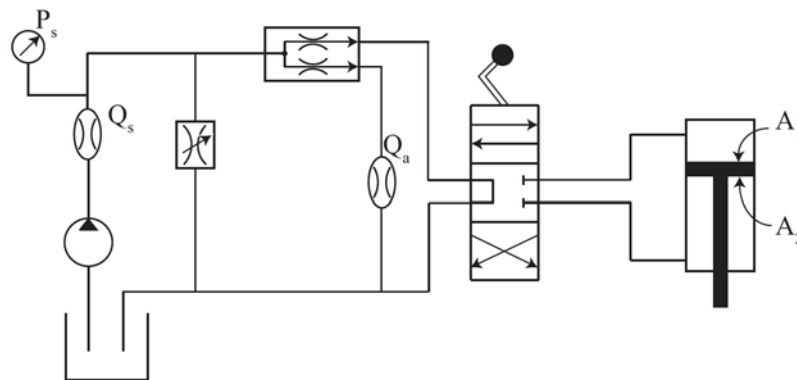


ME 4232: Fluid Power Control Lab
University of Minnesota
Prof. Perry Y. Li

Lab 9: Flow Divider

Objective

To investigate the operation of a flow divider and to determine the division ratio of the particular component given to you. As the figure in your textbook of the flow divider valve is difficult to decipher, additional figures are provided on page 2 of this handout.



Pre-lab

Read about the construction and working of the flow divider. Write a one-paragraph summary about how it works (i.e., how the ratio is maintained irrespective of the pressures). Also, create a list of the physical parameters of the flow-divider that directly affect the flow ratio.

Procedure:

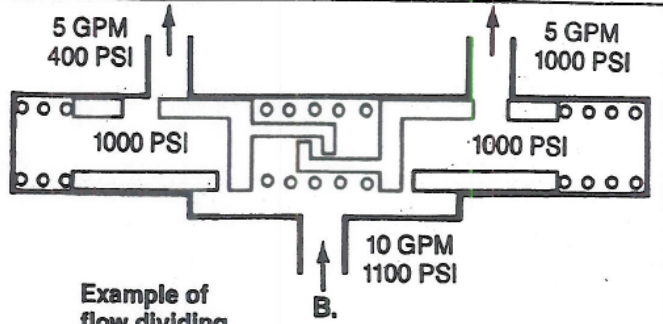
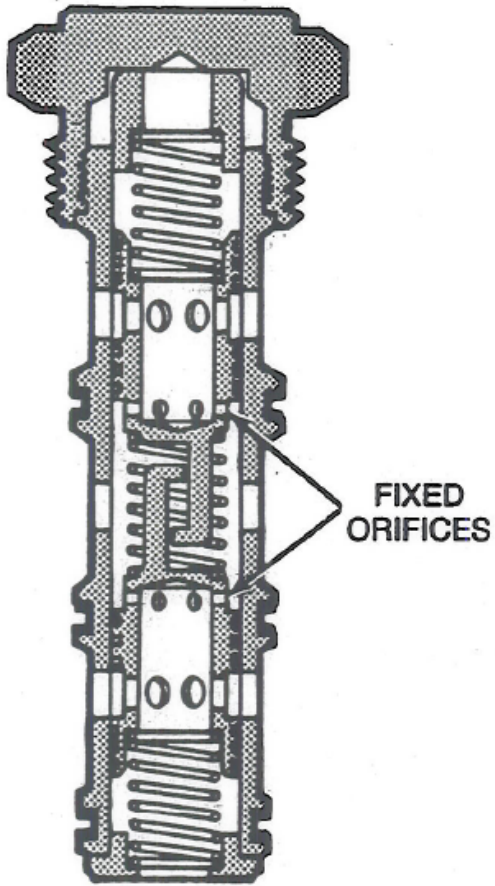
- To make this lab more interesting, we will work with the following constraints
 - Only one flow meter is available
 - The actuator areas and area-ratios are not known
 - The flow divider ratio is not necessarily 1:1
 - The connections to the flow divider can be interchanged
- Adhering to these constraints, derive the expressions required to identify the flow ratio.
- Using the flow meter measurement(s) and / or the speed of the cylinder to obtain the flow ratio.
- Vary the needle valve setting and repeat the experiment to see if the ratio changes as a function of the total flow.

Report

Your report should include the following

- A detailed description of the operation of the flow divider and the relationship of the various physical parameters on the flow ratio.
- A derivation showing relationships between the various flow rates and velocities used to identify the flow ratio.
- Document the data from the experiment and also the flow ratio obtained as the result.

Figures of a Flow Divider Valve



Example of flow dividing with unequal loads.

