FIVE YEARS OF OWNERSHIP

An Engineer's Long Term Evaluation Of His Own Chevrolet Volt

Editor's Note: Michael Natale gave me an enlightened overview a couple years ago about his Chevrolet Volt. I recently asked Michael to write a long-term critique of his electric/gas Chevrolet Volt sedan. Read on for an in-depth, first-person account of a domestic Hybrid automobile.--Bill Wurzell

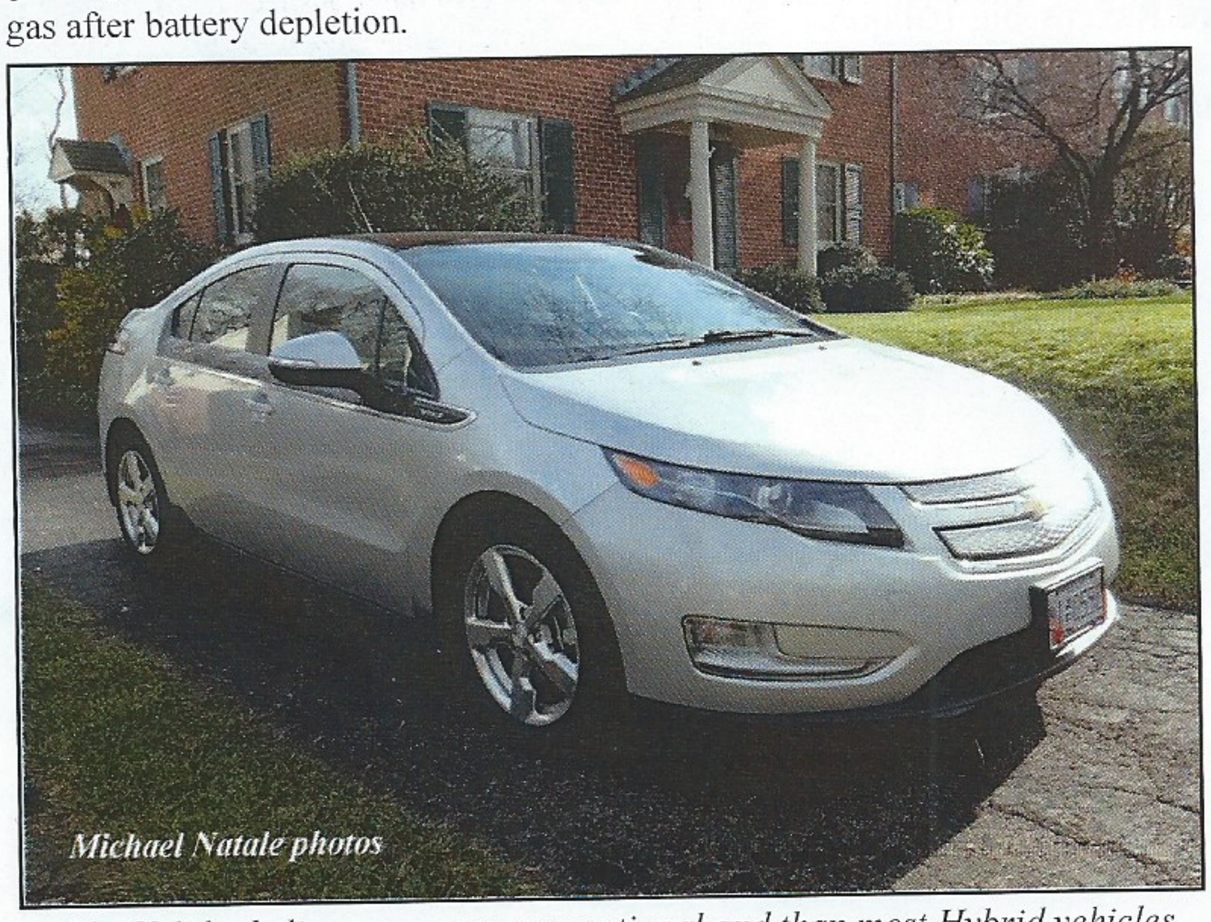
By Michael Natale, Chesapeake Region, AACA

As the fifth anniversary of ownership of my Chevrolet Volt approaches, it seems a good time for a retrospective on the electric vehicle experience. Having ordered my car well before the Volt was due to be available, I took delivery of the first unit sold by Sport Chevrolet in Silver Spring. The Washington suburban area was one of only five regions where the Volt was initially offered. I had traveled to Silver Spring from my home in Towson in July of 2010 to make personal inquiry about the ground breaking vehicle, by chance arriving on the first day they had ordering information available. Being very impressed with what I heard and having checkbook with me, I placed my order. It was not until December that the first production cars were released and I received mine on December 19, serial number 56. Jay Leno received serial number 9 on the same date. In one of his on-line videos Jay says he drives his Volt regularly, charging it at the largely solar powered 'Leno's Garage.' There's no better testimonial than that from the ultimate car guy, and a good friend of President Paula Ruby!

