

Chapter 6

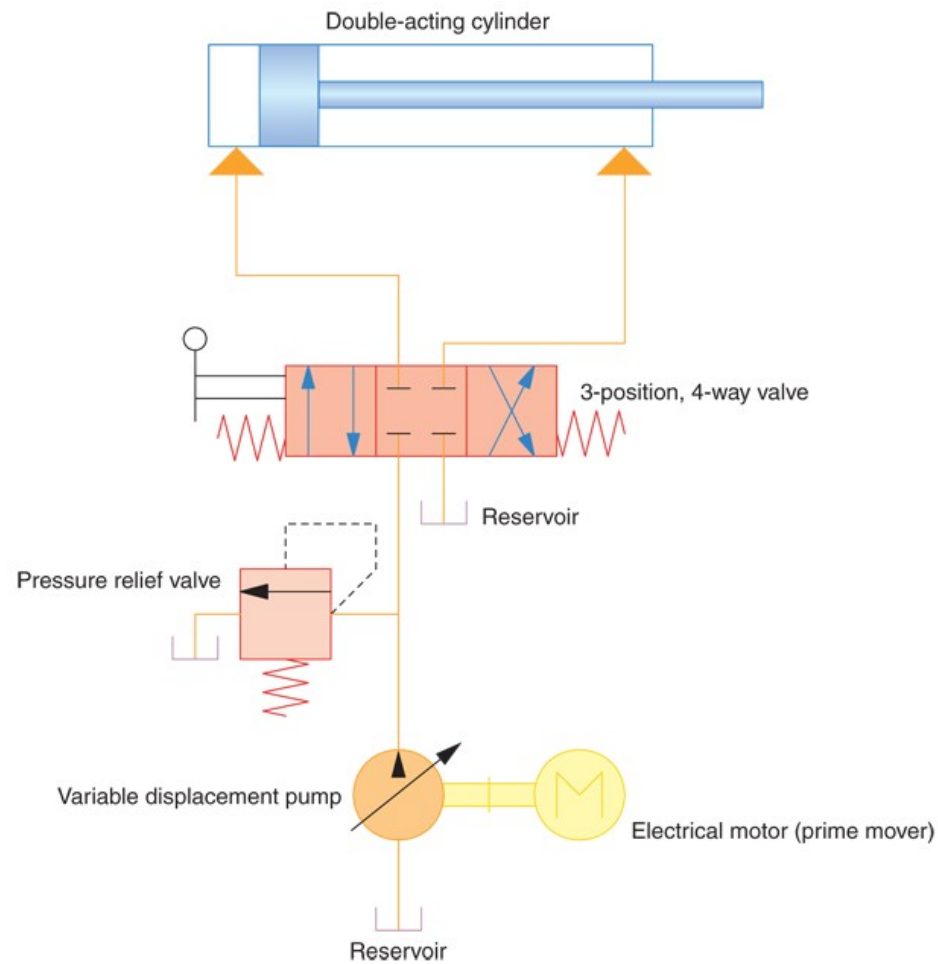
Fluid Power Systems

Objectives

By the end of this lesson the learner should be able to:

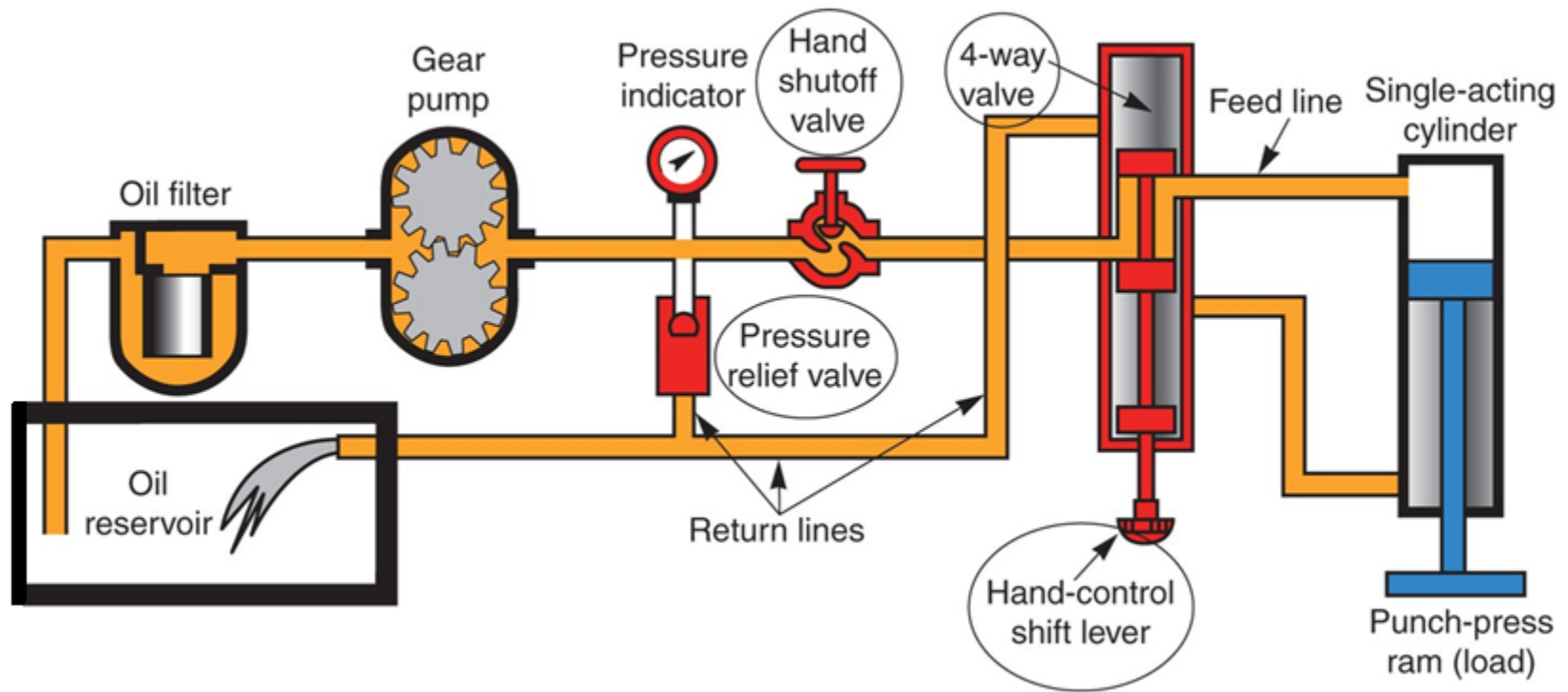
- Describe the characteristics of both hydraulic and pneumatic systems
- Discuss the characteristics of fluid flow
- Explain Pascal's Law and how it applies to fluid power systems
- Define and calculate values for force, pressure, and area relative to fluid power systems
- Identify various components in a fluid power system and explain what they are used for in the fluid power system

