

2.6 METHODS OF EXCITATION

Various methods of excitation of the field windings are Separately-excited generators

Self-excited generators: series generators, shunt generators, compound generators With self-excited generators, residual magnetism must be present in the machine iron to get the self-excitation process started.

The relation between the steady-state generated emf E_a and the armature terminal voltage V_a is $V_a = E_a - I_a R_a$

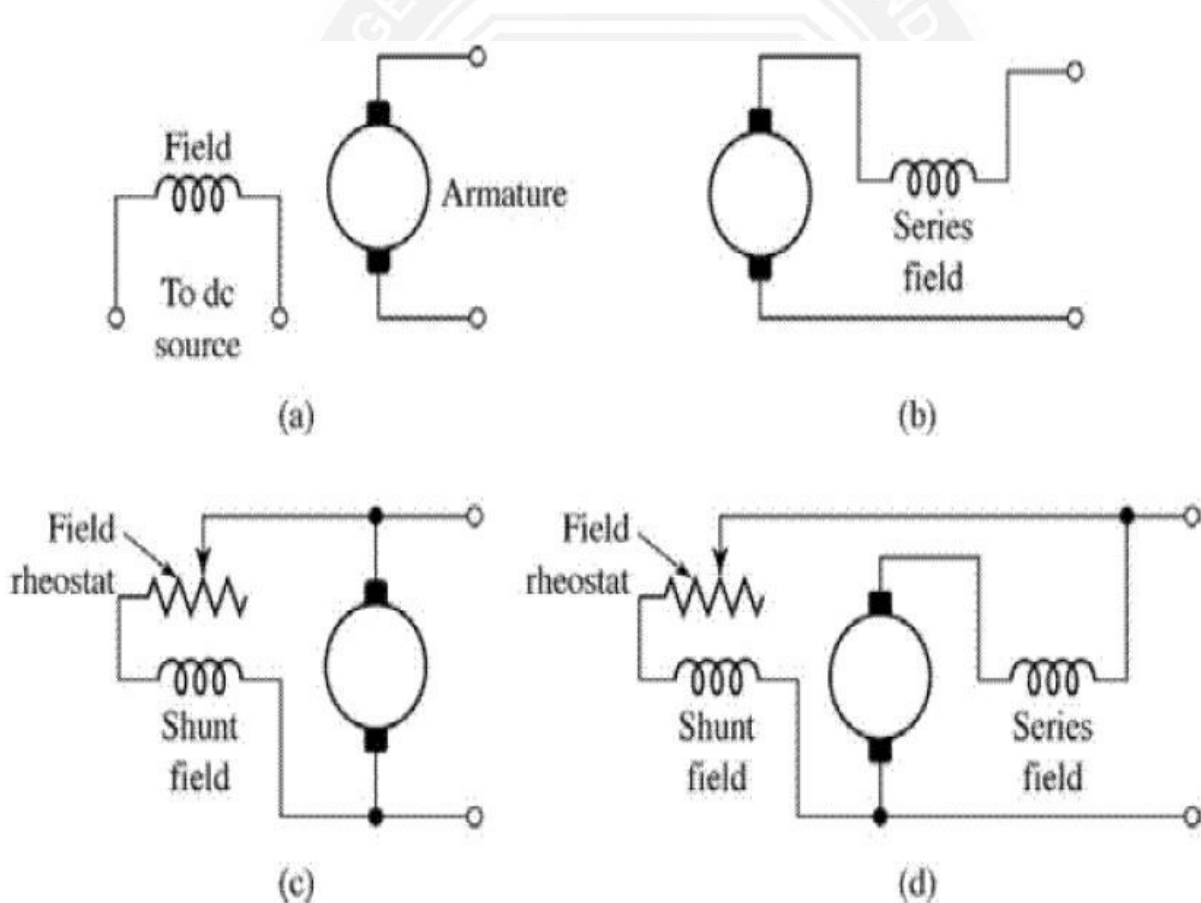


Figure 2.6.1 Method of Excitation

[Source: “Electric Machinery Fundamentals” by Stephen J. Chapman, Page: 332]

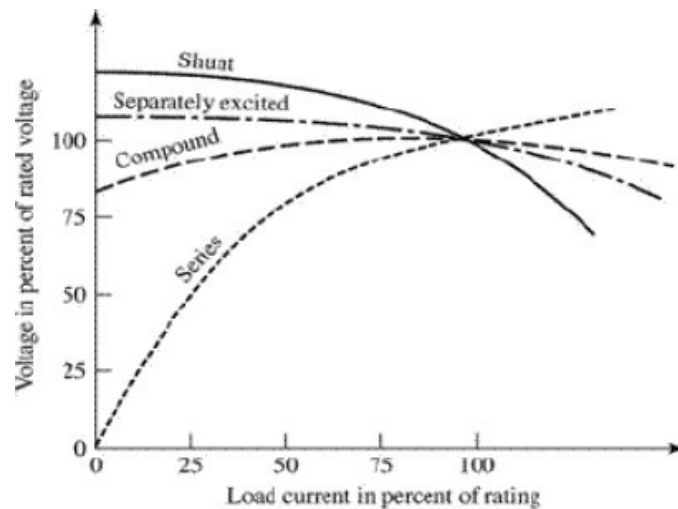


Figure 2.6.2 Load curve

[Source: “Electric Machinery Fundamentals” by Stephen J. Chapman, Page: 333]

Typical steady-state dc-motor speed-torque characteristics are shown in Figure.1.4, in which it is assumed that the motor terminals are supplied from a constant-voltage source.

In a motor the relation between the emf E_a generated in the armature and the armature terminal voltage V_a is $V_a = E_a + I_a R_a$. The application of dc machines lie in the variety of performance characteristics offered by the possibilities of shunt, series, and compound excitation.