

Not All Belts Fit the Same Sprocket: Belt/Sprocket Interchange Guide



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AIRCRAFT POLICY

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Foreword

This brochure can assist you in determining the proper belt/sprocket combinations for original drive designs as well as replacement for existing drive components. Knowing which synchronous belt is compatible with which synchronous sprocket is critical for optimum drive performance.

When system compatibility recommendations are followed, both the life of the belt and sprockets are maximized. In addition, safety issues may arise when high performance synchronous belt ratings are used to design new drives and sprockets are used that are not compatible or recommended.

- A PowerGrip® GT®2 belt should only be used in an HTD® sprocket as a replacement for an existing HTD® belt. For new designs, PowerGrip® GT®2 belts should only be used with PowerGrip® GT®2 Sprockets.
- A Poly Chain® GT®2 belt should only be used in a Poly Chain® GT® sprocket as a replacement for an existing Poly Chain® GT® belt. For new designs, Poly Chain® GT®2 belts should only be used with Poly Chain® GT®2 Sprockets.

Explanation of Recommendations

Recommended—Original Design: This combination is designed to be used together.

Note: **For new drive designs, belts should only be used with the intended sprockets (see warnings).**

Published belt ratings apply only to belts used with the sprockets they were intended for.

Replacement Only: This combination is recommended only for replacement and widths should be adjusted as indicated. **Replacement combinations should not be used in new designs (see warnings).**

Not Recommended: This combination is not recommended due to potentially reduced service life of either the belt, the sprockets, or both. Also, a combination may not be recommended if another product line from the same manufacturer is more appropriate.

No Compatibility: This combination is not compatible, either because the belt does not wrap the sprockets well or because the belt tooth is too large to fit the sprocket grooves.

NOTES

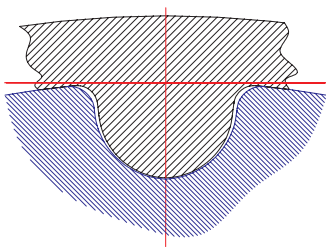
1. Sprocket groove drawings are all based upon 38-40 grooves. Ideal form with no variation from manufacturing tolerance was assumed.
2. Belt tooth drawings represent ideal form with no manufacturing variation.

HTD® Sprockets

WARNING:

When Designing belt drives for **New Applications** with PowerGrip® GT®2 Power Ratings: DO NOT USE HTD® SPROCKET SYSTEMS. HTD® SPROCKETS/BUSHINGS MAY NOT HANDLE THE INCREASED TORQUE LOADS AND DAMAGE TO THE SPROCKET AND/OR BUSHING MAY OCCUR. ONLY USE POWERGRIP® GT®2 SPROCKETS FOR NEW DESIGNS.

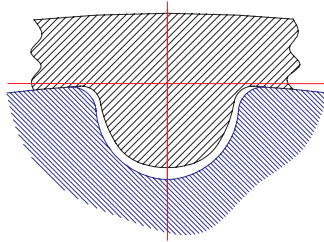
5M/8M/14M HTD® Belts



Recommended – Original Design

- Large robust belt tooth design
- Significant backlash

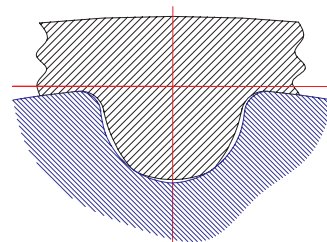
5M PowerGrip® GT®2 Belts



Not Recommended

- Reduced performance
- The sprocket/bushing capacity may be too low for new designs

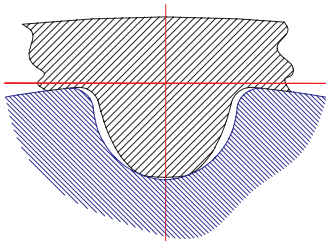
8M PowerGrip® GT®2 Belts



Replacement Only

- Quieter operation/increased backlash
- The sprocket/bushing capacity may be too low for new designs
- When replacing HTD® belts – the belt width may be reduced one size

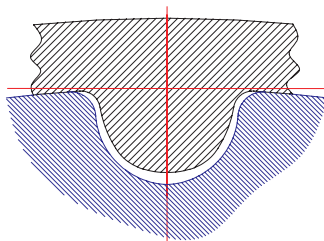
14M PowerGrip® GT®2 Belts



Replacement Only

- Quieter operation/increased backlash
- The sprocket/ bushing capacity may be too low for new designs
- When replacing HTD® belts – the belt width may be reduced one size

