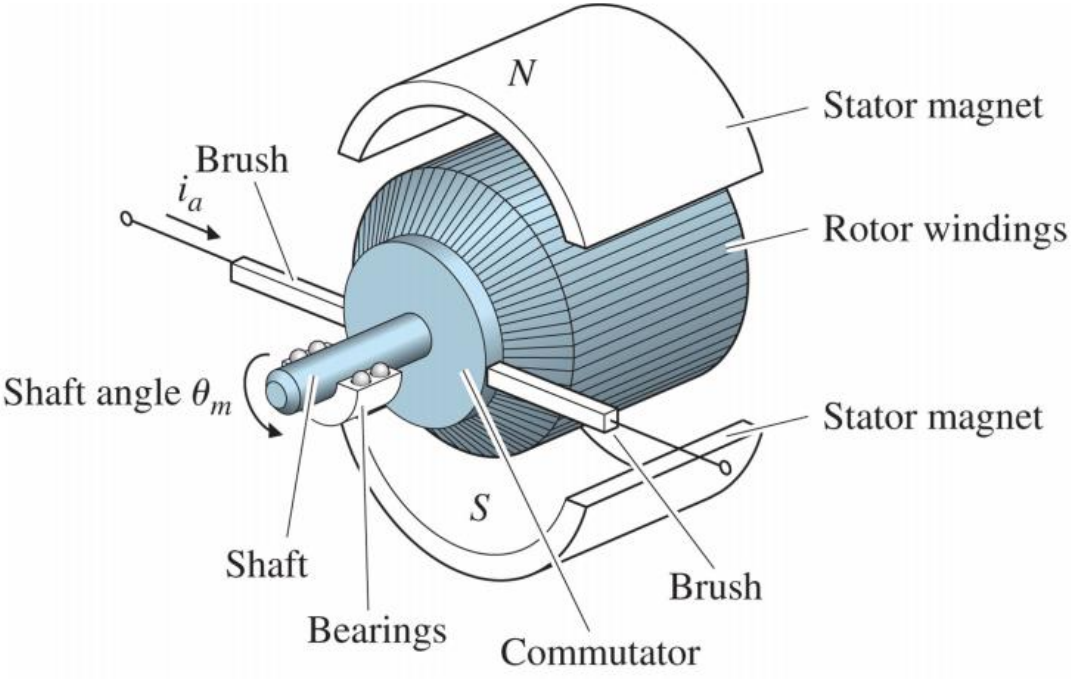
Modeling DC Servo Motor

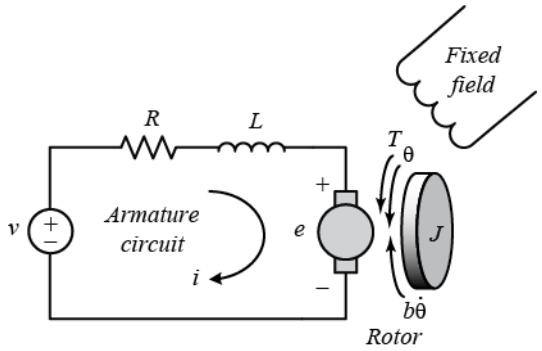
What is a DC Servo Motor

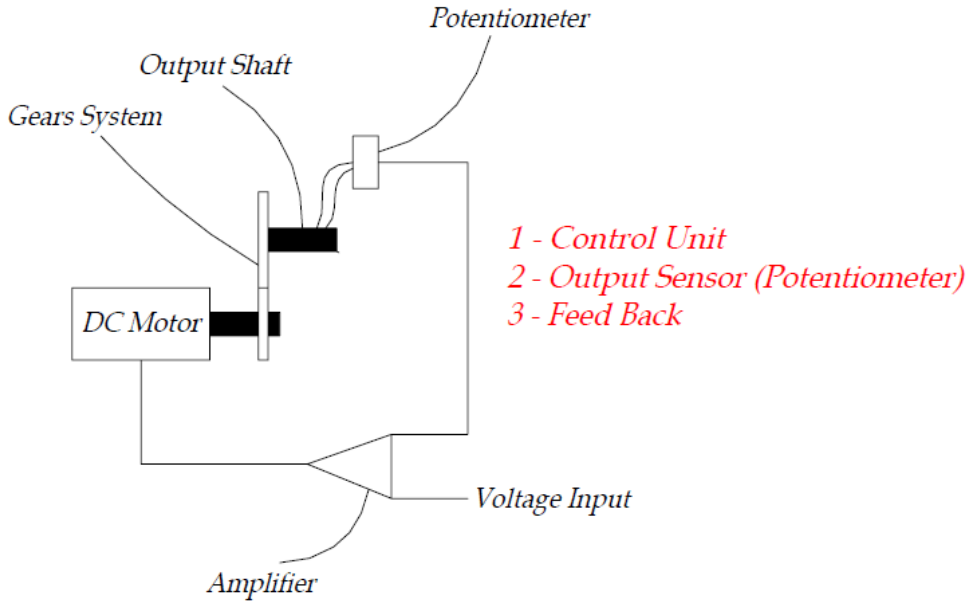
DC Servo Motor = DC Motor + Servo Mechanism

What is a DC Servo Motor

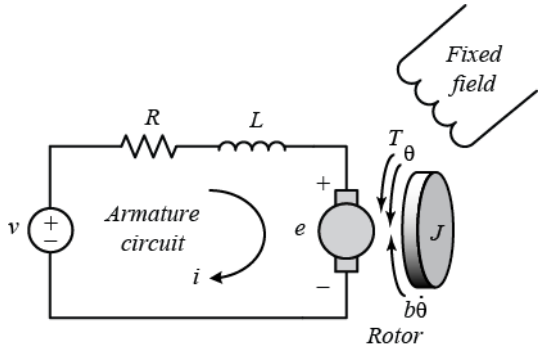


Servo Mechanism





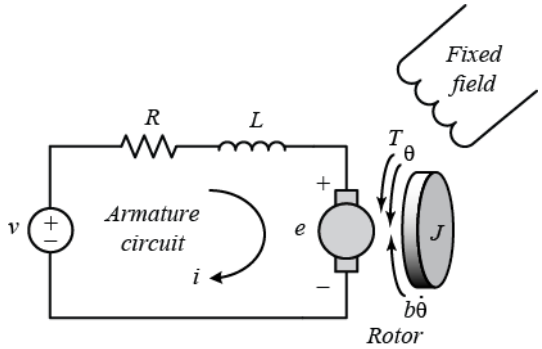
Mathematical Modeling



$$v = iR + Li^{\circ} + e$$
$$e = k_b\theta^{\circ}$$
$$T = k_t i$$
$$T = j\theta^{\circ\circ} + b\theta^{\circ}$$

$$V = I[R + sL] + E$$
$$E = K_b\theta^{\circ}$$
$$T = k_t I$$
$$T = \theta^{\circ}[js + b]$$

Mathematical Modeling



$$v = iR + Li^{\circ} + e$$

$$e = k_b\theta^{\circ}$$

$$T = k_t i$$

$$T = j\theta^{\circ\circ} + b\theta^{\circ}$$

$$i^{\circ} = \frac{1}{L}(v - iR - e)$$

$$T = k_t i$$

$$\theta^{\circ\circ} = \frac{1}{j}(T - b\theta^{\circ})$$

$$e = K_b\theta^{\circ}$$

Assignment Answer

$$V = I[R + sL] + E$$

$$E = K_b\theta°$$

$$T = k_t I$$

$$T = \theta°[js + b]$$