Problem Session - Bearings

The figure below shows a stepped shaft supported by two 6300-series bearings. Two gears with equal and opposite torque are keyed to the shaft as shown. The load on each gear consists of a radial component and a tangential component, which acts at diameter D. The radial component on each gear is 0.466 times the tangential component on that gear. Note that the gear loads are 90° out of phase form gear 1 to gear 2. Select a suitable bearing for bearing 1. Choose the bearing that has the least bore diameter, OD, width, and the basic dynamic load rating of the bearing (report all dimensions in mm).

You may assume all bearings act as simple supports.

a = 4.0 inches b = 8.0 inches c = 12 inches Plt = 2000 lb D1 = 2.00 inches D2 = 4.0 inches Design Life, L10 = 80 E6 revolutions

Repeat this problem given an axial force of 800 lbs. acting on gear 1.