Basic Hydraulic System

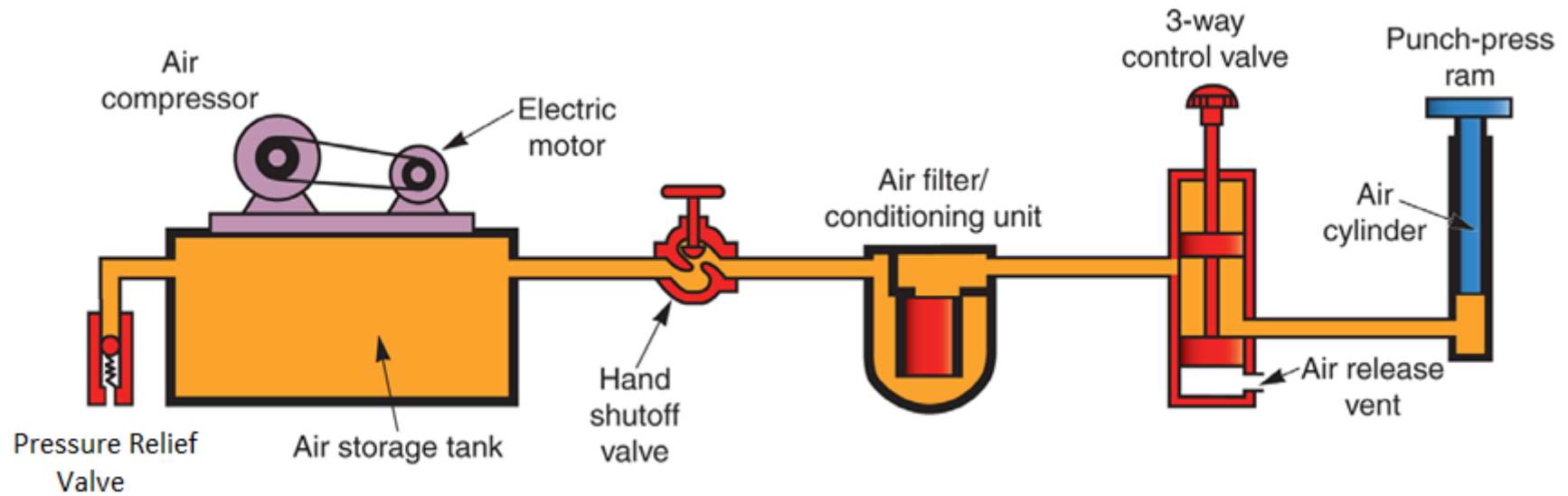


LS 6-1

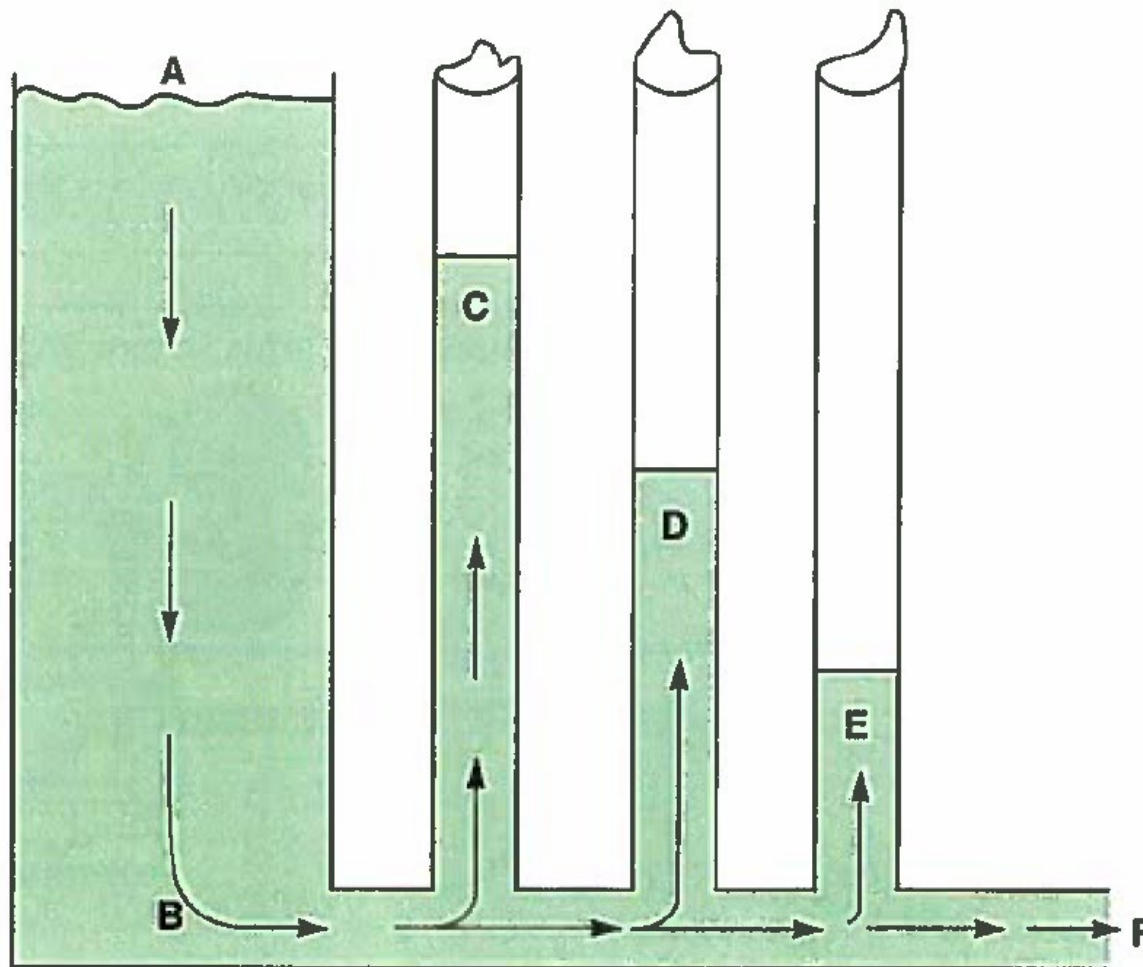
Hydraulic Control Devices



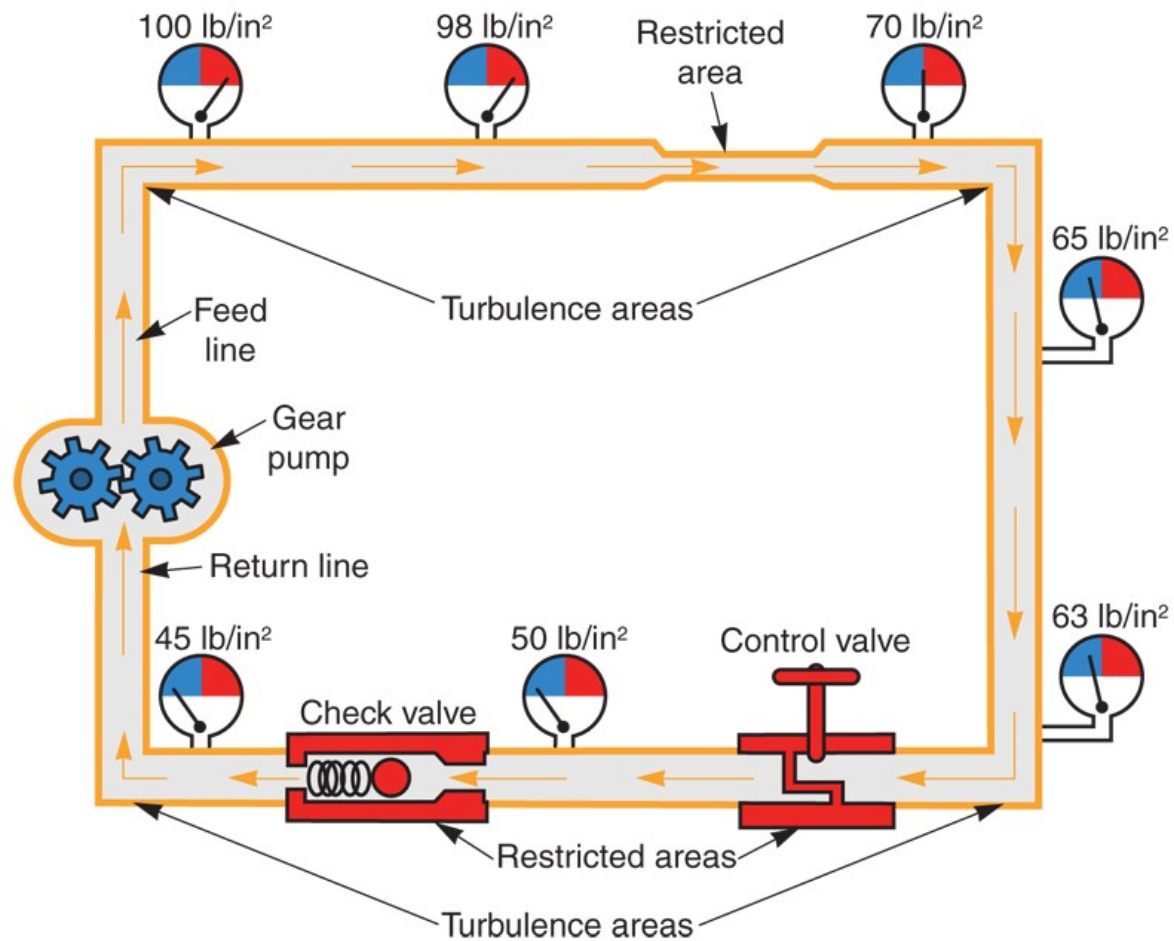
Pneumatic System



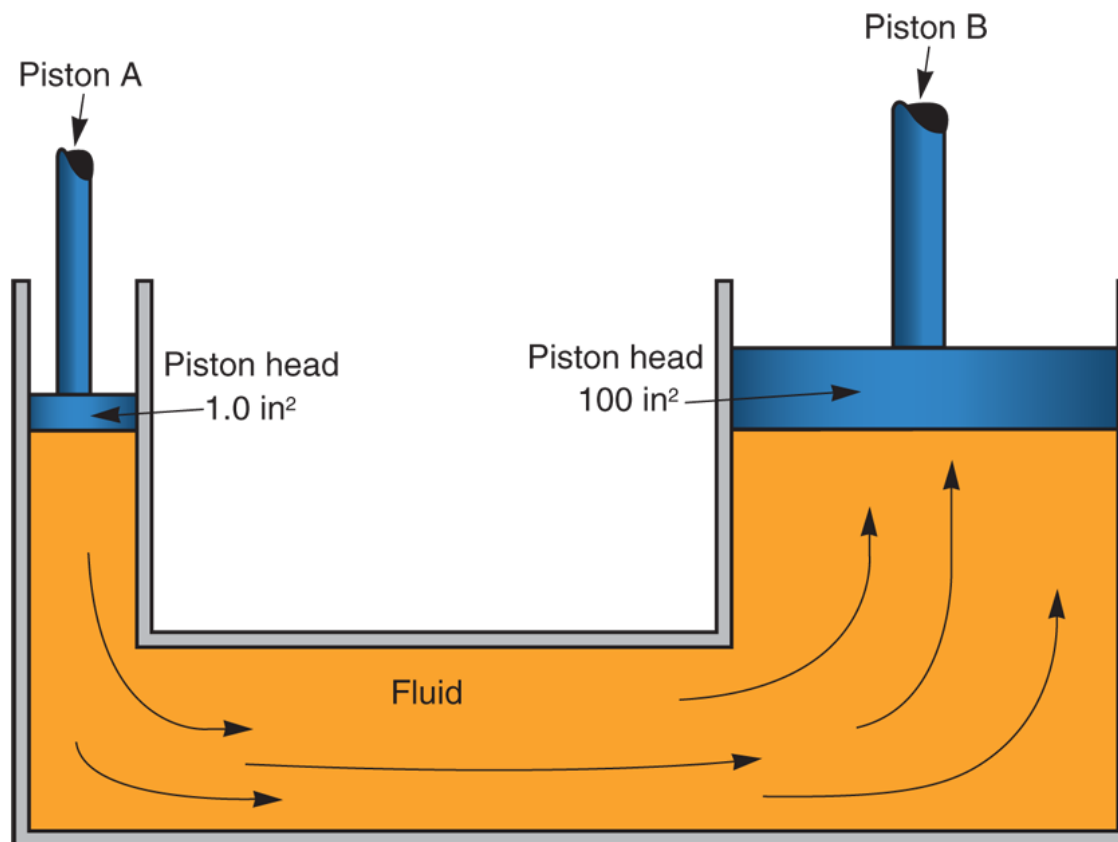
Resistance & Pressure in a Static System



