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JOHN H. GLIMMERVEEN

SAE*International*

Warrendale, Pa.

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John H. Glimmerveen
Atlanta, 2004

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INTRODUCTION

The best racing advice I was ever given was

Know why you win, and know why you lose.

To become proficient at any aspect of automobile racing requires continuous gathering of knowledge. Many excellent books have been written about race car engineering, but for some time, I have felt there was a need to cover the actual hands-on aspect of race engineering, combined with a full understanding of the science and theory (theory and practice combined, if you prefer). Within many small to medium-size teams, crew members will have multiple tasks to perform. A race engineer in one of these teams may have to do an analysis of recorded data and then perform some of the tasks needed for corrective changes—hence, the title of this book, *Hands-On Race Car Engineer*.

This book is intended to appeal to all involved with this highly complex and, at the same time, intriguing and exciting sport of racing. Drivers will gain a better understanding of changes made to aero and mechanical devices and their direct effects on the dynamics of the vehicle. Race engineers without hands-on experience will better understand the practical implications of setup changes they wish to make. Design engineers will gain insight into the practical application of their designs, and mechanics will gain a better understanding of why engineers design things a certain way or make changes to the setup of a car.

Each chapter is structured to guide you through every part of the process required to make a car better than its competitors. Each chapter provides an overview of the respective subject, followed by a description of the practical aspect. This approach closely follows the guidance of my first tutor who, having explained in detail why we were going to do a certain task, would then guide me through the practical application. I believe this approach was

invaluable for my career as a mechanic and engineer, and it greatly assisted my own racing endeavors.

The primary objective of racing is, of course, to win races. You probably have heard some people say that a win was only luck, but that is not true. If the winning team had not given its driver a car capable of winning, luck would not have won the race for him. (However, note that luck does seem to improve as experience grows!) Often, winning can come down to a few tenths (or even hundredths) of a second—even in a 24-hour race. As the level of competition becomes greater, the difference between two cars may be the accuracy of the setup, and winning by 0.1 second still is winning. This accuracy of setup is no more than attention to detail, and this book will help to guide you through each subject with that in mind. If I can help you find that illusive 0.1 second, my work will not have been in vain.

I want this book to help you in your endeavors within racing and, at the same time, be enjoyable and thought-provoking as you read it. I have been in racing for approximately 30 years and still get excited at the sound of race engines, the smell of rubber, and the tension in the air as a race is about to begin. I hope you will find this same excitement. Good luck!