

**Center for Study of
Responsive Law**

**"H.H. Bliss"
Awards of
Appreciation**

to the

**Inventors and
Technical Pioneers
of the Airbag**

**Tuesday, December 3, 1991
The Capital Hilton
Washington, D.C.**

The "H.H. Bliss" Award Recipients

John W. Heibick -- Private Inventor, Newport PA. Received United States patent 2,649,311, "Safety Cushion Assembly For Automotive Vehicles," in 1953. Was the first to conceive the use of an inflatable bag in an automobile to reduce crash injuries. Inspired others to develop and perfect what is now known as the airbag.

Harry A. Bertrand -- Private inventor, Flint MI. Received United States patent 2,834,606 in 1958 for an automatically inflated airbag system using a crash sensor. His patent was the first to demonstrate automatic control to inflate the airbag, using an electromagnetic crash sensor and an electronic control circuit.

Carl C. Clark -- Martin Marietta; National Highway Traffic Safety Administration. At Martin Marietta, first to conduct airbag crash experiments with technical measurements, some as a test subject himself, showing the injury protection provided by controlled yielding airbags. Later, principal government scientist in airbag research program.

Trevor O. Jones -- General Motors; TRW. Currently Chairman, Libbey-Owens-Ford. While at General Motors in the late 1960s, developed innovative crash sensor designs, introduced total systems analysis to airbag systems which led to incorporation of redundant crash sensors for high reliability. He is one of the inventors of the multi-level inflation airbag.

David J. Breed -- Breed Corp.; Breed Automotive Corp. Currently President, Automotive Technologies International. Worked at Breed and Breed Automotive to develop the ball-in-tube crash sensor design that is used in most of the world's airbag vehicles. Co-holder of numerous patents on airbag systems and sensors.

George F. Kirchoff -- Thiokol; Morton International. Early pioneer in automotive airbag development, testing and production at Thiokol and Morton International. Co-holder of numerous patents on airbag inflator modules and self-contained airbag systems. His systems were used in all of the Department of Transportation Research Safety Vehicles and by many auto manufacturers.

Michael Fitzpatrick -- General Motors; Minicars. Currently Fitzpatrick Engineering. Used extensive vehicle crash test experience with airbag restraint systems to write computer programs to simulate crash tests. His computer programs enabled manufacturers to optimize airbag restraints to incorporate them in a wide range of models.

Willi Reidelbach -- Daimler-Benz, A.G. Chief research scientist responsible for engineering and utilization of airbags in Mercedes cars. He developed structural design concepts as well as methods and facilities for testing airbag restraint systems and their contributions to crashworthiness.

David J. Romeo -- Calspan; Talley Industries. Currently Romeo Engineering. Conducted early airbag systems research at Calspan and Talley which demonstrated their safety, effectiveness and reliability. Had primary responsibility for design and development of retrofit airbags for Department of Transportation Police Fleet Program that demonstrated airbag effectiveness.

Arne G. Asberg -- Council on Road Safety Research; Volvo. Currently, Ergoma AB. In the 1970s analyzed and developed structural design of vehicle exterior and interior that maximizes the effectiveness of airbags in protecting occupants in crashes. Project leader for the Volvo Experimental Safety Car.

Robert M. Kemmerer -- Ford Motor Company; Hammill Mfg. Div., Firestone Tire. As a result of work on escape systems for aircraft, he conceived the mechanism of using electricity and explosives to fracture a burst disc to bring about the rapid gas transfer to inflate an airbag. He was the first volunteer at Ford to experience an airbag inflation.

