

Internal Combustion Engine Durability

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Abstract

Internal combustion engines have been around for more than 100 years and their designs continue to evolve and improve. Higher power to weight ratio and lower emissions requirements will continue to force changes and improvements in engine design. As engine power increases, so do the risks of engine and/or component failure. This seminar will provide an overview of the requirements for proper engine durability and will provide some perspective for how to predict and improve engine component life. An overview of the loads on engine components will be discussed, along with potential failure modes. Additionally, this seminar will show how the fundamental concepts learned in undergraduate heat transfer, thermodynamics, and materials courses can be used to improve engine designs and eliminate failures.

Biography

Steve has worked for Caterpillar for the last 12 years. At Caterpillar, Steve has worked in Engine Research and Aftertreatment & Cooling Products at the Caterpillar Technical Center in Peoria, Illinois, and in the Application Performance Section at the Large Engine Center in Lafayette, Indiana. Previously, Steve spent 12 years as an Engine Design Consultant at Ricardo in Detroit, Michigan. During his time at Ricardo, Steve provided technical consultation on engine and engine system design, simulation, validation, and testing, focused on combustion, cooling, and lubrication systems. Steve worked on the many new and existing engines for Ford, GM, Cummins, John Deere, Navistar, and Chrysler, including the second generation Chrysler HEMI. He received his Ph.D. in Mechanical Engineering from Iowa State University in 1994. He has published more than 10 papers in ASME, SAE, ASHRAE journals and conferences. Steve also has been granted 6 patents related to internal combustion engine design.

This seminar counts towards the ME 600 seminar requirement for Mechanical Engineering graduate students.

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