

Dr. Mark Strauss' areas of consulting include injury causation, biomechanics, and accident reconstruction as well as instrumentation and measurement. His research interests include biomechanics, human factors and truck braking systems.

He received his Ph.D. in biomedical engineering from the University of Texas at Arlington and the Health Sciences Center at Dallas. He also holds an undergraduate degree in mechanical engineering and a master's degree in biomedical engineering.

Dr. Strauss serves as an adjunct associate professor in the Department of General Engineering at the University of Illinois at Urbana-Champaign. In addition, Dr. Strauss is the Chairperson of the ANSI/HFES 300 standards committee, reviews research paper submissions for the Human Factors and Ergonomics Society Journal, and is a member of the Transactions Selections Committee for the Society of Automotive Engineers.

He is also a Diplomate of the American College of Forensic Examiners, holds a commercial driver's license, performs research, publishes and presents his results to national and international forums.



Testing may be required of the forensic investigator in order to provide a scientific basis for the conclusions reached. Scientific testing is defined as a method of assessment that allows forensic investigators to examine an event under a controlled situation in order to validate or disprove a theory.

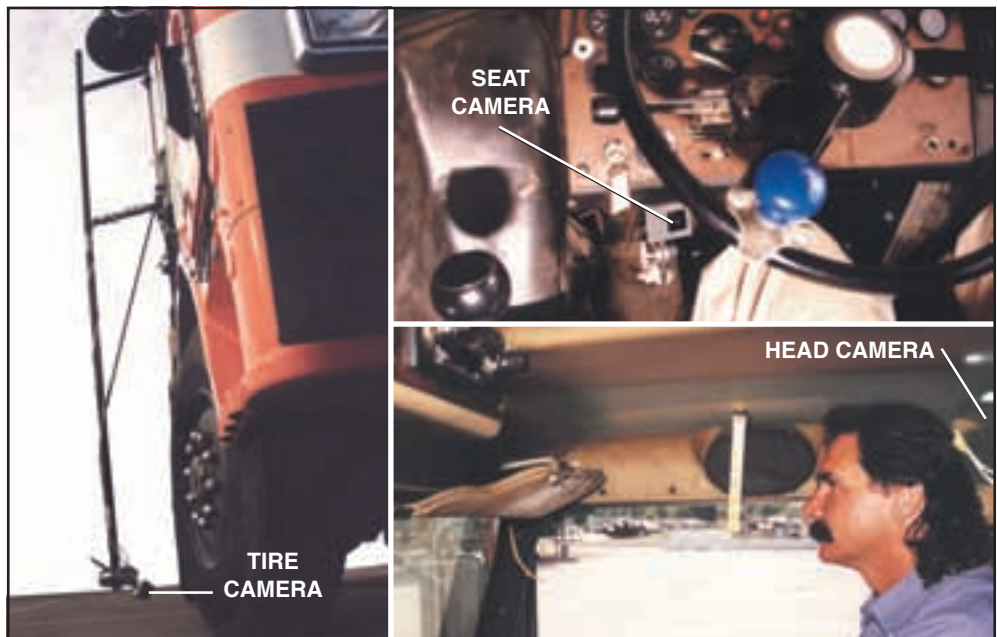
The person designing the tests must have the knowledge and experience to perform tests that can withstand a *Daubert/Kumho* challenge. Courts are becoming increasingly skeptical of expert witness testimony that has no basis except the *ipse dixit* of the testifier. Testing remains one mechanism to insure the reliability of testimony.

Ruhl Forensic, Inc. staff has years of experience not only in utilizing testing methodology that will be accepted in court, but also in explaining the testing process and results in a manner that is understandable to the court and substantiates the testimony. Models, graphs, and visualizations are all used to make the test results clear to the trier of fact.

Scientific testing can conclusively show whether or not an event happened as described. As an example, the driver of a truck complained that the modifications made to the truck caused it to bounce excessively when he drove it over a bumpy road. He claimed that the front tires came off the road and he hit his head on the roof of the truck thus causing an injury.

