

Electric Vehicle Technology Explained 1st Edition

[#electric vehicle technology](#) [#EV explanation](#) [#sustainable transportation](#) [#battery electric vehicles](#) [#EV engineering principles](#)

This comprehensive first edition thoroughly explains the foundational concepts of electric vehicle technology, covering core principles, essential components, and innovations driving modern EV engineering and sustainable transportation.

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Electric Vehicle Technology Explained

Fully updated throughout, Electric Vehicle Technology, Second Edition, is a complete guide to the principles, design and applications of electric vehicle technology. Including all the latest advances, it presents clear and comprehensive coverage of the major aspects of electric vehicle development and offers an engineering-based evaluation of electric motor scooters, cars, buses and trains. This new edition includes: important new chapters on types of electric vehicles, including pickup and linear motors, overall efficiencies and energy consumption, and power generation, particularly for zero carbon emissions expanded chapters updating the latest types of EV, types of batteries, battery technology and other rechargeable devices, fuel cells, hydrogen supply, controllers, EV modeling, ancillary system design, and EV and the environment brand new practical examples and case studies illustrating how electric vehicles can be used to substantially reduce carbon emissions and cut down reliance on fossil fuels futuristic concept models, electric and high-speed trains and developments in magnetic levitation and linear motors an examination of EV efficiencies, energy consumption and sustainable power generation. MATLAB® examples can be found on the companion website <http://www.wiley.com/go/electricvehicle2e> Explaining the underpinning science and technology, this book is essential for practicing electrical, automotive, power, control and instrumentation engineers working in EV research and development. It is also a valuable reference for academics and students in automotive, mechanical, power and electrical engineering.

Modern Electric Vehicle Technology

A comprehensive and up-to-date reference book on modern electric vehicle technology, which covers the engineering philosophy, state-of-the-art technology, and commercialisation of electrical vehicles.

Hybrid Electric Vehicle Technology

Hybrid Electric Vehicle Technology provides foundational information about vehicles that use more than one propulsion technology to power a drive system. This textbook is filled with technical illustrations and concise descriptions of the different configurations and vehicle platforms, the operation of various

systems and the technologies involved, and the maintenance of hybrid electric vehicles. Safety precautions required used when working around high-voltage vehicle systems, especially in emergencies, are highlighted.

The Electric Vehicle

One hopes, as a new generation of electric vehicles becomes a reality, The Electric Vehicle offers a long-overdue reassessment of the place of this technology in the history of street transportation.

The Electric Car

Considerable work has gone into electric car and battery development in the last ten years, with the prospect of substantial improvements in range and performance in battery cars as well as in hybrids and those using fuel cells. This book covers the development of electric cars, from their early days, to new hybrid models in production. Most of the coverage is focused on the very latest technological issues faced by automotive engineers working on electric cars, as well as the key business factors vital for the successful transfer of electric cars into the mass market.

Build Your Own Electric Vehicle, Third Edition

BUILD, CONVERT, OR BUY A STATE-OF-THE-ART ELECTRIC VEHICLE Thoroughly revised and expanded, Build Your Own Electric Vehicle, Third Edition, is your go-to guide for converting an internal combustion engine vehicle to electric or building an EV from the ground up. You'll also find out about the wide variety of EVs available for purchase and how they're being built. This new edition details all the latest breakthroughs, including AC propulsion and regenerative braking systems, intelligent controllers, batteries, and charging technologies. Filled with updated photos, this cutting-edge resource fully describes each component--motor, battery, controller, charger, and chassis--and provides illustrated, step-by-step instructions on how to assemble all the parts. Exclusive web content features current supplier and dealer lists. Custom-built for environmentalists, engineers, students, hobbyists, and mechanics, this hands-on guide puts you in the fast lane toward a cost-effective, reliable green machine. Build Your Own Electric Vehicle, Third Edition, covers: Environmental impact and energy savings The best EV for you--purchase trade-offs, conversion trade-offs, and conversion costs Chassis and design Different types of electric motors and controllers Lithium EV batteries Chargers and electrical systems EV builds and conversions Licensing and insuring your EV Driving and maintenance List of manufacturers and dealers regularly updated on website

Electric Vehicle Engineering (PB)

A complete guide to electric vehicle design, operation, and adoption This hands-on resource thoroughly explains the technologies and techniques involved in the design and operation of today's electric vehicles. Originally written for use in a course co-taught by the authors at Stanford University, Electric Vehicle Engineering discusses the physics of vehicle motion; the electrical principles on which motors rely; the chemistry, operation, and charging of lithium-ion batteries; the design and operation of motor controllers; the energy efficiency and environmental impact of electric vehicles; and the policy and economics affecting their adoption. After teaching you the theory, the authors will guide you through a hands-on project in which you will build a model electric car from the ground up with a hand-wound electric motor of your own design. Coverage includes: Introduction to electric vehicles Electric vehicle history Vehicle dynamics Electric motors Lithium-ion batteries Controllers Well-to-wheels energy and emissions analysis Electric vehicle policies and economics Future prospects