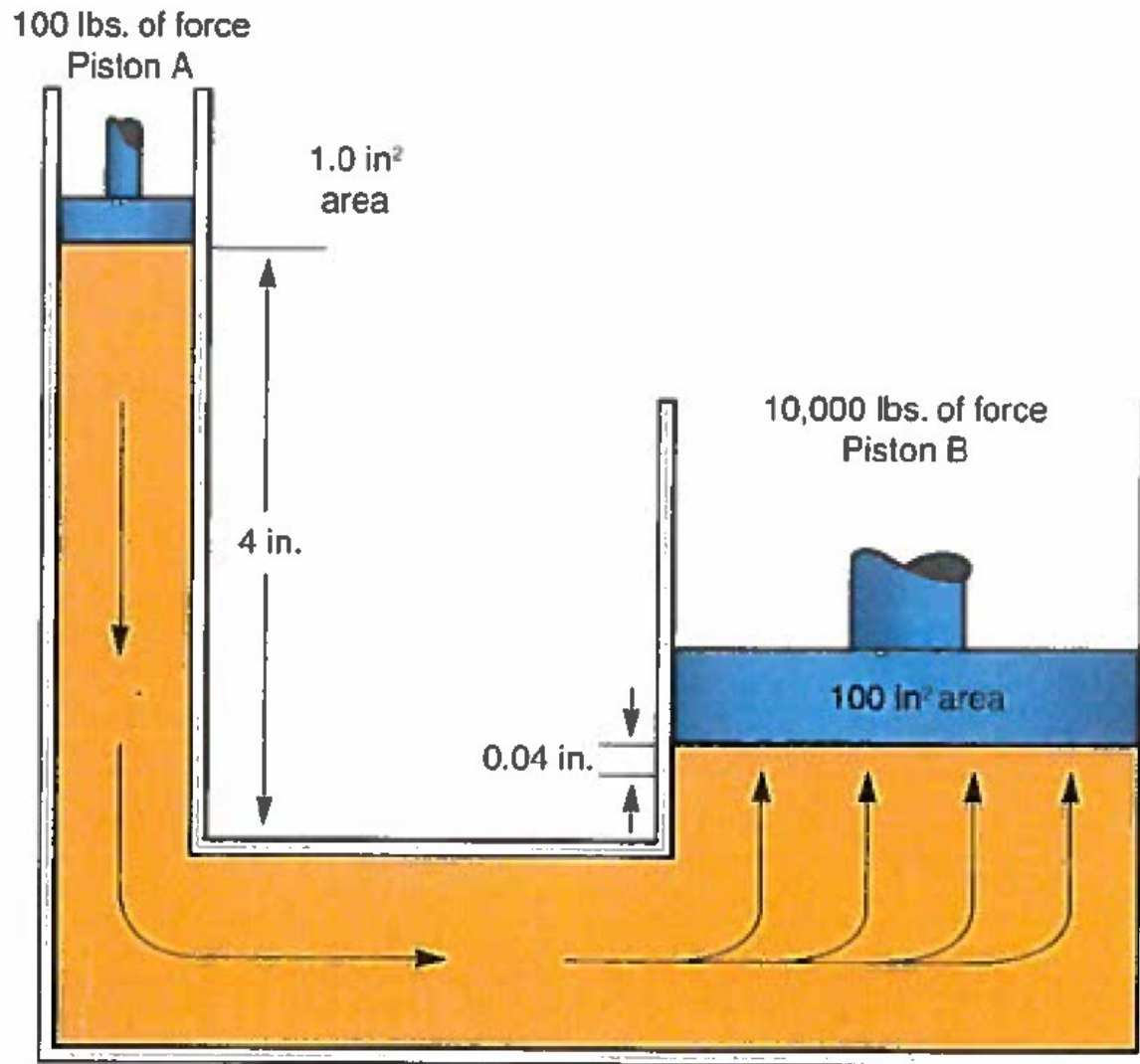
Pressure Drops in a Fluid System



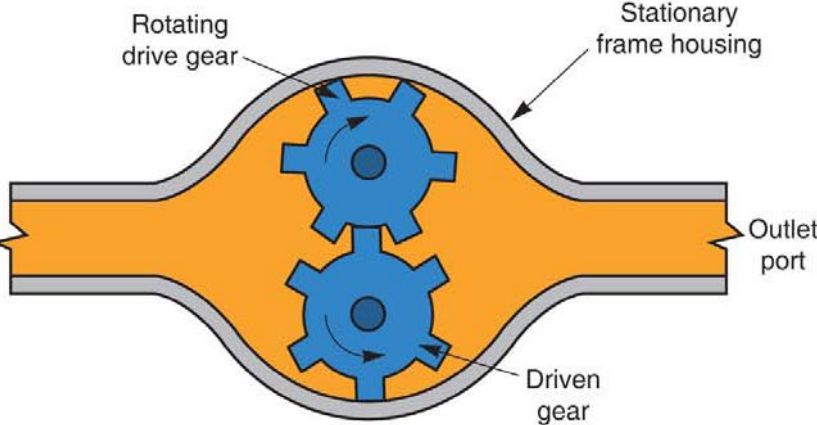
Pascal's Law



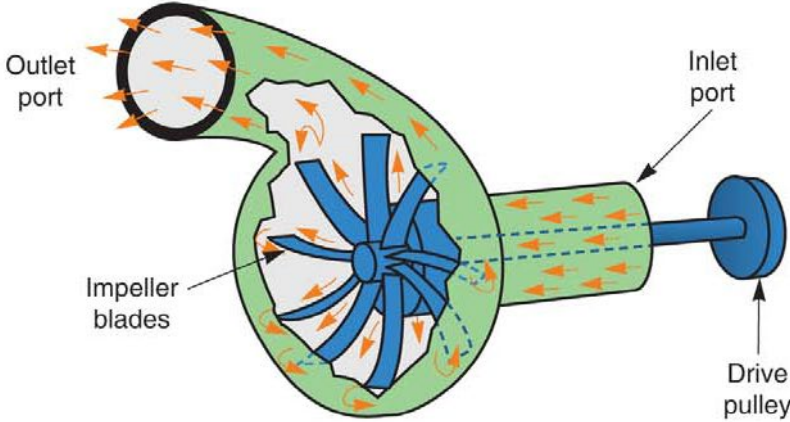
Force, Area, Pressure, and Work



Fluid Pumps

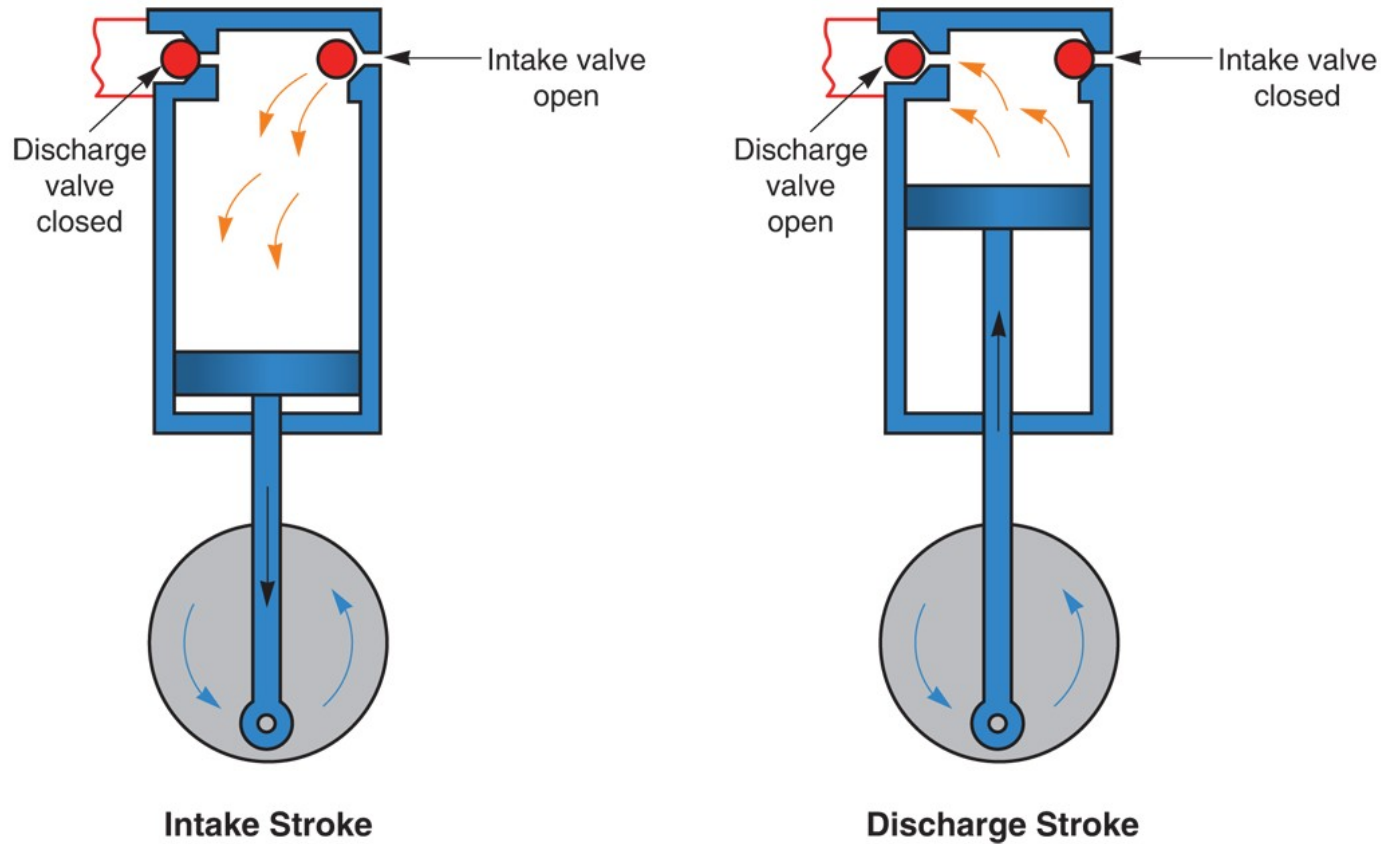


Positive Displacement Pump

