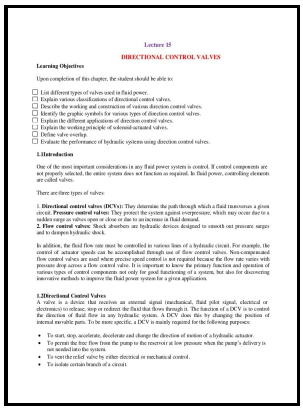
Fluid control--Components and systems.

Technivision Services - Fluid power components, hydraulic flow control components



Lecture 15

DIRECTIONAL CONTROL VALVES

Learning Objectives

Upon completion of this chapter, the student should be able to:

- ☐ List different types of valves used in fluid power.
- ☐ Explain various classifications of directional control valves.
- ☐ Describe the working and construction of various direction control valves.
- ☐ Identify the graphic symbols for various types of direction control valves.
- ☐ Explain the different applications of direction control valves.
- ☐ Explain the working principle of solenoid-actuated valves.
- ☐ Define valve overlap.
- ☐ Evaluate the performance of hydraulic systems using direction control valves.

1.1Introduction

One of the most important considerations in any fluid power system is control. If control components are not properly selected, the entire system does not function as required. In fluid power, controlling elements are called valves.

There are three types of valves:

1. **Directional control valves (DCVs):** They determine the path through which a fluid runs/stops at a given time. **2. Pressure control valves:** They protect the system against overpressure, which may occur due to a sudden drop in circuit resistance (due to an increase in fluid demand).
2. Flow control valves: Shock absorbers are hydraulic devices designed to smooth out pressure surges and to dampen hydraulic shock.

In addition, the fluid flow rate must be controlled in various lines of a hydraulic circuit. For example, the control of actuator speeds can be accomplished through use of flow control valves. Non-compensated flow control valves are used where precise speed control is not required because the flow rate varies with pressure drop across a flow control valve. It is important to know the primary function and operation of various types of control components not only for good functioning of a system, but also for discovering innovative methods to improve the fluid power system for a given application.

1.2Directional Control Valves

A valve is a device that receives an external signal (mechanical, fluid pilot signal, electrical or electronic) to release, stop or redirect the fluid that flows through it. The function of a DCV is to control the direction of fluid flow in any hydraulic system. A DCV does this by changing the position of internal movable parts. To be more specific, a DCV is mainly required for the following purposes:

- To start, stop, accelerate, decelerate and change the direction of motion of a hydraulic actuator.
- To permit the free flow from the pump to the reservoir at low pressure when the pump's delivery is not needed into the system.
- To vent the relief valve by either electrical or mechanical control.
- To isolate certain branch of a circuit.

Description: -
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Skull -- Anatomy
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Fluid dynamics.Fluid control--Components and systems.
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Zenkoku mukashibanashi kiroku
Nihon mukashibanashi kiroku -- 6
AGARDograph -- no. 118.Fluid control--Components and systems.
Notes: The proceedings of a lecture series sponsored in 1966 by the Guidance and Control Panel of AGARD.
This edition was published in 1968

Filesize: 54.22 MB

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Fluid Systems & Components

The previous illustrations were drawn this way only as an aid to your understanding, teaching you how to interpret the meaning of the symbols when you see them in real fluid power diagrams.

Aircraft Division

Applications include metalworking equipment, controllers, automated manipulators, material handling and assembly equipment.

Fluid Control System Applications

Basically there are three types of control valves: 1. Later, you will learn what some of these symbols represent.

Main Products

Were you surprised to see some of the applications and if so, why? Depending on how many PFPDs are available in the classroom, it is recommended that groups of 2-3 students work on each demonstrator. How are engineers trying to improve fuel economy? Hand pumps and power driven pumps are the two categories of hydraulic pumps.

Factory Automation Solutions

Have ready two balloons, a bottle, water and two matchsticks for simple teacher demonstrations.

Aerospace & Defense Hydraulic & Fluid Control Components

End use industries range from plastics working to paper production.

Related Books

- The effect of anxiety on English learning of junior high school students in Taiwan
- Service fatigue loads monitoring, simulation, and analysis - a symposium sponsored by ASTM Committee
- Propylene (Propene)
- Advanced wavefront control - methods, devices and applications IV : 14-15 August, 2006, San Diego, C
- National businessman readership survey