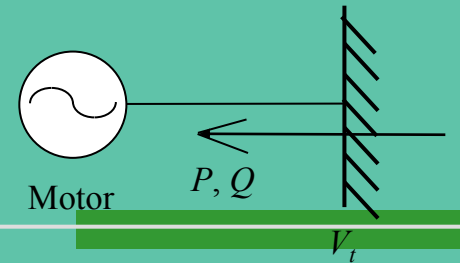


LECTURE 1



Synchronous Motors



- A synchronous motor is the same physical machine as a generator, except that the direction of real power flow is reversed
- Synchronous motors are used to convert electric power to mechanical power
- Most synchronous motors are rated between 150 kW (200 hp) and 15 MW (20,000 hp) and turn at speed ranging from 150 to 1800 r/min. Consequently, these machines are used in heavy industry
- At the other end of the power spectrum, we find tiny single-phase synchronous motors used in control devices and electric clocks

Synchronous Machine Construction

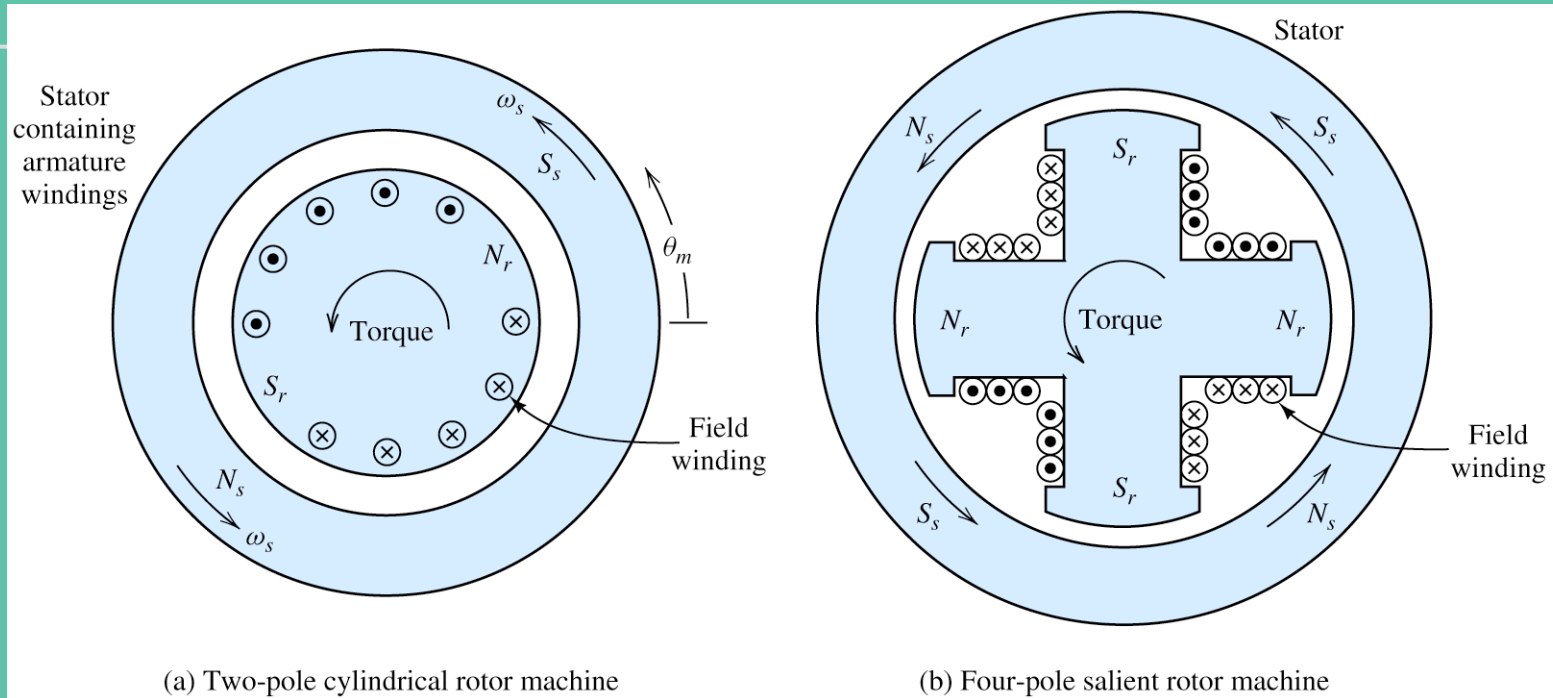
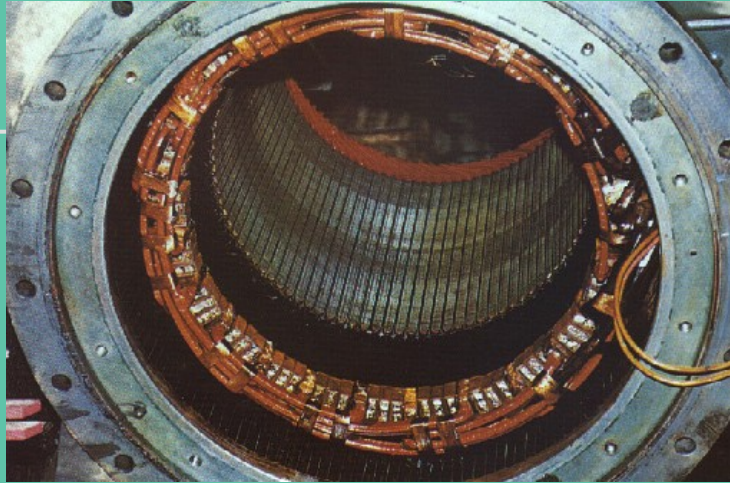
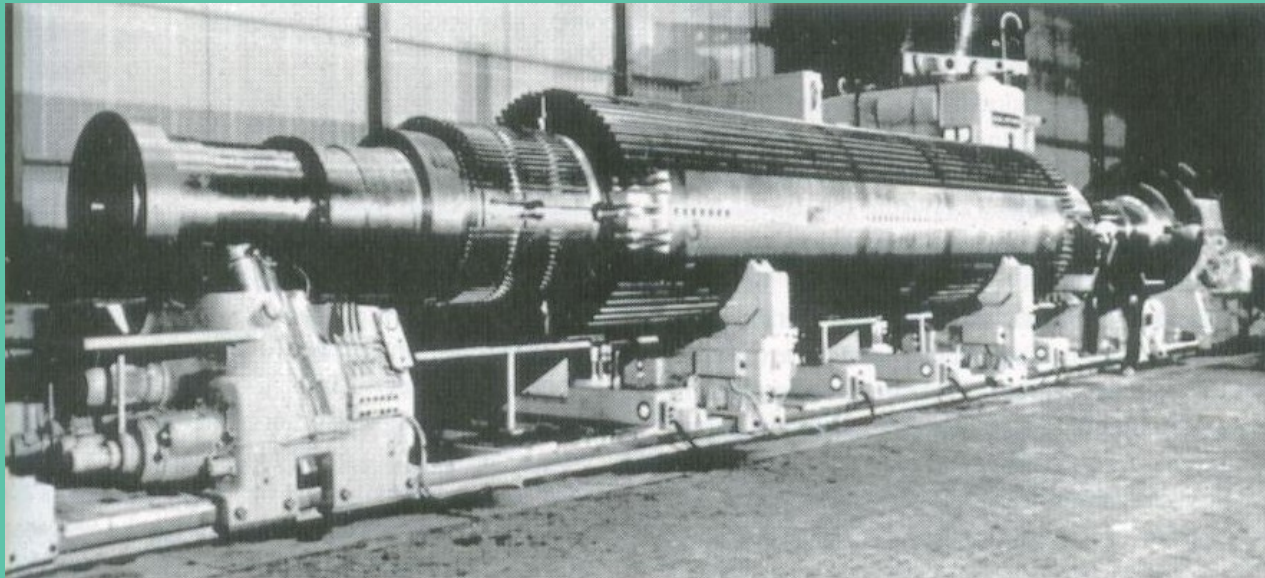


Figure 17.17 Cross sections of two synchronous machines. The relative positions of the stator and rotor poles are shown for motor action. Torque is developed in the direction of rotation because the rotor poles try to align themselves with the opposite stator poles.

Cylindrical-Rotor Synchronous Motor



Stator



Cylindrical rotor