BASICS OF AUTOMOBILE ENGINEERING

Dr. Mohd Atif Wahid

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First Impression: May 2025

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ISBN: 978-81-19481-34-7

Rs. 1000/- ($80)

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Published by:
IARA Publication

Preface

The automobile industry stands as a testament to human ingenuity, having revolutionized transportation and reshaped the modern world. At the heart of every vehicle lies the internal combustion engine—an engineering marvel that has driven progress for more than a century. Understanding the fundamentals of automobiles and engines is essential not only for automotive engineers and enthusiasts, but also for anyone interested in the mechanisms powering our interconnected, mobile society.

This book is crafted to offer a thorough and structured introduction to the core principles that define the field. Spanning from the basics of automobile engineering to the latest advancements in fuel technology and emission control, this text is designed to provide a clear understanding of how vehicles function, how their systems interconnect, and how emerging technologies are shaping the future of mobility.

Each chapter has been carefully developed to blend theoretical knowledge with practical insight. Starting with foundational concepts, the book explores the workings of petrol and diesel engines, transmission systems, braking mechanisms, chassis dynamics, electrical components, cooling and lubrication systems, and steering. It also delves into the specific challenges and innovations related to fuels, alternative energy sources, emissions, and maintenance practices—key areas for any engineer or enthusiast striving to stay informed in an ever-evolving industry.

Whether you are a student beginning your journey in automotive engineering, a professional seeking to refresh your knowledge, or simply a curious mind fascinated by the mechanics of motion, this book aims to be a comprehensive and accessible resource.

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ABOUT THE AUTHOR

Dr. Mohd Atif Wahid is an accomplished academic and researcher currently working in the School of Engineering and Technology at Vivekananda Institute of Professional Studies–Technical Campus (VIPS-TC), Delhi, India. He holds a Ph.D. and M.Tech. in Mechanical Engineering from Jamia Millia Islamia (A Central University), New Delhi, completed in 2018 and 2013, respectively. His M.Tech. was in Production and Industrial Engineering, and his doctoral work focused on Underwater Friction Stir Welding, a specialized area within advanced welding and material processing.

Dr. Wahid's research interests include friction stir welding, material characterization, advanced manufacturing techniques, and the optimization of design and process parameters. Over a career spanning more than 13 years, he has gained rich experience in industry, teaching, and research. He has served as a Basic Scientific Research Fellow in a UGC-funded project and continues to contribute actively to scientific research and development.

He has authored and presented over 60 research papers in SCI, Scopus, and UGC-indexed journals and conferences, and serves as a reviewer for several prestigious international journals such as International Journal of Advanced Manufacturing Technology (Springer), Multidiscipline Modeling in Materials and Structures (Emerald), Journal of Engineering Manufacture (SAGE), Kovove Materialy – Metallic Materials, Indian Journal of Engineering & Materials Sciences (NISCAIR)

Dr. Wahid has also reviewed international research projects and contributed to the academic community by organizing and participating in national/international conferences, workshops, webinars, and faculty development programs. He has attended various Quality Improvement Programs (QIP) and skill enhancement sessions. He has authored/edited several books and has a patent to his name.

Recognized among the top 3% of scientists globally in Engineering & Technology, specifically within Mechanical Engineering (as per the AD Scientific Index), Dr. Wahid maintains a strong academic presence and continues to influence the field of mechanical and materials engineering.

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