

James D Whelan, PE | Mechanical Engineer, United States Patent Agent

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Professional Summary:

Mr. Whelan is a Licensed Professional Engineer and United States Patent Agent. His work is performed in support of accident reconstruction, litigation, intellectual property disputes, product recalls, insurance investigations, and industrial problem solving. He has investigated, analyzed and reconstructed accidents involving vehicles, machines, mechanical systems and industrial equipment. He has also critiqued product infringements within the scope of patent protection. Mr. Whelan has provided expert testimony in numerous legal jurisdictions. He is a member of several professional organizations including the American Society of Mechanical Engineers (ASME), Society of Automotive Engineers (SAE), American Society for Testing Materials (ASTM), National Association of Professional Accident Reconstruction Specialists (NAPARS), and American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). He earned his Bachelor of Science degree in Mechanical Engineering from Lehigh University. He has worked on projects in the Americas, Europe and Asia. Mr. Whelan is a passport holder for the United States and the Republic of Ireland. He speaks basic German and Spanish.

Trucking and Vehicle Accident Reconstruction

Accident reconstruction experience includes analysis of accident causation, avoidance opportunity, visibility, conspicuity, heavy truck ECM and "black box" electronic data retrieval and interpretation, vehicle dynamics, speed-time-distance analysis, occupant kinematics, light bulb filament analysis, photogrammetry, vehicle inspections, cargo securement and low speed impact analysis. Casework has involved automobiles, tractor-trailers, trucks, buses, armored vehicles, emergency response vehicles, forklift trucks, trains, motorcycles, bicycles, construction equipment, farm equipment and pedestrians.

Mechanical Systems Analysis

Mechanical systems experience includes completing analysis on the design, installation, maintenance and failure of systems in multiple application areas including transportation, heavy industry, food industry, exercise equipment, medical equipment, agricultural equipment, home appliances and office equipment. The analysis is performed with the aid of product research, standards research, product testing and computational modeling. Examples of transportation includes heavy and light vehicles, car haulers, motorcycles, motorized carts, steering systems, brake systems, fifth-wheels, axles, drivelines, suspensions, restraint systems, lift gates, combustion motors, superchargers and turbochargers. Examples of heavy industry includes forklift trucks, street sweepers, electric and combustion motors, generators, compressors, industrial pumps, industrial fans, conveyors, crushers, shaker screens, spindles, grinders, industrial peelers, chippers, gearboxes, hydraulic systems, dust collectors, ladders, automated doors and gates, heavy gears, roller bearings, slewing rings, seals, machine guarding, mechanical and powered tools, machining centers, industrial racks, industrial chains, roustabouts, man lifts, elevators, cold forming equipment, forging equipment, safety devices and safety clothing. Examples of the food industry include can seamers, industrial water purifiers, mixers and processing equipment. Examples of exercise equipment include stability balls and weight lifting equipment.

HVAC and Plumbing Systems Failure Analysis

HVAC and plumbing systems experience include failure analysis of commercial and residential climate control systems, boilers, chillers, humidifiers, commercial cooling towers, radiators, underground piping, frozen pipes, valves, meters and sprinklers.

Intellectual Property

Intellectual property experience includes reviewing patents and subject products, analyzing the design or performance of the product within the scope of its associated claims, and creating visual aids to demonstrate the conclusions. Experience also includes patent drafting and prior art searches. Specific product examples include home goods, agricultural equipment, industrial equipment and toys.

Three-Dimensional Data Capture and Modeling

Three-dimensional data capture experience includes scanning accident scenes and reproducing them as three-dimensional computer models. Casework has included buildings, roadways, vehicles, boats, machinery and other structures.