To test the validity of this claim, both his truck and an unmodified exemplar truck were fitted with three cameras. One was located outside the truck and viewed the front tire. The other two were inside the driver's compartment and recorded the movement of the seat and the top of the driver's head. A person of the same weight and height as the original truck driver drove down the same road at varying speeds.

The video from all cameras was merged so as to be viewed simultaneously on one screen to show that at any and all speeds, the tires never left the ground and the driver never hit his head.



To test the validity of a driver's injury claim, Ruhl Forensic staff used three micro-mini cameras to record the movements of an exemplar truck and driver. Analysis of the video and other data gathered proved that the driver's claim of hitting his head on the roof because the tires left the ground was unfounded.



Ruhl Forensic, Inc.'s staff provide expertise in: *mechanical and electrical engineering, collision investigation and vehicle dynamics, biomechanics and human factors, heavy vehicle driving and mechanical systems, federal regulations and compliance, fleet safety, traffic engineering, construction zone safety, OSHA, graphic visualization, and other areas.*

Our experts provide a continuum of service from initial on-site investigations through research, testing and reconstruction to courtroom testimony and presentation graphics and visualization.

We offer quick response to your investigation needs 24 hours a day. Contact us by calling 1-800-355-7800, 1-800-235-2808, or 1-800-278-4095.

Please feel free to call us with any questions that you may have and we will direct you to the appropriate individual within our firm.

In another instance, Ruhl Forensic staff was asked to determine if overheating of the brakes on a tractor-trailer was a contributing factor to a serious accident between the tractor-trailer and several vehicles stopped for a red light at the bottom of a hill. In a prior trial arising out of this accident, the defense expert claimed that the brakes had overheated and there was nothing the driver could do to stop.

Ruhl Forensic staff conducted scientific tests using an exemplar tractor-trailer to determine if the brakes had overheated. A portion of the outside surface of each brake drum was cleaned and one temperature sensitive label was applied to each drum in order to detect the peak brake drum temperature that would occur during testing. The tractor-trailer was then driven three times down the same hill that the accident had occurred on. None of the brakes reached temperatures above 300 degrees; brakes are considered to be overheating at 500 degrees. Driver error and lack of training caused the accident, not overheated brakes.

In the course of testing, Ruhl Forensic staff coordinates the use of facilities, obtains actual or exemplar equipment, specifies and installs the necessary sensors and instrumentation to capture and record the physical quantities, and sets up photographic equipment to document how the tests were conducted. These steps lay the necessary foundation of accepted scientific testing: a testing protocol that can be peer reviewed to evaluate its scientific basis, and results that can be reproduced by others using the same methodology.

Ruhl Forensic has the ability to measure almost any physical quantity including motion, sound, light, force, pressure, and vibration. Examples of testing that have been performed include:

- Dynamic stability testing of a loaded livestock trailer.
- Re-enacting off-road vehicle maneuvers to determine driver kinematics.
- Measuring the friction between pallets and semi-trailer floors in order to determine the maximum speed that a truck could go around a turn without the unrestrained cargo shifting.
- Evaluating night time conspicuity of objects and vehicles.
- Acceleration testing of vehicles.
- Determining the amount of energy in a circular saw blade and evaluating its ability to transect human tissue.
- Measuring the wind force needed to blow the hood of a truck down on a mechanic.
- Timing a steel stamping machine and measuring the reach of the operator.
- Determining the failure modes of a food processing machine.
- Monitoring the complete and simultaneous operation of the braking system of a truck.
- Measuring the brake fluid pressure in a car trailer being towed by a rental truck.
- Performing time lapse photography of lane change movements of trucks.
- Determining strength and durability of roof brackets used to support roofers.

Ruhl Forensic staff also conducts independent, internally funded testing and research to add to the body of knowledge in our respective fields. The results have been peer reviewed and accepted for publication and presentation at scientific meetings nationally and internationally. Members of the staff have been and are currently members of peer review panels for scientific publications and organizations.

For further information on this topic, please contact Mark Strauss at (800) 355-7800 or via e-mail at mgstrauss@ruhl.com.

Visit our website at www.ruhl.com.