

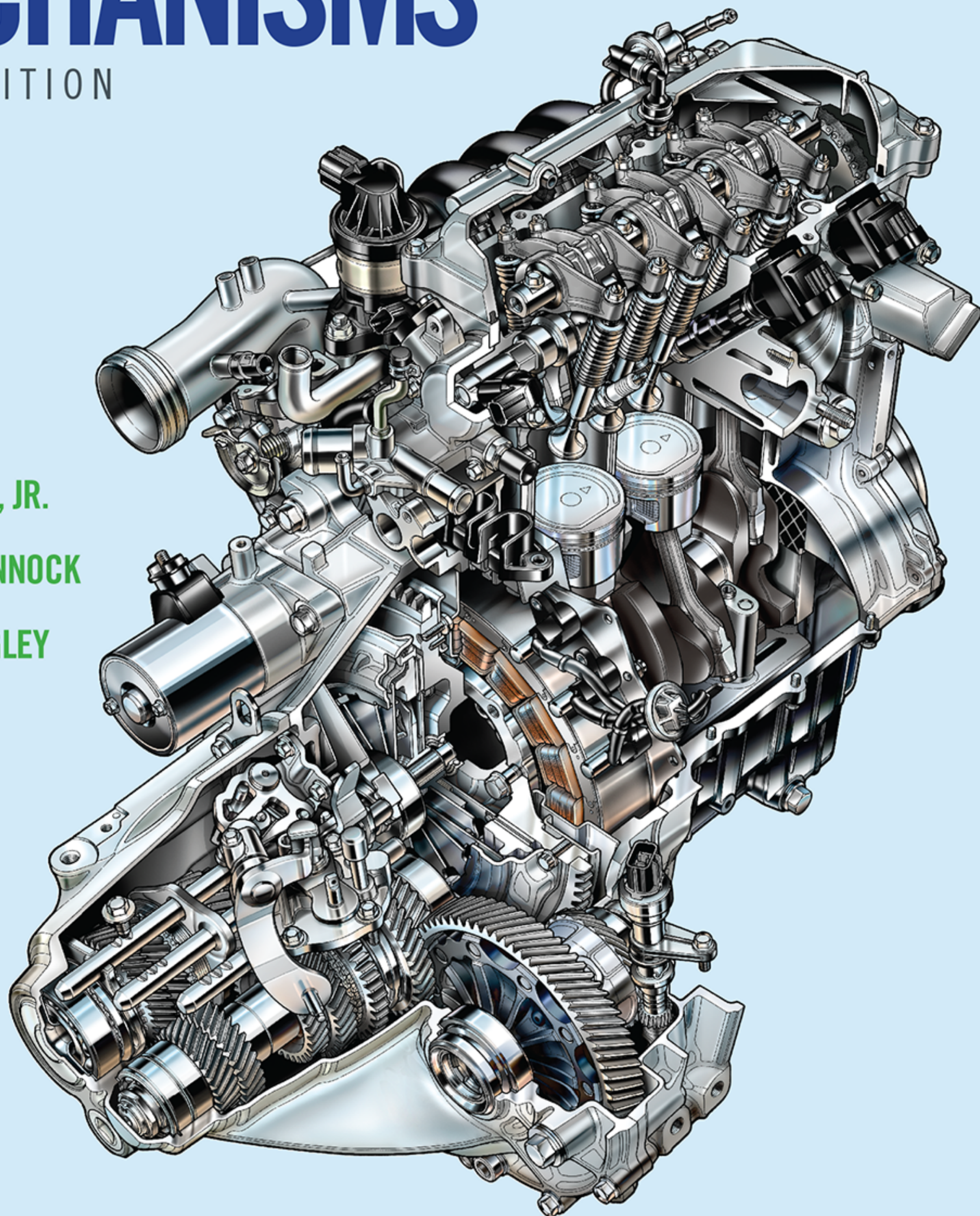
# THEORY OF MACHINES AND MECHANISMS

FIFTH EDITION

JOHN J. VICKER, JR.

