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## Synchronous Belt to Pulley Fit During Installation

Historically the installation of trapezoidal belts presented very few problems over the years. The 40 - 50° angle on the belt teeth and pulley grooves allowed relative ease of belt installation regardless of pitch or pulley diameter. Belt tooth to pulley groove clearance was very good (minimal) providing a belt with excellent backlash characteristics.

With the introduction of the round HTD® tooth form in the early 1970's, some problems became evident. The ability to hand-wrap longer belts around larger diameters with no tension became more difficult. This was compounded if the sprocket diameter tolerance was too great and/or the belt pitch was too short. Even the greater clearance of the HTD® system did not always help, although it made for poorer positioning accuracy.

As the power density of today's newer, modified curvilinear profiles increased even further, the belt development engineer's problems of matching the ideal belt construction to the sprocket groove clearance became a greater concern. The modified profile belts did however allow for improved backlash through minimized clearance values - a plus on positioning applications. However, tolerance stack-up can again create a situation where user cannot hand-wrap a belt more than 90° or so around a larger sprocket.

Switching from a fiberglass tensile belt to an aramid tensile belt can create yet other problems due to tendency for aramid to shrink slightly in a high moisture (humidity) environment.

In the above situations it may become necessary to work a little harder at installing the belt. Gates has successfully used the following process for years. Completely wrap the belt into the small sprocket's grooves (generally the driver). Hand-wrap the belt in the large sprocket as far as possible without undue force. Alternately add tension (typically through the motor base jackscrews) and rotate the drive by hand. Each time you do this one or more additional belt teeth will seat in the grooves. Repeat until the belt is completely seated in the large sprocket. Check the belt for the proper recommended tension and lock the motor base in place.

If the above process fails to do the job, it is quite possible that either the large sprocket is way out of tolerance on the high end and/or the belt is too short. In this instance you will not be able to pull the belt into pitch with the sprocket. Either or both parts will need to be replaced.