Modern Electric, Hybrid Electric, and Fuel Cell Vehicles

Air pollution, global warming, and the steady decrease in petroleum resources continue to stimulate interest in the development of safe, clean, and highly efficient transportation. Building on the foundation of the bestselling first edition, Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design, Second Edition updates and expands its detailed coverage of the vehicle technologies that offer the most promising solutions to these issues affecting the automotive industry. Proven as a useful in-depth resource and comprehensive reference for modern automotive systems engineers, students, and researchers, this book speaks from the perspective of the overall drive train system and not just its individual components. New to the second edition: A case study appendix that breaks down the Toyota Prius hybrid system Corrections and updates of the material in the first

edition Three new chapters on drive train design methodology and control principles A completely rewritten chapter on Fundamentals of Regenerative Braking Employing sufficient mathematical rigor, the authors comprehensively cover vehicle performance characteristics, EV and HEV configurations, control strategies, modeling, and simulations for modern vehicles. They also cover topics including: Drive train architecture analysis and design methodologies Internal Combustion Engine (ICE)-based drive trains Electric propulsion systems Energy storage systems Regenerative braking Fuel cell applications in vehicles Hybrid-electric drive train design The first edition of this book gave practicing engineers and students a systematic reference to fully understand the essentials of this new technology. This edition introduces newer topics and offers deeper treatments than those included in the first. Revised many times over many years, it will greatly aid engineers, students, researchers, and other professionals who are working in automotive-related industries, as well as those in government and academia.

Hybrid Electric Vehicles

The latest developments in the field of hybrid electric vehicles Hybrid Electric Vehicles provides an introduction to hybrid vehicles, which include purely electric, hybrid electric, hybrid hydraulic, fuel cell vehicles, plug-in hybrid electric, and off-road hybrid vehicular systems. It focuses on the power and propulsion systems for these vehicles, including issues related to power and energy management. Other topics covered include hybrid vs. pure electric, HEV system architecture (including plug-in & charging control and hydraulic), off-road and other industrial utility vehicles, safety and EMC, storage technologies, vehicular power and energy management, diagnostics and prognostics, and electromechanical vibration issues. Hybrid Electric Vehicles, Second Edition is a comprehensively updated new edition with four new chapters covering recent advances in hybrid vehicle technology. New areas covered include battery modelling, charger design, and wireless charging. Substantial details have also been included on the architecture of hybrid excavators in the chapter related to special hybrid vehicles. Also included is a chapter providing an overview of hybrid vehicle technology, which offers a perspective on the current debate on sustainability and the environmental impact of hybrid and electric vehicle technology. Completely updated with new chapters Covers recent developments, breakthroughs, and technologies, including new drive topologies Explains HEV fundamentals and applications Offers a holistic perspective on vehicle electrification Hybrid Electric Vehicles: Principles and Applications with Practical Perspectives, Second Edition is a great resource for researchers and practitioners in the automotive industry, as well as for graduate students in automotive engineering.

History of Electric Cars

One hundred years ago electric cars were the most popular automobiles in the world. In the late nineteenth century and at the start of the twentieth century, they outsold every other type of car. And yet, within a couple of decades of the start of the twentieth century, the electric car had vanished. Thousands of battery-powered cars disappeared from the streets, replaced by the internal combustion engine, and their place in the history of the automobile was quietly erased. A century later, electric cars are making a comeback. Fears over pollution and global warming have forced manufacturers to reconsider the electric concept. A History of Electric Cars presents for the first time the full story of electric cars and their hybrid cousins. It examines how and why electric cars failed the first time - and why today's car manufacturers must learn the lessons of the past if they are to avoid repeating previous mistakes all over again. The book examines in detail: Early vehicles such as the Lohner-Porsche petrol-electric hybrid of 1901; Key figures in the history of the electric car development such as Henry Ford; Sir Clive Sinclair's plans to build a number of electric vehicles, designed to sit alongside the Sinclair C5; The return of the electric technology to vehicles as diverse as the NASA Lunar Rover, commuting vehicles and supercars; Future developments in electric cars. For the first time the full story of electric cars and their hybrids are examined. The hidden past of the electric automobile is uncovered and its future developments are discussed. Superbly illustrated with 300 colour photographs, many of which are rare and original sketch designs. Nigel Burton has written and lectured on cars and automotive history for more than twenty years.

