Battery jump boxes, as they are commonly called, have been sold for decades as a portable means of starting a car or light truck with a dead or too-weak battery. The basic components are a sealed, 12-volt (nominal) battery and cables to connect to a car’s electrical system. Jump boxes are an essential tool for Bosch Crash Data Retrieval, because many of the cars which are interrogated have been dormant for a significant period, resulting in very weak or dead batteries. Others may have had the battery smashed at impact, and some have had one or both battery cables cut by rescue or towing people to prevent a fire due to a damaged electrical system. The Bosch CDR system requires 12 volts DC from some source. I have had three jump boxes for over a decade; I have replaced the battery in two of them. The third one recently failed me in the field, and it was not built to have its battery replaced. (If I had known that when I bought it, I would have bought a different jump box.) So I bought another one, reportedly capable of delivering a whopping peak power surge of 2200 amperes. I won’t be able to test that, but it is my most powerful jump box. Among other features, it has an AGM battery, which should make it last longer and deliver more power than a jump box with a similarly sized, sealed, lead-acid battery. Time will tell. The image below shows the new jump box—ugly but hopefully very serviceable.

In the strange happenings department, police in Brocton, Massachusetts, found an unusual way to catch some thieves that were responsible for multiple home break-ins. According to the March 30, 2015, edition of *Autoweek* magazine, details were reported in the *Enterprise* of Brockton. At one crime scene, police found a perfectly formed license-plate image in a snowbank. They traced the license plate number to a specific vehicle and owner and arrested a man and a woman. It also helped that their Chevrolet Avalanche matched descriptions of the getaway vehicle reported by witnesses. I seem to recall that eastern Massachusetts had record snowfall this past winter; that turned out to be a blessing in capturing those criminals.

Those of you who read my last newsletter may recall a brief reference to Penske racing shocks. A short article in the May 2015 issue of *Road and Track* magazine detailed the features of that $10,000-a-piece shock absorber. This shock absorber incorporates a threaded rod on which a flywheel is mounted inside the damper. As the shock compresses, the threaded rod and flywheel spin, storing energy which is then used to control wheel movement. This unique design is stated as having been developed at Cambridge University for use on F1 cars. In my opinion, this is a really neat application of flywheel storage of energy.

Volume 25, Number 2, of *Accident Reconstruction Journal* had an article which I found quite interesting. It involved braking-to-a-stop testing of fully and normally loaded tractor-trailers compared to overloaded tractor-trailers. The reference base was a vehicle with a Gross Vehicle Weight (GVW) of 56,000 pounds. Tests were conducted at GVWs of 60,000 pounds, 80,000 pounds balanced load, 80,000 pounds unbalanced load, 91,000 pounds, 97,000 pounds, 106,000 pounds, and 116,000 pounds. Initial speeds were 20 mph and 60 mph. As one might have expected, there was very little difference in the stopping distance for the various load conditions from an initial speed of 20 mph. (These tests measured distance to stop after brakes were applied; perception/reaction time was not included.) For the 60 mph stops, the stopping distance averages at 80,000 pounds load were slightly less than the stopping distance averages at 60,000 pounds—a properly loaded tractor-trailer stops in less distance than a lightly loaded or unladen vehicle, which is counterintuitive to those with limited knowledge of tractor-trailer braking systems, tires, and suspensions. There was no significant increase in stopping distance until the overload reached 17,000 pounds (GVW 97,000 pounds). At a GVW of 116,000 pounds, the stopping distance increased from an average of 223 feet at 80,000 pounds to 252 feet, roughly a 30-foot—13 percent—increase. These tests were not conducted with vehicles which had been driven a significant distance at highway speeds before the brake application; it is expected that brakes which are heated from normal duty in traffic would cause those distances to increase somewhat, depending on the drum temperatures.

In my previous newsletter, I commented about the aerodynamic surfaces which seem to abound on the new IndyCar vehicles. According to an article in the April 13, 2015, edition of *Autoweek,* the first IndyCar race of the year in St. Petersburg was a comedy (or tragedy) of errors. Bits and pieces and flying front wings and crumpled rear wings and a flat tire caused five full-course cautions before the race was halfway over. As at many other times, ideas which seem excellent require the application of finesse acquired with experience. And experience can often be costly or painful.