Those of us who received one of the first 100 units were surprised later to receive a hard bound book detailing the Volt development, with forward by the legendary Bob Lutz. It had a pocket in the back cover containing a 'Flip Cam,' for recording our Volt experience, I guess.

For me, the Volt has provided an overwhelmingly positive experience. First, it is a pleasure to drive, offering nimble handling in a midsize package with the very solid feel of a larger car, probably due to the combined weight of an internal combustion engine and a electric drive battery pack. There is excellent pedal response from the electric motor which is rated at 150 horsepower, but also offers 249 foot pounds of torque. The high torque is immediately available at zero RPM, making highway merging and lane changing effortless. Additionally, winning the (very) occasional drag race from a stop light against some noisy pocketrocket is quite satisfying!

Fuel cost saving, both electric and gas, is another satisfying feature. Just a few words about how the Volt operates: Propulsion is entirely electric from full battery charge until depletion of available charge, then the car becomes a hybrid electric/gas in a seamless, hardly noticeable transition at about 40 miles range (less at cold temperatures and with hard driving).This means that no gas is used at all if recharging can be done before the 40 or so miles. In the hybrid mode (Chevrolet calls this extended electric range.) The internal combustion engine drives a generator that powers the electric propulsion motor. My experience has been about 80% all electric and 20% hybrid driving. Most of the latter takes place on out of town trips, which can be taken with no limit using the range extending gas engine. There is no so called range anxiety since you simply continue on gas after battery depletion.



The Volt body lines are more conventional and than most Hybrid vehicles

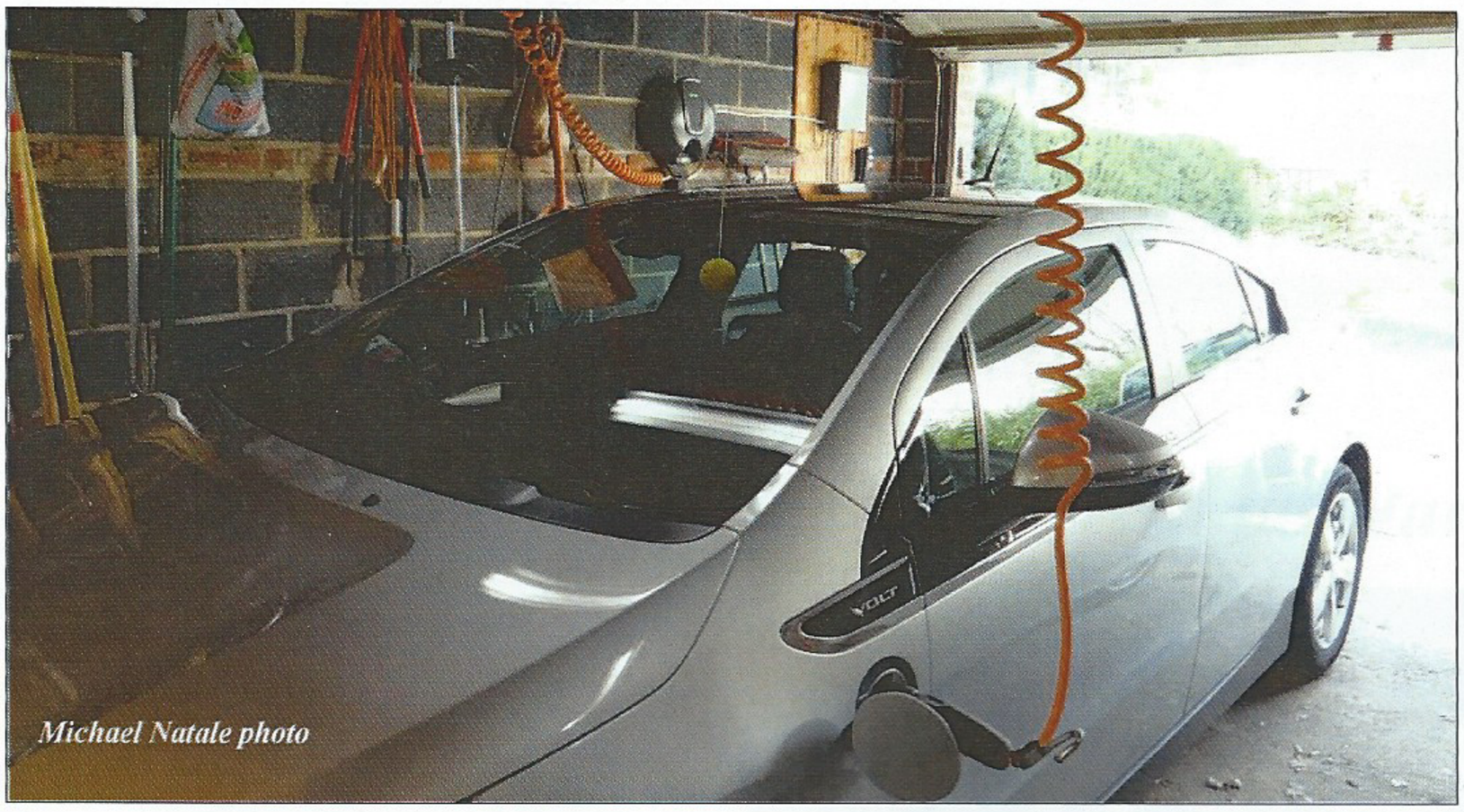
Dash view shows two digital screens and array of touch sensitive controls in center stack.Visibility is as good as any car in the intermediate size.