Battery Technology for Electric Vehicles

Electric drive vehicles (EDVs) are seen on American roads in increasing numbers. Related to this market trend and critical for it to increase are improvements in battery technology. Battery Technology for Electric Vehicles examines in detail at the research support from the U.S. Department of Energy

(DOE) for the development of nickel-metal-hydride (NiMH) and lithium-ion (Li-ion) batteries used in EDVs. With public support comes accountability of the social outcomes associated with public investments. The book overviews DOE investments in advanced battery technology, documents the adoption of these batteries in EDVs on the road, and calculates the economic benefits associated with these improved technologies. It provides a detailed global evaluation of the net social benefits associated with DOE's investments, the results of the benefit-to-cost ratio of over 3.6-to-1, and the life-cycle approach that allows adopted EDVs to remain on the road over their expected future life, thus generating economic and environmental health benefits into the future.

Electrical Vehicle Future of Mobility

The present book has been designed to cover the key aspects of EV technology and issues related to the adoption of plug-in EVs. The key aspects, challenges and opportunities are covered under the heading Electric Vehicle Future of Mobility. The intention of writing this book is to explicate the fundamentals by using simple and perspicuous language and extra care has been taken to make reader comfortable in understanding the basic fundamentals of the topic. The present edition will facilitate the students, engineers, researchers to carry out the research work in the field of Electric Vehicles. The authors wish to express their gratitude to all their well-wishers for the support which they provided during the preparation of manuscript and proof reading of the book. The authors also like to thank all their respected professors for their valuable guidance in bringing out the book in a very nice form.

Hybrid Electric Vehicles

Modern Hybrid Electric Vehicles provides vital guidance to help a new generation of engineers master the principles of and further advance hybrid vehicle technology. The authors address purely electric, hybrid electric, plug-in hybrid electric, hybrid hydraulic, fuel cell, and off-road hybrid vehicle systems. They focus on the power and propulsion systems for these vehicles, including issues related to power and energy management. They concentrate on material that is not readily available in other hybrid electric vehicle (HEV) books such as design examples for hybrid vehicles, and cover new developments in the field including electronic CVT, plug-in hybrid, and new power converters and controls. Covers hybrid vs. pure electric, HEV system architecture (including plug-in and hydraulic), off-road and other industrial utility vehicles, non-ground-vehicle applications like ships, locomotives, aircrafts, system reliability, EMC, storage technologies, vehicular power and energy management, diagnostics and prognostics, and electromechanical vibration issues. Contains core fundamentals and principles of modern hybrid vehicles at component level and system level. Provides graduate students and field engineers with a text suitable for classroom teaching or self-study.

Electric and Hybrid Vehicles

The first book on electric and hybrid vehicles (EVs) written specifically for automotive students and vehicle owners. Clear diagrams, photos and flow charts outline the charging infrastructure, how EV technology works, and how to repair and maintain hybrid and electric vehicles. Optional IMI online eLearning materials enable students to study the subject further and test their knowledge. Full coverage of IMI Level 2 Award in Hybrid Electric Vehicle Operation and Maintenance, IMI Level 3 Award in Hybrid Electric Vehicle Repair and Replacement, IMI Accreditation, C&G and other EV/Hybrid courses. The first book on electric and hybrid vehicles (endorsed by the IMI) starts with an introduction to the market, covering the different types of electric vehicle, costs and emissions, and the charging infrastructure, before moving on to explain how hybrid and electric vehicles work. A chapter on electrical technology introduces learners to subjects such as batteries, control systems and charging which are then covered in more detail within their own chapters. The book also covers the maintenance and repair procedures of these vehicles, including fault finding, servicing, repair and first-responder information. Case studies are used throughout to illustrate different technologies.

Build Your Own Electric Vehicle

Go Green-Go Electric! Faster, Cheaper, More Reliable While Saving Energy and the Environment
"Empowering people with the tools to convert their own vehicles provides an immediate path away from petroleum dependence and should be part of the solutions portfolio." – Chelsea Sexton, Co-founder, Plug In America and featured in Who Killed the Electric Car? "Create a superior driving experience, strengthen America, and restore the planet's ecosystems...that's the promise of this book and it's well worth a read!" – Josh Dorfman, Founder & CEO – Vivavi, Modern Green Furniture Store; Author, The

Lazy Environmentalist: Your Guide to Easy, Stylish, Green Living. This new, updated edition of **Build Your Own Electric Vehicle** contains everything that made the first edition so popular while adding all the technological advances and new parts that are readily available on the market today. **Build Your Own Electric Vehicle** gets on the expressway to a green, ecologically sound, cost-effective way that even can look cool, too! This comprehensive how-to goes through the process of transforming an internal combustion engine vehicle to electric or even building an EV from scratch for as much or even cheaper than purchasing a traditional car. The book describes each component in detail---motor, battery, controller, charger, and chassis---and provides step-by-step instructions on how to put them all together. **Build Your Own Electric Vehicle, Second Edition**, covers: EV vs. Combustible Engine Overview Environmental and Energy Savings EV Evolution since the First Electric Car Current Purchase and Conversion Costs Chassis and Design Today's Best Motors Battery Discharging/Charging Styles Electrical Systems Licensing and Insurance Issues Driving Maintenance Related Clubs and Associations Additional Resources

