PENINSULAR® CYLINDER CO.

Common Hydraulic Formulas

Property	Word Formula	Mathematic Equation
Cylinder Force lbs. *(Pounds of Force)*	**Force=**Pressure (psi) x Net Area (in²)	**F**=PA
Fluid Motor Speed RPM *(Revolutions per Minute)*	**Speed** = 231 x Flow Rate (GPM) / F.M. Displacement (in³/rev.)	**n** = 231 Q / d
Fluid Pressure psi *(Pounds per Square Inch)*	**Pressure** = Force (lbs) / Area (in ²)	**P**= F / A
Fluid Motor Torque lb-in *(Inch Pounds)*	**Torque** = Pressure (psi) x F.M. Displacement (in³/rev.) / 2π	**T**= Pd / 2π
	Torque= Horsepower x 63025 / RPM	**T** = 63025 hp / n
	Torque = Flow Rate (GPM) x Pressure (psi) x 36.77 / RPM	**T**=36.77 Q P / N
Fluid Motor Power **hp** *(Horsepower)*	**Horsepower** = Torque (lbs-in) x RPM / 63025	**hp**= Tn / 63025
Cylinder Area Extend in² *(Square Inches)*	**Are**a = π(4 x Bore Diameter ²)	**A** = .7854 D²
Cylinder Area Retract (w/rod) in² *(Square Inches)*	**Area =** (π/4 x Bore Diameter²) – (π/4 x Rod Diameter²)	**A=** (.7854 Db²)– (.7854 Dr²)
Cylinder Volume G *(Gallons of Fluid)*	**Volume** = Net Area (in²) x Stroke (in) / 231	**V** = A L / 231
Cylinder Power hp *(Horsepower)*	**Horsepower** = Pressure (psi) x Flow Rate (GPM) / 1714	**hp** = P Q / 1714
Cylinder Velocity ft/s *(Feet per Second)*	**Velocity** = 231 x Flow Rate (GPM) / 12 x 60 x Net Area (in²)	**v**= .3208 Q / A
Pump Outlet Flow GPM *(Gallons per Minute)*	**Flow** = RPM x Pump Displacement (in³/rev.) / 231	**Q**= nd / 231
Flow Rate Through Piping ft/s Velocity (Feet per Second)	**Velocity**= .3208 x Flow Rate Through I.D. (GPM) / Internal Area (in²)	**v**=.3208Q / A