# RTR

# Recumbent & Tandem Rider Magazine

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## 2018 RCC Show Coverage

**Reviews:**

**Lightning P-38 Belt Drive**

**HP Velotechnik Gekko 26 Sport**


# Lightning P-38 Belt Drive

*Left: First spotted at the 2018 Recumbent Cycle-Con, Lightning Cycle Dynamics' P-38 Belt Drive also featured Lightning's new pannier racks and center stand. Below: Custom Lightning-designed idler pulleys come in differing diameters for varying the final drive ratio. Setscrew is used to apply the proper tension to the front belt. Details of prototype pannier rack & kickstand can also be seen.*

## By Charles Coyne

Your RTR Magazine staff is always on the lookout for what's new at the annual Recumbent Cycle-Con. Many of the leading recumbent cycle builders and suppliers announce new products and models at the show each year. One industry introduction really caught our eye at the 2018 show in Nashville. Sitting in the Lightning Cycle Dynamics' booth was an unpainted P-38 short wheelbase recumbent bike. Usually, bikes at the show are painted, polished and as pretty as possible, so the sight of a bare frame seemed almost out of place. Looking more closely revealed something entirely new to the world of recumbent bikes; a Gates Carbon Drive system coupled with a Rohloff Speed Hub 14.

Now, the basic P-38 has been around almost long enough to be considered a 'classic' recumbent bike. It's been treated to upgrades and options over the years, but when you get a bike's geometry, riding comfort and performance perfect right out of the gate, it doesn't leave much to improve upon. This P-38, however, looked quite unlike any other, thanks to the installation of the Gates Carbon Drive system.

The bike on display was Lightning's production prototype, upon which company head Tim Brummer had been racking up miles of testing before going public with it at the show. Being much more interested in adding miles to the test program, painting the frame was a considerably lower priority than painting. Tim was still adding test miles right up to the moment he left for the drive to the 2018 Recumbent Cycle-Con in Nashville, so the paint would have to wait for another day. Intrigued by this innovative drive train, we arranged to get it right after the show and put a few of our own test miles on the rig. In fact, Tim graciously dropped the P-38 Belt Drive off for our use on his way back from the show.

To our knowledge, this is the first production recumbent to be marketed with the Gates Carbon Drive system. And, before you ask, the system cannot be retrofitted to earlier P-38s, or other similar 'bents not specifically engineered for the Gates drive. The crux of the installation is the need to fit the belt within the chain stay, which requires the ability to 'open' the chainstay to get the belt into position. Special fitment is also needed to install the 14-speed Roholf Speed Hub, as well as a specially-made power transfer pulley of Lightning's own design. A method to adjust the distance/tightness of the belt between the crank and the power transfer pulley needs to be incorporated, as well as a separate rear axle adjustment.

The key to making a belt-drive recumbent possible was the introduction earlier this year of a belt of the correct length by the Gates Carbon Drive company. The distance between the power transfer pulley and the front sprocket is a longer stretch on most recumbents than the previously-available belts, so once the Lighting team got their hands on the right belt length, the engineering began in earnest. The crank/bottom bracket does not require any special treatment in order to install the Gates system; Gates provides the sprockets needed for most all popular crank models and rear sprockets as well.

Bicycle drivetrain combinations with the Gates Carbon Drive and the 14-speed Rohloff Speed Hub have been in use long enough to have a well proved record of performance and durability. Compared to a chain/derailleur setup, the belt/Rohloff combo is cleaner, smoother, quieter and requires less maintenance. The Rohloff hub has been available for twenty years, and has proven to be sturdy and reliable under extreme touring use in some of the remotest areas accessible by bicycle. Gates has been making V-belts for automotive and other uses for over 100

years, and a variety of carbon/cogged belts for decades. It has been within the past ten years or so that they brought the well-proven carbon belt technology to the bicycle industry, where it has found steadily growing acceptance – and some builders a strong preference.

The P-38 Belt Drive bike we tested weighed 33.92 lbs., without pedals. This new model has a suggested retail price of $6500.00. Lighting reports that quite a few were ordered after the intro at the 2018 Recumbent Cycle-Con, so you'll probably begin to see them out on the roads and trails soon.

After riding the P-38 Belt Drive prototype, it might be fair to suggest adding "Stealth" to the bike's moniker. While the Rohloff's internals do product a bit of gear noise in the lower seven ranges, once the grip shift is twisted to engage gears 8 thru 14, the drivetrain is absolutely silent. And it seems a bit eerie at first, the only audible sound coming from the friction of the tester's riding shorts. You don't realize how noisy a drivetrain is until your ride something that runs so silently.

*Above: 160mm Shimano hydraulic disk brakes deserve a place on a bike with the P-38's performance. Rohloff's shifting system has cables actuating in each direction.*

*Above: Horizontal setscrew seen in this photo are used to provide tension to the rear belt. Removal of the Allen bolt on the lower chainstay allows opening of the tube enough to insert the Gates Carbon Belt.*

Unlike a derailleur, the Rohloff's twist grip shifter can be cranked through multiple ratios in one quick twist – and it can be shifted to any gear range desired when at a complete standstill. That's a useful feature if one comes to a stop on a hill before getting the chance to gear down for the restart. Rohloff's do need a period of breaking in, but the previous miles accumulated by Tim had completed that task, and we found the shifting to be smooth and accurate every time – no over-shooting or under-shooting the gear selection. It does shift better if full power to the cranks is reduced right at the instant of shifting.

A variety of gearing ratios can be ordered when the Gates Carbon Drive option is selected, with differing crank and power transfer pulley diameters available to fine-tune the choices.

This was our first opportunity to ride a P-38 with the now-standard Shimano hydraulic disk brakes, another major difference from the P-38 we tested in RTR #37. As one could expect, they provided ample, well-modulated, smooth and reliable stopping with very little lever pressure required.

As mentioned in our previous review of the P-38, the ride remains, "comfortable enough to sleep on." The handling is sure footed, nimble, but not at all twitchy.

*Above: Gate cogged pulleys are available for all popular cranks and rear sprocket systems, in a variety of diameters. Idler pulley keeps the front belt off the belt.*

Many consider the Lighting P-38 to the ultimate combination of comfort, speed, and handling. It's hard to argue the point, but it is easy to make the argument that when fitted with the Gate Carbon Drive and Rohloff Speed Drive, it may be equipped with the ultimate in drivetrain choices. RTR