

Robson Forensic

Engineers, Architects, Scientists & Fire Investigators

THOMAS P. LACEK, P.E. Mechanical Engineer

VEHICLE EXPERIENCE

1989 to present **Forensic engineering:** inspections, tests, research, analysis, reports, and testimony for civil and criminal litigation related to vehicle and boat crashes. General areas of work:

- **Accident Reconstruction:** single vehicle, multiple vehicle, pedestrian, car, truck, bicycle, horse and buggy, tow truck operations, loading procedures, driver identification, reenactment, biomechanics
- **Biomechanics:** injury occurrence in low and high speed collisions, driver identification by injury and vehicle dynamics, injury reduction or enhancement by seat belt use
- **Vehicle Failures:** seat belt; air bag; structural; suspension; car axle, spindle failure and separation; wheel and bearing failure; transmission failure; contaminated fuel; sudden acceleration; door latch integrity; forklift brake failure, forklift upset, forklift drive-over; forklift upright collapse; cruise control; steering; frame rail; wheel separation; wrecker cable guide; marine engine; steering; ABS; transmission; fuel injection; car, light truck, medium truck, and heavy truck brakes; trailer hitches; glass retention
- **Product Liability:** truck tailgate; tempered glass; towbar; vehicle fire; cruise control lever; boat trailer jack; bicycle cable retainer; car subframe and frame integrity; outboard motor; steering; seat belt; air bag; side impact; ABS; charging system; fuel injection; sudden acceleration; suspension; occupant restraint; charging system; seat; handicap controls

1969 to present **Automotive engineering:** new, used, classic, and antique vehicle diagnosis, repair, and rebuilding:

- Engine drivability and performance diagnosis 1, 2, 4, 6, and 8 cylinder gasoline engine rebuilding
- Transmissions; automatic, standard, with and without overdrive
- Charging, starting and electrical systems
- Power option retrofitting
- Body fit
- Propane carburetion, single and dual fuel
- Brakes; disc and drum, power and non-power; air; ABS; RWAL
- Strut, torsion bar, leaf and coil spring suspensions
- Ignition systems; conventional, electronic, CD, HEI, and computer controlled
- Fuel systems; carburetor, TBI, and port injection
- Steering; recirculating ball and rack and pinion

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- Heating and Air conditioning
- Standard and automatic temperature control
- Sound system installation and upgrade
- Body and fender collision and corrosion repair
- Panel and full body refinishing in lacquer, enamel, or urethane
- Closed and open differentials
- Trailer hitch - installation, setup, and trailer towing
- 4 x 4 transfer cases
- Full and part time 4-wheel drive
- Marine propulsion and steering systems
- Seat belts
- Air bags

PROFESSIONAL EXPERIENCE

- 1989 to present **Robson Forensic, Inc.**
Provide technical services towards resolution of disputes arising from vehicle crashes, including injury occurrence in low and high speed collisions, and other mechanical engineering related activity.
- 1981 to 1991 **AMP, Inc.**
Manufacturing and development engineer for new products. Company manufactures electrical interconnect devices and application equipment.
- 1980 to 1981 **Federal Mogul, Inc.**
Production engineer for bearing manufacture and assembly.
- 1979 to 1980 **K-D Tools, Inc.**
Supervised shut down of hex key plant in Pennsylvania and startup of forging plant in South Carolina. Company manufactures specialty automotive hand tools.
- 1974 to 1976 **Pennsylvania Power and Light Co.**
Power plant performance testing. Strike duty included coal yard conveyor systems, heavy equipment (bulldozer and front end loader) operation and maintenance, and small diesel locomotive operation and maintenance.
- 1970 to 1980 **Hahn & Sons, Inc., Dodge Sales and Service**
Learned and performed all facets of automotive repair, and maintenance. This included new and used vehicle preparation, restoration, and repair of all mechanical and electrical systems as well as collision, corrosion repair, partial and full refinishing.

