



**D E S I G N**  
**R E S E A R C H**  
**E N G I N E E R I N G**

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## **Roger A. Burnett, M.S.**

Roger Burnett has more than 30 years-experience in automotive design, product development, product testing, and safety. While working in the automotive industry he has actively conducted a wide range of analytical research leading to developments in automotive seat design and restraint systems.

### **Professional Specialization**

Mechanical Engineering with focus on automotive design and product development, crashworthiness, biomechanics, occupant kinematics, human tolerance, injury mitigation, analysis of traumatic injury associated with crashes, research evaluating occupant responses and injury in front, side, rear and rollover using crash test dummies, cadavers, and modeling.

### **Education**

University of Virginia, Charlottesville, Virginia, M.S., Mechanical and Aerospace Engineering  
Virginia Tech, Blacksburg, Virginia, B.S., Mechanical Engineering

### **Professional Experience**

Design Research Engineering, Novi, Michigan, August 2022–Present

Senior Engineering Consultant

Ford Motor Company

Product Design Engineer, 1992-1994

Body Engineering, Seats and Hardware Engineering and program assignments in: CT20

Program, Escort Airbag Engineering Vehicle Development, CAE NVH Development

Vehicle Development, Mustang Powertrain Development Powertrain Engineering,

Advanced Powertrain Development Vehicle Center 2, Taurus Seats and Restraints Design.

Product Design Engineer, 1994-1997

Advanced Vehicle Technology, Seats and Interior Trim Engineering Advanced projects and specification development.

Product Design Engineer, 1997

Advanced Vehicle Technology, Seating and Restraints Engineering, Transit restraint systems.

Design Analysis Engineer, 1997-2007, Technical Leader 2006-2007

Design Analysis Office, Vehicle Interiors.

Technical Leader, 2007-August 2022

Automotive Safety Office, Design Analysis.

### **Professional Affiliations**

Member - Society of Automotive Engineers

Member - Association for the Advancement of Automotive Medicine

## Technical Publications

- "The Influence of Seatback Characteristics on Cervical Injury Risk in Severe Rear Impacts", Accident Analysis and Prevention 36 (2004) 591-601.
- "Stiff versus Yielding Seats: Analysis of Matched Rear Impact Tests", Society of Automotive Engineers, SAE 2007-01-0708.
- "Occupant Responses in High-Speed Rear Crashes: Analysis of Government Sponsored Tests", Society of Automotive Engineers, SAE 2008-01-0188.
- "Seat Integrated and Conventional Restraints: A Study of Crash Injury/Fatality Rates in Rollovers", 52nd Annals of Advances in Automotive Medicine, Oct. 2008.
- "Frontal Impact Rear Seatbelt Load marks: An In-Depth Analysis", Society of Automotive Engineers, SAE 2009-01-1249.
- "Influence of Seating Position on Dummy Responses with ABTS Seats in Severe Rear Impacts", Society of Automotive Engineers, SAE 2009-01-0250.
- "Relationships between Seatback Stiffness/Strength and Risk of Serious/Fatal Injury in Rear-Impact Crashes", Society of Automotive Engineers, SAE 2009-01-1201.
- "Vehicle Chassis, Body, and Seat Belt Buckle Acceleration Responses in the Vehicle Crash Environment", Society of Automotive Engineers, SAE 2009-01-1246.
- "Seatback Strength and Occupant Response in Rear Impact Crash: Observations with Respect to Large Occupant Size and Position", Society of Automotive Engineers, SAE 2010-01-1029.
- "Rear Impact Tests of Starcraft-Type Seats with Out-of-Position and In-Position Dummies", Society of Automotive Engineers, SAE 2011-01-0272.
- "Influence of Belt Pretensioning on Dummy Responses in 40 km/h Rear-Impact Sled Tests", Traffic Injury Prevention, 2012.
- "Influence of Standing or Seated Pelvis on Dummy Responses in Rear Impacts", Accident Analysis and Prevention, 45 (2012) 423– 431.
- "Rebound After Rear Impacts", Traffic Injury Prevention, 2013.
- "Influence of a Combo Side Airbag on the Risk for Basilar Skull Fracture in a FarSide Occupant", Traffic Injury Prevention, 2014.
- "Rear Impact Vehicle Seat Structure (RIVSS) Design", American Society of Mechanical Engineers, IMECE2014-36326.
- "The Influence of Body Mounted Shoulder Seat Belt Anchor (D-Ring) Displacement During Dynamic Vehicle-to-Ground Impacts", SAE 2015-01-1756.
- "Seatback Strength as a Predictor of Serious Injury Risk to Belted Drivers and Rear Seat Occupants in Rear-Impact Crashes", SAE 2016-01-1512.
- "Occupant Responses in Conventional and ABTS Seats in High-Speed Rear Sled Tests", Traffic Injury Prevention, 2017.
- "Thoracic and Lumbar Spine Responses in High-Speed Rear Sled Tests", Traffic Injury Prevention 2018.
- "Seat Performance and Occupant Moving Out of the Shoulder Belt in ABTS (All-Belts-to-Seat) in Rear Impacts", SAE 2019-01-1031.
- "FRED II Quasistatic Seat Testing Rearward: An Improved Method Based on the SAE H-point Manikin", SAE 2019-01-1032.
- "Injury Rates by Crash Severity, Belt Use and Head Restraint Type and Performance in Rear Impacts", SAE 2020-01-1223.
- "A Mathematical Model to Assess Occupant Compartment Intrusion on Rear Occupant Responses in Rear Crashes", IMECE2020-24613.
- "Second-Row Occupant Responses with and Without Intrusion in Rear Sled and Crash Tests", Traffic Injury Prevention 2021.

### **Technical Publications** *(continued)*

- “Effect of ABTS and Conventional Seats on Occupant Injury in Rear Impacts: Analysis of Field and Test Data”, Traffic Injury Prevention 2021.
- “Influence of Retractor and Anchor Pretensioning on Dummy Responses in 40 km/h Rear Sled Tests”, Traffic Injury Prevention 2021.
- “Effect of ATD Size, Vehicle Interior and Restraint Misuse on Second-Row Occupant Kinematics in Frontal Sled Tests”. SAE 2021-01-0914.
- “Seat Performance in Rear Impacts: Seatback Deflection and Energy Dissipation”, SAE 2021-01-0916.
- “Dual-Recliner ABTS Seats in Severe Rear Sled Tests with the 5th, 50th and 95th Hybrid III”, SAE 2021-01-0917.
- “Effect of Occupant Weight and Initial Position in Low-to-High Speed Rear Sled Tests with Older and Modern Seats”, SAE 2021-01-0918.
- “Assessment of the 50th Hybrid III Responses in Blunt Rear Impacts to the Torso”, SAE 2021-01-0919.
- “Evaluations of Pretensioner Activation in Rear Impacts”, Traffic Injury Prevention 2021.
- “Rear-End Impacts - Part 1: Field and Test Data Analysis of Crash Characteristics”, SAE 2022-01-0859.
- “Rear-End Impacts - Part 2: Sled Pulse Effect on Front-Seat Occupant Responses”, SAE 2022-01-0854.
- “Quasi-Static Methods to Evaluate Seat Strength in Rear Impacts”, Traffic Injury Prevention 2022.
- “The Effect of Seatback Deformation on Out-of-Position Front-Seat Occupants in Severe Rear Impacts”, Traffic Injury Prevention 2022.