



Résumé of  
**DAVID A. DANAHER, P.E.**  
Principal Engineer

**KinetiCorp™**

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#### **EMPLOYMENT HISTORY:**

Principal Engineer, KinetiCorp, LLC, Colorado, January 2014 to Present  
Principal Engineer, Veritech Consulting Engineering, LLC, Castle Rock, Colorado, April 2008 to October 2013  
Director, Mechanical Engineering, Knott Laboratory, LLC, Centennial, Colorado, April 2005 to April 2008  
Senior Engineer, Knott Laboratory, Inc., Centennial, Colorado, June 2000 to April 2005.  
Engineer, Knott Laboratory, Inc., Denver, Colorado, June 1996 to April 2000.

#### **REGISTRATIONS:**

Registered Professional Engineer in the State of Colorado, Wyoming, Nevada, and Texas (P.E.)  
Board Certified in Forensic Engineering by the National Academy of Forensic Engineers, Fellow (NAFE)  
Accredited Traffic Accident Reconstructionist (ACTAR)  
National Council of Examiners for Engineers and Surveying Record Holder (NCESS)

#### **EDUCATION:**

B.S., Mechanical Engineering, Vehicle Design Specialty, University of Colorado at Denver, Colorado, 1998

**ENGINEERING AND DESIGN:** As a professional mechanical engineer, Mr. Danaher has experience in the areas of mechanical design and operation as well as failure analysis. His experience involves product design evaluation, strength of materials analysis, and failure mechanics. Mr. Danaher has also analyzed mechanical components that are part of larger industrial systems to demonstrate their operation as well as any related failures, at locations both nationwide and internationally. The analysis performed in these industrial systems are then illustrated in a three-dimensional environment, breaking down individual components to visually show the mechanics of the operation. Some of the systems previous analyzed by Mr. Danaher include power plants, boilers, industrial valves, oil refineries and paper mills.

Mr. Danaher has also evaluated and analyzed heavy equipment such as skid steer loaders, motor graders, oil field equipment, off road/on road forklifts, combines, and front-end loaders. Mr. Danaher has also worked with government agencies including OSHA to determine system failures and operator interaction on heavy equipment.

**ACCIDENT RECONSTRUCTION:** Mr. Danaher has extensive experience performing vehicle accident investigations throughout the United States. His hands-on investigative experience includes inspections of passenger cars, motorcycles, trucks, tractor trailers, commercial vehicles and bicycles. He is experienced in analysis of vehicle speeds, crush energy, braking systems, motorcycle braking and performance, driver reaction, time-space analysis, and dynamics. Mr. Danaher has also been trained and certified on downloading and interpreting ACM and ECM (“black box”) data from passenger and commercial vehicles. He has investigated and analyzed hundreds vehicular accidents and applies his knowledge of vehicle dynamics, simulation, crush energy, momentum, and driver response to accident reconstruction. Frequent aspects of these investigations involve analysis of brakes, tires, seat belts, airbags, and other vehicle systems. Mr. Danaher also has working experience with engine, drivetrain, and suspension failure analysis. In addition, Mr. Danaher has evaluated accidents involving recreational activities and equipment. Mr. Danaher has also authored publications related to forensic engineering for the Society of Automotive Engineers (SAE) and the National Academy of Forensic Engineers (NAFE). Mr. Danaher has also presented numerous seminars regarding vehicle accident investigations and reconstruction, product design and failure analysis, seat belts and airbags, and occupant kinematics. Mr. Danaher and his accident reconstruction expertise have been featured several times on local and national television including NBC, MSNBC, and CBS.

**EXPERT TESTIMONY:** As a result of his investigations and experience, Mr. Danaher has been qualified as an expert witness in cases nationwide and has provided expert testimony in both State and Federal Courts.

**PROFESSIONAL AFFILIATIONS:** National Academy of Forensic Engineers, Fellow (NAFE), National Society of Professional Engineers (NSPE), Accreditation Commission for Traffic Accident Reconstruction – Full Accreditation (ACTAR), Society of Automotive Engineers (SAE), National Association of Professional Accident Reconstruction Specialists (NAPARS), American Society of Mechanical Engineers (ASME). Mr. Danaher participated as a member of several SAE Standards Committees, including Reconstruction Information Resources, Investigation Techniques, Vehicle-Road Friction, and Pedestrian Accidents. Commercial Vehicle Safety Alliance (CVSA), Vehicle Committee Member. OSHA GI training.

