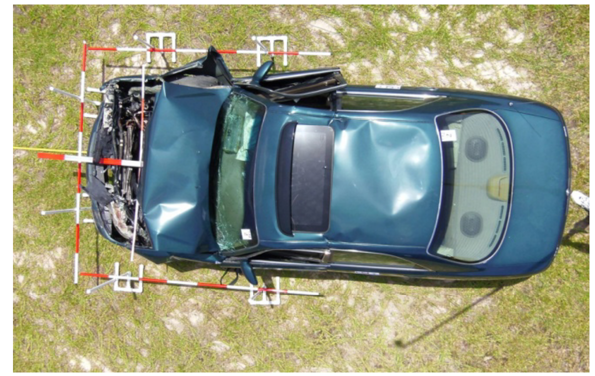
Bosch jumped from Version 6.0 to Version 8.0 of the CDR software, apparently because they added two car lines with this new release: Mazda and Suzuki. Mazda coverage goes back to 2011 models; the 2013 model-year coverage includes the CX-5, the CX-9, Mazda2, Mazda3, Mazda5, and Mazda6. Although there is some Suzuki coverage as far back as 2007, coverage is not extensive until the 2013 model year. Nissan has added a large quantity of 2013 models. There is also expanded coverage for Infiniti, Honda/Acura, Ford/Mercury, Lexus/Scion, and Fiat. Version 8.0 includes 6 new cables and 2 new adaptors, which carried a combined pre-order (discounted) price of $1,115.00. (Ouch!) I ordered them as soon as I received the notification of their availability; I should have the set by the time this newsletter is in the mail. I already have the activated software. To see a listing of all vehicles covered by CDR Version 6 and CDR Version 8, go to www.ralphcunningham.net/60list.pdf and www.ralphcunningham.net/80list.pdf.

As I wrote in my previous newsletter, I attended the 2012 Southeastern Collision Reconstruction Conference held the last week of July in Charleston, South Carolina. Two of the staged collisions conducted on Monday of that week involved cars being driven (by pulleys and a cable) into the rear of a very old Great Dane flatbed semi-trailer, the same one used for the Saturn side-underride crash described in the newsletter which preceded this one. Both cars were supposed to strike the rear of the trailer at a speed of 35 mph. As the first car was being pulled toward the trailer, a pulley separated from its mooring, resulting in loss of acceleration and a collision speed below 35 mph. The second collision, however, occurred at the intended speed. The photograph above shows the final positions after the second car was driven into the rear of the trailer. As you can see, there was no load on the trailer, and it was not connected to a truck tractor at the time of the collision testing. It was moved forward by the impacts at the rear.

The two photographs at the top left of the right column of this newsletter show the rear of the trailer after the impacts and an overhead view of the car which struck it at 35 mph. The underride guard at the rear of this Great Dane trailer was much more structurally sound than Federal standards require; it did not fold under or break, and it exhibited very little permanent deformation.



One of the purposes of these two collisions was to determine if the rear impact by a car at 35 mph could cause sufficient acceleration of the trailer to create hot shock in the filaments of the marker ("clearance") lights. These lights were powered by a 12-volt battery during both crashes, and the bulbs were examined after the crashes. The closeup photograph of the bulb (below the overhead view of the car) shows severe hot shock in the filament of one of the incandescent bulbs from the rear of the semi-trailer.

As mentioned, the trailer was displaced by the impacts. The photo at the bottom of this text shows the movements from the two collisions. This photo was taken under the trailer, in shade, so it is quite dark. (I didn't take it.) At the far left in the photograph is the foot of the trailer's landing gear. Its position before the first impact was marked by a red line on the pavement—that is the small red paint mark evident near the right side of the photo. The red line to its left is the location of the landing gear foot after the first impact. The distance between the middle red line and the one nearest the left side of the photograph is the amount the semi-trailer moved in the second impact. Because the second collision involved a heavier car traveling at a higher speed, there was greater displacement of the trailer as a result of that impact. Had this trailer been connected to a truck tractor, the distance from the second collision would probably have been only half as great. Load on the trailer would have further diminished the post-impact travel which resulted from the rear impacts.

J. Stannard Baker is considered the grandfather of scientific crash reconstruction. As a professor at the Traffic Institute of Northwestern University near the middle of the past century and an engineer, he understood the principles of physics that would govern moving and colliding bodies, but he also knew that automobiles (even then) were complex structures that would not necessarily behave like billiard balls on a pool table or like hockey pucks on an air table during a collision. So he began conducting experiments to collide vehicles at known speeds, documenting the damages to vehicles and their post-impact travels. He also created and documented numerous types of pavement scars and tire marks created by vehicles during crashes and/or during certain maneuvers. He published his findings, observations, and conclusions in a lengthy book, which was mainly directed toward police officers involved in preparing crash reports, and the Traffic Institute began teaching courses on the various aspects and levels of accident investigation and reconstruction. Following his pioneering efforts, more advanced topics were researched, resulting in the original versions of computer programs called CRASH and SMAC developed under the auspices of what would become the National Highway Traffic Safety Administration (NHTSA); research continues.

Many early devices were crude, such as an accelerometer based on a small, external, physical pendulum placed inside the car. Tremendous advances have been made in electronics, computers, and instrumentation, and there are now many thousands of documented, staged collisions which provide a wealth of data concerning how cars react and crush during impact and/or how they move after impact. As far as basics are concerned, very little has changed since Mr. Baker's days: cars now corner faster and flatter and stop shorter due to advances in weight distribution, suspensions, brakes, tires, and pavements, now enhanced by anti-lock brakes, traction control, and electronic stability control, but Newtonian laws of physics still apply to the best of vehicles. (Some of the exotics squeeze the greatest possible functioning from those laws, resulting in exceptional cornering ability, amazing acceleration, and astoundingly short stopping distances, for those willing and able to spend $100K or more for a car.)

So, here we are, nearly at the end of 2012, with (generally) better roads and substantially better cars. But we still have (for the most part) the same drivers, so there will continue to be collisions. All staged collisions provide documentation to support the foundations of accident reconstruction developed through application of physics, primarily Mr. Newton's laws of motion. We now have many late-model vehicles with event data recorders incorporated into their airbag control modules and/or their powertrain control modules, and we will likely see a significantly greater number of manufacturers whose vehicles contain retrievable crash data during 2013. Those data sets will help augment our current base of knowledge about and experience with crash reconstruction.

I am grateful to all clients for your ongoing consideration of my crash-related and vehicle-related services. If you are interested in having me speak at a luncheon meeting or during some type of seminar or conference on a topic like accident reconstruction, crash data retrieval, or other areas in which I am experienced, or whenever you have need of my services, please contact me. I hope all of you have a safe and joyous holiday season and a great new year.

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