

**Fox Valley Electric Auto Association
1522 Clinton Place
River Forest, IL 60305-1208**

Address Correction Requested

**NEXT MEETING: Friday, September 18 August 21 at 7:30PM in Room K-161 at The
College of Dupage SW Corner of 22nd Street & Lambert Road in Glen Ellen.**

**DISCUSSION TOPICS - 1. Member Ed Meyer will explain his battery charger
approach and design. 2. Open Topics.**

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 September will be \$ 4.

To obtain information about the FVEAA, you may contact either President Woods or Vice President Shafer:

President - Ken Woods
1264 Harvest Court
Naperville, IL 60564-8956
(630) 420-1118
E-mail Casa Zeus2@aol.com

Vice President & Editor - Bill Shafer
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River Forest, IL 60305-1208
(708) 771-5202
E-mail electric_bill@compuserve.com

SEPTEMBER, 1998 VEEPSEZ

President Ken Woods epistle for September was unavailable by deadline time. I would like to comment on the possibility of an 80% refund from the Illinois Alternate Fuels Rebate Program. An alternate fuel is something other than gasoline or diesel fuel. The most-prevelant choice will probably be natural gas. Other "fuels" include ethanol, methanol, propane, and electricity.

Cost is a significant barrier to many FVEAA members who would like to do a conversion. Our experience shows a project will cost \$ 6,000-7000, depending on the price for a car being converted. A maximum rebate of \$ 3,200 from the Rebate Program will make a project affordable to an individual who will end up with an electric vehicle that can substitute for a conventional car in most driving situations.

BILL

MINUTES OF AUGUST MEETING

The meeting at the College of DuPage was called to order by President Woods at 8 PM. Before the meeting, members inspected Fred Ketch's new Ford Ranger pickup. Twenty members and two guests attended. Dan Wier joined as a new member at the meeting.

After introductions, Ken noted there would be no treasurer's report due to Dale Corel's absence.

Member Fred Kitch offered comments about the acquisition and use of his Ford Ranger pickup that was delivered on the second week in July. It was manufactured in New Jersey and moved to Ford's only conversion facility in Detroit for equipping. The front end of the vehicle is usually used in an Explorer.

The vehicle has a 90 horsepower AC motor, 312 volt battery system made up 32 12-volt sealed cells that have a 3-year, 30,000 mile warranty that is prorated after the first year. All electric components are liquid-cooled and connect to a standard radiator that is also used for the air conditioning. The pickup is insured for the value of the vehicle.

Fred drives the EV on a 30 mile round trip to and from work. In the Economy mode It has a 45 mile range with regenerative braking. Top speed in the Drive mode is 75 mph and 65 in Economy.

Member John Emde reported on his inspection of the 1986 Ford Ranger that Rich Gloff has offered to donate to either the FVEAA or member who will convert the vehicle. Rich attended the meeting and participated in discussion of this item. He will make a decision later.

Member Dana Mock is moving from his home in Bolingbrook due to a medical problem. He has an estimated \$ 10k of FVEAA parts, equipment and miscellaneous items that need a new storage facility. Anyone interested should call President Woods.

Vice President Shafer assumed the gavel after the Break. Member Ed Meyer gave a presentation on the TRIAC battery charger design that is presently used for his Citicar, Nissan, Krajnovich's Dodge Omni and Shafer's Mazda RX-7.

The Citicar has a nominal 54 volt system from nine 6-volt batteries. The sketch on another page in this newsletter first shows the charger control signalling the TRIAC (black circle) to replenish a discharged battery in a constant-current mode. The second sketch shows the same charger in the off mode after battery is charged.

Ed noted the dual-mode charger delivers a set constant current until the voltage reaches the fully- charged level. It then switches to a constant voltage mode for a period and finishes with a 1/4 amp sustaining mode.

There was discussion of a safety feature to prevent withdrawing the charger ac plug while charging. This would produce unacceptable sparking at the plug. Various means of sensing plug position and turning off the charger electrically before the contacts reached the separation point. An optical sensor or microswitch arrangements were suggested.

The meeting adjourned at 10:50 PM

Submitted from the notes of

Bill Shafer

Will this Illinois Program provide money to help FVEAA members fund a conversion?
Does someone want to check it out?