## PUBLICATIONS

1. **Danaher, D.**, “Forensic Engineering Analysis of a Wheel Spindle Failure Due to Pre-Load and Fatigue” Journal of the National Academy of Forensic Engineers, Vol. 37 No. 1 December 2020, ISSN: 2379-3252 (2020)
2. **Danaher, D.**, Donaldson, D., and McDonough, S., “Acceleration of Left Turning Heavy Trucks,” SAE International Journal of Advances and Current Practices in Mobility 2(4) 2019-2036, 2020-01-0882, <https://doi.org/10.4271/2020-01-0882>, doi:10.4271/2020-01-0882. (2020)
3. **Danaher, D.**, McDonough, S., and Donaldson, D., “Two Phase Heavy Truck Acceleration Model,” SAE Technical Paper, 2019-01-0411, 2019, doi:10.4271/2019-01-0411. (2019)
4. **Danaher, D.**, Neale, W., McDonough, S., and Donaldson, D., “Low Speed Override of Passenger Vehicles with Heavy Trucks,” SAE Technical Paper, 2019-01-0430, 2019, doi:10.4271/2019-01-0430. (2019)
5. McDonough, Sean, **David Danaher**, William Neale. “Mid-Range Data Acquisition Unites Using GPS and Accelerometers.” SAE Paper 2018-01-0513. (2018).
6. Rose, Nathan, Neal Carter, John Kreisher, Martin Randolph, William Neale, **David Danaher**, “How Accurate Are Witness Distance Estimates Given in Car Lengths?” Collision: The International Compendium for Crash Research, Volume 11 Issue 1, 2016. (2016).
7. Neale, William T., **David A. Danaher**, Sean M. McDonough. “Data Acquisition Using Smart Phone Applications.” SAE Paper 2016-01-1461. (2016).
8. **Danaher, David A.** “Forensic Engineering Analysis of Safety Shooting Glasses Subject to Ballistic Impact” Journal of the National Academy of Forensic Engineers. (December 2011).
9. Ball, Jeffrey K., **David A. Danaher**, Trevor J. Buss. “Full-Scale Testing and Analysis of Tractor-Trailer Braking Performance with and without Trailer Anti-Lock Brakes.” SAE Paper 2010-01-1891. (2010).
10. **Danaher, David A.**, Trevor J. Buss, Jeffrey K. Ball. “Operation of the Eaton VORAD Collision Warning System and Analysis of the Recorded Data.” SAE Paper 2009-01-2911. (2009).
11. Ball, Jeffrey K., **David A. Danaher**, Richard M. Ziernicki. “A Method for Determining and Presenting Driver Visibility in Commercial Vehicles.” SAE Paper 2007-01-4232. (2007).
12. Ziernicki, Richard M., Jeffrey K. Ball, **David A. Danaher**. Richard M. Ziernicki. “Forensic Engineering Evaluation of Physical Evidence in Accident Reconstruction.” Journal of the National Academy of Forensic Engineers. (July 2007).
13. Ball, Jeffrey K., **David A. Danaher**, Richard M. Ziernicki. “Considerations for Applying and Interpreting Monte Carlo Simulation Analyses in Accident Reconstruction.” SAE Paper 2007-01-0741. (2007).
14. Ziernicki, Richard M., **David A. Danaher**.. “Forensic Engineering and the Use of Computer Animations and Graphics.” Journal of the National Academy of Forensic Engineers. (December 2006).
15. Palmer, John A., **David A. Danaher**. "A Series of Preventable Events Leads to a Power Plant Explosion." EC&M (Nov. 2004).
16. **Danaher, David A.**, Wendy S. Johnson, Ben T. Railsback, and Richard M. Ziernicki. "A New Polycarbonate and Glass Laminate and its Effects on the Relationship Between Residual Tensile Stresses and Impact Resistance of Windshields." Society of Automotive Engineers paper for the International Body Engineering Conference & Exhibition (IBEC) and The Automotive & Transportation Technology Congress (ATT) Paper number 2002-01-1991 (Jul. 2002).