Inventors and Technical Pioneers of the Airbag

Robert Alexander, Ford
Arne G. Asberg, Council on Road Safety Research; Volvo; Ergoma AB
Ken Barnes, Chrysler; TIP Engineering
Joseph Barrett, ICI Explosives, Inc.
Robert Bayley, TRW
Lon Bell, TRW Technar
Donald Benrud, Inventor
Harry Bertrand, Patent Holder
Alan Breed, Breed Automotive
David Breed, Breed Automotive
David O. Campbell, General Motors
William Carey, Eaton, Yale & Towne
Carl C. Clark, Martin Marietta; National Highway Traffic Safety Administration
Edward N. Cole, General Motors
Roger Daniel, Ford
Mario Delalivtine, CIL
Kennerly Digges, National Highway Traffic Safety Administration
Robert Diller, TRW Technar
Sid Dunford, General Motors
Michael Fitzpatrick, General Motors; Minicars; Fitzpatrick Engineering
Stuart Frey, Ford
Donald Friedman, General Motors; Minicars
Lyle Galbraith, Rocket Research
George Geotz, TRW
William Gruber, TRW Technar
D. Peter Haas, Eaton, Yale & Towne; American Motors Corp.
Brian Hamilton, OEA
John E. Hetrick, Patent Holder
R.N. Hodges, Patent Holder
Fred Irish, General Motors
Kjell Jonasson, Volvo
Trevor O. Jones, General Motors; TRW; Libbey-Owens-Ford
Assen Jordanoff, Inventor
Robert M. Kemmerer, Ford; Hammill Manufacturing

George F. Kirchoff, Thiokol; Morton International
Edwin H. Klove, Jr., General Motors
Saburo Kobayashi, Honda
Y. Kobori, Kabusshiki, CIC
Jo Kotula, Inventor
M. Leising, Chrysler
Walter Linderer, Inventor
Robert Mclean, General Motors
Harold J. "Bud" Mertz, General Motors
John Morris, National Highway Traffic Safety Administration
R. Namsick, Goodyear Tire Co.
Karl Eric Nilsson, Bayern Chemie
Donald L. Nordeen, General Motors
T. Norton, Ensign-Bickford
John Pietz, Talley Industries
Pyra Prasad, Ford
Donald Radke, TRW; Bendix
Willi Reidelbach, Daimler-Benz, A.G.
John Repp, Ford
Robert Resh, TRW
Ralph Rockow, TRW
David Romeo, Calspan; Talley Industries
S. Salvadore, Inventor
Ola Saxmark, Volvo
Eckart Schmidt, Rocket Research
Fred Schneider, Morton International
Hans Jurgen Sholtz, Daimler-Benz, A.G.
Donald Smith, Ford
William Smith, General Motors
Charles Strother, National Highway Traffic Safety Administration
William Thorn, Rocket Research
Leshek Utracki, CIL
Thomas Vos, TRW
Chuck Warner, Brigham Young University
Arnold Witmer, Inventor
Karl Wilfert, Daimler-Benz, A.G.

Celebrating the Airbag --

The concept of an inflatable air cushion for aircraft was conceived in the 1940s. Research and development began on the airbag for automobiles in the 1950s when private inventors led by John Hetrick and Harry Bertrand of the United States first patented the airbag. The auto companies led by Ford Motor Company under Robert M. Kemmerer began research on airbags in the late 1950s. Researchers from the aerospace industry led by Carl Clark began transferring research and technology applications to motor vehicles in the 1960s. Auto industry suppliers led by Eaton, Yale and Towne began their own airbag research and development programs followed by aerospace companies, Rocket Research and Thiokol. By the late 1960s, airbag research was well under way in Europe led by Daimler-Benz, Volvo, and Volkswagen.

In July 1968, the federal government expressed its interest in airbag use at a meeting convened by National Highway Safety Bureau (NHSB) Director, William Haddon, Jr., with representatives of the auto companies. In June 1969, the NHSB issued an Advanced Notice of Proposed Rulemaking for 'Inflatable Occupant Restraint System' with a proposed effective date of January 1, 1972. The first of many international conferences on airbag technology was held in May 1970 at General Motors' Milford Proving Grounds under the auspices of NATO. General Motors President Edward N. Cole, an engineer with airbag patents, announced that GM would make full frontal airbags standard on one million 1974 model cars.

