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NUCL 355
Experiment 6: Friction in Pipe and Similarity Law

Objectives:

1. To measure pressure drop in pipe, bend contraction and expansion pipe.
2. To obtain friction loss in pipe.
3. To study the similarity law of friction in pipe and bend.
4. Compare minor loss in bend with friction loss in pipe.

Experimental Apparatus:

Fully assembled experimental apparatus is show in Fig.1. The apparatus consist of:

(1) Manometers
(2) Pressure taps
(3) Magnetic flow meter
(4) Pipe with round bend
(5) Pipe with sharp bend
(6) Pipes with different diameter
(7) Valve
(8) Pump
(9) Reservoir

Experiment Procedure:

1. Set up the experiment according to Fig.1
2. Connect the manometer to the pressure taps.
3. Open pump and valve. Generate fully developed turbulent flow
4. Observe the flow in the loop.

5. Record the flow rate of the pipe.
6. Measure the pressure drop from the five manometers in the figure 1.
7. Record the experiment results for data analysis.

Data Analysis

1. Using $R_e = \frac{V_p D}{\upsilon}$, calculate the Reynolds number.
2. Using loss coefficient equation, calculate the loss coefficient K of pipe, round bend and the sharp bend.
3. Compare the minor loss in the bend with the friction loss in the pipe.
4. Calculate the ΔP of the contraction and expansion pipe. Compare them with the measured results.

Reference

1. Robert W. **Fox,** Alan T. McDonald, *Introduction to Fluid Mechanics*, New York: Wiley, c1998.

Precautions

1. Don’t disturb the experimental apparatus during the experiment.

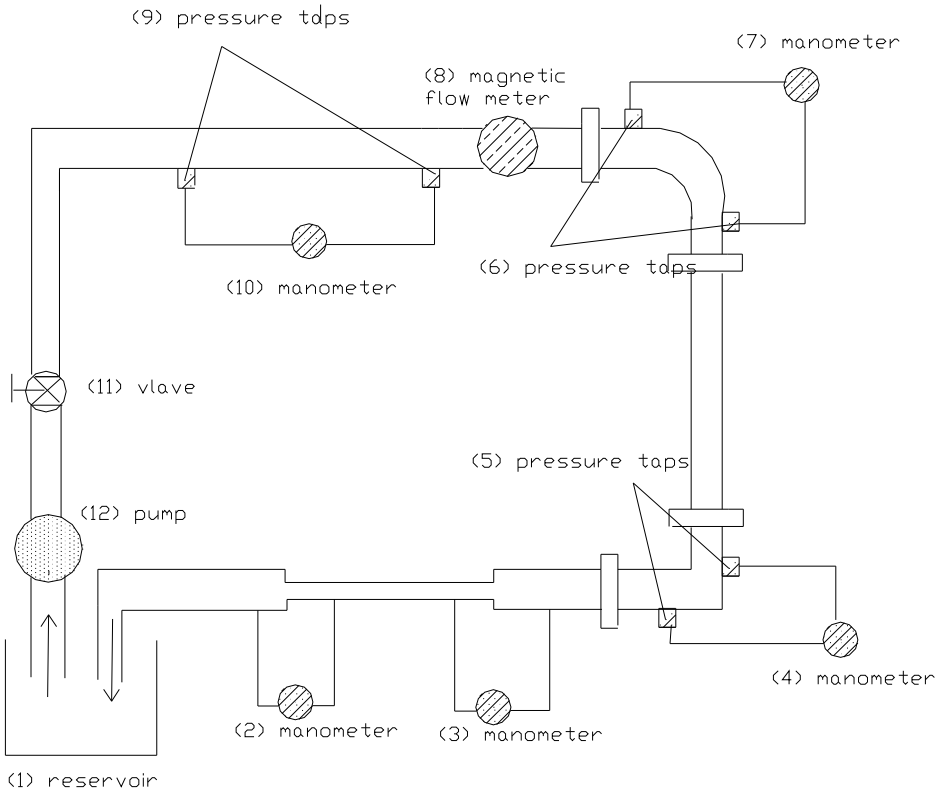

Figure 1 Friction in Pipe and Similarity Law