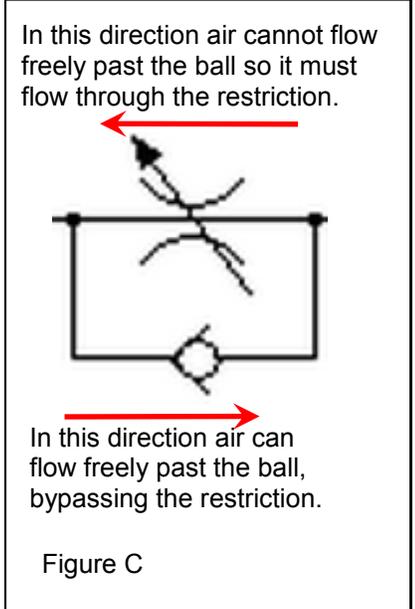
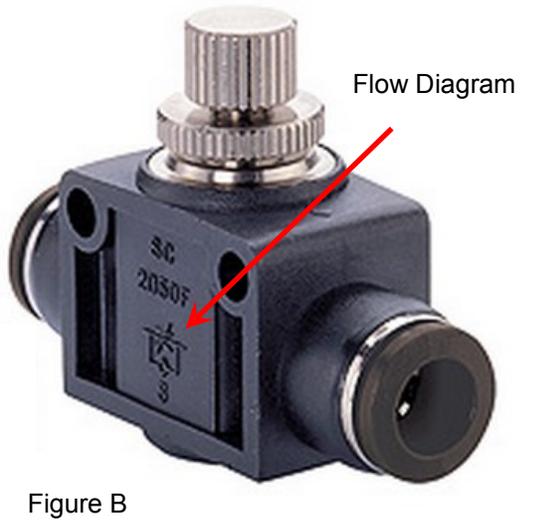
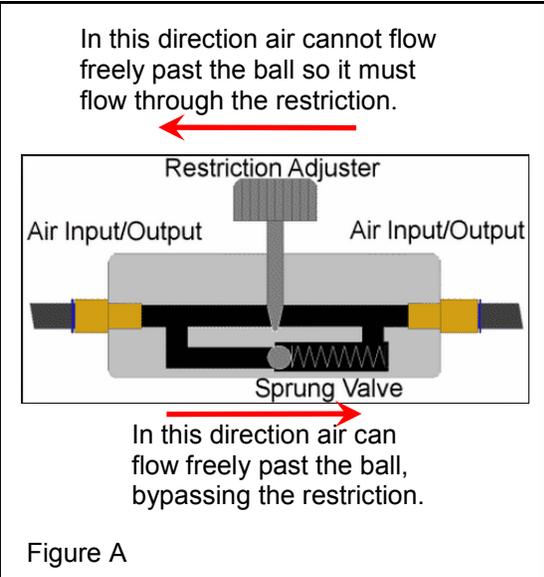


Understanding Flow Controls

Industrial machines usually have pneumatic actuators (air cylinders) to move components of the machine or to move parts flowing through the machine. The force which air cylinders can apply is controlled by a pressure regulator. The speed with which the piston moves is controlled by flow controls. There should be one flow control for each port on the actuator. One of them will control the extend speed and one will control the retract speed. Unlike a needle valve, flow controls have a check valve inside which allows free flow in one direction and controlled flow in the other direction. See Figure A.

Both valves must be installed correctly on the air lines in order to get predictable results. On our saws' front clamp cylinders we find that it works best to "meter in". This means that we control the flow of air into the cylinder as opposed to "meter out" where we control the flow as air exhausts. On nearly all other air cylinder applications, the "meter out" method is used. On RazorGage products we typically use "inline" flow controls as shown in Figure B. These can be used for either meter in or meter out applications depending on the orientation of the flow control as it is installed into the air line. To determine how flow controls should be installed, first decide if you want to meter out or meter in and then examine the flow control for a diagram that indicates the direction of free flow.

Figure C shows how to read the diagram on the flow control. Figures D and E on next page show how flow controls must be installed for both METER IN & METER OUT circuits.