Led by Allstate under its Vice President and General Counsel Donald Schaffer and by State Farm, the insurance industry became strong supporters of airbags in the early 1970s. Allstate participated in the first airbag fleet demonstration program when Ford produced 1,000 1972 models with airbags. After leaving the NHSB, Dr. Haddon became the President of the Insurance Institute for Highway Safety and continued his strong advocacy of airbags.

Technological advances and regulatory delays marked the 1970s for airbags. All the major car companies developed Experimental Safety Vehicles that included airbags. Researchers such as Willi Reidelbach of Daimler-Benz and Arne Asberg of Volvo were instrumental in developing Safety Vehicle Programs for their companies and integrating the results into production vehicles with airbags. General Motors, utilizing airbag systems developed by Trevor Jones, became the first company to sell airbag equipped cars in the mid-1970s but they were discontinued shortly after Edward Cole retired in 1974.

Auto industry suppliers helped make significant advances in airbag technology during the 1970s. George Kirchoff at Thiokol used its rocket technology to develop reliable inflators. Talley Industries and TRW came to the forefront. Advanced sensor development was spurred at Breed Corporation. Michael Fitzpatrick developed computer models to simulate crashes of cars with airbags that speeded their development. The Research Safety Vehicles produced for the Department of Transportation by

A Brief History

Minicars under Donald Friedman's direction demonstrated 50-mph occupant protection with advanced airbags.

Despite its initial support of airbags, the auto industry challenged federal regulation requiring passive restraints in the courts, in the federal agencies and Congress. Although every Secretary of Transportation from John Volpe through William Coleman to Brock Adams supported airbags, their final passive restraint rules were modified and delayed. Strong Congressional support led by Senators Warren Magnuson, Vance Hartke and Frank Moss plus Representatives Harley Staggers, John Moss, and Tim Wirth, kept pressure on the Department of Transportation to pursue airbags. Consumer and safety groups joined forces to keep the airbag alive. The National Highway Traffic Safety Administration let out a key contract in the later 1970s under David Romeo's direction to retrofit police fleets to demonstrate airbag effectiveness.

Events in the 1980s finally set the stage for the success of the lifesaving airbag. In December 1980, Daimler-Benz became the first company since General Motors to sell airbag-equipped cars. Daimler-Benz equipped some 1981 models in Europe with airbags and then, later on, 1984 models in the United States. In July 1983, Ford Motor Company bid on and received a General Services Administration contract to supply 5,000 airbag cars to the federal government in 1985. In 1983, the U.S. Supreme Court unanimously overturned the Reagan Administration's rescission of the passive restraint rule.

After remand from the Supreme Court, Transportation Secretary Elizabeth Dole issued a new final rule requiring airbags to be phased in beginning with 10% of cars in 1987 and ending with all passenger cars in 1990. A provision in the rule -- that it would be rescinded if states with two-thirds the nation's population passed mandatory seat belt laws -- was never invoked because states passed seat belt use laws with provisions that prevented them from being counted toward the two-thirds required. DOT later amended the final rule to give the auto makers until the 1994 model year to install airbags on the passenger side.

In 1989, Chrysler Chairman Lee Iacocca said, "Who says you can't teach an old dog new tricks? I had my doubts about airbags, but today's new technology made me a believer." He then announced driver-side airbags would become standard in all domestically produced 1990 Chrysler models. Other auto makers soon announced they would install standard airbags in most models. When the DOT final rule took effect in 1990, consumer demand for airbags outstripped supply. Manufacturers could not produce enough airbags for all models and front seat positions. After twenty years of delay, the dreams of inventors and safety advocates have come true. Airbags are on their way to being in all passenger vehicles. In conjunction with seat belts, airbags will save 12,000 occupant lives a year when in all vehicles.