Regarding fuel economy, I have obtained 39 to 40 MPG in hybrid mode and have calculated electricity cost of less than $.05 per mile for allelectric mode, both much better than my most recent gasonly fuel costs. I continue to experience Chevrolet's advertized battery range of approximately 40 miles even after five years and 38,000 total miles. I believe this is due to very careful design of the propulsion battery system, which is both cooled and heated when necessary to maintain an operating range between 25° F and 95° F; a range determined to be optimal for Lithium Ion battery technology. On cold winter days the gas engine powers the car and warms the battery, getting it above 25

Continued to page 11

'FIFTY...not forty!'

***RECEIVES 50-YEAR MEMBERSHIP PIN**--In the December edition of The Chesapeake Bulletin, the caption under the above picture incorrectly stated Eleanor Packard was receiving a FORTY year pin from AACA President Don Barlup, however, it should have read: **FIFTY YEAR MEMBERSHIP PIN**. We contacted Eleanor and apologized for the typo; the Bulletin profoundly regrets the error.--Bill Wurzell*



Michael Natale photo

Michael's Volt charging, note 240 volt charger on wall and plug hung from loft for easy access

Continued from page 1, Michael Natale's Chevrolet Volt...

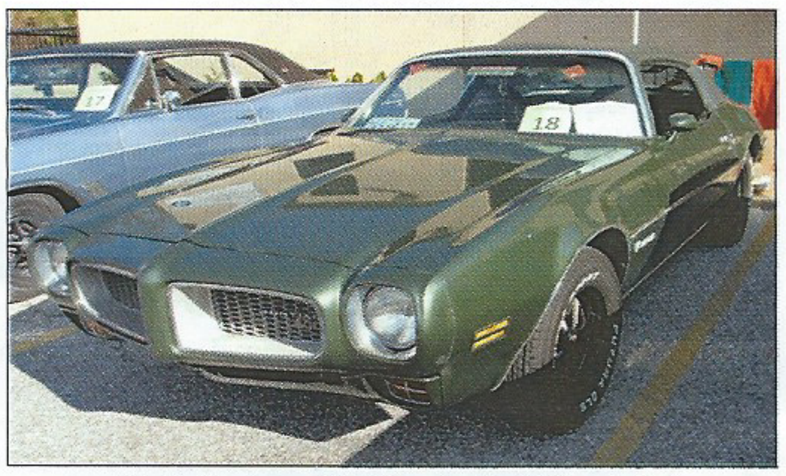
degrees. On very *hot* days the air conditioner runs to cool the 6,000+ Lithium Ion cells that comprise the battery pack.This is done using a liquid temperature control loop, to which the AC and an electric heater are linked. In fact, the car has four separate cooling/heating loops: this one for the battery, one for the charging and the inverter system, naturally one for the gas engine, and finally a fourth for the two electric drive motor/generators. These are contained in a transmissionlike unit mounted to the gas engine and are cooled with transmission fluid, just like an automatic transmission. This unit is designated 4ET50, also in the same manner as a GM automatic. I believe this system represents an engineering *'tourdeforce'* by Chevrolet and is key to the very reliable and extendedlife electric vehicle that the Volt has proven to be.