Illinois Environmental Protection Agency
Bureau of Air

Fact Sheet

September 1998

Illinois Alternate Fuels Rebate Program

Q What Is the Alternate Fuels Rebate Program?

A The Alternate Fuels Rebate Program, authorized by the Alternate Fuels Act, 415 ILCS 120 et seq., as amended by P.A. 90-726 (Aug. 7, 1998) and codified in 35 Ill. Adm. Code Part 275, provides rebates for persons in the state of Illinois who (1) acquire an alternate fuel vehicle – "Original Equipment Manufacturer (OEM) Vehicle Rebate," (2) convert an existing conventional vehicle to an alternate fuel vehicle – "Conversion Rebate," or (3) purchase domestic renewable fuel to operate an alternate fuel vehicle – "Fuel Cost Differential Rebate." Any business, organization, or individual located in the state is eligible to apply for a rebate under this program.

Q What is the rebate amount?

A The amount of a rebate is 80 percent of the additional cost of acquiring an alternate fuel vehicle compared to the cost of the same type of conventional vehicle, 80 percent of the additional cost of the domestic renewable fuel compared to the cost of gasoline or diesel fuel, or 80 percent of the cost of the conversion. Only one type of rebate is allowed per vehicle. The rebate amount is limited to \$4,000 per vehicle. An applicant may apply for rebates for up to 300 vehicles and for only 150 vehicles at any one location. Any business, organization, or individual located in the state is eligible to apply for a rebate under this program.

Q How long does the program last?

A The Alternate Fuels Act establishes expiration dates for rebate application submittals. Applications for an OEM Vehicle Rebate and a Conversion Rebate will be accepted until December 31, 2002. Applications for a Fuel Cost Differential Rebate will be accepted until December 31, 2001. Approved applicants for a Fuel Cost Differential Rebate may receive a rebate over a three-year period provided the necessary documentation for rebate renewal is submitted the following two years to the Illinois EPA prior to the end of the respective calendar year. Call the Illinois EPA for a Fuel Cost Differential Rebate renewal form for the second and third year installments.

Q When will the rebates be issued?

A Applications will be reviewed and processed at the end of June and December of each calendar year during the effective dates of the program. Applications will be reviewed and prioritized according to the Alternate Fuels Act as they are received by the Illinois EPA. Applications not granted a rebate during a six month period will be carried into the next rebate period for consideration at the same priority level.

The rebates will be issued as funds become available in the Alternate Fuels Fund. Rebates will be issued on a semi-annual basis, and will be limited to the funds available at that time in the Alternate Fuels Fund.

Q Where do I get an application form?

A To request an application for a rebate or for assistance, contact Darwin Burkhart in the Illinois EPA's Air Quality Planning Section, Bureau of Air, at 217-524-4343. There are three different application forms for the three types of rebates. In requesting a rebate form, be prepared to identify which type of rebate you are interested in.

AIRFACTS

THIS COLLECTION OF HYBRID IDEAS WAS PUBLISHED IN THE JULY, 1998 ISSUE OF CAR AND DRIVER MAGAZINE. IT IS CONSISTENT WITH THEIR POLICY OF A TOUGH, IRREVERENT EVALUATION OF AUTOMOBILES

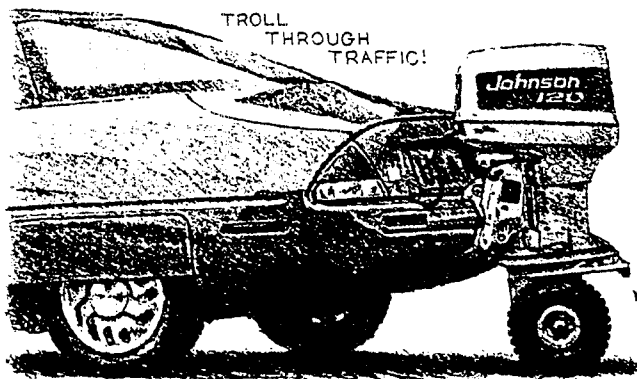
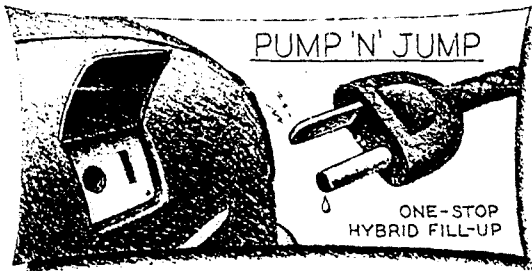
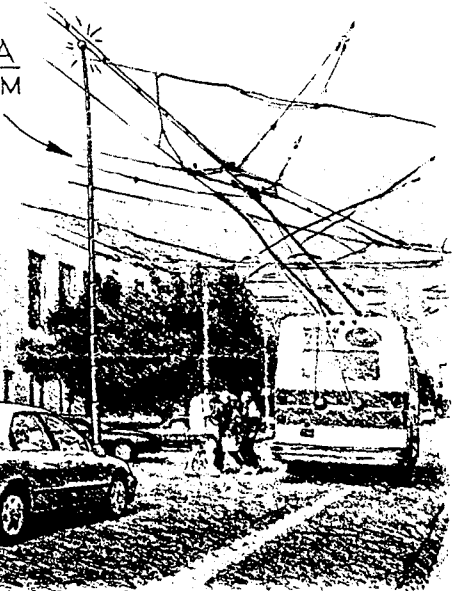
PAGE LAST LOW-BRED HYBRIDS