## TRAINING, TECHNICAL CONFERENCES AND SEMINARS

1. “Basics of Crack Propagation” Training Certification Course. PDHengineer. Crack propagation theories, applying FEA to cracks, ASTM E3999, Charpy test, Stress Intensity factor formulae for center, double single and semi-infinite, single edge, center cracked plate, and real world problems. Denver, CO. November 19, 2020.

2. “How Things Break: Fatigue” Training Certification Course. PDHengineer. Safe life design, fail safe design, damage tolerant design, basic understanding of fatigue failure, characteristics of various materials under cyclic loading, visual indications of fatigue on fracture surfaces, interpretation of S-N curves, influence of environment and geometry, effect of manufacturing processes on component life, calculation methods to estimate component life, design tips to extend life of cyclically loaded components, case studies of fatigue failures. Denver, CO. November 12, 2020.
3. National Academy of Forensic Engineers Conference (NAFE) – Analysis of a Wheel Spindle Failure due to Pre-Load and Fatigue, The Application of Matchmoving for Forensic Video Analysis of a Fatal Sprint Car Accident, Analysis of a Crash Caused by Swingout of an Articulated Booster on a Semi-Trailer, Forensic Engineering Investigation of the Catastrophic Breakdown of a Diesel Engine an Emergency Generator Set, Analysis of a Fatal Overhead Crane Accident, Analysis of a Failed Roll-Over Protective Structure (ROPS), Forensic Engineering Investigation of a Self-Unloading Boom Collapse on a Great Lakes Freighter, Friction or Fiction: The Changing World of Slip-and-Fall Analysis. Denver, CO. July 27-28, 2019.
4. Society of Automotive Engineers (SAE) World Congress – Low Speed Override of Passenger Vehicles with Heavy Trucks; Reconstruction of 3D Accident Sites Using USGS LiDAR, Aerial Images, and Photogrammetry; The Application of Augmented Reality to Reverse Camera Projection; Inter-Vehicular Sliding Friction; Passenger Vehicle Response and Damage Characteristics of Front and Rear Structures during Low to Moderate Speed Impacts; Passenger Vehicle Dynamic Response and Characterization of Side Structure during Low to Moderate Speed Side Impacts; Using Adjusted Force-Displacement Data to Predict the EBS of Car into Barrier Impacts, Detroit, Michigan, April 9, 2019.
5. National Academy of Forensic Engineers Conference (NAFE) – CALSPAN, Failure of Large Marine Propeller Shaft, Apartment Freezing Sequence Using Heat Flow Equations, Computer Fire Modeling and the Law, Analysis of Video Screens, Right Turning Trucks Impacting Bicyclists, Forensic Issues that Arise from Recirculating Hot Water Systems, Failure of Plastic Pool Chlorinators, Machine Safe Guarding, Crash Testing of Forensic Engineering Investigations, Trail Testimony, Application of Professional Surveying. Buffalo, NY. July 28-29, 2018.
6. “Advanced Crash Reconstruction Utilizing Human Factors” Northwestern University. Training and Certification Course. Understanding driver response terms and definitions, Common causes for response delays, Whether weather influences driver response, Evaluating a response during nighttime driving, Nighttime response scenarios and documenting nighttime crashes, Headlight beam analysis, Evaluating path intrusion crashes, Acceleration rate of drivers, Gap acceptance, Driver search patterns, Driver response to lead vehicles, traffic signals and decision making, Effects of fatigue and alcohol, Tutorial on IDRR and V\*Star software. Evanston, IL. May 15-19, 2017.
7. “Vehicle Crash Reconstruction Methods” Training and Certification Course. Society of Automotive Engineers (SAE). Straight-Line Motion, Point Mass Collisions (COLM, Conservation of Linear Momentum), Planar Impact Mechanics (PIM), Class exercises using VCRware software, Crush and Tangential Energy Loss, Event Data Recorder (EDR) Technology, Crash Reconstruction using EDR Data, Planar Impact Mechanics and Spreadsheet Optimization Techniques, Frontal Vehicle-Pedestrian Collisions, Planar Photogrammetry, Mechanics and Modeling of Tire Forces, Critical Speed from Tire Yaw Marks, Articulated Vehicle Impact, Topics from Vehicle Dynamics. Scottsdale, AZ. Sept. 28-30, 2016.
8. ARC-CSI Crash Conference – Motorcycle Crash Testing (27), Vehicle Crash Testing, IIHS Driver and Passenger-Side Crash Test Comparison, Photography for Crash Reconstruction, Analysis using NHSTA NASS Crash Data, Working Around Electric Vehicles, Motorcycle Reconstruction Techniques, Evaluation of Pre-Crash Braking, Evaluating Wheel Impacts in Rollovers, Lateral Acceleration Through a Curve, When do Airbags Deploy, 30. Las Vegas, NV. May 23-26, 2016.
9. “Heavy Vehicle Crash Reconstruction” Northwestern University. Training and Certification Course. Heavy Vehicle nomenclatures, Air Brakes Systems, ABS Braking Systems, Front Axle Brakes and Proportioning Valves, Special Component Issues, Data Collection, Conspicuity, Speed Analysis, Collision behavior, momentum and damage. Event Data Recorders (Basics), Off-tracking, Rollover, Computer analysis, Field testing and analysis, Heavy Vehicle Tire Stamping. Evanston, IL. May 11-15, 2015.
10. “Crash Data Retrieval (CDR) Analysis and Applications Course”. Training and Certification Course. Golden, CO. April 13-14, 2015.
11. “Motorcycle Crash Reconstruction” Northwestern University. Training and Certification Course. Motorcycle nomenclatures, Characteristics of motorcycle tires and wheels, Motorcycle braking systems, Motorcycle electronic control units and air bag systems, Roadway factors, Operator and passenger factors, Motorcycle and rider conspicuity, Motorcycle helmets, Motorcycle dynamics, Velocity determination, Computer analysis, Field testing and analysis, and Case studies. North Las Vegas, NV. April 6-10, 2015.

