



Batteries and electronic controls for new energy motors

Electric motors are key components in all electric drivetrains, particularly battery electric vehicles (BEVs). Consequently, the control strategies of those electric motors play an important role in the development of high performance BEV powertrains. Therefore, this article presents the control design, analysis and comparison of different motor control ...

Based on the power flow there are four modes of operation in series HEV. 1. Start-up/normal driving/acceleration mode: Fig. 6.2a shows the power flow diagram during starting or normal driving or acceleration. In this mode, the electrical energy to the drive motor is supplied by both the battery and IC engine through the converter.

New energy vehicles (NEVs) have become a fundamental part of transportation system. Performance of an NEV is hugely determined by batteries, motors, and embedded electric control units. In this paper, a comprehensive study that covers all these key components is presented. Mechanisms and characterizations of failures are given in detail. On top of these, ...

High power density/energy motors are preferably used in EVs; however, the traction mechanism generates the difference between the EVs and the IC engine vehicles, respectively. Advancement in power electronics control has provided an opportunity for different electric motors to find their application in EVs and HEVs.

The key is to reveal the major features, pros and cons, new technological breakthroughs, future challenges, and opportunities for advancing electric mobility. This critical ...

The battery is merely an energy storage and the key for all-electric vehicles is understanding how to use the battery in the most optimal way in order to secure vehicle performance over a long period of time. The operating and controlling strategies of a battery rely on the understanding of the fundamental cell constraints, which are turned into battery and ...

The three powers, or “三电” in Chinese, in new energy vehicles refer to the Drive Motor, Power Battery, and Electronic Control System. These three key components work in harmony to form the core of new energy vehicles.

This article reviews the process for selecting motor-battery combinations that are suitable for commercial equipment.. Shown here are some typical dc motor performance curves. Batteries and electric-motor power requirements. In any electric motor application, the target equipment performance dictates the required motor power.

This is due to the direct relationship between the energy requirement for the correct thermal control and the battery range as well as the influence on the fast charging process. Thermal management controls the various



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temperature ranges for the vehicle interior, battery, electric motor, and power electronics, as can be seen in Figure 2.

An engine, electric motor(s), and power batteries are combined, and two power sources are matched and optimized for greatly reducing vehicle emissions and fossil energy consumption [59, 60]. According ...

3. Battery Pack. The electric car battery, which can weigh as much as half a ton, is the EV's fuel tank. It stores the electrical energy that powers the motor. Most electric vehicles use lithium-ion batteries due to their ...

Electric motors convert electrical energy into mechanical energy. Two types of electric motors are used in electric vehicles to provide power to the wheels: the direct current (DC) motor and ... The electric vehicle controller is the electronics package that operates between the batteries and the motor to control the electric vehicle 's speed ...

An electric car consists of three main parts: an electric battery (usually a lithium-ion) electric motor; inverter. Batteries store electric energy and produce Direct Current (DC).

Meanwhile, this paper uses computer simulation technology in Matlab/Simulink to establish an intelligent power electronic control system for hybrid vehicles, including flux switching ...

The importance of batteries for energy storage and electric vehicles (EVs) has been widely recognized and discussed in the literature. ... Many companies like General Motors, and some states, have already announced plan to go 100 % electric by 2030. ... It is critical to develop new mechanisms to manage and control the whole energy ...

(See figure 12.) And as ASPI wrote, "For electric batteries, China has a 5.5 times lead over the US in its share of high-impact research, and eight of the top 10 institutions are based in China." [154] Figure 12: Top five countries for high-impact publications about electric batteries in the ASPI Critical Technology Tracker dataset [155]

As the energy conversion and power transmission system of EVs, drive motors and their controllers are an important part of the "Three Verticals and Three Horizontals" R & D ...

When acting as an alternator, it converts the kinetic energy of the EV wheels when decelerating into electric energy that recharges the battery pack. This process is called regenerative braking . The propulsion system consists of the converter, traction motor, and the battery. The motor and the converter dictate the operating characteristics.

Energy harvesting is a fundamental pillar in the evolution of the powering of low-power electronic devices, paving the way for a sustainable technological future with minimal environmental impact. At the same time,



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the ...