Electric and Hybrid Vehicles

Electric and Hybrid Vehicles: Power Sources, Models, Sustainability, Infrastructure and the Market reviews the performance, cost, safety, and sustainability of battery systems for hybrid electric vehicles (HEVs) and electric vehicles (EVs), including nickel-metal hydride batteries and Li-ion batteries. Throughout this book, especially in the first chapters, alternative vehicles with different power trains are compared in terms of lifetime cost, fuel consumption, and environmental impact. The emissions of greenhouse gases are particularly dealt with. The improvement of the battery, or fuel cell, performance and governmental incentives will play a fundamental role in determining how far and how substantial alternative vehicles will penetrate into the market. An adequate recharging infrastructure is of paramount importance for the diffusion of vehicles powered by batteries and fuel cells, as it may contribute to overcome the so-called range anxiety. Thus, proposed battery charging techniques are summarized and hydrogen refueling stations are described. The final chapter reviews the state of the art of the current models of hybrid and electric vehicles along with the powertrain solutions adopted by the major automakers. Contributions from the worlds leading industry and research experts Executive summaries of specific case studies Information on basic research and application approaches

Electric and Hybrid Vehicles

An advanced level introductory book covering fundamental aspects, design and dynamics of electric and hybrid electric vehicles There is significant demand for an understanding of the fundamentals, technologies, and design of electric and hybrid electric vehicles and their components from researchers, engineers, and graduate students. Although there is a good body of work in the literature, there is still a great need for electric and hybrid vehicle teaching materials. **Electric and Hybrid Vehicles: Technologies, Modeling and Control – A Mechatronic Approach** is based on the authors' current research in vehicle systems and will include chapters on vehicle propulsion systems, the fundamentals of vehicle dynamics, EV and HEV technologies, chassis systems, steering control systems, and state, parameter and force estimations. The book is highly illustrated, and examples will be given throughout the book based on real applications and challenges in the automotive industry. Designed to help a new generation of engineers needing to master the principles of and further advances in hybrid vehicle technology Includes examples of real applications and challenges in the automotive industry with problems and solutions Takes a mechatronics approach to the study of electric and hybrid electric vehicles, appealing to mechanical and electrical engineering interests Responds to the increase in demand of universities offering courses in newer electric vehicle technologies

Electric Vehicle Technology

Electrification is an evolving paradigm shift in the transportation industry toward more efficient, higher performance, safer, smarter, and more reliable vehicles. There is in fact a clear trend to move from internal combustion engines (ICEs) to more integrated electrified powertrains. Providing a detailed overview of this growing area, **Advanced Electric Drive Vehicles** begins with an introduction to the automotive industry, an explanation of the need for electrification, and a presentation of the fundamentals of conventional vehicles and ICEs. It then proceeds to address the major components of electrified vehicles—i.e., power electronic converters, electric machines, electric motor controllers, and energy storage systems. This comprehensive work: Covers more electric vehicles (MEVs), hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), range-extended electric vehicles (REEVs),

and all-electric vehicles (EVs) including battery electric vehicles (BEVs) and fuel cell vehicles (FCVs) Describes the electrification technologies applied to nonpropulsion loads, such as power steering and air-conditioning systems Discusses hybrid battery/ultra-capacitor energy storage systems, as well as 48-V electrification and belt-driven starter generator systems Considers vehicle-to-grid (V2G) interface and electrical infrastructure issues, energy management, and optimization in advanced electric drive vehicles Contains numerous illustrations, practical examples, case studies, and challenging questions and problems throughout to ensure a solid understanding of key concepts and applications Advanced Electric Drive Vehicles makes an ideal textbook for senior-level undergraduate or graduate engineering courses and a user-friendly reference for researchers, engineers, managers, and other professionals interested in transportation electrification.

Advanced Electric Drive Vehicles

Electric and hybrid vehicles are now the present, not the future. This straightforward and highly illustrated full-colour textbook is endorsed by the Institute of the Motor Industry (IMI) and introduces the subject for further education and undergraduate students as well as technicians and workshop owners, with sections for drivers who are interested to know more. This new edition contains extensively updated content, especially on batteries, charging and the high-voltage pathway and includes all new case studies and new images, photos and flow charts throughout. It covers the different types of electric vehicle, costs and emissions and the charging infrastructure before moving on to explain how hybrid and electric vehicles work. A chapter on electrical technology introduces learners to subjects such as batteries, control systems and charging, which are then covered in more detail within their own chapters. The book also covers the maintenance and repair procedures of these vehicles, including diagnostics, servicing, repair and first-responder information. The book is particularly suitable for students studying towards IMI Level 1 Award in Hybrid Electric Vehicle Awareness, IMI Level 2 Award in Hybrid Electric Vehicle Operation and Maintenance, IMI Level 3 Award in Hybrid Electric Vehicle Repair and Replacement, IMI Level 4 Award in the Diagnosis, Testing and Repair of Electric/Hybrid Vehicles and Components, IMI accreditation, City & Guilds (C&G) and all other EV/hybrid courses.