GORDON R. PENNOCK

JOSEPH E. SHIGLEY

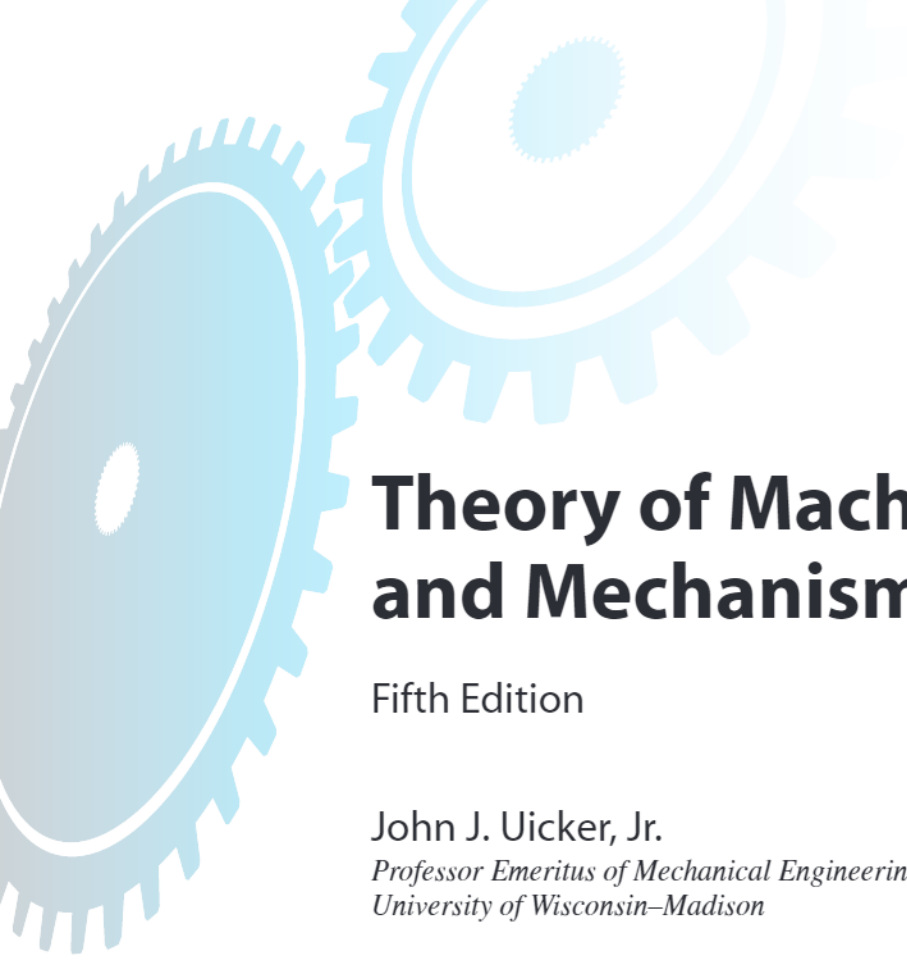


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**Theory of Machines  
and Mechanisms**





# Theory of Machines and Mechanisms

Fifth Edition

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This textbook is dedicated to the memory of my parents, John J. Uicker, Emeritus Dean of Engineering, University of Detroit, Elizabeth F. Uicker, and to my six children, Theresa A. Zenchenko, John J. Uicker III, Joseph M. Uicker, Dorothy J. Winger, Barbara A. Peterson, and Joan E. Horne.

—**John J. Uicker, Jr.**

This work is also dedicated first and foremost to my wife, Mollie B., and my son, Callum R. Pennock. The work is also dedicated to my friend and mentor, the late Dr. An (Andy) Tzu Yang, and my colleagues in the School of Mechanical Engineering, Purdue University, West Lafayette, Indiana.

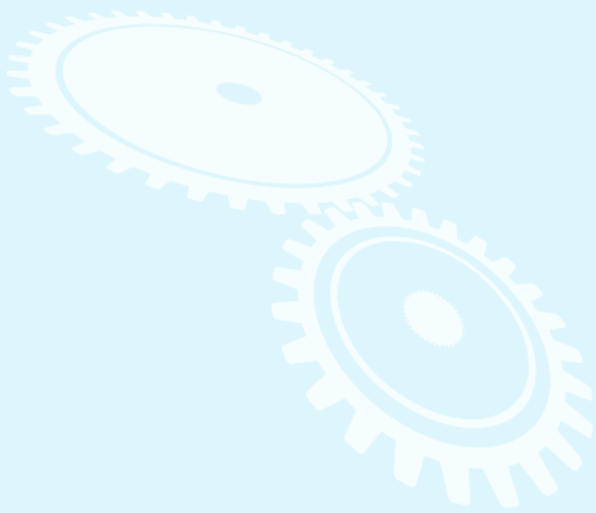
—**Gordon R. Pennock**

Finally, this text is dedicated to the memory of the late **Joseph E. Shigley**, Professor Emeritus, Mechanical Engineering Department, University of Michigan, Ann Arbor. Although this fifth edition contains significant changes from earlier editions, the text remains consistent with his previous writings.





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