12. Motorcycle Safety Foundation Riders Course. Training and Certification Course. T3RG Aurora, CO. June 28-29, 2014.
13. "10-hour Occupational Safety and Health Training Course in General Industry Safety Industry" Hazmat Plans & Programs (HP&P) Certification Course. Course emphasis on practices covered under OSHA Standards for General Industry in 29 CFR 1910. Includes worker's rights, employer responsibilities, work safety and health resources, material data sheets, OSHA log, walking and working surfaces, fall protection, exit routes, emergency action plans, fire prevention plans, fire protection, electrical, personal protective equipment, hazard communication, machine guarding, and safety and health programs. Aurora, CO. May 29-30, 2014.
14. Commercial Vehicle Safety Alliance (CVSA) Workshop: Building a Brighter Future: Quality, Uniformity and Consistency in CMV Safety and Enforcement Conference. Los Angeles, CA. April 6-10, 2014.
15. "Accessing and Interpreting Heavy Vehicle Event Data Recorders" Training and Certification Course. Society of Automotive Engineers (SAE). Oxnard, CA. Oct. 23-26, 2012.
16. "Vehicle Accident Reconstruction." Society of Automotive Engineers (SAE). Seminar: International Congress and Exposition. Cobo Hall. Detroit, MI. April 12-13, 2011.
17. "Essentials and Expert Training using PC-Crash Including Accelerated Essentials Survey and Advanced Special Topics" Training and Certification Course. Orlando, FL. April 6-8, 2011.
18. ARC-CSI Crash Conference – Vehicle Crash Testing, PDOF and Angle Development Over Time, GM OnStar, Accelerometers and Other Devices, Motorcycle Accident Reconstruction, Low Speed Crash Analysis, Motion Equations, Commercial Motor Vehicle Forensic Inspection, Delta-V, Finding Speed or Acceleration from Video, Impact Speed and Post-Collision Speedometer Readings, GPS, Conspicuity Sheeting, Retro Reflective Tape Wear. Las Vegas, NV. May 24-27, 2010.
19. "Vehicle Accident Reconstruction." Society of Automotive Engineers (SAE). Seminar: International Congress and Exposition. Cobo Hall. Detroit, MI. 20-22 Apr. 2009.
20. "Crash Data Retrieval System Operator's Certification Course Series: CDR Technician Course; CDR Data Analyst Course" Certification. Bosch approved, conducted by Collision Safety Institute (CSI). Training and Certification Course. Des Moines, IA 9-13 Mar. 2009.
21. NJAAR Annual Joint Conference – Lateral Pole Collisions, Commercial Vehicle: Event Data Recorders, Critical Speed Yaw, Under Influence and Driving, Perception/Reaction, Airborne Analysis, Vehicle Event Data Retrieval EDR. Atlantic City, NJ. October 15-17, 2008.
22. AIRP Standard Committee Meeting. "Society of Automotive Engineers (SAE). Seminar: International Congress and Exposition. Cobo Hall. Detroit, MI. 18 Apr. 2007.
23. "Commercial Vehicle Braking Systems." Society of Automotive Engineers (SAE). Training and Certification Course. Detroit, MI. 16- 18 Apr. 2007.
24. "Vehicle Accident Reconstruction." Society of Automotive Engineers (SAE). Seminar: International Congress and Exposition. Cobo Hall. Detroit, MI. 3-5 Apr. 2006.
25. "EDC Reconstruction." Engineering Dynamics Corporation. Training and Certification Course. Northridge, CA. 21-25 Jan. 2002.
26. "EDC Simulations." Engineering Dynamic Corporation. Training and Certification Course. Northridge, CA. 22-26 Jan. 2001.
27. "Acceleration and VC2000PC Training Course." Vericom Computers. Greenwood Village, CO. 27 Jun. 2000.
28. "The Role of Computers in Accident Reconstruction." Knott Laboratory, Inc. Centennial, CO. 14 Mar. 2000.
29. "Vehicle Accident Reconstruction." Society of Automotive Engineers (SAE). Seminar: International Congress and Exposition. Cobo Hall. Detroit, MI. 6-9 Mar. 2000.
30. "The Role of Computers in Accident Reconstruction." Knott Laboratory, Inc. Centennial, CO. 26 Oct. 1999.

