

Check Valves

Check valves are used in both hydraulic and pneumatic systems. *Figure 12-73* illustrates a flap-type pneumatic check valve. Air enters the left port of the check valve, compresses a light spring, forcing the check valve open and allowing air

to flow out the right port. But if air enters from the right, air pressure closes the valve, preventing a flow of air out the left port. Thus, a pneumatic check valve is a one-direction flow control valve.

Restrictors

Restrictors are a type of control valve used in pneumatic systems. *Figure 12-74* illustrates an orifice-type restrictor with a large inlet port and a small outlet port. The small outlet port reduces the rate of airflow and the speed of operation of an actuating unit.

Variable Restrictor

Another type of speed-regulating unit is the variable restrictor. [*Figure 12-75*] It contains an adjustable needle valve, which has threads around the top and a point on the lower end. Depending on the direction turned, the needle valve moves the sharp point either into or out of a small

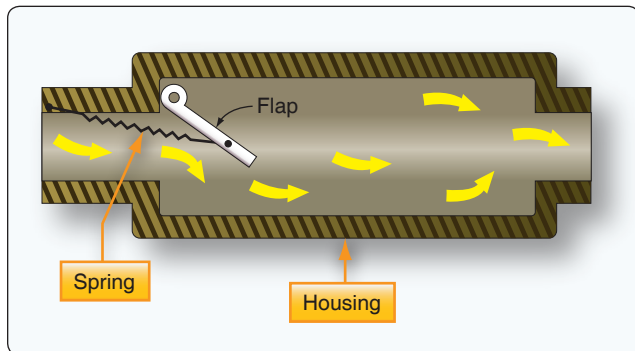


Figure 12-73. *Flap-type pneumatic check valve.*

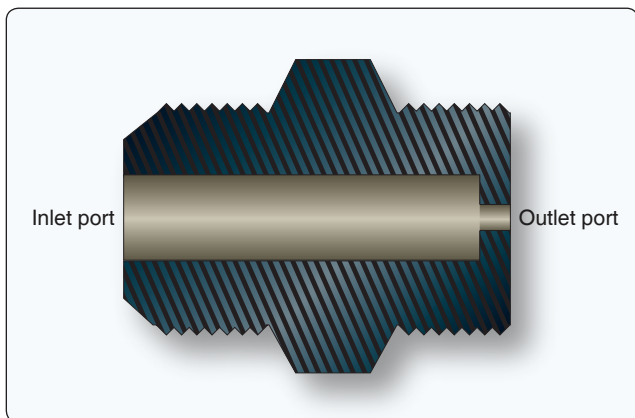


Figure 12-74. *Pneumatic orifice valve.*

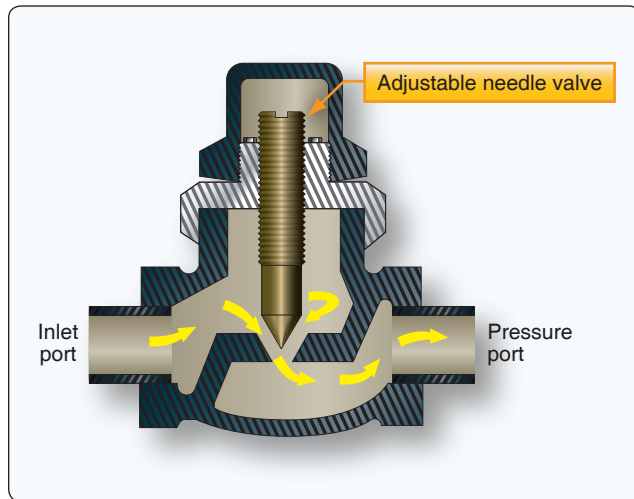


Figure 12-75. *Variable pneumatic restrictor.*

opening to decrease or increase the size of the opening. Since air entering the inlet port must pass through this opening before reaching the outlet port, this adjustment also determines the rate of airflow through the restrictor.

Filters

Pneumatic systems are protected against dirt by means of various types of filters. A micron filter consists of a housing with two ports, a replaceable cartridge, and a relief valve. Normally, air enters the inlet, circulates around the cellulose cartridge, and flows to the center of the cartridge and out the outlet port. If the cartridge becomes clogged with dirt, pressure forces the relief valve open and allows unfiltered air to flow out the outlet port.

A screen-type filter is similar to the micron filter but contains a permanent wire screen instead of a replaceable cartridge. In the screen filter, a handle extends through the top of the housing and can be used to clean the screen by rotating it against metal scrapers.

Desiccant/Moisture Separator

The moisture separator in a pneumatic system is always located downstream of the compressor. Its purpose is to remove any moisture caused by the compressor. A complete moisture separator consists of a reservoir, a pressure switch, a dump valve, and a check valve. It may also include a regulator and a relief valve. The dump valve is energized and deenergized by the pressure switch. When deenergized, it completely purges the separator reservoir and lines up to the compressor. The check valve protects the system against pressure loss during the dumping cycle and prevents reverse flow through the separator.