
XE135 挖掘机总体设计

摘 要

随着我国建设现代化国家进程的进行，我国开展了很多的基础建设项目，工程机械随着基建项目的发展而得到了长足的发展。在 2008 年全球金融危机以后，国家投入了很多的财政收入，用于基础设施的建设，以挖掘机为代表的工程机械发展迎来了一波小高潮。现在，国家进行一带一路的建设，工程机械的发展又迎来了新的发展机遇。

液压挖掘机在很多建设工程以及施工领域中具有不可替代的作用，其具有较高的技术含量，中型液压挖掘机在我国的发展中需求量不断增多，具有很好的市场。我国挖掘机发展的开始时间比外国晚很多，通过这些年的不断努力，我国的挖掘机生产逐渐赶了上来，挖掘机的生产量也位居世界前列，但是，挖掘机的高精尖的技术方面还远远落后于国外。

本文根据反铲式液压挖掘机工作装置的结构特点以及工作原理，在现有运动学分析的基础上，设计出了一套符合整机性能以及作业要求的 xe135 液压挖掘机。本文完成的主要工作有：

- （1）对液压挖掘机工作装置进行数学建模；
- （2）针对工作装置的计算工况，建立了相关的力学模型；
- （3）确定液压挖掘机的设计方案；
- （4）根据计算，初步选取挖掘机主要的装置；
- （5）对主要装置的和关键部位进行力学分析和计算；

（6）用机械画图软件 cad 和 solidworks 软件进行了总装图、工作装置及液压系统图的绘制。

关键词：液压挖掘机, 总体设计, 工作装置, 底盘行走系, 液压系统, 挖掘装置

ABSTRACT

With the progress of my country's construction of a modern country, my country has launched many infrastructure projects, and construction machinery has made great progress with the development of infrastructure projects. After the global financial crisis in 2008, the country invested a lot of fiscal revenue for infrastructure construction, and the development of construction machinery represented by excavators ushered in a small climax. Now that the country is building the Belt and Road, the development of construction machinery has ushered in new development opportunities.

Hydraulic excavators have an irreplaceable role in many construction projects and construction fields, and they have a high technical content. The demand for medium-sized hydraulic excavators is increasing in the development of my country and has a good market. The start time of the development of excavators in China is much later than that of foreign countries. Through continuous efforts over the years, China's excavator production has gradually caught up, and the production volume of excavators is also among the forefront of the world. It still lags far behind abroad.

In this paper, based on the structural characteristics and working principles of the working device of the backhoe hydraulic excavator, based on the existing kinematics analysis, a set of xe135 hydraulic excavator that meets the performance and operation requirements of the whole machine is designed. The main work completed in this article are:

- (1) Mathematical modeling of hydraulic excavator working device
- (2) Regarding the calculation conditions of the working device, the relevant mechanical model is established
- (3) Determine the design plan of the hydraulic excavator
- (4) According to the calculation, preliminary selection of the main equipment of the excavator

(5) Perform mechanical analysis and calculations on the main devices and key parts

(6) Using mechanical drawing software cad and solidworks software to draw the assembly drawing, working device and hydraulic system drawing

Keywords: hydraulic excavator, overall design, working device, chassis travel system, hydraulic system, excavating device

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