31. "High Speed Accident Investigations." Presenter. Knott Laboratory, Inc. Centennial, CO. 14 Oct.1999.
32. "Courtroom Use of Photogrammetry, 3-D Computer Modeling and Animation." Knott Laboratory, Inc. Centennial, CO. 15 Apr. 1999.
33. "Damaged Roof Evaluation: What Every Adjuster Should Know." Knott Laboratory, Inc. Centennial, CO. 7 Apr. 1999.
34. "Medical and Biomechanical Evaluation of Injuries." Knott Laboratory, Inc. Denver, CO. 31 Mar. 1999.
35. "High Speed Accident Investigation." Knott Laboratory, Inc. Centennial, CO. 25 Mar. 1999.
36. "Accident Reconstruction Using Conservation of Momentum & Energy." Training and Certification Course. Society of Automotive Engineers (SAE) Professional Development Program. Detroit, MI. Dec. 1998.
37. "Foundation Failure and Water Problems." Knott Laboratory, Inc. Centennial, CO. 15 Oct. 1998.
38. "Biomechanical and Medical Evaluation of Injuries." Knott Laboratory, Inc. Centennial, CO. 14 Oct.1998.
39. "Product Failure and Malfunction." Knott Laboratory, Inc. Centennial, CO. 8 Oct. 1998.
40. "Accident Reconstruction: State of the Art Technologies." Knott Laboratory, Inc. Centennial, CO. 7 Oct.1998.
41. "Product Liability." Knott Laboratory, Inc. Centennial, CO. 9 Apr. 1998.
42. "Seatbelts and Airbags: Current Technology." Knott Laboratory, Inc. Centennial, CO. 19 Mar.1998.
43. "Low Speed Accident Investigations." Knott Laboratory, Inc. Centennial, CO. 23 Oct. 1997.
44. "Seatbelt and Airbag Investigation." Knott Laboratory, Inc. Centennial, CO. 16 Oct. 1997.
45. "Accident Investigation and Reconstruction." Knott Laboratory, Inc. Centennial, CO. 2 Oct. 1997.