AFFORDABLE GAS-PLUS-ELECTRIC-POWERED CARS ARE JUST A SPARK AND A SPUTTER AWAY!

Substandard insights, vicious dog bites, fundamental smear jobs, the odd confession, assorted dogmas.

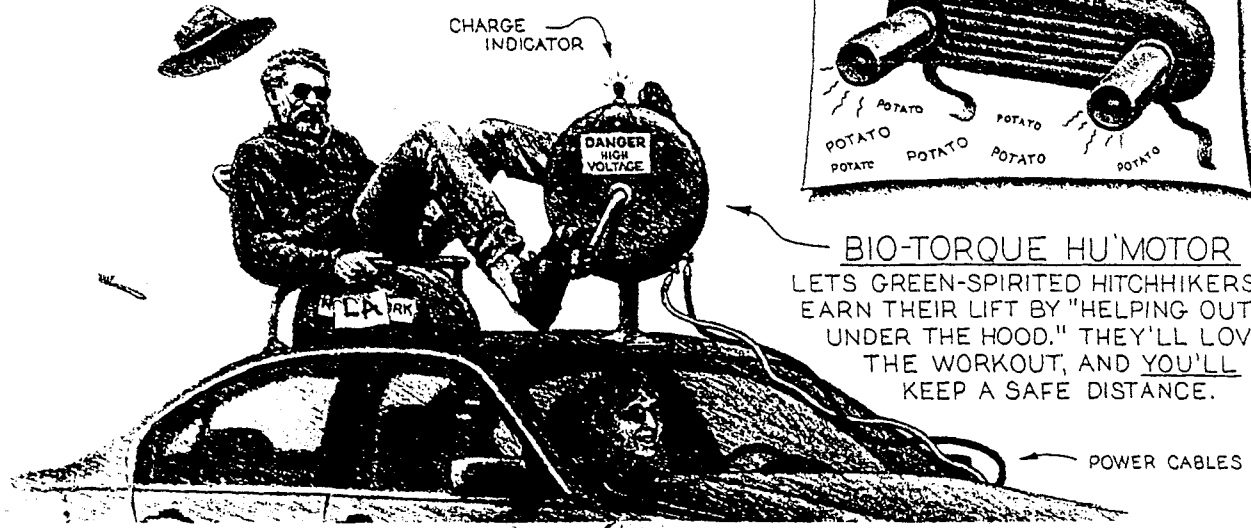
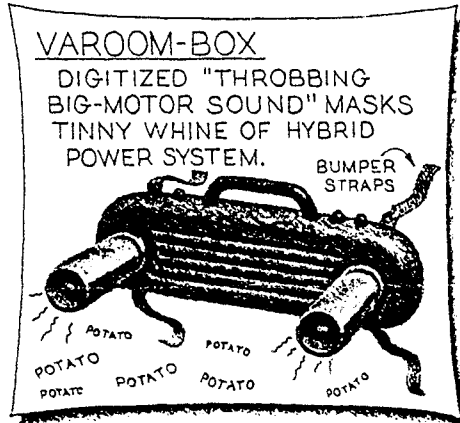
BY PIPPA GARNER

TWENTY-SEGMENT "AMP"-TENNA
HYPEREXTENDS TO LEECH POWER FROM THE LOCAL TRANSIT AUTHORITY FOR GRATUITOUS CITY DRIVING. WHEN CONTACT IS BROKEN, GAS ENGINE AUTOMATICALLY RESTARTS.