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PROFESSIONAL REGISTRATION, SOCIETIES and CONTINUING EDUCATION

Professional Engineer: NCEES, Pennsylvania
Society of Automotive Engineers - Member
NAFE Accident Reconstruction Course - 1991
AAAM Injury Biomechanics Course - 1992
AAAM Annual Meeting - 1991, 1992, 1993, 1995, 1996, 1997, 1998, 1999, 2000,
2001, 2002, 2003, 2004, 2005, 2006
Stapp Car Crash Conference - 1991, 1992, 1993, 1994, 1996, 1997, 1998, 2000, 2001,
2002, 2004, 2006
Association for the Advancement of Automotive Medicine - Member
Accident Reconstruction of Commercial Vehicles - 1993
Vehicle Fire Investigation – 1994

EDUCATION

B.S. Mechanical Engineering, Pennsylvania State University, 1974

BIOMECHANICS AND INJURY CAUSE QUALIFICATIONS

Licensed Professional Engineer -
by exam, experience, and education

Society of Automotive Engineers, Member
This is the engineering society for advancing mobility land, sea, air, and space transportation. Premier professional society for accident reconstruction. Sponsors STAPP Conference (see below).

Society for the Advancement of Automotive Medicine, Member
This society provides an international recognized forum for the presentation and discussion of research and issues concerning crash injury control. Areas of involvement include vehicle crashworthiness, occupant kinematics, clinical injury studies, and experimental biomechanical research.

National Academy of Forensic Engineers Accident Reconstruction Course (1991)
This course covered such topics as seat back failures and associated injuries, errors made during accident reconstruction, seat belt analysis, critical speed, computer programs, and kinematics of restrained occupants with various restraints

Injury Biomechanics and Emergency Medicine Course, AAAM (1992)
This course focused on the biomechanics and patterns of injury and tolerance limits for the main anatomical areas. Biomechanical considerations for children and the elderly

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were included. Fundamental differences in the kinematics of restrained versus unrestrained occupants in various crash scenarios were illustrated. The variability in population and response to impact was discussed. Current injury and impairment methods were described, including their strengths, limitations, and specific applications.

Association for the Advancement of Automotive Medicine Annual Conferences (1991, 1992, 1993, 1995, 1996, 1997, 1998, 2000, 2001, 2002, 2004, 2006)

Topics covered during these conferences included: vehicle - bicycle injury studies; injury patterns of motorcycle operators with and without helmets; effects of 2 point and 3 point seat belt usage on injury pattern; air bag performance; injuries caused by seat belts and/or air bags; vehicle - pedestrian crashes and injury patterns; seat belt release; seat belt syndrome; injuries to restrained children; effects of air bags on injury patterns; injuries associated with air bags; head restraint performance; seat performance in rear-end crashes; injury patterns in lateral crashes; injuries in rear end crashes; effect of restraint use on injuries during rollover.

Annual International Workshop on Human Subjects for Biomechanical Research (1991, 1992, 1993, 1994, 1996, 1997, 2000, 2004, 2005)

Subjects covered were helmet material effectiveness; computer simulation; side impact vehicle motion; cervical trauma; rollover crash tests; analysis of rollover head and neck injury data; child protection; seat belt performance; air bag performance; lower limb injuries; vehicle and occupant response in rollover; air bag effluents; cadaver testing.

Stapp Car Crash (1991, 1992, 1993, 1995, 1996, 1997, 1998, 2000, 2001, 2002, 2004, 2006)

This international annual conference, sponsored by the Society of Automotive Engineers, deals with vehicle and occupant crash data and research, occupant kinematics, injury biomechanics, and simulation. Topics covered at these conferences included: energy absorbing steering system research; crash dynamics of frontal, lateral, rear, and rollover crashes; injury threshold in side, frontal, and rear crashes; side impact crashworthiness design; 2 and 3 point seat belt effectiveness; seat back deformation in rear collisions; air bag folding versus injury; lap belt slippage; seat belt syndrome; glazing; whiplash; lower and upper limb injuries; abdominal injuries in side impact; knee, leg, foot, and ankle injury mechanisms; cervical and lumbar spine injuries; skull fracture; motorcycle crash testing; child protection; helmet performance; accident reconstruction; vehicle rollover performance; cadaver testing.