#### **INVITED LECTURES**

1. "Analysis of a Wheel Spindle Failure due to Pre-Load and Fatigue" Speaker. National Academy of Forensic Engineers (NAFE), Technical Paper Presentation, NAFE Annual Meeting, July 27, 2019
2. "Low Speed Override of Passenger Vehicles with Heavy Trucks" Speaker. Society of Automotive Engineers Technical Paper Presentation, Society of Automotive Engineers World Congress, Detroit Michigan, April 9, 2019
3. "Low Speed Override of Passenger Vehicles with Heavy Trucks" Panel Member. American Bar Association – Transportation Megaconference XIV Trucking and Motor Carrier Litigation. New Orleans, LA. March 22, 2019
4. "Black Box, Drive Cam, and GPS Data Available in Modern Vehicles" Speaker. Safety and Technical Training Conference, (RMEL). Lone Tree, CO. April 22, 2015.
5. "Forensic Engineering Evaluation of Physical Evidence in Accident Reconstruction." Speaker., National Academy of Forensic Engineers (NAFE), Technical Paper Presentation, NAFE Annual Meeting. Denver, CO. 28 Jul. 2007.
6. "Seatbelts & Airbags: Current Technology." Presenter. Vehicular Accident Reconstruction Insurance Seminar. Knott Laboratory, LLC. Centennial, CO. 2 Mar. 2006
7. "Accident Reconstruction: Expert Opinions in Visual Form." Presenter. Kansas Bar Association CLE Meeting. Vail, CO. 10 Jun. 2005.
8. "Vehicle Accident Reconstruction." Presenter. Insurance Claims Seminar. Knott Laboratory Inc. Centennial, CO. 6 May 2004.
9. "The Use of Animation in Litigation." Presenter. Southeast Metropolitan Law Club. Englewood, CO. 4 Nov. 2003.

10. "A New Polycarbonate and Glass Laminate and its Effects on the Relationship Between Residual Tensile Stresses and Impact Resistance of Windshields." Presented paper number 2002-01-1991. Society of Automotive Engineers International Body Engineering Conference & Exhibition (IBEC) and The Automotive & Transportation Technology Congress (ATT). Paris, France. 9 Jul. 2002.
11. "Forensic Engineering: Product Liability." Presenter. Travelers Insurance Claims Seminar. Englewood, CO. 7 Jun. 2002.
12. "Forensic Engineering: Product Liability." Presenter. Travelers Insurance Claims Seminar. Englewood, CO. 7 Jun. 2002.
13. "Forensic Engineering: Buildings, Bumpers and Bodies." Presenter. White & Steele, P.C. Wyoming Insurance Claims Seminar. Radisson Hotel. Aurora, CO. 4 Feb. 2002.
14. "Vehicular Accident Reconstruction." Presenter. Knott Laboratory, Inc. Centennial, CO. 14 Mar. 2000.
15. "New Technologies in Accident Reconstruction." Presenter. Society of Automotive Engineers (SAE), Colorado Section Meeting. Knott Laboratory, Inc. Centennial, CO. 19 Jan. 2000.
16. "Seatbelt and Air Bag Investigation." Presenter. Knott Laboratory, Inc. Centennial, CO. 12 Sept. 2000.

#### **FUNDED AND SUPPORTED RESEARCH**

1. "Video Analysis of Concussion Causing Events in Professional Football." Sponsored by the National Football League (NFL). 2017
2. "Speak up to Slow Down" Wisconsin State National Campaign Against Speeding. Ongoing funding through Score One Production. 2013-present

#### **MEDIA APPEARANCES**

1. "Street Racing Accident in Aurora, Colorado." Channel 4 News. CBS. 10 May 2006.
2. "Knott Laboratory Feature by Business Reporter, Greg Moss." Channel 9 News Morning Show. NBC. 4 Nov. 2004.
3. "How Technology and Animation Work Together to Aid in Forensic Analysis." Channel 4 News. CBS. 8 May 2003.
4. "Out of Control: Why Cars Crash." MSNBC. 2000/2001.