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Simulation and Analysis of Different Parameters in Hydraulic Circuit Due to Leakage

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Abstract : Leakage is the main gradual failure in the fluid power system, which is usually caused by the impurity in the oil and wear of matching surfaces between parts and lead to the change of the gap value. When leakage occurs in the system, the oil will flow from the high pressure chamber into the low pressure chamber through the gap, causing the reduction of system flow as well as the loss of system pressure, resulting in the decreasing of system efficiency. In the fluid power system, internal leakage may occur in various components such as gear pump, reversing valve and hydraulic cylinder, and affect the system work performance. Therefore, component leakage in the fluid power system is selected as the study to characterize the leakage and the effect of leakage on the system. Effect of leakage on system pressure and cylinder displacement can be obtained using pressure sensors and the displacement sensor. The leakage can be varied by changing the orifice using a flow control valve. Hydraulic circuit for leakage will be developed in Matlab/Simulink environment and simulations will be done by changing different parameters.

Keywords : leakage causes, effect, analysis, MATLAB simulation, hydraulic circuit
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