

Curriculum Vitae

Shawn P. Ray, P.E., ACTAR



Mr. Ray is a mechanical engineer with extensive experience in accident reconstruction, mechanical evaluation, and failure analysis. He is a licensed Professional Engineer; ACTAR accredited reconstructionist; Certified Professional Engineering Manager, and an ASE Certified Master Automobile Technician & Undercar Specialist plus an ASE Certified Master Medium/Heavy Truck Technician and Certified Master Transit Bus Technician. In addition, Mr. Ray is a Certified Fire and Explosion Investigator, Certified Fire Investigation Instructor and a Certified Vehicle Fire Investigator specializing in fire cause determination of vehicles, machinery, motor homes and heavy equipment including the examination of vehicle components and accessories. Mr. Ray's expertise and experience are used in evaluating and analyzing vehicle and mechanical failures. One of the many things that set Mr. Ray apart from his colleagues is the amount of independent research and testing he conducts. As a result, he has been invited to present and publish his findings at many national and international science, technology and industry forums. Mr. Ray's consulting experience also extends to the courtroom, where he has provided expert testimony in both state and federal courts regarding investigation and analyses related to accident reconstruction, mechanical systems & failures analysis.

While pursuing his undergraduate degree, Mr. Ray worked at Bell Helicopter Textron in the Field Investigations Laboratory evaluating failures and fatigue testing aircraft components. During the pursuit of his graduate degree he began work as a consultant in accident reconstruction and has worked continuously in this area for 25 years. His work experiences include mechanical failure evaluations, accident reconstruction, product failure analysis, design evaluation, and fire causation determination.

Licensure and Certification

- Registered Professional Engineer, State of Oregon, No. 79470PE
- Registered Professional Engineer, State of Texas, No. 91961
- Registered Professional Engineer, State of California, No. 36633
- Registered Professional Engineer, State of Washington, No. 51499
- National Council of Examiners for Engineering and Surveying (NCEES), No. 52954
- ACTAR Accredited Traffic Accident Reconstructionist, No. 588
- ASE Certified Master Automobile Technician & Undercar Specialist, No. Q8HR6SD7RAY
- ASE Certified Master Medium/Heavy Truck Technician No. 0Q8HR6SD7RAY
- ASE Certified Master Transit Bus Technician –No. Q8HR6SD7RAY
- Certified Fire and Explosion Investigator, NAFI, No. 10886-5139
- Certified Fire Investigation Instructor, NAFI, No. 10886-5139V
- Certified Vehicle Fire Investigator, NAFI, No. 10886-5139V
- Engineering Management Certification Professional, EMCI, No. 505090903

Formal Education

- M.S. in Mechanical Engineering, Southern Methodist University, Dallas, TX 1996
- B.S. in Mechanical Engineering, Southern Methodist University, Dallas, TX 1990
- Associates, Math & Natural Sciences, Fort Hays State University, Hays, KS 1987

Areas of Expertise

- Engineering Analysis
- Equipment & Machinery Fire & Explosions
- Full Scale Vehicle Testing and Demonstrations

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- High- And Low-Speed Vehicle Accidents
- Marine Accident Analysis & Reconstruction
- Mechanical Component and System Analysis
- Mechanical Evaluation / Failure Analysis
- On/Off Road Heavy Equipment Failure Analysis
- Operator/Human Factors Analysis
- Safety Systems & Restraints Analysis
- Scene Mapping
- Tire / Tread Separation Evaluations
- Vehicle Components Inspections
- Vehicle Design Analysis/Component Testing
- Vehicle, Machinery & Equipment Engines and Transmissions
- Vehicle, Machinery, Building Equipment, & Marine Fires

