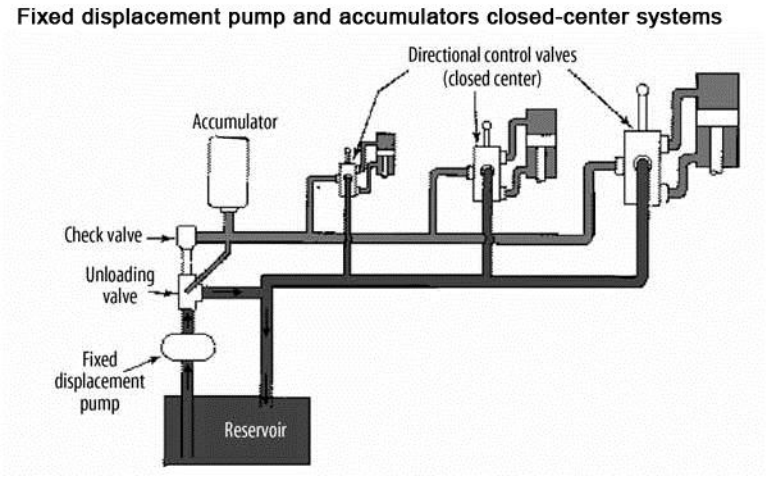
Hydraulic Fluids – Hydraulic Systems

Hydraulic Accumulators

An accumulator is like an electrical storage battery. Hydraulic accumulators store potential power, in this case liquid under pressure, for future conversion into useful work. The work can include briefly operating cylinders and fluid motors, maintaining the required system pressure during starts, stops and direction changes while also providing shock-absorbing or cushioning action with short duration pressure spikes.

A basic system, the accumulator is



There are several kinds of accumulators: (I put this into a chart, but what I think would be effective is it a flowchart. Spring and gas loaded are at the top, then arrows lead from gas loaded to the piston and bladder, with explanations or illustrations (or both) of the details.

Spring loaded	**Gas loaded**	
Energy is stored as the piston is pushed against the spring. When the fluid pressure increases to the point above the preload force of the spring, fluid will enter the accumulator to be stored until the pressure reduces and the fluid flows back out of the accumulator.	Two types: piston and bladder	Piston - The spring is replaced by a chamber behind the piston in which a gas is charged. Thus, a piston accumulator consists of a cylinder assembly, a piston assembly and two end-cap assemblies, with the hydraulic fluid on one side of the piston and a gas on the other side. Further, as the fluid pressure increases, fluid flows into the hydraulic fluid chamber, pushing the free-floating piston back against a precharged (air or nitrogen) gas

		chamber, compressing the gas.
		Bag-type accumulator - a seamless rubber bag mounted within a high pressure steel cylindrical shell, usually with domed ends. A gas is charged on one side of the bag and the hydraulic fluid from the system can enter on the other. As the pump forces liquid into the shell, the fluid presses against the bag, compressing it as the pressure rises. In this way energy is stored.