"EV"-TO-HYBRID UPGRADE KIT
DETACHABLE INTERNAL-COMBUSTION ENGINE INCREASES RANGE AND PERFORMANCE OF PURE ELECTRIC VEHICLE. NO MORE DEAD BATTERIES!

ALSO AVAIL AS ELECTRIC, FOR GAS CARS.



BATTERY INTERNAL RESISTANCE

Rick Lane, a member of the Ottawa, Canada EV Association in their August Newsletter pointed out that the internal resistance of a battery will have a noticeable effect on vehicle performance. He recently completed a conversion using Trojan T-875 batteries that are dimensionally the same as T-125 units. The T-105 or T-125 has been used for most conversions.

I had a similar experience when I increased the system voltage on my Mazda RX-7 from 72 to 96 volts. I substituted twelve T-875 batteries for the same number of the T-105 type used for the original conversion. Here is a comparison of T-125 and T-875 batteries used for a 96-volt system:

| Item | T-125 | T-874 |
|----------------------------------|----------|----------|
| Cell Ohms | 0.00124 | 0.00138 |
| Battery Ohms | 0.00374 | 0.00552 |
| # Batteries | 16 | 12 |
| Pack Weight -Lbs | 990 | 756 |
| Pack Ohms | 0.0598 | 0.0662 |
| Open Circuit Volts | 111.8 | 111.8 |
| IR Drop @ 100 A | 5.98 V | 6.62 V |
| -200 | 11.9 | 13.2 |
| -400 | 23.8 | 26.5 |
| Motor Volt @ 100 | 100 | 106 |
| - 200 Amps | 99 | 98 |
| - 400 | 88 | 85 |
| Power Loss (Watts) | | |
| @ 100 A | 598 | 662 |
| - 200 | 2392 | 2648 |
| - 400 | 9568 | 10592 |
| Mins @ 75 Amps | 75 | 132 |
| Energy Storage @ 75 Amps | 15 KWH | 9 KWH |
| Expected Range @ 400 wathours/mi | 37 miles | 23 miles |

Acceleration is largely unaffected. Motor terminal voltages for each battery type is almost the same for every current level.

Range is 60% less for the 8-volt unit compared with a 6-volt type.

The T-875 vehicle will weigh 234 pounds less. The batteries will occupy a space that is 20% less than the T-125.

Which to use depends on what is important for the project. Weight carrying ability of the base vehicle, weight distribution, and available space are limiting factors.

Less battery weight means less energy storage and range. Cost needs to be considered.

A look at the power loss shows why these batteries will heat during high currents. This is a good argument for a light foot on the accelerator pedal.

When it is time to replace the 8-volt units in my Mazda, I plan to evaluate OPTIMA Yellow Top batteries. These 12-volt sealed units have a 0.0028 ohm internal resistance.

Fred Kitch Drove his new Ford Ranger to Ed Meyer's hangar to have it weighed on the aircraft scales. It is the heaviest EV owned by a FVEEA member.

FOX VALLEY ELECTRIC AUTO ASSOCIATION
(FORD RANGER ELECTRIC VEHICLE)

Fred Kitch
171 East Burlington
Actual Weight and Balance
Model (2 Door Pickup)

SER. NUMBER: VIN 1FTZR107SWTA5770 Report Date: 08-21-98
CERTIFICATE NUMBER:
DATE OF MANUFACTURE: 1998
MAXIMUM WEIGHT: Maximum allowable Gross Weight = 5,467.00
Max. Gross Weight (Front) : 2,559.00 pounds
Max. Gross Weight (Rear) : 2,808.00 pounds

