

Stress Analysis of Hoist Auto Lift Car Frame

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Abstract. Compared with the traditional auto ramp, the auto lift can save 80% of the building area and more than double the car turnover efficiency. Auto lift is referred to as non-commercial auto lift for carrying passenger auto, one of the cargo lifts in the catalogue of special equipment in the GB7024-2008. The auto lift shaft structure should be strong enough to bear not only the load of ordinary lift but also the load produced by loading and unloading of auto. The size and structural type of the car are specially designed to facilitate the access of autos, the selected frame beam system checked, mainly based on whether the bending stress can meet the maximum allowable stress of the selected material; Finally, a three-dimensional model of part of the structure is established and analyzed by finite element method including analysis of the front wheel of auto into the car, analysis of the auto entered into the car, analysis of the car frame compress car buffer, and the stress analysis of main components.

Keywords: Auto lift · Car frame · Stress check · FEA

1 Introduction

As we all know, lifts can be divided into passenger lift, cargo lift, passenger lift, bed lift, residential lift, dumbwaiter lift, marine lift, sightseeing lift, auto lift from the use, be divided into low speed, medium speed, high speed and ultra-high speed lift from the running speed, be divided into direct current, alternating current, hydraulic, pinion and rack, spiral and linear motor driving lift from the driving method, be divided into machine room lift and machine-room-less lift, be divided into gear and gearless tractor lift from the traction structure [1]. The development of human beings is in an infinite process, while the development of cities is in a limited space. The three-dimensional of urban architecture and the three-dimensional of urban traffic correspond to each other. In order to solve the three-dimensional traffic problem in the city, the auto lift has come to reality from the dream. Auto lift is a special lift to solve the problem of auto vertical transportation. It has been widely used in 4S stores, repair workshops and large shopping malls with parking lot on the building roof. Its standard load is 3000 kg, 5000 kg. The speed is 0.25 m/s and 0.5 m/s [2, 3].