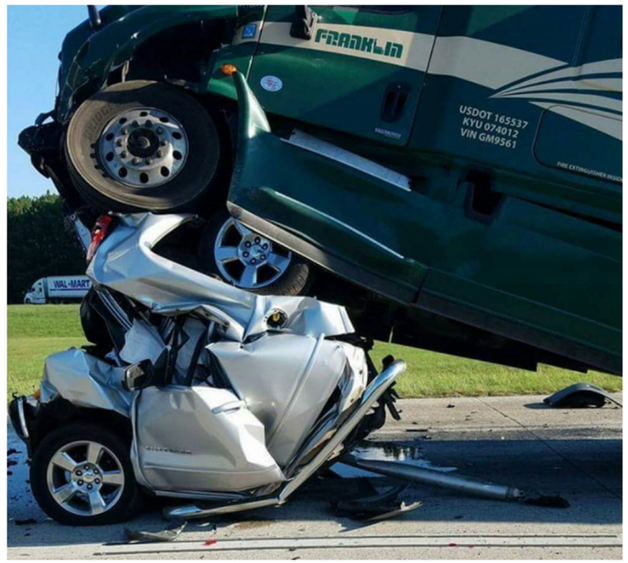
Forty-eight volts in cars may be more ubiquitous more quickly than we have anticipated. There are advantages to 48-volt systems over 12-volt systems. For those unfamiliar with electrical power, it is usually expressed as watts. For a power of 96 watts, a current of 8 amperes is required when the driving force is 12 volts. Power equals volts times amperes. But it is ampere (current) flow that causes wires to heat, not voltage, so a conductor that needs to provide eight amperes needs to be sized to carry that amount of current continuously without overheating. When the electrical driving force is 48 volts, however, it only takes two amperes to provide 96 watts. A much smaller (and lighter) conductor is needed to carry two amps continuously than is needed to carry eight amps continuously. Therefore, a 48 volt system will save a significant amount of weight in conductors when manufacturing a car or truck. Also, because the required current for a given task will be much less, software can be used to monitor and control many more functions with a 48-volt system than what would be feasible with a 12-volt system. There are probably a few of my readers who remember cars and light trucks which had six-volt electrical systems—and we thought that a big step forward was to 12-volt systems!

Those of you who read my previous newsletter may recall my tale of the woman with the black knee-length skirt whose legs suddenly appeared to me as I rounded a curve while driving home at night. I had a similar night-vision scare since. I was making a left turn from an unlighted driveway to an unlighted but low-speed section of highway at around 9:00 p.m. EST in late November. When I was approximately two-thirds through my turn, my headlight beams illuminated a person on a bicycle who was riding facing traffic on the side of the road toward which I was turning. The bicycle had no lights or reflectors, and the bicyclist was wearing drab clothing with no significant reflectance. Fortunately, there were no other vehicles in the immediate vicinity, so I was able to make a tighter turn to avoid colliding with the bicyclist. Of all the motorist-bicyclist night collisions I can recall, no bicycle was equipped with lights or reflectors. I have seen bicyclists riding at night in my neighborhood with lights on the bicycles and reflectors in the spokes of the wheels; those make a huge difference in a motor-vehicle operator's ability to perceive the bicyclist from a significant (safe) distance.

There are problems with some Dodge Ram pickups and Dodge Durangos with the rotary transmission selector like the one shown to the left of this text. The problem reportedly is that it is relatively easy to exit the vehicle without the transmission being fully engaged in park, although it seems to the driver to be in park, resulting in the rollaway of a parked truck or SUV which was assumed to have had the transmission placed in park. If you have one of these or know someone who does, it is a good practice to thoroughly set the parking brake each time the driver leaves the vehicle until a dealer has repaired this issue by recall. This information was obtained from Motor Trend online magazine, as was the photograph of the Aston Martin in the panel to the right.



I have often said, and I may have often written, that pickup trucks are usually safer than cars in general and small cars in particular because of their greater mass, the higher seating positions of occupants, and the generally greater front structural integrity (rigidity). However, as the photo to the left shows, not even a pickup truck has much of a chance against a tractor-trailer. A typical modern, empty pickup weighs six thousand pounds or so; a typical loaded tractor trailer will generally weigh near 80,000 pounds, sometimes more. That is the primary reason why Commercial Driver Licenses (CDLs) have more rigorous requirements than other driver licenses.

