



August 2015 FVEAA Newsletter

Fox Valley Electric Auto Association

The FVEAA is a Not-For-Profit Illinois Corporation and the Chicago-area chapter of The Electric Auto Association

Next Meeting

Friday August 21, 2015

Community Christian Church

1635 Emerson Lane
Naperville, IL 60544

[Google Map](#)

Agenda

- 6:30 p.m. Doors Open
- 7:00 Call to Order, Welcome and Introductions
- 7:15 Old and New Business, Committee Reports
- 7:25 Presentation: Bruce Jones - News from the World of Electric Vehicles, Bruce Jones – Update on Hupmobile PHEV
- 7:35 Presentation: Ted Lowe - Update on Dodge Dakota conversion
- 7:50 National Drive Electric Week planning
- Break
- 8:30 Presentation: Rich Carroll - 2015 Pikes Peak Electric Vehicle Race Results & What you Need to Know About Hacking Car Communication Systems
- 9:15 Close

President's Words

Bruce Jones

Hi Everyone,

The National Drive Electric Week Events are coming along!

The team led by Rich Hirschberg has held 3 conference calls on July 21, Aug. 4 and Aug 18th to plan for the TWO events and there will be PLENTY of publicity thanks to efforts by Jim Schmidt and team. The next conference calls are on Sept 1st and 8th.

ALL HANDS ON DECK! We need everyone to bring their electric vehicles and conversions these two dates Sept 13th and 20th to the Naperville Test track 1720 W. Jefferson Ave. Naperville. Set up starts at noon for both events and it's open to the public from 1:00 to 4:00 p.m. Pizza afterwards for the staff and those who show their cars!

LOCATION: [Naperville Test Track Map](#)

This Friday we have multiple presentations including updates by Ted Lowe on the Dodge Dakota conversion from Lead to Lithium, and Dr. Rich Carroll's review of how electric vehicles fared at the 2015 Pikes Peak race.

Rich will also bring us up to speed on the state of vehicle Hacking, and what we need to know about our car communication systems. Rich has been on the radio - AM station 89 WLS speaking about this lately with Paul Brian on Saturday morning radio shows.

ELECTIONS COMING

The annual elections are coming up at the September 18th meeting, so nominations will be opened at the this August 21st meeting.

Current Officers

| | |
|-----------------|------------------|
| President | Bruce Jones |
| Vice President | Rich Hirschberg |
| Secretary | Open |
| Treasurer | Jeffrey Miller |
| 3 Board Members | |
| | Dr. Rich Carroll |
| | George Hiller |
| | Jim Schmidt |

Hope y'all have had a great summer!

See you Friday!
Sincerely,
Bruce

FVEAA is on Facebook - Like Us!

Grant Gerke

<https://www.facebook.com/FoxValleyElectricAutoAssociation>

Rich's Ramblings

Rich Carroll

Hacking - What you need to know

This month's news has been full of stories of hacking, some automotive, some transportation related, some simply Internet of Things (IoT) related. What does this mean, what should you be aware of, and however do we solve these problems?

If you prefer to start with an audio lesson, listen to the last two weeks of Drive Chicago at <http://www.stationcaster.com/stations/wls/?d=AM&cid=5781> and listen to the programs on 7/25/15 and 8/1/15. For those who don't have access, or choose to read, a summary statement would be,

“Computers or electronic devices that were originally intended to work on their own, are at some risk for hackers gaining unwanted access through wireless signals in order to do something the device owner doesn't want.”

Perhaps a few examples would help. Last week saw a broadcast TV story about hackers who were able to control a Jeep without the owner's permission, and parked it in a ditch despite the owner flailing at the steering wheel and brakes with no effect. Hackers have been able to connect to a Tesla Model S remotely and turn it off, despite the owner's wishes. Even your e-skateboard has a news story about hackers remotely controlling it. Actually, there are apprentice hackers working on television controls, refrigerators, home thermostats, and many other devices that offer remote control or remote reporting. If you thought your precious toaster was likely immune, keep in mind that the apprentice hackers need something to practice on. The real worry is that with all the hacking information available, how secure are our online servers that we think of as “in the cloud.”

The answer is that any device that can be connected to the internet (via WiFi, analog cellular signals, digital cell signals, bluetooth, NFC (near field communications), cable entertainment providers, satellite, optical streams, and many more.) may be at risk.