Completed Weight as weighed : No Passengers , No Payload

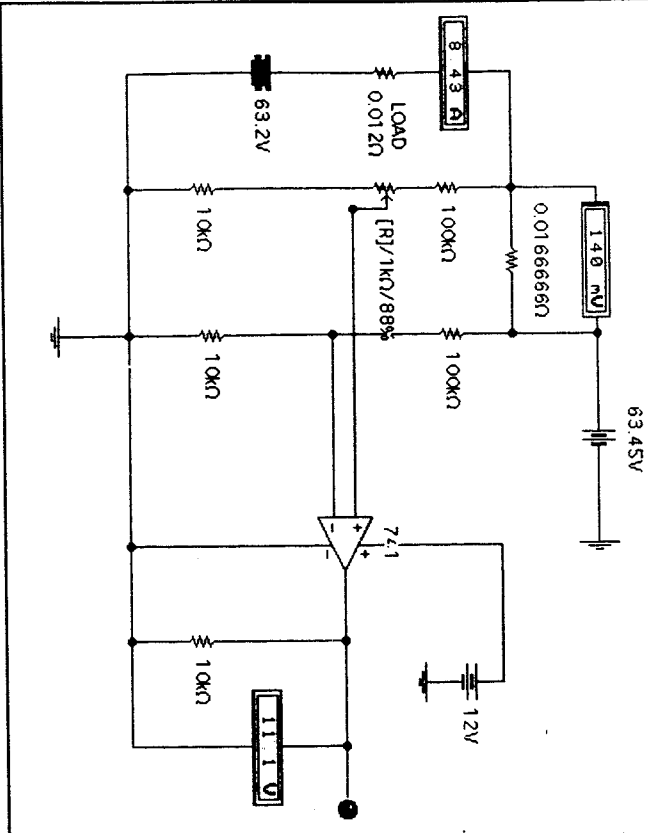
| | |
|-------------------|-------------|
| Left Front Wheel | 1239.0Lbs. |
| Right Front Wheel | 1178.0Lbs. |
| Left Rear Wheel | 1189.0Lbs. |
| Right Rear Wheel | 1203.0Lbs. |
| Total (T) | 4,811.0Lbs. |
| Allowable Payload | 656.00Lbs. |

GEOMETRY:
WHEEL BASE - AXLE-AXLE FRONT TO REAR = 111.60INCHES
WHEEL TREAD -Front Axle LEFT TO RIGHT = 58.60INCHES
WHEEL TREAD -Rear Axle LEFT TO RIGHT = 57.30INCHES

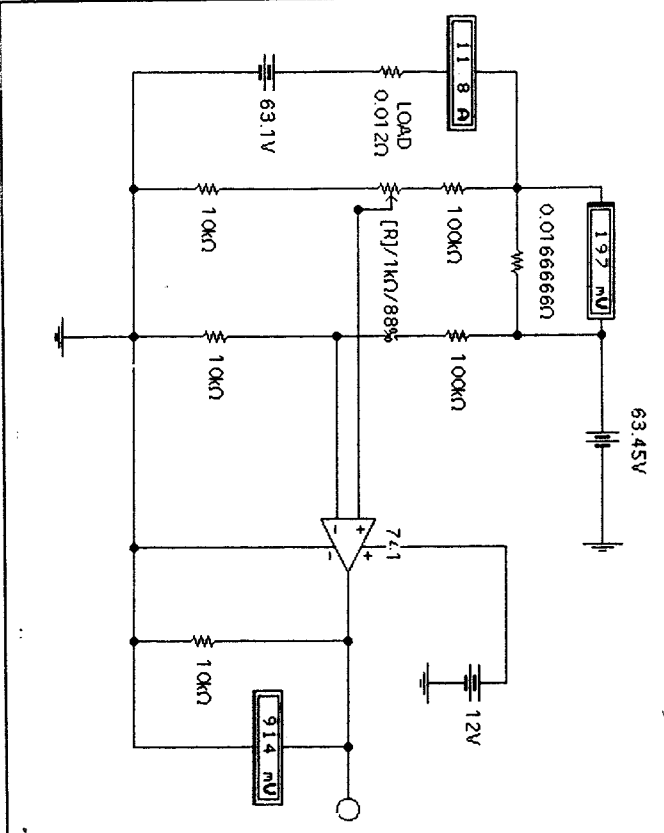
CENTER OF GRAVITY CALCULATIONS:

FRONT TO REAR Front Wheel Weight = 2,417.00Pounds
Rear Wheel Weight = 2,394.00Pounds
Center of Gravity = 55.53 Inches Behind Front Axle
LEFT TO RIGHT Left Wheel Weight = 2,428.00Pounds
Right Wheel Weight = 2,383.00Pounds
Center of Gravity = 28.70 inches Right of Left Wheel Base
Center of Gravity = 0.27 Inches Left of Centerline

Battery Charger for Citicar - Signal to TRIAC "on"



Charger for Citicar. Charger signal to TRIAC "off"





ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 Mary A. Gade, Director

Illinois Alternate Fuels Rebate Program

Instructions for Applying for a Conversion Rebate

The following information is for a person or business applying for a rebate for converting a conventional vehicle to operate with an alternate fuel. The conversion of the vehicle must take place in Illinois to be eligible for a rebate.

