18ECO134T – Sensors and Transducers

Unit IV : Session 1 : SLO 1

Wiedemann effect

(a) Torque sensor   (b) Force sensor

Fig. 4.4 (a) A torque/force sensor using Wiedemann effect. (b) A typical force sensor using magnetostrictive effect.

- Design principles
- With a current I passing in direction

as shown in fig and a torque is produced

in the rod of fig 4.4 a, an output voltage Vot is obtained that gives a measure of the torque.

- Fig 4.4.b, Vof is the output voltage for the force in the balanced condition.
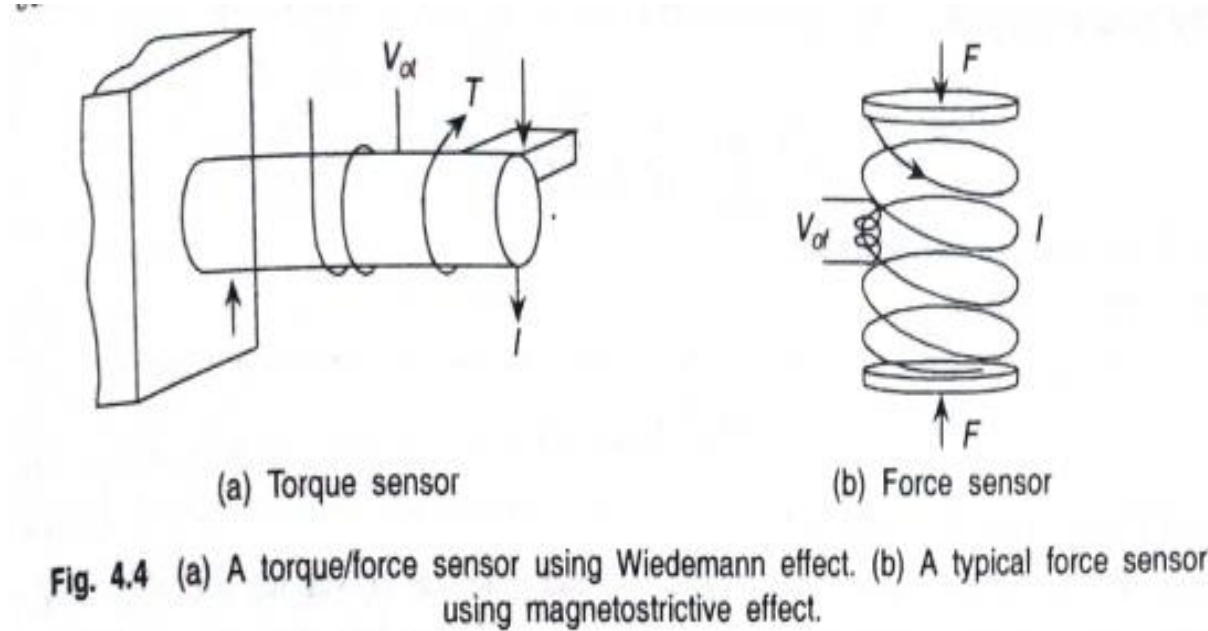
Cont...

- **Wiedemann effect has 2 inverse effects:**

- When a ferromagnetic rod which is circularly magnetized, is twisted, a longitudinal magnetic field is produced in it.

- When such a rod with longitudinal magnetization is twisted, a circular magnetic field is produced in it which essentially is matteucci effect.