

# 双柱机械式汽车举升机设计

## 摘 要

汽车举升机作为汽车的重要构成部件，其主要作用是支撑，利用举升机可以实现汽车的快速升降。汽车举升机是保养和维修汽车的重要器件，无论是汽车的保养小修，还是整车大修，汽车举升机均发挥着极其重要的作用。随着汽车的不断发展，汽车举升机的类型也越来越丰富，其中，液压式举升机作为极其重要的一个类型，这种举升机通常被用于高顶棚车辆的维修，同时由于其具有较大的工作空间，因此在工作的过程中也有着极大的优势。本文选择双立柱机械式举升机作为主要的研究对象，结合应用需求制定了相应的设计方案，并根据举升机自身的结构特征对方案作出进一步的说明，在此基础上核算了汽车举升机托臂与横梁以及主力柱的强度，同时验算了受压杆稳定性与活塞杆强度，根据公式计算结果以及设计需求选择适当的钢丝绳以及链条，确保举升机的应用要求得到充分的满足。

**关键词：**滑动螺旋副；导轨；丝杠；制动；组合开关

## Abstract

As an important component of a car, the car lift is mainly used for support. The car lift can be used to achieve rapid lifting of the car. Car lift is an important component for car maintenance and repair. Whether it is car maintenance or overhaul, car lift plays an extremely important role. With the continuous development of automobiles, the types of car lifts are becoming more and more abundant. Among them, hydraulic lift is an extremely important type. This type of lift is usually used for the maintenance of high-roof vehicles. It has a large working space, so it also has a great advantage in the working process. This paper selects the double-column mechanical lift as the main research object, and formulates the corresponding design plan based on the application requirements, and further explains the plan according to the structural characteristics of the lift itself, and calculates the car lift on this basis. The strength of the support arm, crossbeam and main force column, and the stability of the compression rod and the strength of the piston rod are checked. According to the calculation results of the formula and the design requirements, the appropriate wire rope and chain are selected to ensure that the application requirements of the lift are fully satisfied.

**Keywords:** sliding screw pair; guide rail; lead screw; brake; combination switch

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