5M Poly Chain® GT® Belts

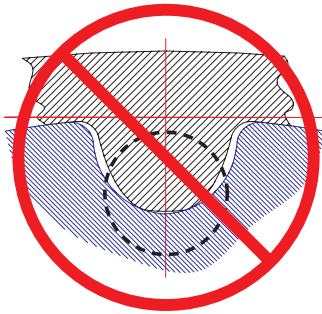


Not Recommended

- Reduced performance
- The sprocket/ bushing capacity may be too low for new designs

HTD® Sprockets (continued)

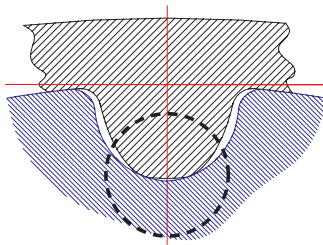
8M Poly Chain® GT®2 Belts



No Compatibility

- The belt will not fully wrap the sprocket
- The belt tooth is deeper than the sprocket groove

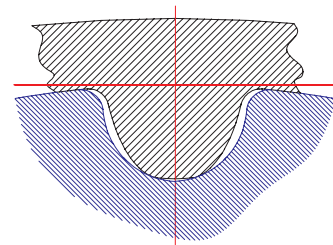
14M Poly Chain® GT®2 Belts



Not Recommended

- Increased noise and belt wear
- The belt tooth is deeper than the sprocket groove
- The sprocket/ bushing capacity may be too low for new designs

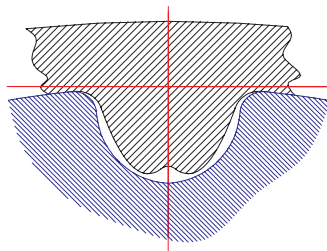
8M/14 Eliminator™ Belts



Not Recommended

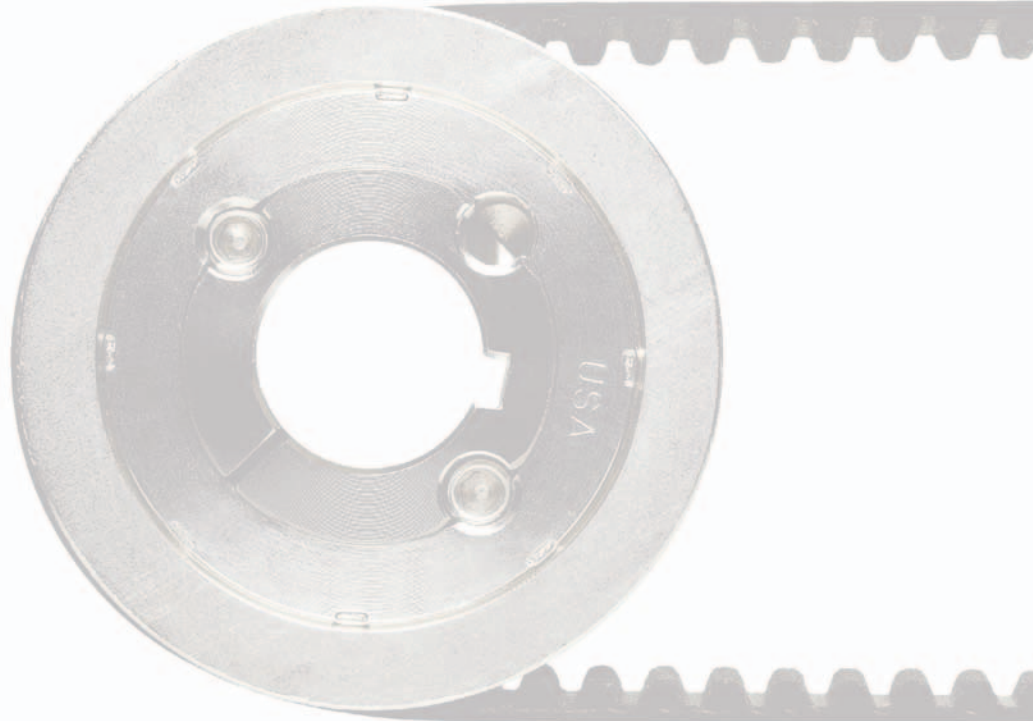
- Belt Widths do not match sprocket widths
- PowerGrip® GT2 belt line is preferred for replacement

