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## A Close Look at PowerGrip® GT® Belts PA NOTE

### Introduction

Since the introduction of 8mm and 14mm PowerGrip GT belts as a replacement for PowerGrip® HTD® belts, confusion about the compatibility of 2, 3, and 5mm PowerGrip GT belts with PowerGrip HTD hardware has become an issue within the marketplace. The purpose of this PA Note is to discuss the origins and features of both large and small pitch PowerGrip GT systems in order to eliminate confusion.

### 2, 3, 5mm PowerGrip® GT® Belts

#### History:

Gilmer trapezoidal timing belts were developed in the early 1940's and have been available since that time. The PowerGrip HTD belt (the first curvilinear synchronous drive system) was first introduced in the early 1970's as an improvement to the traditional timing belt. PowerGrip HTD belts succeeded in providing significantly more load capacity than the PowerGrip trapezoidal timing system, and for many years was regarded as being a very reliable belt drive system.

In the mid 1980's, a further refined curvilinear system known as PowerGrip HTD II was developed. Its primary performance benefits were excellent registration characteristics with load capacity greater than PowerGrip HTD belts. While the PowerGrip HTD II system is used very successfully today in the automotive industry, it was not widely introduced within the general industrial market.

In the process of establishing Gates worldwide product standardization, the PowerGrip HTD II system was further refined in 2, 3, and 5mm pitches, and introduced into the industrial market as the PowerGrip GT system. A stock line of 2, 3 and 5mm PowerGrip GT belts and sprockets are now available. PowerGrip GT is considered to be the highest performance small pitch synchronous drive system available in the world. During the development processes, both PowerGrip HTD II and PowerGrip GT systems were designed with the intention of optimizing performance. As a result, they are not compatible with each other in any way. Accommodating interchangeability within the designs would have compromised performance.

#### Characteristics:

Small pitch PowerGrip HTD and PowerGrip GT belts are two distinctly different synchronous belt drive systems without any compatibility or ability to interchange components. Their performance characteristics are also quite different. A brief summary of the primary features of each is as follows:



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## **3 & 5mm PowerGrip® HTD® Belts**

- 30% more capacity than PowerGrip Timing belts
- High resistance to belt ratcheting
- Limited registration precision
- Can generate objectionable noise levels
- Suitable only for PowerGrip HTD sprockets
- Incompatible with PowerGrip GT sprockets

## **2, 3, 5mm PowerGrip® GT® Belts**

- 30-50% more capacity than PowerGrip HTD belts
- High resistance to belt ratcheting
- Excellent registration precision
- Significantly less noise than PowerGrip HTD belts
- Smooth motion/velocity control
- Suitable only for PowerGrip GT sprockets
- Incompatible with PowerGrip HTD sprockets

## **8 & 14mm PowerGrip GT Belts**

### **History:**

With PowerGrip HTD belts having earned a reputation for reliability and excellence in the market for nearly 25 years, changes in customer expectations as well as in the industrial market prompted the development of an improved belt capable of operating in PowerGrip HTD sprockets. The resulting product has load capacity equal to or greater than PowerGrip HTD belts, operates at lower noise levels than any competitive belt available, and is fully compatible with PowerGrip HTD sprockets. This belt is available in 8 and 14mm pitches, and was introduced under the PowerGrip GT name. This product has literally superseded PowerGrip HTD belts in 8mm and 14mm pitches, except in some specialty product areas.

### **Characteristics:**

The PowerGrip GT belt was designed to improve upon and replace the PowerGrip HTD belt. While PowerGrip GT and PowerGrip HTD are two distinctly different synchronous belt drive systems, both belts were designed to operate in PowerGrip HTD sprockets. The performance characteristics of each are also somewhat different. A brief summary of the primary features is as follows:

### **8 & 14 mm PowerGrip HTD Belt**

- 30% more capacity than PowerGrip Timing belts
- High resistance to belt ratcheting
- Limited registration precision
- Can generate objectionable noise levels
- Suitable only for PowerGrip HTD sprockets

### **8 & 14mm PowerGrip GT Belt**

- Comparable capacity to PowerGrip HTD belts
- High resistance to belt ratcheting
- Limited registration precision
- Significantly less noise than PowerGrip HTD belts
- Compatible with PowerGrip HTD sprockets
- Intended to supersede PowerGrip HTD belts, except in some specialty product areas.



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### Conclusion

While introduced and marketed under the same name, small pitch 2, 3, 5mm PowerGrip GT belts and large pitch 8, 14mm PowerGrip GT belts are vastly different products. They were each designed independently with different dimensional characteristics and performance objectives.

Although both small and large pitch PowerGrip GT drives are intended to replace PowerGrip HTD drives, only the small pitch product offers significant performance enhancements over PowerGrip HTD drives. Small pitch, 2, 3, 5mm PowerGrip GT belts and sprockets are **not** compatible or interchangeable with the PowerGrip HTD system in any way.

Large pitch PowerGrip GT belts perform similarly to PowerGrip HTD belts in PowerGrip HTD sprockets. Only large pitch PowerGrip GT belts are fully compatible and interchangeable with PowerGrip HTD sprockets. In the future, the performance capabilities of large pitch 8, 14mm PowerGrip GT belts could be enhanced by introducing a new PowerGrip GT sprocket line. Large pitch, 8, 14mm PowerGrip GT could be capable of carrying higher loads when operating in PowerGrip GT sprockets, and would have less backlash than with PowerGrip HTD sprockets.