Electric and Hybrid Vehicles

The why, what and how of the electric vehicle powertrain Empowers engineering professionals and students with the knowledge and skills required to engineer electric vehicle powertrain architectures, energy storage systems, power electronics converters and electric drives. The modern electric powertrain is relatively new for the automotive industry, and engineers are challenged with designing affordable, efficient and high-performance electric powertrains as the industry undergoes a technological evolution. Co-authored by two electric vehicle (EV) engineers with decades of experience designing and putting into production all of the powertrain technologies presented, this book provides readers with the hands-on knowledge, skills and expertise they need to rise to that challenge. This four-part practical guide provides a comprehensive review of battery, hybrid and fuel cell EV systems and the associated energy sources, power electronics, machines, and drives. Introduces and holistically integrates the key EV powertrain technologies. Provides a comprehensive overview of existing and emerging automotive solutions. Provides experience-based expertise for vehicular and powertrain system and sub-system level study, design, and optimization. Presents many examples of powertrain technologies from leading manufacturers. Discusses the dc traction machines of the Mars rovers, the ultimate EVs from NASA. Investigates the environmental motivating factors and impacts of electromobility. Presents a structured university teaching stream from introductory undergraduate to postgraduate. Includes real-world problems and assignments of use to design engineers, researchers, and students alike. Features a companion website with numerous references, problems, solutions, and practical assignments. Includes introductory material throughout the book for the general scientific reader. Contains essential reading for government regulators and policy makers. Electric Powertrain: Energy Systems, Power Electronics and Drives for Hybrid, Electric and Fuel Cell Vehicles is an important professional resource for practitioners and researchers in the battery, hybrid, and fuel cell EV transportation industry. The resource is a structured, holistic textbook for the teaching of the fundamental theories and applications of energy sources, power electronics, and electric machines and drives to engineering undergraduate and postgraduate students.

Electric Powertrain

This edited volume presents research results of the PPP European Green Vehicle Initiative (EGVI), focusing on Electric Vehicle Systems Architecture and Standardization Needs. The objectives of energy efficiency and zero emissions in road transportation imply a paradigm shift in the concept of the automobile regarding design, materials, and propulsion technology. A redesign of the electric and electronic architecture provides in many aspects additional potential for reaching these goals. At the same time, standardization within a broad range of features, components and systems is a key enabling factor for a successful market entry of the electric vehicle (EV). It would lower production cost, increase interoperability and compatibilities, and sustain market penetration. Hence, novel architectures and testing concepts and standardization approaches for the EV have been the topic of an expert workshop of the European Green Vehicles Initiative PPP. This book contains the contributions of current European research projects on EV architecture and an expert view on the status of EV standardization. The target audience primarily comprises researchers and experts in the field.

Electric Vehicle Systems Architecture and Standardization Needs

Written for a wide audience, Modern Electric Vehicle Technology offers a multidisciplinary approach to the history and development of electric and hybrid electric vehicles. It also covers the marketing and commercialisation of such vehicles.

Modern Electric Vehicle Technology

A timely comprehensive reference consolidates the research and development of electric vehicle machines and drives for electric and hybrid propulsions • Focuses on electric vehicle machines and drives • Covers the major technologies in the area including fundamental concepts and applications • Emphasis the design criteria, performance analyses and application examples or potentials of various motor drives and machine systems • Accompanying website includes the simulation models and outcomes as supplementary material

Electric Vehicle Machines and Drives

Passionate about sustainable development? Introducing the world's first guide to electric cars! In the first edition of what promises to be the new bestseller in the world of cars, our authors explain the latest on electric vehicles. Speaking to amateurs and more seasoned enthusiasts alike, our two experts answer all your questions: how do you recharge and service an electric vehicle? Are electric cars built for North American winters? Can you even drive on electricity every day of the week? Do you really save money when you go electric? Do electric vehicles have the speed you need? Would a hydrogen car be a wiser choice? Are the batteries in electric cars harmful to the environment—are they dangerous like the oil companies say? Does the government chip in when you buy an electric vehicle? Jacques Duval and Daniel Breton have tested over 70 different models that are on the market now or will be in a matter of months. They get down to the nitty-gritty with in-depth commentary from page one. Learn all there is to know about tech features, pricing, energy consumption stats, greenhouse gas emissions and pollutants. Just fifteen years ago, electric cars were a novelty—now, they're becoming increasingly central to the automobile industry. Soon, the entire world will turn to this eco-friendly mode of transportation!

