

Research on Anti-seated Device of Certain Electromagnetic Weapon



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Abstract: The electromagnetic railgun is a new concept weapon that uses Loren magnetic to accelerate the projectile to super high-sonic speed instantaneously. The initial velocity of the projectile muzzle can reach 2km/s or more in an instant. The projectile launched by the electromagnetic railgun has a high speed and thus has a strong kinetic energy to impact the target. According to the principle of force, when the weapon system pushes the armature, the recoil part will be subjected to a force in the opposite direction, that is, the combined force of the gun. If there is no anti-rear device, the force will generate strong vibration excitation to the launching frame, affecting the shooting intensity of the projectile. In order to reduce the influence of the squat resistance of the electromagnetic weapon on the accuracy of the weapon system, the model of the anti-rear device of the electromagnetic weapon is established. The simulation analysis and experimental verification are carried out. The simulation structure and experimental data are in good agreement.

Conclusion:

Through the simulations of 0° and 87° firing angle, it is concluded that the recoil force is 17.4KN when the firing angle is 87° and is 16.7KN when the shooting angle is 0° . The speed of the recoil part can be rapidly attenuated by the method of hydraulic resistance, and the collision limit speed can be smaller when the recoil angle is 0° . Experiments are carried to verificate the models. The recoil displacement of the simulation model was 16.4mm, and the length of the recoil time was 102ms; the length of the test recoil was 13.1mm, and the time was 100ms.

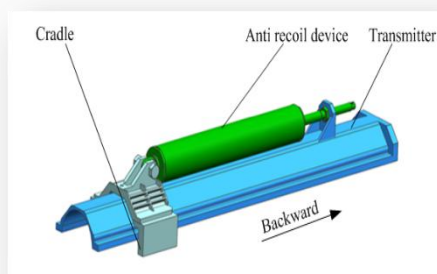


Figure 1. the layout of anti recoil device

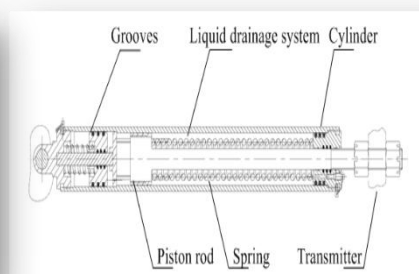


Figure 2. the model of anti recoil device

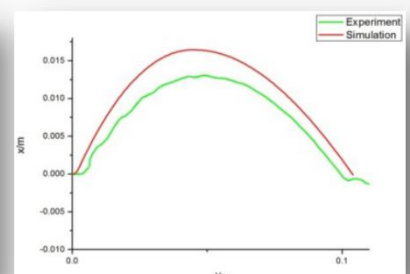


Figure 3. comparison of displacement-time curves under experimental and simulation