5M RPP+Plus® Belts



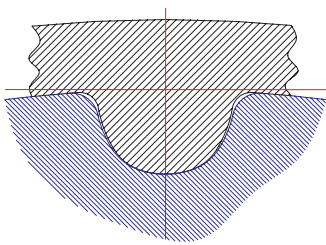
Not Recommended

- The sprocket/ bushing capacity may be too low for new designs
- Increased backlash



PowerGrip® GT®2 Sprockets

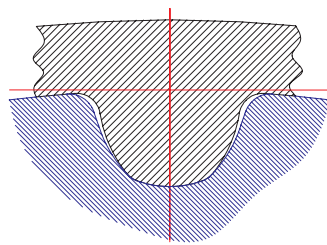
5M PowerGrip® GT®2 Belts



Recommended – Original Design

- Excellent pitch fit
- Very low backlash

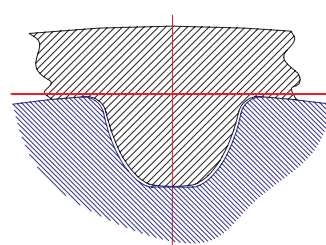
8M PowerGrip® GT®2 Belts



Recommended – Original Design

- Excellent pitch fit
- Very low backlash

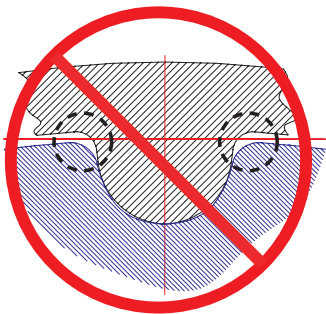
14M PowerGrip® GT®2 Belts



Recommended – Original Design

- Excellent pitch fit
- Very low backlash

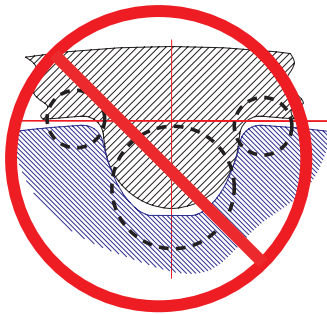
5M/8M HTD® Belts



No Compatibility

- The belt tooth is too large to fully seat in the sprocket groove

14M HTD® Belts

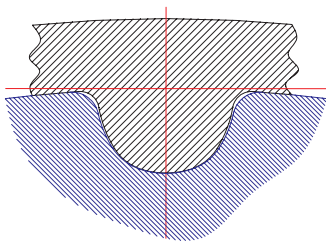


No Compatibility

- The belt tooth is too large to fully seat in the sprocket groove

PowerGrip® GT®2 Sprockets (continued)

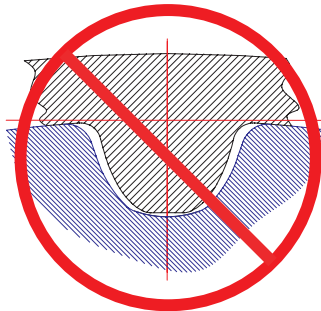
5M Poly Chain® GT® Belts



Recommended - Original Design

- Excellent pitch fit
- Very low backlash

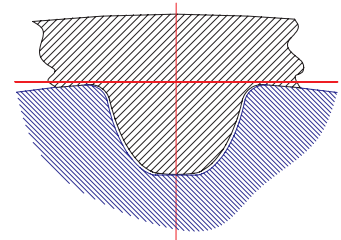
8M Poly Chain® GT®2 Belts



No Compatibility

- The belt will not fully wrap the sprocket

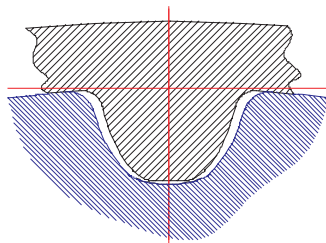
14M Poly Chain® GT®2 Belts



Not Recommended

- The sprocket/ bushing capacity may be too low for new designs
- Belt widths do not match sprocket widths

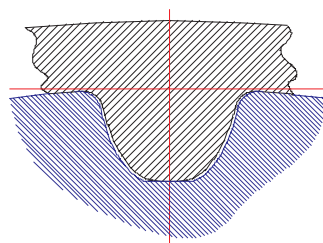
8M Eliminator™ Belts



Not Recommended

- Belt Widths do not match sprocket widths
- Use with PowerGrip® GT®2 belts (Original design)