Here is the problem. Many of these devices, like your digital alarm clock, and any car built in the last 20 years were designed to be a complete system all by themselves. While a few of these systems have some central processing computer chip, many do not. These older systems were not designed to repel hackers, but even worse, without a central processing chip, there is no PRACTICAL means of protecting these systems. That nice German engineered marvel behind you as you drive to work has several hundred nodes in their electrical system, some transmit signals, some receive and act on signals, some do both. The nodes are simply known by almost descriptive names:

Tightn_Motor_Upr_Lmbr_Supp_Driv_Seat

RR_Hi_Outpt_Red_Brk_Lamp-2

Crtsy_Lt_Swtch_Cntr_Cnsl

Absolut_Full_Applic_Brkg

... and they are all wired together.

Let's take a trip back to 30 years ago. The commands to operate that car behind you are all electric signals passed on a common bus. Only the correct device is supposed to respond to appropriate signals. If you can introduce signals to the bus, you can read what is going on and you can issue commands to change what is going on. In cars and light trucks the CanBUS system was well designed for resisting electrical and mechanical interference, but when designed (in the early 1980's) **it was designed that it would be completely isolated. Completely isolated means there were no possibility of outside connections to that system.** The only outside connection permitted in the CanBUS specification was an OBD-II port under the steering wheel. The CanBUS system had one connection where service personnel could see trouble codes, reset devices, and run diagnostics. That device was designed into the CanBUS system as a short term connection in a mechanic's hands. It was designed as a hard wired, non-radio connection.

Fast forward to 2009, and the introduction of bluetooth dongles into the original OBD-II port. We created devices that bridge the isolated CanBUS system with a bluetooth radio. We can now send commands to the CanBUS system from up to 30 feet away (max range for bluetooth receivers) There are several really neat apps for phones that can use the phone display (or many tablets for that matter) for alternative gauges, and apps like Torque make creating gauges a five minute task. You want gauges for boost, distance to empty, current system voltage to several decimal places, and more, simply create a gauge in the app. Beware, if you leave the dongle in place for your gauges, the car next to you can use bluetooth to pair with your system and issue commands (like Absolut_Full_Applic_Brkg if your car uses a drive by wire brake pedal),

Fast forward again to 2014, and we find that car radio systems are no longer simply a question of AM or AM/FM, but frequently include a phone interface, several entertainment input options (USB ports or memory card slots), and perhaps a WiFi hotspot. Most of the larger car companies do not write the software for their entertainment/radio/phone/hotspot equipment. They have one of the major radio companies create and manage as system for them. Harman-Kardon, Bose, Bang & Olufsen, Boston Acoustics, Rockford Fosgate, Mark Levinson, and others create the entire info-tainment system. Each of these systems uses fairly well engineered firmware to balance the various sound levels and create a user friendly interface for muting the sound system when a call is answered. And especially Harman-Kardon has had several issues with very poor bass performance in Dodge Challengers. Harman Industries, the parent company, has made the firmware easy to upgrade using the WiFi hotspot. Unfortunately, they have allowed anyone to upgrade the firmware, and that allows the first stage of a two stage hack. In the first stage, hackers easily upload firmware that allows the hackers immediate access to CanBUS commands. (the newest hacking firmware not only allows the hackers access, but prevents the update of the firmware by Harman (or the car manufacturer, Fiat-Chrysler.) Once the new firmware is uploaded, Chrysler can't even get the system back, unless you go into the dealer. And in stage 2, commands can be sent to the car from any internet connected device. This not only means a precocious 13 year old child in school, learning to hack, but includes folks on the other side of the globe, from

satellite phones, and even from the International Space Station. This is the hack that was demonstrated last week, showing the Jeep with no operator ability to stop the vehicle from driving into a ditch.

And you wonder how many cars this might involve. Last week Chrysler recalled 1.4 million cars that are involved. Again, last week, a hack to GM vehicles was shown through their On-Star cellular connection. While the hack has been known (The Chrysler hack has been known for almost a year) for some time, GM still doesn't have any correction, or new firmware to use. Yesterday, there was an announcement of a Tesla hack.

