New Energy Battery Pack Disassembly

How do you disassemble a battery pack?
To conduct the operations,destructive disassemblyhas been a prevailing practice. The disassembly phase of the battery pack includes cutting cable ties,cutting cooling pipes,and cutting bonded battery modules and the battery bottom cover for separation .

How to design a battery disassembly system?
The design of the disassembly system must consider the analysis of potentially explosive atmospheres (ATEX) 1 of the area around the battery pack and, if necessary, adopt tools enabled to work in the corresponding ATEX zone.

Is a fully automatic battery pack disassembly possible?
Battery pack disassembly is a part of this field of applications as a practical approach to preserving operators' safety and health by coping with the high variability of products [38,64]. However,most authors agree that a fully automatic battery pack disassembly is not feasiblewith the current constraints [17,21,37,41,56].

How ATEX 3 battery pack was disassembled?
Following the recommendations given after the safety analysis,as a specific potentially explosive atmosphere (ATEX) 3 zone,the battery pack was manuallydisassembled. The manual disassembly brought to a disassembly procedure which was decomposed and analysed to identify how to automate the same operations with a robot.

Can a robotic cell disassemble a battery pack?
The analysis highlights that a complete automatic disassembly remains difficult, while human-robot collaborative disassembly guarantees high flexibility and productivity. The paper introduces guidelines for designing a robotic cell to disassemble a battery pack with the support of an operator.

Are battery pack designs a key obstacle to automated disassembly?
As identified in various studies,a key obstacle is the significant variation in battery pack designs,which complicates the automation process . Thompson et al. highlighted that the diversity in battery pack designs,along with the use of various fixtures and adhesives,impedes automated disassembly.

The EV battery Disassembly infosheet exposes the complex and often destructive process with proprietary tools required to disassemble a typical EV battery with cell-pack-module construction for repair, reuse, repurposing or material recovery.

By automating pack disassembly and significantly increasing reuse and refurbishment rates, TEMA"s approach would minimize battery waste and reduce critical material demand, paving the way for a sustainable, circular battery supply chain.

The techno-economic assessment of automated battery pack disassembly shows that automation can indeed decrease costs compared to manual disassembly. This, in turn, might lead to reduced gate fees paid to off-set expenses of the recycling facility or, in the best-case result, in a profitable EV battery recycling process. There are, however ...

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The development of new energy vehicles, particularly electric vehicles, is robust, with the power battery pack being a core component of the battery system, playing a vital role in the vehicle"s range and safety. This study takes the battery pack of an electric vehicle as a subject, employing advanced three-dimensional modeling technology to conduct static and ...

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Analysis of emerging concepts focusing on robotised Electric Vehicle Battery (EVB) disassembly. Gaps and challenges of robotised disassembly are reviewed, and future perspectives are presented. Human-robot collaboration in EVB processing is highlighted. The potential of artificial intelligence in improving disassembly automation is discussed.

This study presents a technoeconomic analysis of EV battery disassembly, focusing on incorporating robotics to address challenges and capitalize on opportunities. Based on the case study of the Mitsubishi Outlander PHEV battery pack, we identify the most labor and cost-intensive components and introduce a structured approach to evaluate automating ...

In the context of current societal challenges, such as climate neutrality, industry digitization, and circular economy, this paper addresses the importance of improving recycling practices for...

A new task planner has been designed for the disassembly of electric vehicle Li-ion battery packs, with as main objective to increase the flexibility and robustness of the system. Lab tests have been used to validate ...

The accurate and efficient intelligent planning of disassembly sequences plays a crucial role in ensuring the high-quality recycling of end-of-life power batteries. However, the solution space obtained by the

metaheuristic algorithm is often incomplete, resulting in suboptimal sequence accuracy. Additionally, the complex and dynamic disassembly information ...

By Allison Proffitt . August 23, 2021 | Researchers at the Department of Energy"s Oak Ridge National Laboratory have developed a robotic disassembly system for spent electric vehicle battery packs to safely and ...

The application of electric vehicles is particularly prominent. Fig. 1 shows China"s new energy vehicle (battery electric vehicles and plug-in hybrid electric vehicles) sales in 2016-2018 [6]. The recycling process comprises of mechanical process and chemical process. The mechanical process involving disassembly, crushing, screening and separation. The basic procedure is ...

Adding a part to a vehicle means it must be assembled as well as disassembled which results in a need for a product that is optimal for an assembly-line. A literature study is therefore ...

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