14M Eliminator™ Belts

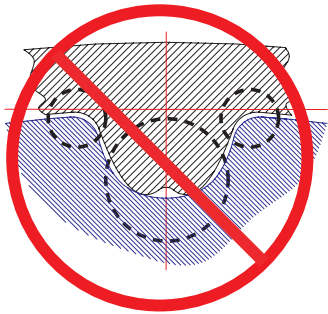


Not Recommended

- Belt widths do not match sprocket widths
- Use with PowerGrip® GT®2 belts (Original design)

PowerGrip® GT®2 Sprockets (continued)

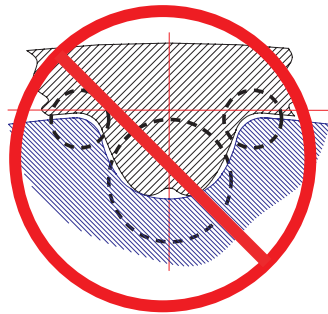
5M RPP+Plus® Belts



No Compatibility

- Reduced performance
- The belt tooth is too large to fully seat in the sprocket groove

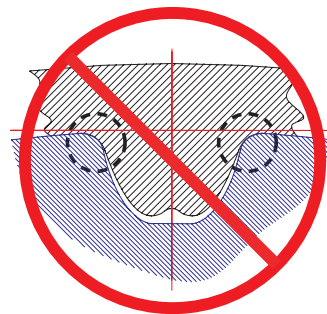
8M RPP+Plus®/WhiteHawk Pd™ Belts



No Compatibility

- Reduced performance
- The belt tooth is too large to fully seat in the sprocket groove

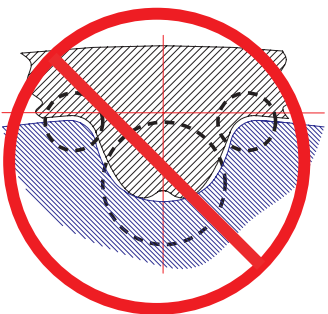
14M RPP+Plus®/WhiteHawk Pd™ Belts



No Compatibility

- Reduced performance
- The belt tooth is too wide to fully seat in the sprocket groove

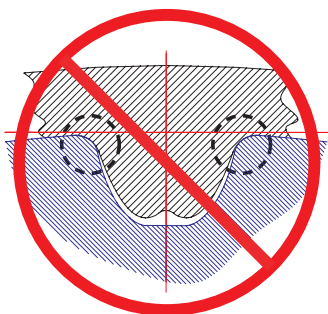
8M Panther®/QT Powerchain®/BlackHawk Pd™ Belts



No Compatibility

- Reduced performance
- The belt tooth is too large to fully seat in the sprocket groove
- Belt widths do not match sprocket widths
- The sprocket capacity may be too low for new designs

14M Panther®/QT Powerchain®/BlackHawk Pd™ Belts



No Compatibility

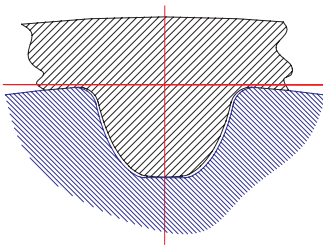
- Reduced performance
- The belt tooth is too wide to fully seat in the sprocket groove
- Belt widths do not match sprocket widths
- The sprocket capacity may be too low for new designs

Poly Chain® GT®2 Sprockets

WARNING:

When Designing Belt Drives for **New Applications** with Poly Chain® GT®2 Power Ratings: DO NOT USE POLY CHAIN® GT® SPROCKET SYSTEMS. POLY CHAIN® GT® SPROCKETS/BUSHINGS MAY NOT HANDLE THE INCREASED TORQUE LOADS AND DAMAGE TO THE SPROCKET AND/OR BUSHING MAY OCCUR. ONLY USE POLYCHAIN® GT®2 SPROCKETS FOR NEW DESIGNS.

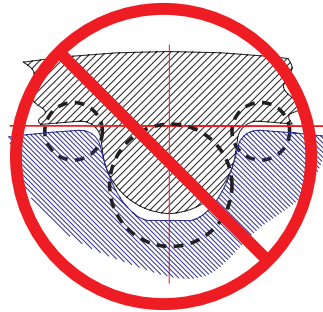
8M/14M Poly Chain® GT®2 Belts



Recommended - Original Design

- Thirty percent increase in belt capacity over Poly Chain® GT® belts

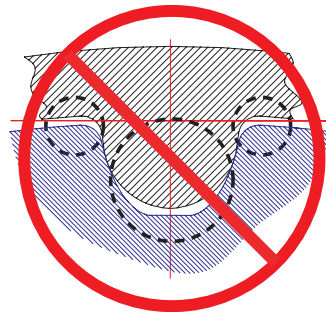
8M HTD® Belts



No Compatibility

- The belt will not fully wrap the sprocket
- The belt tooth is too large to fully seat in the sprocket groove