Licenses and Certifications:

Patent Agent, United States Patent and Trademark Office, #69459

Professional Engineer, CA, #40383

Professional Engineer, DC, #PE907777

Professional Engineer, FL, #75956

Professional Engineer, IL, #062-060136

Professional Engineer, IN, #PE11012095

Professional Engineer, IA, #20175

Professional Engineer, KS, #25786

Professional Engineer, MD, #45624

Professional Engineer, MI, #6201056772

Professional Engineer, MN, #50934

Professional Engineer, MO, #2015003022

Professional Engineer, NC, #041614

Professional Engineer, NY, #093646

Professional Engineer, NE, #E-14390

Professional Engineer, NM, #20468

Professional Engineer, OH, #PE.88895

Professional Engineer, PA, #PE074374

Professional Engineer, TN, #120527

Professional Engineer, VA, #0402053853

Professional Engineer, WI, #41368-6

Professional Engineer, WV, #024086

Certified Instructor (Powered Industrial Trucks), 29 CFR 1910.178 OSHA, Scott Lift Truck OSHA 40-Hour Hazardous Waste Operations, Occupational Training and Supply, Inc.

FAA 107 Drone Pilot

Project Experience:

Nationwide

Trucking and Vehicle Accident Reconstruction

Investigated and reconstructed hundreds of trucking, vehicle and pedestrian accidents. The accidents are investigated with the aid of the newest technology including "black box" downloads and 3D-scanning. The accidents are then reconstructed using accepted scientific principals and methods.

Nationwide

Failure of Appliances, Water Heaters, Boilers and Furnaces

Investigated and reconstructed numerous malfunctions and breakdowns in appliances, water heaters, boilers, and furnaces. The investigation and analysis adheres to recognized scientific principles and methods to analyze the shortcomings in these systems.

Chicago, Illinois

Nighttime Pedestrian and Vehicle Accident

A pedestrian was crossing the roadway, outside of a crosswalk, during the night, and was struck by a vehicle. Completed an analysis as to conspicuity and accident causation.

Minneapolis, MN

Vehicle Brakes

A driver of a rented vehicle reported that the vehicle brakes were defective, which resulted in an accident. Completed an analysis as to the effectiveness of the vehicle brakes by downloading accident data and performing a mechanical brake inspection.

Chicago, Illinois

Fifth Wheel Failure on a Tractor Trailer

A moving trailer decoupled from a tractor at the fifth wheel. Inspected the assembly and determined the cause of the decoupling.

Schaumburg, Illinois

Vehicle Steering

A single vehicle accident occurred as a result of a reportedly defective steering system. Inspected the components, completed laboratory analysis and determined the cause of the accident.

Appleton, WI

Trailer Hub Units

An industrial manufacturer observed a high rate of hub unit failures. Completed an inspection of multiple trailers and components, determined the cause of the loss and provided corrective actions.

Joliet, Illinois

Lift Gate

A worker was injured when operating a lift gate on a truck. Completed an analysis as to the design, maintenance and contribution of the equipment to causing the accident.

Rockford, Illinois

Engine Turbo Fire

A bus engine caught fire during normal operation. Completed an analysis as to the turbocharger's design and contribution to causing the fire.

**Wacpaca, Wisconsin
Tractor Accident**

A mechanic was fatally injured while performing maintenance on a tractor. Completed an analysis with regards to the safe-worthiness of the tractor and the cause of the accident.

**Codelco, Santiago, Chile
Underground Conveyor**

Underground conveyor components were becoming damaged during installation. Inspected the products, completed a review of the installation procedures, and instructed on proper installation methods.

**Hermosillo, Mexico
ABC Daycare Fire**

The daycare experienced significant fire damage. Surveyed the incident building using a three-dimensional scanner and supported the fire model analysis.

**ThyssenKrupp AG, Essen, Germany
Roller Bearings**

Large diameter roller bearings were damaged during shipment. Inspected the bearings, determined the scope and cause of the damage.

**Nationwide
Cargo Securement**

Reviewed multiple incidents in which trucking cargo becomes unsecured during transit or accidents.

**US Sugar, Florida
Screw Pump**

Multiple screw pumps were failing prematurely. Completed a design review and determined that the system was overloaded. Provided corrective actions to include a larger bearing arrangement, housing and contact seals.

**King Ocean Services, Florida
Slewing Bearing**

The vessel Melbourne Strait was struck by a gantry crane, resulting in the vessel moving. Inspected the slewing bearing and determined the extent of damage.