The photo to the left of this text is of one of Aston Martin's latest exotic supercars. The purpose of my including this photo in this newsletter is because it shows the tracking of rear wheels versus front wheels in an under-control turn. Notice that the rear wheels track inside the front wheels. In an out-of-control situation, the rear wheels usually track outside of the front, which is typical in a critical speed yaw.

A little bit of personal stuff: My daughter has become quite a good archer. She began taking archery lessons a little over a year ago. She spent many hours shooting arrows and getting private lessons at an indoor archery range, and her skill developed rapidly. Late last year, she was one of twenty young people from across the United States invited to the Olympic Training Center in Buena Vista, California, to compete for a position on the Junior Archery Dream Team. After a rigorous week of archery, interviews, and other activities, she was invited to join. She had also developed a good friendship with a slightly younger girl who shoots at the same indoor range, and that girl was also invited to California and was also invited to join. So they get to travel the country together to their various meets in 2017. It means that Katherine will have to spend time daily with exercises and shooting arrows, which also means she will now have to be home schooled. Time will tell how well all of that works out. She expects a Silverado when the gets her driver's license but is aware that she will have to maintain both her archery and her studies if she wants a truck. Also, as a little bit of background, there are five levels of archery instructor in the

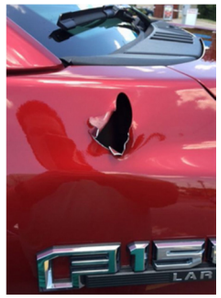
league where she shoots. It was told to me that Level 5 instructors generally are not involved in teaching but are more often seen exclusively as judges at archery competitions. At the indoor range where Katherine and her friend shoot, there is one Level 4 instructor and one Level 3 instructor. Perhaps that explains why the one archery group where she and her friend shoot produced two of the twenty people across the country who were invited to compete for a position on the Archery Dream Team last autumn.

In addition to that aspect, shortly after Katherine turned 15, there was a Level 1 course and test offered at the indoor range where she practices. Most of those who attended were adult men from around the southeastern United States, some as old as 50 years. Not all of them passed, but Katherine did. In addition to everything else, she is a Level 1 archery instructor. To be a Level 2 archery instructor, a person has to be 18, so she will have to wait a while to take the course and test for Level 2.

Business has been quite slow for me lately. Perhaps some of you are thinking that I am nearing retirement age. I am actually past what most would consider to be retirement age, but I love this work, and I am in excellent health for my age. (There is more than one advantage to marrying a physician.) I intend to continue doing the same work that I have been doing with the same passion and desire for excellence and value that I've always had, and I will be grateful for your future consideration of my services for an indefinite period. I plan to work as long as I am mentally and physically able.

Although I had moved my business Web site to a new host and thought I would be able to have everything updated last year, I experienced some file transfer protocol (ftp) problems that I was finally able to resolve in late December. As of January 1, 2017, my Web site is functional and up to date at www.ralphcunningham.net. Please contact me if you have any problems with my newly hosted and updated Web site.

January of 2017 marks the passing of 45 years of my employment in forensic consulting. In recognition of 45 years of service, I have some special pricing on some expenses for the year 2017; to see the special pricing, visit my Web site and click on the time and expense link on the home page.



Not trying to start a Chevy vs. Dodge/Ram vs. Ford argument, but the photograph to the left shows the place where the stationary antenna to an aluminum-body F150 was mounted before it was driven through an automatic car wash without removing the antenna. According to a Motor Trend online article, the resulting damage cost $6000 to repair. I know an aluminum body saves a lot of weight, but I have always thought that aluminum was not a good material for a pickup truck body. My Chevy truck has been through the car wash numerous times without removing the antenna without being damaged, as had the two Dodge pickups I owned before I bought the Chevy pickup I'm now driving. Buyer beware if you own or are contemplating the purchase of an aluminum-body pickup. I'm just sayin'.

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