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Ashley Liston Dunn, Ph.D., P.E.

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Education

The Ohio State University
Ph.D.
Mechanical Engineering
2003

Columbus, Ohio

The Ohio State University
Master of Science
Mechanical Engineering
1999

Columbus, Ohio

North Carolina State University
Bachelor of Science
Mechanical Engineering
1986

Raleigh, North Carolina

Experience

Senior Project Engineer

SEA, Ltd.

2015 to Present

Columbus, Ohio

Serves as a technical consultant in the area of accident reconstruction, vehicle component failure analysis, vehicle dynamics testing, and vehicle dynamics analytical modeling. Strong emphasis in the vehicle dynamics area includes crash reconstruction (all ground vehicles, including motorcycles), and failure analysis for heavy commercial vehicles, light vehicles, and off-road vehicles. Vehicle expertise includes handling and steering, braking performance, stability (testing and modeling), and ABS/stability control system performance. Over 25 years experience testing and evaluating vehicle dynamics and stability as an engineer. Passenger car expertise includes test-driving (6 years), and road racing (over 10 years). Motorcycle experience includes riding, modifying, and maintaining motorcycles for 35 years. Past member of Sports Car Club of America, Porsche Club of America; currently member of BMW Motorcycle Owners of America, and the American Motorcyclist Association.

Project Engineer

2006 to 2015

SEA, Ltd.

Columbus, Ohio

Serves as a technical consultant in the area of accident reconstruction, vehicle component failure analysis, vehicle dynamics testing, and vehicle dynamics analytical modeling. Strong emphasis in the vehicle dynamics area includes crash reconstruction (all ground vehicles, including motorcycles), and failure analysis for heavy commercial vehicles, light vehicles, and off-road vehicles. Vehicle expertise includes handling and steering, braking performance, stability (testing and modeling), and ABS/stability control system performance. Over 25 years experience testing and evaluating vehicle dynamics and stability as an engineer. Passenger car expertise includes test-driving (6 years), and road racing (over 10 years). Motorcycle experience includes riding, modifying, and maintaining motorcycles for 35 years. Past member of Sports Car Club of America, Porsche Club of America; currently member of BMW Motorcycle Owners of America, and the American Motorcyclist Association. Instructor for powered industrial truck (P.I.T.) training at S-E-A for 3 years.

Program Manager, Heavy Truck Modeling and Testing

2005 to 2006

Vehicle Research and Test Center (VRTC)

East Liberty, Ohio

National Highway Traffic Safety Administration (NHTSA), braking and stability performance research experience

Research Scientist

2003 to 2005

TRC, Inc., for NHTSA VRTC

East Liberty, Ohio

Contracted Research Scientist, heavy truck modeling and testing, braking and stability performance research.

Academic Research Experience

2000 to 2003

The Ohio State University

Columbus, Ohio

Dissertation research funded by the National Highway Traffic Safety Administration. Extensive analytical model development: detailed Simulink[®] dynamic models of pneumatic heavy vehicle brake and antilock systems that ran in parallel with third-party vehicle dynamics simulation package; derivation and validation of model of articulated vehicle and Kalman Filter observer to predict jackknife events. Model validation using experimental vehicle handling and brake dynamometer data.

Research Assistant

1999 to 2000

The Ohio State University

Columbus, Ohio

Gear Dynamics and Gear Noise Research Laboratory

Mechanical Engineering

Analysis of thin-rimmed gear vibration and mode shape control. Modal analysis and mode shape animation using Pro/Engineer[®], Pro/Mechanica[®], and ANSYS[®] solid modeling software. Model validation via comparison to experimental modal analyses.

M.S. Graduate Research Assistant, Mechanical Engineering

1996 to 1999

Mechanical Engineering

The Ohio State University

Columbus, Ohio

Extensive use of Matlab[®] analysis and modeling software in theses and class work. Experienced in the use of IDEAS[®] Sound Quality and IDEAS[®] Test Unix-based signal processing and analysis software. Developed low-load transaxle dynamometer to evaluate final drive gear noise and vibration.