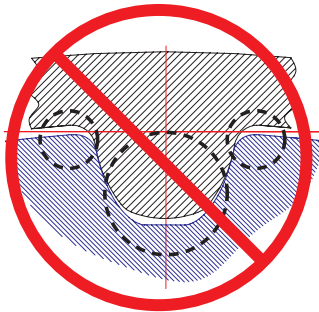
14M HTD® Belts



No Compatibility

- The belt tooth is too large to fully seat in the sprocket groove

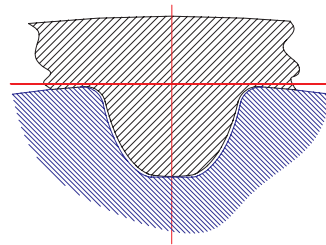
8M PowerGrip® GT®2 Belts



No Compatibility

- The belt will not fully wrap the sprocket
- The belt tooth is too large to fully seat in the sprocket groove

14M PowerGrip® GT®2 Belts



Not Recommended

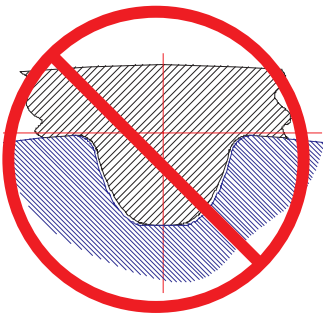
- Greatly reduced performance (if drive originally designed with Poly Chain® GT®2)
- Belt widths do not match sprocket widths
- Excellent pitch fit

Note:

Poly Chain® GT®2 belts may be used to replace Poly Chain® GT® belts on GT® sprockets. In most cases, the belt width may be reduced when replacing a GT® belt with a GT®2 belt. Contact Gates Product Application Help line at 303-744-5800 for more information.

Poly Chain® GT®2 Sprockets (continued)

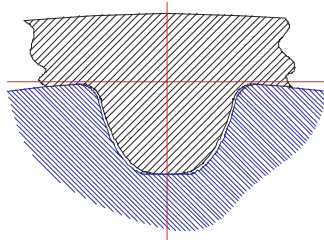
8M Eliminator™ Belts



No Compatibility

- The belt will not fully wrap the sprocket
- Belt widths do not match sprocket widths

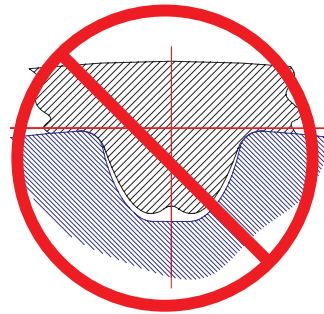
14M Eliminator™ Belts



Not Recommended

- Majority of belt widths do not match sprocket widths
- Greatly reduced performance
- Use with Poly Chain® GT®2 belts (Original design)

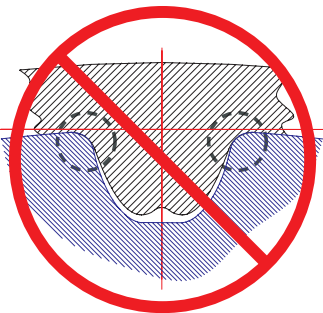
8M RPP+Plus®/ WhiteHawk Pd™ Belts



No Compatibility

- The belt will not fully wrap the sprocket
- Belt widths do not match sprocket widths

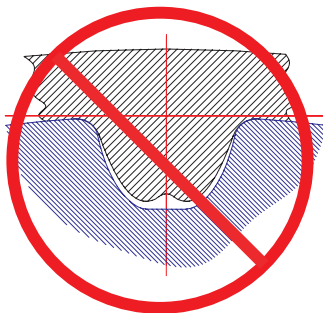
14M RPP+Plus®/ WhiteHawk Pd™ Belts



No Compatibility

- The belt tooth is too wide to fully seat in the sprocket groove
- Greatly reduced performance
- Belt widths do not match sprocket widths

