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Cool! I'am really happy

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#Diego Butler



so many fake sites. this is the first one which worked! Many thanks

**PROBLEM 2.46**

The rigid bar AD is supported by two steel wires of  $\frac{1}{2}$ -in. diameter (E =  $29 \times 10^6$  psi) and a pin and bracket at D. Knowing that the wires were initially taut, determine (a) the additional tension in each wire when a 120-lb load P is applied at B, (b) the corresponding deflection of point B.

**SOLUTION**

Let  $\delta$  be the rotation of bar ABCD.

Then  $\delta = \theta$

$$\delta = \frac{P_{AB} L_{AB}}{AE} = \frac{P_{AB} (12 \text{ in})}{AE}$$

$$P_{AB} = \frac{AE \delta}{12 \text{ in}} = \frac{AE \delta}{12}$$

$$P_{CD} = \frac{AE \delta}{12}$$

$$P_D = \frac{AE \delta}{12} + \frac{AE \delta}{12} = \frac{AE \delta}{6}$$

Using free body ABCD:

$$\sum M_D = 0: 24(42.355 \text{ lb}) + 16(20) - 8(89.711 \text{ lb}) + 0 = 0$$

$$P_{AB} = 42.355 \text{ lb} \quad P_{CD} = 40.403 \text{ lb}$$

(a)  $P_{AB} = 42.355 \text{ lb}$  ( $0.405 \times 10^3$ )  $P_{CD} = 40.4 \text{ lb}$

(b)  $\delta = 16.160(40.403 \text{ lb}) = 654.410 \text{ in}$

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