



Magnetic recumbent exercise bikes

A magnetic eddy current brake or “magnetic ECB” capitalises on the magnetic field anomaly called an “eddy current.” Much like the way eddy currents form in water, the eddy currents around a magnetic field create their own swirling effects and their own magnetic field. These eddy currents can be used to create a braking effect by using the resistance of eddy currents to oppose the rotational movement of the flywheel on a recumbent exercise bike.

The eddy currents that are generated are perpendicular to the flywheel’s direction of travel. In the case of magnetic eddy current brakes, the metal flywheel is exposed to a magnetic field from an electromagnet, creating eddy currents in the flywheel. The eddy currents meet resistance as charges flow through the flywheel, and this acts to slow down the rotation of the flywheel. Interestingly, the faster the flywheel is spinning, the stronger the effect, meaning that as the bike slows the braking (resistance) force is reduced, producing a very smooth “braking” action which results in extremely smooth transitions between resistance levels.

When you use a preselected program or set up your own user program – you can specify the resistance levels for each segment of the fitness program. So, let’s say you use the control panel and choose to begin your workout with a resistance level of 5 for the first segment, 9 for the second segment and 16 for the third segment through the sixth segment and then step the resistance back down to warm down; instead of feeling abrupt and rapid changes in the transition between the different resistance levels, you will feel a gradual change in the resistance level that is very comfortable to adapt to.

Magnetic ECB resistance mechanisms are becoming increasingly popular. Magnetic resistance bikes offer more functionality because they are easier to adjust, have a more sophisticated resistance level, are smoother to use and are quieter than other types of resistance mechanisms.

(Taken from <http://www.bicycleman.com/recumbent-exercise-bikes/magnetic-resistance-recumbent.htm>)

EXERCISES

1 True or false?

- a. Magnetic eddy current are used to accelerate recumbent exercise bikes. T F
- b. Magnetic eddy currents create swirling effects and their own magnetic field. T F
- c. The use of eddy current brakes produce very smooth “braking” actions. T F
- d. The use of eddy current brakes is too expensive to become popular. T F

2 Complete.

Magnetic ECB resistance offers many advantages compared to the other of resistance mechanisms commonly used in exercise bikes. The “braking” action is and even the transitions between levels are more comfortable. Magnetic currents are used to obtain this The metal flywheel of the bike is exposed to a field from an electromagnet, eddy currents in the The eddy currents meet resistance as charges through the flywheel, and this slows down the of the flywheel.

resistance • eddy • creating • recumbent • smoother • types • result • flow • magnetic • flywheel • rotation

3 Match questions and answers.

QUESTIONS		ANSWERS	
A	How can magnetic eddy currents be used in brakes?	1	The metal flywheel of the bike is exposed to a magnetic field from an electromagnet, creating eddy currents in the flywheel.
B	What are the advantages of a magnetic resistance bike?	2	Eddy currents create a braking effect using their resistance to oppose the rotational direction of the flywheel in recumbent exercise bikes.
C	How are magnetic eddy currents generated in a bike’s braking system?	3	It is easier to adjust, and smoother to use, moreover it is quieter and with a more sophisticated resistance level system.

A B C