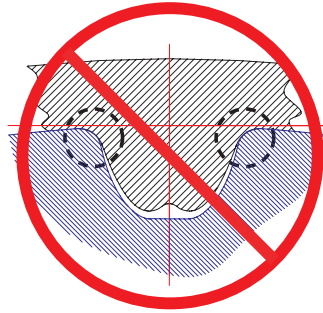
8M Panther®/QT Powerchain®/ BlackHawk Pd™ Belts



No Compatibility

- The belt will not fully wrap the sprocket
- Belt widths do not match sprocket widths

14M Panther®/QT Powerchain®/ BlackHawk Pd™ Belts

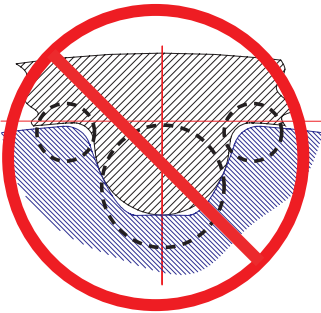


No Compatibility

- The belt tooth is too wide to fully seat in the sprocket groove
- Greatly reduced performance
- Belt widths do not match sprocket widths

RPP®/RPP+Plus® Sprockets

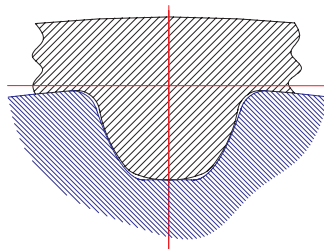
5M HTD® Belts



No Compatibility

- The belt tooth is too large to fully seat in the sprocket groove

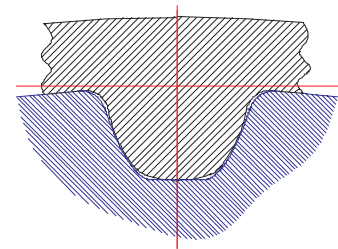
5M PowerGrip® GT®2 Belts



Replacement Only

- The sprocket/ bushing capacity may be too low for new designs

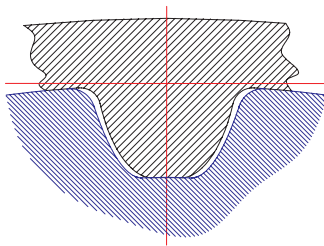
8M PowerGrip® GT®2 Belts



Not Recommended

- Poor meshing quality on sprockets with more than 50 grooves
- Eliminator™ belt line is preferred for replacement

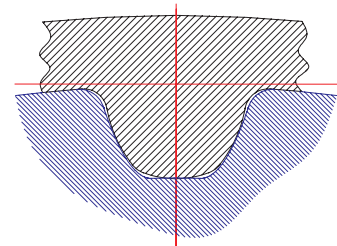
14M PowerGrip® GT®2 Belts



Replacement Only

- For replacement of RPP®/ RPP+Plus® belts, the belt width may be reduced one size
- Fairly good pitch fit
- Improved performance over RPP+Plus®

5M Poly Chain® GT® Belts

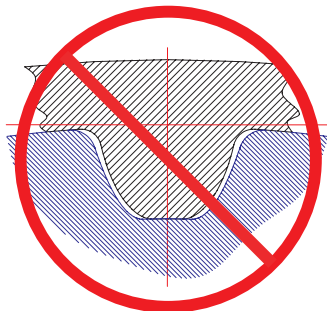


Replacement Only

- The sprocket/ bushing capacity may be too low for new designs

RPP®/RPP+Plus® Sprockets (continued)

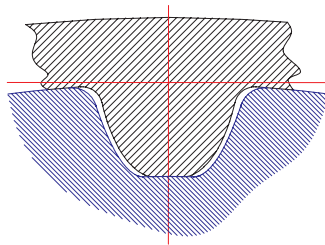
8M Poly Chain® GT®2 Belts



No Compatibility

- The belt will not fully wrap the sprocket
- Belt widths do not match sprocket widths

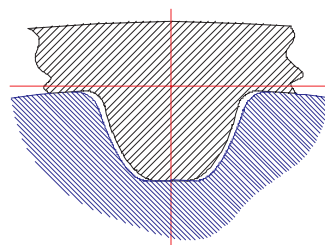
14M Poly Chain® GT®2 Belts



Not Recommended

- Belt widths do not match sprocket widths
- Fairly good pitch fit
- The sprocket/bushing capacity may be too low for new designs

