

The Alternative Line

by Joe Holzer for CNY-PCA Redline Report Copyright 2013 <http://www.holzerent.com>

PT Barnum was right

Hi folks; sorry I have been away so long. Personal issues. But I've been around – just under the radar. I have noticed a disturbing trend, which seems to be pretty widespread; the belief that if you say something loud and often enough, that it becomes fact. Where it has become especially dangerous has been when people who ought to know better, those referred to as “lawmakers”, make outrageous statements which have no basis in truth, an all too familiar refrain from last fall's Republican hopefuls at the least. There has also been a lot of hype about “HHO”, supposedly capable of improving fuel economy and the environment, and found on chat boards all over the internet. Proving how little you can trust on the internet. Since I did a demonstration of the facts, and fallacies, of HHO before it was called that, while I was studying engineering at Clarkson back in the Pleistocene, I feel I have some foundation for this expose.

OK, scientific fact: Hydrogen, which is a potential fuel, can be obtained by electrolysis from water, the concept of HHO. That requires more energy than could be gotten back in the form of useful work from combustion of that hydrogen in any engine, especially since all internal combustion engines convert less than 50% of their available BTU energy potential from any fuel into mechanical work - the rest is lost as heat. Now it is possible that you could use that heat if it is winter in CNY, but the root issue here is that you must in ALL cases input more energy than you can get out. It's called ENTROPY, and there is no such thing as negative entropy, as would be necessary for a perpetual motion machine, which is what the HHO is purported to be. It's not, and never could be.

However, another fact is that it is conceivable that you could use the energy you get from some other source, say for example Natl Grid, to generate enough hydrogen to allow small commutes if you also compressed the H₂ into a storage means you could transport. That would functionally duplicate the process of an electric vehicle, which also would produce no "emissions" AT THE VEHICLE. But, like the batteries for those electric vehicles, there are adverse emissions SOMEWHERE in the energy production - perhaps not at the tailpipe, but somewhere along the line.

As some of you might be aware, Porsche has developed a supercar, called the 918, which is a hybrid. Porsche is not stupid, by any means, so one would think that if HHO could provide benefits, it would be there. It isn't, because it would be a waste of effort. And even the concept of using H₂ as an alternative fuel was not used because there are tons of problems with the handling, storage, and accident potential of H₂, to say nothing of the lack of distribution infrastructure, the key problem now for full electric vehicles made by anyone, such as the Tesla and Fiskar concepts. Once the batteries are depleted, the recharge time is simply unacceptable at any price.

The ONE possibility for HHO produced at a stationary location and stored for mobile usage in that scenario, though, would be if you reached the limited range of the H₂ capacity onboard, you could conceivably run on gasoline if you had some in another tank, thereby making a conceptual “hybrid” of any existing gasoline-only vehicle. Maybe. That would require separate fuel metering for each of the fuels, with shutoff as each is not being used. Conceptually, that would require little more than a relay and valve combination in the fuel stream, something every gasoline car made today uses for its fuel injection. The killer problem is the metering of the fuel. Assuming you effectively pulled the fuse on the electric fuel pump found on almost every new vehicle today, it would take only re-insertion of the fuse for that system to work with gasoline again. But metering of the H₂ would be far more of a problem, as it must meet a similar stoichiometric ratio (the proper mix of air and fuel for efficient burn) with the incoming air in order to work properly. Because H₂ would be a gas at the individual piston in the engine, it could be set to flow at essentially a "rich" condition all the time, which would assure nearly the maximum power output from the engine, but you would waste a HUGE amount of H₂ when the engine ran at low load, which is MOST of the time. But if you set the metering for that instead, it would take a week to get 0-60 at wide open throttle. So to properly avoid wasting more than half the H₂ you produced away from the vehicle in the first place, you would have to have a form of Flex Fuel capability.

Cars made as Flex Fuel today simply have engine control computers (ECU) which adjust the metering based on feedback from the O₂ sensors used for emissions on all vehicles, but those systems are typically limited to the gasoline mixes of between 0 and 15% ethanol blends found in the distribution system today. They cannot work, for example, with mixes less than 85% gasoline itself. And in any case, those fuel delivery systems could not meter enough H₂ through the current injectors, as the H₂ must be at elevated pressures which would freeze the injector if it even COULD handle the H₂ upstream pressure, which they cannot. So a completely duplicate function and ECU would be needed to make the H₂ as a fuel work. And the volume consumed would be HUGE. The whole reason gasoline has been such a great fuel since the turn of the 19th century has been its relative ease of use at atmospheric pressure and high relative BTU availability in small storage volume. Carburetors, without a feedback control mechanism, would be nightmarish.

The addition of ethanol, as with the typical 10% blend in almost any pump gas in CNY, actually reduces the fuel economy, because a similar volume of ethanol contains only about 80% of the BTU of gasoline. Its use has been primarily a welfare program for huge farms, but discovered to simulate octane in the burning process, as it slows the burn rate on the gas, thereby reducing pre-ignition, or "ping" which destroys an engine. So oil companies have embraced it, especially since lead cannot be used, and the prior solution was MTBE, which has been found to be a carcinogen. All of this is because the spark point in a single cycle of the typical otto cycle engine (pretty much every one except small motorbikes, weed whackers and the like) must be advanced to before top dead center to get adequate power, while engine speed and load affects the performance, which is why your ECU must adjust that spark point and fuel mixture continuously.

Now that you have a primer on how your engine works, why HHO is a scam (the energy ain't free, and certainly cannot be produced by the vehicle using it in anywhere NEAR sufficient quantity), and why there is no such thing yet as the perfect "hybrid", can we PLEASE drop HHO as a subject on the chat rooms etc. and let's try to limit posts to those who actually KNOW something, and can express it using proper English spelling and grammar, and with minimal need for profanity, and NO insulting bigotry?! Just because you include a picture of an eagle wrapped in the flag doesn't mean you have any idea what you are talking about. And please let us THINK before we make other silly misinterpretations of fact, especially if we are the ones controlling the lives of others. The US Constitution guarantees you (and me – an example is this diatribe ;-) the right to say what is on your mind. It does NOT guarantee you are correct, however, something which many people seem to overlook.

As full disclosure, I will volunteer that I have been no fan of "Hybrid" technologies, despite the enormous investments and seeming market successes for many of the automakers, including Porsche, which has hybrid add-ons for at least the Cayenne and Panamera, in addition to the 918. My essential gripe has been that the "emissions" as measured by EPA fails to factor any of the sodium godawfulamite disposal for the batteries and their relative mass of dead weight which must be lugged around to give any reasonable range to the vehicle, to say nothing of the demands on already overburdened infrastructure of the electrical grid in the one place where short range electrics could conceivably be reasonable; urban and semi-urban settings. And even there, the generation of the electricity is usually by coal, with the adverse emissions merely shifted, not eliminated. There is simply no such thing as a zero emissions vehicle if one is honest.

The fact is that diesel vehicles obtain near-hybrid mileage with essentially none of the "wink-wink, nudge-nudge" of hybrids' shifted emissions. And I had the opportunity to drive two Opel low-sulfur wagons through the Appenine Mountains in Italy, and did not even realize they were diesels when I stopped for fuel. They have come a long way from the chattering bucket of bolts we normally associate with diesels. And even gas engines are pretty decent, and continue to be made ever more efficient, even as we add bulk to the cars for safety and comforts, as means to justify the costs those developments add to the cars. Let's stop kidding ourselves.

