Kirsten M. Carr, Ph.D., P.E.

Director

PROFESSIONAL EXPERIENCE

2006-Present PACKER ENGINEERING, INC. - Ann Arbor, MI
Director

Areas of specialization include mechanical and manufacturing engineering, with specific expertise in electromechanical systems, signal processing, failure analysis, durability and fatigue analysis, design of experiments, instrumentation, statistical data analysis, metal machining and cutting, manufacturing inspection and quality control, and manufacturing simulations. Also vehicular component and system testing, vehicle restraint systems, safety sensors and algorithms, ergonomics of seat belts, engines, and automatic transmissions.

2004-2006 Ford Motor Company Powertrain Quality Office - Dearborn, MI
Powertrain Forward Model Quality Supervisor

Actively engaged over 50 engine system and component engineering teams in technical design robustness. Led 22 authors in development of eight-hour technical course. Taught nearly 1,500 engineers as primary instructor in 19 sessions.

2000-2004 Ford Motor Company Global Core Engineering - Dearborn, MI
Advanced Safety Sensors Supervisor

Delivered occupant classification sensors (OCS) with cost, weight, and performance advantages using Six Sigma approach. Sensors sourced to 90% of US vehicles by 2010. Honored with Technical Achievement Award. Voiced Ford's current state of technology to meet new government regulations in occupant classification to NHSTA. Co-invented and patented advanced rollover algorithm implemented on 2007 vehicles.

1997-2000 Ford Research Laboratories - Dearborn, MI
Occupant Safety Technical Specialist

Patents awarded for inventions pertaining to various restraint components and systems.

1996-1997 Ford Research Laboratories - Dearborn, MI
Manufacturing Technical Specialist

Responsible for developing and validating machining simulation models.

1995 Ford Motor Company Automatic Transmission Division - Livonia, MI
Automatic Transmission Product Engineer

Responsible for high load, high temperature testing.

1995 Ford Motor Company Truck Center - Allen Park, MI
F-Series Prototype Build Manager

Managed interiors assembly at vehicle prototype plant.

1992-1995 Ford Research Laboratories – Dearborn, MI
Research Engineer

Developed algorithms to verify Geometric Dimensioning and Tolerancing using factory inspection data.

ACADEMIC

Ph.D. University of Illinois, Champaign-Urbana, Illinois
Mechanical Engineering (1995)

M.S. University of Illinois, Champaign-Urbana, Illinois
Mechanical Engineering (1990)

B.S. University of Michigan-Ann Arbor, Michigan
Mechanical Engineering (1987)

CONTINUING EDUCATION

- Traffic Accident Reconstruction II, Northwestern University Center for Public Safety (2/2007)
- Injuries, Anatomy, Biomechanics & Federal Regulation, SAE (8/1999)
- Ergonomics in Vehicle Design, Ford Corporate Design Course (6/1999)
- Sport Utility/Light Truck Vehicle Safety TOPTEC, SAE (12/1997)
- Practical Principles of Metal Machining & Cutting Tools, Lehigh University (6/1996)
- Member of the (Y14) Subcommittee 5.1 (ASME): Applying Geometric Dimensioning Tolerancing to CMM, SME, (5/1994-6/1998)

PATENTS

Seat Belt Restraint System
US Patent 6375270 (4/2002), European Patent EP1116633 (7/2001)

Programmable Seat Back Damper Assembly for Seats
US Patent 6601915 (8/2003), US Patent 6312049 (11/2001), European Patent EP1065096 (1/2001)

Programmable Seat Belt Damper Assembly
US Patent 6705559 (3/2004), European Patent EP1116633 (12/2000)
Kinetic Energy Density Rollover Detective Sensing Algorithm
US Patent 6856868 (2/2005)
Audio Noise Cancellation System for a Sensor in an Automotive Vehicle
US Patent 7127073 (10/24/2006), German Patent DE10336977 (8/2005)

PROFESSIONAL REGISTRATION and AFFILIATIONS

LICENSE
Licensed Professional Engineer, State of Michigan (License No. 6201054930)

AFFILIATIONS
Society of Automotive Engineers (SAE)
American Society of Mechanical Engineers (ASME)
Society of Women Engineers (SWE)
Engineering Society of Detroit

PUBLICATIONS and PRESENTATIONS

1. Lichtenberg, G. and Carr, K., "Performance Evaluation of Occupant Classification Systems," *International Mechanical Engineering Congress and Exposition*, IMECE 2004-60132, AMD-Vol. 255, 2004.

2. Natalini, T., Carr, K., Vala, M., and Boroughf, W., "Variables Influencing Shoulder Belt Positioning of Four Point Safety Belts," *Society of Automotive Engineers Technical Paper 2001-01-0382*, 2001.

3. Carr, K.M., Rodin, Y.M., and Smith, G.H., "Methodology for Detecting and Measuring Workpiece Distortion Caused by Fixture Clamping Forces," *International Mechanical Engineering Congress and Exposition*, MED-Vol 8, 1998.

4. Carr, K.M. and Ferreira, P.M., "Verification of Form Tolerances, Parts I & II: Basic Issues, Flatness, and Straightness; Cylindricity, Circularity, and Straightness," *Precision Engineering*, *American Society for Precision Eng.*, Vol. 17, April 1995.

5. Carr, K.M. and Ferreira, P.M., "Verification of Form Tolerances Using Point Data," American Society of Precision Engineering, Ninth Annual Meeting, Vol. 10, October 1994.

6. Carr, K., Erickson, K., and Ferreira, P., "Obstacle Avoidance for Redundant Robots," *North American Manufacturing Research Proceedings*, 1990.

REPORTS

1. Carr, K.M. and Sullivan, J.L., "Impact Testing of Magneto-Rheological Fluid Dampers," *Technical Report No SRR-2000-0012*.

2. Sullivan, J.L. and Carr, K.M., "Interior System Energy Absorption During Vehicular Crash: A Review," *Technical Report No SRR-2000-0011*.

3. Carr, K.M., "Vehicle Safety Technologies: A Review of Basic and Advanced Vehicle-Implemented Safety Technologies," *Technical Report No SRR-1999-0017*.

4. Carr, K.M., Rodin, Y.M., Smith, G.H., "Methodology for Detecting and Measuring Workpiece Distortion Caused by Fixture Clamping Forces," *Technical Report No SRR-1998-017*.

5. Carr, K.M. and Ferreira, P.M., "Verification of Form Tolerances, Part II: Cylindricity, Circularity, and Straightness," *Technical Report No SR-94-14*.

6. Carr, K.M. and Ferreira, P.M., "Verification of Form Tolerances, Part I: Basic Issues, Flatness, and Straightness, "Technical *Report No SR-94-13*.

LECTURES

1. Carr, K.M., "Safety Application of Magneto-Rheological Dampers," guest lecture to the Active Automotive Safety Systems graduate-level class at University of Michigan – Dearborn, December 1999.

2. Carr, K.M., "Modeling and Verification Methods for the Inspection of Geometric Tolerances Using Point Data," guest lecturer at Manufacturing Research Seminar Series, University of Michigan – Ann Arbor, February 1997.