**EL Dorado Hills, California
Fuel Pumps for Diesel Trains.**

The manufacturer was experiencing a large volume of warranty recalls do to early product failures. Completed an analysis of the product and provided corrective actions resulting in extending the product life beyond the warranty period.

**Salt Lake City, Utah
Industrial Water Purifier, Lubrication Selection**

A large slow-moving bearing assembly was used to support a rotary distribution mechanism. The high load and slow speed caused damage due to insufficient lubrication. Completed an application review and recommended an appropriate lubricant to prevent further damage.

**Dawn Foods, Louisville, Kentucky
Sugar Grinder Explosion**

A sugar grinder exploded during normal operation, causing substantial property damage. Completed an analysis as to the design, maintenance and contribution of the equipment to causing the explosion.

Six Flags, Dallas, Texas**Amusement Ride Failure**

An amusement ride assembly consisting of a housing, bearings, and hydraulics failed during operation. Completed a root cause analysis as to the cause of the accident and recommended corrective actions.

Kulpsville, Pennsylvania**Roller Bearing Friction Modeling**

Mathematically simulated application conditions for roller bearings to determine the most energy efficient design. The variables included bearing type, relative load and lubrication methods.

Massey, Maryland**Portable Conveyor Accident**

A portable conveyor toppled during transportation and injured a worker. Completed an analysis with regards to how modifications of the conveyor caused the accident.

Madison, Wisconsin**Turbine**

A steam turbine failed during operation. Completed a failure analysis, including laboratory inspection.

Willy Vogel AG, Berlin, Germany**Lubrication Systems**

Designed single line, progressive, and oil-air lubrication systems for machine tools used in the automotive manufacturing industry and off-highway equipment.

Elmhurst, Illinois**Portable Manlift Platform**

A portable manlift platform fell to the ground during normal operation. Completed an analysis as to the cause of the accident.

Tip Up Town Winter Festival, Houghton Lake, Michigan**Mechanical Bull**

A rider of a mechanical bull was injured when falling onto a non-padded surface. Completed an analysis as to industry standards and the cause of the accident.

Aurora, Illinois**Rack System Failure**

An industrial rack system failed resulting in property damage. Completed an analysis as to the cause of the failure.

Barrington, Illinois**Overhead Door**

A customer was injured when struck by an overhead door. Inspected the door, reviewed the appropriate safety standards, and determined the cause of the accident.

Chicago, Illinois**Fire Sprinkler**

A fire sprinkler activated in the absence of a fire. Completed an analysis as to the cause of the activation and the contribution of the sprinkler's design.



New York, New York Wood Chipper

A laborer was injured while operating a wood chipper. Completed an analysis in regard to training, procedures and equipment design.

Elgin, Illinois Street Sweeper

A mechanic was fatally injured while replacing a hydraulic cylinder on a street sweeper. Completed an analysis as to product design and causation.

Chicago, Illinois Weld Failure

A weld on a heavy iron gate failed, fatally injuring a person. Completed an analysis as to the integrity of the weld and the cause of the accident.

Chicago, Illinois Power Tool

A laborer was injured while using a power tool. Completed an analysis as to the safe-worthiness of the power tool and the cause of the accident.

Naperville, Illinois Gas Grill Fire

A gas grill caught fire during normal operation. Completed an analysis as to identification, product research, design and causation.

St. Charles, Illinois Fireplace

A fireplace caught on fire as a result of being constructed of combustible material.

Aloha, Oregon Office Chair

An office chair failed during typical use. Inspected the chair, researched the applicable standards, and determined the cause of the failure.

Bolingbrook, Illinois HVAC System Failure

A fire protection system activated when a cooling system used to maintain temperature in a computer server room failed. Inspected the system to determine the faulty component and completed product testing to confirm the cause of the failure.

Wisconsin, Illinois and New Mexico Plumbing Component Failures

Inspected multiple plumbing components which failed due to various reasons including age, poor installation, poor manufacturing and weather.

