

Application Formulas

Belt Length							
To determine the belt length to use for a drive when the center distance and wheel diameters are known:		C = Center Distance D = Large Wheel Diameter d = Small Wheel Diameter		Belt Length = $2C + 1.57(D + d) + \frac{(D - d)^2}{4C}$			
Belt Speed							FPM = Diameter (Inches) x RPM x .262
Center Distance							
To determine the actual center distance (C) on which a given drive will operate:		L = Belt Length D = Large Wheel Diameter d = Small Wheel Diameter		A = $L - 1.57(D + d)$			
Factor h – from the following chart							
D - d	h	D - d	h	D - d	h	D - d	h
A		A		A		A	
0.00	0.00	0.16	0.08	0.30	0.16	0.43	0.24
0.02	0.01	0.18	0.09	0.32	0.17	0.44	0.25
0.04	0.02	0.20	0.10	.034	0.18	0.46	0.26
0.06	0.03	0.21	0.11	.035	0.19	0.47	0.27
0.08	0.04	0.23	0.12	0.37	0.20	0.48	0.28
0.10	0.05	0.25	0.13	0.39	0.21	0.50	0.29
0.12	0.06	0.27	0.14	0.40	0.22	0.51	0.29
0.14	0.07	0.29	0.15	0.41	0.23		
						$C = \frac{[A - h(D - d)]}{2}$	
Force (W) Lbs.							
		Horsepower (HP) and Velocity (V) Feet Per Minute		$W = \frac{33,000 \times \text{HP}}{V}$			
Horsepower							
		Force (W) lbs and Velocity (V) Feet per Minute		$\text{HP} = \frac{W \times V}{33,000}$			
Horsepower (HP) is the rate of doing work. One HP is equal to raising 33,000 lbs. one foot in one min.		Torque (T) lb-in and Revolutions Per Minute (RPM)		$\text{HP} = \frac{T \times \text{RPM}}{63,025}$			
		Torque (T) lb-ft and Revolutions Per Minute (RPM)		$\text{HP} = \frac{T \times \text{RPM}}{5,252}$			
Kilowatts to HP							$\text{HP} = \text{Kilowatts} \times 1.341$
Pitch Diameter (D) of Gear or Sprocket							
		Velocity (V) Feet Per Minute and Revolutions Per Minute (RPM)		$D = \frac{V}{.2618 \times \text{RPM}}$			
Revolutions Per Minute							
		Velocity (V) Feet Per Minute and Pitch Diameter (D) or Gear or Sprocket – Inches		$\text{RPM} = \frac{\text{FPM}}{.262 \times D}$			
		Horsepower (HP) and Torque (T) lb-in		$\text{RPM} = \frac{63,025 \times \text{HP}}{T}$			
Torque							
		Torque (T) is a turning movement or twisting effort.		$T \text{ (lb-in)} = \frac{63,025 \times \text{HP}}{\text{RPM}}$			
				$T \text{ (lb-ft)} = \frac{5,252 \times \text{HP}}{\text{RPM}}$			
		Horsepower (HP) and Revolutions Per Minute (RPM)		$T \text{ (lb-in)} = \text{Force (lb)} \times \text{Lever Arm (in)}$			
				$T \text{ (lb-ft)} = \text{Force (lb)} \times \text{Lever Arm (ft)}$			
				$T \text{ (lb-ft)} = \text{Nm} \times .7376$			
Velocity (V) Feet Per Minute							
		Pitch Diameter (D) of Gear or Sprocket – Inches and Revolutions Per Minute (RPM)		$V = .2618 \times D \times \text{RPM}$			