



FVEAA NEWSLETTER - JANUARY, 1996

**NEXT MEETING - Friday, January 19 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 - Lead Acid Batteries by Tom Baker, Battery Service Company

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 January will be \$ 18.

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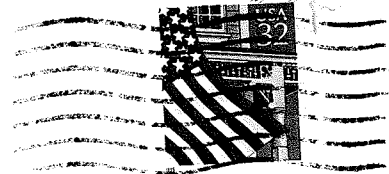
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ADDRESS CORRECTION REQUESTED

DECEMBER MEETING MINUTES

The meeting at the College of DuPage was called to order by President Woods at 7:36 PM. 13 members and three guests attended.

After approval of the minutes the Librarian was requested to prepare a list of material available. There was no Treasurer's report.

Member Emde gave a status report on the Nissan work in his shop. Battery racks for three batteries in the front and another three against the firewall have been fabricated and spot-welded from material furnished by Member Stockberger. They require final welding. A rubber motor mount about 3" diameter with mounting studs on top and bottom is required for the fourth mount.

Two plastic heater connections protruding thru the firewall must be eliminated to provide needed space for front battery mounting. Heater core removal is complex. Sawing these off was recommended.

Member Mock led a discussion of the control-power wiring system. Grounding and a transformerless charger were two important subjects. Dana and two other members will provide recommendations.

A motion for the FVEAA to purchase 20 participation shares from the savings account was approved with one abstention and one no vote. This should provide enough funds to complete the job.

The need to update the Bylaws was discussed. An additional director and other changes are needed.

The meeting adjourned at 11 PM.

Submitted by Secretary Dave Aarvold.

PRESEZ

Our January discussion on lead-acid batteries will be led by Tom Baker from Battery Service Corporation in Bensenville. Come prepared with your questions.

A progress report on the Nissan project will be led by Bob Munroe. There has been only one working session over the holidays but we have been making good progress. About eight members have done the work so far. Members not participating are missing the opportunity to experience what a conversion involves. Call Project Manager Bob Munroe (708) 858-7066 for future work schedules.

The most important national development affecting electric cars was a staff recommendation to the California Air Resources Board (CARB) that stays implementation of the zero-emission -vehicle (ZEV) mandate. A report on this action is included with this issue of the FVEAA Newsletter. If time permits, we will discuss this and develop a FVEAA position. I believe it would be useful to communicate our stand to CARB and others.

Ken

VEEPSEZ

The January Newsletter will be sent only to members who have paid their 1996 dues. The Treasurer's list will be used for mailing.

There may be inaccuracies between the Treasurer's list and the paid-up list on my computer that is used for mailing. Please call or E-mail updated information on your mailing address. I would also appreciate having your ZIP + 4 mail code that will simplify handling by the postal service

BILL

RECENT ARTICLES ABOUT EV'S

A significant EV development this past month concerns CARB. At their March meeting the Board may approve a staff recommendation to revise its 2% ZEV mandate. The following information was provided by Member Jay Johnson from information on the INTERNET.

California officials retreat on electric car quotas. <Lacysr@RESEARCH.SCE.COM>

For the first time in California's history as a leader in setting clean air ruse for the auto industry, state officials said Thursday they will back off from a landmark regulation: a series of quotas that would have forced major car makers to begin selling electric vehicles in 1998.

In reaching their decision, members of the state Air Resources Board (CARB) were urged on by Gov. Pete Wilson and pressured by automakers who say they need more time to develop battery technology. The Board said it will shift to a more "market-based" program for the following years, while retaining a rule that 10% of the cars sold in California must be electric by 2003.

The move, which the Board must formally ratified in March, stands to have a nationwide impact because another high-polluting states have patterned their regulations after California's. Board Chairman, John Dunlap, said the new plan is necessary to ensure the ultimate success of electric cars in the competitive consumer market. And he vowed that the state won't sacrifice air quality because emission would be reduced in other ways.

The recommendation was denounced by environmental groups. They warned that suspending the quotas will send the wrong message both to automakers and to an emerging high-tech industry that is developing components for electric vehicles.

Other critics warned that the auto industry will find it even more difficult to meet the 2003 quota if their production levels are far below 15% in the preceding years. "We may be setting ourselves up for more delays and we may be setting ourselves up for a failure," warned Paul Knepprath of the American Lung Association.

