

## **CURRICULUM VITAE**

**Timothy C. Behrens, P.E., DFE, CFI, CFEI, CVFI**  
**Forensic Mechanical Engineer**  
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**Phoenix, AZ**

### **AREAS OF EXPERTISE**

Mr. Behrens has 42 years of experience in mechanical engineering, with the last 38 years primarily devoted to failure analysis and forensic engineering. His forensic engineering practice is diverse and has included conducting over a thousand engineering investigations involving a vast array of fires, explosions, accidents, and product failures.

Mr. Behrens has conducted hundreds of full-scale vehicle crash, fire and component-level tests, which has provided a practical basis for his extensive knowledge and expertise in vehicle fires, including post-collision fires, and vehicle component and system failures.

Mr. Behrens also has extensive expertise in fire investigation and failure analysis involving all types of vehicles, appliances, propane and natural gas fires and explosions, plumbing systems, fire sprinkler systems, HVAC, and commercial/industrial equipment.

He is also a Board-Certified Diplomate in Forensic Engineering (DFE) by the National Academy of Forensic Engineers (NAFE) in accord with the guidelines of the Council of Engineering Specialty Boards (CESB).

Mr. Behrens has provided expert witness testimony in over 40 cases involving various fires, accidents and failures.

Mr. Behrens is a Certified Fire Investigator (CFI) by the International Association of Arson Investigators (IAAI) and a Certified Fire and Explosion Investigator (CFEI) and Certified Vehicle Fire Investigator (CVFI) by the National Association of Fire Investigators (NAFI).

In addition, Mr. Behrens provides engineering investigations for slip/trip & fall accidents and premises liability issues. He is a Certified XL Tribometrist (CXLT) by Excel Tribometers.

Mr. Behrens is a licensed Professional Engineer (P.E.) in 6 states (AZ, CA, CO, FL, NM, UT) and is available nationwide and globally for forensic engineering assignments.

His specific areas of expertise include:

- Vehicle Fire Origin & Cause (including Passenger Cars, Heavy Trucks, RV's, Motorhomes, Agricultural & Construction Machinery)
- Vehicle Failure Analysis (Fuel Systems, Tires, Brakes, Engine, Drivetrain)
- Plumbing System & Appliance Failure Analysis (Piping Systems, Fire Sprinkler Systems, Plumbing Systems & Components, Water Heaters, RO systems, Water Filters, Washing Machines, Dishwashers)
- Fire Cause Analysis of Appliances, Natural Gas & LPG Equipment & Fireplaces
- Failure Analysis of Mechanical Components & Systems, Industrial Equipment and Consumer Products
- Vehicle Accident Analysis & Reconstruction (Passenger Cars, Heavy Trucks, ATV's, Motorcycles, Bicycles, Golf Carts)
- Low Speed Vehicle Accident Analysis – Biomechanical Injury Potential & Damage Feasibility Analysis

## **EDUCATION**

University of Arizona

Tucson, Arizona

Bachelor of Science Degree in Mechanical Engineering

Graduated with Honors Distinction – 1983

Academic Honors – Tau Beta Pi – Engineering Honor Society

## **EMPLOYMENT**

Behrens Engineering Investigations, LLC, Phoenix, AZ

Owner / Forensic Mechanical Engineer

March 2025 to present

Charles Taylor Engineering Technical Services, Phoenix, AZ

Principal Forensic Engineer

October 2021 to February 2025 (3.5 years)

EFI Global, Inc., Phoenix, AZ  
Principal Engineer  
2015 to 2021 (6 years)

Behrens Engineering Investigations, LLC, Phoenix, AZ  
Owner / Forensic Mechanical Engineer  
2006 to 2015 (9 years)

EFI Global, Inc., Phoenix, AZ  
Senior Engineer  
1999 to 2006 (7 years)

Failure Analysis Associates (now Exponent), Phoenix, AZ  
Senior Engineer  
1987 to 1999 (12 years)

Garrett Turbine Engine Company, Phoenix, AZ  
Development Engineer and Mechanical Component Design Engineer  
1983 to 1987 (4 years)