The Guide to Electric, Hybrid & Fuel-Efficient Cars

The book provides easy interpretable explanations for the key technologies involved in Electric Vehicles and Hybrid Electric Vehicles. The authors discuss the various electrical machines, drives, and controls used in EV and HEV. The book provides a detailed coverage of Regenerative Braking Systems used in EV and HEV. The book also illustrates the battery technology and battery management systems in EV and HEV. This book is intended for academicians, researchers and industrialists. In addition, this book has the following features Discusses the various Economic and Environmental Impact of Electric and Hybrid Electric Vehicles Discusses the role of Artificial Intelligence in Electric / Hybrid Electric Vehicles Illustrates the concept of Vehicle to Grid Technology and the smart charging station infrastructure and issues involved in the same Elucidates the concept of Internet of Vehicles Presents the latest research and applications in alternate energy vehicles

E-Mobility

This Hybrid and Electric Vehicle book, now in its 10th version, is written by Craig Van Batenburg, who for 25 years was repairing vehicles at his independent repair shop adding HEVs in 2000. Today the 2013 edition is packed with chapters on every hybrid and electric vehicle sold in North America along with popular European models. EVs are included along with charts on HV battery location, battery voltage levels, service plug locations, service mode, and much more. An air conditioning section has been added, as well as a section on home chargers for electric cars. Designed as a technician's time saver, only ACDC has this knowledge consolidated in one place for all models. The beginning of the book explains, in simple technician language, what makes a hybrid different from a conventional car. Safety is covered in great detail. Even "Do-It-Yourselfers" will find this book very helpful as it keeps them busy on their HEV, but leaves for the professional, the work that is safer or too technical for the average DIY. The book has more than 330-pages and is bound to lie flat on a workbench for easy reading. This book does NOT take the place of service information, like a shop manual or Internet OEM information. What it does, is make the service information understandable by using common 12-volt language and a glossary so that well-trained 12-volt technicians can make the transition to high-voltage quickly, and with less confusion. ACDC is proud of this publication and ships worldwide.

Understanding Hybrid and Electric Vehicle Service and Technology

Electric Vehicle Battery Systems provides operational theory and design guidance for engineers and technicians working to design and develop efficient electric vehicle (EV) power sources. As Zero Emission Vehicles become a requirement in more areas of the world, the technology required to design and maintain their complex battery systems is needed not only by the vehicle designers, but by those who will provide recharging and maintenance services, as well as utility infrastructure providers. Includes fuel cell and hybrid vehicle applications. Written with cost and efficiency foremost in mind, Electric Vehicle Battery Systems offers essential details on failure mode analysis of VRLA, NiMH battery systems, the fast-charging of electric vehicle battery systems based on Pb-acid, NiMH, Li-ion technologies, and much more. Key coverage includes issues that can affect electric vehicle performance, such as total battery capacity, battery charging and discharging, and battery temperature constraints. The author also explores electric vehicle performance, battery testing (15 core performance tests provided), lithium-ion batteries, fuel cells and hybrid vehicles. In order to make a practical electric vehicle, a thorough understanding of the operation of a set of batteries in a pack is necessary. Expertly written and researched, Electric Vehicle Battery Systems will prove invaluable to automotive engineers, electronics and integrated circuit design engineers, and anyone whose interests involve electric vehicles and battery systems. * Addresses cost and efficiency as key elements in the design process * Provides comprehensive coverage of the theory, operation, and configuration of complex battery systems, including Pb-acid, NiMH, and Li-ion technologies * Provides comprehensive coverage of the theory, operation, and configuration of complex battery systems, including Pb-acid, NiMH, and Li-ion technologies

Electric Vehicle Battery Systems

This is a book about Electric Vehicles and, in particular, the BMW i3. It covers the performance and technical information useful to the growing Electric Vehicle community that are different to those of an Internal Combustion Engine car, including: Dynamics, Battery, Charging, Motors and Drives, Cooling and Heating, and Range Extender.

