



Gayle S. Borman

GARY L. BORMAN

1932–2005

Elected in 1990

*“For pioneering analytical simulation of internal combustion engines
and verification with advanced experimental techniques.”*

BY DAVID E. FOSTER
SUBMITTED BY THE NAE HOME SECRETARY

GARY LEE BORMAN, Emeritus Professor of Mechanical Engineering, University of Wisconsin-Madison (UW-Madison), passed away on January 17, 2005, after a courageous battle with cancer. He was born in Wauwatosa, Wisconsin, on March 15, 1932. He was the only child of Meta Singer and Louis Borman. He graduated from West Allis High School and continued his education at UW-Madison in mathematics (B.S., 1954; M.S., 1956) and mechanical engineering (M.S., 1957) where his thesis was on droplet vaporization. In 1971 he married Marlene Mehls in Chippewa Falls. He is survived by Marlene and cousins in the Milwaukee area.

After graduating from UW-Madison and spending a semester teaching math at UW-Milwaukee, Borman joined General Electric Co. in Cincinnati, Ohio. His work involved rocket heat transfer and electric propulsion research for space applications. After three years at GE he gained the title “Senior Engineer.” Then, when Professor Phil Myers contacted Gary about becoming an instructor in mechanical engineering to teach engineering analysis and pursue a Ph.D., he chose to return to academia. Borman’s 1964 Ph.D. thesis was titled “Mathematical Simulation of IC Engine Processes and Performance.”

Professor Borman's research concentrations included the internal-combustion engine, lubrication, spray vaporization, and cycle analysis. His keen intellect, coupled with a strong analytical background, gave him insight into the processes occurring in the engine and propelled him to the pinnacle of his field. He was acclaimed for activities in engine modeling as well as for fundamental experiments. His pioneering work in thermodynamic analysis of engines led to an analysis technique known as heat-release analysis. This analysis procedure has been adopted by every internal combustion engine manufacturer in the world. It is now a standard component of every engine data analysis package sold today. His insight into the thermophysical processes within the engine resulted in novel measurements of temporally and spatially resolved heat flux within the cylinder, oil film thickness measurements between the piston rings and the liner of a firing engine, and integrated time-resolved, in-cylinder nitrogen oxide measurements of an operating diesel engine. This latter work was recognized by the Society of Automotive Engineers (SAE) with the Horning Memorial Award, an award for the best technical paper of the year in the area of combustion and fuels.

Professor Borman was dedicated to his profession as an educator and a public servant to the university and the technical community. He co-authored a graduate level textbook, *Combustion Engineering*, with Professor Ken Ragland. He regularly taught heat transfer, thermodynamics, and combustion.

Working with Professors Phil Myers and Otto Uyehara, he helped the engine research program at the university grow from a collection of individual faculty with research contracts into the internationally recognized Engine Research Center. He served as its first director from 1986 to his retirement in 1994. Professor Borman advised 40 master of science mechanical engineering, and 21 Ph.D. students.

He was a fellow of the Society of Automotive Engineers (SAE) and served on the Board of Directors of SAE. In 1965, he received the SAE Ralph R. Teetor Award, in 1966 the SAE Arch T. Colwell Merit Award, and in 1978 the SAE Harry L. Horning Memorial Award. He was elected to the National Academy of Engineering

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Gary had a keen interest in gardening. He and his wife Marlene always landscaped their home garden personally and kept it in excellent shape. He traveled throughout his career and after retirement traveled for personal pleasure with Marlene. They went to Europe, England, Spain, Switzerland, Yugoslavia, Egypt, Japan, and the Scandinavian countries, and they traveled extensively in the United States. Their interests were in seeing the gardens, parks, and museums of each country. Gary kept up an active interest in history, economics, and current affairs and was an avid photographer. In addition, he was a fine cook and entertained friends regularly at his home.

His impact on the internal combustion engine community, his colleagues at the university, his students, and his many friends was immeasurable. His spirit lives on in all who knew and worked with him.