## **CERTIFICATIONS**

Registered Professional Mechanical Engineer, Arizona, # 31197  
Registered Professional Engineer, Colorado, # 34469  
Registered Professional Mechanical Engineer, California, # 35500  
Registered Professional Engineer, New Mexico, # 17085  
Registered Professional Engineer, Utah, # 372882-2202  
Registered Professional Engineer, Florida, # 95285  
Board Certified Diplomate in Forensic Engineering, NAFE, # 1126  
Certified Fire Investigator (IAAI) # 28-071209  
Certified Fire and Explosion Investigator (NAFI), # 6805-2704  
Certified Vehicle Fire Investigator (NAFI), # 6805-2704v  
Certified Operator for the English XL Variable Incidence Tribometer, CXLT  
(Slip-Test Instrument for Floors)  
Certified Fireplace & Chimney Inspector, Fireplace Investigation Research &  
Education Service (F.I.R.E), # FCI-250  
ACTAR Accredited Traffic Accident Reconstructionist, # 1020, 1999 to 2014

## **SPECIALIZED EDUCATION**

Evidence Examination: What Happens at the Lab, CFITrainer.net, 2024  
How to Excel at Your Expert Witness Deposition, SEAK, 2023

Photovoltaic Cells & Systems, CFITrainer.net, 2023  
Forensic Photography Symposium, 2023  
Propane Explosions: Investigation, Failures, Scene Exam & Litigation, NASP, 2022  
Electrical Safety, CFITrainer.net, 2022  
Motor Vehicles: Engine, Ignition, Electrical & Fuel Systems, CFITrainer.net, 2022  
Motor Vehicles: Transmission, Exhaust, Brake & Accessory Systems, CFITrainer.net, 2022  
Understanding Undetermined, CFITrainer.net, 2022  
Practical Fractography, ASM International, 2021  
Technical Topics in Forensic Engineering, NAFE, 2021  
Forensic Engineering Seminar, NAFE, Summer 2020  
Bosch CDR Tool Technician Training by IPTM, 2020  
How to use the Bosch CDR Tool, Crash Academy, 2020  
Forensic Engineering Seminar, NAFE, Winter 2020  
CXL Certification Program, EXCEL TRIBOMETERS, LLC, 2019  
Reconstruction and Analysis of Motorcycle Crashes, SAE International, 2018  
Heavy Vehicle & Kawasaki EDR's, Post-Collision Examinations, SATAI, 2018  
Forensic Engineering Seminar, NAFE, 2018  
Dryer Fires: Cleaning Up on Subro, NASP, 2017  
Residential Electricity for Fire Investigators, Fire Findings, 2017  
Commercial Kitchen Fires, International Assoc. of Arson Investigators, 2016  
International Symposium of Fire Investigation Science & Technology, 2016  
Basic Electricity and Fire, International Association of Arson Investigators, 2015  
Investigating Solid Fuel-Burning Appliance Fires, Fire Findings, 2014  
Tire Mechanics and Forensic Tire Examination, TRGtech Tire Consulting, 2014  
Understanding Fire through the Candle Experiments, CFITrainer.net, 2014  
Fire Scene Safety; Personal Protective Equipment Selection and Use, IAFI, 2014  
NFPA 921 Update Class, International Association of Arson Investigators, 2014  
Walkway Auditor Training Course: ASTM F2948, Forcon International, 2014  
Fireplace & Chimney Inspection, Fireplace Investigation Research Education, 2013  
Ten Most Common Fire Scene Errors, IAFI, 2013  
Arc Mapping Basics, CFITrainer.net, 2012  
Forensic Photography Seminar, IAAI, 2012  
Vehicle Fire Failure Analysis Seminar, IAAI, 2011  
Diagnosing Material Failures, American Society of Mechanical Engineers, 2011  
Daubert & Expert Testimony Seminar, IAAI, 2011  
Scene & Investigator Safety Training Seminar, IAAI, 2010  
Fire Investigation of Alternative Fuel Vehicles, IAAI, 2010  
Forensic Evidence Collection & Processing, IAAI, 2010  
Natural Gas Seminar, International Association Arson Investigators, 2010  
Fundamentals of Motor Vehicle Fire Investigation, SAE, 2009  
Commercial Kitchen Fire Losses, NASP, 2009  
Effective Investigation & Testimony Course, IAAI, 2009  
Investigation of LP Gas Fires & Explosions, IAAI, 2008