8M/14M Eliminator™ Belts

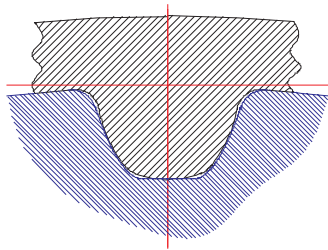


Replacement Only

- Belt widths do not match sprocket widths
- For replacement of RPP®/RPP+ Plus® belts, use the next smaller width
- Good pitch fit
- Greatly improved performance over RPP+ Plus®

Panther®/QT Powerchain® Sprockets

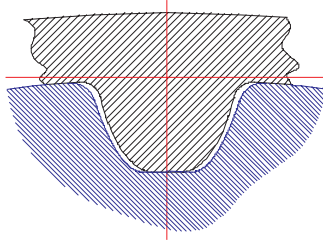
8M PowerGrip® GT®2 Belts



Not Recommended

- Poor meshing quality on sprockets with more than 50 grooves
- Belt widths do not match sprocket widths
- Eliminator™ belt line is preferred for replacement

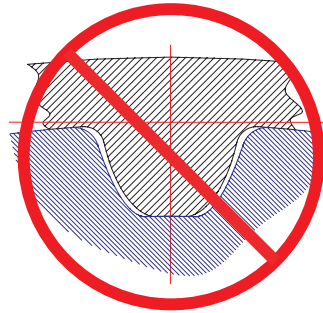
14M PowerGrip® GT®2 Belts



Not Recommended

- Fairly good pitch fit
- Belt widths do not match sprocket widths
- Eliminator™ belt line is preferred for replacement

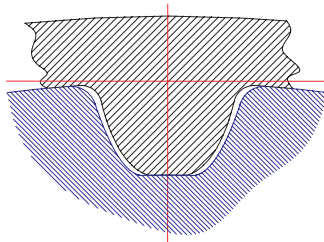
8M Poly Chain® GT®2 Belts



No Compatibility

- The belt will not fully wrap the sprocket
- Belt widths do not match sprocket widths

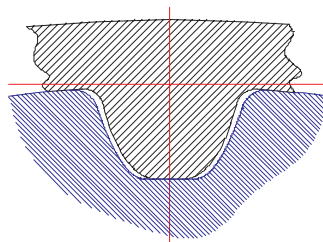
14M Poly Chain® GT®2 Belts



Not Recommended

- Belt widths do not match sprocket widths
- Fairly good pitch fit
- The sprocket/ bushing capacity may be too low for new designs

8M/14M Eliminator™ Belts



Replacement Only

- Good pitch fit
- Improved performance compared to Panther® Ultra®, QT Powerchain®, and BlackHawk PD™

Interchange Matrix

Belt Replacement with PowerGrip® GT²

8 & 14mm belts can be used to replace other non-Gates curvilinear belts in the same width

Company	Product Trade Name	Profile	Nomenclature	Belt-Pitch
Bando	Synchro-Link® HT	H*	1600-8M-20 H	8 & 14MM
Bando	Synchro-Link® XP	H*	1600-8M-20 XP	
Dodge	HT150	GT®	1600-8M-20 HT150	
Dodge	HT200	GT®	1600-8M-20 HT200	
Gates	HTD®	HTD®	1600-8M-20	
Jason	HTB®	H*	1600-8M-20	
Maska	Curvilinear Synchronous Belts	H*	1600-8M-20	

Competitors Width 8MM - Pitch	PowerGrip® GT ² - Width 8MM - Pitch
20	20
30	30
50	50
85	85

Competitors Width 14MM - Pitch	PowerGrip® GT ² - Width 14MM - Pitch
40	40
55	55
85	85
115	115
170	170

*See Rubber Manufacturer's Association Bulletin IP-27(1997) for H type tooth profile specification information

Reduced Width Replacement with Eliminator™

8 & 14mm belts can be used to replace other non-Gates curvilinear belts in the next smallest width

Company	Product Trade Name	Profile	Nomenclature	Belt-Pitch
Browning	HPT®	RPP®	B16008M20	8 & 14 MM
Carlisle	RPP®/ RPP+Plus®	RPP®	1600-8M-20	
Goodyear	HPPD™	RPP®	1600-8M-20	
Goodyear	WhiteHawk PD™	RPP®	1600 8M WH 20	
T.B. Wood's	Synchronous Plus	RPP®	16008M20	

Competitors Width 8MM - Pitch	Eliminator™ - Width 8MM - Pitch
20	12
30	22
50	35
85	60

Competitors Width 14MM - Pitch	Eliminator™ - Width 14MM - Pitch
40	20
55	42
85	65
115	90
170	120