Professional Development

- Symposium on Traffic Safety, Institute of Police Technology and Management, Orlando, FL, 2017
- 10th Annual CDR User's Summit, ARC Network/Collision Publishing, Houston, TX 2015
- CDR Technician Level II Class, CDR User's Summit, Crash Data Group, Houston, TX 2015
- TRB 94th Annual Meeting, Transportation Research Bureau, Washington D.C. 2015
- CAARS 2014 Fall Conference – Reconstruction Methods, CAARS, Lake Tahoe, CA 2014
- Rusty Haight "Crash Analysis of Ped-Bike v Vehicle Impacts", FARO, Hillsboro, OR 2014
- 3D Laser Scanning for Forensics Scene Mapping, PPI Group & FARO, Portland, OR 2014
- President's Dinner, ASME Board of Operations & Board of Governors' Annual Meeting, Portland, OR 2014
- SAE World Congress, Detroit, MI, 2014
- Review of Geometric Dimensioning and Tolerancing, ASME, Portland, OR, 2013
- 2013 ASME District D Leadership Assembly, ASME, Portland OR, 2013
- SAE World Congress, Detroit, MI, 2013
- FARO Seminar and Truck/Equipment Acceleration & Deceleration Testing Salem, OR, 2013
- SAE World Congress, Detroit, MI, 2013
- 10 Major Career Pitfalls for Technical Professionals, ASME, Portland, OR, 2013
- Influencing and Leading your Industry, ASME Portland, OR, 2013
- American Society of Mechanical Engineers Leadership Training Conf., St. Louis, MO, 2013
- SAE World Congress, Detroit, MI, 2012
- SAE Commercial Vehicle Engineering Congress and Exhibition, Chicago, IL, 2012
- 2nd International Conference on Fires in Vehicles – FIVE 2012, Chicago, IL, 2012
- Special Problems in Traffic Crash Reconstruction, U. of N. Florida, Jacksonville, FL, 2012
- American Society of Mechanical Engineers Leadership Training Conf., New Orleans, LA, 2012

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- National Subrogation Professionals Conference (NASP), Orlando, FL, 2011
- GPS – New Technology in Accident Reconstruction, NASP Webinar, 2011
- Strengthening Relationships between Public and Private Sector Fire Investigators and Addressing Ethical Considerations, IAAI, Portland, OR, 2011
- Oregon Professional Engineers Conference, Portland, OR, 2011
- Piping Systems Assessment & Optimization, Portland OR, 2011
- SAE World Congress, Detroit, MI, 2011
- The National Crash Analysis Conference, NCAC, Ashburn, VA, 2010
- Fundamentals of Motor Vehicle Fire Investigation, SAE International, Phoenix, AZ, 2010
- 1st Annual Crash Investigation Skill Building Conference, Forensic Accident Reconstructionist of Oregon (FARO), Hillsboro OR, 2010
- Investigation of Gas and Electric Appliance Fires, Fire Findings Laboratories, Benton Harbor, MI, 2009
- SAE World Congress, Detroit, MI, 2009
- SAE 2009 Hybrid Vehicle Technologies Symposium, San Diego, CA, 2009
- IEEE Symposium on Product Compliance Engineering, PSES, Austin, TX, 2008
- Heavy Vehicle Systems and Reconstruction Conference, WATAI Fall Conf., Seattle WA, 2008
- SAE Commercial Vehicle Engineering Congress and Exhibition, Chicago, IL, 2008
- SAE World Congress, Detroit, MI, 2008
- SAE World Congress, Detroit, MI, 2007
- “How to Organize and Run a Failure Investigation” ASM International, Albany, OR 2007
- WATAI Fall Conference, Vehicle Testing, Everett, WA, 2007
- SAE Commercial Vehicle Engineering Congress and Exhibition, Chicago, IL, 2007
- “Wind Power and Turbine Technology”, ASME, Portland, OR 2007
- SAE Brazil International Congress and Exposition of Automotive Technology, Sao Paulo, Brazil, 2006
- SAE Commercial Vehicle Engineering Congress and Exhibition, Chicago, IL, 2006
- TAARS F3T2 2006 Combined Conference, Houston TX, 2006
- Practical Fracture Analysis, ASM, Materials Park, OH, 2006
- SAE World Congress, Detroit, MI, 2006
- The Tire as a Vehicle Component, SAE, 2006
- SAE XIV International Congress and Exposition of Automotive Technology, Sao Paulo, Brazil, 2005
- WATAI Fall Conference, Crash Test, 2005
- Vehicle Fire, Arson & Explosion Investigation Science & Technology Seminar, NAFI, E. Kentucky Univ., 2005
- Texas Association of Accident Reconstruction Specialists Seminar, 2002
- OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER), 2002
- National Institute for Automotive Service Excellence (ASE), 2001
- Texas Association of Accident Reconstruction Specialists Annual Conference, 2001
- I-Car Restraints Program, 2001

