Module disassembly of lithium battery

What are the key challenges in battery module disassembly?
The state of the art battery modules need to be analysed with regards to their structure, components and the relationship of the components to each other. In particular, the key challenges in battery module disassembly up to cell level are identified and classified in order to systematically derive the requirements for the disassembly system.

What information do I need for a lithium ion battery disassembly?
If a disassembly of the modules down to cell level is planned in the future,further information about the cells,e.g.,design (pouch,prismatic,cylindrical),weight,and dimensions,are required. As mentioned before,lithium-ion batteries are labelled with a "Li-ion" symbol.

How is battery disassembly performed?
Battery disassembly is,therefore,currently carried out manuallyand without the support of robots . The disassembly process is usually performed by multiple qualified workers . ... The structural design of the battery system and the joint connections are of decisive importance for the effort required for a disassembly task .

What is the disassembly process of lithium-ion traction batteries?
Disassembly Process of Lithium-Ion Traction Batteries The disassembly of lithium-ion traction batteries after reaching their end-of-life(EoL) represents a promising approach to maximize the purity of the segregated material .

How to discharge a battery before disassembly?
For a controlled discharging before first step of disassembly, the specific connector models of the high-voltage plug and low-voltage plug, the CAN Connections, the necessary current flows for the battery management system (e.g., 12 V), as well as the specific release commands must be given by the OEM.

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 .

This paper is devoted to module-to-cell disassembly, discharge state characterization measurements, and material analysis of its components based on x-ray fluorescence (XRF) and diffraction (XRD).

Within this paper the initial steps for the realisation of an agile automated system for battery module disassembly will be presented. The state of the art battery modules need to be analysed with regards to their structure, components and the relationship of ...

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This work describes the first step in recycling the LIBs nickel-manganese-cobalt (NMC) based module from a full battery electric vehicle (BEV) holding its high recycling efficiency and considering the process costs and environmental impact. This paper is devoted to module-to-cell disassembly, discharge state characterization measurements, and ...

As the market share of electric vehicles continues to rise, the number of battery systems that are retired after their service life in the vehicle will also increase. This large growth in battery returns will also have a noticeable impact on processes such as battery disassembly. The purpose of this paper is, therefore, to examine the challenges of the battery disassembly ...

In particular, the key challenges in battery module disassembly up to cell level are identified and classified in order to systematically derive the requirements for the disassembly system....

Manual disassembly of a battery pack: (a) Pack with eight modules, (b) module with 12 cells, (c) cell disassembly after separation of electrode-separator composites (ESC) and housing, and (d) ESC disassembly ...

The LithoRec process also provides for manual disassembly activities that go beyond the classic dismantling scope to disassemble the battery pack housing, the battery ...

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In order to realize an automated disassembly, a computer vision pipeline is proposed. The approach of instance segmentation and point cloud registration is applied and validated within a demonstrator grasping busbars from the battery pack.

Manual disassembly of a battery pack: (a) Pack with eight modules, (b) module with 12 cells, (c) cell disassembly after separation of electrode-separator composites (ESC) and housing, and (d) ESC disassembly after separation of different cell components.

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Automated robot-assisted disassembly is essential for the flexible disassembly of Li-ion battery modules for economic and safety reasons. In such a case, a CAD model for the planning process is of immense benefit. The geometric uncertainties due to the breathing of the Li-ion cells as well as the presence of component tolerances underline the importance of a ...

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Manual disassembly of the lithium-ion battery (LIB) modules of electric vehicles (EVs) for recycling is time-consuming, expensive, and dangerous for technicians or workers. Dangers associated with high voltage and thermal ...

Battery chemistries which should be avoided on factory lines include Lithium and Lead based batteries, Carbon-Zinc and alkaline batteries, and Lithium and Silver-Oxides [17]. The main groups of incompatible batteries often take different sizes and forms and can be sorted upon visual inspection. If correctly sorted and identified before material recovery, the process ...

The LithoRec process also provides for manual disassembly activities that go beyond the classic dismantling scope to disassemble the battery pack housing, the battery management system (BMS), the wiring harness, and the cooling system before the separated battery modules are passed on to the next stage of the recycling process .

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