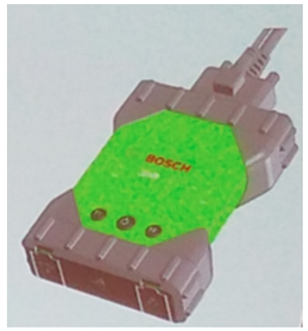
In my newsletter Volume 16, Number 2, I wrote about compression ratios being a major factor in the power an engine can produce. To go an additional step, the compression ratio of Diesel engines is typically twice as high (roughly) as the compression ratio of gasoline (Otto cycle) engines, which is a major factor in the observation that Diesel engines are more fuel efficient (more miles per gallon) than gasoline engines. I wrote that to write this: ASTM International Committee D02 is working on developing a specification for 100 octane gasoline. (Before it became an international group, it was the American Society for Testing and Materials, a long-established entity for creating and providing standards for many types of materials, processes, and equipment, which function has grown tremendously in the last ten years or so.) Motor-vehicle manufacturers all want higher octane fuel than the fit-for-burning-trash-piles gasoline that is now available nationwide, to enable them to design engines with higher compression ratios that develop more power per cubic inch (or cc) of displacement than what can be accomplished with the gasoline currently available at filling stations nationwide. But the higher octane fuel would have to be as widely available as the low-octane gasoline now at pumps if motor-vehicle manufacturers were enabled to build consumer-oriented vehicles with engines that required the higher octane fuel and offer them for general public sale. The 100 octane fuel is available for racing venues, but there is no place the typical consumer can easily purchase that gasoline. ASTM International has taken the initiative to develop a standard specification for 100 octane gasoline. Once adopted by refineries and made as available as the gasolines we are now forced to pump into our vehicles, manufacturers can produce engines with more power for a given displacement, resulting in cars which get more miles per gallon than lower-compression engines of the same displacement. It will be interesting to see if our government interferes with that development: on the one hand, they have mandated specific (higher) mpg ratings for manufactured cars and light trucks. On the other hand, they keep forcing us to use low-octane, alcohol-polluted gasoline, which substantially limits the mpg capabilities of consumer vehicles—cars and light trucks burning gasoline with ten percent alcohol will typically get five percent less fuel economy than the same vehicles burning alcohol-free gasoline of the same octane rating. God bless America.

Tires are seeming to become a regular feature in my recent newsletters. In the July 2017 issue of Motor Trend magazine there was an article about Bugatti's latest supercar, the Chiron. For a mere three million dollars, you can obtain a Chiron for yourself. Driveline features include an eight liter, dual-overhead-cam engine producing an astonishing 1,479 horsepower in this 4400-pound vehicle. For its not-very-old stablemate, the Veyron, capable of a top speed of 253 mph, Bugatti could not find tires that would stay together at that speed. All but Michelin scoffed at the prospect of developing tires for the Veyron. They developed a tire that could last 15 minutes on a Veyron traveling at 253 mph before they disintegrated. Fortunately, the Veyron would run out of fuel in ten minutes at that speed. A set of four of those tires costs $42,000 and lasts 6000 miles in more normal use. For the faster, newer Chiron, Michelin did it again. The current Chiron tires are only good for sustained speeds as high as 268 mph; Bugatti test driver Pierre-Henri Raphanel said that the only thing which prevented him from driving the Chiron past 270 mph was that there were currently no tires available that would stay together above that speed. But apparently Michelin is at it again. Bugatti CEO Wolfgang Durheimer promises that the Chiron will become the fastest production car in history when tires which can stay together at speeds above 270 mph are available. The article did not reveal the price of the currently available Chiron tires. Perhaps you thought that a V (or higher) speed rated tire was for very fast vehicles. Well, yes, but not for cars from Bugatti. I wonder how many of the people who spend three million dollars to buy a Chiron and the tens or hundreds of thousands of dollars to insure and operate it will ever have opportunity to drive at speeds anywhere near its potential. I suspect that most of my readers are not in the market for a Bugatti, but I found the article interesting because of the tire issues.

