11-9  Shown in the figure is a gear-driven squeeze roll that mates with an idler roll, below. The roll is designed to exert a normal force of 30 lbf/in of roll length and a pull of 24 lbf/in on the material being processed. The roll speed is 300 rev/min, and a design life of 30,000 h is desired. Use an application factor of 1.2, and select a pair of angular-contact 02-series ball bearings from Table 11-2 to be mounted at 0 and A. Use the same size bearings at both locations and a combined reliability of at least 0.92.

Problem 11-9
Idler roll is below powered roll.
Dimensions in inches.

11-10  The figure shown is a geared countershaft with an overhanging pinion at C. Select an angular-contact ball bearing from Table 11-2 for mounting at O and a straight roller bearing for mounting at B. The force on gear A is \( F_A = 600 \text{ lbf} \), and the shaft is to run at a speed of 480 rev/min. Solution of the statics problem gives force of bearings against the shaft at O as \( R_O = -387j + 467k \text{ lbf} \), and at B as \( R_B = 316j - 1615k \text{ lbf} \). Specify the bearings required, using an application factor of 1.4, a desired life of 30,000 h, and a combined reliability goal of 0.90.

Problem 11-10
Dimensions in inches.

11-11  The figure is a schematic drawing of a countershaft that supports two V-belt pulleys. The countershaft runs at 1200 rev/min and the bearings are to have a life of 60 kh at a combined reliability of 0.999. The belt tension on the loose side of pulley A is 15 percent of the tension on the tight side. Select deep-groove bearings from Table 11-2 for use at O and E, each to have a 25-mm bore, using an application factor of unity.