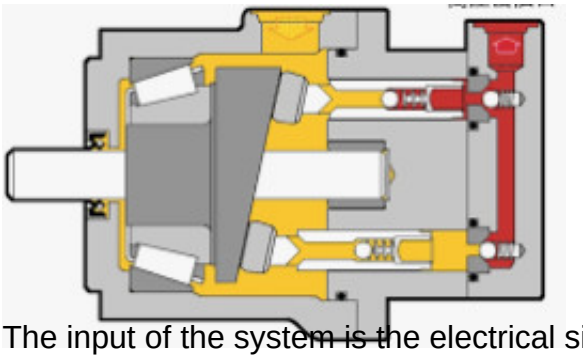
Research on Electro-hydraulic Proportional Control Variable Mechanism of Axial Piston Hydraulic Pump

Abstract: The variable mechanism of electro-hydraulic proportional control of axial piston hydraulic pump is discussed, its composition and working principle are expounded, and it is a closed-loop position control system, which consists of electronic amplifier, two-way electro-hydraulic proportional valve, differential piston, pressure reducing valve and displacement sensor.



The input of the system is the electrical signal to the proportional valve, and the output is the displacement of the differential piston. The displacement of the differential piston is proportional to the electrical signal to the proportional valve. Because the displacement of the hydraulic pump is proportional to the displacement of the differential piston, the displacement of the hydraulic pump is proportional to the electrical signal to the proportional valve, which has a wide application prospect.

Key words: hydraulic pump; electro-hydraulic proportional control; variable mechanism; static characteristics; dynamic characteristics; volumetric transmission

As a bridge connecting modern micro-electronics, computer and fluid transmission and control technology, electro-hydraulic proportional control technology has developed rapidly in the past 20 years. Its performance has been greatly improved and its application field has been rapidly expanded. It has become one of the basic technical components of mechatronics.

In this paper, a variable hydraulic pump with electro-hydraulic proportional control mode is developed. The variable mechanism of CY14-1B series axial piston pumps is supplemented. A new form of variable control mode, electro-hydraulic proportional control mode, has been added to the variable mechanism of CY14-1B series axial piston pumps. It integrates electronic

amplifier, proportional valve, pressure reducing valve, sensor and pump body to form a new one. The electro-hydraulic proportional pump has been put into use and meets the actual needs.

The variable mechanism of the electro-hydraulic proportional pump is to make the displacement of the proportional pump proportional to the input electric signal. In this paper, a new type of variable mechanism with displacement electric feedback is studied theoretically and experimentally.