In a newsletter I printed about one year ago, I described absorbed glass mat (AGM) batteries for cars and light trucks. At that time, AGM batteries cost about twice as much as conventional lead-acid batteries. I needed a new battery for one of my vehicles, and the AGM batteries had dropped in price to about 50 percent more than conventional batteries, so I bought one. Time will tell if the extra cost is justified with longer life/better overall service. On a related note, the four-year-old batteries in my 1000-watt uninterruptable power supply just died, and during replacement I noticed that they were AGM batteries; I had never paid attention to that before.

Another section of my previous newsletter was about the Dodge Hellcat models with the 707-horsepower engines. For the June 2015 issue of *Motor Trend,* there was an article about comparison testing of a 2015 Tesla Model S P85D versus a 2015 Dodge Charger SRT Hellcat. The as-tested price of the Tesla was almost twice the as-tested price of the Dodge, and they were totally different sensually—the Tesla was stealth, the Dodge was obvious. In Internet polls, probably by respondents who didn’t own either, the Tesla was the overall favorite. In 0-60 mph and quarter-mile tests, the Tesla actually beat the Dodge, but by very little. The Dodge had the Tesla beat in top speed, but that is pretty much a moot point—where can you drive 200 mph? Although the

Tesla uses no gasoline and can get its batteries charged at Tesla branded Supercharger stations, the difference in price can buy a lot of fuel for the Dodge, perhaps more than it would burn in its lifetime. So, is it quiet and stealthy that you want or bold and brassy? I read with some interest that the Tesla has several selectable performance modes, one of which is called (no joke) Insane—I'll bet they didn't pass that one by their attorneys before putting it into production. Ultimately, the authors of the article favored brute force over finesse: they preferred the Dodge Hellcat. But the Tesla is widely recognized as a high-performance, reliable electric car.

Several sources have reported an increase in traffic crashes and an associated increase in traffic fatalities. There are many theories about the reasons for the increases. But I haven't seen anyone suggest the factor that I believe is the most significant: the substantially reduced price of gasoline. In the last few months, I have seen many instances of red-light running, stop-sign running, and other failures to yield causing the driver with the right of way to brake heavily to avoid a collision; in some cases, that driver has been me. The incidents I have observed in the past three or four months exceed the number of incidents I have observed in the previous two or three years. For the month of May, I have seen at least one ocassion of red-light running each day I have left the house. So far, no incident I have observed has resulted in a crash or a ticket, but those are the types of driver actions which often lead to collisions and possibly to cases of road rage. I believe that the increase in potential crash situations and other types of poor driving practices are at least partly attributable to the current lower price of gasoline: people who once could only afford gasoline for round trips to work and for necessary errands can now buy more gasoline for their fuel-allotment dollars, enabling those who have had relatively limited driving experience for years to now do some joy riding.

Synthetic oil versus conventional? When synthetic was first publicly available, I was skeptical. At that time, I was changing oil and filter every 3000 miles. I decided to give synthetic a try. After 3000 miles, it was darker than when it went in but still had excellent lubricity. I decided to try it again, going 6000 miles between changes. It still had excellent lubricity; it "felt right" to my fingers. I now use it in all my vehicles. For the vehicles I have with a four-quart system, I change every 5000 miles. (Not recommended for high-mileage vehicles which have been using conventional oil.) Synthetic oil resists oxidation, keeping the engine much cleaner internally. Its long-chain molecules allow a 10W-30 oil to flow like a 10W oil at low temperatures but maintain a viscosity near a 30-weight when hot. Conventional oils earn their 10W-30 rating by adding viscosity improvers to a light-weight oil; those viscosity improvers break down over time, resulting in a thinner oil when hot. I do not use synthetic oil in new engines; I use conventional oil for about 6000 miles to let the engine "break in." Synthetic oil in a new engine not specifically designed for it may prevent proper break-in, including not letting the piston rings seat and seal. Once a new engine has been operated with "too much" lubrication such that it doesn't break in, there may not be any remedy for that condition but an engine rebuild—too high a price to pay for too much lubrication.

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