Electric Vehicles and the BMW i3

With production and planning for new electric vehicles gaining momentum worldwide, this book – the fifth in a series of five volumes on this subject – provides engineers and researchers with perspectives on the most current and innovative developments regarding electric and hybrid-electric vehicle technology, design considerations, and components. This book features 14 SAE technical papers, published from 2008 through 2010, that look at innovative engineering approaches to meeting the major technological challenges associated with fuel cells. Topics covered include: Advances in powertrain systems for fuel cell vehicles Diagnostic design processes for developmental vehicles Application of two fuel cells in hybrid electric vehicles Research and design of a centrifugal compressor for fuel cell turbocharger The future of fuel cell hybrid EVs

Fuel Cell Hybrid EVs

This book introduces the electromagnetic compatibility(EMC) of electric vehicle(EV), including EMC of the whole vehicle, electromagnetic interference(EMI) prediction and suppression of motor drive system, EMI prediction and suppression of DC-DC converter, electromagnetic field safety and EMC of wireless charging system, signal integrity and EMC of the vehicle controller unit(VCU), EMC of battery management system(BMS), electromagnetic radiated emission diagnosis and suppression of the whole vehicle, etc. The analysis method, modeling and simulation method, test method and rectification method of EMC are demonstrated. The simulation and experimental results are presented as tables and figures. This book is useful as reference for graduate students, senior undergraduates and engineering technicians of vehicle engineering related majors. For EMI prediction, suppression and EMC optimization design for EVs, this book provides reference for engineers to solve EMC problems. This book is intended for senior undergraduates, postgraduates, lecturers and laboratory researchers engaged in electric vehicle and electromagnetic compatibility research.

Electromagnetic Compatibility of Electric Vehicle

Author Jennifer MacKay focuses on the invention of electric cars, exploring how it was developed, how it works, its impact on society, and possible future uses.

Electric Cars

This illustrated history chronicles electric and hybrid cars from the late 19th century to today's fuel cell and plug-in automobiles. It describes the politics, technology, marketing strategies, and environmental issues that have impacted electric and hybrid cars' research and development. The important marketing shift from a "woman's car" to "going green" is discussed. Milestone projects and technologies such as early batteries, hydrogen and bio-mass fuel cells, the upsurge of hybrid vehicles, and the various regulations and market forces that have shaped the industry are also covered.

Electric and Hybrid Cars

(Second Edition) Are you considering buying an electric vehicle? All of us are witnessing a once-in-a-lifetime transformation. For over one hundred years, gasoline and diesel fuels have powered ground transportation throughout the world. Now that is changing, and 2023 is the year when most people will recognize that change is happening. This book is a comprehensive, easy-to-understand overview of the passenger EV universe including guides for buying and owning an electric car. The authors discuss choosing, owning and driving an electric car, then explain the features, advantages, benefits and limitations of over 45 EV models including pickup trucks, SUVs, and sedans. "If you have to have a car, make it an electric car. As this book makes clear, they are better than old-fashion vehicles in every way." -Bill McKibben, American environmentalist and climate change authority; co-founded 350.org and spearheaded the fossil fuel divestment campaign resulting in endowments worth more than \$15 trillion stepping back from oil, gas and coal. "Thankfully, now that the electric vehicle R&D "dark ages" are coming to an end and automakers around the world are charging up their EV programs, there's no doubt that we're about to see massive, valuable change in our transportation landscape." -Sebastian Blanco, one of America's leading electric car journalists who has been writing about EVs since 2006.

The Arrival of the Electric Car

Electric vehicles have become very popular in the past few years and are now the exciting and future trend in the automotive industry. The manufacturing production strategy of cars across the world is changing with several vehicles manufacturers preparing to move away from producing vehicles propelled only by an internal combustion engine (ICE) and committing only to manufacture cars with electrified powertrains. So much information about electric cars can be found on the internet; however, much of it, is misleading, false and not supported by reliable sources. This book provides a platform with essential information to help people understand electric vehicle technologies easily. This book has been written to provide reliable data that will answer many questions on electric vehicles. The main objective behind putting the hard work to write this book is to improve the understanding of people around the world on the fast evolution of electric vehicles technologies and provide insight on the motivation behind it, its benefits and disadvantages. Furthermore, this book can help raise awareness on some of the considerations of automotive electrification concerning technical and practical aspects. This book is therefore recommended for you if you fall into any of the below-listed categories: You are keen to learn and better your understanding of electric vehicles. You own an electric vehicle and would

like to know more about what to do to prolong its life. You are a potential buyer of an electric vehicle and would like to enrich or complement your knowledge with all the essential information on their technology. You are a potential stakeholder or investor in electric vehicles and would like to further your overall knowledge at many levels of electric vehicles (EVs) design, including pros and cons. You may want to know some critical details that electric vehicles manufacturers are not always willing to release on batteries. It is recommended that you familiarise yourself with the acronyms and terminologies used, and take notes if necessary while reading to help assimilate the contents quickly. Every effort has been made to ensure that the contents of this book were up to date at the time of writing (2019). However, it is encouraged that you carry out your research on some details that may have slightly changed since then given the rapid evolution of everything related to vehicles electrification. This book series consists of ten chapters covering automotive electrification on all aspects with detailed information on different powertrain architectures. Its publication will be done by chapter. In Chapter 1, the notion of automotive electrification is introduced, with consideration on the motivation behind it, the different types of electric vehicles with the associated technologies and the advantages and disadvantages. There is also a consideration for charging methods and regenerative braking system. Chapter 2 introduces energy storage and high voltage systems for hybrid and electric vehicle applications. The topic is developed and considered with in-depth analysis of the critical components of an energy storage system (ESS). The basic understanding of batteries for electric vehicles is introduced with detailed consideration of all characteristics. Chapter 3 introduces the various types of electric machines used on electric vehicles. It also considers the design of a permanent magnet motor for a premium plug-in electric vehicle, using two permanent magnet electric motors. In Chapter 4, the outline design for a range extender electric vehicle (REEV) for the UK market is considered with details on powertrain and component-level requirements, supervisory control, driving modes, vehicle integration and all other aspects.