Professional Experience:

EFI Global, Chantilly, VA, Consulting Mechanical Engineer, 2015-Present

Beacon Forensic, P.C., Richmond, VA, Principal Engineer, 2014-Present

S-E-A, LTD, Elk Grove Village, IL, Senior Project Engineer, 2007 – 2014

SKF, Naperville, IL, Applications Engineer & Lubrication System Specialist, 2006 – 2007

SKF / Willy Vogel AG, Berlin, Germany, Lubrications Systems Engineer, 2005

SKF, Kulpsville, PA, Applications Engineer, 2001 – 2004

Specialized Education:

Commercial Vehicle ADAS, Evolution, Performance Testing & Applications by NAPARS, 2023

Forensic Photography Symposium by ai2-3D Forensics, 2022

Solving Video Evidence Challenges by Input Ace, 2020

Traffic Engineering Design Factors, 2018

Hybrid Energy System, 2018

Engineering Ethics – Objectivity and Truthfulness by NSPE, 2018

Pedestrian Crash Team for the ARC-CSI, 2017

Investigation of Gas and Electric Appliance Fires by Fire Findings, 2017

Motorcycle Crash Team for the ARC-CSI, 2016

Comparison of IIHS Driver and Passenger-side Small Overlap Crash Tests by ARC-CSI, 2016

Photography for Crash Reconstruction by ARC-CSI, 2016

Defense Logistics Agency Bearing Workshop by ASTM Committee F34, 2016

Indiana Laws and Rules for Engineers, 2016

Ethics and Sustainable Development by the NSPE, 2015

Designing for High Winds by the NSPE, 2015

Cathodic Protection Inspection and Testing, 2015

Impressed Current Cathodic Protection, 2015

An Introduction to Solar Collectors for Heating and Cooling of Buildings and Domestic Water, 2015

Advanced Project Management, 2015

Advanced Crash Reconstruction Utilizing Human Factors, Northwestern University, 2013

Hazardous Materials Refresher, Occupational Training and Supply, Inc., 2013

WE170 Seals for Rotating Motion, SKF Reliability Maintenance Institute, 2010

Bendix Heavy Duty Vehicle Air Brake Systems Training, Bendix, 2009

Heavy Vehicle Crash Reconstruction, Northwestern University, 2008

Pedestrian Vehicle Crash Collision, Northwestern University, 2008

Data Retrieval (CDR) Data Technician, Bosch, 2008

CDR Systems Operator Certification, Bosch, 2008

Traffic Accident Reconstruction II, Northwestern University, 2007

Traffic Accident Reconstruction I, Northwestern University, 2007

Intermediate German, Berlitz, 2005

Introductory & Intermediate German, Hartnackschule, 2005

Solutions for the Moving Universe, Hannover Messe, 2005

Vibration Analysis, SKF, 2004

Bearing Preventive Maintenance, International Pump Users Symposium, 2004

Application Technology Course, SKF College, 2003
Lubrication Technology Course, SKF College, 2003
Surface Engineering and Tribology, SKF College, 2003
Pump Dynamics, International Pump Users Symposium, 2003
Advanced Bearing Failure Analysis, SKF College, 2002
SKF Bearing Pro, SKF USA, 2001

Education:

Bachelor of Science, Mechanical Engineering, Lehigh University, Bethlehem, PA, 2001

Affiliations:

American Society of Mechanical Engineers (ASME)
Society of Automotive Engineers (SAE)
ASM International
American Society for Testing and Materials (ASTM), Committee Member of F34
American National Standards Institute (ANSI)
National Association of Professional Accident Reconstruction Specialists (NAPARS)
American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
National Fire Protection Association (NFPA)
Virginia Society of Professional Engineers, Licensed Member (VSPE)
National Society of Professional Engineers, Licensed Member (NSPE)

Courses Instructed/ Guest Lecturer:

"Vehicle Technology in Accident Investigations", Whelan, J., Winsky, A. and Vaughn, K. presented at the TLA Seminar and Bootcamp in Chicago, Illinois, 2024

"Understanding Vehicle Technology's Role in Casualty Investigations", Whelan, James and Roberts, Torrey presented at the Property & Liability Resource Bureau Western and Central Regional Adjusters Conferences in Dallas, Texas and Chicago, Illinois, 2023

