

## From the idea to the technology and operating principle of the Pinion central gearbox

### Car technology for the bike

Gearboxes fulfil their duties in cars and motorbikes in an unobtrusive and reliable manner. The derailleur gear system used on bikes has been more or less unchanged for decades. The two Pinion founders and managing directors Michael Schmitz and Christoph Lermen got to know each other at Porsche and in 2006 came up with the idea to create a bicycle transmission with the core of a sports car: Always reliable, durable and low maintenance with finely spaced gears, no redundant gears and tailored to the application. The result: An encapsulated gearbox which is integrated in the bicycle frame at the bottom bracket. Thanks to the enclosed structure, no moisture or dirt enters the shifting elements, thus making the gearbox extremely low maintenance.

### Basic knowledge

At Pinion the entire shifting operation takes place inside the gearbox. The gearbox is integrated centrally in the specially designed bicycle frame and sits at the bottom bracket. The centre of gravity is low which has a positive effect on the riding comfort. The gears are shifted using a rotary switch - intuitive and smooth-running. All gears can be shifted in succession or skipped in whatever steps you require. It does not matter in this case whether the bike is moving or not, or whether the foot pedals are rotating. Pinion gearboxes are compatible with chains or toothed belts.

### Operating principle of Pinion central gearbox

Pinion gearbox technology functions on the basis of spur gearing with two gearing sub-units connected on the output end which are arranged on parallel shafts. The combination of gearing sub-units with their different gear pairs generates the individual gears (18, 12, 9 or 6 gears). These are evenly spaced in gearshift steps that make ergonomic sense for the particular application range, depending on the type of gearbox. Pinion has no gear overlaps - like with 3x9 or 2x10 speed derailleur systems due to the chain running askew. Unlike in hub transmissions, where there are usually a greater number of components in mesh for transmitting force, with Pinion gearboxes the force is only transmitted via two gear pairs. This special technical feature ensures a consistently high level of efficiency, minimal noise and a direct and loss-free riding sensation in any gear.

Detailed information can be found online under the following link: <https://pinion.eu/p-linie/basistechnologie/>

Pinion gearboxes achieve the highest transmission ratio on the market. The P1.18 gearbox offers 18 extra fine and evenly graded gears and an overall ratio of over 630 percent. Further gearbox types were derived from this gearbox and customised for the various applications. Pinion central gearboxes are used in the areas touring, trekking, urban, commuting, mountain bikes, e-bikes, pedelecs, cargo bikes and recumbent bikes.

### "Made in Germany" quality with five-year guarantee

Every Pinion gearbox is "Made in Germany". The development, construction, design, manufacture and sale of Pinion central gearboxes all take place in Denkendorf. Pinion gearboxes are manufactured and tested on the company's own test benches according to the standards in the automotive industry. As a unique gear manufacturer, Pinion provides a 5-year guarantee on the function of the gearbox.

# THE TECHNOLOGY

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## The facts - short and sweet

Pinion central gearbox:

- System integration at bicycle frame
- Fully encapsulated system
- Reliable, durable and practically maintenance-free
- Seven gearbox types for different applications
- Evenly graded gears
- The highest transmission ratio on the market
- 5-year manufacturer guarantee
- Made in Germany