Pedestrian-protection-equipped cars have been in common use in Europe for several years now. The way they function is that sensors tell the car when there has been a pedestrian impact; above a certain speed and below approximately 50 mph, the pedestrian protection involves the rear of the engine hood rising significantly. This works because, in many modern cars, there is very little clearance between the underside of the hood and the top of the drivetrain components near it. When an adult pedestrian is struck within a certain speed range, that person will fall onto the hood with significant impact force. By raising the rear of the hood, the impact between the pedestrian and the hood of the car will allow more deformation of the hood, reducing the felt impact and decreasing the likelihood of serious injury. Above 50 mph, significant contact between the hood of the car and the pedestrian is unlikely, but fatal injuries become very likely due to factors other than hood strike. Cars in the United States will soon be equipped with pedestrian impact mitigation features.



Great (?) news for all of us who own and use the complete set of Bosch Crash Data Retrieval equipment: a new interface. The interface is the component that takes the signal data from the vehicle's storage device and configures it appropriately to be fed to the user's computer for analysis and reporting by the Bosch-licensed software. When the CDR system was first developed by Vetronix in the 1990's, almost all computers were equipped with COM ports; I don't recall if USB ports were even available back then. If they were, there weren't many computers equipped with USB. The system was originally configured to interface with a computer's COM port. But, with the essentially universal acceptance of USB (USB stands for Universal Serial Bus), computers don't come with external COM ports, although the operating systems of most computers can be configured to accept USB inputs as COM ports. So the original interface developed by Vetronix has been in use since the original design, with the exception of changing the interface to deal with CAN bus architecture now common in many cars and light trucks. The problem has been having to use a special cable to go from the COM port at the back of the interface to a USB port in a computer, which also required a special driver for that hardware. Sometimes, a notebook/laptop computer, which is essentially always used in the field to image crash data, will have trouble recognizing the COM port that the adaptor needs to communicate the data image to

that computer. More fun and games for the practicing reconstructionist. Can't access the data unless the interface recognizes the internal COM port, but finding a compatible COM port (i.e., one that works with the interface) is sometimes a serious challenge. The new interface is specifically made for direct-to-USB connection, and it allegedly will provide wireless communication. Bosch also states that it adds a second channel of CAN, that it has Ethernet (wired networking) capability, and that it has an integrated ACM adapter, which has been previously sold separately and had to be used for some interrogations.

As of this writing, the new interface is not available, and Bosch has not announced when it will be available or how much it will cost, only that it will be "expensive." With the complete system now representing an eighteen thousand dollar investment, and new cables costing anywhere from $150 to $250 or more each, and annual software licenses currently costing $900 each, I dread the thought of how much the new interface will cost, but it will be a necessary expenditure to keep my system thoroughly complete. I will be grateful for each opportunity you provide for me to put my Bosch CDR Toolkit to use!

A little personal aside: those of you who have been reading my newsletters know that my sixteen-year-old daughter (yes, she's my daughter, not my granddaughter) has become quite a good archer. While shooting at the range where she practices, and once in competition, she has twice shot a perfect score of 300. This accomplishment requires that 60 consecutive arrows strike a bulls eye about the size of a human eyeball while shooting from a distance of 20 meters (roughly 65 feet). Early in 2017, she competed in an outdoor shoot where the distances were 40 meters, 50 meters, and 60 meters. (60 meters is almost 200 feet.) Although she had never shot from 60 meters before, she won that competition. She might have better luck deer hunting with bow and arrow than with a rifle! She expects a Chevrolet Silverado 4x4 pickup when she gets her driver's license, so she can go into the woods with it and "throw a deer in the back" after she kills it. That's what she says.

Some many issues ago, I extolled the virtues of absorbed glass mat (AGM) batteries. I tried several in cars, my truck, and my jump boxes. I now say that the AGM batteries can deliver a serious electrical punch when called upon to do so, but I have not had the long-term durability to which premium lead-acid batteries have spoiled me. Most of the AGM batteries that I bought (at premium-plus prices) failed after what I considered to be a relatively short span. For example, I had an AGM battery with a three-year, full replacement warranty. When it was three and a half years old, it died without prior warning: I got in my Buick one morning to go somewhere and the battery was dead. No warranty after three years. I don't recall that I've ever had a premium lead-acid battery go bad that quickly. The factory battery in my Oldsmobile Aurora, which has an energy-management system, lasted seven years, and it got weak before it died, letting me know that I would soon need a new battery. So my conclusion is that AGM batteries are powerful but not currently durable. Let the buyer beware—I hope my experience helps you with your future battery purchases.

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