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- Texas Association of Accident Reconstruction Specialists Seminar, 2001
- SAE2001 - Society of Automotive Engineers Annual Congress & Exposition, 2001
- Texas Association of Accident Reconstruction Specialists Seminar, 2001
- World Reconstruction Exposition Conference, 2000
- Accident Investigation I & II, AAIAA, 2000
- Acceleration and VC2000PC Training, 2000
- Texas Association of Accident Reconstruction Specialists Seminar, 1999
- Crash '98" - Conference on Reconstruction and Safety on the Highways, TEEX, 1998
- U-Race, Introductory Driver Training Race School, 1998
- Texas Association of Accident Reconstruction Specialists Conference, June 1998
- SAE98 - Society of Automotive Engineers Annual Congress & Exposition, 1998
- Introduction to Claims Exam, Insurance Institute of America, 1997
- Introduction to Claims, Austin Community College, 1997
- Crash '97 - Staged Vehicle Collision Testing, TEEX, 1997
- Technical Writing, American Management Association, 1996
- Commercial Vehicle Inspection/Accident Investigation, TEEX, Texas A & M University, 1994
- Accident Reconstruction & Investigation, Institute of Police Technology and Management, 1992
- Traffic Accident Investigation, Northwestern University, 1991
- Measurements at the Scene, Northwestern University, 1991

OTHER RESEARCH AND TESTING

- Advanced Light Bulb Filament Testing and Research
- Design and construction of an Acceleration Test Apparatus for realistic replication of deceleration pulses involving small components
- Critical Speed Yaw and Vehicle Dynamic Response & Handling Research
- Pressure Switch Fatigue Failure Research & Testing
- In-depth Research of Critical Speed Yaw Formula
- Vehicle Yaw & Dynamic Evaluation Studies
- Vehicle Lateral Drag Factor Tests
- Ride Height Brake Dive Testing
- Staged Pedestrian and Bicyclist Night Time Visibility Studies
- Research of Tire & Suspension Effects on Deceleration
- Curb Override Deceleration Testing
- Bumper Strength Evaluation and Bumper Deformation Threshold Testing
- Car-To-Car and Car-To-Barrier Crash Testing At Low-and Moderate-Speed
- High-Speed Car-To-Car Crash Testing With Airbag Deployment
- Passenger Car Headlight Projection Distribution Mapping

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- Study of Side Panel Damage During Low Speed Vehicle Engagement
- Automotive "Coast Down" Deceleration Testing
- Passenger Vehicle Acceleration Testing
- Pedestrian Walking and Running Speeds
- Locomotive Headlight Projection Distance and Evaluation
- Railroad Boxcar and Flatcar Stationary Visibility Study
- Train Braking Deceleration, Full Braking and Emergency Application
- Exhaust Heat Generation and Transmission Into Passenger Van
- Motorcycle Stability and Sliding / Skid Tests
- Motorcycle Rear-Wheel Only Braking Comparison
- Motorcycle Versus Car Braking Comparison
- U-Haul Cargo Truck Acceleration/Deceleration/Cornering G-Analysis
- Yaw Analysis at Varying Speeds, Acceleration and Deceleration
- Rigid Mount Bumper Deformation Relating To Impact Severity
- Night Time Visibility Involving Passenger Vehicles, Commercial Trucks, Flatbed Trailers, Pedestrians and Bicyclists
- Truck-Tractor Acceleration
- Sound Study of Locomotive Horn Inside and Outside Passenger Vehicle
- Crash Test Simulations - Head-On at 10 mph and Sideswipe Scenarios
- Vehicle Handling, Stability and Tracking Of Large Commercial Trucks and Trailers
- Vehicle Handling, Stability and Maneuverability - Threshold Limit Conditions
- Skid Tests of Passenger Vehicles, Motorcycles and Commercial Vehicles

Professional Affiliations

- American Society of Mechanical Engineers (ASME)
- ASM International, The Materials Information Society (ASM)
- Forensic Accident Reconstructionist of Oregon (FARO)
- International Association of Arson Investigators (IAAI)
- National Fire Protection Association (NFPA)
- National Society of Professional Engineers (NSPE)
- National Association of Fire Investigators (NAFI)
- Porsche Club of America (PCA)
- Human Factors and Ergonomics Society (HFES)
- Society of Automotive Engineers (SAE)
- Sport Car Club of America (SCCA)
- Texas Association of Accident Reconstruction Specialists (TAARS)