Applicant Information

If you are applying as an individual, you may leave the spaces asking for the name of the company, the number of vehicles in the fleet, the FEIN, and the number of employees blank. If you are applying as a business or organization, provide the FEIN, the number of vehicles in the company fleet and the number of employees at all locations throughout the State of Illinois.

Vehicle Information

Provide the make, model, model year, the date the vehicle was converted, the Vehicle Identification Number (VIN), license plate number, the State which the vehicle is registered and the vehicle's Gross Vehicle Weight Rating (GVWR).

Also include the emission certification standard of the conversion system or kit used to convert the vehicle. The following are the current standards in use: Conventional (includes the "Tier I" or Transitional Low Emission Vehicle "TLEV" standards), Low Emission Vehicle ("LEV"), Ultra Low Emission Vehicle ("ULEV"), Inherently Low Emission Vehicle ("ILEV") and Zero Emission Vehicle ("ZEV"). The emissions certification should be indicated on the paperwork associated with the conversion system or kit. It is possible that the conversion system or kit is not certified to an emission standard. In this case, the conversion must be done in accordance with U.S. EPA's Memorandum 1A (June 1974) provisions to be eligible for a rebate. A copy of this federal guidance memo is attached. **Memorandum 1A requires that the conversion of a vehicle to operate on another fuel not result in increased emissions versus the emissions of the vehicle prior to the conversion.** Check the space for "Memorandum 1A" if the conversion installer used an uncertified conversion system but converted the vehicle consistent with U.S. EPA's requirement that the converted vehicle not have increased emissions.

Check the appropriate space regarding who certifies the emissions of the vehicle. Indicate whether the conversion system is certified to one of the above emission standards by U.S. EPA or the State of California. Check both spaces if the vehicle is certified by both U.S. EPA and California. If it is not certified to an emissions standard but meets the Memorandum 1A requirements, check the space for the conversion manufacturer.

Record the Vehicle Emission Configuration Number (if available). This number is 8-characters in length and is adjacent to a bar code on the "Vehicle Emission Control Information," "Important Vehicle Information," or "Important Engine Information" label. This label should accompany a conversion

system certified by either U.S. EPA or by the State of California. If the conversion system is not certified, then place a "NA" for not applicable in this space. An example of one of these labels with the requested number is included in this package.

Conversion Information

Either the person that performed the conversion or the applicant must sign and print his/her name in the space provided. This signature certifies that the conversion system installed on the vehicle meets the U.S. EPA or California emissions standard indicated in the "Vehicle Information" section above or, if the conversion system is not certified, that the conversion was performed in accordance with and meets U.S. EPA's Memorandum 1A requirements.

Fuel Information

Indicate whether the vehicle is primarily fueled at a public or private fuel facility. For this program, a commercial fuel facility that is owned by a company or fleet to primarily refuel its own vehicles or provides access to certain vehicles will be considered a "public fuel facility" only if the company or fleet makes its fuel available for sale to the general public. If such a facility does not offer its fuel to the general public, it shall be considered a "private fuel facility."

Rebate Amount and Certification

Record the amount of the rebate requested. The amount of the rebate is 80 percent of the cost of converting the vehicle to operate with an alternate fuel, up to \$4,000. In addition, a copy of the conversion invoice showing the cost of the conversion must accompany the rebate application.

Example rebate calculation: Cost of the conversion (including labor): \$4,500

$\$4,500 * 80\% = \$3,600$ (amount of rebate requested)

If more than one conversion rebate is being applied for, make copies of the rebate application form. When completed, mail a separate application for each converted vehicle to:

**Illinois Environmental Protection Agency
Alternate Fuel Rebate Program #39
P.O. Box 19276
Springfield, Illinois 62794-9276**

If you have any questions, call Darwin Burkhart, Air Quality Planning Section, Bureau of Air at (217) 524-4343.