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Introduction to Engine Valvetrains

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Acknowledgments

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In more than 100 years of internal combustion engine history, tremendous knowledge about
valvetrains has been accumulated and published. However, much of the technical literature and
many of the books dealing with the design, construction, and maintenance of various compo-
nents of valvetrains are scattered, and the design engineer or student seldom has time to search
through several sources of information for a solution to a problem or question. Therefore, this
book aims to present a unified, precise, clear, and systematic description and explanation of the
fundamentals of all essential components of valvetrains, as well as the valvetrain as a system.
The objective is to introduce and explain fundamental valvetrain engineering concepts so that
the reader can appreciate the design and material considerations and can understand the difficul-
ties the engine designer faces in designing a valvetrain system to satisfy the functional require-
ments and the manufacturer’s challenges in producing components that satisfy the designer’s
requirements. This book also provides up-to-date, broad-based, in-depth information devoted to
the design, material and metallurgy, testing, tribology, and failure analysis of valvetrains. The
completeness of the information given here should make the book useful as a reference source
for design engineers and students alike.

The material within this book has come from many sources. The published sources have been
acknowledged. Although great pains have been taken to avoid errors, it is impossible to eliminate
them entirely in a work of this magnitude. I hope that readers who discover errors will kindly
notify me or the publisher, so that those errors can be corrected at the first opportunity.
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