In addition, the sources of energy for cars have also faced hacks to their distribution network. This applies to gas pumps, as noted above, and smart meters for electricity. Smart meters have had several different hacks, and this is not new, this has been ongoing for at least four years.

So, you can't write new firmware for your car info-tainment system, what can you do? **Here are some important tips:**

- Do not connect additional radios and equipment through the OBD-II port (even if some paid TV personality tells you you can save money)
- Be aware of what hacks are out there and if they could affect a piece of equipment you use.
- Be aware of hacks that pertain to cars owned by family and friends. I almost guarantee grandma doesn't want to take her car in for a computer reflash. She likely doesn't understand what it is, and thinks she won't be able to explain it. She hasn't seen any problems with the car, and grandpa always said, "Don't fix what ain't broke yet." Explain to grandma that this is important. Offer to take the car in for her, this is an critical issue.
- Make sure any computer updates that have anything to do with security, come directly from the manufacturer. I would not even trust the big box auto parts store, as you don't know their source of supply. Also, be firm that your car or appliance be updated as soon as possible. Some dealers will want you to postpone this, claiming it isn't really much of a threat. Do not accept this excuse, the dealer is trying to avoid having 50 - 100 cars come in at the same time for a firmware upgrade or a system 'flash.'
- Dealers really dislike the responsibility of 'reflashing your system.' Here is why: It takes them more than fifteen minutes to write up the work order and drive your car into the shop. Add to that the time needed for making the appointment, etc. and you likely have an hours total time involved in the process. All the manufacturers have a fixed policy of allowing 0.2 hours of billable time in reflashing the system. That 0.2 hours is 12 minutes. Likely by the time the dealer has 12 minutes invested in the project, he hasn't even driven your car. In addition, many dealers give a free wash to every car that comes into the shop. Be firm, and let them know you want it in right now. Explain that you'll keep calling if they don't make an immediate appointment, further taking their time. That's the last thing they want. Don't feel sorry for the dealer, they took thousands of dollars when they sold that car. Oh, and ask about the free wash to make up for your inconvenience. After all, the manufacturer is at fault for creating a car that was open to compromise. Most dealers realize that if they take good care of the customer after the sale, they will come back to that dealer again.

For background reading:

<http://www.wired.com/2015/07/hackers-remotely-kill-jeep-highway/>

<http://www.cnbc.com/2015/08/06/hackers-take-control-of-a-tesla-model-s-and-turn-it-off-at-low-speed.html>

<http://www.techtimes.com/articles/75022/20150807/hackers-now-hack-electric-skatebord.htm>

<http://www.wired.com/2015/03/hacked-fridges-arent-internet-things-biggest-worry/>

http://tech.slashdot.org/story/15/08/08/0558207/hackers-actively-targeting-gas-pumps?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+Slashdot%2Fslashdot+%28Slashdot%29

<http://www.carcomplaints.com/news/2015/onstar-hacked-tesla-hacked-chrysler-hacked.shtml>

<http://krebsonsecurity.com/2012/04/fbi-smart-meter-hacks-likely-to-spread/>

This Month's Presentations

- Bruce Jones will provide updates in the world of EVs and conversion of the 1930 Hupmobile Street Rod into a plug-in hybrid electric (PHEV) at John Emde and John Jeide's Build-EV facility.
- Ted Lowe will discuss the next steps to convert his Dodge Dakota to Lithium and upcoming work sessions
- National Drive Electric Week is nearly upon us - Sept 12 through 20 - so before the break, we'll discussing these two major EV promotional events. Plan to bring your EV!
- Featured presenter, Dr. Rich Carroll will update us on how EVs placed in the annual Pike's Peak race to the top of the mountain, and then discuss what you need to know about HACKING! The latest hacks, breakthroughs and (break-ins?) in car communication systems

Membership Update

Ted Lowe

We currently have **84** paid-up members, 3 down from last month. We live in a large metro area with 8 million people and EVs are the latest buzz so we should be able to grow the FVEAA! **Please invite your friends, neighbors, family, colleagues**, etc. to FVEAA meetings and Events. Volunteer to attend Events on behalf of the FVEAA (with or without an EV)! Your ideas on how to help grow the FVEAA are welcomed at anytime, thanks! Howard Hansen had a **great idea**... giving an FVEAA membership as a gift!



