

## **Ralph's Accident Reconstruction Newsletter**

### **Volume 7, Number 4—Page 2**

ignores tire forces during the collision phase; they are obviously minor in comparison to the forces at work crushing the cars, but they do exist. Also, energies converted by friction during the contact between the vehicles and by noise created by a collision are ignored; not that they aren't real, but that those manifestations of energy conversion are diminutively irrelevant.

A well-known reconstructionist, a man who developed widely used computer programs for various types of numerical analysis of accident reconstruction, described a collision in terms of known quantities into the collision, known quantities after the collision, and a large group of unknowns during the collision. In classes, he used a rather colorful term for the "cloud" of the unknowns in a collision event; in mixed company, this is often called an impact circle. In most cases, we know something about the vehicles going in (such as trajectory), and we usually know quite a bit about what happened to the vehicles after they separated (like departure angles, post-impact paths, and final positions). Documented, instrumented, staged collisions show us that the methods we currently use provide calculated results which are very close to the known pre-impact speeds and trajectories; we don't need to know all the details of what occurs in the impact circle, which details will probably never be minutely understood, anyway. There always has been, and always will be, an "art" portion to accident reconstruction, because science cannot provide us with all the answers. "Art" comes from experience and from reviewing the data from staged collisions and other experiments designed to verify (and correct, if necessary) the methods and assumptions used to reconstruct collisions between motor vehicles with each other, with pedestrians, and with fixed objects.

Another series of tests and experiments currently in progress involves staged collisions of cars into utility poles. Some of these have been conducted to verify the accuracy of various methods of determining impact speed by measuring crush damage to the vehicle; you might be surprised at the number of published formulas for relating pole-impact crush to impact speed. But a separate set of tests is being conducted, at different times and places with different vehicles and poles, to determine the energy (work) associated with breaking a utility pole at impact. To date, all useful methods expounded for calculating speed associated with a pole or tree impact have been based on the assumption that the pole or tree was not sheared/uprooted. Once the work associated with breaking a specific pole at impact has been documented by repeated testing, associating the speed of a specific vehicle which accomplished that amount of work will merely involve knowing or determining its weight. More refinements to the science and art of accident reconstruction!

I am always grateful for your consideration of my services. Please contact me whenever you need vehicle-related forensic consulting.

**Ralph Cunningham, Inc.**  
**Accident Reconstruction**  
**[www.RalphCunningham.net](http://www.RalphCunningham.net)**

**Collision Analysis**

**On-road/Off-road**

**Pedestrian/Bicyclist**

**Motorcycle Collisions**

**Conspicuity Evaluations**

**Lamp Filament Evaluations**

**EDR Downloads**

**Tire Failure Evaluations**

**Brake/Steering Evaluations**

**Seat Belts/Airbags**



**1804 Thornhill Pass, SE**

**Conyers, GA 30013**

**770.918.0973**

**Fax: 770.918.8076**

Ralph Cunningham, Inc.  
1804 Thornhill Pass, SE  
Conyers, GA 30013