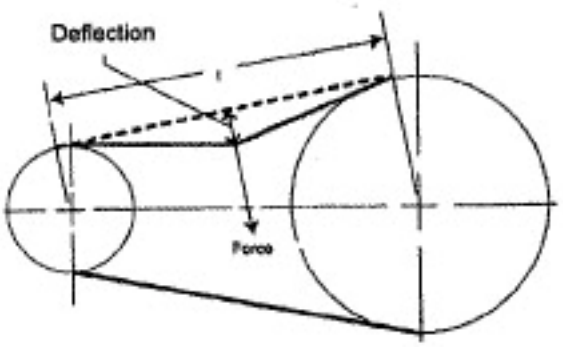
Belt Installation and Tensioning

General Method -This method of tensioning synchronous belts should satisfy most drive requirements.

Step 1: Reduce the center distance so that the belt can be placed onto the pulleys without forcing or prying it over the flanges.
Step 2: Increase the belt tension until the belt feels snug or taut Do not over tension.
Step 3: Start the drive and apply the most severe load condition. This may be either the motor starting torque or during the work cycle. A belt that Is too loose wlll jump teeth under the most severe load condition, When this occurs, gradually increase the belt tension until satisfactory operation is achieved.

Force Deflection Method - An alternate numerical method can also be used to properly tension the belt on a synchronous drive. This procedure, commonly referred to as the Force Deflection Method, consists of measuring the pounds of force required to deflect the belt a given amount.

Step 1: Install the belt as per steps one and two in the General Method. Measure the span length (t) in inches as illustrated below. Or use the formula also given below.
Step 2: From the illustration below determine the deflection height required for the drive. The deflection height is always 1/64" per inch of span length. For example, a 16" span length requires a deflection of 16/64" or 1/4". To measure the deflection height, place a straightedge from pulley to pulley on top of the belt. This will serve as a reference line to measure deflection inches.
Step 3: Using the formula's listed below calculate the minimum and maximum force values (Ibs).
Step 4: Using a spring scale, apply a perpendicular force to the belt at the mid-point of the span as illustrated. Note: For belts wider than two inches, it is suggested that a rigid piece of keystock or something similar be placed across the belt between the point of force and the belt to prevent belt distortion. Compare this deflection force value to that found in Step 3.
Adjust Belt tension accordingly.
Actual belt installation tension required depends on peak loads, system rigidity, teeth in mesh, etc. In some instances, it may be necessary to gradually increase the belt tension to achieve proper operation of the drive.



$$t = \sqrt{C^2 - \left(\frac{D-d}{2}\right)^2}$$

$$\text{Maximum Force} = \frac{4000 \times DHP}{RPM \times \text{Pitch Diameter}}$$

$$\text{Minimum Force} = \frac{5000 \times BHP}{RPM \times \text{Pitch Diameter}}$$

DHP = HP x Recommended Service Factor
BHP = Motor Horsepower
RPM = Speed of Faster Shaft
Pitch Diameter = That of Smaller Pulley