2.4 System Efficiency Analysis

This example will demonstrate the manner in which HyPneu can be used to determine the overall efficiency of a hydraulic system. Included in the HyPneu model base are models called HPH and EFF which stand for Hydraulic Horsepower and overall Efficiency, respectively. By inserting the HPH models into the lines at the two locations within the system which will be used in the efficiency evaluation and connecting their output to the EFF model, HyPneu will calculate efficiency.

The cylinder control system shown in the schematic is used to demonstrate the use of the HPH and the EFF models. The horsepower at the pump outlet and at the cylinder inlet are used in the efficiency determination. The performance of the example system without line considerations is shown by the curves of the pump outlet and cylinder inlet horsepower along with the dynamic efficiency curve. For comparison purposes, the cylinder system is modified to include a 1/4 inch 30 foot line, as shown in the schematic. The various curves illustrate the performance of this modified system. The dynamic efficiency curves are shown without the two horsepower traces for ease of viewing purposes.
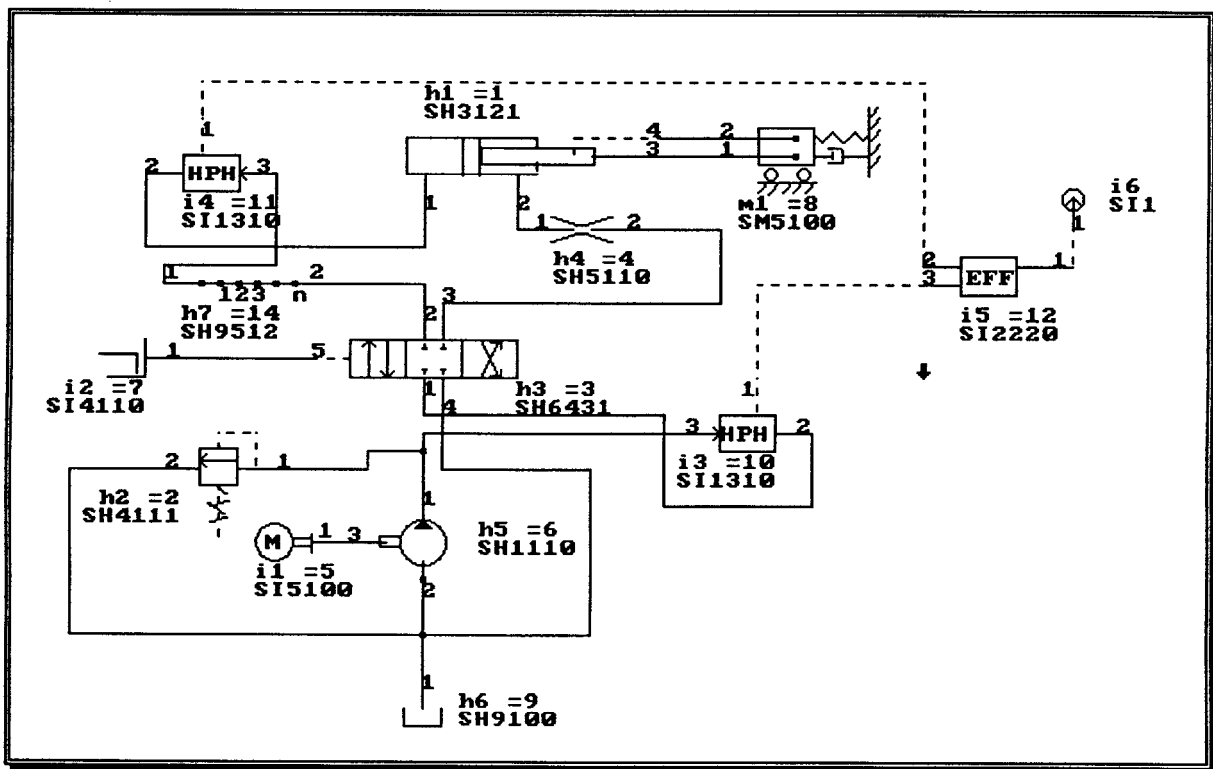

Figure 2.4a. System Efficiency Analysis Schematic
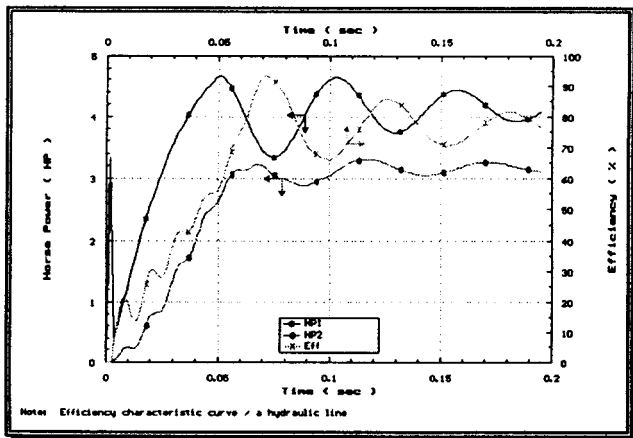
Figure 2.4b.
System Efficiency Analysis
with Line Considerations

Figure 2.4c.
System Efficiency Analysis
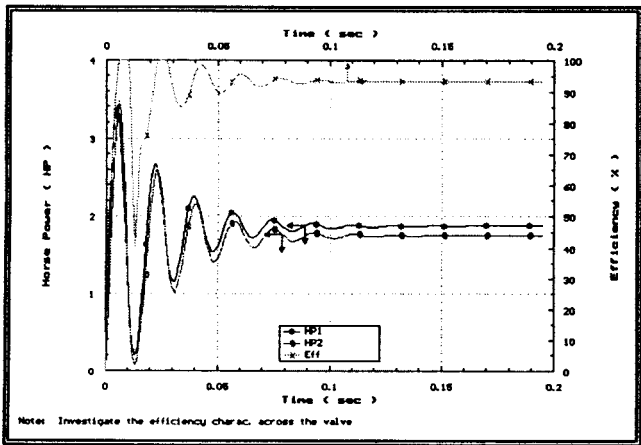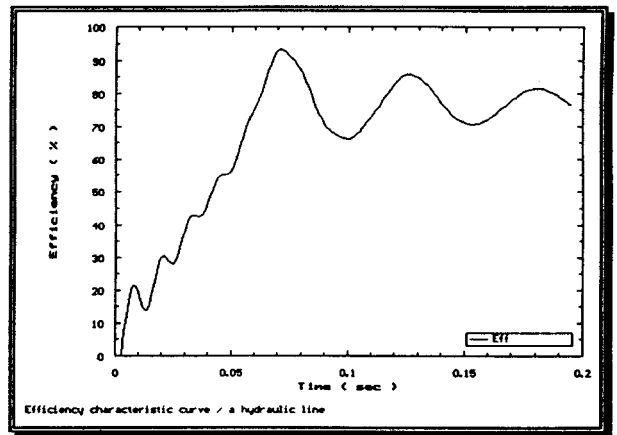with Line Considerations

Figure 2.4d.
System Efficiency Analysis
without Line Consideration

Figure 2.4e.
System Efficiency Analysis
without Line Considerations