Professional Experience

- Principal Mechanical Engineer, CASE Forensics, Portland, OR, 2005 to 2016
- Principal Engineer, S.P. Ray & Associates, formerly Precision Forensics, L.L.C., Austin, TX, 1999 to 2005
- Senior Consultant, Rimkus Consulting Group, Inc., Austin, TX, 2001 to 2002
- Senior Forensic Analyst, Engineering and Fire Investigations, Houston, TX, 1997 to 1999
- Billy Cox & Associates (merged with EFI)
- V.C.R. (merged with Billy Cox & Associates), 1996 to 1997
- Project Engineer, Automotive Research Corporation, Inc., College Station, TX, 1995 to 1996
- Accident Analyst, Evans & Associates, Inc., Las Cruces, NM, 1993 to 1995
- Accident Investigator/Mechanical Engineer, Accident Reconstruction Lab, Inc., Dallas, TX, 1990 to 1993
- CO-OP, Engineering Internship, Bell Helicopter Textron, Fort Worth, TX, 1988 to 1989

Honors and Awards

- ASME Oregon Section Chair 2012-2014
- ASME Oregon Section Vice-Chair 2011-2012 Sally Blum Award - Excellence in Engineering Design
- George Bray Scholarship Award
- Delta Sigma Phi, Outstanding Active Award
- President, Delta Sigma Phi (FHSU)
- Vice President, Alpha Phi Omega Service

Teaching and Curriculum Development

- Ray, S. (2014) EDR, CDR, The Truth and the Myth, Kemper Services Group, Salem, OR, 2014
- Ray, S. (2014) Engineers in Forensic Consulting: The Science of What Went Wrong, ASME Board of Operations & Board of Governors' Annual Meeting Auxiliary Luncheon, Portland, OR 97214
- Gee, R.S., Jones, D.L., & Ray, S.P., (2013) Salt Lake City Crash & Burn: 4 hours of Field Lectures, Crash Tests, Tire Skid Analysis, Air Bag Deployment, Vehicle Fire / Arson, Theft Investigation, and Laboratory and Technological Demonstrations. Developed and presented by CASE Forensics, Magna, UT, 2013
- Ray, S. & Sanchez, J. (2013) Recovery of Lost Treasure by Understanding Marine FAAR (Failure analysis & accident reconstruction) National Association of Subrogation Professionals (NASP), San Diego, CA, December 2013
- Ray, S. (2012) Low Light Site Documentation, Presentation and Validation For Commercial Vehicle Accident Reconstruction: Society of Automotive Engineers (SAE) Commercial Vehicle Engineering Congress, Chicago, IL, 2012
- Ray, S. (2012) Failure Analysis and Accident Reconstruction for Product Improvement and Enhanced Safety: Society of Automotive Engineers (SAE) Commercial Vehicle Engineering Congress, Chicago, IL, October 2012
- Ray, S. (2012) Emerging Trends in New Vehicle Technology Webinar: National Association of Subrogation Professionals (NASP), June 2012
- Ray, S. (2011) Emerging Trends in New Vehicle Technology: National Association of Subrogation Professionals (NASP), Annual Conference, Orlando, FL, November 2011
- Ray, S. (2011) Using New Vehicle Technology in Accident Reconstruction: Utah AI-SIU, Salt Lake City, UT, September 2011

