

## Frequently Asked Questions: i-MOTION 9

1. What is the gear ratio of the i-MOTION 9 hub and how evenly are the gears spaced? The overall gear ratio is 340% and the single gears have 17% of gear spacing. The first and the last gear change feature an even smaller spacing of 14%.

2. What exactly is meant by „gear ratio“?

The gear ratio describes the relation between the smallest and the highest gear. The above pictured diagram shows a covered distance of 2.30 metres per crank revolution. The highest gear with 7.83 metres is 3.4 times (means 340%) higher than the first gear.

3. Why are even gear steps so important?

Gear steps higher than 20% are considered too high by most riders. The next gear is either too big or too small depending on the shifting direction. Cycling is more economical if the gear steps are even and smaller than 20%. i-MOTION 9 has the most even gear spacing in it's category.

4. Is it possible to combine i-MOTION 9 with a double front chainring?

The freewheel versions of the hub will allow such a combination (e.g. a combination with 38-48t front chain wheel and a 22t sprocket in the rear). In fact, any front chainring larger than 32t can be assembled (with the appropriate sprocket in order to maintain a primary transmission of 1.73 to 1.90).

5. Will you offer a discrete shift lever as well, as I would like to build up a bike with hydraulic rim brakes (MAGURA HS11 & HA33)?

A discrete shift lever will be available. This lever will be compatible with hydraulic rim brake levers.

6. Will this be a twist or a trigger shifter?

The discrete shifter will be a twist shifter. This type of shifter is the preferred choice of comfort bike riders. If there is a demand for a more sportive type of shifter when we introduce the more sportive hub versions (like the freewheel and disc brake version) we will certainly react to this demand.

7. What other versions (Freewheel, i-BRAKE, Disc) are planned and when will they be introduced?

All these versions (Freewheel, i-BRAKE, Disc) will be introduced within the year 2007.

8. What kind of brakes fit the i-MOTION IBS brake lever?

The lever is compatible with rim brakes, i-BRAKE and mechanical disc-brakes that work with the ratio and cable pull of linear pull-brakes.

9. Are there any colour options planned?

In addition to the silver anodized version we are testing the possibilities of a black anodized version.

10. Which chainring sizes are allowed primary transmission?

The approved primary transmission of the coaster brake version is 1.73 to 1.90 (relation between front chain wheel and rear sprocket). With the currently approved sprocket of 18-22t it is therefore possible to use chainrings with 33 or 38 teeth.

11. Is it possible to use frames with vertical drop-outs in combination with i-MOTION 9? Such a combination is possible if the drop-out is designed within the specifications (see technical specification) and the proper retaining washer is used.

12. Will there be a tool available that allows for precise cable cutting in case of cable change (or internal cable routing)?

Yes, there will be a tool available for dealers that allows for cutting the cable to the correct length.

13. If I push an i-MOTION 9 bike backwards, the cranks tend to clatter. Is there something wrong with the hub?

This is caused by some pawls that are steered in and out in an alternating way, as you are pushing your bike backwards. It has no impact on pedalling, coasting, or braking while you are riding your bike.

14. The operating noises in the gears 1-6 differ from the sounds in the gears 7-9. Why is that?

i-MOTION 9 is a fast and precisely shifting internal gear hub. When you change gears, this changes the number of ratchet pawls in operation. The different number of pawls results in different sounds. These sounds have no impact on the way the hub functions.

15. Sometimes when I shift gear while standing the changed gear is not engaged. As a result the cable is shoots out the shifter. Is this a defect of the shifting system?

This can happen if there is no load on the pedal. In a normal shifting while standing situation (stopped at a traffic light, one foot on the ground, the other on the pedal) the gear change will always be performed.

16. Is i-MOTION 9 suitable for MTB or Tandem use?

i-MOTION 9 has been designed to provide fast, precise and reliable gear changes. However, the MTB or Tandem application results in high forces and torques that might exceed the strength of functional parts in the hub. In order to guarantee the durability and lifetime of the hub, the use of i-MOTION 9 for these applications can not be approved.