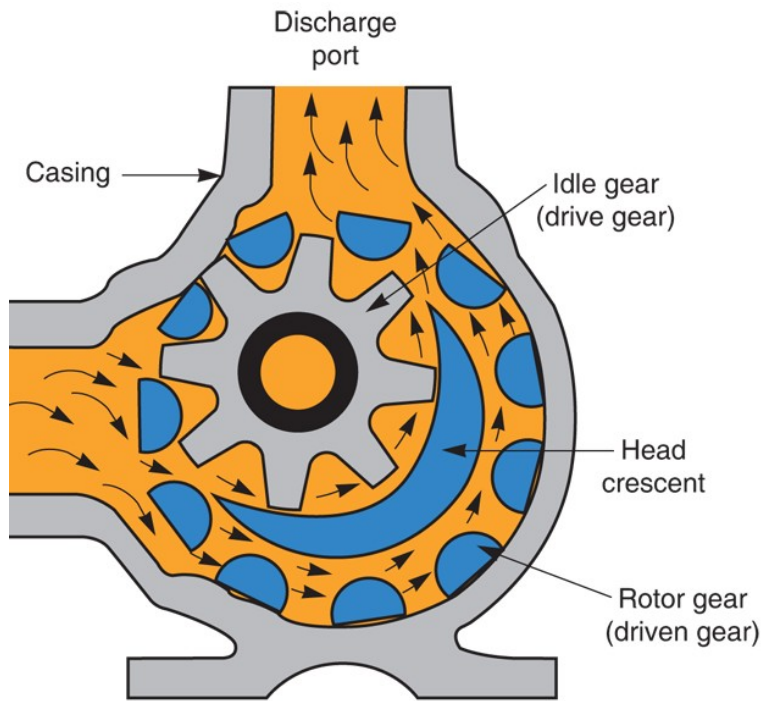


Non-Positive Displacement Pump

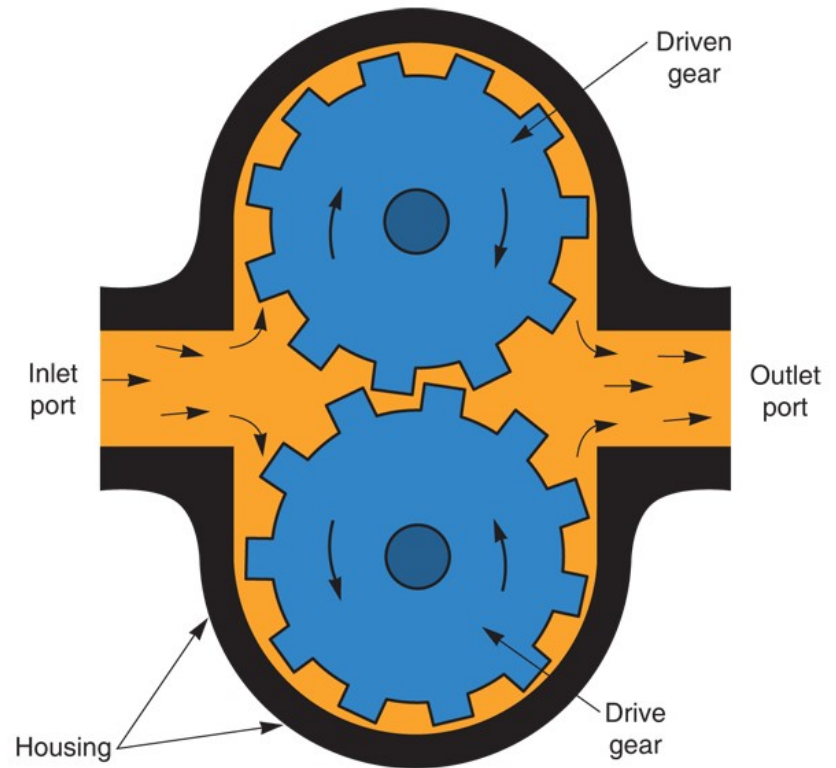
Operation of a Reciprocating Pump



Rotary Gear Pumps

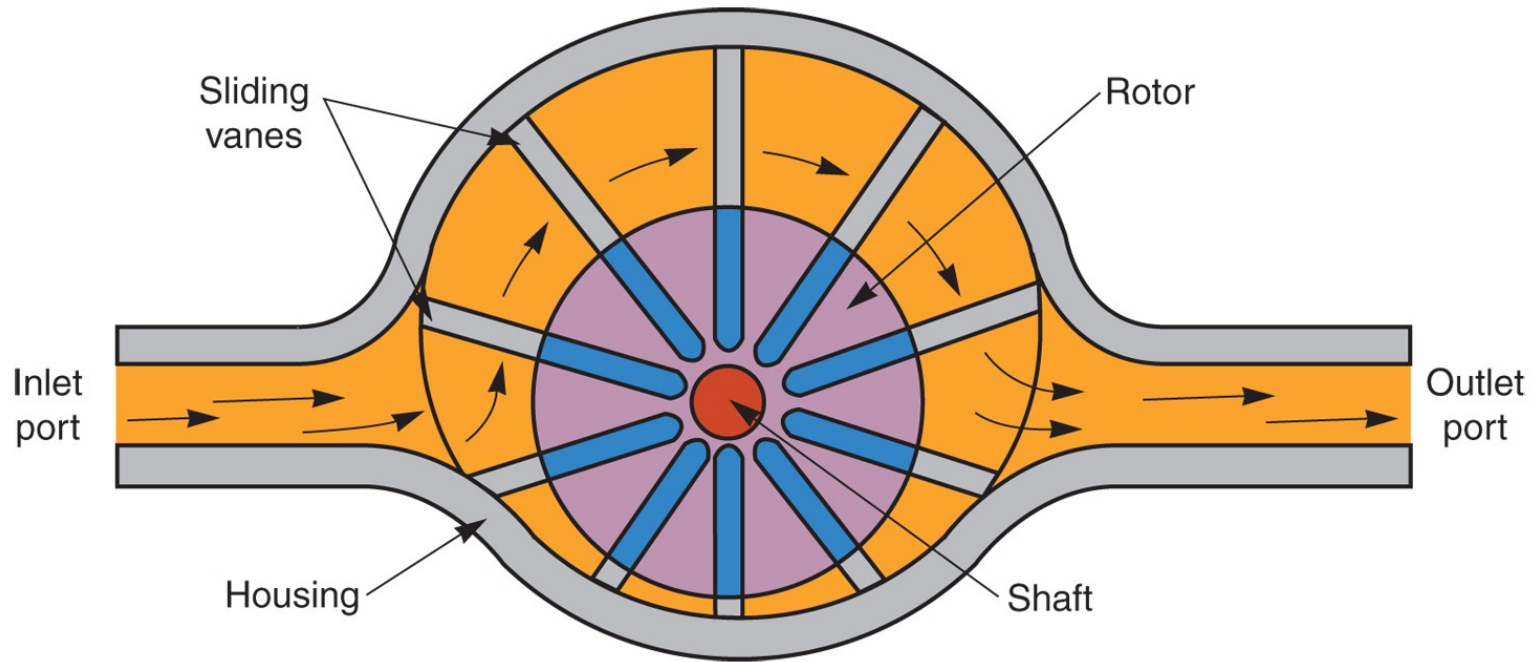


Internal Gear Rotary Pump

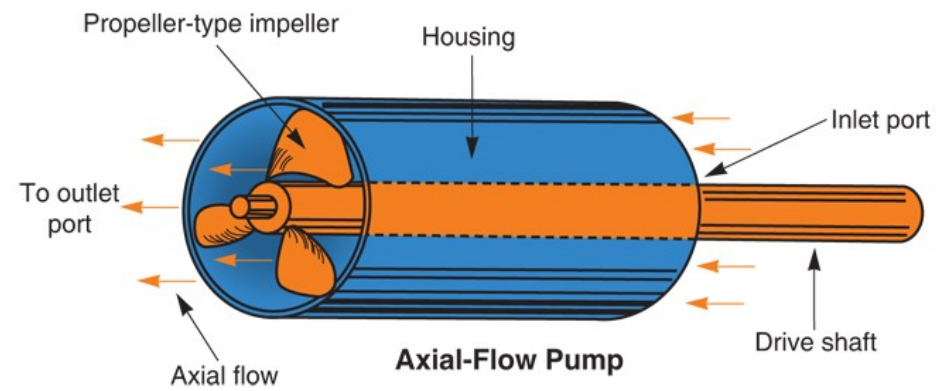
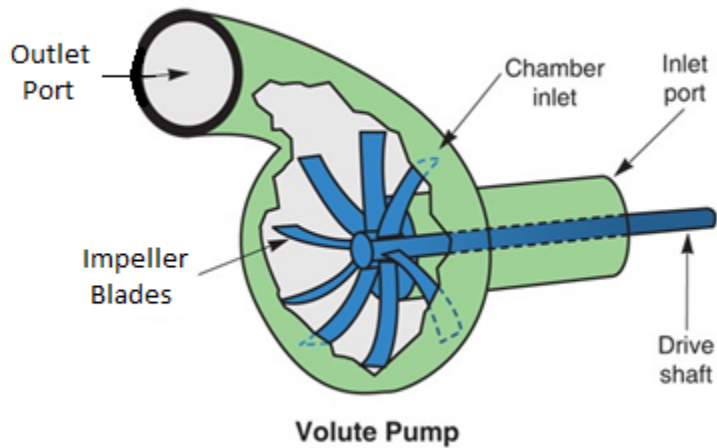


