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## Strength, response critical for racing snowmobile belt

Snowmobile racers have found in the past they've had to give up long belt life to get the quick response and acceleration found in recreational belts. The Gates Rubber Company, manufacturer of high-performance snowmobile belts for both recreational and racing applications, reports that advances made in belt technology are allowing those with the "need for speed" to get everything they want from a racing belt.

### A compromise for speed

Racers sometimes choose to use the recreational belt construction for their racing sleds because it grabs harder in the pulleys and yields faster acceleration. They make the recreational belt choice knowing that the belt life will be rather short.

(Conversely, recreational riders often choose the high-performance construction because of its longer life and lower wear rate.)

For the non-racer, using the recreational belt for its aggressive characteristics **will not** require system changes. Adopting the high-performance class of belt for sleds calibrated for recreational belt construction, however, often **will** require some clutch tuning.

Racers should also be aware that belt construction materials significantly affect the characteristics of the clutch system. High-performance belts made for aggressive riding require that the pulleys be calibrated to exert the correct tension on the belt to reduce slip.

For aggressive riders and especially for high altitude calibrations, clutch recalibration or "tuning" is a service performed by snowmobile dealers and knowledgeable repair



Belt construction is critical as it must slide in and out of the pulleys more than 18,000 times per minute while being squeezed with 2,000 pounds of force.

shops. It requires a clutch compression fixture and special tools and should only be done by someone familiar with the process.

### Quick acceleration, high speeds

A racing belt must have several high performance properties, the most important of which are that it must be strong, durable and provide instant response.

According to The Gates Rubber Company, manufacturer of the Xtreme<sup>®</sup> snowmobile belt, racers should consider the following tips when selecting a belt. Foremost, the belt should resist fatigue, stretch and growth. These features, derived from using DuPont Kevlar<sup>®</sup> reinforcement, result in a drive system that allows the clutch assembly to efficiently transfer power to the track. In racing, high efficiency results in quick acceleration and high speeds.

Kevlar reinforcement in Xtreme belts also provides up to 25 percent longer belt life due to its ability to withstand the flexing and cycling that hypersleds can generate.

Racers have special equipment needs, especially transmission components. Gates' Xtreme belt fulfills these needs. It is recommended for snowmobiles in the 440cc to 900cc and up range. Gates' Xtreme belts are available at auto parts stores and snowmobile dealers.

#### **Withstanding the extreme**

A snowmobile belt must meet several criteria. At maximum rpm, a segment of the belt will rotate around the drive more than 4500 times per minute. Since it enters and exits both pulleys twice per revolution, it must slide in and out of the pulleys more than 18,000 times per minute while being squeezed with 2,000 pounds of squeezing force.

The undercord, in particular, must have dynamic properties to withstand the extreme and fluctuating axial forces imposed by the clutching system. As the belt flexes around the drive's pulley, heat buildup can be a problem. The belt material must minimize energy loss and be wear and crack resistant. Under diverse operating conditions the belt material must also provide the appropriate frictional response.

Sled performance can be seriously compromised if a belt's frictional response changes during operation. Belt characteristics usually don't change much when underhood temperatures go from cold to normal operating conditions. But under very aggressive riding conditions, hard-working belt components cause heat to build to belt temperatures that can exceed 230°F.

This amount of heat is a belt's worst enemy. Hysteresis or heat buildup usually means the elastomeric properties of the belt will be degraded. This condition can lead to belt slippage since heat tends to make the belt hard and lose its "gripping" power. When the belt slips, the clutch cannot react and the heat problem feeds on itself, generating even more heat until the belt fails.

Aramid fiber-loaded belts offer tremendous strength and wear resistance but they also require higher squeezing force which means higher operating tensions. Snowmobile owners are advised against changing belt construction or suppliers to obtain proper maximum engine rpm. There are a lot of snowmobile belts on the market and many are good, so



Gates Xtreme snowmobile belt, reinforced with DuPont Kevlar, resists fatigue, stretch and growth for higher efficiency.

select the belt based on quality and performance. You can then adjust your clutch to get the most out of the belt construction you've chosen.

For free information on selecting belts and calibrating clutches, e-mail [gates@hibbertco.com](mailto:gates@hibbertco.com). Please type "Snowmobile TECHTIPS Literature No. 428-1589" in the Subject; your name, address, city, state and zip in the Message. Or, call toll free 1-800-678-2358.



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