Battery load-bearing bracket in the machine room

How to optimize mechanical design of a battery pack enclosure?
In this study, a design optimization methodology is proposed to optimize the features of mechanical design (e.g. minimization of mass, maximization of minimum natural frequency and minimization of maximum deformation) of the battery pack enclosure. The proposed methodology is comprised of four phases.

What is a battery bracket for EVs?
ement analysis(FEA) of a battery bracket tailored for EVs. This bracket plays a pivotal role in securing the battery pack,ensuring structural integrity,an dampening vibrations and impacts during vehicle operation. The design process incorporates meticulous material selection,weight optimization,and manufacturability

What is the maximum deformation of a battery pack enclosure?
The results of the first phase of deformation analysis of the battery pack enclosure shows that the surface in the middle part of the enclosure is subjected to the large stresses resulting in the maximum deformation ranging from 0.0015 m mm to 0.0016 m(Fig. 4).

How to evaluate natural frequency of battery pack enclosure?
The notion behind evaluation of natural frequencies of battery pack enclosure is to check if these are in the range of 7-200 Hz,which is in the range of vibration frequencies of electric vehicle during its normal operation. The purpose is to maximize the minimum natural frequency observed in each of the case.

What are the parameters of a battery module?
Its specific parameters are listed in the following tables: When the electric vehicle runs, the gravity of battery is implied as the force in the vertical direction of the bottom of the module, the total weight of battery and BMS is approximately 220 kg, the value of the safety factor is set as 3.0.

How to achieve vibration isolation of battery pack?
Literature study conducted by (Jaguemont et al. 2016) and (Chen et al. 2017) stated that the vibration isolation of the battery pack can be achieved by designing the new structure of battery pack/mounting frame, selecting appropriate materials and placing battery pack in the vehicle.

This paper demonstrates the structural and optimization analysis of an L-shaped bracket suitable for any shelf support ranging from industrial equipment shelves, automotive brackets, aerospace...

L-bracket: As its name suggests, it is a standard method of fastening a horizontal component to a vertical one and vice versa. The L-bracket has a plethora of different purposes, but one of the most common is to mount shelves to the wall. As a result, the design"s load-bearing capacity depends greatly on the thickness and type of material in use.

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To determine a machine"s mechanical condition it is of importance to know the radial bearing forces in the machine. Radial forces are caused by magnetic pull forces in the generator, clamped shafts, mass unbalance and flow properties around the turbine. Measuring the shaft displacement in the bearing or the bearing housing acceleration is not sufficient for status ...

Load cases in conformity with Daimler standards of Mercedes-Benz bus are considered for analysis. Stress and deformation values of the battery box structure are obtained with use of Hypermesh 13 and Ansys software. The analysis reveals that cast steel bracket design of the battery box is the most feasible

Robust mechanical design and battery packaging can provide greater degree of protection against all of these. This chapter discusses design elements like thermal barrier and gas exhaust mechanism...

For the functional interval of individual machine room, it is necessary to consider the load-bearing reinforcement of the floor, especially large equipment such as UPS, battery and precision air conditioning.

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The results show that the maximum Mises equivalent stress of the shock-absorbing load-bearing components after lightweight design is not more than the material"s yield stress of 45 MPa and the ...

In this study, the optimum design of load carrying battery packs that can also exchange heat with a coolant is presented. The level set topology optimization method is used as the design tool. The flow is modeled using the Darcy potential flow, and the heat transfer is modeled using the convection-diffusion equation. The displacement field is ...

Diameter of the load bearing area between the bolt head and the clamped material (Figure 1) D c: L: The effective diameter of an assumed cylindrical stress geometry in the clamped material. Used in Pulling"s method (Equation 13) D j: L: Diameter of a bolted joint. Used in Bickford method: d mt: L: Internally threaded material (nut) maximum minor diameter (Figure 2) d t: L: Internally ...

Load-bearing walls are crucial to the structural integrity of a building. They must be designed and constructed with precision to ensure that they can support the weight of the building"s upper floors and roof. The Importance of Structural Integrity. A load-bearing wall must be able to transfer the weight it carries to the foundation of the ...

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As the load-bearing structure of battery modules, the battery bracket of new energy commercial vehicle is subjected to harsh working conditions of variable loads, impact vibration, high and low temperature cycles, and other factors. Whether the structural design of battery bracket is reliable or not directly determines vehicles" service life ...

The bearing, Bracket and two 5/16-24UNF-2A Cap Screws are put together as a sub-assembly. 2. It is desired to keep the bearing and bracket aligned as close as is practical. 3. The bracket hole spacing is 1.7430 ± .0060" and the bearing screw spacing is 1.7430 ± .0050" as illustrated below. 4.

impact events is the battery bracket. Crash testing of battery brackets is essential to evaluate their structural integrity, energy absorption capabilities, and overall performance under severe impact conditions. The battery bracket serves as a crucial structural ...

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