

### Application Information

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#### Torque Test on Stationary Bicycle Trainer

Training techniques for premier athletes are continually evolving in order to gain an edge. Various components make up a regimented training program with equipment a key factor. The training equipment improvements help maximum results by making the workout as realistic and efficient as possible.

One manufacturer of a stationary bicycle trainer has a patented mechanism that simulates real world feedback to the bicyclist. This innovator created a system that provides varying resistance which closely simulates realistic road riding conditions. As the bicyclist increases speed, the trainer increases resistance. The key operation providing this simulation is a high-powered magnet located inside the roller drum beneath the tire. As the rider's output and speed increase, the magnets are drawn closer to the drum wall creating a progressively stronger resistance required to rotate the drum and thus bike tire.

During production, to examine proper calibration of the roller drum's resistance, the technicians used a 3 hp motor to replicate the rider's pedaling output and checked motor power output with a dynamometer. They then took Gauss measurements on the magnets to detect if the corresponding location on the drum was producing the anticipated power detected on the dyno. Due to the magnet's circular alignment with the roller drum, the calibration team decided that measuring the resistance torque of the drum could be a simpler means to calibrate the apparatus. The team chose a Nidec-Shimpo FG-7000T Digital Torque Gauge to handle the job. This hand-held torque measuring instrument offered an effective means to check units quickly with its large display, plus was easily portable to any production area they required a calibration test. Observing the test data, they were able to compare the increase of rotational torque of the roller drum to the work output required of the bike to ensure the real-world simulation would be achieved as advertised.

The team found the FG-7000T Digital Torque Gauge provided a cost-effective and efficient means of consistently measuring their device's performance, reducing time in production significantly as well as ensuring their innovative, industry-leading stationary trainer would continue successful sales growth.

#### Equipment Used

- *FG-7000T Portable Torque Tester*



FG-7000T Portable  
Torque Tester