**Product Development Engineer (Passenger Car Tires)
On-Vehicle Test Engineer/Tire Designer**

1986 to 1996

Michelin Americas Research and Development Corporation

Greenville, South Carolina

Responsibilities encompassed:

- Vehicle Dynamics Measurement
- Test Driving, On-Vehicle Handling, Comfort, and Noise
- Analysis and Correlation of Subjective On-Vehicle Noise, Comfort, and Handling Evaluations with In-Vehicle Measurements
- Managing Offsite Remote Winter Handling and Traction Test Programs (Houghton, Michigan)
- Analytical Tire Traction and Dynamics Test Engineer
- BF Goodrich High-Performance Brand Tire Design

Professional Registrations

State of Alabama, License No. 31852-E
State of Arkansas, Registration No. 15252
State of California, Registration No. 37844
State of Florida, License No. 80691
State of Georgia, Registration No. PE036012
State of Illinois, License No. 062-065506
State of Indiana, Registration No. PE 11100418

State of Kentucky, License No. 26161
State of Michigan, License No. 6201062754
State of Mississippi, License No. 20910
State of Montana, License No. 41180
State of Nevada, License No. 021995
State of New York, License No. 089348-1
State of North Carolina, License No. PE039371
State of Ohio, Registration No. E-72744
Commonwealth of Pennsylvania, Registration No. PE079739
State of South Carolina, License No. 33142
State of Tennessee, Registration No. 114936
State of Texas, License No. 109525
State of West Virginia, Registration No. 19379

Honors

2010 – Society of Automotive Engineers, Lloyd L. Withrow Distinguished Speaker Award
2003 – Society of Automotive Engineers, Meyers Award for Outstanding Student Paper

Publications

Ashley L. Dunn, Donald R. Houser, and Teik C. Lim, “A New Metric for Rating In-Vehicle Gear Whine Levels,” *Noise-Con 98 Proceedings*, Institute of Noise Control Engineering

Ashley L. Dunn, Donald R. Houser, and Teik C. Lim, “Methods for Researching Gear Whine in Automotive Transaxles,” *Proceedings of the Society of Automotive Engineers Noise and Vibrations Conference 1999*, SAE-99NV-167

Ashley L. Dunn, Gary Heydinger, Giorgio Rizzoni, Dennis Guenther, "New Model for Simulating the Dynamics of Pneumatic Heavy Truck Brakes with Integrated Anti-Lock Control," *Proceedings of the Society of Automotive Engineers World Congress 2003*, SAE Paper 2003-01-1322. **Winner of 2003 SAE International Meyers Award for Outstanding Student Paper**

Ashley L. Dunn, Gary Heydinger, Giorgio Rizzoni, and Dennis Guenther, "Empirical Models for Commercial Vehicle Brake Torque from Experimental Data," *Proceedings of the Society of Automotive Engineers World Congress 2003*, SAE Paper 2003-01-1325

Ashley Dunn, Gary Heydinger, Giorgio Rizzoni, and Dennis Guenther, "Derivation and Validation of a New Analytical Model for a Multi-Axle Articulated Vehicle," SAE Paper 2004-01-1784, presented at the SAE World Congress, March 2004

Ashley Dunn, Gary Heydinger, Giorgio Rizzoni, and Dennis Guenther, "Application of the Extended Kalman Filter to a Planar Vehicle Model to Predict the Onset of Jackknife Instability," SAE Paper 2004-01-1785, presented at the SAE World Congress, March 2004

Ashley L. (Al) Dunn, Richard L. Hoover, Scott B. Zagorski, "The Effects of Foundation Brake Configuration on Class-8 Tractor Dry Stopping Performance," SAE Paper 2004-01-2701, presented at the SAE Commercial Vehicle Exposition and Conference, October 2004

Ashley L. (Al) Dunn, Richard L. Hoover, Scott B. Zagorski, "The Effects of Foundation Brake Configuration on Class-8 Tractor Wet Stopping Performance and Stability," SAE Paper 2004-01-2702, presented at the SAE Commercial Vehicle Exposition and Conference, October 2004

Richard L. Hoover and Scott B. Zagorski, "Comparison of Heavy Truck Foundation Brake Performance Measured with an Inertia Brake Dynamometer and Analyses of Brake Output Responses to Dynamic Pressure Inputs," SAE Paper 2005-01-3611, presented at the SAE Commercial Vehicle Exposition and Conference, October 2005 (original author)

A.L., Dunn, G.J. Heydinger, G.D. Uhlenhake, "Comparison of Collision and Noncollision Marks on Vehicle Restraint Systems," SAE Paper No. 2008-01-0160. Reprinted from *Accident Reconstruction Journal*, 2008, SP-2160, pp. 81-104, presented at 2008 World Congress, Detroit, Michigan, April 14-17, 2008

Dunn, A.L., Uhlenhake, G.D., Guenther, D.A., Heydinger, G.J., Heydinger, G.J. (Grant), "Vehicle Coast Analysis: Typical SUV Characteristics," SAE Paper No. 2008-01-0598, *Journal of Passenger Cars*, Vol. 1, Issue 1, pp. 526-535, Vehicle Dynamics and Simulation 2008, SP-2157, pp. 161-170, presented at 2008 World Congress, Detroit, Michigan, April 14-17, 2008

