

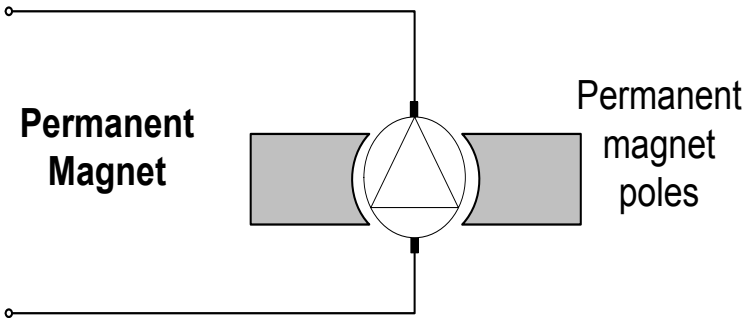
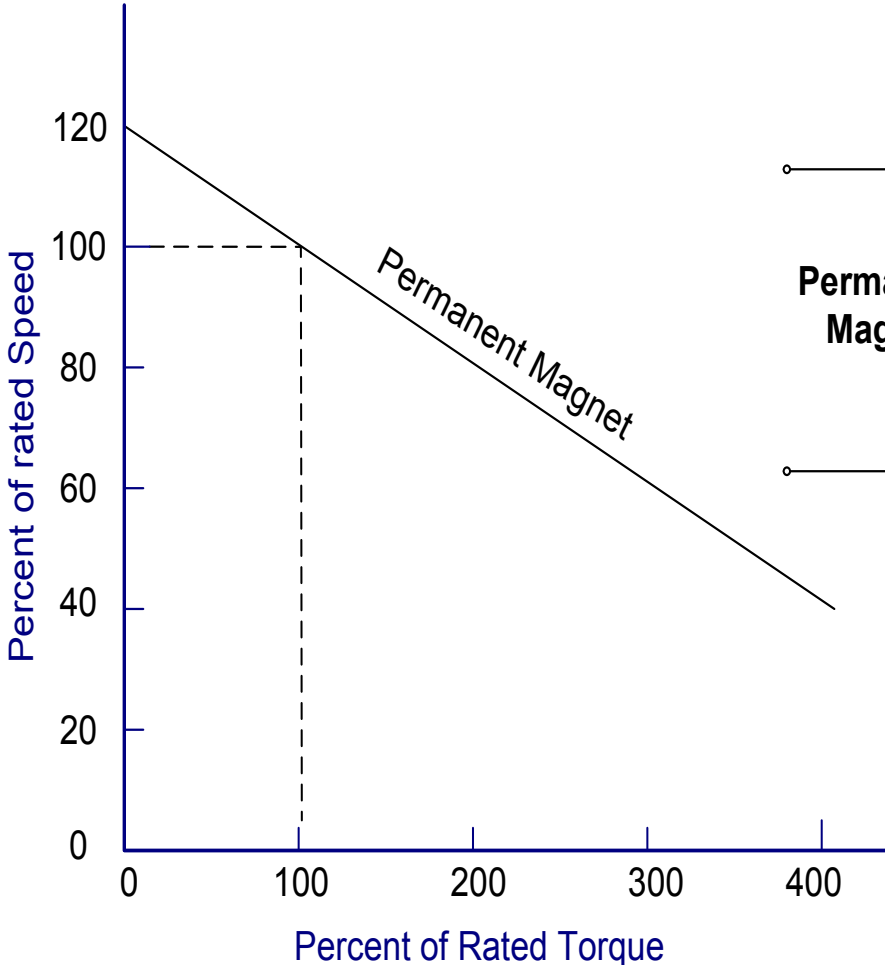
Special Electrical Machines

UNIT-IV

Permanent Magnet Machines

- Types of permanent magnets and their magnetization characteristics, demagnetizing effect, permanent magnet dc motors, sinusoidal PM ac motors, brushless dc motors and their important features and applications, PCB motors.

Permanent magnet DC motors

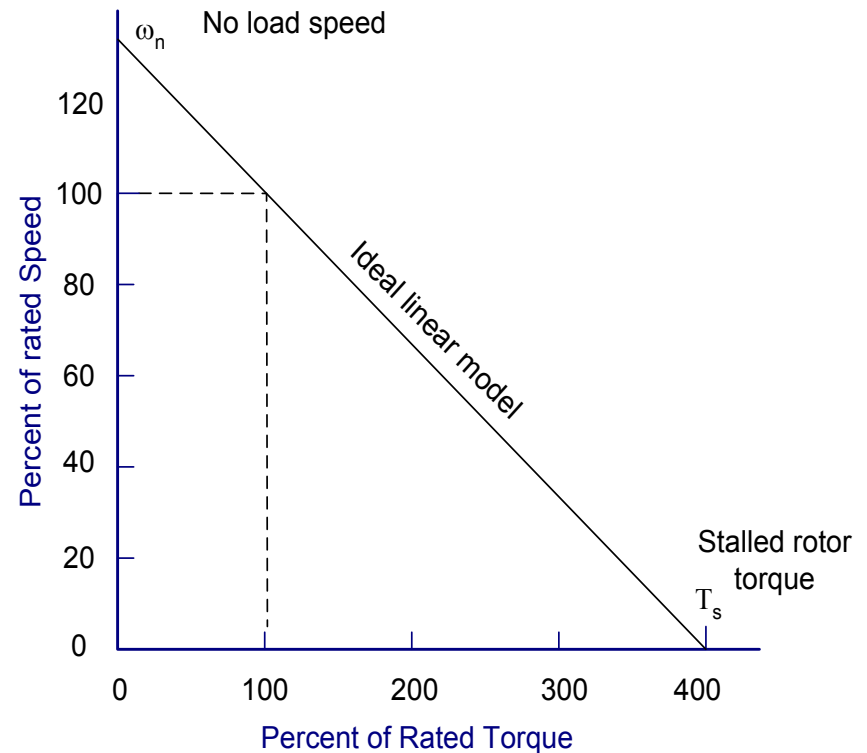


Permanent Magnet DC Motors

- Have permanent magnets rather than field windings but with conventional armatures. Power only to armature.
- Short response time
- Linear Torque/Speed characteristics similar to shunt wound motors. Field magnetic flux is constant
 - Current varies linearly with torque.
- Self-braking upon disconnection of electrical power
 - Need to short + to – supply, May need resistance to dissipate heat.
- Magnets lose strength over time and are sensitive to heating.
 - Lower than rated torque.
 - Not suitable for continuous duty
 - May have windings built into field magnets to re-magnetize.
- Best applications for high torque at low speed intermittent duty.
 - Servos, power seats, windows, and windshield wipers.

Modeling DC motors

- A linear speed/torque curve can be used to model DC motors. This works well for PM and compound designs and can be used for control models for narrow ranges for the other configurations
- Model will assume!
 - Linearity
 - Constant thermal characteristics
 - No armature inductance
 - No friction in motor



THANKS....

Queries Please...