

### Conversions

### Formulas

TO CONVERT	INTO	MULTIPLY BY
Bar	PSI	14.5
cc	Cu. In.	0.06102
°C	°F	(°C x 9/5) + 32
Kg	lbs.	2.205
KW	HP	1.341
Liters	Gallons	0.2642
mm	inches	0.03937
Nm	Lb.-ft.	0.7375
N	Lbs.	0.22481
Cu. In.	cc	16.39
°F	°C	(°F-32) / 1.8
Gallons	Liters	3.785
HP	KW	0.7457
Inches	mm	25.4
Lbs.	Kg	0.4535
Lb.-ft.	Nm	1.356
PSI	Bar	0.06896
In. of HG	PSI	0.4912
In. of H <sub>2</sub> O	PSI	0.03613
Lbs.	Nm	4.4482

<b>CYLINDERS</b>	Cylinder Area = diameter <sup>2</sup> x .7854	Tube Area = $\frac{GPM \times .3208}{oil\ velocity}$
	Cylinder Force = pressure x area	Adjust GPM on Return = $\frac{cyl\ area \times GPM}{area}$
	Cylinder Time (in seconds) = $\frac{area \times stroke \times .26}{GPM}$	Cylinder Speed (Ft/Min) = $\frac{stroke \times 5}{time\ (in\ secs)}$
	Pneumatic HP = $\frac{compressed\ CFM \times PSI \times 144}{33,000}$	Cylinder Speed (Ft/Min) = $\frac{GPM \times 19.25}{area}$
	Cylinder HP = $\frac{cyl\ speed \times cyl\ force}{33,000}$	Comp CFM = $\frac{area \times stroke \times 60}{time\ (in\ secs) \times 1728}$

<b>PUMPS • MOTORS</b>	HP Out = $\frac{HP\ IN \times overall\ Eff.}{100}$	GPM = $\frac{RPM \times disp.\ (in\ inches^3)}{231}$
	Actual Torque = $\frac{theo.\ torque \times mech.\ eff.}{100}$	Hyd. HP = $\frac{GPM \times PSI}{1714}$
	Actual Motor RPM = $\frac{theo.\ RPM \times vol.\ eff.}{100}$	Torque (in lbs.) = $\frac{PSI \times disp.\ (in\ inches^3)}{6.28}$
	Overall Efficiency = $\frac{mech.\ eff. \times vol.\ eff.}{100}$	Torque (in lbs.) = $\frac{HP \times 63025}{RPM}$
	Actual Pump GPM = $\frac{theo.\ GPM \times vol.\ eff.}{100}$	

Don't understand a formula or conversion?  
 Call Hank Rossman at 317•849•5115

<b>VEHICLE SIZING</b>	RPM = $\frac{MPH \times 168}{LR}$
	Torque = TE x LR
	Wheel Slip Torque = WD x ADC x LR
	TE = RR + GR + DP
	RR = $\frac{GVW \times R}{1000}$
	GR = $\frac{\% Grade \times GVW}{100}$

**LEGEND**

- G = Gear Reduction Ratio
- LR = Load Radius
- TE = Tractive Effort
- WD = Weight on Drive Wheels
- ADC = Adhesion Coefficient
- RR = Rolling Resistance
- GR = Grade Resistance
- DP = Draw Bar Pull Desired
- TE = RR + GR + DP
- R = Rolling Resistance Coefficient
- GVW = Gross Vehicle Weight