BELT SPEED

To find BELT SPEED (feet per minute), multiply the PULLEY PITCH DIAMETER, *Dp* (inch), by REVOLUTIONS PER MINUTE, *R*, of the pulley by π and divide by 12.

$$\text{Belt Speed} = \frac{D_p \times R \times \pi}{12}$$

BELT LENGTH

The approximate BELT LENGTH (inch) is equal to the sum of the following: (1) the product of the DIAMETER, D_S (inch), of the small pulley times π divided by 2; (2) the product of the DIAMETER, D_l (inch), of the large pulley times π divided by 2, and (3) the product of the DISTANCE BETWEEN THE SHAFTS, *L (inch)*, times 2.

$$\text{Belt Length} = (D_s \times \tfrac{\pi}{2}) + (D_l \times \tfrac{\pi}{2}) + (L \times 2)$$

A more exact BELT LENGTH (inch) can be calculated as follows:

$$\text{Belt Length} = (D_s \times \tfrac{\pi}{2}) + (D_l \times \tfrac{\pi}{2}) + (L \times 2) + [\tfrac{(D_l - D_s)^2}{L \times 4}]$$

TRANSMISSION FORMULAS FOR GEARS, PULLEYS AND BELTS

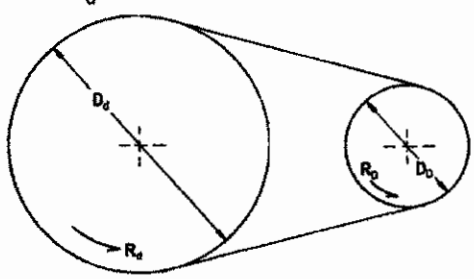
FOR SINGLE TRANSMISSION SYSTEMS:

Belt and Pulleys: REVOLUTIONS PER MINUTE, R_D, of the drive shaft times the DIAMETER, D_D, of the drive pulley equals the REVOLUTIONS PER MINUTE, R_d, of the driven shaft times the DIAMETER, D_d, of the driven pulley.

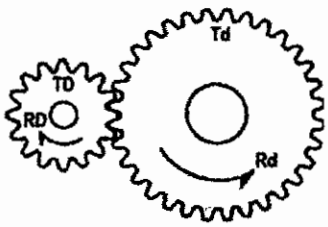
$$R_D \times D_D = R_d \times D_d$$

or

$$R_d = \frac{R_D \times D_D}{D_d}$$



Gears: REVOLUTIONS PER MINUTE, R_D, of the drive shaft times the NUMBER OF TEETH, T_D, of the drive gear equals the REVOLUTIONS PER MINUTE, R_d, of the driven shaft times the NUMBER OF TEETH, T_d, on the driven gear.



$$R_D \times T_D = R_d \times T_d$$

or

$$R_d = \frac{R_D \times T_D}{T_d}$$