External Gear Rotary Pump

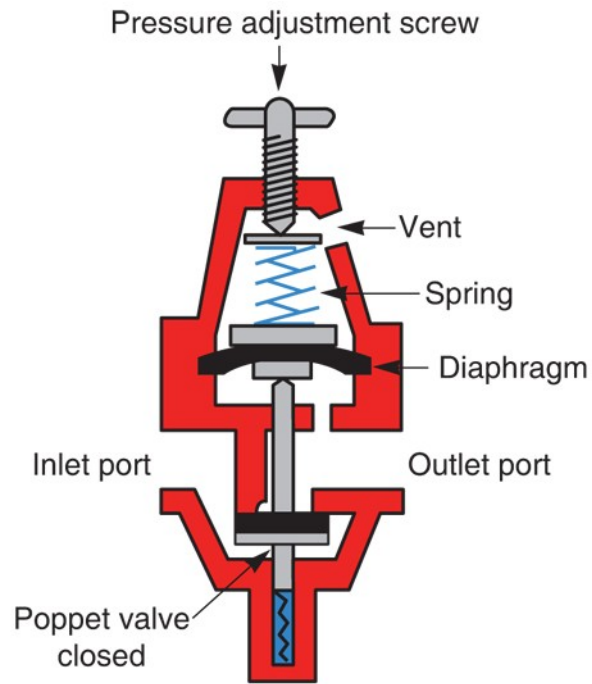
Rotary Vane Pump



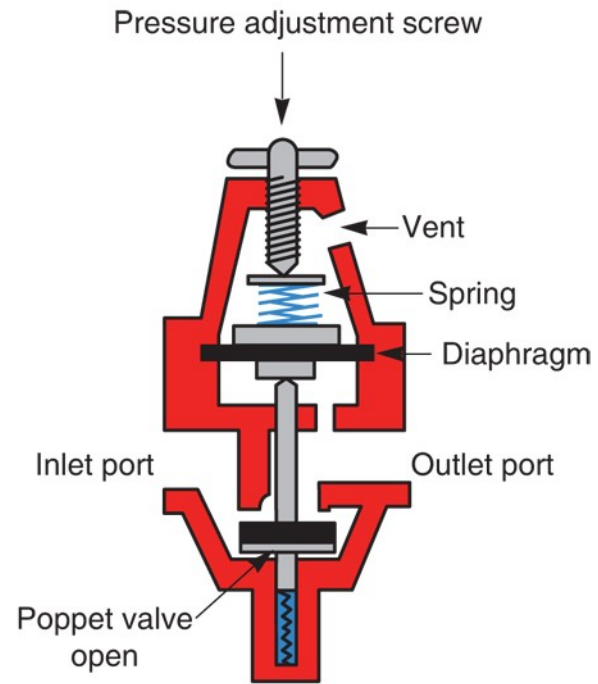
Centrifugal Pumps



Pressure Regulator Valve Operation

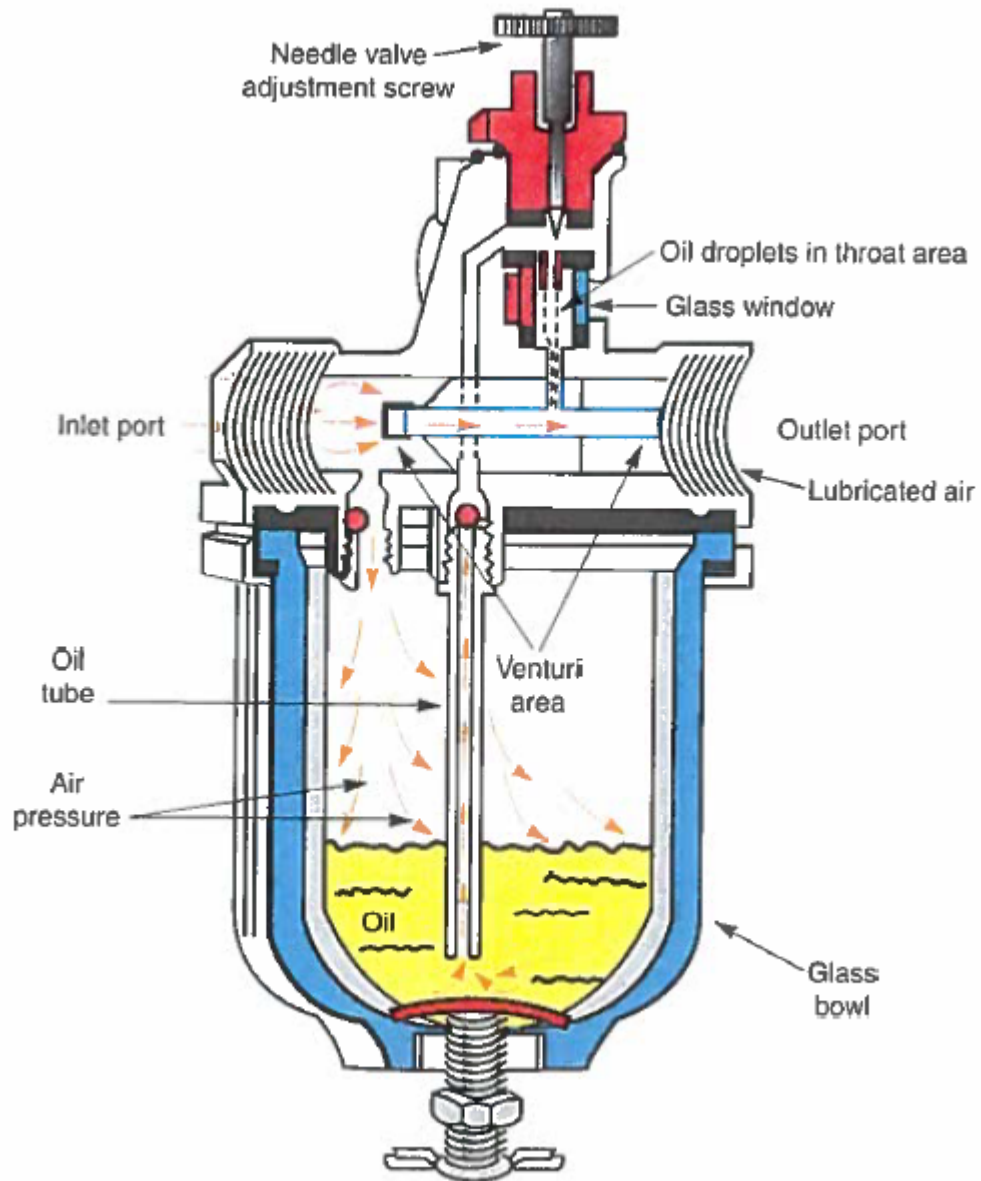


**System Pressure Above
Atmosphere Pressure**

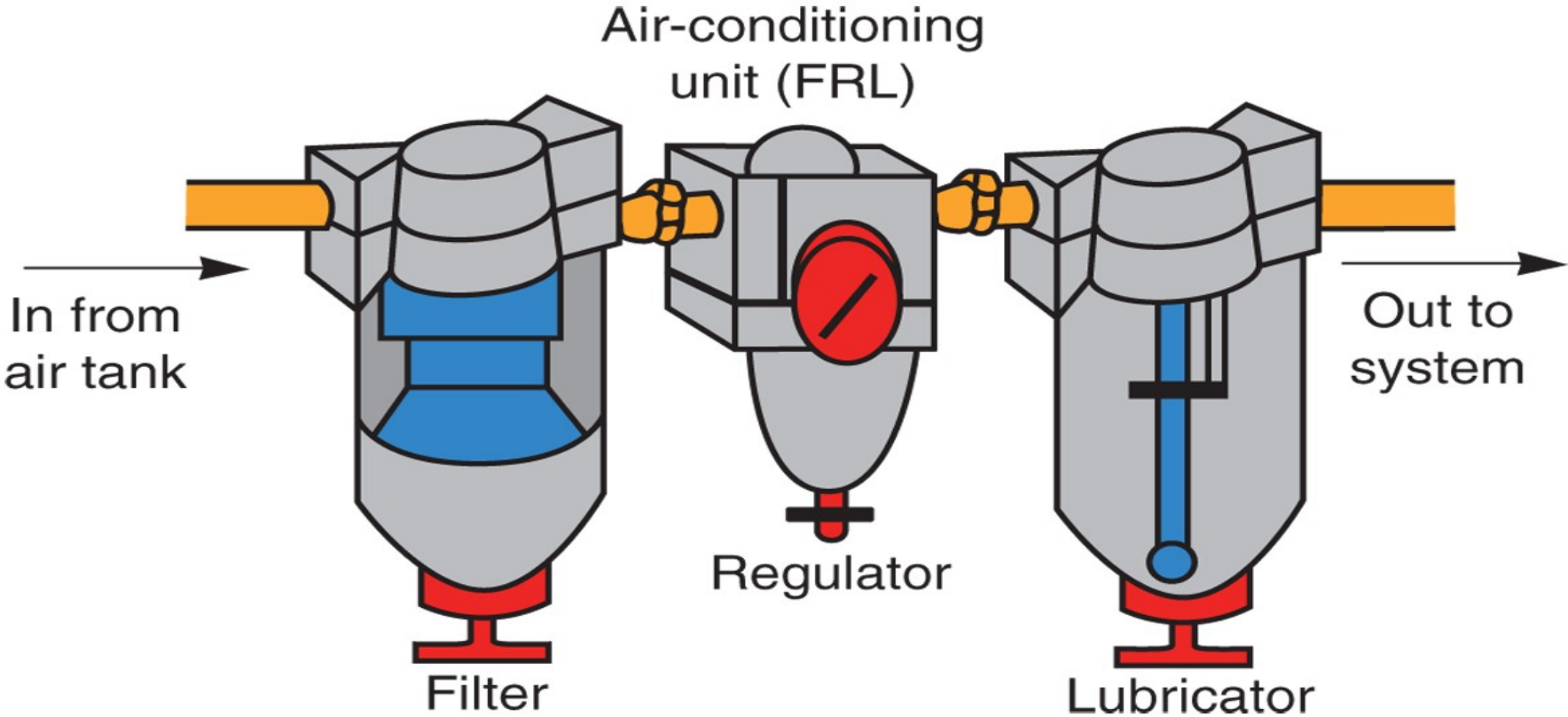


**System Pressure Below
Atmosphere Pressure**

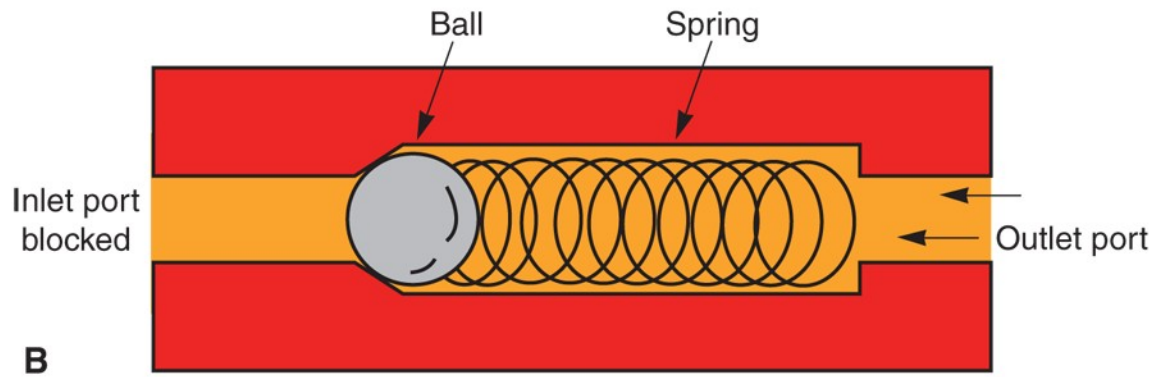
