

3.2 Pump Ripple Reduction

Positive displacement hydraulic pumps do not produce a smooth output flow. This is due to the valving of the pumping chambers within the component. However, the ripple created by this unsteady pumping action is detrimental to precise control and will result in fluid borne noise. HyPneu's pump models, such as SH1110, will produce this ripple characteristic depending upon the pump design.

The example used for this application is a nine piston pump with a $\pm 5\%$ flow ripple as shown in the schematic. The ripple can be greatly reduced by the proper selection of an accumulator. The curves show the flow and pressure ripple in the output of this pump with and without an appropriate accumulator incorporated into the system.

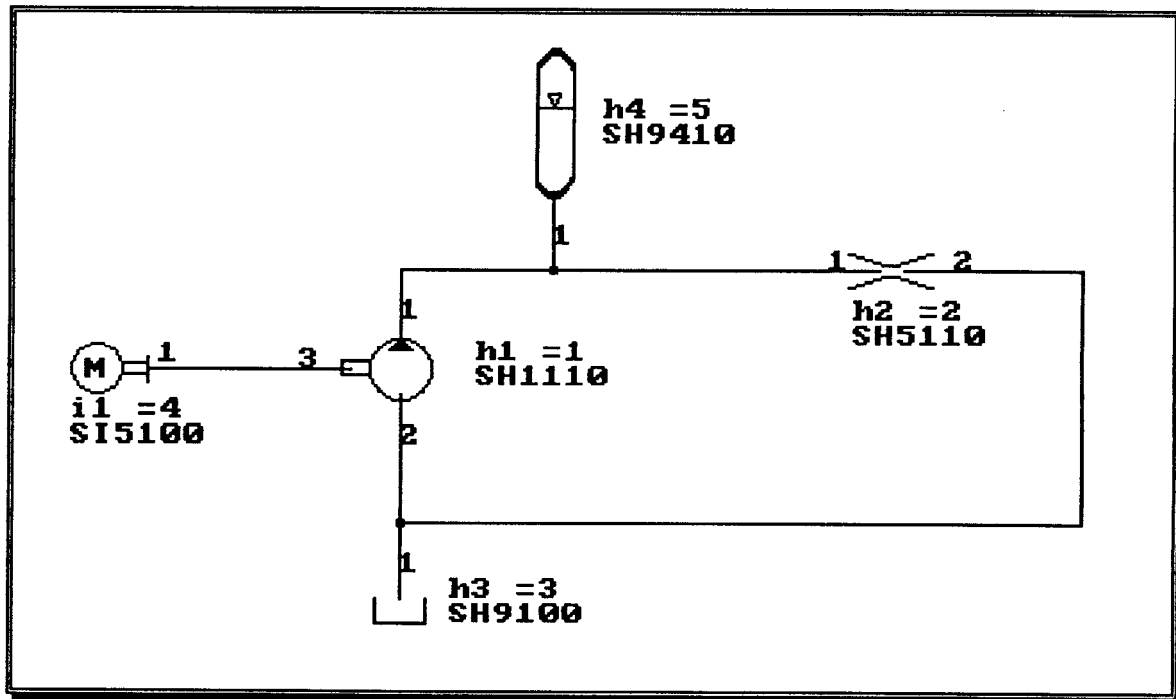


Figure 3.2a. Pump Ripple Reduction Schematic.

