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Nota di contenuto	Electric and Hybrid Vehicles: Technologies, Modeling and Control: A Mechatronic Approach; Contents; Preface; Acknowledgments; 1 Introduction to Vehicle Propulsion and Powertrain Technologies; 1.1 History of Vehicle Development; 1.2 Internal Combustion Engine Vehicles (ICEVs); 1.2.1 The Four-Stroke Gasoline Engine; 1.2.2 The Four-Stroke Diesel Engine; 1.2.3 ICE Performance Characteristics; 1.2.4 ICE Vehicle Emissions; 1.3 Vehicle Emission Control Technologies; 1.3.1 Advanced Engine Design; 1.3.2 Catalytic Converters; 1.3.3 The Diesel Particulate Filter (DPF) 1.3.4 Exhaust Gas Recirculation (EGR)1.3.5 Crankcase Emission Control System; 1.4 Vehicles with Alternative Fuels; 1.4.1 Natural Gas Vehicles (NGVs); 1.4.2 Liquefied Petroleum Gas Vehicles (LPGVs); 1.4.3 Biodiesel; 1.4.4 Hydrogen; 1.5 Powertrain Technologies; 1.5.1 Rear-Wheel Drive Powertrains; 1.5.2 Front-Wheel Drive (FWD) Powertrains; 1.5.3 Multi-Wheel Drive Powertrains; 1.6 Transmission Systems; 1.6.1 Manual Transmission/Transaxle Systems; 1.6.2 Automatic Transmission/Transaxle Systems; 1.6.3 Automated Manual Transmissions (AMTs); 1.6.4 Continuous Variable Transmissions (CVTs)

1.7 Drivetrain and Differentials 1.7.1 Open Differentials; 1.7.2 Limited Slip Differentials; 1.7.3 Locking Differentials; 1.7.4 Transfer Case Differentials; Problems; References; 2 Electric and Hybrid Powertrain Technologies; 2.1 Introduction; 2.2 Battery Electric Vehicles (BEVs); 2.2.1 The BEV Powertrain Configuration; 2.2.2 Electric Traction Motors; 2.2.3 Energy Sources and Storages; 2.2.4 Power Electronic Converters; 2.2.5 Power Bus; 2.2.6 Regenerative Braking System; 2.3 Fuel-Cell Electric Vehicles (FCEVs); 2.3.1 Fuel-Cell Technologies; 2.4 Hybrid Electric Vehicles
2.4.1 Degree of Hybridization 2.4.2 Parallel Hybrid Configuration; 2.4.3 Series Hybrid Configuration; 2.4.4 Power-Split Configuration; 2.4.5 Compound Hybrid Configuration; 2.5 Plug-in Hybrid Electric Vehicles (PHEVs); 2.6 Hybrid Hydraulic Vehicles (HHVs); 2.7 Pneumatic Hybrid Vehicles (PHVs); 2.8 Power/Energy Management Systems; 2.9 Summary; Problems; References; 3 Body and Chassis Technologies and Design; 3.1 Introduction; 3.2 General Configuration of Automobiles; 3.3 Body and Chassis Fundamentals; 3.3.1 General Packaging; 3.3.2 Design Criteria; 3.3.3 Design Loads
3.4 Different Types of Structural Systems 3.4.1 Body-on-Frame Construction; 3.4.2 Backbone Construction; 3.4.3 Space Frame Construction; 3.4.4 Unibody Construction; 3.5 Body and Chassis Materials; 3.5.1 Low Carbon Steel; 3.5.2 Advanced High Strength Steels; 3.5.3 Nonferrous Metals; 3.5.4 Nonmetallic Materials; 3.5.5 Multi-Material Approach in Car Body Design; 3.6 Specific Considerations in Body and Chassis Design of Electric and Hybrid Electric Vehicles; 3.6.1 Packaging; 3.6.2 Material Selection; 3.6.3 Aerodynamics; 3.7 The Chassis Systems of Electric and Hybrid Electric Vehicles
3.7.1 The Suspension System

Sommario/riassunto

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