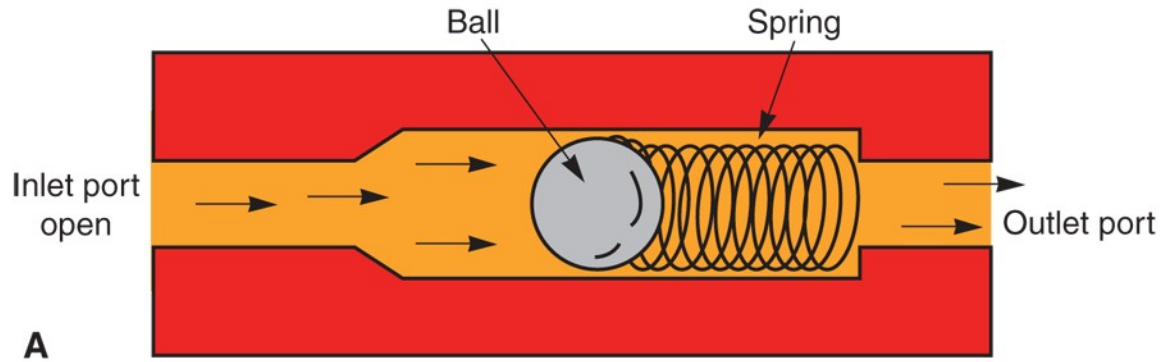
Pneumatic Lubricator



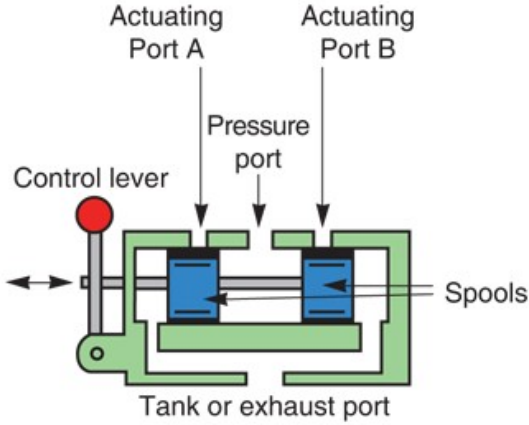
Filtration, Regulation, & Lubrication (FRL) Unit



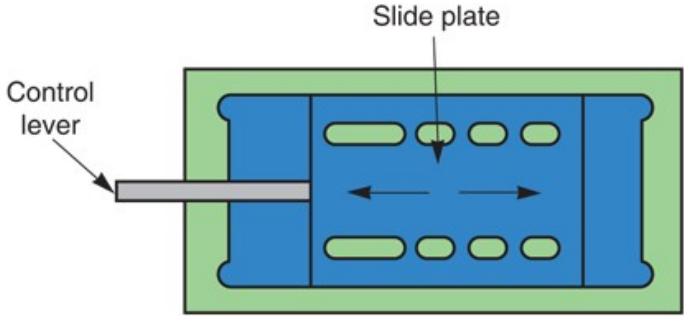
Fluid Check Valve



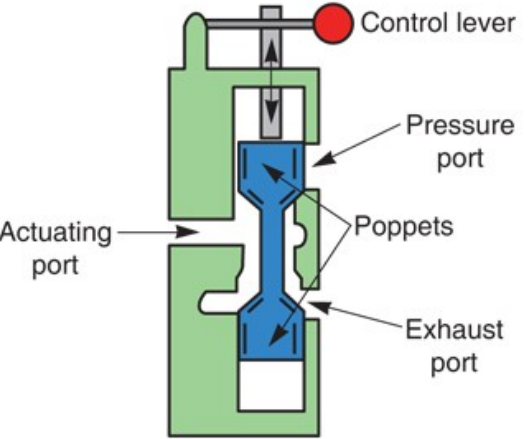
Three-way Valves



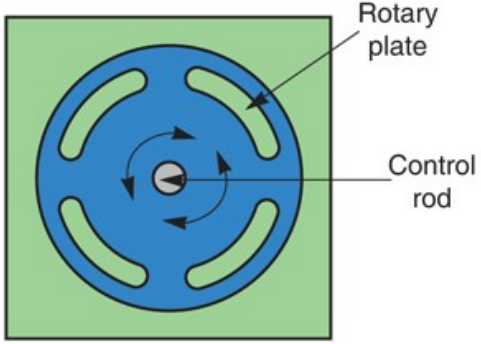
Shifting Spool Valve



Poppet Valve

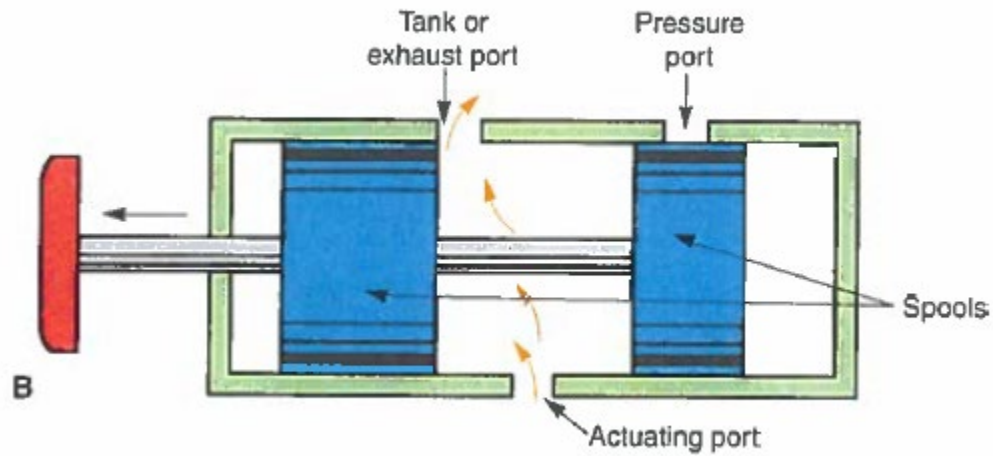
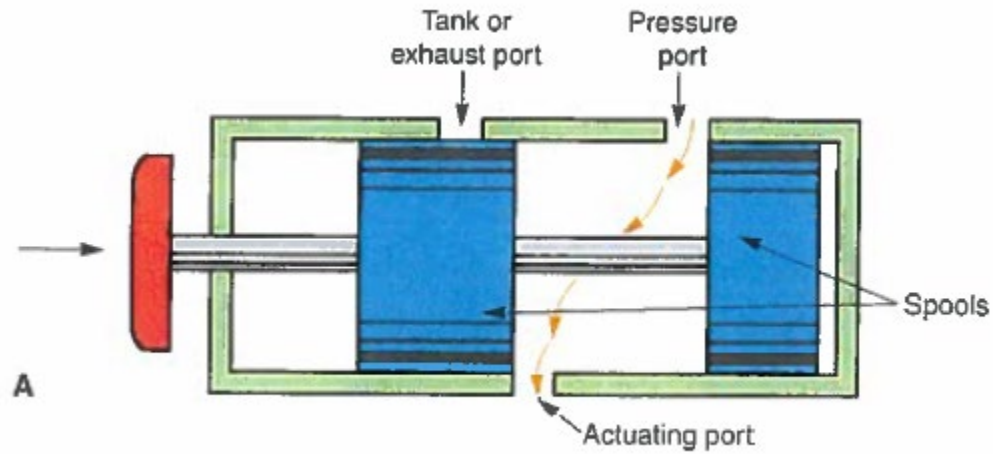