CONTROLLING CYLINDER SPEED USING METER OUT

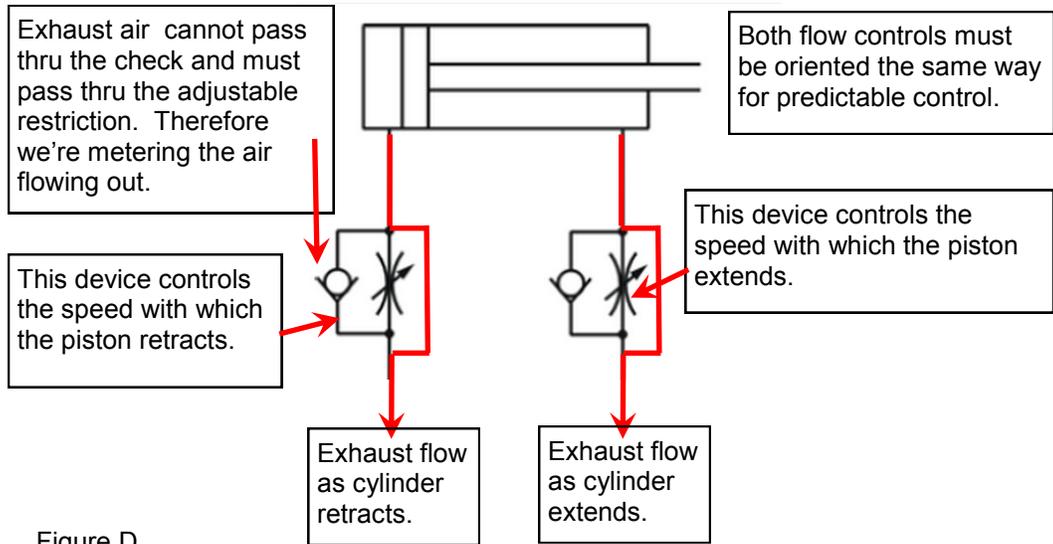


Figure D

CONTROLLING CYLINDER SPEED USING METER IN

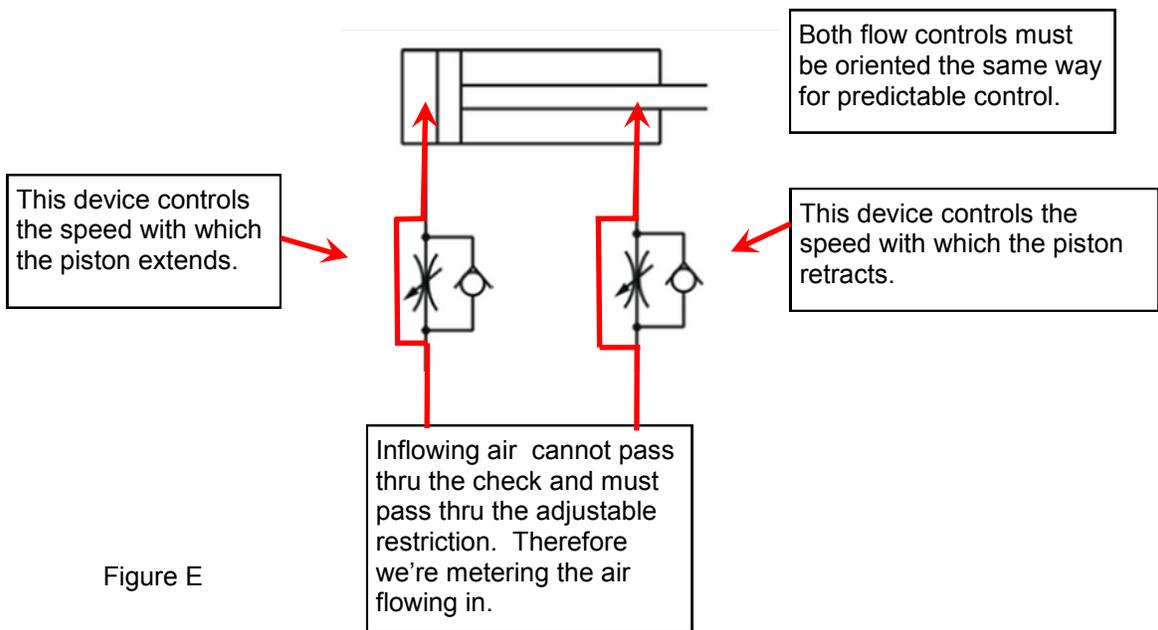


Figure E