Dunlap last month ordered that CARB staff to propose alternatives as they were initially enacted. Several options, from abolishing them outright (As recommended by the California Chamber of Commerce) to simply reducing the quotas. The staff recommended the quotas be replaced with "memorandums of agreement" in which the big seven US and Japanese car-makers will voluntarily introduce electric cars.

The staff plan, which was praised by the Governor, is similar to one proposed by automakers. The Board expects to hold public hearing in early 1996. Sonia Hamel, an environmental planning official from Massachusetts stated, "we're bitterly disappointed" Both MA and NY have adopted similar quota requirements.

The staff proposal will be submitted to the CARB board by the end of January, at which time the formal publication and review period will begin.

Recent Articles About Ev's - Continued

Electric Cars Try Rematch With Winter. Chicago Sun-Times December 27, Page 52.

Solectria electric cars are being tested by EVermont in the rugged winter climate of in that state. Tom Rawls, one of the test participants, forgot to fill the heating unit's fuel tank so all he got from the defroster was a blast of cold air. The car was still able to drive through the roads of central Vermont.

Vermont has been at the center of research into the technology used in EV's They are trying to make sure the vehicles have all the conveniences and comforts of a typical conventional car. Temperature is one of the primary factors that affects performance. The military, interested in putting electric vehicles into battlefield fleets, has been sponsoring research on cold-weather performance through the Northeast Alternative Vehicle Consortium. Thee group won a \$300 k grant last year to study the problem.

Some of the Vermont cars will be sent to Georgia during the summer to test air conditioning and how wintertime improvements affect summer performance. Some steering wheels are electrically heated, others have electrically-heated seats, some have solar glass.

(Editor's note) Refer to the FVEAA December Newsletter for an account of how the Ottawa, Canada EV group copes with the more- severe temperatures there

Two Automakers Put Electric Cars In Gear. USA Today December 12, Page unknown.

Ford and Chrysler have agreed to a common design for electric car recharging. It resembles a miniature gasoline pump that hangs on a garage wall. The system can be used on Chrysler's EPIC, a conversion of their minivan and on the Ford Ranger, a converted pickup truck.

Latest Earthshaking Advance In Electric-Car Batteries Needs Recharge. Chicago Tribune December 18, Business - Page 5. Jim Mateja, Auto writer for the paper, noted that Chrysler and Ford have agreed to a system that can recharge a depleted EV battery in 6 hours, two hours less than earlier systems. A different system has been proposed by GM that is incompatible with the Chrysler-Ford version.

The Electric Mini. Soft Technology (Australia) Number 47, Page 31. John Randall of North Geelong in Victoria, Australia described his conversion of a Mini to electric power. The conversion is powered with a 7.5 horsepower series-wound, 72-volt, 3000 rpm motor geared down and connected to the timing chain end of the clutch housing. Energy storage is provided by six 12-volt car batteries. The control provides 36 or 72 volts from the transmission gear selected by the driver. In first gear, 36-volts thru a resistor provides maneuverability for parking. Second gear proves 36 volts, Third gear is not used. Fourth gear is 72 volts.

An interesting sidelight. They report that Hundai is going to test an Ovonic NIMH battery made up of 2500 small cells. The test vehicle will be the S Coupe. Weight is increased only 30kg; over the standard vehicle. The battery will be placed in space under the bonnet formerly used for the gasoline tank. Over 75% of the space in the boot remains free.

Recent Articles About Ev's - Continued

The Electric Car Unplugged. Technology Review (MIT) January, 1966, Page 30. In this article the authors assessed the total environmental and economic effects of the production and use of electric cars. They conclude the CARB electric car policy is neither cost-effective nor practical. They point out that EV research cost is approaching \$ 1-billion, almost half the National Science Foundation's entire research budget, has yet to produce significant results. They argue that burning fossil fuels for electric car energy will not reduce overall emissions (except in the Chicago area where the energy is primarily nuclear-based. - Editor). They agree with the argument that short-range electric cars costing \$30-50,000 will not be accepted by a significant number of consumers. Subsidies also are not the answer.

They advocate R&D over a wide range of alternative vehicles, competition between these cars, and operational changes such as telecommuting. They state there are probably other, more cost-effective ways to reduce urban air pollution such as junking 7-10% of the older cars that produce 50% of the on-road carbon monoxide and hydrocarbons.

