

# Common Hydraulic formulas

## Rules of Thumb

For every 1 HP of drive, the equivalent of 1 GPM @ 1500 psi can be produced.

To idle a pump when it is unloaded will require 5 % of it's full rated HP.

Volume reduction of oil is approximately 1/2% for every 1000 psi of pressure.

Volume reduction of water is about 1/3% for every 1000 psi of pressure.

Flow velocity in hydraulic lines. Pump suction lines 2-4 feet per second. Continuous duty pressure lines is 15-20 feet per second. Intermittent duty pressure lines 20-30 feet per second. Return lines 10-15 feet per second.

Heat removal in HP for hydraulic tanks. 1/3 of operating HP. Example 30 HP electric motor you want to remove 10 HP worth of heat.

1 bar = 14.5 PSI

Force = Pressure X Area

### Torque and Horsepower Relations

Torque = HP X 5252 / RPM

HP= Torque X RPM / 5252

RPM = HP X 5252 / Torque

### Hydraulic Horsepower (for use when calculating hp of motor for a pump)

Horsepower = Pressure X Gallons Per Minute / 1714

### Velocity of Oil flow in pipe

Velocity = Gallons per Minute X .3208 / Area

### Circle Formulas

Area = 3.14 X Radius (Squared)

Area = 3.14 X Diameter (Squared) / 4

Circumference = 2 X 3.14 X Radius or 3.14 X Diameter

### Calculating gallons in a Tank

L X W X H (in inches) / 231=Gallons in tank

