

Problem 3A.1

Torque required to turn a friction bearing (Fig. 3A.1). Calculate the required torque in $\text{lb}_f \cdot \text{ft}$ and power consumption in horsepower to turn the shaft in the friction bearing shown in the figure. The length of the bearing surface on the shaft is 2 in, and the shaft is rotating at 200 rpm. The viscosity of the lubricant is 200 cp, and its density is $50 \text{ lb}_m/\text{ft}^3$. Neglect the effect of eccentricity.

Answers: $0.32 \text{ lb}_f \cdot \text{ft}$; $0.012 \text{ hp} = 0.009 \text{ kW}$

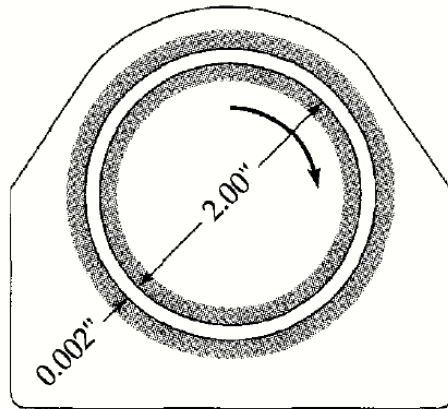


Fig. 3A.1. Friction bearing.