Belt Replacement with Eliminator™

8 & 14mm belts can be used to replace other non-Gates curvilinear belts in the same width

Company	Product Trade Name	Profile	Nomenclature	Belt-Pitch
Browning	Panther®	RPP®	1600PTH8M-12	8 & 14 MM
Carlisle	Panther® Ultra®	RPP®	1600PTH8M-12	
Goodyear	BlackHawk PD™	RPP®	1600 8M BH 12	
T.B. Wood's	QT Powerchain®	RPP®	1600 8M 12W	

Competitors Width 8MM - Pitch	Eliminator™ - Width 8MM - Pitch
12	12
22	22
35	35
60	60

Competitors Width 14MM - Pitch	Eliminator™ - Width 14MM - Pitch
20	20
42	42
65	65
90	90
120	120

Timing Belts / Pulleys

Today's belt market contains a variety of similar, yet distinct Timing belt/pulley profiles. Even though some of the profiles appear visually similar, they cannot be interchanged.

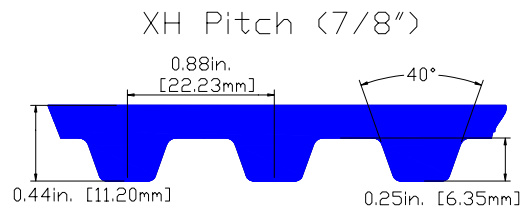
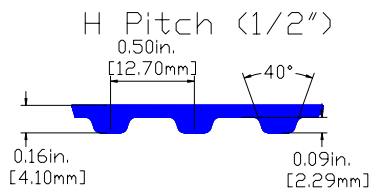
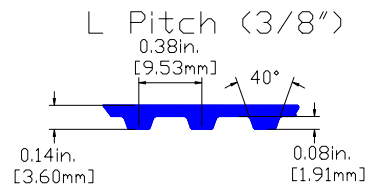
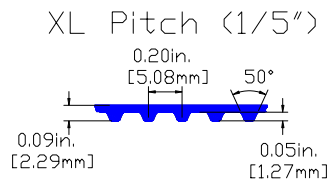
For example, the belt pitch measurements for XL, T5, and AT5 are similar. However, a closer look at additional tooth dimensions reveals that the belts cannot be interchanged due to variations in belt tooth/pulley groove shape, depth, and angle.

Care should be taken to distinguish between various Timing profiles and to ensure that a particular type of Timing belt is only used with its intended mating pulley.

Please reference the chart below for nominal Timing belt dimensions.

Timing Belts – Nominal Dimensions

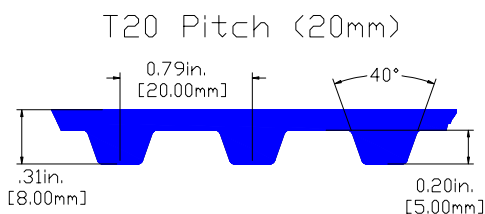
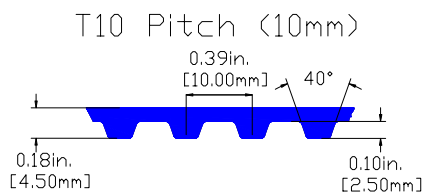
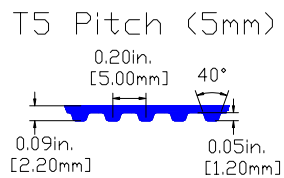
Extra Light, Light, Heavy, and Extra Heavy Pitch Belts



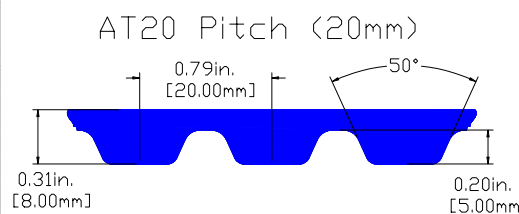
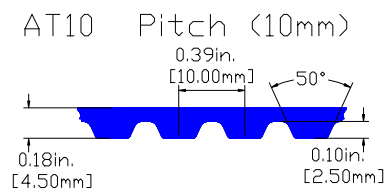
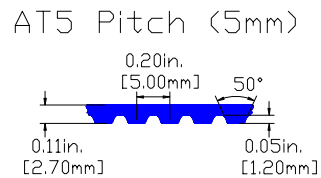
Not Interchangeable

Not Interchangeable

Type "T" Metric Pitch Belts



Type "AT" Metric Pitch Belts



Not Interchangeable



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