Dunn, A.L., Tanner, C.B., Stansifer, R.L., Doyle, S.A., Guenther, D.A., "Vehicle Handling and Control Following Front Ball Joint Failure," SAE Paper No. 2008-01-0171. Reprinted from *Accident Reconstruction Journal*, 2008, SP-2160, pp. 207-220, presented at 2008 World Congress, Detroit, Michigan, April 14-17, 2008

D.A. Guenther and A.L. Dunn, "Truck Brakes," presented at the ABA Transportation Mega Conference IX, March 5-6, 2009, New Orleans, Louisiana (Tab 10, pp. 247-266, CD-ROM)

Fawzi Bayan, Anthony Cornetto, Ashley L. Dunn, C. Brian Tanner, Eric Sauer, Brian M. Boggess, Douglas R. Morr, Rickey Stansifer, Scott Noll, Dennis A. Guenther, Grant Heydinger, "Comparison of Heavy Truck Engine Control Unit Hard Stop Data with Higher-Resolution On-Vehicle Data," SAE World Congress, 2009-01-0879, April 2009

A.L. Dunn, C. Brian Tanner, Eric Sauer, Brian M. Boggess, Fawzi P. Bayan, Anthony Cornetto, Alan Pearlman, Douglas R. Morr, Scott Noll, John F. Wiechel, Dennis Guenther, "The Influence of Disablement of Various Brakes on the Dry Stopping Performance of a Tractor-Semitrailer," SAE World Congress, 2009-01-0099, April 2009

Fawzi P. Bayan, Anthony D. Cornetto III, Ashley (Al) Dunn, Eric Sauer, "Brake Timing Measurements for a Tractor-Semitrailer Under Emergency Braking," SAE Paper 2009-01-2918, presented at the SAE International™ Commercial Vehicle Exposition, Rosemont, Illinois, September 2009

Fawzi P. Bayan, Anthony Cornetto, Ashley Dunn, Ronny Wahba, Eric Sauer, Charles Tanner, "Straight-Line Dry Tractor-Semitrailer Braking and Handling Comparison to HVE Computer Simulation," SAE International™, 2010-01-1921, October 2010

Jiantao Deng, Ashley L. Dunn, Dennis A Guenther, Gary J. Heydinger, "Adaptation of TruckSim Models to Simulate Experimental Heavy Truck Hard Braking Test Data Under Various Levels of Brake Disablement," SAE Paper 2010-01-1920, October 2010

Brian M. Boggess, Ashley Dunn, Douglas R. Morr, Timothy C. Martin, Anthony Cornetto, Fawzi Bayan, SEA, Ltd., "A New Passive Interface to Simulate On-Vehicle Systems for Direct-to-Module (DTM) Engine Control Module (ECM) Data Recovery," SAE Commercial Vehicle Engineering Congress, Paper 2010-01-1994, 2010

Mikesell, D.R., Dunn, A., Heydinger, G.J., and Guenther, D.A., "Semitrailer Torsional Stiffness Data for Improved Modeling Fidelity," SAE Paper No. 2011-01-2163, SAE International Journal of Commercial Vehicles, Vol. 4, No.1, pp.56-66, presented at the 2011 COMVEC, Sept. 13-14, 2011, Rosemont, Illinois

A.L. Dunn, D.A. Guenther, and R. Radlinski, "Application of Air Brake Performance Relationships in Accident Reconstruction and Their Correlation to Real Vehicle Performance," SAE Tech. Paper 2012-01-0609, reprinted from *Accident Reconstruction*, 2012, SP-2335, pp. 227-246, SAE Journal of Commercial Vehicles, Vol. 5, Issue 1, pp. 251-259, presented at the 2012 SAE International Congress and Exposition, Detroit, Michigan, April 23-27, 2012

A.L. Dunn, M. Dorohoff, F. Bayan, A. Cornetto, R. Wahba, M. Chuma, D.A. Guenther, and N. Eiselstein, "Analysis of Motorcycle Braking Performance and Associated Braking Marks," SAE Tech Paper 2012-01-0610, reprinted from *Accident Reconstruction*, 2012, SP-2335, pp. 247-275, presented at the 2012 SAE International Congress and Exposition, Detroit, Michigan, April 23-27, 2012

Anthony Cornetto, Fawzi Bayan, Ashley Dunn, Charles Tanner, Ronny Wahba, Jeffrey Suway, Gary Heydinger, Krishnan Chakravarthy, Dennis Guenther, "Tractor-Semitrailer Stability