FVEAA Membership Report

as of 2015-08-17 04:58:06

Count of Members by Type

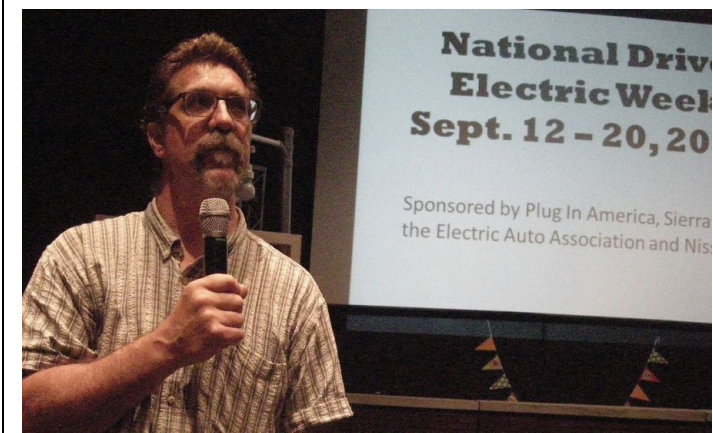
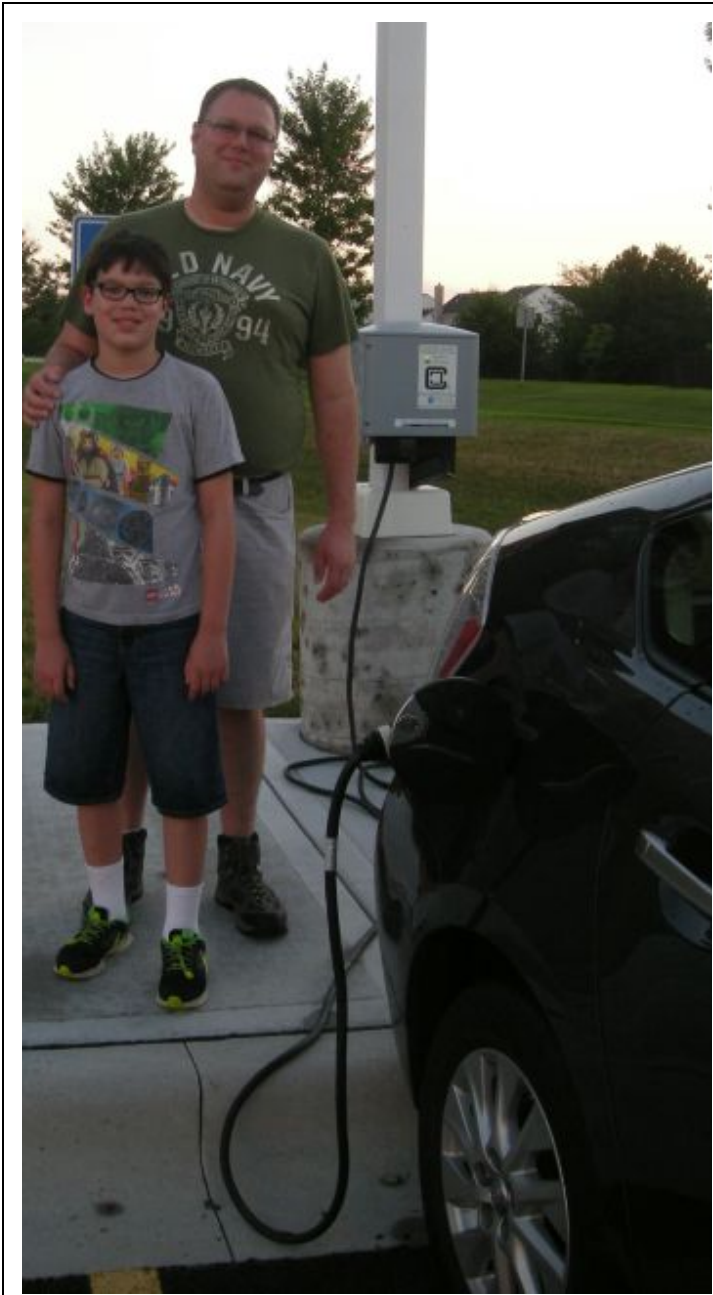
| Membership Type | Count | Paid Up |
|-----------------|-------|---------|
| BusinessPremier | 1 | 1 |
| BusinessStd | 5 | 5 |
| Family | 9 | 9 |
| Individual | 66 | 66 |
| LifetimeInd | 3 | 3 |
| Totals | 84 | 84 |

