The World Championship Grand Prix (WCGP) is the premier championship event of motorcycle road racing. The WCGP was established in 1949 by the sport’s governing body, the Fédération Internationale de Motocyclisme (FIM), and is the oldest world championship event in the motorsports arena.

This book, developed by motorsports engineering expert Dr. Alberto Boretti, provides a broad view of WCGP motorcycle racing and vehicles, but is primarily focused on the design of four-stroke engines for the MotoGP class. The book opens with general background on MotoGP governing bodies and a history of the event’s classes since the competition began in 1949. It then presents some of the key engines that have been developed and used for the competition through the years. Technologies that are used in today’s MotoGP engines are discussed.

A sidebar discussion is included that covers calculating brake, indicated, and friction performance parameters. Future developments of MotoGP engines, including the use of biofuels and recovery of thermal and braking energy, are presented. The introduction concludes with a chart that details the winners of the various classes of WCGP motorcycle racing since the competition began in 1949.

The bulk of the book consists of eight previously published SAE technical papers that were expressly chosen by Dr. Boretti to provide greater insight to the relationships between engine parameters and performance, namely the influence on friction and mean effective pressure of traditional spark ignited four-stroke engines tuned for a narrow high power output.

About the editor
Alberto Boretti is a research professor of mechanical engineering at the Missouri University of Science and Technology. After he received his PhD from the University of Florence, Italy, in 1988, he was a senior researcher and project and team manager in the automotive industry for 17 years. Within the FIAT group, he has been involved in many racing engine projects, mostly with Ferrari, Alfa Romeo, and Fiat Auto Corse. His last position in industry was manager of four-stroke engines for Aprilia racing in 2006. Within the university setting, he supports teaching and research in motorsport. During his career he has worked on many different racing engines, including F1, F3, super touring, rally car, and super bike and Moto GP motorcycle engines.
Engine Design Concepts
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Edited by Alberto A. Boretti
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