on a charge and had fast recharge. A copy can be obtained from the EEI by calling (202) 508-5778.

Events

Editor's note - The coming of the winter season causes many EV owners (& organizations) to put their cars in storage and suspend insurance coverage until the spring.

EnV'96, a meeting concerned with environmental matters and EV's will meet Jan 22-23, 1996 in Dearborn, MI. Contact Rich Moirio, The Engineering Society, 2350 Green Bay Road, Ste 190, Ann Arbor, MI 48105, FAX (313) 663-7835.

Ener*Run, the fourth annual cross-country rally for advanced vehicles that includes EV's, organized by SPORTPRO in Hardy AK, will leave there on May 25, 1996 and end two days later after a course extending for 3764 miles in 13 states. For info on the event, contact Les Adams, coordinator at (501) 856-3877, FAX (501) 856-3840.

EVS-13, the 13th International Vehicle Symposium will be held October 13-16, 1996 in Osaka, Japan. For info contact Lori Adams at the Electric Power Research Institute (EPRI), 3412 Hillview Avenue, Palo Alto, CA 94304, Phone (415) 855-8763; FAX (415) 855-2041.

STEPS REQUIRED TO CONVERT A GASOLINE CAR TO ELECTRIC DRIVE

The following list of tasks involved with converting a car to electric power was approved by FVEAA members. Those wishing to help with a task on the Nissan Sentra conversion or observe work on a specific task should call Project Manager Bob Munroe (708) 858-7066 to be included and notified. (Updated December 7, 1995)

Task Description	l	\$	Time
Selection of car for conversion	100%	---	7wks
Car procurement	100%	550	
Preliminary design	70%	---	30 hr
Measurements of the as-is car, weight on	661	---	4 hr
right front	689		
left front	421		
right rear	414		
left rear	1350		
total front	835		
" rear	2185	---	
TOTAL			
ride height			
Remove all engine-related components, radiator engine (Identify & mark existing wiring) exhaust gasoline tank & lines other	Comp	---	25 hr
Sell unused engine components *	100%	97cr	1 hr
Clean engine compartment & paint	100%	---	1 hr
Install tow bar attachment	50%	75	7 hr
Repair body rust	NR	---	---
Paint, if necessary			
Select major electrical components, motor controller battery charger	9"DC Gel	1654 100	3 hr
Modify suspension components			
Fabricate motor adapter plate, keep clutch	90%	118	
Balance motor-transmission assembly			
Adapt engine mounts for new motor	90%		

Determine battery placement using battery mock-up. Weight distribution & frame limits	90%		
Fabricate battery racks	40%		
Install battery racks	10%		
Determine routing and install power cabling	10%	48	3 hr
Install disconnecting contactor			
Install power fuse or circuit breaker			
Install controller			
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			
Install motor cooling fan, if required			
Install battery charger			
Install AC charging plug & connect to charger			
Install DC-DC converter			
Install electrical meters, Power voltmeter ammeter Auxiliary system voltmeter			
Rebuild brakes			
Defroster & heater modifications			
Install splash pan & rain deflectors			
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 *			
Dispose of vehicle *			

* Added 9/95

December 1995

A B C D E F G

FOX VALLEY ELECTRIC AUTO ASSOCIATION
(NISSAN CONVERSION VEHICLE)

City, Illinois

Actual Weight and Balance

Model (2 Door Sedan)

SERIAL NUMBER: (1N 4GB22B3LC797274)

Date: 11-12-95

MODEL NUMBER: GL - RSIU

DATE Of MANUFACTURE: June, 1990

MAX. WT.: Max. Allow. Gross Wt. = 3,117 pounds

Actual
2,971 pounds

Max. allowable front weight: = 1,764 pounds

Actual
1,252 pounds

Max. allowable rear weight: = 1,786 pounds

1,719 pounds

Installation Complete -(No Pass.) Wt. & Balance

Empty Weight as weighed :
(Includes Items Shown on Subsequent Pages)

Engine
Removed

Install.
Complete

Left Front Wheel	402.0	638.8 Lbs.
Right Front Wheel	395.0	613.5 Lbs.
Left Rear Wheel	380.0	876.7 Lbs.
Right Rear Wheel	356.0	842.0 Lbs.
Total (T)	1,533.0	2,971.0 Lbs.

GEOMETRY:

WHEEL BASE - AXLE-AXLE FRONT TO REAR	=	95.63 INCHES
WHEEL TREAD -Front Axle LEFT TO RIGHT	=	56.50 INCHES
WHEEL TREAD -Rear Axle LEFT TO RIGHT	=	56.00 INCHES

51

52

53

54

55 CENTER OF GRAVITY CALCULATIONS :

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98

FRONT TO REAR

Front Wheel Weight =

Rear Wheel Weight =

Engine
Removed

797.0

736.0

Install.
Complete

1,252.3

1,718.7

Init. Ctr. of Grav.=

45.91 Inches Behind Front Axle

Final Ctr. of Grav.=

55.32 Inches Behind Front Axle

LEFT TO RIGHT

Left Wheel Weight =

Right Wheel Weight =

Engine
Removed

782.0

751.0

Install.
Complete

1,515.3

1,455.7

Ctr. of Grav. =

27.56 Inches Right of Left Wheel Baseline

Center of Gravity =

0.56 Inches Left of Centerline

Final Weight & Balance Predictions Based On:

A.	Motor Weight =	143.0 Pounds
	Transmission Weight =	70.0 Pounds
	Flywheel & Clutch Weight =	25.0 Pounds
	Total =	238.0 Pounds
	Location =	7 Inches forward of front axle
B.	3 Batteries @ 75 Lbs. Ea. =	225.0 Pounds
	Location =	Over front axle
C.	5 Batteries @ 75 Lbs. Ea. =	375.0 Pounds
	Location =	Over Rear axle
D.	8 Batteries @ 75Lbs. Ea. =	600.0 Pounds
	Location =	4 Inches behind rear axle
	Total Added Weight =	1,438.0 Pounds



FVEAA 1996 MEMBERSHIP APPLICATION

PLEASE PRINT

NAME _____ DATE _____

ADDRESS _____ PHONE () _____ - _____

FAX () _____ - _____ E-MAIL _____

CITY _____ STATE _____ ZIP _____ SUBZIP _____

What is your principal interest in electric cars?

- General
- I would like to convert a car.
- I own an EV Make? _____ Yr _____ Year acquired _____
- EV public policy and environmental applications.
- Other (Please describe below)

LIST BELOW YOUR COMMENTS, QUESTIONS, OR SUGGESTED EV TOPICS FOR DISCUSSION

Exclude my name from the published list of 1996 members

FVEAA annual membership is \$ 20. The fiscal year begins November 1. Dues for new members joining after that date is adjusted according to the following schedule:

Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
\$ 20.00	19.00	18.00	17.00	16.00	14.00	12.00	10.00	8.00	6.00	4.00	2.00

Make your check payable to the FVEAA and mail to :

DALE COREL , FVEAA Treasurer
595 Gateshead North
Elk Grove, IL 60007-3433