Electric Vehicles: a Comprehensive Guide

This book examines electric car sharing in cities from a variety of perspectives, from service design to simulation, from mathematical modeling to technology deployment, and from energy use improvement to the integration of different kinds of vehicle. The contents reflect the outcomes of the Green Move project, undertaken by Politecnico di Milano with the aim of fostering an innovative and easily accessible electric vehicle sharing system. The first section of the book illustrates the car sharing service, covering service design, the configuration of the vehicle sharing model and the Milan mobility pattern, analysis of local demand and supply, testing of the condominium-based car sharing model, and communication design for social engagement. The second section then explains the technological choices, from the architecture of the system and dynamic applications to information management, the smartphone-based energy-oriented driving assistance system, automatic fleet balancing systems, and real-time monitoring of vehicle positions. In the final section, readers will find descriptions of the simulation model, a model to estimate potential users of the service, and a model for a full-scale electric car sharing service in Milan.

Electric Vehicle Sharing Services for Smarter Cities

The development of automobiles with heat engines is one of the greatest achievements of modern technology. However, the highly developed automotive industry and a large number of automobiles in use around the world have caused and are still causing serious problems for society and human life. Deterioration in air quality, global warming, and a decrease in petroleum resources are becoming major threats to human beings. More and more stringent emissions and fuel consumption regulations are stimulating an interest in the development of safe, clean, and high-efficiency transportation. It has been well recognized that electric, hybrid electric, and fuel cell-powered drive train technologies are the most. It starts with an introduction to the market, covering the different types of electric vehicles, costs and emissions, and the charging infrastructure, before moving on to explain how hybrid and electric vehicles work. A chapter on electrical technology introduces learners to subjects such as batteries, control systems and charging, which are then covered in more detail within their own chapters. The book also covers the maintenance and repair procedures of these vehicles, including fault finding, servicing, repair and first-responder information. Case studies are used throughout to illustrate different technologies. At the time of writing this book, we believe that this aspect of EV technology has not been significantly documented elsewhere. And the content shall be extremely beneficial for the dynamic student and enthusiastic researcher and service professional associated with this field.

Electric Vehicle Adoption to Revolutionize Automobile Sector

With production and planning for new electric vehicles gaining momentum worldwide, this book – the first in a series of five volumes on this subject – provides engineers and researchers with perspectives on the most current and innovative developments regarding electric and hybrid-electric vehicle technology, design considerations, and components. This book features 12 SAE technical papers, published from 2008 through 2010, that provide an overview of research on topics such as: The CO₂ benefits of electrification The effects of aggressive driving behavior Heat recovery in hybrid vehicles The impact of drive cycles on PHEV component requirements Energy management strategies using game theory and other approaches

Overviews and Viewpoints

Electric Vehicles: Prospects and Challenges looks at recent design methodologies and technological advancements in electric vehicles and the integration of electric vehicles in the smart grid environment, comprehensively covering the fundamentals, theory and design, recent developments and technical issues involved with electric vehicles. Considering the prospects, challenges and policy status of specific regions and vehicle deployment, the global case study references make this book useful for academics and researchers in all engineering and sustainable transport areas. Presents a systematic and integrated reference on the essentials of theory and design of electric vehicle technologies Provides a comprehensive look at the research and development involved in the use of electric vehicle technologies Includes global case studies from leading EV regions, including Nordic and European countries China and India

Electric Vehicles: Prospects and Challenges

With production and planning for new electric vehicles gaining momentum worldwide, this book – the second in a series of five volumes on this subject – provides engineers and researchers with perspectives on the most current and innovative developments regarding electric and hybrid-electric vehicle technology, design considerations, and components. This book features 15 SAE technical papers, published from 2008 through 2010, that provide an overview of research on electric vehicle batteries. Topics include: Charging strategy studies for PHEV batteries Electric vehicle and hybrid-electric vehicle rechargeable energy storage systems Strategies for reducing plug-in battery costs Cold temperature performance Lithium-ion battery power capability testing, crash safety, and modeling

Batteries