

ABSTRACT

A major problem for common conventional motors is the presence of the brushes, which limit the motor life to a few thousand hours and create friction and noise. Brushless motors eliminate these disadvantages, but in most cases they are more expensive and too complicated.

In last year scientific research a new simple inexpensive brushless DC motor, based on a magnetic proximity sensor (reed switch), was invented. The second year study was devoted to the development of this motor.

A complex model was designed and built for the experiments in this project. This model allowed testing the following circuits:

- 1 electromagnet and 1 reed switch as a control circuit representing the original idea
- 2 electromagnets in serial connection with 1 reed switch
- 2 electromagnets in parallel connection with 1 reed switch
- 2 electromagnets controlled by separate reed switches.

Many experiments were performed for several voltage settings and different weights in torque testing. The speed measurements, in revolutions per minute, and the current measurements, in milliamps, provided enough data for effective comparison of the circuits. When attached to the speed reducer, the motor was able to lift significant weight.

The planned future development of the reed switch based brushless DC motor will allow its usage in many applications where high stability, reliability, and efficiency are required.