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Wattage to heat hydraulic oil: each 1 watt will raise the temperature of 1 gallon of oil by 1°F per hour. Guidelines for flow

velocity in hydraulic lines: 2 to 4 ft/sec = suction lines; 10 to 15 ft/sec = pressure lines up to 500 psi; 15 to 20 ft/sec = pressure lines 500 - 3,000 psi; 25 ft/sec = pressure lines over 3,000 psi  
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(also known as First Law of Thermodynamics). These are based on classical mechanics and are modified in quantum mechanics and general relativity. They are expressed using the Reynolds transport theorem.

Hydraulic system might be simple or complex but we will have to start with the basic concepts of hydraulic system to find the root cause of a problem and its real solution. So what are the basic concepts that we have to keep in mind during the analysis of a hydraulic problem?

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Basic Hydraulic Principles. A simple hydraulic system consists of hydraulic fluid, pistons or rams, cylinders, accumulator or oil reservoir, a complete working mechanism, and safety devices.

These systems are capable of remotely controlling a wide variety

of equipment by transmitting force, carried by the hydraulic fluid, in a confined medium.

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Given these simple formulas, try to answer the questions below. Exercises: A hydraulic press has an input cylinder 1 inch in diameter and an output cylinder 6 inches in diameter. Assuming 100% efficiency, find the force exerted by the output piston when a force of 10 pounds is applied to the input piston.

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