



Selected Chapters from Textile and Single-purpose Machines

Drive systems in the construction of single-purpose machines VI.



Content

- Describe the physical principle of a stepper motor
- List the benefits of a stepper motor
- List the disadvantages of a stepper motor.



Stepper motors - types

Variable reluctance motor

- the rotor of this type of motor only forms a bundle of sheets with pole pieces
- The stator also forms a bundle of sheets with pole pieces, on which the windings of the individual phases are mounted



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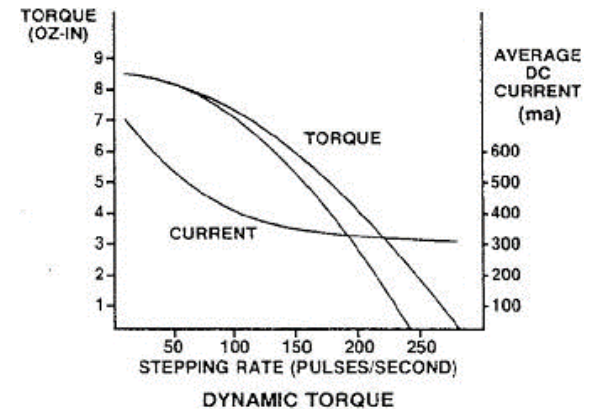
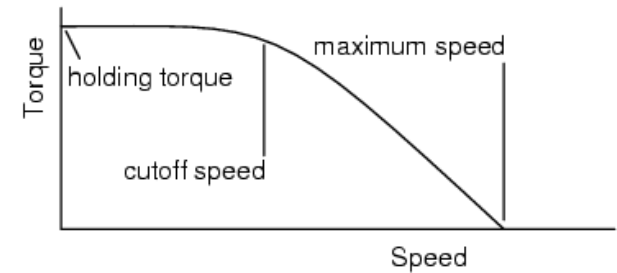
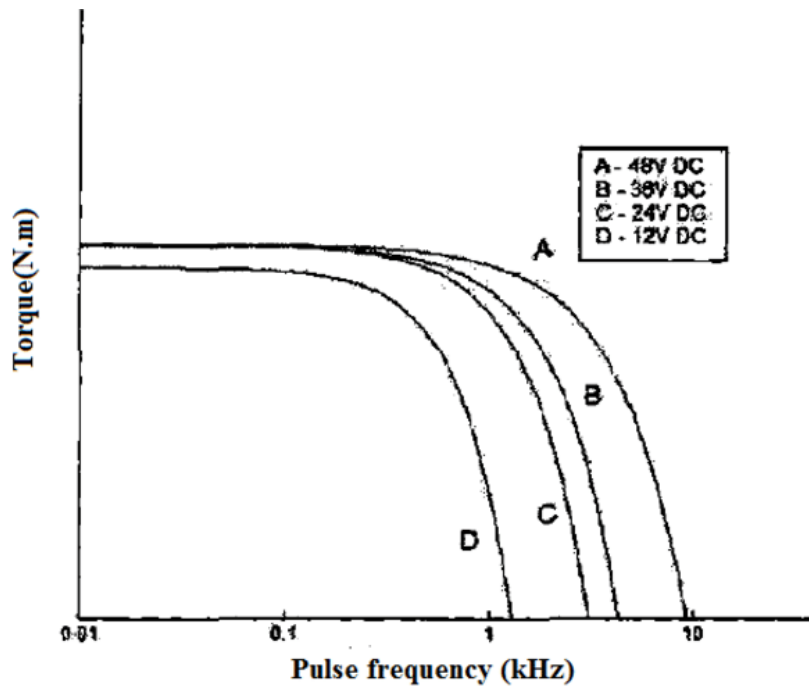
Stepper motors - types

Hybrid engine

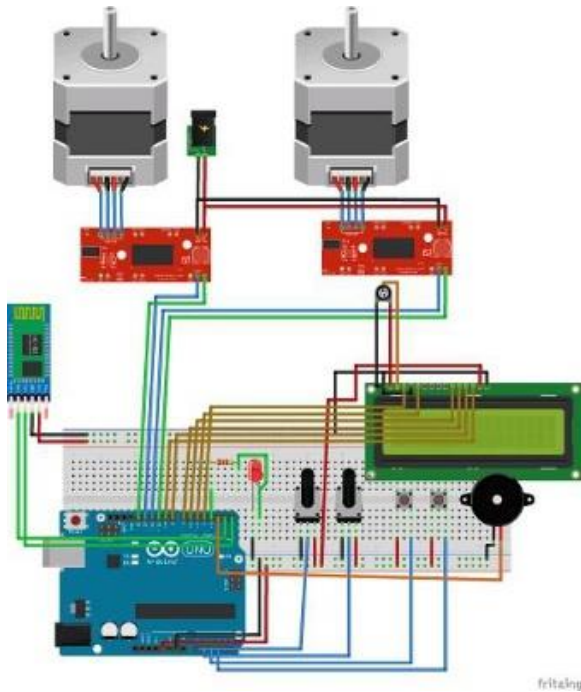
- the rotor of the hybrid motor has two pole pieces pressed onto the shaft made of non-magnetic material.
- axially polarized permanent magnet is placed between the pole pieces, which magnetizes each of the pole pieces to the opposite polarity.
- motors of this design have excellent torque and dynamic parameters and are used almost exclusively in industrial applications today.



Speed-moment characteristic - stepper motors



Stepper motors - control



Stepper motor control

- using an electronic circuit that generates pulses in a certain sequence and length.
- the pulses then excite the individual rotor windings in the exact order via the power section.
- the frequency, order and length of the pulses from the control circuit control the number, direction of rotation of the rotor as well as the torque of the motor
- Step: is the response of the stepper motor rotor to the control pulse. The rotor rotates in one step from the initial position (rest state) to the nearest magnetic rest position.
- the step angle is the nominal angle that corresponds to the change in rotor position after the arrival of one pulse. The size of the step angle is influenced by the motor design, ie the number of stator phases, the number of rotor poles and the method of stepper motor control.

Review

- List the basic types of stepper motors.
- Draw and describe the speed-torque characteristic of the stepper motor.
- Describe stepper motor control.



Thanks for your attention

