This thesis studies an innovative working hydraulic system design for mobile applications, referred to as flow control. The fundamental difference compared to load sensing systems is that the pump is controlled based on the operator’s command signals rather than feedback signals from the loads. This control approach enables higher energy efficiency and better dynamic characteristics compared to load sensing. In this research, both theoretical studies and practical implementations demonstrate the capability of flow control systems. Experiments show a reduced pump pressure margin and energy saving possibilities in a short loading cycle for a wheel loader application.