"How Can an Engineer Help Your Investigation? The Product Failure Roadmap with Case Examples", Whelan, James, presented at the 20th Annual McCandlish Holton Workers' Compensation Seminar in Richmond, Virginia, 2021

"Accidents Happen", Stanaszak, S. and Whelan, J. presented in Nashville, Tennessee, 2018

"Show and Tell - Accident Reconstruction and the Admissibility of Direct Evidence, Opinion Testimony and the Use of Demonstrative Exhibits in Products Liability Cases", Giroux, D., Bondurant, V. and Whelan, J. presented in Williamsburg, Virginia, 2018

"Accident Reconstruction and Technology", Whelan, James, presented in Charlottesville, Virginia, 2018

"Agricultural Liability Claims: A Coverage Primer", Davis, J. and Whelan J., presented in Hartford, Connecticut, 2018

"Eyes in the Sky: Integrating Drones into Vehicle Accident Reconstructions", Wagenhofer, M., Whelan, J. and Moyers, J. presented in Roanoke, Virginia, 2017

“Black Box’ Data from Passenger Vehicles and Heavy Trucks”, Whelan, J., presented in Stevensville, Maryland, 2017

“The Consulting Engineer”, Whelan, J. presented in Richmond, Virginia, 2016

“Black Box’ and Vehicle Accident Reconstruction”, Whelan, James, presented in Flinstone, Maryland, 2016

“Recovery and use of ‘Black Box’ Data from Heavy Trucks and Passenger Vehicles after an Accident”, Whelan, James, presented in Rockville, Maryland, 2016

“Emergency Rapid Response to Trucking Accidents”, Whelan, James, presented in Jekyll Island, Georgia, 2016

“Product Failures”, Whelan, James, presented in Short Pump, Virginia, 2016

“Emergency Rapid Response to Trucking Accidents”, Whelan, James, presented in Richmond, Virginia, 2015
“Black Box Data from Heavy Trucks and Passenger Vehicles”, Whelan, James, presented in Blue Bell, Pennsylvania, 2015

“Collecting and Preserving Evidence Following a Truck Accident and Avoiding Spoliation Claims”, Whelan, James, presented in Boca Raton, Florida, 2014

“Accident Reconstruction 101—Minor/ Moderate/Major Accidents”, Whelan, James, presented in Chicago, Illinois, 2013

“The use and Admissibility of Animations and Simulations,” Whelan, James and Cornetto, Anthony, presented in Miami, Florida, 2012

“Accident Reconstruction, Biomechanical, and Construction Analysis”, certified by the Texas Department of Insurance, Course No. 80247, presented in Chicago, Illinois, 2010

Publications and Presentations:

DiTallo, Michael., Munyon, Brent., et al. “Three Different Methodologies for Determining the Drag Factor for Motorcycles Sliding on Their Sides” Collision Magazine, Vol. 12, Issue 1. Summer 2017

DiTallo, Michael., Paul, Eric., et al. “Motorcycle Center of Gravity Data: Methodology and Reference” Collision Magazine, Vol. 12, Issue 1. Summer 2017

DiTallo, Michael., Munyon, Brent., et al. “3D Laser Scanners in Crash Testing” Collision Magazine, Vol. 12, Issue 1. Summer 2017

Green, Thomas., DiTallo, Michael., et al. “Evaluation of the MIDE Slam Stick as a Low-Cost Accelerometer and Data Acquisition System for Vehicle Skid Testing” Collision Magazine, Vol. 12, Issue 1. Summer 2017

DiTallo, M., Thomas, G., Grimes, W., Salisbury, K., Munyon, B., Lawson, T., Whelan, J., Moody, E., Vosburgh, K., and Paul, E. “Advanced Boot Camp Was Born” Collision Magazine, Vol. 11, Issue 2. Fall 2016



Whelan, James, "Doubling the Life of Maintenance Free Pumps for Locomotives", SKF Publication 2005

Court Qualifications/ Depositions:

Litigation CV available upon request.