**FREQUENTLY ASKED QUESTIONS**

Q: How can load sensing be beneficial to a hydraulic system?
A: A load sensing (LS) system is one typically utilizing a variable volume pump having an LS controller, and designed to maintain a constant pressure drop across an orifice, (i.e. needle valve, fixed orifice, directional control valve, etc.). LS line senses system pressure downstream of the orifice (proportional directional control valve) and the pump controller automatically adjusts the pump output to maintain a constant pressure drop, which means the flow volume is also constant. This is particularly beneficial in unsaturated systems with more than one valve actuated at any given time.

Q: What is the typical efficiency of a hydraulic system?
A: Efficiency can run from 50% to 80%, and is affected by various application parameters, such as ambient temperature, cleanliness, fluid viscosity, duty cycle, etc. Generally speaking, the use of a LS system increases efficiency, but system efficiency may or may not benefit from its use, it all depends on a full understanding of the system’s variables, and intended purpose.

Q: What are the problems when flow is fixed?
A: In systems with fixed displacement pumps, 100 percent of the flow is available but the system does not require it. The flow not used in service of system components are standard with any hydraulic equipment, concrete boom trucks, er trucks, bull dozers, cranes, drilling & fire truck aerials, backhoes, spreader trucks, bull dozers, cranes, drilling equipment, concrete boom trucks.

Q: How is load sensing technology energy effective?
A: Load sensing variable pumps help reduce heat loss which improves energy efficiency. They also offer more precise control of flow in the system. Since they only produce flow when required, the amount of heat loss due to excess flow is reduced. Because the variable pump produces flow on demand, load sensing control results in lower oxidation rates, increases fluid life, and improves actuator control. They also produce a constant pressure drop. A constant pressure drop keeps the flow across the orifice constant. This is achieved by the load sensing circuit. In a load sensing circuit, the load-induced pressure downstream of the orifice is sent back to the pump via the directional control valve's load signal gallery. The load sensing controller responds to the increase of load pressure by increasing the pump flow. This maintains the upstream pressure of the orifice increasing by the corresponding amount.

Q: What are the typical applications of load sensing technology?
A: Typical applications for applying LS technology are those operating more than one valve simultaneously when there is a concern over whether or not operating one will affect the performance of another. If there is no concern running one consumer might affect the speed of another, for example, a load sensing system may not be required. But, if this is an issue, a LS system is likely the better choice. Examples for use of a LS system would include mobile cranes & fire truck aerials, backhoes, spreader trucks, bull dozers, cranes, drilling equipment, concrete boom trucks.

Q: What are the parameters for load sensing technology?
A: One of the convenient aspects of LS technology is the boundaries are almost limitless. Because load sensing is accomplished with shuttled pilot flows, maximum flow rates and pressure capacities are limited to the design of the components used in the system. One LS application may be rated at hundreds of gpm and relatively low pressure, while another may be rated at only one or two gpm and fairly high pressure, but both exhibit the same, general benefits of the system’s design. As with max flow rate and pressure capacity, there is almost no limit to the installed horsepower of the hydraulic system; the only caveat is to be sure the available horsepower is enough to move the required flow volume at the required operating pressure, or the system will stall. Typically a max flow rate of 250 gpm and a pressure capacity of 6000 psi is possible.

Q: What are the components necessary to build a load sensing hydraulic system?
A: The bare minimum components necessary to build a LS hydraulic system are a variable volume pump with a LS controller, and a point downstream of the orifice which is typically a proportional directional control valve. Directional spool valves control the direction of movement the hydraulics and provide load independent, step less control of their speed. The valves serve to control the direction of pumps, motor and delivering infinite speed control. The remaining required components are standard with any hydraulic system: reservoir, hoses, tubes, fittings, prime mover, gauges, etc. The obvious difference between a LS system and a non-LS system is in a typical LS system, a pilot line is run between the pump controller and a point downstream of the orifice.

**Load Sensing Technology**

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Regardless of load type or weight, HAWE’s PSL Valves allow you to control your equipment’s directional movement while maintaining speed control.

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