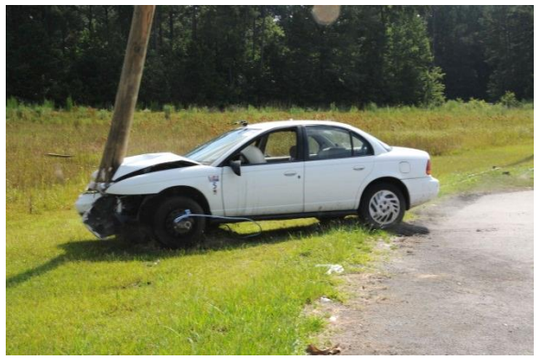
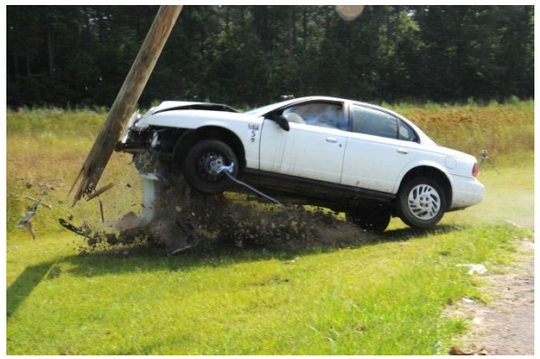
The annual SCARS/SeARS/IAARS conference was held the last week of July in Charleston, South Carolina. Monday was devoted to staged collisions. Perhaps the most interesting crashes were two pole impacts: one by a Saturn sedan and the other by a Volvo sedan. There is a photo sequence below which shows some of the scenes of the Saturn crash. Interestingly, both vehicles broke the poles, although they were new, standard utility poles installed in accordance with power company standards. Perhaps the heavy and frequent rains had something to do with the breakage—each pole shifted significantly in the ground as it was breaking.

As you can see in this photo sequence, the Saturn was completely airborne as it rode up the stub of the broken pole. The separated upper section of the pole struck the top of the Saturn as it traveled to its final position. The impact speed of the Saturn was approximately 41 mph.

A Volvo sedan collided with an identical pole set in the ground near the one the Saturn struck. The results were surprisingly similar: The pole broke, and the Volvo became briefly airborne over the broken stub of the pole. Its speed at impact was 42 mph.

Both poles were new, standard poles as typically used by power companies, and they were installed in the ground by an organization which routinely places utility poles. Perhaps as a combination of newness of placement and moisture content of the soil, each pole was shifted in the direction of the impact force and broken while the stub of the pole still in the ground was partially extracted during the impact. Examination of the fractured poles after the crashes revealed that they were in normal structural condition for a new utility pole before the impacts. It is obviously not as hard to break a utility pole as some may have thought.

Other staged collisions involved two rear underride crashes, each with a Ford Crown Victoria striking the rear of a van-body semi-trailer in an offset alignment—the right side of the Ford struck the left side of the rear of the trailer in each collision. One collision was at a relatively low speed, while the other was at a higher speed. The trailer's crash bar was replaced in the field by a welder after the first crash. This semi-trailer was connected to a truck tractor at the time of each collision, and the movement of the truck and trailer as a result of each impact was recorded, providing a basis for calculating an effective drag factor for the truck and trailer, whose weight was also documented.




A car-to-car staged collision was planned to be head-on, but the pulley anchor for one of the cars pulled out of the pavement as these cars were being towed toward each other. This resulted in the speed of one of the cars being less than the planned impact speed, and the alignment at impact was no longer head-on. So we had a staged, head-on, offset collision. After impact, both vehicles continued in the direction of travel of the heavier and faster car, with the slower car moving rearward much more than was anticipated. Neither car had been equipped with remote-control braking; there was a brief period of angst as the lighter car rolled backward with significant velocity toward the parked cars of the attendees. Fortunately, that car stopped short of the

region where the attendees' cars were parked. Those who had set up the staged collisions reached the astute conclusion that all cars involved is such staged collisions in the future would be equipped with remote braking. If the two vehicles involved in that staged collision had missed each other, each was traveling fast enough to have caused significant damage to another vehicle or to some other property not intended to be part of the experiment.

Among the many attendees were two young reconstructionists from Germany. They commented that the staged collisions which are conducted in Germany are done at lower speeds than the ones we conducted on Monday, and they also commented that they enjoyed the food, the beverages, and the southern American hospitality.

One of the speakers at the seminar was Don Floyd, the General Motors engineer who is considered to be "the godfather of crash data retrieval." General Motors was the first manufacturer to incorporate retrievable data in their airbag control modules, starting that trend in 1994. He is the engineer who has been in charge of that program at GM since its inception. He gave one talk about the development and effectiveness of seat belts and another talk about hybrid and electric vehicles. I gave a talk about the properties, nomenclature, and basic failure mechanisms of pneumatic tires. There were many other presenters addressing a variety of reconstruction related topics.

An interesting presentation was given by Daniel Vomhoff, III. He is the 4N6XPRT engineer who deals with their VIN DeCoder, Expert AutoStats, and StifCalc programs, among others; I have current licenses to all three programs, each of which has useful applications to analysis of one or more aspects of reconstruction. One of his presentations related to a topic called Force Balance, which is a method for developing crush coefficients for a vehicle whose crush coefficients are unknown when it is involved in a crash with another vehicle whose coefficients are known, when the crush on each vehicle has been accurately measured. Although the coefficients for the unknown vehicle are valid only for that specific crash, the Force Balance method allows a reconstructionist to use conservation of energy principles to evaluate a crash when there is previously recorded crash data for only one of the two involved vehicles.

Planning for the 2014 Charleston conference is already well-developed. I am scheduled to speak on Crash Data Retrieval in Real-World Crashes. CDR can be a tremendous augmentation to a reconstruction, but I've also had several cases lately where the stored crash data proved that the driver was involved in submitting a fraudulent claim. Gotcha! I am also working with a pair of reconstructionists who want to try to develop a method of evaluating sideswipe speed differentials from physical evidence on the vehicles. It will be interesting to see if our staged incidents result in useful data or methods; that may be something we can present at the 2014 seminar.

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