

# Book Review

**Engineering Fundamentals of the Internal Combustion Engine, 2nd Ed.**, Willard W. Pulkrabek. Prentice-Hall, Englewood Cliffs, NJ, 2003.

## REVIEWED BY JIM S. COWART<sup>1</sup>

The new second edition internal combustion engine text by Professor Pulkrabek is an excellent undergraduate engineering text book. This book is well suited for a one semester senior level elective course on engines. It provides a broad introductory coverage of the relevant theory and practice surrounding spark ignition (SI) and compression ignition (CI) internal combustion engines. As appropriate, general descriptions of current engine technology (e.g., fuel injection practice) are also presented.

This text covers the fundamental elements of SI and CI internal combustion engines. This includes operating characteristics, ideal cycles, thermochemistry, as well as details on the specific engine strokes: intake and fluid motion, combustion and exhaust processes. Additionally, the topics of heat transfer, emissions and friction/lubrication are presented in individual chapters. Numer-

ous example problems are placed in the text and relevant problems (including design problems) at the end of each chapter will be useful for students.

Pulkrabek's text also includes numerous and frequent historical notes throughout the book. These notes are sure to create interest in both students and professionals who may use this text. A few examples of these historical notes include a discussion of how compression ratios have changed over the years, a description of when automobiles ran on charcoal, and ignition system history. These notes are a wonderful complement to the study of engine technology.

For practicing engineers in the field of engines this text is likely to be less useful than *Internal Combustion Engine Fundamentals* by J. B. Heywood (McGraw-Hill, 1988). Heywood's text generally provides more detail on the engine topics covered by Pulkrabek as well as specific chapters on the properties of engine working fluids, widely used engine models (both physical and phenomenological), and detailed engine operating behavior. Pulkrabek's text is targeted toward undergraduate students and thus, for example, discusses qualitatively the effects of engine operation on heat transfer but does not contain Heywood's detailed analysis and data.

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