It is apparent that I am very pleased with my Volt, but there are some negatives that need to be mentioned. It has been to the dealer for two 'customer satisfaction programs' (note they were not recalls!). The first was for installation of added side bracing to the battery after the well publicized occasion of a fire when the NHTSA performed a side crash test and did not discharge the battery after the crash. This extra protection is a good thing, but the general view is that if the battery had been discharged per usual safety protocol, like emptying a gas tank that might leak after a collision, the current leakage that led to the fire would not have happened. The second program was to modify a computer program so that, if a car is left powered on in a garage with a depleted battery, the gas engine will not run for an extended time trying to maintain a minimum charge, thus causing a carbon monoxide hazard.This apparently occurred, though without injury, when the owners ignored the loud horn blast warning that the car had not been turned off upon exiting the vehicle. This is one of the many alert signals, usual in modern cars, generated by the extensive computer programming operating the Volt systems. I have read that there are about 10 million lines of code in the car's computers, a seemingly large number but one that is only about twice the size of code in any modern gas powered car! In a more stark comparison, the Volt shares a garage with my 1965 Corvair which, except for the transistor radio and alternator diodes, has NO electronics, let alone computers!

Two other areas have caused myself and other owners some concern. Rear seating is comprised of two buckets and is rather confined due to the battery placement down the center of the car. My grandchildren have enjoyed the individual seating, but they too will soon outgrow the area and feel quite cramped. A second complaint is about the extensive use of touch sensitive (tactile) buttons for dash controls, which require that you look where you place your hand or risk inadvertent switching. This is distracting for a driver and has many times made me nostalgic for the old, lowtech buttons and levers. Both of these areas have been addressed in the second generation 2016 Volt soon to be offered for sale. Though there remains extensive electronics (the 'infotainment' section takes up more than half of the users manual), there are more knob controls for the likes of heater/defroster and radio. The rear seating has been made into a bench for three people, though the center seat is over the battery and still offers little leg room.

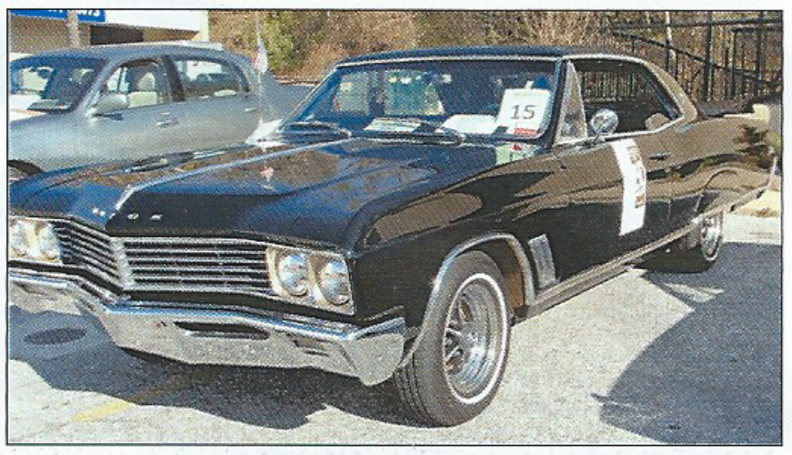
Overall I have much enjoyed Volt ownership and highly recommend this extended range type electric vehicle. The exhilarating driving experience and excellent fuel economy, with its beneficial environmental impact, make Volt ownership very satisfying. Even after owning the car for nearly five years, it still feels like a fresh experience each time I drive it.The second generation Volt and a host of other electric vehicles now available are improving the experience of gasfree or reduced gas driving even further.

Franklin Gage's '57 Chevrolet 4 door hardtop

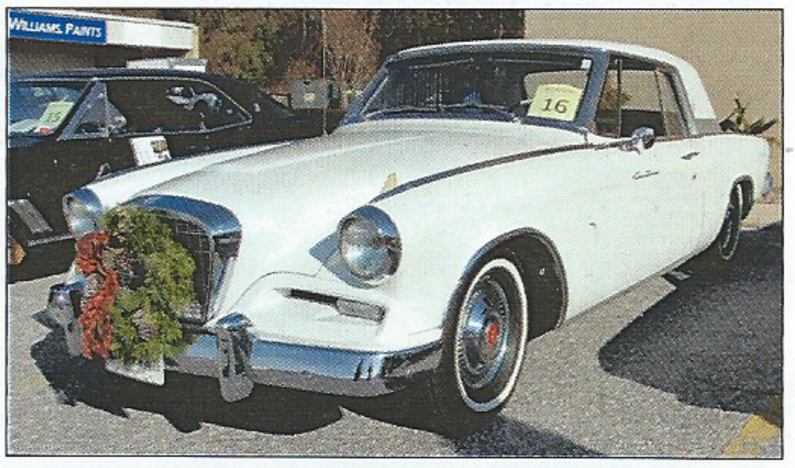


Rich & Anna MaCauley's 'Elfmobile'

Jim Ritter's '66 El Camino with Christmas tree!



Harold Hopewell's 1967 Buick Skylark



Dan & Darlene Sicca's '62 Studebaker Hawk GT

Ryan Allen's 1969 Chevelle