Following a Steer Axle Tire Blowout at Speed and Comparison to Computer Simulation Models,” SAE Paper 2013-01-0795, April 2013

Fawzi P. Bayan, Anthony Cornetto, Ashley Dunn, Ronny Wahba, Jeffrey Suway, Yuri Prokrym, Andrew Price, “Brake Characteristics for a Bobtail Vehicle,” SAE Paper 2013-01-0792, April 2013

Dunn, A.L., Boggess, B., Eiselstein, N., Dorohoff, M., Ralston, H., “The Effect of Application Air Pressure on Brake Stroke Measurements from 70 to 125 psi,” SAE Technical Paper 2015-01-2833, 2015, doi:10.4271/2015-01-2833, presented at the 2015 SAE Commercial Vehicle Engineering Congress, Rosemont, Illinois, October 6-8, 2015

Professional Affiliations

Society of Automotive Engineers (SAE)

Seminars and Additional Education

- 2000 – University of Michigan, “Mechanics of Heavy Duty Truck Systems”
- 2000 – University of Michigan, “Computer Simulation of Vehicle Dynamics”
- 2006 – Ohio Trucking Association, Annual Truck Inspection Course
- 2008 – Bosch/Vetronix-approved Crash Data Retrieval (CDR) Technician Course
- 2016 – Ohio Bureau of Workers’ Compensation, “Powered Industrial Trucks, Developing a Training Program”

Courses Taught/Presentations

- Ashley L. Dunn, Donald R. Houser, and Teik C. Lim, “A New Metric for Rating In-Vehicle Gear Whine Levels,” *Noise-Con 98 Proceedings*, Institute of Noise Control Engineering
- Ashley L. Dunn, Donald R. Houser, and Teik C. Lim, “Methods for Researching Gear Whine in Automotive Transaxles,” *Proceedings of the Society of Automotive Engineers Noise and Vibrations Conference 1999*, SAE-99NV-167
- Ashley L. Dunn, Gary Heydinger, Giorgio Rizzoni, Dennis Guenther, “New Model for Simulating the Dynamics of Pneumatic Heavy Truck Brakes with Integrated Anti-Lock Control,” *Proceedings of the Society of Automotive Engineers World Congress 2003*, SAE 2003-01-1322. **Winner of 2003 SAE International Meyers Award for Outstanding Student Paper**
- Ashley L. Dunn, Gary Heydinger, Giorgio Rizzoni, and Dennis Guenther, “Empirical Models for Commercial Vehicle Brake Torque from Experimental Data,” *Proceedings of the Society of Automotive Engineers World Congress 2003*, SAE 2003-01-1325
- Ashley Dunn, Gary Heydinger, Giorgio Rizzoni, and Dennis A. Guenther, “Derivation and Validation of a New Analytical Model for a Multi-Axle Articulated Vehicle,” SAE Paper 2004-01-1784, presented at the SAE World Congress, March 2004
- Ashley Dunn, Gary Heydinger, Giorgio Rizzoni, and Dennis Guenther, “Application of the Extended Kalman Filter to a Planar Vehicle Model to Predict the Onset of Jackknife Instability,” SAE Paper 2004-01-1785, presented at the SAE World Congress, March 2004
- Ashley L. (Al) Dunn, Richard L. Hoover, Scott B. Zagorski, “The Effects of Foundation Brake Configuration on Class-8 Tractor Dry Stopping Performance,” SAE Paper 2004-01-2701, presented at the SAE Commercial Vehicle Exposition and Conference, October 2004

- Ashley L. (Al) Dunn, Richard L. Hoover, Scott B. Zagorski, “The Effects of Foundation Brake Configuration on Class-8 Tractor Wet Stopping Performance and Stability,” SAE Paper 2004-01-2702, presented at the SAE Commercial Vehicle Exposition and Conference, October 2004
- Powered Industrial Truck (P.I.T.) classroom and driver training at SEA, Ltd.