Sliding-Plate Shear-Seal Valve

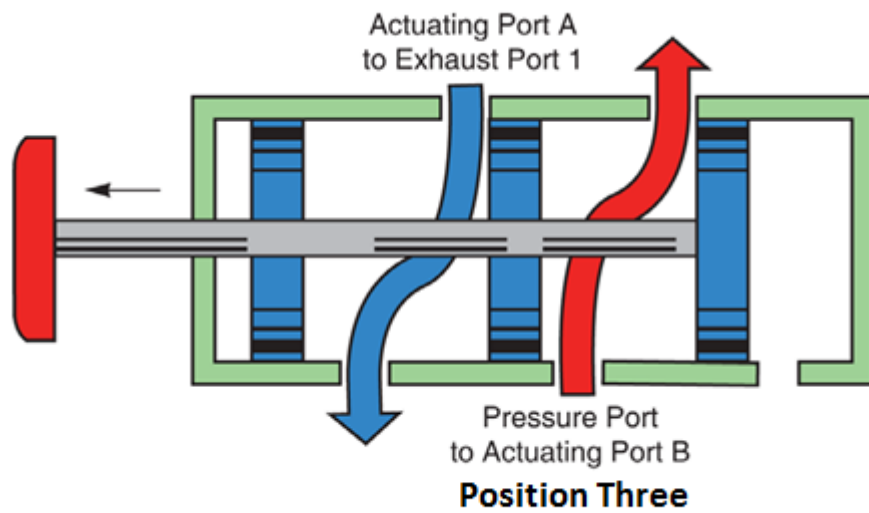
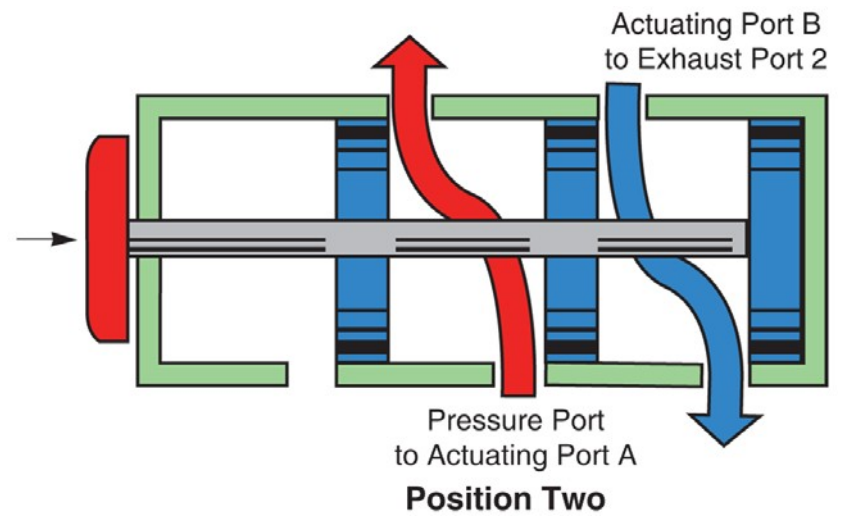
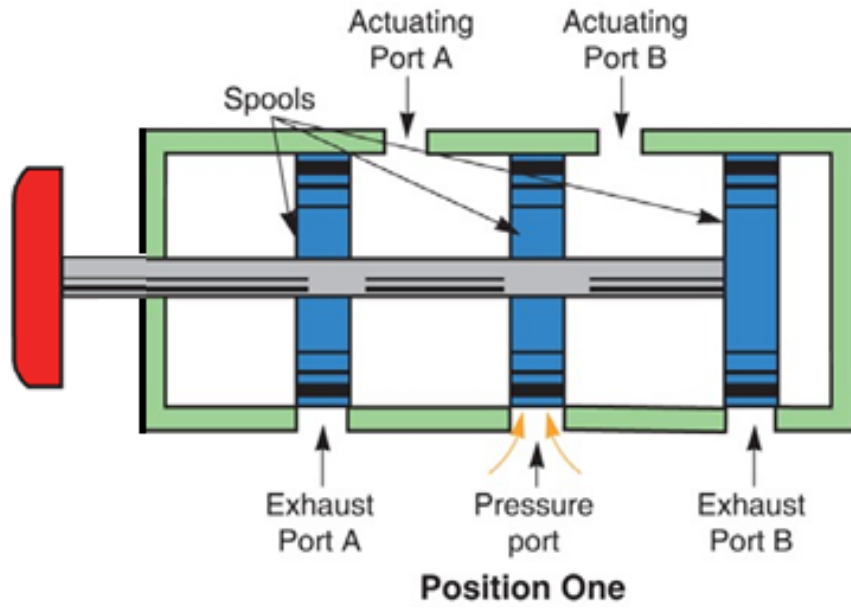


