

4-1. A vertical random force $P \sim N(550, 15^2)$ lb acts on a shaft as shown in the figure. The sleeve bearings at A and B support only vertical forces. The diameter of the shaft is $d = 1.2$ in and the allowable bending stress of the shaft is $S_a \sim N(30, 1.2^2)$ ksi. Determine the probability of failure of the shaft. (**Ans.** $p_f = 0.0019$)