NHTSA Briefings – SAE Government-Industry Presentations

- 2004 – Commercial Vehicle Exposition, “Overview of NHTSA Truck Research at VRTC”
- 2005 – Commercial Vehicle Exposition, “Overview of NHTSA Truck Research at VRTC”

Research/Conference Papers, Contributing Author

Richard L. Hoover, Scott B. Zagorski, and Tim Van Buskirk, “Air Disc and S-Cam Brake Stopping Performance Comparison for Class-8 Tractor and Trailer Combinations,” SAE Paper 2005-01-3614, presented at the SAE Commercial Vehicle Exposition and Conference, October 2005

Zagorski, S.B., Hoover, R.L., “Comparison of ABS Configurations and Their Effects on Stopping Performance and Stability for a Class 8 Straight-Truck,” SAE Paper 2005-01-3610, presented at SAE 2005 Commercial Vehicle Engineering Congress and Exhibition

Zaugg, B.C., Dunn, A.L., Grygier, P.A., Guenther, D.A., Heydinger, G.H., Zagorski, S.B.,” The Development of a Heavy Truck ABS Model,” SAE Paper 2005-01-0413, presented at SAE World Congress 2005

Zagorski, S.B., Dunn, A.L., “Braking of Commercial Vehicles From High Speed – Effects on Stopping Distance,” SAE Paper 2005-01-0397, presented at SAE World Congress 2005

Zagorski, S.B., Dunn, A.L., Hoover, R.L., “Effects of Tractor Foundation Brakes on ABS Operating Regimes on High- and Low-Coefficient Surfaces,” Presentation Only, presented at SAE 2004 Commercial Vehicle Engineering Congress and Exhibition

Garrott, W. Riley, Dunn, A.L., “NHTSA Research Efforts to Significantly Improve Braking Performance of Medium and Heavy Trucks,” National Highway Traffic Safety Administration, EVS Paper Number 07-0242

Selected Report Titles

Significant study reports on tire performance completed at Michelin Research:

“Combined Cornering and Braking Traction Study,” 1987 (a multi-volume report based on research contracted by General Motors)

“The Effects of Tire Compound on the Performance of Anti-Lock Brake Systems for Straight-Ahead Stops,” 1988

“The Effects of Various Production Tires on the Performance of Anti-Lock Brake Systems for Straight-Ahead Stops,” 1989

“The Effects of Tire Type and Compound on Tire Slip During Best-Effort Acceleration on Packed Snow,” 1990

Numerous reports, comparing analytical on-vehicle handling tests (SAE Random Steer and On-Center Steer test procedures) to subjective handling evaluations of the same systems, were published.

Also, numerous reports, comparing analytical on-vehicle noise and vibration (comfort) tests to subjective NVH evaluations of the same systems, were published.

The following reports are for NHTSA-USDOT, Vehicle Research and Test Center, unless noted:

“The Effects of Tire Free Rolling Cornering Properties on Analytical Predictions for Heavy Truck Roll and Yaw Predictions,” September 2001

“Wet and Dry Traction Values from ANOVA Model,” November 2002

“Brake-in-Turn Study Comparing disc/drum to drum/drum Truck Brake Combinations,” September 2001

“Lateral and Longitudinal Traction Coefficients for Heavy Truck Tires on Dry Pavement,” August 2002

“Pneumatic Brake Torque Data Observations and Modeling Methods,” July 2002 (Report for DANA, Spicer Heavy Axle Division)

“The Effects of Tandem and Load Placement on Brake-in-Turn Performance of a Tractor/Semi-Trailer on Wet Jennite,” August 2002

“Longitudinal Slip Ratios and Brake Chamber Pressures During Straight-Ahead Braking for a Tractor/Semi-trailer on Dry Pavement, a Brief Survey,” August 2002

“In-Depth Brake-in-Turn Study Using New Models, Comparing disc/drum to drum/drum Truck Brake Combinations for Low- μ , Low-load conditions,” January-February 2003

“Load Transfer Sensitivity for Heavy Truck Tires,” March 2003

“Class-8 Truck Tractor Braking Performance Improvement Study – Straight Line Stopping Performance on a High Coefficient of Friction Surface,” NHTSA/USDOT Research Report No. DOT HS 809 700, May 2004

“Evaluation Report: Aventech IMU versus BEI MotionPak Inertial Sensor Packages,” August 2004

“Class-8 Truck Tractor Braking Performance Improvement Study – Low Coefficient of Friction Performance and Stability Plus Parking Brake Evaluations of Four Foundation Brake Configurations,” NHTSA/USDOT Research Report No. DOT HS 809 753, October 2005

“Class-8 Straight Truck and Class-7 School Bus, Braking Performance Improvement Study,” NHTSA/USDOT Research Report No. DOT HS 809 895, publication pending

“Class-8 Straight Truck ABS Configuration Study,” NHTSA/USDOT Research Report No. DOT HS 810 554, publication pending

“Vehicle Modeling Research to Estimate Stopping Distances for 80,000-lb GVWR Trucks and Truck Tractors Using Current Brake Technologies” (vehicle dynamics simulation study), July 2006

“Longitudinal Dynamic Load Transfer During Braking – Comparison of Vehicle Type and Wheelbase” (using vehicle dynamics simulations), August 2006