

Research on drop tower technology for simulating explosive impact load

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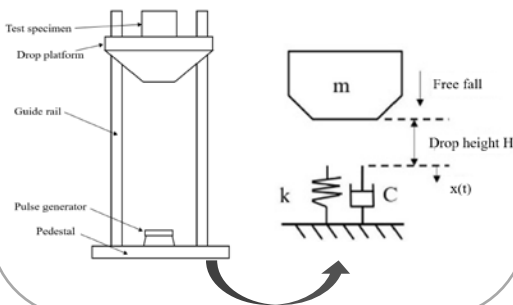
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1. Research significance

In recent years, bottom explosion has become one of the most common causes of casualties among soldiers. Therefore, it is of great practical significance to carry out research on protective seats in an explosive environment to improve the occupant protection level of my country's armored vehicles. And the drop tower technology can be used to simulate the explosion impact load, which provides a experiment method with low cost, good reliability and high repeatability for researching the damage of occupants in armored vehicles under explosion condition.

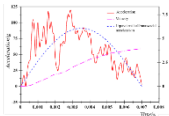
2. Research technique

- ① Finite element simulation analysis of parametric model;
- ② Analysis of mechanical model;
- ③ Comparison of drop tower experiment and actual explosion experiment.



3. Research process

After analyzing the equivalent load of explosion damage by means of finite element method, the factors affecting the impact load of drop tower were researched by means of mechanical model and drop tower experiment. Finally, the relevant results of drop tower experiment and actual explosion experiment were compared and analyzed.



4. Conclusion

- ① The change in velocity ΔV can effectively predict the occupant damage;
- ② The acceleration peak value generated in the drop tower is proportional to the drop height, inversely proportional to the rubber thickness and the drop mass, and the pulse width is proportional to the rubber thickness;
- ③ The drop tower can effectively simulate the explosion impact load.