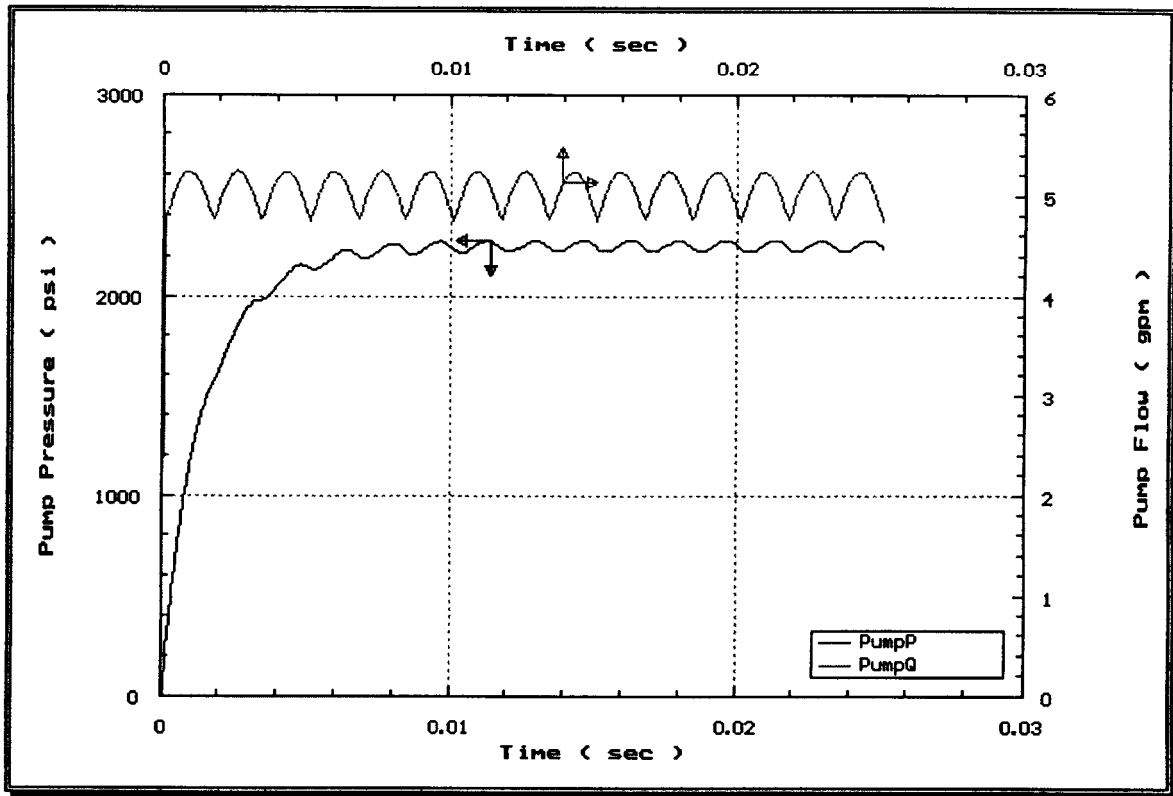


Figure 3.2b. Pump Ripple Reduction Study Without Accumulator.

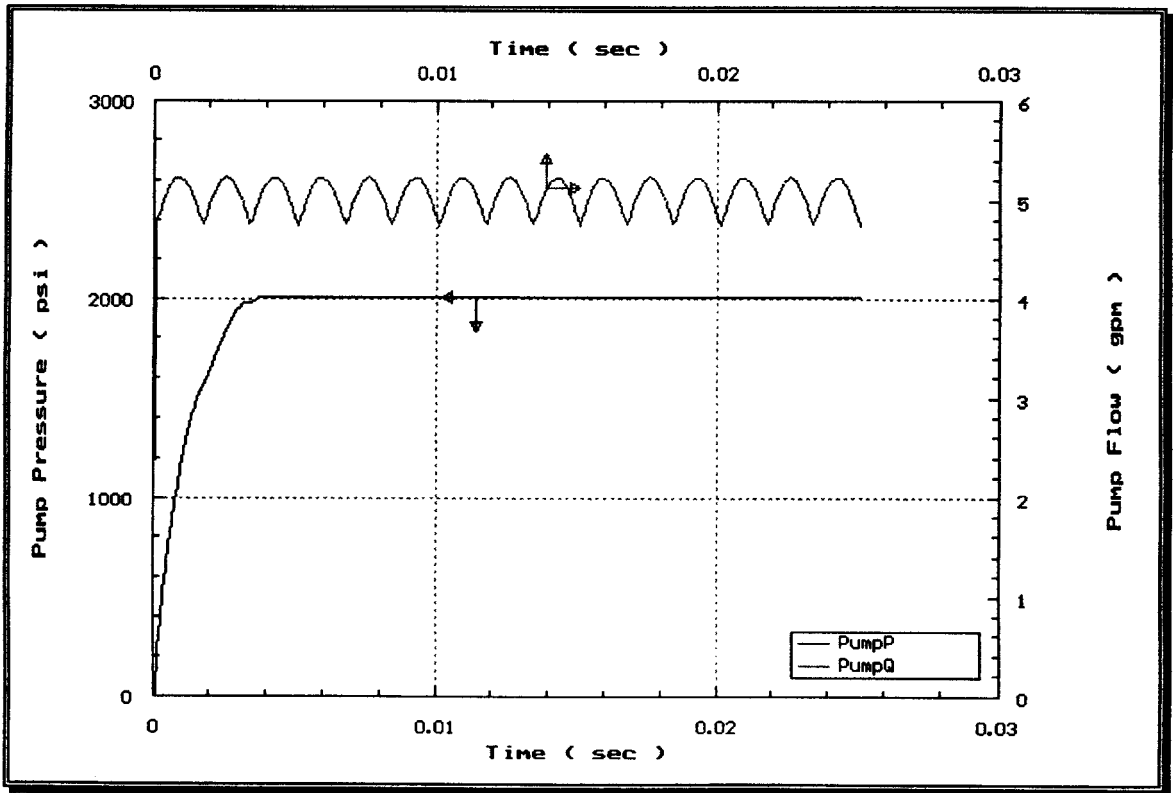


Figure 3.2c. Pump Ripple Reduction Study With Accumulator.