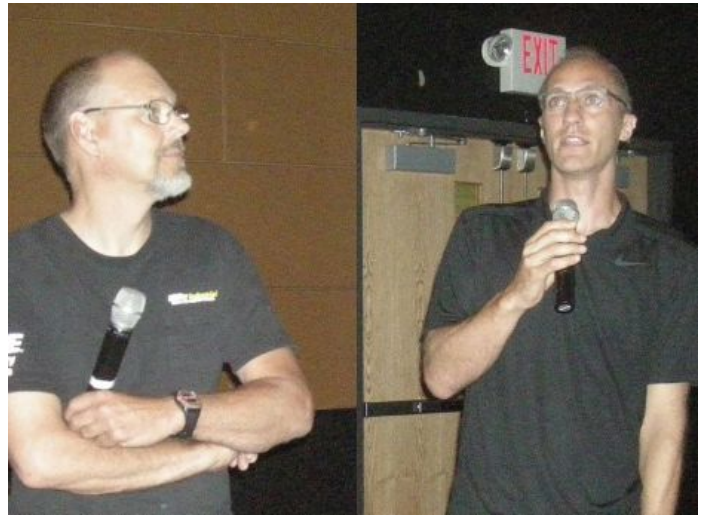
Other Statistics

| Statistic | Value |
|-------------------|------------|
| % Paid Up | 100.0% |
| Avg. Paid Up Days | 155.5 days |
| % With Email | 95.2% |

Photos

Bruce Jones





Meeting Minutes

The July meeting began at 7:05 p.m. and president Bruce Jones had members of the audience introduce themselves. We reviewed last meeting, and mentioned John Emde's and John Jeide's Build-EV facility at 840

Brian Drive, Suite A, in Crest Hill
Old Business
New Business

EVVCON

A clip board was passed, and those interested in attending the 2015 EVCCON – EV Conversion Convention, Cape Girardeau MO September 29 to October 4 signed up.

NDEW SEPT 13 and 20 !!

Rich Hirschberg discussed National Drive Electric Week goals and planning efforts. We are attempting to do something we've never tried before – having a ride-n-drive on two successive weekends, Sept 13th and 20th as proposed by Jim Schmidt. We're stretching ourselves a bit, but going to give it a try, with heavy promotions in the media, with signage and radio station coverage – like WBEZ free airtime however it is very competitive.

Send Jim contacts for media and so forth.

NDEW LOCATION

Naperville Test Track 1720 W Jefferson, Naperville, IL

Preliminary Media Show Sun. Sept 13th

Full Show Sun Sept. 20th

Set up 12:00 noon to 1:00 p.m. Open to public 1:00 – 4:00 p.m. Take down and pizza 4:00 – 5:00 p.m.

FEATURED PRESENTATION

Mike Willuweit and George Hiller presented on Limits of a Warp 9 Motor using Lithium Batteries. George and Mike gave an excellent set of presentations on the electrified Porsche 944 and what can happen to an electric motor from over-revving and /or overheating situations using Lithium batteries

The meeting adjourned at 9:25 p.m.

Membership Form

Ted Lowe

FVEAA Membership Application Form - Version 2014-01-01

Name: _____

Address: _____

City, State Zipcode: _____

Phone: _____ Phone Type: Home ___ Work ___ Cell ___

Email: _____

Please check one: New Member _____ Renewal _____

How did you hear about the FVEAA ? _____

Membership Types and Annual Dues (please circle one):

| | |
|------------------|-------|
| Individual | \$20 |
| Business | \$100 |
| Premier Business | \$250 |
| Charter Business | \$500 |

Newsletter Delivery Type (please circle one): No Newsletter Electronic

Please make checks payable to "FVEAA" and postal mail it with this membership application form to:

FVEAA
PO Box 214
Wheaton, IL 60187-0214
Attn: Membership

FVEAA Business Members

Bill Jacobs

Bill Jacobs BMW

Nancy Chafin, Marketing Director
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Web: www.billjacobsbmw.com

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