SECTION 4 DRIVE COMPARATIVE STUDIES

The development of the PowerGrip GT2 belt has produced an impressive range of enhanced properties and subsequent design opportunities for engineers.

Comparative studies, shown in **Figures 7** through **10**, allow designers to make quantitative assessments and to highlight the most significant improvements and design opportunities. Particularly significant points from the comparative studies follow:

4.1 Durability

The greatly increased durability of the PowerGrip GT2 design has resulted in power capacities far above those quoted for similar size belts of previous designs. The resulting small drive packages will increase design flexibility, space utilization and cost effectiveness.

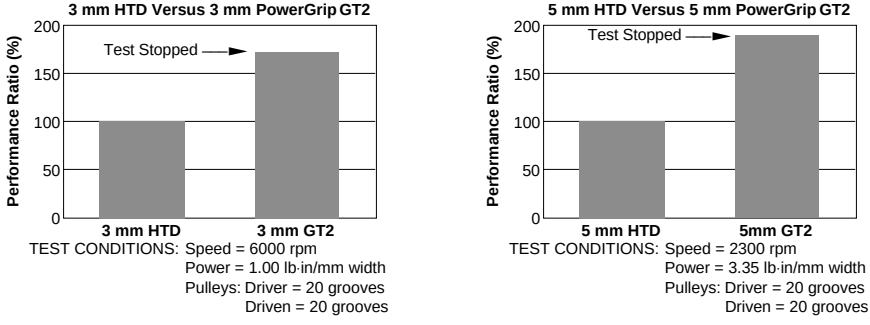


Fig. 7 Comparison of Performance Ratios for Various Belts

4.2 Tooth Jump Resistance

The very significant improvement in tooth jump resistance of PowerGrip GT2 when compared to similar belts has several important advantages.

1. Ratcheting resistance during high start-up torques.
2. Reduced bearing loads, particularly in fixed-center drives. Lower average tensions can be used without encountering tooth jump at the low tension end of the tolerance ranges.
3. Reduced system losses result from lower pre-tensioning, with less potential for tooth jumping.

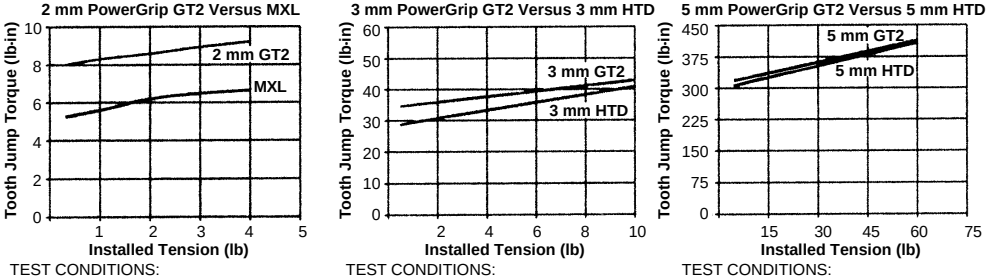
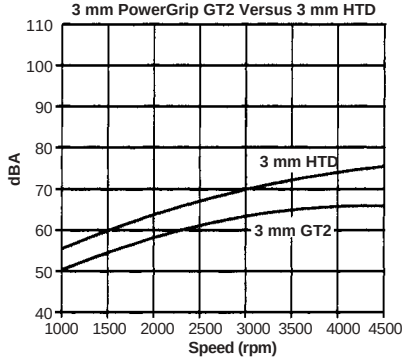


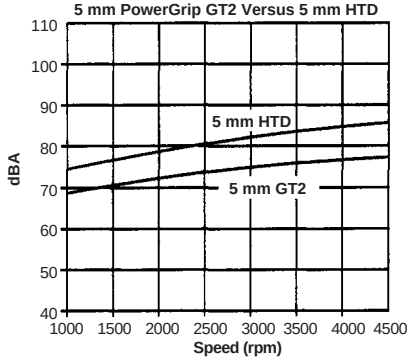
Fig. 8 Comparison of Tooth Jump Torques for Various Belts

4.3 Noise

The smoother meshing action of the PowerGrip GT2 belt, with its optimized design, produces significantly lower noise levels when compared with other similar sized belt types operating under similar speeds and tensions. These improvements are enhanced by the fact that narrower belts can be used due to increased power capacities.



Belt: No. of teeth = 188
Width = 15 mm
Pulleys: Driver = 26 grooves
Driven = 26 grooves
Microphone location midway between the pulleys, 100 mm from the belt edge.



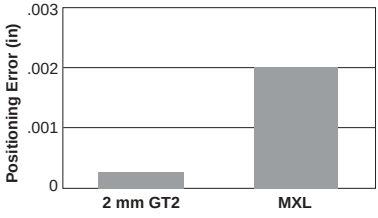
Belt: No. of teeth = 118
Width = 30 mm
Pulleys: Driver = 20 grooves
Driven = 20 grooves
Microphone location midway between the pulleys, 100 mm from the belt edge.

Fig. 9 Comparison of Noise Levels for Various Belts

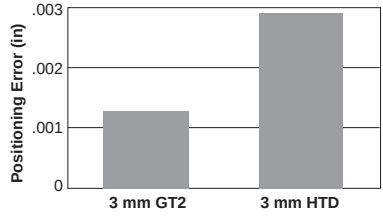
4.4 Positioning Accuracy

The PowerGrip HTD belt tooth forms were primarily designed to transmit high torque loads. This requirement increased tooth to groove clearances which resulted in increased backlash when compared with the original trapezoidal designs.

PowerGrip GT2 has reversed this problem with power capacities now exceeding those of PowerGrip HTD while giving equivalent or higher levels of positional accuracy than trapezoidal timing belts.



APPLICATION: Motion Transfer
Belt: No. of teeth = 126
Width = 8 mm
Pulleys: Driver = 12 grooves
Driven = 40 grooves
Installed tension = 1.8 lb
Motor = 200 steps/cycle



APPLICATION: Motion Transfer
Belt: No. of teeth = 92
Width = 6 mm
Pulleys: Driver = 20 grooves
Driven = 20 grooves
Installed tension = 6.6 lb
Motor = 200 steps/cycle

Fig. 10 Comparison of Positioning Errors of Various Belts