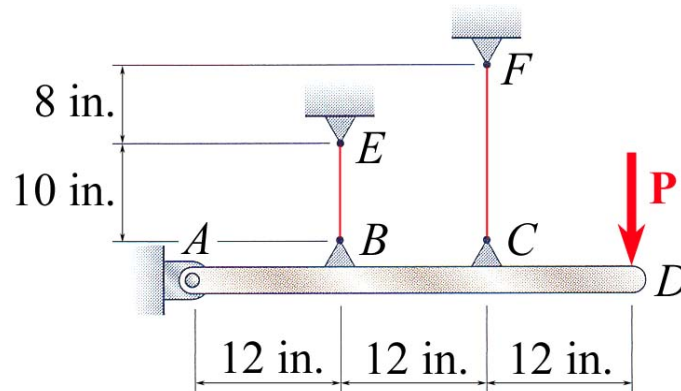The rigid bar *AD* is supported by two steel wires of 0.0625-in. diameter ($E = 29 \times 10^6$ psi) and a pin and bracket at *A*. Knowing that the wires were initially taut, determine (*a*) the additional tension in each wire when a 290-lb load **P** is applied at *D*, (*b*) the corresponding deflection of point *D*.

FBD of bar *AD* ②

$+\circlearrowleft \Sigma M_A = 0:$ $12 F_{BE} + 24 F_{CF} - 36(290) = 0$ ①

$2\delta_{BE} = \delta_{CF}:$ $\dfrac{2 F_{BE}(10)}{\pi(0.0625/2)^2(29\times10^6)} = \dfrac{F_{CF}(18)}{\pi(0.0625/2)^2(29\times10^6)}$ ②

$F_{BE} = 270 \text{ lb}$ ① $F_{CF} = 300 \text{ lb}$ ①

$\delta_D = 3\delta_{BE} = \dfrac{3 F_{BE}(10)}{\pi(0.0625/2)^2(29\times10^6)} = 0.091041$ ②

$\delta_D = 0.0910 \text{ in.} \downarrow$ ①