Rotary-Plate Shear-Seal Valve

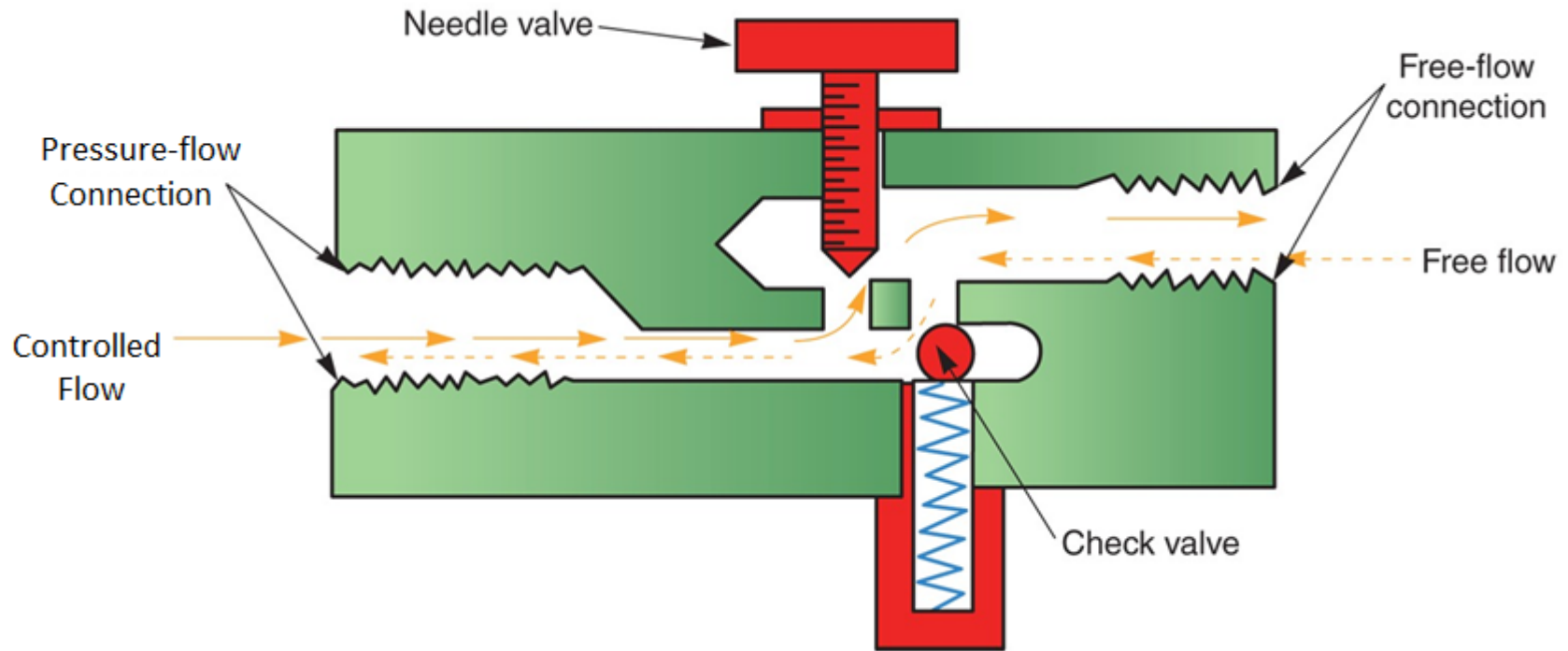
Three-Way Spool Valve



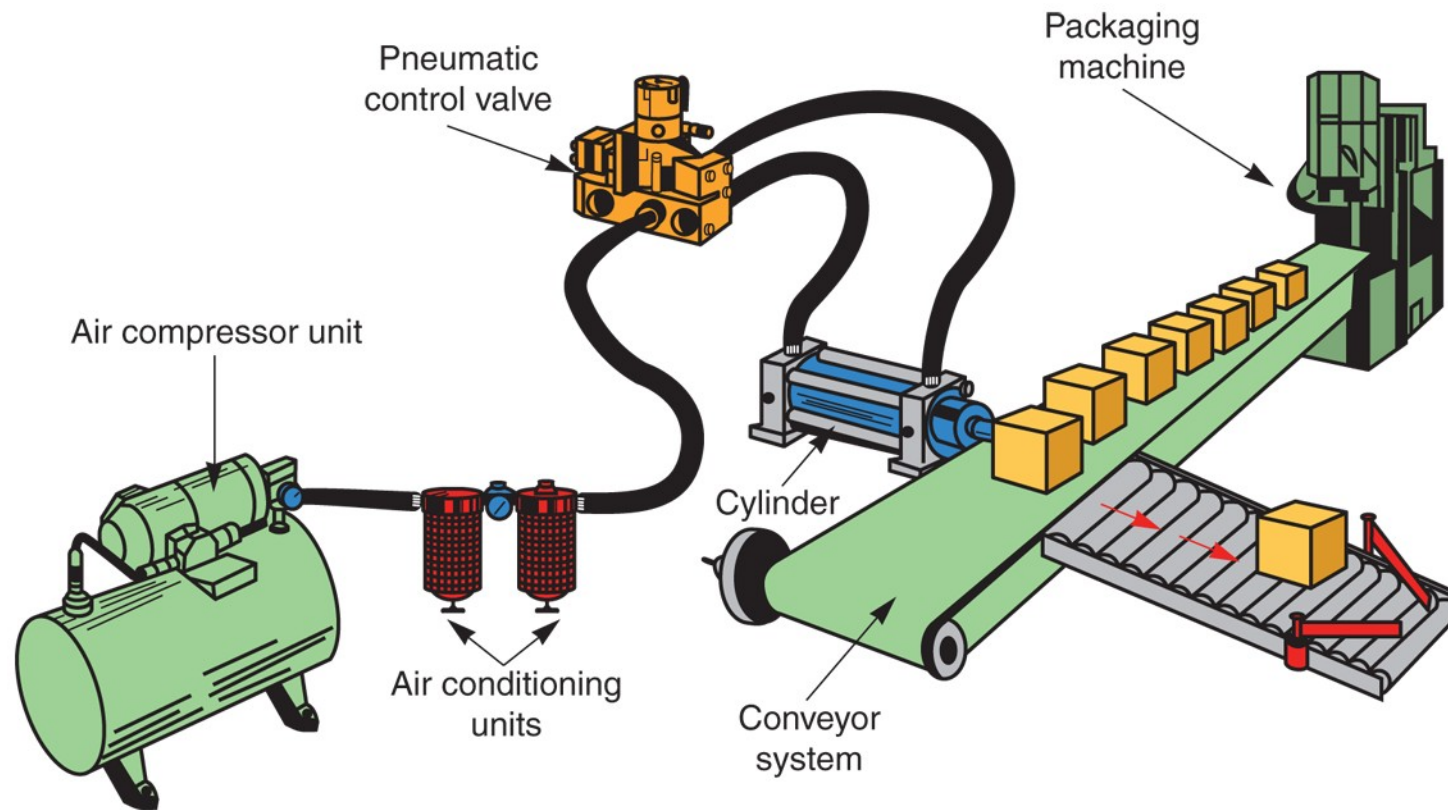
Four-way Valve



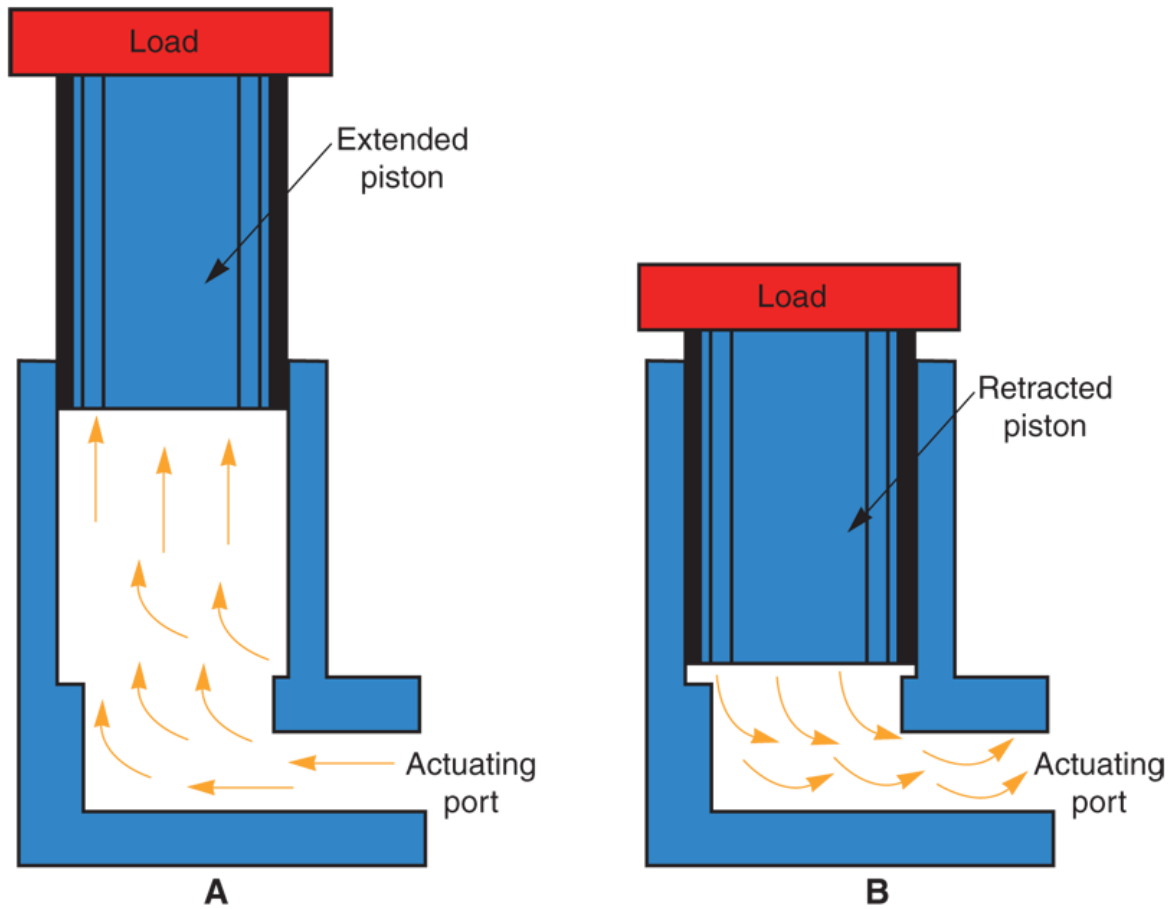
Flow Control Valve Operation



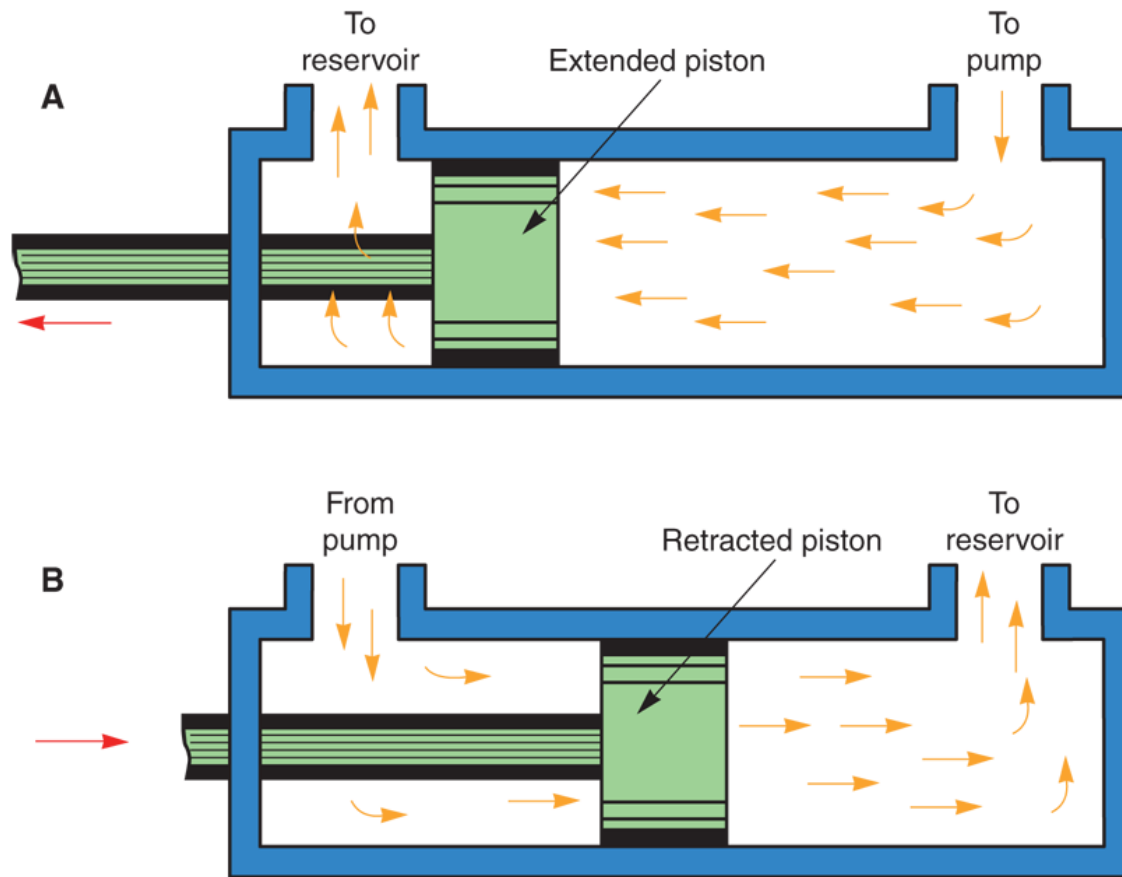
Linear Actuator (Cylinder)



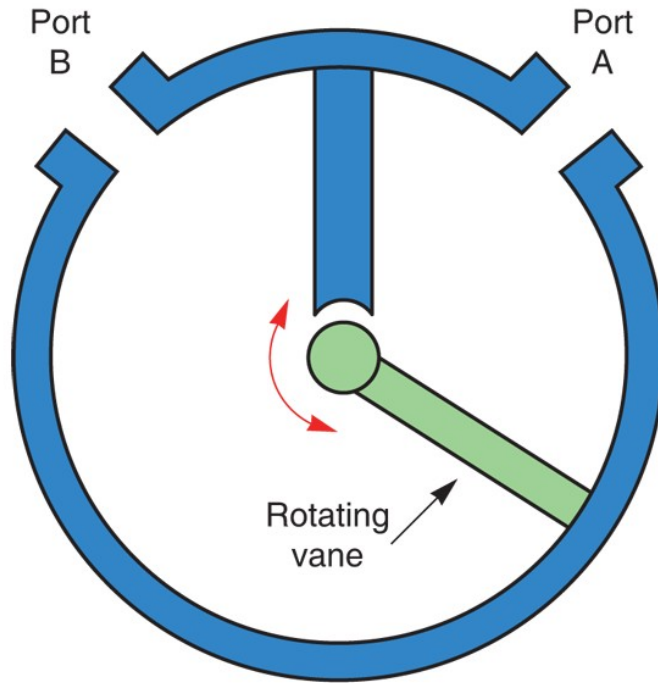
Single-acting Cylinder



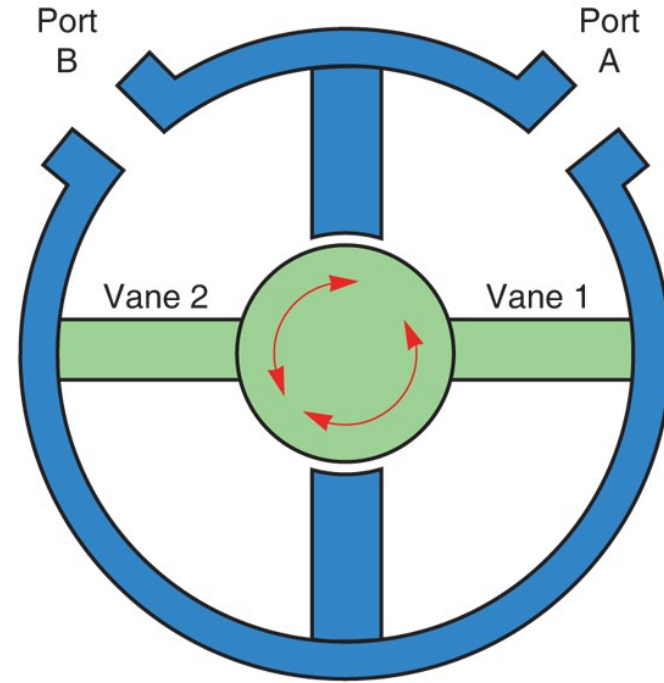
Double-acting Cylinder



Rotary Actuators



Single-Valve Rotary Actuator



Double-Valve Rotary Actuator

Hybrid Systems