As one of the crucial "three electrics" (battery, motor, electronic control) systems of new energy vehicles, the power battery directly affects the performance and range of the vehicle (Van Noorden 2014), and the research and development of its key technology has been supported by governments at the national strategic level (Gong et al. 2013).

Review and Development of Electric Motor Systems and Electric

Powertrains for New Energy Vehicles William Cai¹ · Xiaogang Wu¹ · Minghao Zhou¹ · Yafei Liang² · Yujin Wang³ Received: 27 July 2020 / Accepted: 27 January 2021 / Published online: 25 February 2021 ... 3 Research of NEV Motor Control Nowadays ...

GWM has always insisted on "excessive investment" in research and development. In the most pivotal "three electricity" (batteries, motors and electric control) related technology for NEVs, GWM has already begun its layout. In addition, GWM has strengthened the research and development of new products, new energy and intelligent vehicles and the construction of the ...

energy batteries, which enables more freedom in the design of autonomous driving hardware and software. Secondly, the majority of BEVs and PHEVs are equipped with a wire-controlled electronic control system that is structurally compatible with automated driving. A wire-controlled electronic control system offers better response speed to ...

Popularization of electric vehicles (EVs) is an effective solution to promote carbon neutrality, thus combating the climate crisis. Advances in EV batteries and battery management interrelate with ...

This paper presents an up-to-date review of design trends for electric traction motors of electric vehicles, mainly battery electric vehicles and full hybrid electric vehicles.

The traction motor is a type of electric motor in an EV powertrain system, serving as the primary propulsion system that drives the wheels. The electric traction motor is a key component that operates by converting electrical energy from the vehicle's traction battery into mechanical energy, providing the necessary torque and power to move the car.

Electric vehicles (EVs), during a route, should normally operate at the desired speed by effectively controlling the power that flows between their batteries and the electric motor/generator. To implement this task, in this paper, the voltage source AC/DC converter is considered as a controlled power interface between the electric machine and the output of the ...

Key Technologies on New Energy Vehicles publishes the latest developments in new energy vehicles - quickly, informally and with high quality. The intent is to cover all the main branches of new energy vehicles,



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both theoretical and applied, including but not limited:

An EV needs to implement temperature controls for three new systems: the high-voltage battery pack, the traction motors and the traction motor inverter electronic control boards. An average of three electronic ...

This article was featured in Design World Magazine and Designworldonline. New commercial equipment designs continue to drive smaller, lighter, and more mobile solutions. This has resulted in a rapidly accelerating transition to battery-powered equipment designs from traditional wired products. Proper motor selection for any automated equipment application is critical to ...

The three powers, or “三电”; in Chinese, in new energy vehicles refer to the Drive Motor, Power Battery, and Electronic Control System. These three key components work in harmony to form the core of new energy vehicles. ... An excellent electronic control system is crucial for new energy vehicles, ensuring the collaborative work of various ...

The core technology of new energy vehicles is the “EIC” technology, and the electric control system is one of the key technologies for the development of electric vehicles. This paper investigates the architecture vehicle electronic control system development platform using a new energy vehicle powered vehicle test bed through computerized big data technology. In ...

This paper firstly analyzes the mathematical model of permanent magnet synchronous motor in new energy electric vehicles. Secondly, two control strategies of vector control and direct ...

High power density/energy motors are preferably used in EVs; however, the traction mechanism generates the difference between the EVs and the IC engine vehicles, respectively. Advancement in power electronics ...

This research covered the difficulties and potential directions for EV improvement while summarizing the state of the art. Energy management systems ensure that the battery's capacity is used to its maximum potential by monitoring and controlling the energy flow within the vehicle [13] thus examined the critical function of lithium-ion batteries in EV energy ...

To manage the torque of the motor, the clutch assembly and transmission system are frequently replaced with an electric motor drive system. An accelerator pedal, an electric motor drive/controller, batteries, and traction electric motors are the essential components of an electric vehicle's drive system. 6.1 Major Components of EV

New energy automotive motors and electronic control systems are used as a substitute for traditional engine (gearbox) functions, and their performance directly determines the main performance indicators such as climbing, ...



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Traction battery means the battery which drives the electric motor in BEVs. In general, the development of BEV industry is a function of time in regard to traction battery performance. Currently, the specific energy of battery system has reached 110 Wh/kg.

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