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- Ray, S. (2011) Water Losses: How to determine cause and damages: Presented to IASIU-Oregon Chapter, Portland OR, October 2011
- Ray, S. (2009) Accident Reconstruction: Property Loss Research Bureau/Liability Insurance Research Bureau (PLRB/LIRB), Western Regional Adjusters Conference, 2009
- Ray, S. (2009) Accident Reconstruction: Property Loss Research Bureau/Liability Insurance Research Bureau (PLRB/LIRB), Central Regional Adjusters Conference, 2009
- Ray, S. (2009) Seattle Crash & Burn: 4.5 hours of Field Lectures, Crash Tests, Tire Skid Analysis, Air Bag Deployment, Vehicle Fire / Arson, Theft Investigation, and Laboratory and Technological Demonstrations. Developed and presented by CASE Forensics staff to insurance professionals. Held at Washington State Fire Training Academy, North Bend, WA, July 2009
- Ray, S. (2009) Accident Reconstruction: Property Loss Research Bureau/Liability Insurance Research Bureau (PLRB/LIRB), Eastern Regional Adjusters Conference, 2009
- Ray, S. (2009) Basic Fire Investigation: Investigators Luncheon, Hillsboro Fire Department, June 2009
- Ray, S. (2009) Crash 'N Burn Day: 8 hours of Field Lectures, Crash Tests, Tire Skid Analysis, Air Bag Deployment, Vehicle Fire / Arson, Theft Investigation, and Laboratory and Technological Demonstrations. Developed and presented by CASE Forensics staff to legal and insurance professionals, industrial safety representatives and first responders, in conjunction with the IASIU-Oregon Chapter, held at Chemeketa Community College, Salem OR, June 2009
- Ray, S. (2009) If It Breaks, Crashes or Burns? Careers in Forensic Engineering: MESA Engineering Your Future Conference, Portland State University, April 2009
- Ray, S. (2009) Vehicle Data & Technology: Using electronic data for accident investigation and product/component failure analysis.: Presented to Washington Insurance Network, Vancouver, WA April, 2009
- Ray, S. (2008) Vehicle Data & Technology: Using electronic data for accident investigation and product/component failure analysis.: Presented to Insurance Professionals of Washington, Vancouver, WA April, 2008
- Ray, S. (2008) New Vehicle Technology: What does it mean to accident investigations and product/component failure analyses: Presented to OPA –Masters Specialty Group, Portland OR, April 2008
- Ray, S. (2007) How to Choose an Expert: Presented to IASIU-Oregon Chapter, Portland OR, August 2007
- Ray, S. (2007) Accident Reconstruction Techniques: Presented to NW Paralegal Association, Portland OR, March 2007
- Ray, S. (2007) The Art of Accident Reconstruction: Presented to Boulder County Bar Association, Caplan & Earnest, Boulder, CO, January 2007
- Ray, S. (2006) Antitheft Devices on Domestic Vehicles: Presented to International Association of Special Investigation Units, Oregon Chapter Fall Symposium at Kennedy School, Portland, OR, October 2006
- Ray, S. (2006) Applications and Limitations of the Critical Speed Formula: Testing the Critical Speed Yaw. Presentation and testing of the Critical Speed Yaw Formula. Presented at the TAARS F3T2Expo, Houston, TX, September 2006
- Ray, S. (2006) Truck Day: 4 hours of field lectures and hands on training on the rules, regulations and workings of big rigs. Developed and presented solely by CASE Forensics staff to legal, insurance and industry representatives, Golden, CO, September 2006
- Ray, S. (2006) Crash 'N Burn Day: 8 hours of Field Lectures, Crash Tests, Air Bag Deployment, Vehicle Fire, Vehicle Break-In and Theft Investigations, and Laboratory and Technological Demonstrations. Developed and presented solely by CASE Forensics Corporation staff to legal and insurance professionals, industrial safety representatives and first responders, held at Chemeketa Community College, Salem OR, June 2006
- Ray, S. (2006) Quantifying The Change In Ride Height Due To Braking: Brake Dive Test Data, SAE International Paper No. 2006-01-1563. Published and presented at the 2006 SAE World Congress, April 2006

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- Ray, S. (2005) Proper Use & Qualifications of Your Expert, presented to the Oregon Casualty Adjusters Association, October 2005
- Ray, S. (2001) Light Bulb Filament Analysis - Understanding The Effect Of Inertial Impact Force, SAE International Paper No. 2001-01-1282. Published and presented at the 2001 SAE International Congress, March 2001
- Ray, S. (2000) Ford / Firestone - Tread Separation and Rollover Event, presented to the Capital Area Trial Lawyers Association, Austin, Texas, September 2000

Publications

- Ray, S. P., Testing of The Critical Speed Yaw Formula, Presentation and Publication TAARS F3T2Expo, Houston, TX, September, 2006.
- Ray, S. P., Newbery, T. M., Koziol, J. A., Quantifying The Change In Ride Height Due To Braking: Brake Dive Test Data, SAE International Paper No. 2006-01-1563. Accident Reconstruction, SP-1999, 2006, Society of Automotive Engineers. Published and presented at the 2006 SAE World Congress, Detroit, MI, April 2006.
- Ray, S. P., Fabris-Jewell, M., Treat, B., Light Bulb Filament Analysis - Understanding The Effect Of Inertial Impact Force, SAE International Paper No. 2001-01-1282, Society of Automotive Engineers. Published and presented at the 2001 SAE International Congress, March 2001.
- Ray, S. P., When SUVs Collide with Passenger Cars - The Incompatibility Question, Cause & Effect Vol. 1, Issue II, April 2000.
- Ray, S. P., New Technology - You May Have a Black Box in Your Car, Cause & Effect Vol. 1, Issue 1, January 2000.
- Ray, S. P., When Should You Use an Accident Reconstructionist? Accident Alert Vol. V, Issue VI, Summer 1998.
- Ray, S. P., Are Airbags Really Dangerous? Accident Alert Vol. V, Issue VI, Summer 1998.