The following FVEAA comment was e-mailed to MIT.

Subj: Plugging in the electric car

Date 95-12-20 17:46:12 EST

From: WHShafer, FVEAA Vice President & Newsletter Editor. E-mail WHShafer@aol.com

To: <technology-review-letters@mit.edu

The EV article in the Jan. issue of Technology Review presents an accurate evaluation of the technical deficiencies of electric energy storage systems for EVs. It makes the case why these limitations will deter consumer acceptance. The article omits an important factor - marketing.

Marketing -not mandates. Enough prototype EVs and individual car conversions have been made, tested, and used to define EV performance. Range is likely to be about 100 km (60 miles) in urban traffic when a lead-acid battery is used. The marketing challenge will be to convince customers to accept this EV as a niche produce useful for most driving missions, and that cost savings can be realized when EV use is substituted for a petro car.

Suburban developments since 1950 have made the personal car indispensable. This driving is where the EV has its greatest advantage. When EV use substitutes for a petro car on short trips, including solo commuting, the owner's costs are reduced. EV depreciation is low because of its long life (>15 years). Periodic purchases of a new car can be less-frequent for an EV owner, a significant financial advantage. Operating costs are also minimized. Petro car mileage is poorest and missions are at a maximum with cold-starting, and when used for start-stop short trips.

There is evidence to support EV operating cost advantages. About 3000 individuals have recycled and converted petro cars to electric power. Energy consumption for these have been 0.3-0.5 kWh/km (0.5-0.8 kWh/mile). Periodic battery replacements have been on a four-year cycle. The resulting battery amortization cost has been found to be about seven cents/km (10 cents/mile). Annual operating costs, including insurance, has been about \$ 500/year, far less than a petro.

The EV must pamper the driver. Fortunately most accessories that perform this function do not require much energy. A consumer-acceptable EV must be more than the bare-bones vehicles produced thus far.

The EV must also be price-competitive, probably about \$ 10,000, to be acceptable. This is an achievable goal.

When you are perceived to have a lemon - make lemonade.

FROM OTHER EV NEWSLETTERS

EEVC - The Eastern Club in their December Newsletter reviewed the Chrysler EPIC that was introduced during the Atlanta Infrastructure Conference. EPIC is an acronym for "Electric Powered Interurban Commuter". It is a converted Chrysler minivan using 1600 pounds of Electrosource lead-acid batteries rated 27 kWh at 324 volts. Expected range is 60 miles on the SAE J 1634 cycle. Top speed is 80 mph; 0-60 acceleration is 16 seconds. The charger requires a 208/240, 40-amp circuit. The three-phase motor is rated at 75hp continuous, 100 hp peak. The gross vehicle weight is 5900 pounds with a payload allowance of 800 pounds.

They report that US Electricar received a \$ 2.8-million contract, funded by the Defense Advanced Projects Agency, to field-test advanced batteries in ES-10 pickup trucks. They also report that a recently-released EPRI study entitled, "A Cost Effective Emission Control Strategy", concluded that EVs can be up to 10 times more cost-effective than some alternative programs that have been proposed. A summary table shows:

Control Measure	\$/Ton Pollution Removed
EV in CA	\$ 2,500
EV elsewhere	900
Controls On:	
Commercial Bakeries	11,200
Painting activities	20,100
Commercial dry cleaners	21,300
Car painting	24,800
Restaurant charbroilers	30,400

They also note the Green Car Journal charges that if automakers treat EVs the same way commercial cars and trucks are considered the electric cars could be priced competitively.

VEVA - The Vancouver Group in their December Newsletter reported that in six years, cars sold in British Columbia will be required to produce 7-% less pollution than they do today. In eight years, 10% of vehicle sales cannot be fueled with gasoline. Non-compliance will draw a \$25,000/vehicle fine. Also, a special task force of club members is defining a Neighborhood Electric Vehicle (NEV) to be built by the club. It probably will be a 3-wheeler with two 20" BMX wheels in front for steering and stability and one power wheel in the rear. The motor will be about 5hp and have two 12-volt or three 8-volt EV batteries.

From the Internet they report that: Honda has a 2-door Civic; Toyota has exhibited their Prius - a small hybrid prototype in Frankfurt; Nissan showed a light-weight, producible, FEV II with a Sony Lithium-Iron battery; VW is setting up Mexican production of the "retro beetle" The Concept 1 car, that includes a hybrid-electric option using a direct-injection diesel engine. They appear to be taking California's ZEV mandate seriously and quietly doing their homework.

