Contents

Statement of nonliability 5
Preface 6
Introduction 7

1 Characteristics of metal 9
2 Stress, strain, load and fatigue 22
3 Thread physics 33
4 Bolts and bolted joints 53
5 Bolt specifics 87
6 Female threads 99
7 Locking devices 116
8 Washers and miscellaneous fasteners 130
9 Rivets and riveting 147
10 High-performance plumbing 176
11 Future trends in fastening 209

Appendices

Recommended reading 218
Sources 219
Index 222
Welcome to Carroll Smith's Nuts, Bolts, Fasteners & Plumbing Handbook, the most complete guide to racing hardware ever compiled. After months of planning, preparation and testing, the final result can rely on just one fastener doing its job. If that fastener shears or loosens, the race can be lost and possibly worse.

In this book Carroll relies on his many years as a race car engineer, constructor and team manager to demonstrate each nut, bolt, fastener and plumbing piece. How it works, how to choose it and where to use it. As with the other books in Carroll's iconic series, "there is no magic," only knowledge, hard work and dedication to the task at hand.

Here is a big part of the knowledge with solid, understandable theory, more than 320 photographs, illustrations and charts and priceless advice and recommendations. The rest is up to you.

Be sure to check out Carroll's other titles and racing history at www.carrollsmith.com.

Carroll Smith's racing career spanned nearly a half century. As a driver, a team manager, an engineer and ultimately as an author and lecturer, he brought his lifelong passion for the sport and pursuit of excellence to every project and undertaking. His cars won races at the hands of Andretti, Foyt, Gurney, Hulme, Ickx, Ongais, Posey and Amon among countless others. His series of books, continuing here with Nuts, Bolts, Fasteners & Plumbing Handbook, still serves as both road map and encyclopedia to amateur and professional racers alike. Carroll passed on peacefully at home on his horse ranch in Northern California in 2003. We are all fortunate to have his books as a reference to his accumulated knowledge and experience as well as his big personality, sense of humor and heart. He is fondly remembered and sorely missed by all who crossed his path.