Plastics Failure Analysis Seminar, Society of Plastics Engineers, 2007  
Investigating Residential Dryer Fires, Fire Findings Laboratories, 2007  
English XL Variable Incidence Tribometer Certification Program, 2006  
Vehicle Fire, Arson & Explosion Investigation, NAFI, 2005  
Boiler Operation, Maintenance & Safety, American Trainco, 2004  
Tire Failure Analysis in Traffic Accidents, University of California Riverside, 2004  
Toilet Assembly Failures, National Association of Subrogation Professionals, 2004  
Tire & Wheel Safety Issues, Society of Automotive Engineers, 2004  
Testifying Skills for Engineers, American Society of Civil Engineers, 2003  
Troubleshooting Concrete Construction, The American Concrete Institute, 2002  
Investigation of Gas and Electric Appliance Fires, Fire Findings Laboratories, 2002  
Advanced Vehicle Fire Investigation, Steve R. Mackaig & Associates, 2001  
Natural Gas Seminar, International Association of Arson Investigators, 2001  
Determining Cause & Origin of Fires/Explosions, NAFI, 2000  
Low Speed Auto Accidents, Lawyers & Judges Publishing Company, 1999  
Mechanics of Vehicle Theft Seminar, Lee S. Cole & Associates, 1999  
Low Speed Impact Analysis & Crash Testing, EFI Global, 1999  
High Speed Rear Impact TOPTec Symposium, SAE, 1997  
Investigation of Vehicle Fires, Lee S. Cole & Associates, 1994  
Vehicle Accident Reconstruction Training/Seminar, Failure Analysis Assoc, 1994

## **PROFESSIONAL MEMBERSHIPS**

Member, Society of Automotive Engineers (SAE)  
Member, American Society of Mechanical Engineers (ASME)  
Member, National Association of Fire Investigators (NAFI)  
Member, International Association of Fire Investigators (IAFI)  
Member, International Association of Arson Investigators (IAAI)  
Member, American Society for Testing and Materials (ASTM)

### Committee Memberships

D21 on Polishes  
E58 on Forensic Engineering  
F13 on Pedestrian / Walkway Safety and Footwear  
F15 on Consumer Products

Member, Southwestern Association of Technical Accident Investigators (SATAI)  
Appointed to Enforcement Advisory Committee, AZ State Board of Technical  
Registration

## **COURSES AS AN INSTRUCTOR & GUEST LECTURER**

The Mechanics of the Collision, National Business Institute, 2012  
Ford Cruise Control Failures & Fires, Pacific Rim Investigative Services, 2011  
Low Speed Biomechanical Analysis, The Hartford Insurance Company, 2003

Mechanical Engineering Investigation of Fires, AZ Risk Management Dept, 2002  
Low Speed Biomechanical Analysis, Wisconsin Insurance Claims, 2001  
Low Speed Biomechanical Conference, American National Property&Casualty, 2000  
Accident Reconstruction, Arizona Insurance Claims Association, 1998

## **PUBLICATIONS**

“The Physics and Anatomy of Auto Collisions – The Mechanics of the Collision”,  
National Business Institute, January 2012 (58447)

“High Speed Rear Impact Crash Test Video and Notebook”  
Society of Automotive Engineers, January 1998 (with S.M. Werner).

“Heavy Truck Crashworthiness Phase III,” Society of Automotive Engineers,  
Cooperative Research Project, Report No. CRP-013, April 1997 (with R.E. Larson,  
M.C. Marine and S.M. Werner). (This project resulted in the development of the  
SAE Recommended Practices J4218, J4219, J2420, J2421, J2422, J2423, J2424,  
J2425, and J2426).

“Ignition and Combustion of Automotive Carbon Canisters,” Failure Analysis  
Associates, Inc. Report, October 1991 (with D.A. Limbert, R.C. Lange, and J.L.  
Wirth).

“Comparative Refueling Losses from Disconnected Evaporative Emission and  
Onboard Refueling Vapor Recovery Systems,” Failure Analysis Associates, Inc.  
Report, October 1991 (with R. C. Lange and D.A. Limbert).

“Refueling Vapor Ignition Demonstration,” Failure Analysis Associates, Inc. Report,  
October 1991 (with N.K. Cooperrider).

“Thirty MPH Side Impact Crash Test 1985 Buick Century with Mobile Oil Company  
Onboard Refueling Vapor Recovery System,” Failure Analysis Associates, Inc.  
Report, February 1988 (with N.K. Cooperrider and T. Thomas).