EVAOSC - The Southern California Organization in their December Newsletter on their covers asks, "What will happen in 96-97-98?". One answer may be a presentation by Dr Keith Kenyon in his presentation to the group. He analyzed vehicles based on wheelchairs, industrial EVs, and golf cars and argues these types of vehicles should receive more attention. An article describes the competitive testing done on prototype and commercially-available EVs. Solectria and Baker products were endorsed for purchase by utilities participating in the effort.

FROM OTHER EV NEWSLETTERS - Continued

(Catching up on other Newsletters that arrived before my move to River Forest - ED)

AVEA - Our Australian Friends in their Sept/Oct Newsletter describes the Aussie Draper EV that has a modest max speed of 25 mph and a daily range of 40 miles. It is intended for foodstuff vendors that carry on their business in residential areas. They also reported the results of their fall Electrathon. The winning entry travelled 40.23 km with an average speed of 40.23 km/h. A converted Diahatsu Charade was tested with a set of 30 Genesis batteries. These are 12 volt, 38 AH units that are standard equipment in Ford and Chevy pick-up trucks made in the US.

They also published a cutaway sketch of the Solectria E-10 pickup and the 4-door Force. It was accompanied by a profile from the NY Times, March 6, 1994 about James Worden, the Company CEO that is worth reading. (Ed note -if a FVEAA member wishes to do this, check out the Library copy from Ed Meyer).

Electric Grand Prix Corp. that Paul Heany issues in Rochester, NY in their Oct-Dec Newsletter describes a battery monitor available from Cruising Equipment Co, 6315 Seaview Avenue NW, Seattle, WA 98107 (206)-782-5869. Their E-meter is a multi-functional instrument that keeps track of voltages up to 500, 20-200 amp currents, and amp-hours. It also includes a direct-reading time remaining function (assuming constant discharge). All this is contained in a 2" panel mount. Cost is \$200. Necessary accessories will add another \$79-99.

They also report that SAFT Ni-Cad batteries performed well in the Scandanavian EV gathering held in August. The PIVCO City Bee used these units in ten vehicles used in the Lillehammer Olympics.

The **EEVC November Newsletter** noted that not all EVs are cars. They had an interesting account of trolleys still in operation in Philadelphia.

EVents

EnV'96, a meeting concerned with environmental matters and EVs will meet Jan 22-23 in Dearborn, MI.

The **1996 SAE Meeting in Detroit** will be held Feb 26-29. Contact the SAE at 400 Commonwealth Drive, Warrendale, PA 15096-0001.

The **Annual APS Firebird** will be March 1-3. For info call EVTC, (602)-256-2599.

This year's **Tour de Sol** will be May 10-17. The run will be from NYC to Washington DC. For info call NESEA at (413) 774-6051.

The **eighth annual SEV96 Event** is scheduled to be in Boston in December. Contact Jack Groh at (401) 732-1551 for info or e-mail at GrohPR@aol.com.

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 to call Project Manager Bob Munroe (708) 858-7066 for the work schedule & notified. (Updated 12/95 & 1/96)

Task Description	%	\$	Time
Selection of car for conversion	100	---	7wks
Car procurement	100	550	8 hrs
Preliminary design	90	---	35hrs
Measurements of the as-is car, weight on	661	---	4 hrs
right front	689		
left front	421		
right rear	414		
left rear	1350		
total front	835		
" rear	2185	---	
TOTAL			
ride height			
Sell unused engine components *	100	97cr	1 hr
Clean engine compartment & paint.	100	---	1 hr
Install tow bar attachment	70	75	7 hrs
Repair body components: Steering wheel, RH door hinge, seat, ignition & door lock.	20	50	---
Paint			
Select major electrical components, motor	9"DC	1654	3 hrs
controller	Gel	100	
battery			
charger			
Modify suspension components			
Fabricate motor adapter plate, keep clutch	100	118	
Balance motor-transmission assembly			
Adapt engine mounts and install new motor. Reconnect drivetrain.	80		
Determine battery placement.	100	---	3 hrs
Fabricate & install battery racks	50		4 hrs
Determine power cable routing & install	20		2 hrs
(Information and table updated January 12, 1996. Work not started on page 2 items)			